

Monday, September 14, 2020

College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
5:00 PM

Meeting may be viewed at: Live Stream on City of College Place, Washington YouTube at https://www.youtube.com/channel/UCbx3qrqzLDL_05NusReSI-g/featured

Or you may call this number to listen: 1-669-900-9128 ID#949 9347 8357

1. Opening Items

Subject :	1.01 Call To Order
Meeting :	Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category :	1. Opening Items
Access :	Public
Type :	Procedural

Public Content

	Bill Clemens,
	Kelli Leen,
EDTEC Appointed Members	Jeff Lambert,
	Doug Case
	Jenny Fuchs
EDTEC Ex Officio Members	WW Chamber, Kyle Tarbett
EDTEC Advisory Members	City Administrator, Mike Rizzitiello
	Finance Director, Brian Carleton

2. Consent Agenda

Subject :	2.01 Approve Agenda for
Meeting :	Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category :	2. Consent Agenda
Access :	Public
Type :	Action (Consent)

Consent

Our adopted rules of Parliamentary Procedure, The Standard Code of Parliamentary Procedure by Alice Sturgis, 4th Edition, provide for a consent agenda listing several items for approval of the Board by a single motion. Most of the items listed under the consent agenda have gone through Board subcommittee review and recommendation. Documentation concerning these items has been provided to all board members and the public in advance to assure an extensive and thorough review. Items may be removed from the consent agenda at the request of any board member.

Subject : 2.02 Approve Minutes from July 6, 2020
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 2. Consent Agenda
Access : Public
Type : Action (Consent), Minutes

File Attachments

[2020-07-06-BoardDocs® LT Plus.pdf \(915 KB\)](#)

Consent

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Subject : 2.03 Excuse Absence of Jeff Lambert
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 2. Consent Agenda
Access : Public
Type : Action (Consent)

Consent

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Subject : 2.04 Approve Consent Agenda and Excuse Absence of Jeff Lambert - Our adopted rules of Parliamentary Procedure, The Standard Code of Parliamentary Procedure, provide for a consent agenda listing items for approval of the Commission by a single motion. Typically the items listed under the consent agenda are the minutes from previous meetings and the agenda for the current meeting. Documentation concerning these items has been provided to all Commission

Members and the public in advance to assure an extensive and thorough review. Items may be removed from the consent agenda at the request of any Commission Member.

Meeting :	Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category :	2. Consent Agenda
Access :	Public
Type :	Action (Consent)
Recommended Action :	Motion to approve the consent agenda

Consent

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3. Reports

Subject :	3.01 Discussion Protocol for Virtual Meetings
Meeting :	Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category :	3. Reports
Access :	Public
Type :	Information

Public Content

Virtual Meeting Discussion Protocol:

- After staff presentation of an item, the Chair will request comments from each Member
- After each member has had an opportunity, the Chair will then speak if so desired and Members will use the raise hand feature to notify the Chair of their desire to speak again. However, they will not enter the conversation without first being recognized by the Chair. This should allow for a thorough discussion with everyone having opportunity to express their views while maintaining order.

File Attachments

[Virtual_Meeting_Raise_Your_Hand.pdf \(50 KB\)](#)

Subject :	3.02 College Avenue Traffic Assessment Recommendations - Mr. Gordon
Meeting :	Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category :	3. Reports

Access :

Public

Type :

Discussion, Information

Public Content

Historical Perspective:

Since College Avenue was reconstructed some users have complained of the traffic patterns on South College Avenue. This item was originally brought to City Council on January 10th, 2017 and again on March 28th, 2017. It was tabled until substantial completion on the project was met. Council authorized DN Traffic Consultants to conduct an assessment on 3/12/2019.

Information for Consideration:

DN Traffic Consultants completed their deliverables on 5/15/2020 and presented their recommendations (Exhibit 2) to the Utilities and Transportation Advisory Commission on 7/9/2020.

The UTAC evaluated the various issues and made the following recommendations (Exhibit 1):

1. College Avenue Traffic Patterns/Striping/Configuration

UTAC Recommendation: Leave left-turn lanes as they currently are.

2. College Avenue Sight Distance Triangles

UTAC Recommendation: Deferred. Staff to provide additional research (impacts to lots, parking and practices of other jurisdictions, etc.)

3. College Avenue Speed Limit

UTAC Recommendation: Set speed limit consistently from Rose St. to Cedar Bend.

4. Bicycle Accommodations

UTAC Recommendation: Bring proposed amendment to ordinance allowing bicycle use of College Avenue under certain conditions back to UTAC at next meeting along with recommendation for either striping or signing College Avenue as a bicycle route.

5. Other Recommendations

a) Pedestrian detection at HAWK signals (pedestrian signals between Whitman Dr. and 4th St.)

UTAC Recommendation: Table issue unless staff brings it back for a recommendation.

b) Bus stops at intersections

UTAC Recommendation: Staff to work with Valley Transit to evaluate each bus stop location on the College Ave. corridor regarding safety issues.

DN Traffic Consultants had also been asked to evaluate a one/way, back-in parking revision on 3rd Street (Exhibit 3). The UTAC recommended not to change the traffic configuration due to the hazardous nature of back-in angled parking.

DN's traffic assessment was based on the assumption of a future north-south Davis extension terminating

across from Sunny Ave. Three other options (including no Davis extension) are also under consideration and DN Traffic Consultant was also asked to analyze traffic volumes and levels of services associated with each option. This analysis is attached as Exhibit 4.

File Attachments

[20200709.Exhibit_1_UTAC_Draft_Minutes.pdf \(1.779 KB\)](#)
[20200501.Exhibit_2_College Ave Traffic Assessment.pdf \(12.674 KB\)](#)
[20190515.Exhibit_3_3rd Street Parking Mod.pdf \(533 KB\)](#)
[20200506.Exhibit_4_AltAnalMemo.pdf \(410 KB\)](#)

Subject : 3.03 College Place Farmers Market Update
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 3. Reports
Access : Public
Type : Discussion, Information

File Attachments

[College Place Farmers & Artisan Market2020.07.24.pdf \(653 KB\)](#)

Administrative File Attachments

[College Place Farmers & Artisan Market2020.07.24.pptx \(3.699 KB\)](#)

Subject : 3.04 CP Holiday Decorations "Light Up The Avenue"
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 3. Reports
Access : Public
Type : Discussion, Information

File Attachments

[Light up the Avenue.PARbd.presentation.pdf \(3.729 KB\)](#)

Subject : 3.05 Library Update
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 3. Reports
Access : Public
Type : Discussion, Information

File Attachments

[Picture3.jpg \(106 KB\)](#)
[CurbsidePickUp.jpg \(53 KB\)](#)
[Picture1.jpg \(77 KB\)](#)
[Picture2.jpg \(70 KB\)](#)

Subject : 3.06 Development Tracker
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 3. Reports
Access : Public
Type : Information

File Attachments

[DevelopmentTrackSheet_08032020.pdf \(450 KB\)](#)

4. Action Agenda

Subject : 4.01 EDA Grant Application for Treatment Plant Letter of Support
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 4. Action Agenda
Access : Public
Type : Action
Recommended Action : Motion to submit letter of support for the grant application to the Economic Development Administration's Public Works and Economic Adjustment Assistance CARES Act Funding Grant Program for the City's Wastewater Treatment Plant Upgrade/Renovation Project.

File Attachments

[Wastewater_WTTPUpgrade_Flier.pdf \(496 KB\)](#)
[GrantManagement_PublicWorks_2020_EDA_LOS_Template.pdf \(78 KB\)](#)
[GrantManagement_PublicWorks_2020_ProjectBeneficiaryForms-copy.pdf \(1.414 KB\)](#)

5. Closing Items

Subject : 5.01 Adjourn
Meeting : Sep 14, 2020 - College Place Economic Development, Tourism, and Events Commission- Electronic Meeting
Category : 5. Closing Items
Access : Public
Type : Procedural

College Place Economic Development, Tourism, and Events Commission - Electronic Meeting (Monday, July 6, 2020)

Generated by Carolyn Holm on Monday, July 6, 2020

1. Opening Items

Procedural: 1.01 Call To Order

Member Clemens called the meeting to order at 5:02 PM.

PRESENT:

Commission Members	Bill Clemens, Kelli Leen, Jenny Fuchs
Ex- Officio	Kyle Tarbet-Walla Walla Chamber of Commerce City Administrator, Mike Rizzitiello
Staff	Finance Director, Brian Carleton; Deputy City Clerk, Carolyn Holm;

MEMBERS EXCUSED: Jeff Lambert

MEMBERS ABSENT: Doug Case/Dan Andrews

2. Consent Agenda

Action (Consent): 2.01 Approve Agenda for 7/6/2020

Action (Consent), Minutes: 2.02 Approve Minutes from February 3rd, 2020

Action (Consent): 2.03 Approve Consent Agenda - Our adopted rules of Parliamentary Procedure, The Standard Code of Parliamentary Procedure, provide for a consent agenda listing items for approval of the Commission by a single motion. Typically the items listed under the consent agenda are the minutes from previous meetings and the agenda for the current meeting. Documentation concerning these items has been provided to all Commission Members and the public in advance to assure an extensive and thorough review. Items may be removed from the consent agenda at the request of any Commission Member.

Member Tarbet made a motion to approve the consent agenda. Second by Member Leen and the motion passed 3-0.

3. Reports

Information: 3.01 Discussion Protocol for Virtual Meetings

Discussion, Information: 3.02 Safe Start Reopening

Mr. Rizzitiello informed we are in Phase 2 and reviewed how we will move forward with the Safe Start. He indicated the county submitted an application for Phase 2.5 Phase 2 weeks ago; but during this timeframe the county did not meet one of the benchmarks. The Governor announced a freeze of any county moving phases for the next two weeks. Mr. Rizzitiello reviewed the case counts for the county by city. The city received some emergency cares money from the state to assist with COVID-19 preparedness; this money was used to purchase personal protective equipment. The City will have a drive-through distribution of free sanitizer and masks at the City Hall and another at Lion's Park.

The City recently passed the continuation of the City Emergency Disaster Declaration. He reviewed the items that are covered in the Declaration. The library will not be opened until we are approved for the Phase 2.9, submitted to the State. He informed the original plan was to have the Library staff serve as the distribution for masks and hand sanitizer.

Discussion, Information: 3.03 Business Aide - COVID-19

Mr. Rizzitiello informed a group of advisors have been working on business aide to provide grants and technical assistance to small businesses in the community. He informed they have received grant funding from Working Washington Small Business Emergency Grants and Walla Walla Small Business Relief Program. The award amounts and recipients are available in the packet attachments.

Discussion, Information: 3.04 Economic Impact

Mr. Rizzitiello announced he was recently appointed to Association Washington Municipal Cities Legislative Priorities Committee. He gave an update regarding the economic impacts at this time.

Discussion, Information: 3.05 Farmers Market Stats / Update

Ms. Holm provided an update on the status of the Farmers Market; the market season opened with Phase 1 allowing only essential vendor types. When the County moved to Phase 2, the market was able to extend the vendor opportunity to hand crafters/artisans and any others. The season to date gross revenue pie graph was provided for review. Supplemental Nutritional Assistance Program (SNAP) is a new program this year and requires that we have 50% of annual gross sales are from staple foods. The COVID-19 updated layout and logistics were reviewed.

Discussion, Information: 3.06 College Avenue Study

Mr. Rittitiello introduced the report for the College Avenue Traffic Study and asked the Commission to review. This will be provided at the next meeting for comment. He reviewed key points in the report.

Discussion, Information: 3.07 Eservices - Community Development

Mr. Rizzitiello provided an informational update regarding the new software purchase for Community Development. This software will automate our permitting program and provide a project management platform, which is required. Many grant applications ask if a formal project management platform is being used. The software allows contractors and homeowners who have submitted permit applications to see where their applications are in the approval process.

Discussion, Information: 3.08 Development Tracker

Mr. Rizzitiello gave an overview of the status of current and potential development projects. Discussion ensued.

4. Action Agenda

Action: 4.01 Lions Park Renovation Letter of Support - Mr. Rizzitiello

Member Leen made a motion to approve issuing letter of support for the various submittals to the State Recreation Conservation Office (RCO) for grants to renovate Lions Park.

Second by Member Tarbett and the motion passed 4-0.

5. Closing Items

Procedural: 5.01 Adjourn

With no further business, Member Clemens adjourned the meeting at 6:03 PM.

Approved:

Jeff Lambert- Chair

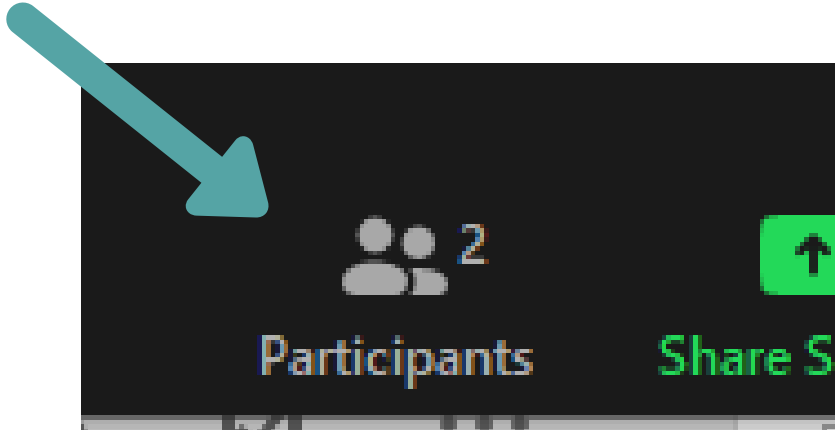
Attest:

Lisa Neissl – City Clerk

The foregoing minutes are the official record of the Economic Development, Tourism, and Events Commission meeting that occurred July 6 2020. Further detail may be obtained by reviewing the actual audio recording made during this session.

Zoom Tutorial:

How To Raise Your Hand!



To use the "Raise Hand" function of the meeting software:

Locate
"Participants" at
the bottom of the
meeting window.
Click on it.

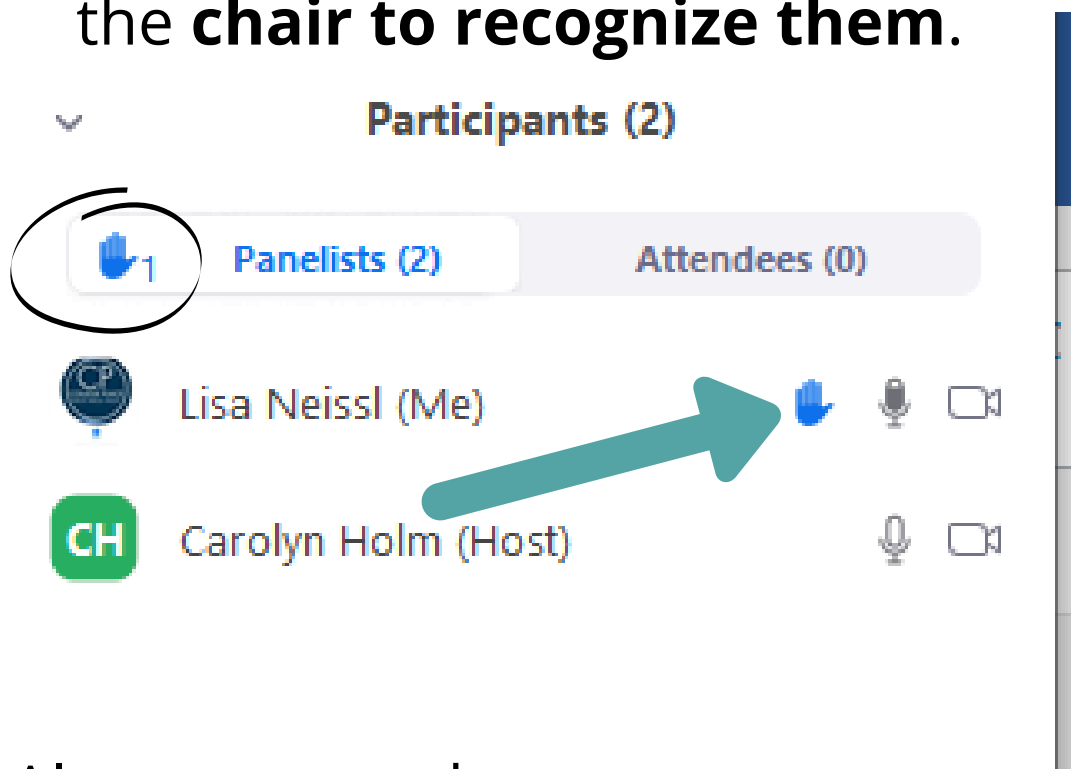
This will bring up a list of the participants. One tab for panelists and another for attendees.

On the bottom right is a button to **Raise Hand**



Zoom Tutorial: How To Raise Your Hand! (Cont.)

The participants tabs will show who and how many are raising their hands to allow the **chair to recognize them**.



Also note, you have easy access to mute/unmute and video settings here.



Utility and Transportation Advisory Commission Meeting (Thursday, July 9, 2020)

Generated by Lisa Neissl on Thursday, July 9, 2020

1. Opening Items.

Procedural: 1.01 Call to Order

Commissioner Bennett called the meeting to order at 3:32 PM.

Information, Procedural: 1.02 Roll Call

Commissioners Present:

George Bennett

Scott Hanson

Byron Trop

Nadine Barragan Stecklein

Commissioners Absent:

Ray Geigle, Excused

Others Present:

City Engineer, Robert Gordon

Public Works Director, Paul Hartwig (left meeting at 5:20 PM)

Community Development Director, Jon Rickard (left meeting at 5:30 PM)

Consultant, Gary Norris

Consultant, Robert Shull

City Clerk, Lisa Neissl

2. Consent Agenda.

Action (Consent): 2.01 Approve Agenda for July 9, 2020

Action (Consent), Minutes: 2.02 Approve Minutes from February 13, 2020

Action (Consent): 2.03 Excuse Absence of Commissioner Geigle.

Action (Consent): 2.04 Approve Consent Agenda - Our adopted rules of Parliamentary Procedure, The Standard Code of Parliamentary Procedure, provide for a consent agenda listing several items for approval of the Council by a single motion. Most of the items listed under the consent agenda have gone through previous review either during the budget process, at a workshop, or by subcommittee review and recommendation. Documentation concerning these items has been provided to all Commissioners and the public in advance to assure an extensive and thorough review. Items may be removed from the consent agenda at the request of any Commissioner.

Commissioner Stecklein made a motion to approve the consent agenda items. Second by Commissioner Trop and the motion passed 4-0.

3. Regular Agenda.

Information: 3.01 Discussion Protocol for Virtual Meetings -

Ms. Neissl reviewed the process to use on virtual meetings for raising hands for discussion.

Discussion, Information: 3.02 Commission Resignations/Appointments -

Ms. Neissl noted that there have been two resignations and appointments since the last meeting of this commission.

Action: 3.03 Election of Chair / Vice Chair

Discussion was held to determine if any members were willing and able to perform the duties of Chair and Vice Chair.

Commissioner Trop made a motion to appoint George Bennett as Chair of the commission. Second by Commissioner Stecklein and the motion passed 3-0.

Commissioner Trop made a motion to appoint Nadine Stecklein as Vice Chair of the commission. Second by Commissioner Bennett and the motion passed 4-0.

Action, Discussion: 3.04 College Avenue Traffic Assessment Study Review -

Mr. Gordon introduced Gary Norris of DN Traffic Consultants, and Robert (Bob) Shull of Eco Resource Management Systems who both worked on this study. He explained the various aspects of the College Avenue corridor that were reviewed in the study. He asked that the Commission listen to the

information and recommendations from the consultants and staff; and provide recommendations to Council regarding those recommendations.
Discussion ensued.

Following actions/requests were made regarding the study recommendations:

- A) College Avenue Traffic Patterns/Striping/Configuration - After discussion,
Commissioner Stecklein made a motion to recommend Council leave the left turn lanes as they are currently. Second by Commissioner Trop and the motion passed 4-0.
- B) College Avenue Sight Distance Triangle - After discussion,
The Commission requested additional information be brought back to answer some questions regarding this recommendation. This will be added to the agenda for the next meeting.
- C) College Avenue Speed Limit - After discussion,
Commissioner Bennett made a motion to recommend Council set the speed limit consistently at 25 mph from Rose St. to Cedar Bend. Second by Commissioner Trop and the motion passed 4-0.
- D) Bicycle Accommodations on College Avenue - After discussion,
Commissioner Bennett made a motion to recommend Council amend the Ordinance about bicycles on sidewalks to indicate that bicycles under certain conditions can use the sidewalk, and they must obey pedestrian rules. And the bike route on College Ave. be designated by signage or paint at staff's discretion at least every block that it is a bike route. Second by Commissioner Stecklein.
Discussion ensued.
Mr. Rickard requested additional clarification and specification on exactly what the ordinance amendment should be.
Discussion ensued.
Commissioner Bennett made a motion to amend the motion to specify bicycle traffic on the sidewalk less than 10 mph. With no second, Commissioner Bennett withdrew his amendment.
Commissioner Bennett made a motion to amend the motion to have staff draw up an ordinance amendment and bring it back to the commission for consideration. Second by Commissioner Stecklein and after additional discussion the amendment passed 4-0.
Vote on the amended motion: Recommendation on modification to the ordinance about bicycles that staff will bring back a proposed amendment at the next meeting of the UTAC. And recommending at this time for signage by either paint or sign, at Staff's discretion, to designate a bike route on College Avenue. - On vote the motion passed 4-0.
- E) Other Recommendations
- Post Office Crosswalk Improvements - Mr. Gordon noted that Council has already authorized staff to seek funding for this project.

Consensus was not to make a recommendation as Council is already moving on this.
 - Pedestrian detection at Hawk Signals -

After discussion, the consensus of the Commission was to table the issue unless the staff brings it back for a recommendation.
 - Bus stops at intersections - Discussion ensued.

Commissioner Stecklein made a motion to have city staff work with Valley Transit to evaluate each bus stop location on the College Avenue corridor regarding safety issues. Second by Commissioner Trop and the motion passed 4-0.

Action, Discussion: 3.05 3rd Street Parking Modification -

Mr. Gordon & Gary Norris of DN Traffic Consultants provided some information regarding a request to introduce back-in diagonal parking on 3rd street between College Ave and Ash Ave. They gave safety information related to options of one way traffic with parallel parking, back-in diagonal parking or front-in diagonal parking.

Note: Commissioner Bennett abstained from motions or voting on this item due to his position at the requesting agency. He did provide some insight to the reasoning behind the request.

Commissioner Trop made a motion to not change the traffic configuration due to the hazardous nature of back-in angled parking. Second by Commissioner Hanson.

Discussion ensued.

On vote, the motion passed 2-1 with one abstention. (For, Trop & Hanson; Against, Stecklein; Abstain, Bennett)

Discussion ensued.

Action, Discussion: 3.06 Cancellation of Regular UTAC Meeting scheduled for August 13th, 2020

Commissioner Trop made a motion to cancel the regularly scheduled meeting in August. Second by Commissioner Bennett and the motion passed 4-0.

The next meeting of the UTAC will be held on November 12, 2020.

4. Reports - None.

5. Closing Items.

Procedural: 5.01 Adjourn

With no additional business and no objection, the meeting adjourned at 6:08 PM.

Approved:

George Bennett

Attest:

Lisa Neissl – City Clerk

The foregoing minutes are the official record of the City Council meeting that occurred July 9, 2020. Further detail may be obtained by reviewing the actual audio recording made during this session.

2020

EXHIBIT 2

CITY OF COLLEGE PLACE

**COLLEGE AVENUE
TRAFFIC ASSESSMENT**



DN Traffic Consultants, Inc.

PO Box 547

Preston, WA 98050

(425)765-5721

Info@dntrafficconsultants.com



CITY OF COLLEGE PLACE

FOR

COLLEGE AVENUE TRAFFIC ASSESSMENT

Summary Report

Prepared By

DN Traffic Consultants, Inc.
eRMSi, Inc
PO Box 547
Preston, Washington 98050-0547

March 13, 2020

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TECHNICAL MEMORANDA

- TASK 2. - DATA COLLECTION
- TASK 3. - IS CURRENT TRAFFIC PATTERN OPTIMAL
- TASK 4. - SIGHT DISTANCE TRIANGLE ANALYSIS
- TASK 5. - SPEED LIMIT ANALYSIS
- TASK 6. - BICYCLE ROUTING EVALUATION

TECHNICAL APPENDIX

- 24 Hour ADT/Speed/Classification Counts
- AM and PM Peak Period Traffic Counts
- AM and PM Peak Hour Level of Service Analysis Worksheets
- Percent of Traffic Entering and Exiting the Corridor
- Bike Survey Form
- HAWK Proposal

INTRODUCTION

The City of College Place desires “a traffic assessment of the College Avenue corridor from Rose Street to Lamperti Street with emphasis on the section from SW/SE 4th Street to SW/SE 13th Streets”. This corridor was reconstructed in 2016 to address the City’s desire to implement a Complete Streets Policy as stated in the College Place Municipal Code (CPMC 12.14). The project resulted in a design which included one traffic lane in each direction with turn lanes at key intersections and public parking mid-block. The project also included 10-foot sidewalks and the designation as a bicycle route to promote active transportation along the corridor. A vicinity map is presented in Figure 1.

In addition, the City installed traffic signals at the following intersections:

- College Avenue/E. Whitman Drive
- College Avenue/SW/SE 12th Street
- College Avenue/Lamperti Street

Note: The College Avenue/SW/SE 4th intersection was under signal control prior to the “Complete Streets” project.

Subsequently, the City expressed concern the resulting traffic circulation pattern was confusing for some and the removal of parking in the Downtown area has created problems for downtown business. After completion of the project, the City received a few complaints, but in the words of City staff “not many”.

PROJECT DESCRIPTION

The City of College Place requested the College Avenue Traffic Assessment answer the following questions:

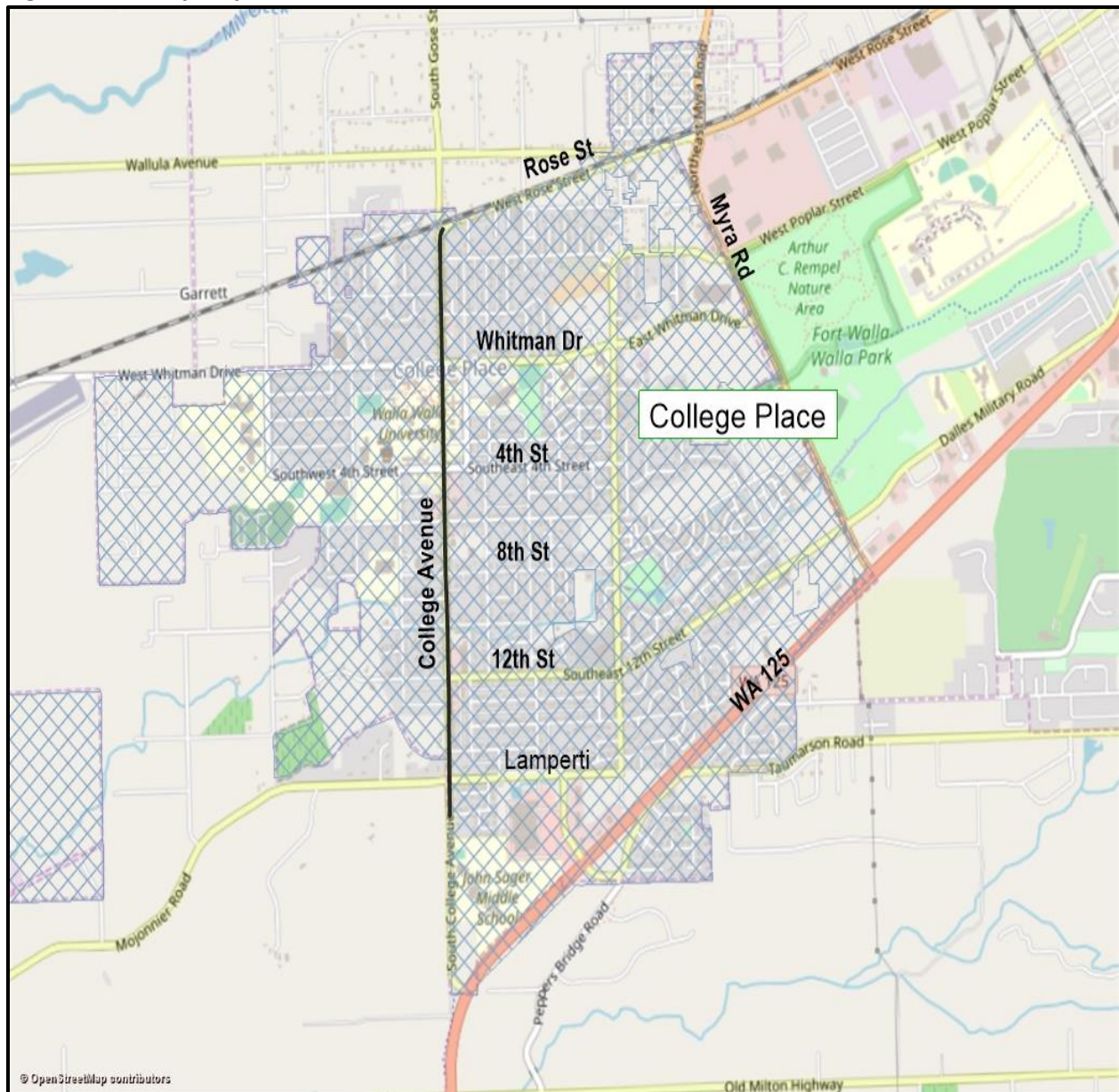
1. Is the current traffic pattern optimal? Should parking be reintroduced at the expense of the left turn lanes at the intersections? What is the best performing traffic pattern for the corridor?
2. The existing city code currently mandates a sight-triangle be enforced at intersections; however, this corridor also has ten-foot-wide sidewalks which most other streets in the City lack. The College Avenue Design Standards encourages development to the back of sidewalk. Based on the wider sidewalks in the corridor, to what extent would it be safe and effective to reduce sight triangle requirements in the College Avenue corridor?
3. What is the appropriate speed limit along College Avenue from Rose Street to Lamperti Street?
4. How should bicycle traffic along College Avenue be best accommodated (signage, sharrows, use of sidewalks, reassignment of bicycle route, etc.)?

Response to these questions is the fundamental focus of the Assessment. The response requires a documented understanding of each of the issues suggested by the question. Based on the Consultants understanding of the issues, findings from the data collection, results of the associated analysis, and input from City staff a solution will be developed.

STUDY AREA

The City defined the study area as the College Avenue corridor from Rose Street on the north to Lamperti Street on the south with the emphasis on the following intersections:

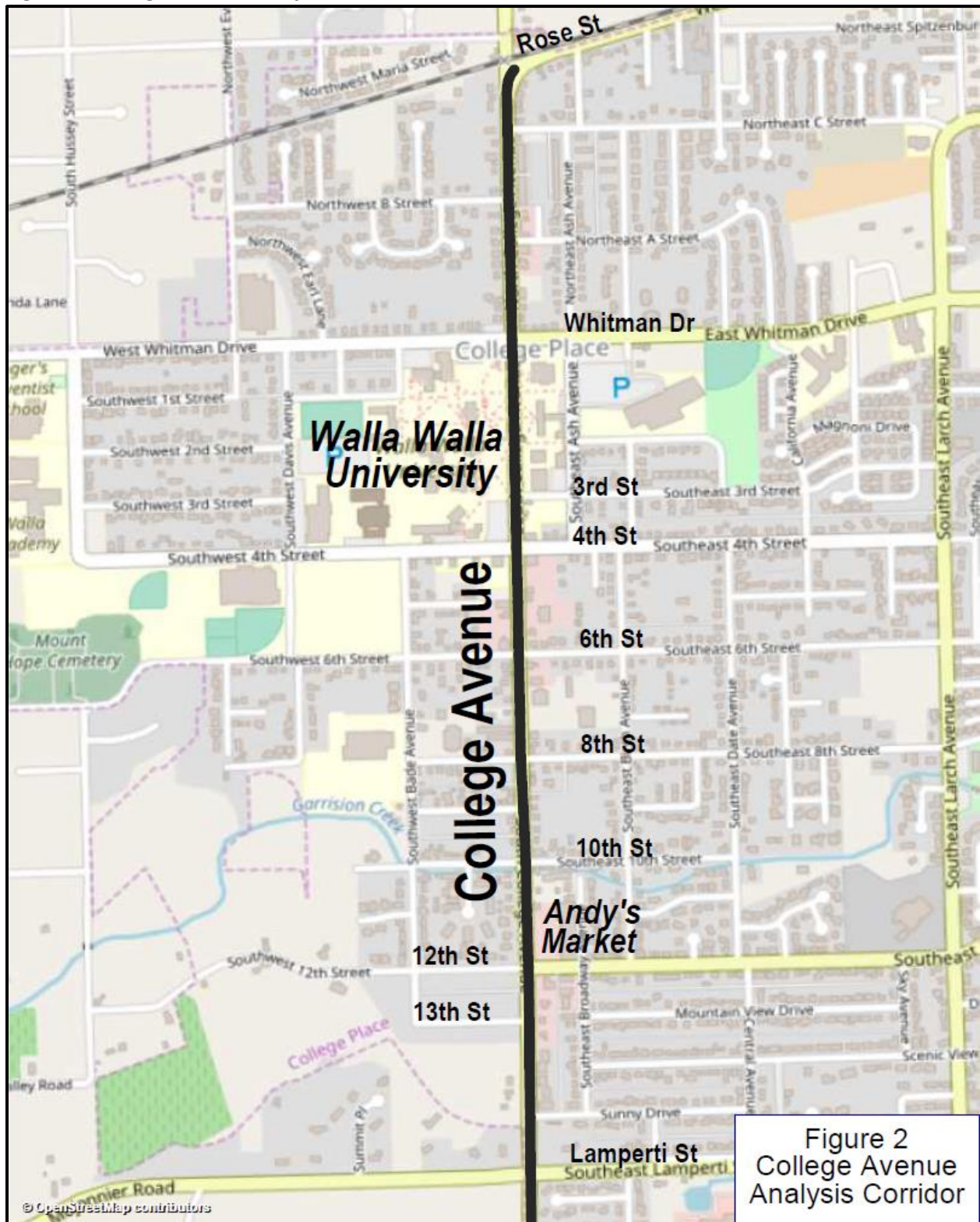
Figure 1. Vicinity Map



- Lamperti Street.
- SW 13th Street.
- SW/SE 12th Street.
- SW/SE 10th Street.
- SW/SE 8th Street.
- SW/SE 6th Street.
- SW/SE 4th Street.
- Whitman Drive

A graphic illustrating the College Avenue corridor is presented in Figure 2.

Figure 2. College Avenue Analysis Corridor



APPROACH TO THE PROJECT

Our approach to the project is based on the following:

- Engage the City of College Place staff in a collaborative effort to develop traffic operations plans and policies which serves the various users of the transportation system today and in the future.
- Collect enough data to provide an accurate assessment of current multimodal traffic operations on the corridor to include intersection level of service, speed, parking demand, and safe roadway geometrics.
- Seek creative solutions to address community concerns for all roadway users.
- In addition to National Standards such as AASHTO¹ and MUTCD², the Consultant will use existing City policies³ to guide our work including:

TRANSPORTATION POLICY 1: The City adopts a LOS standard of “D” for all roadway segments, a LOS of “D” for all signalized intersections, and a LOS “D” for the critical movement of all non-signalized intersections.

TRANSPORTATION POLICY 2c: Implement complete streets practices as guided by the City’s Complete Streets Policy (CPMC 12.14).

TRANSPORTATION POLICY 10: Establish and maintain truck routes that are clearly signed to serve designated commercial and industrial areas.

TRANSPORTATION POLICY 13: Recognize SW 4th Street and SW Davis Avenue as key elements to the utility and transportation infrastructure on the west side of the City.

TRANSPORTATION POLICY 14: Identify and implement north-south transportation corridors as part of development requirements for westernmost portions of the city to connect to Highway 125.

TRANSPORTATION POLICY 15: As the City continues to grow and develop, identify, evaluate and as needed implement alternative north-south transportation routes to relieve reliance on College Avenue.

TRANSPORTATION POLICY 18: Develop and implement a parking strategy for the College Avenue corridor.

TRANSPORTATION POLICY 20: Establish and maintain a system of bicycle and pedestrian trails, and routes that link neighborhoods and public facilities, and that enhance the walking and bicycling experience.

TRANSPORTATION POLICY 20j: Continue to evaluate where bicycle and pedestrian routes should be designated and encourage their construction.

¹ AASHTO – American Association of Highway and Transportation Officials

² MUTCD – Manual on Uniform Traffic Control Devices, Current Edition, 2009.

³ City of College Place, Transportation Plan September 2018

RESPONSE TO QUESTIONS

The consultant prepared a technical memorandum to address each of the questions identified by the City to include:

Question #1 – Is the current traffic pattern optimal? (See Task #3 Memo).

The answer to the question is “No”! As discussed in Tech Memo #3, the existing left turn channelization is not required to support an acceptable level of service. Therefore, it is recommended, the left turn channelization be eliminated, and the roadway be converted to a two-lane section; one lane in each direction. The additional space can be evaluated for the provision of additional parking. It was determined there isn’t sufficient width for the length of the College Avenue corridor to provide a five (5) foot bike lane on each side.

The provision of signal coordination between the four (4) signalized intersections was determined to be detrimental to traffic signal operations, on the College Avenue corridor and the intersecting side streets, under current traffic patterns. The basis for this conclusion is the distance between the signalized intersections is so long that the platoon disperses before arrival at the next intersection.

Signal operations were found to be significantly better under the proposed two (2) lane, two (2) phase signal operations. Queuing analysis was conducted for the AM and PM peak periods and all queues computed were shorter than the available storage lengths.

Question #2 – To what extent would it be safe and acceptable to reduce sight triangles in the College Avenue corridor? (See Task #4 Memo)

The existing ordinance does not provide sufficient sight distance triangles to support safe stopping sight distance on approach to the intersections. The ordinance should be revised to identify establishment of sight distance triangles using the AASHTO⁴ triangle to determine safe stopping sight distance. An example of the sight distance triangle is provided in the Task #4 Memo. With imposition of this technique, sight distance issues on private property will be virtually eliminated. The revised ordinance will however impact the extent of parking in the vicinity of a stop sign controlled intersection.

Question #3 – What is the appropriate speed limit on College Avenue? (See Task #5 Memo)

For the most part, the existing speed limits on the corridor are acceptable and are accepted by the travelling public. However, to address the “Complete Streets” character stated by City Policy (CPMC 12.14) and Transportation Policy 2c, speed limits south of SW/SE 8th Street should be reduced to 25 mph. This will reduce the potential for serious injury and fatal crashes as motor vehicles interact with bicycles and pedestrians in the corridor. It is also important to note the College Place High School and Middle School are located on the south end of the corridor where the higher speed limits of 30 mph (8th Street to Lamperti Street) and 35 mph (Lamperti Street to SR 125) exist. However, the posted speed limit in this section is reduced to 20 mph between the hours of 7:30 AM and 4:30 PM. Reducing the posted speed limit to 25 mph would provide a safer environment for all roadway users. The reduce speed limit would also reduce the required sight distance for intersecting side streets.

⁴ A Policy of Geometric Design of Highways and Streets; AASHTO Green Book – American Association of State Highway and Transportation Officials; 7th Edition; 2018.

Question #4 – How should bicycle traffic be accommodated? (See Task #6 Memo)

The City staff requested provisions for bicycles be consistent across the length of the College Avenue Corridor. Because the roadway width isn't adequate to accommodate a five (5) foot bicycle lane on both sides, it was decided that bike lanes should not be provided. During the collection of traffic volumes on the corridor, it was documented the typical bicycle rider tended to use the sidewalk. Riding on a sidewalk in the business district is contrary to City Ordinance.⁵ If the City determines to allow bicycle riding on sidewalks in the business district, the ordinance should be revised.

OTHER ISSUES

Post Office Pedestrian Crossing and Parking

There are existing parking and pedestrian crossing issues at the United States Post Office, 500 South College Avenue. Field observations indicate a difficulty in seeing pedestrians crossing College Avenue in the marked crosswalk in front of the Post Office. The sight distance issue results from vehicles parking in close proximity to the cross walk.



It is recommended the crosswalk be enhanced with the addition of pedestrian activated Rapid Rectangular Flashing Beacons (RRFB) and appropriate pedestrian crossing signs. The signs are typically the Pedestrian Crosswalk (Symbol) Sign, W11-2 with the supporting arrow delineating the crosswalk location mounted to the post above the flasher unit. The typical RRFB beacon system installation costs approximately \$22,250⁶. In addition, ADA compliant curb bulb outs should be provided on both sides of College Avenue to promote pedestrian visibility.

In addition, it is recommended parking alignment be revised to provide adequate stopping sight distance for College Avenue traffic to see pedestrians as they enter the crosswalk.

HAWK Beacon

There are two High Intensity Activated crossWalk (HAWK) beacons in the College Avenue corridor. Each of these beacons are located between SE 3rd Street and Whitman Drive in front of Walla Walla University. Field observations indicate that during times of intense pedestrian activity, the HAWK beacons are overwhelmed, and the timing plan is terminated prior to all pedestrians crossing the corridor. The students fail to reactivate the beacon and are often crossing when the beacon is not operational. Drivers following the direction of the beacon are not necessarily watching for students when the beacon is dark.

⁵ City of College Place Municipal Code; Chapter 10.16.160 Riding on Sidewalks.

⁶ Rectangular Rapid-Flashing Beacon (RRFB); Safe Transportation for Every Pedestrian; Countermeasure Tech Sheet; Federal Highway Administration; June 2018.

Possible solutions, to this issue discussed with staff, include the construction of a tunnel under College Avenue to provide unrestricted pedestrian crossing between major campus activity centers. Of course, this would be a major disruption on College Avenue with an associated high price.

As an alternative, it is recommended the City pursue the installation of equipment to detect pedestrian crossing activity so that crossing times can be adjusted to accommodate pedestrian demand. The estimated cost of this equipment is approximately \$8,000. The technical specifications are included in the Technical Appendix.

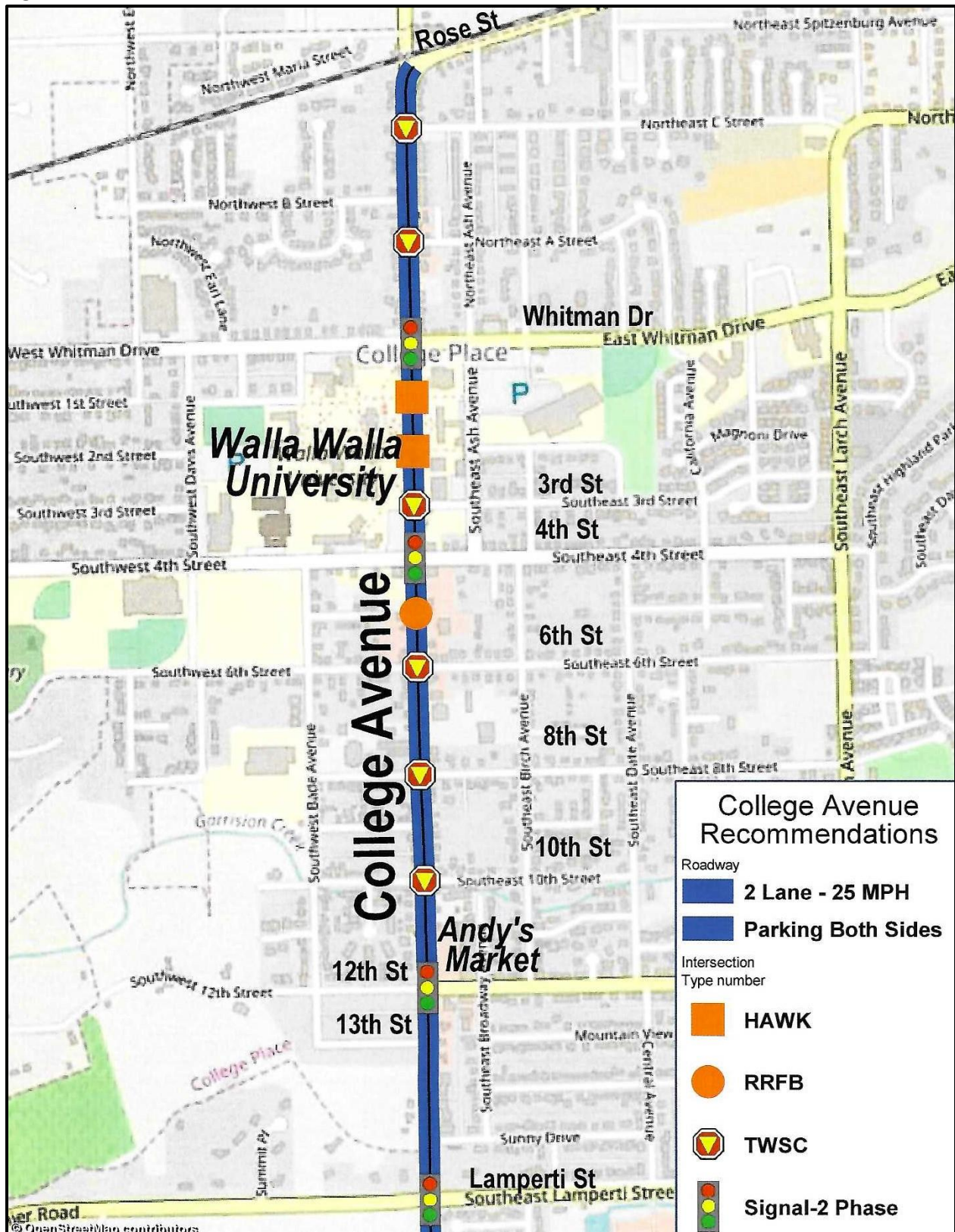
RECOMMENDED ACTIONS

In summary, the Consultant Team conducted the foregoing analysis under the assumption the City of College Place desired to implement a “Complete Streets” design on the College Avenue corridor from Lamperti Street to Rose Street. The purpose of the “complete streets” concept is to facilitate travel for “all modes” of transportation in a safe and efficient manner. The following actions are recommended to accomplish this objective:

- Revise existing channelization to eliminate left turn pockets at the intersections and the two-way left turn lane in selected corridor sections. Rechanelize the corridor to provide a two (2) lane cross section with parking on both sides. This action will require modifications to the traffic signal head alignment at the signalized intersections and modifications to the existing signal timings to improve the efficiency of the signal operation. In addition, it is suggested that all red flash operation be considered for the signalized intersections during the hours of 7 PM to 5 AM.
- It is recommended that a consistent posted speed limit of 25 MPH be implemented on the corridor from SR125 to Rose Street.
- Sight Distance ordinance should be rewritten to provide adequate stopping sight distance for stop controlled intersection approaches. Parking shall be adjusted to accommodate the revised sight distance triangles.
- After discussion with City staff, it is recommended no on-street provision be provided for bicycles along the College Avenue corridor. It is recommended the current ordinance which restricts bicycles on the sidewalk be changed to allow bicycle traffic.
- A RRFB shall be installed at the Post Office crosswalk, 500 S College Avenue. Parking on approach to the crosswalk should be modified to ensure adequate stopping sight distance is provided on approach to the crosswalk. In addition, ADA compliant curb bulb outs shall be installed on either end of the crosswalk to promote pedestrian visibility.
- It is recommended that pedestrian detection be provided at each HAWK location. The estimated cost of this equipment is \$8,000 plus installation.
- It is recommended that the bus stops on the corridor be located at a two-block spacing between stops. The stops shall be located on the “near side” of the intersection to allow pedestrians to exit the bus and cross College Avenue at a marked crosswalk. This action should be coordinated with Valley Transit. It is estimated that each bus stop should be provided 50 feet of curb length to facilitate access to the sidewalk.

A graphic illustrating the Recommended Actions is presented in Figure 3.

Figure 3. Recommended Actions.





City of College Place

College Avenue Traffic Assessment

A D D E N D U M

April 27, 2020

The following addendum was prepared to address specific questions generated by City of College Place staff in response to the Final Report for the College Avenue Traffic Assessment Report dated March 13, 2020. The questions were submitted by email on March 24, 2020. It was agreed the March 13, 2020 report would remain intact and the response to the questions would be included in this addendum.

It was determined the findings of the report could be interpreted in different ways based on the City goals for the College Avenue corridor. As a point of beginning, the City offered the following statement on how to interpret the study results:

"Traffic recommendations are, to some degree, dependent upon the community's final vision for the corridor. As a Federally classified principal arterial doubling as the City of College Place's main commercial corridor, College Avenue provides a continuum of opportunities between serving as an efficient transportation corridor and a slower-paced, complete-streets commercial corridor. In attempting to balance the competing demands of pedestrian, bicycle and vehicle facilities, it is important that policy makers are aware there are pros and cons related to recommendations that favor one end of the continuum over the other or that favor one transportation mode (pedestrian, bicycle, vehicles) over the other. As a part of addressing a staff request for clarifications to the College Avenue Traffic Assessment, the balance of the following responses is intended to provide additional insight and background to assist in adjusting the recommendations, if desired, to reflect the community's balance of priorities."

Comment #1: Table 3 – Add a column for CARS counts, as available.

A column was added to Table 3 to include the findings of the 2012 CARS 24-hour traffic volume study. It should be noted that the 2012 study does not offer a corresponding count to the 2019 study. Specific differences are noted in Table 3.

Table 3. 24-hour Vehicle Volume Summary

#	Location	Section	2019 24 Hour Traffic Volume			2012 CARS Traffic Volumes ¹		
			Northbound	Southbound	Total	Northbound	Southbound	Total
1	College Avenue	n/o 4 th Street	2488	2657	5145	4246	4010	8256 ²
2	College Avenue	n/o Whitman Drive	2846	3039	5885	2958	2917	5875
3	College Avenue	n/o C Street	2734	2692	5426	2593	2263	4856 ³
4	College Avenue	n/o B Street	2925	3044	5969			
5	College Avenue	n/o A Street	2816	3006	5822			
6	College Avenue	n/o SR 125	1880	1918	3798			
7	College Avenue	s/o Lamperti Street	2205	2241	4446			
8	College Avenue	s/o 10 th Street	4274	3926	8200			
9	College Avenue	n/o 8 th Street	4103	3988	8091	4044	4369	8413 ⁴
10	College Avenue	n/o Lamperti Street	4144	3838	7983	3603	3499	7102 ⁵

1) 2012 CARS 24 Hour Traffic Volumes were conducted in February/March 2012

2) CARS Count – Volume recorded as south of 4th Street

3) CARS Count – Volume recorded as south of Rose Street

4) CARS Count – Volume recorded as south of 8th Street

5) CARS Count – Volume recorded as south of 13th Street

Response #1. As shown in Table 3, a comparison of the 2012 CARS data and the 2019 data indicates the volumes are relatively consistent between the two time frames with the exception of the section recorded in the vicinity of 4th Street where the 2012 data (8256) is approximately 3000 vehicles per day higher than the 2019 volume (5145). Some of the difference could be attributed to the count location where the 2012 count was south of 4th Street and the 2019 count was north of 4th Street.

Comment #2. It appears most of the benefits in LOS related to Alternative Two (Remove Left Turn Channelization) are related to the signal phasing recommendations, not necessarily to the removal of the left turn pockets. Would most of the benefits in LOS be retained if signal phasing recommendation were

adopted but the left turn pockets were retained at A) the unsignalized intersections? B) at the signalized intersections?

Response #2. Although the analysis suggests the benefits are the result of signal phasing recommendation, a review of standard practice in regards to provision of protected left turn phasing at signalized intersection and the need for designated left turn pockets suggest in most cases, neither conditions are necessary for the College Avenue corridor. Regarding designated left turn lanes, the Highway Capacity Manual¹ (HCM), states the need for a left-turn lane is suggested if the left-turn volume is greater than 100 vehicles in a peak hour. Left turns on College Avenue for the AM and PM peak hour is presented in the following Table.

Intersection	Traffic Control	AM Peak Hour				PM Peak Hour			
		NB	SB	EB	WB	NB	SB	EB	WB
Whitman Drive	Signal	28	30	79	36	74	28	30	19
4 th Street	Signal	109	8	15	88	72	14	34	61
6 th Street	TWSC	10	0	6	5	12	15	12	5
8 th Street	TWSC	11	0	6	5	12	15	12	5
10 th Street	TWSC	6	1	8	0	19	11	13	1
12 th Street	Signal	16	44	4	41	16	69	11	64
13 th Street	Stop Control	5	n/a	3	n/a	5	n/a	0	n/a
Lamperti Street	Signal	10	74	35	51	9	140	27	12

As shown in the Table above², there are only two intersections: 4th Street during the AM peak and Lamperti Street during the PM peak. which have a peak hour left turn volume which meets the HCM suggest criteria of 100 left turn during the peak hour. It should be noted that each of these intersections meet the 100-left turn per hour criteria during only one peak hour. Although the two intersections satisfy the HCM requirement, the level of service and queuing analysis do not suggest a designated left turn lane is required to satisfy the capacity requirements of either intersection.

The other factor to consider is the need for protected left turn signal phasing. To address this issue, the HCM³ suggests the following criteria be applied:

“Left-turn phasing (protected-permissive, permissive-protected, or protected-only) should be considered if any one of the following criteria is satisfied:

Table 118. Guidelines for use of left-turn phasing. ^(186,187)

1. A minimum of 2 left-turning vehicles per cycle and the product of opposing and left-turn hourly volumes exceeds the appropriate following value:
 - a. Random arrivals (no other traffic signals within 0.8 km (0.5 mi))
 - One opposing lane: 45,000 Two opposing lanes: 90,000

¹ Highway Capacity Manual (HCM) Signalized Intersections; Chapter 12 Individual Movement Treatments; August 2004.

² Source: Figure 1; Technical Memorandum – Data Collection.

³ Ibid. HCM Chapter 12.

-
- b. *Platoon arrivals (other traffic signals within 0.8 km (0.5 mi))*
One opposing lane: 50,000 Two opposing lanes: 100,000"

Based on this requirement, there are no intersections on College Avenue that warrant left turn phasing. A summary of the calculations is presented as an attachment to this addendum.

In conclusion, the answer to the basic question, "are most of the benefits in LOS retained if signal phasing recommendation was adopted but the left turn pockets were retained," the answer is yes. At the signalized intersections, the benefit in LOS is realized by eliminating the left turn phase and the associated lost time of the traffic signal timing plan. For the unsignalized intersections, the north/south bound left turns are "free flowing" and therefore not subject to level of service analysis. Left turn pockets are not provided on the side streets at the unsignalized intersections. As discussed above, left turn pockets and protected left turn signal phasing are not required for safe and efficient movement at the signalized intersections.

Comment #3. *The City's currently codified default sight visibility max height criteria is 36" as measured from the gutter. We need a recommendation regarding whether this should be changed, and if so, to what height.*

Response #3. Stopping Sight Distance (SSD) is the sum of two distances: the distance traveled during perception and reaction time and the distance required to stop the vehicle. The perception and reaction time used in design is 2.5 seconds. The stopping sight distance is calculated using a constant deceleration rate of 11.2 feet/second². Available stopping sight distance is calculated for a passenger car using an eye height of 3.50 feet and an object height of **2.00 feet**.

As a result, it is recommended that a height of **24 inches** above the gutter be used as the default value.

Comment #4. *Table 4 (p.8) in the Sight Distance Memorandum would benefit from an additional column listing "remaining parking inventory" at current and proposed speed limits.*

Response #4. The Comment suggests the proposed action, reduction in parking supply to accommodate sight distance requirements, would have an adverse impact on parking. As shown in Table 4 (after Table 7 below), *Potential Parking Stall Reduction*, suggests a total of 28 stalls would be eliminated under the existing posted speed limits and 21 stalls would be eliminated if the posted speed limits on the corridor were reduced to 25 mph.

As discussed in the *Data Collection Memorandum*, the available parking supply on the College Avenue corridor is significantly higher than the current parking demand. The *Data Collection* memorandum summarized parking demand on the corridor during two different time periods. A summary of the study findings is presented in Table 7 below.

Table 7. CARS – Available Parking Supply

		Hourly Summary								
		Peak Demand								
		6/12/2019			2/27/20			Available Supply		
Corridor	Section	E	W	Total	E	W	Total	E	W	Total
College Avenue	4 th St to 6 th St	0	6	6	5	1	6	3	6	9
College Avenue	6 th St to 8 th St	2	0	2	3	0	3	0	5	5
College Avenue	8 th St to 10 th St	0	1	1	2	0	2	3	4	7
College Avenue	10 th St to 12 th St	1	3	4	0	4	4	15	12	27
College Avenue	12 th St to 13 th St	0	1	1	3	0	3	3	6	9
College Avenue	13 th St to Lamperti	8	1	9	8	0	8	22	17	39
Corridor Total		11	12	23	21	5	26	46	50	96

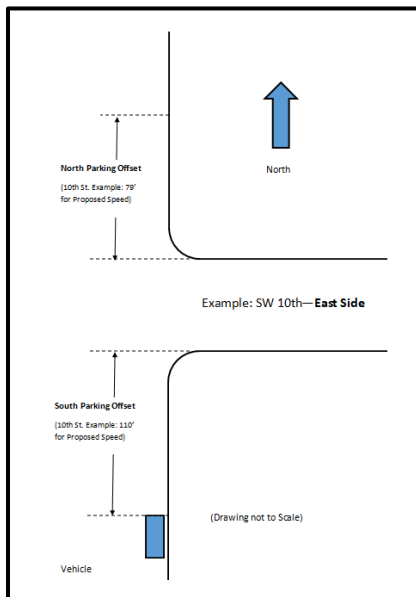
As shown in Table 7, the peak hourly parking demand for the corridor, 23 stalls in June 2019 and 26 stalls in February 2020, is significantly less than the available parking supply which is 96 stalls in the sections between 4th Street and Lamperti Street. The only section where the demand is equivalent to the available supply is the section between SW/SE 4th Street to SW/SE 6th Street where the parking demand, six (6) stalls, is equivalent to the available supply. This section is adjacent to the United States Post Office. Peak hourly parking demand occurs in the section between SW/SE 13th Street and Lamperti Street where the peak demand is nine (9) stalls and the available supply is 39 stalls.

Table 4. Potential Parking Stalls Reduction

Intersection	Speed Limit			Parking Offset				Parking Reduction	
	Posted		Proposed	Posted Speed		Proposed Speed		Posted Speed	Proposed Speed
	North	South		North	South	North	South		
Sunny Drive	30	30	25	74'	136'	55'	101'	2	1
SW 13th	30	30	25	140'	76'	104'	57'	7	4
SW 10th (west side)	30	30	25	143'	102'	107'	76'	3	2
SE 10th (east side)	30	30	25	105'	146'	79'	110'	0	0
SW 9th	30	30	25	134'	88'	100'	66'	4	2
SW 8th (west side)	25	30	25	105'	101'	105'	75'	0	0
SE 8 th (east side)	25	25	25	75'	105'	75'	105'	0	0
SW 6th (west side)	25	25	25	105'	75'	105'	75'	0	0
SE 6 th (east side)	25	25	25	75'	105'	75'	105'	0	0

Intersection	Speed Limit			Parking Offset				Parking Reduction	
	Posted		Proposed	Posted Speed		Proposed Speed		Posted Speed	Proposed Speed
	North	South		North	South	North	South		
SE 3rd	25	25	25	69'	99'	69'	99'	0	0
NE A	25	25	25	75'	104'	75'	104'	4	4
NW B	25	25	25	75'	104'	75'	104'	5	5
NE C	25	25	25	67'	104'	67'	104'	3	3
				Total Stalls Removed				28	21

Note: An illustration of the parking offset is shown in the figure below.



As shown in Table 4, the proposed parking reduction due to the sight distance offset is limited to the section north of Whitman Drive and south of 9th Street. Between 10th Street (eastside), except for 9th Street, there is no parking reduction required to meet the sight distance requirements.

As shown in Table 7, there is a peak demand of 26 stalls and a total supply of 96 stalls. If the parking reduction for the various speeds is added to the peak parking demand, the result would be a demand for 54 stalls under the existing posted speed limit (25 – 30 mph) and 47 stalls under the proposed posted speed limit (25 mph). These numbers compare to an available supply of 96 stalls so that there is still a surplus of 42 stalls under the existing speed limits and 49 stalls under the proposed speed limit.

The highest parking demand, including the proposed reduction, occurs in the section between 13th Street and Lamperti Street where there is a demand for 18 stalls under the existing speed and 14 stalls under the proposed speed.

In this section, 13th Street to Lamperti Street the available supply is 39 suggesting there is a surplus of 21 stalls under the existing speed and 25 stalls under the proposed speed.

The conclusion of this analysis is that there is ample parking supply on the corridor to accommodate the proposed parking reduction under the existing posted speed as well as the proposed speed parking reduction and still accommodate existing parking demand.

Comment #5. Provide a list of the specific factors contributing to the speed limit recommendation (p. 5 of *Appropriate Speed Limit Memorandum*) or, if recommendation is not compelled by the data, state so and note the speed limit reduction as an option for City consideration in light ofand list the

considerations. Some of the considerations, such as increasing bicycle safety may not as directly apply if bicycles are allowed to travel on sidewalks by code. The Memorandum on Bicycle Traffic should then be revised as necessary for consistency.

Response #5. The comment suggests the basis for the posted speed is the commonly accepted 85 percentile speed. The speed data collected on the corridor is shown in Table 4 below.

Table 4. Daily Speed Summary

#	Location	Section	Posted	Daily Speed					
				Northbound		Southbound		Total	
				Average	85 th Percentile	Average	85 th Percentile	Average	85 th Percentile
1	College Avenue	n/o 4 th Street	25	22	26	22	26	22	26
2	College Avenue	n/o Whitman Drive	30	24	28	24	27	24	28
3	College Avenue	n/o C Street	30	26	30	25	29	26	29
4	College Avenue	n/o B Street	30	25	29	25	29	25	29
5	College Avenue	n/o A Street	30	25	29	25	28	25	29
6	College Avenue	n/o SR 125	35	27	33	31	36	29	35
7	College Avenue	s/o Lamperti Street	35	26	32	26	34	26	33
8	College Avenue	s/o 10 th Street	30	27	31	28	31	27	31
9	College Avenue	n/o 8 th Street	25	25	29	26	29	26	29
10	College Avenue	n/o Lamperti Street	30	27	31	28	32	27	31

As shown in Table 4, the posted speed on the College Avenue corridor ranges between 25 mph and 35 mph. The posted speed is 35 mph south of Lamperti Street; 30 mph between Lamperti Street and 8th Street; 25 mph between 8th Street and Whitman Drive; and 30 mph north of Whitman Drive.

The result of the speed study indicates that motorists on College Avenue comply with the posted speeds. The observed speeds indicate the posted speed reflects actual speeds on the corridor. There is no significant difference between speeds in the northbound and speeds in the southbound direction.

If the recommended posted speeds were based on the 85th percentile speeds observed on the corridor, then the recommendation would be to leave the posted speed limits as they currently exist. However, the Consultant is working under the premise that the City desires to provide a “Complete Streets” construct on College Avenue. The goal of “Complete Streets” is to make the street safe and efficient for “all users” i.e. bicycles, pedestrians, and motor vehicles as opposed to focusing on the speed, capacity, and efficiency of the automobile. Improve. If the City desires to promote the automobile, then the existing posted speeds should remain. If the City desires to promote “Complete Streets” then an alternative posted speed should be considered.

The lower speed, although increasing travel time on the corridor for the car, it significantly beneficial to the safety of bicycles and pedestrians. In a crash at 20 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 18 percent whereas a crash at 30 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 50 percent.

Comment #6. *There should be some discussion on the pros and cons of allowing bicycle use on College Avenue sidewalk in the Bicycle Traffic Memorandum. Does this increase danger to pedestrians? Is there any data on this? What limitations on bicycle use of sidewalks should be in place if allowed? Is there a max speed limit? Recommended signage?*

Response #6. In a meeting with City staff, the various options of providing bicycle provisions on College Avenue were discussed. Staff expressed concern about the ability to provide a continuous bicycle path for the full length of the College Avenue corridor from Lamperti Street to Rose Street. The predominant concern was the lack of cross-sectional width to accommodate a bicycle lane plus parking on both sides. The decision was whatever was provided should be continuous. At that point, it was decided that bicycle traffic should be allowed to use the sidewalk. This proposal is contrary to existing city ordinance and would require modification to that ordinance.

A review of the existing cross-sectional width of College Avenue confirmed that, except for College Avenue south of 10th Street, the cross-sectional width is inadequate to accommodate a standard bike lane along with parking.

To address the questions:

- ***Does this increase the danger to pedestrians?*** The intuitive response to this question is yes. Bicycles are moving at a faster speed than the pedestrians and hence the reaction time to objects in their path is reduced. A research of the literature however did not indicate a major problem. A recent report from Cornell University stated⁴:

“Sidewalks, by definition, are designed for pedestrians. According to the law, a sidewalk is defined as “That portion of a street between the curb lines, or the lateral lines of a roadway, and the adjacent property lines, intended for the use of pedestrians.” Sidewalk riding has the potential of bringing the cyclist into conflict with pedestrians. Although the crashes are not typically life threatening to either party, certainly the comfort level of the pedestrian is compromised. Many communities ban cycling from downtown sidewalks to avoid this conflict.”

Most of the data available suggested that cycling on a sidewalk was significantly more hazardous to the biker. Again, the Cornell University Report stated⁵:

“Bicycling on the sidewalk eliminates the relatively small danger to cyclists of crashes with overtaking motorists but increases the potential for more common intersection collisions. To follow is

⁴ http://www.bike.cornell.edu/pdfs/Sidewalk_biking_FAQ.pdf

⁵ Ibid.

an excerpt from the Pedestrian and Bicycling Information Center's web site about sidewalk bicyclists and crashes:

Rather like the situation with riding the wrong way against traffic, there is no specific crash type reserved for bicyclists riding on the sidewalk. However, the fact that the bicyclist was on the sidewalk is a contributing factor in a great many crashes at intersections.

- *Motorist turns left in front of cyclist: 42% of bicyclists are on the sidewalk*
- *Motorist turns left into oncoming cyclist: 15% of bicyclists are on the sidewalk*
- *Motorist turns right into bicyclist: 31% of bicyclists are on the sidewalk*
- *Motorist drives out of alley/driveway: 48% of bicyclists are on the sidewalk*
- *Motorist drives through intersection: 15% of bicyclists are on the sidewalk*
- *Bicyclist rode out intersection with signal: 24% of bicyclists are on the sidewalk*

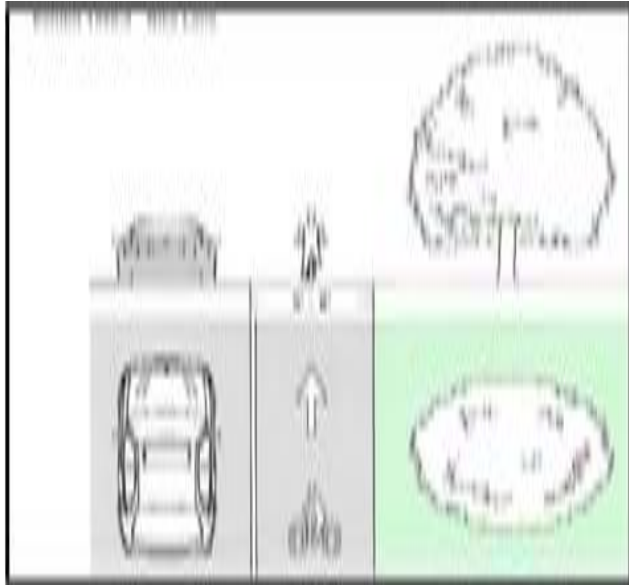
*Once again, the perception is that someone is safer riding on the sidewalk than on the road—and many motorists and even law enforcement officers repeat that message. **The problem is that, as the numbers above suggest, bicyclists are not safer on the sidewalk because they become almost invisible to the motorist.** When a driver turns, either left or right, or into a driveway or alley, they are simply not looking for, or expecting to encounter, a bicyclist. And even if they do look and see a bicyclist, they may still underestimate the speed a rider is traveling on the sidewalk - because it will likely be much faster than a pedestrian.*

- ***What limitations on bicycle use of sidewalks should be in place if allowed?*** As discussed above, it is not “safer” for bicycles to travel on the sidewalk. Therefore, the question should be who should be allowed to travel on the sidewalk.

The WSDOT Design Manual⁶ identifies three types of cyclists as follows:

- ***Strong and Fearless*** – This cyclist type is confident not only in their abilities as a cyclist but also with their ability to operate intermixed with other modal users.
- ***Enthusied and Confident*** – These cyclists prefer utilizing separated facilities, but are comfortable riding intermixed within other modes in some transportation contexts. •
- ***Interested, but Concerned*** – Cyclists who primarily have safety concerns and who are less skilled or less familiar with the rules of the road but would like to ride more. These cyclists are frequently dissuaded from cycling, even if bike facilities are present, because of the degree of separation between themselves and other traffic. This category includes children and others new to bicycling.

⁶ WSDOT Design Manual; Section 1520.03(1); November 3, 2015.

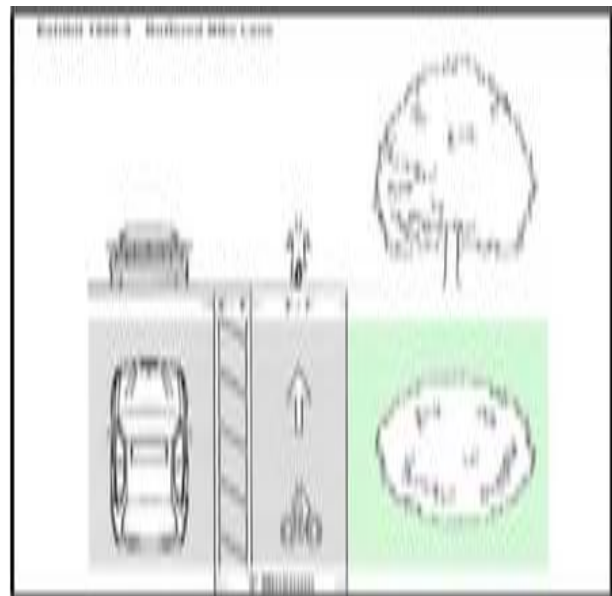
Bike Lane

It is assumed that all three cyclist types exist on the College Avenue corridor. According to the WSDOT Design Manual⁷, *"The Interested, but Concerned cyclist constitutes the largest segment of cyclist types within suburban, urban and small-town populations. Bike facility selection on state routes is based on designing for the 'Interested but Concerned' user type as a starting point."* According to Exhibit 1520-6a⁸, a "Bike Lane" would be recommended for the segments of College Avenue with speeds in the range of 25 mph.

In the sections where the posted speed is 30 mph, a "Buffered Bike Lane" would be recommended.

The Design Manual shows ranges of applications for the different types of bicycle facilities related to generally accepted safety and mobility performance. Other performance needs may increase or decrease the viability of certain types of bike facilities, such as shared-use paths through aesthetic areas or those planned for a mixture of commute and recreational purposes.

The Design Manual goes on to state: *"Further considerations for cyclist perception of comfort are another factor that can affect use of the facility. Designing for a higher level of separation may be more important at locations that serve community activity centers, schools or popular destinations (such as a retail oriented segment of a route) where additional accommodations are appropriate for either the functional uses or less skilled cyclists (including children). In these situations, separated facilities or wider dimensions may provide the level of comfort needed to satisfy user needs and context considerations. Additionally, some suburban, urban, and small-town contexts will have more specific bicycle performance needs that will help identify either spot improvements or alteration of the type of existing facility to enhance a specific performance area. Bike facility selection in 1520.03(1)(b) are provided for these reasons."*

Buffered Bike Lane

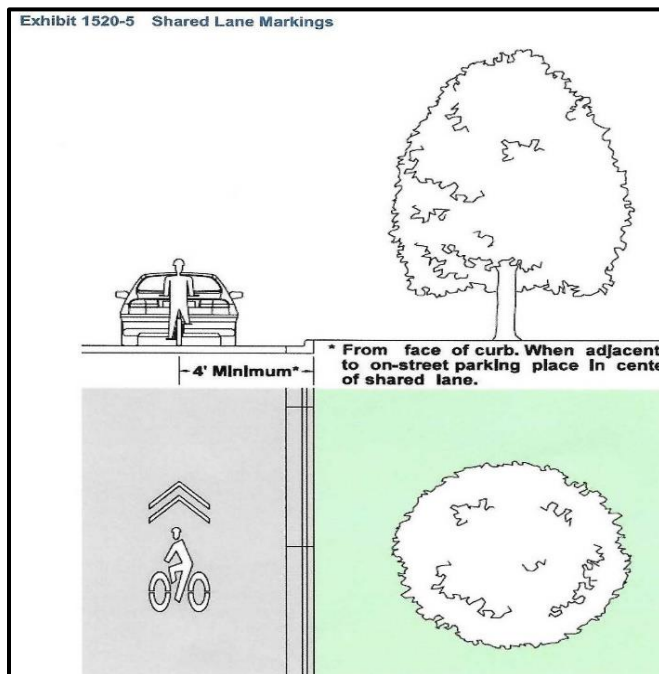
⁷ Ibid. Section 1520.03(1)(a).

⁸ Ibid.

"In some contexts, it is appropriate to design for the Strong and Fearless, and Enthused and Confident user types. In cases, where right of way is very constrained or where bicycles are not considered the modal priority (see Chapter 1103), it is appropriate to use Exhibit 1520- 6b for determining facility selection after input from community engagement efforts. However, understand that the application of Exhibit 1520-6b may result in less mode shift or use of the capacity provided."

In light of the foregoing, it is suggested the City consider alternative facilities for two classes of biker. The "Strong and Fearless" and the "interested but Concerned".

Shared Lane



For the "Strong and Fearless", the City should allow these users to ride in the street under the "Shared Lane" concept. The data presented above suggests bicycle speed is contributing to bike crashes on sidewalks. It is expected that higher speeds are attributed to the Strong and Fearless riders. Limiting their use of the sidewalk appears to offer benefit for the biker as well as the pedestrian. The application of the "Shared Lane" would require marking the existing lanes with "sharrows"

For the "Interested, but Concerned", it is suggested they should be allowed to ride on the sidewalk because of their inexperience and apprehension about riding with traffic.

Therefore, the following limitations are suggested:

- Sidewalk riding be limited to inexperienced riders.
- On the sidewalk, bicycles are required to YIELD to pedestrians.
- Bike speeds should be limited to 10 mph on sidewalks.

Signing supporting these constraints should be posted along the sidewalk.

Comment #7. *The Bicycle Traffic Memorandum lists incidence of bicycles at intersections during the peak AM and PM hours. Please provide an estimate of the number of unique bicycles using the full extent of the corridor. In other words, theoretically, if the same bicycle were to have ridden the full length of the route, there could have been as little as 7 bicycles during the AM peak hour and 6 during the PM peak hour. It would be helpful to have an estimate of how many bicyclists we are serving during the peak hours.*

Response #7. Unfortunately, there is no data available to determine the volume of bicycle traffic that travels the length of the corridor. Would require significant data collection. Otherwise it would be simply conjecture.

Comment #8. Table 2 (p. 2) of the *Bicycle Traffic Memorandum* references state crash rate comparisons in crashes per 100M VMT. Add a “crashes per 100M VMT” column to Table 5 so that a direct comparison to state and county averages can be made.

Response #8. The WSDOT report was limited to data on roadway segments without identification of intersection rates. Therefore, we have no basis for comparison.

Comment #9. Errata: P. 15, Table 8 reference should be Table 9.

Response #9. Noted. The correction is on page 15 of the *Data Collection Memoranda* in the paragraph (first sentence) following **Table 9. 2019 vs 2040 Land Use**. The correction was incorporated into the final report to be forwarded to the City.

Comment #10. *Provide comments on location of bus stops with respect to traffic flow in context of Complete Streets vs. vehicle-only priority efficiency.*

Response #10. During the study, it was observed that transit patrons disembarking from the bus would exit the bus and proceed to cross College Avenue illegally at the location where the bus stopped. The result of this action creates three points of conflict without any protection for the bus or the pedestrian. The three points of conflict with potential for serious injury crashes include the bus stopping in the traffic stream, the pedestrian crossing the street after departing from the bus, and the bus reentering the traffic stream. In the “complete streets” scenario all modes of travel are provided protection and efficiency for all movements. By moving the bus stop to the far side of the signalized intersection, the pedestrian is provided with a marked crosswalk and traffic signal control and the bus is provided signal protection while reentering the traffic stream thereby providing necessary protection and efficiency.

TECHNICAL MEMORANDA

Memorandum – Data Collection

The purpose of this memorandum is to provide a summary of the process and findings relating to Task 2 – Data Collection. The intent of Task 2 was to collect sufficient and accurate data to understand current traffic patterns on the College Avenue corridor and respond to the questions and issues identified by the City in the College Avenue Traffic Assessment Scope of Work. Task 2 included the following:

- Traffic Counts
- Existing Traffic Control
- Prevailing Vehicular Speed
- Five (5) Year Crash Data
- Traffic Signal Timing Plans
- Existing Parking Demand
- Land Use Data
- Sight Distance Triangles

Traffic Counts

For the purposes of this project, traffic counts included AM and PM peak period turning movement counts and 24-hour ADT counts.

Turning Movement Counts

AM and PM peak period counts were collected during the month of May 2019 on an average weekday, Tuesday through Thursday, during the AM peak period: 6:30 AM – 8:30 AM and the PM peak period: 4:00 PM – 6:00 PM. Counts were collected at each of the analysis intersections including:

- College Avenue/East Whitman Drive
- College Avenue/SW-SE 4th Street
- College Avenue/SW-SE 6th Street
- College Avenue/SW-SE 8th Street
- College Avenue/SW-SE 10th Street
- College Avenue/SW-SE 12th Street
- College Avenue/SW-SE 13th Street
- College Avenue/SW-SE Lamperti Street

A copy of the AM and PM peak period turning movement counts is presented in the Appendix. The result of the turning movement count is presented in Figure 1.

24 Hour ADT Counts

Average Daily Traffic (ADT) volumes on College Avenue were provided by the City. The ADT counts were collected for an average three (3) day period, Tuesday – Thursday, during the weeks of May 14th to May 16th and June 4th to June 6th. To ensure the counts covered the full 24-hour period for each day, the counts were set on Monday and collected on Friday.

City staff identified ten (10) locations along College Avenue where traffic counts were desired. The counts are based on average weekday conditions as that is the traditional period for traffic analysis and design. The locations included are shown in Table 1.

Table 1. 24 Hour Volume, Classification, and Speed Data

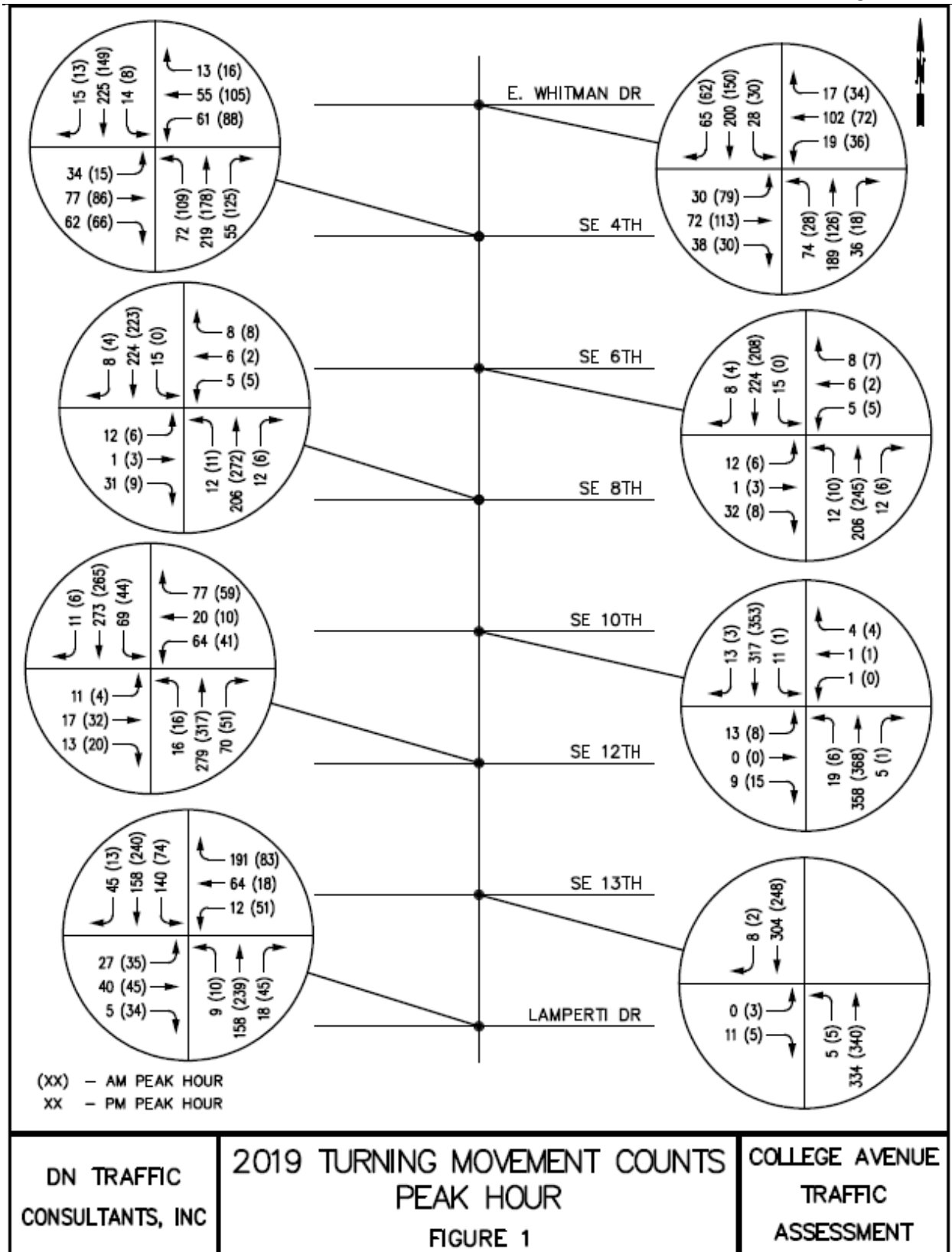
#	Location	Address	Date	Data Collected		
				Classification	Volume	Speed
1	College Avenue	313 South College Avenue	May 14 – May 16	X	X	X
2	College Avenue	26 North College Avenue	May 14 - May 16	X	X	X
3	College Avenue	309 North College Avenue	May 14 – May 16	X	X	X
4	College Avenue	205 North College Avenue	May 14 – May 16	X	X	X
5	College Avenue	105 North College Avenue	May 14 – May 16	X	X	X
6	College Avenue	1875 South College Avenue	June 4 – June 6	X	X	X
7	College Avenue	SE Cedar Bend Road	June 4 – June 6	X	X	X
8	College Avenue	1028 South College Avenue	June 4 – June 6	X	X	X
9	College Avenue	625 South College Avenue	June 4 – June 6	X	X	X
10	College Avenue	1425 South College Avenue	June 4 – June 6	X	X	X

A summary of the data obtained from these counts is discussed below.

Classification Data

Vehicle classification data was collected for the College Avenue corridor using the tube counters at the ten (10) locations identified above. The purpose of the data is to understand the percentage of trucks and buses that use the College Avenue corridor on an average day. Conversely, the percentage of automobiles on the corridor is also defined.

The vehicle classification data was determined through the 24-hour tube counts counting the number of axles per vehicle. The data was collected for three average days, Tuesday through Thursday, and summarized as an average for that location. For the purposes of this analysis the following stratification was identified for classifying vehicles:



- Cars – includes Class 2, Class 3, and Class 5 vehicles in accordance with the FHWA Vehicle Category Classification:¹
- Buses – includes Class 4 vehicles²;
- Trucks – includes the remaining classes except for Class 1 - motorcycles.³

The data presented in Table 2 indicates the percentage of cars and trucks/buses northbound and southbound on College Avenue at the ten (10) locations where the 24-hour counts were collected.

Table 2. Vehicle Classification Summary

#	Location	Section	Classification					
			Northbound		Southbound		Total	
			Cars ¹	Trucks/Buses ¹	Cars ¹	Trucks/Buses ¹	Cars ¹	Trucks/Buses ¹
1	College Avenue	n/o 4 th Street	92	8	97	3	95	5
2	College Avenue	n/o Whitman Drive	93	7	98	2	96	4
3	College Avenue	n/o C Street	95	5	97	3	96	4
4	College Avenue	n/o B Street	97	3	97	3	97	3
5	College Avenue	n/o A Street	97	3	97	3	97	3
6	College Avenue	n/o SR 125	96	4	98	2	97	3
7	College Avenue	s/o Lamperti Street	95	5	95	5	95	5
8	College Avenue	s/o 10 th Street	96	4	97	3	96	4
9	College Avenue	n/o 8 th Street	96	4	97	3	96	4
10	College Avenue	n/o Lamperti Street	95	5	96	4	96	4

As shown in Table 2, the vehicle classification percentages along the corridor is relatively consistent. The percentage of cars range from 92 percent to 98 percent with trucks and buses ranging from two (2) percent to eight (8) percent; the converse percent to the auto percentage.

In general, the highest percentage of trucks and buses, and lowest percentage of cars, is in the extreme ends of the College Avenue study area; south of Lamperti Street and north of 4th Street. On the south end, it is expected there would be a higher percentage of trucks/buses because of the proximity of College Place High School which generates significant bus traffic and intense retail which includes the Wal-Mart Supercenter and other retail outlets which generate significant truck traffic. The highest percentage of automobiles occurs on the north end of the corridor where College Avenue passes through the residential neighborhoods, A Street to C Street.

A summary of the classification data is presented in the Technical Appendix.

¹ Source: Figure C-1 vehicle category classifications used by FHWA; April 1, 2019.

² Ibid.

³ Ibid.

Volume

Daily (24 hour) traffic volumes were collected on the College Avenue corridor at the ten (10) locations identified above. Traffic counts were collected at each location for three days considered to be average weekdays: Tuesday through Thursday. The three days were averaged to identify an average daily traffic volume (ADT) on the College Avenue corridor.

Table 3. 24 Hour Traffic Volume Summary

#	Location	Section	2019 Volume Summary			2012 Volume Summary		
			Northbound	Southbound	Total	Northbound	Southbound	Total
1	College Avenue	n/o 4 th Street	2488	2657	5145	4246	4010	8256 ⁴
2	College Avenue	n/o Whitman Drive	2846	3039	5885	2958	2917	5875 ⁵
3	College Avenue	n/o C Street	2734	2692	5426	2593	2263	4856 ⁶
4	College Avenue	n/o B Street	2925	3044	5969			
5	College Avenue	n/o A Street	2816	3006	5822			
6	College Avenue	n/o SR 125	1880	1918	3798			
7	College Avenue	s/o Lamperti Street	2205	2241	4446			
8	College Avenue	s/o 10 th Street	4274	3926	8200			
9	College Avenue	n/o 8 th Street	4103	3988	8091	4044	4369	8413 ⁷
10	College Avenue	n/o Lamperti Street	4144	3838	7983	3603	3499	7102 ⁸

As shown in Table 3, the total two-way vehicle volume along the corridor is relatively low for an arterial street. The two-way volumes range between 3798 vehicles per day north of SR125 to 8200 vehicles per day south of SW/SE 10th Street. The highest volumes on the corridor occur between 8th Street and Lamperti Street where volumes are in the range of 8000 vehicles per day. The northbound volumes tend to be slightly lower at the count stations between 4th Street and B Street. The northbound volumes are higher from 8th Street to Lamperti Street.

Table 3 also includes the 2012 ADT volumes at selected locations collected as part of the CARS⁹ Study. As shown in Table 3, the 2012 ADT volumes are relatively consistent with the 2019 volumes with the

⁴ CARS count identified as College South of 4th Street

⁵ CARS count identified as College North of Whitman Drive

⁶ CARS count identified as College South of Rose Street

⁷ CARS count identified as College South of 8th Street

⁸ CARS count identified as College South of 13th Street

⁹ CARS – College Avenue Rose Street Reconstruction Project. Counts were collected February/March 2012

exception of College Avenue north of 4th Street where the 2012 ADT is significantly higher, approximately 38 percent, in 2012 than 2019.

When comparing these recent traffic volume counts with those used for the previous WWVMPO model calibration, it was observed that with some variation, the daily volumes had generally stayed about the same as the 24-hour volume counts taken before the CARS construction. The AM and PM peak hour volumes had increased slightly south of 8th and decreased slightly north of 8th.

The traffic volume summary report is presented in the Technical Appendix.

Speed

Prevailing travel speeds on the corridor were collected at the same ten (10) locations identified above, where the traffic volume counts were collected. Speeds were categorized in 5 mph increments from 0 mph to greater than 70 mph. Speeds were summarized each hour for three consecutive days. The three-day results were averaged and presented in Table 4. Table 4 identifies the average speed and the 85th percentile speed. The 85th percentile is the speed which is generally used as the basis for the posted speed limit. The 85th percentile speed is the speed where 85 percent of the traffic is traveling equal to or less than and 15 percent exceed the speed.

Figure 2 illustrates the existing speed limits on the College Avenue Corridor.

Figure 2. Existing Speed Limit

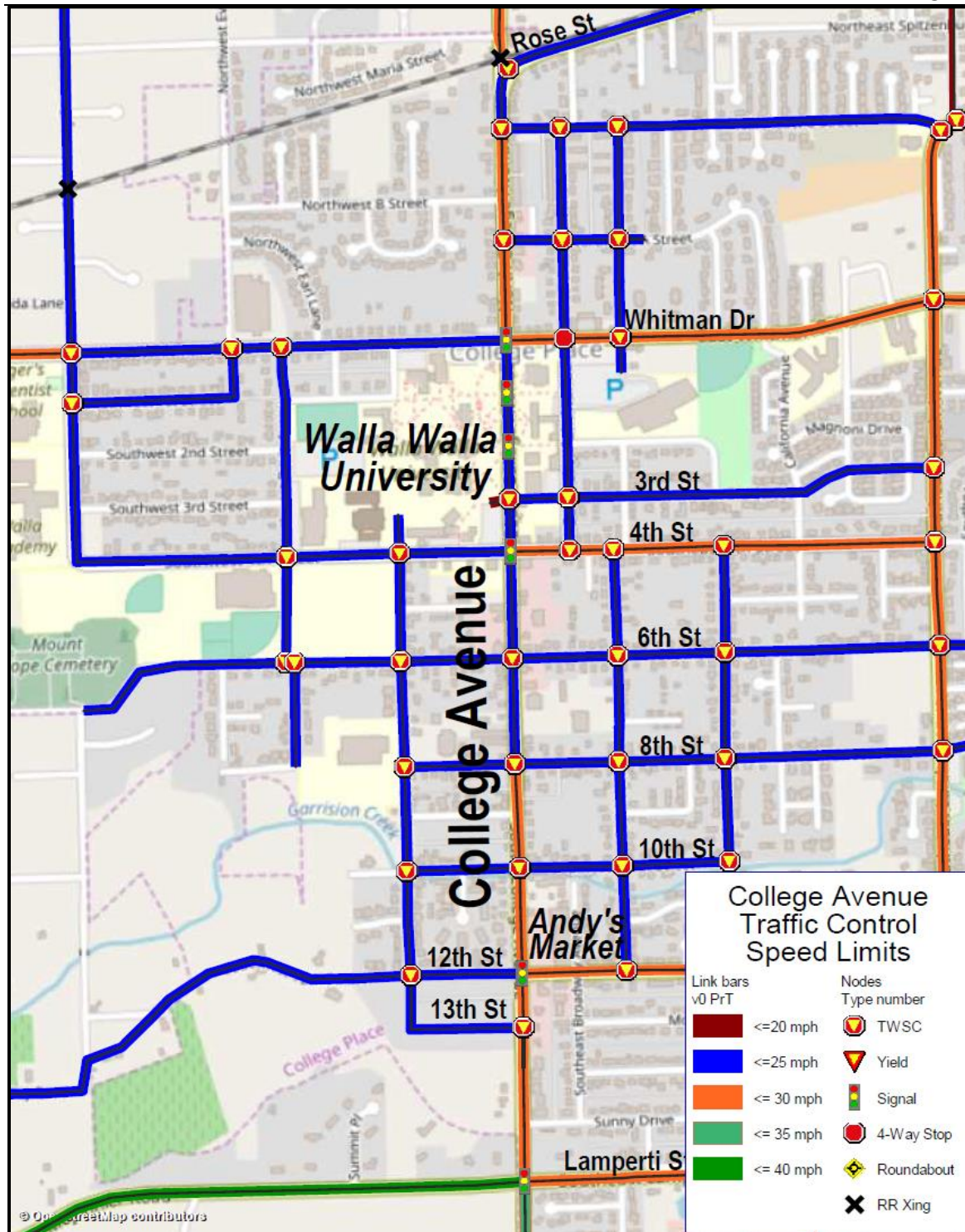


Table 4. Daily Speed Summary

#	Location	Section	Posted	Daily Speed					
				Northbound		Southbound		Total	
				Average	85 th Percentile	Average	85 th Percentile	Average	85 th Percentile
1	College Avenue	n/o 4 th Street	25	22	26	22	26	22	26
2	College Avenue	n/o Whitman Drive	30	24	28	24	27	24	28
3	College Avenue	n/o C Street	30	26	30	25	29	26	29
4	College Avenue	n/o B Street	30	25	29	25	29	25	29
5	College Avenue	n/o A Street	30	25	29	25	28	25	29
6	College Avenue	n/o SR 125	35	27	33	31	36	29	35
7	College Avenue	s/o Lamperti Street	35	26	32	26	34	26	33
8	College Avenue	s/o 10 th Street	30	27	31	28	31	27	31
9	College Avenue	n/o 8 th Street	25	25	29	26	29	26	29
10	College Avenue	n/o Lamperti Street	30	27	31	28	32	27	31

As shown in Table 4, the posted speed on the College Avenue corridor ranges between 25 mph and 35 mph. The posted speed is 35 mph south of Lamperti Street; 30 mph between Lamperti Street and 8th Street; 25 mph between 8th Street and Whitman Drive; and 30 mph north of Whitman Drive.

The result of the speed study indicates that motorists on College Avenue comply with the posted speeds. The observed speeds indicate the posted speed reflects actual speeds on the corridor. There is no significant difference between speeds in the northbound and speeds in the southbound direction.

Existing Traffic Control

In general, traffic control along the College Avenue corridor is dominated by two way stop control (TWSC). Of the nine (9) intersections in the study area, five (5) are controlled by side street stop (TWSC). Traffic signals are provided at the major intersections including:

- Lamperti Street
- 12th Street
- 4th Street
- Whitman Drive.

In addition to the four (4) traffic signals, there are also two (2) High-Intensity Activated crossWalk “HAWK” beacons located between 4th Street and Whitman Drive on the Walla Walla University (WWU) campus, to provide crosswalk protection for WWU students.

Figure 2 also illustrates the existing traffic control.

Traffic Signal Timing Plans

Existing traffic signal timing plans were provided for each of the four (4) signalized intersections within the study area. The traffic signal timing plans are included in the Appendix.

Five Year Crash Data

Crash data was requested through WSDOT's public records request process for the five years starting in 2014. The public record request included all recorded crashes on College Avenue between SR 125 and NE Rose Street. There was a total of 72 total crashes on this portion of the corridor over the 5-year period, 2014 to 2019. Of the 72 crashes, 14 involved "serious injury" and two (2) were fatalities. There was also one (1) bicycle crash. There was a total of 53 crashes within the College Avenue study area.

A summary of the five-year crash history by intersection is shown in Table 5 below. The five-year crash rate for the each of the intersections that were analyzed and counted was calculated to provide an evaluation of the number of crashes relative to the total entering volume. The crash rate was calculated using a standardized formula, from the Federal Highway Administration. The crash rate was not calculated for intersections for which peak hour counts were not collected.

Table 5. Five Year Crash Data 2014 -2018.

Corridor	Intersection	5-year Crash History	Crash Rate ¹
College Avenue	NE Rose Street	1	NA
College Avenue	C Street	2	N/A
College Avenue	NW B Street	2	N/A
College Avenue	NE A Street	6	N/A
College Avenue	Whitman Drive	7	0.60
College Avenue	SE 4 th Street	7	0.82
College Avenue	SE 6 th Street	3	0.33
College Avenue	SE 8 th Street	1	0.11
College Avenue	SE 9 th Street	3	N/A
College Avenue	SE 10 th Street	2	0.15
College Avenue	SE 12 th Street	15	0.98
College Avenue	SW 13 th Street	1	0.09
College Avenue	SE Sunny Drive	5	N/A
College Avenue	SE Lamperti Street	9	0.62
College Avenue	SR 125	8	N/A
Total		72	

1) $\text{Crash Rate} = \frac{C \text{ for } n \text{ years}}{\text{MEV for } n \text{ years}}$; where C = # of crashes, n = number of years, and MEV = million entering vehicles; Source: Federal Highway Administration

2) N/A – Intersections not included in the study area for which traffic counts were not available to determine the crash rate.

As shown in Table 5, the highest number of crashes (15) occurs at the SW/SE 12th Street intersection which also has the highest crash rate (0.98). Other high crash locations in the study area, Lamperti Street to Whitman Drive, include Lamperti Street (9 crashes), Whitman Drive and 4th Street (8 crashes). These intersections also have a relatively high crash rate within the study ranging from 0.82 at 4th Street to 0.60 at Whitman Drive.

Of the 72 crashes on the corridor, 17 (24%) were right angle, 25 (35%) were rear end; 26 (36%) were fixed object and 3 (4%) were head on. One collision involved a bicycle. There were no pedestrian crashes recorded during the five-year period on the College Avenue corridor.

Injury and Fatality Crashes

As shown in Table 5, there was a total of 72 crashes reported during the 5-year period on the College Avenue corridor from NE Rose Street to SR 125. Of the total crashes there were 17 serious injuries and two (2) fatalities. Both fatality crashes occurred at the College Avenue/SR 125 intersection. Of the 15 injury crashes, seven (7), or 41%, occurred at College Avenue/Whitman Drive; two (2) occurred at the SW/SE 12th Street intersection and two (2) at the SR 125 intersection; one (1) crash each at C Street, SE/SW 4th Street, SW/SE 13th Street intersection and one (1) at the SE Lamperti Street intersection. There were no crashes involving pedestrians on the corridor during the 5-year period. One (1) crash occurred involving a bicycle on the corridor in the last five years; it occurred at College Avenue/SW/SE 12th Street intersection.

Crash Rate

Those intersections with a crash rate approaching 1.0 should be considered for further evaluation and safety improvements. These intersections are:

- SE 4th Street
- SE 12th Street

Figure 3 presents a summary of the crashes within the College Avenue study area.

Parking

Parking Demand

The Consultant conducted a parking accumulation study on the College Avenue between Lamperti Street on the south and Rose Street on the north. The study was conducted on Wednesday June 12, 2019 between 8:00 AM and 6:00 PM and again on Thursday February 27, 2020 during the same hours. The June study was limited to the section between Lamperti Street and Whitman Drive. The study was conducted via a drive by observation on each block face of College Avenue. The study did not observe if the vehicles were parked in delineated stalls. A summary of the study observations is presented in Table 5 and Table 6 below.

Figure 3. Five Year Crash History

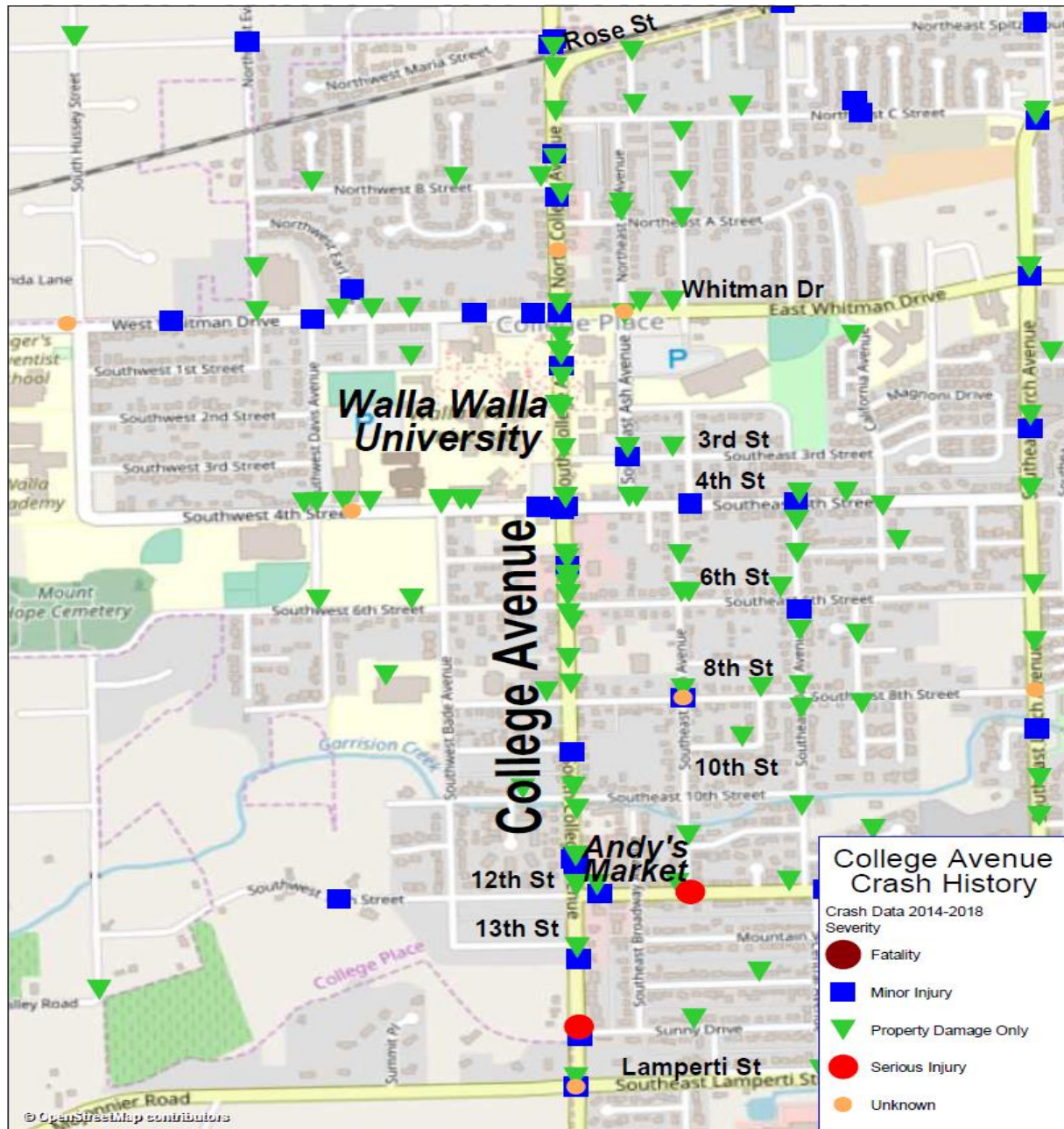


Table 5. Summary of College Avenue Parking Demand – 6/12/2019

Corridor	Section	8 AM		9 AM		10 AM		11 AM		12 PM		1 PM		2 PM		3 PM		4 PM		5 PM		Daily Total
		E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	
College Avenue	Whitman Dr to 4 th St	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
College Avenue	4 th St to 6 th St	1	0	0	0	1	3	1	3	0	6	1	2	1	3	2	0	0	2	1	2	29
College Avenue	6 th St to 8 th St	0	2	0	0	0	1	0	1	0	1	0	1	0	0	0	1	1	1	0	0	9
College Avenue	8 th St to 10 th St	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	4
College Avenue	10 th St to 12 th St	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	3	0	3	9
College Avenue	12 th St to 13 th St	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
College Avenue	13 th St to Lamperti	2	5	2	4	4	3	5	2	2	6	5	2	1	5	4	1	6	1	8	1	69
Corridor Total		3	7	2	4	5	8	6	7	2	13	6	5	2	8	6	3	9	9	10	7	122

E = East side of College Avenue

W = West side of College Avenue

Table 5 summarizes parking utilization on College Avenue between Lamperti Street and Whitman Drive on June 12, 2019. As shown in Table 5, hourly parking accumulation ranges between six (6) cars during the 9 AM hour to 18 during the 4 PM hour. Peak parking accumulation (18) occurs during the 4 PM reporting period. Peak parking varies between the east side and west side of the corridor depending on the time of day. There is no on-street parking provided between Whitman Drive and SW/SE 4th Street and consequently there is no parking utilization in this section during the day. Total parking accumulation on this day, during this time period, was shown to be 122 vehicles.

The section between SW/SE 4th Street and SW/SE 6th Street, the section adjacent to the United States Post Office, had 29 parked vehicles between 8 AM and 5 PM. The parking demand peaks during the noon hour on the westside, the side of the Post Office with six (6) parked vehicles.

The section between SW/SE 6th Street and SW/SE 8th Street, nine (9) vehicles were parked between 8 AM and 5 PM. Parking accumulation is spread throughout the day. Parking is limited to the west side where eight (8) of the nine parked vehicles were parked on the west side. One car was observed parking illegally on the east side.

The section between SW/SE 8th Street and SW/SE 10th Street had four (4) vehicles parked during the day. Parking accumulation is spread throughout the day.

The section between SW/SE 10th Street and SW/SE 12th Street had nine (9) vehicles parked during the day. Parking accumulation is focused on the 4PM to 5PM period. Eight (8) of the nine parked vehicles were on the west side of College Avenue.

The section between SW/SE 13th Street and Lamperti Street had 69 vehicles parked during the day. The study observed parked vehicles during every hour of the day. Peak accumulation nine (9) occurred during the 5 PM period. It is assumed the parking demand in this section, is the result of the residential land use along the corridor.

Table 6. Summary of College Avenue Parking Demand – 2/27/2020

Corridor	Section	8 AM		9 AM		10 AM		11 AM		12 PM		1 PM		2 PM		3 PM		4 PM		5 PM		Daily Total
		E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	
College Avenue	Rose St to C St	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
College Avenue	C St to B St	2	0	1	0	2	1	1	0	1	1	1	0	1	0	0	0	3	0	2	2	18
College Avenue	B St to A St	1	3	2	2	2	2	3	2	3	4	1	0	1	0	0	2	2	0	1	1	32
College Avenue	A St to Whitman Dr	2	3	2	4	0	2	2	2	1	2	0	2	0	2	1	2	0	1	1	1	30
College Avenue	Whitman Dr to 4 th St	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
College Avenue	4 th St to 6 th St	0	2	1	0	5	1	1	1	3	2	0	3	2	0	1	0	2	0	0	2	26
College Avenue	6 th St to 8 th St	0	0	0	0	1	0	1	0	0	0	3	0	1	0	0	1	0	0	0	0	7
College Avenue	8 th St to 9 ^h St	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
College Avenue	9 th St to 10 th St	0	2	0	2	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	8
College Avenue	10 th St to 12 th St	0	2	0	1	1	1	2	1	0	2	2	0	0	2	1	0	1	1	0	4	21
College Avenue	12 th St to 13 th St	3	0	3	0	2	0	0	0	3	0	2	0	2	0	0	2	2	0	0	2	21
College Avenue	13 th St to Lamperti	2	4	1	4	3	3	2	5	2	5	4	2	1	4	5	2	5	0	8	0	62
Corridor Total		10	16	10	13	16	12	12	13	13	17	13	7	8	8	8	9	15	2	12	13	227

E = East side of College Avenue

W = West side of College Avenue

Table 6 summarizes parking utilization on College Avenue between Lamperti Street and Rose Street on February 27, 2020. As shown in Table 6, parking utilization on the College Avenue corridor fluctuates throughout the day. Overall, 227 vehicles were observed parking on College Avenue between 8 AM and 5 PM between Lamperti Street and Rose Street. Deducting the addition of parked vehicles between Whitman Drive and Rose Street, 81 parked vehicles, the total parked vehicles between Lamperti Street and Whitman Drive was 146 parked vehicles. This is significantly higher, 146 parked cars versus 122 parked cars, than was observed during the same time period in the month of June 2019. This may be the result of Walla Walla University approaching summer break during the June observation period.

Hourly parking accumulation ranges between 17 cars during the 4 PM hour to 30 vehicles during the 12 PM hour. Peak parking varies between the east side and west side of the corridor depending on the time of day. Peak parking on the east side, 16 parked cars, occurs during the 10 AM period whereas peak parking on the west side, 17 parked vehicles, occurs during the 12 PM hour.

There is no on-street parking provided between Whitman Drive and SW/SE 4th Street through the Walla Walla University campus and consequently there is no parking utilization in this section during the day.

The highest contiguous parking utilization, during the day, occurs in the section between 10th Street and Lamperti Street. In this section, there is a total of 104 parked vehicles. The section between Whitman Drive and Rose Street also has significant parking utilization during the day, with 80 vehicles during the day. The section through the heart of the downtown, 4th Street to 10th Street, has a daily utilization of 42 parked vehicles. In the section adjacent to the United States Post Office, SW/SE 4th Street to SW/SE 6th Street, the parking demand during the day is 26 vehicles. Parking utilization adjacent to the Post Office peaks during the 10 AM hour on the eastside, opposite the Post Office with 5 parked vehicles.

Parking Supply

The City provided a summary of available parking stalls along the corridor as part of the CARS¹⁰ analysis. A summary of the parking supply is presented in Table 7.

Table 7. CARS – Available Parking Supply

		Hourly Summary								
		Peak Demand								
		6/12/2019			2/27/20			Available Supply		
Corridor	Section	E	W	Total	E	W	Total	E	W	Total
College Avenue	4 th St to 6 th St	0	6	6	5	1	6	3	6	9
College Avenue	6 th St to 8 th St	2	0	2	3	0	3	0	5	5
College Avenue	8 th St to 10 th St	0	1	1	2	0	2	3	4	7
College Avenue	10 th St to 12 th St	1	3	4	0	4	4	15	12	27
College Avenue	12 th St to 13 th St	0	1	1	3	0	3	3	6	9
College Avenue	13 th St to Lamperti	8	1	9	8	0	8	22	17	39
Corridor Total		11	12	23	21	5	26	46	50	96

As shown in Table 7, the peak hourly parking demand for the corridor, 23 stalls in June 2019 and 26 stalls in February 2020, is significantly less than the available parking supply which is 96 stalls in the sections between 4th Street and Lamperti Street. The only section where the demand is equivalent to the available supply is the section between SW/SE 4th Street to SW/SE 6th Street where the parking demand, six (6) stalls, is equivalent to the available supply. This section is adjacent to the United States Post Office. Peak hourly parking demand occurs in the section between SW/SE 13th Street and Lamperti Street where the peak demand is nine (9) stalls and the available supply is 39 stalls.

¹⁰ CARS – Available parking stalls identified by City survey after the complete streets project, March 28, 2016.

Transit

The College Avenue corridor is served by four different bus routes including the “Walla Walla Whistler” and Valley Transit Routes 1 - Mainline Eastbound, Route 2 – College Place and Route 310 – West Loop. Bus stops are located on both sides of the corridor for opposite directions of travel. The stops are spaced at approximate two block intervals. A summary of the bus stops on the College Avenue corridor between Lamperti Street and Rose Street is presented in Table 8.

Table 8. Transit Stop Locations

Corridor	Section	Route	Direction	
			North Bound	South Bound
College Avenue	Lamperti St to 12 th St	1, 2, and 310	100 ft north of Sunny Dr	110 ft south of Silverstar Lane
College Avenue	12 th St to 10 th St	Walla Walla Whistler	360 ft north of 12 th St	
College Avenue	12 th St to 10 th St	1, 310	450 ft north of 12 th St	200 ft north of 12 th St
College Avenue	9 th St to 8 th St	1, 310	75 ft north of 9 th St	90 ft south of 9 th St
College Avenue	9 th St to 8 th St	1, 310	430 ft north of 8 th St	
College Avenue	6 th St to 4 th St			200 ft south of 4 th St
College Avenue	4 th St to Whitman Dr			
College Avenue	Whitman Dr to A St	1, 310	300 north of Whitman Dr	175 ft north of Whitman
College Avenue	A St to C St	1, 310	300 ft north of B St	50 feet north of B St



As shown in Table 8, there are seven (7) bus stops on the east side of College Avenue in the north bound direction and six (6) bus stops on the west side in the south bound direction. There are no bus stops on College Avenue passing through the Walla Walla University campus; 4th Street to Whitman Drive. The bus stops are generally located at mid-block locations. In observing riders disembarking from

the bus, they tended to cross College Avenue at the stop rather than proceeding to the nearest intersection with a crosswalk. In addition, the bus stops are typically signed “No Parking” and yet the pavement markings delineate a parking stall. This confusion should be remedied.

Land Use Data

The College Avenue Traffic Assessment employed the Walla Walla Valley Metropolitan Planning Organization (WVVMPO) transportation demand model to analyze traffic flow and circulation on the College Avenue corridor. The analysis evaluated the traffic flow conditions in 2019 and 2040 during the PM peak hour. The purpose of the two-phase analysis is to determine if the proposed solutions in 2019

are viable in 2040 or will additional improvements be necessary in 2040 to accommodate the projected growth in the corridor.

The future land use was provided by the WWVMPO during development of the WWVMPO model used for this study. A summary of the 2019 existing and 2040 proposed land use is summarized for key traffic analysis along the College Avenue corridor. During the WWVMPO model development, all the jurisdictions, including the City of College Place, had supplied current and 2040 forecast land use data for the model. The summary is presented in Table 9.

Table 9. 2019 vs 2040 Land Use

Traffic Analysis Zone	Total Employment			Dwelling Units			Total Students		
	2019	2040	Growth	2019	2040	Growth	2019	2040	Growth
A	31	53	22	142	302	160	0	0	0
B	879	909	30	289	289	0	500	500	0
C	194	194	0	378	434	56	0	0	0
D	44	44	0	391	434	43	0	0	0
E	339	339	0	1269	1416	147	1568	1568	0
F	112	112	0	541	610	69	880	880	0
Total	1599	1651	52	3010	3485	475	2948	2948	0

As shown in Table 8, the six (6) traffic analysis zones (TAZ's) include existing and 2040 estimates of dwelling units, employment and students. As shown in Table 7, the total employment is expected to grow approximately 52 jobs, or approximately three (3) percent; dwelling units are estimated to grow by 475 jobs, or approximately 16 percent; and students which aren't expected to grow between the 2019 and 2040 time horizon.

Figure 5 illustrates the existing traffic analysis zones (TAZ) in the College Avenue study area. These traffic analysis zones were established by the WWVMPO and member jurisdictions, including the City of College Place. The TAZ structure was developed for the purpose of developing traffic forecasts in College Place and throughout the WWVMPO area. There are a total of 137 internal and external zones in the WWVMPO model.

Sight Distance

The City requested an evaluation of the sight visibility triangles at critical intersections along the corridor. Sight visibility triangle requirements are stated in Section 17.42.050 Sight Visibility Triangle¹¹:

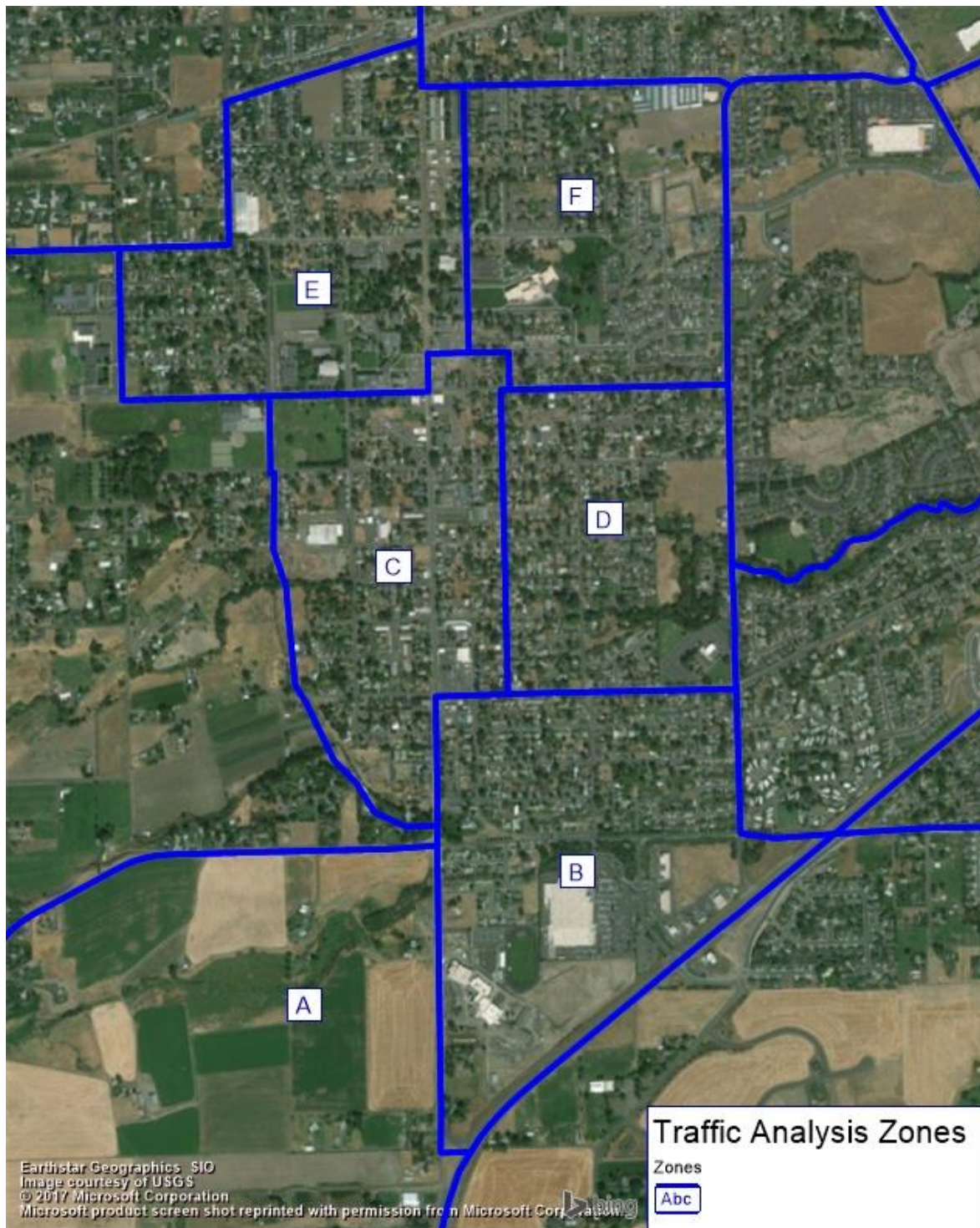
"A. At uncontrolled intersections, the sight visibility triangle shall be formed by measuring back from the point where street corner property lines meet, a distance of 30 feet along the property line, with the third side of the triangle being the straight-line connection between the above-mentioned sidelines. (Refer to Figure 17.42.050A.)"

¹¹ City of College Place Municipal Code; Section 17.42.050.

B. At controlled intersections the side street side of the sight visibility triangle shall be a distance of ten feet measured back from the point where street corner property lines meet; the through street side of the triangle shall be a distance of 30 feet for speed limits up to 25 miles per hour and 55 feet for speed limits up to 35 miles per hour; the third side of the triangle being the straight line connection between the above-mentioned side lines. (Refer to Figure 17.42.050B.)

Uncontrolled intersections are defined as intersections where there are no specific traffic control devices and drivers are required to follow the “rules of the road” when determining right of way. “Controlled intersections” are intersections where “stop signs” are installed on the minor leg without control on the through street or major leg of the intersection. Signalized intersections are typically not subject to these requirements as the traffic signal assigns “right of way” to the approaches to the intersection.

Figure 5. College Place Traffic Analysis Zones.



Four (4) of the intersections along the corridor are under signal control¹². The remaining intersections provide stop sign control on the intersecting side street

A summary of the intersections with sight distance constraints is presented in Table 10.

Table 10. Intersections with Sight Distance Constraints

Intersection	West Side		East Side	
	Looking North	Looking South	Looking North	Looking South
SE Sunny Drive	N/A	N/A	Landscape/Parking	No Constraints
SW 13 th Street	Landscape/Berm	Landscape/Berm	N/A	N/A
SW/SE 10 th Street	Equipment/Fence	No Constraints	No Constraints	Landscape/Fence
SW/SE 8 th Street	Street Furniture	No Constraints	Landscape/Fence	Building
SW/SE 6 th Street	Landscape	Landscape	Fence	No Constraints
SW/SE 3 rd Street	N/A	N/A	Landscape	Building

N/A – Not applicable. There is no approach on the leg.

As shown in Table 10, six (6) of the ten (9) intersections in the study area have sight distance constraints on the side street approach. Most of the intersections are impacted by landscaping on the adjacent property. Three (3) intersections are constrained by existing buildings along the property line, including SW 10th Street, SE 8th Street, and SE 3rd Street. At SW 10th Street, equipment storage along the property line for “The Empire” retail outlet impedes intersection sight distance at this location.

¹² College Avenue signalized intersections include Lamperti Street; 12th Street; 4th Street; and Whitman Drive.

Memorandum – Is Current Traffic Pattern Optimal?

The purpose of this memorandum is to provide a summary of the process and findings relating to Task 3 – *Is the current traffic pattern optimal?* The objective of the task is to conduct a thorough analysis of existing and future traffic patterns to determine if the cross section and channelization provides the most optimal circulation along the College Avenue corridor. The scope for Task 3 is to evaluate the level of service at each of the nine intersections along the College Avenue corridor from Lamperti Drive to Whitman Drive for the 2019 AM and PM peak hours for three different alternative operational configurations to include:

- Alternative one – Do Nothing – existing left turn channelization configuration at the corridor intersections.
- Alternative Two – Remove Left Turn Channelization.
- Alternative Three – Evaluate the impact of signal coordination on Alternatives One and Two.

In addition to the 2019 analysis, an evaluation of the level of service in the 2040-time frame was also provided to determine the effect of anticipated public works infrastructure improvements and land use development on traffic operations in the corridor.

Process

To address this issue, the Consultant employed the 2015 Walla Walla Valley Metropolitan and Sub-Regional Organization Travel Demand Model. The base year of the model is 2014 with a forecast year of 2040. The model was designed to forecast travel demand for the AM and PM peak hours as well as weekday daily traffic. The model was also used to evaluate the Highway Capacity Manual Level of Service (LOS) for the AM and PM peak hours at designated intersection for comparison and evaluation of alternative.

Model Update

The existing WWVMPO model includes College Avenue intersections with Rose, C Street, Whitman Drive, 4th Street, 12th Street, and Lamperti Avenue in this corridor. The model was enhanced to add intersections for 6th, 8th, 10th, and 13th Streets with street connections to ensure the volumes are properly modeled. This included adding additional links, nodes, and zone connectors. Traffic analysis zones were not subdivided so that the current land use forecasts could be used. New traffic count data, including bicycle and pedestrian volumes for the project area and the analysis intersections of Whitman Drive, 4th, 6th, 8th, 10th, 12th, 13th, and Lamperti was entered into the WWVMPO model. Geometrics, traffic control, and signal timing as appropriate was updated in the model.

The WWVMPO model also has the ability to optimize and test signal coordination with offsets based upon complete traffic assignment paths, and optional signal coordination was added to the model for testing in this corridor.

Model network surrounding the study area was evaluated and updated with new construction and changes based upon Google Streetview and the field review. Land use was adjusted to 2019 by interpolation to better reflect existing conditions.

The model calibration was updated and checked in the study area to replicate the new count data and to improve the forecasts. HCM intersection LOS was reported for the AM and PM peak hours for 2019 conditions with testing of different left turn configurations and with and without signal coordination. For budget purposes three different base year forecast scenarios were run.

Forecasts

WWVMPO projected 2040 land use data and planned network changes for the study area were provided to the City of College Place for review in case expectations have changed since the model was completed in 2016. The Davis Avenue and 12th Street Extension projects along with others assumed in the WWVMPO 2040 plan were assumed to be included in the forecast scenarios. The forecast analysis conditions including land use and assumed future year network will be confirmed with the City before the model runs and analysis are completed. Volumes and intersection LOS will be provided for the AM and PM Peak hours, as well as AWDT.

Findings

The following section presents the findings of the level of service analysis for each of the scenarios identified above. For each alternative, an evaluation of the existing 2019 condition is presented. The evaluation is supplemented with a level of service analysis for the 2040 forecast scenario. The purpose of the 2040 forecast is to document that any proposed changes suggested by the 2019 evaluation will work in the 2040-time frame. This is to ensure that if recommendations include significant infrastructure modifications, they will be viable in 2040.

Alternative One – Do Nothing

Existing Condition

Alternative One “Do Nothing” focuses on an evaluation of the existing channelization and traffic signal operations under the 2019 AM and PM peak volume scenarios. Level of service (LOS) was calculated for each intersection during each time period, AM and PM peak hour. The City has adopted LOS D as the level of service standard for the College Avenue corridor¹. A summary of the LOS results is presented in Table 1.

Table 1. 2019 Peak Hour Level of Service

Intersection	Traffic Control	Peak Hour Level of Service		LOS Standard
		AM Peak	PM Peak	
College Avenue/Whitman Drive	Signal	C (27.3)	C (20.2)	D
College Avenue/SE 3 rd Street	TWSC	B (12.3)	B (11.7)	D
College Avenue/SE/SW 4 th Street	Signal	D (44.4)	C (26.8)	D
College Avenue/SE/SW 6 th Street	TWSC	C (17.3)	B (14.2)	D
College Avenue/SE/SW 8 th Street	TWSC	C (18.9)	B (14.2)	D
College Avenue/SE/SW 10 th Street	TWSC	D (27.5)	C (20.0)	D
College Avenue/SE/SW 12 th Street	Signal	C (25.5)	C (22.5)	D
College Avenue/SE/SW 13 th Street	TWSC	C (17.4)	B (14.4)	D
College Avenue/SE/SW Lamperti Lane	Signal	C (24.2)	C (25.9)	D

(xx.x) = seconds of delay

TWSC – Two Way Stop Control

As shown in Table 1, each of the intersections operate at or above the City of College Place level of service standard, LOS D. During the AM period, two (2) of the intersections, 4th Street and 10th Street, were estimated to operate at LOS D during the AM peak period. Six (6) of the intersections operate at LOS C and one (1) intersection operates at LOS B; SE 3rd Street. During the PM peak, five (5) intersections operate at LOS C and four (4) intersections operate at LOS B.

Signal timing for 2019 and for the 2040 computations, shown in Table 2, was entered directly from the signal timing sheets provided by WSDOT. The signal timing has separate phases for the through movements and the left turns when there are left turn lanes. After each green phase, there is an amber phase and an all-red phase. Depending upon operation, each signal can have four or six phases, each with amber and all-red times. The more phases the more “lost” time at the intersection, when no traffic is moving.

It should be noted that LOS for signals is shown for the average of the intersection. LOS for TWSC (Two-Way Stop Control) intersection is reported for the worst movement. For example, at the intersection of

¹ City of College Place Transportation Plan; Appendix E; Policy 1; September 2018.

College Avenue with SW 6th St, the LOS C in the AM Peak is for the stop controlled west leg left turn. All LOS calculation worksheets are supplied in the Technical Appendix.

Future Condition

An evaluation of the existing College Avenue channelization was conducted to determine if the current design is acceptable in the future. A summary of the level of service in the 2040 AM and PM peak hour is presented in Table 2 below.

As shown in Table 2, each of the nine analysis intersections continue to operate at an acceptable level of service in accordance with the City's LOS D standard. During the 2040 AM Peak, two (2) intersections, Whitman Drive and 4th Street operate at LOS D and seven (7) intersections operate at LOS C. The level of service at five (5) intersections improved between the 2019 peak hours and the 2040 peak hours as a result of the extension of Davis Avenue to connect with College Avenue at Sunny Drive which changed the traffic patterns along the College Avenue corridor. During the 2040 PM peak, all intersections were estimated to operate at a level of service above the city standard. Four (4) of the nine (9) intersections were estimated to operate at LOS B and five (5) were estimated to operate at LOS C. The level of service improved at five (5) intersections between 2019 and 2040. Again, the level of service improvement resulted from roadway improvements expected in College Place.

Table 2. 2040 Peak Hour Level of Service

		Peak Hour Level of Service				
		AM Peak		PM Peak		
Intersection	Traffic Control	2019	2040	2019	2040	LOS Standard
College Avenue/Whitman Drive	Signal	C (27.3)	D (35.2)	C (20.2)	C (21.2)	D
College Avenue/SE/SW 3 rd Street	TWSC	B (12.3)	C (15.6)	B (11.7)	B (13.2)	D
College Avenue/SE/SW 4 th Street	Signal	D (44.4)	D (50.3)	C (26.8)	C (25.3)	D
College Avenue/SE/SW 6 th Street	TWSC	C (17.3)	C (17.2)	B (14.2)	B (13.6)	D
College Avenue/SE/SW 8 th Street	TWSC	C (18.9)	C (17.2)	B (14.2)	B (13.7)	D
College Avenue/SE/SW 10 th Street	TWSC	D (27.5)	C (24.1)	C (20.0)	C (18.8)	D
College Avenue/SE/SW 12 th Street	Signal	C (25.5)	C (25.4)	C (22.5)	C (21.9)	D
College Avenue/SE/SW 13 th Street	TWSC	C (17.4)	C (15.3)	B (14.4)	B (13.6)	D
College Avenue/SE/SW Lamperti Lane	Signal	C (24.2)	C (25.8)	C (25.9)	C (28.7)	D

(xx.x) = seconds of delay

TWSC – Two Way Stop Control

The 2019 level of service at each intersection for both the AM and PM peak hour is shown for comparison with the 2040 level of service.

Alternative Two – Remove Left Turn Channelization

The City requested an evaluation of the impact of eliminating the existing left turn channelization at the nine (9) analysis intersections. The basis of this request was to determine if the left turn lanes can be eliminated and the space used for parking and bicycle lanes. Currently, vehicular traffic serpentine through the intersection approach crossing left turn channelization. The City expressed concern regarding driver discomfort with this condition.

Existing Condition

The “existing condition” analysis considered the level of service at each of the nine (9) intersections without the existing left turn channelization. In other words, the College Avenue approach to each intersection for northbound and southbound traffic would be limited one (1) lane in each direction. This channelization would allow the extension of existing parking and eliminate the current serpentine traffic flow.

With the changes in channelization, the signal timing plans were changed to two-phase operation from the current multi-phase operation. What this means is that, because there are no longer left turn lanes, there are also no left-turn arrows, with accompanying amber and all-red times. Instead, the North-South movement gets a green phase, with an accompanying amber and all-red time, and the East-West movement gets a green phase, with an accompanying amber and all-red time. The result is there is roughly half as much “lost time” as with multi-phase signal timing. There is the potential for more time when traffic is moving, which can result in improved Level of Service, because of the reduced “lost” time.

The existing condition level of service is also provided for comparison purposes during the AM and PM peak hour.

Table 3. 2019 Peak Hour Level of Service w/o Left Turn Channelization

		Peak Hour Level of Service				
		AM Peak		PM Peak		
Intersection	Traffic Control	Existing	w/o LT	Existing	w/o LT	LOS Standard
College Avenue/Whitman Drive	Signal	C (27.3)	B (13.3)	C (20.2)	B (10.7)	D
College Avenue/SE/SW 3 rd Street	TWSC	B (12.3)	C (12.6)	B (11.7)	B (11.9)	D
College Avenue/SE/SW 4 th Street	Signal	D (44.4)	B (17.9)	C (26.8)	B (11.8)	D
College Avenue/SE/SW 6 th Street	TWSC	C (17.3)	C (17.3)	B (14.2)	B (14.3)	D
College Avenue/SE/SW 8 th Street	TWSC	C (18.9)	C (18.9)	B (14.2)	B (14.6)	D
College Avenue/SE/SW 10 th Street	TWSC	D (27.5)	D (27.0)	C (20.0)	C (20.0)	D
College Avenue/SE/SW 12 th Street	Signal	C (25.5)	A (9.3)	C (22.5)	A (9.2)	D
College Avenue/SE/SW 13 th Street	TWSC	C (17.4)	C (17.0)	B (14.4)	B (14.3)	D
College Avenue/SE/SW Lamperti Lane	Signal	C (24.1)	B (12.1)	C (25.9)	B (13.0)	D

(xx.x) = seconds of delay

TWSC – Two Way Stop Control

As shown in Table 3, each of the nine (9) intersections operate above the City level of service standard during the AM and PM peak hours. During the AM peak, one (1) intersection operates at LOS A; three (3) intersections operate at LOS B; four (4) intersections operate at LOS C; and one (1) intersection operates at LOS D. This is a significant improvement over the existing channelization where two (2) intersections operate at LOS D; six (6) at LOS C; and one (1) at LOS B.

During the PM peak hour, one (1) intersection operates at LOS A; seven (7) intersections operate at LOS B; and one (1) intersection operates at LOS C. Again, with the elimination of the left turn channelization, there is a significant improvement over the existing channelization where five (5) intersections operate at LOS C and four (4) at LOS B.

These improvements to the level of service are due to the decrease in lost time due to implementation of two-phase signal operation. Eliminating the left turn channelization permits the two-phase signal operation to decrease the delay at the signals without a significant impact to the TWSC controlled intersections.

Future Condition

An evaluation of the existing College Avenue channelization was conducted to determine if the current design is acceptable in the future. A summary of the level of service in the 2040 AM and PM peak hour is presented in Table 4 below. The 2040 AM and PM peak hour level of service for the existing channelization is included in the table for comparison with the 2040 existing channelization scenario.

As shown in Table 4, all nine (9) intersections were determined to operate above the City level of service standard of LOS D, during the 2040 AM and PM peak hours, without the existing left turn channelization. During the 2040 AM peak, four (4) intersections were estimated to operate at LOS B, whereas five (5) intersections were estimated to operate at LOS C. Elimination of the left turn pockets provides a significant benefit in level of service over the existing channelization configuration. Under the existing left turn channelization, two (2) intersections were estimated to operate at LOS D during 2040 AM peak; and seven (7) intersections were estimated to operate at LOS C.

During the PM peak, without the left turn channelization, one (1) of the intersections were estimated to operate at LOS C and eight (8) intersections were estimated to LOS B. Under the existing left turn channelization, five (5) intersections operate at LOS C and four (4) intersections operate at LOS B. This results in an improvement over the existing conditions.

Table 4. 2040 Peak Hour Level of Service w/o Left Turn Channelization

		Peak Hour Level of Service				
		AM Peak		PM Peak		
Intersection	Traffic Control	Existing	w/o LT	Existing	w/o LT	LOS Standard
College Avenue/Whitman Drive	Signal	D (35.2)	B (14.6)	C (21.2)	B (11.5)	D
College Avenue/SE/SW 3 rd Street	TWSC	C (15.6)	C (15.5)	B (13.2)	B (13.8)	D
College Avenue/SE/SW 4 th Street	Signal	D (50.3)	B (15.5)	C (25.3)	B (10.3)	D
College Avenue/SE/SW 6 th Street	TWSC	C (17.2)	C (17.7)	B (13.6)	B (13.4)	D
College Avenue/SE/SW 8 th Street	TWSC	C (17.2)	C (16.6)	B (13.7)	B (14.0)	D
College Avenue/SE/SW 10 th Street	TWSC	C (24.1)	C (23.4)	C (18.8)	C (18.7)	D
College Avenue/SE/SW 12 th Street	Signal	C (25.4)	B (10.9)	C (21.9)	B (11.1)	D
College Avenue/SE/SW 13 th Street	TWSC	C (15.3)	C (15.1)	B (13.6)	B (13.2)	D
College Avenue/SE/SW Lamperti Lane	Signal	C (25.8)	B (13.5)	C (28.7)	B (13.5)	D

(xx.x) = seconds of delay

TWSC – Two Way Stop Control

Alternative Three - Evaluate the impact of signal coordination on Alternatives One and Two

The final question in the evaluation of existing traffic patterns was to determine if coordination of the four (4) existing signalized intersections would improve traffic operations on the College Avenue corridor. Currently, the intersections are not coordinated and effectively operating in a “Free” mode. In the “Free” mode the traffic signal responds to the actuation created by arriving vehicles. The City requested the analysis include an evaluation of both the existing channelization (with left turn) and without left turn channelization, if the traffic signals were coordinated.

Signal Coordination

Signal coordination was evaluated along the College Avenue Corridor between Whitman Drive on the north and Lamperti Lane/Mojonnier Road on the south. This section includes four (4) signalized intersections including Whitman Drive, 4th Street, 12th Street, and Lamperti Lane.

Coordination is useful when the platoons traveling between the signals can be timed so that the drivers can maintain a steady speed between the signals and arrive at the next signal when it is green. This analysis considers both traffic traveling along College Avenue from Whitman to Lamperti as well as traffic exiting and entering the corridor at each intersection through traffic that turns on and off the corridor.

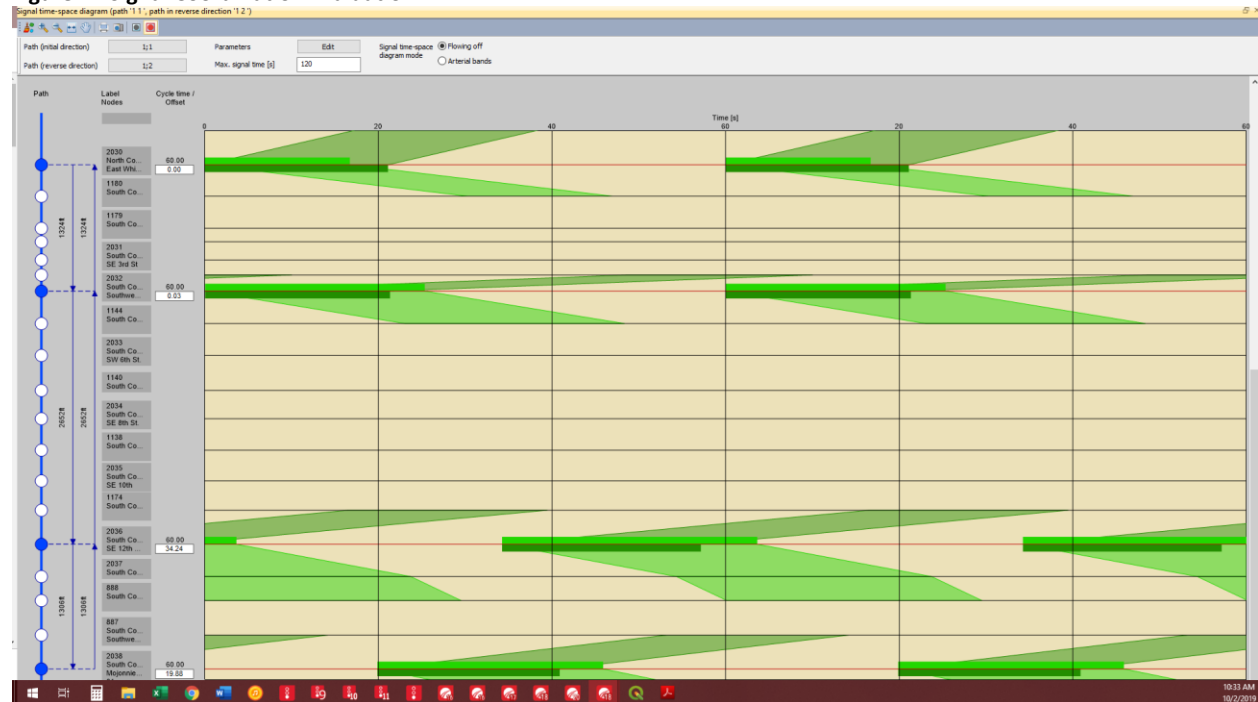
The Highway Capacity Manual presents a method of coding signal arrival types to evaluate the effectiveness of signal coordination. The method assigns a number of one (1) through six (6) for each arrival type. These numbers are defined as:

- #1 - 80% of vehicles arrives at start of Red.
- #2 - 40-80% of vehicles arrive during the Red interval.
- #3 – Random arrivals
- #4 – 40-80% arrives in Green
- #5 - 80% arrives at start of Green
- #6 - Exceptional Progression

VISUM, the model used in this analysis, tracks the paths of all traffic and can therefore quantify the arrivals of traffic both going through the corridor and turning on and off the corridor. Analysis of current operation shows random arrivals corresponding to an arrival type of #3 as described above. Improvement could be realized if signal coordination results in traffic arrivals at the signalized intersections are improved with arrival numbers 4, 5, and 6.

To test this, a coordination group was established with the four (4) signals and tested both with computed optimized signal timing coordination offsets and with manually adjusted signal coordination offsets. Then, using the model, the traffic arrivals were again evaluated to see if an improvement could be realized. The flow of traffic platoons from each signal both southbound (lighter green) and northbound (darker green) is shown in Figure 1. The intersections are shown on the vertical axis of the graphic and time is shown on the horizontal axis. The green bands show the flow of the traffic platoons

Figure 1 - Signal Coordination Evaluation

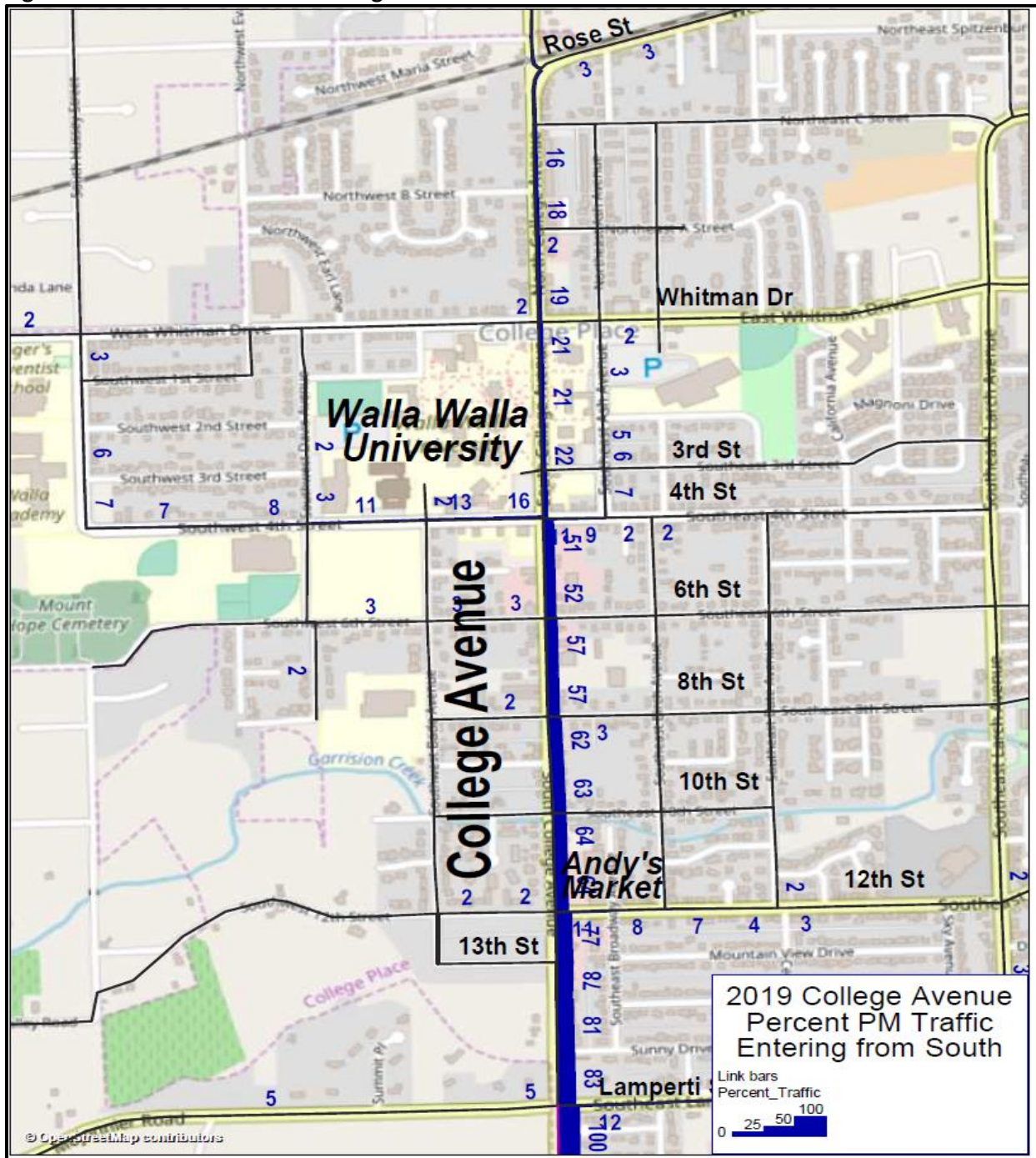


In both cases, the best arrival type computed was #3 – Random arrivals. As shown in the graphic above, the platoons are shown in the green bands and then “dissolve” or spread out in the space between the bands. So, the spacing (1/4 to 1/2 mile) is too great between the signals and there are too many other turning movements on and off the corridor to benefit from signal coordination.

To further understand operation of the College Avenue corridor and possible operational improvement from signal coordination, the paths of trips traversing the corridor were analyzed. Using the model, paths of trips were plotted to show the percentages of trips entering and exiting the corridor on the north and south ends. One example is shown here as Figure 2 which depicts the northbound trips that enter the corridor from the south of Lamperti. The link where the path starts shows 100% of the trips. As can be seen, the percentage drops as travel continues northbound along the corridor, with only 19% of the trips that start south of Lamperti continuing on to the north of Whitman and only 3% continuing onto Rose.

Similar plots are for the AM and PM and for entering and exiting both at the North and South are included in the appendix. None of these show over 20% of the traffic that enters or exits the corridor at over 20%. This means that over 80% of the traffic is destined for other locations along the corridor instead of being through traffic.

Figure 2 - Percent PM Traffic Entering from South



The analysis methods show that the current signal operation isn't improved upon by coordinating the signals. No significant improvement will be made by interconnecting and coordinating the activated signals.

Existing Signal Timing

It was noted during the analysis that there is significant lost time in the existing signal timing plans due to long amber, walk and pedestrian clearance intervals, as well as "all-red" times in combination with

the left turn phasing. During the tests of removing the left turn lanes, the signal timing was converted to a simple two-phase signal with amber times of three (3) seconds and all-red times of (one) second which resulted in a significant improvement in operation was obtained.

It is recommended that detailed analysis be conducted on the existing signal timing parameters to ensure they are effective and provide efficient signal operation.

Other Possibilities

All Way Stop Control (AWSC)

As part of the evaluation, the Consultant also considered converting the traffic signal operation to an “All Way Stop Control”. At the signalized intersections, this would be accomplished by converting the signal operation to an all-way red flash. A summary of the analysis for this condition is presented below.

Existing Conditions

Level of service on the College Avenue corridor was evaluated for each of the nine (9) analysis intersection with all way stop control (AWSC) provided at each of the four (4) signalized intersection. The signalized intersections include Whitman Drive, SW/SE 12th Street, SW/SE 4th Street, and Whitman Drive. The result of the 2019 level of service analysis is presented in Table 5 below. The level of service for the existing 2019 AM and PM peak hours is shown for comparison with the AWSC condition.

Table 5. 2019 Peak Hour Level of Service - All Way Stop w/o Left Turn Channelization

		Peak Hour Level of Service				
		AM Peak		PM Peak		
Intersection	Traffic Control	Existing	AWSC w/o LT	Existing	AWSC w/o LT	LOS Standard
College Avenue/Whitman Drive	Signal	C (27.3)	C (20.2)	C (20.2)	B (12.8)	D
College Avenue/SE/SW 3 rd Street	TWSC	B (12.3)	B (12.3)	B (11.7)	B (11.8.3)	D
College Avenue/SE/SW 4 th Street	Signal	D (44.4)	F (246)	C (26.4)	B (13.8)	D
College Avenue/SE/SW 6 th Street	TWSC	C (17.3)	C (18.3)	B (14.2)	B (14.6)	D
College Avenue/SE/SW 8 th Street	TWSC	C (18.9)	C (19.8)	B (14.2)	B (14.4)	D
College Avenue/SE/SW 10 th Street	TWSC	D (27.5)	D (27.9)	C (20.0)	C (20.1)	D
College Avenue/SE/SW 12 th Street	Signal	C (25.5)	F (59.5)	C (22.5)	B (14.5)	D
College Avenue/SE/SW 13 th Street	TWSC	C (17.4)	C (18.1)	B (14.4)	C (15.3)	D
College Avenue/SE/SW Lamperti Lane	Signal	C (24.1)	F (52.9)	C (25.9)	B (13.1)	D

(xx.x) = seconds of delay

TWSC – Two Way Stop Control

As shown in Table 5, three (3) of the intersections are estimated to operate below the City of College Place level of service standard. In fact, the three (3) intersections would experience LOS F during the AM peak period, if the AWSC operation were implemented. During the AM peak, three (3)

intersections, SW/SE 4th Street, SW/SE 12th Street, and Lamperti Lane are estimated to operate at LOS F; one (1) intersection, Whitman Drive, is estimated to operate at LOS C; and the remaining five (5) intersections are estimated to operate at LOS similar to the existing conditions. The comparison between the existing condition and the proposed AWSC operation LOS indicates the AWSC operation is worse than the 2019 existing condition LOS during the AM peak hour. Under the existing 2019 AM peak, without the AWSC operation, two (2) intersections are estimated to operate at LOS D; six (6) of the intersections are estimated to operate at LOS C; and one (1) intersection is estimated to operate at LOS B.

During the PM peak period, with AWSC operation and without left turn channelization, seven (7) of the intersections are estimated to operate at LOS B; and two (2) of the intersections are estimated to operate at LOS C. In comparison, the level of service under the existing 2019 condition, indicates five (5) of the intersections are estimated to operate at LOS C and four (4) are estimated to operate at LOS B. As shown, during the PM peak, the AWSC control without left turn channelization has a better overall LOS than the 2019 existing condition.

Future Condition

The LOS evaluation for the 2019 indicates the AM peak level of service would be significantly lower than the City's adopted LOS standard at three (3) locations. As a result, the AWSC condition was dropped from further consideration.

During review, the question was asked whether all the intersections except 4th, 12th, and Lamperti were converted to AWSC. This was not explicitly tested but given that the LOS the TWSC at these intersections operates acceptably, the AWSC will not have an adverse LOS. However, this will add delay to the movement along College Avenue. It will also result in increased emissions and noise with the accelerations and decelerations at each intersection and may lead to increased driver frustration.

Queueing

Remove Left Turn Channelization

The analysis shows that removing the left turn channelization allows for two-phase signal operation which reduces delay. The left turn channelization does allow for through vehicles to bypass vehicles waiting for a gap to turn left and there is the possibility of longer queues that may negatively impact operation. Therefore, the 95% queues were analyzed with 2040 traffic for all of the nine (9) analysis intersections. A 95% queue means that 95% of the time the queue will be equal to or less than the computed value. In addition, the available queue storage length was measured from the intersection to the next major driveway or intersection. For example, on the east leg of 12th St, the distance was measure to the driveway of Andy's Market.

Table 6 compares the AM queues with available storage lengths by intersection leg. As can be seen, all of the queue lengths are less than the available storage. The queues are measured in numbers of vehicles, with the average length of a vehicle estimated at 20 feet including space between vehicles. The Ford F-150 ranges in length from 17.4' to 20.8' and the Ford Mustang is 15.7'. Table 7 compares the PM queues with available storage lengths by intersection leg. As can be seen, all of the queue lengths are less than the available storage.

Table 6 - 2040 AM Peak Intersection Queues

	95% Queue by Approach Leg (Veh) AM Peak							
Intersection	North		East		South		West	
	Queue	Storage	Queue	Storage	Queue	Storage	Queue	Storage
College & Whitman	6.6	26.0	3.6	12.5	7.8	13.5	7.6	13.0
N College & 3rd St.	0.0	8.2	0.2	5.0	0.0	12.9	0.2	13.0
S College Ave & 4th St	3.4	12.4	7.3	13.0	9.9	15.0	4.5	31.0
S College Ave & 6th St	0.0	13.0	0.2	17.0	0.0	13.0	0.6	31.0
S College Ave & 8th St	0.0	8.5	0.3	10.5	0.0	8.8	0.3	22.0
S College Ave & 10th St	0.0	13.0	0.3	27.0	0.0	20.0	0.5	13.8
S College Ave & 12th St	3.3	6.0	4.2	5.0	5.3	12.5	3.9	30.0
S College and 13th St.	-	-	-	-	0.0	10.0	0.1	16.0
S College Ave & Lamperti	6.7	14.0	5.5	25.0	5.2	17.0	5.8	19.0
* Queue Lengths in number of vehicles using 20 ft/veh								

Table 7 - PM Peak Intersection Queues

	95% Queue by Approach Leg (Veh) PM Peak							
Intersection	North		East		South		West	
	Queue	Storage	Queue	Storage	Queue	Storage	Queue	Storage
College & Whitman	4.4	26.0	4.4	12.5	4.7	13.5	3.5	13.0
N College & 3rd St.	0.0	8.2	0.1	5.0	0.0	12.9	0.1	13.0
S College Ave & 4th St	4.1	12.4	2.1	13.0	3.7	15.0	3.5	31.0
S College Ave & 6th St	0.0	13.0	0.1	17.0	0.0	13.0	0.3	31.0
S College Ave & 8th St	0.0	8.5	0.2	10.5	0.1	8.8	0.3	22.0
S College Ave & 10th St	0.0	13.0	0.2	27.0	0.1	20.0	0.3	13.8
S College Ave & 12th St	3.1	6.0	5.6	5.0	2.9	12.5	1.7	30.0
S College and 13th St.	-	-	-	-	0.0	10.0	0.1	16.0
S College Ave & Lamperti	6.4	14.0	6.6	25.0	3.3	17.0	1.7	19.0
* Queue Lengths in number of vehicles using 20 ft/veh								

Andy's Market

City staff had requested special analysis of the potential queue on College Avenue with the Andy's Market driveway. Counts were conducted on Thursday, February 27, 2020 for both the mid-day peak (11:45-12:45) and the PM Peak. Intersection LOS was computed with the 95% queues.

Left turns into Andy's Market were higher during the PM Peak with 53 in an hour, or slightly less than one per minute. The left turn into the driveway operates at LOS A with an average delay of less than 8 seconds and a 95% queue of 0.05 vehicles. The overall delay for the southbound movement, including the left turn, is approximately 0.5 second. The exit from this driveway operates at LOS B with an average delay of 11.4 seconds. As shown in Table 7, the 95% queue from 12th St does not obstruct this driveway.

Left turns into Andy's Market during the Mid-Day (lunch time) were counted at 17 during the hour, or roughly one left-turn each 3 to 4 minutes. The left turn into the driveway again operates at LOS A with an average delay of less than 8 seconds and a 95% queue of 0.04 vehicles. The overall delay for the southbound movement, including the left turn, is approximately 0.5 seconds. The exit from this driveway operates at LOS B with an average delay of 11.1 seconds. Although the model was not run with queues from 12th Street for the Mid-Day period, the volume counts are lower than in the AM and PM peaks so the 95% queue from 12th St should not obstruct this driveway.

Conclusions

The conclusion of the foregoing analysis is the College Avenue corridor under the existing channelization and traffic control is not operating under an optimal condition. The analysis indicated College Avenue traffic operations could be improved through the elimination of left turn channelization and conversion to two-phase signal operation. The level of service, in general, is improved during the AM and PM peak hours for both the 2019 existing and 2040 future condition.

Signal coordination and elimination of the traffic signal control were considered in this analysis. The conclusion of the signal coordination evaluation indicated the spacing of the signals on the corridor was too long to provide efficient traffic signal timing. In effect, the platoon of vehicles is dispersed before arriving at the next signal. In addition, coordination is not considered viable because of the low percentage of traffic traveling the length of the corridor.

Memorandum – Sight Distance

The purpose of this memorandum is to provide a summary of the process and findings relating to Task 4 – *To what extent would it be safe and acceptable to reduce sight triangles in the College Avenue Corridor?*

Background

The City requested an evaluation of the sight visibility triangles at critical intersections along the corridor. Sight visibility triangle requirements are stated in Section 17.42.050 Sight Visibility Triangle¹:

“A. At uncontrolled intersections, the sight visibility triangle shall be formed by measuring back from the point where street corner property lines meet, 30 feet along the property line, with the third side of the triangle being the straight-line connection between the above-mentioned sidelines. (Refer to Figure 17.42.050A.)”

B. At controlled intersections the side street side of the sight visibility triangle shall be a distance of ten feet measured back from the point where street corner property lines meet; the through street side of the triangle shall be a distance of 30 feet for speed limits up to 25 miles per hour and 55 feet for speed limits up to 35 miles per hour; the third side of the triangle being the straight line connection between the above-mentioned side lines. (Refer to Figure 17.42.050B.)

Uncontrolled intersections are defined as intersections where there are no specific traffic control devices and drivers are required to follow the “rules of the road” when determining right of way. “Controlled intersections” are intersections where “stop signs” are installed on the minor leg without control on the through street or major leg of the intersection. Signalized and All Way Stop (AWSC) intersections are typically not subject to these requirements as the traffic signal assigns “right of way” to the approaches to the intersection.

Four (4) of the intersections along the corridor are under signal control² and therefore are not considered in this evaluation. The remaining seven (7) intersections provide stop sign control on the intersecting side street.

A summary of the intersections with obstructed sight distance constraints is presented in Table 1.

¹ City of College Place Municipal Code; Section 17.42.050.

² College Avenue signalized intersections include Lamperti Lane; 12th Street; 4th Street; and Whitman Drive.

Table 1. Intersections with Sight Distance Constraints

Intersection	West Side		East Side	
	Looking North	Looking South	Looking North	Looking South
SE Sunny Drive	N/A	N/A	Landscape/Parking	No Constraints
SW 13 th Street	Landscape/Berm	Landscape/Berm	N/A	N/A
SW/SE 10 th Street	Equipment/Fence	No Constraints	No Constraints	Landscape/Fence
SW/SE 8 th Street	Street Furniture	No Constraints	Landscape/Fence	Building
SW/SE 6 th Street	Landscape	Landscape	Fence	No Constraints
SW/SE 3 rd Street	N/A	N/A	Landscape	Building

N/A – Not applicable. There is no approach on the leg.

As shown in Table 1, six (6) of the ten (10) College Avenue intersections, in the study area, have sight distance constraints on the side street approach. Most of the intersections are impacted by landscaping on the adjacent property. Two (2) intersections are constrained by existing buildings along the property line, including SE 8th Street and SE 3rd Street. At SW 10th Street, equipment storage along the property line for “The Empire” retail outlet impedes intersection sight distance at this location.

The following photos document the existing sight distance obstructions at the intersecting streets of SE Sunny Drive, SW 13th Street, SW/SE 10th Street, SW/SE 8th Street, SW/SE 6th Street and SW/SE 3rd Street on the corridor.

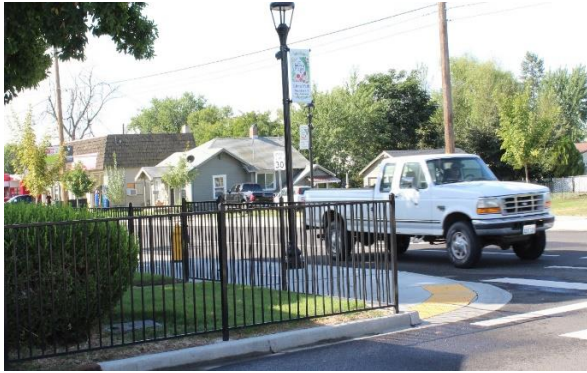
Sunny Drive Looking North



SE 10th Street Looking South



SE 8th Street Looking South



SE 6th Looking North



SE 3rd Street Looking North



SE 3rd Street Looking South



SW 6th Street Looking North



SW 8th Street Looking North



SW 8th Street Looking South



SW 10th Street Looking North



SW 13th Street Looking South



SW 13th Street Looking North



Stopping Sight Distance

The purpose of the sight distance triangle is to provide enough distance on College Avenue to allow vehicles to stop before hitting a vehicle entering the intersection from the side street. In addition, the triangle distance provided allows each entering vehicle on the side street to see approaching vehicles, with enough distance to stop in time to avoid hitting the entering vehicle. To appropriately evaluate the existing sight triangle requirements, a review of required stopping sight distance (SSD) values is necessary. SSD values for the intersecting streets on the corridor are provided in Table 2.

Table 2. Required Stopping Sight Distance

Intersection	Posted Speed	Required SSD ³		Sight Triangle		Meets Requirement
		North ⁴	South ⁵	North ⁶	South ⁷	
SE Sunny Drive	30	200	200	350	220	Yes
SW 13 th Street	30	200	200	190	265	Looking to South
SW 10 th Street	30	200	200	110	415	Looking to South
SE 10 th Street	30	200	200	295	190	Looking to North
SW 8 th Street	25	155	200	125	275	Looking to South
SE 8 th Street	25	155	200	150	190	No
SW 6 th Street	25	155	155	100	160	Looking to South
SE 6 th Street	25	155	155	150	120	No
SE 3 rd Street	25	155	155	150	115	No

As shown in Table 2, acceptable stopping sight distance (SSD) is provided with the application of the sight distance triangle at the following intersections:

- SE Sunny Drive
- SW 13th – Looking to the South
- SW 10th Street – Looking to the South
- SE 10th Street – Looking to the North
- SW 8th Street – Looking to the South
- SW 6th Street – Looking to the South

The sight distance provided through the application of the Sight Distance Triangle requirements does not provide adequate stopping sight distance (SSD) at the following intersections:

- SW 13th Street – Looking to the North
- SW 10th Street – Looking to the North
- SE 10th Street – Looking to the South
- SW 8th Street – Looking to the North
- SE 8th Street – Both Directions
- SW 6th Street – Looking to the North
- SE 6th Street – Both Directions
- SE 3rd Street – Both Direction

³ AASHTO “A Policy on Geometric Design of Highways and Streets”, 7th Edition; 2018.

⁴ North – From the North measured in feet

⁵ South – From the South measured in feet

⁶ North – Looking to the North measured in feet

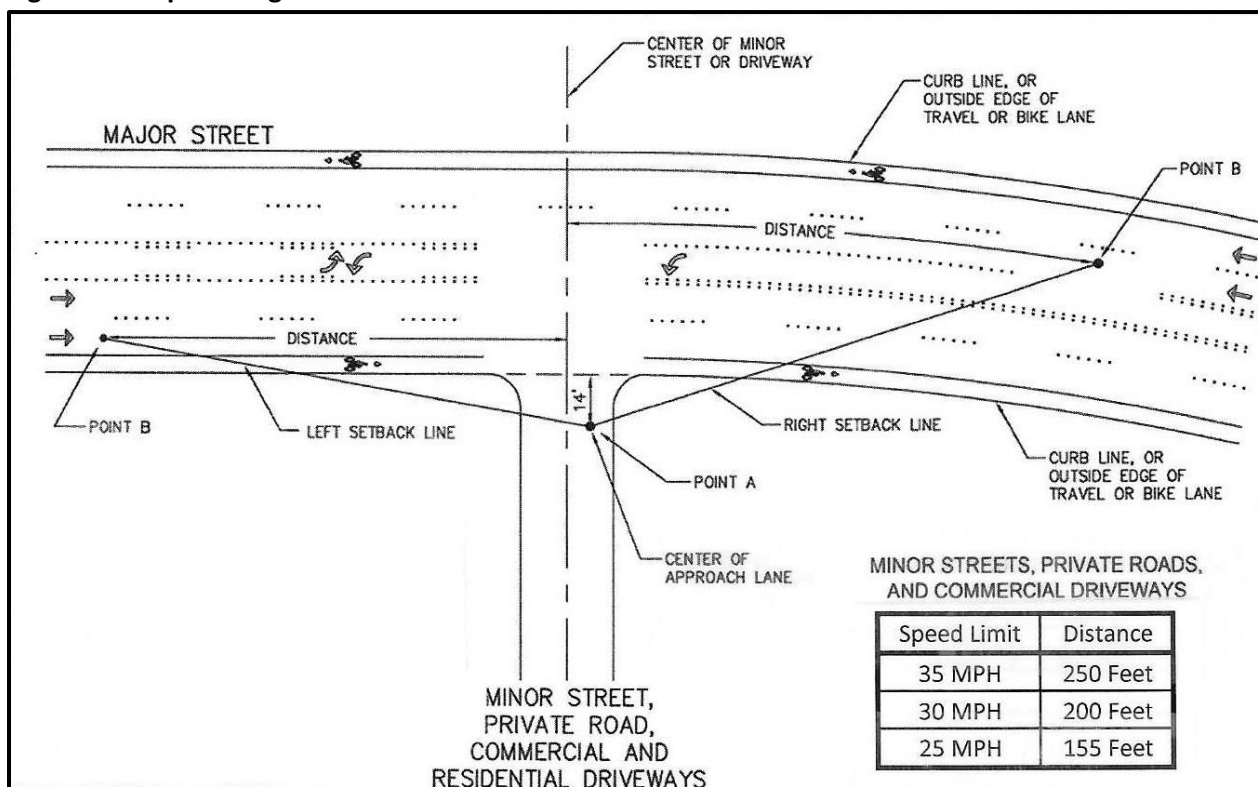
⁶ South - Looking to the South measured in feet

Conclusions

A review of the foregoing indicates the sight visibility triangle requirements, as stated in Section 17.42.050 of the City of College Place Municipal Code, does not comply with adopted national standards⁸. The effectiveness of the City requirements is totally dependent on the existing property lines at the intersecting streets. Since there is no consistency in the property lines between intersecting streets, the available sight distance varies between the various College Avenue intersections.

Rather than basing the sight visibility triangle on existing property lines, a more consistent approach would be to base the sight visibility triangle on the edge of the travel way, or when there is a curb and gutter on the curb line. The triangle is formed by a point on the intersecting street located 14 feet back from the face of curb and the stopping distance measured along the main travel way in each direction from the intersection. An example of this approach is presented in Figure 1.

Figure 1. Proposed Sight Distance Setback Lines⁹



Suggested triangle distances for various speeds is also shown in Figure 1.

⁸ American Association of State Highway Transportation Officials; A Policy on Geometric Design of Highways and Streets; Stopping Sight Distance; 7th Edition, 2018.

⁹ Source - City of Bellevue Current Design Standards; 2017; Bellevue, Washington.

It is recommended the City of College Place replace the existing sight distance triangle ordinance with one that reflects the existing geometry and speeds on the College Avenue corridor. The recommended revision is related to controlled intersections only, as there are no uncontrolled intersections in the College Avenue Corridor study area. The recommended changes are as follows:

B. At controlled intersections, the side street side of the sight visibility triangle shall be a distance of fourteen (14) feet measured back from the edge of the travel way on the major roadway. The major through street side of the triangle, looking left and right, shall be 155 feet for a posted speed limit of 25 miles per hour and 200 feet for posted speed limit of 30 miles per hour as measured in the center of the outside approach lane. See Figure 1 above.

Application of the proposed ordinance to the stop sign controlled intersections in the College Avenue corridor would yield the Stopping Sight Distances (SSD) identified in Table 3 below.

Table 3. Stopping Sight Distance at Stop Controlled Intersections

Intersection	Center of Travel Lane (Measured from Face of Curb)		Speed Limit			Stopping Sight Distance		Parking Offset			
			Posted		Proposed	30 MPH	25 MPH	Posted Speed		Proposed Speed	
	North	South	North	South				North	South	North	South
Sunny Drive	32	8	30	30	25	200	155	74'	136'	55'	101'
SW 13th	10	32	30	30	25	200	155	140'	76'	104'	57'
SW 10th (west side)	10	36	30	30	25	200	155	143'	102'	107'	76'
SE 10th (east side)	24	12	30	30	25	200	155	105'	146'	79'	110'
SW 9th	10	24	30	30	25	200	155	134'	88'	100'	66'
SW 8th (west side)	14	28	25	30	25	200	155	105'	101'	105'	75'
SE 8 th (east side)	20	8	25	25	25	200	155	75'	105'	75'	105'
SW 6th (west side)	10	27	25	25	25	200	155	105'	75'	105'	75'
SE 6 th (east side)	27	10	25	25	25	200	155	75'	105'	75'	105'
SE 3rd	28	8	25	25	25	200	155	69'	99'	69'	99'
NE A	28	12	25	25	25	200	155	75'	104'	75'	104'
NW B	12	25	25	25	25	200	155	75'	104'	75'	104'
NE C	20	10	25	25	25	200	155	67'	104'	67'	104'

Table 3 presents the stopping sight distance required for the various speeds on the College Avenue corridor; 25 MPH and 30 MPH. In addition, the table represents the parking offset required to provide the recommended stopping sight distance at the two alternative posted speeds.

This study recommends the adoption of a 25 MPH posted speed along the College Avenue corridor from Lamperti Street to Rose Street. Table 4 indicates the potential parking stalls eliminated through the application of the proposed stopping sight distance ordinance.

Table 4. Potential Parking Stalls Reduction

Intersection	Speed Limit			Parking Offset				Parking Reduction	
	Posted		Proposed	Posted Speed		Proposed Speed		Posted Speed	Proposed Speed
	North	South		North	South	North	South		
Sunny Drive	30	30	25	74'	136'	55'	101'	2	1
SW 13th	30	30	25	140'	76'	104'	57'	7	4
SW 10th (west side)	30	30	25	143'	102'	107'	76'	3	2
SE 10th (east side)	30	30	25	105'	146'	79'	110'	0	0
SW 9th	30	30	25	134'	88'	100'	66'	4	2
SW 8th (west side)	25	30	25	105'	101'	105'	75'	0	0
SE 8 th (east side)	25	25	25	75'	105'	75'	105'	0	0
SW 6th (west side)	25	25	25	105'	75'	105'	75'	0	0
SE 6 th (east side)	25	25	25	75'	105'	75'	105'	0	0
SE 3rd	25	25	25	69'	99'	69'	99'	0	0
NE A	25	25	25	75'	104'	75'	104'	4	4
NW B	25	25	25	75'	104'	75'	104'	5	5
NE C	25	25	25	67'	104'	67'	104'	3	3
				Total Stalls Removed				28	21

As shown in Table 4, with the implementation of the proposed sight distance ordinance, it is expected that 28 stalls would be removed from the College Avenue between Lamperti Street and Rose Street under the existing posted speeds. If the posted speed is reduced to 25 MPH, for the entire corridor, 21 parking stalls will be eliminated. In the section between 3rd Street and 8th Street, and SE 10th (east side), there is no parking provided and hence no parking impact.

Memorandum – Appropriate Speed Limit

The purpose of this memorandum is to provide a discussion regarding the appropriate speed limit on the College Avenue corridor within the study area. This memorandum addresses the contract requirement of Task 5 - *What is the Appropriate Speed Limit on College Avenue?* The intent of Task 5 is to determine if the current posted speed limit at various locations is appropriate for the desired “Complete Streets” character of College Avenue between East Whitman Drive and SW Lamperti Street.

Current Conditions

Prevailing travel speeds on the corridor were collected, using tube counters, at ten (10) locations on College Avenue including:

- College Avenue n/o 4th Street
- College Avenue n/o Whitman Drive
- College Avenue n/o C Street
- College Avenue n/o B Street
- College Avenue n/o A Street
- College Avenue n/o SR 125
- College Avenue s/o Lamperti Street
- College Avenue s/o 10th Street
- College Avenue n/o 8th Street
- College Avenue n/o Lamperti Street

The speed data was collected by the City during the month of May 2019¹. The prevailing speeds at each location were recorded for each hour for three consecutive days, a total of 72 hours. The resultant speed data was summarized in 5 mph increments from 0 mph to greater than 70 mph. The hourly data was averaged for the three days to provide a single recorded speed. The results are presented in Table 4.

Table 4 identifies the average speed and the 85th percentile speed² for each location. The 85th percentile speed is the basis of the posted speed as it is assumed a responsible driver will consider roadway and roadside conditions in when driving.³

¹

² 85th percentile speed – the speed at which 85 percent of the vehicles are at or below and 15 percent are above. The 85th percentile speed is generally used to determine the posted speed limit.

³ <https://www.wsdot.wa.gov/Operations/Traffic/speedlimits.htm>

Table 4. Daily Speed Summary

#	Location	Section	Posted	Daily Speed					
				Northbound		Southbound		Total	
				Average	85 th Percentile	Average	85 th Percentile	Average	85 th Percentile
1	College Avenue	n/o 4 th Street	25	22	26	22	26	22	26
2	College Avenue	n/o Whitman Drive	30	24	28	24	27	24	28
3	College Avenue	n/o C Street	30	26	30	25	29	26	29
4	College Avenue	n/o B Street	30	25	29	25	29	25	29
5	College Avenue	n/o A Street	30	25	29	25	28	25	29
6	College Avenue	n/o SR 125	35	27	33	31	36	29	35
7	College Avenue	s/o Lamperti Street	35	26	32	26	34	26	33
8	College Avenue	s/o 10 th Street	30	27	31	28	31	27	31
9	College Avenue	n/o 8 th Street	25	25	29	26	29	26	29
10	College Avenue	n/o Lamperti Street	30	27	31	28	32	27	31

As shown in Table 4, the posted speed on the College Avenue corridor ranges between 25 mph and 35 mph. The posted speed is 35 mph south of Lamperti Street; 30 mph between Lamperti Street and 8th Street; 25 mph between 8th Street and Whitman Drive; and 30 mph north of Whitman Drive. The existing posted speeds on the College Avenue corridor within the study area are presented in Figure 1.

The result of the speed study indicates that motorists on College Avenue are exceptionally compliant with posted speeds on the corridor with the average and 85th percentile speeds well within the range of the posted speed limit. This fact suggests motorists are comfortable with the posted speeds on the corridor.

Under consideration is the removal of the two-way left turn lane (TWLTL) along the College Avenue corridor and the dedicated left turn pockets at the signalized intersections. City staff expressed concern that removal of the channelization would encourage higher speeds on the corridor. It is not expected an increase in speed would be realized as the motorists appear to be compliant with the posted speed limit on the corridor. If in fact speeds increased, the City could stripe an edge line to restrict the width of the travel lane and thereby discourage higher speeds.

Development of Speed Limits

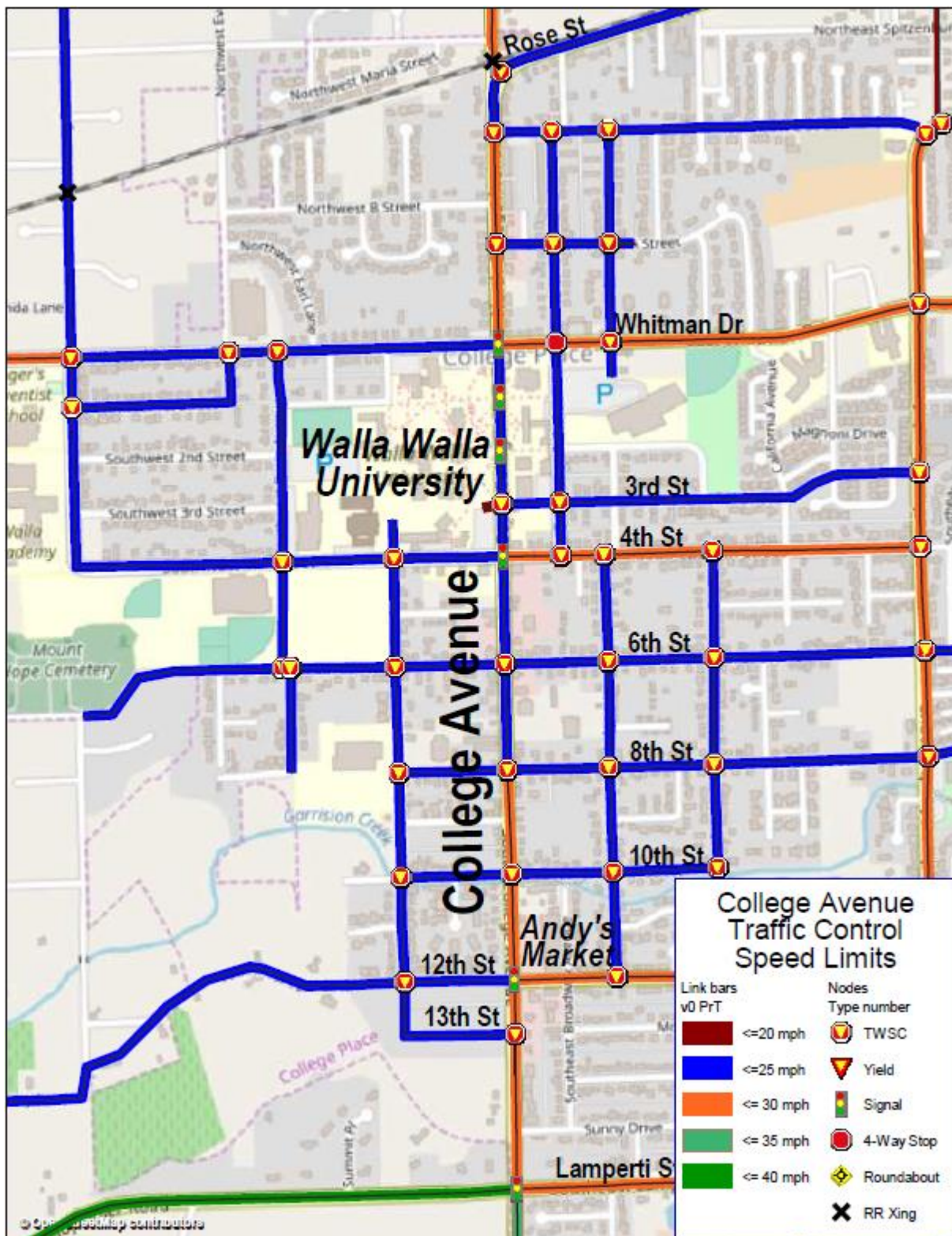
Washington State Law dictates the formulation of speed limits on state and local roadways. The maximum speed limit for city and town streets is 25 mph, 50 mph for county roadways, and 60 mph for state highways⁴. Local authorities may establish or alter maximum speeds under the following conditions⁵:

- Cities and towns may establish a maximum speed of 20 mph on nonarterial routes without an engineering and traffic investigation.

⁴ RCW 46.61.400

⁵ RCW 46.61.415.

Figure 1. Existing Speed Limits



-
- Cities and towns may raise speed limits above the state maximum (25 mph) with an engineering and traffic investigation.

Factors to consider when conducting a speed related engineering and traffic investigation include⁶:

- Shoulder condition
- Roadway Grade
- Alignment
- Sight Distance
- Roadside Development and Lighting
- Parking practices
- Pedestrian and bicycle activity
- Collision rates

In addition, the location of schools should be identified and considered to determine the speed limit for the school zone.

Significant factors to consider when establishing speed limits is the range of travel speeds is reduced when speed limits are based on 85th percentile speed and survivability of a vehicular/pedestrian crash is significantly higher the lower the vehicular speed. For example, nine (9) out of ten (10) pedestrians survive at 20 mph; seven (7) out of ten (10) at 25 mph; five (5) out of ten (10) at 30 mph and one (1) out of ten (10) at 40 mph.⁷

Several major cities around the nation and in Washington State have adopted ordinances to reduce residential speeds to 20 mph. These cities include Seattle, Portland, Renton, New York. The intent is to reduce the potential for pedestrian injuries and fatalities.

Implications for College Avenue

College Avenue is an arterial street in the city of College Place. The City staff has indicated a desire to offer a corridor which provides multi-modal circulation along College Avenue. This is supported by the recent CARS project which offered a "Complete Streets" design. In addition, City Policies support these concepts.

- Goal 4 on pg. 17 - *Develop a commercial district reminiscent of a small town "main street" with a mix of uses including commercial, offices, banking, public facilities, and other specialty retail uses, with residences above, consistent with a pleasant pedestrian environment.*
- Goal 25 on pg. 19 - *Support the development and redevelopment of a walkable College Avenue from Rose Street to 13th Street as a Mixed-Use Downtown District that serves as an attractive location for diverse small businesses, tourism, arts and culture, entertainment, community events, and residents.*

⁶ <https://www.wsdot.wa.gov/Operations/Traffic/speedlimits.htm>

⁷ Source – Seattle Vision Zero Plan

Conclusion

After review of the foregoing, and consideration of all the factors, it is recommended the posted limit for the corridor be established at 25 mph. The proposed 25 mph speed limit, although not consistent with the observed 85 percentile speed in all sections of the corridor, is consistent with the City's desire to provide a "complete streets" concept on College Avenue.

Memorandum – Bicycle Traffic

The purpose of this memorandum is to evaluate different options for accommodating bicycle traffic on College Avenue between Lamperti Lane and Whitman Drive. This memorandum addresses the contract requirement of Task 6 – *How should bicycle traffic be accommodated?* The scope included an evaluation of the following:

- Bicycle volumes on College Avenue
- Crash Data related to bicycles
- Speed Limits on College Avenue
- Survey of bicycle stakeholders

Bicycle Volumes

Bicycle volumes on College Avenue were collected as part of the peak period turning movement counts collected during May 2019. A summary of the pedestrian volumes at each of the nine (9) analysis intersection. A summary of the bicycle volumes is presented in Table 1.

Table 1. Bicycle Volumes

	AM Peak Hour					PM Peak Hour				
	Approach From					Approach From				
Intersection	North	East	South	West	Total	North	East	South	West	Total
Whitman Drive	1	2	4	1	8	9	0	0	1	1
SW/SE 4 th Street	0	0	1	1	2	1	0	3	1	5
SW/SE 6 th Street	1	1	0	1	3	1	3	0	1	5
SW/SE 8 th Street	1	1	0	1	3	2	3	0	1	6
SW/SE 10 th Street	1	4	2	1	8	1	1	1	1	4
SW/SE 12 th Street	6	5	1	1	13	5	1	4	1	11
SW/SE 13 th Street	1	0	4	1	6	1	0	2	1	4
Lamperti Lane	2	4	0	1	7	2	1	1	1	5
					50					41

As shown in Table 1, there were a total of 50 bicycles recorded at the eight (8) analysis intersection during the AM peak hour and 41 during the PM peak hour. The highest AM peak bicycle volume (13) was recorded at the SW/SE 12th Street intersection whereas the highest PM peak bicycle volume (11) also occurred at the SW/SE 12th Street intersection. The lowest bicycle volume (2) occurred at the SW/SE 4th Street intersection during the AM period and at Whitman Drive (1) during the PM peak hour.

Crash Data

A summary of the five-year crash history by intersection is shown in Table 5 below. The five-year crash rate for each of the intersections that were analyzed and counted was calculated to provide an evaluation of the number of crashes relative to the total entering volume. The crash rate was calculated using a standardized formula, from the Federal Highway Administration. The crash rate was not calculated for intersections for which peak hour counts were not collected.

Table 5. Five Year Crash Data 2014 -2018.

Corridor	Intersection	5-year Crash History	Crash Rate ¹
College Avenue	NE Rose Street	1	NA
College Avenue	C Street	2	N/A
College Avenue	NW B Street	2	N/A
College Avenue	NE A Street	6	N/A
College Avenue	Whitman Drive	7	0.60
College Avenue	SE 4 th Street	7	0.82
College Avenue	SE 6 th Street	3	0.33
College Avenue	SE 8 th Street	1	0.11
College Avenue	SE 9 th Street	3	N/A
College Avenue	SE 10 th Street	2	0.15
College Avenue	SE 12 th Street	15	0.98
College Avenue	SW 13 th Street	1	0.09
College Avenue	SE Sunny Drive	5	N/A
College Avenue	SE Lamperti Street	9	0.62
College Avenue	SR 125	8	N/A
Total		72	

1) Crash Rate = $\frac{C \text{ for } n \text{ years}}{MEV \text{ for } n \text{ years}}$; Source: Federal Highway Administration

2) N/A – Intersections not included in the study area for which traffic counts were not available to determine the crash rate.

As shown in Table 5, the highest number of crashes (15) occurs at the SW/SE 12th Street intersection which also has the highest crash rate (0.98). Other high crash locations in the study area, Lamperti Lane to Whitman Drive, include Lamperti Lane (9 crashes), Whitman Drive and 4th Street (8 crashes). These intersections also have a relatively high crash rate within the study ranging from 0.82 at 4th Street to 0.60 at Whitman Drive.

These crash rates were compared to data available from the 2015 Washington State Annual Collision Summary which compares rates by county. The rates in this document are for segments not intersections. Converting the crash rate to segment rates, the crash rate is 322.13 crashes per 100M VMT (100 Million Vehicle Miles Traveled). The average for Walla Walla County in the 2015 report is 184.7 crashes per 100M VMT and the average rate for all State of Washington roads is 196.2. The crash rate for this section of College Avenue is above the county and statewide averages.

Of the 72 crashes on the corridor, 17 (24%) were right angle, 25 (35%) were rear end; 26 (36%) were fixed object and 3 (4%) were head on. One collision involved a bicycle. There were no pedestrian crashes recorded during the five-year period on the College Avenue corridor.

Speed Limits

Existing Speeds

Prevailing travel speeds on the corridor were collected at the ten (10) locations identified above. Speeds were summarized in general on 5 mph increments from 0 mph to greater than 70 mph. Speeds were summarized each hour for three consecutive days. The three-day results were averaged and presented in Table 2. Table 2 identifies the average speed and the 85th percentile speed. The 85th percentile is the speed which is usually the basis for the posted speed limit. The 85th percentile speed is the speed where 85 percent of the traffic is going less than and 15 percent exceed.

Table 2. Daily Speed Summary

#	Location	Section	Posted	Daily Speed					
				Northbound		Southbound		Total	
				Average	85 th Percentile	Average	85 th Percentile	Average	85 th Percentile
1	College Avenue	n/o 4 th Street	25	22	26	22	26	22	26
2	College Avenue	n/o Whitman Drive	30	24	28	24	27	24	28
3	College Avenue	n/o C Street	30	26	30	25	29	26	29
4	College Avenue	n/o B Street	30	25	29	25	29	25	29
5	College Avenue	n/o A Street	30	25	29	25	28	25	29
6	College Avenue	n/o SR 125	35	27	33	31	36	29	35
7	College Avenue	s/o Lamperti Lane	35	26	32	26	34	26	33
8	College Avenue	s/o 10 th Street	30	27	31	28	31	27	31
9	College Avenue	n/o 8 th Street	25	25	29	26	29	26	29
10	College Avenue	n/o Lamperti Lane	30	27	31	28	32	27	31

As shown in Table 2, the posted speed on the College Avenue corridor ranges between 25 mph and 35 mph. The posted speed is 35 mph south of Lamperti Lane; 30 mph between Lamperti Lane and 8th Street; 25 mph between 8th Street and Whitman Drive; and 30 mph south of Whitman Drive.

The result of the speed study indicates that motorists on College Avenue comply with the posted speeds. The observed speeds indicate the posted speed reflects actual speeds on the corridor. There is no significant difference between speeds in the northbound and speeds in the southbound direction.

Impact of Speed

The following information was obtained from National Highway Traffic Safety Administration (NHTSA) "Traffic Safety Facts"¹

Combined Studies have estimated the survivability of crashes for non-motorists, based on the motor vehicle speed upon impact. For example, in a 2011 study, Brian Tefft of the Automobile Association of America (AAA) Foundation for Traffic Safety determined that:

- In a crash at 20 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 18 percent;
- In a crash at 30 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 50 percent;
- In a crash at 40 mph, the likelihood of a pedestrian sustaining a serious or fatal injury is 77 percent.²

This Research Note considers the survivability of pedestrian and bicyclist crashes, using posted speed limit as a surrogate for travel speed. The analysis examines data regarding fatally injured non-motorists from FARS and non-motorists who were injured (but not fatally) from NHTSA's National Automotive Sampling System General Estimate System. Fatal pedestrian crashes were more likely to occur on roads with higher posted speed limits, compared with non-fatal injury pedestrian crashes. While the most common posted speed limits for pedestrian fatalities were 45 mph (18.3%), 35 mph (17.4%), and 55 mph (13.9%), the most common posted speed limits for pedestrian non-fatal injuries were 25 mph (31.9%), 35 mph (24.3%), and 30 mph (14.1%).

In summary, the prevailing speed has a significant impact on the extent of injury realized if pedestrian-bicycle/crashes occur. Approximately 32 percent of the crashes at 25 mph result in non-fatal injuries.

Survey

A survey of bicycle users in the College Avenue corridor was conducted. The purpose of the survey was to determine how bicycle traffic should be accommodated on the College Avenue corridor. The survey asked five specific questions as follows:

Question 1: *What is your preferred transportation mode when riding a bicycle?*

Response: Of the six (6) responses, four (66%) requested a "Designated Bicycle Lane". Two (33%) stated "In the roadway".

¹Pedestrian and Bicyclist Data Analysis; March 2018;

https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812502_pedestrian-and-bicyclist-data-analysis-tsfr-research-note.pdf

² Tefft, B. C. (2011). Impact speed and a pedestrian's risk of severe injury or death. Retrieved from the AAA Foundation website: www.aaafoundation.org/pdf/2011PedestrianRiskVsSpeed.pdf.

Question 2: *Where do you ride your bicycle on College Avenue – the sidewalk or the roadway, and why?*

Response: Of the six (6) responses, four (66%) indicated they ride in the roadway and two (33%) indicated they ride on the sidewalk. The reasons for riding in the roadway include: conflict with pedestrian traffic; bicycles don't belong on the sidewalk; and too many driveway cuts and potential for pedestrian/bicycle conflicts on the sidewalk. Reasons for riding on the sidewalk include: sidewalk is safety; and traffic is scary, and I am not going to get killed to satisfy a city ordinance.

Question 3: *Would you be comfortable riding your bicycle between parked cars and the curb?*

Response: Of the six (6) responses; five (83%) said "no" they would not be comfortable riding between parked cars and the curb; one (17%) said they would be comfortable between parked cars and the travel lane.

Question 4: *What preferred north-south route; if any, would like to see designated as an alternative to College Avenue for bicycle traffic?*

Response: Of the six (6) responses, four (66%) didn't believe there were any other acceptable routes; one (17%) identified 6th Street; and one (17%) identified SW Bade Avenue.

Question 5: *Please list your three most frequent destinations when riding a bicycle?*

Response: Of the six (6) responses, there were thirteen (13) destinations as noted in the survey identified. The survey destinations selected include: two (2) indicated Andy's Market and two (2) indicated Kiwanis Park; one (1) identified Roger's Bakery, the Post Office, Lion's Park and Walmart; and four (4) identified locations other than those identified in the survey to include 1) going either north or south to longer rides outside town; 2) often just passing through; 3) ride for workout; and 4) recreational ride through the city.

Question 6: *How many times a week do you ride your bicycle?*

Response: Of the six (6) responses, two (33%) ride their bicycle three (3) times a week and two (33%) ride five (5) times a week; and one (1) each (17%) ride there bike either twice a week or once a week.

Question 7: *What improvements or activities would encourage you to ride your bicycle more frequently? For Example: better connections, more bike lanes, more separation from traffic, better street lighting?*

Response: Of the six (6) responses, four (4) requested "more bike lanes"; one (1) response indicated more sharrows and lower speed limit on College Avenue with painted green bike boxes at intersections with signals; and one (1) indicated "all of the above. One comment indicated more bike lanes should be provided although not configured like the bike lanes are along 4th and Academy Way. One request also asked that bike lanes be on the street but separated from traffic.

Question 8: *If there is anything else that you would like to note in completing this survey, please include below:*

Response: Of the five (5) responses, two (2) responses thanked the City for seeking input from those who bike; one (1) comment stated the configuration with the poles along the path on 4th Street and Academy are a real eye sore and make bike riding through there catastrophic; one (1) comment stated College Avenue from 10th Street to Whitman Drive is narrow and dangerous for bicyclists; and one (1) comment said there was nothing else they would like to note.

Conclusions

A review of the foregoing discussion suggests that provision of bicycles lanes on College Avenue would be a benefit to users and enhance multi-modal circulation on the College Avenue corridor. Currently, there are significant bicycle volumes on the corridor as noted in the AM and PM peak hour traffic counts. During the AM peak, there were 50 bicycles recorded at the eight (8) analysis intersections. During the PM peak hour, there were 41 bicycles noted at the intersections.

Although there was a significant number of crashes along the corridor, there was only one (1) bicycle crash which occurred at the SW/SE 12th Street intersection. It appears that bicycling on the corridor is relatively safe as indicated by the bicycle crash history.

Speeds on the corridor are consistent with the observed 85th percentile speed. The speeds between 8th Street and Whitman Drive are consistent with the posted speed of 25 mph. The speeds south of 8th Street are consistent with the posted speed of 30 mph. Even so, the chance for injury or death is significantly reduced if the speed limit between 8th and Lamperti is reduced to 25 mph.

The result of the survey indicated the stakeholders would like to see more bike lanes on the corridor and preferably separated from traffic.

Recommended Action

Based on input from City staff, it was determined that whatever action was decided for serving bicycles in the College Avenue corridor should be consistent for the length of the corridor. Because the roadway cross sectional width varies significantly through the corridor, in some locations not providing sufficient width for a bicycle lane, it was determined that no bike lane provisions should be provided in the corridor.

Under this action, the staff agreed the City ordinance *Chapter 10.16.160 Riding on Sidewalks* should be revised to allow bicycles to ride on the sidewalk.

TECHNICAL APPENDIX

12' SPACING

6-2-19

COUNTERS

check

#1 1875 S. COLLEGE A = S. BOUND B = N. BOUND

#2 CEDAR BEND ¹/₂ COLLEGE A = S. BOUND B = N. BOUND

#6 1425 S. COLLEGE B = S. BOUND A = N. BOUND

#3 1028 S. COLLEGE A = S. BOUND B = N. BOUND

#5 625 S. COLLEGE A = S. BOUND B = N. BOUND

College Avenue Traffic Assessment

July 5, 2019

24 Hour Data Summary

Tues 5/14														
Speed					Classification									
Counter	NB		SB		Total		NB		SB		Total		Volume	
	Avg	85%ile	Avg	85%ile	Avg	85%ile	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	NB	SB
1	21.9	26.1	21.7	25.9	22	26	90.8	9.2	96.9	3.1	94	6	2498	2624
2	23.6	27.8	24.2	27.5	24	28	92.5	7.5	98.1	1.9	95	5	2890	3036
4	26.4	30.2	25.1	28.7	26	29	96.5	3.5	96.3	3.7	96	4	2722	2683
5	25.5	29.4	25.4	29.4	25	29	97.4	2.6	97	3	97	3	2974	3043
6	24.7	28.6	24.7	28.3	25	28	97.4	2.6	97.4	2.6	97	3	2845	2986

Wed 5/15														
Speed					Classification									
Counter	NB		SB		Total		NB		SB		Total		Volume	
	Avg	85%ile	Avg	85%ile	Avg	85%ile	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	NB	SB
1	21.6	25.5	22.1	26.3	22	26	92.6	7.4	97.1	2.9	95	5	2398	2614
2	24.1	28.4	24.2	27.5	24	28	94	6	98	2	96	4	2738	2985
4	25.9	29.8	24.9	28.7	25	29	95	5	96.8	3.2	96	4	2670	2620
5	25.1	29	25.2	29.4	25	29	97.1	2.9	97	3	97	3	2848	2991
6	24.4	28.5	24.4	28.5	24	29	97.3	2.7	97.2	2.8	97	3	2735	2982

	Thur 5/16																									
	Speed								Classification																	
	NB				SB				Total				NB				SB				Total				Volume	
Counter	Avg	85%ile	Avg	85%ile	Avg	85%ile	Avg	85%ile	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	NB	SB	Total			
1	21.6	25.2	22.1	26.2	22	26			92.8	7.2	97.1	2.9	95	5	2569	2732										
2	23.6	27.6	24	27.3	24	27			93.9	6.1	97.8	2.2	96	4	2910	3095										
4	26	29.8	25	28.7	26	29			94.7	5.3	97.1	2.9	96	4	2809	2774										
5	25.5	29.8	25.3	29.4	25	30			96.9	3.1	97.6	2.4	97	3	2953	3098										
6	24.7	28.8	24.4	28.4	25	29			97.3	2.7	97.4	2.6	97	3	2868	3050										

Summary																								
Speed								Classification																
NB				SB				Total		NB				SB		Total								
Counter	Avg	85%ile		Avg	85%ile			Avg	85%ile			Cars	Trucks/Buses		Cars	Trucks/Buses		Cars	Trucks/Buses		NB	SB	Volume	Total
1	22	26		22	26			22	26			92	7.93		97.03	2.97		95	5		2488.3	2656.7		5145
2	24	28		24	27			24	28			93	6.53		97.97	2.03		96	4		2846	3038.7		5884.7
4	26	30		25	29			26	29			95	4.6		96.73	3.27		96	4		2733.7	2692.3		5426
5	25	29		25	29			25	29			97	2.87		97.2	2.8		97	3		2925	3044		5969
6	25	29		25	28			25	29			97	2.67		97.33	2.67		97	3		2816	3006		5822

College Avenue Traffic Assessment

July 5, 2019

24 Hour Data Summary

Time: June 4 - June 6

Tues 6/4															
Speed								Classification							
NB				SB				NB				SB			
Counter	Avg	85%ile	Avg	85%ile	Avg	85%ile	Total	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Total
1	27.7	33.5	31.4	36.4	30	35	35	97.3	2.7	98.2	1.8	98	2	1888	3832
2	26.1	32.1	26.1	34	26	33	33	96.8	3.2	95.8	4.2	96	4	2255	4526
4	27.2	31	27.8	31	28	31	31	96.3	3.7	97.2	2.8	97	3	4350	8305
5	25.6	28.6	25.7	29	26	29	29	97	3	97	3	97	3	4085	8050
6	26.8	30.7	28.3	32	28	31	31	95.9	4.1	96.5	3.5	96	4	4036	7866

Wed 6/5															
Speed								Classification							
NB				SB				NB				SB			
Counter	Avg	85%ile	Avg	85%ile	Avg	85%ile	Total	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	Cars	Total
1	26.8	32.8	31.5	36.4	29	35	35	93.7	6.3	96.8	3.2	95	5	1846	3803
2	25.8	31.8	26	33.8	26	33	33	93.5	6.5	94.9	5.1	94	6	2205	4474
4	27.1	31	27.8	31	27	31	31	95.2	4.8	96.8	3.2	96	4	4207	8126
5	25.5	28.6	25.6	29	26	29	29	95.6	4.4	96.5	3.5	96	4	4133	8194
6	26.4	30.3	28.1	31.7	27	31	31	94.2	5.8	96.2	3.8	95	5	4152	7844

College Avenue Traffic Assessment

July 5, 2019

24 Hour Data Summary

Thur6/6														
Speed					Classification									
NB					SB					Total				
Counter	Avg	85%ile	Avg	85%ile	Avg	85%ile	Cars	Trucks/Buses	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	Total
1	26.2	32.7	30.5	35.8	28	34	95.5	4.5	98.2	97	1.8	95	5	3054
2	25.7	31.3	25.1	33.4	25	32	94.9	5.1	95.1	95	4.9	1693	1709	3402
4	26.6	30.6	27.5	31	27	31	95.4	4.6	97.1	96	2.9	3350	3141	6491
5	25.2	28.3	25.3	28.6	25	28	96.1	3.9	96.7	96	3.3	1774	1769	3543
6	26.5	30.6	28.1	31.4	27	31	95.1	4.9	96.6	96	3.4	3513	3165	6678

Summary														
Speed					Classification									
NB					SB					Total				
Counter	Avg	85%ile	Avg	85%ile	Avg	85%ile	Cars	Trucks/Buses	Trucks/Buses	Cars	Trucks/Buses	Cars	Trucks/Buses	Total
1	27	33	31	36	29	35	96	4.5	97.73	97	2.27	95	5	3563
2	26	32	26	34	26	33	95	4.93	95.27	95	4.73	2051	2083	4134
4	27	31	28	31	27	31	96	4.37	97.03	96	2.97	3969	3671.7	7640.7
5	25	29	26	29	26	29	96	3.77	96.73	96	3.27	3330.7	3265	6595.7
6	27	31	28	32	27	31	95	4.93	96.43	96	3.57	3900.3	3562.3	7462.7

Location: S College Avenue/SW 13th Street

City/Town College Place

Checker: DLN

Weather: Sunny

Job: College Avenue

Date: 5/14/19

Thur

Start Time: 6:30 AM

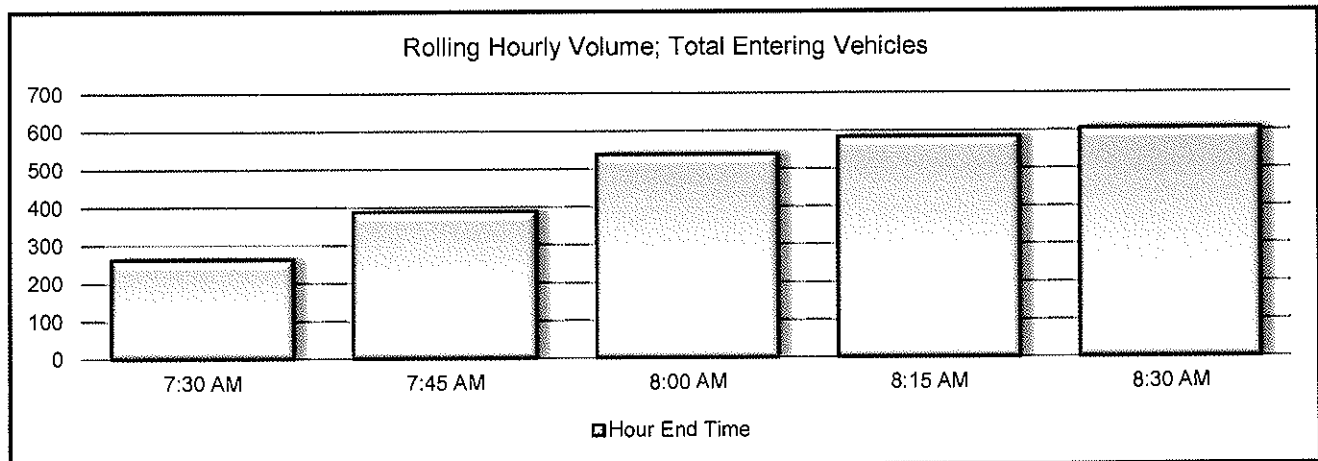
Pk Hr: 7:30 AM 8:30 AM

of minutes counted per interval: 14.0 minutes

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	0	12	0	12	0	0	1	0	0	0	0	0	0	0
7:00 AM	1	32	0	33	2	0	1	0	0	0	0	0	0	0
7:15 AM	0	39	0	39	2	1	1	0	0	0	0	0	0	0
7:30 AM	0	39	0	39	3	1	2	0	0	0	0	0	0	0
7:45 AM	0	72	0	72	4	1	1	0	0	0	0	0	0	0
8:00 AM	1	55	0	56	10	0	1	0	0	0	0	0	0	0
8:15 AM	0	64	0	64	2	0	1	0	0	0	0	0	0	0
8:30 AM	1	40	0	41	3	0	1	0	0	0	0	0	0	0
PK HR	2	231	0	233	19	1	4	0	0	0	0	0	0	0
Adj HR	2	248	0	250	20	1	4	0	0	0	0	0	0	0

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	0	16	0	16	2	0	0	0	0	0	0	0	2	1
7:00 AM	0	31	1	32	4	0	1	0	0	0	0	0	1	1
7:15 AM	0	38	1	39	4	1	1	0	0	0	0	0	0	0
7:30 AM	0	30	2	32	7	1	2	1	0	1	2	0	0	0
7:45 AM	0	73	1	74	3	1	1	0	0	0	0	0	0	0
8:00 AM	0	145	2	147	6	0	0	1	0	1	2	0	0	0
8:15 AM	0	53	2	55	2	0	0	2	0	0	2	1	0	0
8:30 AM	0	46	0	46	5	3	5	2	0	2	4	0	0	0
PK HR	0	317	5	322	16	4	6	5	0	3	8	1	1	0
Adj HR	0	340	5	345	17	4	6	5	0	3	8	1	1	0

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes				
6:45	30	2	2	2	Time Start - End Rolling Hr Vol Pk Hr? 6:30 AM 7:30 AM 262 no 6:45 AM 7:45 AM 388 no 7:00 AM 8:00 AM 538 no 7:15 AM 8:15 AM 584 no 7:30 AM 8:30 AM 604 YES			
7:00	70	6	1	3				
7:15	84	6	2	2				
7:30	78	11	2	4				
7:45	156	8	2	2				
8:00	220	17	0	1				
8:15	130	5	0	1				
8:30	98	9	3	6				



INTERSECTION: S College Avenue/SW 13th Street
 PEAK HOUR: 7:30 AM 8:30 AM
 DATE: 14-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		250	343
W	7		0
	8		0
		253	345
		S	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		250			
		2	248	0	
		RIGHT	THRU	LEFT	
		NORTH			
		WEST		EAST	
		SOUTH			
		LEFT	THRU	RIGHT	
		5	340	0	
		345			
				0	
				0	
				0	

		3		LEFT	
8	0		THRU		
		5		RIGHT	

		0		RIGHT	
		0		THRU	
		0		LEFT	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	4
South	6
East	0
West	0
Total	10

Bikes (Peak Hour)	
Approach	# of
From North:	1
From South:	4
From East:	0
From West:	1
Total	6

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.81	SB
	From South:	0.55	NB
	From East:	n/a	WB
	From West:	0.47	EB
	Total	0.69	All

Heavy Vehicles:	From North:	20	8.0%	SB
	From South:	17	4.9%	NB
	From East:	0	#DIV/0!	WB
	From West:	1	12.5%	EB

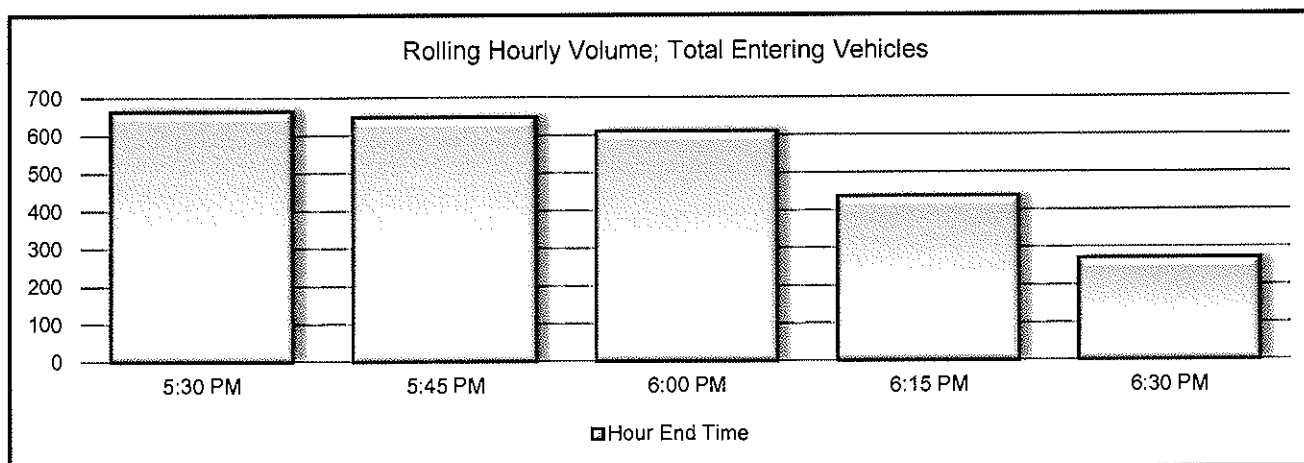
Location: S College Avenue/SW 13th Street	City/Town: College Place	
Checker: DLN	Weather: Sunny	Job: Avenue Traffic Asse
Date: 5/13/19	Thur	Start Time: 4:30 PM
# of minutes counted per interval: 14.0 minutes		Pk Hr: 4:30 PM 5:30 PM

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:45 PM	2	68	0	70	3	0	2	0	0	0	0	0	0	0
5:00 PM	1	74	0	75	2	0	1	0	0	0	0	0	0	0
5:15 PM	3	72	0	75	1	0	1	0	0	0	0	0	0	0
5:30 PM	1	70	0	71	2	1	1	0	0	0	0	0	0	0
5:45 PM	0	65	0	65	3	0	1	0	0	0	0	0	0	0
6:00 PM	1	61	0	62	1	0	1	0	0	0	0	0	0	0
6:15 PM				0							0			
6:30 PM				0							0			
PK HR	7	284	0	291	8	1	5	0	0	0	0	0	0	0
Adj HR	8	304	0	312	9	1	5	0	0	0	0	0	0	0

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:45 PM	1	67	1	69	5	0	1	2	0	0	2	0	0	1
5:00 PM	0	82	1	83	3	1	1	3	0	0	3	1	0	1
5:15 PM	0	82	3	85	3	1	1	2	0	0	2	0	0	1
5:30 PM	0	81	0	81	1	0	0	3	0	0	3	0	0	1
5:45 PM	0	56	2	58	4	0	0	2	0	1	3	0	0	1
6:00 PM	0	59	2	61	0	0	0	1	0	2	3	0	0	0
6:15 PM				0							0			
6:30 PM				0							0			
PK HR	1	312	5	318	12	2	3	10	0	0	10	1	1	4
Adj HR	1	334	5	340	13	2	3	11	0	0	11	1	1	4

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes				
16:45	151	9	0	4				
17:00	173	6	1	3				
17:15	174	4	1	3				
17:30	166	3	1	2				
17:45	135	8	0	2				
18:00	135	1	0	1				
18:15	0	0	0	0				
18:30	0	0	0	0				

Time	Rolling	
Start - End	Hr Vol	Pk Hr?
4:30 PM 5:30 PM	664	YES
4:45 PM 5:45 PM	648	no
5:00 PM 6:00 PM	610	no
5:15 PM 6:15 PM	436	no
5:30 PM 6:30 PM	270	no



INTERSECTION: S College Avenue/SW 13th Street
 PEAK HOUR: 4:30 PM 5:30 PM
 DATE: 13-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		312	334
W	13		0
	11		1
		315	340
		S	
		E	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		312	
		8	304
		RIGHT	THRU
		NORTH	
		LEFT	
		WEST	EAST
		SOUTH	
		LEFT	THRU
		5	334
		340	
		RIGHT	
		THRU	
		LEFT	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	5
South	3
East	0
West	4
Total	12

Bikes (Peak Hour)	
Approach	# of
From North:	1
From South:	2
From East:	0
From West:	1
Total	4

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.97	SB
	From South:	0.93	NB
	From East:	n/a	WB
	From West:	0.86	EB
	Total	0.95	All

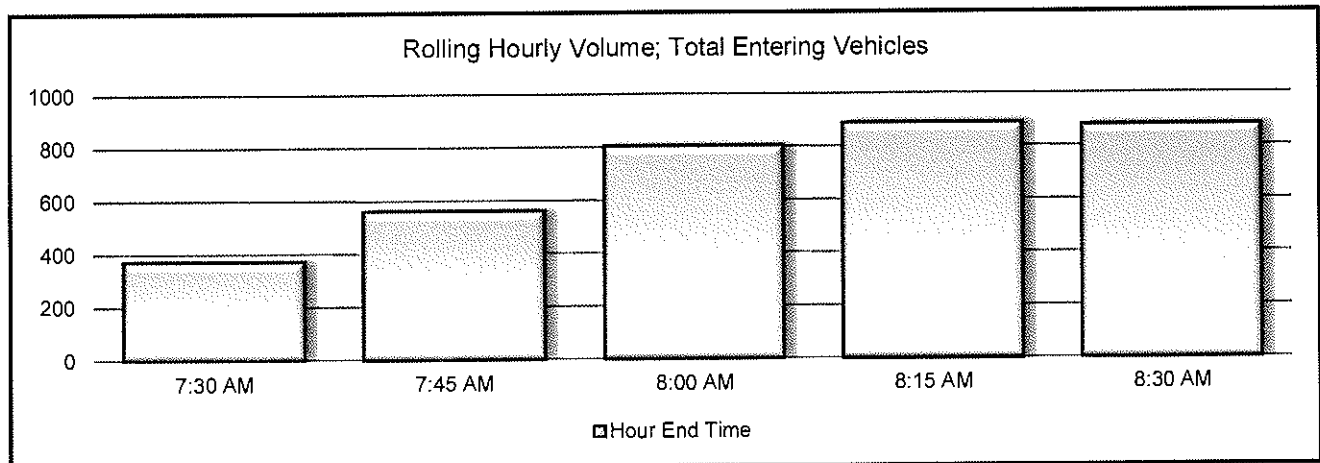
Heavy Vehicles:	From North:	9	2.9%	SB
	From South:	13	3.8%	NB
	From East:	0	#DIV/0!	WB
	From West:	1	9.1%	EB

Location: S College Avenue/Lamperti Lane Checker: GAN Weather: Sunny Date: 5/7/19 Thur Start Time: 6:30 AM # of minutes counted per interval: 14.0 minutes	City/Town: College Place Job: e Avenue Traffic Asse Pk Hr: 7:15 AM 8:15 AM
--	--

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	9	22	4	35	1	1	0	8	2	0	10	1	0	0
7:00 AM	2	21	13	36	1	0	1	9	4	1	14	1	0	5
7:15 AM	3	26	12	41	2	1	0	14	6	5	25	2	1	10
7:30 AM	3	29	5	37	2	2	1	11	8	5	24	2	2	3
7:45 AM	2	71	15	88	9	0	0	21	1	12	34	1	2	1
8:00 AM	4	84	17	105	3	0	0	28	2	26	56	0	0	1
8:15 AM	3	40	32	75	5	0	0	17	6	5	28	2	0	0
8:30 AM	3	20	11	34	1	0	1	16	0	3	19	0	0	0
PK HR	12	224	69	305	19	2	1	77	17	48	142	5	4	5
Adj HR	13	240	74	327	20	2	1	83	18	51	152	5	4	5

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	0	8	1	9	3	0	0	0	7	1	8	0	0	0
7:00 AM	2	20	2	24	5	1	0	1	12	2	15	0	1	0
7:15 AM	2	20	1	23	2	0	0	2	9	2	13	1	0	0
7:30 AM	0	20	1	21	3	0	1	5	7	1	13	2	0	0
7:45 AM	5	72	3	80	6	0	0	8	12	16	36	1	0	0
8:00 AM	26	92	4	122	2	0	0	17	5	10	32	1	0	0
8:15 AM	11	39	1	51	5	0	0	2	18	6	26	2	0	0
8:30 AM	2	17	1	20	2	0	0	0	9	5	14	0	0	0
PK HR	42	223	9	274	16	0	1	32	42	33	107	6	1	0
Adj HR	45	239	10	294	17	0	1	34	45	35	114	6	1	0

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time Start - End	Rolling Hr Vol	Pk Hr?	
6:45	66	5	1	0	6:30 AM - 7:30 AM	372	no	
7:00	95	8	2	6	6:45 AM - 7:45 AM	561	no	
7:15	109	8	2	11	7:00 AM - 8:00 AM	804	no	
7:30	102	10	4	5	7:15 AM - 8:15 AM	888	YES	
7:45	255	18	2	1	7:30 AM - 8:30 AM	879	no	
8:00	338	6	0	1				
8:15	193	15	0	0				
8:30	93	3	0	1				



INTERSECTION:	S College Avenue/Lamperti Lane
PEAK HOUR:	7:15 AM 8:15 AM
DATE:	7-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

	W	E	
N	41 114	152 164	327 357
S	325 294		

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

[illegible]

Crossing Leg	# of
North	1
South	1
East	5
West	0
Total	7

Approach	# of
From North:	2
From South:	0
From East:	4
From West:	1
Total	7

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.73	SB
	From South:	0.56	NB
	From East:	0.63	WB
	From West:	0.74	EB
	Total	0.66	All

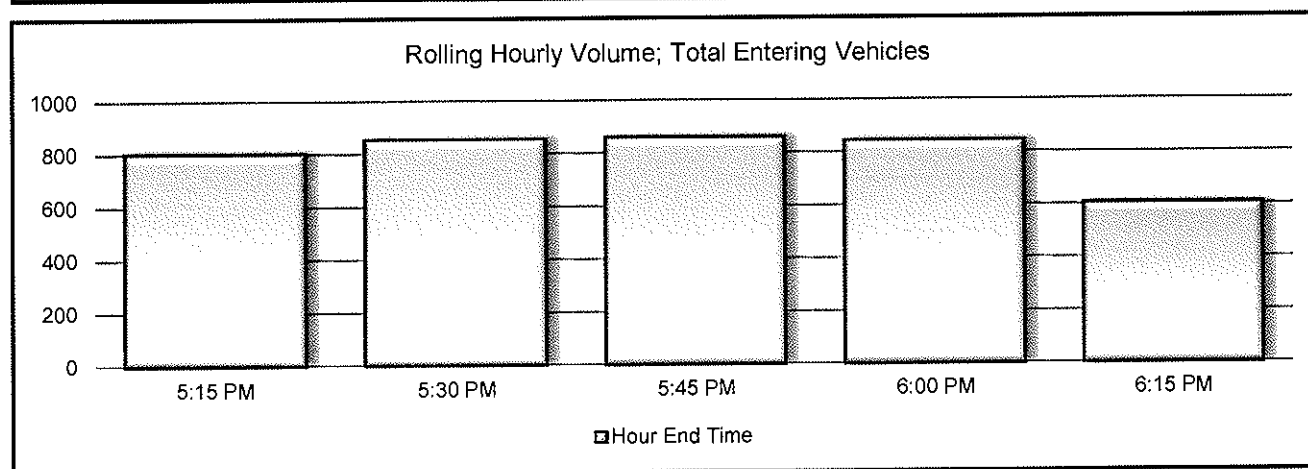
Heavy Vehicles:	From North:	20	6.1%	SB
	From South:	17	5.8%	NB
	From East:	5	3.3%	WB
	From West:	6	5.3%	EB

Location: S College Avenue/Lamperti Lane	City/Town: College Place	
Checker: GAN	Weather: Sunny	Job: Avenue Traffic Asse
Date: 5/6/19 Thur	Start Time: 4:15 PM	Pk Hr: 4:45 PM 5:45 PM
# of minutes counted per interval: 14.0 minutes		

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:30 PM	8	31	30	69	5	0	0	22	14	4	40	1	0	1
4:45 PM	8	33	27	68	3	0	0	36	8	3	47	1	0	10
5:00 PM	8	38	28	74	1	1	0	41	13	4	58	0	0	0
5:15 PM	10	41	36	87	3	0	0	48	16	4	68	4	0	0
5:30 PM	17	35	39	91	3	1	0	48	13	1	62	2	1	4
5:45 PM	7	33	28	68	4	0	0	41	18	2	61	1	0	1
6:00 PM	8	23	28	59	0	0	0	39	14	2	55	0	1	0
6:15 PM				0							0			
PK HR	42	147	131	320	11	2	0	178	60	11	249	7	1	5
Adj HR	45	158	140	343	12	2	0	191	64	12	267	8	1	5

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:30 PM	1	38	1	40	2	0	0	2	9	7	18	0	0	0
4:45 PM	2	33	3	38	3	1	1	3	16	4	23	1	1	2
5:00 PM	1	30	3	34	2	0	0	0	11	7	18	0	1	1
5:15 PM	7	40	2	49	1	1	0	3	8	7	18	1	0	0
5:30 PM	3	42	3	48	1	0	0	0	6	8	14	1	1	0
5:45 PM	0	35	0	35	0	0	0	2	12	3	17	0	0	0
6:00 PM	2	32	5	39	1	0	0	2	7	8	17	2	0	0
6:15 PM				0							0			
PK HR	11	147	8	166	4	1	0	5	37	25	67	2	1	1
Adj HR	12	158	9	179	4	1	0	5	40	27	72	2	1	1

END TIME	15 Min Totals (adj)				Time	Rolling	Pk Hr?
	Veh	HV	Peds	Bikes			
16:30	179	9	0	1	4:15 PM - 5:15 PM	803	no
16:45	189	9	2	14			
17:00	197	3	2	1	4:30 PM - 5:30 PM	854	no
17:15	238	10	1	0			
17:30	230	8	3	4	4:45 PM - 5:45 PM	859	YES
17:45	194	5	0	1			
18:00	182	3	1	0	5:00 PM - 6:00 PM	844	no
18:15	0	0	0	0			
18:15	0	0	0	0	5:15 PM - 6:15 PM	606	no
18:15	0	0	0	0			



INTERSECTION: S College Avenue/Lamperti Lane
 PEAK HOUR: 4:45 PM 5:45 PM
 DATE: 6-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		343	376
W	118		267
	72		192
		175	179
		S	
		E	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		343	
		45	158
		RIGHT	THRU
		NORTH	
		WEST	EAST
		SOUTH	
		LEFT	THRU
		9	158
		179	
		RIGHT	
		191	
		64	
		THRU	
		12	
		LEFT	
		267	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	0
South	0
East	5
West	1
Total	6

Bikes (Peak Hour)	
Approach	# of
From North:	2
From South:	1
From East:	1
From West:	1
Total	5

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.88	SB
	From South:	0.85	NB
	From East:	0.92	WB
	From West:	0.93	EB
	Total	0.90	All

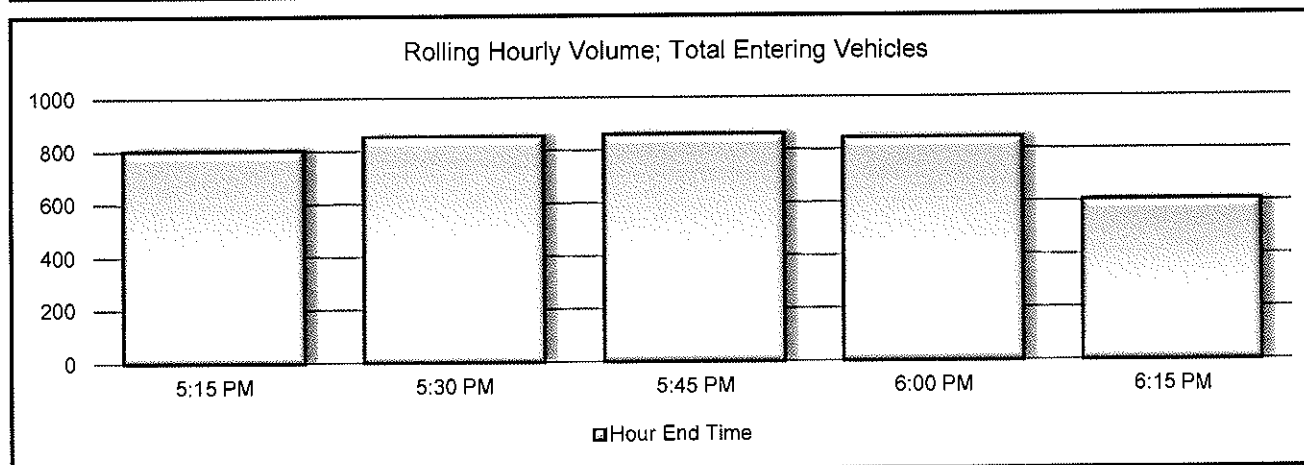
Heavy Vehicles:	From North:	12	3.5%	SB
	From South:	4	2.2%	NB
	From East:	8	3.0%	WB
	From West:	2	2.8%	EB

Location:	S College Avenue/Lamperti Lane	City/Town	College Place
Checker:	GAN	Weather:	Sunny
Date:	5/6/19	Thur	Start Time: 4:15 PM
# of minutes counted per interval:		14.0 minutes	
		Job:	3 Avenue Traffic Asse
		Pk Hr:	4:45 PM 5:45 PM

END TIME	From the NORTH (SOUTHBOUND)							N Leg Peds	From the EAST (WESTBOUND)							E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes			RT	TH	LT	TOTAL	HV	Bikes		
4:30 PM	8	31	30	69	5	0		0	22	14	4	40	1	0		1
4:45 PM	8	33	27	68	3	0		0	36	8	3	47	1	0		10
5:00 PM	8	38	28	74	1	1		0	41	13	4	58	0	0		0
5:15 PM	10	41	36	87	3	0		0	48	16	4	68	4	0		0
5:30 PM	17	35	39	91	3	1		0	48	13	1	62	2	1		4
5:45 PM	7	33	28	68	4	0		0	41	18	2	61	1	0		1
6:00 PM	8	23	28	59	0	0		0	39	14	2	55	0	1		0
6:15 PM				0								0				
PK HR	42	147	131	320	11	2		0	178	60	11	249	7	1		5
Adj HR	45	158	140	343	12	2		0	191	64	12	267	8	1		5

END TIME	From the SOUTH (NORTHBOUND)							S Leg Peds	From the WEST (EASTBOUND)							W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes			RT	TH	LT	TOTAL	HV	Bikes		
4:30 PM	1	38	1	40	2	0		0	2	9	7	18	0	0		0
4:45 PM	2	33	3	38	3	1		1	3	16	4	23	1	1		2
5:00 PM	1	30	3	34	2	0		0	0	11	7	18	0	1		1
5:15 PM	7	40	2	49	1	1		0	3	8	7	18	1	0		0
5:30 PM	3	42	3	48	1	0		0	0	6	8	14	1	1		0
5:45 PM	0	35	0	35	0	0		0	2	12	3	17	0	0		0
6:00 PM	2	32	5	39	1	0		0	2	7	8	17	2	0		0
6:15 PM				0								0				
PK HR	11	147	8	166	4	1		0	5	37	25	67	2	1		1
Adj HR	12	158	9	179	4	1		0	5	40	27	72	2	1		1

END TIME	15 Min Totals (adj)						
	Veh	HV	Peds	Bikes			
16:30	179	9	0	1			
16:45	189	9	2	14			
17:00	197	3	2	1			
17:15	238	10	1	0			
17:30	230	8	3	4			
17:45	194	5	0	1			
18:00	182	3	1	0			
18:15	0	0	0	0			
					Time	Rolling	
					Start - End	Hr Vol	Pk Hr?
					4:15 PM 5:15 PM	803	no
					4:30 PM 5:30 PM	854	no
					4:45 PM 5:45 PM	859	YES
					5:00 PM 6:00 PM	844	no
					5:15 PM 6:15 PM	606	no



INTERSECTION: S College Avenue/Lamperti Lane
 PEAK HOUR: 4:45 PM 5:45 PM
 DATE: 6-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		343	376
W	118		267
	72		192
		175	179
		S	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

			343									
			45	158	140							
			RIGHT	THRU	LEFT							
			NORTH									
72	27	LEFT							RIGHT	191	267	
	40	THRU	WEST	EAST						THRU		64
	5	RIGHT							LEFT	12		
			SOUTH									
			LEFT	THRU	RIGHT							
			9	158	12							
						179						

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	0
South	0
East	5
West	1
Total	6

Bikes (Peak Hour)	
Approach	# of
From North:	2
From South:	1
From East:	1
From West:	1
Total	5

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.88	SB
	From South:	0.85	NB
	From East:	0.92	WB
	From West:	0.93	EB
	Total	0.90	All

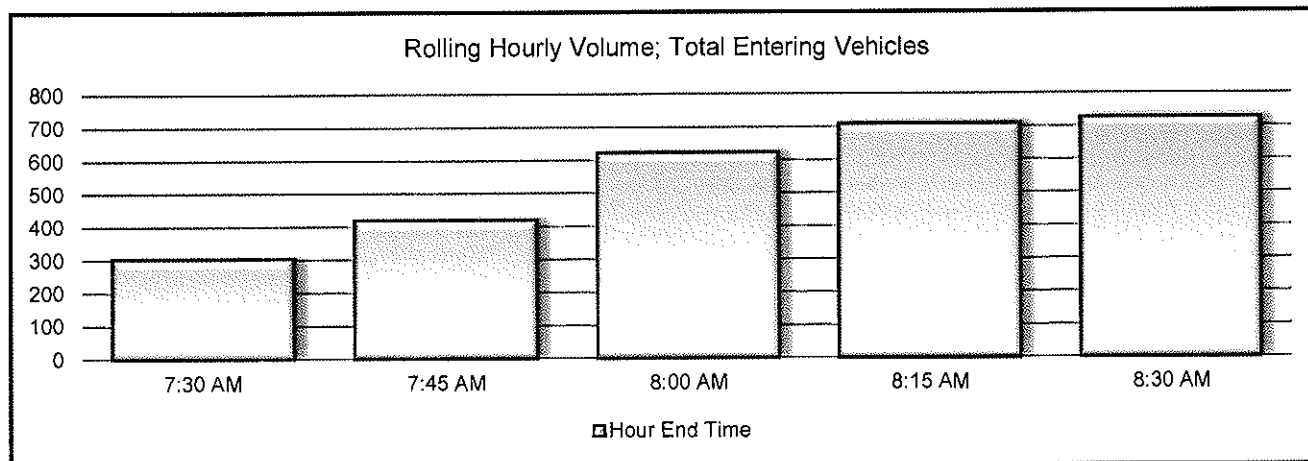
Heavy Vehicles:	From North:	12	3.5%	SB
	From South:	4	2.2%	NB
	From East:	8	3.0%	WB
	From West:	2	2.8%	EB

Location:	S College Avenue/SW 10th Street	City/Town:	College Place
Checker:	GAN	Weather:	Sunny
Date:	5/14/19	Thur	Start Time: 6:30 AM
# of minutes counted per interval:	14.0 minutes	Pk Hr:	7:30 AM 8:30 AM

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	1	23	0	24	1	0	0	1	0	0	1	0	0	1
7:00 AM	0	33	0	33	1	0	1	0	0	2	2	0	0	1
7:15 AM	1	32	1	34	1	0	1	2	0	1	3	0	0	4
7:30 AM	0	37	2	39	3	0	0	3	0	0	3	1	0	6
7:45 AM	1	72	0	73	3	1	0	2	1	0	3	1	2	0
8:00 AM	0	106	0	106	7	0	2	1	0	0	1	0	2	1
8:15 AM	2	71	1	74	3	0	1	0	0	0	0	0	0	1
8:30 AM	0	47	0	47	2	0	0	1	0	0	1	0	0	0
PK HR	3	296	1	300	15	1	3	4	1	0	5	1	4	2
Adj HR	3	317	1	321	16	1	3	4	1	0	5	1	4	2

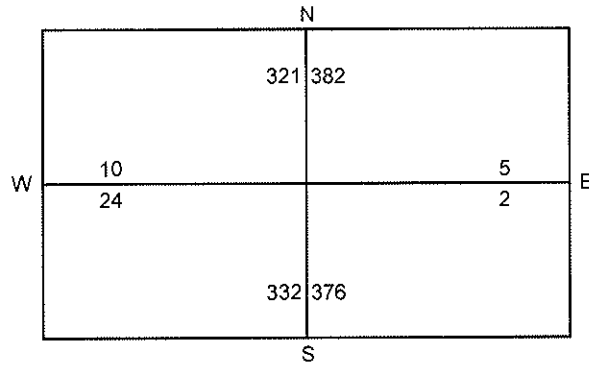
END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	0	26	0	26	2	0	1	0	0	0	0	0	0	2
7:00 AM	1	27	0	28	3	0	0	0	0	1	1	0	0	2
7:15 AM	0	40	0	40	4	0	0	1	0	3	4	1	0	1
7:30 AM	1	39	3	43	5	0	0	1	0	0	1	0	3	1
7:45 AM	0	77	1	78	2	0	0	2	0	4	6	0	0	1
8:00 AM	0	140	2	142	5	2	0	4	0	1	5	1	1	0
8:15 AM	0	78	3	81	2	0	0	5	0	2	7	2	0	0
8:30 AM	1	49	0	50	6	0	0	3	0	1	4	0	1	0
PK HR	1	344	6	351	15	2	0	14	0	8	22	3	1	1
Adj HR	1	369	6	376	16	2	0	15	0	9	24	3	1	1

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes				
6:45	55	3	0	4	Time Start - End Rolling Hr Vol Pk Hr?			
7:00	69	4	0	4				
7:15	87	6	0	6	6:30 AM	7:30 AM	303	no
7:30	92	10	3	8	6:45 AM	7:45 AM	419	no
7:45	171	6	3	1	7:00 AM	8:00 AM	622	no
8:00	272	14	5	3	7:15 AM	8:15 AM	709	no
8:15	174	8	0	2	7:30 AM	8:30 AM	726	YES
8:30	109	9	1	0				

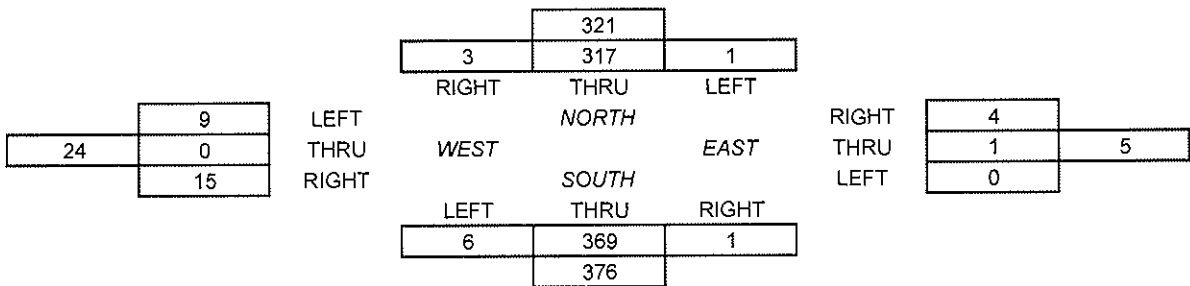


INTERSECTION:	S College Avenue/SW 10th Street
PEAK HOUR:	7:30 AM 8:30 AM
DATE:	14-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR



APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR



Crossing Leg	# of
North	3
South	0
East	2
West	1
Total	6

Approach	# of
From North:	1
From South:	2
From East:	4
From West:	1
Total	8

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.71	SB
	From South:	0.62	NB
	From East:	0.39	WB
	From West:	0.80	EB
	Total	0.67	All

Heavy Vehicles:	From North:	16	5.0%	SB
	From South:	16	4.3%	NB
	From East:	1	20.0%	WB
	From West:	3	12.5%	EB

INTERSECTION: S College Avenue/SW 12th Street
 PEAK HOUR: 7:30 AM 8:30 AM
 DATE: 8-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
W		315	380
	32		112
	56		127
		S	
		328	384
		E	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		315	
56	4	RIGHT	THRU
	32	THRU	LEFT
	20	RIGHT	LEFT
		NORTH	
		WEST	
		EAST	
		SOUTH	
		LEFT	THRU
		RIGHT	RIGHT
		16	317
		384	
		59	
		RIGHT	THRU
		THRU	LEFT
		LEFT	LEFT
		10	112
		43	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	2
South	1
East	8
West	1
Total	12

Bikes (Peak Hour)	
Approach	# of
From North:	6
From South:	1
From East:	5
From West:	1
Total	13

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.76	SB
	From South:	0.61	NB
	From East:	0.57	WB
	From West:	0.65	EB
	Total	0.66	All

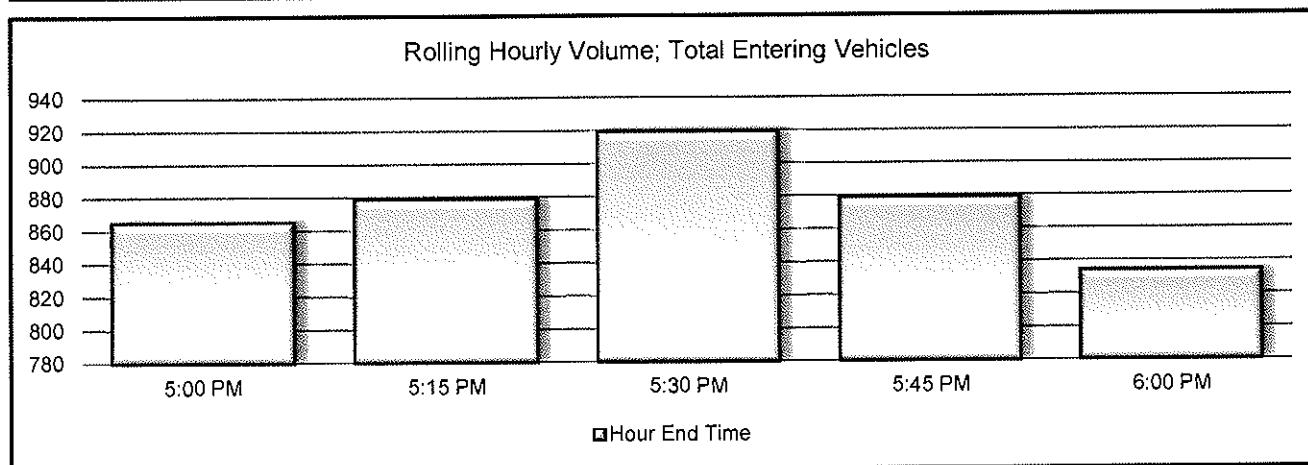
Heavy Vehicles:	From North:	16	5.1%	SB
	From South:	13	3.4%	NB
	From East:	6	5.4%	WB
	From West:	1	1.8%	EB

Location:	S College Avenue/SW 12th Street	City/Town:	College Place
Checker:	GAN	Weather:	Sunny
Date:	5/7/19	Thur	Start Time: 4:00 PM
# of minutes counted per interval:	14.0 minutes	Pk Hr:	4:30 PM 5:30 PM

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	2	52	18	72	3	3	2	17	8	9	34	0	0	2
4:30 PM	2	54	22	78	1	2	1	15	2	11	28	0	1	0
4:45 PM	2	57	18	77	2	3	0	23	5	13	41	1	0	1
5:00 PM	3	64	16	83	1	1	2	13	6	12	31	0	1	0
5:15 PM	3	73	12	88	3	0	0	17	4	12	33	1	0	0
5:30 PM	2	61	18	81	1	1	2	19	4	23	46	1	0	0
5:45 PM	3	48	12	63	1	0	0	19	4	11	34	0	0	2
6:00 PM	4	53	14	71	1	1	0	7	9	7	23	1	0	2
PK HR	10	255	64	329	7	5	4	72	19	60	151	3	1	1
Adj HR	11	273	69	353	8	5	4	77	20	64	161	3	1	1

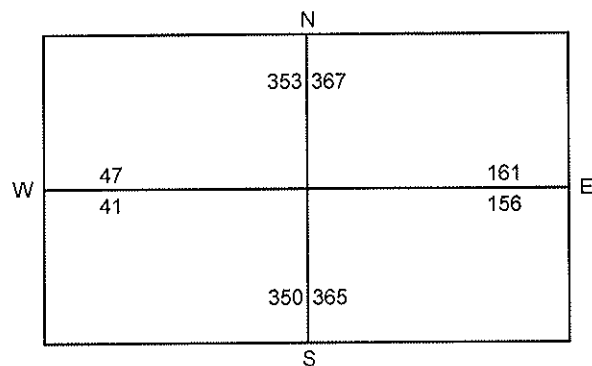
END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	20	58	2	80	5	0	1	2	8	1	11	2	0	5
4:30 PM	13	49	1	63	2	0	1	4	4	0	8	1	1	0
4:45 PM	21	64	3	88	6	1	0	3	5	2	10	0	1	0
5:00 PM	18	73	2	93	1	2	0	2	5	3	10	1	0	0
5:15 PM	14	63	2	79	3	0	0	4	3	3	10	0	0	0
5:30 PM	12	60	8	80	0	1	0	3	3	2	8	0	1	0
5:45 PM	12	62	1	75	1	0	0	2	3	1	6	0	0	2
6:00 PM	7	63	1	71	1	0	0	6	4	0	10	0	0	0
PK HR	65	260	15	340	10	4	0	12	16	10	38	1	1	0
Adj HR	70	279	16	365	11	4	0	13	17	11	41	1	1	0

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time Start - End	Rolling Hr Vol	Pk Hr?	
16:15	211	11	3	11	4:00 PM 5:00 PM	865	no	
16:30	190	4	4	2	4:15 PM 5:15 PM	879	no	
16:45	231	10	5	1	4:30 PM 5:30 PM	919	YES	
17:00	233	3	4	2	4:45 PM 5:45 PM	879	no	
17:15	225	8	0	0	5:00 PM 6:00 PM	834	no	
17:30	230	2	3	2				
17:45	191	2	0	4				
18:00	188	3	1	2				

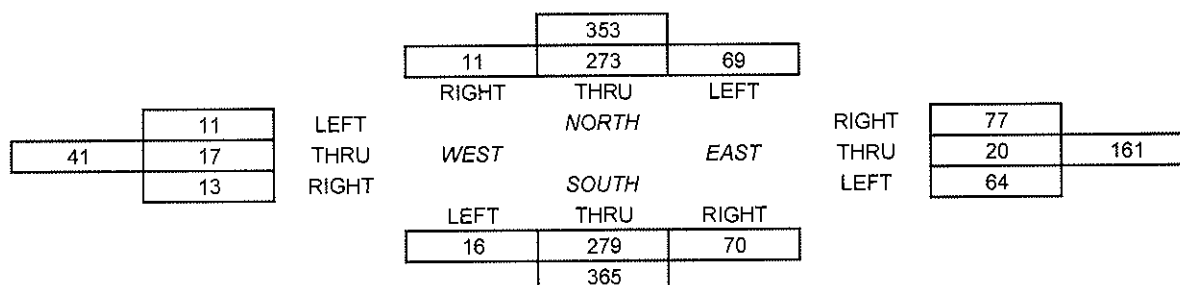


INTERSECTION:	S College Avenue/SW 12th Street
PEAK HOUR:	4:30 PM 5:30 PM
DATE:	7-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR



APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR



Crossing Leg	# of
North	4
South	0
East	1
West	0
Total	5

Bikes (Peak Hour)	
Approach	# of
From North:	5
From South:	4
From East:	1
From West:	1
Total	11

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.94	SB
	From South:	0.92	NB
	From East:	0.82	WB
	From West:	0.96	EB
	Total	0.99	All

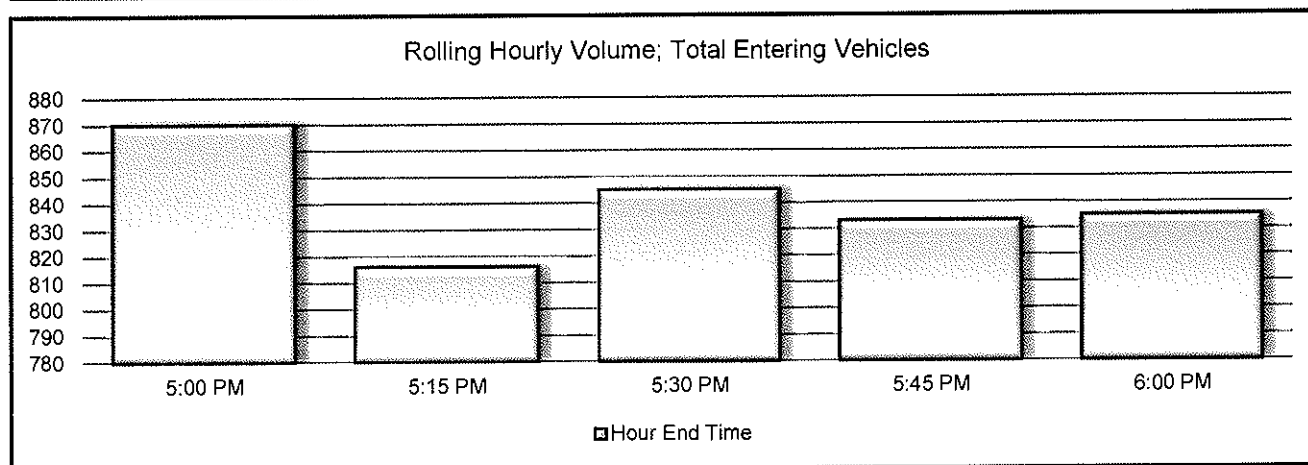
Heavy Vehicles:	From North:	8	2.3%	SB
	From South:	11	3.0%	NB
	From East:	3	1.9%	WB
	From West:	1	2.4%	EB

Location: S College Avenue/Whitman Drive	City/Town: College Place
Checker: DN	Weather: Cloudy
Date: 5/14/19	Job: Avenue Traffic Asse
Thur	Pk Hr: 4:00 PM 5:00 PM
# of minutes counted per interval: 14.0 minutes	

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	17	60	7	84	3	2	5	3	23	7	33	3	0	2
4:30 PM	12	34	6	52	7	2	5	2	22	4	28	0	0	2
4:45 PM	18	44	6	68	5	2	4	5	26	4	35	1	0	2
5:00 PM	14	49	7	70	2	2	4	6	24	3	33	0	0	3
5:15 PM	10	38	4	52	3	2	4	6	22	7	35	2	0	2
5:30 PM	17	57	5	79	2	2	4	3	24	1	28	0	1	2
5:45 PM	13	43	6	62	3	2	5	5	16	7	28	1	0	2
6:00 PM	17	30	6	53	0	1	5	4	26	9	39	0	0	2
PK HR	61	187	26	274	17	8	18	16	95	18	129	4	0	9
Adj HR	65	200	28	293	18	9	19	17	102	19	138	4	0	10

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	8	57	25	90	6	0	7	13	18	9	40	1	0	1
4:30 PM	12	47	15	74	2	0	7	4	9	7	20	0	0	1
4:45 PM	11	36	16	63	5	0	7	9	25	9	43	0	0	1
5:00 PM	3	36	13	52	2	0	7	9	15	3	27	2	0	1
5:15 PM	4	44	11	59	3	0	7	12	23	16	51	1	0	1
5:30 PM	5	41	9	55	1	0	7	8	23	8	39	1	0	1
5:45 PM	3	43	18	64	2	0	7	11	22	11	44	1	0	1
6:00 PM	5	37	14	56	6	24	8	9	20	7	36	0	8	1
PK HR	34	176	69	279	15	0	28	35	67	28	130	3	1	4
Adj HR	36	189	74	299	16	0	30	38	72	30	140	3	1	4

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time Start - End	Rolling Hr Vol	Pk Hr?	
16:15	265	14	2	16	4:00 PM 5:00 PM	870	YES	
16:30	186	10	2	16	4:15 PM 5:15 PM	816	no	
16:45	224	12	2	15	4:30 PM 5:30 PM	845	no	
17:00	195	6	2	16	4:45 PM 5:45 PM	833	no	
17:15	211	10	2	15	5:00 PM 6:00 PM	835	no	
17:30	215	4	3	15				
17:45	212	8	2	16				
18:00	197	6	35	17				



INTERSECTION:	S College Avenue/Whitman Drive
PEAK HOUR:	4:00 PM 5:00 PM
DATE:	14-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

	W	E	
N	293	236	529
S	140	138	278
	401	372	1000

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

[illegible]

Crossing Leg	# of
North	19
South	30
East	10
West	4
Total	63

Approach	# of
From North:	9
From South:	0
From East:	0
From West:	1
Total	10

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.81	SB
	From South:	0.78	NB
	From East:	0.92	WB
	From West:	0.76	EB
	Total	0.82	All

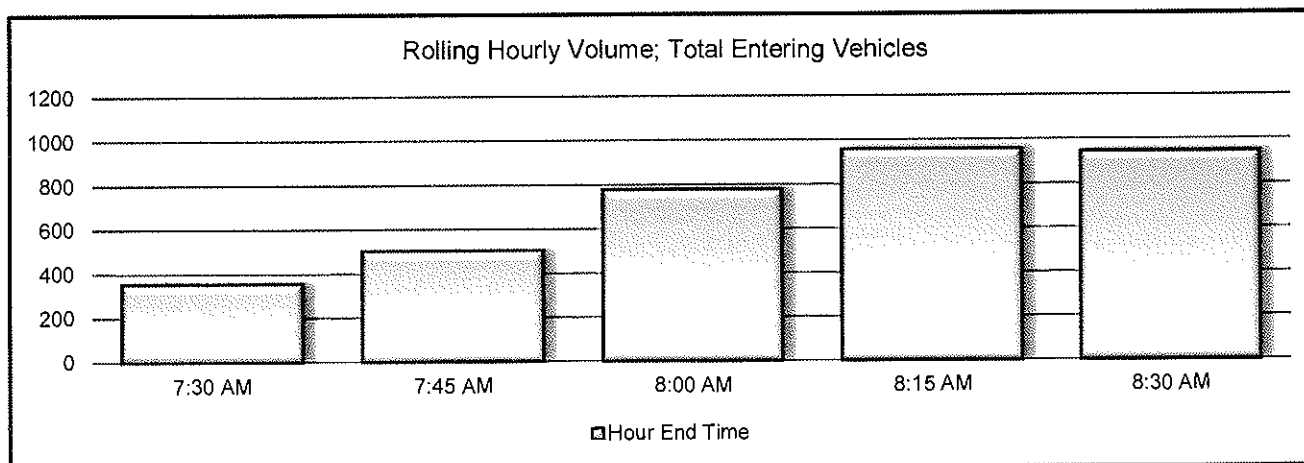
Heavy Vehicles:	From North:	18	6.1%	SB
	From South:	16	5.4%	NB
	From East:	4	2.9%	WB
	From West:	3	2.1%	EB

Location:	S College Way/SW 4th Street	City/Town:	College Place
Checker:	GAN	Weather:	Sunny
Date:	5/9/19	Thur	Start Time: 6:30 AM
# of minutes counted per interval:		14.0 minutes	
		Job:	avenue Traffic Asse
		Pk Hr:	7:15 AM 8:15 AM

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	0	24	1	25	1	0	0	5	4	4	13	1	1	0
7:00 AM	1	17	1	19	1	0	0	1	4	1	6	1	0	0
7:15 AM	1	13	0	14	1	0	0	0	9	4	13	2	0	1
7:30 AM	2	22	2	26	6	0	0	2	8	5	15	2	0	0
7:45 AM	2	32	0	34	2	0	4	3	24	24	51	4	0	0
8:00 AM	1	52	1	54	4	0	3	3	39	32	74	3	0	0
8:15 AM	7	33	4	44	1	0	1	7	27	21	55	1	0	1
8:30 AM	3	27	0	30	6	0	0	3	5	2	10	2	0	0
PK HR	12	139	7	158	13	0	8	15	98	82	195	10	0	1
Adj HR	13	149	8	170	14	0	9	16	105	88	209	11	0	1

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	2	18	2	22	2	0	0	5	2	2	9	0	0	0
7:00 AM	7	27	2	36	3	0	1	5	2	3	10	0	0	0
7:15 AM	6	26	5	37	3	1	0	8	3	2	13	0	0	1
7:30 AM	12	33	8	53	3	0	1	8	8	3	19	0	0	1
7:45 AM	28	42	21	91	4	0	1	18	12	1	31	0	0	3
8:00 AM	59	39	52	150	4	1	0	15	32	3	50	2	0	0
8:15 AM	18	52	21	91	5	0	0	21	28	7	56	1	0	0
8:30 AM	12	21	11	44	4	0	2	5	8	3	16	0	0	1
PK HR	117	166	102	385	16	1	2	62	80	14	156	3	1	4
Adj HR	125	178	109	412	17	1	2	66	86	15	167	3	1	4

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time Start - End	Rolling Hr Vol	Pk Hr?	
6:45	74	4	1	0	6:30 AM 7:30 AM	354	no	
7:00	76	5	0	1	6:45 AM 7:45 AM	502	no	
7:15	83	6	1	2	7:00 AM 8:00 AM	777	no	
7:30	121	12	0	2	7:15 AM 8:15 AM	958	YES	
7:45	222	11	0	9	7:30 AM 8:30 AM	944	no	
8:00	351	14	1	3				
8:15	264	9	0	2				
8:30	107	13	0	3				



INTERSECTION: S College Way/SW 4th Street
 PEAK HOUR: 7:15 AM 8:15 AM
 DATE: 9-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
	170	209	
W	227		209
	167		219
		S	
	303	412	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

			170		
	13		149		8
	RIGHT		THRU		LEFT
		WEST	NORTH	EAST	
			SOUTH		
	LEFT		THRU		RIGHT
	109		178		125
			412		
167	15	LEFT		RIGHT	16
	86	THRU		THRU	105
	66	RIGHT		LEFT	88
					209

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	9
South	2
East	1
West	4
Total	16

Bikes (Peak Hour)	
Approach	# of
From North:	0
From South:	1
From East:	0
From West:	1
Total	2

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.73	SB
	From South:	0.64	NB
	From East:	0.66	WB
	From West:	0.70	EB
	Total	0.68	All

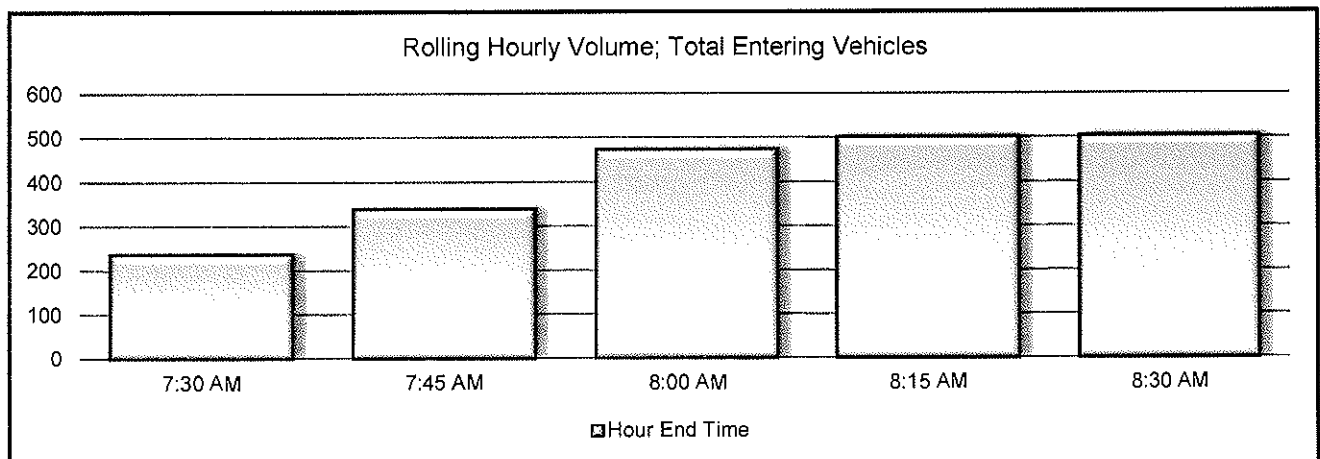
Heavy Vehicles:	From North:	14	8.2%	SB
	From South:	17	4.1%	NB
	From East:	11	5.3%	WB
	From West:	3	1.8%	EB

Location:	S College Avenue/SW 6th Street	City/Town	College Place
Checker:	GAN	Weather:	Cloudy
Date:	5/15/19	Thur	Start Time: 6:30 AM
# of minutes counted per interval:		15.0 minutes	Pk Hr: 7:30 AM 8:30 AM

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	0	18	0	18	1	0	0	0	2	0	2	0	0	1
7:00 AM	1	21	1	23	2	0	0	0	0	0	0	0	0	1
7:15 AM	0	24	2	26	2	0	2	0	0	1	1	2	0	5
7:30 AM	0	27	1	28	2	0	1	3	0	4	7	0	0	7
7:45 AM	0	63	0	63	4	0	0	2	0	3	5	0	0	0
8:00 AM	1	72	0	73	2	0	0	2	0	0	2	0	0	0
8:15 AM	1	42	0	43	2	1	1	2	0	2	4	0	1	2
8:30 AM	2	31	0	33	3	0	0	1	2	0	3	0	0	0
PK HR	4	208	0	212	11	1	1	7	2	5	14	0	1	2
Adj HR	4	208	0	212	11	1	1	7	2	5	14	0	1	2

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	1	19	0	20	1	0	0	2	0	1	3	3	0	2
7:00 AM	0	26	0	26	2	0	0	1	0	4	5	0	0	4
7:15 AM	3	29	0	32	2	0	0	0	0	0	0	0	0	1
7:30 AM	0	32	6	38	3	0	0	4	1	2	7	1	1	0
7:45 AM	2	71	0	73	1	0	0	2	0	2	4	0	0	0
8:00 AM	1	102	4	107	2	0	0	5	0	2	7	0	0	0
8:15 AM	2	35	1	38	0	0	1	0	1	1	2	0	0	0
8:30 AM	1	37	5	43	4	0	1	1	2	1	4	0	0	0
PK HR	6	245	10	261	7	0	2	8	3	6	17	0	1	0
Adj HR	6	245	10	261	7	0	2	8	3	6	17	0	1	0

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time Start - End	Rolling Hr Vol	Pk Hr?	
6:45	43	5	0	3	6:30 AM - 7:30 AM	236	no	
7:00	54	4	0	5	6:45 AM - 7:45 AM	338	no	
7:15	59	6	0	8	7:00 AM - 8:00 AM	473	no	
7:30	80	6	1	8	7:15 AM - 8:15 AM	501	no	
7:45	145	5	0	0	7:30 AM - 8:30 AM	504	YES	
8:00	189	4	0	0				
8:15	87	2	2	4				
8:30	83	7	0	1				



INTERSECTION: S College Avenue/SW 6th Street
 PEAK HOUR: 7:30 AM 8:30 AM
 DATE: 15-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		212	258
W	16		
	17	14	9
		221	261
		S	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		212	
		4	208
		RIGHT	THRU
		NORTH	
		WEST	EAST
		SOUTH	
		LEFT	THRU
		10	245
		261	
		RIGHT	
		THRU	LEFT
		7	14
		2	5
		LEFT	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	1
South	2
East	2
West	0
Total	5

Bikes (Peak Hour)	
Approach	# of
From North:	1
From South:	0
From East:	1
From West:	1
Total	3

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.73	SB
	From South:	0.61	NB
	From East:	0.70	WB
	From West:	0.61	EB
	Total	0.67	All

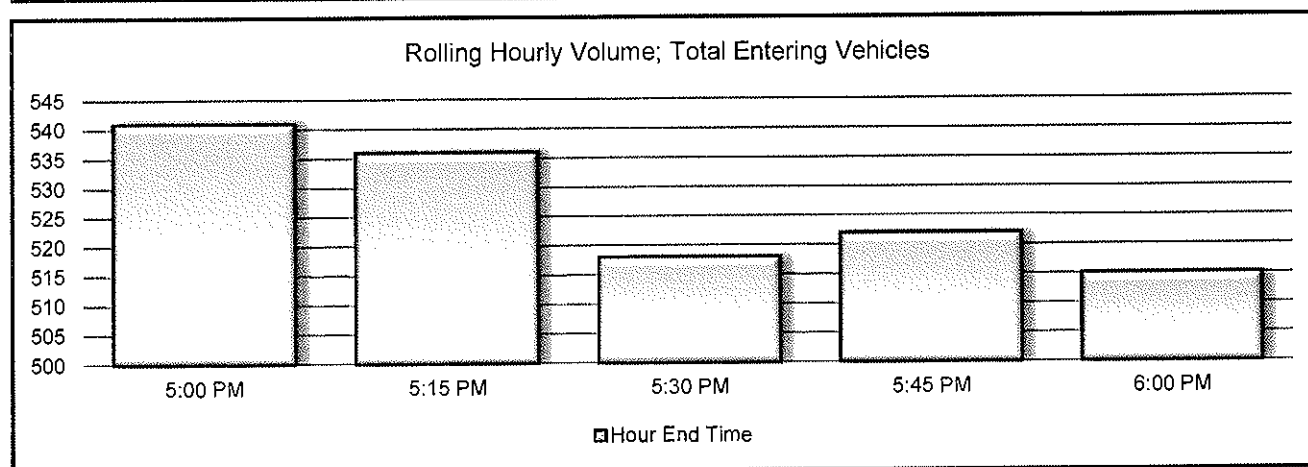
Heavy Vehicles:	From North:	11	5.2%	SB
	From South:	7	2.7%	NB
	From East:	0	0.0%	WB
	From West:	0	0.0%	EB

Location: S College Avenue/SW 6th Street	City/Town: College Place	
Checker: GAN	Weather: Cloudy	Job: Avenue Traffic Asse
Date: 5/14/19 Thur	Start Time: 4:00 PM	Pk Hr: 4:00 PM 5:00 PM
# of minutes counted per interval: 15.0 minutes		

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	1	59	4	64	2	1	2	2	1	1	4	0	0	1
4:30 PM	3	57	4	64	4	0	0	0	0	1	1	0	2	2
4:45 PM	0	54	1	55	3	0	0	0	3	3	6	1	0	1
5:00 PM	4	54	6	64	2	0	1	6	2	0	8	0	1	0
5:15 PM	4	59	1	64	2	0	0	0	0	4	4	1	0	2
5:30 PM	4	57	1	62	1	0	0	1	0	1	2	0	0	0
5:45 PM	1	46	3	50	2	1	1	4	2	0	6	0	0	0
6:00 PM	6	51	1	58	0	0	0	1	1	2	4	0	1	4
PK HR	8	224	15	247	11	1	3	8	6	5	19	1	3	4
Adj HR	8	224	15	247	11	1	3	8	6	5	19	1	3	4

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	3	60	1	64	1	0	0	7	1	2	10	0	1	0
4:30 PM	4	60	4	68	3	0	0	8	0	4	12	0	0	1
4:45 PM	3	45	3	51	2	0	0	9	0	1	10	0	2	1
5:00 PM	2	41	4	47	1	0	0	8	0	5	13	0	1	2
5:15 PM	3	56	1	60	2	0	0	7	0	2	9	1	1	1
5:30 PM	3	50	1	54	1	0	0	6	0	3	9	0	0	0
5:45 PM	3	54	4	61	1	0	1	6	2	1	9	0	0	4
6:00 PM	0	51	1	52	1	0	1	7	0	4	11	1	0	0
PK HR	12	206	12	230	7	0	0	32	1	12	45	0	1	4
Adj HR	12	206	12	230	7	0	0	32	1	12	45	0	1	4

END TIME	15 Min Totals (adj)						
	Veh	HV	Peds	Bikes			
16:15	142	3	2	3	Time Start - End Rolling Hr Vol Pk Hr?		
16:30	145	7	2	3			
16:45	122	6	2	2	4:00 PM 5:00 PM	541	YES
17:00	132	3	2	3	4:15 PM 5:15 PM	536	no
17:15	137	6	1	3	4:30 PM 5:30 PM	518	no
17:30	127	2	0	0	4:45 PM 5:45 PM	522	no
17:45	126	3	1	6	5:00 PM 6:00 PM	515	no
18:00	125	2	1	5			



INTERSECTION:	S College Avenue/SW 6th Street
PEAK HOUR:	4:00 PM 5:00 PM
DATE:	14-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

247	226
261	230

W E

N S

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

[illegible]

Crossing Leg	# of
North	3
South	0
East	4
West	4
Total	11

Approach	# of
From North:	1
From South:	0
From East:	3
From West:	1
Total	5

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.96	SB
	From South:	0.85	NB
	From East:	0.59	WB
	From West:	0.87	EB
	Total	0.93	All

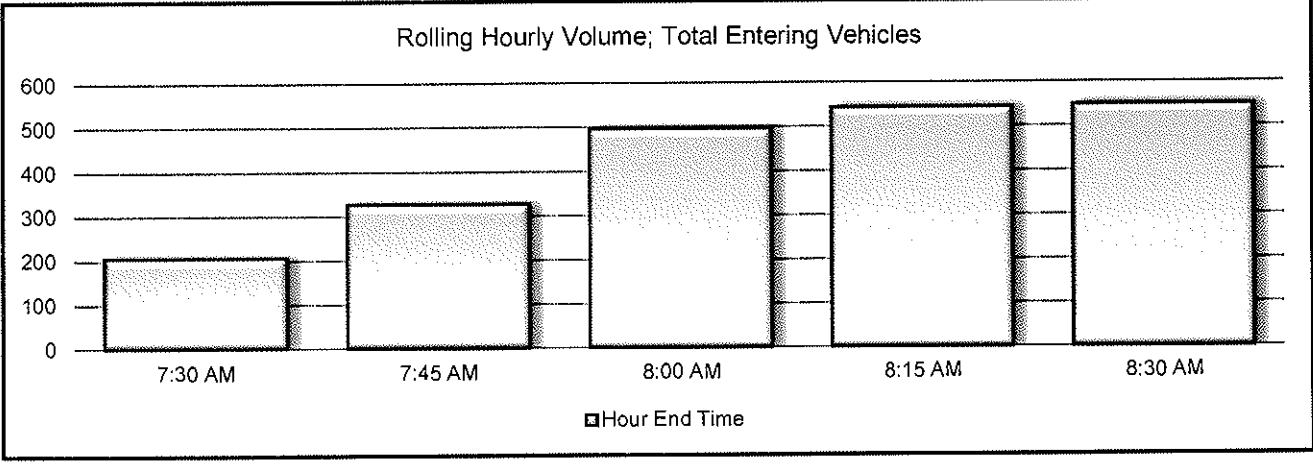
Heavy Vehicles:	From North:	11	4.5%	SB
	From South:	7	3.0%	NB
	From East:	1	5.3%	WB
	From West:	0	0.0%	EB

Location: S College Avenue/SW 8th Street	City/Town: College Place
Checker: GAN	Weather: Cloudy
Date: 5/15/19	Job: Avenue Traffic Asse
Thur	Pk Hr: 7:30 AM 8:30 AM
# of minutes counted per interval: 14.0 minutes	

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	0	15	0	15	1	0	0	0	2	0	2	0	0	1
7:00 AM	1	17	1	19	2	0	0	0	0	0	0	0	0	1
7:15 AM	0	18	2	20	2	0	2	0	0	1	1	2	0	5
7:30 AM	0	24	1	25	2	0	1	3	0	4	7	0	0	7
7:45 AM	0	63	0	63	4	0	0	2	0	3	5	0	0	0
8:00 AM	1	72	0	73	2	0	0	2	0	0	2	0	0	0
8:15 AM	1	42	0	43	2	1	1	2	0	2	4	0	1	2
8:30 AM	2	31	0	33	3	0	0	1	2	0	3	0	0	0
PK HR	4	208	0	212	11	1	1	7	2	5	14	0	1	2
Adj HR	4	223	0	227	12	1	1	8	2	5	15	0	1	2

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	1	12	0	13	1	0	0	2	0	1	3	3	0	2
7:00 AM	0	15	0	15	2	0	0	1	0	4	5	0	0	4
7:15 AM	3	19	0	22	2	0	0	0	0	0	0	0	0	1
7:30 AM	0	32	6	38	3	0	0	4	1	2	7	1	1	0
7:45 AM	2	71	0	73	1	0	0	2	0	2	4	0	0	0
8:00 AM	1	111	4	116	2	0	0	5	0	2	7	0	0	0
8:15 AM	2	35	1	38	0	0	1	0	1	1	2	0	0	0
8:30 AM	1	37	5	43	4	0	1	1	2	1	4	0	0	0
PK HR	6	254	10	270	7	0	2	8	3	6	17	0	1	0
Adj HR	6	272	11	289	8	0	2	9	3	6	18	0	1	0

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time		Rolling	
6:45	35	5	0	3	Start -	End	Hr Vol	Pk Hr?
7:00	42	4	0	5	6:30 AM	7:30 AM	206	no
7:15	46	6	0	9	6:45 AM	7:45 AM	326	no
7:30	83	6	1	9	7:00 AM	8:00 AM	496	no
7:45	155	5	0	0	7:15 AM	8:15 AM	543	no
8:00	212	4	0	0	7:30 AM	8:30 AM	549	YES
8:15	93	2	2	4				
8:30	89	8	0	1				



INTERSECTION: S College Avenue/SW 8th Street
 PEAK HOUR: 7:30 AM 8:30 AM
 DATE: 15-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		227	286
W	17		15
	18		9
		237	289
		S	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		227	
		4	223
		RIGHT	THRU
		NORTH	
		WEST	EAST
		SOUTH	
		LEFT	THRU
		11	272
		289	
		6	
		8	
		2	
		5	
		15	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	1
South	2
East	2
West	0
Total	5

Bikes (Peak Hour)	
Approach	# of
From North:	1
From South:	0
From East:	1
From West:	1
Total	3

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.73	SB
	From South:	0.58	NB
	From East:	0.70	WB
	From West:	0.60	EB
	Total	0.65	All

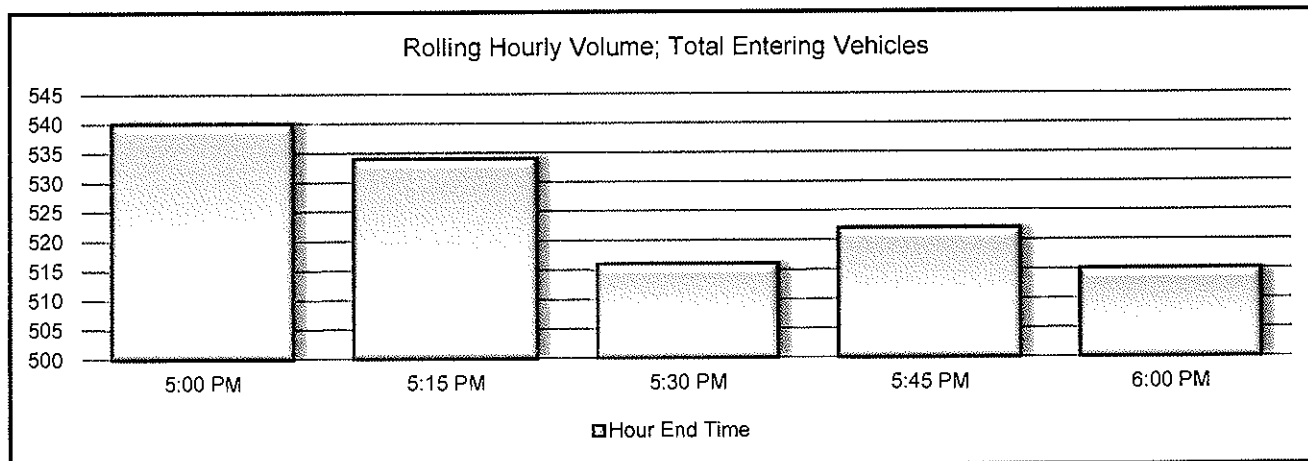
Heavy Vehicles:	From North:	12	5.3%	SB
	From South:	8	2.8%	NB
	From East:	0	0.0%	WB
	From West:	0	0.0%	EB

Location: S College Avenue/SW 8th Street	City/Town: College Place	
Checker: GAN	Weather: Cloudy	Job: Avenue Traffic Asse
Date: 5/14/19 Thur	Start Time: 4:00 PM	Pk Hr: 4:00 PM 5:00 PM
# of minutes counted per interval: 15.0 minutes		

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	1	59	4	64	2	1	2	2	1	1	4	0	0	1
4:30 PM	3	57	4	64	4	1	2	0	0	1	1	0	2	2
4:45 PM	0	54	1	55	3	0	0	0	3	3	6	1	0	1
5:00 PM	4	54	6	64	2	0	1	6	2	0	8	0	1	0
5:15 PM	4	59	1	64	2	0	0	0	0	4	4	1	0	2
5:30 PM	4	57	1	62	1	0	0	1	0	1	2	0	0	0
5:45 PM	1	46	3	50	2	1	1	4	2	0	6	0	0	0
6:00 PM	6	51	1	58	0	0	0	1	1	2	4	0	1	4
PK HR	8	224	15	247	11	2	5	8	6	5	19	1	3	4
Adj HR	8	224	15	247	11	2	5	8	6	5	19	1	3	4

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	3	60	1	64	1	0	0	8	1	2	11	0	1	0
4:30 PM	4	60	4	68	3	0	0	8	0	4	12	0	0	1
4:45 PM	3	45	3	51	2	0	0	7	0	1	8	0	2	1
5:00 PM	2	41	4	47	1	0	0	8	0	5	13	0	1	2
5:15 PM	3	56	1	60	2	0	0	7	0	2	9	1	1	1
5:30 PM	3	50	1	54	1	0	0	6	0	3	9	0	0	0
5:45 PM	3	54	4	61	1	0	1	6	2	1	9	0	0	4
6:00 PM	0	51	1	52	1	0	0	7	0	4	11	1	0	0
PK HR	12	206	12	230	7	0	0	31	1	12	44	0	1	4
Adj HR	12	206	12	230	7	0	0	31	1	12	44	0	1	4

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time Start - End	Rolling Hr Vol	Pk Hr?	
16:15	143	3	2	3	4:00 PM 5:00 PM	540	YES	
16:30	145	7	3	5	4:15 PM 5:15 PM	534	no	
16:45	120	6	2	2	4:30 PM 5:30 PM	516	no	
17:00	132	3	2	3	4:45 PM 5:45 PM	522	no	
17:15	137	6	1	3	5:00 PM 6:00 PM	515	no	
17:30	127	2	0	0				
17:45	126	3	1	6				
18:00	125	2	1	4				



INTERSECTION: S College Avenue/SW 8th Street
 PEAK HOUR: 4:00 PM 5:00 PM
 DATE: 14-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		247	226
W	26 44		19 28
		260	230
		S	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		247	
		8	224
		15	
		RIGHT	THRU
		NORTH	
		WEST	EAST
		SOUTH	
		LEFT	THRU
		12	206
		230	
		RIGHT	THRU
		8	19
		6	
		5	
		LEFT	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	5
South	0
East	4
West	4
Total	13

Bikes (Peak Hour)	
Approach	# of
From North:	2
From South:	0
From East:	3
From West:	1
Total	6

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.96	SB
	From South:	0.85	NB
	From East:	0.59	WB
	From West:	0.85	EB
	Total	0.93	All

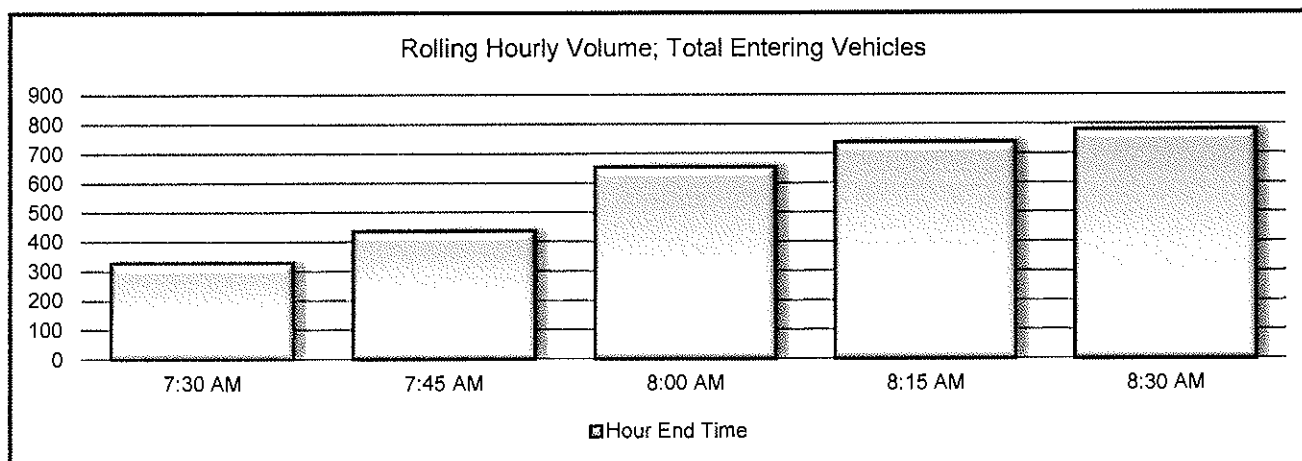
Heavy Vehicles:	From North:	11	4.5%	SB
	From South:	7	3.0%	NB
	From East:	1	5.3%	WB
	From West:	0	0.0%	EB

Location:	S College Avenue/Whitman Drive	City/Town	College Place
Checker:	DN	Weather:	Cloudy
Date:	5/15/19	Thur	Start Time: 6:30 AM
# of minutes counted per interval:		14.0 minutes	
		Job:	→ Avenue Traffic Asse
		Pk Hr:	7:30 AM 8:30 AM

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	2	19	2	23	2	0	3	1	1	3	5	0	0	2
7:00 AM	3	13	2	18	3	0	3	2	2	1	5	1	0	1
7:15 AM	2	14	2	18	1	1	3	2	4	3	9	0	0	1
7:30 AM	4	17	5	26	3	1	3	0	6	0	6	0	0	1
7:45 AM	7	35	11	53	1	1	3	6	10	6	22	0	1	1
8:00 AM	28	44	12	84	2	0	3	13	37	12	62	1	0	1
8:15 AM	14	29	5	48	3	0	3	12	8	11	31	1	0	1
8:30 AM	9	32	0	41	5	0	2	1	12	5	18	1	1	1
PK HR	58	140	28	226	11	1	11	32	67	34	133	3	2	4
Adj HR	62	150	30	242	12	1	12	34	72	36	142	3	2	4

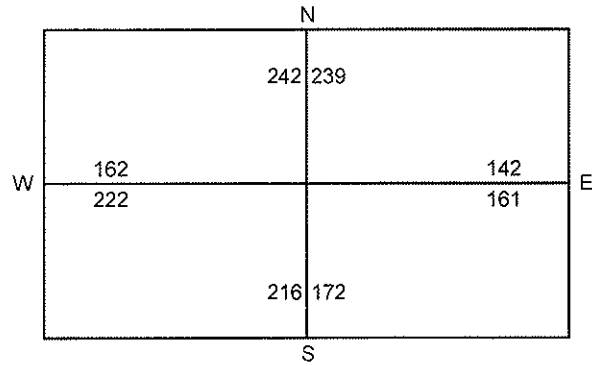
END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
6:45 AM	1	17	2	20	1	0	4	4	7	3	14	2	0	2
7:00 AM	2	23	5	30	4	0	4	5	10	8	23	1	0	1
7:15 AM	1	23	5	29	4	1	4	3	19	6	28	4	0	2
7:30 AM	1	22	2	25	2	1	4	6	11	10	27	1	0	1
7:45 AM	2	31	3	36	2	1	4	9	31	12	52	0	0	1
8:00 AM	5	38	6	49	1	0	4	10	35	39	84	0	0	1
8:15 AM	5	18	13	36	1	0	4	6	26	15	47	2	0	1
8:30 AM	5	31	4	40	2	3	1	3	13	8	24	0	1	1
PK HR	17	118	26	161	6	4	13	28	105	74	207	2	1	4
Adj HR	18	126	28	172	6	4	14	30	113	79	222	2	1	4

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes	Time Start - End	Rolling Hr Vol	Pk Hr?	
6:45	66	5	0	12	6:30 AM 7:30 AM	327	no	
7:00	81	10	0	10	6:45 AM 7:45 AM	436	no	
7:15	90	10	2	11	7:00 AM 8:00 AM	654	no	
7:30	90	6	2	10	7:15 AM 8:15 AM	738	no	
7:45	175	3	3	10	7:30 AM 8:30 AM	780	YES	
8:00	299	4	0	10				
8:15	174	8	0	10				
8:30	132	9	5	5				

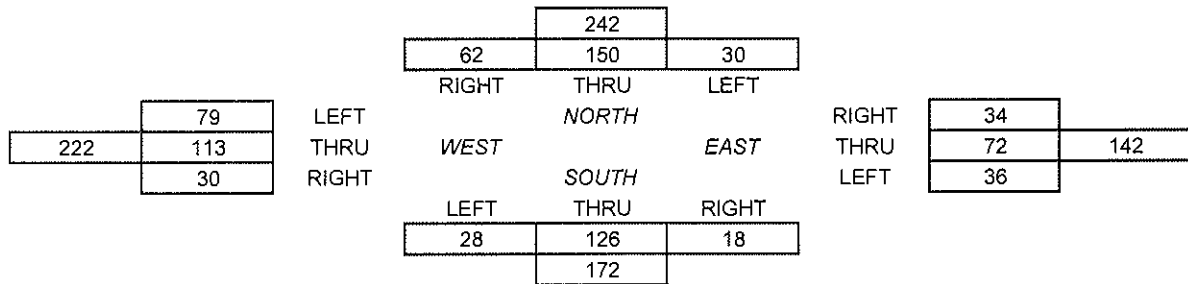


INTERSECTION:	S College Avenue/Whitman Drive
PEAK HOUR:	7:30 AM 8:30 AM
DATE:	15-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR



APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR



Crossing Leg	# of
North	12
South	14
East	4
West	4
Total	34

Approach	# of
From North:	1
From South:	4
From East:	2
From West:	1
Total	8

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.67	SB
	From South:	0.82	NB
	From East:	0.53	WB
	From West:	0.62	EB
	Total	0.65	All

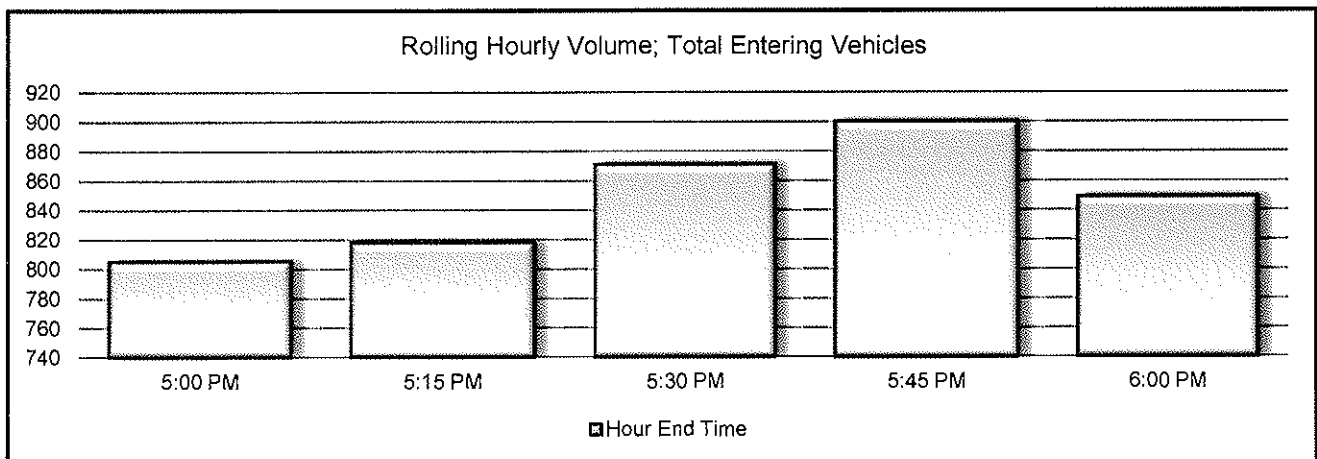
Heavy Vehicles:	From North:	12	5.0%	SB
	From South:	6	3.5%	NB
	From East:	3	2.1%	WB
	From West:	2	0.9%	EB

Location:	S College Avenue/SW 4th Street	City/Town	College Place
Checker:	GAN	Weather:	Sunny
Date:	5/8/19	Thur	Start Time: 4:00 PM
# of minutes counted per interval:		Pk Hr:	4:45 PM 5:45 PM
14.0 minutes			

END TIME	From the NORTH (SOUTHBOUND)						N Leg Peds	From the EAST (WESTBOUND)						E Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	2	47	3	52	1	0	0	3	11	23	37	2	1	3
4:30 PM	6	28	1	35	1	0	1	6	6	14	26	3	0	0
4:45 PM	3	47	1	51	3	0	1	4	9	13	26	1	0	0
5:00 PM	2	60	7	69	7	0	1	2	13	12	27	0	0	1
5:15 PM	2	44	2	48	3	0	1	4	12	15	31	2	0	3
5:30 PM	4	50	3	57	2	0	0	2	10	18	30	1	0	1
5:45 PM	6	56	1	63	2	1	1	4	16	12	32	0	0	1
6:00 PM	3	40	3	46	0	0	4	0	14	16	30	0	0	2
PK HR	14	210	13	237	14	1	3	12	51	57	120	3	0	6
Adj HR	15	225	14	254	15	1	3	13	55	61	129	3	0	6

END TIME	From the SOUTH (NORTHBOUND)						S Leg Peds	From the WEST (EASTBOUND)						W Leg Peds
	RT	TH	LT	TOTAL	HV	Bikes		RT	TH	LT	TOTAL	HV	Bikes	
4:15 PM	15	51	11	77	4	0	0	17	13	7	37	2	0	2
4:30 PM	9	46	10	65	2	3	2	11	7	5	23	3	0	0
4:45 PM	13	35	9	57	6	0	4	14	12	11	37	0	0	0
5:00 PM	13	59	19	91	5	0	2	12	20	9	41	0	0	0
5:15 PM	14	57	21	92	6	0	3	20	16	9	45	1	0	3
5:30 PM	14	46	13	73	2	2	4	10	21	8	39	1	0	1
5:45 PM	10	42	14	66	6	1	1	16	15	6	37	1	0	2
6:00 PM	13	37	17	67	1	0	0	16	18	3	37	0	0	4
PK HR	51	204	67	322	19	3	10	58	72	32	162	3	1	6
Adj HR	55	219	72	346	20	3	11	62	77	34	173	3	1	6

END TIME	15 Min Totals (adj)							
	Veh	HV	Peds	Bikes				
16:15	218	10	1	5	Time Start - End	Rolling Hr Vol	Pk Hr?	
16:30	160	10	3	3				
16:45	183	11	0	5				
17:00	244	13	0	4				
17:15	231	13	0	11				
17:30	213	6	2	6				
17:45	212	10	2	5				
18:00	193	1	0	11				
					4:00 PM 5:00 PM	805	no	
					4:15 PM 5:15 PM	818	no	
					4:30 PM 5:30 PM	871	no	
					4:45 PM 5:45 PM	900	YES	
					5:00 PM 6:00 PM	849	no	



INTERSECTION: S College Avenue/SW 4th Street
 PEAK HOUR: 4:45 PM 5:45 PM
 DATE: 8-May-19

DIRECTIONAL LEG VOLUMES -- PEAK HOUR

		N	
		254	266
W	142		129
	173		146
		348	346
		S	

APPROACH VOLUME TURN MOVEMENTS -- PEAK HOUR

		254			
		15	225	14	
		RIGHT	THRU	LEFT	
		NORTH			
173	34	LEFT			RIGHT
	77	THRU	WEST	EAST	THRU
	62	RIGHT			LEFT
		SOUTH			
		LEFT	THRU	RIGHT	
		72	219	55	
		346			
				13	
				55	129
				61	

Pedestrians (Peak Hour)	
Crossing Leg	# of
North	3
South	11
East	6
West	6
Total	26

Bikes (Peak Hour)	
Approach	# of
From North:	1
From South:	3
From East:	0
From West:	1
Total	5

ADJUSTMENT FACTORS DERIVED FROM COUNT

Peak Hour Factors:	From North:	0.86	SB
	From South:	0.88	NB
	From East:	0.94	WB
	From West:	0.90	EB
	Total	0.92	All

Heavy Vehicles:	From North:	15	5.9%	SB
	From South:	20	5.8%	NB
	From East:	3	2.3%	WB
	From West:	3	1.7%	EB

Intersection Capacity Analysis Summary Page

Analysis Time: Fri Mar 13 08:40:41 21
 Driving Side: Right
 Analysis Period: 1 Hours

Number	Name	Control Type	V/C	Avg Delay	Avg LOS	Max Delay	Max LOS
2030	College & Whilman	AWSC	0.44	20.22	C	22.80	C
2031	N College & SE 3rd St	TWSC	0.00	1.31	A	12.75	B
2032	S College Ave & SW 4th St	AWSC	0.45	245.93	F	550.76	F
2033	S College Ave & SE 6th St	TWSC	0.00	1.21	A	18.25	C
2034	S College Ave & SE 8th St	TWSC	0.00	1.15	A	19.82	C
2035	S College Ave & SE 10th St	TWSC	0.00	1.32	A	27.94	D
2036	S College Ave & SE 12th St	AWSC	0.80	59.51	F	100.80	F
2037	S College and 13th 13th St	TWSC	0.00	0.29	A	18.12	C
2038	S College Ave & Lamperti	AWSC	0.69	52.93	F	87.74	F
2039	SE 3rd & Ash Ave	TWSC	0.00	9.51	A	11.27	B

Node 2030: College & Whitman

Control Type
Method
Average Delay
Average LOS

AWSC
HCM 6th Edition
20.22
C

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	23.00	156.00	62.00	37.00	72.00	34.00	29.00	134.00	35.00	82.00	108.00	32.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
Flow Rate	35.38	240.00	95.38	56.92	110.77	52.31	44.62	206.15	53.85	126.15	166.15	49.23
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	370.77	220.00	304.62	341.54				
Left Turn Flow Rate	35.38	56.92	44.62	126.15				
Right Turn Flow Rate	95.38	52.31	53.85	49.23				
PLT, Proportion LT	0.10	0.26	0.15	0.37				
PRT, Proportion RT	0.26	0.24	0.18	0.14				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT,adj, Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT,adj, Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV,adj, Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	-0.14	-0.09	-0.08	-0.01				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	370.77	220.00	304.62	341.54				
hd initial	3.20	3.20	3.20	3.20				
x initial	0.33	0.20	0.27	0.30				
hd, iteration 1	4.99	5.27	5.12	5.22				
Difference, iteration 1	1.79	2.07	1.92	2.02				
hd, iteration 2	5.83	6.22	6.00	6.05				
Difference, iteration 2	0.83	0.95	0.88	0.83				
hd, iteration 3	6.21	6.68	6.41	6.45				
Difference, iteration 3	0.39	0.46	0.41	0.40				
hd, iteration 4	6.40	6.91	6.61	6.64				
Difference, iteration 4	0.19	0.22	0.20	0.19				
hd, iteration 5	6.50	7.02	6.71	6.74				
Difference, iteration 5	0.09	0.11	0.10	0.10				
hd, iteration 6	6.55	7.08	6.77	6.79				
Difference, iteration 6	0.05	0.06	0.05	0.05				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	6.55	7.08	6.77	6.79				
x final, Degree of Utilization	0.57	0.43	0.57	0.64				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	370.77	220.00	304.62	341.54				
hd, Departure Headway	6.55	7.08	6.77	6.79				
x, Degree of Utilization	0.67	0.43	0.57	0.64				
m, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	4.55	5.08	4.77	4.79				
Capacity	549.64	508.11	531.89	530.32				
Delay	22.80	15.44	18.72	21.84				
LOS	C	C	C	C				
Q95, 95% Queue Length	5.83	2.25	3.88	5.15				
Approach Delay	22.80	15.44	18.72	21.84				
Approach LOS	C	C	C	C				
Intersection Delay	20.22							
Intersection LOS	C							

Node 2031: N Collage & SE 3rd St

Control Type TWSC
 Method HCM 6th Edition
 dl, Average Delay 1.31
 Worst Case Delay 12.75
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	136.00	5.00	5.00	5.00	5.00	6.00	139.00	12.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	209.23	7.69	7.69	7.69	7.69	9.23	213.85	18.46	7.69	7.69	7.69

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			7.69	7.69	7.69	9.23			7.69	7.69	7.69
Conflicting Volume (Veh)	232.31			477.69	473.85	223.08	216.92			477.69	479.23	213.08
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	232.31			477.69	473.85	223.08	216.92			477.69	479.23	213.08
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
opx, Potential Capacity	1347.23			501.22	492.04	821.46	1364.76			501.22	488.61	832.03
Capacity	1347.23			485.23	485.04	821.46	1364.76			485.21	481.66	832.03

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
lf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
lf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
lf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	209.23	7.69	7.69	7.69	7.69	9.23	213.85	18.46	7.69	7.69	7.69
cmx, Capacity	1347.23			485.23	485.04	821.46	1364.76			485.21	481.66	832.03
V / C	0.01			0.02	0.02	0.01	0.01			0.02	0.02	0.01
d, Delay	7.69			12.69	12.70	9.66	7.68			12.69	12.75	9.60
LOS	A			B	B	A	A			B	B	A
dA, Approach Delay		0.26			11.68			0.29			11.68	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.05						0.06				

Delay and Level of Service by Lane

Approach	N (Major)		E	S (Major)	W
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	224.62	23.08	241.54	23.08	
Flared Storage Size					
cmx, Capacity	1347.23	561.80	1364.76	561.90	
V / C	0.17	0.04	0.18	0.04	
Q95, 95% Queue Length	0.02	0.13	0.02	0.13	
d, Delay	7.69	11.68	7.66	11.68	
LOS		B		B	
dA, Approach Delay	0.26	11.68	0.29	11.68	
Approach LOS		B		B	

Node 2032: S College Ave & SW 4th St

Control Type AWSC
 Method HCM 6th Edition
 Average Delay 245.93
 Average LOS F

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	18.00	146.00	14.00	104.00	100.00	16.00	110.00	191.00	119.00	25.00	82.00	78.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
Flow Rate	27.69	224.62	21.54	160.00	153.85	24.62	169.23	293.85	183.08	38.46	126.15	116.92
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	273.85	338.46	646.15	281.54				
Left Turn Flow Rate	27.69	160.00	169.23	38.46				
Right Turn Flow Rate	21.54	24.62	183.08	116.92				
PLT, Proportion LT	0.10	0.47	0.26	0.14				
PRT, Proportion RT	0.08	0.07	0.28	0.42				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT,adj, Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT,adj, Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV,adj, Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	-0.03	0.05	-0.12	-0.22				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	273.85	338.46	646.15	281.54				
hd initial	3.20	3.20	3.20	3.20				
x initial	0.24	0.30	0.57	0.25				
hd, iteration 1	5.55	5.78	5.08	5.57				
Difference, iteration 1	2.35	2.58	1.88	2.37				
hd, iteration 2	6.98	7.07	6.15	6.98				
Difference, iteration 2	1.43	1.29	1.07	1.41				
hd, iteration 3	7.57	7.53	6.80	7.49				
Difference, iteration 3	0.59	0.46	0.65	0.51				
hd, iteration 4	7.78	7.70	7.06	7.67				
Difference, iteration 4	0.21	0.17	0.25	0.18				
hd, iteration 5	7.85	7.76	7.15	7.74				
Difference, iteration 5	0.08	0.06	0.09	0.07				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	7.85	7.76	7.15	7.74				
x final, Degree of Utilization	0.60	0.73	1.28	0.61				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	273.85	338.46	646.15	281.54				
hd, Departure Headway	7.85	7.76	7.15	7.74				
x, Degree of Utilization	0.60	0.73	1.28	0.61				
m, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	5.85	5.76	5.16	5.74				
Capacity	457.84	463.40	646.15	485.20				
Delay	22.32	30.85	550.76	22.41				
LOS	C	D	F	C				
Q95, 95% Queue Length	4.25	7.25	83.01	4.39				
Approach Delay	22.32	30.85	550.76	22.41				
Approach LOS	C	D	F	C				
Intersection Delay	245.93							
Intersection LOS	F							

Node 2033: S College Ave & SE 8th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.21
 Worst Case Delay 18.25
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	227.00	7.00	5.00	5.00	7.00	10.00	253.00	6.00	6.00	5.00	8.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	349.23	10.77	7.69	7.69	10.77	15.38	389.23	9.23	9.23	7.69	12.31

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			7.69	7.69	10.77	15.38			9.23	7.69	12.31
Conflicting Volume (Veh)	398.46			804.62	800.00	393.85	360.00			803.85	799.23	354.82
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	398.46			804.62	800.00	393.85	360.00			803.85	799.23	354.82
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpv, Potential Capacity	1171.11			303.33	320.44	659.55	1209.81			303.69	320.77	693.79
Capacity	1171.11			286.92	312.61	659.55	1209.81			287.67	312.93	693.79

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc, base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3, II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
tf, base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf, hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	349.23	10.77	7.69	7.69	10.77	15.38	389.23	9.23	9.23	7.69	12.31
cmv, Capacity	1171.11			286.92	312.61	659.55	1209.81			287.67	312.93	693.79
V / C	0.01			0.03	0.02	0.02	0.01			0.03	0.02	0.02
d, Delay	8.09			18.22	17.19	11.14	8.01			18.25	17.24	10.93
LOS	A			C	C	B	A			C	C	B
dA, Approach Delay		0.17			15.00			0.30			14.90	
Approach LOS					C						B	
dRank1, Rank 1 Delay		0.07						0.13				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	367.69	26.15	413.85	29.23				
Planned Storage Size								
cmv, Capacity	1171.11	388.06	1209.81	392.64				
V / C	0.31	0.07	0.34	0.07				
Q95, 95% Queue Length	0.02	0.22	0.04	0.24				
d, Delay	8.09	15.00	8.01	14.90				
LOS		C		B				
dA, Approach Delay	0.17	15.00	0.30	14.90				
Approach LOS		C		B				

Node 2034: S College Ave & SE 8th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.15
 Worst Case Delay 19.82
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	240.00	5.00	5.00	5.00	8.00	11.00	282.00	6.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	369.23	7.69	7.69	7.69	13.85	16.92	433.85	9.23	7.69	7.69	7.69

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			7.69	7.69	13.85	16.92			7.69	7.69	7.69
Conflicting Volume (Veh)	443.08			868.46	864.62	438.46	376.92			871.54	865.38	373.08
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	443.08			868.46	864.62	438.46	376.92			871.54	865.38	373.08
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
opx, Potential Capacity	1127.71			274.72	293.97	622.58	1192.63			273.41	293.66	677.47
Capacity	1127.71			260.50	285.93	622.58	1192.63			256.41	285.64	677.47

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc, base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3, II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
tf, base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf, hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	369.23	7.69	7.69	7.69	13.85	16.92	433.85	9.23	7.69	7.69	7.69
cmx, Capacity	1127.71			260.50	285.93	622.58	1192.63			256.41	285.64	677.47
V / C	0.01			0.03	0.03	0.02	0.01			0.03	0.03	0.01
d, Delay	8.21			19.65	18.42	11.61	8.06			19.82	18.38	11.09
LOS	A			C	C	B	A			C	C	B
dA, Approach Delay		0.16			15.52			0.30			16.43	
Approach LOS					C						C	
dRank1, Rank 1 Delay		0.07						0.15				

Delay and Level of Service by Lane

Approach	N (Major)			E			S (Major)			W		
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	384.62	29.23	460.00									
Flared Storage Size												
cmx, Capacity	1127.71	371.55	1192.63									
V / C	0.34	0.08	0.39									
Q95, 95% Queue Length	0.02	0.26	0.04									
d, Delay	8.21	15.52	8.06									
LOS		C										
dA, Approach Delay	0.16	15.52	0.30									
Approach LOS		C										

Node 2035: S College Ave & SE 10th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.32
 Worst Case Delay 27.94
 Worst Case LOS D

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	314.00	5.00	5.00	5.00	5.00	8.00	379.00	5.00	9.00	5.00	15.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	483.08	7.69	7.69	7.69	7.69	9.23	583.08	7.69	13.85	7.69	23.08

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			7.69	7.69	7.69	9.23			13.85	7.69	23.08
Conflicting Volume (Veh)	590.77			1123.08	1111.54	586.92	490.77			1115.38	1111.54	486.92
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	590.77			1123.08	1111.54	586.92	490.77			1115.38	1111.54	486.92
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	994.76			184.51	210.65	513.34	1083.02			186.76	210.65	584.68
Capacity	994.76			169.14	205.76	513.34	1083.02			175.56	205.76	584.68

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,lt, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
lf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
lf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
lf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	483.08	7.69	7.69	7.69	7.69	9.23	583.08	7.69	13.85	7.69	23.08
cmx, Capacity	994.76			169.14	205.76	513.34	1083.02			175.56	205.76	584.68
V / C	0.01			0.05	0.04	0.01	0.01			0.08	0.04	0.04
d, Delay	8.65			27.94	24.15	13.67	8.35			27.82	24.81	13.47
LOS	A			D	C	B	A			D	C	B
dA, Approach Delay		0.13			21.92			0.13			19.88	
Approach LOS					C						C	
dRank1, Rank 1 Delay		0.09						0.11				

Delay and Level of Service by Lane

Approach	N (Major)			E			S (Major)			W		
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	498.46	23.08	600.00									
Flared Storage Size												
cmx, Capacity	994.76	235.84	1083.02									
V / C	0.50	0.10	0.55									
Q95, 95% Queue Length	0.02	0.32	0.03									
d, Delay	8.65	21.92	8.35									
LOS		C										
dA, Approach Delay	0.13	21.92	0.13									
Approach LOS		C										

Node 2036: S College Ave & SE 12th St

Control Type AWS
 Method HCM 6th Edition
 Average Delay 59.51
 Average LOS F

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	47.00	259.00	6.00	59.00	10.00	59.00	16.00	323.00	58.00	9.00	31.00	20.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
Flow Rate	72.31	398.46	9.23	90.77	15.38	90.77	24.62	495.92	89.23	13.85	47.89	30.77
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	480.00	196.92	610.77	92.31				
Left Turn Flow Rate	72.31	90.77	24.62	13.85				
Right Turn Flow Rate	9.23	90.77	89.23	30.77				
PLT, Proportion LT	0.15	0.46	0.04	0.15				
PRT, Proportion RT	0.02	0.46	0.15	0.33				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT,adj, Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT,adj, Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV,adj, Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	0.02	-0.18	-0.08	-0.17				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	480.00	196.92	610.77	92.31				
hd, initial	3.20	3.20	3.20	3.20				
x, initial	0.43	0.18	0.54	0.09				
hd, iteration 1	4.93	5.56	4.72	5.71				
Difference, iteration 1	1.73	2.36	1.52	2.51				
hd, iteration 2	5.62	6.48	5.37	6.81				
Difference, iteration 2	0.70	0.92	0.65	1.10				
hd, iteration 3	5.93	6.87	5.65	7.29				
Difference, iteration 3	0.31	0.39	0.28	0.48				
hd, iteration 4	6.06	7.04	5.77	7.50				
Difference, iteration 4	0.14	0.17	0.12	0.21				
hd, iteration 5	6.12	7.12	5.83	7.59				
Difference, iteration 5	0.06	0.08	0.06	0.09				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	6.12	7.12	5.83	7.59				
x final, Degree of Utilization	0.82	0.39	0.99	0.19				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	480.00	196.92	610.77	92.31				
hd, Departure Headway	6.12	7.12	5.83	7.59				
x, Degree of Utilization	0.82	0.39	0.99	0.19				
m, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	4.12	5.12	3.83	5.59				
Capacity	587.81	505.59	617.33	474.07				
Delay	34.45	14.63	100.80	12.43				
LOS	D	B	F	B				
Q95, 95% Queue Length	11.08	1.89	28.54	0.72				
Approach Delay	34.45	14.63	100.80	12.43				
Approach LOS	D	B	F	B				
Intersection Delay	59.51							
Intersection LOS	F							

Node 2037: S College and 13th 13th St

Control Type	TWSC
Method	HCM 6th Edition
dI, Average Delay	0.29
Worst Case Delay	18.12
Worst Case LOS	C

Volume and Adjustments

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
Base Volume	258.00	5.00	5.00	357.00	5.00	5.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	396.92	7.69	7.69	549.23	7.69	7.69

Pedestrians

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
vx, Flow (Ped/hr)			0.00		0.00	0.00
w, Lane Width (ft)			12.00		12.00	12.00
Sp, Walking Speed (ft/s)			3.50		3.50	3.50
fpb, Percent Blockage			0.00		0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
Rank	1	1	2	1	3	2
vx, Volume			7.69		7.69	7.69
Conflicting Volume (Veh)			404.62		965.38	400.77
Conflicting Volume (Ped)			0.00		0.00	0.00
Conflicting Volume			404.62		965.38	400.77
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median Refuge Area						
cpx, Potential Capacity			1165.03		285.01	653.68
Capacity			1165.03		282.30	653.68

Critical Headway and Follow Up Headway

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
tc,base, Base Critical Headway			4.10		7.10	6.20
tc,base,I, Base Critical Headway (Stage I)						
tc,base,II, Base Critical Headway (Stage II)						
tc,HV, Heavy Vehicles Adjustment Factor			1.00		1.00	1.00
Phv, % Heavy Vehicles			0.00		0.00	0.00
tc,G, Grade Adjustment Factor			0.00		0.20	0.10
G, % Grade		0.00	0.00		0.00	
T3,II, Geometry Adjustment Factor			0.00		0.70	0.00
tc, Critical Headway			4.10		6.40	6.20
tc,I, Critical Headway (Stage I)						
tc,II, Critical Headway (Stage II)						
tf,base, Base Follow-Up Headway			2.20		3.50	3.30
tf,hv, Heavy Vehicles Adjustment Factor			0.90		0.90	0.90
tf, Follow-Up Headway			2.20		3.50	3.30

Delay and Level of Service by Movement

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
vx, Volume	396.92	7.69	7.69	549.23	7.69	7.69
cmx, Capacity			1165.03		282.30	653.68
V / C			0.01		0.03	0.01
d, Delay			8.11		18.12	10.88
LOS			A		C	B
dA, Approach Delay		0.00		0.11		14.50
Approach LOS						B
dRank1, Rank 1 Delay		0.00		0.08		

Delay and Level of Service by Lane

Approach	N (Major)		S (Major)		W	
	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	T, R1	L1, T	L1, R1			
vx, Volume	404.62	556.92	15.38			
Flared Storage Size						
cmx, Capacity		1165.03	394.32			
V / C		0.48	0.04			
Q95, 95% Queue Length		0.02	0.12			
d, Delay		8.11	14.50			
LOS			B			
dA, Approach Delay		0.00	0.11			
Approach LOS			B			

Node 2038: S College Ave & Lampert

Control Type AWSC
 Method HCM 6th Edition
 Average Delay 52.93
 Average LOS F

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	80.00	242.00	15.00	51.00	16.00	85.00	10.00	247.00	43.00	42.00	39.00	34.00
PHF, Peak-hour factor	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850	0.850
Flow Rate	123.08	372.31	23.08	78.46	24.62	130.77	15.38	380.00	66.15	64.62	60.00	52.31
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	518.46	233.85	461.54	176.92				
Left Turn Flow Rate	123.08	78.46	15.38	64.62				
Right Turn Flow Rate	23.08	130.77	66.15	52.31				
PLT, Proportion LT	0.24	0.34	0.03	0.37				
PRT, Proportion RT	0.04	0.56	0.14	0.30				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT, adj. Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT, adj. Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV, adj. Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	0.02	-0.27	-0.08	-0.10				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	518.46	233.85	461.54	176.92				
hd initial	3.20	3.20	3.20	3.20				
x initial	0.46	0.21	0.41	0.16				
hd, iteration 1	5.03	5.41	4.98	5.65				
Difference, iteration 1	1.83	2.21	1.78	2.45				
hd, iteration 2	5.85	6.48	5.85	6.79				
Difference, iteration 2	0.82	1.07	0.87	1.14				
hd, iteration 3	6.27	7.01	6.29	7.37				
Difference, iteration 3	0.42	0.53	0.44	0.58				
hd, iteration 4	6.49	7.29	6.52	7.67				
Difference, iteration 4	0.22	0.28	0.23	0.30				
hd, iteration 5	6.61	7.44	6.64	7.84				
Difference, iteration 5	0.12	0.15	0.12	0.16				
hd, iteration 6	6.67	7.52	6.71	7.93				
Difference, iteration 6	0.06	0.08	0.07	0.09				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	6.67	7.52	6.71	7.93				
x final, Degree of Utilization	0.96	0.49	0.86	0.39				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	518.46	233.85	461.54	176.92				
hd, Departure Headway	6.67	7.52	6.71	7.93				
x, Degree of Utilization	0.96	0.49	0.86	0.39				
m, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	4.67	5.52	4.71	5.93				
Capacity	538.71	478.43	536.36	453.71				
Delay	87.74	17.64	45.89	15.96				
LOS	F	C	E	C				
Q95, 95% Queue Length	23.14	2.80	13.57	1.89				
Approach Delay	87.74	17.64	45.89	15.96				
Approach LOS	F	C	E	C				
Intersection Delay	52.93							
Intersection LOS	F							

Node 2039: SE 3rd & Ash Ave

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 9.51
 Worst Case Delay 11.27
 Worst Case LOS B

Volume and Adjustments

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	85.00	5.00	5.00	5.00	6.00	5.00	118.00	5.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	130.77	7.69	7.69	7.69	9.23	7.69	181.54	7.69	7.69	7.69	7.69

Pedestrians

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
w, Lane Width (ft)	12.00	12.00	12.00	12.00			12.00	12.00	12.00	12.00		
Sp, Walking Speed (ft/s)	3.50	3.50	3.50	3.50			3.50	3.50	3.50	3.50		
fpb, Percent Blockage	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		

Capacity of Movements below Rank 1

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	4	3	2	2	1	1	4	3	2	2	1	1
vx, Volume	7.69	130.77	7.69	7.69			7.69	181.54	7.69	7.69		
Conflicting Volume (Veh)	149.23	58.46	12.31	15.38			123.85	59.23	11.54	16.92		
Conflicting Volume (Ped)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
Conflicting Volume	149.23	58.46	12.31	15.38			123.85	59.23	11.54	16.92		
Two-Stage Gap Acceptance	No	No					No	No				
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	823.26	836.43	1074.07	1615.51			855.15	835.62	1075.11	1613.44		
Capacity	674.51	828.40	1074.07	1615.51			740.82	827.60	1075.11	1613.44		

Critical Headway and Follow Up Headway

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,hv, Heavy Vehicles Adjustment Factor	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00		
Phv, % Heavy Vehicles	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc,G, Grade Adjustment Factor	0.20	0.20	0.10	0.00			0.20	0.20	0.10	0.00		
G, % Grade		0.00			0.00			0.00			0.00	
T3,It, Geometry Adjustment Factor	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc, Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
If,base, Base Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		
If,hv, Heavy Vehicles Adjustment Factor	0.90	0.90	0.90	0.90			0.90	0.90	0.90	0.90		
If, Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		

Delay and Level of Service by Movement

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	130.77	7.69	7.69	7.69	9.23	7.69	181.54	7.69	7.69	7.69	7.69
cmx, Capacity	674.51	828.40	1074.07	1615.51			740.82	827.60	1075.11	1613.44		
V / C	0.01	0.16	0.01	0.00			0.01	0.22	0.01	0.00		
d, Delay	11.27	10.28	9.28	7.24			11.20	10.69	9.69	7.24		
LOS	B	B	A	A			B	B	A	A		
dA, Approach Delay		10.28			2.26			10.67			2.41	
Approach LOS		B						B				
dRank1, Rank 1 Delay					0.03						0.03	

Delay and Level of Service by Lane

Approach	N		E (Major)		S		W (Major)	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	146.15	24.62	196.92	23.08				
Flared Storage Size								
cmx, Capacity	828.42	1615.51	831.27	1613.44				
V / C	0.18	0.02	0.24	0.01				
Q95, 95% Queue Length	0.64	0.01	0.93	0.01				
d, Delay	10.28	7.24	10.67	7.24				
LOS	B		B					
dA, Approach Delay	10.28	2.26	10.67	2.41				
Approach LOS	B		B					

Intersection Capacity Analysis Summary Page

Analysis Time: Thu Mar 12 20:05:23 :
 Driving Side: Right
 Analysis Period: 1 Hours

Number	Name	Control Type	V/C	Avg Delay	Avg LOS	Max Delay	Max LOS
2030	College & Whitman	Signalized	0.49	13.26	B	14.92	B
2031	N College & SE 3rd St.	TWSC	0.00	1.36	A	12.62	B
2032	S College Ave & SW 4th St	Signalized	0.26	17.89	B	25.13	C
2033	S College Ave & SE 6th St	TWSC	0.00	1.47	A	17.30	C
2034	S College Ave & SE 8th St	TWSC	0.00	1.38	A	18.87	C
2035	S College Ave & SE 10th St	TWSC	0.00	1.31	A	26.88	D
2036	S College Ave & SE 12th St	Signalized	0.52	9.30	A	24.97	C
2037	S College and 13th 13th St	TWSC	0.00	0.30	A	17.01	C
2038	S College Ave & Lamperti	Signalized	0.52	12.08	B	21.30	C
2039	SE 3rd & Ash Ave	TWSC	0.00	9.54	A	11.49	B

1. **Principles of the Theory of the Firm**

Node 2031: N College & SE 3rd St.

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.36
 Worst Case Delay 12.62
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	136.00	5.00	6.00	5.00	5.00	6.00	131.00	12.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	209.23	7.69	9.23	7.69	7.69	9.23	201.54	18.46	7.69	7.69	7.69

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			9.23	7.69	7.69	9.23			7.69	7.69	7.69
Conflicting Volume (Veh)	220.00			465.38	461.54	210.77	218.92			465.38	466.92	213.08
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	220.00			465.38	461.54	210.77	218.92			465.38	466.92	213.08
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1361.23			510.71	499.98	834.49	1364.76			510.71	496.48	832.03
Capacity	1361.23			494.55	492.91	834.49	1364.76			494.61	489.48	832.03

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,It, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
tf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	209.23	7.69	9.23	7.69	7.69	9.23	201.54	18.46	7.69	7.69	7.69
cmx, Capacity	1361.23			494.55	492.91	834.49	1364.76			494.61	489.48	832.03
V / C	0.01			0.02	0.02	0.01	0.01			0.02	0.02	0.01
d, Delay	7.66			12.57	12.59	6.60	7.66			12.55	12.62	9.59
LOS	A			B	B	A	A			B	B	A
dA, Approach Delay		0.26			11.65			0.31			11.59	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.05						0.06				

Delay and Level of Service by Lane

Approach	N (Major)	E	S (Major)	W
Lane	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	224.62	24.62	229.23	23.08
Flared Storage Size				
cmx, Capacity	1361.23	566.02	1364.76	569.62
V / C	0.17	0.04	0.17	0.04
Q95, 95% Queue Length	0.02	0.14	0.02	0.13
d, Delay	7.66	11.65	7.66	11.59
LOS		B		B
dA, Approach Delay	0.26	11.65	0.31	11.59
Approach LOS		B		B

Input RT 32: 6 Chgo Ave & SW 4th St

Control Type	Signalized
Intersect	N/Cat Pre-Coord
Average Delay	17.63
Average LOS	D
Loss Time	0.20
	4

Volume and Adjustments by Movement

Movement	N	S	E	W	N	S	E	W	N	S	E	W
Base Volume	17	152	13	155	18	124	154	125	18	124	154	125
Peak Hour Volume	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660
Peak 15 Volume	7	54	5	29	49	40	71	48	8	34	29	100
Adjusted Volume	28	234	20	112	152	29	160	265	192	14	135	100

Volume and Adjustments by Lane Group

Lane Group	N	S	E	W
Thru	28	234	20	112
Left	17	152	13	155
Right	18	124	154	125
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660

Signalized Flow Rate

Lane Group	N	S	E	W
Thru	28	234	20	112
Left	17	152	13	155
Right	18	124	154	125
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660

Capacity, Control Delay, and Level of Service Determination

Lane Group	N	S	E	W
Thru	28	234	20	112
Left	17	152	13	155
Right	18	124	154	125
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660

Base of Queue

Lane Group	N	S	E	W
Thru	28	234	20	112
Left	17	152	13	155
Right	18	124	154	125
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660

Signal Timing Information

Lane Group	N	S	E	W
Thru	28	234	20	112
Left	17	152	13	155
Right	18	124	154	125
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660

Left Turn Adjustment Factors for Permitted Phasing

Lane Group	N	S	E	W
Thru	28	234	20	112
Left	17	152	13	155
Right	18	124	154	125
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660

Procedures and Cycle Adjustment Factors

Lane Group	N	S	E	W
Thru	28	234	20	112
Left	17	152	13	155
Right	18	124	154	125
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660
Left Turn	0.660	0.660	0.660	0.660
Right Turn	0.660	0.660	0.660	0.660

Adjusted Phase Priorities

Adjusted Lane Group Priorities

Procedural and Design Analysis

Node 2033: S College Ave & SE 6th St

Control Type TWSC
 Method HCM 6th Edition
 dl, Average Delay 1.47
 Worst Case Delay 17.3
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	198.00	5.00	5.00	5.00	7.00	10.00	240.00	6.00	13.00	5.00	7.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	304.82	7.69	7.69	7.69	10.77	15.38	369.23	9.23	20.00	7.69	10.77

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			7.69	7.69	10.77	15.38			20.00	7.69	10.77
Conflicting Volume (Veh)	378.46			737.69	732.31	373.85	312.31			737.69	733.08	308.46
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	378.46			737.69	732.31	373.85	312.31			737.69	733.08	308.46
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1191.08			336.40	350.57	676.80	1259.48			336.40	350.22	736.25
Capacity	1191.08			320.04	342.45	676.80	1259.48			319.63	342.10	736.25

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,lt, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
lf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
lf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
lf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	304.82	7.69	7.69	7.69	10.77	15.38	369.23	9.23	20.00	7.69	10.77
cmx, Capacity	1191.08			320.04	342.45	676.80	1259.48			319.63	342.10	736.25
V/C	0.01			0.02	0.02	0.02	0.01			0.06	0.02	0.01
d, Delay	8.04			16.82	16.08	10.89	7.89			17.30	16.56	10.92
LOS	A			C	C	B	A			C	C	B
dA, Approach Delay		0.19			14.16			0.31			15.36	
Approach LOS					B						C	
dRank1, Rank 1 Delay		0.06						0.12				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	320.00	26.15	393.85	38.46				
Flared Storage Size								
cmx, Capacity	1191.08	419.07	1259.48	385.83				
V/C	0.27	0.06	0.31	0.10				
Q95, 95% Queue Length	0.02	0.20	0.04	0.33				
d, Delay	8.04	14.16	7.89	15.36				
LOS		B	C	C				
dA, Approach Delay	0.19	14.16	0.31	15.36				
Approach LOS		B	C	C				

Node 2034: S College Ave & SE 8th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.38
 Worst Case Delay 18.87
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	214.00	5.00	8.00	5.00	8.00	16.00	267.00	8.00	6.00	5.00	9.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	329.23	7.69	9.23	7.69	12.31	24.62	410.77	9.23	9.23	7.69	13.85

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			9.23	7.69	12.31	24.62			9.23	7.69	13.85
Conflicting Volume (Veh)	420.00			823.85	816.92	415.38	336.92			823.08	817.69	333.08
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	420.00			823.85	816.92	415.38	336.92			823.08	817.69	333.08
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
opx, Potential Capacity	1149.97			294.42	313.29	641.45	1233.61			294.77	312.97	713.31
Capacity	1149.97			275.76	302.52	641.45	1233.61			276.16	302.31	713.31

Critical Headway and Follow-Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc, base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3, It, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
uf, basa, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
uf, hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
uf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	329.23	7.69	9.23	7.69	12.31	24.62	410.77	9.23	9.23	7.69	13.85
cmx, Capacity	1149.97			275.76	302.62	641.45	1233.61			276.16	302.31	713.31
V / C	0.01			0.03	0.03	0.02	0.02			0.03	0.03	0.02
d, Delay	8.15			18.87	17.71	11.43	7.98			18.81	17.69	10.82
LOS	A			C	C	B	A			C	C	B
dA, Approach Delay		0.18			15.43			0.44			14.94	
Approach LOS					C						B	
dRank1, Rank 1 Delay		0.07						0.21				

Delay and Level of Service by Lane

Approach	N (Major)	E	S (Major)	W
Lane	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	344.62	29.23	444.62	30.77
Flared Storage Size				
cmx, Capacity	1149.97	374.37	1233.61	393.06
V / C	0.30	0.08	0.36	0.08
Q95, 95% Queue Length	0.02	0.25	0.06	0.25
d, Delay	8.15	15.43	7.98	14.94
LOS		C		B
dA, Approach Delay	0.18	15.43	0.44	14.94
Approach LOS		C		B

Node 2035: S College Ave & SE 10th St

Control Type TWSC
 Method HCM 6th Edition
 dl, Average Delay 1.31
 Worst Case Delay 26.88
 Worst Case LOS D

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	309.00	5.00	5.00	5.00	5.00	8.00	368.00	5.00	9.00	5.00	15.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	475.38	7.69	7.69	7.69	7.69	9.23	566.15	7.69	13.85	7.69	23.08

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	7.69			7.69	7.69	7.69	9.23			13.85	7.69	23.08
Conflicting Volume (Veh)	573.85			1098.46	1086.92	570.00	483.08			1090.77	1086.92	479.23
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	573.85			1098.46	1086.92	570.00	483.08			1090.77	1086.92	479.23
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1009.19			191.79	217.82	524.79	1090.12			194.12	217.82	590.54
Capacity	1009.19			176.12	212.87	524.79	1090.12			182.79	212.87	590.54

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
tf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	475.38	7.69	7.69	7.69	7.69	9.23	566.15	7.69	13.85	7.69	23.08
cmx, Capacity	1009.19			176.12	212.87	524.79	1090.12			182.79	212.87	590.54
V / C	0.01			0.04	0.04	0.01	0.01			0.08	0.04	0.04
d, Delay	8.59			26.88	23.45	13.40	8.33			26.88	24.07	13.26
LOS	A			D	C	B	A			D	C	B
dA, Approach Delay		0.13			21.27			0.13			19.34	
Approach LOS					C						C	
dRank1, Rank 1 Delay		0.09						0.10				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	490.77	23.08	583.08					
Flared Storage Size								
cmx, Capacity	1009.19	244.28	1090.12					
V / C	0.49	0.09	0.53					
Q95, 95% Queue Length	0.02	0.31	0.03					
d, Delay	8.59	21.27	8.33					
LOS		C						
dA, Approach Delay	0.13	21.27	0.13					
Approach LOS		C						

Procedures and Data Analysis

Node 2037: S College and 13th 13th St

Control Type TWSC
 Method HCM 6th Edition
 dl, Average Delay 0.3
 Worst Case Delay 17.01
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
Base Volume	231.00	5.00	5.00	343.00	5.00	5.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	355.38	7.69	7.69	527.69	7.69	7.69

Pedestrians

Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
vx, Flow (Ped/hr)			0.00		0.00	0.00
w, Lane Width (ft)			12.00		12.00	12.00
Sp, Walking Speed (ft/s)			3.50		3.50	3.50
fpb, Percent Blockage			0.00		0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
Rank	1	1	2	1	3	2
vx, Volume			7.69		7.69	7.69
Conflicting Volume (Veh)			363.08		902.31	359.23
Conflicting Volume (Ped)			0.00		0.00	0.00
Conflicting Volume			363.08		902.31	359.23
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median Refuge Area						
cpx, Potential Capacity			1206.67		310.62	689.68
Capacity			1206.67		307.82	689.68

Critical Headway and Follow Up Headway

Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
tc,base, Base Critical Headway			4.10		7.10	6.20
tc,base,I, Base Critical Headway (Stage I)						
tc,base,II, Base Critical Headway (Stage II)						
tc,HV, Heavy Vehicles Adjustment Factor			1.00		1.00	1.00
Phv, % Heavy Vehicles			0.00		0.00	0.00
tc, G, Grade Adjustment Factor			0.00		0.20	0.10
G, % Grade		0.00		0.00		0.00
T3,I, Geometry Adjustment Factor			0.00		0.70	0.00
tc, Critical Headway			4.10		6.40	6.20
tc,I, Critical Headway (Stage I)						
tc,II, Critical Headway (Stage II)						
tf,base, Base Follow-Up Headway			2.20		3.50	3.30
tf,hv, Heavy Vehicles Adjustment Factor			0.90		0.90	0.90
tf, Follow-Up Headway			2.20		3.50	3.30

Delay and Level of Service by Movement

Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
vx, Volume	355.38	7.69	7.69	527.69	7.69	7.69
cmx, Capacity			1206.67		307.82	689.68
V / C			0.01		0.02	0.01
d, Delay			8.00		17.01	10.54
LOS			A		C	B
dA, Approach Delay		0.00		0.11		13.77
Approach LOS						B
dRank1, Rank 1 Delay		0.00		0.07		

Delay and Level of Service by Lane

Approach	N (Major)	S (Major)	W
Lane	Lane 1	Lane 1	Lane 1
Movements	T, R1	L1, T	L1, R1
vx, Volume	355.38	535.38	15.38
Flared Storage Size			
cmx, Capacity		1206.67	425.66
V / C		0.44	0.04
Q95, 95% Queue Length		0.02	0.11
d, Delay		8.00	13.77
LOS			B
dA, Approach Delay	0.00	0.11	13.77
Approach LOS			B

***NORTH 2012: S. Canada Ave & E. Linden**

Control Type	Signal-to-Noise
Variation	100.00 dB
Average Delay	10.00
Average LOS	0
VOC	0.02
Test Time	0

Visits and Assessments by Monitors

Approach	N			E			S			W		
Measure	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	58	241	33	58	18	83	19	719	45	18	34	34
Full (base) Volume	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660	0.660
Peak 15 Volume	20	93	5	20	7	12	4	92	17	13	17	13
Adjusted Volume	62	371	20	78	78	78	15	368	69	54	68	62

Values and Equivalents by Line Code

Aggression	A	B	S	W
Land Crab	C	C	C	C
LR	0.930	0.920	0.928	0.931
Control Type	LR	LR	LR	LR
Y. Tachina	Param	Param	Param	Param
LR	0.92	0.91	0.92	0.91
PLT, psychomotoric Turn	0.97	0.94	0.93	0.91
PLT, hippocampal Right Turn	0.94	0.95	0.96	0.90

Session 10: X34

Adjustment	11	12	13	14
Line Item	1992	1993	1994	1995
Control Type	Perm	Perm	Perm	Perm
1. Base Education Flow Rate	1750	1750	1750	1750
2. Number of Years	1	1	1	1
3. Life Work Adjustment	1,000	1,000	1,000	1,000
4. Property Values	0.000	0.000	0.000	0.000
5. Property Tax Credit Adjustment	1,000	1,000	1,000	1,000
6. Moving Adjustment	1,000	1,000	1,000	1,000
7. Real Estate Tax Adjustment	1,000	1,000	1,000	1,000
8. Home Type Adjustment	1,000	1,000	1,000	1,000
9. Life Work Adjustment	1,000	1,000	1,000	1,000
10. Life Work Adjustment	0.916	0.916	0.916	0.916
11. Property Tax Credit Adjustment	0.993	0.912	0.974	0.990
12. Life Work Adjustment	1,000	1,000	1,000	1,000
13. Life Work Adjustment	1,000	1,000	1,000	1,000
14. Life Work Adjustment	1,000	1,000	1,000	1,000
15. Life Work Adjustment	1,000	1,000	1,000	1,000
16. Life Work Adjustment	1,000	1,000	1,000	1,000
17. Life Work Adjustment	1,000	1,000	1,000	1,000
18. Life Work Adjustment	1,000	1,000	1,000	1,000
19. Life Work Adjustment	1,000	1,000	1,000	1,000
20. Life Work Adjustment	1,000	1,000	1,000	1,000
21. Life Work Adjustment	1,000	1,000	1,000	1,000
22. Life Work Adjustment	1,000	1,000	1,000	1,000
23. Life Work Adjustment	1,000	1,000	1,000	1,000
24. Life Work Adjustment	1,000	1,000	1,000	1,000
25. Life Work Adjustment	1,000	1,000	1,000	1,000
26. Life Work Adjustment	1,000	1,000	1,000	1,000
27. Life Work Adjustment	1,000	1,000	1,000	1,000
28. Life Work Adjustment	1,000	1,000	1,000	1,000
29. Life Work Adjustment	1,000	1,000	1,000	1,000
30. Life Work Adjustment	1,000	1,000	1,000	1,000
31. Life Work Adjustment	1,000	1,000	1,000	1,000
32. Life Work Adjustment	1,000	1,000	1,000	1,000
33. Life Work Adjustment	1,000	1,000	1,000	1,000
34. Life Work Adjustment	1,000	1,000	1,000	1,000
35. Life Work Adjustment	1,000	1,000	1,000	1,000
36. Life Work Adjustment	1,000	1,000	1,000	1,000
37. Life Work Adjustment	1,000	1,000	1,000	1,000
38. Life Work Adjustment	1,000	1,000	1,000	1,000
39. Life Work Adjustment	1,000	1,000	1,000	1,000
40. Life Work Adjustment	1,000	1,000	1,000	1,000
41. Life Work Adjustment	1,000	1,000	1,000	1,000
42. Life Work Adjustment	1,000	1,000	1,000	1,000
43. Life Work Adjustment	1,000	1,000	1,000	1,000
44. Life Work Adjustment	1,000	1,000	1,000	1,000
45. Life Work Adjustment	1,000	1,000	1,000	1,000
46. Life Work Adjustment	1,000	1,000	1,000	1,000
47. Life Work Adjustment	1,000	1,000	1,000	1,000
48. Life Work Adjustment	1,000	1,000	1,000	1,000
49. Life Work Adjustment	1,000	1,000	1,000	1,000
50. Life Work Adjustment	1,000	1,000	1,000	1,000
51. Life Work Adjustment	1,000	1,000	1,000	1,000
52. Life Work Adjustment	1,000	1,000	1,000	1,000
53. Life Work Adjustment	1,000	1,000	1,000	1,000
54. Life Work Adjustment	1,000	1,000	1,000	1,000
55. Life Work Adjustment	1,000	1,000	1,000	1,000
56. Life Work Adjustment	1,000	1,000	1,000	1,000
57. Life Work Adjustment	1,000	1,000	1,000	1,000
58. Life Work Adjustment	1,000	1,000	1,000	1,000
59. Life Work Adjustment	1,000	1,000	1,000	1,000
60. Life Work Adjustment	1,000	1,000	1,000	1,000
61. Life Work Adjustment	1,000	1,000	1,000	1,000
62. Life Work Adjustment	1,000	1,000	1,000	1,000
63. Life Work Adjustment	1,000	1,000	1,000	1,000
64. Life Work Adjustment	1,000	1,000	1,000	1,000
65. Life Work Adjustment	1,000	1,000	1,000	1,000
66. Life Work Adjustment	1,000	1,000	1,000	1,000
67. Life Work Adjustment	1,000	1,000	1,000	1,000
68. Life Work Adjustment	1,000	1,000	1,000	1,000
69. Life Work Adjustment	1,000	1,000	1,000	1,000
70. Life Work Adjustment	1,000	1,000	1,000	1

Capacity, Control, and Change in Service Organizations

AggrType	N	E	S	W
LevelFlow	8930	8930	8930	8930
Control Type	Param	Param	Param	Param
V. volume	472.31	233.65	452.31	175.38
3. Subarea Flow Rate	1551	1551	1551	1551
4. Capacity	1009	648	1009	516
gk. Green Delay	0.91	0.18	0.92	0.21
5. Unsat. Capacity	0.47	0.46	0.43	0.36
6. Uniform Delay	5.94	18.75	5.02	17.47
7. Delay Reduction	0.60	0.50	0.50	0.50
8. Incremental Delay	1.04	3.04	1.00	1.29
9. Total Queue Delay	0.00	0.00	0.00	0.00
10. Queue Length	1.02	1.00	1.00	1.00
11. Probability of Green	0.98	0.98	0.98	0.98
12. Probability of Red	1.00	1.00	1.00	1.00
13. Delay	5.58	21.33	5.20	18.18
14. LOS	A	C	A	B
15. Accession Delay	5.58	21.33	5.20	18.18
16. Accession LOS	A	C	A	B
17. Intersection Delay	17.03			
18. Intersection LOS	B			

Run & Check:

[illegible]

Signal Timing Information

[illegible]

Let's Not Ignore the Risks for Payroll Practices

[illegible]

Project 57 and Social Adjustment / 1939

[illegible]

Abstract

Abstract

Abstract

Node 2039: SE 3rd & Ash Ave

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 9.54
 Worst Case Delay 11.49
 Worst Case LOS B

Volume and Adjustments

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	78.00	5.00	5.00	9.00	5.00	5.00	132.00	5.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V, Adjusted Volume	7.69	120.00	7.69	7.69	13.85	9.23	7.69	203.08	7.69	7.69	7.69	7.69

Pedestrians

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
w, Lane Width (ft)	12.00	12.00	12.00	12.00			12.00	12.00	12.00	12.00		
Sp, Walking Speed (ft/s)	3.50	3.50	3.50	3.50			3.50	3.50	3.50	3.50		
fpb, Percent Blockage	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		

Capacity of Movements below Rank 1

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	4	3	2	2	1	1	4	3	2	2	1	1
vx, Volume	7.69	120.00	7.69	7.69			7.69	203.08	7.69	7.69		
Conflicting Volume (Veh)	166.15	64.62	18.46	15.38			124.62	65.38	11.54	23.08		
Conflicting Volume (Ped)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
Conflicting Volume	166.15	64.62	18.46	15.38			124.62	65.38	11.54	23.08		
Two-Stage Gap Acceptance	No	No					No	No				
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	802.65	829.99	1065.74	1615.51			854.16	829.19	1075.11	1605.18		
Capacity	640.35	821.98	1065.74	1615.51			747.62	821.19	1075.11	1605.18		

Critical Headway and Follow Up Headway

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc, base, Base Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, HV, Heavy Vehicles Adjustment Factor	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00		
Phv, % Heavy Vehicles	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc, G, Grade Adjustment Factor	0.20	0.20	0.10	0.00			0.20	0.20	0.10	0.00		
G, % Grade		0.00			0.00			0.00			0.00	
T3, II, Geometry Adjustment Factor	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc, Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
If, base, Base Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		
If, hv, Heavy Vehicles Adjustment Factor	0.90	0.90	0.90	0.90			0.90	0.90	0.90	0.90		
If, Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		

Delay and Level of Service by Movement

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	7.69	120.00	7.69	7.69	13.85	9.23	7.69	203.08	7.69	7.69	7.69	7.69
cmx, Capacity	640.35	821.98	1065.74	1615.51			747.62	821.19	1075.11	1605.18		
V / C	0.01	0.15	0.01	0.00			0.01	0.25	0.01	0.00		
d, Delay	11.49	10.25	9.25	7.24			11.38	10.95	9.92	7.25		
LOS	B	B	A	A			B	B	A	A		
dA, Approach Delay		10.26			1.81			10.93			2.42	
Approach LOS		B						B				
dRank1, Rank 1 Delay					0.03						0.04	

Delay and Level of Service by Lane

Approach	N		E (Major)		S		W (Major)	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	135.38	30.77	218.46	23.08				
Flared Storage Size								
cmx, Capacity	819.43	1615.51	825.19	1605.18				
V / C	0.17	0.02	0.26	0.01				
Q95, 95% Queue Length	0.59	0.01	1.06	0.01				
d, Delay	10.26	7.24	10.93	7.25				
LOS	B		B					
dA, Approach Delay	10.26	1.81	10.93	2.42				
Approach LOS	B		B					

Intersection Capacity Analysis Summary Page

Analysis Time: Thu Mar 12 20:30:29
 Driving Side: Right
 Analysis Period: 1 Hours

Number	Name	Control Type	V/C	Avg Delay	Avg LOS	Max Delay	Max LOS
2030	College & Whitman	Signalized	0.36	10.72	B	19.62	B
2031	N College & SE 3rd St.	TWSC	0.00	1.39	A	11.88	B
2032	S College Ave & SW 4th St	Signalized	0.15	11.77	B	18.59	B
2033	S College Ave & SE 6th St	TWSC	0.00	2.15	A	14.31	B
2034	S College Ave & SE 8th St	TWSC	0.00	2.09	A	14.57	B
2035	S College Ave & SE 10th St	TWSC	0.00	1.18	A	20.00	C
2036	S College Ave & SE 12th St	Signalized	0.42	9.15	A	25.75	C
2037	S College and 13th 13th St	TWSC	0.00	0.34	A	14.27	B
2038	S College Ave & Lampert	Signalized	0.51	12.96	B	16.93	B
2039	SE 3rd & Ash Ave	TWSC	0.00	6.25	A	9.41	A

Node 2002: Dwyer & Whitson												
Control Type										Signalized		
Method										HCM 6th Edition		
Average Delay										10.12		
Average LOS										B		
V/C										0.36		
Lost Time										8		

Volume and Adjustments by Movement												
Approach	L			T			R			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	21	212	18	18	18	18	18	18	18	23	78	58
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Volume and Adjustments by Lane Group												
Approach	L			T			R			W		
Lane Group	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Saturation Flow Rate												
Approach	L			T			R			W		
Lane Group	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Capacity, Control Delay, and Level of Service Determination												
Approach	L			T			R			W		
Lane Group	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Base of Queue												
Approach	L			T			R			W		
Lane Group	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Signal Timing Determination												
Approach	L			T			R			W		
Lane Group	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Left Turn Adjustment Factors for Protected Phasing												
Approach	L			T			R			W		
Lane Group	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Proportional Delay Adjustment Factors												
Approach	L			T			R			W		
Lane Group	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Peak 15 Minute Volume	21	212	18	18	18	18	18	18	18	23	78	58
Adjusted Volume	21	212	18	18	18	18	18	18	18	23	78	58

Adjusted Peak Properties

Adjusted Left Turn Properties

Proportional Delay Adjustment Factors

Node 2031: N College & SE 3rd St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.39
 Worst Case Delay 11.88
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	168.00	5.00	10.00	5.00	10.00	8.00	147.00	9.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	5.56	186.67	5.56	11.11	5.56	11.11	8.89	163.33	10.00	5.56	5.56	5.56

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	5.56			11.11	5.56	11.11	8.89			5.56	5.56	5.56
Conflicting Volume (Veh)	173.33			392.22	389.44	168.33	192.22			395.00	391.67	189.44
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	173.33			392.22	389.44	168.33	192.22			395.00	391.67	189.44
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1415.62			570.77	548.84	880.97	1393.36			568.37	547.26	857.55
Capacity	1415.62			557.73	542.56	880.97	1393.36			551.97	541.01	857.55

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
lf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
lf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
lf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	5.56	186.67	5.56	11.11	5.56	11.11	8.89	163.33	10.00	5.56	5.56	5.56
cmx, Capacity	1415.62			557.73	542.56	880.97	1393.36			551.97	541.01	857.55
V / C	0.00			0.02	0.01	0.01	0.01			0.01	0.01	0.01
d, Delay	7.55			11.70	11.88	9.33	7.60			11.68	11.81	9.36
LOS	A			B	B	A	A			B	B	A
dA, Approach Delay		0.21			10.79			0.37			10.95	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.03						0.05				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	197.78	27.78	182.22		16.67			
Flared Storage Size								
cmx, Capacity	1415.62	649.41	1393.36		621.61			
V / C	0.14	0.04	0.13		0.03			
Q95, 95% Queue Length	0.01	0.13	0.02		0.08			
d, Delay	7.55	10.79	7.60		10.95			
LOS		B			B			
dA, Approach Delay	0.21	10.79	0.37		10.95			
Approach LOS		B			B			

Node 2532: S College Ave & HWY 405 SR

Control Type	Signalized
Intersection	11.77
Average Delay	0
Average LOS	0.15
Loss Time	4

Volume and Adjustment by Movement

Movement	N	E	S	W
Approach	1	1	1	1
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Volume and Adjustment by Lane Group

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Substreet Flow Rate

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Capacity, Control Delay, and Level of Service Outcomes

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Ratio of Queue

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Signal Timing Information

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Left Turn Adjustment Factors for Permitted Phasing

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Intersection Specific Adjustment Factors

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Adjusted Phase Properties

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Adjusted Lane Group Properties

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Intersection Specific Properties

Approach	N	E	S	W
Lane Group	1	1	1	1
Control Type	Perm	Perm	Perm	Perm
V. Volume	100	122	147	199
Pk. Volume	8	65	4	11
Adjusted Volume	22	251	17	62

Node 2033: S College Ave & SE 6th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 2.15
 Worst Case Delay 14.31
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	15.00	223.00	8.00	5.00	8.00	8.00	29.00	173.00	12.00	12.00	5.00	32.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	16.67	247.78	8.89	5.56	6.67	8.89	32.22	192.22	13.33	13.33	5.56	35.56

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	16.67			5.56	6.67	8.89	32.22			13.33	5.56	35.56
Conflicting Volume (Veh)	205.56			569.44	553.33	198.89	256.67			556.67	555.56	252.22
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	205.56			569.44	553.33	198.89	256.67			556.67	555.56	252.22
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1377.85			435.69	443.65	947.26	1319.91			444.29	442.36	791.37
Capacity	1377.85			398.98	425.31	947.26	1319.91			420.69	424.07	791.37

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00		0.00				0.00	
T3,lt, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
lf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
lf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
lf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	16.67	247.78	8.89	5.56	6.67	8.89	32.22	192.22	13.33	13.33	5.56	35.56
cmx, Capacity	1377.85			398.98	425.31	947.26	1319.91			420.69	424.07	791.37
V/C	0.01			0.01	0.02	0.01	0.02			0.03	0.01	0.04
d, Delay	7.64			14.31	13.75	9.53	7.80			14.14	14.07	10.13
LOS	A			B	B	A	A			B	B	B
dA, Approach Delay		0.47			12.12			1.06			11.52	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.11						0.22				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	273.33	21.11	237.78			54.44		
Flared Storage Size								
cmx, Capacity	1377.85	526.58	1319.91			606.80		
V/C	0.20	0.04	0.18			0.09		
Q95, 95% Queue Length	0.04	0.13	0.08			0.30		
d, Delay	7.64	12.12	7.80			11.52		
LOS		B	B			B		
dA, Approach Delay	0.47	12.12	1.06			11.52		
Approach LOS		B	B			B		

Node 2034: S Collage Ave & SE 8th St

Control Type TWSC
 Method HCM 6th Edition
 d1, Average Delay 2.09
 Worst Case Delay 14.57
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	15.00	226.00	7.00	8.00	7.00	8.00	27.00	191.00	12.00	12.00	5.00	27.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	16.67	251.11	7.78	8.89	7.78	8.89	30.00	212.22	13.33	13.33	5.56	30.00

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	16.67			8.89	7.78	8.89	30.00			13.33	5.56	30.00
Conflicting Volume (Veh)	225.56			585.00	571.11	218.89	258.89			575.56	573.89	255.00
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	225.56			585.00	571.11	218.89	258.89			575.56	573.89	255.00
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1354.89			425.43	433.45	825.67	1317.44			431.63	431.88	788.55
Capacity	1354.89			392.69	416.08	825.87	1317.44			408.05	414.57	788.55

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,It, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
lf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
lf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
lf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	16.67	251.11	7.78	8.89	7.78	8.89	30.00	212.22	13.33	13.33	5.56	30.00
cmx, Capacity	1354.89			392.69	416.08	825.87	1317.44			408.05	414.57	788.55
V / C	0.01			0.02	0.02	0.01	0.02			0.03	0.01	0.04
d, Delay	7.69			14.57	14.06	9.76	7.80			14.39	14.25	10.13
LOS	A			B	B	A	A			B	B	B
dA, Approach Delay		0.47			12.74			0.92			11.76	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.11						0.20				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	275.56	25.56	255.56	48.89				
Flared Storage Size								
cmx, Capacity	1354.89	490.59	1317.44	581.17				
V / C	0.20	0.05	0.19	0.08				
Q95, 95% Queue Length	0.04	0.16	0.07	0.28				
d, Delay	7.69	12.74	7.80	11.76				
LOS	B	B	B	B				
dA, Approach Delay	0.47	12.74	0.92	11.76				
Approach LOS		B		B				

Node 2035: S Collage Ave & SE 10th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.18
 Worst Case Delay 20
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Movement												
Base Volume	11.00	364.00	13.00	5.00	5.00	5.00	19.00	358.00	5.00	13.00	5.00	9.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	12.22	393.33	14.44	5.56	5.56	5.56	21.11	397.78	5.56	14.44	5.56	10.00

Pedestrians

Approach	N (Major)			E			S (Major)			W		
	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Movement												
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Movement												
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	12.22			5.56	5.56	5.56	21.11			14.44	5.56	10.00
Conflicting Volume (Veh)	403.33			875.56	875.00	400.56	407.78			873.33	870.56	400.56
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	403.33			875.56	875.00	400.56	407.78			873.33	870.56	400.56
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpv, Potential Capacity	1166.30			271.71	289.91	653.86	1161.92			272.65	291.64	653.86
Capacity	1166.30			256.16	279.27	653.86	1161.92			258.80	280.94	653.86

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Movement												
tc, base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3, It, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
lf, base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
lf, hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
lf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Movement												
vx, Volume	12.22	393.33	14.44	5.56	5.56	5.56	21.11	397.78	5.56	14.44	5.56	10.00
cmv, Capacity	1166.30			256.16	279.27	653.86	1161.92			258.80	280.94	653.86
V / C	0.01			0.02	0.02	0.01	0.02			0.06	0.02	0.02
d, Delay	8.12			19.62	18.46	11.08	8.16			20.00	18.90	11.60
LOS	A			C	C	B	A			C	C	B
dA, Approach Delay		0.24			16.39			0.41			17.00	
Approach LOS					C						C	
dRank1, Rank 1 Delay		0.11						0.19				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Lane								
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	420.00	16.67	424.44		30.00			
Flared Storage Size								
cmv, Capacity	1166.30	332.82	1161.92		330.10			
V / C	0.36	0.06	0.37		0.09			
Q95, 95% Queue Length	0.03	0.16	0.06		0.30			
d, Delay	8.12	16.39	8.16		17.00			
LOS		C			C			
dA, Approach Delay	0.24	16.39	0.41		17.00			
Approach LOS		C			C			

Node 2010 at College Ave & SR 17th St													
Control Type										Signalized			
Volume										Vehicle Ectors			
Average Delay										9.15			
Average LOS										A			
W/C										0.42			
Lost Time										0			

Volume and Adjustments by Movement													
Approach	N			E			S			W			
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1	
Approach Volume	49	278	11	51	24	77	19	260	21	11	17	13	
Peak Flow Rate	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Peak to Volume	19	77	3	14	7	21	4	78	20	3	5	4	
Adjusted Volume	77	307	12	57	27	89	19	311	21	12	19	14	

Volume and Adjustments by Lane Group														
Approach	N				E				S				W	
Lane Group	C	C	C	C	C	C	C	C	C	C	C	C	C	C
ID	1522	1523	1524	1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535
Lane	LTH	LTH	LTH	LTH	LTH	LTH	LTH	LTH	LTH	LTH	LTH	LTH	LTH	LTH
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
V. Volume	795	197	68	49										
Pct. Intersection Left Turns	0.12	0.14	0.04	0.27										
Pct. Intersection Right Turns	0.03	0.51	0.18	0.32										

Saturation Flow Rate														
Approach	N				E				S				W	
Lane Group	15028	15025	15024	15027										
Control Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
No. Sat. Saturation Flow Rate	1100	1700	1100	1700	1100	1700	1100	1700	1100	1700	1100	1700	1100	1700
N. Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
N. Lane Width Adjustment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Pct. % Heavy Vehicle	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. Wt. and Grade Adjustment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Flowing Adjustment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Flow Sat. Adjustment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
N. Area Type Adjustment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
N. Area Type Adjustment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adjustment	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. Right Turn Adjustment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Left Turn Adj. Adj.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Adj. Right Turn Adj. Adj.	1.000	1.000	1.000	1.000	1									

Node 2037: S College and 13th/13th St

Control Type	TWSC
Method	HCM 6th Edition
dI, Average Delay	0.34
Worst Case Delay	14.27
Worst Case LOS	B

Volume and Adjustments						
Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
Base Volume	298.00	5.00	5.00	335.00	5.00	11.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	331.11	5.56	5.56	372.22	5.56	12.22

Pedestrians						
Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
vx, Flow (Ped/hr)			0.00		0.00	0.00
w, Lane Width (ft)			12.00		12.00	12.00
Sp, Walking Speed (ft/s)			3.50		3.50	3.50
fpb, Percent Blockage			0.00		0.00	0.00

Capacity of Movements below Rank 1						
Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
Rank	1	1	2	1	3	2
vx, Volume			5.56		5.56	12.22
Conflicting Volume (Veh)			336.67		717.22	333.89
Conflicting Volume (Ped)			0.00		0.00	0.00
Conflicting Volume			336.67		717.22	333.89
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median Refuge Area						
cpx, Potential Capacity			1233.87		399.15	712.56
Capacity			1233.87		396.88	712.56

Critical Headway and Follow Up Headway						
Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
tc, base, Base Critical Headway			4.10		7.10	6.20
tc, base, I, Base Critical Headway (Stage I)						
tc, base, II, Base Critical Headway (Stage II)						
tc, HV, Heavy Vehicles Adjustment Factor			1.00		1.00	1.00
Phv, % Heavy Vehicles			0.00		0.00	0.00
tc, G, Grade Adjustment Factor			0.00		0.20	0.10
G, % Grade		0.00		0.00		0.00
T3, II, Geometry Adjustment Factor			0.00		0.70	0.00
tc, Critical Headway			4.10		6.40	6.20
tc, I, Critical Headway (Stage I)						
tc, II, Critical Headway (Stage II)						
tf, base, Base Follow-Up Headway			2.20		3.50	3.30
tf, hv, Heavy Vehicles Adjustment Factor			0.90		0.90	0.90
tf, Follow-Up Headway			2.20		3.50	3.30

Delay and Level of Service by Movement						
Approach	N (Major)		S (Major)		W	
Movement	T	R1	L1	T	L1	R1
vx, Volume	331.11	5.56	5.56	372.22	5.56	12.22
cmx, Capacity			1233.87		396.88	712.56
V / C			0.00		0.01	0.02
d, Delay			7.93		14.27	10.25
LOS			A		B	B
dA, Approach Delay		0.00		0.12		11.51
Approach LOS						B
dRank1, Rank 1 Delay		0.00		0.05		

Delay and Level of Service by Lane						
Approach	N (Major)		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	T, R1	L1, T	L1, R1			
vx, Volume	336.67	377.78	17.78			
Flared Storage Size						
cmx, Capacity		1233.87	570.71			
V / C		0.31	0.03			
Q95, 95% Queue Length		0.01	0.10			
d, Delay		7.93	11.51			
LOS			B			
dA, Approach Delay		0.00	0.12			
Approach LOS			B			

Node 222M, 9 Configs and 4 Samples	
Control Type	Signalized
Vehicle	MDM On Echon
Average Delay	12.26
Average LOS	B
W/O	0.51
Loss Time	B

VOLUMES AND ADJUSTMENTS BY MEASUREMENT												
APPROXIMATE MEASUREMENT	L1	H	R1	L1	E	T	S	R1	L1	W	T	R5
Water Volume	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
Water Volume	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
Peak 15 Volume	38	44	12	7	18	53	4	4	3	8	11	1
Adjusted Volume	152	174	48	13	73	172	10	178	11	33	44	4

Variable	N	Q	S	W
AgeGroup	C	C	C	C
18-24	15240	14920	15528	15031
25-34	110	110	110	110
ControlType	Parent	Parent	Parent	Parent
Variables	274	293	193	80
PLT Assessment Letters	0.41	0.04	0.08	0.38
PLT Response Letters	0.13	0.71	0.07	0.07

[illegible]

Agency, County, and Level of Service Description	IL	IL	IL	IL
Agency	10000	10729	10628	11531
County Type	Perms	Perms	Perms	Perms
V. Lake County	374.44	719.83	1043.9	60
1. Lake County Fee Rule	1000	1000	1717	1011
2. Capacity	426	441	907	612
3. Capacity	0.49	0.58	0.69	0.46
4. Capacity	0.48	0.46	0.72	0.13
5. Capacity	2.07	14.51	4.76	12.29
A. Capacity	0.50	0.50	0.50	0.50
B. Capacity	1.81	2.47	0.56	0.44
C. Capacity	3.00	5.00	2.00	0.00
D. Capacity	1.00	1.00	1.00	1.00
E. Capacity	0.49	0.54	0.49	0.38
F. Capacity	1.00	1.00	1.00	1.00
G. Capacity	11.27	16.93	9.12	12.73
H. Capacity	0	0	0	0
I. Capacity	11.77	16.93	9.12	12.73
J. Capacity	0	0	0	0
K. Capacity	0	0	0	0
L. Capacity	0	0	0	0
M. Capacity	0	0	0	0
N. Capacity	0	0	0	0
O. Capacity	0	0	0	0
P. Capacity	0	0	0	0
Q. Capacity	0	0	0	0
R. Capacity	0	0	0	0
S. Capacity	0	0	0	0
T. Capacity	0	0	0	0
U. Capacity	0	0	0	0
V. Capacity	0	0	0	0
W. Capacity	0	0	0	0
X. Capacity	0	0	0	0
Y. Capacity	0	0	0	0
Z. Capacity	0	0	0	0

[illegible]

Signal Timing Information				
Approach	N	E	S	W
Left Turn	15930	15929	15928	15931
Control Type	Phase	Phase	Phase	Phase
Signal Type	P	P	P	P
G, C, I, or T	60.00	60.00	60.00	60.00
1. Minimum Green Time	0	0	0	0
1.1. Minimum Green per Cycle	3.00	4.00	4.00	4.00
1.2. Start-up Loss Time	2.00	2.00	2.00	2.00
1.3. Minimum Clearance Time	2.00	2.00	2.00	2.00
2. Clearance Loss Time	2.00	2.00	2.00	2.00
Green Time Start	0	25.5	0	0
Green Time End	0	25.5	25.5	25.5
3. Actuated Green Time	25.5	25.5	25.5	25.5
3.1. Effective Green Time	25.5	25.5	25.5	25.5
3.2. Green Cycle	0.49	0.38	0.49	0.38
3.3. Volume / Saturation Flow Rate	0.29	0.19	0.12	0.06

Life Cycle Assessment Practice for Painted Ceiling				
Approach	3S	E	S	W
Level of detail	10/50	10/20	10/20	10/30
Complexity of type	Paint	Paint	Paint	Paint
Substrate material(s) or wall(s)	S	S	S	S
Operating boundary or model(s)	S	S	S	S
Costs and value	60.00	60.00	60.00	60.00
Goal statement	29.50	29.50	29.50	29.50
WOT for each GO	29.50	29.50	29.50	29.50
Overall Approach for GO	29.50	29.50	29.50	29.50
For Number of Lines of Operating	1	1	1	1
Number of Lines of Operating	1	1	1	1
For Lines of Operating	152.22	13.33	15.00	30.00
For Lines of Operating	0.41	0.04	0.05	0.10
For Lines of Operating	0.06	0.30	0.41	0.04
For Lines of Operating	2.54	0.07	0.17	0.02
For Lines of Operating	142.33	60.60	144.44	294.00
For Lines of Operating	1.35	1.33	6.24	4.04
For Lines of Operating	1.00	1.00	1.00	1.00
For Lines of Operating	1.00	1.00	1.00	1.00
For Lines of Operating	2.97	16.11	10.13	3.32
For Lines of Operating	0.31	0.63	0.51	0.63
For Lines of Operating	2.96	16.11	10.13	10.92
For Lines of Operating	23.54	6.10	9.37	11.55
For Lines of Operating	0.45	0.04	0.02	0.33
For Lines of Operating	1.44	1.27	1.49	1.58
For Lines of Operating	1.05	1.05	1.05	2.06
For Lines of Operating	3.04	0.00	0.00	2.61
For Lines of Operating	0.58	1.00	0.99	0.82
For Lines of Operating	0.66	1.00	0.99	0.82

[illegible]**Actual Costs**

Abstract

Product and Service Analysis

Node 2039: SE 3rd & Ash Ave

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 6.25
 Worst Case Delay 9.41
 Worst Case LOS A

Volume and Adjustments

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	5.00	5.00	5.00	7.00	5.00	5.00	20.00	5.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	5.56	5.56	5.56	5.56	7.78	5.56	5.56	22.22	5.56	5.56	5.56	5.56

Pedestrians

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
w, Lane Width (ft)	12.00	12.00	12.00	12.00			12.00	12.00	12.00	12.00		
Sp, Walking Speed (ft/s)	3.50	3.50	3.50	3.50			3.50	3.50	3.50	3.50		
fpb, Percent Blockage	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		

Capacity of Movements below Rank 1

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	4	3	2	2	1	1	4	3	2	2	1	1
vx, Volume	5.56	5.56	5.56	5.56			5.56	22.22	5.56	5.56		
Conflicting Volume (Veh)	55.00	43.89	10.56	11.11			46.67	43.89	8.33	13.33		
Conflicting Volume (Ped)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
Conflicting Volume	55.00	43.89	10.56	11.11			46.67	43.89	8.33	13.33		
Two-Stage Gap Acceptance	No	No					No	No				
Number of Storage Spaces in Median Refuge Area												
opx, Potential Capacity	947.73	851.87	1076.45	1621.28			959.57	851.87	1079.48	1618.28		
Capacity	919.11	845.99	1076.45	1621.28			944.85	845.99	1079.48	1618.28		

Critical Headway and Follow Up Headway

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00		
Phv, % Heavy Vehicles	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc,G, Grade Adjustment Factor	0.20	0.20	0.10	0.00			0.20	0.20	0.10	0.00		
G, % Grade		0.00			0.00			0.00			0.00	
T3,It, Geometry Adjustment Factor	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc, Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
tf,base, Base Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		
tf,hv, Heavy Vehicles Adjustment Factor	0.90	0.90	0.90	0.90			0.90	0.90	0.90	0.90		
tf, Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		

Delay and Level of Service by Movement

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	5.56	5.56	5.56	5.56	7.78	5.56	5.56	22.22	5.56	5.56	5.56	5.56
cmx, Capacity	919.11	845.99	1076.45	1621.28			944.85	845.99	1079.48	1618.28		
V / C	0.01	0.01	0.01	0.00			0.01	0.03	0.01	0.00		
d, Delay	8.99	9.32	8.41	7.23			8.97	9.41	8.49	7.23		
LOS	A	A	A	A			A	A	A	A		
dA, Approach Delay		8.91			2.13			9.18			2.41	
Approach LOS		A						A				
dRank1, Rank 1 Delay					0.02						0.02	

Delay and Level of Service by Lane

Approach	N	E (Major)	S	W (Major)
Lane	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	16.67	18.89	33.33	16.67
Flared Storage Size				
cmx, Capacity	937.78	1621.28	893.80	1618.28
V / C	0.02	0.01	0.04	0.01
Q95, 95% Queue Length	0.05	0.01	0.12	0.01
d, Delay	8.91	7.23	9.18	7.23
LOS	A		A	
dA, Approach Delay	8.91	2.13	9.18	2.41
Approach LOS	A		A	

Intersection Capacity Analysis Summary Page

Analysis Time: Thu Mar 12 21:33:17 ;
 Driving Side: Right
 Analysis Period: 1 Hours

Number	Name	Control Type	V/C	Avg Delay	Avg LOS	Max Delay	Max LOS
2030	College & Whitman	AWSC	0.33	12.81	B	13.97	B
2031	N College & SE 3rd St.	TWSC	0.00	1.25	A	11.82	B
2032	S College Ave & SW 4th St	AWSC	0.37	13.78	B	16.12	C
2033	S College Ave & SE 6th St	TWSC	0.00	1.77	A	14.58	B
2034	S College Ave & SE 8th St	TWSC	0.00	1.62	A	14.41	B
2035	S College Ave & SE 10th St	TWSC	0.00	1.18	A	20.17	C
2036	S College Ave & SE 12th St	AWSC	0.45	14.45	B	15.45	C
2037	S College and 13th 13th St	TWSC	0.00	0.33	A	14.66	B
2038	S College Ave & Lampert	AWSC	0.26	13.04	B	15.34	C
2039	SE 3rd & Ash Ave	TWSC	0.00	6.87	A	9.39	A

Node 2030: College & Whitman

Control Type AWSC
 Method HCM 6th Edition
 Average Delay 12.81
 Average LOS B

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	30.00	200.00	65.00	27.00	100.00	18.00	76.00	196.00	38.00	31.00	71.00	38.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
Flow Rate	33.33	222.22	72.22	30.00	111.11	20.00	84.44	217.78	40.00	34.44	78.89	42.22
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	327.78	161.11	342.22	155.56				
Left Turn Flow Rate	33.33	30.00	84.44	34.44				
Right Turn Flow Rate	72.22	20.00	40.00	42.22				
PLT, Proportion LT	0.10	0.19	0.25	0.22				
PRT, Proportion RT	0.22	0.12	0.12	0.27				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT,adj, Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT,adj, Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV,adj, Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	-0.11	-0.04	-0.02	-0.12				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	327.78	161.11	342.22	155.56				
hd initial	3.20	3.20	3.20	3.20				
x initial	0.29	0.14	0.30	0.14				
hd, iteration 1	4.62	5.12	4.69	5.04				
Difference, iteration 1	1.42	1.92	1.49	1.84				
hd, iteration 2	5.10	5.72	5.16	5.66				
Difference, iteration 2	0.49	0.60	0.47	0.61				
hd, iteration 3	5.26	5.92	5.32	5.86				
Difference, iteration 3	0.16	0.20	0.16	0.20				
hd, iteration 4	5.32	5.99	5.38	5.93				
Difference, iteration 4	0.05	0.07	0.05	0.07				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	5.32	5.99	5.38	5.93				
x final, Degree of Utilization	0.48	0.27	0.51	0.26				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	327.78	161.11	342.22	155.56				
hd, Departure Headway	5.32	5.99	5.38	5.93				
x, Degree of Utilization	0.48	0.27	0.51	0.26				
m, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	3.32	3.99	3.38	3.93				
Capacity	676.36	600.08	669.07	606.73				
Delay	13.28	11.19	13.97	10.97				
LOS	B	B	B	B				
Q95, 95% Queue Length	2.77	1.09	3.08	1.03				
Approach Delay	13.28	11.19	13.97	10.97				
Approach LOS	B	B	B	B				
Intersection Delay	12.81							
Intersection LOS	B							

Node 2031: N College & SE 3rd St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.25
 Worst Case Delay 11.82
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	163.00	5.00	5.00	5.00	10.00	8.00	152.00	9.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	5.56	181.11	5.56	5.56	5.56	11.11	8.89	168.89	10.00	5.56	5.56	5.56

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	5.56			5.56	5.56	11.11	8.89			5.56	5.56	5.56
Conflicting Volume (Veh)	178.89			392.22	389.44	173.89	185.67			395.00	391.67	183.89
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	178.89			392.22	389.44	173.89	185.67			395.00	391.67	183.89
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
opx, Potential Capacity	1409.03			570.77	549.84	874.74	1399.87			568.37	547.26	863.65
Capacity	1409.03			557.76	542.56	874.74	1399.87			551.92	541.01	863.65

Critical Headway and Follow-Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc, base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00		0.00				0.00	
T3, It, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
If, base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
If, hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
If, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	5.56	181.11	5.56	5.56	5.56	11.11	8.89	168.89	10.00	5.56	5.56	5.56
cmx, Capacity	1409.03			557.76	542.56	874.74	1399.87			551.92	541.01	863.65
V / C	0.00			0.01	0.01	0.01	0.01			0.01	0.01	0.01
d, Delay	7.57			11.84	11.82	9.30	7.59			11.88	11.81	9.33
LOS	A			B	B	A	A			B	B	A
dA, Approach Delay		0.22			10.51			0.36			10.94	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.03						0.05				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	192.22	22.22	187.78					
Planned Storage Size								
cmx, Capacity	1409.03	675.41	1399.87					
V / C	0.14	0.03	0.13					
Q95, 95% Queue Length	0.01	0.10	0.02					
d, Delay	7.57	10.51	7.59					
LOS		B						
dA, Approach Delay	0.22	10.51	0.36					
Approach LOS		B						

Node 2032: S College Ave & SW 4th St

Control Type AWSC
 Method HCM 6th Edition
 Average Delay 13.78
 Average LOS B

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	15.00	226.00	15.00	75.00	46.00	13.00	74.00	221.00	55.00	40.00	74.00	69.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
Flow Rate	16.67	251.11	16.67	83.33	51.11	14.44	82.22	245.56	61.11	44.44	82.22	76.67
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	284.44	148.89	388.89	203.33				
Left Turn Flow Rate	16.67	83.33	82.22	44.44				
Right Turn Flow Rate	16.67	14.44	61.11	76.67				
PLT, Proportion LT	0.06	0.56	0.21	0.22				
PRT, Proportion RT	0.06	0.10	0.16	0.38				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT,adj, Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT,adj, Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV,adj, Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	-0.02	0.05	-0.05	-0.18				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	284.44	148.89	388.89	203.33				
hd initial	3.20	3.20	3.20	3.20				
x initial	0.25	0.13	0.35	0.18				
hd, iteration 1	4.81	5.27	4.69	4.97				
Difference, iteration 1	1.61	2.07	1.49	1.77				
hd, iteration 2	5.37	5.94	5.20	5.61				
Difference, iteration 2	0.56	0.67	0.51	0.64				
hd, iteration 3	5.56	6.18	5.38	5.84				
Difference, iteration 3	0.20	0.24	0.18	0.22				
hd, iteration 4	5.64	6.27	5.44	5.92				
Difference, iteration 4	0.07	0.09	0.06	0.08				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	5.64	6.27	5.44	5.92				
x final, Degree of Utilization	0.45	0.26	0.59	0.33				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	284.44	148.89	388.89	203.33				
hd, Departure Headway	5.64	6.27	5.44	5.92				
x, Degree of Utilization	0.45	0.26	0.59	0.33				
rn, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	3.64	4.27	3.44	3.82				
Capacity	638.61	573.75	661.57	608.41				
Delay	13.14	11.46	16.12	11.88				
LOS	B	B	C	B				
Q95, 95% Queue Length	2.38	1.05	4.15	1.49				
Approach Delay	13.14	11.46	16.12	11.88				
Approach LOS	B	B	C	B				
Intersection Delay	13.78							
Intersection LOS	B							

Node 2033: S College Ave & SE 8th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.77
 Worst Case Delay 14.58
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	15.00	299.00	13.00	5.00	5.00	9.00	12.00	211.00	11.00	11.00	5.00	33.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	16.67	265.56	14.44	5.56	5.56	10.00	13.33	234.44	12.22	12.22	5.56	36.67

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
Ipb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	16.67			5.56	5.56	10.00	13.33			12.22	5.56	36.67
Conflicting Volume (Veh)	246.67			594.44	580.56	240.56	280.00			581.11	579.44	272.78
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	246.67			594.44	580.56	240.56	280.00			581.11	579.44	272.78
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1331.06			419.32	428.13	803.28	1294.24			427.98	428.75	770.78
Capacity	1331.06			387.30	416.72	803.28	1294.24			409.86	417.33	770.78

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,It, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
If,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
If,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
If, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	16.67	265.56	14.44	5.56	5.56	10.00	13.33	234.44	12.22	12.22	5.56	36.67
cmx, Capacity	1331.06			387.30	416.72	803.28	1294.24			409.86	417.33	770.78
V / C	0.01			0.01	0.01	0.01	0.01			0.03	0.01	0.05
d, Delay	7.74			14.58	13.92	9.77	7.81			14.38	14.22	10.27
LOS	A			B	B	A	A			B	B	B
dA, Approach Delay		0.43			12.13			0.40			11.60	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.11						0.09				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	296.67	21.11	260.00					
Flared Storage Size								
cmx, Capacity	1331.06	526.14	1294.24					600.25
V / C	0.22	0.04	0.20					0.09
Q95, 95% Queue Length	0.04	0.13	0.03					0.30
d, Delay	7.74	12.13	7.81					11.60
LOS		B	B					B
dA, Approach Delay	0.43	12.13	0.40					11.60
Approach LOS		B						B

Node 2034: S College Ave & SE 8th St

Control Type TWSC
 Method HCM 6th Edition
 dl, Average Delay 1.62
 Worst Case Delay 14.41
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	14.00	236.00	12.00	5.00	6.00	9.00	12.00	214.00	12.00	9.00	5.00	26.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	15.56	262.22	13.33	5.56	6.67	10.00	13.33	237.78	13.33	10.00	5.56	28.89

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	15.56			5.56	6.67	10.00	13.33			10.00	5.56	28.89
Conflicting Volume (Veh)	251.11			588.33	577.78	244.44	275.56			579.44	577.78	268.89
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	251.11			588.33	577.78	244.44	275.56			579.44	577.78	268.89
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1326.09			423.27	429.69	799.29	1299.09			429.07	429.69	774.63
Capacity	1326.09			395.47	416.66	799.29	1299.09			410.38	416.66	774.63

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc, base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, hv, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3, II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
tf, base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf, hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	15.56	262.22	13.33	5.56	6.67	10.00	13.33	237.78	13.33	10.00	5.56	28.89
cmx, Capacity	1326.09			395.47	416.66	799.29	1299.09			410.38	416.66	774.63
V / C	0.01			0.01	0.02	0.01	0.01			0.02	0.01	0.04
d, Delay	7.75			14.41	13.90	9.81	7.80			14.26	14.09	10.14
LOS	A			B	B	A	A			B	B	B
dA, Approach Delay		0.41			12.19			0.39			11.56	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.11						0.09				

Delay and Level of Service by Lane

Approach	N (Major)	E	S (Major)	W
Lane	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	291.11	22.22	264.44	44.44
Flared Storage Size				
cmx, Capacity	1326.09	523.09	1299.09	593.14
V / C	0.22	0.04	0.20	0.07
Q95, 95% Queue Length	0.04	0.13	0.03	0.24
d, Delay	7.75	12.19	7.80	11.56
LOS		B		B
dA, Approach Delay	0.41	12.19	0.39	11.56
Approach LOS		B		B

Node 2035: S College Ave & SE 10th St

Control Type TWSC
 Method HCM 6th Edition
 dl, Average Delay 1.18
 Worst Case Delay 20.17
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	11.00	352.00	13.00	5.00	5.00	5.00	19.00	366.00	5.00	13.00	5.00	9.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	12.22	391.11	14.44	5.56	5.56	5.56	21.11	406.67	5.56	14.44	5.56	10.00

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	12.22			5.56	5.56	5.56	21.11			14.44	5.56	10.00
Conflicting Volume (Veh)	412.22			882.22	881.67	409.44	405.56			880.00	877.22	398.33
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	412.22			882.22	881.67	409.44	405.56			880.00	877.22	398.33
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpv, Potential Capacity	1157.56			268.91	267.33	646.40	1164.11			269.84	289.05	655.74
Capacity	1157.56			253.46	276.74	646.40	1164.11			256.03	278.39	655.74

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,lt, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
tf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	12.22	391.11	14.44	5.56	5.56	5.56	21.11	406.67	5.56	14.44	5.56	10.00
cmx, Capacity	1157.56			263.46	276.74	646.40	1164.11			256.03	278.39	655.74
V / C	0.01			0.02	0.02	0.01	0.02			0.06	0.02	0.02
d, Delay	8.14			19.79	18.59	11.15	8.15			20.17	19.04	11.60
LOS	A			C	C	B	A			C	C	B
dA, Approach Delay		0.24			16.51			0.40			17.10	
Approach LOS					C						C	
dRank1, Rank 1 Delay		0.11						0.19				

Delay and Level of Service by Lane

Approach	N (Major)		E	S (Major)		W
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	417.78	16.67	433.33	30.00		
Flared Storage Size						
cmx, Capacity	1157.56	329.45	1164.11	327.43		
V / C	0.36	0.05	0.37	0.09		
Q95, 95% Queue Length	0.03	0.16	0.06	0.30		
d, Delay	8.14	16.51	8.15	17.10		
LOS		C		C		
dA, Approach Delay	0.24	16.51	0.40	17.10		
Approach LOS		C		C		

Node 2036: S College Ave & SE 12th St

Control Type AWSC
 Method HCM 6th Edition
 Average Delay 14.45
 Average LOS B

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	72.00	270.00	11.00	77.00	19.00	78.00	16.00	282.00	75.00	15.00	16.00	13.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
Flow Rate	80.00	300.00	12.22	85.56	21.11	86.67	17.78	313.33	83.33	16.67	17.78	14.44
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	392.22	193.33	414.44	48.89				
Left Turn Flow Rate	80.00	85.56	17.78	16.67				
Right Turn Flow Rate	12.22	86.67	83.33	14.44				
PLT, Proportion LT	0.20	0.44	0.04	0.34				
PRT, Proportion RT	0.03	0.45	0.20	0.30				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT,adj, Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT,adj, Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV,adj, Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	0.02	-0.18	-0.11	-0.11				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	392.22	193.33	414.44	48.89				
hd initial	3.20	3.20	3.20	3.20				
x initial	0.35	0.17	0.37	0.04				
hd, iteration 1	4.68	5.08	4.52	5.31				
Difference, iteration 1	1.48	1.88	1.32	2.11				
hd, iteration 2	5.10	5.65	4.95	6.03				
Difference, iteration 2	0.42	0.57	0.43	0.72				
hd, iteration 3	5.24	5.82	5.09	6.26				
Difference, iteration 3	0.14	0.17	0.13	0.23				
hd, iteration 4	5.28	5.88	5.13	6.33				
Difference, iteration 4	0.04	0.06	0.04	0.07				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	5.28	5.88	5.13	6.33				
x final, Degree of Utilization	0.58	0.32	0.59	0.09				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	392.22	193.33	414.44	48.89				
hd, Departure Headway	5.28	5.88	5.13	6.33				
x, Degree of Utilization	0.58	0.32	0.59	0.09				
m, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	3.28	3.88	3.13	4.33				
Capacity	681.79	611.91	701.80	568.09				
Delay	15.36	11.58	15.45	9.93				
LOS	C	B	C	A				
Q95, 95% Queue Length	3.95	1.38	4.20	0.28				
Approach Delay	15.36	11.58	15.45	9.93				
Approach LOS	C	B	C	A				
Intersection Delay	14.45							
Intersection LOS	B							

Node 2037: S College and 13th 13th St

Control Type	TWSC
Method	HCM 6th Edition
dl, Average Delay	0.33
Worst Case Delay	14.66
Worst Case LOS	B

Volume and Adjustments

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
Base Volume	313.00	8.00	5.00	345.00	5.00	11.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	347.78	8.89	5.56	383.33	5.56	12.22

Pedestrians

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
vx, Flow (Ped/hr)			0.00		0.00	0.00
w, Lane Width (ft)			12.00		12.00	12.00
Sp, Walking Speed (ft/s)			3.50		3.50	3.50
fpb, Percent Blockage			0.00		0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
Rank	1	1	2	1	3	2
vx, Volume			5.56		5.56	12.22
Conflicting Volume (Veh)			356.67		746.67	352.22
Conflicting Volume (Ped)			0.00		0.00	0.00
Conflicting Volume			356.67		746.67	352.22
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median Refuge Area						
cpx, Potential Capacity			1213.22		383.61	695.94
Capacity			1213.22		381.38	695.94

Critical Headway and Follow Up Headway

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
tc,base, Base Critical Headway			4.10		7.10	6.20
tc,base,I, Base Critical Headway (Stage I)						
tc,base,II, Base Critical Headway (Stage II)						
tc,HV, Heavy Vehicles Adjustment Factor			1.00		1.00	1.00
Phv, % Heavy Vehicles			0.00		0.00	0.00
tc,G, Grade Adjustment Factor			0.00		0.20	0.10
G, % Grade		0.00		0.00		0.00
T3,II, Geometry Adjustment Factor			0.00		0.70	0.00
tc, Critical Headway			4.10		6.40	6.20
tc,I, Critical Headway (Stage I)						
tc,II, Critical Headway (Stage II)						
tf,base, Base Follow-Up Headway			2.20		3.50	3.30
tf,hv, Heavy Vehicles Adjustment Factor			0.90		0.90	0.90
tf, Follow-Up Headway			2.20		3.50	3.30

Delay and Level of Service by Movement

Approach	N (Major)		S (Major)		W	
	T	R1	L1	T	L1	R1
Movement						
vx, Volume	347.78	8.89	5.56	383.33	5.56	12.22
cmx, Capacity			1213.22		381.38	695.94
V / C			0.00		0.01	0.02
d, Delay			7.98		14.66	10.39
LOS			A		B	B
dA, Approach Delay		0.00		0.11		11.72
Approach LOS						B
dRank1, Rank 1 Delay		0.00		0.05		

Delay and Level of Service by Lane

Approach	N (Major)		S (Major)		W	
	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	T, R1	L1, T	L1, R1			
vx, Volume	356.67	388.89	17.78			
Flared Storage Size						
cmx, Capacity		1213.22	553.32			
V / C		0.32	0.03			
Q95, 95% Queue Length		0.01	0.10			
d, Delay		7.98	11.72			
LOS			B			
dA, Approach Delay		0.00	0.11			
Approach LOS			B			

Node 2038: S College Ave & Lampert

Control Type AWSC
 Method HCM 6th Edition
 Average Delay 13.04
 Average LOS B

Volume and Adjustments

Approach	N			E			S			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	144.00	159.00	46.00	12.00	61.00	191.00	9.00	185.00	9.00	29.00	37.00	5.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
Flow Rate	160.00	178.67	53.33	13.33	67.78	212.22	10.00	183.33	10.00	32.22	41.11	5.56
Geometry Group	1			1			1			1		

Saturation Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	390.00	293.33	203.33	78.89				
Left Turn Flow Rate	160.00	13.33	10.00	32.22				
Right Turn Flow Rate	53.33	212.22	10.00	5.56				
PLT, Proportion LT	0.41	0.05	0.05	0.41				
PRT, Proportion RT	0.14	0.72	0.05	0.07				
PHV, Proportion HV	0.00	0.00	0.00	0.00				
hLT,adj, Headway adjustment for left turns	0.20	0.20	0.20	0.20				
hRT,adj, Headway adjustment for right turns	-0.60	-0.60	-0.60	-0.60				
hHV,adj, Headway adjustment for heavy vehicles	1.70	1.70	1.70	1.70				
hadj, Headway adjustment	0.00	-0.42	-0.02	0.04				

Departure Headway

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	390.00	293.33	203.33	78.89				
hd initial	3.20	3.20	3.20	3.20				
x initial	0.35	0.26	0.18	0.07				
hd, iteration 1	4.71	4.53	4.65	5.21				
Difference, iteration 1	1.51	1.33	1.65	2.01				
hd, iteration 2	5.11	5.05	5.34	5.85				
Difference, iteration 2	0.40	0.52	0.49	0.64				
hd, iteration 3	5.25	5.19	5.51	6.05				
Difference, iteration 3	0.14	0.14	0.17	0.20				
hd, iteration 4	5.29	5.24	5.56	6.12				
Difference, iteration 4	0.04	0.05	0.05	0.07				
Convergence	Y	Y	Y	Y				
hd final, Departure Headway	5.29	5.24	5.56	6.12				
x final, Degree of Utilization	0.57	0.43	0.31	0.13				

Capacity and Level of Service

Approach	N		E		S		W	
Lanes	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Total Lane Flow Rate	390.00	293.33	203.33	78.89				
hd, Departure Headway	5.29	5.24	5.56	6.12				
x, Degree of Utilization	0.57	0.43	0.31	0.13				
m, Move Up Time	2.00	2.00	2.00	2.00				
ts, Service Time	3.29	3.24	3.56	4.12				
Capacity	680.21	686.07	646.54	587.97				
Delay	15.34	12.14	11.11	10.07				
LOS	C	B	B	B				
Q85, 95% Queue Length	3.92	2.21	1.37	0.46				
Approach Delay	15.34	12.14	11.11	10.07				
Approach LOS	C	B	B	B				
Intersection Delay	13.04							
Intersection LOS	B							

Node 2039: SE 3rd & Ash Ave

Control Type TWSC
 Method HCM 6th Edition
 d1, Average Delay 6.87
 Worst Case Delay 9.39
 Worst Case LOS A

Volume and Adjustments

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	19.00	5.00	5.00	5.00	5.00	5.00	19.00	5.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	5.56	21.11	5.56	5.56	5.56	5.56	5.56	21.11	5.56	5.56	5.56	5.56

Pedestrians

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
w, Lane Width (ft)	12.00	12.00	12.00	12.00			12.00	12.00	12.00	12.00		
Sp, Walking Speed (ft/s)	3.50	3.50	3.50	3.50			3.50	3.50	3.50	3.50		
fpb, Percent Blockage	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		

Capacity of Movements below Rank 1

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	4	3	2	2	1	1	4	3	2	2	1	1
vx, Volume	5.56	21.11	5.56	5.56			5.56	21.11	5.56	5.56		
Conflicting Volume (Veh)	52.22	41.67	8.33	11.11			52.22	41.67	8.33	11.11		
Conflicting Volume (Ped)	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
Conflicting Volume	52.22	41.67	8.33	11.11			52.22	41.67	8.33	11.11		
Two-Stage Gap Acceptance	No	No					No	No				
Number of Storage Spaces in Median Refuge Area												
cp, Potential Capacity	951.66	854.25	1079.48	1621.28			951.66	854.25	1079.48	1621.28		
Capacity	923.92	848.36	1079.48	1621.28			923.92	848.36	1079.48	1621.28		

Critical Headway and Follow Up Headway

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc, base, Base Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc, base, I, Base Critical Headway (Stage I)												
tc, base, II, Base Critical Headway (Stage II)												
tc, HV, Heavy Vehicles Adjustment Factor	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00		
Phv, % Heavy Vehicles	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc, G, Grade Adjustment Factor	0.20	0.20	0.10	0.00			0.20	0.20	0.10	0.00		
G, % Grade		0.00			0.00			0.00			0.00	
T3, It, Geometry Adjustment Factor	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00		
tc, Critical Headway	7.10	6.50	6.20	4.10			7.10	6.50	6.20	4.10		
tc, I, Critical Headway (Stage I)												
tc, II, Critical Headway (Stage II)												
tf, base, Base Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		
tf, hv, Heavy Vehicles Adjustment Factor	0.90	0.90	0.90	0.90			0.90	0.90	0.90	0.90		
tf, Follow-Up Headway	3.50	4.00	3.30	2.20			3.50	4.00	3.30	2.20		

Delay and Level of Service by Movement

Approach	N			E (Major)			S			W (Major)		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	5.56	21.11	5.56	5.56	5.56	5.56	5.56	21.11	5.56	5.56	5.56	5.56
cmx, Capacity	923.92	848.36	1079.48	1621.28			923.92	848.36	1079.48	1621.28		
V / C	0.01	0.02	0.01	0.00			0.01	0.02	0.01	0.00		
d, Delay	9.05	9.39	8.49	7.23			9.05	9.39	8.49	7.23		
LOS	A	A	A	A			A	A	A	A		
dA, Approach Delay		9.18			2.41			9.18			2.41	
Approach LOS		A						A				
dRank1, Rank 1 Delay					0.02						0.02	

Delay and Level of Service by Lane

Approach	N	E (Major)	S	W (Major)
Lane	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	32.22	16.67	32.22	16.67
Planned Storage Size				
cmx, Capacity	893.97	1621.28	893.97	1621.28
V / C	0.04	0.01	0.04	0.01
Q95, 95% Queue Length	0.11	0.01	0.11	0.01
d, Delay	9.18	7.23	9.18	7.23
LOS	A		A	
dA, Approach Delay	9.18	2.41	9.18	2.41
Approach LOS	A		A	

Intersection Capacity Analysis Summary Page

Analysis Time: Wed Mar 11 14:36:26
 Driving Side: Right
 Analysis Period: 1 Hours

Number	Name	Control Type	V/C	Avg Delay	Avg LOS	Max Delay	Max LOS
2030	College & Whitman	Signalized	0.45	11.51	B	19.73	B
2031	N College & SE 3rd St.	TWSC	0.00	1.02	A	13.81	B
2032	S College Ave & SW 4th St	Signalized	0.42	10.25	B	20.85	C
2033	S College Ave & SE 6th St	TWSC	0.00	1.95	A	13.44	B
2034	S College Ave & SE 8th St	TWSC	0.00	2.58	A	14.00	B
2035	S College Ave & SE 10th St	TWSC	0.00	1.18	A	18.68	C
2036	S College Ave & SE 12th St	Signalized	0.44	11.05	B	25.55	C
2037	S College and 13th 13th St	TWSC	0.00	0.36	A	13.21	B
2038	S College Ave & Lamperti	Signalized	0.56	13.52	B	17.74	B
2039	SE 3rd & Ash Ave	TWSC	0.00	6.17	A	9.46	A

ICAWWW/PO 2042 PM Remove LT and RT Laces 03-11-2014 Kx - Nasty 2022

Node 2031: N College & SE 3rd St.

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.02
 Worst Case Delay 13.81
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	5.00	253.00	5.00	7.00	5.00	10.00	8.00	217.00	14.00	5.00	5.00	5.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	5.56	281.11	5.56	7.78	5.56	11.11	8.89	241.11	15.56	5.56	5.56	5.56

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	5.56			7.78	5.56	11.11	8.89			5.56	5.56	5.56
Conflicting Volume (Veh)	256.67			567.22	564.44	248.89	286.67			570.00	569.44	283.89
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	256.67			567.22	564.44	248.89	286.67			570.00	569.44	283.89
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpv, Potential Capacity	1319.91			437.17	437.25	794.75	1286.99			435.32	434.40	759.87
Capacity	1319.91			425.42	431.55	794.75	1286.99			420.80	428.73	759.87

Critical Headway and Follow-Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,hv, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00			0.00			0.00	
T3,lt, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
uf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
uf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
uf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	5.56	281.11	5.56	7.78	5.56	11.11	8.89	241.11	15.56	5.56	5.56	5.56
cmv, Capacity	1319.91			425.42	431.55	794.75	1286.99			420.80	428.73	759.87
V / C	0.00			0.02	0.01	0.01	0.01			0.01	0.01	0.01
d, Delay	7.74			13.78	13.66	9.84	7.82			13.81	13.65	9.89
LOS	A			B	B	A	A			B	B	A
dA, Approach Delay		0.15			11.96			0.26			12.48	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.04						0.06				

Delay and Level of Service by Lane

Approach	N (Major)	E	S (Major)	W
Lane	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	282.22	24.44	265.56	16.67
Flared Storage Size				
cmv, Capacity	1319.91	541.57	1286.99	497.93
V / C	0.22	0.05	0.21	0.03
Q95, 95% Queue Length	0.01	0.14	0.02	0.10
d, Delay	7.74	11.96	7.82	12.48
LOS		B		B
dA, Approach Delay	0.15	11.96	0.26	12.48
Approach LOS		B		B

Node 2033: S College Ave & SE 6th St

Control Type TWSC
 Method HCM 6th Edition
 d1, Average Delay 1.95
 Worst Case Delay 13.44
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	17.00	213.00	14.00	8.00	8.00	9.00	5.00	175.00	11.00	21.00	7.00	16.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	18.89	236.67	15.56	6.67	8.89	10.00	5.56	194.44	12.22	23.33	7.78	17.78

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	18.89			6.67	8.89	10.00	5.56			23.33	7.78	17.78
Conflicting Volume (Veh)	206.67			506.67	501.67	200.56	252.22			503.33	500.00	244.44
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	206.67			506.67	501.67	200.56	252.22			503.33	500.00	244.44
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cp, Potential Capacity	1376.56			479.58	474.57	845.46	1324.85			482.01	475.60	799.29
Capacity	1376.56			455.64	464.76	845.46	1324.85			461.98	465.77	799.29

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,hv, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00		0.00				0.00	
T3,II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	8.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
tf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	18.89	236.67	15.56	6.67	8.89	10.00	5.56	194.44	12.22	23.33	7.78	17.78
cmx, Capacity	1376.56			455.64	464.76	845.46	1324.85			461.98	465.77	799.29
V / C	0.01			0.01	0.02	0.01	0.00			0.05	0.02	0.02
d, Delay	7.65			13.21	13.05	9.56	7.73			13.44	13.38	10.15
LOS	A			B	B	A	A			B	B	B
dA, Approach Delay		0.53			11.73		0.20				12.23	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.12					0.04					

Delay and Level of Service by Lane

Approach	N (Major)	E	S (Major)	W
Lane	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	271.11	25.56	212.22	48.89
Flared Storage Size				
cmx, Capacity	1376.56	560.61	1324.85	546.56
V / C	0.20	0.05	0.16	0.09
Q95, 95% Queue Length	0.04	0.14	0.01	0.29
d, Delay	7.65	11.73	7.73	12.23
LOS		B		B
dA, Approach Delay	0.53	11.73	0.20	12.23
Approach LOS		B		B

Node 2034: S College Ave & SE 8th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 2.58
 Worst Case Delay 14
 Worst Case LOS B

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	18.00	195.00	8.00	10.00	10.00	9.00	29.00	155.00	20.00	12.00	5.00	35.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	20.00	216.67	8.89	11.11	11.11	10.00	32.22	172.22	22.22	13.33	5.56	38.89

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	20.00			11.11	11.11	10.00	32.22			13.33	5.56	38.89
Conflicting Volume (Veh)	194.44			531.11	513.33	183.33	225.56			519.44	520.00	221.11
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	194.44			531.11	513.33	183.33	225.56			519.44	520.00	221.11
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
cpx, Potential Capacity	1390.76			461.99	467.41	864.26	1354.89			470.30	463.37	823.53
Capacity	1390.76			421.76	447.43	864.26	1354.89			441.22	443.56	823.53

Critical Headway and Follow Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Pliv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00		0.00				0.00	
T3,lt, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
tf,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
tf,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
tf, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	20.00	216.67	8.89	11.11	11.11	10.00	32.22	172.22	22.22	13.33	5.56	38.89
cmx, Capacity	1390.76			421.76	447.43	864.26	1354.89			441.22	443.56	823.53
V / C	0.01			0.03	0.02	0.01	0.02			0.03	0.01	0.05
d, Delay	7.63			14.00	13.52	9.63	7.72			13.71	13.67	9.93
LOS	A			B	B	A	A			B	B	A
dA, Approach Delay		0.62			12.48			1.10			11.16	
Approach LOS					B						B	
dRank1, Rank 1 Delay		0.13						0.21				

Delay and Level of Service by Lane

Approach	N (Major)		E	S (Major)		W
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	245.56	32.22	226.67	57.78		
Flared Storage Size						
cmx, Capacity	1390.76	513.52	1354.89	642.21		
V / C	0.18	0.06	0.17	0.09		
Q95, 95% Queue Length	0.04	0.20	0.07	0.30		
d, Delay	7.63	12.48	7.72	11.16		
LOS		B		B		
dA, Approach Delay	0.62	12.48	1.10	11.16		
Approach LOS		B		B		

Node 2035: S College Ave & SE 10th St

Control Type TWSC
 Method HCM 6th Edition
 dI, Average Delay 1.18
 Worst Case Delay 18.68
 Worst Case LOS C

Volume and Adjustments

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Base Volume	11.00	332.00	13.00	5.00	5.00	5.00	19.00	332.00	7.00	12.00	5.00	9.00
PHF, Peak-hour factor	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
V, Adjusted Volume	12.22	368.89	14.44	5.56	5.56	5.56	21.11	368.89	7.78	13.33	5.56	10.00

Pedestrians

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Flow (Ped/hr)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
w, Lane Width (ft)	12.00			12.00	12.00	12.00	12.00			12.00	12.00	12.00
Sp, Walking Speed (ft/s)	3.50			3.50	3.50	3.50	3.50			3.50	3.50	3.50
fpb, Percent Blockage	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00

Capacity of Movements below Rank 1

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
Rank	2	1	1	4	3	2	2	1	1	4	3	2
vx, Volume	12.22			5.56	5.56	5.56	21.11			13.33	5.56	10.00
Conflicting Volume (Veh)	376.67			823.33	822.78	372.78	383.33			821.11	819.44	376.11
Conflicting Volume (Ped)	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
Conflicting Volume	376.67			823.33	822.78	372.78	383.33			821.11	819.44	376.11
Two-Stage Gap Acceptance				No	No					No	No	
Number of Storage Spaces in Median Refuge Area												
capx, Potential Capacity	1192.89			294.65	310.88	677.74	1186.19			295.67	312.24	674.83
Capacity	1192.89			278.52	299.89	677.74	1186.19			281.34	301.23	674.83

Critical Headway and Follow-Up Headway

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
tc,base, Base Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,base,I, Base Critical Headway (Stage I)												
tc,base,II, Base Critical Headway (Stage II)												
tc,HV, Heavy Vehicles Adjustment Factor	1.00			1.00	1.00	1.00	1.00			1.00	1.00	1.00
Phv, % Heavy Vehicles	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc,G, Grade Adjustment Factor	0.00			0.20	0.20	0.10	0.00			0.20	0.20	0.10
G, % Grade		0.00			0.00		0.00				0.00	
T3,II, Geometry Adjustment Factor	0.00			0.00	0.00	0.00	0.00			0.00	0.00	0.00
tc, Critical Headway	4.10			7.10	6.50	6.20	4.10			7.10	6.50	6.20
tc,I, Critical Headway (Stage I)												
tc,II, Critical Headway (Stage II)												
If,base, Base Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30
If,hv, Heavy Vehicles Adjustment Factor	0.90			0.90	0.90	0.90	0.90			0.90	0.90	0.90
If, Follow-Up Headway	2.20			3.50	4.00	3.30	2.20			3.50	4.00	3.30

Delay and Level of Service by Movement

Approach	N (Major)			E			S (Major)			W		
Movement	L1	T	R1	L1	T	R1	L1	T	R1	L1	T	R1
vx, Volume	12.22	368.89	14.44	5.56	5.56	5.56	21.11	368.89	7.78	13.33	5.56	10.00
capx, Capacity	1192.89			278.52	299.89	677.74	1186.19			281.34	301.23	674.83
V / C	0.01			0.02	0.02	0.01	0.02			0.05	0.02	0.01
d, Delay	8.05			18.42	17.50	10.81	8.09			18.68	17.83	11.22
LOS	A			C	C	B	A			C	C	B
dA, Approach Delay		0.25			15.57			0.43			15.93	
Approach LOS					C						C	
dRank1, Rank 1 Delay		0.10						0.18				

Delay and Level of Service by Lane

Approach	N (Major)		E		S (Major)		W	
Lane	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1	Lane 1
Movements	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1	L1, T, R1
vx, Volume	395.56	16.67	397.78	28.89				
Flared Storage Size								
capx, Capacity	1192.89	357.12	1186.19	358.18				
V / C	0.33	0.05	0.34	0.08				
Q95, 95% Queue Length	0.03	0.15	0.05	0.26				
d, Delay	8.05	15.57	8.09	15.93				
LOS		C		C				
dA, Approach Delay	0.25	15.57	0.43	15.93				
Approach LOS		C		C				

NEW YORK: 3/24/94 12:52 PM

Control Type	Synthesized
Method	KCM-6th Edition
Average Delay	11.05
Average LGS	3
WC	0.44
Loss Time	8

Value of the Investment

Notes: 1. *See* <http://www.fishbase.org> for species names.

Keywords: child sexual abuse; disclosure; social support

Abstract

1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 26

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<sup>a</sup>  $\chi^2 = 1.04$ ,  $df = 1$ ,  $p = .31$ .

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## Node 2037: S College and 13th/13th St

Control Type TWSC  
 Method HCM 6th Edition  
 dt, Average Delay 0.36  
 Worst Case Delay 13.21  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |       | S (Major) |        | W     |       |
|-----------------------|-----------|-------|-----------|--------|-------|-------|
|                       | T         | R1    | L1        | T      | L1    | R1    |
| Movement              |           |       |           |        |       |       |
| Base Volume           | 268.00    | 5.00  | 5.00      | 285.00 | 5.00  | 10.00 |
| PHF, Peak-hour factor | 0.900     | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 |
| V, Adjusted Volume    | 297.78    | 5.56  | 5.56      | 316.67 | 5.56  | 11.11 |

## Pedestrians

| Approach                 | N (Major) |    | S (Major) |   | W     |       |
|--------------------------|-----------|----|-----------|---|-------|-------|
|                          | T         | R1 | L1        | T | L1    | R1    |
| Movement                 |           |    |           |   |       |       |
| vx, Flow (Ped/hr)        |           |    | 0.00      |   | 0.00  | 0.00  |
| w, Lane Width (ft)       |           |    | 12.00     |   | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) |           |    | 3.50      |   | 3.50  | 3.50  |
| fpb, Percent Blockage    |           |    | 0.00      |   | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |    | S (Major) |   | W      |        |
|------------------------------------------------|-----------|----|-----------|---|--------|--------|
|                                                | T         | R1 | L1        | T | L1     | R1     |
| Movement                                       |           |    |           |   |        |        |
| Rank                                           | 1         | 1  | 2         | 1 | 3      | 2      |
| vx, Volume                                     |           |    | 5.56      |   | 5.56   | 11.11  |
| Conflicting Volume (Veh)                       |           |    | 303.33    |   | 628.33 | 300.56 |
| Conflicting Volume (Ped)                       |           |    | 0.00      |   | 0.00   | 0.00   |
| Conflicting Volume                             |           |    | 303.33    |   | 628.33 | 300.56 |
| Two-Stage Gap Acceptance                       |           |    |           |   | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |    |           |   |        |        |
| cpx, Potential Capacity                        |           |    | 1269.05   |   | 449.81 | 743.77 |
| Capacity                                       |           |    | 1269.05   |   | 447.42 | 743.77 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      | S (Major) |      | W    |      |
|----------------------------------------------|-----------|------|-----------|------|------|------|
|                                              | T         | R1   | L1        | T    | L1   | R1   |
| Movement                                     |           |      |           |      |      |      |
| tc,base, Base Critical Headway               |           |      | 4.10      |      | 7.10 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |           |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |           |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      |           |      | 1.00      |      | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        |           |      | 0.00      |      | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                |           |      | 0.00      |      | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |           | 0.00 |      | 0.00 |
| T3,II, Geometry Adjustment Factor            |           |      | 0.00      |      | 0.70 | 0.00 |
| tc, Critical Headway                         |           |      | 4.10      |      | 6.40 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |           |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |           |      |      |      |
| tf,base, Base Follow-Up Headway              |           |      | 2.20      |      | 3.50 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      |           |      | 0.90      |      | 0.90 | 0.90 |
| tf, Follow-Up Headway                        |           |      | 2.20      |      | 3.50 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |      | S (Major) |        | W      |        |
|----------------------|-----------|------|-----------|--------|--------|--------|
|                      | T         | R1   | L1        | T      | L1     | R1     |
| Movement             |           |      |           |        |        |        |
| vx, Volume           | 297.78    | 5.56 | 5.56      | 316.67 | 5.56   | 11.11  |
| cmx, Capacity        |           |      | 1269.05   |        | 447.42 | 743.77 |
| V / C                |           |      | 0.00      |        | 0.01   | 0.01   |
| d, Delay             |           |      | 7.85      |        | 13.21  | 10.01  |
| LOS                  |           |      | A         |        | B      | B      |
| dA, Approach Delay   |           | 0.00 |           | 0.14   |        | 11.07  |
| Approach LOS         |           |      |           |        |        | B      |
| dRank1, Rank 1 Delay |           | 0.00 |           | 0.04   |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) | S (Major) | W      |
|-----------------------|-----------|-----------|--------|
|                       | Lane 1    | Lane 1    | Lane 1 |
| Movements             | T, R1     | L1, T     | L1, R1 |
| vx, Volume            | 303.33    | 322.22    | 16.67  |
| Flared Storage Size   |           |           |        |
| cmx, Capacity         |           | 1269.05   | 609.26 |
| V / C                 |           | 0.25      | 0.03   |
| Q95, 95% Queue Length |           | 0.01      | 0.08   |
| d, Delay              |           | 7.85      | 11.07  |
| LOS                   |           |           | B      |
| dA, Approach Delay    |           | 0.00      | 11.07  |
| Approach LOS          |           |           | B      |

| Node 2300: 3 College Ave & Lempster |                 |
|-------------------------------------|-----------------|
| Control Type                        | Signaled        |
| Vehicle                             | MCU 4th Section |
| Average Delay                       | 13.52           |
| Average LOS                         | D               |
| V/C                                 | 0.56            |
| Total Time                          | 0               |

| Values and Aggregates by Measure |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aggregates                       |       | N     |       |       | 8     |       | 8     |       | W     |       |       |       |
| LI                               | 7     | 81    | 11    | 7     | 81    | 11    | 7     | 81    | 11    | 7     | 81    | 7     |
| SS                               | 155   | 147   | 10    | 10    | 98    | 15    | 103   | 15    | 93    | 15    | 83    | 15    |
| SD                               | 12.45 | 12.45 | 1.00  | 1.00  | 9.90  | 9.90  | 9.90  | 9.90  | 9.90  | 9.90  | 9.90  | 9.90  |
| Skewness                         | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 |
| Kurtosis                         | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Peak                             | 37    | 51    | 18    | 6     | 24    | 63    | 5     | 56    | 4     | 10    | 14    | 3     |
| Agg. Skewness                    | 147   | 200   | 62    | 29    | 97    | 232   | 22    | 221   | 16    | 58    | 58    | 13    |

| ANALYSIS OF VARIANCE          | N     | E     | S     | W     |
|-------------------------------|-------|-------|-------|-------|
|                               | C     | C     | C     | C     |
| Adjusted                      | 20004 | 28755 | 26622 | 26070 |
| Inter-Group                   | 178   | 178   | 178   | 178   |
| Total                         | 20182 | 28933 | 26800 | 26248 |
| Within-Group                  | 416   | 352   | 252   | 159   |
| Mean Squares                  | 0.55  | 0.47  | 0.58  | 0.56  |
| Final Adjusted Sum of Squares | 0.19  | 0.64  | 0.05  | 0.12  |

[illegible]

| Category, Critical Delay, and Level of Service Determination | A      | B      | C     | D     |
|--------------------------------------------------------------|--------|--------|-------|-------|
| Approach                                                     | 26554  | 26554  | 26555 | 26556 |
| Accession                                                    | Perm   | Perm   | Perm  | Perm  |
| V. Value                                                     | 415.22 | 331.52 | 288.7 | 108.7 |
| W. Value                                                     | 1915   | 1500   | 1098  | 1198  |
| W. Value                                                     | 800    | 640    | 899   | 605   |
| W. Value                                                     | 0.49   | 0.34   | 0.48  | 0.34  |
| W. Value                                                     | 0.5    | 0.51   | 0.28  | 0.18  |
| W. Value                                                     | 12.78  | 14.65  | 8.11  | 12.51 |
| W. Value                                                     | 0.56   | 0.59   | 0.52  | 0.59  |
| W. Value                                                     | 2.32   | 2.89   | 0.81  | 0.56  |
| W. Value                                                     | 0.00   | 0.00   | 0.00  | 0.00  |
| W. Value                                                     | 1.00   | 1.00   | 1.00  | 1.00  |
| W. Value                                                     | 0.63   | 0.34   | 0.48  | 0.36  |
| W. Value                                                     | 1.00   | 1.00   | 1.00  | 1.00  |
| W. Value                                                     | 12.47  | 17.74  | 9.07  | 13.36 |
| W. Value                                                     | 0      | 0      | 0     | 0     |
| W. Value                                                     | 17.41  | 17.74  | 6.92  | 13.16 |
| W. Value                                                     | 0      | 0      | 0     | 0     |
| W. Value                                                     | 0      | 13.31  | 0     | 0     |
| W. Value                                                     | 0      | 0      | 0     | 0     |

| Area of Growth | N      | S      | S      | W      |
|----------------|--------|--------|--------|--------|
| Area of Type   | 1      | 1      | 1      | 1      |
| Line of Growth | 26,654 | 26,654 | 26,652 | 26,656 |
| Area of Growth | 0.49   | 0.53   | 0.49   | 0.51   |
| Area of Growth | 1.00   | 1.00   | 1.00   | 1.00   |
| Area of Growth | 1.06   | 1.16   | 1.03   | 0.87   |
| Area of Growth | 0.52   | 0.52   | 0.52   | 0.11   |
| Area of Growth | 0.00   | 0.00   | 0.00   | 0.00   |
| Area of Growth | 1.00   | 1.00   | 1.00   | 1.00   |
| Area of Growth | 1.00   | 1.00   | 1.00   | 1.00   |
| Area of Growth | 1.57   | 1.43   | 1.85   | 0.63   |
| Area of Growth | 1.00   | 1.00   | 1.00   | 1.00   |
| Area of Growth | 0.00   | 0.00   | 0.00   | 0.00   |
| Area of Growth | 0.42   | 0.63   | 1.50   | 1.68   |

| Signal Timing Methods           | H     | S     | B     | VT    |
|---------------------------------|-------|-------|-------|-------|
| Apparel                         |       |       |       |       |
| Line/Through                    | 2004  | 2003  | 10002 | 2000  |
| Design type                     | Perm  | Perm  | Perm  | Perm  |
| Signal type                     | P     | P     | P     | P     |
| C. Queue length                 | 60.00 | 60.00 | 60.00 | 60.00 |
| Q. Queue/Maximum Queue          | 0     | 0     | 0     | 0     |
| Release Rate/Following Time     | 1.00  | 4.00  | 1.00  | 4.00  |
| H. Non-Recall Time              | 2.00  | 2.00  | 2.00  | 2.00  |
| HP. Resulted Co-Occurrence Time | 2.00  | 2.00  | 2.00  | 2.00  |
| G. Co-Occurrence Time           | 2.00  | 2.00  | 2.00  | 2.00  |
| Green Time Size                 | 20.0  | 0     | 20.0  | 0     |
| Green Time Size                 | 56    | 22.5  | 56    | 22.5  |
| G. Simulation Time              | 20.0  | 22.5  | 20.0  | 22.5  |
| G. Simulation Time              | 20.0  | 22.5  | 20.0  | 22.5  |
| gC. Direct Cycle                | 0.42  | 0.18  | 0.49  | 0.18  |
| gC. Volume/Queue Flow Rate      | 0.77  | 0.31  | 0.18  | 0.06  |
| Cycle Length                    |       |       |       |       |

| Section 4 - Equipment Factors for Personnel Pricing |        |        |        |        |
|-----------------------------------------------------|--------|--------|--------|--------|
| Equipment                                           | N      | E      | S      | W      |
| Linehaul (ton)                                      | 200.54 | 200.54 | 200.54 | 200.54 |
| Operator Type                                       | Perm   | Perm   | Perm   | Perm   |
| Shifts in a day (or in month)                       | N      | E      | S      | W      |
| Operator in a day (or in month)                     | N      | E      | S      | W      |
| Operator type                                       | 60.00  | 60.00  | 60.00  | 60.00  |
| Operator type                                       | 20.50  | 22.50  | 20.50  | 21.50  |
| Operator type                                       | 20.50  | 20.50  | 20.50  | 21.50  |
| Operator type                                       | 20.50  | 20.50  | 20.50  | 22.50  |
| Operator type                                       | 1      | 1      | 1      | 1      |
| Operator type                                       | 1      | 1      | 1      | 1      |
| Operator type                                       | 160.74 | 22.43  | 31.74  | 58.24  |
| Operator type                                       | 0.30   | 0.97   | 0.08   | 0.35   |
| Operator type                                       | 0.04   | 0.05   | 0.35   | 0.07   |
| Operator type                                       | 2.45   | 0.35   | 0.36   | 0.67   |
| Operator type                                       | 256.70 | 168.70 | 416.22 | 333.12 |
| Operator type                                       | 4.31   | 1.41   | 5.92   | 5.53   |
| Operator type                                       | 1.00   | 1.00   | 1.00   | 1.00   |
| Operator type                                       | 1.00   | 1.00   | 1.00   | 1.00   |
| Operator type                                       | 3.46   | 17.60  | 3.33   | 3.99   |
| Operator type                                       | 0.01   | 0.44   | 0.02   | 0.63   |
| Operator type                                       | 7.36   | 17.00  | 15.43  | 12.02  |
| Operator type                                       | 22.14  | 20.41  | 53.67  | 10.48  |
| Operator type                                       | 0.36   | 0.07   | 0.06   | 0.35   |
| Operator type                                       | 1.51   | 1.50   | 1.50   | 1.60   |
| Operator type                                       | 1.00   | 1.00   | 1.00   | 2.21   |
| Operator type                                       | 3.71   | 0.00   | 0.00   | 8.33   |
| Operator type                                       | 0.33   | 0.09   | 0.04   | 0.81   |
| Operator type                                       | 0.99   | 0.09   | 0.04   | 0.81   |

| Regional and National Employment Patterns |      |   |      |      |      |      |   |      |      |   |      |      |
|-------------------------------------------|------|---|------|------|------|------|---|------|------|---|------|------|
| Applicant                                 | N    |   | R    |      | E    |      | S |      | W    |   | R    |      |
| Measure                                   | L1   | T | R1   | L1   | R1   | L1   | T | R1   | L1   | T | R1   | L1   |
| GA Percent of Green                       | 0.00 |   | 0.00 | 0.00 | 0.00 | 0.00 |   | 0.00 | 0.00 |   | 0.00 | 0.00 |
| ODJWS Average Prisoner Occupancy          | 0.00 |   | 0.00 | 0.00 | 0.00 | 0.00 |   | 0.00 | 0.00 |   | 0.00 | 0.00 |
| ODJWS Percent of State Prisoners          | 0.00 |   | 0.00 | 0.00 | 0.00 | 0.00 |   | 0.00 | 0.00 |   | 0.00 | 0.00 |
| Age of Prisoners                          | 1.00 |   | 1.00 | 1.00 | 1.00 | 1.00 |   | 1.00 | 1.00 |   | 1.00 | 1.00 |
| Age of Prisoners                          | 1.00 |   | 1.00 | 1.00 | 1.00 | 1.00 |   | 1.00 | 1.00 |   | 1.00 | 1.00 |
| Age of Prisoners                          | 1.00 |   | 1.00 | 1.00 | 1.00 | 1.00 |   | 1.00 | 1.00 |   | 1.00 | 1.00 |

## Abstract

### Available Online Programme

## References

## Node 2039: SE 3rd &amp; Ash Ave

Control Type TWSC  
 Method HCM 6th Edition  
 dt, Average Delay 6.17  
 Worst Case Delay 9.46  
 Worst Case LOS A

## Volume and Adjustments

| Approach              | N     |       |       | E (Major) |       |       | S     |       |       | W (Major) |       |       |
|-----------------------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|-----------|-------|-------|
| Movement              | L1    | T     | R1    | L1        | T     | R1    | L1    | T     | R1    | L1        | T     | R1    |
| Base Volume           | 6.00  | 21.00 | 5.00  | 5.00      | 9.00  | 5.00  | 5.00  | 10.00 | 5.00  | 5.00      | 8.00  | 5.00  |
| PHF, Peak-hour factor | 0.900 | 0.900 | 0.900 | 0.900     | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900 | 0.900 |
| V, Adjusted Volume    | 6.67  | 23.33 | 5.56  | 5.56      | 10.00 | 5.56  | 5.56  | 11.11 | 5.56  | 5.56      | 8.89  | 5.56  |

## Pedestrians

| Approach                 | N     |       |       | E (Major) |   |    | S     |       |       | W (Major) |   |    |
|--------------------------|-------|-------|-------|-----------|---|----|-------|-------|-------|-----------|---|----|
| Movement                 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 |
| vx, Flow (Ped/hr)        | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |
| w, Lane Width (ft)       | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    |
| Sp, Walking Speed (ft/s) | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    |
| fpb, Percent Blockage    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |

## Capacity of Movements below Rank 1

| Approach                                       | N      |        |         | E (Major) |   |    | S      |        |         | W (Major) |   |    |
|------------------------------------------------|--------|--------|---------|-----------|---|----|--------|--------|---------|-----------|---|----|
| Movement                                       | L1     | T      | R1      | L1        | T | R1 | L1     | T      | R1      | L1        | T | R1 |
| Rank                                           | 4      | 3      | 2       | 2         | 1 | 1  | 4      | 3      | 2       | 2         | 1 | 1  |
| vx, Volume                                     | 6.67   | 23.33  | 5.56    | 5.56      |   |    | 5.56   | 11.11  | 5.56    | 5.56      |   |    |
| Conflicting Volume (Veh)                       | 55.00  | 49.44  | 12.78   | 14.44     |   |    | 61.11  | 49.44  | 11.67   | 15.56     |   |    |
| Conflicting Volume (Ped)                       | 0.00   | 0.00   | 0.00    | 0.00      |   |    | 0.00   | 0.00   | 0.00    | 0.00      |   |    |
| Conflicting Volume                             | 55.00  | 49.44  | 12.78   | 14.44     |   |    | 61.11  | 49.44  | 11.67   | 15.56     |   |    |
| Two-Stage Gap Acceptance                       | No     | No     |         |           |   |    | No     | No     |         |           |   |    |
| Number of Storage Spaces in Median Refuge Area |        |        |         |           |   |    |        |        |         |           |   |    |
| opx, Potential Capacity                        | 947.73 | 845.95 | 1073.43 | 1616.78   |   |    | 939.14 | 845.95 | 1074.94 | 1615.28   |   |    |
| Capacity                                       | 928.40 | 840.09 | 1073.43 | 1616.78   |   |    | 909.66 | 840.09 | 1074.94 | 1615.28   |   |    |

## Critical Headway and Follow-Up Headway

| Approach                                       | N    |      |      | E (Major) |      |    | S    |      |      | W (Major) |      |    |
|------------------------------------------------|------|------|------|-----------|------|----|------|------|------|-----------|------|----|
| Movement                                       | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 |
| tc, base, Base Critical Headway                | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc, base, I, Base Critical Headway (Stage I)   |      |      |      |           |      |    |      |      |      |           |      |    |
| tc, base, II, Base Critical Headway (Stage II) |      |      |      |           |      |    |      |      |      |           |      |    |
| tc, HV, Heavy Vehicles Adjustment Factor       | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    |
| Phv, % Heavy Vehicles                          | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc, G, Grade Adjustment Factor                 | 0.20 | 0.20 | 0.10 | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |      |    |
| G, % Grade                                     |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |
| T3, ft, Geometry Adjustment Factor             | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc, I, Critical Headway                        | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc, I, Critical Headway (Stage I)              |      |      |      |           |      |    |      |      |      |           |      |    |
| tc, II, Critical Headway (Stage II)            |      |      |      |           |      |    |      |      |      |           |      |    |
| If, base, Base Follow-Up Headway               | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |
| If, hv, Heavy Vehicles Adjustment Factor       | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    |
| If, Follow-Up Headway                          | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |

## Delay and Level of Service by Movement

| Approach             | N      |        |         | E (Major) |       |      | S      |        |         | W (Major) |      |      |
|----------------------|--------|--------|---------|-----------|-------|------|--------|--------|---------|-----------|------|------|
| Movement             | L1     | T      | R1      | L1        | T     | R1   | L1     | T      | R1      | L1        | T    | R1   |
| vx, Volume           | 6.67   | 23.33  | 5.56    | 5.56      | 10.00 | 5.56 | 5.56   | 11.11  | 5.56    | 5.56      | 8.89 | 5.56 |
| cmx, Capacity        | 928.40 | 840.09 | 1073.43 | 1616.78   |       |      | 909.66 | 840.09 | 1074.94 | 1615.28   |      |      |
| V / C                | 0.01   | 0.03   | 0.01    | 0.00      |       |      | 0.01   | 0.01   | 0.01    | 0.00      |      |      |
| d, Delay             | 9.05   | 9.46   | 8.52    | 7.23      |       |      | 9.06   | 9.38   | 8.45    | 7.24      |      |      |
| LOS                  | A      | A      | A       | A         |       |      | A      | A      | A       | A         |      |      |
| dA, Approach Delay   |        | 9.23   |         |           | 1.90  |      |        | 9.07   |         |           | 2.01 |      |
| Approach LOS         |        | A      |         |           |       |      |        | A      |         |           |      |      |
| dRank1, Rank 1 Delay |        |        |         |           | 0.03  |      |        |        |         |           | 0.03 |      |

## Delay and Level of Service by Lane

| Approach              | N         | E (Major) | S         | W (Major) |
|-----------------------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 35.56     | 21.11     | 22.22     | 20.00     |
| Flared Storage Size   |           |           |           |           |
| cmx, Capacity         | 885.99    | 1616.78   | 909.97    | 1615.28   |
| V / C                 | 0.04      | 0.01      | 0.02      | 0.01      |
| Q95, 95% Queue Length | 0.13      | 0.01      | 0.08      | 0.01      |
| d, Delay              | 9.23      | 7.23      | 9.07      | 7.24      |
| LOS                   | A         | A         | A         | A         |
| dA, Approach Delay    | 9.23      | 1.90      | 9.07      | 2.01      |
| Approach LOS          | A         |           | A         |           |

## Intersection Capacity Analysis Summary Page

Analysis Time: Fri Sep 27 12:46:32 21  
 Driving Side: Right  
 Analysis Period: 1 Hours

| Number | Name                       | Control Type | V/C  | Avg Delay | Avg LOS | Max Delay | Max LOS |
|--------|----------------------------|--------------|------|-----------|---------|-----------|---------|
| 2030   | College & Whitman          | Signalized   | 0.59 | 35.15     | D       | 66.63     | E       |
| 2031   | N College & SE 3rd St.     | TWSC         | 0.00 | 1.16      | A       | 15.62     | C       |
| 2032   | S College Ave & SW 4th St  | Signalized   | 0.82 | 50.27     | D       | 91.25     | F       |
| 2033   | S College Ave & SE 6th St  | TWSC         | 0.00 | 1.93      | A       | 17.23     | C       |
| 2034   | S College Ave & SE 8th St  | TWSC         | 0.00 | 1.79      | A       | 17.15     | C       |
| 2035   | S College Ave & SE 10th St | TWSC         | 0.00 | 1.30      | A       | 24.08     | C       |
| 2036   | S College Ave & SE 12th St | Signalized   | 0.73 | 25.43     | C       | 50.03     | D       |
| 2037   | S College and 13th 13th St | TWSC         | 0.00 | 0.32      | A       | 15.34     | C       |
| 2038   | S College Ave & Lampert    | Signalized   | 0.73 | 25.83     | C       | 41.12     | D       |
| 2039   | SE 3rd & Ash Ave           | TWSC         | 0.00 | 9.19      | A       | 11.27     | B       |

1CAWAYMPO 2040 AM 02-27-19,xxx-xxxx-xxxx-xxxx

## Node 2031: N College &amp; SE 3rd St.

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 1.16  
 Worst Case Delay 15.62  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 177.00 | 5.00  | 7.00  | 5.00  | 6.00  | 6.00      | 221.00 | 19.00 | 5.00  | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 |
| V, Adjusted Volume    | 7.69      | 272.31 | 7.69  | 10.77 | 7.69  | 9.23  | 9.23      | 340.00 | 29.23 | 7.69  | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 10.77  | 7.69   | 9.23   | 9.23      |   |    | 7.69   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       | 369.23    |   |    | 672.31 | 668.46 | 354.62 | 280.00    |   |    | 673.08 | 679.23 | 276.15 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 369.23    |   |    | 672.31 | 668.46 | 354.62 | 280.00    |   |    | 673.08 | 679.23 | 276.15 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpk, Potential Capacity                        | 1200.41   |   |    | 372.06 | 381.43 | 683.79 | 1294.24   |   |    | 371.62 | 376.06 | 767.45 |
| Capacity                                       | 1200.41   |   |    | 357.93 | 375.13 | 693.79 | 1294.24   |   |    | 356.40 | 369.84 | 767.45 |

## Critical Headway and Follow Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                       | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3, It, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |      |    |      |      |      |
| lf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| lf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| lf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 7.69      | 272.31 | 7.69 | 10.77  | 7.69   | 9.23   | 9.23      | 340.00 | 29.23 | 7.69   | 7.69   | 7.69   |
| cmx, Capacity        | 1200.41   |        |      | 357.93 | 375.13 | 693.79 | 1294.24   |        |       | 356.40 | 369.84 | 767.45 |
| V / C                | 0.01      |        |      | 0.03   | 0.02   | 0.01   | 0.01      |        |       | 0.02   | 0.02   | 0.01   |
| d, Delay             | 8.02      |        |      | 15.62  | 15.16  | 10.76  | 7.80      |        |       | 15.55  | 15.19  | 10.14  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.21   |      |        | 13.87  |        |           | 0.19   |       |        | 13.63  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        |           | E      |        |        | S (Major) |        |        | W      |        |        |
|-----------------------|-----------|--------|-----------|--------|--------|--------|-----------|--------|--------|--------|--------|--------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1 | Lane 2 | Lane 1 | Lane 1    | Lane 2 | Lane 1 | Lane 1 | Lane 2 | Lane 1 |
| Movements             | T, R1     | T, R1  | L1, T, R1 | T, R1  | T, R1  | T, R1  | T, R1     | T, R1  | T, R1  | T, R1  | T, R1  | T, R1  |
| vx, Volume            | 7.69      | 280.00 | 27.69     | 9.23   | 369.23 | 23.08  |           |        |        |        |        |        |
| Flared Storage Size   |           |        |           |        |        |        |           |        |        |        |        |        |
| cmx, Capacity         |           |        | 433.38    |        |        | 440.35 |           |        |        |        |        |        |
| V / C                 |           |        | 0.06      |        |        | 0.05   |           |        |        |        |        |        |
| Q95, 95% Queue Length |           |        | 0.20      |        |        | 0.17   |           |        |        |        |        |        |
| d, Delay              |           |        | 13.87     |        |        | 13.63  |           |        |        |        |        |        |
| LOS                   |           |        | B         |        |        | B      |           |        |        |        |        |        |
| dA, Approach Delay    |           | 0.21   | 13.87     |        | 0.19   | 13.63  |           |        |        |        |        |        |
| Approach LOS          |           |        | B         |        |        | B      |           |        |        |        |        |        |

NOON TIDE S. C. 4-24 Apr 5. NW 40. 50

|               |                 |
|---------------|-----------------|
| Control Type  | Signalized      |
| Method        | HCM d'n Edition |
| Average Delay | 30.27           |
| Average LOS   | D               |
| V/C           | 0.82            |
| Lost Time     | 10              |

Video Analysis made by Moveworks

|                   | N     |       | Z     |       | S     |       | W     |       |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Movement          | L1    | R1    | L1    | R1    | L1    | R1    | L1    | R1    |
| Base Volume       | 10    | 160   | 18    | 65    | 37    | 254   | 47    | 58    |
| Prof. requirement | 0.060 | 0.050 | 0.060 | 0.050 | 0.060 | 0.050 | 0.060 | 0.050 |
| Peak to Volume    | 4     | 13    | 24    | 37    | 3     | 64    | 16    | 22    |
| Aquired Volume    | 23    | 225   | 28    | 100   | 110   | 124   | 121   | 112   |

Version 3.0.4, 2014-04-14 by Luvu Group

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## 54227-574X26

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#### **Capacity, Control, Causality, and Level of Service Determinations**

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Page 2 of 4

[illegible]

**Sigrid Thorsen** *Wien, Ö*

[illegible]

### Let's Run and Measure Your Feet for Perfect Fit

|                                  | V       |         |         |         | W       |         |         |         |
|----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                  | 1371154 | 1371154 | 1371155 | 1371155 | 1371160 | 1371160 | 1371165 | 1371165 |
|                                  | Prod    | 20x L4P | Prod    | 20x L4P | Prod    | 20x L4P | Prod    | 20x L4P |
| Line Width                       |         |         |         |         |         |         |         |         |
| Channel Type                     |         |         |         |         |         |         |         |         |
| Substrate Kind (W or M)          |         |         |         |         |         |         |         |         |
| Operating Temp (W or M)          |         |         |         |         |         |         |         |         |
| C. Chip Length                   |         |         |         |         |         |         |         |         |
| Ch. Actual GT                    |         |         |         |         |         |         |         |         |
| W. GT                            |         |         |         |         |         |         |         |         |
| W. GT                            |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing       |         |         |         |         |         |         |         |         |
| No. Interlines                   |         |         |         |         |         |         |         |         |
| W. L. Ag. LT                     |         |         |         |         |         |         |         |         |
| W. L. Ag. LT                     |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line Group    |         |         |         |         |         |         |         |         |
| PLT. Proportion in Opposing      |         |         |         |         |         |         |         |         |
| LT Value per Cycle               |         |         |         |         |         |         |         |         |
| No. Opposing Pairs               |         |         |         |         |         |         |         |         |
| No. Interlines in Opposing Pairs |         |         |         |         |         |         |         |         |
| No. Opposing Line Utilization    |         |         |         |         |         |         |         |         |
| No. Opposing Pairs Ratio         |         |         |         |         |         |         |         |         |
| PLT. Proportion in Line          |         |         |         |         |         |         |         |         |

### Principles of the Design Process

[illegible]

### Appendix 2: Study 2

**Abstract**

### Future research



## Node 2033: S College Ave &amp; SE 6th St

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 1.93  
 Worst Case Delay 17.23  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
|                       | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Movement              |           |        |       |       |       |       |           |        |       |       |       |       |
| Base Volume           | 5.00      | 168.00 | 5.00  | 5.00  | 5.00  | 8.00  | 5.00      | 248.00 | 7.00  | 22.00 | 12.00 | 5.00  |
| PHF, Peak-hour factor | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 |
| V, Adjusted Volume    | 7.69      | 258.46 | 7.69  | 7.69  | 7.69  | 12.31 | 7.69      | 383.08 | 10.77 | 33.85 | 18.46 | 7.69  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
|                          | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| Movement                 |           |   |    |       |       |       |           |   |    |       |       |       |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
|                                                | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Movement                                       |           |   |    |        |        |        |           |   |    |        |        |        |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 12.31  | 7.69      |   |    | 33.85  | 18.46  | 7.69   |
| Conflicting Volume (Veh)                       | 393.85    |   |    | 694.62 | 685.38 | 388.46 | 268.15    |   |    | 691.54 | 686.92 | 262.31 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 393.85    |   |    | 694.62 | 685.38 | 388.46 | 268.15    |   |    | 691.54 | 686.92 | 262.31 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpv, Potential Capacity                        | 1175.69   |   |    | 359.50 | 373.01 | 664.16 | 1309.41   |   |    | 361.21 | 372.26 | 781.20 |
| Capacity                                       | 1175.69   |   |    | 338.34 | 367.35 | 664.16 | 1309.41   |   |    | 344.83 | 366.61 | 781.20 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
|                                                | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| Movement                                       |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3, II, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |   |    |      |      |      |
| tf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
|                      | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| Movement             |           |        |      |        |        |        |           |        |       |        |        |        |
| vx, Volume           | 7.69      | 258.46 | 7.69 | 7.69   | 7.69   | 12.31  | 7.69      | 383.08 | 10.77 | 33.85  | 18.46  | 7.69   |
| cmx, Capacity        | 1175.69   |        |      | 338.34 | 367.36 | 664.16 | 1309.41   |        |       | 344.83 | 366.61 | 781.20 |
| V / C                | 0.01      |        |      | 0.02   | 0.02   | 0.02   | 0.01      |        |       | 0.10   | 0.05   | 0.01   |
| d, Delay             | 8.08      |        |      | 16.18  | 15.34  | 10.98  | 7.77      |        |       | 17.23  | 16.61  | 11.39  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.23   |      |        | 13.62  |        |           | 0.15   |       |        | 16.29  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E      |        | S (Major) |        | W      |        |
|-----------------------|-----------|--------|--------|--------|-----------|--------|--------|--------|
|                       | Lane 1    | Lane 2 | Lane 1 | Lane 1 | Lane 2    | Lane 1 | Lane 1 | Lane 1 |
| Lane                  |           |        |        |        |           |        |        |        |
| Movements             |           |        |        |        |           |        |        |        |
| vx, Volume            | 7.69      | 266.15 | 27.69  | 7.69   | 393.85    | 60.00  |        |        |
| Flared Storage Size   |           |        |        |        |           |        |        |        |
| cmx, Capacity         |           |        | 445.17 |        |           | 378.89 |        |        |
| V / C                 |           |        | 0.06   |        |           | 0.16   |        |        |
| Q95, 95% Queue Length |           |        | 0.20   |        |           | 0.56   |        |        |
| d, Delay              |           |        | 13.62  |        |           | 16.29  |        |        |
| LOS                   |           |        | B      |        |           | C      |        |        |
| dA, Approach Delay    |           | 0.23   | 13.62  |        | 0.15      | 16.29  |        |        |
| Approach LOS          |           |        | B      |        |           | C      |        |        |

## Node 2034: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.79  
 Worst Case Delay 17.15  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 162.00 | 5.00  | 10.00 | 5.00  | 10.00 | 12.00     | 253.00 | 13.00 | 8.00  | 6.00  | 17.00 |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 249.23 | 7.69  | 15.38 | 7.69  | 15.38 | 18.46     | 389.23 | 20.00 | 12.31 | 9.23  | 26.15 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fbp, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 15.38  | 7.69   | 15.38  | 18.46     |   |    | 12.31  | 9.23   | 26.15  |
| Conflicting Volume (Veh)                       | 409.23    |   |    | 722.31 | 708.46 | 399.23 | 256.92    |   |    | 716.15 | 714.62 | 253.08 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 409.23    |   |    | 722.31 | 708.46 | 399.23 | 256.92    |   |    | 716.15 | 714.62 | 253.08 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| capx, Potential Capacity                       | 1160.49   |   |    | 344.48 | 361.81 | 654.98 | 1319.62   |   |    | 347.76 | 358.88 | 790.50 |
| Capacity                                       | 1160.49   |   |    | 319.98 | 352.49 | 654.98 | 1319.62   |   |    | 327.40 | 349.64 | 790.50 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3,It, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| If,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| If,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| If, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 7.69      | 249.23 | 7.69 | 15.38  | 7.69   | 15.38  | 18.46     | 389.23 | 20.00 | 12.31  | 9.23   | 26.15  |
| cmx, Capacity        | 1160.49   |        |      | 319.98 | 352.49 | 654.98 | 1319.62   |        |       | 327.40 | 349.64 | 790.50 |
| V / C                | 0.01      |        |      | 0.05   | 0.02   | 0.02   | 0.01      |        |       | 0.04   | 0.03   | 0.03   |
| d, Delay             | 8.12      |        |      | 17.15  | 18.11  | 11.40  | 7.77      |        |       | 16.78  | 16.08  | 10.34  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.24   |      |        | 14.64  |        |           | 0.34   |       |        | 13.12  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E      | S (Major) |        | W      |
|-----------------------|-----------|--------|--------|-----------|--------|--------|
| Lane                  | Lane 1    | Lane 2 | Lane 1 | Lane 1    | Lane 2 | Lane 1 |
| Movements             | T, R1     | T, R1  | T, R1  | T, R1     | T, R1  | T, R1  |
| vx, Volume            | 7.69      | 256.92 | 38.46  | 18.46     | 409.23 | 47.69  |
| Flared Storage Size   |           |        |        |           |        |        |
| cmx, Capacity         |           |        | 411.83 |           |        | 491.28 |
| V / C                 |           |        | 0.09   |           |        | 0.10   |
| Q95, 95% Queue Length |           |        | 0.31   |           |        | 0.32   |
| d, Delay              |           |        | 14.64  |           |        | 13.12  |
| LOS                   |           |        | B      |           |        | B      |
| dA, Approach Delay    |           | 0.24   | 14.64  |           | 0.34   | 13.12  |
| Approach LOS          |           |        | B      |           |        | B      |

## Node 2035: S College Ave &amp; SE 10th St

Control Type TWSC  
 Method HCM 6th Edition  
 df, Average Delay 1.3  
 Worst Case Delay 24.08  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 269.00 | 5.00  | 5.00  | 5.00  | 5.00  | 5.00      | 355.00 | 5.00  | 9.00  | 5.00  | 15.00 |
| PHF, Peak-hour factor | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 |
| V, Adjusted Volume    | 7.69      | 413.85 | 7.69  | 7.69  | 7.69  | 7.69  | 9.23      | 546.15 | 7.69  | 13.85 | 7.69  | 23.08 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E       |         |        | S (Major) |   |    | W       |         |        |
|------------------------------------------------|-----------|---|----|---------|---------|--------|-----------|---|----|---------|---------|--------|
| Movement                                       | L1        | T | R1 | L1      | T       | R1     | L1        | T | R1 | L1      | T       | R1     |
| Rank                                           | 2         | 1 | 1  | 4       | 3       | 2      | 2         | 1 | 1  | 4       | 3       | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69    | 7.69    | 7.69   | 9.23      |   |    | 13.85   | 7.69    | 23.08  |
| Conflicting Volume (Veh)                       | 553.85    |   |    | 1016.92 | 1005.38 | 550.00 | 421.54    |   |    | 1009.23 | 1005.38 | 417.69 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00    | 0.00    | 0.00   | 0.00      |   |    | 0.00    | 0.00    | 0.00   |
| Conflicting Volume                             | 553.85    |   |    | 1016.92 | 1005.38 | 550.00 | 421.54    |   |    | 1009.23 | 1005.38 | 417.69 |
| Two-Stage Gap Acceptance                       |           |   |    | No      | No      |        |           |   |    | No      | No      |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |         |         |        |           |   |    |         |         |        |
| cpv, Potential Capacity                        | 1026.51   |   |    | 217.95  | 243.28  | 538.65 | 1148.47   |   |    | 220.59  | 243.28  | 639.54 |
| Capacity                                       | 1026.51   |   |    | 201.59  | 238.09  | 538.65 | 1148.47   |   |    | 208.65  | 238.09  | 639.54 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                       | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| lc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| lc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| lc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| lc, HV, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| lc, G, Grade Adjustment Factor                 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3, II, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| lc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| lc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |      |    |      |      |      |
| lc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |      |    |      |      |      |
| If, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| If, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| If, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| vx, Volume           | 7.69      | 413.85 | 7.69 | 7.69   | 7.69   | 7.69   | 9.23      | 546.15 | 7.69 | 13.85  | 7.69   | 23.08  |
| cmv, Capacity        | 1026.51   |        |      | 201.59 | 238.09 | 538.65 | 1148.47   |        |      | 208.65 | 238.09 | 639.54 |
| V / C                | 0.01      |        |      | 0.04   | 0.03   | 0.01   | 0.01      |        |      | 0.07   | 0.03   | 0.04   |
| d, Delay             | 8.53      |        |      | 24.08  | 21.34  | 12.91  | 8.16      |        |      | 23.95  | 21.81  | 12.32  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |      | C      | C      | B      |
| dA, Approach Delay   |           | 0.15   |      |        | 19.44  |        |           | 0.13   |      |        | 17.56  |        |
| Approach LOS         |           |        |      |        | C      |        |           |        |      |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        |           | E      |        |        | S (Major) |        |        | W      |        |           |
|-----------------------|-----------|--------|-----------|--------|--------|--------|-----------|--------|--------|--------|--------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1 | Lane 2 | Lane 1 | Lane 1    | Lane 2 | Lane 1 | Lane 1 | Lane 2 | Lane 1    |
| Movements             |           | T, R1  | L1, T, R1 |        |        |        |           | T, R1  |        |        |        | L1, T, R1 |
| vx, Volume            | 7.69      | 421.54 | 23.08     |        |        |        | 9.23      | 553.85 |        |        |        | 44.62     |
| Planned Storage Size  |           |        |           |        |        |        |           |        |        |        |        |           |
| cmv, Capacity         |           |        | 272.30    |        |        |        |           |        |        |        |        | 331.09    |
| V / C                 |           |        | 0.08      |        |        |        |           |        |        |        |        | 0.13      |
| Q95, 95% Queue Length |           |        | 0.28      |        |        |        |           |        |        |        |        | 0.47      |
| d, Delay              |           |        | 19.44     |        |        |        |           |        |        |        |        | 17.56     |
| LOS                   |           |        | C         |        |        |        |           |        |        |        |        | C         |
| dA, Approach Delay    |           | 0.15   | 19.44     |        |        |        | 0.13      |        |        |        |        | 17.56     |
| Approach LOS          |           |        | C         |        |        |        |           |        |        |        |        | C         |

Node 0706: S College Ave @ SE 17th St

Control Type  
 Signalized  
 Average Delay  
 25.43  
 Average LOS  
 C  
 V/C  
 0.73  
 Lost Time  
 21

Signalized  
 h-Cat 10/15/2000  
 25.43  
 C  
 0.73  
 21

Volume and Adjustments by Movement

| Approach         | L1  | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   |
|------------------|-----|------|------|------|------|------|------|------|------|------|------|------|
| Approach         | 40  | 217  | 8    | 36   | 18   | 63   | 12   | 282  | 51   | 12   | 78   | 17   |
| Base Volume      | 800 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Peak Hour Volume | 17  | 88   | 2    | 15   | 7    | 24   | 5    | 112  | 20   | 5    | 30   | 7    |
| Adjusted Volume  | 49  | 334  | 0    | 58   | 23   | 47   | 18   | 442  | 78   | 16   | 109  | 24   |

Volume and Adjustments by Lane Group

| Lane Group                     | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Adjustment Factors

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Capacity, Control Delay, and Level of Service Determination

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Level of Service

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Signal Timing Determination

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Level of Service Determination

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Level of Service Determination

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Adjusted Delay

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Adjusted Delay

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Adjusted Delay

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Adjusted Delay

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

Adjusted Delay

| Approach                       | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Lane Group                     | 137161 | 137162 | 137163 | 137164 | 137165 | 137166 | 137167 | 137168 | 137169 | 137170 | 137171 | 137172 |
| Control Type                   | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    | Prd    |
| V. Volume                      | 88     | 545    | 28     | 125    | 18     | 528    | 18     | 165    | 18     | 165    | 18     | 165    |
| P.T. Proportion of Lane Groups | 1.00   | 1.00   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   | 1.00   | 0.60   |
| P.T. Proportion of Lane Groups | 0.00   | 0.00   | 0.00   | 0.78   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   | 0.00   | 0.15   |

## Node 2037: S College and 13th/13th St

|                   |                 |
|-------------------|-----------------|
| Control Type      | TWSC            |
| Method            | HCM 5th Edition |
| dI, Average Delay | 0.32            |
| Worst Case Delay  | 15.34           |
| Worst Case LOS    | C               |

## Volume and Adjustments

| Approach              | N (Major) |       | S (Major) |        | W     |       |
|-----------------------|-----------|-------|-----------|--------|-------|-------|
|                       | T         | R1    | L1        | T      | L1    | R1    |
| Movement              |           |       |           |        |       |       |
| Base Volume           | 193.00    | 5.00  | 5.00      | 311.00 | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 |
| V, Adjusted Volume    | 296.92    | 7.69  | 7.69      | 478.46 | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |    | S (Major) |   | W     |       |
|--------------------------|-----------|----|-----------|---|-------|-------|
|                          | T         | R1 | L1        | T | L1    | R1    |
| Movement                 |           |    |           |   |       |       |
| vx, Flow (Ped/hr)        |           |    | 0.00      |   | 0.00  | 0.00  |
| w, Lane Width (ft)       |           |    | 12.00     |   | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) |           |    | 3.50      |   | 3.50  | 3.50  |
| fpb, Percent Blockage    |           |    | 0.00      |   | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |    | S (Major) |   | W      |        |
|------------------------------------------------|-----------|----|-----------|---|--------|--------|
|                                                | T         | R1 | L1        | T | L1     | R1     |
| Movement                                       |           |    |           |   |        |        |
| Rank                                           | 1         | 1  | 2         | 1 | 3      | 2      |
| vx, Volume                                     |           |    | 7.69      |   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       |           |    | 304.62    |   | 794.62 | 300.77 |
| Conflicting Volume (Ped)                       |           |    | 0.00      |   | 0.00   | 0.00   |
| Conflicting Volume                             |           |    | 304.62    |   | 794.62 | 300.77 |
| Two-Stage Gap Acceptance                       |           |    |           |   | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |    |           |   |        |        |
| cpx, Potential Capacity                        |           |    | 1267.68   |   | 359.53 | 743.57 |
| Capacity                                       |           |    | 1267.68   |   | 356.56 | 743.57 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      | S (Major) |   | W    |      |
|----------------------------------------------|-----------|------|-----------|---|------|------|
|                                              | T         | R1   | L1        | T | L1   | R1   |
| Movement                                     |           |      |           |   |      |      |
| tc,base, Base Critical Headway               |           |      | 4.10      |   | 7.10 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |           |   |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |           |   |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      |           |      | 1.00      |   | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        |           |      | 0.00      |   | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                |           |      | 1.00      |   | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 | 0.00      |   | 0.00 |      |
| T3,II, Geometry Adjustment Factor            |           |      | 0.00      |   | 0.70 | 0.00 |
| tc, Critical Headway                         |           |      | 4.10      |   | 6.40 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |           |   |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |           |   |      |      |
| tf,base, Base Follow-Up Headway              |           |      | 2.20      |   | 3.50 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      |           |      | 0.90      |   | 0.90 | 0.90 |
| tf, Follow-Up Headway                        |           |      | 2.20      |   | 3.50 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |      | S (Major) |        | W      |        |
|----------------------|-----------|------|-----------|--------|--------|--------|
|                      | T         | R1   | L1        | T      | L1     | R1     |
| Movement             |           |      |           |        |        |        |
| vx, Volume           | 296.92    | 7.69 | 7.69      | 478.46 | 7.69   | 7.69   |
| cmx, Capacity        |           |      | 1267.68   |        | 356.56 | 743.57 |
| V / C                |           |      | 0.01      |        | 0.02   | 0.01   |
| d, Delay             |           |      | 7.85      |        | 15.34  | 10.09  |
| LOS                  |           |      | A         |        | C      | B      |
| dA, Approach Delay   |           | 0.00 |           | 0.12   |        | 12.72  |
| Approach LOS         |           |      |           |        |        | B      |
| dRank1, Rank 1 Delay |           | 0.00 |           | 0.06   |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) | S (Major) | W      |
|-----------------------|-----------|-----------|--------|
|                       | Lane 1    | Lane 1    | Lane 1 |
| Movements             | T, R1     | L1, T     | L1, R1 |
| vx, Volume            | 304.62    | 486.15    | 15.38  |
| Flared Storage Size   |           |           |        |
| cmx, Capacity         |           | 1267.68   | 481.99 |
| V / C                 |           | 0.38      | 0.03   |
| Q95, 95% Queue Length |           | 0.02      | 0.10   |
| d, Delay              |           | 7.86      | 12.72  |
| LOS                   |           |           | B      |
| dA, Approach Delay    |           | 0.00      | 12.72  |
| Approach LOS          |           |           | B      |

| Node 2220, 5 Channels, 6 Layers |                  |
|---------------------------------|------------------|
| Control Type                    | Signalized       |
| Method                          | MCU with Section |
| Average Delay                   | 75.63            |
| Average LOS                     | C                |
| V/C                             | 0.73             |
| Loop Time                       | 16               |

| Values and Adjustments by Movement |       |       |       |       |       |       |       |       |       |       |       |       |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Appropriation                      | L     |       |       | E     |       |       | S     |       |       | W     |       |       |
| Movements                          | L1    | T     | R1    | L1    | T     | R1    | L1    | T     | R1    | L1    | T     | R1    |
| Base Volume                        | 779   | 302   | 10    | 58    | 13    | 23    | 244   | 55    | 47    | 71    | 71    | 71    |
| Base Volume Adjustments            | 0.650 | 0.900 | 0.650 | 0.650 | 0.650 | 0.650 | 0.650 | 0.900 | 0.650 | 0.650 | 0.650 | 0.650 |
| Peak 15 Volume                     | 30    | 118   | 4     | 29    | 7     | 30    | 5     | 98    | 21    | 18    | 27    | 18    |
| Adjusted Volume                    | 122   | 485   | 15    | 82    | 20    | 122   | 251   | 65    | 79    | 102   | 79    | 102   |

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## Keywords

## Node 2039: SE 3rd &amp; Ash Ave

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 9.19  
 Worst Case Delay 11.27  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N     |        |       | E (Major) |       |       | S     |        |       | W (Major) |       |       |
|-----------------------|-------|--------|-------|-----------|-------|-------|-------|--------|-------|-----------|-------|-------|
| Movement              | L1    | T      | R1    | L1        | T     | R1    | L1    | T      | R1    | L1        | T     | R1    |
| Base Volume           | 5.00  | 78.00  | 5.00  | 5.00      | 9.00  | 6.00  | 5.00  | 114.00 | 5.00  | 5.00      | 9.00  | 5.00  |
| PHF, Peak-hour factor | 0.850 | 0.850  | 0.850 | 0.850     | 0.850 | 0.850 | 0.850 | 0.850  | 0.850 | 0.850     | 0.850 | 0.850 |
| V, Adjusted Volume    | 7.69  | 120.00 | 7.69  | 7.69      | 13.85 | 9.23  | 7.69  | 175.38 | 7.69  | 7.69      | 13.85 | 7.69  |

## Pedestrians

| Approach                 | N     |       |       | E (Major) |   |    | S     |       |       | W (Major) |   |    |
|--------------------------|-------|-------|-------|-----------|---|----|-------|-------|-------|-----------|---|----|
| Movement                 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 |
| vx, Flow (Ped/hr)        | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |
| w, Lane Width (ft)       | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    |
| Sp, Walking Speed (ft/s) | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    |
| fpb, Percent Blockage    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |

## Capacity of Movements below Rank 1

| Approach                                       | N      |        |         | E (Major) |   |    | S      |        |         | W (Major) |   |    |
|------------------------------------------------|--------|--------|---------|-----------|---|----|--------|--------|---------|-----------|---|----|
| Movement                                       | L1     | T      | R1      | L1        | T | R1 | L1     | T      | R1      | L1        | T | R1 |
| Rank                                           | 4      | 3      | 2       | 2         | 1 | 1  | 4      | 3      | 2       | 1         | 1 | 1  |
| vx, Volume                                     | 7.69   | 120.00 | 7.69    | 7.69      |   |    | 7.69   | 175.38 | 7.69    | 7.69      |   |    |
| Conflicting Volume (Veh)                       | 158.46 | 70.77  | 18.46   | 21.54     |   |    | 130.77 | 71.54  | 17.89   | 23.08     |   |    |
| Conflicting Volume (Ped)                       | 0.00   | 0.00   | 0.00    | 0.00      |   |    | 0.00   | 0.00   | 0.00    | 0.00      |   |    |
| Conflicting Volume                             | 158.46 | 70.77  | 18.46   | 21.54     |   |    | 130.77 | 71.54  | 17.89   | 23.08     |   |    |
| Two-Stage Gap Acceptance                       | No     | No     |         |           |   |    | No     | No     |         |           |   |    |
| Number of Storage Spaces in Median Refuge Area |        |        |         |           |   |    |        |        |         |           |   |    |
| cpx, Potential Capacity                        | 811.96 | 823.59 | 1065.74 | 1607.24   |   |    | 848.33 | 822.80 | 1066.77 | 1605.18   |   |    |
| Capacity                                       | 687.73 | 815.62 | 1065.74 | 1607.24   |   |    | 740.01 | 814.83 | 1066.77 | 1605.18   |   |    |

## Critical Headway and Follow Up Headway

| Approach                                     | N    |      |      | E (Major) |      |    | S    |      |      | W (Major) |      |    |
|----------------------------------------------|------|------|------|-----------|------|----|------|------|------|-----------|------|----|
| Movement                                     | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 |
| tc,base, Base Critical Headway               | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc,base,I, Base Critical Headway (Stage I)   |      |      |      |           |      |    |      |      |      |           |      |    |
| tc,base,II, Base Critical Headway (Stage II) |      |      |      |           |      |    |      |      |      |           |      |    |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    |
| Phv, % Heavy Vehicles                        | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc,G, Grade Adjustment Factor                | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    |
| G, % Grade                                   |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |
| T3,IT, Geometry Adjustment Factor            | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc, Critical Headway                         | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc,I, Critical Headway (Stage I)             |      |      |      |           |      |    |      |      |      |           |      |    |
| tc,II, Critical Headway (Stage II)           |      |      |      |           |      |    |      |      |      |           |      |    |
| If,base, Base Follow-Up Headway              | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |
| If,hv, Heavy Vehicles Adjustment Factor      | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    |
| If, Follow-Up Headway                        | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |

## Delay and Level of Service by Movement

| Approach             | N      |        |         | E (Major) |       |      | S      |        |         | W (Major) |       |      |
|----------------------|--------|--------|---------|-----------|-------|------|--------|--------|---------|-----------|-------|------|
| Movement             | L1     | T      | R1      | L1        | T     | R1   | L1     | T      | R1      | L1        | T     | R1   |
| vx, Volume           | 7.69   | 120.00 | 7.69    | 7.69      | 13.85 | 9.23 | 7.69   | 175.38 | 7.69    | 7.69      | 13.85 | 7.69 |
| cmx, Capacity        | 667.73 | 815.62 | 1065.74 | 1607.24   |       |      | 740.01 | 814.83 | 1066.77 | 1605.18   |       |      |
| V / C                | 0.01   | 0.15   | 0.01    | 0.00      |       |      | 0.01   | 0.22   | 0.01    | 0.00      |       |      |
| d, Delay             | 11.27  | 10.29  | 9.25    | 7.25      |       |      | 11.20  | 10.75  | 9.71    | 7.25      |       |      |
| LOS                  | B      | B      | A       | A         |       |      | B      | B      | A       | A         |       |      |
| dA, Approach Delay   |        | 10.29  |         |           | 1.81  |      |        | 10.73  |         |           | 1.91  |      |
| Approach LOS         |        | B      |         |           |       |      |        | B      |         |           |       |      |
| dRank1, Rank 1 Delay |        |        |         |           | 0.04  |      |        |        |         |           | 0.04  |      |

## Delay and Level of Service by Lane

| Approach              | N         |           | E (Major) |           | S         |           | W (Major) |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 135.38    | 30.77     | 190.77    | 29.23     |           |           |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 816.23    | 1607.24   | 819.29    | 1605.18   |           |           |           |           |
| V / C                 | 0.17      | 0.02      | 0.23      | 0.02      |           |           |           |           |
| Q95, 95% Queue Length | 0.60      | 0.01      | 0.91      | 0.01      |           |           |           |           |
| d, Delay              | 10.29     | 7.25      | 10.73     | 7.25      |           |           |           |           |
| LOS                   | B         |           | B         |           |           |           |           |           |
| dA, Approach Delay    | 10.29     | 1.81      | 10.73     | 1.91      |           |           |           |           |
| Approach LOS          | B         |           | B         |           |           |           |           |           |

## Intersection Capacity Analysis Summary Page

Analysis Time: Wed Mar 11 11:13:19  
 Driving Side: Right  
 Analysis Period: 1 Hours

| Number | Name                       | Control Type | V/C  | Avg Delay | Avg LOS | Max Delay | Max LOS |
|--------|----------------------------|--------------|------|-----------|---------|-----------|---------|
| 2030   | College & Whitman          | Signalized   | 0.59 | 14.63     | B       | 15.82     | B       |
| 2031   | N College & SE 3rd St.     | TWSC         | 0.00 | 1.21      | A       | 15.54     | C       |
| 2032   | S College Ave & SW 4th St  | Signalized   | 0.78 | 15.45     | B       | 27.30     | C       |
| 2033   | S College Ave & SE 6th St  | TWSC         | 0.00 | 2.09      | A       | 17.17     | C       |
| 2034   | S College Ave & SE 8th St  | TWSC         | 0.00 | 1.67      | A       | 16.82     | C       |
| 2035   | S College Ave & SE 10th St | TWSC         | 0.00 | 1.29      | A       | 23.44     | C       |
| 2036   | S College Ave & SE 12th St | Signalized   | 0.51 | 10.87     | B       | 23.25     | C       |
| 2037   | S College and 13th 13th St | TWSC         | 0.00 | 0.32      | A       | 15.06     | C       |
| 2038   | S College Ave & Lampert    | Signalized   | 0.59 | 13.15     | B       | 23.18     | C       |
| 2039   | SE 3rd & Ash Ave           | TWSC         | 0.00 | 9.31      | A       | 11.60     | B       |





## Intersection Capacity Analysis Summary Page

Analysis Time: Wed Mar 11 11:13:19  
 Driving Side: Right  
 Analysis Period: 1 Hours

| Number | Name                       | Control Type | V/C  | Avg Delay | Avg LOS | Max Delay | Max LOS |
|--------|----------------------------|--------------|------|-----------|---------|-----------|---------|
| 2030   | College & Whitman          | Signalized   | 0.59 | 14.63     | B       | 15.82     | B       |
| 2031   | N College & SE 3rd St.     | TWSC         | 0.00 | 1.21      | A       | 15.54     | C       |
| 2032   | S College Ave & SW 4th St  | Signalized   | 0.78 | 15.45     | B       | 27.30     | C       |
| 2033   | S College Ave & SE 8th St  | TWSC         | 0.00 | 2.09      | A       | 17.17     | C       |
| 2034   | S College Ave & SE 8th St  | TWSC         | 0.00 | 1.67      | A       | 16.62     | C       |
| 2035   | S College Ave & SE 10th St | TWSC         | 0.00 | 1.29      | A       | 23.44     | C       |
| 2036   | S College Ave & SE 12th St | Signalized   | 0.51 | 10.87     | B       | 23.25     | C       |
| 2037   | S College and 13th 13th St | TWSC         | 0.00 | 0.32      | A       | 15.06     | C       |
| 2038   | S College Ave & Lampert    | Signalized   | 0.59 | 13.15     | B       | 23.18     | C       |
| 2039   | SE 3rd & Ash Ave           | TWSC         | 0.00 | 9.31      | A       | 11.60     | B       |

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| Approach                    | N     | E     | S     | W     |
|-----------------------------|-------|-------|-------|-------|
| Lane Group                  | C     | C     | C     | C     |
| IO                          | 19570 | 19669 | 19668 | 19571 |
| Leaves                      | LTR   | LTR   | LTR   | LTR   |
| Queue Type                  | Queue | Queue | Queue | Queue |
| V-Volume                    | 442   | 722   | 431   | 398   |
| PdT, Proportion Left Turns  | 0.04  | 0.55  | 0.10  | 0.22  |
| WdL, Proportion Right Turns | 0.23  | 0.13  | 0.19  | 0.12  |

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| Aspect of Queue             | N      | E      | S      | W      |
|-----------------------------|--------|--------|--------|--------|
| Aspects                     | 2      | 3      | 3      | 3      |
| Arrival Type                |        |        |        |        |
| Law of Queue                | 150/70 | 180/90 | 160/80 | 150/70 |
| Q1: Mean of Queue           | 0.45   | 0.62   | 0.45   | 0.42   |
| Q2: Standard Deviation      | 1.00   | 1.00   | 1.00   | 1.00   |
| Q3: Minimum of Queue        | 0.21   | 0.73   | 0.78   | 3.04   |
| Q4: Maximum of Queue        | 3.47   | 0.45   | 0.58   | 0.58   |
| Q5: Inter-arrival Time      | 0.00   | 0.00   | 0.00   | 0.00   |
| L: Expected Avg. Length     | 1.00   | 1.00   | 1.00   | 1.00   |
| W: Expected Avg. Delay      | 1.00   | 1.00   | 1.00   | 1.00   |
| Q: Average Queue of Queue   | 1.06   | 1.97   | 1.87   | 4.19   |
| WIP: W in Queue             | 1.09   | 1.60   | 1.76   | 1.80   |
| Q6: WIP in Queue Percentage | 95     | 91     | 99     | 90     |
| WIP: W out of Queue         | 0.62   | 3.76   | 7.79   | 7.58   |

| Aggregated Performance  |       |       |       |       |
|-------------------------|-------|-------|-------|-------|
| Aggregates              | H     | C     | S     | V     |
| Leaf-Node               | 16513 | 13599 | 16683 | 16774 |
| Internal Node           | 1666  | 1666  | 1666  | 1666  |
| Global Size             | 18    | 18    | 18    | 18    |
| C-Tree Size             | 60.00 | 60.00 | 60.00 | 60.00 |
| Q-Tree Size             | 0     | 0     | 0     | 0     |
| Leaf-Node Time (ms)     | 4.00  | 4.00  | 4.00  | 4.00  |
| Internal Node Time (ms) | 2.00  | 2.00  | 2.00  | 2.00  |
| Global Size Time (ms)   | 2.00  | 2.00  | 2.00  | 2.00  |
| C-Tree Size Time (ms)   | 2.00  | 2.00  | 2.00  | 2.00  |
| Q-Tree Size Time (ms)   | 0     | 0.0   | 0     | 0.0   |
| Leaf-Node Time (ms)     | 20.0  | 20.0  | 20.0  | 20.0  |
| Internal Node Time (ms) | 20.0  | 20.0  | 20.0  | 20.0  |
| Global Size Time (ms)   | 0.40  | 0.40  | 0.40  | 0.40  |
| C-Tree Size Time (ms)   | 0.15  | 0.15  | 0.15  | 0.15  |
| Q-Tree Size Time (ms)   | -     | -     | -     | -     |

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**Academy Award Nominees**

Accepted for publication 4 October 2004

## References

## Node 2031: N College &amp; SE 3rd St.

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.21  
 Worst Case Delay 15.54  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 7.00      | 172.00 | 5.00  | 7.00  | 5.00  | 6.00  | 6.00      | 218.00 | 19.00 | 5.00  | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 10.77     | 264.62 | 7.69  | 10.77 | 7.69  | 9.23  | 9.23      | 335.38 | 29.23 | 7.69  | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 10.77     |   |    | 10.77  | 7.69   | 9.23   | 9.23      |   |    | 7.69   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       | 364.62    |   |    | 666.15 | 662.31 | 350.00 | 272.31    |   |    | 666.92 | 673.08 | 268.46 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 364.62    |   |    | 666.15 | 662.31 | 350.00 | 272.31    |   |    | 666.92 | 673.08 | 268.46 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| capx, Potential Capacity                       | 1205.10   |   |    | 375.60 | 384.54 | 697.93 | 1302.65   |   |    | 375.16 | 379.12 | 775.06 |
| Capacity                                       | 1205.10   |   |    | 360.61 | 377.09 | 697.93 | 1302.65   |   |    | 359.07 | 371.78 | 775.06 |

## Critical Headway and Follow-Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3,II, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |   |    |      |      |      |
| If,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| If,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| If, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 10.77     | 264.62 | 7.69 | 10.77  | 7.69   | 9.23   | 9.23      | 335.38 | 29.23 | 7.69   | 7.69   | 7.69   |
| cmx, Capacity        | 1205.10   |        |      | 360.61 | 377.09 | 697.93 | 1302.65   |        |       | 359.07 | 371.78 | 775.06 |
| V / C                | 0.01      |        |      | 0.03   | 0.02   | 0.01   | 0.01      |        |       | 0.02   | 0.02   | 0.01   |
| d, Delay             | 8.01      |        |      | 15.54  | 15.11  | 10.72  | 7.78      |        |       | 15.47  | 15.13  | 10.09  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.30   |      |        | 13.81  |        |           | 0.19   |       |        | 13.56  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.08   |      |        |        |        |           | 0.07   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           |           | E         |           |           | S (Major) |           |           | W         |           |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 263.08    | 27.69     | 373.65    |           |           |           |           |           |           |           |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 1205.10   | 436.18    | 1302.65   |           |           |           |           |           |           |           |           |           |
| V / C                 | 0.23      | 0.06      | 0.29      |           |           |           |           |           |           |           |           |           |
| Q85, 95% Queue Length | 0.03      | 0.20      | 0.02      |           |           |           |           |           |           |           |           |           |
| d, Delay              | 8.01      | 13.81     | 7.78      |           |           |           |           |           |           |           |           |           |
| LOS                   |           | B         |           |           |           |           |           |           |           |           |           |           |
| dA, Approach Delay    | 0.30      | 13.81     | 0.19      |           |           |           |           |           |           |           |           |           |
| Approach LOS          |           | B         |           |           |           |           |           |           |           |           |           |           |

| July 2012, 8 Change Bits & 4040 Bit |               |             |
|-------------------------------------|---------------|-------------|
| Control Type                        | Control Type  | Signalers   |
| Method                              | Method        | ncwfm Robot |
| Average Delay                       | Average Delay | 15.45       |
| Average UGS                         | Average UGS   | 0           |
| V/C                                 | V/C           | 0.18        |
| Loss Time                           | Loss Time     | 8           |

| Values and Adjustments by Affected |       |       |       |       |       |       |       |       |       |       |       |  |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| Affected                           | N     | E     |       |       | S     |       |       | W     |       |       |       |  |
|                                    |       | R1    | R2    | R3    | R1    | R2    | R3    | R1    | R2    | R3    | R4    |  |
| Before 1990                        | 15    | 0.68  | 0.61  | 0.57  | 0.81  | 0.72  | 0.71  | 0.74  | 0.71  | 0.71  | 0.71  |  |
| Post 1990                          | 0.600 | 0.600 | 0.600 | 0.650 | 0.670 | 0.682 | 0.680 | 0.660 | 0.660 | 0.660 | 0.660 |  |
| Pre 1990                           | 6     | 71    | 7     | 23    | 37    | 33    | 34    | 36    | 15    | 23    | 7     |  |
| Adjusted Value                     | 39    | 75    | 28    | 94    | 140   | 75    | 134   | 97    | 100   | 02    | 114   |  |

| Variable                   | N     | E     | S     | W     |
|----------------------------|-------|-------|-------|-------|
| Age (years)                |       |       |       |       |
| C                          | C     | C     | C     | C     |
| AD                         | 19074 | 19073 | 19074 | 19075 |
| Length                     | 1.1R  | 1.1R  | 1.1R  | 1.1R  |
| Depth (m)                  | 9.0m  | 9.0m  | 9.0m  | 9.0m  |
| V. Volume                  | 325   | 264   | 611   | 123   |
| PdL (m) (depth) (m) (area) | 0.07  | 0.30  | 0.20  | 0.33  |
| PdL (m) (depth) (m) (area) | 0.08  | 0.03  | 0.21  | 0.07  |

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| Aspect of Disease     | N     | P     | SE    | W     |
|-----------------------|-------|-------|-------|-------|
| Attitude              | 1     | 2     | 3     | 4     |
| Learn to Cope         | 10574 | 10573 | 10572 | 10575 |
| Get Used to It        | 0.61  | 0.75  | 0.61  | 0.75  |
| Put Up With It        | 1.00  | 1.00  | 1.00  | 1.00  |
| Learn to Live With It | 1.81  | 3.21  | 4.60  | 7.11  |
| Get Used to It        | 0.25  | 0.85  | 1.76  | 0.43  |
| Learn to Live With It | 0.92  | 0.90  | 0.91  | 0.90  |
| Learn to Live With It | 1.00  | 1.00  | 1.00  | 1.00  |
| Learn to Live With It | 1.00  | 1.00  | 1.00  | 1.00  |
| Learn to Live With It | 1.06  | 1.64  | 2.68  | 2.52  |
| Learn to Live With It | 1.00  | 1.00  | 1.00  | 1.00  |
| Learn to Live With It | 0.9   | 0.5   | 0.6   | 0.1   |
| Learn to Live With It | 1.35  | 7.27  | 9.85  | 4.53  |

| Signal Timing Optimization       |       |       |       |       |
|----------------------------------|-------|-------|-------|-------|
| Algorithm                        | Y     | B     | S     | W     |
| Level of Sign                    | 15074 | 15173 | 14972 | 15075 |
| Control Type                     | Perm  | Perm  | Perm  | Perm  |
| Signal Type                      | P     | P     | P     | P     |
| C. Queue Length                  | 60.00 | 60.00 | 63.00 | 60.00 |
| Op. Movement per Green Time      | 0     | 0     | 0     | 0     |
| A. Total Lost Time per Cycle     | 4.00  | 4.00  | 4.00  | 4.00  |
| B. Start-up Lost Time            | 2.00  | 2.00  | 2.00  | 2.00  |
| HP. Permitted Start-up Lost Time | 4.00  | 2.00  | 2.00  | 2.00  |
| B. Green-up Loss Time            | 2.00  | 2.00  | 2.00  | 2.00  |
| Queue Time Loss                  | 0     | 0.00  | 0     | 0.00  |
| Queue Time Loss                  | 36.00 | 36    | 36.00 | 36    |
| C. Acceleration Time             | 36.0  | 35.1  | 36.0  | 35.1  |
| C. Effective Queue Time          | 36.0  | 35.1  | 36.0  | 35.1  |
| gC. Green Cycle                  | 0.61  | 0.20  | 0.61  | 0.25  |
| gC. Yellow Time                  | 0.22  | 0.19  | 0.43  | 0.14  |
| Control Cycle Time               |       |       |       |       |

| Get Time Acquisition Patterns for Personnel Processing |       |       |       |       |
|--------------------------------------------------------|-------|-------|-------|-------|
| Apparatus                                              | N     | E     | S     | W     |
| Lateral Motion                                         | 19374 | 19373 | 19372 | 19375 |
| Control Type                                           | Perim | Perim | Perim | Perim |
| Subplot = S(x,y,z) or M(x,y)                           | S     | S     | S     | S     |
| Operator = N(x,y,z) or M(x,y)                          | S     | S     | S     | S     |
| C. Operating                                           | 60.00 | 60.00 | 60.00 | 60.00 |
| Get - Initial GT                                       | 36.40 | 35.10 | 36.00 | 35.10 |
| Get - 2nd Get - 1st                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 3rd Get - 2nd                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 4th Get - 3rd                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 5th Get - 4th                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 6th Get - 5th                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 7th Get - 6th                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 8th Get - 7th                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 9th Get - 8th                                    | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 10th Get - 9th                                   | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 11th Get - 10th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 12th Get - 11th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 13th Get - 12th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 14th Get - 13th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 15th Get - 14th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 16th Get - 15th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 17th Get - 16th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 18th Get - 17th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 19th Get - 18th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 20th Get - 19th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 21st Get - 20th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 22nd Get - 21st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 23rd Get - 22nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 24th Get - 23rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 25th Get - 24th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 26th Get - 25th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 27th Get - 26th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 28th Get - 27th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 29th Get - 28th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 30th Get - 29th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 31st Get - 30th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 32nd Get - 31st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 33rd Get - 32nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 34th Get - 33rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 35th Get - 34th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 36th Get - 35th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 37th Get - 36th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 38th Get - 37th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 39th Get - 38th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 40th Get - 39th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 41st Get - 40th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 42nd Get - 41st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 43rd Get - 42nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 44th Get - 43rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 45th Get - 44th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 46th Get - 45th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 47th Get - 46th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 48th Get - 47th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 49th Get - 48th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 50th Get - 49th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 51st Get - 50th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 52nd Get - 51st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 53rd Get - 52nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 54th Get - 53rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 55th Get - 54th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 56th Get - 55th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 57th Get - 56th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 58th Get - 57th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 59th Get - 58th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 60th Get - 59th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 61st Get - 60th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 62nd Get - 61st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 63rd Get - 62nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 64th Get - 63rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 65th Get - 64th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 66th Get - 65th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 67th Get - 66th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 68th Get - 67th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 69th Get - 68th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 70th Get - 69th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 71st Get - 70th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 72nd Get - 71st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 73rd Get - 72nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 74th Get - 73rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 75th Get - 74th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 76th Get - 75th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 77th Get - 76th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 78th Get - 77th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 79th Get - 78th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 80th Get - 79th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 81st Get - 80th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 82nd Get - 81st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 83rd Get - 82nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 84th Get - 83rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 85th Get - 84th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 86th Get - 85th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 87th Get - 86th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 88th Get - 87th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 89th Get - 88th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 90th Get - 89th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 91st Get - 90th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 92nd Get - 91st                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 93rd Get - 92nd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 94th Get - 93rd                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 95th Get - 94th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 96th Get - 95th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 97th Get - 96th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 98th Get - 97th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 99th Get - 98th                                  | 36.00 | 35.10 | 36.00 | 35.10 |
| Get - 100th Get - 99th                                 | 36.00 | 35.10 | 36.00 | 35.10 |

[illegible]Atlantic Ocean, Portugal

Arbeitskreis „Glossar-Entwurf“

**Postscript**

## Node 2033: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 2.09  
 Worst Case Delay 17.17  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 159.00 | 5.00  | 5.00  | 5.00  | 8.00  | 5.00      | 249.00 | 7.00  | 26.00 | 12.00 | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 244.62 | 7.69  | 7.69  | 7.69  | 12.31 | 7.69      | 383.08 | 10.77 | 40.00 | 18.46 | 7.69  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 12.31  | 7.69      |   |    | 40.00  | 18.46  | 7.69   |
| Conflicting Volume (Veh)                       | 393.85    |   |    | 680.77 | 671.54 | 388.46 | 252.31    |   |    | 677.69 | 673.08 | 248.46 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 393.85    |   |    | 680.77 | 671.54 | 388.46 | 252.31    |   |    | 677.69 | 673.08 | 248.46 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cp, Potential Capacity                         | 1175.69   |   |    | 367.25 | 379.89 | 664.16 | 1324.76   |   |    | 368.99 | 379.12 | 795.19 |
| Capacity                                       | 1175.69   |   |    | 345.99 | 374.19 | 664.16 | 1324.76   |   |    | 352.41 | 373.43 | 795.19 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                       | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, hv, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3, lt, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |   |    |      |      |      |
| tf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 7.69      | 244.62 | 7.69 | 7.69   | 7.69   | 12.31  | 7.69      | 383.08 | 10.77 | 40.00  | 18.46  | 7.69   |
| cmx, Capacity        | 1175.69   |        |      | 345.99 | 374.19 | 664.16 | 1324.76   |        |       | 352.41 | 373.43 | 795.19 |
| V / C                | 0.01      |        |      | 0.02   | 0.02   | 0.02   | 0.01      |        |       | 0.11   | 0.05   | 0.01   |
| d, Delay             | 8.08      |        |      | 15.93  | 15.14  | 10.94  | 7.73      |        |       | 17.17  | 16.60  | 11.48  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.24   |      |        | 13.49  |        |           | 0.15   |       |        | 16.35  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.06   |      |        |        |        |           | 0.06   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           | E         | S (Major) |           | W         |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 260.00    | 27.69     | 401.54    | 66.15     |           |           |
| Flared Storage Size   |           |           |           |           |           |           |
| cmx, Capacity         | 1175.69   | 451.59    | 1324.76   | 383.24    |           |           |
| V / C                 | 0.22      | 0.06      | 0.30      | 0.17      |           |           |
| Q95, 95% Queue Length | 0.02      | 0.20      | 0.02      | 0.62      |           |           |
| d, Delay              | 8.08      | 13.49     | 7.73      | 16.35     |           |           |
| LOS                   |           | B         |           | C         |           |           |
| dA, Approach Delay    | 0.24      | 13.49     | 0.15      | 16.35     |           |           |
| Approach LOS          |           | B         |           | C         |           |           |

## Node 2034: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.67  
 Worst Case Delay 16.62  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 152.00 | 5.00  | 7.00  | 5.00  | 10.00 | 12.00     | 253.00 | 13.00 | 8.00  | 5.00  | 17.00 |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 233.85 | 7.69  | 10.77 | 7.69  | 15.38 | 18.46     | 389.23 | 20.00 | 12.31 | 7.69  | 26.15 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 10.77  | 7.69   | 15.38  | 18.46     |   |    | 12.31  | 7.69   | 26.15  |
| Conflicting Volume (Veh)                       | 409.23    |   |    | 706.15 | 693.08 | 399.23 | 241.54    |   |    | 700.77 | 699.23 | 237.69 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 409.23    |   |    | 706.15 | 693.08 | 399.23 | 241.54    |   |    | 700.77 | 699.23 | 237.69 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpv, Potential Capacity                        | 1160.49   |   |    | 353.17 | 369.24 | 654.98 | 1336.81   |   |    | 356.11 | 368.26 | 808.23 |
| Capacity                                       | 1160.49   |   |    | 329.58 | 359.85 | 654.98 | 1336.81   |   |    | 335.45 | 356.93 | 806.23 |

## Critical Headway and Follow-Up Headway

| Approach                                      | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|-----------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                      | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc, base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, base I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, hv, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Pliv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                    |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3, lt, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                          | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |   |    |      |      |      |
| tc II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |   |    |      |      |      |
| lf, base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| lf, hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| lf, Follow-Up Headway                         | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 7.69      | 233.85 | 7.69 | 10.77  | 7.69   | 15.38  | 18.46     | 389.23 | 20.00 | 12.31  | 7.69   | 26.15  |
| cmx, Capacity        | 1160.49   |        |      | 329.58 | 359.85 | 654.98 | 1336.81   |        |       | 335.45 | 356.93 | 806.23 |
| V / C                | 0.01      |        |      | 0.03   | 0.02   | 0.02   | 0.01      |        |       | 0.04   | 0.02   | 0.03   |
| d, Delay             | 6.12      |        |      | 16.62  | 15.70  | 11.19  | 7.73      |        |       | 16.44  | 15.79  | 10.17  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.25   |      |        | 13.94  |        |           | 0.33   |       |        | 12.78  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.06   |      |        |        |        |           | 0.14   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           | E         |           | S (Major) |           | W         |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 249.23    | 33.85     | 427.69    |           |           | 46.15     |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 1160.49   | 436.50    | 1336.81   |           |           | 508.97    |           |           |
| V / C                 | 0.21      | 0.08      | 0.32      |           |           | 0.09      |           |           |
| Q95, 95% Queue Length | 0.02      | 0.25      | 0.04      |           |           | 0.30      |           |           |
| d, Delay              | 8.12      | 13.94     | 7.73      |           |           | 12.78     |           |           |
| LOS                   |           | B         |           |           |           | B         |           |           |
| dA, Approach Delay    | 0.25      | 13.94     | 0.33      |           |           | 12.78     |           |           |
| Approach LOS          |           | B         |           |           |           | B         |           |           |

Node 2035: S College Ave & SE 10th St

Control Type TWSC  
Method HCM 6th Edition  
dI, Average Delay 1.29  
Worst Case Delay 23.44  
Worst Case LOS C

Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 258.00 | 5.00  | 5.00  | 5.00  | 5.00  | 6.00      | 355.00 | 5.00  | 9.00  | 5.00  | 15.00 |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 393.85 | 7.69  | 7.69  | 7.69  | 7.69  | 9.23      | 546.15 | 7.69  | 13.85 | 7.69  | 23.08 |

Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 7.69   | 9.23      |   |    | 13.85  | 7.69   | 23.08  |
| Conflicting Volume (Veh)                       | 553.85    |   |    | 996.92 | 985.38 | 550.00 | 401.54    |   |    | 989.23 | 985.38 | 397.69 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 553.85    |   |    | 996.92 | 985.38 | 550.00 | 401.54    |   |    | 989.23 | 985.38 | 397.69 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cp, Potential Capacity                         | 1026.51   |   |    | 224.88 | 249.94 | 538.65 | 1168.07   |   |    | 227.60 | 249.94 | 656.29 |
| Capacity                                       | 1026.51   |   |    | 208.39 | 244.69 | 538.65 | 1168.07   |   |    | 215.48 | 244.69 | 656.29 |

Critical Headway and Follow-Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3,II, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |   |    |      |      |      |
| tf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| vx, Volume           | 7.69      | 393.85 | 7.69 | 7.69   | 7.69   | 7.69   | 9.23      | 546.15 | 7.69 | 13.85  | 7.69   | 23.08  |
| cmx, Capacity        | 1026.51   |        |      | 208.39 | 244.69 | 538.65 | 1168.07   |        |      | 215.48 | 244.69 | 656.29 |
| V / C                | 0.01      |        |      | 0.04   | 0.03   | 0.01   | 0.01      |        |      | 0.06   | 0.03   | 0.04   |
| d, Delay             | 8.53      |        |      | 23.44  | 20.87  | 12.84  | 8.11      |        |      | 23.30  | 21.30  | 12.07  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |      | C      | C      | B      |
| dA, Approach Delay   |           | 0.16   |      |        | 19.05  |        |           | 0.13   |      |        | 17.15  |        |
| Approach LOS         |           |        |      |        | C      |        |           |        |      |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.08   |      |        |        |        |           | 0.09   |      |        |        |        |

Delay and Level of Service by Lane

| Approach              | N (Major) |           |           | E         |           |           | S (Major) |           |           | W         |           |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 409.23    | 23.08     | 563.08    |           |           |           |           |           |           |           |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 1026.51   | 279.28    | 1168.07   |           |           |           |           |           |           |           |           |           |
| V / C                 | 0.40      | 0.08      | 0.48      |           |           |           |           |           |           |           |           |           |
| Q95, 95% Queue Length | 0.02      | 0.27      | 0.02      |           |           |           |           |           |           |           |           |           |
| d, Delay              | 8.53      | 19.05     | 8.11      |           |           |           |           |           |           |           |           |           |
| LOS                   |           | C         |           |           |           |           |           |           |           |           |           |           |
| dA, Approach Delay    | 0.16      | 19.05     | 0.13      |           |           |           |           |           |           |           |           |           |
| Approach LOS          |           | C         |           |           |           |           |           |           |           |           |           |           |



10/11/2011 10:40 AM Removal LT and RT Lane 03-11-2011 2011-11-20 2011-11-20

## Node 2037: S College and 13th 13th St

|                   |                 |
|-------------------|-----------------|
| Control Type      | TWSC            |
| Method            | HCM 6th Edition |
| dI, Average Delay | 0.32            |
| Worst Case Delay  | 15.06           |
| Worst Case LOS    | C               |

## Volume and Adjustments

| Approach              | N (Major) |       | S (Major) |        | W     |       |
|-----------------------|-----------|-------|-----------|--------|-------|-------|
|                       | T         | R1    | L1        | T      | L1    | R1    |
| Movement              |           |       |           |        |       |       |
| Base Volume           | 176.00    | 5.00  | 5.00      | 315.00 | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 |
| V, Adjusted Volume    | 270.77    | 7.69  | 7.69      | 484.62 | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |    | S (Major) |   | W     |       |
|--------------------------|-----------|----|-----------|---|-------|-------|
|                          | T         | R1 | L1        | T | L1    | R1    |
| Movement                 |           |    |           |   |       |       |
| vx, Flow (Ped/hr)        |           |    | 0.00      |   | 0.00  | 0.00  |
| w, Lane Width (ft)       |           |    | 12.00     |   | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) |           |    | 3.50      |   | 3.50  | 3.50  |
| fpb, Percent Blockage    |           |    | 0.00      |   | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |    | S (Major) |   | W      |        |
|------------------------------------------------|-----------|----|-----------|---|--------|--------|
|                                                | T         | R1 | L1        | T | L1     | R1     |
| Movement                                       |           |    |           |   |        |        |
| Rank                                           | 1         | 1  | 2         | 1 | 3      | 2      |
| vx, Volume                                     |           |    | 7.69      |   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       |           |    | 278.46    |   | 774.62 | 274.62 |
| Conflicting Volume (Ped)                       |           |    | 0.00      |   | 0.00   | 0.00   |
| Conflicting Volume                             |           |    | 278.46    |   | 774.62 | 274.62 |
| Two-Stage Gap Acceptance                       |           |    |           |   | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |    | 1295.92   |   | 369.39 | 768.96 |
| cpx, Potential Capacity                        |           |    | 1295.92   |   | 366.39 | 768.96 |
| Capacity                                       |           |    | 1295.92   |   | 366.39 | 768.96 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      | S (Major) |   | W    |      |
|------------------------------------------------|-----------|------|-----------|---|------|------|
|                                                | T         | R1   | L1        | T | L1   | R1   |
| Movement                                       |           |      |           |   |      |      |
| tc, base, Base Critical Headway                |           |      | 4.10      |   | 7.10 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |           |   |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |           |   |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       |           |      | 1.00      |   | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          |           |      | 0.00      |   | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 |           |      | 0.00      |   | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 | 0.00      |   | 0.00 |      |
| T3, It, Geometry Adjustment Factor             |           |      | 0.00      |   | 0.70 | 0.00 |
| tc, Critical Headway                           |           |      | 4.10      |   | 6.40 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |           |   |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |           |   |      |      |
| tf, base, Base Follow-Up Headway               |           |      | 2.20      |   | 3.50 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       |           |      | 0.90      |   | 0.90 | 0.90 |
| tf, Follow-Up Headway                          |           |      | 2.20      |   | 3.50 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |      | S (Major) |        | W      |        |
|----------------------|-----------|------|-----------|--------|--------|--------|
|                      | T         | R1   | L1        | T      | L1     | R1     |
| Movement             |           |      |           |        |        |        |
| vx, Volume           | 270.77    | 7.69 | 7.69      | 484.62 | 7.69   | 7.69   |
| cmx, Capacity        |           |      | 1295.92   |        | 366.39 | 768.96 |
| V / C                |           |      | 0.01      |        | 0.02   | 0.01   |
| d, Delay             |           |      | 7.79      |        | 15.06  | 9.91   |
| LOS                  |           |      | A         |        | C      | A      |
| dA, Approach Delay   |           | 0.00 |           | 0.12   |        | 12.49  |
| Approach LOS         |           |      |           |        |        | B      |
| dRank1, Rank 1 Delay |           | 0.00 |           | 0.06   |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) | S (Major) | W      |
|-----------------------|-----------|-----------|--------|
|                       | Lane 1    | Lane 1    | Lane 1 |
| Movements             | T, R1     | L1, T     | L1, R1 |
| vx, Volume            | 278.46    | 492.31    | 15.38  |
| Flared Storage Size   |           |           |        |
| cmx, Capacity         |           | 1295.92   | 496.31 |
| V / C                 |           | 0.38      | 0.03   |
| Q95, 95% Queue Length |           | 0.02      | 0.10   |
| d, Delay              |           | 7.79      | 12.49  |
| LOS                   |           |           | B      |
| dA, Approach Delay    |           | 0.00      | 12.49  |
| Approach LOS          |           |           | B      |

| Node 2035 - S College Ave & I-405 |  |  |  |  |  |  |  |  |  |               |        |  |
|-----------------------------------|--|--|--|--|--|--|--|--|--|---------------|--------|--|
|                                   |  |  |  |  |  |  |  |  |  | Control Type  | Signal |  |
|                                   |  |  |  |  |  |  |  |  |  | Vehicle       | 13.15  |  |
|                                   |  |  |  |  |  |  |  |  |  | Average Delay | 0      |  |
|                                   |  |  |  |  |  |  |  |  |  | Average LOS   | B      |  |
|                                   |  |  |  |  |  |  |  |  |  | VIC           | 0.50   |  |
|                                   |  |  |  |  |  |  |  |  |  | Lost Time     | 0      |  |

| Volume and Adjustments by Movement |     |     |     |     |  |  |  |  |  |  |  |  |
|------------------------------------|-----|-----|-----|-----|--|--|--|--|--|--|--|--|
| Approach                           | N   | E   | S   | W   |  |  |  |  |  |  |  |  |
| Left Turn                          | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Thru                               | 100 | 100 | 100 | 100 |  |  |  |  |  |  |  |  |
| Right Turn                         | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Left Turn                          | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Thru                               | 100 | 100 | 100 | 100 |  |  |  |  |  |  |  |  |
| Right Turn                         | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Left Turn                          | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Thru                               | 100 | 100 | 100 | 100 |  |  |  |  |  |  |  |  |
| Right Turn                         | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |

| Volume and Adjustments by Lane Group |     |     |     |     |  |  |  |  |  |  |  |  |
|--------------------------------------|-----|-----|-----|-----|--|--|--|--|--|--|--|--|
| Approach                             | N   | E   | S   | W   |  |  |  |  |  |  |  |  |
| Left Turn                            | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Thru                                 | 100 | 100 | 100 | 100 |  |  |  |  |  |  |  |  |
| Right Turn                           | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Left Turn                            | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Thru                                 | 100 | 100 | 100 | 100 |  |  |  |  |  |  |  |  |
| Right Turn                           | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Left Turn                            | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |
| Thru                                 | 100 | 100 | 100 | 100 |  |  |  |  |  |  |  |  |
| Right Turn                           | 0   | 0   | 0   | 0   |  |  |  |  |  |  |  |  |

| Signal Timing Parameters |       |       |       |       |  |  |  |  |  |  |  |  |
|--------------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach                 | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

| Capacity, Control Delay, and Level of Service Determination |       |       |       |       |  |  |  |  |  |  |  |  |
|-------------------------------------------------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach                                                    | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn                                                   | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                                  | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                                                   | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                                  | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                                                   | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                                  | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                                                   | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                                  | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

| Level of Service |       |       |       |       |  |  |  |  |  |  |  |  |
|------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach         | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru             | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn       | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru             | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn       | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru             | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn       | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn        | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru             | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn       | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

| Signal Timing Parameters |       |       |       |       |  |  |  |  |  |  |  |  |
|--------------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach                 | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                     | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn               | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

| Level of Service Determination for Permitted Phasing |       |       |       |       |  |  |  |  |  |  |  |  |
|------------------------------------------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach                                             | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn                                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

| Permitted Phasing Adjustment Factors |       |       |       |       |  |  |  |  |  |  |  |  |
|--------------------------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach                             | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

| Permitted Phasing Adjustment Factors |       |       |       |       |  |  |  |  |  |  |  |  |
|--------------------------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach                             | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

| Permitted Phasing Adjustment Factors |       |       |       |       |  |  |  |  |  |  |  |  |
|--------------------------------------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|
| Approach                             | N     | E     | S     | W     |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Left Turn                            | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Thru                                 | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |
| Right Turn                           | 10.00 | 10.00 | 10.00 | 10.00 |  |  |  |  |  |  |  |  |

## Node 2039: SE 3rd &amp; Ash Ave

Control Type TWSC  
 Method HCM 6th Edition  
 di, Average Delay 9.31  
 Worst Case Delay 11.6  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N     |        |       | E (Major) |       |       | S     |        |       | W (Major) |       |       |
|-----------------------|-------|--------|-------|-----------|-------|-------|-------|--------|-------|-----------|-------|-------|
| Movement              | L1    | T      | R1    | L1        | T     | R1    | L1    | T      | R1    | L1        | T     | R1    |
| Base Volume           | 5.00  | 78.00  | 5.00  | 5.00      | 9.00  | 6.00  | 5.00  | 129.00 | 5.00  | 5.00      | 13.00 | 5.00  |
| PHF, Peak-hour factor | 0.650 | 0.650  | 0.650 | 0.650     | 0.650 | 0.650 | 0.650 | 0.650  | 0.650 | 0.650     | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69  | 120.00 | 7.69  | 7.69      | 13.85 | 9.23  | 7.69  | 198.46 | 7.69  | 7.69      | 20.00 | 7.69  |

## Pedestrians

| Approach                 | N     |       |       | E (Major) |   |    | S     |       |       | W (Major) |   |    |
|--------------------------|-------|-------|-------|-----------|---|----|-------|-------|-------|-----------|---|----|
| Movement                 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 |
| vx, Flow (Ped/hr)        | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |
| w, Lane Width (ft)       | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    |
| Sp, Walking Speed (ft/s) | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    |
| fpb, Percent Blockage    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |

## Capacity of Movements below Rank 1

| Approach                                       | N      |        |         | E (Major) |   |    | S      |        |         | W (Major) |   |    |
|------------------------------------------------|--------|--------|---------|-----------|---|----|--------|--------|---------|-----------|---|----|
| Movement                                       | L1     | T      | R1      | L1        | T | R1 | L1     | T      | R1      | L1        | T | R1 |
| Rank                                           | 4      | 3      | 2       | 2         | 1 | 1  | 4      | 3      | 2       | 2         | 1 | 1  |
| vx, Volume                                     | 7.69   | 120.00 | 7.69    | 7.69      |   |    | 7.69   | 198.46 | 7.69    | 7.69      |   |    |
| Conflicting Volume (Veh)                       | 176.15 | 76.92  | 18.46   | 27.69     |   |    | 135.92 | 77.69  | 23.85   | 23.08     |   |    |
| Conflicting Volume (Ped)                       | 0.00   | 0.00   | 0.00    | 0.00      |   |    | 0.00   | 0.00   | 0.00    | 0.00      |   |    |
| Conflicting Volume                             | 176.15 | 76.92  | 18.46   | 27.69     |   |    | 135.92 | 77.69  | 23.85   | 23.08     |   |    |
| Two-Stage Gap Acceptance                       | No     | No     |         |           |   |    | No     | No     |         |           |   |    |
| Number of Storage Spaces in Median Refuge Area |        |        |         |           |   |    |        |        |         |           |   |    |
| cpx, Potential Capacity                        | 790.70 | 817.24 | 1065.74 | 1599.01   |   |    | 838.58 | 816.45 | 1058.50 | 1605.18   |   |    |
| Capacity                                       | 631.83 | 809.29 | 1065.74 | 1599.01   |   |    | 732.47 | 808.51 | 1058.50 | 1605.18   |   |    |

## Critical Headway and Follow Up Headway

| Approach                                     | N    |      |      | E (Major) |   |    | S    |      |      | W (Major) |   |    |
|----------------------------------------------|------|------|------|-----------|---|----|------|------|------|-----------|---|----|
| Movement                                     | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   | L1        | T | R1 |
| tc,base, Base Critical Headway               | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    |
| tc,base.I, Base Critical Headway (Stage I)   |      |      |      |           |   |    |      |      |      |           |   |    |
| tc,base.II, Base Critical Headway (Stage II) |      |      |      |           |   |    |      |      |      |           |   |    |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    |
| Pliv, % Heavy Vehicles                       | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    |
| tc,G, Grade Adjustment Factor                | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    |
| G, % Grade                                   |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      | 0.00      |   |    |
| T3,lt, Geometry Adjustment Factor            | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    |
| tc, Critical Headway                         | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    |
| tc.I, Critical Headway (Stage I)             |      |      |      |           |   |    |      |      |      |           |   |    |
| tc.II, Critical Headway (Stage II)           |      |      |      |           |   |    |      |      |      |           |   |    |
| lf,base, Base Follow-Up Headway              | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    |
| lf,hv, Heavy Vehicles Adjustment Factor      | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    |
| lf, Follow-Up Headway                        | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    |

## Delay and Level of Service by Movement

| Approach             | N      |        |         | E (Major) |       |      | S      |        |         | W (Major) |       |      |
|----------------------|--------|--------|---------|-----------|-------|------|--------|--------|---------|-----------|-------|------|
| Movement             | L1     | T      | R1      | L1        | T     | R1   | L1     | T      | R1      | L1        | T     | R1   |
| vx, Volume           | 7.69   | 120.00 | 7.69    | 7.69      | 13.85 | 9.23 | 7.69   | 198.46 | 7.69    | 7.69      | 20.00 | 7.69 |
| cpx, Capacity        | 631.83 | 809.29 | 1065.74 | 1599.01   |       |      | 732.47 | 808.51 | 1058.50 | 1605.18   |       |      |
| V / C                | 0.01   | 0.15   | 0.01    | 0.00      |       |      | 0.01   | 0.25   | 0.01    | 0.00      |       |      |
| d, Delay             | 11.60  | 10.35  | 9.28    | 7.26      |       |      | 11.50  | 11.03  | 9.98    | 7.25      |       |      |
| LOS                  | B      | B      | A       | A         |       |      | B      | B      | A       | A         |       |      |
| dA, Approach Delay   |        | 10.36  |         | 1.82      |       |      |        | 11.01  |         | 1.58      |       |      |
| Approach LOS         |        | B      |         |           |       |      |        | B      |         |           |       |      |
| dRank1, Rank 1 Delay |        |        |         | 0.04      |       |      |        |        |         | 0.04      |       |      |

## Delay and Level of Service by Lane

| Approach              | N         | E (Major) | S         | W (Major) |
|-----------------------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 135.38    | 30.77     | 213.85    | 35.38     |
| Flared Storage Size   |           |           |           |           |
| cpx, Capacity         | 807.45    | 1599.01   | 812.38    | 1605.18   |
| V / C                 | 0.17      | 0.02      | 0.26      | 0.02      |
| Q95, 95% Queue Length | 0.60      | 0.01      | 1.07      | 0.01      |
| d, Delay              | 10.36     | 7.26      | 11.01     | 7.25      |
| LOS                   | B         |           | B         |           |
| dA, Approach Delay    | 10.36     | 1.82      | 11.01     | 1.58      |
| Approach LOS          | B         |           | B         |           |

## Intersection Capacity Analysis Summary Page

Analysis Time: Wed Mar 11 11:13:19  
 Driving Side: Right  
 Analysis Period: 1 Hours

| Number | Name                       | Control Type | V/C  | Avg Delay | Avg LOS | Max Delay | Max LOS |
|--------|----------------------------|--------------|------|-----------|---------|-----------|---------|
| 2030   | College & Whitman          | Signalized   | 0.59 | 14.63     | B       | 15.82     | B       |
| 2031   | N College & SE 3rd St.     | TWSC         | 0.00 | 1.21      | A       | 15.54     | C       |
| 2032   | S College Ave & SW 4th St  | Signalized   | 0.78 | 15.45     | B       | 27.30     | C       |
| 2033   | S College Ave & SE 6th St  | TWSC         | 0.00 | 2.09      | A       | 17.17     | C       |
| 2034   | S College Ave & SE 8th St  | TWSC         | 0.00 | 1.67      | A       | 16.62     | C       |
| 2035   | S College Ave & SE 10th St | TWSC         | 0.00 | 1.29      | A       | 23.44     | C       |
| 2036   | S College Ave & SE 12th St | Signalized   | 0.51 | 10.87     | B       | 23.25     | C       |
| 2037   | S College and 13th 13th St | TWSC         | 0.00 | 0.32      | A       | 15.06     | C       |
| 2038   | S College Ave & Lampart    | Signalized   | 0.59 | 13.15     | B       | 23.18     | C       |
| 2039   | SE 3rd & Ash Ave           | TWSC         | 0.00 | 9.31      | A       | 11.60     | B       |

| Node 2030, Control & Volume |  |  |  |  |  |            |  |  |  |  |  |
|-----------------------------|--|--|--|--|--|------------|--|--|--|--|--|
| Control Type                |  |  |  |  |  | Signalized |  |  |  |  |  |
| Warrant                     |  |  |  |  |  | Warrant    |  |  |  |  |  |
| Average Delay               |  |  |  |  |  | 14.53      |  |  |  |  |  |
| Average LOS                 |  |  |  |  |  | D          |  |  |  |  |  |
| Level of Service            |  |  |  |  |  | B          |  |  |  |  |  |

| Volume and Adjustment by Movement |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach                          | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group                        | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Volume                            | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume                  | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume                  | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume                   | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

| Volume and Adjustment by Lane Group |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach                            | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group                          | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Volume                              | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume                    | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume                    | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume                     | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

| Suburban Flow Rate |      |      |      |      |      |      |      |      |      |      |      |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach           | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group         | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Control Type       | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm |
| Volume             | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume   | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume   | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume    | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

| Classical Control Delay and Level of Service Calculations |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach                                                  | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group                                                | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Control Type                                              | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm |
| Volume                                                    | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume                                          | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume                                          | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume                                           | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

| Basic of Queue   |      |      |      |      |      |      |      |      |      |      |      |
|------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach         | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group       | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Control Type     | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm |
| Volume           | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume  | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

| Signal Timing Parameters |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach                 | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group               | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Control Type             | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm |
| Volume                   | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume         | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume         | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume          | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

| Lane Volume Adjustment Factors for Protected Phasing |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach                                             | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group                                           | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Control Type                                         | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm |
| Volume                                               | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume                                     | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume                                     | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume                                      | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

| Adjustment and Signal Adjustment Factors |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Approach                                 | N    |      | E    |      | S    |      | W    |      | W    |      |      |
| Lane Group                               | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Control Type                             | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm | Perm |
| Volume                                   | 10   | 134  | 50   | 78   | 18   | 208  | 44   | 56   | 172  | 31   | 31   |
| Peak Hour Volume                         | 0.05 | 0.65 | 0.50 | 0.60 | 0.10 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Peak Hour Volume                         | 4    | 71   | 25   | 29   | 7    | 11   | 30   | 18   | 22   | 56   | 12   |
| Adjusted Volume                          | 15   | 263  | 91   | 77   | 117  | 28   | 43   | 320  | 66   | 66   | 45   |

Adjustment and Signal Adjustment Factors

Adjustment and Signal Adjustment Factors

Adjustment and Signal Adjustment Factors

## Node 2031: N College &amp; SE 3rd St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.21  
 Worst Case Delay 15.54  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 7.00      | 172.00 | 5.00  | 7.00  | 5.00  | 6.00  | 6.00      | 218.00 | 19.00 | 5.00  | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 10.77     | 264.62 | 7.69  | 10.77 | 7.69  | 9.23  | 9.23      | 335.38 | 29.23 | 7.69  | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 10.77     |   |    | 10.77  | 7.69   | 9.23   | 9.23      |   |    | 7.69   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       | 364.62    |   |    | 666.15 | 662.31 | 350.00 | 272.31    |   |    | 666.92 | 673.08 | 268.46 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 364.62    |   |    | 666.15 | 662.31 | 350.00 | 272.31    |   |    | 666.92 | 673.08 | 268.46 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpk, Potential Capacity                        | 1205.10   |   |    | 375.80 | 384.54 | 697.93 | 1302.65   |   |    | 375.16 | 379.12 | 775.06 |
| Capacity                                       | 1205.10   |   |    | 360.61 | 377.09 | 697.93 | 1302.65   |   |    | 359.07 | 371.78 | 775.06 |

## Critical Headway and Follow-Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3,II, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| tf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 10.77     | 264.62 | 7.69 | 10.77  | 7.69   | 9.23   | 9.23      | 335.38 | 29.23 | 7.69   | 7.69   | 7.69   |
| cmx, Capacity        | 1205.10   |        |      | 360.61 | 377.09 | 697.93 | 1302.65   |        |       | 359.07 | 371.78 | 775.06 |
| V / C                | 0.01      |        |      | 0.03   | 0.02   | 0.01   | 0.01      |        |       | 0.02   | 0.02   | 0.01   |
| d, Delay             | 8.01      |        |      | 15.54  | 15.11  | 10.72  | 7.78      |        |       | 15.47  | 15.13  | 10.09  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.30   |      |        | 13.81  |        |           | 0.19   |       |        | 13.56  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.08   |      |        |        |        |           | 0.07   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           | E         |           | S (Major) |           | W         |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 263.08    | 27.69     | 373.85    |           | 23.08     |           |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 1205.10   | 436.18    | 1302.65   |           | 443.46    |           |           |           |
| V / C                 | 0.23      | 0.06      | 0.29      |           | 0.05      |           |           |           |
| Q95, 95% Queue Length | 0.03      | 0.20      | 0.02      |           | 0.16      |           |           |           |
| d, Delay              | 8.01      | 13.81     | 7.78      |           | 13.56     |           |           |           |
| LOS                   |           | B         |           |           | B         |           |           |           |
| dA, Approach Delay    | 0.30      | 13.81     | 0.19      |           | 13.56     |           |           |           |
| Approach LOS          |           | B         |           |           | B         |           |           |           |

**Researcher's Name:**



## Node 2033: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 2.09  
 Worst Case Delay 17.17  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 159.00 | 5.00  | 5.00  | 5.00  | 8.00  | 5.00      | 249.00 | 7.00  | 26.00 | 12.00 | 5.00  |
| PHF, Peak-hour factor | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 | 0.850     | 0.850  | 0.850 | 0.850 | 0.850 | 0.850 |
| V, Adjusted Volume    | 7.69      | 244.82 | 7.69  | 7.69  | 7.69  | 12.31 | 7.69      | 383.08 | 10.77 | 40.00 | 18.46 | 7.69  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 12.31  | 7.69      |   |    | 40.00  | 18.46  | 7.69   |
| Conflicting Volume (Veh)                       | 393.85    |   |    | 680.77 | 671.54 | 388.46 | 252.31    |   |    | 677.69 | 673.08 | 248.46 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 393.85    |   |    | 680.77 | 671.54 | 388.46 | 252.31    |   |    | 677.69 | 673.08 | 248.46 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpx, Potential Capacity                        | 1175.69   |   |    | 367.25 | 379.89 | 664.16 | 1324.76   |   |    | 368.99 | 379.12 | 795.19 |
| Capacity                                       | 1175.69   |   |    | 345.99 | 374.19 | 664.16 | 1324.76   |   |    | 352.41 | 373.43 | 795.19 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                       | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3, II, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |   |    |      |      |      |
| tf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 7.69      | 244.82 | 7.69 | 7.69   | 7.69   | 12.31  | 7.69      | 383.08 | 10.77 | 40.00  | 18.46  | 7.69   |
| cmx, Capacity        | 1175.69   |        |      | 345.99 | 374.19 | 664.16 | 1324.76   |        |       | 352.41 | 373.43 | 795.19 |
| V / C                | 0.01      |        |      | 0.02   | 0.02   | 0.02   | 0.01      |        |       | 0.11   | 0.05   | 0.01   |
| d, Delay             | 8.08      |        |      | 15.93  | 15.14  | 10.94  | 7.73      |        |       | 17.17  | 16.60  | 11.48  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.24   |      |        | 13.49  |        |           | 0.15   |       |        | 16.35  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.06   |      |        |        |        |           | 0.06   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           | E         | S (Major) |           | W         |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 260.00    | 27.69     | 401.54    | 66.15     |           |           |
| Flared Storage Size   |           |           |           |           |           |           |
| cmx, Capacity         | 1175.69   | 451.59    | 1324.76   | 383.24    |           |           |
| V / C                 | 0.22      | 0.06      | 0.30      | 0.17      |           |           |
| Q95, 95% Queue Length | 0.02      | 0.20      | 0.02      | 0.62      |           |           |
| d, Delay              | 8.08      | 13.49     | 7.73      | 16.35     |           |           |
| LOS                   |           | B         | C         | C         |           |           |
| dA, Approach Delay    | 0.24      | 13.49     | 0.15      | 16.35     |           |           |
| Approach LOS          |           | B         | C         | C         |           |           |

## Node 2034: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 1.87  
 Worst Case Delay 16.62  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
|                       | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Movement              |           |        |       |       |       |       |           |        |       |       |       |       |
| Base Volume           | 5.00      | 152.00 | 5.00  | 7.00  | 5.00  | 10.00 | 12.00     | 253.00 | 13.00 | 8.00  | 5.00  | 17.00 |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 233.85 | 7.69  | 10.77 | 7.69  | 15.38 | 18.46     | 389.23 | 20.00 | 12.31 | 7.69  | 26.15 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
|                          | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| Movement                 |           |   |    |       |       |       |           |   |    |       |       |       |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
|                                                | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Movement                                       |           |   |    |        |        |        |           |   |    |        |        |        |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 10.77  | 7.69   | 15.38  | 18.46     |   |    | 12.31  | 7.69   | 26.15  |
| Conflicting Volume (Veh)                       | 409.23    |   |    | 706.15 | 693.08 | 399.23 | 241.54    |   |    | 700.77 | 699.23 | 237.69 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 409.23    |   |    | 706.15 | 693.08 | 399.23 | 241.54    |   |    | 700.77 | 699.23 | 237.69 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| capx, Potential Capacity                       | 1160.49   |   |    | 353.17 | 369.24 | 654.98 | 1336.81   |   |    | 356.11 | 366.26 | 806.23 |
| Capacity                                       | 1160.49   |   |    | 329.58 | 359.85 | 654.98 | 1336.81   |   |    | 335.45 | 356.93 | 806.23 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
|                                                | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| Movement                                       |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3, II, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |   |    |      |      |      |
| tf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
|                      | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| Movement             |           |        |      |        |        |        |           |        |       |        |        |        |
| vx, Volume           | 7.69      | 233.85 | 7.69 | 10.77  | 7.69   | 15.38  | 18.46     | 389.23 | 20.00 | 12.31  | 7.69   | 26.15  |
| cmx, Capacity        | 1160.49   |        |      | 329.58 | 359.85 | 654.98 | 1336.81   |        |       | 335.45 | 356.93 | 806.23 |
| V / C                | 0.01      |        |      | 0.03   | 0.02   | 0.02   | 0.01      |        |       | 0.04   | 0.02   | 0.03   |
| d, Delay             | 8.12      |        |      | 16.62  | 15.70  | 11.19  | 7.73      |        |       | 16.44  | 15.79  | 10.17  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |       | C      | C      | B      |
| dA, Approach Delay   |           | 0.25   |      |        | 13.94  |        |           | 0.33   |       |        | 12.78  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.06   |      |        |        |        |           | 0.14   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           | E         |           | S (Major) |           | W         |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                       | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 249.23    | 33.85     | 427.69    | 46.15     |           |           |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 1160.49   | 436.50    | 1336.81   | 508.97    |           |           |           |           |
| V / C                 | 0.21      | 0.08      | 0.32      | 0.09      |           |           |           |           |
| Q95, 95% Queue Length | 0.02      | 0.25      | 0.04      | 0.30      |           |           |           |           |
| d, Delay              | 8.12      | 13.94     | 7.73      | 12.78     |           |           |           |           |
| LOS                   |           | B         |           | B         |           |           |           |           |
| dA, Approach Delay    | 0.25      | 13.94     | 0.33      | 12.78     |           |           |           |           |
| Approach LOS          |           | B         |           | B         |           |           |           |           |

## Node 2035: S College Ave &amp; SE 10th St

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 1.29  
 Worst Case Delay 23.44  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 258.00 | 5.00  | 5.00  | 5.00  | 5.00  | 6.00      | 355.00 | 5.00  | 9.00  | 5.00  | 15.00 |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 393.85 | 7.69  | 7.69  | 7.69  | 7.69  | 9.23      | 546.15 | 7.69  | 13.85 | 7.69  | 23.08 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 7.69   | 9.23      |   |    | 13.85  | 7.69   | 23.08  |
| Conflicting Volume (Veh)                       | 553.85    |   |    | 996.92 | 985.38 | 550.00 | 401.54    |   |    | 989.23 | 985.38 | 397.69 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 553.85    |   |    | 996.92 | 985.38 | 550.00 | 401.54    |   |    | 989.23 | 985.38 | 397.69 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpx, Potential Capacity                        | 1026.51   |   |    | 224.88 | 249.94 | 538.65 | 1168.07   |   |    | 227.60 | 249.94 | 656.29 |
| Capacity                                       | 1026.51   |   |    | 208.39 | 244.69 | 538.65 | 1168.07   |   |    | 215.48 | 244.69 | 656.29 |

## Critical Headway and Follow-Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3,ft, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |   |    |      |      |      |
| lf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| lf,lv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| lf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| vx, Volume           | 7.69      | 393.85 | 7.69 | 7.69   | 7.69   | 7.69   | 9.23      | 546.15 | 7.69 | 13.85  | 7.69   | 23.08  |
| cmx, Capacity        | 1026.51   |        |      | 208.39 | 244.69 | 538.65 | 1168.07   |        |      | 215.48 | 244.69 | 656.29 |
| V/C                  | 0.01      |        |      | 0.04   | 0.03   | 0.01   | 0.01      |        |      | 0.06   | 0.03   | 0.04   |
| d, Delay             | 8.53      |        |      | 23.44  | 20.87  | 12.84  | 8.11      |        |      | 23.30  | 21.30  | 12.07  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |      | C      | C      | B      |
| dA, Approach Delay   |           | 0.18   |      |        | 19.05  |        |           | 0.13   |      |        | 17.15  |        |
| Approach LOS         |           |        |      |        | C      |        |           |        |      |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.08   |      |        |        |        |           | 0.09   |      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           | E         |           | S (Major) |           | W         |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 409.23    | 23.08     | 589.08    | 44.62     |           |           |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 1026.51   | 279.28    | 1168.07   | 340.94    |           |           |           |           |
| V/C                   | 0.40      | 0.08      | 0.48      | 0.13      |           |           |           |           |
| Q95, 95% Queue Length | 0.02      | 0.27      | 0.02      | 0.45      |           |           |           |           |
| d, Delay              | 8.53      | 19.05     | 8.11      | 17.15     |           |           |           |           |
| LOS                   |           | C         |           | C         |           |           |           |           |
| dA, Approach Delay    | 0.18      | 19.05     | 0.13      | 17.15     |           |           |           |           |
| Approach LOS          |           | C         |           | C         |           |           |           |           |

MOOSE and BOB X 4761

## Node 2037: S College and 13th 13th St

|                   |                 |
|-------------------|-----------------|
| Control Type      | TWSC            |
| Method            | HCM 6th Edition |
| dI, Average Delay | 0.32            |
| Worst Case Delay  | 15.06           |
| Worst Case LOS    | C               |

## Volume and Adjustments

| Approach              | N (Major) |       | S (Major) |        | W     |       |
|-----------------------|-----------|-------|-----------|--------|-------|-------|
|                       | T         | R1    | L1        | T      | L1    | R1    |
| Movement              |           |       |           |        |       |       |
| Base Volume           | 176.00    | 5.00  | 5.00      | 315.00 | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 |
| V, Adjusted Volume    | 270.77    | 7.69  | 7.69      | 484.62 | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |    | S (Major) |   | W     |       |
|--------------------------|-----------|----|-----------|---|-------|-------|
|                          | T         | R1 | L1        | T | L1    | R1    |
| Movement                 |           |    |           |   |       |       |
| vx, Flow (Ped/hr)        |           |    | 0.00      |   | 0.00  | 0.00  |
| w, Lane Width (ft)       |           |    | 12.00     |   | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) |           |    | 3.50      |   | 3.50  | 3.50  |
| fbp, Percent Blockage    |           |    | 0.00      |   | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |    | S (Major) |   | W      |        |
|------------------------------------------------|-----------|----|-----------|---|--------|--------|
|                                                | T         | R1 | L1        | T | L1     | R1     |
| Movement                                       |           |    |           |   |        |        |
| Rank                                           | 1         | 1  | 2         | 1 | 3      | 2      |
| vx, Volume                                     |           |    | 7.69      |   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       |           |    | 278.46    |   | 774.62 | 274.62 |
| Conflicting Volume (Ped)                       |           |    | 0.00      |   | 0.00   | 0.00   |
| Conflicting Volume                             |           |    | 278.46    |   | 774.62 | 274.62 |
| Two-Stage Gap Acceptance                       |           |    |           |   | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |    |           |   |        |        |
| cpv, Potential Capacity                        |           |    | 1295.92   |   | 369.39 | 768.96 |
| Capacity                                       |           |    | 1295.92   |   | 366.39 | 768.96 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      | S (Major) |   | W    |      |
|----------------------------------------------|-----------|------|-----------|---|------|------|
|                                              | T         | R1   | L1        | T | L1   | R1   |
| Movement                                     |           |      |           |   |      |      |
| tc,base, Base Critical Headway               |           |      | 4.10      |   | 7.10 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |           |   |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |           |   |      |      |
| tc,hv, Heavy Vehicles Adjustment Factor      |           |      | 1.00      |   | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        |           |      | 0.00      |   | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                |           |      | 0.00      |   | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 | 0.00      |   | 0.00 |      |
| T3,II, Geometry Adjustment Factor            |           |      | 0.00      |   | 0.70 | 0.00 |
| tc, Critical Headway                         |           |      | 4.10      |   | 6.40 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |           |   |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |           |   |      |      |
| tf,base, Base Follow-Up Headway              |           |      | 2.20      |   | 3.50 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      |           |      | 0.90      |   | 0.90 | 0.90 |
| tf, Follow-Up Headway                        |           |      | 2.20      |   | 3.50 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |      | S (Major) |        | W      |        |
|----------------------|-----------|------|-----------|--------|--------|--------|
|                      | T         | R1   | L1        | T      | L1     | R1     |
| Movement             |           |      |           |        |        |        |
| vx, Volume           | 270.77    | 7.69 | 7.69      | 484.62 | 7.69   | 7.69   |
| cmx, Capacity        |           |      | 1295.92   |        | 366.39 | 768.96 |
| V / C                |           |      | 0.01      |        | 0.02   | 0.01   |
| d, Delay             |           |      | 7.79      |        | 15.06  | 9.91   |
| LOS                  |           |      | A         |        | C      | A      |
| dA, Approach Delay   |           | 0.00 |           | 0.12   |        | 12.49  |
| Approach LOS         |           |      |           |        |        | B      |
| dRank1, Rank 1 Delay |           | 0.00 |           | 0.06   |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) | S (Major) | W      |
|-----------------------|-----------|-----------|--------|
|                       | Lane 1    | Lane 1    | Lane 1 |
| Movements             | T, R1     | L1, T     | L1, R1 |
| vx, Volume            | 278.46    | 492.31    | 15.38  |
| Flared Storage Size   |           |           |        |
| cmx, Capacity         |           | 1295.92   | 496.31 |
| V / C                 |           | 0.38      | 0.03   |
| Q95, 95% Queue Length |           | 0.02      | 0.10   |
| d, Delay              |           | 7.79      | 12.49  |
| LOS                   |           |           | B      |
| dA, Approach Delay    |           | 0.00      | 12.49  |
| Approach LOS          |           |           | B      |

\_\_\_\_\_

## Node 2039: SE 3rd &amp; Ash Ave

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 9.31  
 Worst Case Delay 11.6  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N     |        |       | E (Major) |       |       | S     |        |       | W (Major) |       |       |
|-----------------------|-------|--------|-------|-----------|-------|-------|-------|--------|-------|-----------|-------|-------|
| Movement              | L1    | T      | R1    | L1        | T     | R1    | L1    | T      | R1    | L1        | T     | R1    |
| Base Volume           | 5.00  | 78.00  | 5.00  | 5.00      | 9.00  | 6.00  | 5.00  | 129.00 | 5.00  | 5.00      | 13.00 | 5.00  |
| PHF, Peak-hour factor | 0.850 | 0.850  | 0.850 | 0.850     | 0.850 | 0.850 | 0.850 | 0.850  | 0.850 | 0.850     | 0.850 | 0.850 |
| V, Adjusted Volume    | 7.69  | 120.00 | 7.69  | 7.69      | 13.85 | 9.23  | 7.69  | 198.46 | 7.69  | 7.69      | 20.00 | 7.69  |

## Pedestrians

| Approach                 | N     |       |       | E (Major) |   |    | S     |       |       | W (Major) |   |    |
|--------------------------|-------|-------|-------|-----------|---|----|-------|-------|-------|-----------|---|----|
| Movement                 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 |
| vx, Flow (Ped/hr)        | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |
| w, Lane Width (ft)       | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    |
| Sp, Walking Speed (ft/s) | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    |
| fpb, Percent Blockage    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |

## Capacity of Movements below Rank 1

| Approach                                       | N      |        |         | E (Major) |   |    | S      |        |         | W (Major) |   |    |
|------------------------------------------------|--------|--------|---------|-----------|---|----|--------|--------|---------|-----------|---|----|
| Movement                                       | L1     | T      | R1      | L1        | T | R1 | L1     | T      | R1      | L1        | T | R1 |
| Rank                                           | 4      | 3      | 2       | 2         | 1 | 1  | 4      | 3      | 2       | 2         | 1 | 1  |
| vx, Volume                                     | 7.69   | 120.00 | 7.69    | 7.69      |   |    | 7.69   | 198.46 | 7.69    | 7.69      |   |    |
| Conflicting Volume (Veh)                       | 176.15 | 76.92  | 18.46   | 27.69     |   |    | 136.92 | 77.69  | 23.85   | 23.08     |   |    |
| Conflicting Volume (Ped)                       | 0.00   | 0.00   | 0.00    | 0.00      |   |    | 0.00   | 0.00   | 0.00    | 0.00      |   |    |
| Conflicting Volume                             | 176.15 | 76.92  | 18.46   | 27.69     |   |    | 136.92 | 77.69  | 23.85   | 23.08     |   |    |
| Two-Stage Gap Acceptance                       | No     | No     |         |           |   |    | No     | No     |         |           |   |    |
| Number of Storage Spaces in Median Refuge Area | 790.70 | 817.24 | 1065.74 | 1599.01   |   |    | 838.58 | 816.45 | 1058.50 | 1605.18   |   |    |
| cap, Potential Capacity                        | 631.83 | 809.29 | 1065.74 | 1599.01   |   |    | 732.47 | 808.51 | 1058.50 | 1605.18   |   |    |

## Critical Headway and Follow Up Headway

| Approach                                      | N    |      |      | E (Major) |      |    | S    |      |      | W (Major) |      |    |
|-----------------------------------------------|------|------|------|-----------|------|----|------|------|------|-----------|------|----|
| Movement                                      | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 |
| tc, base, Base Critical Headway               | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc, base I, Base Critical Headway (Stage I)   |      |      |      |           |      |    |      |      |      |           |      |    |
| tc, base II, Base Critical Headway (Stage II) |      |      |      |           |      |    |      |      |      |           |      |    |
| tc, HV, Heavy Vehicles Adjustment Factor      | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    |
| Phv, % Heavy Vehicles                         | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc, G, Grade Adjustment Factor                | 0.20 | 0.20 | 0.10 | 0.00      |      |    | 0.20 | 0.20 | 0.10 | 0.00      |      |    |
| G, % Grade                                    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |
| TGA, Geometry Adjustment Factor               | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc, Critical Headway                          | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc I, Critical Headway (Stage I)              |      |      |      |           |      |    |      |      |      |           |      |    |
| tc II, Critical Headway (Stage II)            |      |      |      |           |      |    |      |      |      |           |      |    |
| tf, base, Base Follow-Up Headway              | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |
| tf, hv, Heavy Vehicles Adjustment Factor      | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    |
| tf, Follow-Up Headway                         | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |

## Delay and Level of Service by Movement

| Approach             | N      |        |         | E (Major) |       |      | S      |        |         | W (Major) |       |      |
|----------------------|--------|--------|---------|-----------|-------|------|--------|--------|---------|-----------|-------|------|
| Movement             | L1     | T      | R1      | L1        | T     | R1   | L1     | T      | R1      | L1        | T     | R1   |
| vx, Volume           | 7.69   | 120.00 | 7.69    | 7.69      | 13.85 | 9.23 | 7.69   | 198.46 | 7.69    | 7.69      | 20.00 | 7.69 |
| cmx, Capacity        | 631.83 | 809.29 | 1065.74 | 1599.01   |       |      | 732.47 | 808.51 | 1058.50 | 1605.18   |       |      |
| V / C                | 0.01   | 0.15   | 0.01    | 0.00      |       |      | 0.01   | 0.25   | 0.01    | 0.00      |       |      |
| d, Delay             | 11.60  | 10.35  | 9.28    | 7.26      |       |      | 11.50  | 11.03  | 9.98    | 7.25      |       |      |
| LOS                  | B      | B      | A       | A         |       |      | B      | B      | A       | A         |       |      |
| dA, Approach Delay   |        | 10.36  |         |           | 1.82  |      |        | 11.01  |         |           | 1.58  |      |
| Approach LOS         |        | B      |         |           |       |      |        | B      |         |           |       |      |
| dRank1, Rank 1 Delay |        |        |         |           | 0.04  |      |        |        |         |           | 0.04  |      |

## Delay and Level of Service by Lane

| Approach               | N         |           |           | E (Major) |           |           | S         |           |           | W (Major) |           |           |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                   | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements              | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume             | 135.38    | 30.77     | 213.85    | 35.38     |           |           |           |           |           |           |           |           |
| Planned Storage Size   |           |           |           |           |           |           |           |           |           |           |           |           |
| cmx, Capacity          | 807.45    | 1599.01   | 812.38    | 1605.18   |           |           |           |           |           |           |           |           |
| V / C                  | 0.17      | 0.02      | 0.26      | 0.02      |           |           |           |           |           |           |           |           |
| OS95, 95% Queue Length | 0.60      | 0.01      | 1.07      | 0.01      |           |           |           |           |           |           |           |           |
| d, Delay               | 10.36     | 7.26      | 11.01     | 7.25      |           |           |           |           |           |           |           |           |
| LOS                    | B         |           | B         |           |           |           |           |           |           |           |           |           |
| dA, Approach Delay     | 10.36     | 1.82      | 11.01     | 1.58      |           |           |           |           |           |           |           |           |
| Approach LOS           | B         |           | B         |           |           |           |           |           |           |           |           |           |

## Intersection Capacity Analysis Summary Page

Analysis Time: Fri Sep 27 12:57:13 20  
 Driving Side: Right  
 Analysis Period: 1 Hours

| Number | Name                       | Control Type | V/C  | Avg Delay | Avg LOS | Max Delay | Max LOS |
|--------|----------------------------|--------------|------|-----------|---------|-----------|---------|
| 2030   | College & Whitman          | Signalized   | 0.53 | 21.21     | C       | 30.02     | C       |
| 2031   | N College & SE 3rd St      | TWSC         | 0.00 | 1.05      | A       | 13.24     | B       |
| 2032   | S College Ave & SW 4th St  | Signalized   | 0.47 | 25.33     | C       | 45.09     | D       |
| 2033   | S College Ave & SE 6th St  | TWSC         | 0.00 | 1.87      | A       | 13.57     | B       |
| 2034   | S College Ave & SE 8th St  | TWSC         | 0.00 | 2.31      | A       | 13.74     | B       |
| 2035   | S College Ave & SE 10th St | TWSC         | 0.00 | 1.18      | A       | 18.81     | C       |
| 2036   | S College Ave & SE 12th St | Signalized   | 0.55 | 21.92     | C       | 30.86     | C       |
| 2037   | S College and 13th 13th St | TWSC         | 0.00 | 0.37      | A       | 13.26     | B       |
| 2038   | S College Ave & Lampart    | Signalized   | 0.66 | 28.72     | C       | 42.24     | D       |
| 2039   | SE 3rd & Ash Ave           | TWSC         | 0.00 | 6.98      | A       | 9.59      | A       |



Book 2015: Chapter 8 Worksheet

Control Type  
Manual  
Average Delay  
C  
VOC  
0.53  
Lost Time  
22

Signalization  
Intersection  
21 21  
C  
0.53  
22

| Approach        | L1 | T   | R1 | L1 | T   | R1 | L1 | T   | R1 | L1 | T   | R1 |
|-----------------|----|-----|----|----|-----|----|----|-----|----|----|-----|----|
| Major Street    | 15 | 270 | 84 | 28 | 142 | 5  | 78 | 270 | 84 | 28 | 142 | 5  |
| Minor Street    | 5  | 23  | 23 | 7  | 33  | 1  | 21 | 43  | 14 | 10 | 28  | 10 |
| Adjusted Volume | 21 | 273 | 91 | 28 | 154 | 6  | 83 | 250 | 98 | 41 | 165 | 41 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

| Approach        | L      | C      | R      | L      | C      | R      | L      | C      | R      | L      | C      | R      |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Major Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Minor Street    | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |
| Adjusted Volume | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 | 153469 |

## Node 2031: N College &amp; SE 3rd St

Control Type TWSC  
 Method HCM 8th Edition  
 df, Average Delay 1.05  
 Worst Case Delay 13.24  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
|                       | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Movement              |           |        |       |       |       |       |           |        |       |       |       |       |
| Base Volume           | 5.00      | 232.00 | 5.00  | 5.00  | 5.00  | 10.00 | 8.00      | 200.00 | 14.00 | 5.00  | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 5.58      | 257.78 | 5.58  | 6.67  | 5.58  | 11.11 | 8.89      | 222.22 | 15.56 | 5.56  | 5.56  | 5.56  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
|                          | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| Movement                 |           |   |    |       |       |       |           |   |    |       |       |       |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
|                                                | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Movement                                       |           |   |    |        |        |        |           |   |    |        |        |        |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 5.58      |   |    | 6.67   | 5.58   | 11.11  | 8.89      |   |    | 5.58   | 5.56   | 5.58   |
| Conflicting Volume (Veh)                       | 237.78    |   |    | 525.00 | 522.22 | 230.00 | 263.33    |   |    | 527.78 | 527.22 | 260.56 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 237.78    |   |    | 525.00 | 522.22 | 230.00 | 263.33    |   |    | 527.78 | 527.22 | 260.56 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpx, Potential Capacity                        | 1341.04   |   |    | 466.33 | 462.03 | 814.21 | 1312.53   |   |    | 464.35 | 459.03 | 782.96 |
| Capacity                                       | 1341.04   |   |    | 454.28 | 456.19 | 814.21 | 1312.53   |   |    | 449.39 | 453.23 | 782.96 |

## Critical Headway and Follow-Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
|                                              | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| Movement                                     |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Pttv, % Heavy Vehicles                       | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3,It, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| lf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| lf,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| lf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
|                      | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| Movement             |           |        |      |        |        |        |           |        |       |        |        |        |
| vx, Volume           | 5.58      | 257.78 | 5.58 | 6.67   | 5.58   | 11.11  | 8.89      | 222.22 | 15.56 | 5.56   | 5.56   | 5.56   |
| cmx, Capacity        | 1341.04   |        |      | 454.28 | 456.19 | 814.21 | 1312.53   |        |       | 449.39 | 453.23 | 782.96 |
| V / C                | 0.00      |        |      | 0.01   | 0.01   | 0.01   | 0.01      |        |       | 0.01   | 0.01   | 0.01   |
| d, Delay             | 7.70      |        |      | 13.19  | 13.16  | 9.89   | 7.76      |        |       | 13.24  | 13.17  | 9.82   |
| LOS                  | A         |        |      | B      | B      | A      | A         |        |       | B      | B      | A      |
| dA, Approach Delay   |           | 0.16   |      |        | 11.51  |        |           | 0.28   |       |        | 12.07  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E      | S (Major) |        | W      |
|-----------------------|-----------|--------|--------|-----------|--------|--------|
|                       | Lane 1    | Lane 2 |        | Lane 1    | Lane 2 |        |
| Lane                  |           |        |        |           |        |        |
| Movements             |           |        |        |           |        |        |
| vx, Volume            | 5.58      | 263.33 | 23.33  | 8.89      | 237.78 | 16.67  |
| Flared Storage Size   |           |        |        |           |        |        |
| cmx, Capacity         |           |        | 576.13 |           |        | 525.50 |
| V / C                 |           |        | 0.04   |           |        | 0.03   |
| Q95, 95% Queue Length |           |        | 0.13   |           |        | 0.10   |
| d, Delay              |           |        | 11.51  |           |        | 12.07  |
| LOS                   |           |        | B      |           |        | B      |
| dA, Approach Delay    |           | 0.16   | 11.51  |           | 0.28   | 12.07  |
| Approach LOS          |           |        | B      |           |        | B      |

New 2042 S College Ave & SW 4th St

Control Type: Signalized  
 Method: HCM 2000 Edition  
 Average Delay: 25.33  
 Average LOS: C  
 V/C: 0.47  
 Loss Time: 15

| Volume and Aggregates by Movement | L  |     | T  |    | R  |    | L  |     | T  |    | R  |    | L  |     | T  |    | R  |    |
|-----------------------------------|----|-----|----|----|----|----|----|-----|----|----|----|----|----|-----|----|----|----|----|
| Approach                          | L  |     | T  |    | R  |    | L  |     | T  |    | R  |    | L  |     | T  |    | R  |    |
| Volume                            | 14 | 281 | 33 | 44 | 47 | 10 | 37 | 371 | 27 | 40 | 63 | 23 | 14 | 281 | 33 | 44 | 47 | 10 |
| Peak Hour Volume                  | 14 | 281 | 33 | 44 | 47 | 10 | 37 | 371 | 27 | 40 | 63 | 23 | 14 | 281 | 33 | 44 | 47 | 10 |
| Aggregated Volume                 | 16 | 312 | 37 | 49 | 52 | 11 | 41 | 451 | 30 | 51 | 70 | 24 | 16 | 312 | 37 | 49 | 52 | 11 |

| Volume and Aggregates by Lane Group | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Approach                            | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
| Lane Group                          | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 |
| Control Type                        | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    |
| Volume                              | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Peak Hour Volume                    | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Aggregated Volume                   | 16     | 312    | 37     | 49     | 52     | 11     | 41     | 451    | 30     | 51     | 70     | 24     | 16     | 312    | 37     | 49     | 52     | 11     |

| Volume and Aggregates by Lane Group | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Approach                            | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
| Lane Group                          | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 |
| Control Type                        | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    |
| Volume                              | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Peak Hour Volume                    | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Aggregated Volume                   | 16     | 312    | 37     | 49     | 52     | 11     | 41     | 451    | 30     | 51     | 70     | 24     | 16     | 312    | 37     | 49     | 52     | 11     |

| Volume and Aggregates by Lane Group | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Approach                            | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
| Lane Group                          | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 |
| Control Type                        | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    |
| Volume                              | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Peak Hour Volume                    | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Aggregated Volume                   | 16     | 312    | 37     | 49     | 52     | 11     | 41     | 451    | 30     | 51     | 70     | 24     | 16     | 312    | 37     | 49     | 52     | 11     |

| Volume and Aggregates by Lane Group | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Approach                            | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
| Lane Group                          | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 |
| Control Type                        | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    |
| Volume                              | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Peak Hour Volume                    | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Aggregated Volume                   | 16     | 312    | 37     | 49     | 52     | 11     | 41     | 451    | 30     | 51     | 70     | 24     | 16     | 312    | 37     | 49     | 52     | 11     |

| Volume and Aggregates by Lane Group | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Approach                            | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
| Lane Group                          | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 |
| Control Type                        | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    |
| Volume                              | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Peak Hour Volume                    | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Aggregated Volume                   | 16     | 312    | 37     | 49     | 52     | 11     | 41     | 451    | 30     | 51     | 70     | 24     | 16     | 312    | 37     | 49     | 52     | 11     |

| Volume and Aggregates by Lane Group | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Approach                            | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
| Lane Group                          | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 |
| Control Type                        | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    |
| Volume                              | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Peak Hour Volume                    | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Aggregated Volume                   | 16     | 312    | 37     | 49     | 52     | 11     | 41     | 451    | 30     | 51     | 70     | 24     | 16     | 312    | 37     | 49     | 52     | 11     |

| Volume and Aggregates by Lane Group | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Approach                            | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        | L      |        | T      |        | R      |        |
| Lane Group                          | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 | 152397 | 152398 | 152395 | 152396 | 152401 | 152402 | 152399 | 152400 |
| Control Type                        | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    | Pre    |
| Volume                              | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Peak Hour Volume                    | 14     | 281    | 33     | 44     | 47     | 10     | 37     | 371    | 27     | 40     | 63     | 23     | 14     | 281    | 33     | 44     | 47     | 10     |
| Aggregated Volume                   | 16     | 312    | 37     | 49     | 52     | 11     | 41     | 451    | 30     | 51     | 70     | 24     | 16     | 312    | 37     | 49     | 52     | 11     |

Adjusted Grade Provisions:

Adjusted Lane Group Provisions:

Adjusted Lane Group Provisions:

## Node 2033: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 8th Edition  
 dI, Average Delay 1.67  
 Worst Case Delay 13.57  
 Worst Case LOS B

## Volumes and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
|                       | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Movement              |           |        |       |       |       |       |           |        |       |       |       |       |
| Base Volume           | 17.00     | 214.00 | 15.00 | 6.00  | 8.00  | 9.00  | 5.00      | 195.00 | 11.00 | 12.00 | 7.00  | 16.00 |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 18.89     | 237.78 | 16.67 | 6.67  | 8.89  | 10.00 | 5.56      | 216.67 | 12.22 | 13.33 | 7.78  | 17.78 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
|                          | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| Movement                 |           |   |    |       |       |       |           |   |    |       |       |       |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
|                                                | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Movement                                       |           |   |    |        |        |        |           |   |    |        |        |        |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 18.89     |   |    | 6.67   | 8.89   | 10.00  | 5.56      |   |    | 13.33  | 7.78   | 17.78  |
| Conflicting Volume (Veh)                       | 228.89    |   |    | 530.56 | 526.11 | 222.78 | 254.44    |   |    | 527.22 | 523.89 | 246.11 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 228.89    |   |    | 530.56 | 526.11 | 222.78 | 254.44    |   |    | 527.22 | 523.89 | 246.11 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| opx, Potential Capacity                        | 1351.10   |   |    | 462.39 | 459.69 | 821.77 | 1322.38   |   |    | 464.75 | 461.03 | 797.59 |
| Capacity                                       | 1351.10   |   |    | 438.99 | 450.01 | 821.77 | 1322.38   |   |    | 444.93 | 451.32 | 797.59 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
|                                                | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| Movement                                       |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3, R, Geometry Adjustment Factor              | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |      |    |      |      |      |
| tf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |       | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|-------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
|                      | L1        | T      | R1    | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| Movement             |           |        |       |        |        |        |           |        |       |        |        |        |
| vx, Volume           | 18.89     | 237.78 | 16.67 | 6.67   | 8.89   | 10.00  | 5.56      | 216.67 | 12.22 | 13.33  | 7.78   | 17.78  |
| cmx, Capacity        | 1351.10   |        |       | 438.99 | 450.01 | 821.77 | 1322.38   |        |       | 444.93 | 451.32 | 797.59 |
| V / C                | 0.01      |        |       | 0.02   | 0.02   | 0.01   | 0.00      |        |       | 0.03   | 0.02   | 0.02   |
| d, Delay             | 7.70      |        |       | 13.53  | 13.33  | 9.71   | 7.73      |        |       | 13.57  | 13.46  | 9.99   |
| LOS                  | A         |        |       | B      | B      | A      | A         |        |       | B      | B      | A      |
| dA, Approach Delay   |           | 0.53   |       |        | 11.96  |        |           | 0.18   |       |        | 11.91  |        |
| Approach LOS         |           |        |       |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |       |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         |        | S (Major) |           | W      |        |
|-----------------------|-----------|--------|-----------|--------|-----------|-----------|--------|--------|
|                       | Lane 1    | Lane 2 | Lane 1    | Lane 1 | Lane 2    | Lane 1    | Lane 1 | Lane 1 |
| Movements             |           | T, R1  | L1, T, R1 |        | T, R1     | L1, T, R1 |        |        |
| vx, Volume            | 18.89     | 254.44 | 25.56     |        | 228.89    | 38.89     |        |        |
| Flared Storage Size   |           |        |           |        |           |           |        |        |
| cmx, Capacity         |           |        | 542.49    |        |           | 559.63    |        |        |
| V / C                 |           |        | 0.05      |        |           | 0.07      |        |        |
| Q95, 95% Queue Length |           |        | 0.15      |        |           | 0.22      |        |        |
| d, Delay              |           |        | 11.96     |        |           | 11.91     |        |        |
| LOS                   |           |        | B         |        |           | B         |        |        |
| dA, Approach Delay    |           | 0.53   | 11.96     |        | 0.18      | 11.91     |        |        |
| Approach LOS          |           |        | B         |        |           | B         |        |        |

## Node 2034: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 2.31  
 Worst Case Delay 13.74  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 18.00     | 196.00 | 8.00  | 10.00 | 10.00 | 9.00  | 13.00     | 174.00 | 20.00 | 12.00 | 5.00  | 36.00 |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 20.00     | 217.78 | 8.89  | 11.11 | 11.11 | 10.00 | 14.44     | 193.33 | 22.22 | 13.33 | 5.56  | 40.00 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpo, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 20.00     |   |    | 11.11  | 11.11  | 10.00  | 14.44     |   |    | 13.33  | 5.56   | 40.00  |
| Conflicting Volume (Veh)                       | 215.56    |   |    | 518.33 | 500.00 | 204.44 | 226.67    |   |    | 506.11 | 506.67 | 222.22 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 215.56    |   |    | 518.33 | 500.00 | 204.44 | 226.67    |   |    | 506.11 | 506.67 | 222.22 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| opx, Potential Capacity                        | 1366.32   |   |    | 471.10 | 475.60 | 841.27 | 1353.63   |   |    | 479.97 | 471.49 | 822.36 |
| Capacity                                       | 1366.32   |   |    | 434.32 | 461.94 | 841.27 | 1353.63   |   |    | 455.39 | 457.95 | 822.36 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3,lt, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,I, Critical Headway                       | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| lf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| lf,HV, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| lf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 20.00     | 217.78 | 8.89 | 11.11  | 11.11  | 10.00  | 14.44     | 193.33 | 22.22 | 13.33  | 5.56   | 40.00  |
| cmx, Capacity        | 1366.32   |        |      | 434.32 | 461.94 | 841.27 | 1353.63   |        |       | 455.39 | 457.95 | 822.36 |
| V / C                | 0.01      |        |      | 0.03   | 0.02   | 0.01   | 0.01      |        |       | 0.03   | 0.01   | 0.05   |
| d, Delay             | 7.67      |        |      | 13.74  | 13.24  | 9.73   | 7.69      |        |       | 13.45  | 13.41  | 9.92   |
| LOS                  | A         |        |      | B      | B      | A      | A         |        |       | B      | B      | A      |
| dA, Approach Delay   |           | 0.62   |      |        | 12.32  |        |           | 0.48   |       |        | 11.05  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |        | W         |
|-----------------------|-----------|--------|-----------|-----------|--------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1    | Lane 2 | Lane 1    |
| Movements             | T, R1     | T, R1  | L1, T, R1 | L1, T, R1 | T, R1  | L1, T, R1 |
| vx, Volume            | 20.00     | 226.67 | 32.22     | 14.44     | 215.56 | 58.89     |
| Planned Storage Size  |           |        |           |           |        |           |
| cmx, Capacity         |           |        | 523.74    |           |        | 653.95    |
| V / C                 |           |        | 0.06      |           |        | 0.09      |
| Q95, 95% Queue Length |           |        | 0.20      |           |        | 0.30      |
| d, Delay              |           |        | 12.32     |           |        | 11.05     |
| LOS                   |           |        | B         |           |        | B         |
| dA, Approach Delay    |           | 0.62   | 12.32     |           | 0.48   | 11.05     |
| Approach LOS          |           |        | B         |           |        | B         |

## Node 2035: S College Ave. &amp; SE 10th St

Control Type TWSC  
 Method HCM 6th Edition  
 dt, Average Delay 1.18  
 Worst Case Delay 18.81  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 11.00     | 334.00 | 13.00 | 5.00  | 5.00  | 5.00  | 19.00     | 335.00 | 7.00  | 12.00 | 5.00  | 9.00  |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 12.22     | 371.11 | 14.44 | 5.56  | 5.56  | 5.56  | 21.11     | 372.22 | 7.78  | 13.33 | 5.56  | 10.00 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 12.22     |   |    | 5.56   | 5.56   | 5.56   | 21.11     |   |    | 13.33  | 5.56   | 10.00  |
| Conflicting Volume (Veh)                       | 380.00    |   |    | 828.89 | 828.33 | 378.11 | 385.56    |   |    | 828.67 | 825.00 | 378.33 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 380.00    |   |    | 828.89 | 828.33 | 378.11 | 385.56    |   |    | 828.67 | 825.00 | 378.33 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| opx, Potential Capacity                        | 1189.54   |   |    | 292.13 | 308.56 | 674.83 | 1183.96   |   |    | 293.14 | 309.94 | 672.89 |
| Capacity                                       | 1189.54   |   |    | 276.05 | 297.63 | 674.83 | 1183.96   |   |    | 278.85 | 298.96 | 672.89 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3,It, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |   |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |   |    |      |      |      |
| tf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |       | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|-------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
| Movement             | L1        | T      | R1    | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| vx, Volume           | 12.22     | 371.11 | 14.44 | 5.56   | 5.56   | 5.56   | 21.11     | 372.22 | 7.78 | 13.33  | 5.56   | 10.00  |
| cmx, Capacity        | 1189.54   |        |       | 276.05 | 297.63 | 674.83 | 1183.96   |        |      | 278.85 | 298.96 | 672.89 |
| V / C                | 0.01      |        |       | 0.02   | 0.02   | 0.01   | 0.02      |        |      | 0.05   | 0.02   | 0.01   |
| d, Delay             | 8.06      |        |       | 18.54  | 17.60  | 10.84  | 8.10      |        |      | 18.81  | 17.94  | 11.25  |
| LOS                  | A         |        |       | C      | C      | B      | A         |        |      | C      | C      | B      |
| dA, Approach Delay   |           | 0.25   |       |        | 15.66  |        |           | 0.43   |      |        | 16.02  |        |
| Approach LOS         |           |        |       |        | C      |        |           |        |      |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.90   |       |        |        |        |           | 0.00   |      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |        | W         |
|-----------------------|-----------|--------|-----------|-----------|--------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1    | Lane 2 | Lane 1    |
| Movements             | T, R1     | T, R1  | L1, T, R1 | T, R1     | T, R1  | L1, T, R1 |
| vx, Volume            | 12.22     | 385.56 | 16.67     | 21.11     | 380.00 | 28.89     |
| Flared Storage Size   |           |        |           |           |        |           |
| cmx, Capacity         |           |        | 354.43    |           |        | 355.51    |
| V / C                 |           |        | 0.05      |           |        | 0.08      |
| Q95, 95% Queue Length |           |        | 0.15      |           |        | 0.26      |
| d, Delay              |           |        | 15.66     |           |        | 16.02     |
| LOS                   |           |        | C         |           |        | C         |
| dA, Approach Delay    |           | 0.25   | 15.66     |           | 0.43   | 16.02     |
| Approach LOS          |           |        | C         |           |        | C         |

Node 2036 - 5 Colosseum Ave & SE 12th St

Control Type  
Warrant  
Average Delay  
Average LOS  
V/C  
Lost Time

Signalized  
W-CM Intersection  
21.92  
G  
0.55  
21

Volume and Adjustments by Movement

| Approach           | E    |      |     | S   |     |     | W   |     |     |
|--------------------|------|------|-----|-----|-----|-----|-----|-----|-----|
| Movement           | L1   | T    | R1  | L1  | T   | R1  | L1  | T   | R1  |
| Peak Volume        | 72   | 244  | 17  | 62  | 50  | 66  | 12  | 237 | 68  |
| Peak Hourly Volume | 2960 | 9800 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| Peak Hourly Volume | 29   | 98   | 5   | 17  | 14  | 26  | 3   | 68  | 18  |
| Adjusted Volume    | 62   | 271  | 18  | 69  | 54  | 103 | 13  | 243 | 73  |

Volume and Adjustments by Lane Group

| Approach           | E     |       |       | S     |       |       | W     |       |       |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Group         | L     | C     | L     | C     | L     | C     | L     | C     | L     |
| Left               | 15407 | 15408 | 15409 | 15410 | 15411 | 15412 | 15413 | 15414 | 15415 |
| Through            | 15416 | 15417 | 15418 | 15419 | 15420 | 15421 | 15422 | 15423 | 15424 |
| Right              | 15425 | 15426 | 15427 | 15428 | 15429 | 15430 | 15431 | 15432 | 15433 |
| Peak Volume        | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |
| Peak Hourly Volume | 2960  | 9800  | 600   | 600   | 600   | 600   | 600   | 600   | 600   |
| Peak Hourly Volume | 29    | 98    | 5     | 17    | 14    | 26    | 3     | 68    | 18    |
| Adjusted Volume    | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |

Relocation Factor

| Approach           | E     |       |       | S     |       |       | W     |       |       |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Group         | L     | C     | L     | C     | L     | C     | L     | C     | L     |
| Left               | 15407 | 15408 | 15409 | 15410 | 15411 | 15412 | 15413 | 15414 | 15415 |
| Through            | 15416 | 15417 | 15418 | 15419 | 15420 | 15421 | 15422 | 15423 | 15424 |
| Right              | 15425 | 15426 | 15427 | 15428 | 15429 | 15430 | 15431 | 15432 | 15433 |
| Peak Volume        | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |
| Peak Hourly Volume | 2960  | 9800  | 600   | 600   | 600   | 600   | 600   | 600   | 600   |
| Peak Hourly Volume | 29    | 98    | 5     | 17    | 14    | 26    | 3     | 68    | 18    |
| Adjusted Volume    | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |

Relocation Factor by Lane Group

| Approach           | E     |       |       | S     |       |       | W     |       |       |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Group         | L     | C     | L     | C     | L     | C     | L     | C     | L     |
| Left               | 15407 | 15408 | 15409 | 15410 | 15411 | 15412 | 15413 | 15414 | 15415 |
| Through            | 15416 | 15417 | 15418 | 15419 | 15420 | 15421 | 15422 | 15423 | 15424 |
| Right              | 15425 | 15426 | 15427 | 15428 | 15429 | 15430 | 15431 | 15432 | 15433 |
| Peak Volume        | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |
| Peak Hourly Volume | 2960  | 9800  | 600   | 600   | 600   | 600   | 600   | 600   | 600   |
| Peak Hourly Volume | 29    | 98    | 5     | 17    | 14    | 26    | 3     | 68    | 18    |
| Adjusted Volume    | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |

Relocation Factor by Movement

| Approach           | E    |      |     | S   |     |     | W   |     |     |
|--------------------|------|------|-----|-----|-----|-----|-----|-----|-----|
| Movement           | L1   | T    | R1  | L1  | T   | R1  | L1  | T   | R1  |
| Peak Volume        | 72   | 244  | 17  | 62  | 50  | 66  | 12  | 237 | 68  |
| Peak Hourly Volume | 2960 | 9800 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| Peak Hourly Volume | 29   | 98   | 5   | 17  | 14  | 26  | 3   | 68  | 18  |
| Adjusted Volume    | 62   | 271  | 18  | 69  | 54  | 103 | 13  | 243 | 73  |

Relocation Factor by Lane Group

| Approach           | E     |       |       | S     |       |       | W     |       |       |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Group         | L     | C     | L     | C     | L     | C     | L     | C     | L     |
| Left               | 15407 | 15408 | 15409 | 15410 | 15411 | 15412 | 15413 | 15414 | 15415 |
| Through            | 15416 | 15417 | 15418 | 15419 | 15420 | 15421 | 15422 | 15423 | 15424 |
| Right              | 15425 | 15426 | 15427 | 15428 | 15429 | 15430 | 15431 | 15432 | 15433 |
| Peak Volume        | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |
| Peak Hourly Volume | 2960  | 9800  | 600   | 600   | 600   | 600   | 600   | 600   | 600   |
| Peak Hourly Volume | 29    | 98    | 5     | 17    | 14    | 26    | 3     | 68    | 18    |
| Adjusted Volume    | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |

Relocation Factor by Movement

| Approach           | E    |      |     | S   |     |     | W   |     |     |
|--------------------|------|------|-----|-----|-----|-----|-----|-----|-----|
| Movement           | L1   | T    | R1  | L1  | T   | R1  | L1  | T   | R1  |
| Peak Volume        | 72   | 244  | 17  | 62  | 50  | 66  | 12  | 237 | 68  |
| Peak Hourly Volume | 2960 | 9800 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| Peak Hourly Volume | 29   | 98   | 5   | 17  | 14  | 26  | 3   | 68  | 18  |
| Adjusted Volume    | 62   | 271  | 18  | 69  | 54  | 103 | 13  | 243 | 73  |

Relocation Factor by Lane Group

| Approach           | E     |       |       | S     |       |       | W     |       |       |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Group         | L     | C     | L     | C     | L     | C     | L     | C     | L     |
| Left               | 15407 | 15408 | 15409 | 15410 | 15411 | 15412 | 15413 | 15414 | 15415 |
| Through            | 15416 | 15417 | 15418 | 15419 | 15420 | 15421 | 15422 | 15423 | 15424 |
| Right              | 15425 | 15426 | 15427 | 15428 | 15429 | 15430 | 15431 | 15432 | 15433 |
| Peak Volume        | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |
| Peak Hourly Volume | 2960  | 9800  | 600   | 600   | 600   | 600   | 600   | 600   | 600   |
| Peak Hourly Volume | 29    | 98    | 5     | 17    | 14    | 26    | 3     | 68    | 18    |
| Adjusted Volume    | 62    | 271   | 18    | 69    | 54    | 103   | 13    | 243   | 73    |

Relocation Factor by Movement

| Approach           | E    |      |     | S   |     |     | W   |     |     |
|--------------------|------|------|-----|-----|-----|-----|-----|-----|-----|
| Movement           | L1   | T    | R1  | L1  | T   | R1  | L1  | T   | R1  |
| Peak Volume        | 72   | 244  | 17  | 62  | 50  | 66  | 12  | 237 | 68  |
| Peak Hourly Volume | 2960 | 9800 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| Peak Hourly Volume | 29   | 98   | 5   | 17  | 14  | 26  | 3   | 68  | 18  |
| Adjusted Volume    | 62   | 271  | 18  | 69  | 54  | 103 | 13  | 243 | 73  |

## Node 2037: S College and 13th/13th St

Control Type TWSC  
 Method HCM 6th Edition  
 dt, Average Delay 0.37  
 Worst Case Delay 13.26  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |       | S (Major) |        | W     |       |
|-----------------------|-----------|-------|-----------|--------|-------|-------|
| Movement              | T         | R1    | L1        | T      | L1    | R1    |
| Base Volume           | 270.00    | 9.00  | 5.00      | 284.00 | 5.00  | 11.00 |
| PHF, Peak-hour factor | 0.900     | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 |
| V, Adjusted Volume    | 300.00    | 10.00 | 5.56      | 315.56 | 5.56  | 12.22 |

## Pedestrians

| Approach                 | N (Major) |    | S (Major) |   | W     |       |
|--------------------------|-----------|----|-----------|---|-------|-------|
| Movement                 | T         | R1 | L1        | T | L1    | R1    |
| vx, Flow (Ped/hr)        |           |    | 0.00      |   | 0.00  | 0.00  |
| w, Lane Width (ft)       |           |    | 12.00     |   | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) |           |    | 3.50      |   | 3.50  | 3.50  |
| fpb, Percent Blockage    |           |    | 0.00      |   | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |    | S (Major) |   | W      |        |
|------------------------------------------------|-----------|----|-----------|---|--------|--------|
| Movement                                       | T         | R1 | L1        | T | L1     | R1     |
| Rank                                           | 1         | 1  | 2         | 1 | 3      | 2      |
| vx, Volume                                     |           |    | 5.56      |   | 5.56   | 12.22  |
| Conflicting Volume (Veh)                       |           |    | 310.00    |   | 631.67 | 305.00 |
| Conflicting Volume (Ped)                       |           |    | 0.00      |   | 0.00   | 0.00   |
| Conflicting Volume                             |           |    | 310.00    |   | 631.67 | 305.00 |
| Two-Stage Gap Acceptance                       |           |    |           |   | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |    |           |   |        |        |
| cmx, Potential Capacity                        |           |    | 1261.94   |   | 447.81 | 739.54 |
| Capacity                                       |           |    | 1261.94   |   | 445.41 | 739.54 |

## Critical Headway and Follow Up Headway

| Approach                                       | N (Major) |      | S (Major) |      | W    |      |
|------------------------------------------------|-----------|------|-----------|------|------|------|
| Movement                                       | T         | R1   | L1        | T    | L1   | R1   |
| tc, base, Base Critical Headway                |           |      | 4.10      |      | 7.10 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |           |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |           |      |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       |           |      | 1.00      |      | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          |           |      | 0.00      |      | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 |           |      | 1.00      |      | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |           | 0.00 |      | 0.00 |
| TS, It, Geometry Adjustment Factor             |           |      | 0.00      |      | 0.70 | 0.00 |
| tc, Critical Headway                           |           |      | 4.10      |      | 6.40 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |           |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |           |      |      |      |
| tf, base, Base Follow-Up Headway               |           |      | 2.20      |      | 3.50 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       |           |      | 0.90      |      | 0.90 | 0.90 |
| tf, Follow-Up Headway                          |           |      | 2.20      |      | 3.50 | 3.30 |

## Delay and Level of Service by Movement

| Approach              | N (Major) |       | S (Major) |        | W      |        |
|-----------------------|-----------|-------|-----------|--------|--------|--------|
| Movement              | T         | R1    | L1        | T      | L1     | R1     |
| vx, Volume            | 300.00    | 10.00 | 5.56      | 315.56 | 5.56   | 12.22  |
| cmx, Capacity         |           |       | 1261.94   |        | 445.41 | 739.54 |
| V / C                 |           |       | 0.00      |        | 0.01   | 0.02   |
| d, Delay              |           |       | 7.87      |        | 13.26  | 10.04  |
| LOS                   |           |       | A         |        | B      | B      |
| dA, Approach Delay    |           | 0.00  |           | 0.14   |        | 11.05  |
| Approach LOS          |           |       |           |        |        | B      |
| dRank 1, Rank 1 Delay |           | 0.00  |           | 0.04   |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) | S (Major) | W      |
|-----------------------|-----------|-----------|--------|
| Lane                  | Lane 1    | Lane 1    | Lane 1 |
| Movements             | T, R1     | L1, T     | L1, R1 |
| vx, Volume            | 310.00    | 321.11    | 17.78  |
| Flared Storage Size   |           |           |        |
| cmx, Capacity         |           | 1261.94   | 613.04 |
| V / C                 |           | 0.25      | 0.03   |
| QS5, 95% Queue Length |           | 0.01      | 0.09   |
| d, Delay              |           | 7.87      | 11.05  |
| LOS                   |           |           | B      |
| dA, Approach Delay    | 0.00      | 0.14      | 11.05  |
| Approach LOS          |           |           | B      |



Node 2334, S College Ave & Lantport

|               |               |
|---------------|---------------|
| Control Type  | Sequenced     |
| Max LOS       | High on Green |
| Average Delay | 24.72         |
| Average LOS   | C             |
| LOS           | 0.56          |
| Lost Time     | 21            |

Vehicle and Adjustment by Movement

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Vehicle and Adjustment by Lane Group

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Signalized Intersection

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Capacity, Control Delay, and Level of Service Determination

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Signalized Intersection

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Signalized Intersection

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Signalized Intersection

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Signalized Intersection

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

Signalized Intersection

| Adjustment           | L    | T    | R    | L    | T    | R    | L    | T    | R    | L    | T    | R    |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Base Value           | 13.6 | 18.7 | 9.0  | 21   | 33   | 19.0 | 20   | 29.0 | 15   | 15   | 5.3  | 12   |
| Peak Hour Adjustment | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Peak Hour Adjustment | 38   | 51   | 15   | 9    | 24   | 53   | 5    | 59   | 4    | 10   | 16   | 3    |
| Adjusted Value       | 100  | 170  | 81   | 23   | 37   | 212  | 22   | 221  | 16   | 16   | 58   | 13   |

## Node 2039: SE 3rd &amp; Ash Ave

Control Type TWSC  
 Method HCM 6th Edition  
 dt, Average Delay 8.98  
 Worst Case Delay 9.59  
 Worst Case LOS A

## Volume and Adjustments

| Approach              | N     |       |       | E (Major) |       |       | S     |       |       | W (Major) |       |       |
|-----------------------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|-----------|-------|-------|
| Movement              | L1    | T     | R1    | L1        | T     | R1    | L1    | T     | R1    | L1        | T     | R1    |
| Base Volume           | 6.00  | 44.00 | 5.00  | 5.00      | 8.00  | 5.00  | 5.00  | 10.00 | 5.00  | 5.00      | 8.00  | 5.00  |
| PHF, Peak-hour factor | 0.900 | 0.900 | 0.900 | 0.900     | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900 | 0.900 |
| V, Adjusted Volume    | 6.67  | 48.89 | 5.56  | 5.56      | 8.89  | 5.56  | 5.56  | 11.11 | 5.56  | 5.56      | 8.89  | 5.56  |

## Pedestrians

| Approach                 | N     |       |       | E (Major) |   |    | S     |       |       | W (Major) |   |    |
|--------------------------|-------|-------|-------|-----------|---|----|-------|-------|-------|-----------|---|----|
| Movement                 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 |
| vx, Flow (Ped/hr)        | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |
| w, Lane Width (ft)       | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    |
| Sp, Walking Speed (ft/s) | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    |
| fpb, Percent Blockage    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |

## Capacity of Movements below Rank 1

| Approach                                       | N      |        |         | E (Major) |   |    | S      |        |         | W (Major) |   |    |
|------------------------------------------------|--------|--------|---------|-----------|---|----|--------|--------|---------|-----------|---|----|
| Movement                                       | L1     | T      | R1      | L1        | T | R1 | L1     | T      | R1      | L1        | T | R1 |
| Rank                                           | 4      | 3      | 2       | 2         | 1 | 1  | 4      | 3      | 2       | 2         | 1 | 1  |
| vx, Volume                                     | 6.67   | 48.89  | 5.56    | 5.56      |   |    | 5.56   | 11.11  | 5.56    | 5.56      |   |    |
| Conflicting Volume (Veh)                       | 53.89  | 48.33  | 11.67   | 14.44     |   |    | 72.78  | 48.33  | 11.67   | 14.44     |   |    |
| Conflicting Volume (Ped)                       | 0.00   | 0.00   | 0.00    | 0.00      |   |    | 0.00   | 0.00   | 0.00    | 0.00      |   |    |
| Conflicting Volume                             | 53.89  | 48.33  | 11.67   | 14.44     |   |    | 72.78  | 48.33  | 11.67   | 14.44     |   |    |
| Two-Stage Gap Acceptance                       | No     | No     |         |           |   |    | No     | No     |         |           |   |    |
| Number of Storage Spaces in Median Refuge Area |        |        |         |           |   |    |        |        |         |           |   |    |
| cpx, Potential Capacity                        | 949.30 | 847.13 | 1074.94 | 1616.78   |   |    | 922.94 | 847.13 | 1074.94 | 1616.78   |   |    |
| Capacity                                       | 929.96 | 841.27 | 1074.94 | 1616.78   |   |    | 872.80 | 841.27 | 1074.94 | 1616.78   |   |    |

## Critical Headway and Follow Up Headway

| Approach                                     | N    |      |      | E (Major) |      |    | S    |      |      | W (Major) |      |    |
|----------------------------------------------|------|------|------|-----------|------|----|------|------|------|-----------|------|----|
| Movement                                     | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 |
| tc,base, Base Critical Headway               | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc,base,I, Base Critical Headway (Stage I)   |      |      |      |           |      |    |      |      |      |           |      |    |
| tc,base,II, Base Critical Headway (Stage II) |      |      |      |           |      |    |      |      |      |           |      |    |
| tc,hv, Heavy Vehicles Adjustment Factor      | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    |
| Phv, % Heavy Vehicles                        | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc,G, Grade Adjustment Factor                | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    |
| G, % Grade                                   |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |
| TSR, Geometry Adjustment Factor              | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc, Critical Headway                         | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc,I, Critical Headway (Stage I)             |      |      |      |           |      |    |      |      |      |           |      |    |
| tc,II, Critical Headway (Stage II)           |      |      |      |           |      |    |      |      |      |           |      |    |
| tf,base, Base Follow-Up Headway              | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |
| tf,hv, Heavy Vehicles Adjustment Factor      | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    |
| tf, Follow-Up Headway                        | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |

## Delay and Level of Service by Movement

| Approach             | N      |        |         | E (Major) |      |      | S      |        |         | W (Major) |      |      |
|----------------------|--------|--------|---------|-----------|------|------|--------|--------|---------|-----------|------|------|
| Movement             | L1     | T      | R1      | L1        | T    | R1   | L1     | T      | R1      | L1        | T    | R1   |
| vx, Volume           | 6.67   | 48.89  | 5.56    | 5.56      | 8.89 | 5.56 | 5.56   | 11.11  | 5.56    | 5.56      | 8.89 | 5.56 |
| cmx, Capacity        | 929.96 | 841.27 | 1074.94 | 1616.78   |      |      | 872.80 | 841.27 | 1074.94 | 1616.78   |      |      |
| V/C                  | 0.01   | 0.06   | 0.01    | 0.00      |      |      | 0.01   | 0.01   | 0.01    | 0.00      |      |      |
| d, Delay             | 9.19   | 9.59   | 8.66    | 7.23      |      |      | 9.23   | 9.38   | 8.45    | 7.23      |      |      |
| LOS                  | A      | A      | A       | A         |      |      | A      | A      | A       | A         |      |      |
| dA, Approach Delay   |        | 9.46   |         |           | 2.01 |      |        | 9.11   |         |           | 2.01 |      |
| Approach LOS         |        | A      |         |           |      |      |        | A      |         |           |      |      |
| dRank1, Rank 1 Delay |        |        |         |           | 0.03 |      |        |        |         |           | 0.03 |      |

## Delay and Level of Service by Lane

| Approach              | N         |           | E (Major) |           | S         |           | W (Major) |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 61.11     | 20.00     | 22.22     | 20.00     |           |           |           |           |
| Flared Storage Size   |           |           |           |           |           |           |           |           |
| cmx, Capacity         | 867.44    | 1616.78   | 898.20    | 1616.78   |           |           |           |           |
| V/C                   | 0.07      | 0.01      | 0.02      | 0.01      |           |           |           |           |
| GS5, 95% Queue Length | 0.23      | 0.01      | 0.08      | 0.01      |           |           |           |           |
| d, Delay              | 9.46      | 7.23      | 9.11      | 7.23      |           |           |           |           |
| LOS                   | A         |           | A         |           |           |           |           |           |
| dA, Approach Delay    | 9.46      | 2.01      | 9.11      | 2.01      |           |           |           |           |
| Approach LOS          | A         |           | A         |           |           |           |           |           |

## Intersection Capacity Analysis Summary Page

Analysis Time: Fri Sep 27 12:28:51 2  
 Driving Side: Right  
 Analysis Period: 1 Hours

| Number | Name                       | Control Type | V/C  | Avg Delay | Avg LOS | Max Delay | Max LOS |
|--------|----------------------------|--------------|------|-----------|---------|-----------|---------|
| 2030   | College & Whitman          | Signalized   | 0.43 | 20.15     | C       | 30.91     | C       |
| 2031   | N College & SE 3rd St.     | TWSC         | 0.00 | 1.32      | A       | 11.70     | B       |
| 2032   | S College Ave & SW 4th St  | Signalized   | 0.51 | 26.81     | C       | 46.79     | D       |
| 2033   | S College Ave & SE 6th St  | TWSC         | 0.00 | 1.84      | A       | 14.20     | B       |
| 2034   | S College Ave & SE 8th St  | TWSC         | 0.00 | 1.82      | A       | 14.18     | B       |
| 2035   | S College Ave & SE 10th St | TWSC         | 0.00 | 1.18      | A       | 19.97     | C       |
| 2036   | S College Ave & SE 12th St | Signalized   | 0.50 | 22.51     | C       | 35.77     | D       |
| 2037   | S College and 13th 13th St | TWSC         | 0.00 | 0.34      | A       | 14.37     | B       |
| 2038   | S College Ave & Lampert    | Signalized   | 0.62 | 25.92     | C       | 38.87     | D       |
| 2039   | SE 3rd & Ash Ave           | TWSC         | 0.00 | 6.71      | A       | 9.39      | A       |



## Node 2031: N College &amp; SE 3rd St

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 1.32  
 Worst Case Delay 11.7  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
|                       | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Movement              |           |        |       |       |       |       |           |        |       |       |       |       |
| Base Volume           | 5.00      | 158.00 | 5.00  | 6.00  | 5.00  | 10.00 | 8.00      | 144.00 | 9.00  | 5.00  | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 5.56      | 175.58 | 5.56  | 6.67  | 5.56  | 11.11 | 8.89      | 160.00 | 10.00 | 5.56  | 5.56  | 5.56  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
|                          | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| Movement                 |           |   |    |       |       |       |           |   |    |       |       |       |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
|                                                | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Movement                                       |           |   |    |        |        |        |           |   |    |        |        |        |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 5.56      |   |    | 6.67   | 5.56   | 11.11  | 8.89      |   |    | 5.56   | 5.56   | 5.56   |
| Conflicting Volume (Veh)                       | 170.00    |   |    | 377.78 | 375.00 | 165.00 | 181.11    |   |    | 380.56 | 377.22 | 178.33 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 170.00    |   |    | 377.78 | 375.00 | 165.00 | 181.11    |   |    | 380.56 | 377.22 | 178.33 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpv, Potential Capacity                        | 1419.58   |   |    | 583.41 | 559.15 | 884.72 | 1406.41   |   |    | 580.96 | 557.55 | 869.80 |
| Capacity                                       | 1419.58   |   |    | 570.27 | 552.83 | 884.72 | 1406.41   |   |    | 564.36 | 551.25 | 869.80 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
|                                              | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| Movement                                     |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3,t, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| tf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
|                      | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| Movement             |           |        |      |        |        |        |           |        |       |        |        |        |
| vx, Volume           | 5.56      | 175.58 | 5.56 | 6.67   | 5.56   | 11.11  | 8.89      | 160.00 | 10.00 | 5.56   | 5.56   | 5.56   |
| cmv, Capacity        | 1419.58   |        |      | 570.27 | 552.83 | 884.72 | 1406.41   |        |       | 564.36 | 551.25 | 869.80 |
| V / C                | 0.00      |        |      | 0.01   | 0.01   | 0.01   | 0.01      |        |       | 0.01   | 0.01   | 0.01   |
| d, Delay             | 7.55      |        |      | 11.50  | 11.70  | 9.26   | 7.58      |        |       | 11.53  | 11.68  | 9.29   |
| LOS                  | A         |        |      | B      | B      | A      | A         |        |       | B      | B      | A      |
| dA, Approach Delay   |           | 0.22   |      |        | 10.48  |        |           | 0.38   |       |        | 10.84  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E      |        | S (Major) |        | W      |        |
|-----------------------|-----------|--------|--------|--------|-----------|--------|--------|--------|
|                       | Lane 1    | Lane 2 | Lane 1 | Lane 1 | Lane 2    | Lane 1 | Lane 1 | Lane 1 |
| Lane                  |           |        |        |        |           |        |        |        |
| Movements             |           |        |        |        |           |        |        |        |
| vx, Volume            | 5.56      | 181.11 | 23.33  | 8.89   | 170.00    | 16.67  |        |        |
| Planned Storage Size  |           |        |        |        |           |        |        |        |
| cmv, Capacity         |           |        | 680.30 |        |           | 633.49 |        |        |
| V / C                 |           |        | 0.03   |        |           | 0.03   |        |        |
| Q95, 95% Queue Length |           |        | 0.11   |        |           | 0.08   |        |        |
| d, Delay              |           |        | 10.48  |        |           | 10.84  |        |        |
| LOS                   |           |        | B      |        |           | B      |        |        |
| dA, Approach Delay    |           | 0.22   | 10.48  |        | 0.38      | 10.84  |        |        |
| Approach LOS          |           |        | B      |        |           | B      |        |        |

From 2012, S. Cabbage Ave & SW 4th St

| Control Type  | Signalized   |
|---------------|--------------|
| Warrant       | Intersection |
| Average Delay | 29.81        |
| Average LOS   | C            |
| WPC           | 0.51         |
| LOS Time      | 15           |

Vehicle and Pedestrian Movement

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 18    | 225   | 15    | 61    | 55    | 13    | 72    | 219   | 55    | 34    | 17    | 62    |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 4     | 63    | 4     | 17    | 15    | 4     | 20    | 61    | 15    | 9     | 21    | 17    |
| Right Turn | 16    | 200   | 17    | 65    | 61    | 14    | 80    | 243   | 61    | 26    | 24    | 65    |

Vehicle and Pedestrian by Lane Group

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Signalized Intersection

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Controlled Intersection Control of Service Determination

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Base of Service

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Signalized Intersection

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Left Turn Signalized Intersection

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Right Turn Signalized Intersection

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Signalized Intersection

|            | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     | R     |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Approach   | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Left Turn  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Through    | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Right Turn | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

## Node 2033: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.84  
 Worst Case Delay 14.2  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 15.00     | 224.00 | 8.00  | 5.00  | 6.00  | 8.00  | 12.00     | 205.00 | 12.00 | 12.00 | 5.00  | 32.00 |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 16.67     | 248.89 | 8.89  | 5.56  | 6.67  | 8.89  | 13.33     | 228.89 | 13.33 | 13.33 | 5.56  | 35.56 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fp, Percent Blockage     | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 16.67     |   |    | 5.56   | 6.67   | 8.89   | 13.33     |   |    | 13.33  | 5.56   | 35.56  |
| Conflicting Volume (Veh)                       | 242.22    |   |    | 569.44 | 553.33 | 235.56 | 257.78    |   |    | 556.67 | 555.56 | 253.33 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 242.22    |   |    | 569.44 | 553.33 | 235.56 | 257.78    |   |    | 556.67 | 555.56 | 253.33 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cp, Potential Capacity                         | 1336.04   |   |    | 435.69 | 443.65 | 808.44 | 1318.68   |   |    | 444.29 | 442.39 | 790.24 |
| Capacity                                       | 1336.04   |   |    | 403.80 | 432.06 | 808.44 | 1318.68   |   |    | 425.60 | 430.81 | 790.24 |

## Critical Headway and Follow-Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                       | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, hv, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3, It, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |      |    |      |      |      |
| tf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 16.67     | 248.89 | 8.89 | 5.56   | 6.67   | 8.89   | 13.33     | 228.89 | 13.33 | 13.33  | 5.56   | 35.56  |
| cmx, Capacity        | 1336.04   |        |      | 403.80 | 432.06 | 808.44 | 1318.68   |        |       | 425.60 | 430.81 | 790.24 |
| V / C                | 0.01      |        |      | 0.01   | 0.02   | 0.01   | 0.01      |        |       | 0.03   | 0.01   | 0.04   |
| d, Delay             | 7.73      |        |      | 14.20  | 13.62  | 9.74   | 7.76      |        |       | 14.04  | 13.93  | 10.13  |
| LOS                  | A         |        |      | B      | B      | A      | A         |        |       | B      | B      | B      |
| dA, Approach Delay   |           | 0.47   |      |        | 12.14  |        |           | 0.40   |       |        | 11.48  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |        | W         |
|-----------------------|-----------|--------|-----------|-----------|--------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1    | Lane 2 | Lane 1    |
| Movements             | T, R1     | T, R1  | L1, T, R1 | T, R1     | T, R1  | L1, T, R1 |
| vx, Volume            | 16.67     | 257.78 | 21.11     | 13.33     | 242.22 | 54.44     |
| Planned Storage Size  |           |        |           |           |        |           |
| cmx, Capacity         |           |        | 525.37    |           |        | 810.25    |
| V / C                 |           |        | 0.04      |           |        | 0.09      |
| Q95, 95% Queue Length |           |        | 0.13      |           |        | 0.29      |
| d, Delay              |           |        | 12.14     |           |        | 11.48     |
| LOS                   |           |        | B         |           |        | B         |
| dA, Approach Delay    |           | 0.47   | 12.14     |           | 0.40   | 11.48     |
| Approach LOS          |           |        | B         |           |        | B         |

## Node 2034: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.82  
 Worst Case Delay 14.18  
 Worst Case LOS B

## Volumes and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 15.00     | 224.00 | 8.00  | 5.00  | 6.00  | 8.00  | 12.00     | 208.00 | 12.00 | 12.00 | 5.00  | 31.00 |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 16.67     | 248.89 | 8.89  | 5.56  | 6.67  | 8.89  | 13.33     | 228.89 | 13.33 | 13.33 | 5.56  | 34.44 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 16.67     |   |    | 5.56   | 6.67   | 8.89   | 13.33     |   |    | 13.33  | 5.56   | 34.44  |
| Conflicting Volume (Veh)                       | 242.22    |   |    | 568.89 | 553.33 | 235.56 | 257.78    |   |    | 556.67 | 555.56 | 253.33 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 242.22    |   |    | 568.89 | 553.33 | 235.56 | 257.78    |   |    | 556.67 | 555.56 | 253.33 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cmx, Potential Capacity                        | 1336.04   |   |    | 436.06 | 443.65 | 808.44 | 1318.68   |   |    | 444.29 | 442.36 | 790.24 |
| Capacity                                       | 1336.04   |   |    | 404.74 | 432.06 | 808.44 | 1318.68   |   |    | 425.60 | 430.81 | 790.24 |

## Critical Headway and Follow-Up Headway

| Approach                                      | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|-----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                      | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| to base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| to base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| to base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| to hv, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                         | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| to G, Grade Adjustment Factor                 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                    |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3, II, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| to Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| to I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |      |    |      |      |      |
| to II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |      |    |      |      |      |
| to base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| to hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| to Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 16.67     | 248.89 | 8.89 | 5.56   | 6.67   | 8.89   | 13.33     | 228.89 | 13.33 | 13.33  | 5.56   | 34.44  |
| cmx, Capacity        | 1336.04   |        |      | 404.74 | 432.06 | 808.44 | 1318.68   |        |       | 425.60 | 430.81 | 790.24 |
| V / C                | 0.01      |        |      | 0.01   | 0.02   | 0.01   | 0.01      |        |       | 0.03   | 0.01   | 0.04   |
| d, Delay             | 7.73      |        |      | 14.18  | 13.62  | 9.74   | 7.76      |        |       | 14.03  | 13.93  | 10.13  |
| LOS                  | A         |        |      | B      | B      | A      | A         |        |       | B      | B      | B      |
| dA, Approach Delay   |           | 0.47   |      |        | 12.13  |        |           | 0.40   |       |        | 11.50  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |        | W         |
|-----------------------|-----------|--------|-----------|-----------|--------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1    | Lane 2 | Lane 1    |
| Movements             | T, R1     | T, R1  | L1, T, R1 | L1, T, R1 | T, R1  | L1, T, R1 |
| vx, Volume            | 16.67     | 257.78 | 21.11     | 13.33     | 242.22 | 53.33     |
| Flared Storage Size   |           |        |           |           |        |           |
| cmx, Capacity         |           |        | 525.79    |           |        | 607.36    |
| V / C                 |           |        | 0.04      |           |        | 0.09      |
| Q85, 95% Queue Length |           |        | 0.13      |           |        | 0.29      |
| d, Delay              |           |        | 12.13     |           |        | 11.50     |
| LOS                   |           |        | B         |           |        | B         |
| dA, Approach Delay    |           | 0.47   | 12.13     |           | 0.40   | 11.50     |
| Approach LOS          |           |        | B         |           |        | B         |



## Node 2035: S College Ave &amp; SE 10th St

Control Type TWSC  
 Method HCM 6th Edition  
 dt, Average Delay 1.18  
 Worst Case Delay 19.97  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 11.00     | 353.00 | 13.00 | 5.00  | 5.00  | 5.00  | 19.00     | 358.00 | 5.00  | 13.00 | 5.00  | 9.00  |
| PHF, Peak-hour factor | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 | 0.900 | 0.900 |
| V, Adjusted Volume    | 12.22     | 392.22 | 14.44 | 5.56  | 5.56  | 5.56  | 21.11     | 397.78 | 5.56  | 14.44 | 5.56  | 10.00 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 12.22     |   |    | 5.56   | 5.56   | 5.56   | 21.11     |   |    | 14.44  | 5.56   | 10.00  |
| Conflicting Volume (Veh)                       | 403.33    |   |    | 874.44 | 873.89 | 400.56 | 406.67    |   |    | 872.22 | 869.44 | 399.44 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 403.33    |   |    | 874.44 | 873.89 | 400.56 | 406.67    |   |    | 872.22 | 869.44 | 399.44 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cmx, Potential Capacity                        | 1166.30   |   |    | 272.18 | 290.34 | 653.86 | 1163.01   |   |    | 273.12 | 292.07 | 654.80 |
| Capacity                                       | 1166.30   |   |    | 256.62 | 279.70 | 653.86 | 1163.01   |   |    | 259.26 | 281.36 | 654.80 |

## Critical Headway and Follow Up Headway

| Approach                                      | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|-----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                      | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc, base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, base I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, base II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, IV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Prv, IV, Heavy Vehicles                       | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                    |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3, H, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                          | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc, II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| tf, base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf, IV, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                         | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |       | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|-------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
| Movement             | L1        | T      | R1    | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| vx, Volume           | 12.22     | 392.22 | 14.44 | 5.56   | 5.56   | 5.56   | 21.11     | 397.78 | 5.56 | 14.44  | 5.56   | 10.00  |
| cmx, Capacity        | 1166.30   |        |       | 256.62 | 279.70 | 653.86 | 1163.01   |        |      | 259.26 | 281.36 | 654.80 |
| V / C                | 0.01      |        |       | 0.02   | 0.02   | 0.01   | 0.02      |        |      | 0.06   | 0.02   | 0.02   |
| d, Delay             | 8.12      |        |       | 19.80  | 18.44  | 11.07  | 8.15      |        |      | 19.97  | 18.88  | 11.58  |
| LOS                  | A         |        |       | C      | C      | B      | A         |        |      | C      | C      | B      |
| dA, Approach Delay   |           | 0.24   |       |        | 16.37  |        |           | 0.41   |      |        | 16.97  |        |
| Approach LOS         |           |        |       |        | C      |        |           |        |      |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.00   |       |        |        |        |           | 0.00   |      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |           | E         | S (Major) |        | W         |
|-----------------------|-----------|-----------|-----------|-----------|--------|-----------|
| Lane                  | Lane 1    | Lane 2    | Lane 1    | Lane 1    | Lane 2 | Lane 1    |
| Movements             | T, R1     | L1, T, R1 | L1, T, R1 | T, R1     | T, R1  | L1, T, R1 |
| vx, Volume            | 12.22     | 406.67    | 16.67     | 21.11     | 403.33 | 30.00     |
| Planned Storage Size  |           |           |           |           |        |           |
| cmx, Capacity         |           | 333.28    |           |           |        | 330.65    |
| V / C                 |           | 0.05      |           |           |        | 0.09      |
| Q85, 95% Queue Length |           | 0.16      |           |           |        | 0.30      |
| d, Delay              |           | 16.37     |           |           |        | 16.97     |
| LOS                   |           | C         |           |           |        | C         |
| dA, Approach Delay    |           | 0.24      |           |           | 0.41   | 18.97     |
| Approach LOS          |           |           |           |           |        | C         |

| Node 2030: (College Ave & 3rd 12th St) |            |
|----------------------------------------|------------|
| Control Type                           | Signalized |
| Wayins                                 | multilane  |
| Average Delay                          | 22.51      |
| Average LOS                            | C          |
| V/C                                    | 0.5        |
| Loss Time                              | 21         |

| ANALYSIS OF VARIANCE BY UNIVERSITY |       |       |       |       |       |       |       |       |       |       |       |       |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| APPLICANT                          | N     |       |       | E     |       |       | S     |       |       | W     |       |       |
| DEPARTMENT                         | L1    | T     | R1    | L1    | T     | R1    | L1    | T     | R1    | L1    | T     | R1    |
| BIOLOGY                            | 15    | 213   | 15    | 02    | 20    | 17    | 18    | 278   | 15    | 17    | 3     | 17    |
| PHYSICS                            | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| PHYSICS/BIOPHYSICS                 | 19    | 24    | 3     | 18    | 9     | 21    | 4     | 70    | 13    | 3     | 5     | 4     |
| APPLIED PHYSICS                    | 77    | 205   | 12    | 75    | 22    | 09    | 16    | 518   | 28    | 12    | 19    | 14    |

[illegible][illegible]

|     |  | N     |       | B     |       | C     |       | D     |       | E     |       | F     |       | G     |       | H     |       | I     |       | J     |       | K     |       | L     |       | M     |       | N     |       | O     |       | P     |       | Q     |       | R     |       | S     |       | T     |       | U     |       | V     |       | W     |       | X     |       | Y     |       | Z     |       | AA    |       | AB    |       | AC    |       | AD    |       | AE    |       | AF    |       | AG    |       | AH    |       | AI    |       | AJ    |       | AK    |       | AL    |       | AM    |       | AN    |       | AO    |       | AP    |       | AQ    |       | AR    |       | AS    |       | AT    |       | AU    |       | AV    |       | AW    |       | AX    |       | AY    |       | AZ    |       | BA    |       | BB    |       | BC    |       | BD    |       | BE    |       | BF    |       | BG    |       | BH    |       | BI    |       | BJ    |       | BK    |       | BL    |       | BM    |       | BN    |       | BO    |       | BP    |       | BQ    |       | BR    |       | BS    |       | BT    |       | BU    |       | BV    |       | BW    |       | BX    |       | BY    |       | BZ    |       | CA    |       | CB    |       | CC    |       | CD    |       | CE    |       | CF    |       | CG    |       | CH    |       | CI    |       | CJ    |       | CK    |       | CL    |       | CM    |       | CN    |       | CO    |       | CP    |       | CQ    |       | CR    |       | CS    |       | CT    |       | CU    |       | CV    |       | CW    |       | CX    |       | CY    |       | CZ    |       | DA    |       | DB    |       | DC    |       | DD    |       | DE    |       | DF    |       | DG    |       | DH    |       | DI    |       | DJ    |       | DK    |       | DL    |       | DM    |       | DN    |       | DO    |       | DP    |       | DQ    |       | DR    |       | DS    |       | DT    |       | DU    |       | DV    |       | DW    |       | DX    |       | DY    |       | DZ    |       | EA    |       | EB    |       | EC    |       | ED    |       | EE    |       | EF    |       | EG    |       | EH    |       | EI    |       | EJ    |       | EK    |       | EL    |       | EM    |       | EN    |       | EO    |       | EP    |       | EQ    |       | ER    |       | ES    |       | ET    |       | EU    |       | EV    |       | EW    |       | EX    |       | EY    |       | EZ    |       | FA    |       | FB    |       | FC    |       | FD    |       | FE    |       | FF    |       | FG    |       | FH    |       | FI    |       | FJ    |       | FK    |       | FL    |       | FM    |       | FN    |       | FO    |       | FP    |       | FQ    |       | FR    |       | FS    |       | FT    |       | FU    |       | FV    |       | FW    |       | FX    |       | FY    |       | FZ    |       | GA    |       | GB    |       | GC    |       | GD    |       | GE    |       | GF    |       | GG    |       | GH    |       | GI    |       | GJ    |       | GK    |       | GL    |       | GM    |       | GN    |       | GO    |       | GP    |       | GQ    |       | GR    |       | GS    |       | GT    |       | GU    |       | GV    |       | GW    |       | GX    |       | GY    |       | GZ    |       | HA    |       | HB    |       | HC    |       | HD    |       | HE    |       | HF    |       | HG    |       | HH    |       | HI    |       | HJ    |       | HK    |       | HL    |       | HM    |       | HN    |       | HO    |       | HP    |       | HQ    |       | HR    |       | HS    |       | HT    |       | HU    |       | HV    |       | HW    |       | HX    |       | HY    |       | HZ    |       | IA    |       | IB    |       | IC    |       | ID    |       | IE    |       | IF    |       | IG    |       | IH    |       | II    |       | IJ    |       | IK    |       | IL    |       | IM    |       | IN    |       | IO    |       | IP    |       | IQ    |       | IR    |       | IS    |       | IT    |       | IU    |       | IV    |       | IW    |       | IX    |       | IY    |       | IZ    |       | JA    |       | JB    |       | JC    |       | JD    |       | JE    |       | JF    |       | JG    |       | JH    |       | JI    |       | JJ    |       | JK    |       | JL    |       | JM    |       | JN    |       | JO    |       | JP    |       | JQ    |       | JR    |       | JS    |       | JT    |       | JU    |       | JV    |       | JW    |       | JX    |       | JY    |       | JZ    |       | KA    |       | KB    |       | KC    |       | KD    |       | KE    |       | KF    |       | KG    |       | KH    |       | KI    |       | KJ    |       | KK    |       | KL  |  | KM |  | KN |  | KO |  | KP |  | KQ |  | KR |  | KS |  | KT |  | KU |  | KV |  | KW |  | KX |  | KY |  | KZ |  | LA |  | LB |  | LC |  | LD |  | LE |  | LF |  | LG |  | LH |  | LI |  | LJ |  | LK |  | LM |  | LN |  | LO |  | LP |  | LQ |  | LR |  | LS |  | LT |  | LU |  | LV |  | LW |  | LX |  | LY |  | LZ |  | MA |  | MB |  | MC |  | MD |  | ME |  | MF |  | MG |  | MH |  | MI |  | MJ |  | MK |  | ML |  | MN |  | MO |  | MP |  | MQ |  | MR |  | MS |  | MT |  | MU |  | MV |  | MW |  | MX |  | MY |  | MZ |  | NA |  | NB |  | NC |  | ND |  | NE |  | NF |  | NG |  | NH |  | NI |  | NJ |  | NK |  | NL |  | NM |  | NN |  | NO |  | NP |  | NQ |  | NR |  | NS |  | NT |  | NU |  | NV |  | NW |  | NX |  | NY |  | NZ |  | OA |  | OB |  | OC |  | OD |  | OE |  | OF |  | OG |  | OH |  | OI |  | OJ |  | OK |  | OL |  | OM |  | ON |  | OO |  | OP |  | OQ |  | OR |  | OS |  | OT |  | OU |  | OV |  | OW |  | OX |  | OY |  | OZ |  | PA |  | PB |  | PC |  | PD |  | PE |  | PF |  | PG |  | PH |  | PI |  | PJ |  | PK |  | PL |  | PM |  | PN |  | PO |  | PP |  | PQ |  | PR |  | PS |  | PT |  | PU |  | PV |  | PW |  | PX |  | PY |  | PZ |  | QA |  | QB |  | QC |  | QD |  | QE |  | QF |  | QG |  | QH |  | QI |  | QJ |  | QK |  | QL |  | QM |  | QN |  | QO |  | QP |  | QQ |  | QR |  | QS |  | QT |  | QU |  | QV |  | QW |  | QX |  | QY |  | QZ |  | RA |  | RB |  | RC |  | RD |  | RE |  | RF |  | RG |  | RH |  | RI |  | RJ |  | RK |  | RL |  | RM |  | RN |  | RO |  | RP |  | RQ |  | RR |  | RS |  | RT |  | RU |  | RV |  | RW |  | RX |  | RY |  | RZ |  | SA |  | SB |  | SC |  | SD |  | SE |  | SF |  | SG |  | SH |  | SI |  | SJ |  | SK |  | SL |  | SM |  | SN |  | SO |  | SP |  | SQ |  | SR |  | SS |  | ST |  | SU |  | SV |  | SW |  | SX |  | SY |  | SZ |  | TA |  | TB |  | TC |  | TD |  | TE |  | TF |  | TG |  | TH |  | TI |  | TJ |  | TK |  | TL |  | TM |  | TN |  | TO |  | TP |  | TQ |  | TR |  | TS |  | TT |  | TU |  | TV |  | TW |  | TX |  | TY |  | TZ |  | UA |  | UB |  | UC |  | UD |  | UE |  | UF |  | UG |  | UH |  | UI |  | UJ |  | UK |  | UL |  | UM |  | UN |  | UO |  | UP |  | UQ |  | UR |  | US |  | UT |  | UU |  | UV |  | UW |  | UX |  | UY |  | UZ |  | VA |  | VB |  | VC |  | VD |  | VE |  | VF |  | VG |  | VH |  | VI |  | VJ |  | VK |  | VL |  | VM |  | VN |  | VO |  | VP |  | VQ |  | VR |  | VS |  | VT |  | VU |  | VV |  | VW |  | VX |  | VY |  | VZ |  | WA |  | WB |  | WC |  | WD |  | WE |  | WF |  | WG |  | WH |  | WI |  | WJ |  | WK |  | WL |  | WM |  | WN |  | WO |  | WP |  | WQ |  | WR |  | WS |  | WT |  | WU |  | WV |  | WW |  | WX |  | WY |  | WZ |  | XA |  | XB |  | XC |  | XD |  | XE |  | XF |  | XG |  | XH |  | XI |  | XJ |  | XK |  | XL |  | XM |  | XN |  | XO |  | XP |  | XQ |  | XR |  | XS |  | XT |  | XU |  | XV |  | XW |  | XX |  | XY |  | XZ |  | YA |  | YB |  | YC |  | YD |  | YE |  | YF |  | YG |  | YH |  | YI |  | YJ |  | YK |  | YL |  | YM |  | YN |  | YO |  | YP |  | YQ |  | YR |  | YS |  | YT |  | YU |  | YV |  | YW |  | YX |  | YY |  | YZ |  | ZA |  | ZB |  | ZC |  | ZD |  | ZE |  | ZF |  | ZG |  | ZH |  | ZI |  | ZJ |  | ZK |  | ZL |  | ZM |  | ZN |  | ZO |  | ZP |  | ZQ |  | ZR |  | ZS |  | ZT |  | ZU |  | ZV |  | ZW |  | ZX |  | ZY |  | ZZ |  |
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| Age |  | 92576 | 22253 | 92574 | 92573 | 92572 | 92571 | 92570 | 92569 | 92568 | 92567 | 92566 | 92565 | 92564 | 92563 | 92562 | 92561 | 92560 | 92559 | 92558 | 92557 | 92556 | 92555 | 92554 | 92553 | 92552 | 92551 | 92550 | 92549 | 92548 | 92547 | 92546 | 92545 | 92544 | 92543 | 92542 | 92541 | 92540 | 92539 | 92538 | 92537 | 92536 | 92535 | 92534 | 92533 | 92532 | 92531 | 92530 | 92529 | 92528 | 92527 | 92526 | 92525 | 92524 | 92523 | 92522 | 92521 | 92520 | 92519 | 92518 | 92517 | 92516 | 92515 | 92514 | 92513 | 92512 | 92511 | 92510 | 92509 | 92508 | 92507 | 92506 | 92505 | 92504 | 92503 | 92502 | 92501 | 92500 | 92499 | 92498 | 92497 | 92496 | 92495 | 92494 | 92493 | 92492 | 92491 | 92490 | 92489 | 92488 | 92487 | 92486 | 92485 | 92484 | 92483 | 92482 | 92481 | 92480 | 92479 | 92478 | 92477 | 92476 | 92475 | 92474 | 92473 | 92472 | 92471 | 92470 | 92469 | 92468 | 92467 | 92466 | 92465 | 92464 | 92463 | 92462 | 92461 | 92460 | 92459 | 92458 | 92457 | 92456 | 92455 | 92454 | 92453 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| a <sub>4</sub> | 92576 | 92576 | 92576 | 92576 |
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| a <sub>5</sub> | 92576 | 92576 | 92576 | 92576 |
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| y <sub>6</sub> | 92576 | 92576 | 92576 | 92576 |
| z <sub>6</sub> | 92576 | 92576 | 92576 | 92576 |
| a <sub>7</sub> | 92576 | 92576 | 92576 | 92576 |
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| m <sub>7</sub> | 92576 | 92576 | 92576 | 92576 |
| n <sub>7</sub> | 92576 | 92576 | 92576 | 92576 |
| o <sub>7</sub> | 92576 | 92576 | 92576 | 92576 |
| p <sub>7</sub> | 92576 | 925   |       |       |

[illegible]

| Analysis of Variance for Parameter Estimating |        |        |        |        |        |        |        |        |
|-----------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| AN                                            | H      |        | B      |        | S      |        | W      |        |
|                                               | 925156 | 925176 | 925156 | 925176 | 925156 | 925176 | 925156 | 925176 |
|                                               | Proc   | NoL64  | Proc   | NoL64  | Proc   | NoL64  | Proc   | NoL64  |
| A                                             |        |        |        |        |        |        |        |        |
| B                                             |        |        |        |        |        |        |        |        |
| C                                             |        |        |        |        |        |        |        |        |
| D                                             |        |        |        |        |        |        |        |        |
| E                                             |        |        |        |        |        |        |        |        |
| F                                             |        |        |        |        |        |        |        |        |
| G                                             |        |        |        |        |        |        |        |        |
| H                                             |        |        |        |        |        |        |        |        |
| I                                             |        |        |        |        |        |        |        |        |
| J                                             |        |        |        |        |        |        |        |        |
| K                                             |        |        |        |        |        |        |        |        |
| L                                             |        |        |        |        |        |        |        |        |
| M                                             |        |        |        |        |        |        |        |        |
| N                                             |        |        |        |        |        |        |        |        |
| O                                             |        |        |        |        |        |        |        |        |
| P                                             |        |        |        |        |        |        |        |        |
| Q                                             |        |        |        |        |        |        |        |        |
| R                                             |        |        |        |        |        |        |        |        |
| S                                             |        |        |        |        |        |        |        |        |
| T                                             |        |        |        |        |        |        |        |        |
| U                                             |        |        |        |        |        |        |        |        |
| V                                             |        |        |        |        |        |        |        |        |
| W                                             |        |        |        |        |        |        |        |        |
| X                                             |        |        |        |        |        |        |        |        |
| Y                                             |        |        |        |        |        |        |        |        |
| Z                                             |        |        |        |        |        |        |        |        |
| aa                                            |        |        |        |        |        |        |        |        |
| ab                                            |        |        |        |        |        |        |        |        |
| ac                                            |        |        |        |        |        |        |        |        |
| ad                                            |        |        |        |        |        |        |        |        |
| ae                                            |        |        |        |        |        |        |        |        |
| af                                            |        |        |        |        |        |        |        |        |
| ag                                            |        |        |        |        |        |        |        |        |
| ah                                            |        |        |        |        |        |        |        |        |
| ai                                            |        |        |        |        |        |        |        |        |
| aj                                            |        |        |        |        |        |        |        |        |
| ak                                            |        |        |        |        |        |        |        |        |
| al                                            |        |        |        |        |        |        |        |        |
| am                                            |        |        |        |        |        |        |        |        |
| an                                            |        |        |        |        |        |        |        |        |
| ao                                            |        |        |        |        |        |        |        |        |
| ap                                            |        |        |        |        |        |        |        |        |
| aq                                            |        |        |        |        |        |        |        |        |
| ar                                            |        |        |        |        |        |        |        |        |
| as                                            |        |        |        |        |        |        |        |        |
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|                                               |        |        |        |        |        |        |        |        |
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| Dependent and Keyed Assumptions Factors |      |   |      |      |   |      |      |    |      |      |      |
|-----------------------------------------|------|---|------|------|---|------|------|----|------|------|------|
| Assumptions                             | L1   | S | R1   | L3   | E | L1   | S    | R1 | L3   | W    | R3   |
| Minimum                                 | T    |   |      | T    |   | T    |      |    | T    |      |      |
| ga: Population Size                     | 0.00 |   | 0.00 | 0.00 |   | 0.00 | 3.00 |    | 0.00 | 0.00 | 0.00 |
| OC:log10 Average Population Occupancy   | 0.00 |   | 0.00 | 0.00 |   | 0.00 | 3.00 |    | 0.00 | 0.00 | 0.00 |
| OC: log10 Percent of Area Occupied      | 0.00 |   | 0.00 | 0.00 |   | 0.00 | 0.00 |    | 0.00 | 0.00 | 0.00 |
| Appl: Acquisition Factor                | 1.00 |   | 1.00 | 1.00 |   | 1.00 | 1.00 |    | 1.00 | 1.00 | 1.00 |
| Rise: Acquisition Factor                | 1.00 |   | 1.00 | 1.00 |   | 1.00 | 1.00 |    | 1.00 | 1.00 | 1.00 |
| Appl: Set Turn Factor                   | 1.00 |   | 1.00 | 1.00 |   | 1.00 | 1.00 |    | 1.00 | 1.00 | 1.00 |
| Rise: Set Turn Factor                   | 1.00 |   | 1.00 | 1.00 |   | 1.00 | 1.00 |    | 1.00 | 1.00 | 1.00 |

**Abstract**

### Abstract

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## Node 2037: S College and 13th/13th St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 0.34  
 Worst Case Delay 14.37  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |       | S (Major) |        | W     |       |
|-----------------------|-----------|-------|-----------|--------|-------|-------|
| Movement              | T         | R1    | L1        | T      | L1    | R1    |
| Base Volume           | 304.00    | 8.00  | 5.00      | 334.00 | 5.00  | 11.00 |
| PHF, Peak-hour factor | 0.900     | 0.900 | 0.900     | 0.900  | 0.900 | 0.900 |
| V, Adjusted Volume    | 337.78    | 8.89  | 5.56      | 371.11 | 5.56  | 12.22 |

## Pedestrians

| Approach                 | N (Major) |    | S (Major) |   | W     |       |
|--------------------------|-----------|----|-----------|---|-------|-------|
| Movement                 | T         | R1 | L1        | T | L1    | R1    |
| vx, Flow (Ped/hr)        |           |    | 0.00      |   | 0.00  | 0.00  |
| w, Lane Width (ft)       |           |    | 12.00     |   | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) |           |    | 3.50      |   | 3.50  | 3.50  |
| fpb, Percent Blockage    |           |    | 0.00      |   | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |    | S (Major) |   | W      |        |
|------------------------------------------------|-----------|----|-----------|---|--------|--------|
| Movement                                       | T         | R1 | L1        | T | L1     | R1     |
| Rank                                           | 1         | 1  | 2         | 1 | 3      | 2      |
| vx, Volume                                     |           |    | 5.56      |   | 5.56   | 12.22  |
| Conflicting Volume (Veh)                       |           |    | 346.67    |   | 724.44 | 342.22 |
| Conflicting Volume (Ped)                       |           |    | 0.00      |   | 0.00   | 0.00   |
| Conflicting Volume                             |           |    | 346.67    |   | 724.44 | 342.22 |
| Two-Stage Gap Acceptance                       |           |    |           |   | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |    |           |   |        |        |
| cap, Potential Capacity                        |           |    | 1223.50   |   | 395.28 | 704.96 |
| Capacity                                       |           |    | 1223.50   |   | 393.02 | 704.96 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      | S (Major) |      | W    |      |
|----------------------------------------------|-----------|------|-----------|------|------|------|
| Movement                                     | T         | R1   | L1        | T    | L1   | R1   |
| to base, Base Critical Headway               |           |      | 4.10      |      | 7.10 | 6.20 |
| to base I, Base Critical Headway (Stage I)   |           |      |           |      |      |      |
| to base II, Base Critical Headway (Stage II) |           |      |           |      |      |      |
| to HV, Heavy Vehicles Adjustment Factor      |           |      | 1.00      |      | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        |           |      | 0.00      |      | 0.00 | 0.00 |
| to G, Grade Adjustment Factor                |           |      | 1.00      |      | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |           | 0.00 |      | 0.00 |
| TsIt, Geometry Adjustment Factor             |           |      | 0.00      |      | 0.70 | 0.00 |
| to, Critical Headway                         |           |      | 4.10      |      | 6.40 | 6.20 |
| to I, Critical Headway (Stage I)             |           |      |           |      |      |      |
| to II, Critical Headway (Stage II)           |           |      |           |      |      |      |
| to base, Base Follow-Up Headway              |           |      | 2.20      |      | 3.50 | 3.30 |
| to HV, Heavy Vehicles Adjustment Factor      |           |      | 0.90      |      | 0.90 | 0.90 |
| to, Follow-Up Headway                        |           |      | 2.20      |      | 3.50 | 3.30 |

## Delay and Level of Service by Movement

| Approach              | N (Major) |      | S (Major) |        | W      |        |
|-----------------------|-----------|------|-----------|--------|--------|--------|
| Movement              | T         | R1   | L1        | T      | L1     | R1     |
| vx, Volume            | 337.78    | 8.89 | 5.56      | 371.11 | 5.56   | 12.22  |
| cmx, Capacity         |           |      | 1223.50   |        | 393.02 | 704.96 |
| V / C                 |           |      | 0.00      |        | 0.01   | 0.02   |
| d, Delay              |           |      | 7.96      |        | 14.37  | 10.31  |
| LOS                   |           |      | A         |        | B      | B      |
| dA, Approach Delay    | 0.00      |      | 0.12      |        | 11.58  |        |
| Approach LOS          |           |      |           |        | B      |        |
| dRank 1, Rank 1 Delay | 0.00      |      | 0.05      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) | S (Major) | W      |
|-----------------------|-----------|-----------|--------|
| Lane                  | Lane 1    | Lane 1    | Lane 1 |
| Movements             | T, R1     | L1, T     | L1, R1 |
| vx, Volume            | 346.67    | 376.67    | 17.78  |
| Flared Storage Size   |           |           |        |
| cmx, Capacity         |           | 1223.50   | 564.86 |
| V / C                 |           | 0.31      | 0.03   |
| Q95, 95% Queue Length |           | 0.01      | 0.10   |
| d, Delay              |           | 7.96      | 11.58  |
| LOS                   |           |           | B      |
| dA, Approach Delay    | 0.00      | 0.12      | 11.58  |
| Approach LOS          |           |           | B      |

| Variable Frequency Factorial Latin Group |       |       |       |       |       |       |       |       |       |       |       |  |
|------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| App                                      | L     |       |       | C     |       |       | R     |       |       | W     |       |  |
| Language                                 | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     |  |
| ID                                       | 92583 | 92584 | 92585 | 92586 | 92587 | 92588 | 92589 | 92590 | 92591 | 92592 | 92593 |  |
| Gender                                   | L     | T     | R     | L     | T     | R     | L     | T     | R     | L     | T     |  |
| Complexity                               | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |  |
| PLT                                      | 1.00  | 0.00  | 0.00  | 1.00  | 0.00  | 0.00  | 1.00  | 0.00  | 0.00  | 1.00  | 0.00  |  |
| PLT                                      | 0.00  | 1.00  | 0.00  | 0.00  | 1.00  | 0.00  | 0.00  | 1.00  | 0.00  | 0.00  | 1.00  |  |
| PLT                                      | 0.00  | 0.00  | 1.00  | 0.00  | 0.00  | 1.00  | 0.00  | 0.00  | 1.00  | 0.00  | 0.00  |  |

| Agency, contract type, and level of service description | II     |        |       | E     |        |       | S      |       |       | IV    |       |       |
|---------------------------------------------------------|--------|--------|-------|-------|--------|-------|--------|-------|-------|-------|-------|-------|
| Agency                                                  | 92568  | 92564  | 92565 | 92565 | 92562  | 92578 | 92570  | 92564 | 92564 | 92564 | 92564 | 92564 |
| Contract type                                           | Perf   | Perf   | Perf  | Perf  | Perf   | Perf  | Perf   | Perf  | Perf  | Perf  | Perf  | Perf  |
| W. 10000                                                | 155.56 | 176.54 | 50    | 13.33 | 243.33 | 15    | 184.89 | 30    | 50    |       |       |       |
| V. 10000                                                | 1661   | 1720   | 1488  | 1667  | 1245   | 1667  | 1714   | 1667  | 1714  | 1667  | 1714  | 1667  |
| G. 10000                                                | 440    | 510    | 424   | 111   | 415    | 415   | 211    | 211   | 211   | 211   | 211   | 211   |
| 0. 10000                                                | 0.37   | 0.23   | 0.21  | 0.37  | 0.37   | 0.37  | 0.37   | 0.37  | 0.37  | 0.37  | 0.37  | 0.37  |
| K. 10000                                                | 0.35   | 0.54   | 0.12  | 0.12  | 0.09   | 0.04  | 0.7    | 0.14  | 0.09  |       |       |       |
| 10000                                                   | 17.63  | 15.73  | 15.58 | 20.24 | 19.15  | 20.15 | 22.53  | 22.53 | 22.53 | 22.53 | 22.53 | 22.53 |
| 10000                                                   | 2.56   | 0.52   | 0.58  | 0.56  | 0.52   | 1.00  | 2.53   | 2.53  | 2.53  | 2.53  | 2.53  | 2.53  |
| 10000                                                   | 2.11   | 1.63   | 2.54  | 2.21  | 0.44   | 0.44  | 16.92  | 16.92 | 16.92 | 16.92 | 16.92 | 16.92 |
| 10000                                                   | 0.50   | 0.50   | 0.50  | 0.50  | 0.50   | 0.50  | 0.50   | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  |
| 10000                                                   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| 10000                                                   | 0.27   | 0.27   | 0.27  | 0.07  | 0.27   | 0.16  | 0.16   | 0.16  | 0.16  | 0.16  | 0.16  | 0.16  |
| 10000                                                   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00   | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| 10000                                                   | 13.14  | 16.48  | 16.12 | 28.55 | 29.20  | 29.45 | 38.87  | 38.87 | 38.87 | 38.87 | 38.87 | 38.87 |
| 10000                                                   | B      | B      | B     | C     | C      | C     | D      | D     | D     | D     | D     | D     |
| 10000                                                   | 18.13  |        |       |       | 20.17  |       | 38.07  |       | 17.45 |       |       |       |
| 10000                                                   | B      | B      | B     | C     | C      | C     | D      | D     | D     | D     | D     | D     |
| 10000                                                   |        |        |       |       | 25.92  |       |        |       |       |       |       |       |

[illegible]

| Performance Characteristics of Personnel Training |       |       |       |       |       |       |       |       |       |
|---------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A:                                                |       | P     | P     | P     | P     | S     | S     | W     | W     |
| Lo                                                |       | 9543  | 9544  | 9545  | 9546  | 9547  | 9548  | 9549  | 9550  |
| Hi                                                |       | 9551  | 9552  | 9553  | 9554  | 9555  | 9556  | 9557  | 9558  |
| C                                                 |       | 9559  | 9560  | 9561  | 9562  | 9563  | 9564  | 9565  | 9566  |
| Lo                                                | 9567  | 9568  | 9569  | 9570  | 9571  | 9572  | 9573  | 9574  | 9575  |
| Hi                                                | 9576  | 9577  | 9578  | 9579  | 9580  | 9581  | 9582  | 9583  | 9584  |
| C                                                 | 9585  | 9586  | 9587  | 9588  | 9589  | 9590  | 9591  | 9592  | 9593  |
| Lo                                                | 9594  | 9595  | 9596  | 9597  | 9598  | 9599  | 9600  | 9601  | 9602  |
| Hi                                                | 9603  | 9604  | 9605  | 9606  | 9607  | 9608  | 9609  | 9610  | 9611  |
| C                                                 | 9612  | 9613  | 9614  | 9615  | 9616  | 9617  | 9618  | 9619  | 9620  |
| Lo                                                | 9621  | 9622  | 9623  | 9624  | 9625  | 9626  | 9627  | 9628  | 9629  |
| Hi                                                | 9630  | 9631  | 9632  | 9633  | 9634  | 9635  | 9636  | 9637  | 9638  |
| C                                                 | 9639  | 9640  | 9641  | 9642  | 9643  | 9644  | 9645  | 9646  | 9647  |
| Lo                                                | 9648  | 9649  | 9650  | 9651  | 9652  | 9653  | 9654  | 9655  | 9656  |
| Hi                                                | 9657  | 9658  | 9659  | 9660  | 9661  | 9662  | 9663  | 9664  | 9665  |
| C                                                 | 9666  | 9667  | 9668  | 9669  | 9670  | 9671  | 9672  | 9673  | 9674  |
| Lo                                                | 9675  | 9676  | 9677  | 9678  | 9679  | 9680  | 9681  | 9682  | 9683  |
| Hi                                                | 9684  | 9685  | 9686  | 9687  | 9688  | 9689  | 9690  | 9691  | 9692  |
| C                                                 | 9693  | 9694  | 9695  | 9696  | 9697  | 9698  | 9699  | 9700  | 9701  |
| Lo                                                | 9702  | 9703  | 9704  | 9705  | 9706  | 9707  | 9708  | 9709  | 9710  |
| Hi                                                | 9711  | 9712  | 9713  | 9714  | 9715  | 9716  | 9717  | 9718  | 9719  |
| C                                                 | 9720  | 9721  | 9722  | 9723  | 9724  | 9725  | 9726  | 9727  | 9728  |
| Lo                                                | 9729  | 9730  | 9731  | 9732  | 9733  | 9734  | 9735  | 9736  | 9737  |
| Hi                                                | 9738  | 9739  | 9740  | 9741  | 9742  | 9743  | 9744  | 9745  | 9746  |
| C                                                 | 9747  | 9748  | 9749  | 9750  | 9751  | 9752  | 9753  | 9754  | 9755  |
| Lo                                                | 9756  | 9757  | 9758  | 9759  | 9760  | 9761  | 9762  | 9763  | 9764  |
| Hi                                                | 9765  | 9766  | 9767  | 9768  | 9769  | 9770  | 9771  | 9772  | 9773  |
| C                                                 | 9774  | 9775  | 9776  | 9777  | 9778  | 9779  | 9780  | 9781  | 9782  |
| Lo                                                | 9783  | 9784  | 9785  | 9786  | 9787  | 9788  | 9789  | 9790  | 9791  |
| Hi                                                | 9792  | 9793  | 9794  | 9795  | 9796  | 9797  | 9798  | 9799  | 9800  |
| C                                                 | 9801  | 9802  | 9803  | 9804  | 9805  | 9806  | 9807  | 9808  | 9809  |
| Lo                                                | 9810  | 9811  | 9812  | 9813  | 9814  | 9815  | 9816  | 9817  | 9818  |
| Hi                                                | 9819  | 9820  | 9821  | 9822  | 9823  | 9824  | 9825  | 9826  | 9827  |
| C                                                 | 9828  | 9829  | 9830  | 9831  | 9832  | 9833  | 9834  | 9835  | 9836  |
| Lo                                                | 9837  | 9838  | 9839  | 9840  | 9841  | 9842  | 9843  | 9844  | 9845  |
| Hi                                                | 9846  | 9847  | 9848  | 9849  | 9850  | 9851  | 9852  | 9853  | 9854  |
| C                                                 | 9855  | 9856  | 9857  | 9858  | 9859  | 9860  | 9861  | 9862  | 9863  |
| Lo                                                | 9864  | 9865  | 9866  | 9867  | 9868  | 9869  | 9870  | 9871  | 9872  |
| Hi                                                | 9873  | 9874  | 9875  | 9876  | 9877  | 9878  | 9879  | 9880  | 9881  |
| C                                                 | 9882  | 9883  | 9884  | 9885  | 9886  | 9887  | 9888  | 9889  | 9890  |
| Lo                                                | 9891  | 9892  | 9893  | 9894  | 9895  | 9896  | 9897  | 9898  | 9899  |
| Hi                                                | 9900  | 9901  | 9902  | 9903  | 9904  | 9905  | 9906  | 9907  | 9908  |
| C                                                 | 9909  | 9910  | 9911  | 9912  | 9913  | 9914  | 9915  | 9916  | 9917  |
| Lo                                                | 9918  | 9919  | 9920  | 9921  | 9922  | 9923  | 9924  | 9925  | 9926  |
| Hi                                                | 9927  | 9928  | 9929  | 9930  | 9931  | 9932  | 9933  | 9934  | 9935  |
| C                                                 | 9936  | 9937  | 9938  | 9939  | 9940  | 9941  | 9942  | 9943  | 9944  |
| Lo                                                | 9945  | 9946  | 9947  | 9948  | 9949  | 9950  | 9951  | 9952  | 9953  |
| Hi                                                | 9954  | 9955  | 9956  | 9957  | 9958  | 9959  | 9960  | 9961  | 9962  |
| C                                                 | 9963  | 9964  | 9965  | 9966  | 9967  | 9968  | 9969  | 9970  | 9971  |
| Lo                                                | 9972  | 9973  | 9974  | 9975  | 9976  | 9977  | 9978  | 9979  | 9980  |
| Hi                                                | 9981  | 9982  | 9983  | 9984  | 9985  | 9986  | 9987  | 9988  | 9989  |
| C                                                 | 9990  | 9991  | 9992  | 9993  | 9994  | 9995  | 9996  | 9997  | 9998  |
| Lo                                                | 9999  | 10000 | 10001 | 10002 | 10003 | 10004 | 10005 | 10006 | 10007 |
| Hi                                                | 10008 | 10009 | 10010 | 10011 | 10012 | 10013 | 10014 | 10015 | 10016 |
| C                                                 | 10017 | 10018 | 10019 | 10020 | 10021 | 10022 | 10023 | 10024 | 10025 |

[illegible]



## Node 2039: SE 3rd &amp; Ash Ave

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 6.71  
 Worst Case Delay 9.39  
 Worst Case LOS A

## Volume and Adjustments

| Approach              | N     |       |       | E (Major) |       |       | S     |       |       | W (Major) |       |       |
|-----------------------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|-----------|-------|-------|
| Movement              | L1    | T     | R1    | L1        | T     | R1    | L1    | T     | R1    | L1        | T     | R1    |
| Base Volume           | 5.00  | 14.00 | 5.00  | 5.00      | 5.00  | 5.00  | 5.00  | 19.00 | 5.00  | 5.00      | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.900 | 0.900 | 0.900 | 0.900     | 0.900 | 0.900 | 0.900 | 0.900 | 0.900 | 0.900     | 0.900 | 0.900 |
| V, Adjusted Volume    | 5.56  | 15.56 | 5.56  | 5.56      | 5.56  | 5.56  | 5.56  | 21.11 | 5.56  | 5.56      | 5.56  | 5.56  |

## Pedestrians

| Approach                 | N     |       |       | E (Major) |   |    | S     |       |       | W (Major) |   |    |
|--------------------------|-------|-------|-------|-----------|---|----|-------|-------|-------|-----------|---|----|
| Movement                 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 |
| vx, Flow (Ped/hr)        | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |
| w, Lane Width (ft)       | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    |
| Sp, Walking Speed (ft/s) | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    |
| fpb, Percent Blockage    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |

## Capacity of Movements below Rank 1

| Approach                                       | N      |        |         | E (Major) |   |    | S      |        |         | W (Major) |   |    |
|------------------------------------------------|--------|--------|---------|-----------|---|----|--------|--------|---------|-----------|---|----|
| Movement                                       | L1     | T      | R1      | L1        | T | R1 | L1     | T      | R1      | L1        | T | R1 |
| Rank                                           | 4      | 3      | 2       | 2         | 1 | 1  | 4      | 3      | 2       | 2         | 1 | 1  |
| vx, Volume                                     | 5.56   | 15.56  | 5.56    | 5.56      |   |    | 5.56   | 21.11  | 5.56    | 5.56      |   |    |
| Conflicting Volume (Veh)                       | 52.22  | 41.67  | 8.33    | 11.11     |   |    | 49.44  | 41.67  | 8.33    | 11.11     |   |    |
| Conflicting Volume (Ped)                       | 0.00   | 0.00   | 0.00    | 0.00      |   |    | 0.00   | 0.00   | 0.00    | 0.00      |   |    |
| Conflicting Volume                             | 52.22  | 41.67  | 8.33    | 11.11     |   |    | 49.44  | 41.67  | 8.33    | 11.11     |   |    |
| Two-Stage Gap Acceptance                       | No     | No     |         |           |   |    | No     | No     |         |           |   |    |
| Number of Storage Spaces in Median Refuge Area |        |        |         |           |   |    |        |        |         |           |   |    |
| capx, Potential Capacity                       | 951.66 | 854.25 | 1079.48 | 1621.28   |   |    | 955.61 | 854.25 | 1079.48 | 1621.28   |   |    |
| Capacity                                       | 923.92 | 848.36 | 1079.48 | 1621.28   |   |    | 932.48 | 848.36 | 1079.48 | 1621.28   |   |    |

## Critical Headway and Follow-Up Headway

| Approach                                      | N    |      |      | E (Major) |      |    | S    |      |      | W (Major) |      |    |
|-----------------------------------------------|------|------|------|-----------|------|----|------|------|------|-----------|------|----|
| Movement                                      | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 |
| tc base, Base Critical Headway                | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc base, I, Base Critical Headway (Stage I)   |      |      |      |           |      |    |      |      |      |           |      |    |
| tc base, II, Base Critical Headway (Stage II) |      |      |      |           |      |    |      |      |      |           |      |    |
| tc HV, Heavy Vehicles Adjustment Factor       | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    |
| pfhv, % Heavy Vehicles                        | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc G, Grade Adjustment Factor                 | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    |
| G, % Grade                                    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |
| TGIt, Geometry Adjustment Factor              | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc, Critical Headway                          | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc I, Critical Headway (Stage I)              |      |      |      |           |      |    |      |      |      |           |      |    |
| tc II, Critical Headway (Stage II)            |      |      |      |           |      |    |      |      |      |           |      |    |
| uf base, Base Follow-Up Headway               | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |
| uf hv, Heavy Vehicles Adjustment Factor       | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    |
| uf, Follow-Up Headway                         | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |

## Delay and Level of Service by Movement

| Approach             | N      |        |         | E (Major) |      |      | S      |        |         | W (Major) |      |      |
|----------------------|--------|--------|---------|-----------|------|------|--------|--------|---------|-----------|------|------|
| Movement             | L1     | T      | R1      | L1        | T    | R1   | L1     | T      | R1      | L1        | T    | R1   |
| vx, Volume           | 5.56   | 15.56  | 5.56    | 5.56      | 5.56 | 5.56 | 5.56   | 21.11  | 5.56    | 5.56      | 5.56 | 5.56 |
| capx, Capacity       | 923.92 | 848.36 | 1079.48 | 1621.28   |      |      | 932.48 | 848.36 | 1079.48 | 1621.28   |      |      |
| V, C                 | 0.01   | 0.02   | 0.01    | 0.00      |      |      | 0.01   | 0.02   | 0.01    | 0.00      |      |      |
| d, Delay             | 9.02   | 9.36   | 8.46    | 7.23      |      |      | 9.01   | 9.39   | 8.49    | 7.23      |      |      |
| LOS                  | A      | A      | A       | A         |      |      | A      | A      | A       | A         |      |      |
| dA, Approach Delay   |        | 9.10   |         |           | 2.41 |      |        | 9.17   |         |           | 2.41 |      |
| Approach LOS         |        | A      |         |           |      |      |        | A      |         |           |      |      |
| dRank1, Rank 1 Delay |        |        |         |           | 0.02 |      |        |        |         |           | 0.02 |      |

## Delay and Level of Service by Lane

| Approach              | N         |           |           | E (Major) |           |           | S         |           |           | W (Major) |           |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 26.67     | 16.67     | 32.22     | 16.67     |           |           | 26.67     | 16.67     | 32.22     | 16.67     |           |           |
| Flare: Storage Size   |           |           |           |           |           |           |           |           |           |           |           |           |
| capx, Capacity        | 904.09    | 1621.28   | 895.34    | 1621.28   |           |           | 904.09    | 1621.28   | 895.34    | 1621.28   |           |           |
| V, C                  | 0.03      | 0.01      | 0.04      | 0.01      |           |           | 0.03      | 0.01      | 0.04      | 0.01      |           |           |
| CSL, 95% Queue Length | 0.09      | 0.01      | 0.11      | 0.01      |           |           | 0.09      | 0.01      | 0.11      | 0.01      |           |           |
| d, Delay              | 9.10      | 7.23      | 9.17      | 7.23      |           |           | 9.10      | 7.23      | 9.17      | 7.23      |           |           |
| LOS                   | A         | A         | A         | A         |           |           | A         | A         | A         | A         |           |           |
| dA, Approach Delay    | 9.10      | 2.41      | 9.17      | 2.41      |           |           | 9.10      | 2.41      | 9.17      | 2.41      |           |           |
| Approach LOS          | A         |           | A         |           |           |           | A         |           | A         |           |           |           |

## Intersection Capacity Analysis Summary Page

Analysis Time: Fri Sep 27 12:20:21 2019  
 Driving Side: Right  
 Analysis Period: 1 Hours

| Number | Name                       | Control Type | V/C  | Avg Delay | Avg LOS | Max Delay | Max LOS |
|--------|----------------------------|--------------|------|-----------|---------|-----------|---------|
| 2030   | College & Whitman          | Signalized   | 0.51 | 27.26     | C       | 72.05     | E       |
| 2031   | N College & SE 3rd St      | TWSC         | 0.00 | 1.40      | A       | 12.27     | B       |
| 2032   | S College Ave & SW 4th St  | Signalized   | 0.93 | 44.36     | D       | 87.29     | F       |
| 2033   | S College Ave & SE 6th St  | TWSC         | 0.00 | 1.24      | A       | 17.34     | C       |
| 2034   | S College Ave & SE 8th St  | TWSC         | 0.00 | 1.25      | A       | 18.87     | C       |
| 2035   | S College Ave & SE 10th St | TWSC         | 0.00 | 1.32      | A       | 27.52     | D       |
| 2036   | S College Ave & SE 12th St | Signalized   | 0.71 | 25.25     | C       | 34.15     | C       |
| 2037   | S College and 13th 13th St | TWSC         | 0.00 | 0.30      | A       | 17.38     | C       |
| 2038   | S College Ave & Lampert    | Signalized   | 0.68 | 24.21     | C       | 40.20     | D       |
| 2039   | SE 3rd & Ash Ave           | TWSC         | 0.00 | 9.71      | A       | 11.54     | B       |

| Node 20122: Control & Monitor |  |                 |
|-------------------------------|--|-----------------|
| Control Type                  |  | Signalized      |
| Waves                         |  | n/20 ft E/20 ft |
| Average Delay                 |  | 37.26           |
| Average LOS                   |  | C               |
| V/C                           |  | 0.51            |
| Loss Time                     |  | 21              |

| Values and Equivalents by Movement |       |       |       |       |       |       |       |       |       |       |       |       |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Altitude                           | N     |       |       | E     |       |       | S     |       |       | W     |       |       |
| Measurement                        | L1    | T     | R1    | L1    | T     | R1    | L1    | T     | R1    | L1    | T     | R1    |
| Peak 150                           | 55    | 165   | 52    | 52    | 16    | 52    | 54    | 18    | 53    | 54    | 19    | 51    |
| Peak 150 (S)                       | 6,640 | 2,640 | 0,650 | 9,650 | 0,650 | 0,650 | 0,650 | 0,650 | 0,650 | 0,650 | 0,650 | 0,650 |
| Peak 150 (S)                       | 12    | 58    | 24    | 14    | 21    | 13    | 11    | 48    | 7     | 50    | 43    | 45    |
| Peak 150 (S)                       | 16    | 231   | 65    | 55    | 351   | 52    | 43    | 574   | 28    | 172   | 124   | 45    |

| Values and Assignments by Node Class |      |      |      |      |      |      |      |      |      |      |      |  |
|--------------------------------------|------|------|------|------|------|------|------|------|------|------|------|--|
| Approx                               | L    |      |      | E    |      |      | S    |      |      | W    |      |  |
| Line/Node ID                         | C    | N    | H    | L    | C    | C    | L    | C    | R    | L    | R    |  |
| Core                                 | 1000 | 1000 | 1000 | 1001 | 1002 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |  |
| Control Type                         | C    | Y    | R    | R    | R    | R    | C    | C    | R    | C    | R    |  |
| V. Volume                            | Pos  | Pos  | Neg  | Pos  | Neg  | Pos  | Pos  | Neg  | Neg  | Pos  | Neg  |  |
| Pct. Population in Turn              | 00   | 201  | 50   | 50   | 183  | 43   | 181  | 28   | 172  | 174  | 45   |  |
| Pct. Population by Turn              | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |  |
| Pct. Population by Turn              | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |  |

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| Species/Genus | N     |       | C     |       | S     |       | W     |       |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Age/sex       | N     | W     | C     | W     | S     | W     | S     | W     |
| 230003        | 72004 | 72005 | 73001 | 73002 | 72006 | 72009 | 72008 | 73007 |
| Q1            | 0.07  | 0.28  | 0.28  | 0.25  | 0.31  | 0.15  | 0.30  | 0.09  |
| Q2            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Q3            | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q4            | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q5            | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q6            | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q7            | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q8            | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q9            | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q10           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q11           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q12           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q13           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q14           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q15           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q16           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q17           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q18           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q19           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q20           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q21           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q22           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q23           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q24           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q25           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q26           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q27           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q28           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q29           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q30           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q31           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q32           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q33           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q34           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q35           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q36           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q37           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q38           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q39           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q40           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q41           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q42           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q43           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q44           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q45           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q46           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q47           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q48           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q49           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q50           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q51           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q52           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q53           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q54           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q55           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q56           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q57           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q58           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q59           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q60           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q61           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q62           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q63           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q64           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q65           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q66           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q67           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q68           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q69           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q70           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q71           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q72           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q73           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q74           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q75           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q76           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q77           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q78           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q79           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q80           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q81           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q82           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q83           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q84           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q85           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q86           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q87           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q88           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q89           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q90           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q91           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q92           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q93           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q94           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q95           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q96           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q97           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q98           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q99           | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q100          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q101          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q102          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q103          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q104          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q105          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q106          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q107          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q108          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q109          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q110          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q111          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q112          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q113          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q114          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q115          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q116          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q117          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q118          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q119          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q120          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q121          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q122          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q123          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q124          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q125          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q126          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q127          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q128          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q129          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q130          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q131          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q132          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q133          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q134          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q135          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q136          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q137          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q138          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q139          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q140          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q141          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q142          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q143          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q144          | 0.25  | 0.41  | 0.33  | 0.25  | 0.25  | 0.31  | 0.18  | 0.23  |
| Q145          | 0.25  | 0.41  | 0.33  | 0.25  | 0     |       |       |       |

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Acta Otolaryngol (Stockh) 1994; 112: 105-109

**Keywords:** *work engagement, organizational commitment, turnover intentions, organizational citizenship behaviors, job satisfaction, organizational trust, organizational identification, organizational justice, organizational support, organizational identification, organizational trust, organizational justice, organizational support, organizational identification, organizational trust, organizational justice, organizational support*

1. *Journal of the American Medical Association*, 1997; 277: 1001-1005.

## Node 2031: N College &amp; SE 3rd St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.4  
 Worst Case Delay 12.27  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 128.00 | 5.00  | 5.00  | 5.00  | 5.00  | 6.00      | 116.00 | 12.00 | 5.00  | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 196.92 | 7.69  | 7.69  | 7.69  | 7.69  | 9.23      | 176.46 | 18.46 | 7.69  | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 7.69   | 9.23      |   |    | 7.69   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       | 196.92    |   |    | 430.00 | 426.15 | 187.69 | 204.82    |   |    | 430.00 | 431.54 | 200.77 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 196.92    |   |    | 430.00 | 426.15 | 187.69 | 204.82    |   |    | 430.00 | 431.54 | 200.77 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| opx, Potential Capacity                        | 1387.87   |   |    | 538.95 | 523.42 | 859.47 | 1378.94   |   |    | 538.95 | 519.78 | 845.23 |
| Capacity                                       | 1387.87   |   |    | 522.41 | 516.22 | 859.47 | 1378.94   |   |    | 522.53 | 512.64 | 845.23 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Pttv, % Heavy Vehicles                       | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3,t, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| tf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf,HV, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |       | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|-------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1    | L1     | T      | R1     |
| vx, Volume           | 7.69      | 196.92 | 7.69 | 7.69   | 7.69   | 7.69   | 9.23      | 176.46 | 18.46 | 7.69   | 7.69   | 7.69   |
| cmx, Capacity        | 1387.87   |        |      | 522.41 | 516.22 | 859.47 | 1378.94   |        |       | 522.53 | 512.64 | 845.23 |
| V, C                 | 0.01      |        |      | 0.01   | 0.01   | 0.01   | 0.01      |        |       | 0.01   | 0.02   | 0.01   |
| d, Delay             | 7.61      |        |      | 12.13  | 12.22  | 9.43   | 7.63      |        |       | 12.13  | 12.27  | 9.50   |
| LOS                  | A         |        |      | B      | B      | A      | A         |        |       | B      | B      | A      |
| dA, Approach Delay   |           | 0.28   |      |        | 11.26  |        |           | 0.34   |       |        | 11.30  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |       |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |       |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |        | W         |
|-----------------------|-----------|--------|-----------|-----------|--------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1    | Lane 2 | Lane 1    |
| Movements             | T, R1     | T, R1  | L1, T, R1 | L1, T, R1 | T, R1  | L1, T, R1 |
| vx, Volume            | 7.69      | 204.62 | 23.08     | 9.23      | 196.92 | 23.08     |
| Flared Storage Size   |           |        |           |           |        |           |
| cmx, Capacity         |           |        | 598.22    |           |        | 594.35    |
| V, C                  |           |        | 0.04      |           |        | 0.04      |
| Qs6, 95% Queue Length |           |        | 0.12      |           |        | 0.12      |
| d, Delay              |           |        | 11.26     |           |        | 11.30     |
| LOS                   |           |        | B         |           |        | B         |
| dA, Approach Delay    |           | 0.28   | 11.26     |           | 0.34   | 11.30     |
| Approach LOS          |           |        | B         |           |        | B         |



| March 2022: 35 Complete Runs & 11V Ap. In: |           |            |
|--------------------------------------------|-----------|------------|
| Control Type                               | Manual    | Signalized |
| Wardens                                    | no Warden | no Warden  |
| Average Delay                              | 44.35     |            |
| Average LOS                                | D         |            |
| V/C                                        | 0.61      |            |
| Lost Time                                  | 19        |            |

| Variable and description by treatment | N     |       | E     |       | S     |       | W     |       |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Age (yr)                              | 11    | 11    | 11    | 11    | 11    | 11    | 11    | 11    |
| Weight (kg)                           | 8     | 13    | 8     | 16    | 10    | 13    | 8     | 16    |
| Height (cm)                           | 163   | 163   | 163   | 163   | 163   | 163   | 163   | 163   |
| Pretest (N=10)                        | 0.650 | 0.650 | 0.650 | 0.650 | 0.650 | 0.650 | 0.650 | 0.650 |
| Posttest (N=10)                       | 3     | 5     | 3     | 4     | 4     | 4     | 3     | 5     |
| Age (N=10)                            | 12    | 20    | 13    | 10    | 19    | 21    | 23    | 12    |

| ANALYSIS OF VARIANCE FOR LAMINAR |        |    |        |    |        |    |        |    |        |
|----------------------------------|--------|----|--------|----|--------|----|--------|----|--------|
|                                  | L      |    | B      |    | S      |    | V      |    |        |
| Source                           | SS     | df | SS     | df | SS     | df | SS     | df | MS     |
| Corrected Total                  | 2301.8 | 15 | 1501.4 | 15 | 1501.2 | 15 | 1500.8 | 15 | 150.13 |
| Between Groups                   | 1.0    | 3  | 1.0    | 3  | 1.0    | 3  | 1.0    | 3  | .33    |
| Within Groups                    | 2300.8 | 12 | 1500.4 | 12 | 1500.2 | 12 | 1500.5 | 12 | 125.07 |
| Total                            | 2302.8 | 18 | 1502.4 | 18 | 1502.2 | 18 | 1501.8 | 18 |        |
| Error                            | 1.8    | 3  | 1.4    | 3  | 1.2    | 3  | 1.3    | 3  | .60    |
| Regression                       | 1.0    | 1  | 1.0    | 1  | 1.0    | 1  | 1.0    | 1  | 1.00   |
| Residual                         | 0.0    | 2  | 0.4    | 2  | 0.2    | 2  | 0.3    | 2  | 0.15   |
| Adjusted R Square                | 0.00   |    | 0.00   |    | 0.00   |    | 0.00   |    | 0.00   |
| Adjusted R Square                | 0.00   |    | 0.00   |    | 0.00   |    | 0.00   |    | 0.00   |

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| Grade of Outcome | N     |       | B     |       | W     |       |
|------------------|-------|-------|-------|-------|-------|-------|
|                  | 73014 | 73015 | 73012 | 73009 | 73010 | 73016 |
| APR              | 0.13  | 0.12  | 0.14  | 0.22  | 0.12  | 0.10  |
| APR + 10%        | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Q1 - APR + 10%   | 0.13  | 0.27  | 1.71  | 2.15  | 2.25  | 0.23  |
| Q2 - APR + 10%   | 0.42  | 0.53  | 0.67  | 0.83  | 0.27  | 0.13  |
| Q3 - APR + 10%   | 0.09  | 0.04  | 0.00  | 0.00  | 0.00  | 0.00  |
| Q4 - APR + 10%   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Q5 - APR + 10%   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Q6 - APR + 10%   | 0.16  | 0.33  | 2.62  | 2.76  | 6.45  | 0.38  |
| Q7 - APR + 10%   | 0.25  | 1.20  | 4.79  | 1.77  | 1.55  | 1.47  |
| Q8 - APR + 10%   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Q9 - APR + 10%   | 0.25  | 0.48  | 0.70  | 0.91  | 0.44  | 0.55  |

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| List of Parameters for Parameter Measures |       |       |       |       |       |       |       |       |
|-------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                           | X     |       | E     |       | S     |       | W     |       |
|                                           | 23018 | 23019 | 23018 | 23019 | 23018 | 23019 | 23018 | 23019 |
|                                           | Prod  | NoLet | Prod  | NoLet | Prod  | NoLet | Prod  | NoLet |
| A1:                                       |       |       |       |       |       |       |       |       |
| W1:                                       |       |       |       |       |       |       |       |       |
| C1:                                       |       |       |       |       |       |       |       |       |
| Q1:                                       |       |       |       |       |       |       |       |       |
| C2:                                       |       |       |       |       |       |       |       |       |
| B1:                                       |       |       |       |       |       |       |       |       |
| D1:                                       |       |       |       |       |       |       |       |       |
| R1:                                       |       |       |       |       |       |       |       |       |
| N1:                                       |       |       |       |       |       |       |       |       |
| P1:                                       |       |       |       |       |       |       |       |       |
| LT1:                                      |       |       |       |       |       |       |       |       |
| W2:                                       |       |       |       |       |       |       |       |       |
| C3:                                       |       |       |       |       |       |       |       |       |
| Q2:                                       |       |       |       |       |       |       |       |       |
| C4:                                       |       |       |       |       |       |       |       |       |
| B2:                                       |       |       |       |       |       |       |       |       |
| D2:                                       |       |       |       |       |       |       |       |       |
| R2:                                       |       |       |       |       |       |       |       |       |
| N2:                                       |       |       |       |       |       |       |       |       |
| P2:                                       |       |       |       |       |       |       |       |       |
| LT2:                                      |       |       |       |       |       |       |       |       |
| W3:                                       |       |       |       |       |       |       |       |       |
| C5:                                       |       |       |       |       |       |       |       |       |
| Q3:                                       |       |       |       |       |       |       |       |       |
| C6:                                       |       |       |       |       |       |       |       |       |
| B3:                                       |       |       |       |       |       |       |       |       |
| D3:                                       |       |       |       |       |       |       |       |       |
| R3:                                       |       |       |       |       |       |       |       |       |
| N3:                                       |       |       |       |       |       |       |       |       |
| P3:                                       |       |       |       |       |       |       |       |       |
| LT3:                                      |       |       |       |       |       |       |       |       |
| W4:                                       |       |       |       |       |       |       |       |       |
| C7:                                       |       |       |       |       |       |       |       |       |
| Q4:                                       |       |       |       |       |       |       |       |       |
| C8:                                       |       |       |       |       |       |       |       |       |
| B4:                                       |       |       |       |       |       |       |       |       |
| D4:                                       |       |       |       |       |       |       |       |       |
| R4:                                       |       |       |       |       |       |       |       |       |
| N4:                                       |       |       |       |       |       |       |       |       |
| P4:                                       |       |       |       |       |       |       |       |       |
| LT4:                                      |       |       |       |       |       |       |       |       |
| W5:                                       |       |       |       |       |       |       |       |       |
| C9:                                       |       |       |       |       |       |       |       |       |
| Q5:                                       |       |       |       |       |       |       |       |       |
| C10:                                      |       |       |       |       |       |       |       |       |
| B5:                                       |       |       |       |       |       |       |       |       |
| D5:                                       |       |       |       |       |       |       |       |       |
| R5:                                       |       |       |       |       |       |       |       |       |
| N5:                                       |       |       |       |       |       |       |       |       |
| P5:                                       |       |       |       |       |       |       |       |       |
| LT5:                                      |       |       |       |       |       |       |       |       |
| W6:                                       |       |       |       |       |       |       |       |       |
| C11:                                      |       |       |       |       |       |       |       |       |
| Q6:                                       |       |       |       |       |       |       |       |       |
| C12:                                      |       |       |       |       |       |       |       |       |
| B6:                                       |       |       |       |       |       |       |       |       |
| D6:                                       |       |       |       |       |       |       |       |       |
| R6:                                       |       |       |       |       |       |       |       |       |
| N6:                                       |       |       |       |       |       |       |       |       |
| P6:                                       |       |       |       |       |       |       |       |       |
| LT6:                                      |       |       |       |       |       |       |       |       |
| W7:                                       |       |       |       |       |       |       |       |       |
| C13:                                      |       |       |       |       |       |       |       |       |
| Q7:                                       |       |       |       |       |       |       |       |       |
| C14:                                      |       |       |       |       |       |       |       |       |
| B7:                                       |       |       |       |       |       |       |       |       |
| D7:                                       |       |       |       |       |       |       |       |       |
| R7:                                       |       |       |       |       |       |       |       |       |
| N7:                                       |       |       |       |       |       |       |       |       |
| P7:                                       |       |       |       |       |       |       |       |       |
| LT7:                                      |       |       |       |       |       |       |       |       |
| W8:                                       |       |       |       |       |       |       |       |       |
| C15:                                      |       |       |       |       |       |       |       |       |
| Q8:                                       |       |       |       |       |       |       |       |       |
| C16:                                      |       |       |       |       |       |       |       |       |
| B8:                                       |       |       |       |       |       |       |       |       |
| D8:                                       |       |       |       |       |       |       |       |       |
| R8:                                       |       |       |       |       |       |       |       |       |
| N8:                                       |       |       |       |       |       |       |       |       |
| P8:                                       |       |       |       |       |       |       |       |       |
| LT8:                                      |       |       |       |       |       |       |       |       |
| W9:                                       |       |       |       |       |       |       |       |       |
| C17:                                      |       |       |       |       |       |       |       |       |
| Q9:                                       |       |       |       |       |       |       |       |       |
| C18:                                      |       |       |       |       |       |       |       |       |
| B9:                                       |       |       |       |       |       |       |       |       |
| D9:                                       |       |       |       |       |       |       |       |       |
| R9:                                       |       |       |       |       |       |       |       |       |
| N9:                                       |       |       |       |       |       |       |       |       |
| P9:                                       |       |       |       |       |       |       |       |       |
| LT9:                                      |       |       |       |       |       |       |       |       |
| W10:                                      |       |       |       |       |       |       |       |       |
| C19:                                      |       |       |       |       |       |       |       |       |
| Q10:                                      |       |       |       |       |       |       |       |       |
| C20:                                      |       |       |       |       |       |       |       |       |
| B10:                                      |       |       |       |       |       |       |       |       |
| D10:                                      |       |       |       |       |       |       |       |       |
| R10:                                      |       |       |       |       |       |       |       |       |
| N10:                                      |       |       |       |       |       |       |       |       |
| P10:                                      |       |       |       |       |       |       |       |       |
| LT10:                                     |       |       |       |       |       |       |       |       |
| W11:                                      |       |       |       |       |       |       |       |       |
| C21:                                      |       |       |       |       |       |       |       |       |
| Q11:                                      |       |       |       |       |       |       |       |       |
| C22:                                      |       |       |       |       |       |       |       |       |
| B11:                                      |       |       |       |       |       |       |       |       |
| D11:                                      |       |       |       |       |       |       |       |       |
| R11:                                      |       |       |       |       |       |       |       |       |
| N11:                                      |       |       |       |       |       |       |       |       |
| P11:                                      |       |       |       |       |       |       |       |       |
| LT11:                                     |       |       |       |       |       |       |       |       |
| W12:                                      |       |       |       |       |       |       |       |       |
| C23:                                      |       |       |       |       |       |       |       |       |
| Q12:                                      |       |       |       |       |       |       |       |       |
| C24:                                      |       |       |       |       |       |       |       |       |
| B12:                                      |       |       |       |       |       |       |       |       |
| D12:                                      |       |       |       |       |       |       |       |       |
| R12:                                      |       |       |       |       |       |       |       |       |
| N12:                                      |       |       |       |       |       |       |       |       |
| P12:                                      |       |       |       |       |       |       |       |       |
| LT12:                                     |       |       |       |       |       |       |       |       |
| W13:                                      |       |       |       |       |       |       |       |       |
| C25:                                      |       |       |       |       |       |       |       |       |
| Q13:                                      |       |       |       |       |       |       |       |       |
| C26:                                      |       |       |       |       |       |       |       |       |
| B13:                                      |       |       |       |       |       |       |       |       |
| D13:                                      |       |       |       |       |       |       |       |       |
| R13:                                      |       |       |       |       |       |       |       |       |
| N13:                                      |       |       |       |       |       |       |       |       |
| P13:                                      |       |       |       |       |       |       |       |       |
| LT13:                                     |       |       |       |       |       |       |       |       |
| W14:                                      |       |       |       |       |       |       |       |       |
| C27:                                      |       |       |       |       |       |       |       |       |
| Q14:                                      |       |       |       |       |       |       |       |       |
| C28:                                      |       |       |       |       |       |       |       |       |
| B14:                                      |       |       |       |       |       |       |       |       |
| D14:                                      |       |       |       |       |       |       |       |       |
| R14:                                      |       |       |       |       |       |       |       |       |
| N14:                                      |       |       |       |       |       |       |       |       |
| P14:                                      |       |       |       |       |       |       |       |       |
| LT14:                                     |       |       |       |       |       |       |       |       |
| W15:                                      |       |       |       |       |       |       |       |       |
| C29:                                      |       |       |       |       |       |       |       |       |
| Q15:                                      |       |       |       |       |       |       |       |       |
| C30:                                      |       |       |       |       |       |       |       |       |
| B15:                                      |       |       |       |       |       |       |       |       |
| D15:                                      |       |       |       |       |       |       |       |       |
| R15:                                      |       |       |       |       |       |       |       |       |
| N15:                                      |       |       |       |       |       |       |       |       |
| P15:                                      |       |       |       |       |       |       |       |       |
| LT15:                                     |       |       |       |       |       |       |       |       |
| W16:                                      |       |       |       |       |       |       |       |       |
| C31:                                      |       |       |       |       |       |       |       |       |
| Q16:                                      |       |       |       |       |       |       |       |       |
| C32:                                      |       |       |       |       |       |       |       |       |
| B16:                                      |       |       |       |       |       |       |       |       |
| D16:                                      |       |       |       |       |       |       |       |       |
| R16:                                      |       |       |       |       |       |       |       |       |
| N16:                                      |       |       |       |       |       |       |       |       |
| P16:                                      |       |       |       |       |       |       |       |       |
| LT16:                                     |       |       |       |       |       |       |       |       |
| W17:                                      |       |       |       |       |       |       |       |       |
| C33:                                      |       |       |       |       |       |       |       |       |
| Q17:                                      |       |       |       |       |       |       |       |       |
| C34:                                      |       |       |       |       |       |       |       |       |
| B17:                                      |       |       |       |       |       |       |       |       |
| D17:                                      |       |       |       |       |       |       |       |       |
| R17:                                      |       |       |       |       |       |       |       |       |
| N17:                                      |       |       |       |       |       |       |       |       |
| P17:                                      |       |       |       |       |       |       |       |       |
| LT17:                                     |       |       |       |       |       |       |       |       |
| W18:                                      |       |       |       |       |       |       |       |       |
| C35:                                      |       |       |       |       |       |       |       |       |
| Q18:                                      |       |       |       |       |       |       |       |       |
| C36:                                      |       |       |       |       |       |       |       |       |
| B18:                                      |       |       |       |       |       |       |       |       |
| D18:                                      |       |       |       |       |       |       |       |       |
| R18:                                      |       |       |       |       |       |       |       |       |
| N18:                                      |       |       |       |       |       |       |       |       |
| P18:                                      |       |       |       |       |       |       |       |       |
| LT18:                                     |       |       |       |       |       |       |       |       |
| W19:                                      |       |       |       |       |       |       |       |       |
| C37:                                      |       |       |       |       |       |       |       |       |
| Q19:                                      |       |       |       |       |       |       |       |       |
| C38:                                      |       |       |       |       |       |       |       |       |
| B19:                                      |       |       |       |       |       |       |       |       |
| D19:                                      |       |       |       |       |       |       |       |       |
| R19:                                      |       |       |       |       |       |       |       |       |
| N19:                                      |       |       |       |       |       |       |       |       |
| P19:                                      |       |       |       |       |       |       |       |       |
| LT19:                                     |       |       |       |       |       |       |       |       |
| W20:                                      |       |       |       |       |       |       |       |       |
| C39:                                      |       |       |       |       |       |       |       |       |
| Q20:                                      |       |       |       |       |       |       |       |       |
| C40:                                      |       |       |       |       |       |       |       |       |
| B20:                                      |       |       |       |       |       |       |       |       |
| D20:                                      |       |       |       |       |       |       |       |       |
| R20:                                      |       |       |       |       |       |       |       |       |
| N20:                                      |       |       |       |       |       |       |       |       |
| P20:                                      |       |       |       |       |       |       |       |       |
| LT20:                                     |       |       |       |       |       |       |       |       |
| W21:                                      |       |       |       |       |       |       |       |       |
| C41:                                      |       |       |       |       |       |       |       |       |
| Q21:                                      |       |       |       |       |       |       |       |       |
| C42:                                      |       |       |       |       |       |       |       |       |
| B21:                                      |       |       |       |       |       |       |       |       |
| D21:                                      |       |       |       |       |       |       |       |       |
| R21:                                      |       |       |       |       |       |       |       |       |
| N21:                                      |       |       |       |       |       |       |       |       |
| P21:                                      |       |       |       |       |       |       |       |       |
| LT21:                                     |       |       |       |       |       |       |       |       |
| W22:                                      |       |       |       |       |       |       |       |       |
| C43:                                      |       |       |       |       |       |       |       |       |
| Q22:                                      |       |       |       |       |       |       |       |       |
| C44:                                      |       |       |       |       |       |       |       |       |
| B22:                                      |       |       |       |       |       |       |       |       |
| D22:                                      |       |       |       |       |       |       |       |       |
| R22:                                      |       |       |       |       |       |       |       |       |
| N22:                                      |       |       |       |       |       |       |       |       |
| P22:                                      |       |       |       |       |       |       |       |       |
| LT22:                                     |       |       |       |       |       |       |       |       |
| W23:                                      |       |       |       |       |       |       |       |       |
| C45:                                      |       |       |       |       |       |       |       |       |
| Q23:                                      |       |       |       |       |       |       |       |       |
| C46:                                      |       |       |       |       |       |       |       |       |
| B23:                                      |       |       |       |       |       |       |       |       |
| D23:                                      |       |       |       |       |       |       |       |       |
| R23:                                      |       |       |       |       |       |       |       |       |
| N23:                                      |       |       |       |       |       |       |       |       |
| P23:                                      |       |       |       |       |       |       |       |       |
| LT23:                                     |       |       |       |       |       |       |       |       |
| W24:                                      |       |       |       |       |       |       |       |       |
| C47:                                      |       |       |       |       |       |       |       |       |
| Q24:                                      |       |       |       |       |       |       |       |       |
| C48:                                      |       |       |       |       |       |       |       |       |
| B24:                                      |       |       |       |       |       |       |       |       |
| D24:                                      |       |       |       |       |       |       |       |       |
| R24:                                      |       |       |       |       |       |       |       |       |
| N24:                                      |       |       |       |       |       |       |       |       |
| P24:                                      |       |       |       |       |       |       |       |       |
| LT24:                                     |       |       |       |       |       |       |       |       |
| W25:                                      |       |       |       |       |       |       |       |       |
| C49:                                      |       |       |       |       |       |       |       |       |
| Q25:                                      |       |       |       |       |       |       |       |       |
| C50:                                      |       |       |       |       |       |       |       |       |
| B25:                                      |       |       |       |       |       |       |       |       |
| D25:                                      |       |       |       |       |       |       |       |       |
| R25:                                      |       |       |       |       |       |       |       |       |
| N25:                                      |       |       |       |       |       |       |       |       |
| P25:                                      |       |       |       |       |       |       |       |       |
| LT25:                                     |       |       |       |       |       |       |       |       |
| W26:                                      |       |       |       |       |       |       |       |       |
| C51:                                      |       |       |       |       |       |       |       |       |
| Q26:                                      |       |       |       |       |       |       |       |       |
| C52:                                      |       |       |       |       |       |       |       |       |
| B26:                                      |       |       |       |       |       |       |       |       |
| D26:                                      |       |       |       |       |       |       |       |       |
| R26:                                      |       |       |       |       |       |       |       |       |
| N26:                                      |       |       |       |       |       |       |       |       |
| P26:                                      |       |       |       |       |       |       |       |       |
| LT26:                                     |       |       |       |       |       |       |       |       |
| W27:                                      |       |       |       |       |       |       |       |       |
| C53:                                      |       |       |       |       |       |       |       |       |
| Q27:                                      |       |       |       |       |       |       |       |       |
| C54:                                      |       |       |       |       |       |       |       |       |
| B27:                                      |       |       |       |       |       |       |       |       |
| D27:                                      |       |       |       |       |       |       |       |       |
| R27:                                      |       |       |       |       |       |       |       |       |
| N27:                                      |       |       |       |       |       |       |       |       |
| P27:                                      |       |       |       |       |       |       |       |       |
| LT27:                                     |       |       |       |       |       |       |       |       |
| W28:                                      |       |       |       |       |       |       |       |       |
| C55:                                      |       |       |       |       |       |       |       |       |
| Q28:                                      |       |       |       |       |       |       |       |       |
| C56:                                      |       |       |       |       |       |       |       |       |
| B28:                                      |       |       |       |       |       |       |       |       |
| D28:                                      |       |       |       |       |       |       |       |       |
| R28:                                      |       |       |       |       |       |       |       |       |
| N28:                                      |       |       |       |       |       |       |       |       |
| P28:                                      |       |       |       |       |       |       |       |       |
| LT28:                                     |       |       |       |       |       |       |       |       |
| W29:                                      |       |       |       |       |       |       |       |       |
| C57:                                      |       |       |       |       |       |       |       |       |
|                                           |       |       |       |       |       |       |       |       |

| Table 1. The results of the ANOVA test |                     |      |      |      |                |      |      |      |    |      |      |      |  |
|----------------------------------------|---------------------|------|------|------|----------------|------|------|------|----|------|------|------|--|
| ANOVA                                  | Source of Variation |      |      |      | Sum of Squares |      |      |      |    |      |      |      |  |
|                                        | df                  | SS   | MS   | F    | df             | SS   | MS   | F    | df | SS   | MS   | F    |  |
| Between Groups                         | 1                   | 0.00 | 0.00 | 0.00 | 1              | 0.00 | 0.00 | 0.00 | 1  | 0.00 | 0.00 | 0.00 |  |
| Within Groups                          | 9                   | 0.00 | 0.00 | 0.00 | 9              | 0.00 | 0.00 | 0.00 | 9  | 0.00 | 0.00 | 0.00 |  |
| Total                                  | 10                  | 0.00 | 0.00 | 0.00 | 10             | 0.00 | 0.00 | 0.00 | 10 | 0.00 | 0.00 | 0.00 |  |
| Error                                  | 1                   | 0.00 | 0.00 | 0.00 | 1              | 0.00 | 0.00 | 0.00 | 1  | 0.00 | 0.00 | 0.00 |  |
| Residual                               | 9                   | 0.00 | 0.00 | 0.00 | 9              | 0.00 | 0.00 | 0.00 | 9  | 0.00 | 0.00 | 0.00 |  |
| Corrected Total                        | 10                  | 0.00 | 0.00 | 0.00 | 10             | 0.00 | 0.00 | 0.00 | 10 | 0.00 | 0.00 | 0.00 |  |
| Adjusted R Squared                     | 1                   | 0.00 | 0.00 | 0.00 | 1              | 0.00 | 0.00 | 0.00 | 1  | 0.00 | 0.00 | 0.00 |  |
| Adjusted F                             | 1                   | 0.00 | 0.00 | 0.00 | 1              | 0.00 | 0.00 | 0.00 | 1  | 0.00 | 0.00 | 0.00 |  |
| Adjusted R Squared                     | 1                   | 0.00 | 0.00 | 0.00 | 1              | 0.00 | 0.00 | 0.00 | 1  | 0.00 | 0.00 | 0.00 |  |
| Adjusted F                             | 1                   | 0.00 | 0.00 | 0.00 | 1              | 0.00 | 0.00 | 0.00 | 1  | 0.00 | 0.00 | 0.00 |  |

**Abstract** *Background:* The purpose of this study was to determine the prevalence of self-reported depression and anxiety among a sample of young adults in the United States. *Methods:* Data were obtained from the 2007 National Survey of Adolescent Health, a nationally representative survey of young adults aged 18–24 years. *Results:* The prevalence of self-reported depression was 10.3% and the prevalence of self-reported anxiety was 11.8%. *Conclusions:* The prevalence of self-reported depression and anxiety among young adults in the United States is high. *Keywords:* Depression, Anxiety, Prevalence, Young adults.

As a result, the *Journal of Management* is the only journal in the field to have been ranked in the top 10 of the ISI Social Sciences Citation Index® for 10 years.

**Figure 2**

## Node 2033: S Collage Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 dI, Average Delay 1.24  
 Worst Case Delay 17.34  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
|                       | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Movement              |           |        |       |       |       |       |           |        |       |       |       |       |
| Base Volume           | 5.00      | 208.00 | 5.00  | 5.00  | 5.00  | 7.00  | 10.00     | 245.00 | 6.00  | 8.00  | 5.00  | 8.00  |
| PHF, Peak-Hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 320.00 | 7.69  | 7.69  | 7.69  | 10.77 | 15.38     | 376.92 | 9.23  | 9.23  | 7.69  | 12.31 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
|                          | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| Movement                 |           |   |    |       |       |       |           |   |    |       |       |       |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
|                                                | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 10.77  | 15.38     |   |    | 9.23   | 7.69   | 12.31  |
| Conflicting Volume (Veh)                       | 386.15    |   |    | 761.54 | 755.38 | 381.54 | 327.69    |   |    | 760.77 | 756.15 | 323.85 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 386.15    |   |    | 761.54 | 755.38 | 381.54 | 327.69    |   |    | 760.77 | 756.15 | 323.85 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cpx, Potential Capacity                        | 1183.37   |   |    | 324.23 | 340.01 | 670.12 | 1243.25   |   |    | 324.62 | 339.67 | 721.83 |
| Capacity                                       | 1183.37   |   |    | 307.44 | 331.99 | 670.12 | 1243.25   |   |    | 308.12 | 331.65 | 721.83 |

## Critical Headway and Follow-Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
|                                              | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| Movement                                     |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3It, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| tf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf,HV, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
|                      | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| Movement             |           |        |      |        |        |        |           |        |      |        |        |        |
| vx, Volume           | 7.69      | 320.00 | 7.69 | 7.69   | 7.69   | 10.77  | 15.38     | 376.92 | 9.23 | 9.23   | 7.69   | 12.31  |
| cmx, Capacity        | 1183.37   |        |      | 307.44 | 331.99 | 670.12 | 1243.25   |        |      | 308.12 | 331.65 | 721.83 |
| V, C                 | 0.01      |        |      | 0.03   | 0.02   | 0.02   | 0.01      |        |      | 0.03   | 0.02   | 0.02   |
| d, Delay             | 8.06      |        |      | 17.32  | 16.45  | 10.98  | 7.93      |        |      | 17.34  | 16.51  | 10.64  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |      | C      | C      | B      |
| dA, Approach Delay   |           | 0.18   |      |        | 14.45  |        |           | 0.30   |      |        | 14.30  |        |
| Approach LOS         |           |        |      |        | B      |        |           |        |      |        | B      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |        | W         |
|-----------------------|-----------|--------|-----------|-----------|--------|-----------|
|                       | Lane 1    | Lane 2 |           | Lane 1    | Lane 2 |           |
| Lane                  |           |        |           |           |        |           |
| Movements             |           |        | L1, T, R1 |           |        | L1, T, R1 |
| vx, Volume            | 7.69      | 327.69 | 26.15     | 15.38     | 386.15 | 29.23     |
| Planned Storage Size  |           |        |           |           |        |           |
| cmx, Capacity         |           |        | 406.99    |           |        | 416.37    |
| V, C                  |           |        | 0.06      |           |        | 0.07      |
| QSS, 95% Queue Length |           |        | 0.21      |           |        | 0.23      |
| d, Delay              |           |        | 14.45     |           |        | 14.30     |
| LOS                   |           |        | B         |           |        | B         |
| dA, Approach Delay    |           | 0.18   | 14.45     |           | 0.30   | 14.30     |
| Approach LOS          |           |        | B         |           |        | B         |

## Node 2034: S College Ave &amp; SE 8th St

Control Type TWSC  
 Method HCM 6th Edition  
 d1, Average Delay 1.25  
 Worst Case Delay 18.87  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 223.00 | 5.00  | 5.00  | 5.00  | 8.00  | 11.00     | 272.00 | 6.00  | 6.00  | 5.00  | 9.00  |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 343.08 | 7.69  | 7.69  | 7.69  | 12.31 | 16.92     | 418.46 | 9.23  | 9.23  | 7.69  | 13.85 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Su, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fbs, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E      |        |        | S (Major) |   |    | W      |        |        |
|------------------------------------------------|-----------|---|----|--------|--------|--------|-----------|---|----|--------|--------|--------|
| Movement                                       | L1        | T | R1 | L1     | T      | R1     | L1        | T | R1 | L1     | T      | R1     |
| Rank                                           | 2         | 1 | 1  | 4      | 3      | 2      | 2         | 1 | 1  | 4      | 3      | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69   | 7.69   | 12.31  | 16.92     |   |    | 9.23   | 7.69   | 13.85  |
| Conflicting Volume (Veh)                       | 427.69    |   |    | 830.00 | 823.08 | 423.08 | 350.77    |   |    | 829.23 | 823.85 | 346.92 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00   | 0.00   | 0.00   | 0.00      |   |    | 0.00   | 0.00   | 0.00   |
| Conflicting Volume                             | 427.69    |   |    | 830.00 | 823.08 | 423.08 | 350.77    |   |    | 829.23 | 823.85 | 346.92 |
| Two-Stage Gap Acceptance                       |           |   |    | No     | No     |        |           |   |    | No     | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |        |        |        |           |   |    |        |        |        |
| cp, Potential Capacity                         | 1142.50   |   |    | 291.62 | 310.73 | 635.10 | 1219.27   |   |    | 291.97 | 310.42 | 700.70 |
| Capacity                                       | 1142.50   |   |    | 274.67 | 302.52 | 635.10 | 1219.27   |   |    | 275.11 | 302.21 | 700.70 |

## Critical Headway and Follow Up Headway

| Approach                                       | N (Major) |      |    | E    |      |      | S (Major) |   |    | W    |      |      |
|------------------------------------------------|-----------|------|----|------|------|------|-----------|---|----|------|------|------|
| Movement                                       | L1        | T    | R1 | L1   | T    | R1   | L1        | T | R1 | L1   | T    | R1   |
| tc, base, Base Critical Headway                | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, base, I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, base, II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, HV, Heavy Vehicles Adjustment Factor       | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |   |    | 1.00 | 1.00 | 1.00 |
| Phv, % Heavy Vehicles                          | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, G, Grade Adjustment Factor                 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |   |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                     |           | 0.00 |    |      | 0.00 |      | 0.00      |   |    |      | 0.00 |      |
| T3, II, Geometry Adjustment Factor             | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |   |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                           | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |   |    | 7.10 | 6.50 | 6.20 |
| tc, I, Critical Headway (Stage I)              |           |      |    |      |      |      |           |   |    |      |      |      |
| tc, II, Critical Headway (Stage II)            |           |      |    |      |      |      |           |   |    |      |      |      |
| tf, base, Base Follow-Up Headway               | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |
| tf, hv, Heavy Vehicles Adjustment Factor       | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |   |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                          | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |   |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| vx, Volume           | 7.69      | 343.08 | 7.69 | 7.69   | 7.69   | 12.31  | 16.92     | 418.46 | 9.23 | 9.23   | 7.69   | 13.85  |
| cmx, Capacity        | 1142.50   |        |      | 274.67 | 302.52 | 635.10 | 1219.27   |        |      | 275.11 | 302.21 | 700.70 |
| V / C                | 0.01      |        |      | 0.03   | 0.03   | 0.02   | 0.01      |        |      | 0.03   | 0.03   | 0.02   |
| d, Delay             | 8.17      |        |      | 18.95  | 17.64  | 11.41  | 7.99      |        |      | 18.87  | 17.70  | 10.93  |
| LOS                  | A         |        |      | C      | C      | B      | A         |        |      | C      | C      | B      |
| dA, Approach Delay   |           | 0.18   |      |        | 15.21  |        | 0.30      |        |      |        | 15.00  |        |
| Approach LOS         |           |        |      |        | C      |        |           |        |      |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        | 0.00      |        |      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |        | W         |
|-----------------------|-----------|--------|-----------|-----------|--------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 1    | Lane 2 | Lane 1    |
| Movements             | T, R1     | T, R1  | L1, T, R1 | L1, T, R1 | T, R1  | L1, T, R1 |
| vx, Volume            | 7.69      | 350.77 | 27.69     | 16.92     | 427.69 | 30.77     |
| Flared Storage Size   |           |        |           |           |        |           |
| cmx, Capacity         |           |        | 380.33    |           |        | 390.64    |
| V / C                 |           |        | 0.07      |           |        | 0.08      |
| Q95, 95% Queue Length |           |        | 0.24      |           |        | 0.26      |
| d, Delay              |           |        | 15.21     |           |        | 15.00     |
| LOS                   |           |        | C         |           |        | C         |
| dA, Approach Delay    |           | 0.18   | 15.21     |           | 0.30   | 15.00     |
| Approach LOS          |           |        | C         |           |        | C         |

## Node 2035: S College Ave &amp; SE 10th St

Control Type TWSC  
 Method HCM 6th Edition  
 di, Average Delay 1.32  
 Worst Case Delay 27.52  
 Worst Case LOS D

## Volume and Adjustments

| Approach              | N (Major) |        |       | E     |       |       | S (Major) |        |       | W     |       |       |
|-----------------------|-----------|--------|-------|-------|-------|-------|-----------|--------|-------|-------|-------|-------|
| Movement              | L1        | T      | R1    | L1    | T     | R1    | L1        | T      | R1    | L1    | T     | R1    |
| Base Volume           | 5.00      | 317.00 | 5.00  | 5.00  | 5.00  | 5.00  | 6.00      | 369.00 | 5.00  | 9.00  | 5.00  | 15.00 |
| PHF, Peak-hour factor | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69      | 487.69 | 7.69  | 7.69  | 7.69  | 7.69  | 9.23      | 567.69 | 7.69  | 13.85 | 7.69  | 23.08 |

## Pedestrians

| Approach                 | N (Major) |   |    | E     |       |       | S (Major) |   |    | W     |       |       |
|--------------------------|-----------|---|----|-------|-------|-------|-----------|---|----|-------|-------|-------|
| Movement                 | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    |
| vx, Flow (Ped/hr)        | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |
| w, Lane Width (ft)       | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  |
| fpb, Percent Blockage    | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |   |    | E       |         |        | S (Major) |   |    | W       |         |        |
|------------------------------------------------|-----------|---|----|---------|---------|--------|-----------|---|----|---------|---------|--------|
| Movement                                       | L1        | T | R1 | L1      | T       | R1     | L1        | T | R1 | L1      | T       | R1     |
| Rank                                           | 2         | 1 | 1  | 4       | 3       | 2      | 2         | 1 | 1  | 4       | 3       | 2      |
| vx, Volume                                     | 7.69      |   |    | 7.69    | 7.69    | 7.69   | 9.23      |   |    | 13.85   | 7.69    | 23.08  |
| Conflicting Volume (Veh)                       | 575.38    |   |    | 1112.31 | 1100.77 | 571.54 | 495.38    |   |    | 1104.62 | 1100.77 | 491.54 |
| Conflicting Volume (Ped)                       | 0.00      |   |    | 0.00    | 0.00    | 0.00   | 0.00      |   |    | 0.00    | 0.00    | 0.00   |
| Conflicting Volume                             | 575.38    |   |    | 1112.31 | 1100.77 | 571.54 | 495.38    |   |    | 1104.62 | 1100.77 | 491.54 |
| Two-Stage Gap Acceptance                       |           |   |    | No      | No      |        |           |   |    | No      | No      |        |
| Number of Storage Spaces in Median Refuge Area |           |   |    |         |         |        |           |   |    |         |         |        |
| cap, Potential Capacity                        | 1007.87   |   |    | 187.66  | 213.76  | 523.74 | 1078.79   |   |    | 189.95  | 213.76  | 581.19 |
| Capacity                                       | 1007.87   |   |    | 172.09  | 208.84  | 523.74 | 1078.79   |   |    | 178.72  | 208.84  | 581.19 |

## Critical Headway and Follow Up Headway

| Approach                                     | N (Major) |      |    | E    |      |      | S (Major) |      |    | W    |      |      |
|----------------------------------------------|-----------|------|----|------|------|------|-----------|------|----|------|------|------|
| Movement                                     | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   |
| tc,base, Base Critical Headway               | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,base,I, Base Critical Headway (Stage I)   |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,base,II, Base Critical Headway (Stage II) |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,HV, Heavy Vehicles Adjustment Factor      | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 |
| Plv, % Heavy Vehicles                        | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc,G, Grade Adjustment Factor                | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 |
| G, % Grade                                   |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |
| T3,lt, Geometry Adjustment Factor            | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 |
| tc, Critical Headway                         | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 |
| tc,I, Critical Headway (Stage I)             |           |      |    |      |      |      |           |      |    |      |      |      |
| tc,II, Critical Headway (Stage II)           |           |      |    |      |      |      |           |      |    |      |      |      |
| tf,base, Base Follow-Up Headway              | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |
| tf,hv, Heavy Vehicles Adjustment Factor      | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 |
| tf, Follow-Up Headway                        | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |        |      | E      |        |        | S (Major) |        |      | W      |        |        |
|----------------------|-----------|--------|------|--------|--------|--------|-----------|--------|------|--------|--------|--------|
| Movement             | L1        | T      | R1   | L1     | T      | R1     | L1        | T      | R1   | L1     | T      | R1     |
| vx, Volume           | 7.69      | 487.69 | 7.69 | 7.69   | 7.69   | 7.69   | 9.23      | 567.69 | 7.69 | 13.85  | 7.69   | 23.08  |
| cmx, Capacity        | 1007.87   |        |      | 172.09 | 208.84 | 523.74 | 1078.79   |        |      | 178.72 | 208.84 | 581.19 |
| V / C                | 0.01      |        |      | 0.04   | 0.04   | 0.01   | 0.01      |        |      | 0.08   | 0.04   | 0.04   |
| d, Delay             | 8.60      |        |      | 27.52  | 23.83  | 13.47  | 8.37      |        |      | 27.40  | 24.50  | 13.45  |
| LOS                  | A         |        |      | D      | C      | B      | A         |        |      | D      | C      | B      |
| dA, Approach Delay   |           | 0.13   |      |        | 21.61  |        |           | 0.13   |      |        | 19.69  |        |
| Approach LOS         |           |        |      |        | C      |        |           |        |      |        | C      |        |
| dRank1, Rank 1 Delay |           | 0.00   |      |        |        |        |           | 0.00   |      |        |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |        | E         | S (Major) |           | W         |
|-----------------------|-----------|--------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 2 | Lane 1    | Lane 2    | Lane 1    | Lane 1    |
| Movements             | T, R1     | T, R1  | L1, T, R1 | T, R1     | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 7.69      | 495.38 | 23.08     | 9.23      | 575.38    | 44.62     |
| Planned Storage Size  |           |        |           |           |           |           |
| cmx, Capacity         |           |        | 239.84    |           |           | 289.68    |
| V / C                 |           |        | 0.10      |           |           | 0.15      |
| Q95, 95% Queue Length |           |        | 0.32      |           |           | 0.54      |
| d, Delay              |           |        | 21.61     |           |           | 19.69     |
| LOS                   |           |        | C         |           |           | C         |
| dA, Approach Delay    |           | 0.13   | 21.61     |           | 0.13      | 19.69     |
| Approach LOS          |           |        | C         |           |           | C         |

Node 2306: S College Ave & SE 12th St

| Control Type  | Signalized       |
|---------------|------------------|
| Vehicle       | W/Curb Extension |
| Average Delay | 25.25            |
| Average LOS   | C                |
| V/C           | 0.71             |
| Lost Time     | 21               |

Volume and Adjustments by Weekday

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Volume and Adjustments by Lane Group

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Signalized Intersections

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Control Type and Level of Service Determination

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Signal Timing Parameters

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Signal Timing Parameters

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Left Turn Adjustment Factors for Permitted Turning

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Proportion and Volume Adjustment Factors

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Adjusted Peak Hour Volume

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Adjusted Peak Hour Volume

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

Adjusted Peak Hour Volume

| Approach       | L  | T   | R   | L  | T   | R   | L  | T   | R   | L  | T   | R   |
|----------------|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|-----|
| Major Street   | 44 | 765 | 765 | 43 | 765 | 765 | 44 | 765 | 765 | 44 | 765 | 765 |
| Minor Street   | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 | 17 | 132 | 132 |
| Approach Total | 61 | 897 | 897 | 60 | 897 | 897 | 61 | 897 | 897 | 61 | 897 | 897 |

## Node 2037: S College and 13th/13th St

Control Type TWSC  
 Method HCM 8th Edition  
 dI, Average Delay 0.3  
 Worst Case Delay 17.38  
 Worst Case LOS C

## Volume and Adjustments

| Approach              | N (Major) |       | S (Major) |        | W     |       |
|-----------------------|-----------|-------|-----------|--------|-------|-------|
|                       | T         | R1    | L1        | T      | L1    | R1    |
| Base Volume           | 248.00    | 5.00  | 5.00      | 340.00 | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650     | 0.650 | 0.650     | 0.650  | 0.650 | 0.650 |
| V, Adjusted Volume    | 381.54    | 7.69  | 7.69      | 523.08 | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N (Major) |    | S (Major) |   | W     |       |
|--------------------------|-----------|----|-----------|---|-------|-------|
|                          | T         | R1 | L1        | T | L1    | R1    |
| vx, Flow (Ped/hr)        |           |    | 0.00      |   | 0.00  | 0.00  |
| w, Lane Width (ft)       |           |    | 12.00     |   | 12.00 | 12.00 |
| Sp, Walking Speed (ft/s) |           |    | 3.50      |   | 3.50  | 3.50  |
| fpb, Percent Blockage    |           |    | 0.00      |   | 0.00  | 0.00  |

## Capacity of Movements below Rank 1

| Approach                                       | N (Major) |    | S (Major) |   | W      |        |
|------------------------------------------------|-----------|----|-----------|---|--------|--------|
|                                                | T         | R1 | L1        | T | L1     | R1     |
| Rank                                           | 1         | 1  | 2         | 1 | 3      | 2      |
| vx, Volume                                     |           |    | 7.69      |   | 7.69   | 7.69   |
| Conflicting Volume (Veh)                       |           |    | 389.23    |   | 923.85 | 385.38 |
| Conflicting Volume (Ped)                       |           |    | 0.00      |   | 0.00   | 0.00   |
| Conflicting Volume                             |           |    | 389.23    |   | 923.85 | 385.38 |
| Two-Stage Gap Acceptance                       |           |    |           |   | No     |        |
| Number of Storage Spaces in Median Refuge Area |           |    |           |   |        |        |
| cmx, Potential Capacity                        |           |    | 1180.29   |   | 301.64 | 666.80 |
| Capacity                                       |           |    | 1180.29   |   | 288.87 | 666.80 |

## Critical Headway and Follow Up Headway

| Approach                                      | N (Major) |      | S (Major) |      | W    |      |
|-----------------------------------------------|-----------|------|-----------|------|------|------|
|                                               | T         | R1   | L1        | T    | L1   | R1   |
| to base, Base Critical Headway                |           |      | 4.10      |      | 7.10 | 6.20 |
| to base, I, Base Critical Headway (Stage I)   |           |      |           |      |      |      |
| to base, II, Base Critical Headway (Stage II) |           |      |           |      |      |      |
| to HV, Heavy Vehicles Adjustment Factor       |           |      | 1.00      |      | 1.00 | 1.00 |
| Pttv, % Heavy Vehicles                        |           |      | 0.00      |      | 0.00 | 0.00 |
| to G, Grade Adjustment Factor                 |           |      | 1.00      |      | 0.20 | 0.10 |
| G, % Grade                                    |           | 0.00 |           | 0.00 |      | 0.00 |
| TAB, Geometry Adjustment Factor               |           |      | 0.00      |      | 0.70 | 0.00 |
| to, Critical Headway                          |           |      | 4.10      |      | 6.40 | 6.20 |
| to I, Critical Headway (Stage I)              |           |      |           |      |      |      |
| to II, Critical Headway (Stage II)            |           |      |           |      |      |      |
| to base, Base Follow-Up Headway               |           |      | 2.20      |      | 3.50 | 3.30 |
| to hv, Heavy Vehicles Adjustment Factor       |           |      | 0.90      |      | 0.90 | 0.90 |
| to, Follow-Up Headway                         |           |      | 2.20      |      | 3.50 | 3.30 |

## Delay and Level of Service by Movement

| Approach             | N (Major) |      | S (Major) |        | W      |        |
|----------------------|-----------|------|-----------|--------|--------|--------|
|                      | T         | R1   | L1        | T      | L1     | R1     |
| vx, Volume           | 381.54    | 7.69 | 7.69      | 523.08 | 7.69   | 7.69   |
| cmx, Capacity        |           |      | 1180.29   |        | 298.87 | 666.80 |
| V / C                |           |      | 0.01      |        | 0.03   | 0.01   |
| d, Delay             |           |      | 8.07      |        | 17.38  | 10.74  |
| LOS                  |           |      | A         |        | C      | B      |
| dA, Approach Delay   |           | 0.00 |           | 0.12   |        | 14.06  |
| Approach LOS         |           |      |           |        |        | B      |
| dRank1, Rank 1 Delay |           | 0.00 |           | 0.07   |        |        |

## Delay and Level of Service by Lane

| Approach              | N (Major) |         | S (Major) |        | W      |        |
|-----------------------|-----------|---------|-----------|--------|--------|--------|
|                       | Lane 1    | Lane 1  | Lane 1    | Lane 1 | Lane 1 | Lane 1 |
| Movements             | T, R1     | L1, T   | L1, R1    |        |        |        |
| vx, Volume            | 389.23    | 530.77  | 15.38     |        |        |        |
| Flared Storage Size   |           |         |           |        |        |        |
| cmx, Capacity         |           | 1180.29 | 412.74    |        |        |        |
| V / C                 |           | 0.45    | 0.04      |        |        |        |
| Q95, 95% Queue Length |           | 0.02    | 0.12      |        |        |        |
| d, Delay              |           | 8.07    | 14.06     |        |        |        |
| LOS                   |           |         | B         |        |        |        |
| dA, Approach Delay    |           | 0.00    | 0.12      |        |        |        |
| Approach LOS          |           |         | B         |        |        |        |

| Node 2536: S College Ave & Lenses |  |  |  |  |  |         |  |  |  |  |  |
|-----------------------------------|--|--|--|--|--|---------|--|--|--|--|--|
| Concord Type                      |  |  |  |  |  | Squares |  |  |  |  |  |
| W/Sec                             |  |  |  |  |  | H/Sec   |  |  |  |  |  |
| Average Delay                     |  |  |  |  |  | 24.21   |  |  |  |  |  |
| Average LOS                       |  |  |  |  |  | C       |  |  |  |  |  |
| W/C                               |  |  |  |  |  | 0.55    |  |  |  |  |  |
| Loss Time                         |  |  |  |  |  | 10      |  |  |  |  |  |

| Volume and Assignment by Movement |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                          | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left Turn                         | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                           | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right Turn                        | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment                        | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Volume and Assignment by Lane Group |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Group                          | L    | C    | R    | L    | C    | R    | L    | C    | R    | L    | C    |
| Left                                | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                             | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right                               | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment                          | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Signalized Intersection |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left                    | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                 | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right                   | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment              | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Control Delay, Delay, and Level of Service Determination |      |      |      |      |      |      |      |      |      |      |      |
|----------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                                                 | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left                                                     | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                                                  | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right                                                    | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment                                               | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Signalized Intersection |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left                    | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                 | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right                   | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment              | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Signalized Intersection |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left                    | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                 | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right                   | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment              | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Signalized Intersection |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left                    | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                 | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right                   | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment              | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Pedestrian and Bicycle Movement Factors |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement                                | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left                                    | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through                                 | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right                                   | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment                              | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Adjustment Factors |      |      |      |      |      |      |      |      |      |      |      |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement           | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left               | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through            | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right              | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment         | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Adjustment Factors |      |      |      |      |      |      |      |      |      |      |      |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement           | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left               | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through            | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right              | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment         | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

| Adjustment Factors |      |      |      |      |      |      |      |      |      |      |      |
|--------------------|------|------|------|------|------|------|------|------|------|------|------|
| Movement           | L1   | T    | R1   | L1   | T    | R1   | L1   | T    | R1   | L1   | T    |
| Left               | 74   | 240  | 13   | 51   | 18   | 83   | 10   | 220  | 45   | 35   | 45   |
| Through            | 9460 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Right              | 28   | 92   | 5    | 20   | 7    | 32   | 4    | 87   | 17   | 13   | 13   |
| Adjustment         | 114  | 362  | 20   | 78   | 28   | 125  | 15   | 364  | 69   | 54   | 52   |

## Node 2039: SE 3rd &amp; Ash Ave

Control Type TWSC  
 Method HCM 8th Edition  
 d1, Average Delay 9.71  
 Worst Case Delay 11.54  
 Worst Case LOS B

## Volume and Adjustments

| Approach              | N     |        |       | E (Major) |       |       | S     |        |       | W (Major) |       |       |
|-----------------------|-------|--------|-------|-----------|-------|-------|-------|--------|-------|-----------|-------|-------|
| Movement              | L1    | T      | R1    | L1        | T     | R1    | L1    | T      | R1    | L1        | T     | R1    |
| Base Volume           | 5.00  | 89.00  | 5.00  | 5.00      | 5.00  | 6.00  | 5.00  | 132.00 | 5.00  | 5.00      | 5.00  | 5.00  |
| PHF, Peak-hour factor | 0.650 | 0.650  | 0.650 | 0.650     | 0.650 | 0.650 | 0.650 | 0.650  | 0.650 | 0.650     | 0.650 | 0.650 |
| V, Adjusted Volume    | 7.69  | 136.92 | 7.69  | 7.69      | 7.69  | 9.23  | 7.69  | 203.08 | 7.69  | 7.69      | 7.69  | 7.69  |

## Pedestrians

| Approach                 | N     |       |       | E (Major) |   |    | S     |       |       | W (Major) |   |    |
|--------------------------|-------|-------|-------|-----------|---|----|-------|-------|-------|-----------|---|----|
| Movement                 | L1    | T     | R1    | L1        | T | R1 | L1    | T     | R1    | L1        | T | R1 |
| vx, Flow (Ped/hr)        | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |
| w, Lane Width (ft)       | 12.00 | 12.00 | 12.00 | 12.00     |   |    | 12.00 | 12.00 | 12.00 | 12.00     |   |    |
| Sp, Walking Speed (ft/s) | 3.50  | 3.50  | 3.50  | 3.50      |   |    | 3.50  | 3.50  | 3.50  | 3.50      |   |    |
| fpb, Percent Blockage    | 0.00  | 0.00  | 0.00  | 0.00      |   |    | 0.00  | 0.00  | 0.00  | 0.00      |   |    |

## Capacity of Movements below Rank 1

| Approach                                       | N      |        |         | E (Major) |   |    | S      |        |         | W (Major) |   |    |
|------------------------------------------------|--------|--------|---------|-----------|---|----|--------|--------|---------|-----------|---|----|
| Movement                                       | L1     | T      | R1      | L1        | T | R1 | L1     | T      | R1      | L1        | T | R1 |
| Rank                                           | 4      | 3      | 2       | 2         | 1 | 1  | 4      | 3      | 2       | 2         | 1 | 1  |
| vx, Volume                                     | 7.69   | 136.92 | 7.69    | 7.69      |   |    | 7.69   | 203.08 | 7.69    | 7.69      |   |    |
| Conflicting Volume (Veh)                       | 160.00 | 58.46  | 12.31   | 15.38     |   |    | 126.92 | 59.23  | 11.54   | 16.92     |   |    |
| Conflicting Volume (Ped)                       | 0.00   | 0.00   | 0.00    | 0.00      |   |    | 0.00   | 0.00   | 0.00    | 0.00      |   |    |
| Conflicting Volume                             | 160.00 | 58.46  | 12.31   | 15.38     |   |    | 126.92 | 59.23  | 11.54   | 16.92     |   |    |
| Two-Stage Gap Acceptance                       | No     | No     |         |           |   |    | No     | No     |         |           |   |    |
| Number of Storage Spaces in Median Refuge Area |        |        |         |           |   |    |        |        |         |           |   |    |
| cpk, Potential Capacity                        | 810.09 | 836.43 | 1074.07 | 1615.51   |   |    | 851.22 | 835.62 | 1075.11 | 1613.44   |   |    |
| Capacity                                       | 647.50 | 828.40 | 1074.07 | 1615.51   |   |    | 732.60 | 827.60 | 1075.11 | 1613.44   |   |    |

## Critical Headway and Follow-Up Headway

| Approach                                     | N    |      |      | E (Major) |      |    | S    |      |      | W (Major) |      |    |
|----------------------------------------------|------|------|------|-----------|------|----|------|------|------|-----------|------|----|
| Movement                                     | L1   | T    | R1   | L1        | T    | R1 | L1   | T    | R1   | L1        | T    | R1 |
| tc base, Base Critical Headway               | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc base I, Base Critical Headway (Stage I)   |      |      |      |           |      |    |      |      |      |           |      |    |
| tc base II, Base Critical Headway (Stage II) |      |      |      |           |      |    |      |      |      |           |      |    |
| tc IV, Heavy Vehicles Adjustment Factor      | 1.00 | 1.00 | 1.00 | 1.00      |      |    | 1.00 | 1.00 | 1.00 | 1.00      |      |    |
| Phv, Heavy Vehicles                          | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc G, Grade Adjustment Factor                | 0.20 | 0.20 | 0.10 | 1.00      |      |    | 0.20 | 0.20 | 0.10 | 1.00      |      |    |
| G, % Grade                                   |      | 0.00 |      |           | 0.00 |    |      | 0.00 |      |           | 0.00 |    |
| Ta, Geometry Adjustment Factor               | 0.00 | 0.00 | 0.00 | 0.00      |      |    | 0.00 | 0.00 | 0.00 | 0.00      |      |    |
| tc Critical Headway                          | 7.10 | 6.50 | 6.20 | 4.10      |      |    | 7.10 | 6.50 | 6.20 | 4.10      |      |    |
| tc I Critical Headway (Stage I)              |      |      |      |           |      |    |      |      |      |           |      |    |
| tc II Critical Headway (Stage II)            |      |      |      |           |      |    |      |      |      |           |      |    |
| tf base, Base Follow-Up Headway              | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |
| tf Phv, Heavy Vehicles Adjustment Factor     | 0.90 | 0.90 | 0.90 | 0.90      |      |    | 0.90 | 0.90 | 0.90 | 0.90      |      |    |
| tf, Follow-Up Headway                        | 3.50 | 4.00 | 3.30 | 2.20      |      |    | 3.50 | 4.00 | 3.30 | 2.20      |      |    |

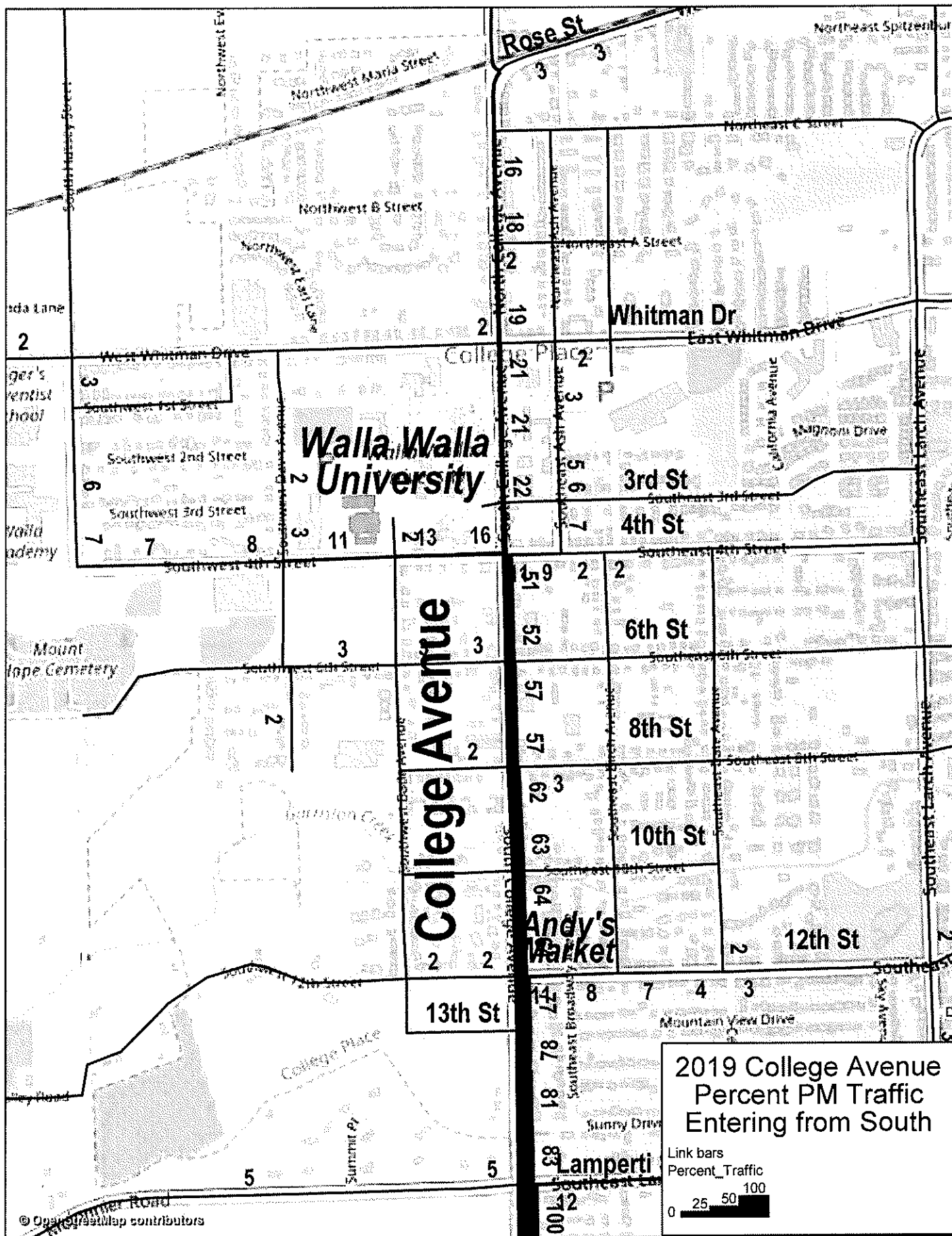
## Delay and Level of Service by Movement

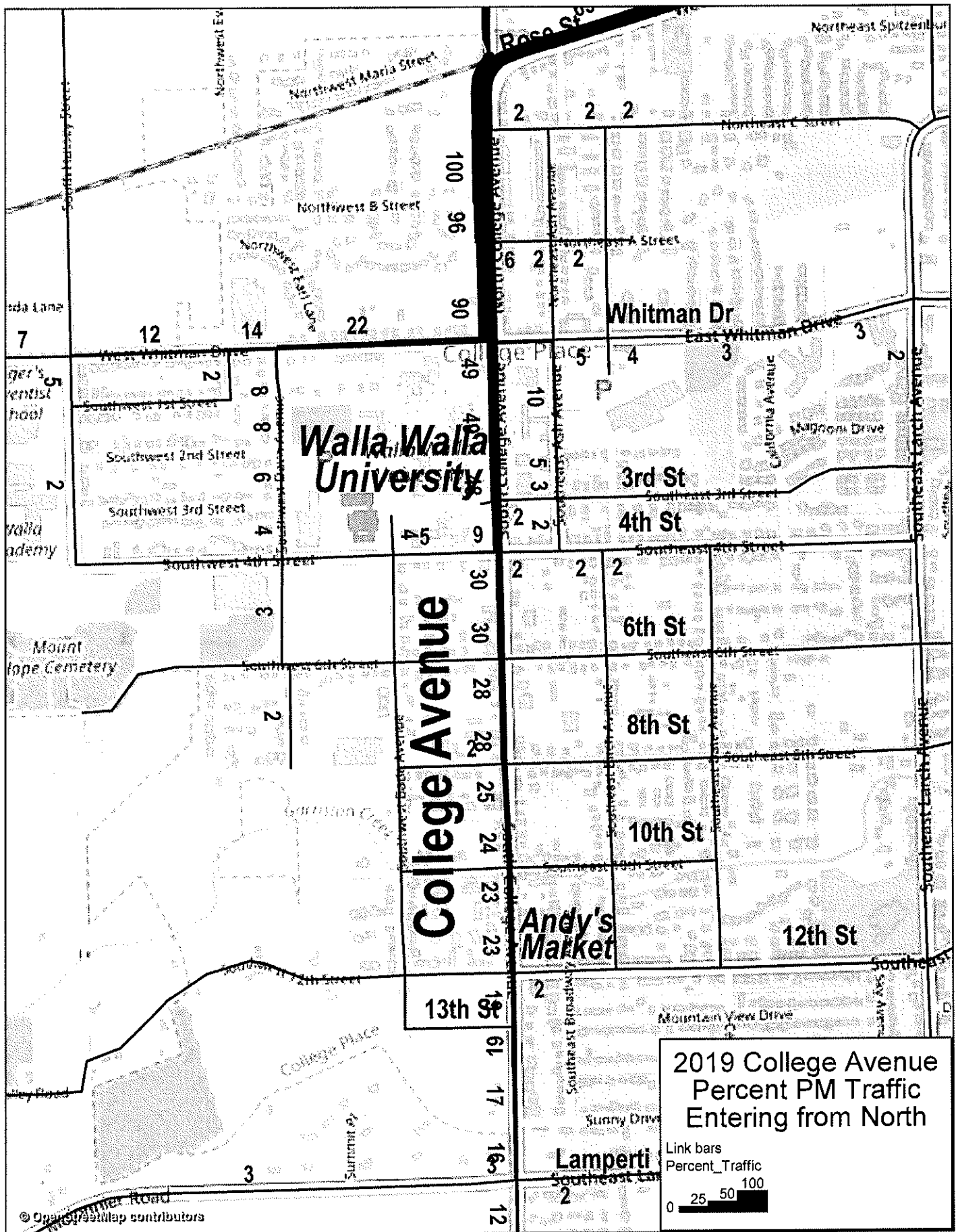
| Approach              | N      |        |         | E (Major) |      |      | S      |        |         | W (Major) |      |      |
|-----------------------|--------|--------|---------|-----------|------|------|--------|--------|---------|-----------|------|------|
| Movement              | L1     | T      | R1      | L1        | T    | R1   | L1     | T      | R1      | L1        | T    | R1   |
| vx, Volume            | 7.69   | 136.92 | 7.69    | 7.69      | 7.69 | 9.23 | 7.69   | 203.08 | 7.69    | 7.69      | 7.69 | 7.69 |
| cnx, Capacity         | 647.50 | 828.40 | 1074.07 | 1615.51   |      |      | 732.60 | 827.60 | 1075.11 | 1613.44   |      |      |
| V/C                   | 0.01   | 0.17   | 0.01    | 0.00      |      |      | 0.01   | 0.25   | 0.01    | 0.00      |      |      |
| d, Delay              | 11.54  | 10.33  | 9.34    | 7.24      |      |      | 11.46  | 10.90  | 9.89    | 7.24      |      |      |
| LOS                   | B      | B      | A       | A         |      |      | B      | B      | A       | A         |      |      |
| dA, Approach Delay    |        | 10.34  |         |           | 2.26 |      |        | 10.88  |         |           | 2.41 |      |
| Approach LOS          |        | B      |         |           |      |      |        | B      |         |           |      |      |
| dRank 1, Rank 1 Delay |        |        |         |           | 0.03 |      |        |        |         |           | 0.03 |      |

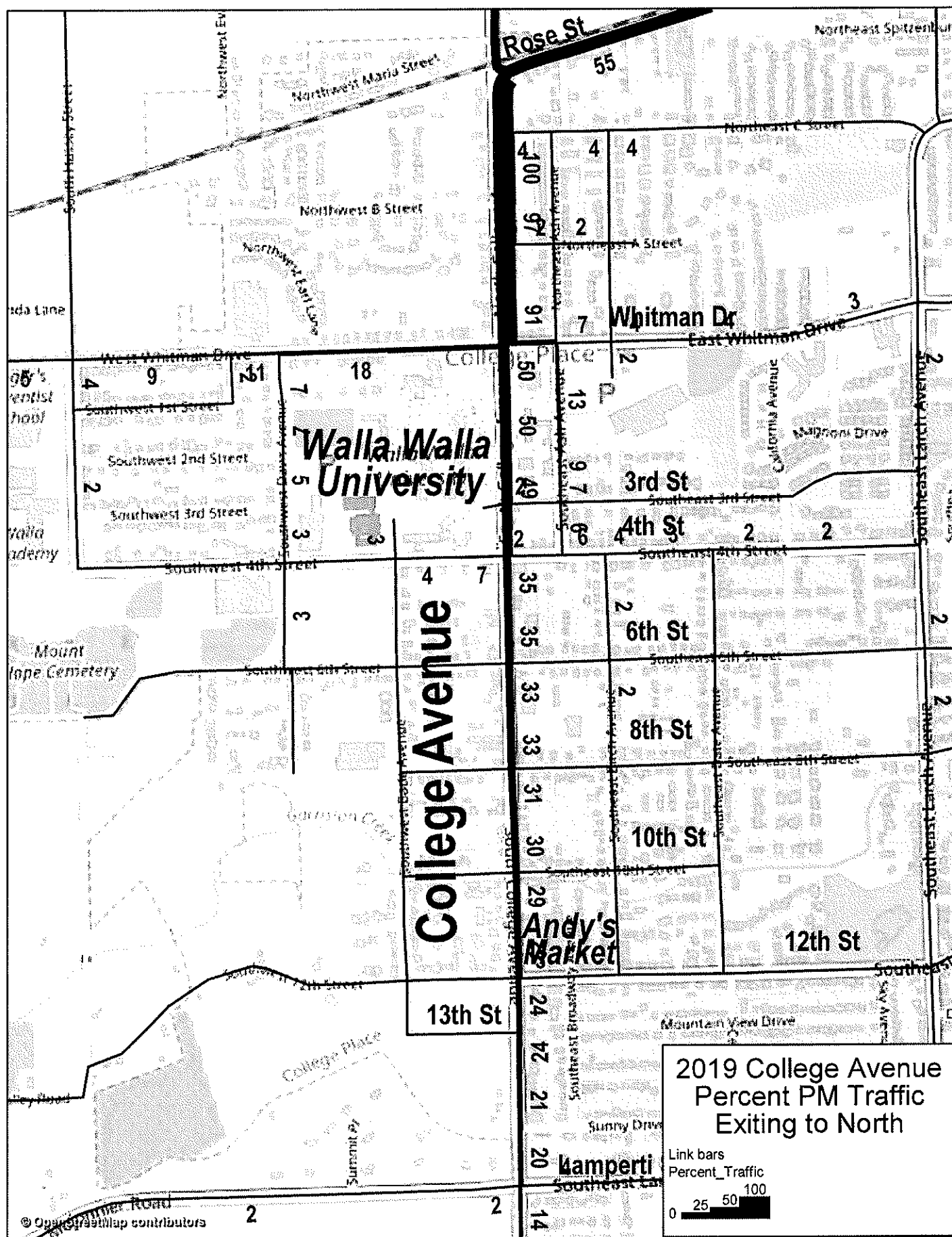
## Delay and Level of Service by Lane

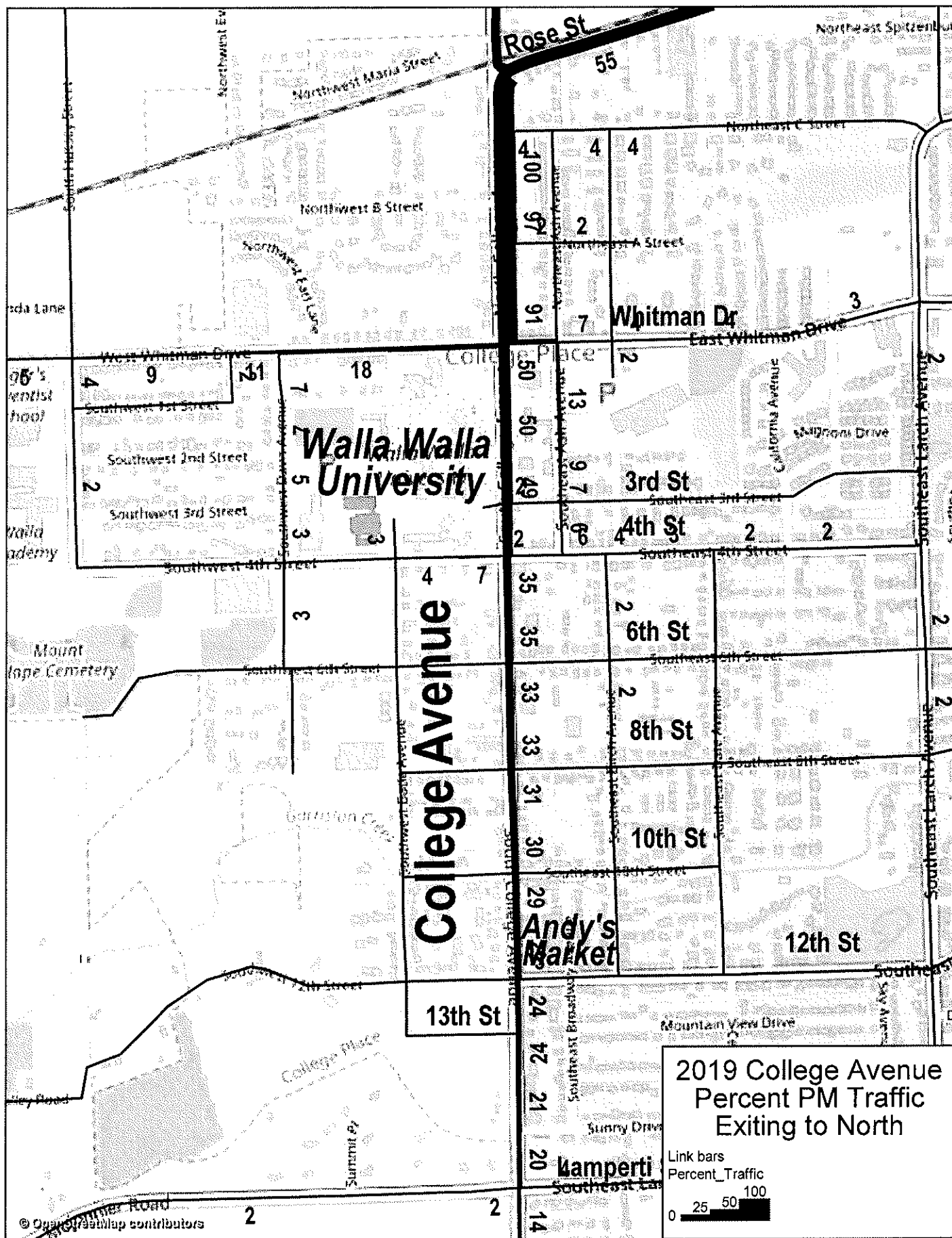
| Approach              | N         |           | E (Major) |           | S         |           | W (Major) |           |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane                  | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    | Lane 1    |
| Movements             | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 | L1, T, R1 |
| vx, Volume            | 152.31    | 24.62     | 218.46    | 23.08     |           |           |           |           |
| Planned Storage Size  |           |           |           |           |           |           |           |           |
| cnx, Capacity         | 826.28    | 1615.51   | 830.54    | 1613.44   |           |           |           |           |
| V/C                   | 0.18      | 0.02      | 0.26      | 0.01      |           |           |           |           |
| Q95, 95% Queue Length | 0.68      | 0.01      | 1.07      | 0.01      |           |           |           |           |
| d, Delay              | 10.34     | 7.24      | 10.88     | 7.24      |           |           |           |           |
| LOS                   | B         |           | B         |           |           |           |           |           |
| dA, Approach Delay    | 10.34     | 2.26      | 10.88     | 2.41      |           |           |           |           |
| Approach LOS          | B         |           | B         |           |           |           |           |           |

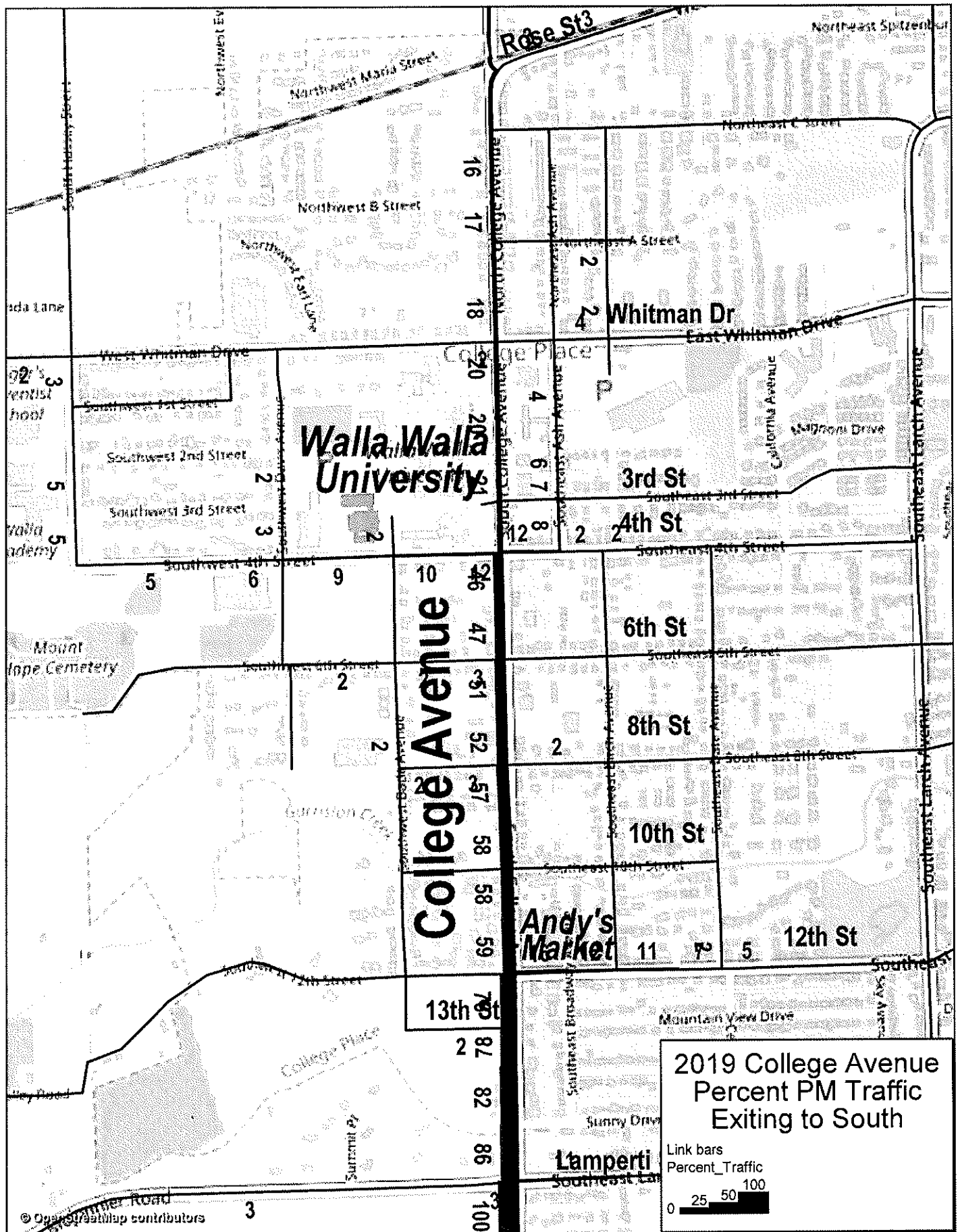






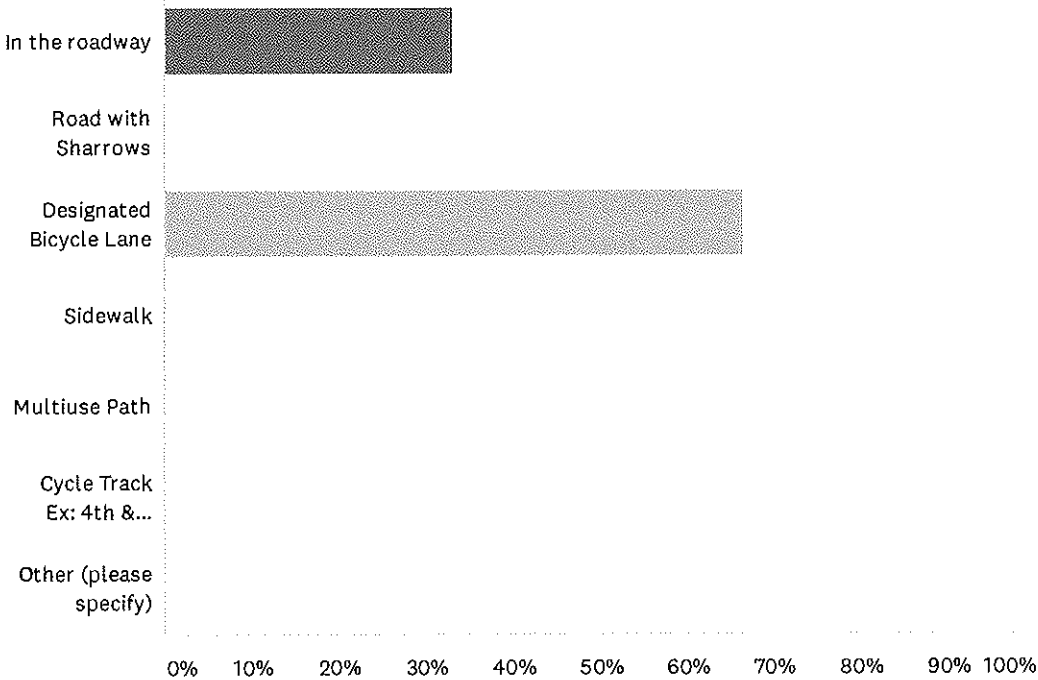






Q1 What is your preferred transportation mode when riding a bicycle?

Answered: 6 Skipped: 0



| ANSWER CHOICES                                     |  | RESPONSES |   |
|----------------------------------------------------|--|-----------|---|
| In the roadway                                     |  | 33.33%    | 2 |
| Road with Sharrows                                 |  | 0.00%     | 0 |
| Designated Bicycle Lane                            |  | 66.67%    | 4 |
| Sidewalk                                           |  | 0.00%     | 0 |
| Multiuse Path                                      |  | 0.00%     | 0 |
| Cycle Track Ex: 4th & Academy Way in College Place |  | 0.00%     | 0 |
| Other (please specify)                             |  | 0.00%     | 0 |
| TOTAL                                              |  |           | 6 |

| # | OTHER (PLEASE SPECIFY)  | DATE |
|---|-------------------------|------|
|   | There are no responses. |      |

## Q2 Where do you ride your bicycle on College Avenue - the sidewalk or the roadway, and why?

Answered: 6 Skipped: 0

| # | RESPONSES                                                                                                                                     | DATE              |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1 | sidewalk because its safer                                                                                                                    | 7/23/2019 3:35 PM |
| 2 | Roadway. I don't choose the sidewalk because of pedestrian traffic.                                                                           | 7/15/2019 8:39 AM |
| 3 | Roadway, bikes don't belong on sidewalks.                                                                                                     | 7/15/2019 6:49 AM |
| 4 | Roadway. Always have                                                                                                                          | 7/12/2019 5:23 PM |
| 5 | Roadway. I ride fairly fast and the roadway is safest. Too many driveway cuts and potential for pedestrian/bicycle conflicts on the sidewalk. | 7/12/2019 5:11 PM |
| 6 | Sidewalk - Traffic is scary. I know I am not supposed to ride on the sidewalk but I am not going to get killed to satisfy a city ordinance.   | 7/12/2019 4:40 PM |

### Q3 Would you be comfortable riding your bicycle between parked cars and the curb?

Answered: 6 Skipped: 0

| # | RESPONSES                                                                                       | DATE              |
|---|-------------------------------------------------------------------------------------------------|-------------------|
| 1 | not really                                                                                      | 7/23/2019 3:35 PM |
| 2 | no                                                                                              | 7/15/2019 8:39 AM |
| 3 | Maybe, prefer outside of cars, don't want to get doored and have no place to escape.            | 7/15/2019 6:49 AM |
| 4 | No                                                                                              | 7/12/2019 5:23 PM |
| 5 | NO, this would be very non-standard and the potential for door opening would be very hazardous. | 7/12/2019 5:11 PM |
| 6 | Yes                                                                                             | 7/12/2019 4:40 PM |



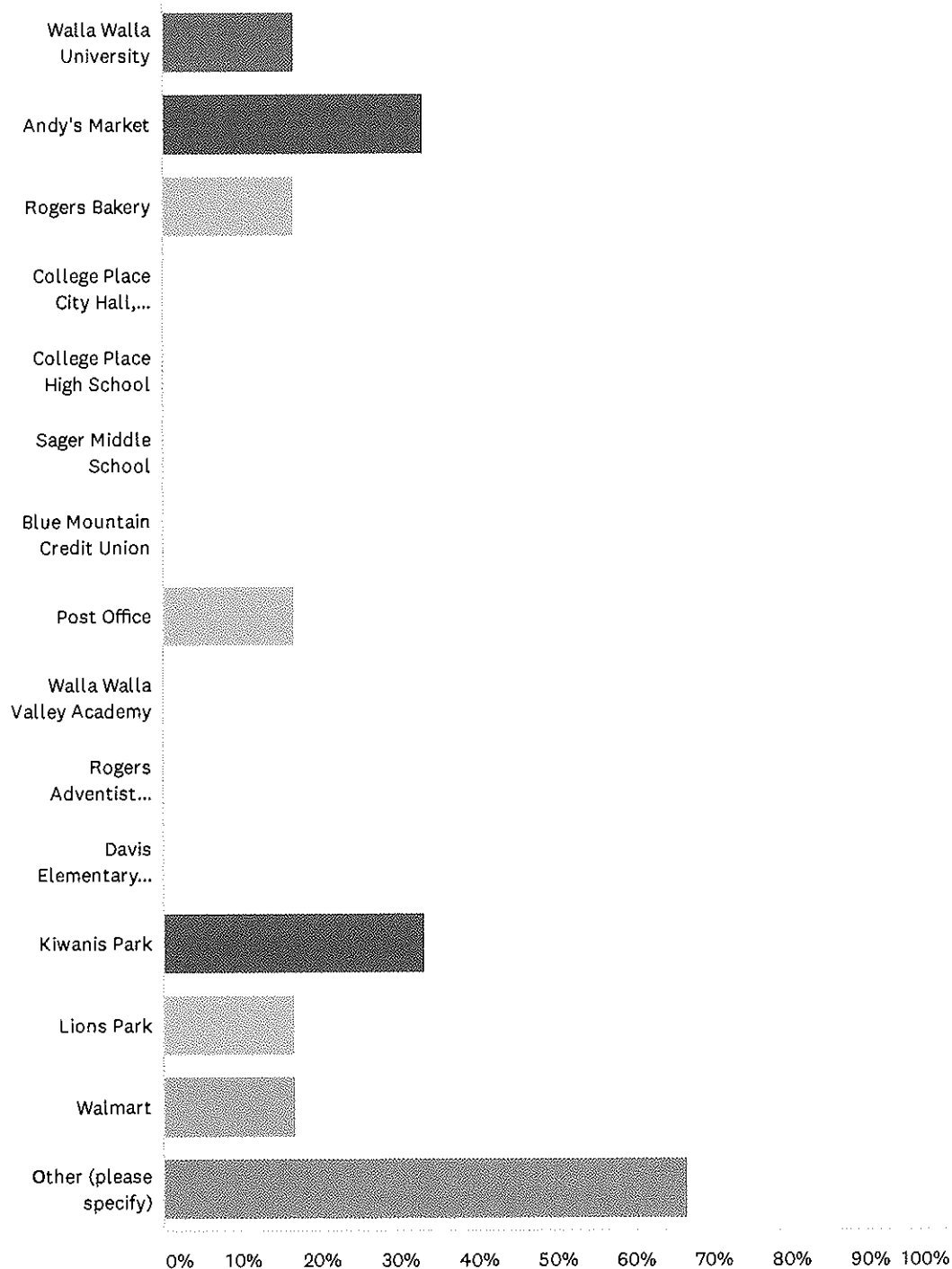
## Q4 What preferred north-south route; if any, would you like to see designated as an alternate to College Avenue for bicycle traffic?

Answered: 6 Skipped: 0

| # | RESPONSES                                                                     | DATE              |
|---|-------------------------------------------------------------------------------|-------------------|
| 1 | 6th st                                                                        | 7/23/2019 3:35 PM |
| 2 | There really is no good direct alternative.                                   | 7/15/2019 8:39 AM |
| 3 | n/a                                                                           | 7/15/2019 6:49 AM |
| 4 | Don't know                                                                    | 7/12/2019 5:23 PM |
| 5 | There is no other north-south route that I know of to traverse College Place. | 7/12/2019 5:11 PM |
| 6 | Bade                                                                          | 7/12/2019 4:40 PM |

## Q5 Please list your three most frequent destinations when riding a bicycle?

Answered: 6 Skipped: 0



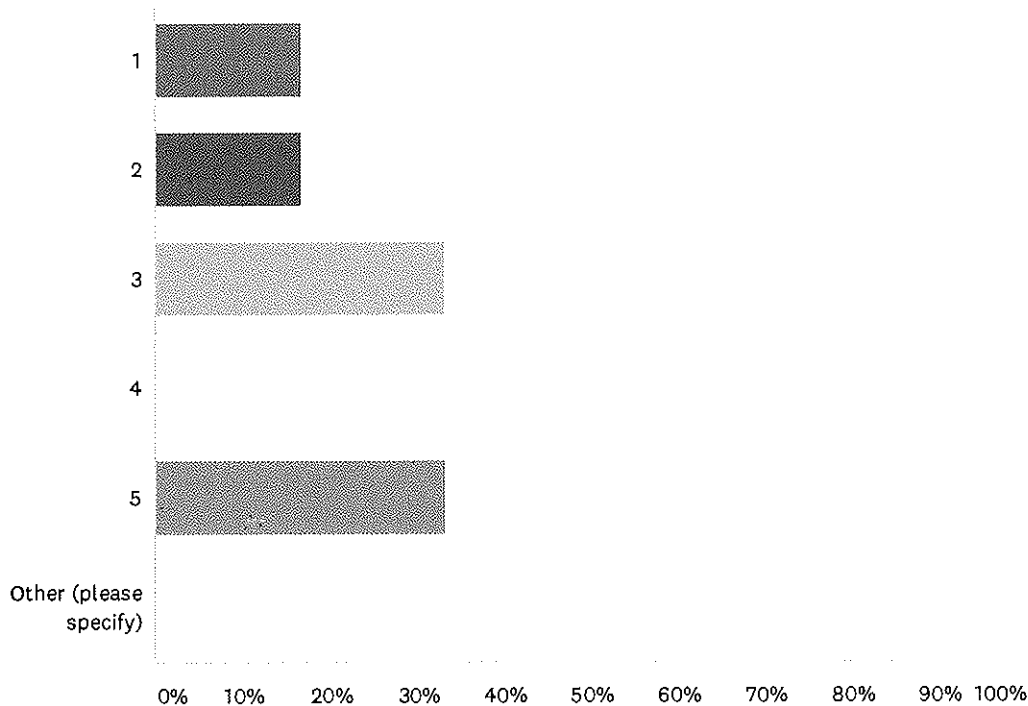
# College Avenue Bicycle Traffic Accomodation Survey

| ANSWER CHOICES                                    | RESPONSES |   |
|---------------------------------------------------|-----------|---|
| Walla Walla University                            | 16.67%    | 1 |
| Andy's Market                                     | 33.33%    | 2 |
| Rogers Bakery                                     | 16.67%    | 1 |
| College Place City Hall, Police, Fire Departments | 0.00%     | 0 |
| College Place High School                         | 0.00%     | 0 |
| Sager Middle School                               | 0.00%     | 0 |
| Blue Mountain Credit Union                        | 0.00%     | 0 |
| Post Office                                       | 16.67%    | 1 |
| Walla Walla Valley Academy                        | 0.00%     | 0 |
| Rogers Adventist School                           | 0.00%     | 0 |
| Davis Elementary School                           | 0.00%     | 0 |
| Kiwanis Park                                      | 33.33%    | 2 |
| Lions Park                                        | 16.67%    | 1 |
| Walmart                                           | 16.67%    | 1 |
| Other (please specify)                            | 66.67%    | 4 |
| Total Respondents: 6                              |           |   |

| # | OTHER (PLEASE SPECIFY)                                       | DATE              |
|---|--------------------------------------------------------------|-------------------|
| 1 | going either north or south to longer rides outside of town. | 7/15/2019 8:39 AM |
| 2 | Often just passing through                                   | 7/15/2019 6:49 AM |
| 3 | Ride for workout                                             | 7/12/2019 5:23 PM |
| 4 | Recreational ride through the city.                          | 7/12/2019 5:11 PM |

## Q6 How many times a week do you ride your bicycle?

Answered: 6 Skipped: 0



### ANSWER CHOICES

### RESPONSES

|                        |        |   |
|------------------------|--------|---|
| 1                      | 16.67% | 1 |
| 2                      | 16.67% | 1 |
| 3                      | 33.33% | 2 |
| 4                      | 0.00%  | 0 |
| 5                      | 33.33% | 2 |
| Other (please specify) | 0.00%  | 0 |
| TOTAL                  |        | 6 |

| # | OTHER (PLEASE SPECIFY)  | DATE |
|---|-------------------------|------|
|   | There are no responses. |      |

**Q7 What improvements or activities would encourage you to ride your bicycle more frequently? For Example: better connections, more bike lanes, more separation from traffic, better street lighting.**

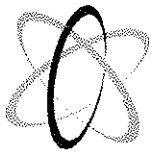
Answered: 6 Skipped: 0

| # | RESPONSES                                                                                             | DATE              |
|---|-------------------------------------------------------------------------------------------------------|-------------------|
| 1 | all the above                                                                                         | 7/23/2019 3:35 PM |
| 2 | more bike lanes - although not configured like they are along 4th and Academy way.                    | 7/15/2019 8:39 AM |
| 3 | More bike lanes                                                                                       | 7/15/2019 6:49 AM |
| 4 | More bike lanes                                                                                       | 7/12/2019 5:23 PM |
| 5 | More bike lanes on the street and separated from traffic.                                             | 7/12/2019 5:11 PM |
| 6 | Sharrows, lower speed limit on College Ave, and paint green bike boxes at intersections with signals. | 7/12/2019 4:40 PM |

**Q8 If there is anything else that you would like to note in completing this survey, please include below:**

Answered: 5    Skipped: 1

| # | RESPONSES                                                                                                                                      | DATE              |
|---|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1 | thank you for having this survey                                                                                                               | 7/23/2019 3:35 PM |
| 2 | The configuration with the poles along the path on 4th Street and Academy are a real eye sore and make bike riding through there castraphobic. | 7/15/2019 8:39 AM |
| 3 | No                                                                                                                                             | 7/12/2019 5:23 PM |
| 4 | Thanks for seeking input from those who ride bikes.                                                                                            | 7/12/2019 5:11 PM |
| 5 | College Ave from 10th to Whitman is narrow and dangerous for bicyclists.                                                                       | 7/12/2019 4:40 PM |

**Western Systems**

Innovative Transportation Solutions

# Quotation

Quote #: Q-01438

Revision #:

Date: 10/22/2019

Estimator: Robert Nims

Sales: Kai Antrim

Project: City of Walla Walla / HAWK Pedestrian Detection

Attention: Gary Norris / DN Traffic Consultants

Bid Opening: 10/22/2019

We are pleased to provide you with this quotation. If you have any questions, please let us know immediately.

| Qty | Part #     | Description                                                                                                                                                | Ind. Cost   | Total Cost  |
|-----|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| 1   | 5885000030 | MIGMA WALKTIME; SIGNALIZED CROSSING PEDESTRIAN DETECTION & EXTENSION IN THE CROSSWALK INCLUDES; (1) SBC CONTROLLER AND (2) DUAL IR CAMERA SYSTEMS (MW0611) | \$ 3,553.85 | \$ 3,553.85 |
| 1   | 5885000150 | ETHERNET SURGE PROTECTOR                                                                                                                                   | \$ 67.69    | \$ 67.69    |
| 1   | 5885000110 | MIGMA MONITOR; 10" PORTABLE PRE-CONFIGURED                                                                                                                 | \$ 372.31   | \$ 372.31   |
| 2   | 5885000140 | MIGMA BRACKET; CAMERA AMOUNTING BRACKET                                                                                                                    | \$ 126.92   | \$ 253.84   |
| 1   | 0000000000 | CAT5E CABLE; SHIELDED GEL FILLED DIRECT BURIAL (1000FT) PART # 5885000130                                                                                  | \$ 355.38   | \$ 355.38   |
| 2   | 7110020000 | LED 16" ORANGE/WHITE PEDESTRIAN SIDE BY SIDE DIALIGHT (2007 ITE)                                                                                           | \$ 193.17   | \$ 386.34   |
| 1   | 9780010000 | SIGNAL/VIDEO TURN-ON ASSISTANCE                                                                                                                            | \$ 1,625.00 | \$ 1,625.00 |

**GENERAL CONDITIONS OF SALE**

The acceptance of this quotation implies the acceptance of the following terms and conditions which cannot be varied or waived except by express written authorization by a Western Systems representative. These terms govern the sale of goods and services supplied by Western Systems. Differing terms from Buyer in any purchase order or written communication shall not be binding on Western Systems.

|                    |                    |
|--------------------|--------------------|
| <b>Subtotal</b>    | <b>\$ 6,614.41</b> |
| <b>Shipping</b>    | <b>\$ 110.00</b>   |
| <b>Tax</b>         | <b>\$ 588.68</b>   |
| <b>Grand Total</b> | <b>\$ 7,313.09</b> |

**TERMS AND CONDITIONS**

**Purchase Order:** All purchases require a formal purchase order. Emails or verbal communication does not constitute an acceptable purchase order.

**Material Lead Time** (after release of order):

**Freight Terms:** FOB DESTINATION - Seller is responsible for all freight charges & fees

**Validity Period:** 30 days from date of quotation.

**Taxes/Fees:** Unless current resale certificate is on file with Western Systems, purchaser shall be responsible for all, tariffs, duties or sales or use taxes in addition to the quoted prices herein.

**Payment Terms:** Net 30 Upon Approval of Credit / we impose a surcharge of 2% on the transaction amount on VISA and Master Card credit card products, which is not greater than our cost of acceptance.

We do not surcharge VISA and Master Card debit cards. All prices are quoted as USD funds.

**Non-Payment Penalties:** If payment has not been received within terms, the purchaser will be considered in default. Western Systems will be entitled, without prejudice to our other rights, without serving notice of default, to charge the purchaser for all costs incurred such as administration, storage, legal advice etc. The unpaid portion of any amount due to Western Systems will bear interest at the rate of 1.5% per month simple interest. Western Systems reserves the right to hold goods until customer balances their account.

**Collections:** Upon Buyer default of these terms, Western Systems may, in addition to any other rights or remedies at contract or law, declare the entire balance of Buyer's account immediately due and payable. If unpaid balance is referred for collections, Buyer agrees to pay Western Systems, to

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Phone (425) 438-1133 | Fax (425) 438-1585

the extent permitted by law, reasonable attorney fees in addition to all damages otherwise available, plus any court costs or expenses incurred by Western Systems, plus any finance charges accrued on any unpaid balance owed by Purchaser. Deferment or Cancellation Policy: Order deferment or cancellation once materials have been released will be subject to cancellation and/or restocking fees.

Documentation: Any operational documentation supplied as a part of this quotation remains the property of Western Systems and may not be copied, reproduced, transmitted or communicated to 3rd parties without the express written consent of Western Systems.

On-Site Services: On-site services such as signal or video system turn-on support shall be scheduled three weeks in advance. If services need to be cancelled or postponed, any non-reimbursable travel expenses will be billed to purchaser. This quotation does not provide nor imply any on-site support services unless mentioned specifically herein. If on-site support services are required, and not included as part of this proposed scope of work, please contact Western Systems for a revised quotation.

Warranty: Standard one-year warranty on material goods manufactured or supplied by Western Systems from the date of manufacturers factory shipment, unless superseded by an additional manufacturer's warranty, provided such goods are maintained and operated in accordance with manufacturers standard method of operation. For additional information on Western Systems warranty, please send an email to [info@westernsystems-inc.com](mailto:info@westernsystems-inc.com)

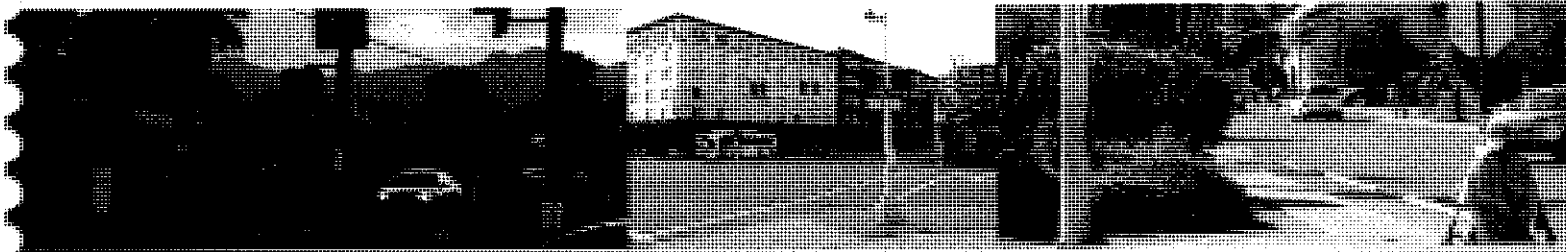
Return and Restocking Policy: Western Systems will be the sole source in determining whether any item is eligible for return. To be eligible the item(s) must be standard product models, new and unused, in the original packaging, and invoiced within the last 90 days.

Restocking fees are applied to all returns and can vary between 20-50% based on annual sales activity. In no case will Western Systems be obligated to take returns for materials, including items that are obsolete, custom orders, or past the 90-day invoice period.

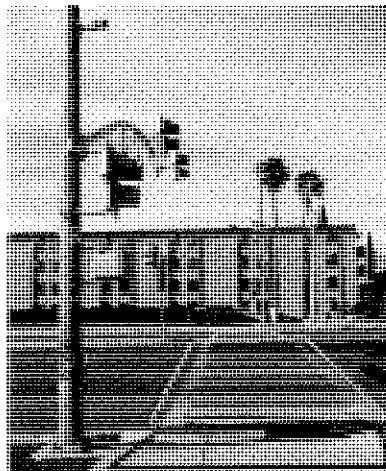
Delivery Inspection: All materials deliveries must be inspected upon receipt from freight carrier. Any freight damages must be reported to the carrier at the time of receipt of goods. Any materials shortages or inaccuracies in shipment must be reported to Western Systems within ten days receipt of goods. Thereafter, any discrepancies will be considered incidental and the responsibility of the receiver.

Force Majeure: Western Systems, Inc. shall in no event be responsible for delays in performance due to actions beyond its reasonable control including without limitation acts of God, strikes, labor shortage or disturbance, fire, accident, war, civil disturbance or carrier delays. Western Systems, Inc. accepts no liability for errors or omissions or the accuracy or the completeness of this quotation. It has been prepared to the best of our knowledge per plans, specifications, documentation and communications provided but we do not guarantee these to be accurate or of the latest revision. Determination of accuracy of this quotation and final quantities are the sole responsibility of recipient. Western Systems, Inc. shall in no event be liable for any special, consequential, incidental or liquidated damages (including without limitation damages for loss of use of facilities or equipment, loss of revenue, loss of profits or loss of goodwill), regardless of whether seller (a) has been informed of the possibility of such damages or (b) is negligent.





## MigmaWalktime™ for Pedestrian Walktime Extension and Ped Call Canceling

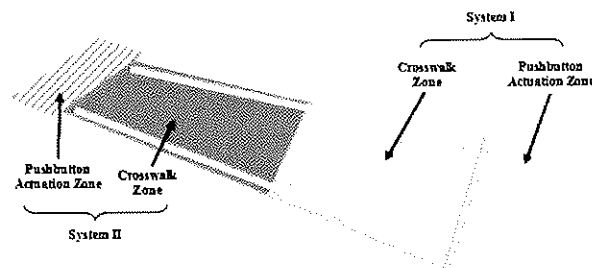


**MigmaWalktime™** is an outdoor passive pedestrian detector for the pedestrian walktime extension and ped call canceling. As long as slow-walking pedestrians such as senior citizens, visually impaired or wheel-chair pedestrians are still in the crosswalk, it can automatically extend the walktime for them.

- △ High resolution IR LED stereo camera for day and night detection
- △ Industrial single board computer (SBC) running Windows XPe
- △ Remote view, configuration and diagnosis over Ethernet (option)
- △ Robust pedestrian detection using stereo vision analysis
- △ Two-zone support for reliable detection of pedestrians
- △ Coordination of two systems for very long crosswalks

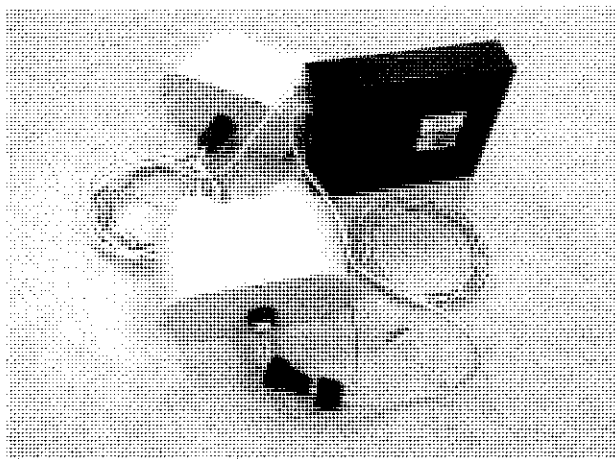
**MigmaWalktime™** utilizes the field-proven technologies to extend the walktime for slow-walking pedestrians.

- △ Analytical video cueing and 3D pattern recognition
- △ Operational under any weather conditions
- △ Simple wiring and connection using CAT5e Ethernet cables
- △ Support of both walktime extension and ped call canceling
- △ Support of APS buttons made by Campbell, Novax and Polara
- △ Over 98% detection rate and negligible false calls per day



### SPECIFICATIONS

- △ Image Sensor: 1/3" Sony CCD Chip
- △ Camera Resolution: 600 TV lines
- △ Camera Mounting Height: 18 ~ 20 ft
- △ Camera Power: Power over Ethernet (application dependable)
- △ IR Range: 100 ft (~30m) in total darkness
- △ S/N Ratio: ≥ 48 dB
- △ Cable: CAT5e Ethernet cable
- △ Operating Temperature: -22 °F ~ 158 °F (-30 °C ~ 70 °C)
- △ Operating Humidity: 0% ~ 96%
- △ Operating Environment: All weather, day and night
- △ Chassis Dimension (one crosswalk): 8(L)×6.5(W)×2(H) (inch)
- △ Chassis Dimension (one intersection): 11.5(L)×5(W)×9(H) (inch)
- △ Stereo Camera Dimension: 5(L)×7.5(W)×3.5(H) (inch)
- △ Failsafe and watchdog timer support



**Corporate Headquarters**  
Migma Systems, Inc.  
1600 Providence Highway  
Walpole, Massachusetts 02081

**Contact Information**  
Web: <http://www.migmapd.com>  
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Support: [support@migmapd.com](mailto:support@migmapd.com)  
Phone: 508-660-0328

Migma

# Migma Walktime™

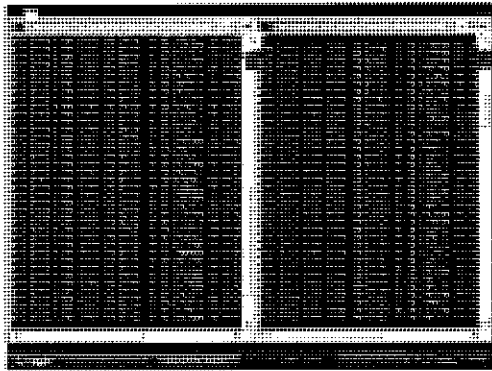
for pedestrian detection and walk time extension

## Configuration Instructions

### SBC Display

There are three ways to interfacing with SBC:

- MigmaMonitor™, a portable computer monitor with VGA connector and touch screen. This monitor can be left in the controller cabinet.
- A laptop using an Ethernet crossover cable (not provided). You can find the remote login procedures in this guide.
- A regular desktop PC VGA monitor and USB mouse/keyboard. This approach is suitable for configuration and test in the office.



Once connecting to SBC using one of these methods, close both programs (two screens with yellow prints) by clicking on the exit button (X) on top of each DOS window.

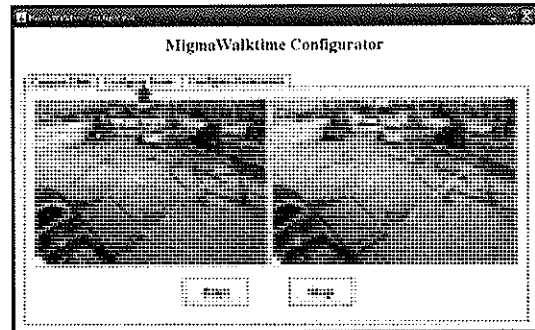
### Zone Configuration

The configuration procedures for System1 and System2 are exactly the same. To configure the two zones for System1, please follow the steps under each zone configuration.

On the desktop double click on the **System1\_GUI** icon to start the configurator for System1.



Once the configuration software application has started, select the tab named **Configure Zones**.

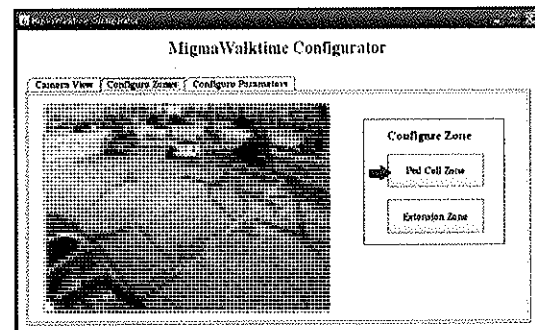


The camera view from System1 is shown. The existing zones are in RED and YELLOW. There are two configuration zones, one for automated ped call, and the other for walk time extension.

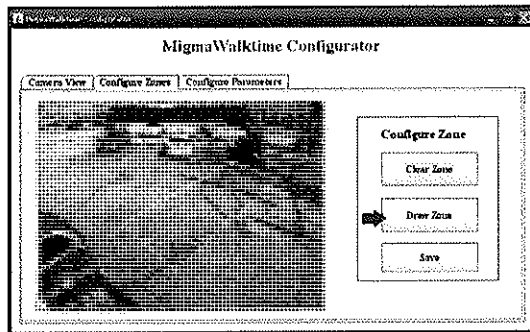
### Configuring Ped Call Zone

**Ped Call Zone** is a zone in which the pedestrian will enter and wait for green light. Once the pedestrian is detected in this zone, a ped call will be placed automatically. It should be drawn to cover as much of the waiting area as possible. **Ped Call Zone** will be shown in color red.

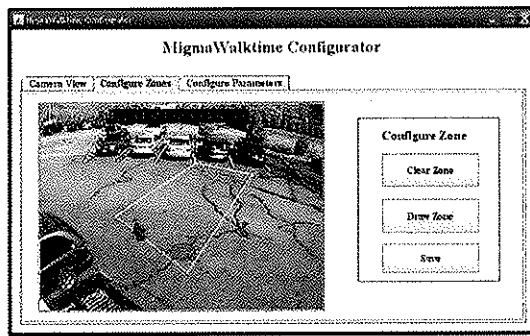
**Step 1:** Click on the **Ped Call Zone** button.



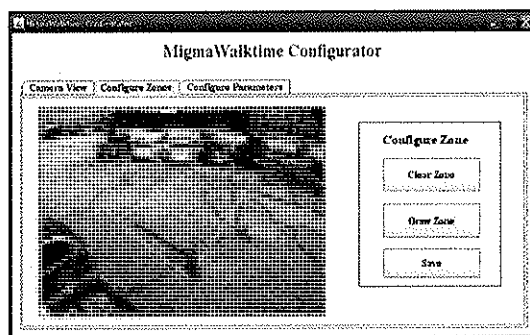
**Step 2:** Click on **Clear Zone** and then click on **Draw Zone** buttons.



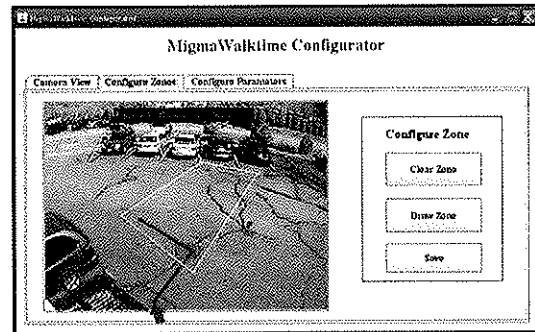
**Step 3:** Now using the stylus or mouse touch the *upper left corner* of the desired zone to start drawing.



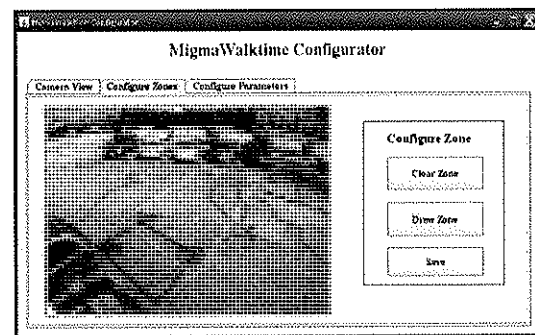
**Step 4:** Next touch the upper right corner of the zone with the stylus or mouse. This will connect the two points and there will be one red line drawn.



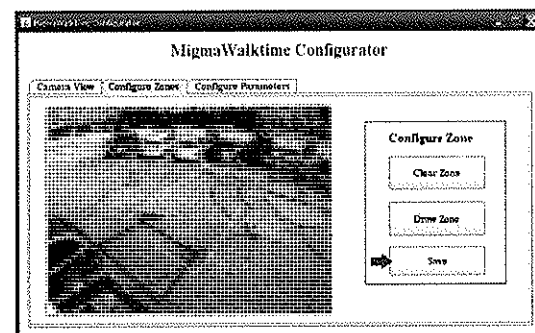
**Step 5:** Next touch the lower right corner of the zone and this will connect the three points. There will be two red lines drawn.



**Step 6:** Finally touch the lower left corner with the stylus or mouse and this will complete the zone by connecting all four points.



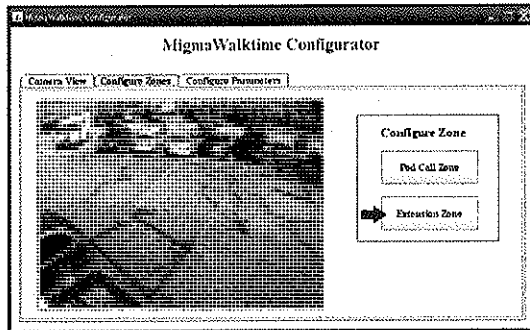
**Step 7:** After completing the zone configuration, click on the **Save** button. This will save the newly configured **Ped Call Zone** to the computer. This is the zone that will be used to detect pedestrians and place a ped call.



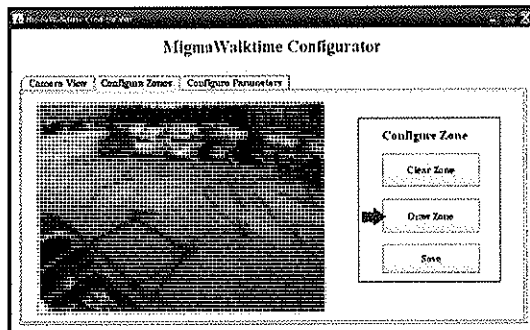
**Note:** All configured zones can be cleared and drawn again.

### Configuring Extension Zone

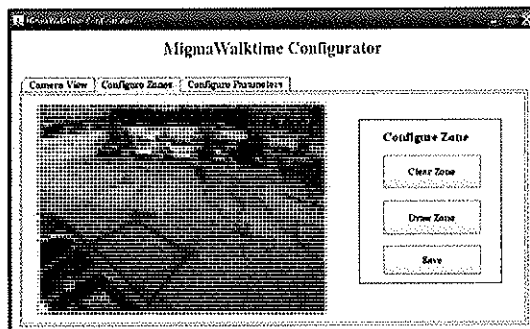
**Step 1:** Click on **Extension Zone** button to start configuration.



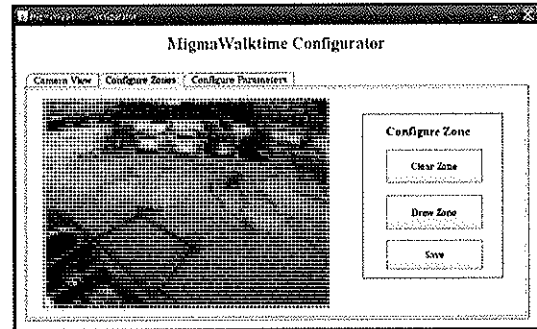
**Step 2:** Click on the **Clear Zone** button to clear the existing zone and then click the **Draw Zone** button. The **Extension Zone** should cover as much of the crosswalk as possible. As long as there are pedestrians detected in this zone, the walk time extension request (i.e., relay contact closure) is sent to the controller until he or she is out of this zone.



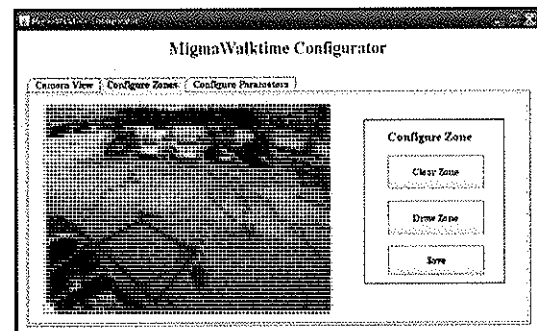
**Step 3:** Use the stylus or mouse and touch the upper left corner of the desired zone.



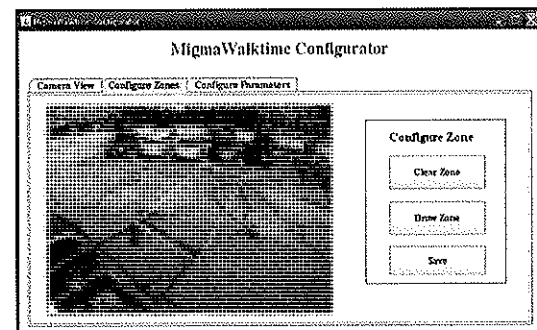
**Step 4:** Now touch the upper right corner with the stylus or mouse. This will connect the two points and there will be one yellow line drawn.



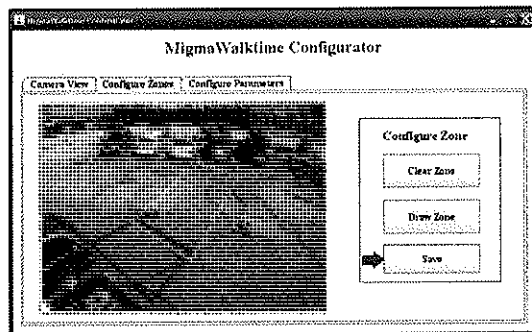
**Step 5:** Touch the lower right corner with the stylus or mouse. This will connect the three points and there will be two yellow lines drawn.



**Step 6:** Finally touch the lower left corner of the zone and this will complete the small zone.



**Step 7:** Click on **Save** to save the zone configuration.



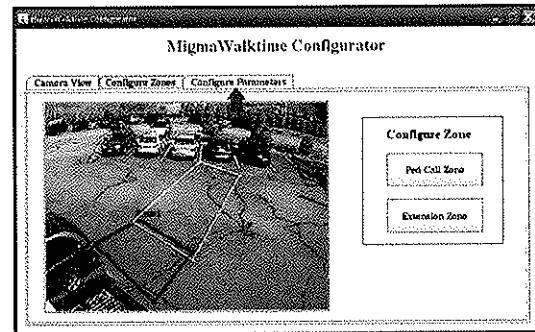
You have completed the System1 zone configuration. Now you need to configure two zones for System2 by following the same procedures outlined for System1.

### Parameters Configuration

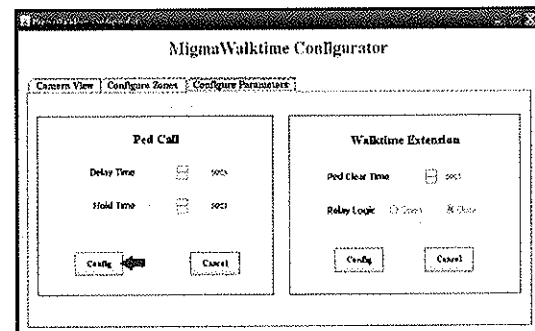
For **Ped Call** part, you can configure the Delay Time (*i.e. how long the pedestrian must be in the ped call zone before being detected*) and the Hold Time (*i.e. how long ped call will be held by the system*). The default Delay Time for **Ped Call** is 4 seconds, meaning the pedestrian will be detected after staying in the zone for 4 seconds. Default time for the Hold Time is 3 seconds (*i.e., relay will be closed for 3 seconds*).

For **Walktime Extension** part, you can configure Ped Clear Time (*i.e. how long the extension is released once the pedestrian is no longer in the crosswalk*). The default Ped Clear Time is 2 seconds, meaning the extension will be cleared in 2 seconds after a pedestrian leaves the crosswalk. The Relay Logic can be used to set whether or not the extension relay should be *close* or *open* when the system makes the extension request to the controller. It should be set based on the controller you use.

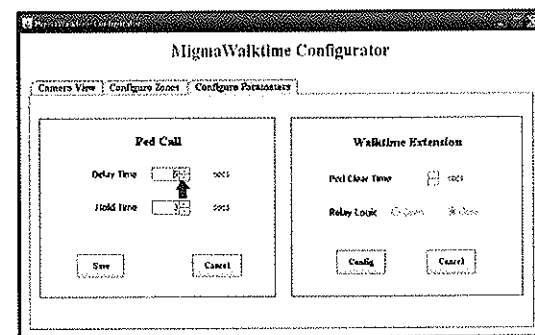
To configure Delay Time and Hold Time, please select the **Configure Parameters** tab to start the configuration. The screen is shown below.



For both **Ped Call**, click on the **Config** button to configure the system for your specific needs.



Simply click the Up or Down arrow to adjust the time to your application. Once the time configurations are complete, please click on the **Save** button.

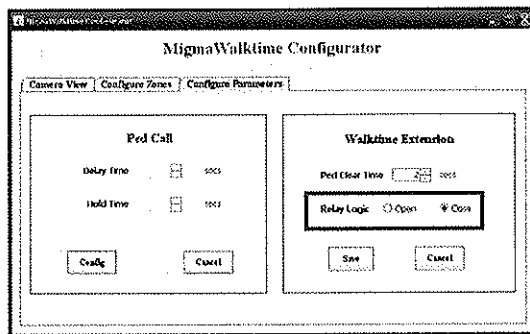
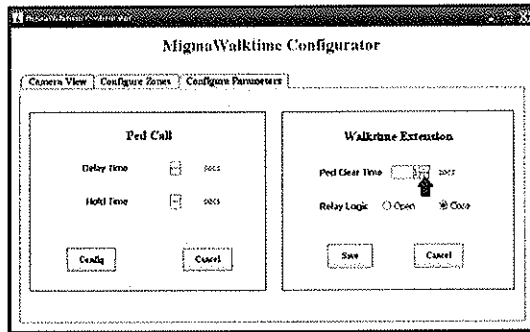


Configuring the **Walktime Extension** is identical to the **Ped Call**. Click on the **Config** button, select your preferred time for Ped Clear Time and your choice for Relay Logic.

# Migma Walktime™

for pedestrian detection and walk time extension

## Configuration Instructions



You have completed the System1 parameter configurations. Now you will need to configure System2 by following the same procedures outlined for System1.

Now that you have finished all configurations and ready to have the system operational, you MUST save all configuration data to the disk inside SBC.



To do this, on the desktop screen,

**Double Click on the Save icon**

The system will then save the data and automatically reboot. The system will use the new configuration data for detecting pedestrians and extend walk time at street intersections.

**REMEMBER:** Whenever you configure the system, you must click on the Save icon to save the configuration. Otherwise your configuration changes will NOT be saved.

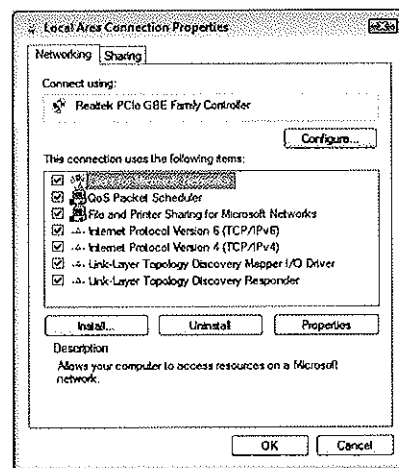


Once the system has restarted, you may unplug the monitor and close the cabinet door. The system is ready for use.

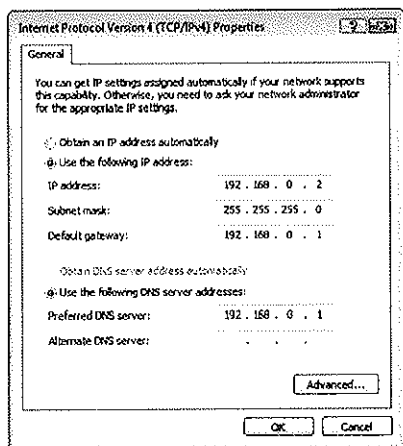
### Remote Login Configuration

Before logging into SBC remotely, you should configure your laptop you will use to connect to SBC with crossover Ethernet cable.

- Open Properties of Local Area Connection in Network Connections in Control Panel



- Open Properties of Internet Protocol version 4 (TCP/IPv4)



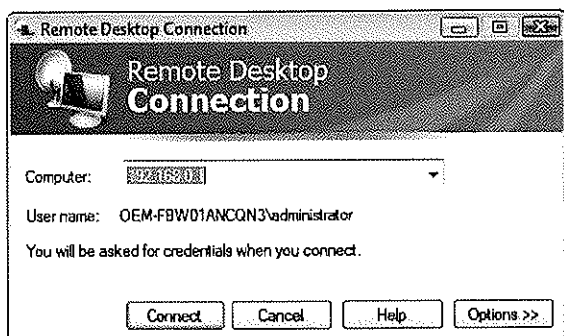
- Select **Use the following IP address** and enter the following network information:
  - IP address: 192.168.0.2
  - Subnet mask: 255.255.255.0
  - Default gateway: 192.168.0.1

Select **Use the following DNS server addresses:**

- Preferred DNS server: 192.168.0.1
- Click on **OK** button to finish configuration of local area connection.

### Remote Access

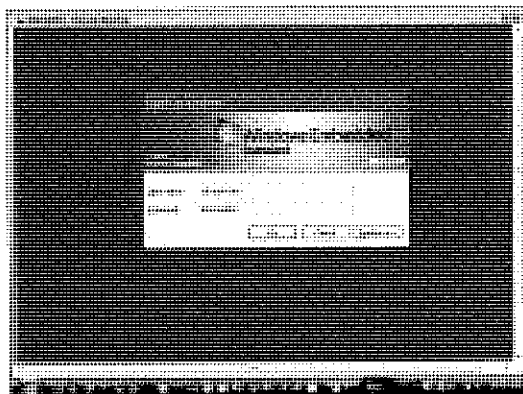
- Open **Remote Desktop Connection** in Windows
- Enter 192.168.0.1 in **Computer**
- Click **Connect** button



A remote desktop login window appears. Enter the following information:

- **Username:** administrator
- **Password:** migmasys

Click on **OK** button to access the SBC.



# MigmaWalktime™

Product for pedestrian detection and walktime extension

## INSTALLATION INSTRUCTIONS

### Camera Height

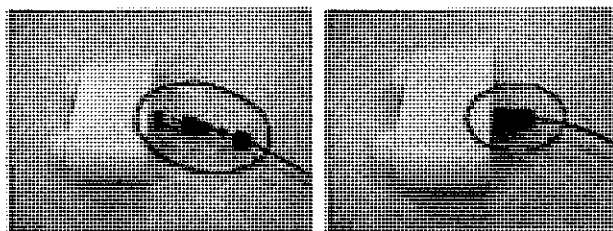
One MigmaWalktime™ unit comprises of one single board computer (SBC) and two stereo cameras. The SBC needs to be placed inside a cabinet. The two stereo cameras should be mounted to the existing signal poles or pedestals at a desired height above the ground, typically 15 - 20 ft.

### Camera Alignment

For the stereo camera to work properly, it must be leveled. If the signal pole the camera is mounted to is vertical, Migma's mounting bracket is sufficient for the camera alignment. Otherwise, please use a ball-type mounting bracket and place a bubble level on top of stereo camera to measure the camera alignment.

### Camera Wiring

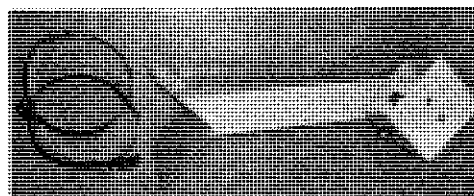
Unscrew the waterproof Ethernet connector at the back of the stereo camera, carefully push the Cat5e cable through the connector, and then crimp the RJ45 connector to the Cat5e cable. Now screw back the connector and tighten it.



Mount the cameras on the signal poles. Mark the Cat5e cable connected to each camera as "System 1" or "System 2". At the back of SBC, there are two RJ45 connectors. Connect Cat5e cable marked as "System 1" to RJ45 connector labeled as "System 1". Similarly connect Cat5e cable marked as "System 2" to the connector labeled as "System 2".

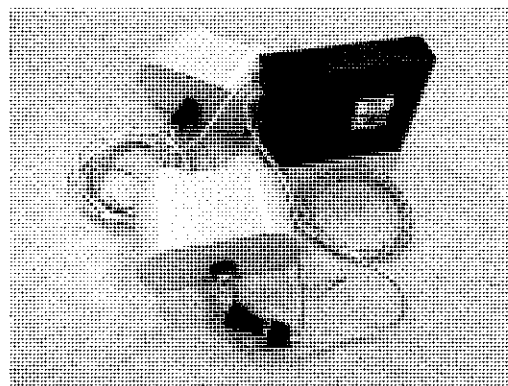
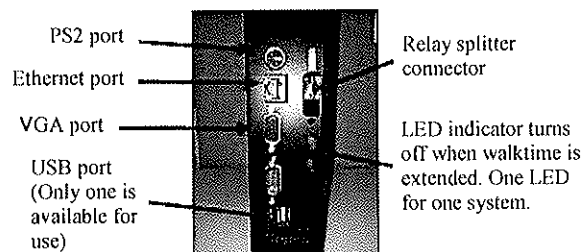
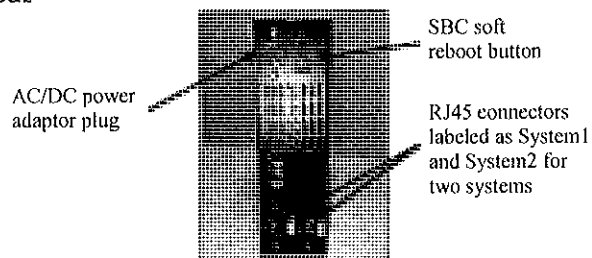
### Camera Mounting

Attach the mounting bracket to the signal pole, and use two banding strips to tie the mounting bracket to the signal pole. Put camera on the bracket, adjust its view and tighten it completely.



### Power for Cameras

The stereo cameras are powered by SBC over Cat5e cable (PoE).

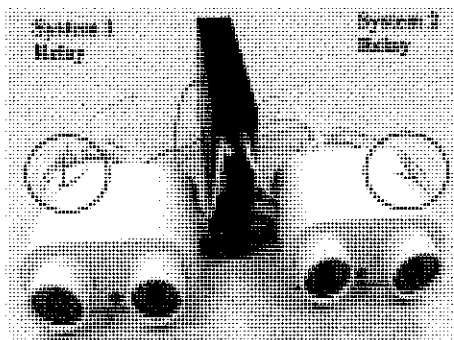




## Relay Connections for MigmaWalktime™

### Connection for Pushbuttons

Each camera has a relay cable. Please use this relay cable to connect to the pushbutton (regular or APS pushbutton) at one side of crosswalk.



#### System 1 (one side of crosswalk)

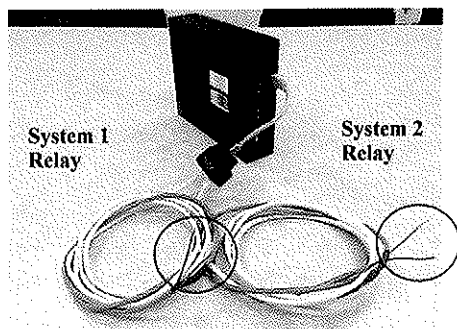
Red wire → Ped call terminal  
Black wire → Ped call terminal

#### System 2 (the other side of crosswalk)

Red wire → Ped call terminal  
Black wire → Ped call terminal

### Connection for Walktime Extension

Connect Migma Ethernet splitter to the RJ45 connector located at the front of SBC and labeled as Relay. Plug two relay cables marked as System 1 and System 2 to the splitter. System 1 is associated with System 1 camera mounted to one side of a crosswalk. System 2 is associated with the System 2 camera at the other side of the crosswalk.



#### System 1 (one side of crosswalk)

Red wire → Controller terminal block  
Black wire → Controller terminal block

#### System 2 (the other side of crosswalk)

Red wire → Controller terminal block  
Black wire → Controller terminal block

# Memorandum

**Date:** May 6, 2020

**To:** Robert Gordon, City Engineer  
City of College Place

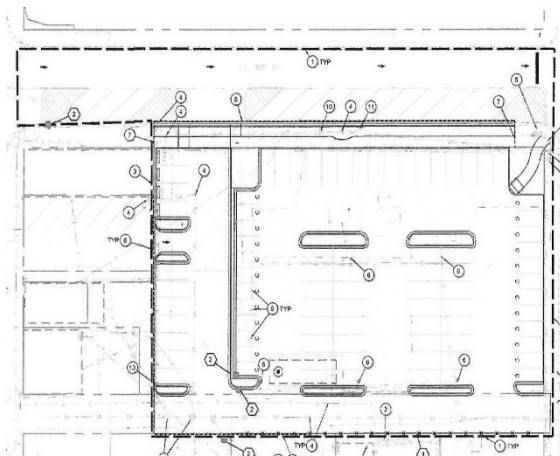
**From:** Gary A. Norris, PE, PTOE  
DN Traffic Consultants, Inc.

Robert Shull, PE  
eRMSi, Inc

**Subject:** SE 3<sup>rd</sup> Street Conversion

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The following memorandum was prepared to summarize the process, findings, and conclusions of the analysis prepared to address the potential conversion of SE 3<sup>rd</sup> Street between College



Avenue and Ash Street into a one-way, east bound street. Walla Walla University has requested this action to increase parking supply on SE 3<sup>rd</sup> Street through the installation of diagonal back in parking. The City requested the Consultant evaluate Walla Walla University's proposal in the context of the operation of College Avenue and access to the east through the community.

According to the City, while this proposal would provide the University with additional parking for their facilities, the City desires to understand the overall public benefit or impact to determine if the

proposal makes sense.

The City of College Place requested the Consultant evaluate the following elements:

1. Traffic circulation & LOS impact/benefits (include consideration for circulation around University Campus and Davis Elementary School and access to Larch).
2. Safety impacts/benefits

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3. Traffic network redundancy impacts/benefits (during nearby street closures)
  4. Emergency Vehicle/School Bus route impacts
  5. Recommended improvements/design changes to mitigate any safety and traffic circulation concerns.
  6. Other concerns/benefits the City may want to consider

## Operational Analysis

To evaluate the impact of converting SE 3<sup>rd</sup> Street to one-way eastbound (EB) between College Avenue and Ash Avenue, peak hour turning movement counts were collected in June 2019 for the College Avenue/SE 3<sup>rd</sup> Street and Ash Avenue/SE 3<sup>rd</sup> Street.

At the intersection with College Avenue, there were 7 vehicles westbound (WB) and 15 vehicles EB in the AM peak hour for a total of 22 vehicles per hour on the street. There were 21 vehicles WB and 6 vehicles EB for a total of 27 vehicles in the PM peak hour. These volumes would translate into a daily volume of 270 vehicles per day. At the intersection with Ash Avenue, there were 6 vehicles WB and 8 vehicles EB in the AM peak hour for a total of 14 vehicles per hour. During the PM peak hour, there were 7 vehicles WB and 6 vehicles EB for a total of 13 vehicles per hour. These volumes translate into a daily volume of 140 vehicles per day. This volume pattern indicates that SE 3<sup>rd</sup> Street is virtually a local access street serving adjacent land uses with minimal through movement.

Both intersections, College Avenue/SE 3<sup>rd</sup> Street and Ash Avenue/SE 3<sup>rd</sup> Street, are two-way stop controlled (TWSC) intersections with the stop signs located on the east and west leg of SE 3<sup>rd</sup> Street. This is appropriate as the major movements at both intersections, College Avenue and Ash Avenue, is north-south with very little traffic going east-west.

The WWVMPO<sup>1</sup> model, which was used for the College Avenue Corridor study was used to evaluate the impact of making SE 3<sup>rd</sup> Street one-way eastbound (EB). The AM peak hour was used as the primary analysis period because the peaking conditions are greater during that period with LOS results being more critical. The AM peak hour was evaluated with both the 2019 and 2040 forecast model. The 2040 forecast was run with the “worst” case condition, which excludes the proposed Davis Avenue Extension.

## 2019 Level of Service

Level of Service (LOS) analysis was run for all intersections along College Avenue from Whitman Drive through Lamperti Street., although the intersections of Whitman, 3<sup>rd</sup>, and 4<sup>th</sup> Street would have the greatest impact due to the potential changes to 3<sup>rd</sup> Street. The analysis was conducted for both the Existing Channelization and the “w/o Left Turn Channelization” conditions recommended in the recently completed *College Avenue Traffic Assessment* and Alternatives Analysis.<sup>2</sup>

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<sup>1</sup> Walla Walla Valley Metropolitan Planning Organization

<sup>2</sup> College Avenue Traffic Assessment, DN Traffic Consultants; March 2020.

Comparing 2019 AM conditions for the “Do Nothing” and “3<sup>rd</sup> Street One Way” scenarios, the LOS at the intersections of College Avenue with Whitman, 3<sup>rd</sup>, and 4<sup>th</sup> have the same LOS letter grade, with the average delay changing less than one (second). The SE 3<sup>rd</sup> Street/College Avenue and

**Table 1 – 2019 AM LOS Analysis**

|                           |         | 2019 AM Do Nothing      |       |                       |       | 2019 AM 3rd Street One-Way |       |                       |       |
|---------------------------|---------|-------------------------|-------|-----------------------|-------|----------------------------|-------|-----------------------|-------|
|                           |         | Existing Channelization |       | w/o LT Channelization |       | Existing Channelization    |       | w/o LT Channelization |       |
| Intersection              | Control | LOS                     | Delay | LOS                   | Delay | LOS                        | Delay | LOS                   | Delay |
| N College Ave/Whitman Dr  | Signal  | C                       | 27.26 | B                     | 13.26 | C                          | 27.24 | B                     | 13.31 |
| S College Ave/SE 3rd St.  | TWSC    | B                       | 12.27 | B                     | 12.62 | B                          | 12.33 | B                     | 12.69 |
| S College Ave/4th St      | Signal  | D                       | 44.36 | B                     | 17.93 | D                          | 45.28 | B                     | 18.51 |
| S College Ave/6th St      | TWSC    | C                       | 17.34 | C                     | 17.30 | C                          | 17.37 | C                     | 17.23 |
| S College Ave/8th St      | TWSC    | C                       | 18.87 | C                     | 18.82 | C                          | 18.91 | C                     | 18.75 |
| S College Ave/10th St     | TWSC    | D                       | 27.52 | D                     | 27.09 | D                          | 27.64 | D                     | 26.98 |
| S College Ave/12th St     | Signal  | C                       | 25.25 | A                     | 9.30  | C                          | 25.24 | A                     | 9.33  |
| S College/13th St         | TWSC    | C                       | 17.38 | C                     | 17.01 | C                          | 17.41 | C                     | 16.96 |
| S College Ave/Lamperti St | Signal  | C                       | 24.21 | B                     | 12.05 | C                          | 24.21 | B                     | 12.05 |
| SE 3rd St/Ash Ave         | TWSC    | B                       | 11.54 | B                     | 11.49 | B                          | 11.73 | B                     | 11.57 |

the SE 3<sup>rd</sup> Street/SE Ash Avenue intersections saw very little change, both with the “worst case” level of service at LOS B. The result of this analysis confirms, with existing volumes, the conversion of SE 3<sup>rd</sup> Street to one-way eastbound would be insignificant. The 2019 LOS conditions, for the AM LOS, are summarized in Table 1.

## 2040 Level of Service

Similar studies were run for 2040-time horizon. In 2040, during the AM peak hour, under the existing lane configuration, the College Avenue/4<sup>th</sup> Street intersection remains at LOS E with an increase in delay of less than 1 second. With the recommended removal of the existing left turn channelization and modifications to the signal timing, this intersection only changes from LOS B with 19.88 average seconds of delay to LOS C with 20.93 for an increase in average delay of slightly over 1 second. The SE 3<sup>rd</sup> Street/College Avenue and SE 3<sup>rd</sup> Street/Ash Avenue also saw very little change. The result of the 2040 AM peak hour analysis is summarized in Table 2.

**Table 2 - 2040 AM LOS Analysis**

|                           |         | 2040 AM Do Nothing      |       |                       |       | 2040 AM 3rd Street One-Way |       |                       |       |
|---------------------------|---------|-------------------------|-------|-----------------------|-------|----------------------------|-------|-----------------------|-------|
|                           |         | Existing Channelization |       | w/o LT Channelization |       | Existing Channelization    |       | w/o LT Channelization |       |
| Intersection              | Control | LOS                     | Delay | LOS                   | Delay | LOS                        | Delay | LOS                   | Delay |
| N College Ave/Whitman Dr  | Signal  | D                       | 36.02 | B                     | 15.19 | D                          | 35.90 | B                     | 15.08 |
| S College Ave/SE 3rd St.  | TWSC    | C                       | 15.84 | C                     | 16.28 | C                          | 15.36 | C                     | 15.78 |
| S College Ave/4th St      | Signal  | E                       | 61.99 | B                     | 19.88 | E                          | 62.40 | C                     | 20.93 |
| S College Ave/6th St      | TWSC    | C                       | 22.79 | C                     | 23.45 | C                          | 22.94 | C                     | 23.50 |
| S College Ave/8th St      | TWSC    | C                       | 24.95 | C                     | 24.71 | D                          | 25.01 | C                     | 24.71 |
| S College Ave/10th St     | TWSC    | E                       | 37.57 | E                     | 36.10 | E                          | 37.66 | E                     | 36.19 |
| S College Ave/12th St     | Signal  | C                       | 30.61 | B                     | 10.53 | C                          | 30.61 | B                     | 10.54 |
| S College Ave/13th St     | TWSC    | C                       | 20.06 | C                     | 20.09 | C                          | 20.09 | C                     | 20.09 |
| S College Ave/Lamperti St | Signal  | C                       | 25.48 | C                     | 25.54 | C                          | 25.54 | C                     | 25.54 |
| SE 3rd St/Ash Ave         | TWSC    | B                       | 11.32 | B                     | 11.62 | B                          | 11.48 | B                     | 11.62 |

The PM peak hour, which has generally better average operation than the AM peak hour, was only analyzed for 2040, because 2040 represents the worst-case condition. Similar to the findings for the AM peak hour, changes are very minimal with no changes in the LOS letter grade and only slight changes in average delay. This analysis shows there is an insignificant traffic flow impact in the PM peak hour, even in 2040. These findings are summarized in Table 3.

**Table 2 - 2040 PM LOS Analysis**

|                           |         | 2040 PM - Do Nothing    |       |                       |       | 2040 PM 3rd Street One-Way |       |                       |       |
|---------------------------|---------|-------------------------|-------|-----------------------|-------|----------------------------|-------|-----------------------|-------|
|                           |         | Existing Channelization |       | w/o LT Channelization |       | Existing Channelization    |       | w/o LT Channelization |       |
| Intersection              | Control | LOS                     | Delay | LOS                   | Delay | LOS                        | Delay | LOS                   | Delay |
| N College Ave/Whitman Dr  | Signal  | C                       | 21.19 | B                     | 10.72 | C                          | 21.25 | B                     | 11.09 |
| S College Ave/SE 3rd St.  | TWSC    | B                       | 11.72 | B                     | 12.18 | B                          | 11.87 | B                     | 12.30 |
| S College Ave/4th St      | Signal  | C                       | 32.59 | B                     | 13.35 | C                          | 32.51 | B                     | 13.42 |
| S College Ave/6th St      | TWSC    | C                       | 19.99 | C                     | 19.74 | C                          | 19.98 | C                     | 19.77 |
| S College Ave/8th St      | TWSC    | C                       | 19.09 | C                     | 18.95 | C                          | 19.07 | C                     | 19.04 |
| S College Ave/10th St     | TWSC    | D                       | 27.35 | D                     | 26.66 | D                          | 27.39 | D                     | 26.74 |
| S College Ave/12th St     | Signal  | C                       | 20.58 | A                     | 8.48  | C                          | 20.67 | A                     | 8.48  |
| S College Ave/13th St     | TWSC    | C                       | 17.75 | C                     | 17.60 | C                          | 17.75 | C                     | 17.62 |
| S College Ave/Lamperti St | Signal  | C                       | 24.25 | C                     | 24.31 | C                          | 24.24 | C                     | 24.30 |
| SE 3rd St/Ash Ave         | TWSC    | A                       | 9.39  | A                     | 9.39  | A                          | 9.44  | A                     | 9.35  |

## Safety Impacts/Benefits

According to national research<sup>3</sup>, curb parking is directly involved in approximately 18 percent of all accidents on urban streets. There are three types of parking maneuvers allowed along the curb. These maneuvers include parallel, angle, and back-in parking. The focus of this discussion is the angle/back-in parking as proposed by Walla Walla University on the south side of SE 3<sup>rd</sup> Street between College Avenue and Ash Avenue.

The angle parking maximizes the number of parking stalls that can be provided along the curb line, and as noted in some studies, provides a wider buffer between sidewalks and driving lanes, which helps reduce vehicle splash, noise and fumes as well as improve pedestrian safety<sup>4</sup>.

Diagonal/back-in parking was found to be safer than “front first” diagonal parking. Back-in parking, also referred to as “reverse parking” maximizes the safety aspects of the diagonal parking maneuver. The reason reverse parking is safer is because it prevents drivers from having to blindly back out of a parking spot and into vehicular traffic. When backing out of an angled parking space, there are countless blind spots created by surrounding vehicles with a limited ability to use the mirrors. Trying to back out into unknown traffic is more hazardous and difficult than backing into a clear and safe parking stall. When reverse parking, a driver is going into a known space with no vehicle and pedestrian traffic. When leaving the parking space, the driver can see the surroundings more clearly. On the other hand, backing out of a parking space means going out into unknown and changing traffic. A driver’s view is further hindered by the cars parked next to it. The other cars increase the driver’s blind spots.

In comparison with parallel parking, crash rates for angle parking were found to be higher than parallel parking. Most of the studies<sup>5</sup> found higher crash rates for angle parking in all cases when compared to parallel parking.

Other benefits of diagonal/back-in parking include:

- Ability to unload the trunk outside from the sidewalk.
- The ability to address emergency maintenance from the street where access to maintenance vehicles can be provided.
- Ability to leave the parking stall expeditiously in an emergency.

Other safety issues, converting SE 3<sup>rd</sup> Street to one way east bound would eliminate the westbound College Avenue intersection stopping sight issue

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<sup>3</sup>Operational and Safety Impacts of Angle versus Parallel versus Back-in Parking; Transportation Research Board; April 2007.

<sup>4</sup> Ibid. Brooks (2002)

<sup>5</sup> OpCit.





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## Emergency Vehicle/School Bus Impacts

### Emergency Response

Accessibility is a primary concern of the first responders. Modifications to the circulation patterns have the potential to impact critical emergency services routings. Fire stations serving College Place include the College Place Fire Department with the station located at 629 S College Avenue and a supporting station in Walla Walla located at 675 Wallula Avenue.

The College Place Fire Station has access to College Avenue on the west and SE Birch Avenue on the east. Emergency response along College Avenue from the station would not be impacted as the proposed action will convert SE 3<sup>rd</sup> Street to a one way east bound roadway. Similarly, the response from the Walla Walla fire station on Wallula Avenue would also use College Avenue from the north to SE 3<sup>rd</sup> Street.

According to the City of College Place Fire Marshall

### School Bus Impacts

School bus routing impacts are determined from the routings of the various buses from the main transportation hub to the various schools. The school bus transportation hub is located at 1825 S College Avenue. The three (3) College Place School District schools include:

- College Place High School – 1755 S College Avenue
- John Sager Middle School – 1755 S College Avenue
- Davis Elementary School – 31 SE Ash Avenue

In review of the location of the District schools, it appears that the only school with any potential impact from the proposed action would be Davis Elementary which is located on Ash Avenue east of College Avenue. For bus routes heading east of College Avenue there is no impact as the action would maintain SE 3<sup>rd</sup> as an eastbound route. For routes heading west from SE Ash Avenue, school buses would not be allowed to use SE 3<sup>rd</sup> Street but would be directed to SE 4<sup>th</sup> Street to access College Avenue. Under this scenario, the school bus would benefit from the signal at the 4<sup>th</sup> Street/College Avenue intersection and the elimination of the sight distance deficiency at the SE 3<sup>rd</sup> Street/College Avenue intersection.

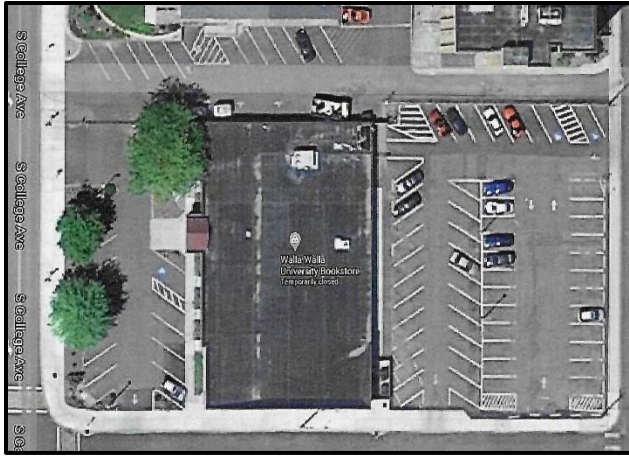
According the College Place School District Transportation Coordinator<sup>6</sup>,

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<sup>6</sup> Carman Gerking; Transportation Supervisor.



## Recommended Improvements



The conversion of SE 3<sup>rd</sup> Street to one way eastbound, suggests the parking stall alignment in the parking lots serving the Walla Walla University Bookstore should be realigned so that the parking stall alignment can accommodate traffic entering the parking lot from SE 3<sup>rd</sup> Street.

The current parking stall alignment forces traffic to enter the parking lot from the north and exit the lot to the south. Under the proposed action, the current alignment would require traffic to enter the parking lot from the

north access on College Avenue and exit onto SE 3<sup>rd</sup> Street heading east. This maneuver may either confuse the motorist or the motorist may not want to head east on SE 3<sup>rd</sup> Street and simply ignore the one-way direction and travel the short distance westbound to the College Avenue intersection.

Therefore, it is recommended the parking stalls be aligned to accommodate traffic entering the lot from SE 3<sup>rd</sup> Street and exiting through the north access to College Avenue.

## Other Concerns

Of specific concern regarding reverse parking is the implication of Washington State Law. According to Revised Code of Washington (RCW) "The driver of a vehicle shall not back the same unless such movement can be made with safety and without interfering with other traffic."<sup>7</sup> This RCW would place the burden on the backing vehicle to insure they didn't interfere with other traffic. The interpretation of interfere could have different meanings but the provision of back-in parking will create scenarios where the backing vehicle will interfere with other traffic.

## Conclusion

The conclusion of this evaluation is the result of converting SE 3<sup>rd</sup> Street to a single lane one-way eastbound roadway is insignificant.

- Traffic volumes on SE 3<sup>rd</sup> Street are insignificant;
- The impact on intersection delay and resultant level of service is insignificant;
- Although the safety impacts of diagonal/back-in parking are worse than parallel parking in all cases, there are other benefits which will improve overall safety
- SE 3<sup>rd</sup> Street is not required to provide network redundancy;
- The College Place Fire Department indicated the impact of converting SE 3<sup>rd</sup> Street to one way eastbound is insignificant in the overall response to emergency events;

<sup>7</sup> RCW 46.61.605. Limitations of backing.

- 
- College Place School District indicated the proposed action would not impact overall school bus routing;
  - With implementation of one-way travel on SE 3<sup>rd</sup> Street, parking stall alignment will be required to facilitate efficient and safe parking lot circulation;
  - Other Concerns – state law indicates back-in parking is not allowed if vehicle circulation is impacted.

# Memorandum

**Date:** May 6, 2020

**To:** Robert Gordon, City Engineer  
City of College Place

**From:** Gary A. Norris, PE, PTOE  
DN Traffic Consultants, Inc.

Robert M Shull, P.E.  
eRMSi, Inc

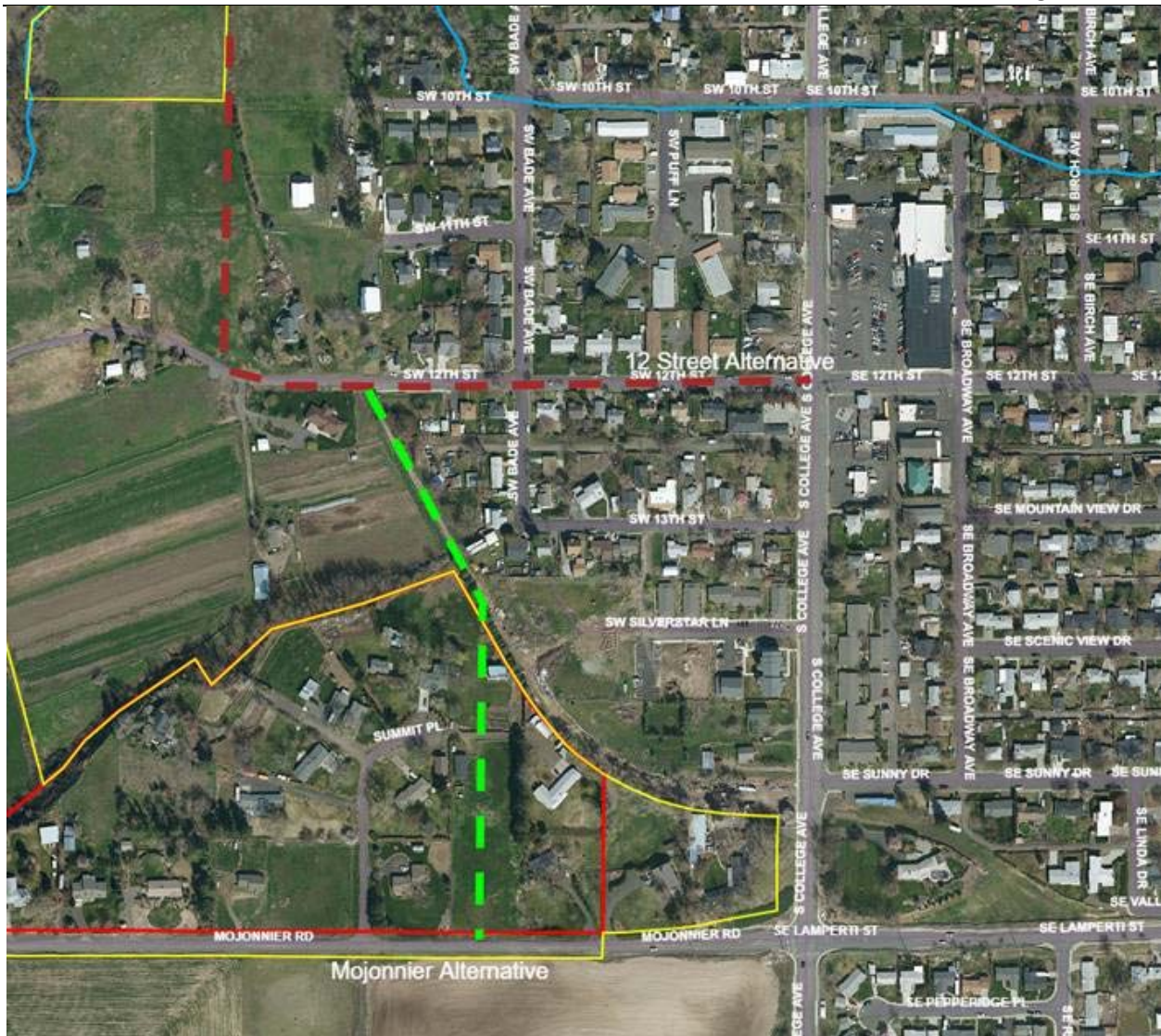
**Subject:** Alternatives Analysis

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The following memorandum was prepared to summarize the process, findings, and conclusions of the analysis prepared to evaluate the levels of service on College Avenue for three (3) alternatives related to the extension of Davis Avenue west of College Avenue. The City requested an analysis of the following three (3) alternatives:

- Existing Condition Alternative. – represents the existing arterial network without the extension of Davis Avenue. Under this configuration, Davis Avenue runs north/south parallel to College Avenue from Whitman Drive to SW 8<sup>th</sup> Street where it terminates.
- SW 12<sup>th</sup> Street Alternative. Under this alternative, SW Davis Avenue would be extended approximately 1,350 feet from its existing termini at the SW 8<sup>th</sup> Street alignment to an intersection with SW 12<sup>th</sup> Street, approximately 1,350 west of S College Avenue.
- Mojonnier Alternative. The Mojonnier Alternative would extend Davis Avenue from the existing termini at the SW 8<sup>th</sup> Street alignment to an intersection with SW 12<sup>th</sup> Street approximately 1,350 feet west of S College Avenue to a point 1,050 west of S College Avenue where it runs at a diagonal along the old railroad right of way for approximately 650 feet where it runs north/south for approximately 725 feet where it intersects with Mojonnier Road approximately 730 feet west of S College Avenue.

These alternatives are illustrated in the map below. The red dash line illustrates the extension of Davis Avenue to SW 12<sup>th</sup> Street and the yellow dash line represents the Davis Avenue extension to Mojonnier Street.



### WWVMPO Traffic Assignment Model

The Walla Walla Valley Metropolitan Planning Organization (WWVMPO) traffic assignment model was used to evaluate the impact of each alternative. The 2019 and 2040 “Do Nothing” alternative used the same model that was developed for the *College Avenue Traffic Assessment* recently completed by DN Traffic Consultants/eRMSI<sup>1</sup> with the caveat that the Davis Avenue extension included in the 2040 analysis was deleted for the Do Nothing alternative analysis.

The existing WWVMPO model includes College Avenue intersections with Rose, C Street, Whitman Drive, 4<sup>th</sup> Street, 12<sup>th</sup> Street, and Lamperti Avenue in this corridor. For the College Avenue Traffic Assessment project, the model was enhanced to add intersections for 6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup>, and 13<sup>th</sup> Streets with street connections to ensure the volumes were properly modeled. This

<sup>1</sup> College Avenue Traffic Assessment; DN Traffic Consultants, Inc; March 2020.



included adding additional links, nodes, and zone connectors. Traffic analysis zones were not subdivided so that the current land use forecasts could be used. New traffic count data, including bicycle and pedestrian volumes for the project area and the analysis intersections of Whitman Drive, 4<sup>th</sup>, 6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup>, and Lamperti was entered into the WWVMPO model. Geometrics, traffic control, and signal timing as appropriate was updated in the model.

The model network surrounding the study area, was evaluated and updated with new construction and changes based upon Google Streetview and a field review. Land use was adjusted to 2019 by interpolation to better reflect existing conditions.

Model calibration was updated and verified in the study area to replicate the new count data and to improve the forecasts. HCM intersection LOS was reported for the AM and PM peak hours for 2019 conditions with testing of different left turn configurations and with and without signal coordination. The PM peak hour level of service analysis was not included in this alternative evaluation.

### Alternatives Analysis

The WWVMPO model was modified to analyze the three alternatives, each with existing channelization and with removal of the channelization as per the recommendations of the College Avenue Traffic Assessment, March 2020. The modifications are as follows:

- Existing Condition Alternative – the model remained the same for the 2019 “Do Nothing” alternative. For the 2040 “Do Nothing” analysis the proposed Davis Avenue and 12 Street extension links were eliminated to represent the existing condition.
- SW 12<sup>th</sup> Street Alternative – Building on the model used for the Existing Condition alternative, a link was provided connecting Davis Avenue from its existing termini at SW 8th Street to the existing SW 12<sup>th</sup> Street alignment for both the 2019 and 2040 scenarios.
- Mojonnier Alternative – Building on the SW 12<sup>th</sup> Street alternative, the Mojonnier connection was added between SW 12<sup>th</sup> Street to Mojonnier Street.

### Findings

The following summarizes the findings of level of service analysis for the three (3) alternatives and two (2) channelization scenarios. The level of service analysis was determined using the WWVMPO traffic assignment model.

### Traffic Volumes

Peak hour traffic volumes were generated for each alternative and channelization scenario. The AM peak hour was used for this analysis as it was determined to represent the “worst case” volume scenario for the College Avenue corridor. This determination was made through an evaluation of intersection turning movement counts collected during the AM and PM peak period during May 2019, as part of the College Avenue Traffic Assessment<sup>2</sup>.

The model was used to generate AM peak hour turning movement volumes which were used to generate the intersection level of service for each alternative and channelization scenario used

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<sup>2</sup> Ibid.

in this analysis for the 2019 and 2040 volume scenarios. The City requested a summary of ADT volumes on the College Avenue corridor be provided. The model volumes were used to develop a two-way link volume for sections of College Avenue to include:

- Whitman Drive to 4<sup>th</sup> Street
- 4<sup>th</sup> Street to 8<sup>th</sup> Street
- 8<sup>th</sup> Street to 12<sup>th</sup> Street
- 12<sup>th</sup> Street to Lamperti Street

The two way link volumes on these section were factored to Average Daily Traffic (ADT) using the “k” factor determined from the AM peak hour intersection turning movement volumes compared to the daily volume obtained from the 24 hour counts collected on College Avenue as part of the College Avenue Traffic Analysis. This comparison resulted in a “k” factor of 0.08. The daily volumes on the College Avenue corridor were achieved by dividing the AM peak hour two-way link volumes by 0.08.

The resultant 2019 ADT link volumes for each section are presented in Table 1.

**Table 1. 2019 ADT Volumes.**

|                                | 2019       |        |             |        |           |        |
|--------------------------------|------------|--------|-------------|--------|-----------|--------|
|                                | Do Nothing |        | 12th Street |        | Mojonnier |        |
| Section                        | Existing   | w/o LT | Existing    | w/o LT | Existing  | w/o LT |
| Whitman Drive to 4th Street    | 4300       | 4600   | 4200        | 4500   | 4300      | 4500   |
| 4th Street to 8th Street       | 7100       | 6900   | 6500        | 6400   | 6000      | 5500   |
| 8th Street to 12th Street      | 7500       | 7400   | 6900        | 6900   | 6400      | 6000   |
| 12th Street to Lamperti Street | 7700       | 7600   | 7600        | 7400   | 6600      | 6200   |

As shown in Table 1, the ADT volume in the College Avenue section between Whitman Drive and 4<sup>th</sup> Street is virtually the same for each of the three (3) alternatives under the Existing Channelization scenario. For the w/o Left Turn Channelization scenario, ADT volumes are slightly higher than the Existing Channelization scenario but consistent between the three (3) alternatives.

For the 4<sup>th</sup> Street to 8<sup>th</sup> Street section, the volume is significantly higher for the “Do Nothing” Existing Channelization scenario than for the 12<sup>th</sup> Street and Mojonnier alternatives. The volume for the w/o Left Turn Channelization scenario is somewhat less than the Existing Channelization scenario for each of the three (3) alternatives.

For the 8<sup>th</sup> Street to 12<sup>th</sup> Street section, the Do-Nothing Existing Channelization and w/o Left Turn Channelization scenarios are significantly higher than the ADT volumes for the 12<sup>th</sup> Street and Mojonnier alternatives under both channelization scenarios. The volumes for the Do Nothing alternative are similar between the two channelization scenarios; the volumes for the 12<sup>th</sup> Street alternative are the same for both channelization scenarios; and the volume for the Existing Channelization scenario under the Mojonnier alternative is somewhat higher than the w/o Left Turn Channelization scenario.

For the 12<sup>th</sup> Street to Lamperti Street section, the Mojonnier volumes are significantly less than the volumes for the Do Nothing and 12<sup>th</sup> Street alternatives. The volumes for the Do Nothing and 12<sup>th</sup> Street alternative are relatively the same for the alternative channelization scenarios.

Overall, it appears, except for the Whitman Drive to 4<sup>th</sup> section, the 2019 volumes on the College Avenue corridor are reduced under the w/o Left Turn Channelization scenario.

The 2040 ADT link volumes for each section are presented in Table 2.

**Table 2. 2040 ADT Volumes**

| Section                        | 2040       |        |             |        |           |        |
|--------------------------------|------------|--------|-------------|--------|-----------|--------|
|                                | Do Nothing |        | 12th Street |        | Mojonnier |        |
|                                | Existing   | w/o LT | Existing    | w/o LT | Existing  | w/o LT |
| Whitman Drive to 4th Street    | 6400       | 6500   | 6400        | 6400   | 6300      | 6300   |
| 4th Street to 8th Street       | 8600       | 8400   | 7800        | 7500   | 7200      | 7100   |
| 8th Street to 12th Street      | 9200       | 9000   | 8400        | 8200   | 7800      | 7600   |
| 12th Street to Lamperti Street | 8900       | 8900   | 8600        | 8400   | 7400      | 7300   |

As shown in Table 2, for the Whitman Drive to 4<sup>th</sup> Street section, the 2040 ADT volumes are virtually the same for the three (3) alternatives and two (2) channelization scenarios.

For the section between 4<sup>th</sup> Street and 8<sup>th</sup> Street, the volumes under the Do Nothing alternative for both channelization scenarios, are significantly higher than the 12<sup>th</sup> Street and Mojonnier alternatives. The Existing Channelization ADT volumes are somewhat higher than the w/o Left Turn Channelization for 12<sup>th</sup> Street alternative, and the volumes for both channelization scenarios are virtually the same for the Mojonnier alternative.

For the section between 8<sup>th</sup> Street and 12<sup>th</sup> Street, the Do-Nothing volumes for both channelization scenarios are significantly higher than the other two (2) alternatives for both channelization scenarios and significantly higher volumes than other sections on the College Avenue corridor.

For the section between 12<sup>th</sup> Street and Lamperti Street, the Do-Nothing volumes are higher than the 12<sup>th</sup> Street and Mojonnier alternatives for each channelization scenario. The Do-Nothing volumes are the same for both channelization scenarios. The Existing Channelization scenario has a slightly higher volume than the w/o Left Turn Channelization scenario for the 12<sup>th</sup> Street and Mojonnier alternative.

Overall, it appears, except for the Whitman Drive to 4<sup>th</sup> section, the 2040 ADT volumes on the College Avenue corridor are lower under the w/o Left Turn Channelization scenario than the Existing Channelization scenario. The Mojonnier alternative appears to offer the lowest volume scenario among the three (3) alternatives.

### Level of Service

Level of service (LOS) was calculated as part of the alternative's analysis. The result of the analysis is summarized below for each alternative.

### *Do-Nothing Alternative*

A summary of the delay and resultant level of service for the 12th Street alternative during the 2019 and 2040 scenario is presented in Table 3.

**Table 3. “Do-Nothing” Level of Service**

|                           |         | 2019-Do Nothing         |       |                              |       | 2040-Do Nothing         |       |                              |       |
|---------------------------|---------|-------------------------|-------|------------------------------|-------|-------------------------|-------|------------------------------|-------|
|                           |         | Existing Channelization |       | w/o Left Turn Channelization |       | Existing Channelization |       | w/o Left Turn Channelization |       |
| Intersection              | Control | LOS                     | Delay | LOS                          | Delay | LOS                     | Delay | LOS                          | Delay |
| N College Ave/Whitman Dr  | Signal  | C                       | 27.26 | B                            | 13.26 | D                       | 36.02 | B                            | 15.19 |
| N College Ave/SE 3rd St   | TWSC    | B                       | 12.27 | B                            | 12.62 | C                       | 15.84 | C                            | 16.28 |
| S College Ave/4th St      | Signal  | D                       | 44.36 | B                            | 17.93 | E                       | 61.99 | B                            | 19.88 |
| S College Ave/6th St      | TWSC    | C                       | 17.34 | C                            | 17.30 | C                       | 22.79 | C                            | 23.45 |
| S College Ave/8th St      | TWSC    | C                       | 18.87 | C                            | 18.82 | C                       | 24.95 | C                            | 24.71 |
| S College Ave/10th St     | TWSC    | D                       | 27.52 | D                            | 27.09 | E                       | 37.57 | E                            | 36.10 |
| S College Ave/12th St     | Signal  | C                       | 25.25 | A                            | 9.30  | C                       | 30.61 | B                            | 10.53 |
| S College Ave/13th St     | TWSC    | C                       | 17.38 | C                            | 17.01 | C                       | 20.06 | C                            | 20.09 |
| S College Ave/Lamperti St | Signal  | C                       | 24.21 | B                            | 12.05 | C                       | 25.48 | C                            | 25.54 |
| SE 3rd St/Ash Ave         | TWSC    | B                       | 11.54 | B                            | 11.49 | B                       | 11.32 | B                            | 11.62 |

### *2019 Do Nothing Alternative*

As shown in Table 3, under the 2019 Do Nothing alternative, the level of service for the existing channelization ranges between LOS D at 10<sup>th</sup> Street and LOS B at SE 3<sup>rd</sup> Street. The majority of intersections, Whitman Drive, 6<sup>th</sup> Street, 8<sup>th</sup> Street, 12<sup>th</sup> Street, 13<sup>th</sup> Street and Lamperti Street all operate at LOS C. Two of the intersections, 4<sup>th</sup> Street and 10<sup>th</sup> Street operate at LOS D.

With the recommended elimination of the existing left turn channelization, the level of service in 2019 ranges between LOS D and LOS A. The level of service on College Avenue remains the same at three intersections: SE 3<sup>rd</sup> Street (LOS B), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 10<sup>th</sup> Street (LOS D), and 13<sup>th</sup> Street (LOS C). The SE 3<sup>rd</sup> Street/Ash Avenue intersection also remains the same (LOS B). The level of service improves at four (4) of the analysis intersections: Whitman Drive improves from LOS C to LOS B; 4<sup>th</sup> Street improves from LOS D to LOS B; 12<sup>th</sup> Street improves from LOS C to LOS A, and Lamperti Street improves from LOS C to LOS B.

Overall, the Do-Nothing 2019 level of service at the College Avenue intersections is higher under the w/o Left Turn Channelization scenario than the Existing Channelization scenario.

### *2040 Do Nothing Alternative*

Comparing the 2019 Do Nothing alternative to the 2040 Do Nothing alternative the following is noted: the level of service at five (5) College Avenue intersections remain the same between 2019 and 2040 for the Existing Channelization condition: 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 12<sup>th</sup> Street (LOS C), 13<sup>th</sup> Street, and Lamperti Street (LOS C). The level of service also remains the



same at the SE 3<sup>rd</sup> Street/Ash Avenue (LOS B) intersection. For the w/o Left Turn Channelization scenario, the level of service at five (5) of the College Avenue intersections remains the same between 2019 and 2040: Whitman Drive (LOS B ), 4<sup>th</sup> Street (LOS B), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), and 13<sup>th</sup> Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue also remains the same between the 2019 and 2020 without left turn channelization scenario.

Comparing the 2040 Do Nothing Existing Channelization scenario to the 2040 Do Nothing w/o Left Turn Channelization scenario found: six (6) of the College Avenue intersections maintained the same level of service between the Existing Channelization and the w/o Left Turn Channelization scenarios. These intersections included SE 3<sup>rd</sup> Street (LOS C), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 10<sup>th</sup> Street (LOS E), 13<sup>th</sup> Street (LOS E), and Lamperti Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue also remains the same (LOS B) between the 2040 existing channelization and the 2040 w/o Left Turn Channelization scenarios. The level of service improved at two (2) College Avenue intersections: Whitman Drive improved from LOS D to LOS B and 4<sup>th</sup> Street improved from LOS E to LOS B.

Overall, the Do-Nothing 2040 level of service at the College Avenue intersections is higher under the w/o Left Turn Channelization scenario than the Existing Channelization scenario.

### *SW 12th Street Alternative*

A summary of the delay and resultant level of service for the 12<sup>th</sup> Street alternative during the 2019 and 2040 scenario is presented in Table 4.

#### *2019 12<sup>th</sup> Street Alternative*

As shown in Table 4, under the 2019 12<sup>th</sup> Street alternative, the level of service for the Existing Channelization ranges between LOS D at 4<sup>th</sup> Street and LOS B at SE 3<sup>rd</sup> Street. The majority (7) of the College Avenue intersections: Whitman Drive, 6<sup>th</sup> Street, 8<sup>th</sup> Street, 10<sup>th</sup> Street, 12<sup>th</sup> Street, 13<sup>th</sup> Street and Lamperti Street all operate at LOS C under the Existing Channelization scenario. One of the intersections, 4<sup>th</sup> Street, operates at LOS D and one, SE 3<sup>rd</sup> Street, operates at LOS B. The SE 3<sup>rd</sup> Street/Ash Avenue intersection also operates at LOS B.

With the recommended elimination of the left turn channelization, the level of service in 2019 under the 12<sup>th</sup> Street Alternative ranges between LOS C and LOS A. The level of service on College Avenue remains the same as the Existing Channelization scenario at five (5) intersections: SE 3<sup>rd</sup> Street (LOS B), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 10<sup>th</sup> Street (LOS C), and 13<sup>th</sup> Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue intersection also remains the same between the Existing and w/o Left Turn Channelization scenarios. The level of service improves at four (4) intersections between the two alternative channelization scenarios: the level of service improves from LOS C to LOS B at the College Avenue/Whitman Drive intersection, LOS D to LOS B at the 4<sup>th</sup> Street intersection, LOS C to LOS A at the 12<sup>th</sup> Street intersection and LOS C to LOS B at the Lamperti Street intersection.

Overall, the 12<sup>th</sup> Street 2019 level of service at the College Avenue intersections is higher under the w/o Left Turn Channelization scenario than the Existing Channelization scenario.

**Table 4. 12th Street Alternative Level of Service.**

|                           |         | 2019-12th St Alternative |       |                              |       | 2040-12th St Alternative |       |                              |       |
|---------------------------|---------|--------------------------|-------|------------------------------|-------|--------------------------|-------|------------------------------|-------|
|                           |         | Existing Channelization  |       | w/o Left Turn Channelization |       | Existing Channelization  |       | w/o Left Turn Channelization |       |
| Intersection              | Control | LOS                      | Delay | LOS                          | Delay | LOS                      | Delay | LOS                          | Delay |
| N College Ave/Whitman Dr  | Signal  | C                        | 26.95 | B                            | 13.24 | C                        | 34.91 | B                            | 14.92 |
| S College Ave/SE 3rd St   | TWSC    | B                        | 12.24 | B                            | 12.57 | C                        | 15.92 | C                            | 15.92 |
| S College Ave/4th St      | Signal  | D                        | 41.21 | B                            | 17.68 | E                        | 58.44 | B                            | 18.52 |
| S College Ave/6th St      | TWSC    | C                        | 16.55 | C                            | 16.59 | C                        | 21.86 | C                            | 20.82 |
| S College Ave/8th St      | TWSC    | C                        | 17.33 | C                            | 17.39 | C                        | 21.80 | C                            | 21.46 |
| S College Ave/10th St     | TWSC    | C                        | 24.91 | C                            | 24.81 | D                        | 32.09 | D                            | 30.92 |
| S College Ave/12th St     | Signal  | C                        | 24.92 | A                            | 9.70  | C                        | 31.05 | B                            | 11.03 |
| S College Ave/13th St     | TWSC    | C                        | 17.07 | C                            | 16.68 | C                        | 19.26 | C                            | 18.80 |
| S College Ave/Lamperti St | Signal  | C                        | 24.25 | B                            | 11.97 | C                        | 25.66 | B                            | 13.21 |
| SE 3rd St/Ash Ave         | TWSC    | B                        | 11.54 | B                            | 11.49 | B                        | 11.29 | B                            | 11.59 |

#### 2040 12<sup>th</sup> Street Alternative

Comparing the 2019 levels of service to the 2040 levels for the 12<sup>th</sup> Street alternative the following is noted. The level of service at six (6) College Avenue intersections remain the same between 2019 and 2040 for the Existing Channelization alternative: Whitman Drive (LOS C), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 12<sup>th</sup> Street (LOS C), 13<sup>th</sup> Street, and Lamperti Street (LOS C). The level of service also remains the same at the SE 3<sup>rd</sup> Street/Ash Avenue (LOS B) intersection. For the w/o Left Turn Channelization scenario, the level of service at six (6) of the College Avenue intersections remains the same between 2019 and 2040: Whitman Drive (LOS B), 4<sup>th</sup> Street (LOS B), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 13<sup>th</sup> Street (LOS C), and Lamperti Street (LOS B). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue also remains the same (LOS B) between the 2019 and 2020 existing channelization scenario.

Comparing the 2040 12th Street Existing Channelization scenario to the 2040 12th Street w/o Left Turn Channelization found: five (5) of the College Avenue intersections maintained the same level of service between the Existing Channelization and the w/o Left Turn Channelization scenarios. These intersections included SE 3<sup>rd</sup> Street (LOS C), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 10<sup>th</sup> Street (LOS D), and 13<sup>th</sup> Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue also remains the same between the 2040 Existing Channelization and the 2040 w/o Left Turn Channelization scenarios. The level of service improved at four (4) College Avenue intersections: Whitman Drive improved from LOS C to LOS B, 4<sup>th</sup> Street improved from LOS E to LOS B, 12<sup>th</sup> Street improved from LOS C to LOS B, and Lamperti Street LOS C to LOS B.

Overall, the 12<sup>th</sup> Street 2040 level of service at the College Avenue intersections is higher under the w/o Left Turn Channelization scenario than the Existing Channelization scenario.

### *Mojonnier Alternative*

A summary of the delay and resultant level of service for the Mojonnier Alternative during the 2019 and 2040 scenario is presented in Table 5.

**Table 5. Mojonnier Alternative Level of Service**

|                           |         | 2019-Mojonnier Alternative |       |                              |       | 2040-Mojonnier Alternative |       |                              |       |
|---------------------------|---------|----------------------------|-------|------------------------------|-------|----------------------------|-------|------------------------------|-------|
|                           |         | Existing Channelization    |       | w/o Left Turn Channelization |       | Existing Channelization    |       | w/o Left Turn Channelization |       |
| Intersection              | Control | LOS                        | Delay | LOS                          | Delay | LOS                        | Delay | LOS                          | Delay |
| N College Ave/Whitman Dr  | Signal  | C                          | 26.86 | B                            | 13.21 | C                          | 34.65 | B                            | 14.76 |
| S College Ave/SE 3rd St.  | TWSC    | B                          | 12.28 | B                            | 12.61 | C                          | 15.79 | C                            | 15.81 |
| S College Ave/4th St      | Signal  | D                          | 35.69 | B                            | 15.99 | D                          | 53.33 | B                            | 17.69 |
| S College Ave/6th St      | TWSC    | C                          | 15.45 | B                            | 14.82 | C                          | 20.21 | C                            | 20.35 |
| S College Ave/8th St      | TWSC    | C                          | 16.19 | C                            | 15.22 | C                          | 19.65 | C                            | 19.22 |
| S College Ave/10th St     | TWSC    | C                          | 22.87 | C                            | 21.31 | D                          | 28.57 | D                            | 27.94 |
| S College Ave/12th St     | Signal  | C                          | 22.49 | A                            | 9.47  | C                          | 24.66 | B                            | 10.28 |
| S College Ave/13th St     | TWSC    | C                          | 15.21 | B                            | 14.48 | C                          | 16.56 | C                            | 16.51 |
| S College Ave/Lamperti St | Signal  | C                          | 24.04 | B                            | 13.28 | C                          | 26.58 | B                            | 14.57 |
| SE 3rd St/Ash Ave         | TWSC    | B                          | 11.50 | B                            | 11.50 | B                          | 11.27 | B                            | 11.59 |

### *2019 Mojonnier Alternative*

As shown in Table 5, under the 2019 Mojonnier alternative, the level of service for the Existing Channelization ranges between LOS D at 4<sup>th</sup> Street and LOS B at SE 3<sup>rd</sup> Street. The majority (7) of the College Avenue intersections: Whitman Drive, 6<sup>th</sup> Street, 8<sup>th</sup> Street, 10<sup>th</sup> Street, 12<sup>th</sup> Street, 13<sup>th</sup> Street and Lamperti Street all operate at LOS C. One of the intersections, 4<sup>th</sup> Street, operates at LOS D and one intersection SE 3<sup>rd</sup> Street operates at LOS B. The SE 3<sup>rd</sup> Street/Ash Avenue intersection operates at LOS B.

With the recommended elimination of the left turn channelization, the level of service in 2019, under the Mojonnier Alternative, ranges between LOS C and LOS A. The level of service on College Avenue remains the same at three (3) intersections: SE 3<sup>rd</sup> Street (LOS B), 8<sup>th</sup> Street (LOS C), and 10<sup>th</sup> Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue intersection also remains the same (LOS B) between the Existing and w/o Left Turn Channelization alternatives. The level of service improves at six (6) intersections between the two alternative channelization scenarios: Whitman Drive improves from LOS C to LOS B, 4<sup>th</sup> Street improves from LOS D to LOS B, 6<sup>th</sup> Street improves from LOS C to LOS B, 12<sup>th</sup> Street improves from LOS C to LOS A, 13<sup>th</sup> Street improves from LOS C to LOS B, and Lamperti Street improves from LOS C to LOS B.

Overall, the Mojonnier 2019 level of service at the College Avenue intersections is higher under the w/o Left Turn Channelization scenario than the Existing Channelization scenario.

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### **2040 Mojonner Alternative**

Comparing the 2019 Mojonner Alternative to the 2040 Mojonner Alternative notes the following: the level of service at seven (7) College Avenue intersections remain the same between 2019 and 2040 for the Existing Channelization scenario: Whitman Drive (LOS C), 4<sup>th</sup> Street (LOS D), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street, 12<sup>th</sup> Street (LOS C), 13<sup>th</sup> Street and Lamperti Street (LOS C). The level of service also remains the same at the SE 3<sup>rd</sup> Street/Ash Avenue (LOS B) intersection. For the w/o Left Turn Channelization scenario, the level of service at four (4) of the College Avenue intersections remains the same between 2019 and 2040: Whitman Drive (LOS B), 4<sup>th</sup> Street (LOS B), 8<sup>th</sup> Street (LOS C), and Lamperti Street (LOS B). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue also remains the same between the 2019 and 2040 w/o Left Turn Channelization.

Comparing the 2040 Mojonner Alternative Existing Channelization scenario to the 2040 Mojonner Alternative w/o Left Turn Channelization found: five (5) of the College Avenue intersections maintained the same level of service between the Existing Channelization and the w/o Left Turn Channelization scenarios. These intersections included SE 3<sup>rd</sup> Street (LOS C), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), 10<sup>th</sup> Street (LOS D), and 13<sup>th</sup> Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue also remains the same between the 2040 existing channelization and the 2040 w/o Left Turn Channelization. The level of service improved at four (4) College Avenue intersections: Whitman Drive improved from LOS C to LOS B, 4<sup>th</sup> Street improved from LOS D to LOS B, 12<sup>th</sup> Street improved from LOS C to LOS B, and Lamperti Street LOS C to LOS B.

Overall, the Mojonner 2040 level of service at the College Avenue intersections is higher under the w/o Left Turn Channelization scenario than the Existing Channelization scenario.

### ***Comparison of Three Alternatives***

A comparison of the result of the level of service for the three alternatives is discussed below.

### **2019 LOS Results**

A comparison of the 2019 level of service for the three alternatives: Do Nothing, 12<sup>th</sup> Street, and Mojonner and the two alternative channelization scenarios, Existing Channelization and w/o Left Turn Channelization is presented in Table 6.

As shown in Table 6, the level of service is the same for each of the three alternatives and channelization scenarios at the following two (2) College Avenue intersections: SE 3<sup>rd</sup> Street (LOS B), and 8<sup>th</sup> Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue intersection remains the same for all analysis scenarios.

The level of service is the same for all three alternatives for either the Existing Channelization or w/o Left Turn Channelization scenarios at the following two (2) College Avenue intersections: Whitman Drive LOS C for each of the three alternatives under the Existing Channelization scenario and LOS B under the w/o Left Turn Channelization scenario, 4<sup>th</sup> Street LOS D for each of the three alternatives under the Existing Channelization scenario and LOS B under the w/o Left

Turn Channelization scenario, Lamperti Street LOS C for the Existing Channelization and LOS B for the w/o Left Turn Channelization scenario.

**Table 6. 2019 LOS Comparison for Three Alternatives**

| Intersection              | 2019        |        |             |        |           |        |
|---------------------------|-------------|--------|-------------|--------|-----------|--------|
|                           | Alternative |        |             |        |           |        |
|                           | Do Nothing  |        | 12th Street |        | Mojonnier |        |
|                           | Existing    | w/o LT | Existing    | w/o LT | Existing  | w/o LT |
| N College Ave/Whitman Dr  | C           | B      | C           | B      | C         | B      |
| S College Ave/SE 3rd St.  | B           | B      | B           | B      | B         | B      |
| S College Ave/4th St      | D           | B      | D           | B      | D         | B      |
| S College Ave/6th St      | C           | C      | C           | C      | C         | B      |
| S College Ave/8th St      | C           | C      | C           | C      | C         | C      |
| S College Ave/10th St     | D           | D      | C           | C      | C         | C      |
| S College Ave/12th St     | C           | A      | C           | A      | C         | A      |
| S College Ave/13th St     | C           | C      | C           | C      | C         | B      |
| S College Ave/Lamperti St | C           | B      | C           | B      | C         | B      |
| SE 3rd St/Ash Ave         | B           | B      | B           | B      | B         | B      |

At the College Avenue/10<sup>th</sup> Street intersection, the 2019 level of service is D for the Do Nothing alternative for both the Existing and w/o Left Turn Channelization scenarios.

For the S College Avenue/13<sup>th</sup> Street intersection, the 2019 level of service is the same for each of the three (3) alternatives and channelization scenarios (LOS C) with the exception of the Mojonnier Alternative in the w/o Left Turn Channelization scenario was LOS B.

Overall, comparing the 2019 level of service for the three alternatives and two channelization scenarios, the Mojonnier Alternative, w/o Left Turn Channelization appears to offer the best overall performance. The 2040 level of service at the College Avenue intersections is higher under the w/o Left Turn Channelization scenario than the Existing Channelization scenario.

#### 2040 LOS Results

A comparison of the 2040 level of service for the three alternatives: Do Nothing, 12<sup>th</sup> Street, and Mojonnier and the two alternative channelization scenarios, Existing Channelization and w/o Left Turn Channelization is presented in Table 7.

As shown in Table 7, the level of service is the same for each of the three alternatives and channelization scenarios at the following four (4) College Avenue intersections: SE 3<sup>rd</sup> Street (LOS B), 6<sup>th</sup> Street (LOS C), 8<sup>th</sup> Street (LOS C), and 13<sup>th</sup> Street (LOS C). The level of service at the SE 3<sup>rd</sup> Street/Ash Avenue intersection remains the same for all analysis scenarios.

The level of service at the College Avenue/12<sup>th</sup> Street intersection is the same for all three alternatives for either the Existing Channelization (LOS C) or w/o Left Turn Channelization (LOS B) scenarios.

At the N College Avenue/Whitman Drive intersection, the level of service is LOS D for the Do Nothing alternative under the Existing Channelization scenario. The level of service is LOS C for both the 12<sup>th</sup> Avenue Alternative and Mojonnier Alternative under the Existing Channelization scenario. For the w/o Left Turn Channelization alternative, the level of service is the same for all alternatives (LOS B).

**Table 7. 2040 LOS Comparison for Three Alternatives**

|                           | 2040        |        |             |        |           |        |
|---------------------------|-------------|--------|-------------|--------|-----------|--------|
|                           | Alternative |        |             |        |           |        |
|                           | Do Nothing  |        | 12th Street |        | Mojonnier |        |
| Intersection              | Existing    | w/o LT | Existing    | w/o LT | Existing  | w/o LT |
| N College Ave/Whitman Dr  | D           | B      | C           | B      | C         | B      |
| S College Ave/SE 3rd St.  | C           | C      | C           | C      | C         | C      |
| S College Ave/4th St      | E           | B      | E           | B      | D         | B      |
| S College Ave/6th St      | C           | C      | C           | C      | C         | C      |
| S College Ave/8th St      | C           | C      | C           | C      | C         | C      |
| S College Ave/10th St     | E           | E      | D           | D      | D         | D      |
| S College Ave/12th St     | C           | B      | C           | B      | C         | B      |
| S College Ave/13th St     | C           | C      | C           | C      | C         | C      |
| S College Ave/Lamperti St | C           | C      | C           | B      | C         | B      |
| SE 3rd St/Ash Ave         | B           | B      | B           | B      | B         | B      |

At the S College Avenue/4<sup>th</sup> Street intersection, the level of service is LOS E for the Do Nothing and 12<sup>th</sup> Avenue Alternatives under the Existing Channelization scenario improving to LOS D under the Mojonnier alternative. The level of service is the same (LOS B) for all alternatives under the w/o Left Turn Channelization scenario.

For the S College Avenue/10<sup>th</sup> Street, the level of service is LOS E for the Do Nothing alternative under both channelization scenarios. For the other alternatives and channelization scenarios, the level of service is LOS D.

For the S College Avenue/Lamperti Street intersection, the level of service is C for both the Do-Nothing alternative channelization scenarios. For the 12<sup>th</sup> Street and Mojonnier alternatives, the level of service is C for the Existing Channelization and LOS B for the w/o Left Turn Channelization scenarios.

## Conclusions

Overall, the Mojonnier Alternative w/o Left Turn Channelization offers the best overall level of service performance among the three alternatives. As shown in the College Avenue Traffic Assessment, removing the left turn channelization, and corresponding traffic signal timing plans, on College Avenue will significantly improve traffic operations on the College Avenue corridor.

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With the construction of the Mojonier connection to Davis Avenue level of service benefits will be realized on the south end of College Avenue.

General Comments.

For the 2019 scenario:

- The result of the level of service analysis indicated that all intersections would operate at LOS D or above. Under the Do Nothing alternative, two intersections are estimated to operate at LOS D with 10<sup>th</sup> Street operating at LOS D for both the Existing and w/o Left Turn Channelization scenarios.
- The 12<sup>th</sup> Street and Mojonier alternatives have one intersection, College Avenue/4<sup>th</sup> Street, operating at LOS D, both under the Existing Channelization condition.
- The level of service for the 12<sup>th</sup> Street and Mojonier alternatives is virtually the same with the exception of College Avenue/6<sup>th</sup> Street and College Avenue/13<sup>th</sup> Street where the level of service at these intersections is LOS B compared to LOS C at the other intersections
- Overall, the Mojonier Alternative w/o LT Channelization offers a slightly better level of service than the other three alternatives and channelization scenarios.

For the 2040 scenario:

- The result of the level of service analysis indicates all intersections would operate at LOS E or above. Under the Do Nothing alternative, two intersections are estimated to operate at LOS E with 4<sup>th</sup> Street operating at LOS E for the Existing Channelization scenario and 10<sup>th</sup> Street operating at LOS E for both the Existing and w/o Left Turn Channelization scenarios.
- Under the 12<sup>th</sup> Street alternative, the College Avenue/4<sup>th</sup> Street intersection operates at LOS E under the Existing Channelization scenario and the College Avenue/10<sup>th</sup> Street intersection operates at LOS D
- One intersection, College Avenue/Whitman Drive, is estimated to operate at LOS D under the Do Nothing alternative and the Existing Channelization scenario.
- Overall, the Mojonier alternative w/o LT Channelization offers a slightly better level of service than the other three alternatives and channelization scenarios.





# College Place Farmers & Artisan Market

Opening Day – Thursday, May 28<sup>th</sup> from 4 to 7 PM







# COVID-19 Safety Measures In Place

- Vendor types are based upon what phase the county is in – No non-essential activities such as kid events, live music, etc.
- Additional spacing between vendor booths
- Hand washing & sanitizing stations throughout market
- Wipe down of high touch areas frequently
- Health check for staff and vendors prior to market start
- Revised layout with One-Way traffic flow – Single entrance and exit
- No sampling / handling of products prior to purchase
- No loitering or dining on premises – (purchase and leave)

# Opening Day Layout – One Way Traffic





# Current Layout – One Way Traffic





# New for 2020!

- CPFM is approved for SNAP!! No cost to the City for equipment or transactions
- SNAP Market Match. Distribution of equal amount dollar to dollar.





# Continuing in 2020!

- CPFM participates in the WIC and Senior Farm Market Nutrition Program
- SFMNP is designed to provide low-income seniors with access to locally grown fruits, vegetables, honey and herbs
- FMNP (WIC participants) established to provide fresh, unprepared, locally grown fruits & vegetables to expand awareness, use of, and sales at farmers' markets.



# Customers to purchase & leave, no loitering

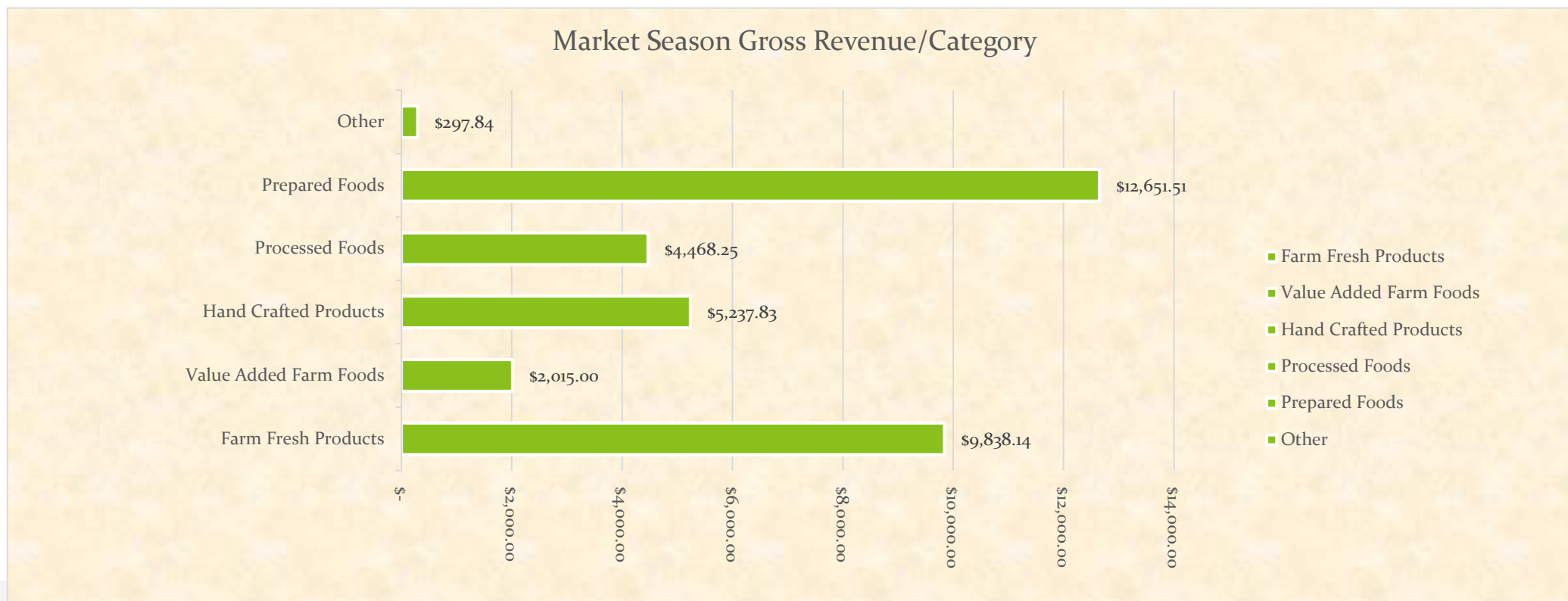


During Phase 1 & 2

- No activities that encourage anyone to hang around and visit.
- No community outreach, no entertainment, no picnic tables for dining, etc.
- Please ***do*** come to the market to shop and support our local small business vendors.

# Market Stats

As of Market day #8 the gross sales is \$34,508.57





## Vendor Information

Each market has ranged from 12-19 vendors

- Produce vendors
- Hot food vendors
- Artisan vendors
- Bakery vendors





Questions?

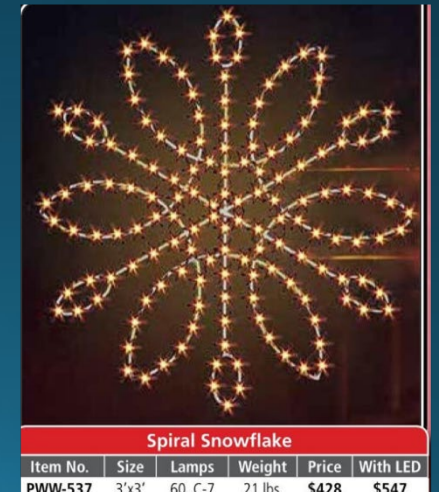
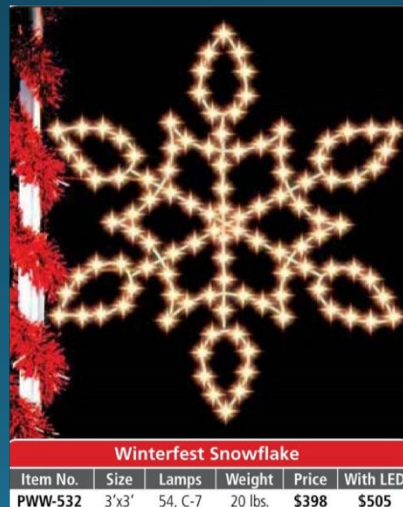


City of College Place

Light up the Avenue

# College Avenue

- Snowflake lights on poles from 13<sup>th</sup> Street to Rose (22 snowflakes)
- Choosing a variety of the snowflakes below.



# Cost Analysis for Snowflakes on College Avenue

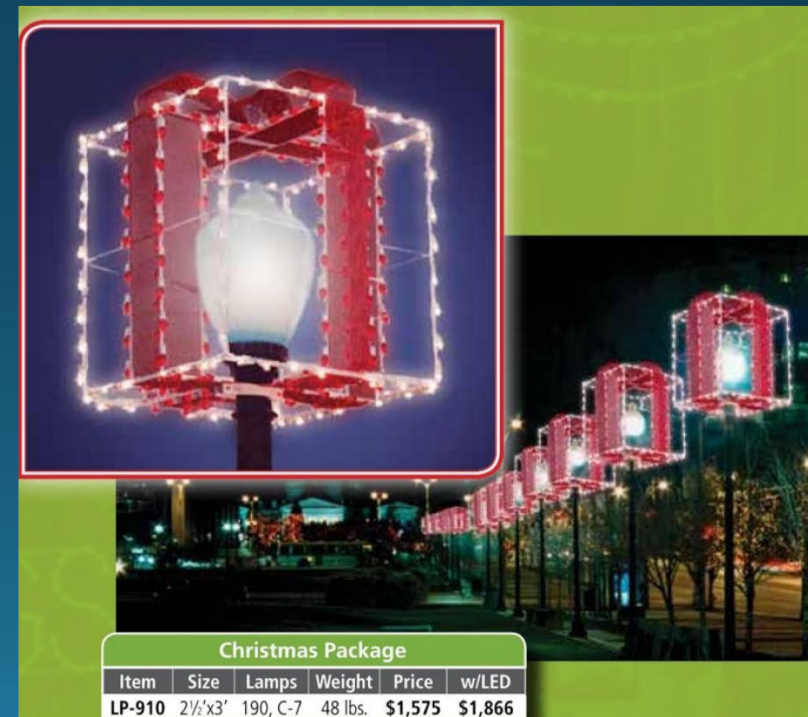
Snowflake variety for 22 poles on College Avenue

| Option A (mix of snowflake lights)   | LED 3'    | total       |
|--------------------------------------|-----------|-------------|
| Temple Spiral Snowflake (4 each)     | \$ 547.00 | \$ 2,188.00 |
| Silhouette Snowflake (3 each)        | \$ 470.00 | \$ 1,410.00 |
| Diamond Snowflake (3 each)           | \$ 437.00 | \$ 1,311.00 |
| Winterfest Snowflake (3 each)        | \$ 505.00 | \$ 1,515.00 |
| Presidential snowflake (3 each)      | \$ 542.00 | \$ 1,626.00 |
|                                      |           | \$ 8,050.00 |
| 20% discount (purchase by 8/31/2020) |           | \$ 1,610.00 |
| Total if purchased by 8/31/2020      |           | \$ 6,440.00 |

| Option B (pick one type of the snowflake for a total of 22) | 3' LED    | total        |
|-------------------------------------------------------------|-----------|--------------|
| Temple LED Spiral Snowflake 3'                              | \$ 547.00 | \$ 12,034.00 |
| 20% discount (purchase by 8/31/2020)                        |           | \$ 2,406.80  |
| Total if purchased by 8/31/2020                             |           | \$ 9,627.20  |
| Temple LED Silhouette Snowflake 3'                          | \$ 470.00 | \$ 10,340.00 |
| 20% discount (purchase by 8/31/2020)                        |           | \$ 2,068.00  |
| Total if purchased by 8/31/2020                             |           | \$ 8,272.00  |
| Temple LED Diamond Snowflake 3'                             | \$ 437.00 | \$ 9,614.00  |
| 20% discount (purchase by 8/31/2020)                        |           | \$ 1,922.80  |
| Total if purchased by 8/31/2020                             |           | \$ 7,691.20  |
| Temple LED Winterfest Snowflake 3'                          | \$ 505.00 | \$ 11,110.00 |
| 20% discount (purchase by 8/31/2020)                        |           | \$ 2,222.00  |
| Total if purchased by 8/31/2020                             |           | \$ 8,888.00  |
| Temple LED Presidential snowflake 3'                        | \$ 542.00 | \$ 11,924.00 |
| 20% discount (purchase by 8/31/2020)                        |           | \$ 2,384.80  |
| Total if purchased by 8/31/2020                             |           | \$ 9,539.20  |

# Municipal Campus

- 5 light poles in parking lot. Two of the poles are twin lights and this may not work well for Christmas packages. Alternative plan is to do Burst of Stars on the twin light poles.



# Cost Analysis for Christmas package light in parking lot

| Parking lot light poles (5 quantity)                     | price/each  | total       |
|----------------------------------------------------------|-------------|-------------|
| Christmas package light w/LED (3)                        | \$ 1,866.00 | \$ 5,598.00 |
| burst of stars for twin light poles (4 lights) (2 poles) | \$ 1,409.00 | \$ 5,636.00 |
|                                                          | \$ 3,275.00 | \$11,234.00 |
| 20% discount (purchase by 8/31/2020)                     |             | \$ 2,246.80 |
| Total if purchased by 8/31/2020                          |             | \$ 8,987.20 |



# Municipal Campus –string lights





# Municipal Campus –front lawn



**12 Horse Carousel under 20' Canopy (A)**

| Item      | Size                                                                                                | Lamps      | Price    | w/LED    |
|-----------|-----------------------------------------------------------------------------------------------------|------------|----------|----------|
| SSTDL-115 | 30' diameter, 20' Canopy Pole<br>Horse Poles (from top of star): 13'h<br>Horse: 5 1/4' h x 7 1/4' w | 5,592, C-7 | \$38,175 | \$46,071 |

ANIMATED

**North Pole Express Train (A)**

| Item      | Size     | Lamps      | Price    | w/LED    |
|-----------|----------|------------|----------|----------|
| SSTDL-105 | 124'x20' | 4,358, C-7 | \$51,844 | \$58,138 |

ANIMATED

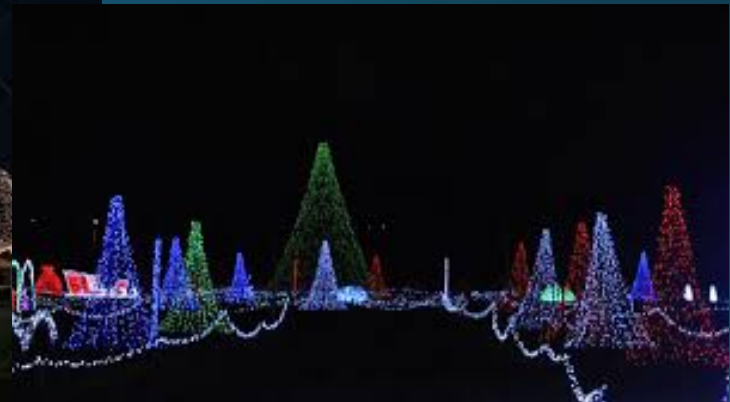
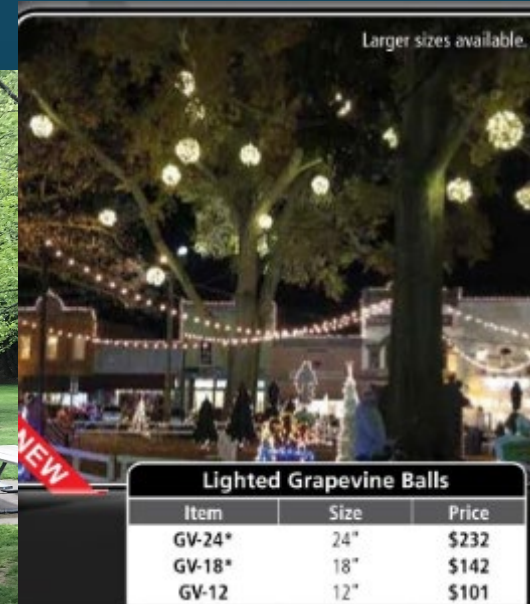


# Municipal Campus readerboard





# Lions Park lighting-after renovation



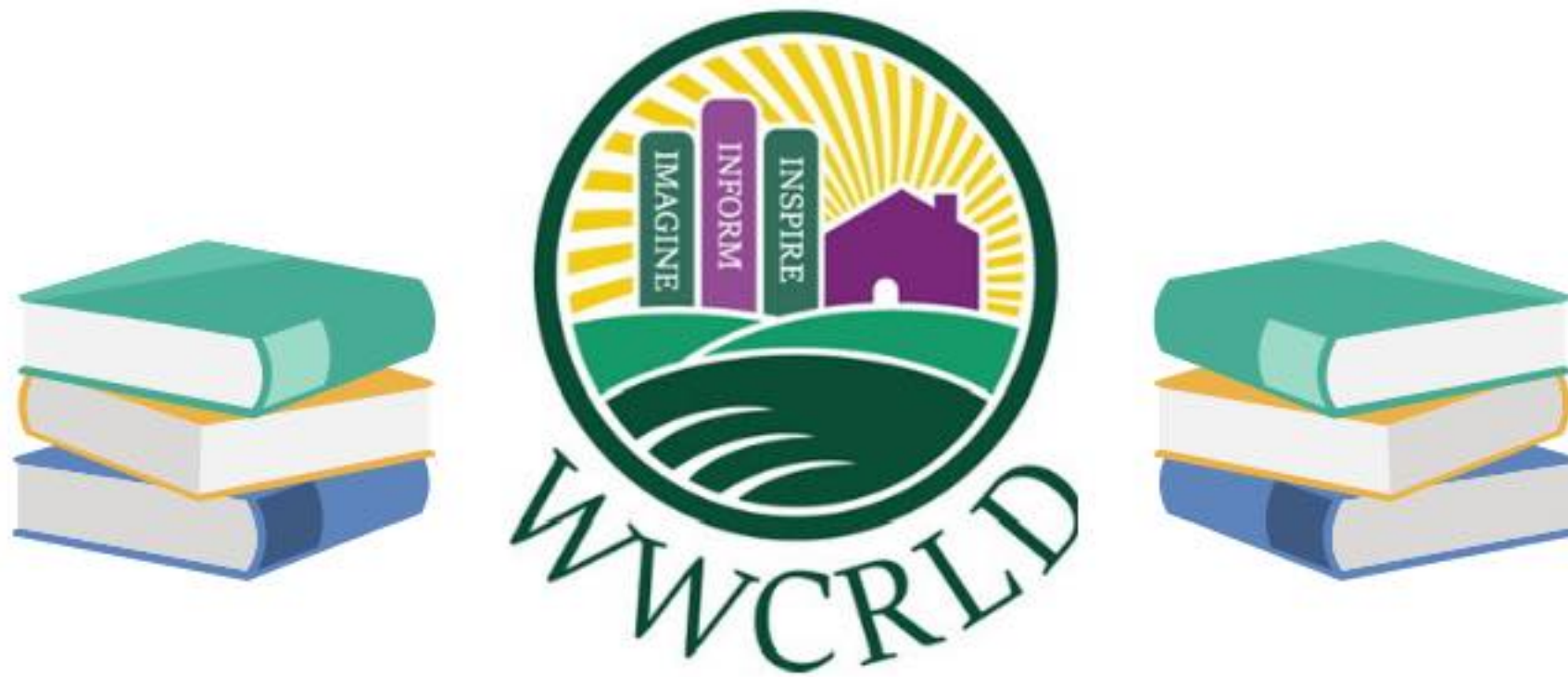
# Light up the Avenue

- Sponsors so far...
  - Community Bank \$2,000.00
  - Pacific Power and Light \$1,000.00
  - City funds...
  
- Questions?









# Curbside is Coming!

at College Place Library

Starting Monday August 3  
Monday - Friday Noon-4pm









## City of College Place: Development Activity - August 2020

| Project Name                 | Use                             | Location                 | Status                                                                                                                                                                                                                                                                                                                                                                                                                     | Lead Generated  |
|------------------------------|---------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Commercial/Industrial</b> |                                 |                          |                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |
| Project CK                   | Gas Station & Convenience Store | NW corner of 12th & Myra | <ul style="list-style-type: none"> <li>- Jan 2019 In site negotiations.</li> <li>- May 2019 Continue working with developer on plans.</li> <li>- June 2019 Issues with land chosen. May consider 12th and Myra as alternate site.</li> <li>- August 2019 Performing due diligence on 12th and Myra site.</li> <li>- March 2020 Still working on Myra/Whitman and Myra/12th sites.</li> <li>- July 2020 On Hold.</li> </ul> | ICSC Las Vegas  |
| Project HM                   | Automotive                      | College Avenue Corridor  | <ul style="list-style-type: none"> <li>- March 2020 Coffee shop located on west side of Walla Walla is potentially interested in opening a second location as primarily a drive through with large outdoor patio seating at southwest corner of 9th and College Avenues.</li> <li>- July 2020 On hold</li> <li>- August 2020 Starting to prepare a site plan. Preliminary engineering meeting scheduled.</li> </ul>        | Local Business. |



|            |                                                     |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |
|------------|-----------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Project FM | Medium sized grocery and general merchandise store. | College Avenue, across from College Place High School. | <p>- Jan 2019 This site is shortlisted with another site at end of Myra Rd in Walla Walla. User would like to open up by 2021/2022.</p> <p>- October 2019 Will commit to site once wastewater trunk is done next Summer. Gave city benchmarks to hit. Closing on lift station sewer property.</p> <p>- November 2019 City closed on lift station property. Achieving timelines.</p> <p>- February 2020 No change. - March 2020 Wastewater engineering plans will be done by June then to construction of sewer. This project is contingent on City getting sewer constructed. - July 2020 Company still interested. Waiting on SW Sewer to be completed.</p> | Discussion with potential client. |
|------------|-----------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|

|            |                                 |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |
|------------|---------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Project BK | Fast food burger establishment. | Either SR 125 & Commercial Dr or Tamaurson & SR 125. | <ul style="list-style-type: none"> <li>- Jan 2019 Two sites are shortlisted. In due diligence/negotiation phase.</li> <li>- August 2019 Due diligence.</li> <li>- September 2019 Site agreement signed.</li> <li>- October 2019 Construction to take place next Spring.</li> <li>- December 2019 Getting plans together.</li> <li>- January 2020 Conceptual plans turned into City.</li> <li>- February 2020 Also reviewing a site on Commercial Drive.</li> <li>- March 2020 Continue to work with corporate on final location of Burger King.</li> <li>- July 2020 On hold.</li> <li>- August 2020 On hold.</li> </ul> | ICSC Las Vegas |
|------------|---------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|

|                                    |                                                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                    |
|------------------------------------|---------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Walla Walla Rural Library District | Interim location for Library for next five years. | Meadowbrook Plaza | <ul style="list-style-type: none"> <li>- December 2019 Lease formally signed for former Inland Cellular space at Meadowbrook Plaza. Will open up at the earliest by March and latest by early May.</li> <li>- January 2020 Former Inland Cellular site is being renovated for the Library.</li> <li>- February 2020 Renovations continue. Should be open by May.</li> <li>- March 2020 The space has new flooring. New furniture and shelving is being ordered. Should be ready for early May.</li> <li>- July 2020 Facility is ready to go. Waiting for the County to move to Phase 2.9.</li> <li>- August 2020 County stuck at Phase II. Curbside service will start this week. Waiting for Phase III to open facility.</li> </ul> | City annexed into Library District in August 2019. |
|------------------------------------|---------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|

|           |                      |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |
|-----------|----------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Project W | Fast Food restaurant | Meadowbrook Area                                              | <ul style="list-style-type: none"> <li>- June 2019 Corporate looking to open up a tri-branded location of a fast food restaurant.</li> <li>- August 2019 Due diligence underway on Meadowbrook taxlots.</li> <li>- October 2019 Sites narrowed to Commercial Drive and Tamaurson</li> <li>- November 2019 Narrowed to Commercial Dr site.</li> <li>- March 2020 Site negotiations ongoing for Commercial Drive.</li> <li>- July 2020 Project on hold.</li> <li>- August 2020 Project on hold.</li> </ul> | ICSC Las Vegas |
| Project D | Sit Down restaurant  | Sites are either SR 125/Commercial Drive or SR 125/Tamaurson. | <ul style="list-style-type: none"> <li>- Jan 2019 Two sites are going through due diligence.</li> <li>- Mar 2019 Due diligence continues.</li> <li>- April 2019 Awaiting plans from State about SR 125 to determine next move.</li> <li>- June 2019 Waiting for the Myra and SR 125 intersection to be improved for site to be acquired.</li> <li>- August 2019 Awaiting permanent Myra/SR 125/Commercial Dr plans.</li> <li>- March 2020 No Change</li> <li>- August 2020 Project on hold.</li> </ul>   | ICSC Las Vegas |

|                     |                         |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |
|---------------------|-------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Project Flight      | Aerospace Manufacturing | Martin Airfield                 | <ul style="list-style-type: none"> <li>- September 2019 Interest by incoming owner of Airfield about potential siting of facility on west side of property. Improve airport. Likely this project will start between four and five years.</li> <li>- October 2019 Airfield now owned by Tarragon/Mike Corliss.</li> <li>- February 2020 No Change.</li> <li>- August 2020 Tarragon doing preliminary planning of site.</li> </ul>                                                                                                                                                                                         | Property owner.         |
| Project GW/Goodwill | Second hand store       | C Street across from Home Depot | <ul style="list-style-type: none"> <li>- September 2019 Board of company getting ready to approve purchase of 1.94 acre John Stejer site behind Banner Bank.</li> <li>- October 2019 Awaiting word from Board of this company.</li> <li>- November 2019 Property deal closed. Goodwill is moving to College Place by March 2021.</li> <li>- December 2019 Goodwill is working on site plans. They control site.</li> <li>- February 2020 Plans are in development.</li> <li>- March 2020 Developing preliminary site plans.</li> <li>- August 2020 Project is paused until stores open back up for liquidity.</li> </ul> | Board member of Company |

|                                                         |               |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |
|---------------------------------------------------------|---------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| College Place Public Schools -<br>Portable Construction | Classrooms    | Davis School - 2nd & Ash.                 | <ul style="list-style-type: none"> <li>- July 2020 Construction going on three portable buildings on the soccer field section of the Davis School property.</li> <li>- August 2020 Contractor will finish portable construction.</li> </ul>                                                                                                                                                                                                                                     | College Place Public Schools Board.   |
| Project Food Cart                                       | Food Cart Pod | Southwest corner of 8th & College Avenue. | <ul style="list-style-type: none"> <li>- December 2019 Since new development regulations allow food cart pods, Christian Bell and Chris Murray are working on a concept to develop a food cart pod on the vacant land at 8th and College.</li> <li>- January 2020 Had conceptual development meeting with the Bell family on this concept.</li> <li>- March 2020 Planning to run a pilot first with a couple of food trucks.</li> <li>- August 2020 Project on hold.</li> </ul> | College Place Farmer's Market vendor. |
| <b>Residential</b>                                      |               |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |

|                                             |                                                      |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                      |
|---------------------------------------------|------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Homestead Subdivision Phase 3C, 3D, and 3E. | Residential subdivision constructed by Hayden Homes. | Homestead and Doans Street south of Fourth Street. | <p>wrapping up. Plans for 3E still being revised. Still dealing with stormwater.</p> <ul style="list-style-type: none"> <li>- October 2019 Phase 3D development ongoing. Looking at development of underground stormwater storage. Community park under development for late October opening.</li> <li>- Jan 2020 Cement Treated Base will be installed on Doans first full week of January. Stormwater in progress.</li> <li>- February 2020 Additional MOU to be signed in Feb to permit Phase 3E and Tract 1 and 2 if they deal with Stormwater, finish up punch list, and put Doans thru.</li> <li>- March 2020 MOU signed.</li> <li>- July 2020 Doans put through. Utility infrastructure is being installed. No permanent installed stormwater solution yet.</li> <li>- August 2020 Contractor working on roadways south of Virginia Street between</li> </ul> | Hayden Homes has owned property for the last decade. |
|---------------------------------------------|------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|

|                              |                                   |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                               |
|------------------------------|-----------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Villages at Fort Walla Walla | 180 multi-family apartment units. | South side of Whitman Drive/Deccion intersection. | <ul style="list-style-type: none"> <li>- Jan 2019 Plan submittal is being reviewed by development staff. Spring 2019 construction.</li> <li>- Feb 2019 Plans reviewed and approved.</li> <li>- October 2019 Engineering issuing approval for first group of buildings.</li> <li>- November 2019 Engineer will likely be starting work again. Was told to idle by developer.</li> <li>- February 2020 Farran requested groundbreak meeting with staff in February.</li> <li>- July 2020 Q4 groundbreaking.</li> <li>- August 2020 No change.</li> </ul> | Port of Walla Walla was approached by Farran Group about property and was directed to Bob Price and the City. |
|------------------------------|-----------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|



|                  |                          |                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |
|------------------|--------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Stepper Addition | Multi-family apartments. | South side of C Street near Della intersection. | <p>- Jan 2019 Plan submittal is being reviewed by development staff.</p> <p>- Feb 2019 Developer about to break ground.</p> <p>- Mar 2019 Plans approved. Waiting for snow to melt to break ground.</p> <p>- April 2019 Wrapping up bonding issues and will be ready to go.</p> <p>- June 2019 Site has broken ground.</p> <p>- August 2019 Road and utilities are installed and in place.</p> <p>- Sept 2019 Construction of structures to begin.</p> <p>-February 2020 Under construction.</p> <p>- March 2020 Getting ready to release bond on this.</p> <p>- July 2020 Structures being built.</p> <p>- August 2020 Continue work.</p> | Property owner. |
|------------------|--------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|

|                 |                                                                   |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |
|-----------------|-------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Country Estates | Additional manufactured units on former Poor Form House property. | 924 SE Scenic View Dr | <p>- Jan 2019 Poor Farm House is demolished. Site ready for manufactured unit construction.</p> <p>- Feb 2019 Development plans for additional units turned into the Community Development Department. - March 2019 Waiting for additional information from Country Estates. - April 2019 Met with property owner to discuss plans and what was needed to move development along. - June 2019 First double wide is on site. Waiting for plans for others.</p> <p>- August 2019 Awaiting revised plans. - November 2019 No change</p> <p>- July 2020 No change.</p> <p>- August 2020 Turning in paperwork to begin construction on additional mobile units.</p> | Property owner. |
|-----------------|-------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|

|                    |                          |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |
|--------------------|--------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Sirmon Development | Multi-family apartments. | 942 NE Spitzenburg St | <p>- Jan 2019 Plan submittal is being reviewed by development staff.</p> <p>- Feb 2019 Development needs fire flow test. Applicant will coordinate with Green Tank Irrigation District.</p> <p>- March 2019 Planning approvals done. Contingent on fire flow water test with Green Tank.</p> <p>- April 2019 No Update.</p> <p>- June 2019 No Update.</p> <p>- August 2019 No update.</p> <p>Sept 2019 Site passed flow test. It does support multifamily now.</p> <p>- November 2019 Planning to develop next Summer.</p> <p>- August 2020 Still planning to develop this year.</p> | Property owner. |
|--------------------|--------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|

|                    |               |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |
|--------------------|---------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|                    |               |                     | <p>- Jan 2019 Plan reviewed, awaiting resubmittal. -</p> <p>Feb 2019 Working with applicant on remaining items for plans. -</p> <p>Mar 2019 Met with applicant on plans to subdivide property and discuss needed improvements.</p> <p>- June 2019 Continue to work with applicant on various thoughts pertaining to short and long plats. -</p> <p>August 2019 Still working on platting issues. -</p> <p>October 2019 Earthwork is now occurring. -</p> <p>December 2019 Wrapping up 12th Street half road improvements. -</p> <p>January 2020 Issue and record final plat. - July</p> <p>2020 Some properties on 12th selling. -</p> <p>August 2021 No Change.</p> |                 |
| Mauiri Development | Single-Family | 428 SW 12th Street. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Property owner. |

|                          |                       |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |
|--------------------------|-----------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Stone Creek Development. | Single & Multi-Family | 197 Mojonnier Rd | <ul style="list-style-type: none"> <li>- Feb 2019 SW Trunk Line MOU contents agreed upon with property owners. MOU needed to make this property and others developable.</li> <li>- March 2019 MOU approved by City Council. Plan to let engineering contract on SW Sewer at March 12th, 2019 City Council meeting.</li> <li>- Nov 2019 City owns lift station property. Doing engineering plans for it. Courting residential developers.</li> <li>- Jan 2020 Working on easements right-of-way for wastewater trunk line.</li> <li>- March 2020 Property owner short platting development to permit more developable tracts.</li> <li>- August 2020 Awaiting Sewer Trunk line to actively market. Planning for late summer construction.</li> </ul> | Property owner. |
|--------------------------|-----------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|

|       |                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |
|-------|--------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Hanby | Multi-family apartments. | West side of College & Sunny | <ul style="list-style-type: none"> <li>- June 2019 Turned in preliminary plans for additional multifamily structures.</li> <li>-November 2019 Planning approvals done. In Civil review.</li> <li>- December 2019 Ongoing</li> <li>- January 2020 Apartment building under construction.</li> <li>- February 2020 Under construction.</li> <li>- March 2020 Apartments continue to be under construction.</li> <li>- July 2020 Construction continues.</li> <li>- August 2020 No Change.</li> </ul> | Property owner. |
|-------|--------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|

|                              |               |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |
|------------------------------|---------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Whispering Creek Subdivision | Single Family | 620 SE 8th Street | <ul style="list-style-type: none"><li>- Feb 2019 Annexation hearing set for the property.</li><li>- Mar 2019 Property annexed at February 26th, 2019 Council meeting. Awaiting plans.</li><li>- Sept 2019 Awaiting revisions from developers engineer.</li><li>- Dec 2019 Scheduled public hearing with Hearing Examiner.</li><li>- Feb 2020 Hearing examiner issuing conditions for development.</li><li>- March 2020 Working with developer and engineer on final review.</li><li>- July 2020 Utilities installed. Roadway is being constructed. Housing construction has started.</li><li>- August 2020 Most utility infrastructure in change.</li></ul> Working on constructing houses. | Property owner. |
|------------------------------|---------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|



# Wastewater Treatment Plant Upgrade Project

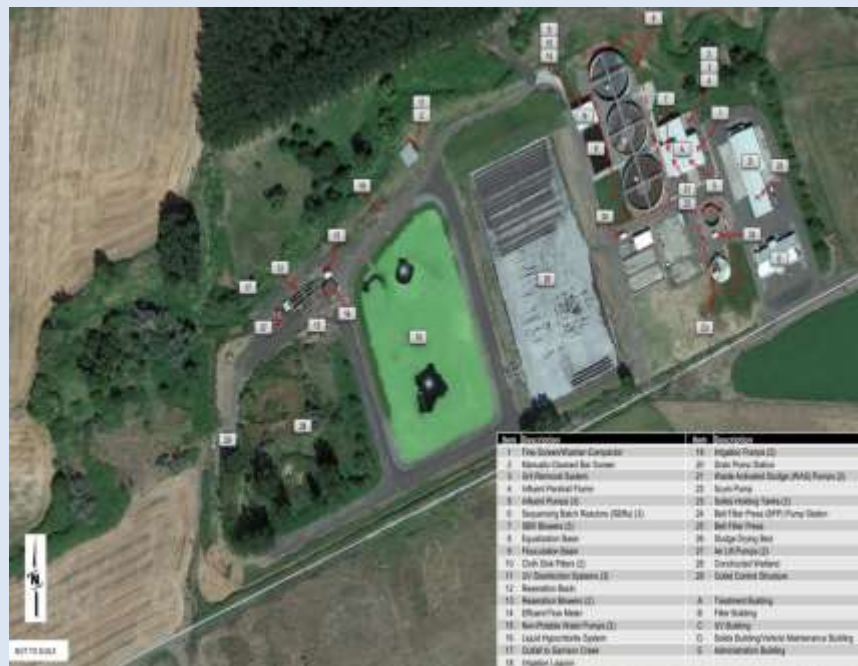
This project entails the renovation of the City's Wastewater Treatment Plant (WWTP). The WWTP is located at 430 Owens Rd just west of the City. It was constructed in 2000 and is a Sequence Batch Reactor facility which processes 1.6 Million Gallons of Sewage per Day for 5,095 connections. The renovation is required per the State Department of Ecology as part of the City's NPDES Permit. This renovation project must be constructed by 2023 to satisfy the State NPDES Permit. The project cost is estimated at around **\$20 million dollars**. The City is seeking State & Federal Funding partners as the cost is too big to burden utility ratepayers with.

- Increases storage capacity at the WWTP to prevent discharge to Garrison Creek during the critical period.
  - Required to be constructed by the end of 2023 per compliance schedule in NPDES Permit – which disallows discharge to Garrison Creek from May through October.
  - Improves water quality in Garrison Creek – tributary of the Walla Walla River which TMDL restrictions for bacteria, temperature, pH, toxics, and dissolved oxygen.
  - New storage lagoon will allow storage of effluent in slowly throughout the winter – which will eventually be irrigated onto crops; and will also store effluent in September and October – which will eventually be disinfected and discharged into Garrison Creek.
- Project includes
  - New 50 MG effluent storage lagoon.
  - Pump station to pump effluent up to new lagoon.
  - New irrigation pump station and distribution system to irrigate existing 110 acres of crops.
  - New system to disinfect lagoon effluent and allow discharge to Garrison Creek during non-critical period.
  - Improvements to existing influent screens.
- Financing
  - Estimated construction cost of \$20 million.
  - City self-funded a Facility Plan (\$235,000) in 2017 to 2018.
  - Submitted for State Ecology funding for design (\$2.5 million) in Fall 2018 – was ranked #4 and fully funded.
- Project Schedule
  - City has secured 80-acre parcel which will be site for new storage lagoon.
  - City has selected engineer and design is underway.
  - Design will be completed by end of 2021.
  - Anticipate application for Washington State Department of Ecology funding in Fall 2021 and construction during 2022 and 2023.

## Project Map



## Site Plan



Please direct questions and concerns to: Mr. Paul Hartwig – Public Works Director, College Place City Hall – 625 S. College Ave, Phone: (509)-394-8526, Email: [phartwig@cpwa.us](mailto:phartwig@cpwa.us)





August 3<sup>rd</sup>, 2020

Mr. Richard Berndt  
Economic Development Administration  
Jackson Federal Building, Room 1890  
915 Second Avenue, Seattle, WA, 98174

Dear Mr. Berndt,

I wish to convey my full support for the City of College Place's Wastewater Treatment Plant Upgrade/Renovation Grant Application to the Economic Development Administration's Public Works and Economic Adjustment Assistance CARES Act Funding Grant Program. The Wastewater Treatment Plant project is a requirement imposed on the City by the State Department of Ecology. The project is needed to meet environmental requirements and address capacity issues. The City of College Place is a community of 9,665 (2019) with an average total budget of around \$35 million. The City is deemed a "hardship" community by State regulatory agencies. The Wastewater Treatment Plant project at an estimated price tag of \$22 million imposes too great a hardship on College Place utility ratepayers to bear and will deter economic development activities and pose a business retention challenge for the City. Please award the City the Economic Development Administration Public Works and Economic Adjustment Assistance CARES Act Funding Grant to help pay for the needed Wastewater Treatment Plant Upgrades/Renovation. Thank you.

Sincerely,

Members of the College Place Economic Development, Tourism, and Events Commission



## ED-900B – Beneficiary Information Form

### A. General Information

A.1. Proposed EDA Project Title:

proposed by Lead Applicant:

A.2. Beneficiary Organization Name:

A.3. Beneficiary Organization Address:

Street 1:

Street 2:

City:

County:

State:

Province:

Country:

Zip/Postal Code:

A.4. Please characterize the main industry/field of this beneficiary organization including the 6-digit NAICS code for the products and services produced by the organization:

### B. Estimated Impact of the EDA Investment

B.1. As indicated in the table below, as a direct result of the proposed scope of work, will be able to create and/or save jobs and/or generate private investment.

| Jobs Created         | Jobs Saved           | Private Investment   |
|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> |

B.2. Please identify the basis for the estimated number of jobs that will be created or saved for your organization?

B.3. What types of private investment are likely to be generated?

B.4. Please describe the timeframe associated with the jobs and private investment identified in the table above:

B.5. Are there other ways that this project will benefit your business or organization?

## C. Provision of Data on the EDA Investment

The Economic Development Administration (EDA) tracks job and private investment resulting from its awards. If this application results in an award, each beneficiary must provide to the successful recipient job and private investment results up to 9 years after the EDA grant award in order to assist the grantee with fulfilling these reporting requirements.

☐ Check box to indicate that your company intends to provide the recipient with information on jobs and private investment generated as a result of the EDA project.

Signature of authorized representative for the beneficiary organization

Date

\_\_\_\_\_

\_\_\_\_\_

Name and title of beneficiary organization authorized representative

Name

Title



## D. Assurances by Beneficiary that is an "Other Party"

An authorized or corporate representative of any beneficiary that is considered an "Other Party" as defined below, must also sign to show that the beneficiary intends to comply with the U.S. Department of Commerce (DOC) and EDA regulations described below.

As defined at 13 C.F.R. § 302.20(b)(1), an "Other Party" is an entity that intends to create or save **15 or more permanent jobs** as a result of this EDA-supported project and is specifically named in the application as benefiting from the project or will be located in a building; port; facility; or industrial, commercial, or business park constructed or improved in whole or in part with EDA investment assistance prior to EDA's final disbursement of funds.

By submitting these assurances, the Other Party will comply with the following requirements:

- Section 601 of Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and the DOC's implementing regulations at 15 C.F.R. part 8, which proscribe discrimination on the basis of race, color, or national origin.
- 42 U.S.C. 3123, 42 U.S.C. 6709, and the DOC's regulations at 15 C.F.R. part 8a, which proscribe discrimination on the basis of sex.
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794), and the DOC's implementing regulations at 15 C.F.R. part 8b, which proscribe discrimination on the basis of disabilities.
- The Age Discrimination Act of 1975, as amended (42 U.S.C. 6101 et seq.), and the DOC's implementing regulations at 15 C.F.R. part 20, which proscribe discrimination on the basis of age.

Signature of authorized representative for the beneficiary ("Other Party") entity

Date

\_\_\_\_\_  
Name and title of beneficiary organization authorized representative

Name

Title

# Instructions for the ED-900B – Beneficiary Information Form

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This form must be completed as provided by EDA's policies and at a minimum by an authorized or corporate representative of the identified beneficiary organization whose position reflects the authority required to make these assurances (such as the authority to hire employees). Legal authorization for a corporate official may be specified in the Corporation's or LLC's formation documentation, bylaws, or similar document and under the laws governing the Virgin Islands, American Samoa, Guam and the Commonwealth of the Northern Marianas Islands. In the case of an individual executing this form as a sole proprietor or private owner, the sole proprietor's or owner's role and position must be indicated. For other circumstances, please contact your Regional Office.

## A. General Information

1. Enter the title of the proposed EDA project and the lead applicant.
2. Enter the name of the organization that is a "committed beneficiary" in the application for EDA assistance. Note that a separate form must be completed by each identified "committed beneficiary."
3. Enter the address of the organization in #2.
4. Please characterize the main industry/field for the beneficiary organization. A searchable list of North American industries is available at <http://www.census.gov/eos/www/naics/>.

## B. Estimated Impact of the EDA Investment

This section should be completed by each beneficiary of the proposed project that has been identified as "committed" by the EDA applicant.

For the purposes of completing the table in this section

- Jobs created means that as a direct result of this project, these jobs will be generated.
- Jobs saved means that without this project, the jobs listed here would be lost.

Only long-term, full-time direct jobs should be listed in the table. Part-time jobs should be converted to full-time equivalents (sum the total part-time hours worked per week and divide by the hourly work week for full-time employees, normally 35-40 hours).

- Private Investment means the total private sector capital investment made because of the EDA investment, including investments in new plant and equipment. Do not report private sector contributions to project construction or loan fund capitalization reported above in this section.

## C. Provision of Data on the EDA Investment

This section should be completed by each beneficiary of the proposed project that has been identified as "committed" by the EDA applicant.

## D. Assurances by Beneficiary that is an "Other Party"

Any beneficiary that meets the definition of "Other Party" that will create or save 15 or more permanent jobs as a result of the EDA investment, must have an authorized representative for the beneficiary "Other Party" organization complete Section D.