City of Cascade
City Council Public Hearing
Staff Report
The River District
Annex 19-01, Zone 19-01, PUC 19-01, SUB 19-01

Staff:	Heather M. Soelberg
Public Hearing:	January 27, 2020
Applicant:	Steve Arnold, A-Team Land Development & Real Estate
Owner:	Cascade River LLC
Location:	North-east of Highway 55, adjacent to the Payette River
Size of Site:	122.41 acres (updated)
Existing Zone:	Mixed Use (MU)
Proposed Use:	Mixed Use Subdivision

This Staff Report is for the Public Hearing for Monday, January 27, 2020 called by City of Cascade Regular City Council meeting schedule. This is a Public Hearing.

REQUEST

Steve Arnold, A-Team Land Development & Real Estate (hereby "Applicant" or "Developer") made a request for approval of a mixed-use development for The River District fka River Ranch Subdivision ("Project" or "Site"). The application packet consisted of an Annexation Application, Rezone Application, Planned Unit Development Application and a Preliminary Plat Application (hereto referred as "Submittal").

The applicant is requesting annexation of 122.41 acres currently zoned as MU. The site is located outside of the City limits within the area of impact and is currently used as agricultural/grazing land (see **Exhibit A**). The site is contiguous with existing City limits to the west (at the river point, wherein the river is not considered a separator). The applicant has requested the site be zoned C along the frontage of Highway 55, and R-3 for the remaining property.

The development consists of [updated numbers]: (i) 6.17 acres of commercial use; (ii) 15.06 acres of multi-family use; (iii) 65.39 acres of single-family use; and (iv) 35.79 acres of open space. The subject property is located northeast of Highway 55, adjacent to the Payette River along the southern bank.

STANDARDS REVIEWED AND APPLIED FOR APPLICATIONS

1. Idaho Statute Sections: 67-6512, 6509, 6535, 50-222(3), 50-223, 63-2215, 67-6525, 67-6511
2. Idaho Code Section 5-1301 through 50-1329
3. Cascade City Codes: CCC 3-2-6-C-6, CCC 3-1-12-A-7(j), CCC 3-2-6-C-7, CCC 3-2-4-A, CCC 3-2-4-C/D, CCC 3-2-6-E-1(a-d), CCC 3-2-3-C-4, CCC 3-1-8-D-2(f-g), CCC 3-1-8-D-2(d), CCC 3-1-8-D-2(a), CCC 3-2-4-D-1, CCC 3-1-8-F, CCC 3-2-3-B-5-c-1, CCC 3-5-4-E-3-h, CCC 3-1-14-A-2-b-2, CCC 8-5-4, and Section 3.2.2 Functional Classification of the Comprehensive Plan

Final Plat for the subdivision will be considered after approval of Construction Drawings.

BACKGROUND

As Council will recall, the applications in this matter came before the City Council for a public hearing and deliberation on November 18. At that meeting the Council received public comment, completed the public hearing, and continued deliberations to December 9.

Since that date, the City held a water/wastewater workshop before the Council with the City's water/wastewater consultant, Paul Scoresby, and the City Engineer, Trevor Howard. The meeting provided further information relevant to future development – which in turns makes such information relevant to the ongoing deliberations about the River District proposal. As a result of this meeting and further investigation on the part of the engineering team new information is ready for consideration by the Council regarding the City's water and wastewater capacities.

Also since that date, staff received a Summary of the forthcoming Traffic Impact Study ("TIS") which was still incomplete as of that time (received on December 20, 2019)(**Exhibit B**); and then received the complete TIS on January 13, 2020 (**Exhibit C**). Staff has also engaged the Applicant in discussions about further forthcoming information, and further discussions of items/conditions relevant to a draft development agreement.

UPDATES

A. **Sewer/Wastewater infrastructure** have been preliminarily determined (reference **Exhibit D**). This Exhibit reflects the available connections and required system improvements to correlate with the developer's phasing. Items related to sewer/wastewater capacities, permittable EDUs and SAF Fee payment negotiations are currently underway through the Development Agreement process.

B. **Water supply data remains the same, per the letter provided by Schiess and Associates dated November 21, 2019.** Consideration should be given to the Agency Letter received from Cascade Rural Fire Protection District on November 13, 2019 (attached as **Exhibit E**) which remarks on concerns of water storage for fire suppression for such a large development. A water model is needed to verify fire flows to the PUD.

C. **Unknown Fiscal Impacts to the City remains.** As stated previously Treasurer review of the Fiscal Impact Report indicates that the numbers as prepared by Applicant do not accurately reflect the fiscal impact to the City. Treasurer review indicates that the development as proposed is likely to cause financial impact in the form of a deficit to the City. **The Treasurer has made multiple requests to the Applicant to provide data to further attempt to verify Applicant's figures but Applicant was non-responsive to these requests.**

1. It should be noted that Parties have been negotiating the Development Agreement and as submitted to date, Applicant and Developer have not included plans to mitigate the likely deficit the City may experience if the PUD is approved. It was stated in former Conditions that the "Development Agreement shall include stipulation(s) for developer to provide fiscal relief in order for the passage of Planned Unit Development". Treasurer recommends upholding this required Condition.

D. **Traffic impacts on State Highway 55** (ITD jurisdiction) **continue to remain unknown since ITD has not begun their review of the TIS.** Applicant submitted the Traffic Impact Study to City and ITD on January 13, 2020. This did not allow enough time for ITD to review the Study by January 27, 2020 Hearing. ITD has the review of the Study scheduled to begin January 30, 2020.

1. Until ITD's review and determinations are received, it leaves the continued uncertainty of where the two (2) access points of the PUD will be; it is Staff's opinion that ITD will not allow for both accesses to remain on Highway 55 which would then require modification of the Preliminary Plat.

2. Applicant is requesting that Council stipulate conditional approval of the PUD subject to parties' blanket agreement to ITD's Conditions of Approval - meaning to agree to whatever ITD conditions are before City and Council has had a chance to review ITD's conditions. Staff strongly recommends against this action as this would commit the City to unknown contractual agreements and conditions which could involve cost or risk that the City may never consider entering into in other circumstances. The City must know ITD's Conditions of Approval and the ramifications to the City before entering into a blanket agreement.

Staff therefore recommends allowing the standard process of development to continue:

1. Allow for ITD to complete their initial review. At this point ITD will "redline" the Study and require revisions and/or additional data to be performed on the Study and/or provided by the Applicant; once items are redlined, the updated Study and supplemental information will be resubmitted to ITD for second review (this may transpire one or more cycles).

2. Additionally, as is standard process, the City will also be issuing City's comments and redlines of the TIS to Applicant which Applicant will be required to address. This will happen concurrently with ITD's review.

3. Upon issuance of ITD's approval of the Study with ITD's stated Conditions of Approval, as per industry standard and best practices, the City should then review ITD's Conditions to determine possible impacts that ITD's determinations will have on the City. These impacts could be minimal or significant to the City. **Examples** *may include* **but are not limited to**:
    I. If signaled intersection at the entrance of the PUD is required, the City would be required to accept the signals and all responsibilities that entails including but not limited to maintenance and repair of the signal lights, poles and apparatus; this would add operating cost to the City's budget.
    II. By adding one signaled intersection to the City along the highway ITD may require a signal at the opposite end of town or within town to create a controlled and balanced traffic flow. The same rule would apply to the City requiring acceptance of the signals.
    III. Adding a signaled intersection could trigger ITD requiring pedestrian facilities from the PUD into town; while the developer would pay for the installation of the infrastructure ITD would require the City to enter into a Maintenance Agreement for the upkeep of said infrastructure, adding operating costs to the City's budget.

4. The City will then have all data necessary to thoughtfully and knowledgably make determinations on the City's own Conditions of Approval, should Council decide to approve the applications.

COMMENTS

PUBLIC COMMENTS

1. No public comments have been received by the City since the December 9, 2019 public hearing.

AGENCY COMMENTS

1. Email received from Idaho Transportation Department ("ITD"), PO Box 8028, Boise, Idaho, on January 16, 2020 (**Exhibit F**): wrote that ITD has received the Traffic Impact Study and that it is scheduled for review January 30, 2020. Copy of this agency comment is attached.

STAFF COMMENTS

Applicant has made request of Staff to provide clear Conditions of Approval and to certify that Staff has no remaining requirements of Applicant that have not already disclosed.

1. At this time, Staff anticipates no requests for additional reports or studies. For clarification, Staff does anticipate subsequent submittals to adequately address comments that have been made (and that are forthcoming - TIS).
2. As standard industry best practice, Staff will be submitting comments/redlines to the Applicant on the TIS which will require Applicant response.
3. Staff must elicit direction from Council in order to provide clear Conditions of Approval; Staff will issue Conditions of Approval upon final determinations stipulated by Council.

TREASURER COMMENTS

The global financial impact to the City should be considered. At this time, the City has significant property already located within the City limits that would stretch the City's ability to provide adequate services to, if they were to be developed. This includes concerns related to infrastructure, staffing, code enforcement, building inspector, potentially law enforcement and emergency services, etc.

The City has expended close to $70k on this development to date. That is a significant amount of money. The length of time this process has taken is a financial strain that is going to have a lasting impact on the City.

Experience with the developer/applicant on this process to date has been antagonistic at best. I foresee the developer's resistance to provide basic information as requested as an indicator that the developer will continue to be difficult to work with in the future. If we cannot work cohesively as staff and developer to bring this development forward, how is the City going to be able to work with the developer in the future as the development progresses?

STAFF FINDINGS AND RECOMMENDATIONS

A. **Staff finds** that the Applicant's intent to Annex and Zone the property is for development of the PUD. Approval of annexation and zoning is dependent upon approval of, or confidence that the City will approve such PUD and related Development Agreement.
    1. **Staff recommends** that Council deny Annexation and Zone requests due to Applicant's refusal to continue discussing key elements of the Development Agreement which are required to protect the City's interests.

B. **Staff finds** that since new information has been uncovered since last Council meeting, and further relevant information is forthcoming, Staff does not feel all relevant information has been presented for Council to make an informed decision on approval or denial of the Preliminary Plat and Planned Unit Development at this time.
    1. **Staff recommends** deliberations on the Preliminary Plat and Planned Unit Development be continued to a regular City Council meeting after such time that all remaining information is presented fully.

C. **Staff finds** that as new information has been provided that is relevant to the submittal that the public should have time to review the information and provide comment.
    1. **Staff recommends** Council direct re-opening of the public hearing with such new information be made available for public review.

D. **Staff finds** that P&Z Commission made determinations on a list of six (6) Exceptions requested by Applicant that would allow the project to develop certain components not in compliance with City Code (**Exhibit G**). These items need to be acted upon by Council at this time.
    1. **Staff recommends** Council approval of Items 1, 3-5. Item 2, which had previously been rescinded by Applicant but is now being requested, is prohibited by Code and Fire Marshall, is recommended to be denied. Staff remains moot on Item 6 but if pressed by Council, Staff would recommend denial. Staff requests Council to make final determination on each of the Exceptions requested.

E. **Staff finds** that the City cannot accommodate a deficit to the budget as a result of any development, and that solutions and mitigation prior to approval or denial of the submittal are essential for the City to ensure that the citizens do not pay the price for costly development.
    1. **Staff recommends** City Council require Applicant to provide the City Treasurer with the information that has been requested, in addition to providing a formal economic plan illustrating solutions and measures that will ensure that the City does not experience a deficit. This plan would then be integrated into the Development Agreement which is currently under draft and negotiation by parties.

F. **Staff finds** that there are discrepancies in the number of units between the Preliminary Plat, the Market Absorption Letter and the Development Agreement. Staff has determined that the number reflected in the Development Agreement draft is correct.
    1. **Staff recommends** Council to direct Applicant to make corrections and submit updated Preliminary Plat and Market Absorption Letter to City.

G. **Staff finds** that the two (2) access road names as shown on the TIS (Payette and Ponderosa) are duplicative to existing roads in Cascade. Per CCC (8)(5)(4)(B-1) changes in suffix (lane, street, avenue, etc) shall not differentiate road names. Per CCC (8)(5)(4)(B-6) the extension of River View Drive from across Highway 55 shall apply to the main access point into The River District.
    1. **Staff recommends** Council to direct Applicant to rename roadways and submit updated Preliminary Plat to City.

ATTACHMENTS:

I. Exhibit A - City Limits Map
II. Exhibit B - Preliminary Traffic Impact Study Summary
III. Exhibit C - Completed Traffic Impact Study
IV. Exhibit D - City Engineer SAF Fee / Phasing Schedule
V. Exhibit E - Agency Letter: Cascade Rural Fire District
VI. Exhibit F - Agency Email: Idaho Transportation Department

EXHIBIT A

City of Cascade

- 4.69 square miles
- 3,001.6 total acres

City Limits Boundary

EXHIBIT B

Peggy Breski

From: steve@ateamboise.com
Sent: Friday, December 20, 2019 10:24 AM
To: Peggy Breski; Judith R. Nissula; Heather Soelberg
Subject: RE: Traffic Impact Study
Attachments: The River Distsrict TIS Memo-DRAFT 12132019.pdf

Peggy,

Attached is a summary of the preliminary findings of the TIS, we will have the finalized draft by next week. Please let me know if you have any questions.

Thank You,

Steve Arnold, Project Manager
208-871-7020
Steve@ateamboise.com

From: Peggy Breski <peggyb@horrocks.com>
Sent: Monday, December 16, 2019 8:45 AM
To: steve@ateamboise.com; Judith R. Nissula <mayor@cascadeid.us>; Heather Soelberg <clerk@cascadeid.us>
Subject: Traffic Impact Study

Steve,

If I remember correctly you said we'd have the TIS today? Looking forward to it.

Thanks so much,

Peggy Breski
Senior Planner | Project Manager

HORROCKS ENGINEERS

2775 W. Navigator Dr., Suite 210
Meridian, Idaho 83642

Phone 208-895-2520, ext. 435
Email peggyb@horrocks.com
Web www.horrocks.com

EXHIBIT B

CR ENGINEERING, INC.
181 East 50th Street
Garden City, ID 83714
(208) 841-4996

MEMORANDUM – DRAFT

DATE: December 13, 2019

TO: Steve Arnold
A Team Land Development

FROM: Chhang Ream, P.E., PTOE
CR Engineering, Inc.

PROJECT: The River District
Cascade, Idaho

SUBJECT: Traffic Impact Study – Preliminary Findings

This memo summarizes preliminary results and findings from the traffic impact study for the referenced project (site plan attached). The key findings are that the proposed Ponderosa Street and SH 55 intersection is expected to exceed ITD's minimum operational thresholds with 2040 full build-out year total traffic and will need improvements. Three mitigation options were evaluated:

1. Conventional signalized intersection
2. Single-lane roundabout
3. Restricted Crossing U-Turn (RCUT) intersection
   - RCUT is an alternative intersection design which prohibits left-turn and through movements from the side street approaches. These movements are accommodated by requiring the drivers to make a right turn onto the main road and then make a U-turn 400 to 1,000 feet after the intersection (Please refer to FHWA Restricted Crossing U-turn Information Guide, 2014 for more information). Example concept exhibit is attached.

Based on operational analysis, all three intersection alternatives are expected to mitigate the estimated 2040 traffic conditions to meet ITD's minimum operational thresholds. The preferred alternative will need to be studied further and worked out among ITD, the City of Cascade, and the developer.

The preliminary results and findings are summarized below.

1. PROPOSED DEVELOPENT (Preliminary site plan is attached)

- Mixed-use development with: 9 cottages, 135 single-family dwelling units, 43 townhomes, 256 multifamily dwelling units, and approximately 54,000 square feet of general commercial space
- The expected build-out year (full occupancy) is 2040
- Two full-access approaches are proposed on SH 55 for site access, Payette Street to the northwest and Ponderosa Street to the southeast to align with Riverview Driveway
- Based on Institute of Transportation Engineers (ITE) trip generation rates, build-out of the proposed development is expected to generate 7,628 trips per weekday, 421 trips during the AM peak hour, and 645 trips during the PM peak hour.
  - 1% of trips generated by the development in the AM peak hour and 20% in the PM peak hour are expected to be captured internally within the site
  - The development is expected to attract 94 pass-by trips in the PM peak hour

- Most of the site traffic (90%) is expected to have origins/destinations northwest of the site and 10% southeast of the site

2. 2019 EXISTING TRAFFIC CONDITIONS

- Existing AM and PM peak hours traffic counts were obtained for the Riverview Parkway and SH 55 intersection on November 20-21, 2019
  - The peak hour counts were adjusted to the peak month volumes (July) based on the seasonal adjustment factors developed from historical traffic data from Automated Traffic Recorder (ATR) No. 043 "Valley" located 14 miles north of the development on SH 55
- One crash was reported on SH 55 along the site frontage between 2014 and 2018.
- Riverview Parkway and SH 55 intersection is operating at LOS B during the peak hours with the seasonal adjusted peak hour volumes, which meets ITD minimum operational thresholds.
  - No intersection control, capacity improvements, or turn lanes are needed under 2019 existing traffic conditions

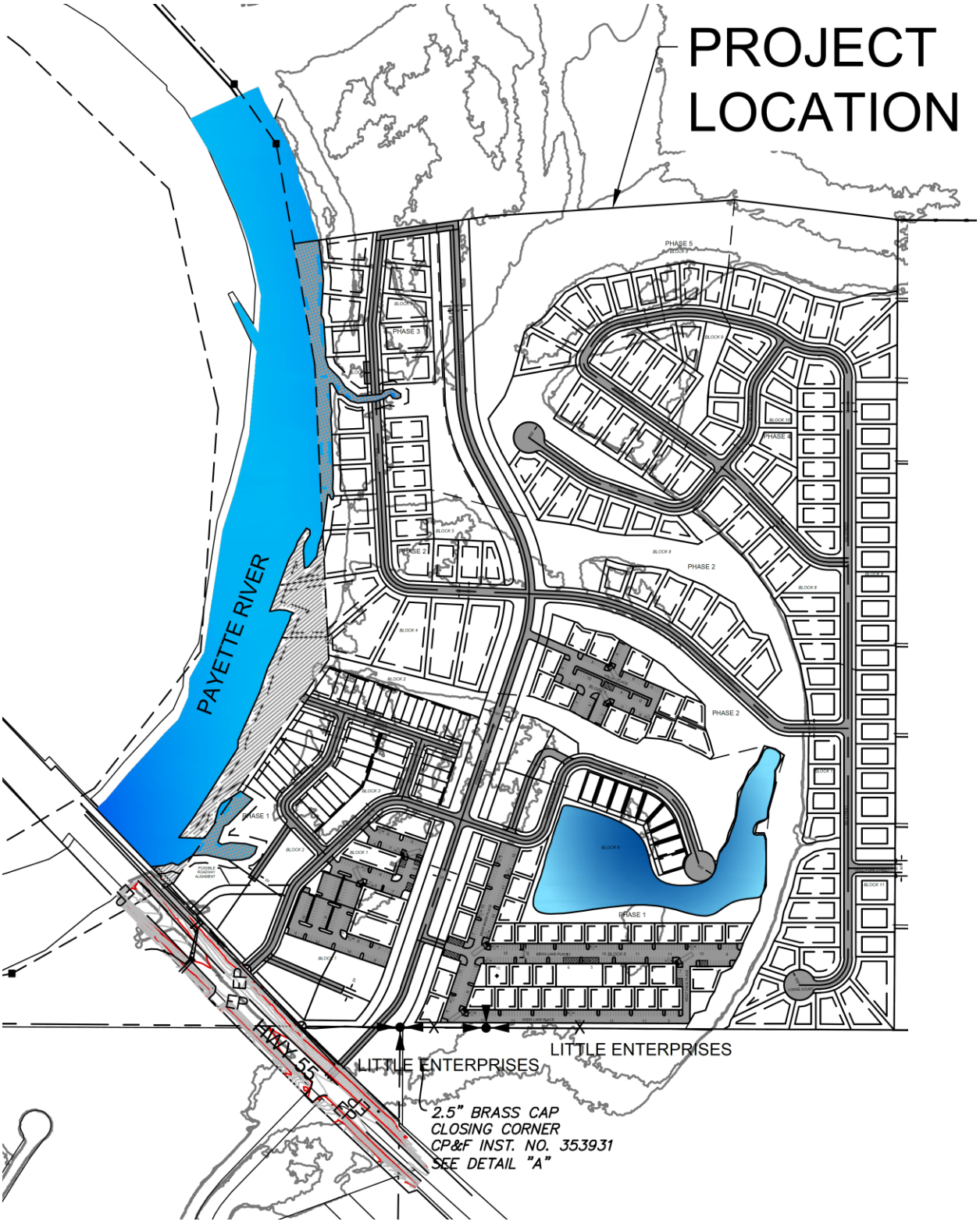
3. 2040 BACKGROUND TRAFFIC

- The expected background traffic growth on SH 55 is estimated by extrapolating the adjusted existing counts with a 2.0% annual growth
- The proposed Riverview Park Subdivision (55 dwelling units) is planning to take access on Riverview Parkway. Site traffic generated by this off-site development is included in the analysis
- With 2040 background traffic, the Riverview Parkway and SH 55 intersection is expected to meet ITD's turn lane guidelines for following turn lanes on SH 55:
  - Southeast-bound right-turn lane
  - Northwest-bound left-turn lane
- With 2040 background traffic growth and turn lanes, Riverview Parkway and SH 55 intersection is expected to operate at LOS C or better during the peak hours, meeting ITD minimum operational thresholds.

4. 2040 TOTAL TRAFFIC

- With 2040 total traffic, the proposed Payette Street and SH 55 intersection is expected to meet ITD's turn-lane guidelines for the following turn lanes on SH 55:
  - Northwest-bound right-turn lane
  - Southeast-bound left-turn lane
- The proposed Payette Street and SH 55 intersection is expected to meet ITD minimum operational thresholds with the turn lanes as an unsignalized intersection
- With 2040 total traffic, the proposed Ponderosa Street/Riverview Parkway and SH 55 intersection is expected to meet ITD's turn-lane guidelines for the following turn lanes on SH 55:
  - Northwest-bound right-turn lane
  - Southeast-bound left-turn lane
- The proposed Ponderosa Street/Riverview Parkway and SH 55 intersection is expected to exceed ITD minimum operational thresholds during the peak hours and will need improvements
  - Three intersection alternatives are proposed to mitigate the intersection:
    - Single-lane roundabout
    - Traffic signal
    - RCUT intersection

Attachment A – Site Plan



Attachment B – RCUT Intersection Concept Example

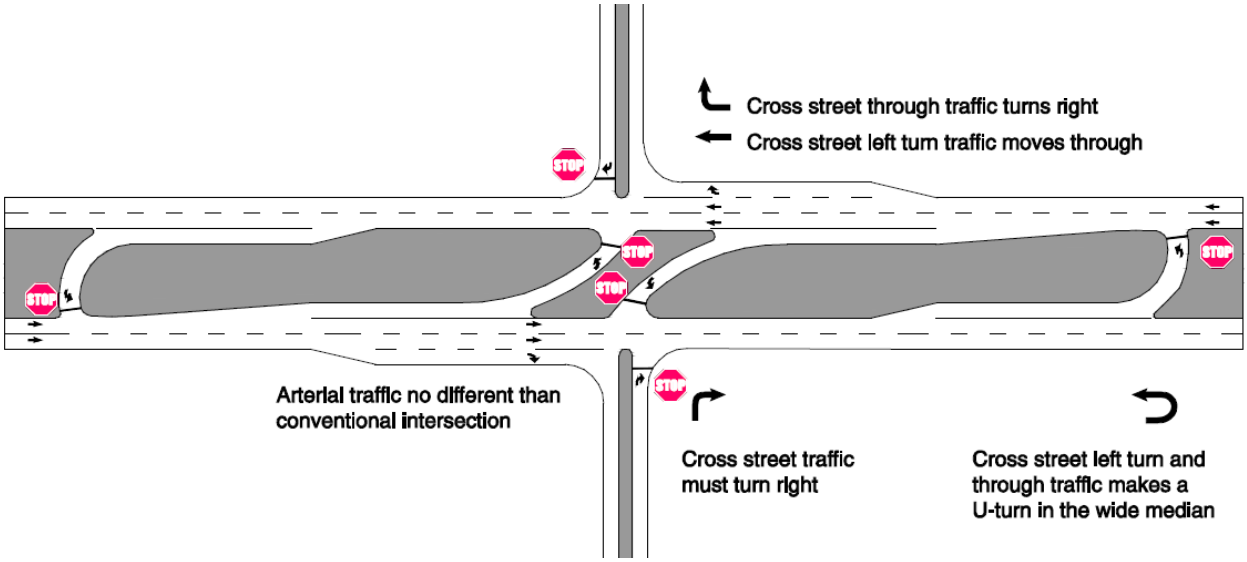
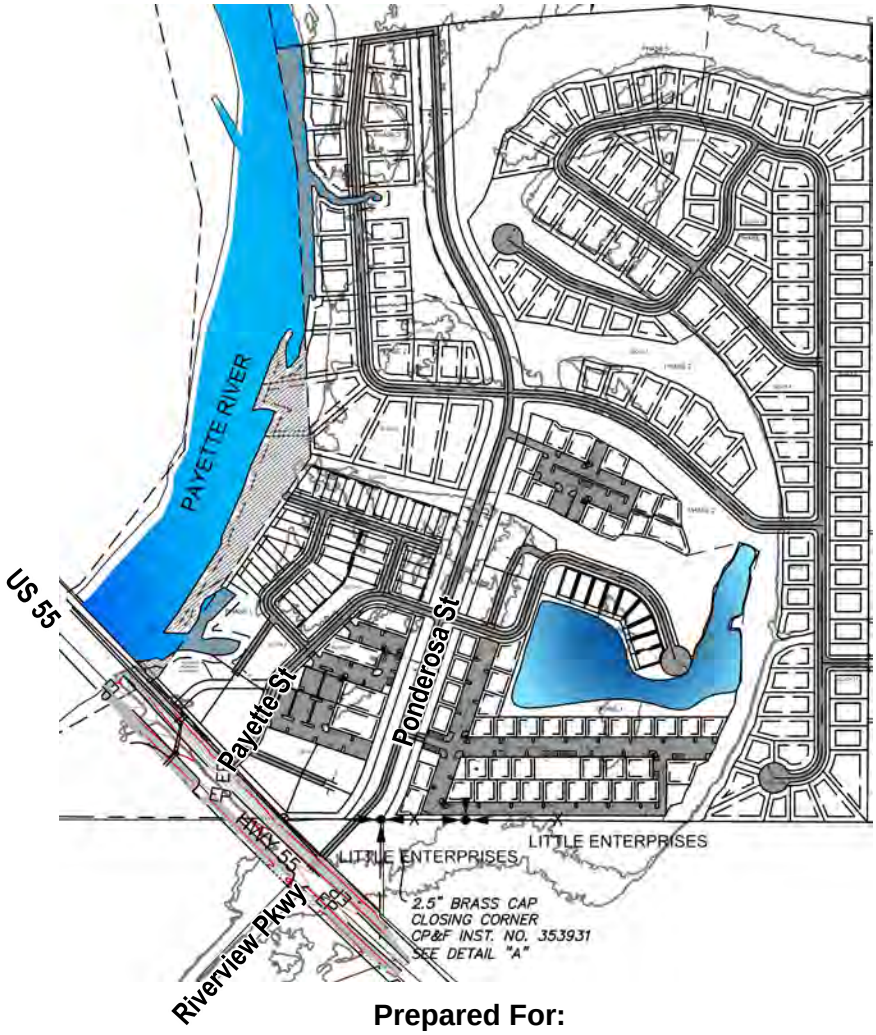


EXHIBIT C
(84 pages total)

TRAFFIC IMPACT STUDY

THE RIVER DISTRICT

Cascade, Idaho
January 10, 2020



Prepared For:

A TEAM
Land Development & Real Estate Services

Prepared By:

GR ENGINEERING, INC.
181 East 50th Street
Garden City, ID 83714
(208) 841-4996

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EXECUTIVE SUMMARY

A-Team Land Development retained CR Engineering, Inc. to prepare a traffic impact study (TIS) for The River District, a proposed mixed-use development located northeast of the Riverview Parkway and SH 55 intersection in Cascade, Idaho, as shown in **Figure 1.1**. The scope of this TIS was determined through coordination with the Idaho Transportation Department (ITD).

The TIS evaluates the potential traffic impacts resulting from, background traffic growth, off-site development in the area, and the proposed development, and identifies improvements to mitigate the impacts if needed. Traffic impacts were evaluated based on the proposed land uses and access as shown in the preliminary site plan under weekday AM and PM peak hours traffic conditions. **Table 1** summarizes the improvements needed to mitigate the traffic impacts for the following analysis years traffic conditions:

- 2019 Existing traffic
- 2040 Build-out year background traffic
- 2040 Build-out year total traffic

Table 1 – Proposed Intersection Improvements Summary

Intersection		2019 Existing	2040 Build-Out Year	
			Background	Total
(1)	Riverview Parkway and SH 55	None	**Southeast-bound right-turn lane**	**Roundabout, signal, or RCUT**
(2)	Payette Street and SH 55 (proposed access)	N/A	N/A	**Northwest-bound right-turn lane**

1.0 Proposed Development

1.1 The River District is a proposed mixed-use development estimated to include 144 single-family dwelling units, 299 multifamily dwelling units, and 54,000 square feet of general retail land use. The expected build-out year is 2040 but may change depending on the market conditions.

1.2 Based on the procedures outlined in the *Trip Generation Handbook, 3rd Edition* and the *Trip Generation Manual, 10th Edition,* both published by the Institute of Transportation Engineers (ITE), the proposed development is estimated to generate approximately 7,628 trips per weekday with 421 trips during the AM peak hour and 645 trips during the PM peak hour.

- Based on the proposed land use and ITE methodologies, the development is expected to capture approximately 1% of the AM peak hour trips and 20% of the PM peak hour trips within the site. The daily capture rate was assumed to be 10%, the average of the AM and PM peak hour capture rates.
- Based on ITE pass-by rates, the proposed retail land use within the development is expected to generate 94 pass-by trips in the PM peak hour. No ITE pass-by trip rate is available for the proposed retail land use in the AM peak hour or daily and was not included in the analysis.
- All trips generated by the development were assumed to be made by personal or commercial vehicles.

1.3 The estimated site traffic distribution patterns are:

- 90% with origins/destinations northwest of the site
- 10% with origins/destinations southeast of the site

1.4 The River District is proposing two access points on SH 55 for site access:

- Payette Street (Northwest access)
  - Proposed as a full access located approximately 450 feet southeast of the existing North Fork Payette River bridge and 400 feet northwest of Riverview Parkway, an existing approach on SH 55
  - Does not meet ITD's 1,320-foot minimum spacing requirements for public road spacing on a regional route in a transitional area
  - Meets ITD's 360-foot minimum spacing requirements for a full access driveway on a regional route in a transitional area
  - Expected to meet ITD's minimum operational thresholds with 2040 total traffic as an unsignalized intersection

- Ponderosa Street (Southeast access)
  - Proposed as a full access to align with Riverview Parkway to the southwest
  - Located approximately 460 feet northwest of the northernmost access to the Cascade Airport
  - Does not meet ITD's 1,320-foot minimum spacing requirements for public road spacing on a regional route in a transitional area
  - Meets ITD's 360-foot minimum spacing requirements for a full access on a regional route in a transitional area

2.0 2019 Existing Traffic Conditions

2.1 Traffic counts were collected at the Riverview Parkway and SH 55 intersection on November 21, 2019. To account for peak season travel along SH 55, the traffic volumes along SH 55 were adjusted for seasonal variations to reflect the summer peak month traffic volumes. Seasonal adjustment factors were estimated from historical traffic data from Automatic Traffic Recorder (ATR) No. 043. The seasonal adjustment factors used in this study are:

- 1.96 in the AM peak hour
- 2.67 in the PM peak hour

2.2 With 2019 seasonally-adjusted existing traffic, the Riverview Parkway and SH 55 intersection meets ITD's minimum operational thresholds. Additionally, no turn lanes are required based on ITD's turn-lane guidelines. As a result, no improvements are needed to mitigate 2019 existing traffic.

3.0 2040 Background Traffic Conditions

3.1. The study area intersection and roadway are expected to remain the same as existing conditions. ITD conducted a corridor study for SH 55 from Marsing to Banks Lowman Road between 2014-2016. However, the North Corridor Plan (Banks Lowman Road to New Meadows) has not been completed and is not available at the time of this study.

3.2. 2040 background traffic on SH 55 was estimated by extrapolating the seasonally adjusted 2019 existing counts with a 2% annual growth rate.

- This growth rate was estimated based on historical traffic count data from ATR No. 043

3.3. In addition to the traffic growth, one proposed off-site development located along Riverview Parkway was also included in the background traffic:

- Riverview Park Subdivision – 55 single-family lots

3.4. With 2040 background traffic, the Riverview Parkway and SH 55 intersection is expected to continue to meet ITD's minimum operational thresholds analyzed with the existing intersection control and lane configurations. Based on ITD's turn-lane guidelines, the following turn lane is needed:

- Southwest-bound right-turn lane

4.0 2040 Build-Out Year Total Traffic Conditions

4.1 With 2040 total traffic, the proposed Payette Street and SH 55 intersection is expected to meet ITD's minimum operational thresholds as an unsignalized intersection. Based on ITD's turn-lane guidelines, the following turn lane is needed

- Northwest-bound right-turn lane
  - The right-turn lane is warranted when the development generates approximately 590 PM peak hour trips

4.2 With 2040 total traffic, the Riverview Parkway/Ponderosa Street and SH 55 intersection is expected to exceed ITD's minimum operational thresholds. Three mitigation options are proposed to mitigate 2040 build-out conditions:

- Single-lane Roundabout
  - A single-lane roundabout is expected to operate at LOS B or better under 2040 build-out year peak hour total traffic conditions with two accesses on SH 55 and LOS C or better with one access onto SH 55
- Signal with left-turn lanes on all approaches
  - A signal is expected to operate at LOS A under 2040 build-out year peak hour total traffic conditions with two accesses on SH 55 and LOS B or better with one access on SH 55
- Restricted Crossing U-turns (RCUT) intersection – RCUT intersection alternative would allow right-in, right-out, and left-in movements only, and prohibits left-turn and through movements from the proposed access and Riverview Parkway. These movements will be accommodated by requiring the drivers to make a right-turn onto SH 55 and then make a U-turn after the intersection. A loon will need to be constructed on SH 55 400 to 1,000 feet southeast of the intersection to accommodate U-turns. Additional widenings on SH 55 will be needed to include a southeast-bound U-turn lane. The Payette Street intersection will also need to be widened to include a loon to accommodate U-turns.
  - All lane groups are expected to operate at LOS C or better with a v/c ratio of 0.38 or less with two accesses on SH 55 and LOS C or better with a v/c ratio of 0.55 or less with one access on SH 55

4.3 As discussed above, the Riverview Parkway/Ponderosa Street and SH 55 intersection is expected to exceed ITD's minimum operational thresholds under build-out conditions. Preliminary phasing analysis was conducted to determine when the intersection exceeds LOS D thresholds. The intersection is expected to operate at LOS E by year 2025 when the development generates 144 PM peak hour trips.

1.0 INTRODUCTION

CR Engineering, Inc. has been retained to prepare a traffic impact study (TIS) for The River District, a proposed mixed-use development located in the northeast quadrant of the Riverview Parkway and SH 55 intersection in Cascade, Idaho. **Figure 1.1** shows the site location and its vicinity. The TIS evaluates the potential traffic impacts resulting from background traffic growth, off-site development in the area, the proposed development, and identifies improvements to mitigate the impacts if needed.

Figure 1.1 – Site Location and Vicinity

1.1 Proposed Development

Figure 1.2 shows the preliminary site development plan with the proposed access locations. The expected build-out year for the development is 2040 but may change depending on the market conditions. At full build-out, The River District is estimated to include the following land uses:

- 144 single-family dwelling units
  - 135 single-family homes
  - 9 cottages
- 299 multifamily dwelling units
  - 43 townhomes
  - 52 fourplexes
- 54,000 square feet of general retail

Based on the preliminary site plan, the development is proposing one full access to align with Riverview Parkway and one full access to align with the existing private approach located approximately 400 feet northwest of Riverview Parkway.

1.2 Study Approach

The TIS was prepared in accordance with ITD *IDAPA 39.03.42 – Rules Governing Highway Right-of-Way Encroachments on State Rights-of-Way*. The scope of this TIS was determined through coordination with ITD.

1.3 Study Area

The following study area intersections were identified by ITD for collecting peak hour turning movement counts and traffic impact analysis:

1. Riverview Parkway and SH 55 intersection
2. All proposed site access points

1.4 Study Period

The analysis periods will be weekday AM and PM peak hours of operation of the transportation system. The analysis years are:

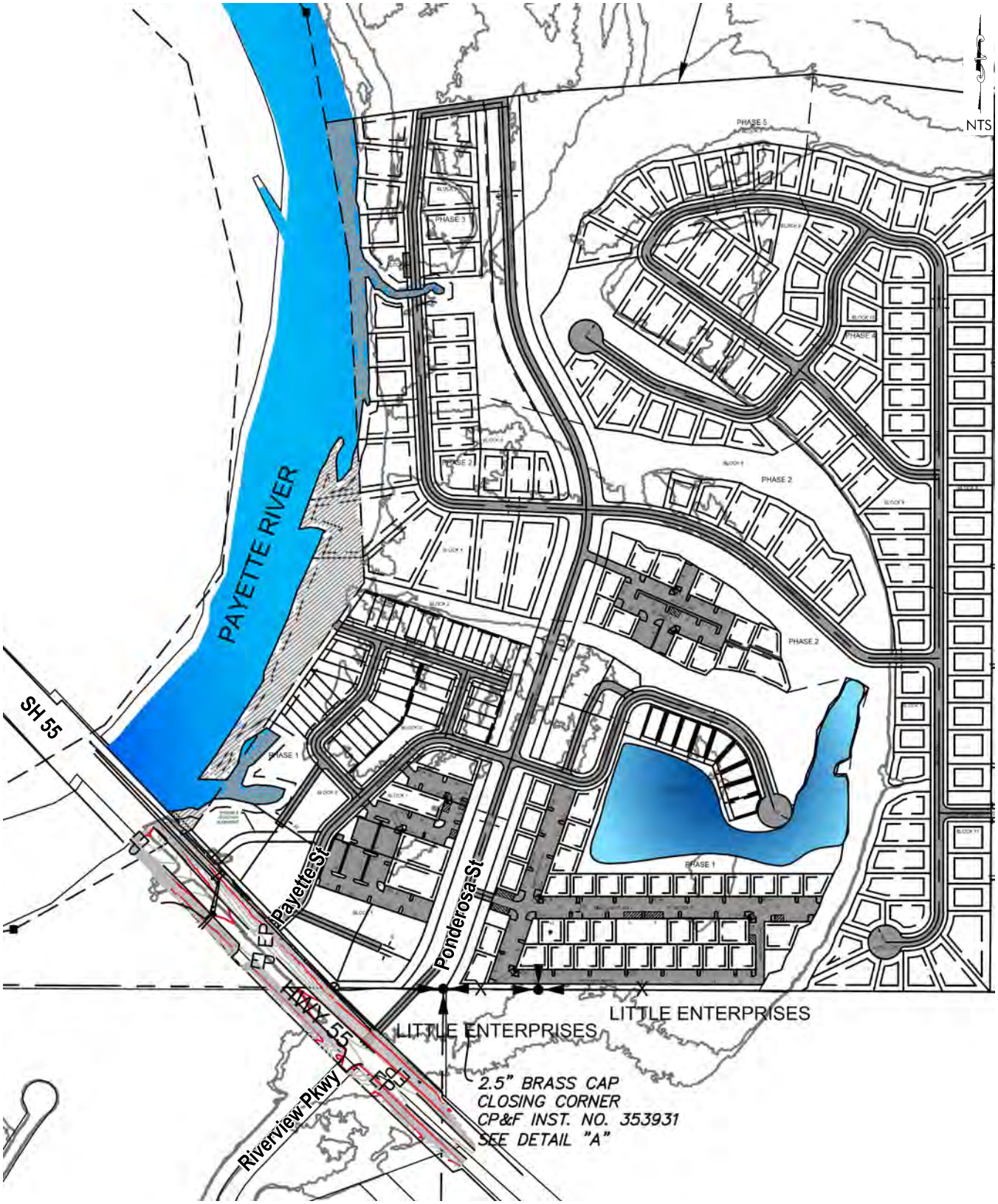
- 2019 existing traffic
- 2040 build-out year background traffic
- 2040 build-out year total traffic

1.5 Analysis Methods and Performance Measure Thresholds

Intersection capacity analysis was performed using the Synchro 10 (Version 10.3.122.0), which utilizes HCM6 methodologies. All parameters used in the analysis were based on existing data when available or Synchro default values, when not available. For future signals, the signal timing was optimized in Synchro for the intersection lane configuration and traffic conditions.

For intersections under ITD's jurisdiction, the minimum operational threshold is a v/c ratio of 0.90 for the overall intersection and lane group.

Figure 1.2 – Preliminary Site Plan



2.0 EXISTING CONDITIONS

2.1 Roadway Network and Lane Configuration

The study area roadways are described below. The roadway functional classification is based on the 2012 ITD Access Control Map for roadways under ITD's jurisdiction.

SH 55 is classified as a Regional Route with a posted speed limit of 35 mph west of Riverview Parkway and 45 mph east of Riverview Parkway. SH 55 has one lane in each direction with a center turn lane and a rural section without curb, gutter, or sidewalk.

Riverview Parkway is an unpaved local road providing access for the airport and recreational sites along the river.

2.2 Existing Traffic Volumes

Weekday AM and PM peak hour turning movement traffic counts were obtained on November 21, 2019. The peak hour intersection turning movement counts were collected on a weekday for a 2-hour period at 15-minute intervals between 7:00 and 9:00 during the AM peak travel period hour and between 4:00 and 6:00 during the PM peak travel period. Existing turning movement counts are included in the appendix.

Traffic volumes on SH 55 experience high seasonal variations due to numerous recreational sites. Based on historical traffic count data from ITD automatic traffic recorder (ATR) No. 043, traffic volumes on SH 55 are generally lower in the winter months compared to the summer months. The peak month typically occurred in July and the low month typically occurred in January. Based on the historical count data, the seasonal adjustment factors are 1.96 for the AM peak hour and 2.67 for the PM peak hour. **Figure 2.2** summarizes the seasonally adjusted existing peak hour traffic volumes for the AM and PM peak hours.

2.3 Intersection Crash Data

The most current five-year crash data (2014-2018) was obtained from the Local Highway Technical Assistance Council (LHTAC) website (http://gis.lhtac.org/safety/). There was one reported crash in the five-year span in which the driver drove left of centerline into an embankment due to inattentive driving.

Figure 2.1 – Existing Intersection Control Lane and Configuration

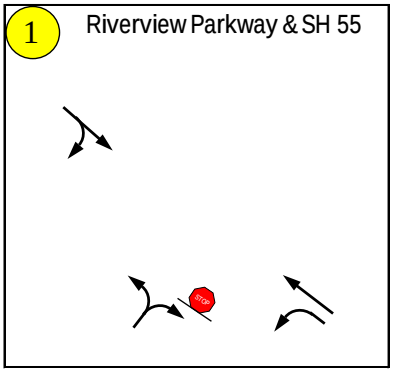
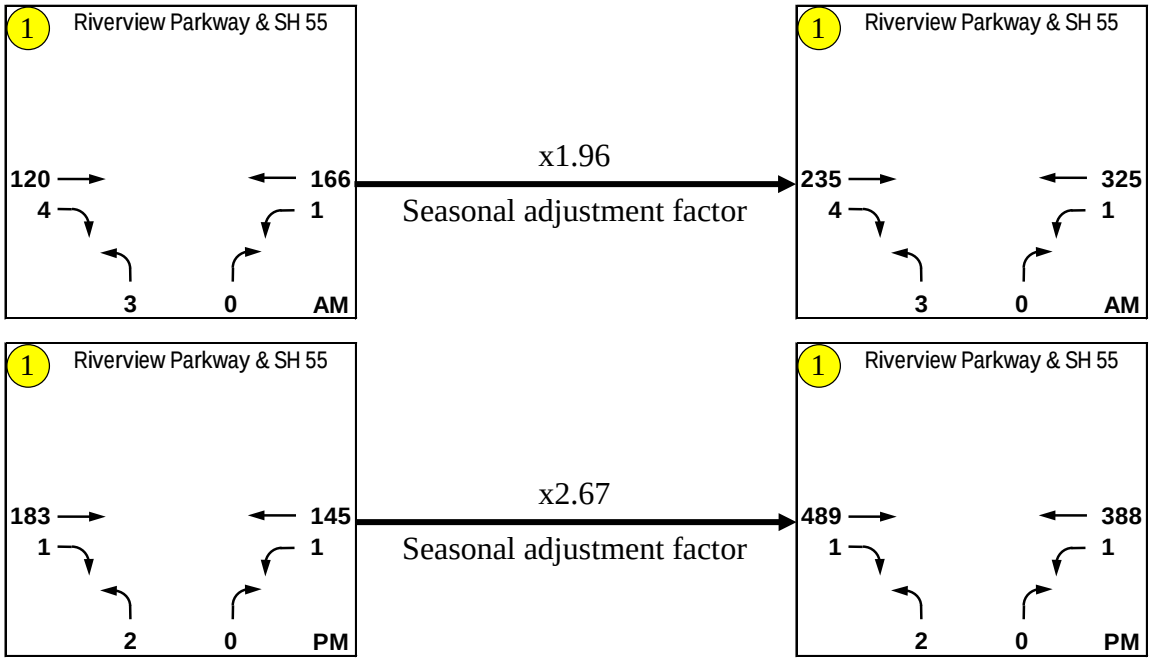


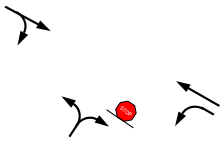
Figure 2.2 – 2019 Existing Peak Hour Traffic



2.4 Intersection Operations

To determine the existing traffic impacts, the study area intersection was analyzed with the existing intersection control and lane configuration with 2019 seasonally-adjusted existing peak hour traffic. Copies of the analysis reports are included in the appendix. **Table 2.5** summarizes the intersection capacity analysis results. The study area intersection of Riverview Parkway and SH 55 currently meets ITD minimum operational thresholds with the seasonally adjusted volumes.

Table 2.1 – Intersection Operations – 2019 Seasonally Adjusted Existing Traffic

Intersection		Control	Intersection or Lane Group	AM Peak Hour			PM Peak Hour		
				LOS	Delay [s/veh]	v/c Ratio	LOS	Delay [s/veh]	v/c Ratio
1	Riverview Parkway and SH 55		SEB	-	-	-	-	-	-
			NWL	A	8	< 0.01	A	9	< 0.01
			NWT	-	-	-	-	-	-
			NEB	B	11	0.01	B	13	0.01

2.5 Intersection Mitigation

The SH 55 and Riverview Parkway intersection is expected to meet minimum operational thresholds with the existing lane configuration, intersection control, and seasonally adjusted traffic volumes. No improvements are needed to mitigate 2019 existing traffic impacts.

3.0 2040 BACKGROUND TRAFFIC CONDITIONS

3.1 Roadway Network

The study area roadways and intersection are expected to remain the same as existing conditions. SH 55 conducted a corridor plan from Marsing to Nampa and State Street to Banks Lowman Road between 2014-2016. However, the North Corridor Plan (Banks Lowman Road to New Meadows) has not been completed and is not available at this time.

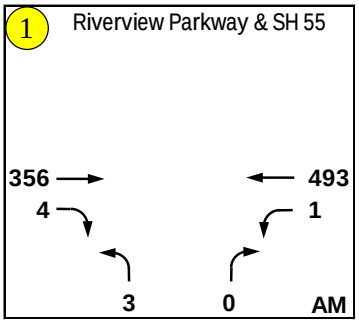
3.2 Background Traffic

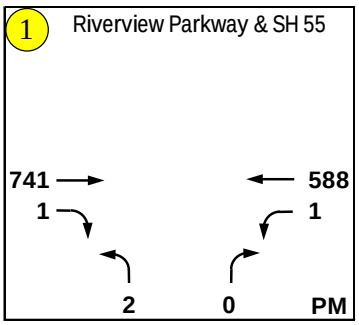
2040 background traffic was estimated by extrapolating the 2019 seasonally-adjusted existing traffic counts by the following annual growth rates:

- 2.0% per year on SH 55

This growth rate is based on ATR #043 data collected from 1990 to October 2019. In addition, the Riverview Park Subdivision, a 55 residential lot development southwest of The River District which accesses SH 55 via Riverview Driveway, was assumed to be fully constructed by 2025 and was included as off-site traffic. **Figure 3.1** summarizes the 2040 build-out year peak hour background traffic.

Figure 3.1 – 2040 Build-Out Year Peak Hour Background Traffic

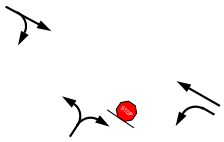




3.3 Intersection Operations

To determine the 2040 background traffic impacts, the intersection of Riverview Parkway and SH 55 was analyzed with the existing intersection control and lane configuration with 2040 background traffic volumes as discussed in Section 3.2. Copies of the analysis reports are included in the appendix. **Table 3.1** summarizes the intersection capacity analysis results. The intersection is expected to meet ITD's minimum operational thresholds under 2040 background traffic conditions.

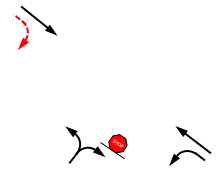
Table 3.1 – Intersection Operations – 2040 Build-Out Year Background Traffic

Intersection		Control / Lane	Intersection or Lane Group	AM Peak Hour			PM Peak Hour		
				LOS	Delay [s/veh]	v/c Ratio	LOS	Delay [s/veh]	v/c Ratio
1	Riverview Parkway and SH 55		SEB	-	-	-	-	-	-
			NWL	A	8	< 0.01	A	10	0.01
			NWT	-	-	-	-	-	-
			NEB	B	13	0.08	C	17	0.08

3.4 Intersection Mitigation

The SH 55 and Riverview Parkway intersection is expected to continue to meet minimum operational thresholds with the existing lane configuration, intersection control, and seasonally adjusted 2040 background traffic volumes. However, a southeast-bound right-turn lane is warranted based on ITD's turn-lane guidelines. Turn-lane warrant worksheets are included in the appendix. The right-turn lane is needed to mitigate the proposed Riverview Park Subdivision's impacts. **Table 3.2** summarizes the intersection's operations with the additional right-turn lane.

Table 3.2 – Intersection Operations – 2040 Build-Out Year Background Traffic Mitigation

Intersection		Control / Lane	Intersection or Lane Group	AM Peak Hour			PM Peak Hour		
				LOS	Delay [s/veh]	v/c Ratio	LOS	Delay [s/veh]	v/c Ratio
1	Riverview Parkway and SH 55		SEB	-	-	-	-	-	-
			NWL	A	8	< 0.01	A	10	0.01
			NWT	-	-	-	-	-	-
			NEB	B	13	0.08	C	17	0.08

4.0 2040 BUILD-OUT YEAR TOTAL TRAFFIC CONDITIONS

4.1 Roadway Network

SH 55 along the site frontage is expected to remain the same as existing conditions with the exception of the southeast-bound right-turn lane needed to mitigate 2040 background traffic impacts. Based on the preliminary site plan, The River District is proposing two full-access approaches on SH 55, one aligning with Riverview Parkway and the other one aligning with an existing private approach. 2040 total traffic analysis is based on the proposed site access as shown in the preliminary site plan. In addition, the traffic impact analysis was also evaluated with only one access on SH 55.

4.2 Site Traffic

4.2.1 Trip Generation

Site trip generation is estimated using the procedures recommended in the latest edition of the Trip Generation Manual (10th edition), published by the Institute of Transportation Engineers. **Table 4.1** summarizes the site trip generation. The proposed development is estimated to generate approximately 7,628 trips per weekday with 421 trips during the AM peak hour and 645 trips during the PM peak hour.

Table 4.1 – Build-Out Site Traffic Trip Generation Summary

Land Use	ITE Code	Size	Unit	Total Trips	Capture Rate	Internal Capture Trips	Pass-by Rates	Pass-by Trips	Primary Trips				
									Total	Entering		Exiting	
Weekday Daily (vpd)													
Single-Family Detached Housing	210	144	DU	1,454	10%	145	--	--	1,309	50%	655	50%	654
Multifamily Housing (Low-Rise)	220	299	DU	2,220	10%	222	--	--	1,998	50%	999	50%	999
Retail	820	54	TSF	3,954	10%	395	--	--	3,559	50%	1,779	50%	1780
Weekday Daily Total Trips				**7,628**		**762**		--	**6,866**		**3,433**		**3,433**
Weekday AM Peak Hour (vph)													
Single-Family Detached Housing	210	144	DU	107	1%	1	--	--	106	25%	27	75%	79
Multifamily Housing (Low-Rise)	220	299	DU	135	1%	1	--	--	134	23%	31	77%	103
Retail	820	54	TSF	179	1%	2	--	--	177	62%	110	38%	67
Weekday AM Peak Hour Total Trips				**421**		**4**		--	**417**		**168**		**249**
Weekday PM Peak Hour (vph)													
Single-Family Detached Housing	210	144	DU	144	20%	29	--	--	115	63%	72	37%	43
Multifamily Housing (Low-Rise)	220	299	DU	157	20%	31	--	--	126	63%	79	37%	47
Retail	820	54	TSF	344	20%	69	34%	94	181	48%	87	52%	94
Weekday PM Peak Hour Total Trips				**645**		**129**		**94**	**422**		**238**		**184**

4.2.2 Trip Capture

Internal capture trips were estimated based on ITE methodologies. Copies of the internal capture worksheets are included in the appendix. Based on the proposed land uses, the development is expected to retain 1% of trips during the AM peak hour and 20% during the PM peak hour. Daily capture rates were not available; a 10% daily capture rate was assumed, the average of the AM and the PM peak hour trip capture rates.

4.2.3 Pass-by Trips

Based on ITE pass-by rates of 34% for ITE Land Use Code 820, the proposed commercial development's respective land use is expected to attract approximately 94 pass-by trips during the PM peak hour. ITE does not have pass-by rates for the daily or AM peak hour. No pass-by trips were assumed in the AM peak hour analysis.

4.2.4 Modal Split

For the traffic analysis purposes, all trips generated by the development were assumed to be made by personal and commercial vehicles.

4.2.5 Trip Distribution and Assignment

Site traffic was distributed and assigned to the external roadway system based on current travel patterns, site layout, and the general location of the site within the area. **Figure 4.1** summarizes the expected site traffic distribution patterns. **Figure 4.2** summarizes the estimated build-out AM and PM peak hour site traffic.

4.3 Total Traffic

The site traffic is then added to the 2040 background traffic as determined above to obtain the 2040 total traffic. In addition, trips were added to the inflow and outflow movements affecting the southwest leg of the Payette Street and SH 55 intersection to account for a potential, small development southwest of the site. **Table 4.2** summarizes the build-out site traffic percentage estimate at the intersection of Riverview Parkway and SH 55. **Figure 4.3** summarizes the estimated 2040 build-out year AM and PM peak hour total traffic.

Table 4.2 – Build-Out Site Traffic Percentage of 2040 Total Traffic

Intersection		% Site Traffic of 2040 Total Traffic		
		AM Peak	PM Peak	Average
1	Riverview Parkway and SH 55	22%	17%	19%
2	Payette Street and SH 55	30%	23%	26%

Figure 4.1 – Site Traffic Primary Trip Distribution Patterns

Figure 4.2 – 2040 Build-Out Year Peak Hour Site Traffic

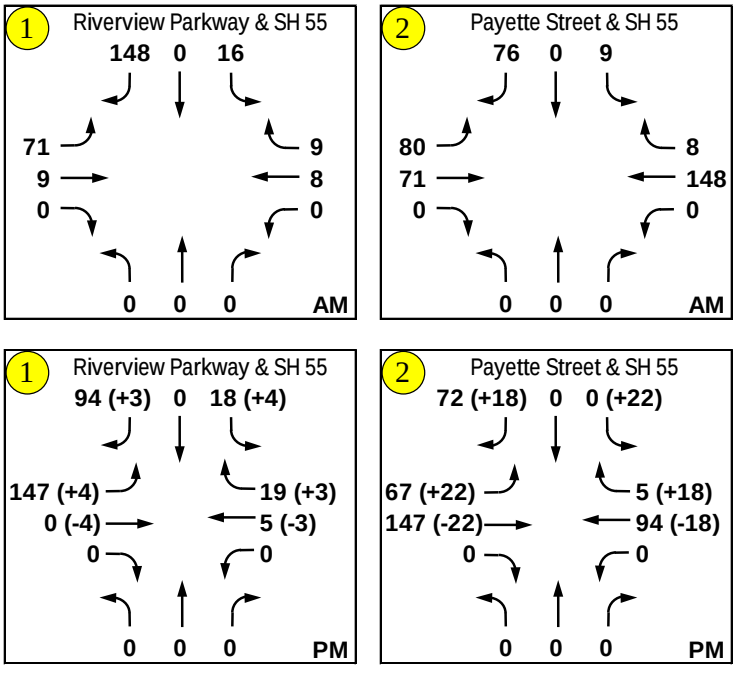
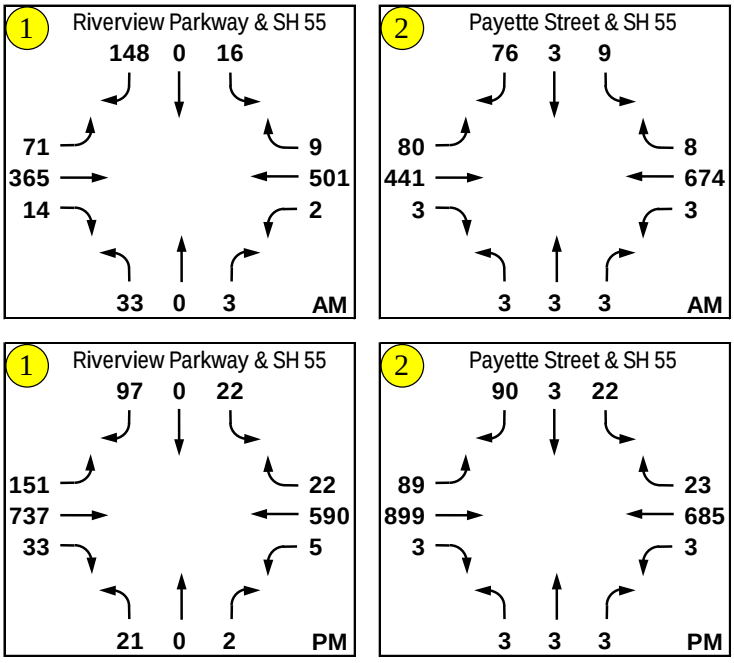


Figure 4.3 – 2040 Build-Out Year Peak Hour Total Traffic



4.4 Intersection Operations

To determine the 2040 total traffic impacts, the study area intersections were analyzed with the existing intersection control and lane configuration or with the preceding improvements needed to mitigate 2040 background traffic. Traffic impacts were evaluated with two proposed site accesses on SH 55 as shown in the preliminary site plan. Additionally, the traffic impacts were also evaluated with the site having only one access on SH 55. Northeast-bound right-turn lanes are needed at the Riverview Parkway/Ponderosa Street and Payette Street intersections on SH 55 with 2040 total traffic and were included in the analysis. Copies of the analysis reports are included in the appendix. **Table 4.3** and **Table 4.4** summarizes the intersection capacity analysis results. The Riverview Parkway/Ponderosa Street and SH 55 intersection is expected to exceed ITD's minimum operational thresholds under 2040 build-out total traffic conditions for both site access scenarios.

Table 4.3 – Intersection Operations – 2040 Build-Out Year Total Traffic (Two SH 55 Accesses)

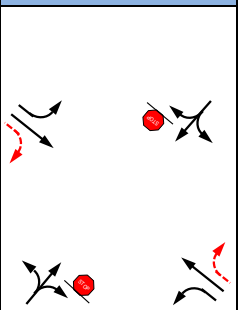
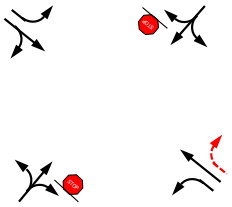
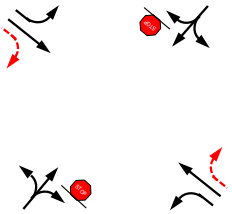
Intersection		Control / Lane	Intersection or Lane Group	AM Peak Hour			PM Peak Hour		
				LOS	Delay [s/veh]	v/c Ratio	LOS	Delay [s/veh]	v/c Ratio
1	Riverview Parkway /Ponderosa Street and SH 55		SEL	A	9	0.08	A	10	0.18
			SET	-	-	-	-	-	-
			SER	-	-	-	-	-	-
			NWL	A	8	< 0.01	A	10	0.01
			NWT	-	-	-	-	-	-
			NWTR	-	-	-	-	-	-
			NEB	**F**	55	0.36	**F**	211	0.67
			SWB	C	19	0.42	**F**	65	0.73
2	Payette Street and SH 55		SEL	A	10	0.10	A	10	0.12
			SETR	-	-	-	-	-	-
			NWB	A	8	< 0.01	B	10	0.01
			NEB	C	19	0.04	D	27	0.06
			SWB	C	18	0.25	C	25	0.42

Table 4.4 – Intersection Operations – 2040 Build-Out Year Total Traffic (One SH 55 Access)

Intersection		Control / Lane	Intersection or Lane Group	AM Peak Hour			PM Peak Hour		
				LOS	Delay [s/veh]	v/c Ratio	LOS	Delay [s/veh]	v/c Ratio
1	Riverview Parkway /Ponderosa Street and SH 55		SEL	A	9	0.17	B	11	0.29
			SET	-	-	-	-	-	-
			SER	-	-	-	-	-	-
			NWL	A	8	< 0.01	A	10	0.01
			NWT	-	-	-	-	-	-
			NWR	-	-	-	-	-	-
			NEB	**F**	157	0.70	**F**	620	**1.35**
			SWB	D	32	0.70	**F**	474	**1.87**

4.5 Intersection Mitigation

Riverview Parkway/Ponderosa Street and SH 55 Intersection

The Riverview Parkway/Ponderosa Street and SH 55 intersection is expected to exceed ITD's minimum operational thresholds as an unsignalized intersection with 2040 total traffic. Three mitigation improvement options were evaluated and the results are summarized in **Table 4.5** and **Table 4.6**. The mitigation options and results are:

- Single-lane roundabout
  - The roundabout is expected to operate at LOS B or better under 2040 build-out year peak hour total traffic conditions with one or two site accesses on SH 55
- Traffic signal with left-turn lanes on all approaches
  - The signal is expected to operate at LOS A under 2040 build-out year peak hour total traffic conditions for both site access scenarios
- Restricted Crossing U-Turn (RCUT) intersection – RCUT intersection alternative would allow right-in, right-out, and left-in movements only, and prohibits left-turn and through movements from the proposed access and Riverview Parkway. These movements will be accommodated by requiring the drivers to make a right-turn onto SH 55 and then make a U-turn after the intersection. A loon will need to be constructed on SH 55 400 to 1,000 feet southeast of the intersection to accommodate U-turns. Additional widenings on SH 55 will be needed to include a southeast-bound U-turn lane. The Payette Street intersection will also need to be widened to include a loon to accommodate U-turns.
  - All movements are expected to operate at LOS C or better with a v/c ratio of 0.38 or less under 2040 build-out year total traffic conditions for both site access scenarios

These improvement options are expected to mitigate 2040 total traffic to meet ITD's minimum operational thresholds for the summer peak hours. The preferred alternative will need to be studied further and worked out among ITD, the City of Cascade, and the developer.

Table 4.5 – Intersection Operations – 2040 Build-Out Year Total Traffic Mitigation (Two SH 55 Accesses)

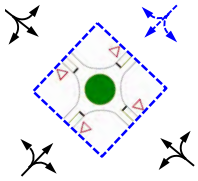
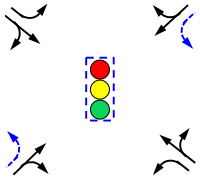
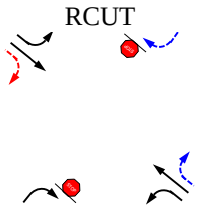
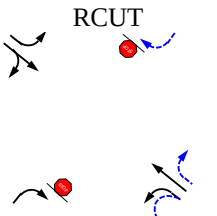
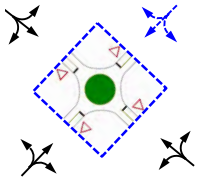
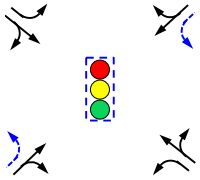
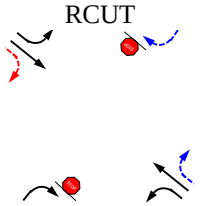
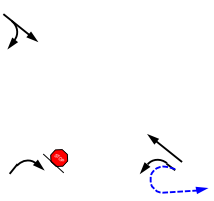
Intersection		Control / Lane	Intersection or Lane Group	AM Peak Hour			PM Peak Hour		
				LOS	Delay [s/veh]	v/c Ratio	LOS	Delay [s/veh]	v/c Ratio
1	Riverview Parkway and SH 55		Intersection	A	8	-	B	14	-
			SE	A	7	0.39	C	17	0.80
			NW	A	8	0.49	B	12	0.64
			NE	A	5	0.05	A	8	0.05
			SW	A	8	0.25	A	8	0.20
			Intersection	A	7	0.38	A	10	0.69
			SEL	A	6	0.12	A	8	0.38
			SETR	A	6	0.57	A	6	0.71
			NWL	A	7	< 0.01	A	9	0.02
			NWTR	A	5	0.32	B	13	0.82
			NEL	B	11	0.09	C	21	0.11
			NETR	A	8	0.01	B	18	0.01
			SWL	A	8	0.03	B	18	0.08
			SWTR	B	11	0.61	C	23	0.62
			SEL	A	9	0.08	A	10	0.19
			SET	-	-	-	-	-	-
			SER	-	-	-	-	-	-
			NWL	A	8	< 0.01	A	10	0.01
			NWT	-	-	-	-	-	-
			NWR	-	-	-	-	-	-
			NER	B	11	0.06	C	16	0.07
			SWR	C	17	0.38	C	17	0.35
2	Payette Street and SH 55		SEL	A	10	0.10	A	10	0.12
			SETR	-	-	-	-	-	-
			NWL	A	9	0.03	B	11	0.08
			NWT	-	-	-	-	-	-
			NWR	-	-	-	-	-	-
			NER	B	11	0.02	C	18	0.03
			SWR	C	16	0.21	C	17	0.26

Table 4.6 – Intersection Operations – 2040 Build-Out Year Total Traffic Mitigation (One SH 55 Access)

Intersection		Control / Lane	Intersection or Lane Group	AM Peak Hour			PM Peak Hour		
				LOS	Delay [s/veh]	v/c Ratio	LOS	Delay [s/veh]	v/c Ratio
1	Riverview Parkway and SH 55		Intersection	A	8	-	C	19	-
			SE	A	7	0.44	C	23	0.88
			NW	A	9	0.52	C	16	0.70
			NE	A	6	0.06	A	9	0.06
			SW	A	10	0.38	B	11	0.38
			Intersection	A	10	0.48	B	14	0.72
			SEL	B	12	0.38	B	12	0.66
			SETR	A	6	0.43	A	6	0.71
			NWL	A	8	< 0.01	A	8	0.02
			NWTR	A	7	0.59	A	7	0.86
			NEL	B	18	0.14	B	18	0.12
			NETR	B	12	0.01	B	12	0.01
			SWL	B	13	0.06	B	13	0.13
			SWTR	B	17	0.71	B	17	0.74
			SEL	A	9	0.17	B	11	0.30
			SET	-	-	-	-	-	-
			SER	-	-	-	-	-	-
			NWL	A	8	< 0.01	A	10	0.01
			NWT	-	-	-	-	-	-
			NWR	-	-	-	-	-	-
			NER	B	11	0.06	C	16	0.07
			SWR	C	20	0.54	C	22	0.55
2	Payette Street and SH 55		SETR	-	-	-	-	-	-
			NWL	A	9	0.03	B	11	0.08
			NWT	-	-	-	-	-	-
			NER	B	12	0.02	C	20	0.04

4.6 Site Access and Circulation

The River District is proposing two accesses on SH 55. Payette Street, the northwest access, is proposed as a full access located approximately 400 feet northwest of Riverview Driveway, where existing approaches are constructed on both sides of SH 55. Ponderosa Street, the southeast access, is set to align with Riverview Driveway, the existing roadway into the future Riverview Park Subdivision south of the site. Minimum spacing requirements for the site accesses on SH 55 are based on ITD IDAPA 39.03.42 minimum access spacing requirements on SH 55, a Regional Route located in a transitional area with speeds greater than 35 mph. According to IDAPA access spacing requirements, the minimum separation distances are as follows:

- 2,640 feet (½ mile) between signals
- 1,320 feet (¼ mile) between public roads
- 690 feet driveway distance separation from the nearest upstream public road intersection
- 360 feet driveway distance separation from the nearest downstream public road intersection
- 360 feet driveway distance separation from nearest unsignalized access other than a public road

The accesses proposed into The River District are assumed to be public streets. Therefore, the separation distance between Payette Street and Ponderosa Street does not meet ITD IDAPA spacing requirements for public roads but does meet ITD IDAPA driveway distance separation requirements.

As discussed in the previous sections, the Payette Street intersection is expected to meet ITD's minimum operational thresholds. A northwest-bound right-turn is needed to mitigate the 2040 total traffic impacts.

The Riverview Parkway/Ponderosa Street and SH 55 intersection is expected to exceed ITD's minimum operational thresholds as an unsignalized intersection. Based on a phasing analysis, when two accesses are permitted onto SH 55, the intersection is expected to fail when the development generates approximately 144 PM peak hour trips, equivalent to 144 dwelling units. This finding assumes the background traffic increases at a 2% annual growth rate and the proposed Riverview Park Subdivision is constructed.

APPENDIX A: TRAFFIC COUNTS

L2 Data Collection

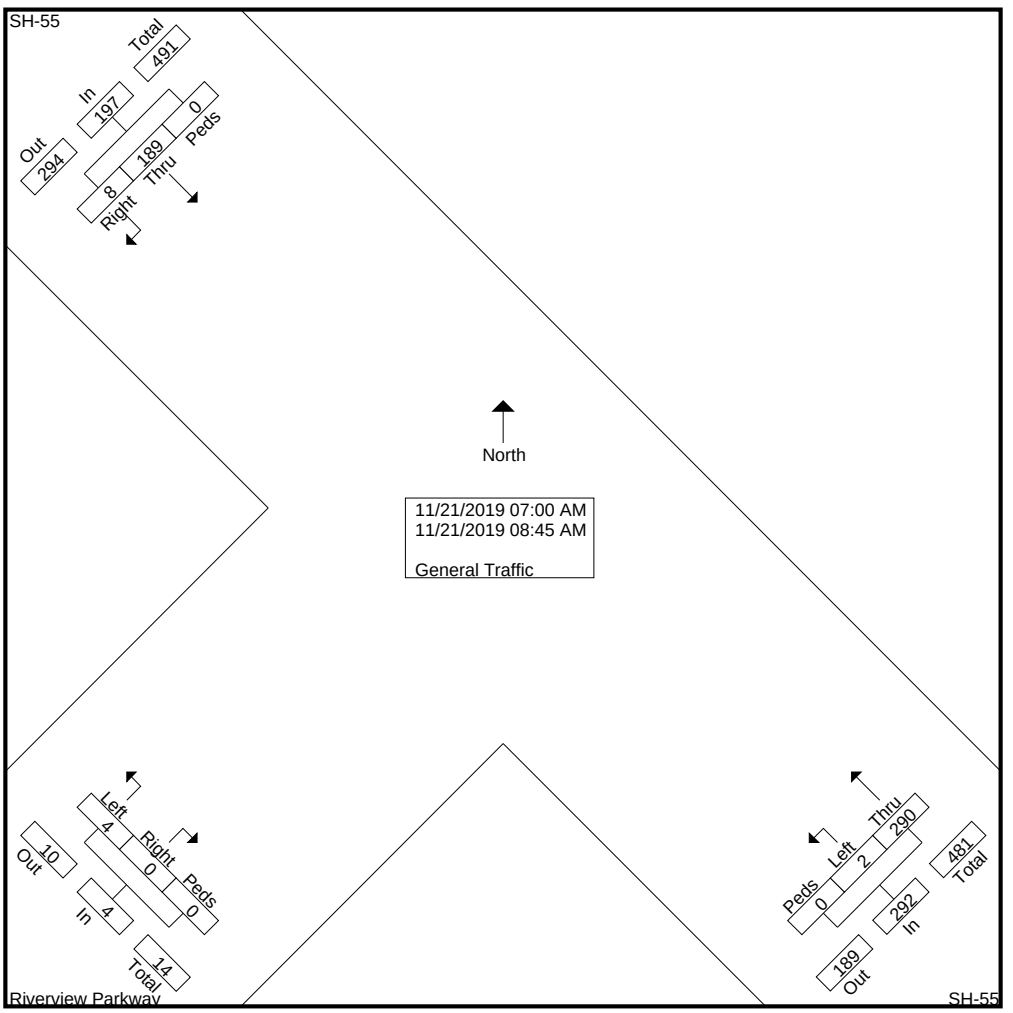
L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway AM
Site Code : 00000000
Start Date : 11/21/2019
Page No : 1

Groups Printed- General Traffic

	SH-55 From Southeast				Riverview Parkway From Southwest				SH-55 From Northwest				
Start Time	**Thru**	**Left**	**Peds**	**App. Total**	**Right**	**Left**	**Peds**	**App. Total**	**Right**	**Thru**	**Peds**	**App. Total**	**Int. Total**
07:00 AM	14	0	0	14	0	0	0	0	0	17	0	17	31
07:15 AM	32	0	0	32	0	0	0	0	1	13	0	14	46
07:30 AM	31	0	0	31	0	0	0	0	1	14	0	15	46
07:45 AM	47	1	0	48	0	1	0	1	2	25	0	27	76
Total	124	1	0	125	0	1	0	1	4	69	0	73	199
08:00 AM	34	0	0	34	0	0	0	0	3	18	0	21	55
08:15 AM	43	1	0	44	0	2	0	2	0	33	0	33	79
08:30 AM	36	0	0	36	0	1	0	1	0	28	0	28	65
08:45 AM	53	0	0	53	0	0	0	0	1	41	0	42	95
Total	166	1	0	167	0	3	0	3	4	120	0	124	294
Grand Total	290	2	0	292	0	4	0	4	8	189	0	197	493
Apprch %	99.3	0.7	0		0	100	0		4.1	95.9	0		
Total %	58.8	0.4	0	59.2	0	0.8	0	0.8	1.6	38.3	0	40	



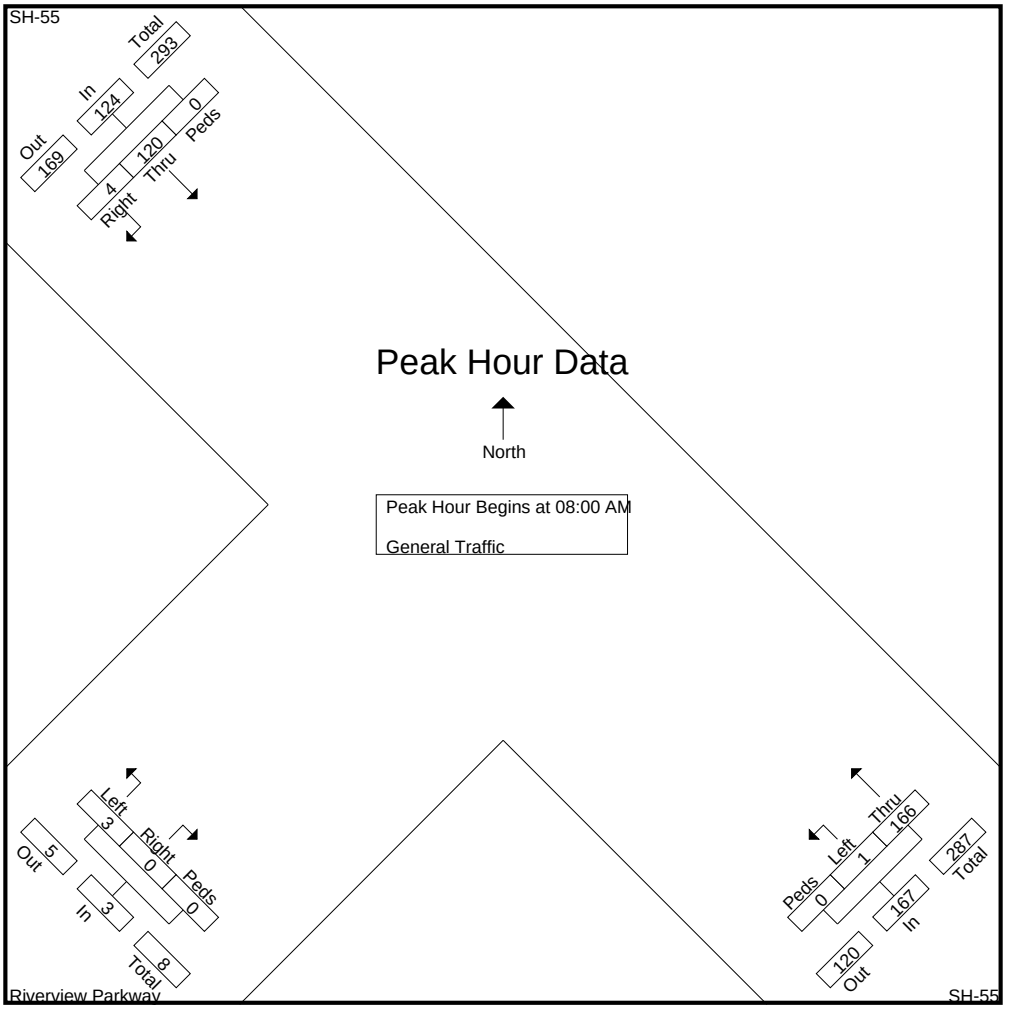
L2 Data Collection

L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway AM
Site Code : 00000000
Start Date : 11/21/2019
Page No : 2

	SH-55 From Southeast				Riverview Parkway From Southwest				SH-55 From Northwest				
Start Time	**Thru**	**Left**	**Peds**	**App. Total**	**Right**	**Left**	**Peds**	**App. Total**	**Right**	**Thru**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	34	0	0	34	0	0	0	0	**3**	18	0	21	55
08:15 AM	43	**1**	0	44	0	**2**	0	**2**	0	33	0	33	79
08:30 AM	36	0	0	36	0	1	0	1	0	28	0	28	65
08:45 AM	**53**	0	0	**53**	0	0	0	0	1	**41**	0	**42**	**95**
Total Volume	166	1	0	167	0	3	0	3	4	120	0	124	294
% App. Total	99.4	0.6	0		0	100	0		3.2	96.8	0		
PHF	.783	.250	.000	.788	.000	.375	.000	.375	.333	.732	.000	.738	.774



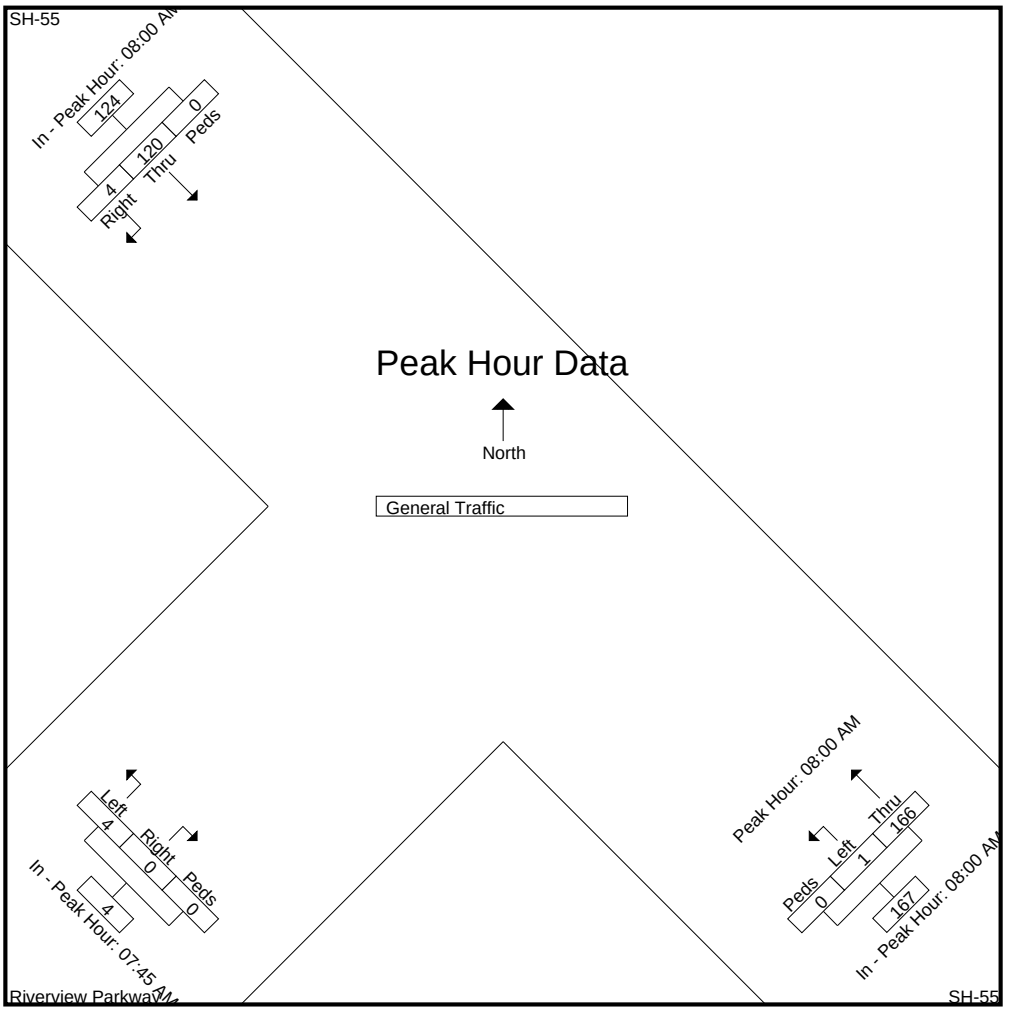
L2 Data Collection

L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway AM
Site Code : 00000000
Start Date : 11/21/2019
Page No : 3

	SH-55 From Southeast				Riverview Parkway From Southwest				SH-55 From Northwest				
Start Time	**Thru**	**Left**	**Peds**	**App. Total**	**Right**	**Left**	**Peds**	**App. Total**	**Right**	**Thru**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	08:00 AM				07:45 AM				08:00 AM				
+0 mins.	34	0	0	34	0	1	0	1	**3**	18	0	21	
+15 mins.	43	**1**	0	44	0	0	0	0	0	33	0	33	
+30 mins.	36	0	0	36	0	**2**	0	**2**	0	28	0	28	
+45 mins.	**53**	0	0	**53**	0	1	0	1	1	**41**	0	**42**	
Total Volume	166	1	0	167	0	4	0	4	4	120	0	124	
% App. Total	99.4	0.6	0		0	100	0		3.2	96.8	0		
PHF	.783	.250	.000	.788	.000	.500	.000	.500	.333	.732	.000	.738	



L2 Data Collection

L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway AM
Site Code : 00000000
Start Date : 11/21/2019

Image 1

L2 Data Collection

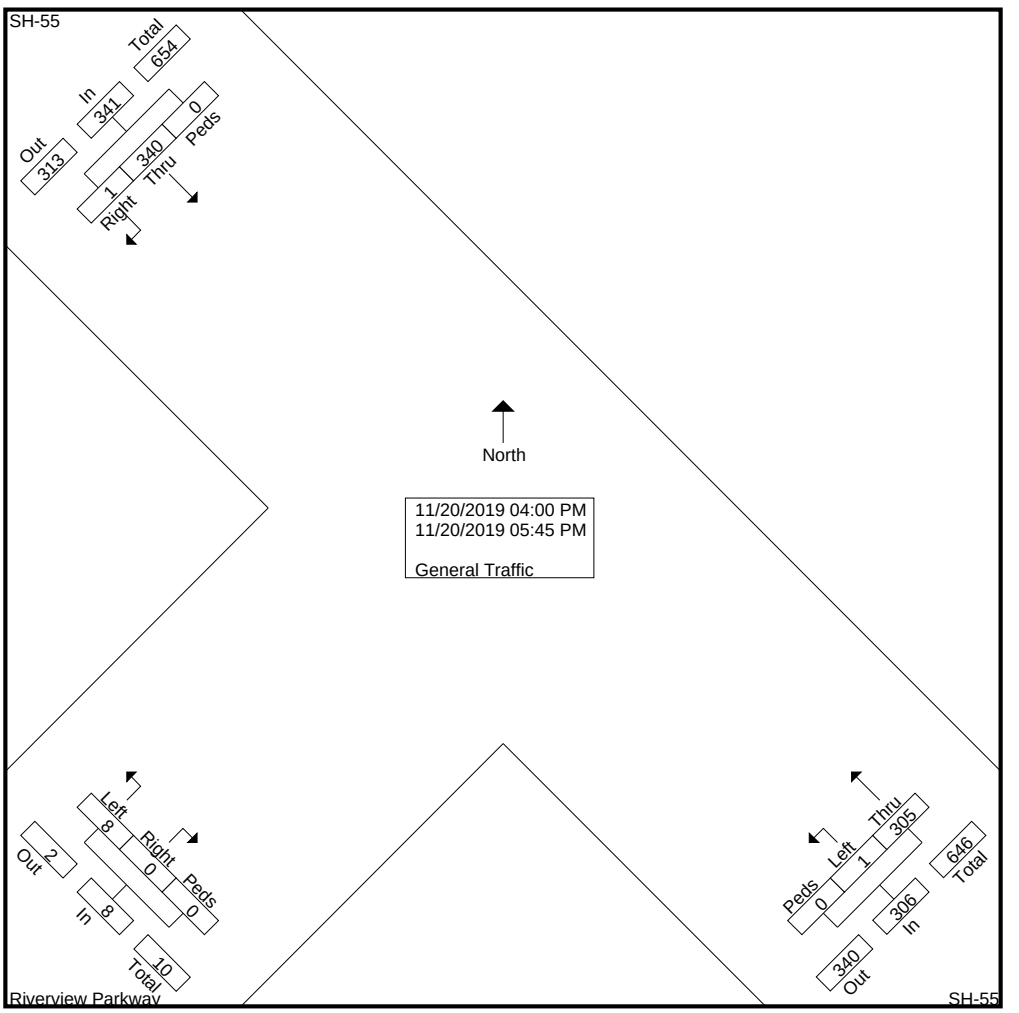
L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway PM
Site Code : 00000000
Start Date : 11/20/2019
Page No : 1

Groups Printed- General Traffic

	SH-55 From Southeast				Riverview Parkway From Southwest				SH-55 From Northwest				
Start Time	**Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Left**	**Peds**	**App. Total**	**Right**	**Left**	**Peds**	**App. Total**	**Int. Total**
04:00 PM	0	52	0	52	36	0	0	36	0	4	0	4	92
04:15 PM	0	40	0	40	44	0	0	44	0	1	0	1	85
04:30 PM	0	34	0	34	43	0	0	43	0	1	0	1	78
04:45 PM	0	31	0	31	37	0	0	37	0	0	0	0	68
Total	0	157	0	157	160	0	0	160	0	6	0	6	323
05:00 PM	0	41	0	41	27	0	0	27	0	0	0	0	68
05:15 PM	0	58	0	58	40	0	0	40	0	1	0	1	99
05:30 PM	1	48	0	49	35	1	0	36	0	1	0	1	86
05:45 PM	0	36	0	36	43	0	0	43	0	0	0	0	79
Total	1	183	0	184	145	1	0	146	0	2	0	2	332
Grand Total	1	340	0	341	305	1	0	306	0	8	0	8	655
Apprch %	0.3	99.7	0		99.7	0.3	0		0	100	0		
Total %	0.2	51.9	0	52.1	46.6	0.2	0	46.7	0	1.2	0	1.2	



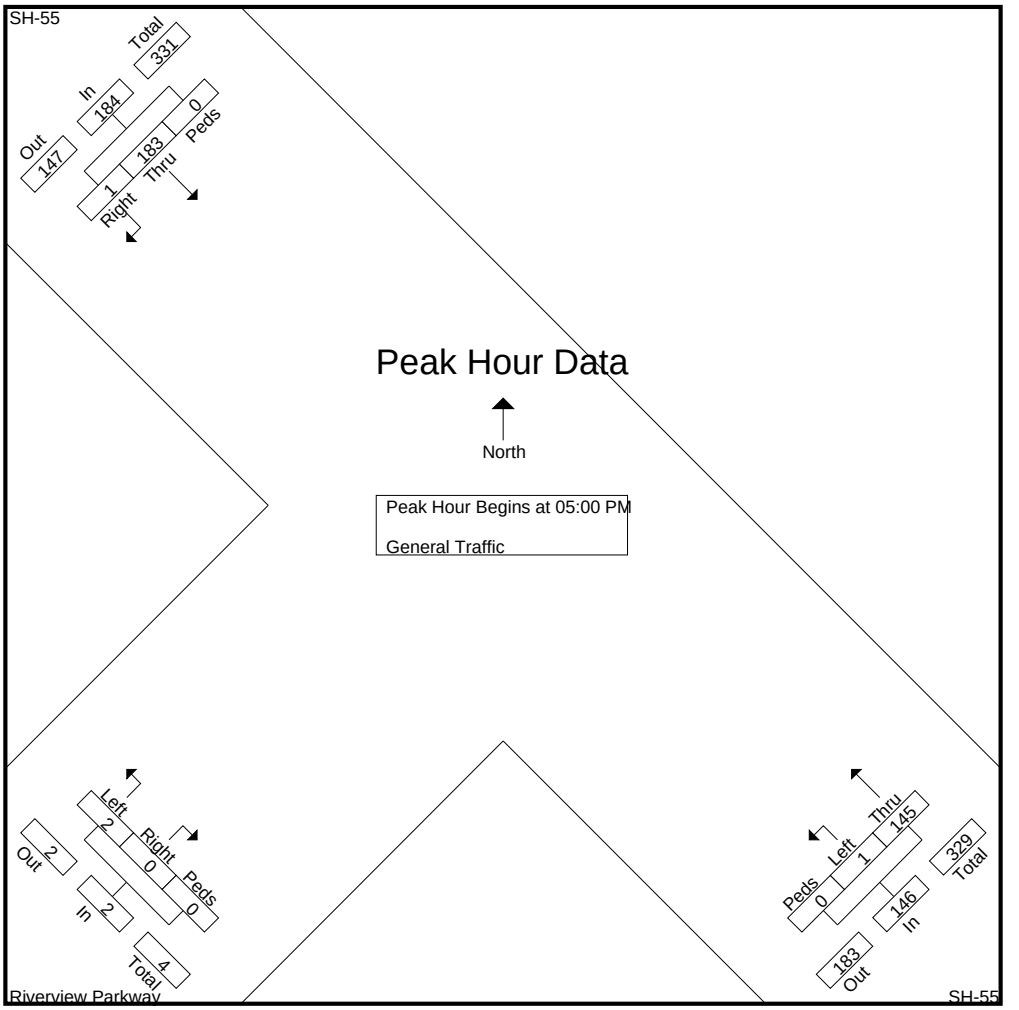
L2 Data Collection

L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway PM
Site Code : 00000000
Start Date : 11/20/2019
Page No : 2

	SH-55 From Southeast				Riverview Parkway From Southwest				SH-55 From Northwest				
Start Time	**Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Left**	**Peds**	**App. Total**	**Right**	**Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	41	0	41	27	0	0	27	0	0	0	0	68
05:15 PM	0	**58**	0	**58**	40	0	0	40	0	**1**	0	**1**	**99**
05:30 PM	**1**	48	0	49	35	**1**	0	36	0	1	0	1	86
05:45 PM	0	36	0	36	**43**	0	0	**43**	0	0	0	0	79
Total Volume	1	183	0	184	145	1	0	146	0	2	0	2	332
% App. Total	0.5	99.5	0		99.3	0.7	0		0	100	0		
PHF	.250	.789	.000	.793	.843	.250	.000	.849	.000	.500	.000	.500	.838



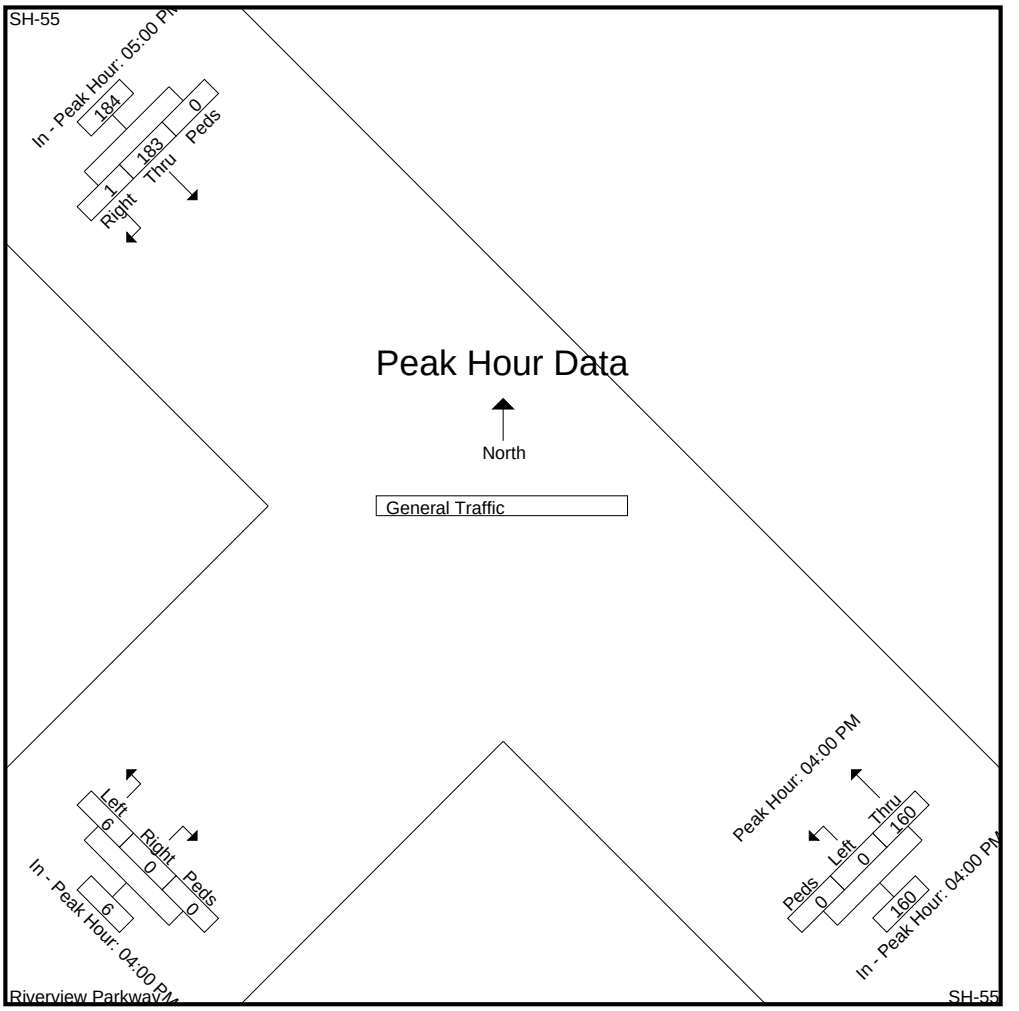
L2 Data Collection

L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway PM
Site Code : 00000000
Start Date : 11/20/2019
Page No : 3

	SH-55 From Southeast				Riverview Parkway From Southwest				SH-55 From Northwest				
Start Time	**Right**	**Thru**	**Peds**	**App. Total**	**Thru**	**Left**	**Peds**	**App. Total**	**Right**	**Left**	**Peds**	**App. Total**	**Int. Total**
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	05:00 PM				04:00 PM				04:00 PM				
+0 mins.	0	41	0	41	36	0	0	36	0	**4**	0	**4**	
+15 mins.	0	**58**	0	**58**	**44**	0	0	**44**	0	1	0	1	
+30 mins.	**1**	48	0	49	43	0	0	43	0	1	0	1	
+45 mins.	0	36	0	36	37	0	0	37	0	0	0	0	
Total Volume	1	183	0	184	160	0	0	160	0	6	0	6	
% App. Total	0.5	99.5	0		100	0	0		0	100	0		
PHF	.250	.789	.000	.793	.909	.000	.000	.909	.000	.375	.000	.375	



L2 Data Collection

L2DataCollection.com
(208) 860-7554 Utah (801) 413-2993

Study: CR0052
Intersection: SH-55 / Riverview Pkwy
City, State: Cascade, Idaho
Control: Stop Sign

File Name : SH-55 & Riverview Parkway PM
Site Code : 00000000
Start Date : 11/20/2019

Image 1

Road, Monthly Hourly Volume for July 2018

Site names: 043 Valley | Seasonal Factor Grp: 8 | Daily Factor Grp: 6

Funct Class: R Principal Arterial - Other | Axle Factor Grp: 8

Location: SH-55 3.6 Mi. S of Roseberry Rd.

	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00
01	19	13	7	20	33	80	178	320	358	403	526	497
02	30	11	7	12	19	52	144	270	323	362	453	489
03	36	21	6	10	17	52	127	237	324	387	533	665
04	91	44	26	18	24	30	85	172	340	588	740	610
05	98	30	21	9	26	57	112	220	318	540	659	823
06	41	19	11	8	13	40	89	200	350	575	779	913
07	42	20	16	8	16	41	124	251	459	645	719	917
08	20	12	10	6	34	89	198	365	439	482	573	604
09	20	14	9	13	13	52	135	257	306	375	402	443
10	13	8	9	7	23	51	155	257	314	381	431	473
11	19	12	12	12	18	55	169	293	380	376	460	499
12	25	14	9	11	22	42	135	283	338	461	552	713
13	38	19	11	6	9	32	98	203	304	470	551	650
14	33	16	9	8	11	30	62	162	310	473	724	847
15	23	7	9	14	40	103	205	303	367	478	556	589
16	11	6	10	11	20	38	159	242	321	376	386	420
17	25	11	10	9	13	42	137	256	349	370	434	477
18	30	6	10	10	15	54	131	266	346	421	503	616
19	24	17	11	14	14	50	129	231	356	476	597	654
20	47	25	23	13	19	30	96	206	331	449	679	746
21	33	25	19	6	16	20	68	159	316	515	657	912
22	22	13	8	17	27	87	155	331	404	434	579	625
23	18	16	10	18	23	51	145	222	310	336	407	505
24	13	21	17	8	18	42	162	295	370	402	446	573
25	12	5	8	8	20	52	153	259	321	410	472	603
26	24	19	16	8	17	54	116	268	342	470	577	661
27	43	18	8	11	14	26	67	192	381	558	605	781
28	29	20	9	6	11	26	74	153	322	540	717	909
29	22	13	9	16	24	85	210	287	401	462	534	529
30	18	9	14	7	16	58	134	250	305	365	435	463
31	25	13	10	7	15	40	140	242	328	364	507	472

Two-Way Hourly Sum for General Weekdays	2650	3444
Two-Way Hourly Daily Average	265	344

November 2018 Two-Way Hourly Daily Average 176

AM Seasonal Adjustment Factor 1.96

Road, Monthly Hourly Volume for July 2018

12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
377	604	554	503	519	487	369	261	213	146	80	26	6,593
502	492	533	582	501	579	450	352	290	218	108	48	6,827
742	721	752	833	785	848	743	686	588	481	269	186	10,049
789	731	602	490	389	362	354	267	238	174	80	356	7,600
830	870	806	725	682	722	578	496	376	257	135	68	9,458
950	865	793	743	618	628	524	420	354	269	132	66	9,400
891	841	738	693	596	755	566	417	270	146	110	39	9,320
561	523	513	563	551	418	367	198	198	117	59	29	6,929
453	430	418	433	426	454	346	226	182	105	69	38	5,619
413	488	487	495	406	470	333	227	182	168	76	44	5,911
519	557	588	581	564	573	426	348	279	208	112	71	7,131
678	666	701	758	761	706	642	544	406	293	141	91	8,992
664	679	626	641	507	441	451	286	296	247	149	68	7,446
806	845	807	684	748	681	532	430	256	176	92	39	8,781
553	547	526	513	521	494	316	223	192	100	61	21	6,761
414	452	455	493	438	446	328	202	155	131	89	46	5,649
539	500	482	528	515	468	311	269	223	126	80	46	6,220
594	537	560	595	574	578	456	333	237	189	106	80	7,247
725	673	718	757	710	687	618	501	378	262	141	80	8,823
719	684	689	661	588	544	474	326	273	260	147	81	8,110
939	874	829	738	765	683	572	445	300	213	72	48	9,224
622	574	587	552	484	497	356	245	178	157	58	33	7,045
477	493	522	470	412	408	330	244	206	134	75	40	5,872
507	518	478	508	498	499	401	247	192	144	95	53	6,507
561	563	584	628	551	602	412	348	271	200	113	61	7,217
732	734	793	733	875	787	700	568	395	339	158	80	9,466
647	628	549	627	597	497	406	331	282	254	120	58	7,700
835	839	820	794	682	653	536	430	276	175	92	37	8,985
507	584	539	536	548	459	297	215	153	117	77	36	6,660
453	490	447	457	412	384	337	206	131	125	85	31	5,632
505	496	482	458	467	452	318	217	177	149	81	34	5,999

Two-Way Hourly Sum for General Weekdays	5921	5822
Two-Way Hourly Daily Average	592	582

November 2018 Two-Way Hourly Daily Average	221
PM Seasonal Adjustment Factor	2.67

Road, Monthly Hourly Volume for November 2018

Site names: 043 Valley | Seasonal Factor Grp: 8 | Daily Factor Grp: 6

Funct Class: R Principal Arterial - Other | Axle Factor Grp: 8

Location: SH-55 3.6 Mi. S of Roseberry Rd.

	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00
01	3	4	0	3	4	28	57	122	113	134	221	240
02	8	3	4	2	13	15	46	131	222	205	275	326
03	17	6	8	5	8	21	36	48	92	102	144	292
05	4	0	3	1	5	20	66	185	186	225	217	233
06	10	2	5	10	12	20	99	154	171	204	218	209
07	9	3	3	5	8	28	90	159	194	214	190	232
08	5	6	2	9	13	33	95	172	184	216	245	239
09	12	8	7	5	16	34	77	183	172	236	301	354
10	17	15	4	7	11	23	43	70	147	177	285	292
11	13	4	5	4	6	13	22	60	100	196	335	382
12	13	3	4	5	15	31	62	155	183	245	226	245
13	10	3	3	13	17	26	84	186	203	193	230	216
14	6	5	1	1	18	30	90	171	209	221	252	228
15	4	4	1	5	4	24	55	151	220	213	228	228
16	1	3	0	4	4	11	60	155	170	253	255	276
17	10	11	2	10	6	15	36	53	116	193	264	309
18	11	9	3	1	9	9	18	50	71	159	258	336
19	9	1	7	8	10	13	89	158	195	236	308	261
20	8	4	6	2	9	19	84	147	152	199	251	292
21	11	6	3	1	5	24	54	119	123	229	307	330
22	14	18	8	6	11	16	12	23	68	165	199	208
24	2	4	3	1	7	9	29	29	52	138	298	390
25	6	6	2	1	6	17	25	34	53	140	348	469
26	3	4	4	3	8	27	78	145	177	187	220	242
27	13	3	4	4	7	20	84	147	167	167	168	164
28	4	7	3	6	11	19	62	120	161	153	147	182
29	6	7	5	7	8	20	79	142	162	163	171	201
30	7	2	1	7	14	23	53	148	145	168	185	239
							Two-Way Hourly Sum for General Weekdays	1671	1936			
							Two-Way Hourly Daily Average	152	176			

Road, Monthly Hourly Volume for November 2018

12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
247	274	266	286	295	223	119	70	37	41	24	21	2,832
291	381	395	413	327	164	126	149	91	58	33	25	3,703
296	312	315	341	287	155	134	84	70	73	20	15	2,881
223	211	244	249	266	230	125	75	42	34	20	6	2,870
202	210	223	238	218	202	138	73	67	26	19	9	2,739
222	208	257	258	264	236	149	100	55	39	21	12	2,956
241	239	278	304	295	298	217	136	100	64	36	27	3,454
372	329	379	425	449	401	376	282	152	105	50	25	4,750
363	343	321	324	263	219	154	146	74	48	47	21	3,414
405	435	443	445	394	257	187	122	73	60	23	13	3,997
259	287	244	295	215	260	124	76	66	32	18	16	3,079
229	214	243	234	265	249	137	65	47	35	21	11	2,934
235	247	244	263	237	237	146	85	33	42	17	13	3,031
263	259	293	251	199	196	124	90	62	37	24	11	2,946
305	339	353	416	438	300	242	148	97	79	27	15	3,951
360	384	252	250	249	194	114	67	54	48	25	12	3,034
421	384	392	247	281	168	135	104	76	49	19	6	3,216
328	290	216	246	267	192	109	62	48	45	18	18	3,134
312	314	230	228	292	183	140	75	62	34	20	21	3,084
412	425	425	465	470	235	194	147	62	54	25	26	4,152
210	168	118	129	57	86	52	51	39	73	12	11	1,754
411	409	419	401	316	181	138	62	53	28	24	11	3,415
540	524	460	479	330	196	111	88	38	15	13	7	3,908
235	218	211	243	211	219	101	65	47	37	18	6	2,709
158	161	158	165	159	173	88	59	48	32	23	17	2,189
223	180	150	95	94	138	86	69	35	41	17	12	2,015
171	63	95	152	118	157	81	89	77	44	26	20	2,064
194	232	223	261	240	264	174	160	149	95	37	26	3,047
Two-Way Hourly Sum for General Weekdays				2436	2292							
Two-Way Hourly Daily Average				221	208							

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Idaho Transportation Department

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	24-Hour Annual	% Change	
1990	1551	1471	1673	1911	2602	3190	4208	3919	3204	2490	1925	1578	2484		
1991	1456	2275	1737	1798	2500	3315	4568	4248	3441	2774	2030	2005	2683	8.0%	
1992	1808	2417	2057	2163	3232	3697	4626	4579	3378	3079	2273	1690	2928	9.1%	
1993	1711	2055	1918	2110	3117	3632	4843	4245	3583	3030	2412	2037	2898	-1.0%	
1994	2169	1936	2080	2288	3269	3678	4495	3940	3347	2987	2072	1947	2858	-1.4%	
1995	1812	2479	2095	2266	3388	3922	5044	4639	3782	3168	2473	2073	3095	8.3%	
1996	1932	2325	2120	2352	2924	3815	4847	4740	3590	3186	2301	1819	2996	-3.2%	
1997	1311	2475	2050	2146	2978	3692	4572	4555	3500	3127	2459	2043	2909	-2.9%	
1998	1971	2426	2097	2209	2820	3652	5044	4710	3775	3056	2427	2083	3023	3.9%	
1999	2081	1980	2036	2126	2729	3810	5121	4716	3717	3149	2552	2048	3005	-0.6%	
2000	2045	2374	2150	2340	3141	3945	5047	4729	3608	3127	2374	2063	3079	2.5%	
2001	2149	2282	2081	2267	3374	3936	4890	4682	3656	3089	2525	1993	3077	-0.1%	
2002	2145	2412	2190	2282	3182	4132	5150	5047	3760	3314	2631	2254	3208	4.3%	
2003	2264	2697	2379	2398	3360	4310	5329	5227	3893	3587	2686	2584	3393	5.8%	
2004	2335	2742	2580	2792	3620	4661	5990	5244	4707	4130	3478	3083	3780	11.4%	
2005	3109	3453	3083	3041	3827	4827	6281	5986	4945	4176	3678	3246	4138	9.5%	
2006	3113	3352	3193	3113	3920	5235	6580	6152	5348	4738	3691	3455	4324	4.5%	
2007	3603	3662	3410	3469	4398	5288	6428	6112	4796	4197	3458	3081	4325	0.0%	
2008	2970	3066	2839	2555	3195	4342	5679	5350	4058	3550	2897	2445	3579	-17.2%	
2009	2935	3123	2523	2482	3356	4255	5748	4977	4133	3308	2694	2410	3495	-2.3%	
2010	2702	2756	2472	2455	3162	4149	5611	5294	4079	3391	2522	2399	3416	-2.3%	
2011	2646	2703	2423	2199	2898	3950	5675	4801	3957	3172	2551	2426	3283	-3.9%	estimated
2012	2593	2678	2390	2355	2876	4341	5606	4658	3927	3154	2557	2460	3300	0.5%	
2013	2578	2756	2526	2378	3319	4432	6008	5437	3614	3330	2635	2538	3462	4.9%	
2014	3079	2753	2668	2532	3062	4815	6230	5466	4134	3625	2646	2607	3635	5.0%	
2015	3016	3287	2907	2780	3828	5024	6110	5507	4522	3829	2914	2924	3887	6.9%	
2016	3300	3375	2925	2968	4066	5408	6620	5942	4845	3885	3278	2917	4127	6.2%	
2017	3139	3236	3024	3034	4101	5597	7235	6574	5016	4112	3135	3190	4283	3.8%	
2018	3772	3383	3013	3167	4512	5884	7214	6467	5281	4263	3156	3463	4465	4.2%	
2019	3973	3150	3265	2966	4162	5941	7626	6730	5308	4393					

5 year	5.2%
10 year	2.5%
15 year	1.1%
20 year	2.0%
25 year	1.8%

APPENDIX B: 2019 CAPACITY ANALYSIS REPORTS

Intersection	
Int Delay, s/veh	0.1

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	235	4	1	325	3	0
Future Vol, veh/h	235	4	1	325	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	2	5	2	2
Mvmt Flow	261	4	1	361	3	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	265	0	626	263
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	363	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1299	-	448	776
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1299	-	448	776
Mov Cap-2 Maneuver	-	-	-	-	607	-
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	703	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	607	1299	-	-	-
HCM Lane V/C Ratio	0.005	0.001	-	-	-
HCM Control Delay (s)	11	7.8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0	0	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	489	1	1	388	2	0
Future Vol, veh/h	489	1	1	388	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	5	2	2	5	2	2
Mvmt Flow	582	1	1	462	2	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	583	0	1047	583
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	464	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	991	-	253	512
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	633	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	991	-	253	512
Mov Cap-2 Maneuver	-	-	-	-	453	-
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	632	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	453	991	-	-	-
HCM Lane V/C Ratio	0.005	0.001	-	-	-
HCM Control Delay (s)	13	8.6	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0	0	-	-	-

APPENDIX C: 2040 CAPACITY ANALYSIS REPORTS

Intersection	
Int Delay, s/veh	0.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	356	14	2	493	33	3
Future Vol, veh/h	356	14	2	493	33	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	396	16	2	548	37	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	412	0	956	404
Stage 1	-	-	-	-	404	-
Stage 2	-	-	-	-	552	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1147	-	286	647
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1147	-	285	647
Mov Cap-2 Maneuver	-	-	-	-	480	-
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	576	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	491	1147	-	-	-
HCM Lane V/C Ratio	0.081	0.002	-	-	-
HCM Control Delay (s)	13	8.1	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	741	33	5	588	21	2
Future Vol, veh/h	741	33	5	588	21	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	823	37	6	653	23	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	860	0	1507	842
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	665	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	781	-	133	364
Stage 1	-	-	-	-	423	-
Stage 2	-	-	-	-	511	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	781	-	132	364
Mov Cap-2 Maneuver	-	-	-	-	332	-
Stage 1	-	-	-	-	423	-
Stage 2	-	-	-	-	507	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.1	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	335	781	-	-	-
HCM Lane V/C Ratio	0.076	0.007	-	-	-
HCM Control Delay (s)	16.6	9.6	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	356	14	2	493	33	3
Future Vol, veh/h	356	14	2	493	33	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	396	16	2	548	37	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	412	0	948	396
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	552	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1147	-	289	653
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1147	-	288	653
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	576	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	493	1147	-	-	-
HCM Lane V/C Ratio	0.081	0.002	-	-	-
HCM Control Delay (s)	12.9	8.1	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	741	33	5	588	21	2
Future Vol, veh/h	741	33	5	588	21	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	823	37	6	653	23	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	860	0	1488	823
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	665	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	781	-	137	373
Stage 1	-	-	-	-	431	-
Stage 2	-	-	-	-	511	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	781	-	136	373
Mov Cap-2 Maneuver	-	-	-	-	336	-
Stage 1	-	-	-	-	431	-
Stage 2	-	-	-	-	507	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.1	16.5
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	339	781	-	-	-
HCM Lane V/C Ratio	0.075	0.007	-	-	-
HCM Control Delay (s)	16.5	9.6	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	71	365	14	2	501	9	33	0	3	16	0	148
Future Vol, veh/h	71	365	14	2	501	9	33	0	3	16	0	148
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	406	16	2	557	10	37	0	3	18	0	164

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	567	0	0	422	0	0	1212	1135	406	1135	1141	557
Stage 1	-	-	-	-	-	-	564	564	-	561	561	-
Stage 2	-	-	-	-	-	-	648	571	-	574	580	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1005	-	-	1137	-	-	159	202	645	179	201	530
Stage 1	-	-	-	-	-	-	510	508	-	512	510	-
Stage 2	-	-	-	-	-	-	459	505	-	504	500	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1005	-	-	1137	-	-	103	186	645	167	185	530
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	186	-	167	185	-
Stage 1	-	-	-	-	-	-	470	468	-	472	509	-
Stage 2	-	-	-	-	-	-	316	504	-	462	461	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	1.4	0	54.7	19
HCM LOS			F	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	111	1137	-	-	1005	-	- 437
HCM Lane V/C Ratio	0.36	0.002	-	-	0.078	-	- 0.417
HCM Control Delay (s)	54.7	8.2	-	-	8.9	-	- 19
HCM Lane LOS	F	A	-	-	A	-	- C
HCM 95th %tile Q(veh)	1.5	0	-	-	0.3	-	- 2

Intersection	
Int Delay, s/veh	1.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	80	441	3	3	674	8	3	3	3	9	3	76
Future Vol, veh/h	80	441	3	3	674	8	3	3	3	9	3	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	89	490	3	3	749	9	3	3	3	10	3	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	758	0	0	493	0	0	1473	1434	492	1428	1426	749
Stage 1	-	-	-	-	-	-	670	670	-	755	755	-
Stage 2	-	-	-	-	-	-	803	764	-	673	671	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	853	-	-	1071	-	-	105	134	577	113	135	412
Stage 1	-	-	-	-	-	-	446	455	-	401	417	-
Stage 2	-	-	-	-	-	-	377	413	-	445	455	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	853	-	-	1071	-	-	76	120	577	102	121	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	183	263	-	268	298	-
Stage 1	-	-	-	-	-	-	400	408	-	359	416	-
Stage 2	-	-	-	-	-	-	296	412	-	393	408	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	1.5	0	18.7	17.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	273	1071	-	-	853	-	- 386
HCM Lane V/C Ratio	0.037	0.003	-	-	0.104	-	- 0.253
HCM Control Delay (s)	18.7	8.4	-	-	9.7	-	- 17.5
HCM Lane LOS	C	A	-	-	A	-	- C
HCM 95th %tile Q(veh)	0.1	0	-	-	0.3	-	- 1

Intersection	
Int Delay, s/veh	8.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	151	737	33	5	590	22	21	0	2	22	0	97
Future Vol, veh/h	151	737	33	5	590	22	21	0	2	22	0	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	168	819	37	6	656	24	23	0	2	24	0	108

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	680	0	0	856	0	0	1889	1847	819	1843	1860	656
Stage 1	-	-	-	-	-	-	1155	1155	-	668	668	-
Stage 2	-	-	-	-	-	-	734	692	-	1175	1192	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	912	-	-	784	-	-	53	75	375	58	73	465
Stage 1	-	-	-	-	-	-	240	271	-	448	456	-
Stage 2	-	-	-	-	-	-	412	445	-	233	261	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	912	-	-	784	-	-	35	61	375	49	59	465
Mov Cap-2 Maneuver	-	-	-	-	-	-	35	61	-	49	59	-
Stage 1	-	-	-	-	-	-	196	221	-	366	452	-
Stage 2	-	-	-	-	-	-	314	441	-	189	213	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	1.6	0.1	210.7	65.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	38	784	-	-	912	-	-	181
HCM Lane V/C Ratio	0.673	0.007	-	-	0.184	-	-	0.731
HCM Control Delay (s)	210.7	9.6	-	-	9.8	-	-	65.3
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	2.4	0	-	-	0.7	-	-	4.6

Intersection	
Int Delay, s/veh	2.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	89	899	3	3	685	23	3	3	3	22	3	90
Future Vol, veh/h	89	899	3	3	685	23	3	3	3	22	3	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	99	999	3	3	761	26	3	3	3	24	3	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	787	0	0	1002	0	0	2031	1992	1001	1969	1967	761
Stage 1	-	-	-	-	-	-	1199	1199	-	767	767	-
Stage 2	-	-	-	-	-	-	832	793	-	1202	1200	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	832	-	-	691	-	-	42	61	295	47	63	405
Stage 1	-	-	-	-	-	-	226	259	-	395	411	-
Stage 2	-	-	-	-	-	-	363	400	-	225	258	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	832	-	-	691	-	-	28	53	295	42	55	405
Mov Cap-2 Maneuver	-	-	-	-	-	-	125	178	-	161	191	-
Stage 1	-	-	-	-	-	-	199	228	-	348	409	-
Stage 2	-	-	-	-	-	-	270	398	-	193	227	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.9	0	26.7	24.8
HCM LOS			D	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	176	691	-	-	832	-	- 307
HCM Lane V/C Ratio	0.057	0.005	-	-	0.119	-	- 0.416
HCM Control Delay (s)	26.7	10.2	-	-	9.9	-	- 24.8
HCM Lane LOS	D	B	-	-	A	-	- C
HCM 95th %tile Q(veh)	0.2	0	-	-	0.4	-	- 2

Intersection	
Int Delay, s/veh	11.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	151	356	14	2	493	17	33	0	3	25	0	224
Future Vol, veh/h	151	356	14	2	493	17	33	0	3	25	0	224
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	168	396	16	2	548	19	37	0	3	28	0	249

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	567	0	0	412	0	0	1418	1303	396	1294	1300	548
Stage 1	-	-	-	-	-	-	732	732	-	552	552	-
Stage 2	-	-	-	-	-	-	686	571	-	742	748	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1005	-	-	1147	-	-	114	161	653	139	161	536
Stage 1	-	-	-	-	-	-	413	427	-	518	515	-
Stage 2	-	-	-	-	-	-	438	505	-	408	420	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1005	-	-	1147	-	-	53	134	653	120	134	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	53	134	-	120	134	-
Stage 1	-	-	-	-	-	-	344	356	-	431	514	-
Stage 2	-	-	-	-	-	-	234	504	-	338	350	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	2.7	0	157.4	32.3
HCM LOS			F	D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	57	1147	-	-	1005	-	- 398
HCM Lane V/C Ratio	0.702	0.002	-	-	0.167	-	- 0.695
HCM Control Delay (s)	157.4	8.1	-	-	9.3	-	- 32.3
HCM Lane LOS	F	A	-	-	A	-	- D
HCM 95th %tile Q(veh)	3	0	-	-	0.6	-	- 5.1

Intersection	
Int Delay, s/veh	68

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	240	715	33	5	567	45	21	0	2	44	0	187
Future Vol, veh/h	240	715	33	5	567	45	21	0	2	44	0	187
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	267	794	37	6	630	50	23	0	2	49	0	208

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	680	0	0	831	0	0	2099	2020	794	1990	2007	630
Stage 1	-	-	-	-	-	-	1328	1328	-	642	642	-
Stage 2	-	-	-	-	-	-	771	692	-	1348	1365	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	912	-	-	801	-	-	38	58	388	~ 45	59	482
Stage 1	-	-	-	-	-	-	191	224	-	463	469	-
Stage 2	-	-	-	-	-	-	393	445	-	186	215	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	912	-	-	801	-	-	~ 17	41	388	~ 34	41	482
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 17	41	-	~ 34	41	-
Stage 1	-	-	-	-	-	-	135	158	-	327	466	-
Stage 2	-	-	-	-	-	-	222	442	-	131	152	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	2.6	0.1	$ 619.5	$ 474.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	19	801	-	-	912	-	- 137
HCM Lane V/C Ratio	1.345	0.007	-	-	0.292	-	- 1.873
HCM Control Delay (s)	$ 619.5	9.5	-	-	10.6	-	-$ 474.3
HCM Lane LOS	F	A	-	-	B	-	- F
HCM 95th %tile Q(veh)	3.5	0	-	-	1.2	-	- 19.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	SE	NW	NE	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	501	569	40	182
Demand Flow Rate, veh/h	523	597	41	185
Vehicles Circulating, veh/h	20	119	525	625
Vehicles Exiting, veh/h	790	447	18	91
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.5	8.4	5.1	8.0
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	523	597	41	185
Cap Entry Lane, veh/h	1352	1222	808	729
Entry HV Adj Factor	0.957	0.953	0.976	0.984
Flow Entry, veh/h	501	569	40	182
Cap Entry, veh/h	1294	1165	788	718
V/C Ratio	0.387	0.488	0.051	0.254
Control Delay, s/veh	6.5	8.4	5.1	8.0
LOS	A	A	A	A
95th %tile Queue, veh	2	3	0	1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	71	365	14	2	201	9	33	0	3	16	0	148
Future Volume (vph)	71	365	14	2	201	9	33	0	3	16	0	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1801		1770	1800		1770	1583		1770	1583	
Flt Permitted	0.61	1.00		0.52	1.00		0.74	1.00		0.76	1.00	
Satd. Flow (perm)	1143	1801		961	1800		1380	1583		1408	1583	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	406	16	2	223	10	37	0	3	18	0	164
RTOR Reduction (vph)	0	2	0	0	2	0	0	3	0	0	137	0
Lane Group Flow (vph)	79	420	0	2	231	0	37	0	0	18	27	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	17.1	17.1		17.1	17.1		5.4	5.4		5.4	5.4	
Effective Green, g (s)	17.1	17.1		17.1	17.1		5.4	5.4		5.4	5.4	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.17	0.17		0.17	0.17	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	601	947		505	947		229	263		233	263	
v/s Ratio Prot		c0.23			0.13			0.00			0.02	
v/s Ratio Perm	0.07			0.00			c0.03			0.01		
v/c Ratio	0.13	0.44		0.00	0.24		0.16	0.00		0.08	0.10	
Uniform Delay, d1	3.9	4.8		3.7	4.2		11.6	11.3		11.4	11.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.0	0.1		0.3	0.0		0.1	0.2	
Delay (s)	4.0	5.1		3.7	4.3		11.9	11.3		11.6	11.7	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		4.9			4.3			11.9			11.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	32.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	71	365	14	2	201	9	33	0	3	16	0	148
Future Volume (veh/h)	71	365	14	2	201	9	33	0	3	16	0	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1826	1870	1826	1826	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	406	16	2	223	10	37	0	3	18	0	164
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	5	2	5	5	2	2	2	2	2	2
Cap, veh/h	670	707	28	523	703	32	396	0	269	544	0	269
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.17	0.00	0.17	0.17	0.00	0.17
Sat Flow, veh/h	1147	1745	69	965	1734	78	1222	0	1585	1414	0	1585
Grp Volume(v), veh/h	79	0	422	2	0	233	37	0	3	18	0	164
Grp Sat Flow(s),veh/h/ln	1147	0	1814	965	0	1812	1222	0	1585	1414	0	1585
Q Serve(g_s), s	1.2	0.0	4.2	0.0	0.0	2.1	0.7	0.0	0.0	0.3	0.0	2.3
Cycle Q Clear(g_c), s	3.3	0.0	4.2	4.3	0.0	2.1	2.9	0.0	0.0	0.3	0.0	2.3
Prop In Lane	1.00		0.04	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	670	0	735	523	0	734	396	0	269	544	0	269
V/C Ratio(X)	0.12	0.00	0.57	0.00	0.00	0.32	0.09	0.00	0.01	0.03	0.00	0.61
Avail Cap(c_a), veh/h	2449	0	3547	2019	0	3544	1436	0	1617	1746	0	1617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.9	0.0	5.4	7.1	0.0	4.8	10.4	0.0	8.1	8.2	0.0	9.0
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.7	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.0	0.0	6.1	7.1	0.0	5.0	10.5	0.0	8.1	8.3	0.0	11.3
LnGrp LOS	A	A	A	A	A	A	B	A	A	A	A	B
Approach Vol, veh/h		501			235			40			182	
Approach Delay, s/veh		6.1			5.0			10.3			11.0	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.5		9.0		14.5		9.0				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		46.0		24.0		46.0		24.0				
Max Q Clear Time (g_c+I1), s		6.3		4.9		6.2		4.3				
Green Ext Time (p_c), s		1.2		0.1		3.3		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			6.9									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	3.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	71	381	14	2	534	7	0	0	33	0	0	173
Future Vol, veh/h	71	381	14	2	534	7	0	0	33	0	0	173
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	79	423	16	2	593	8	0	0	37	0	0	192

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	601	0	0	439	0	0	-	-	423	-	-	597
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	976	-	-	1121	-	-	0	0	631	0	0	503
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	976	-	-	1121	-	-	-	-	631	-	-	503
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	1.4	0	11.1	16.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	631	1121	-	-	976	-	- 503
HCM Lane V/C Ratio	0.058	0.002	-	-	0.081	-	- 0.382
HCM Control Delay (s)	11.1	8.2	-	-	9	-	- 16.5
HCM Lane LOS	B	A	-	-	A	-	- C
HCM 95th %tile Q(veh)	0.2	0	-	-	0.3	-	- 1.8

Intersection	
Int Delay, s/veh	1.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	80	441	9	28	674	8	0	0	9	0	0	76
Future Vol, veh/h	80	441	9	28	674	8	0	0	9	0	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	0	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	89	490	10	31	749	9	0	0	10	0	0	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	758	0	0	500	0	0	-	-	495	-	-	749
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	853	-	-	1064	-	-	0	0	575	0	0	412
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	853	-	-	1064	-	-	-	-	575	-	-	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	1.5	0.3	11.4	16
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	575	1064	-	-	853	-	- 412
HCM Lane V/C Ratio	0.017	0.029	-	-	0.104	-	- 0.205
HCM Control Delay (s)	11.4	8.5	-	-	9.7	-	- 16
HCM Lane LOS	B	A	-	-	A	-	- C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.3	-	- 0.8

Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

Approach	SE	NW	NE	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1024	686	25	132
Demand Flow Rate, veh/h	1069	719	25	134
Vehicles Circulating, veh/h	30	194	1055	718
Vehicles Exiting, veh/h	822	886	44	195
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.8	12.1	8.3	7.9
Approach LOS	C	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	1069	719	25	134
Cap Entry Lane, veh/h	1338	1132	470	663
Entry HV Adj Factor	0.958	0.954	1.000	0.985
Flow Entry, veh/h	1024	686	25	132
Cap Entry, veh/h	1282	1080	470	654
V/C Ratio	0.799	0.635	0.053	0.202
Control Delay, s/veh	16.8	12.1	8.3	7.9
LOS	C	B	A	A
95th %tile Queue, veh	9	5	0	1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	151	737	33	5	590	22	21	0	2	22	0	97
Future Volume (vph)	151	737	33	5	590	22	21	0	2	22	0	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1800		1770	1802		1770	1583		1770	1583	
Flt Permitted	0.21	1.00		0.34	1.00		0.74	1.00		0.76	1.00	
Satd. Flow (perm)	387	1800		642	1802		1380	1583		1409	1583	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	168	819	37	6	656	24	23	0	2	24	0	108
RTOR Reduction (vph)	0	2	0	0	1	0	0	2	0	0	98	0
Lane Group Flow (vph)	168	854	0	6	679	0	23	0	0	24	10	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	40.4	40.4		28.7	28.7		5.4	5.4		5.4	5.4	
Effective Green, g (s)	40.4	40.4		28.7	28.7		5.4	5.4		5.4	5.4	
Actuated g/C Ratio	0.72	0.72		0.51	0.51		0.10	0.10		0.10	0.10	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	446	1303		330	926		133	153		136	153	
v/s Ratio Prot	0.05	c0.47			c0.38			0.00			0.01	
v/s Ratio Perm	0.23			0.01			0.02			c0.02		
v/c Ratio	0.38	0.66		0.02	0.73		0.17	0.00		0.18	0.07	
Uniform Delay, d1	5.5	4.0		6.6	10.6		23.1	22.8		23.2	22.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.2		0.0	3.0		0.6	0.0		0.6	0.2	
Delay (s)	6.0	5.2		6.7	13.6		23.8	22.8		23.8	23.1	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		5.4			13.5			23.7			23.2	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	151	737	33	5	590	22	21	0	2	22	0	97
Future Volume (veh/h)	151	737	33	5	590	22	21	0	2	22	0	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1826	1870	1826	1826	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	819	37	6	656	24	23	0	2	24	0	108
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	5	2	5	5	2	2	2	2	2	2
Cap, veh/h	437	1159	52	399	805	29	217	0	174	313	0	174
Arrive On Green	0.10	0.67	0.67	0.46	0.46	0.46	0.11	0.00	0.11	0.11	0.00	0.11
Sat Flow, veh/h	1781	1733	78	645	1750	64	1286	0	1585	1415	0	1585
Grp Volume(v), veh/h	168	0	856	6	0	680	23	0	2	24	0	108
Grp Sat Flow(s),veh/h/ln	1781	0	1812	645	0	1814	1286	0	1585	1415	0	1585
Q Serve(g_s), s	1.9	0.0	13.4	0.3	0.0	14.6	0.8	0.0	0.1	0.7	0.0	2.9
Cycle Q Clear(g_c), s	1.9	0.0	13.4	4.3	0.0	14.6	3.7	0.0	0.1	0.7	0.0	2.9
Prop In Lane	1.00		0.04	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	437	0	1211	399	0	834	217	0	174	313	0	174
V/C Ratio(X)	0.38	0.00	0.71	0.02	0.00	0.82	0.11	0.00	0.01	0.08	0.00	0.62
Avail Cap(c_a), veh/h	540	0	2092	676	0	1612	590	0	634	724	0	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.9	0.0	4.7	9.0	0.0	10.5	20.9	0.0	17.9	18.2	0.0	19.2
Incr Delay (d2), s/veh	0.6	0.0	0.8	0.0	0.0	2.0	0.2	0.0	0.0	0.1	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.3	0.0	0.0	3.4	0.2	0.0	0.0	0.2	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	0.0	5.5	9.0	0.0	12.5	21.1	0.0	17.9	18.3	0.0	22.8
LnGrp LOS	A	A	A	A	A	B	C	A	B	B	A	C
Approach Vol, veh/h		1024			686			25			132	
Approach Delay, s/veh		5.9			12.5			20.9			22.0	
Approach LOS		A			B			C			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.4	25.7		9.9		35.1		9.9				
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	7.0	40.0		18.0		52.0		18.0				
Max Q Clear Time (g_c+I1), s	3.9	16.6		5.7		15.4		4.9				
Green Ext Time (p_c), s	0.1	4.1		0.0		8.1		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		9.7	
HCM 6th LOS		A	

Intersection	
Int Delay, s/veh	2.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	151	768	33	5	617	22	0	0	22	0	0	141
Future Vol, veh/h	151	768	33	5	617	22	0	0	22	0	0	141
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	168	853	37	6	686	24	0	0	24	0	0	157

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	710	0	0	890	0	0	-	-	853	-	-	686
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	889	-	-	761	-	-	0	0	359	0	0	447
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	889	-	-	761	-	-	-	-	359	-	-	447
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	1.6	0.1	15.8	17.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	359	761	-	-	889	-	- 447
HCM Lane V/C Ratio	0.068	0.007	-	-	0.189	-	- 0.35
HCM Control Delay (s)	15.8	9.8	-	-	10	-	- 17.3
HCM Lane LOS	C	A	-	-	A	-	- C
HCM 95th %tile Q(veh)	0.2	0	-	-	0.7	-	- 1.6

Intersection	
Int Delay, s/veh	1.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	89	899	6	47	685	23	0	0	9	0	0	93
Future Vol, veh/h	89	899	6	47	685	23	0	0	9	0	0	93
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	0	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	99	999	7	52	761	26	0	0	10	0	0	103

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	787	0	0	1006	0	0	-	-	1003	-	-	761
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	832	-	-	689	-	-	0	0	294	0	0	405
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	832	-	-	689	-	-	-	-	294	-	-	405
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.9	0.7	17.7	16.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	294	689	-	-	832	-	- 405
HCM Lane V/C Ratio	0.034	0.076	-	-	0.119	-	- 0.255
HCM Control Delay (s)	17.7	10.7	-	-	9.9	-	- 16.9
HCM Lane LOS	C	B	-	-	A	-	- C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0.4	-	- 1

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Approach	SE	NW	NE	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	580	569	40	277
Demand Flow Rate, veh/h	591	580	41	283
Vehicles Circulating, veh/h	31	209	604	599
Vehicles Exiting, veh/h	851	436	18	190
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.1	9.4	5.5	9.7
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	591	580	41	283
Cap Entry Lane, veh/h	1337	1115	745	749
Entry HV Adj Factor	0.982	0.981	0.976	0.979
Flow Entry, veh/h	580	569	40	277
Cap Entry, veh/h	1312	1094	727	733
V/C Ratio	0.442	0.520	0.055	0.378
Control Delay, s/veh	7.1	9.4	5.5	9.7
LOS	A	A	A	A
95th %tile Queue, veh	2	3	0	2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	151	356	14	2	493	17	33	0	3	25	0	224
Future Volume (vph)	151	356	14	2	493	17	33	0	3	25	0	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1801		1770	1802		1770	1583		1770	1583	
Flt Permitted	0.38	1.00		0.52	1.00		0.60	1.00		0.76	1.00	
Satd. Flow (perm)	702	1801		961	1802		1126	1583		1408	1583	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	168	396	16	2	548	19	37	0	3	28	0	249
RTOR Reduction (vph)	0	2	0	0	2	0	0	2	0	0	197	0
Lane Group Flow (vph)	168	410	0	2	565	0	37	1	0	28	52	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	18.2	18.2		18.2	18.2		7.4	7.4		7.4	7.4	
Effective Green, g (s)	18.2	18.2		18.2	18.2		7.4	7.4		7.4	7.4	
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.21	0.21		0.21	0.21	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	358	920		491	921		234	329		292	329	
v/s Ratio Prot		0.23			c0.31			0.00			0.03	
v/s Ratio Perm	0.24			0.00			c0.03			0.02		
v/c Ratio	0.47	0.45		0.00	0.61		0.16	0.00		0.10	0.16	
Uniform Delay, d1	5.6	5.5		4.3	6.2		11.5	11.2		11.4	11.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.3		0.0	1.2		0.3	0.0		0.1	0.2	
Delay (s)	6.6	5.9		4.3	7.4		11.9	11.2		11.5	11.8	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		6.1			7.4			11.8			11.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	35.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	151	356	14	2	493	17	33	0	3	25	0	224
Future Volume (veh/h)	151	356	14	2	493	17	33	0	3	25	0	224
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1826	1870	1826	1826	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	396	16	2	548	19	37	0	3	28	0	249
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	5	2	5	5	2	2	2	2	2	2
Cap, veh/h	446	926	37	561	932	32	265	0	352	489	0	352
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.22	0.00	0.22	0.22	0.00	0.22
Sat Flow, veh/h	844	1743	70	974	1754	61	1131	0	1585	1414	0	1585
Grp Volume(v), veh/h	168	0	412	2	0	567	37	0	3	28	0	249
Grp Sat Flow(s),veh/h/ln	844	0	1813	974	0	1815	1131	0	1585	1414	0	1585
Q Serve(g_s), s	6.9	0.0	5.6	0.1	0.0	8.6	1.3	0.0	0.1	0.6	0.0	5.9
Cycle Q Clear(g_c), s	15.5	0.0	5.6	5.6	0.0	8.6	7.1	0.0	0.1	0.7	0.0	5.9
Prop In Lane	1.00		0.04	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	446	0	963	561	0	964	265	0	352	489	0	352
V/C Ratio(X)	0.38	0.00	0.43	0.00	0.00	0.59	0.14	0.00	0.01	0.06	0.00	0.71
Avail Cap(c_a), veh/h	999	0	2150	1198	0	2152	628	0	861	944	0	861
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	0.0	5.8	7.5	0.0	6.5	17.8	0.0	12.3	12.6	0.0	14.5
Incr Delay (d2), s/veh	0.5	0.0	0.3	0.0	0.0	0.6	0.2	0.0	0.0	0.0	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	1.4	0.0	0.0	1.2	0.3	0.0	0.0	0.2	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	0.0	6.1	7.5	0.0	7.0	18.1	0.0	12.3	12.6	0.0	17.2
LnGrp LOS	B	A	A	A	A	A	B	A	B	B	A	B
Approach Vol, veh/h		580			569			40			277	
Approach Delay, s/veh		7.9			7.0			17.6			16.7	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.5		14.0		26.5		14.0				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		48.0		22.0		48.0		22.0				
Max Q Clear Time (g_c+I1), s		10.6		9.1		17.5		7.9				
Green Ext Time (p_c), s		3.4		0.1		4.0		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			9.5									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	151	381	14	2	526	14	0	0	36	0	0	249
Future Vol, veh/h	151	381	14	2	526	14	0	0	36	0	0	249
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	168	423	16	2	584	16	0	0	40	0	0	277

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	600	0	0	439	0	0	-	-	423	-	-	584
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	977	-	-	1121	-	-	0	0	631	0	0	512
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	977	-	-	1121	-	-	-	-	631	-	-	512
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	2.6	0	11.1	20
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	631	1121	-	-	977	-	- 512
HCM Lane V/C Ratio	0.063	0.002	-	-	0.172	-	- 0.54
HCM Control Delay (s)	11.1	8.2	-	-	9.4	-	- 20
HCM Lane LOS	B	A	-	-	A	-	- C
HCM 95th %tile Q(veh)	0.2	0	-	-	0.6	-	- 3.2

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	521	6	28	750	0	9
Future Vol, veh/h	521	6	28	750	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	2	5	2	2
Mvmt Flow	579	7	31	833	0	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	586	0	-	583
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-	3.318
Pot Cap-1 Maneuver	-	-	989	-	0	512
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	989	-	-	512
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.3	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	512	989	-	-	-
HCM Lane V/C Ratio	0.02	0.031	-	-	-
HCM Control Delay (s)	12.2	8.8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0.1	-	-	-

Intersection	
Intersection Delay, s/veh	18.9
Intersection LOS	C

Approach	SE	NW	NE	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1098	686	25	257
Demand Flow Rate, veh/h	1144	719	25	262
Vehicles Circulating, veh/h	56	295	1156	690
Vehicles Exiting, veh/h	896	886	44	323
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	23.3	15.5	9.3	10.6
Approach LOS	C	C	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	1144	719	25	262
Cap Entry Lane, veh/h	1303	1021	424	683
Entry HV Adj Factor	0.960	0.955	1.000	0.981
Flow Entry, veh/h	1098	686	25	257
Cap Entry, veh/h	1251	975	424	670
V/C Ratio	0.878	0.704	0.059	0.384
Control Delay, s/veh	23.3	15.5	9.3	10.6
LOS	C	C	A	B
95th %tile Queue, veh	13	6	0	2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	240	715	33	5	567	45	21	0	2	44	0	187
Future Volume (vph)	240	715	33	5	567	45	21	0	2	44	0	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1800		1770	1793		1770	1583		1770	1583	
Flt Permitted	0.17	1.00		0.35	1.00		0.51	1.00		0.76	1.00	
Satd. Flow (perm)	315	1800		658	1793		955	1583		1409	1583	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	267	794	37	6	630	50	23	0	2	49	0	208
RTOR Reduction (vph)	0	2	0	0	3	0	0	2	0	0	181	0
Lane Group Flow (vph)	267	829	0	6	677	0	23	0	0	49	27	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	42.5	42.5		28.3	28.3		7.8	7.8		7.8	7.8	
Effective Green, g (s)	42.5	42.5		28.3	28.3		7.8	7.8		7.8	7.8	
Actuated g/C Ratio	0.70	0.70		0.47	0.47		0.13	0.13		0.13	0.13	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	444	1268		308	841		123	204		182	204	
v/s Ratio Prot	0.09	c0.46			c0.38			0.00			0.02	
v/s Ratio Perm	0.33			0.01			0.02			c0.03		
v/c Ratio	0.60	0.65		0.02	0.80		0.19	0.00		0.27	0.13	
Uniform Delay, d1	7.9	4.9		8.6	13.6		23.4	22.9		23.7	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	1.2		0.0	5.6		0.7	0.0		0.8	0.3	
Delay (s)	10.2	6.1		8.6	19.3		24.2	22.9		24.5	23.5	
Level of Service	B	A		A	B		C	C		C	C	
Approach Delay (s)		7.1			19.2			24.1			23.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	240	715	33	5	567	45	21	0	2	44	0	187
Future Volume (veh/h)	240	715	33	5	567	45	21	0	2	44	0	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1826	1870	1826	1826	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	267	794	37	6	630	50	23	0	2	49	0	208
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	5	2	5	5	2	2	2	2	2	2
Cap, veh/h	407	1112	52	354	734	58	192	0	281	379	0	281
Arrive On Green	0.11	0.64	0.64	0.44	0.44	0.44	0.18	0.00	0.18	0.18	0.00	0.18
Sat Flow, veh/h	1781	1731	81	660	1670	133	1174	0	1585	1415	0	1585
Grp Volume(v), veh/h	267	0	831	6	0	680	23	0	2	49	0	208
Grp Sat Flow(s),veh/h/ln	1781	0	1811	660	0	1802	1174	0	1585	1415	0	1585
Q Serve(g_s), s	4.0	0.0	16.8	0.3	0.0	18.9	1.1	0.0	0.1	1.6	0.0	6.9
Cycle Q Clear(g_c), s	4.0	0.0	16.8	5.9	0.0	18.9	8.0	0.0	0.1	1.7	0.0	6.9
Prop In Lane	1.00		0.04	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	1164	354	0	793	192	0	281	379	0	281
V/C Ratio(X)	0.66	0.00	0.71	0.02	0.00	0.86	0.12	0.00	0.01	0.13	0.00	0.74
Avail Cap(c_a), veh/h	558	0	1695	492	0	1168	364	0	514	587	0	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.0	0.0	6.5	12.2	0.0	14.0	25.4	0.0	18.8	19.5	0.0	21.6
Incr Delay (d2), s/veh	1.8	0.0	0.8	0.0	0.0	4.4	0.3	0.0	0.0	0.2	0.0	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.3	0.0	0.0	6.0	0.3	0.0	0.0	0.5	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.8	0.0	7.4	12.2	0.0	18.4	25.7	0.0	18.8	19.7	0.0	25.5
LnGrp LOS	B	A	A	B	A	B	C	A	B	B	A	C
Approach Vol, veh/h		1098			686			25			257	
Approach Delay, s/veh		8.7			18.4			25.1			24.4	
Approach LOS		A			B			C			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.3	29.4		14.8		40.7		14.8				
Change Period (Y+Rc), s	5.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	11.0	36.0		18.0		52.0		18.0				
Max Q Clear Time (g_c+I1), s	6.0	20.9		10.0		18.8		8.9				
Green Ext Time (p_c), s	0.4	3.6		0.0		7.5		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		14.1	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	4.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	240	759	33	5	588	45	0	0	23	0	0	231
Future Vol, veh/h	240	759	33	5	588	45	0	0	23	0	0	231
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	267	843	37	6	653	50	0	0	26	0	0	257

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	703	0	0	880	0	0	-	-	843	-	-	653
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	-	6.22	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	-	3.318	-	-	3.318
Pot Cap-1 Maneuver	895	-	-	768	-	-	0	0	364	0	0	467
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	895	-	-	768	-	-	-	-	364	-	-	467
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	2.5	0.1	15.6	21.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	364	768	-	-	895	-	- 467
HCM Lane V/C Ratio	0.07	0.007	-	-	0.298	-	- 0.55
HCM Control Delay (s)	15.6	9.7	-	-	10.7	-	- 21.7
HCM Lane LOS	C	A	-	-	B	-	- C
HCM 95th %tile Q(veh)	0.2	0	-	-	1.3	-	- 3.3

Intersection	
Int Delay, s/veh	0.4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	988	6	47	775	0	9
Future Vol, veh/h	988	6	47	775	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	2	5	2	2
Mvmt Flow	1098	7	52	861	0	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1105	0	-	1102
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-	3.318
Pot Cap-1 Maneuver	-	-	632	-	0	257
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	632	-	-	257
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.6	19.6
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	257	632	-	-	-
HCM Lane V/C Ratio	0.039	0.083	-	-	-
HCM Control Delay (s)	19.6	11.2	-	-	-
HCM Lane LOS	C	B	-	-	-
HCM 95th %tile Q(veh)	0.1	0.3	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	53	553	33	5	441	5	21	0	2	3	0	25
Future Vol, veh/h	53	553	33	5	441	5	21	0	2	3	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	59	614	37	6	490	6	23	0	2	3	0	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	496	0	0	651	0	0	1251	1240	614	1257	1274	493
Stage 1	-	-	-	-	-	-	732	732	-	505	505	-
Stage 2	-	-	-	-	-	-	519	508	-	752	769	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1068	-	-	935	-	-	149	175	492	148	167	576
Stage 1	-	-	-	-	-	-	413	427	-	549	540	-
Stage 2	-	-	-	-	-	-	540	539	-	402	411	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1068	-	-	935	-	-	135	164	492	140	157	576
Mov Cap-2 Maneuver	-	-	-	-	-	-	135	164	-	140	157	-
Stage 1	-	-	-	-	-	-	390	404	-	519	537	-
Stage 2	-	-	-	-	-	-	511	536	-	378	388	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.7	0.1	35.3	14
HCM LOS			E	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	144	935	-	-	1068	-	- 432
HCM Lane V/C Ratio	0.177	0.006	-	-	0.055	-	- 0.072
HCM Control Delay (s)	35.3	8.9	-	-	8.6	-	- 14
HCM Lane LOS	E	A	-	-	A	-	- B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	- 0.2

Intersection	
Int Delay, s/veh	0.5

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	29	637	483	4	2	23
Future Vol, veh/h	29	637	483	4	2	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	5	5	2	2	2
Mvmt Flow	32	708	537	4	2	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	541	0	-	0	1311	539
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	772	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1028	-	-	-	175	542
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	456	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1028	-	-	-	170	542
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	456	-

Approach	SE	NW	SW
HCM Control Delay, s	0.4	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1028	-	523
HCM Lane V/C Ratio	-	-	0.031	-	0.053
HCM Control Delay (s)	-	-	8.6	-	12.3
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.1	-	0.2

Intersection	
Int Delay, s/veh	1.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	68	540	28	4	428	6	18	0	2	5	0	41
Future Vol, veh/h	68	540	28	4	428	6	18	0	2	5	0	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	76	600	31	4	476	7	20	0	2	6	0	46

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	483	0	0	631	0	0	1263	1243	600	1257	1271	480
Stage 1	-	-	-	-	-	-	752	752	-	488	488	-
Stage 2	-	-	-	-	-	-	511	491	-	769	783	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1080	-	-	951	-	-	147	174	501	148	168	586
Stage 1	-	-	-	-	-	-	402	418	-	561	550	-
Stage 2	-	-	-	-	-	-	545	548	-	394	404	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1080	-	-	951	-	-	128	161	501	139	156	586
Mov Cap-2 Maneuver	-	-	-	-	-	-	128	161	-	139	156	-
Stage 1	-	-	-	-	-	-	374	389	-	522	548	-
Stage 2	-	-	-	-	-	-	501	546	-	365	376	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.9	0.1	36	14.4
HCM LOS			E	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	138	951	-	-	1080	-	-	434
HCM Lane V/C Ratio	0.161	0.005	-	-	0.07	-	-	0.118
HCM Control Delay (s)	36	8.8	-	-	8.6	-	-	14.4
HCM Lane LOS	E	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	-	0.4

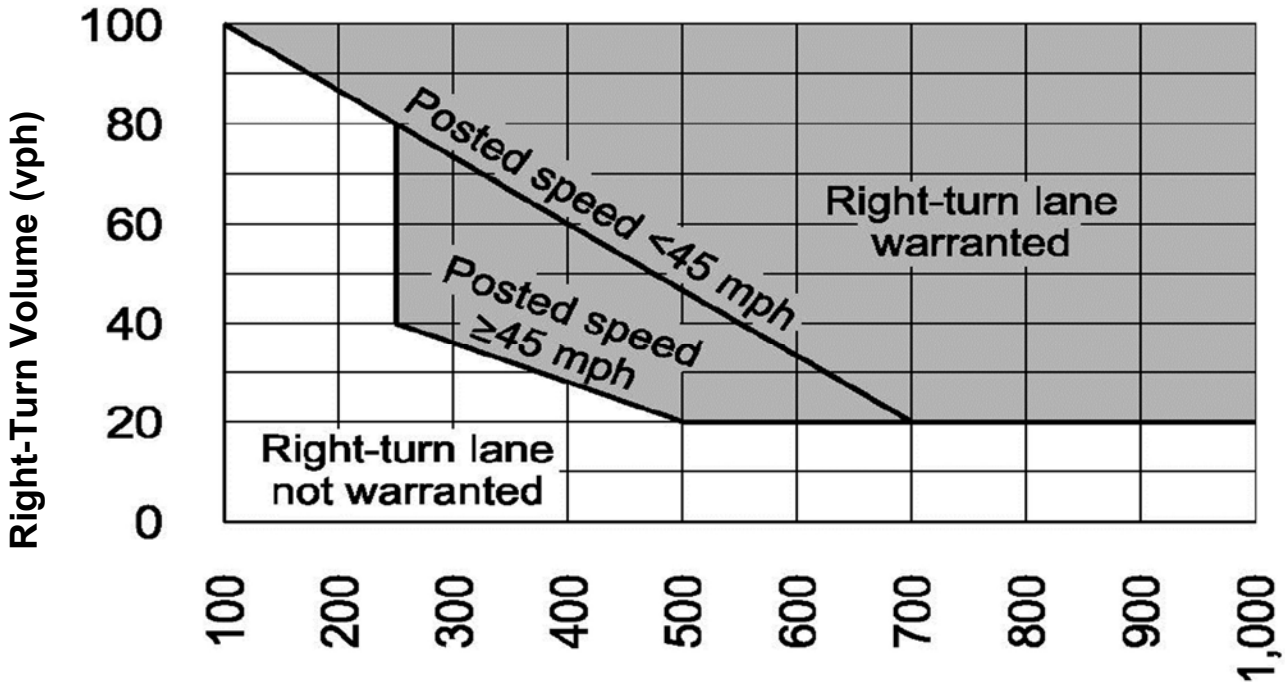
APPENDIX D: TURN LANE WARRANT WORKSHEETS

The River District
ITD Right-Turn Lane Analysis

2019 Existing Traffic (Seasonally Adjusted)

Intersection		Approach	Speed Limit (mph)	Peak Hour	Right-Turn Volume (vph)	Major Road Volume (vphpl)	Meet Warrant?
1	SH 55 and Riverview Parkway	SEB	50	AM	4	239	No*
				PM	1	490	No*

*Approach volume per lane < 100 vphpl or right-turn volume < 20 vph = Not Warranted

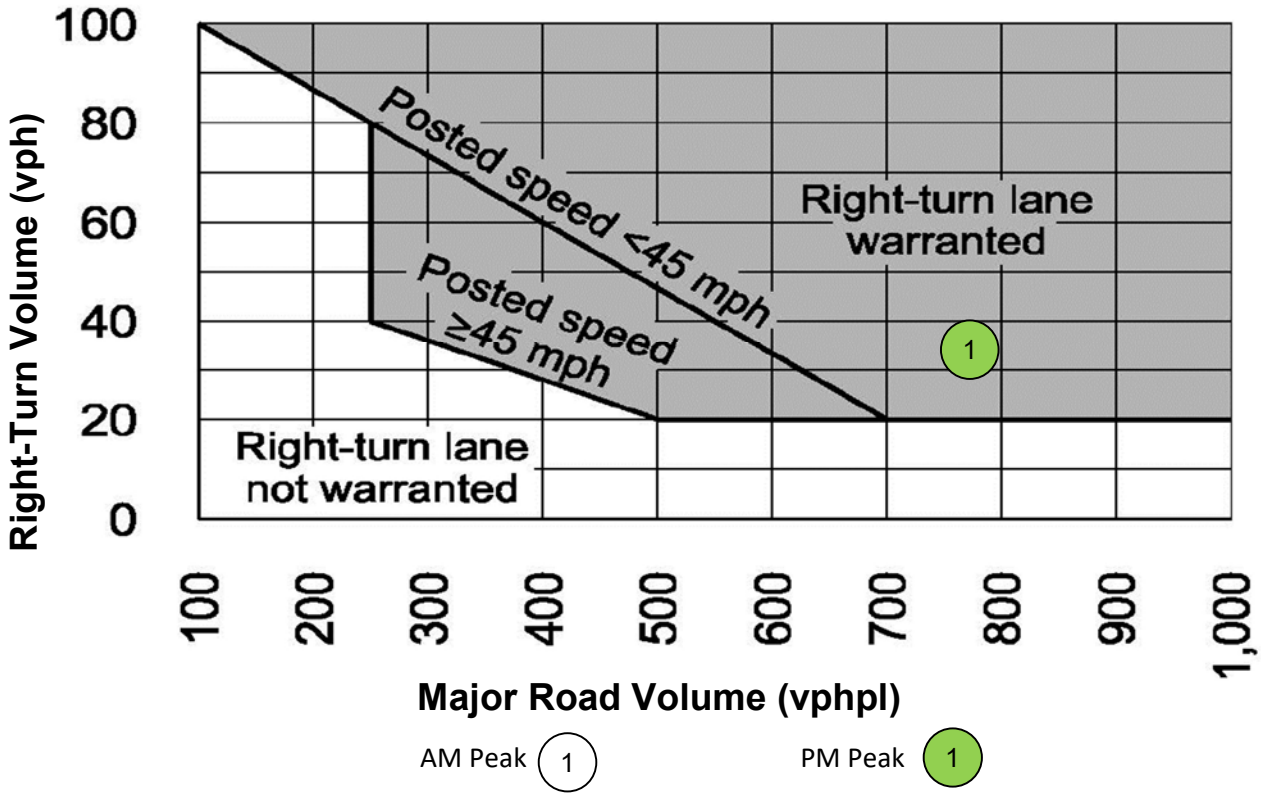


The River District
ITD Right-Turn Lane Analysis

2040 Background Traffic

Intersection	Approach	Speed Limit (mph)	Peak Hour	Right-Turn Volume (vph)	Major Road Volume (vphpl)	Meet Warrant?
(1) SH 55 and Riverview Parkway	SEB	50	AM	14	370	No*
			PM	**33**	**774**	**Yes**

*Approach volume per lane < 100 vphpl or right-turn volume < 20 vph = Not Warranted



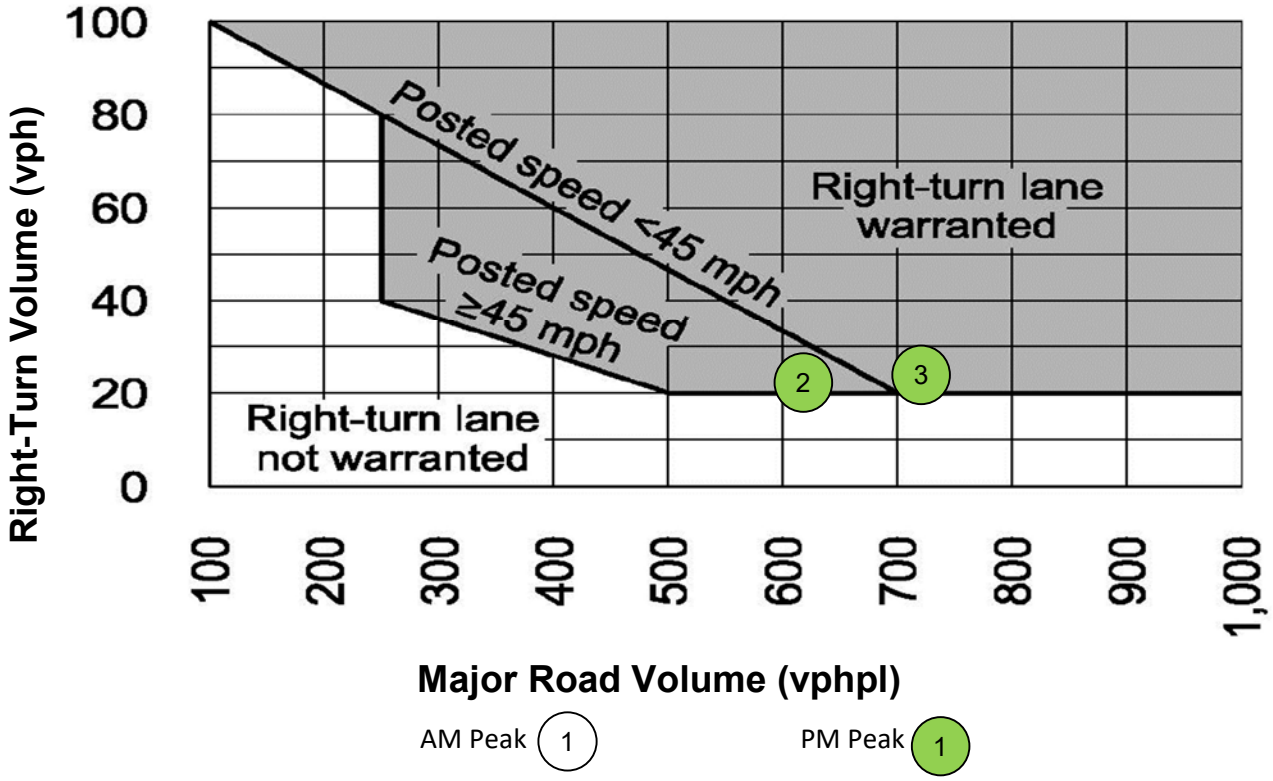
AM Peak (1) PM Peak 1

The River District
ITD Right-Turn Lane Analysis

2040 Total Traffic

Intersection	Approach	Speed Limit (mph)	Peak Hour	Right-Turn Volume (vph)	Major Road Volume (vphpl)	Meet Warrant?
(1) SH 55 and Riverview Parkway	SEB	50	AM PM	**Warranted Under 2040 Background**		
(2) SH 55 and Ponderosa Street	NWB	50	AM	9	512	No*
			PM	**22**	**617**	**Yes**
(3) SH 55 and Payette Street	NWB	35	AM	8	685	No*
			PM	**23**	**711**	**Yes**

*Approach volume per lane < 100 vphpl or right-turn volume < 20 vph = Not Warranted

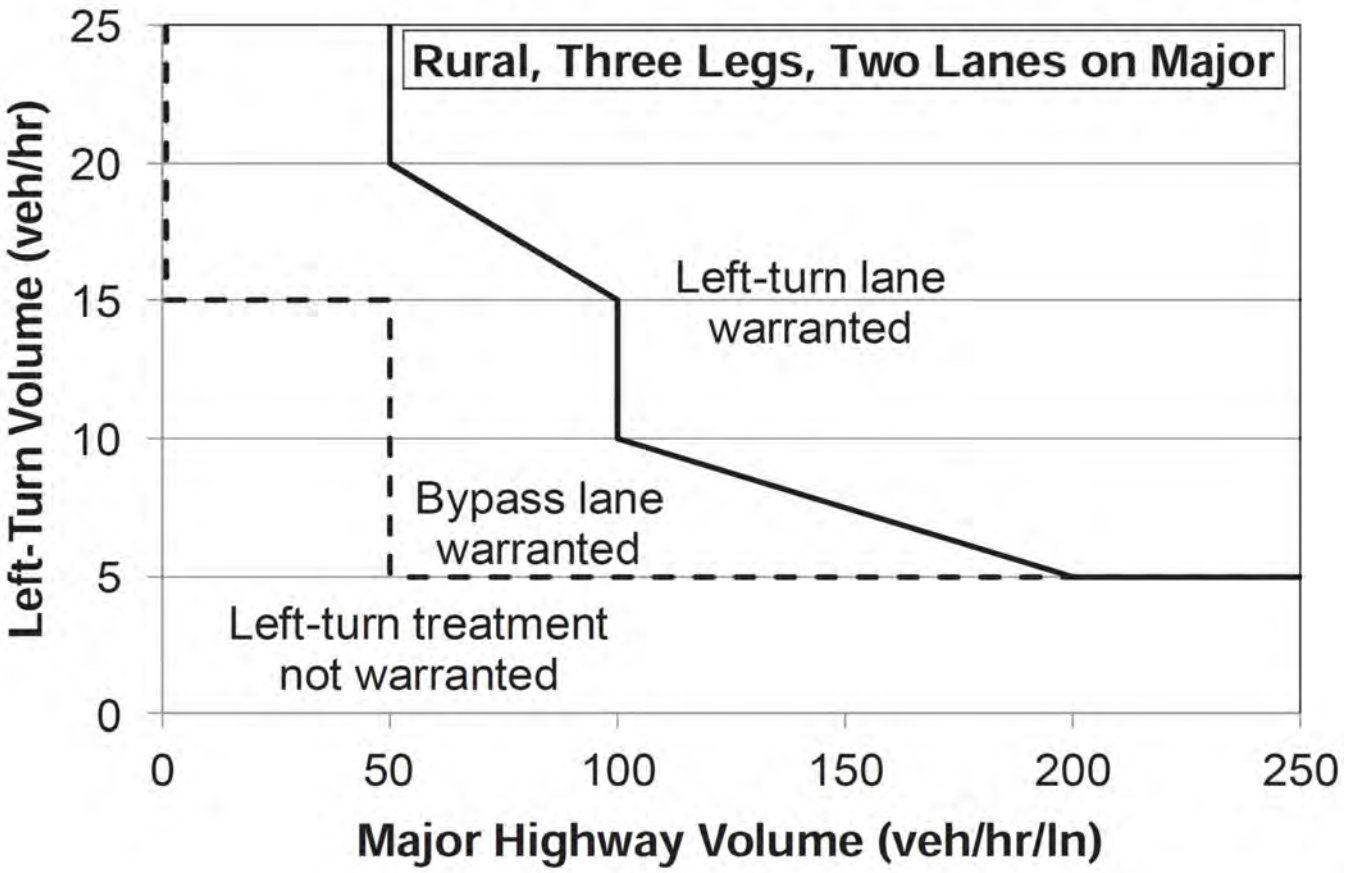


The River District
NCHRP Report 745 Left-turn Lane Guidelines

2019 Existing Traffic (Seasonally Adjusted)

Intersection	Approach	Speed Limit [mph]	Peak Hour	Turning Volume [vph]	Opposing Volume [vph]	Meet Warrant?
(1) SH 55 and Riverview Driveway	NWB	50	AM	1	239	No*
			PM	1	490	No*

* Left-turn Volume less than 5 vph - Not Warranted



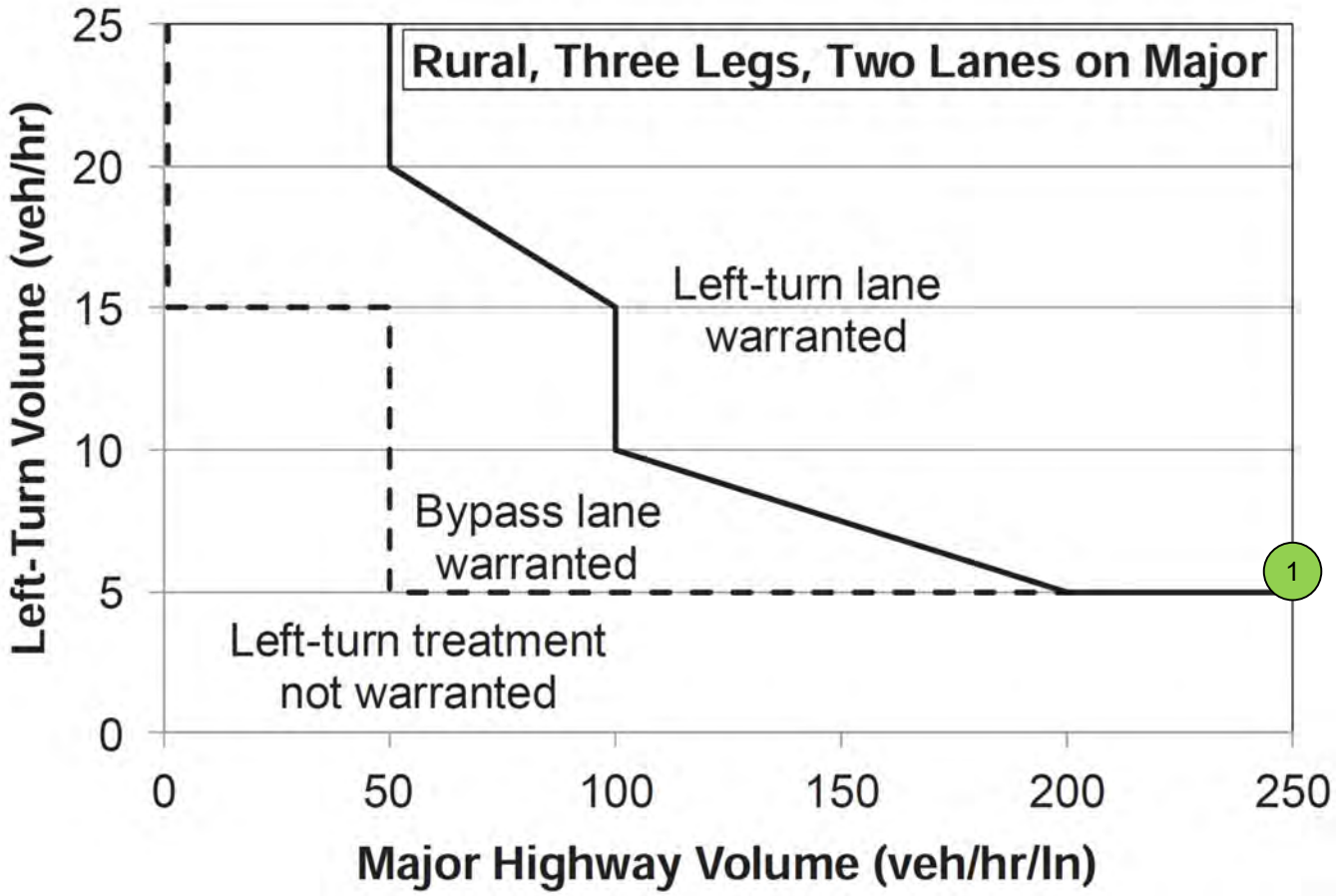
AM Peak (1) PM Peak (1)

The River District
NCHRP Report 745 Left-turn Lane Guidelines

2040 Background Traffic

Intersection	Approach	Speed Limit [mph]	Peak Hour	Turning Volume [vph]	Opposing Volume [vph]	Meet Warrant?
(1) SH 55 and Riverview Driveway	NWB	50	AM	2	370	No*
			PM	**5**	**774**	**Yes**

* Left-turn Volume less than 5 vph - Not Warranted



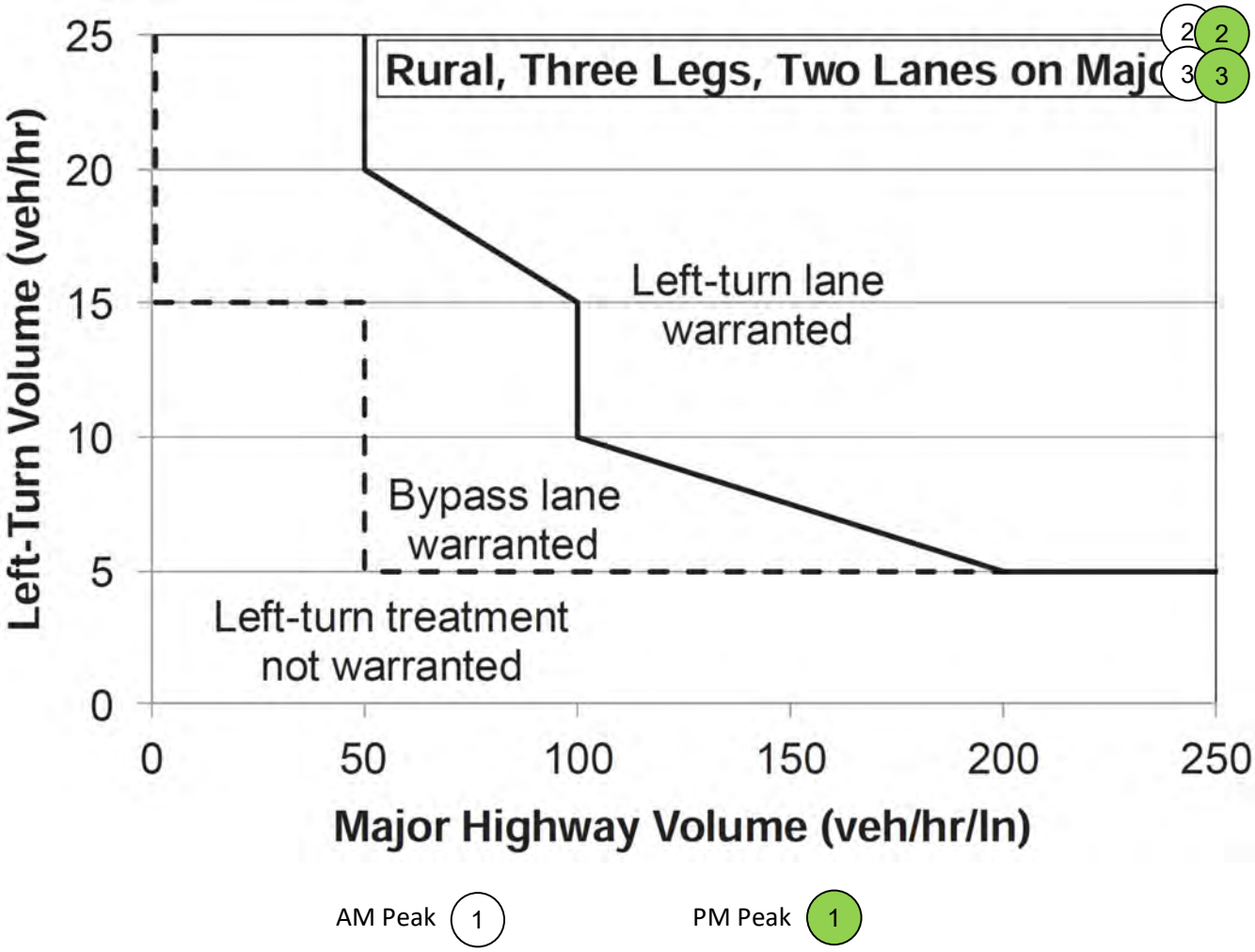
AM Peak (1) PM Peak (1)

The River District
NCHRP Report 745 Left-turn Lane Guidelines

2040 Total Traffic

Intersection	Approach	Speed Limit [mph]	Peak Hour	Turning Volume [vph]	Opposing Volume [vph]	Meet Warrant?
1 SH 55 and Riverview Driveway	NWB	50	AM	**Warranted Under Background Conditions**		
			PM			
2 SH 55 and Payette Street	SEB	50	**AM**	**80**	**682**	**Yes**
			PM	**89**	**708**	**Yes**
3 SH 55 and Ponderosa Street	SEB	50	**AM**	**71**	**510**	**Yes**
			PM	**151**	**612**	**Yes**
4 SH 55 and Payette Street	NWB	50	AM	3	444	No*
			PM	3	902	No*

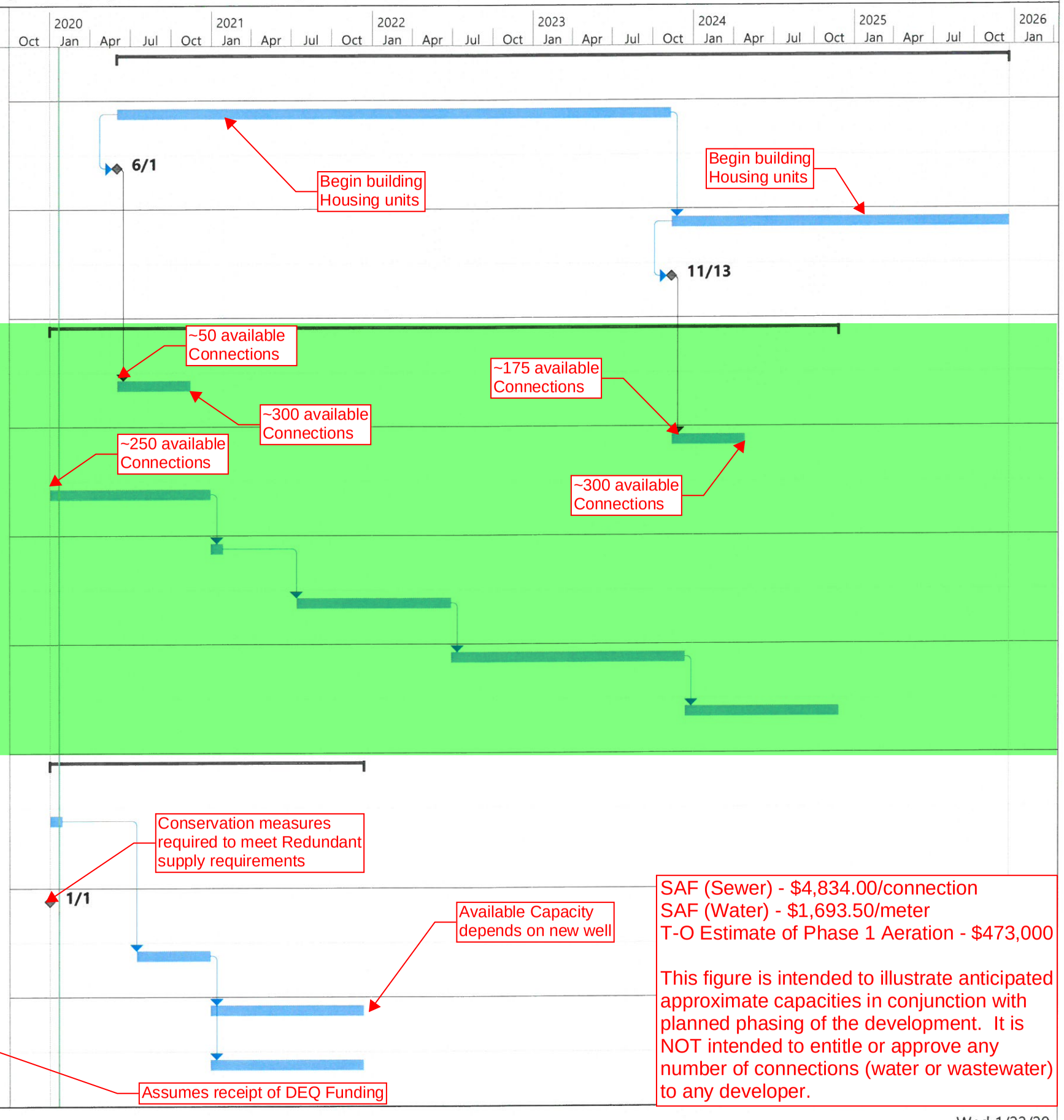
* Left-turn Volume less than 5 vph - Not Warranted



HORROCKS ENGINEERS

The River District PUD Phasing with Water and Wastewater System Planning

ID	Task Mode	Task Name	Duration (Working Days)	Start	Finish	Predecessors
1		**Development Phasing per Nov 18, 2019 Letter**	**1450 days**	**Mon 6/1/20**	**Fri 12/19/25**	
2		River District PUD Phase 1	900 days	Mon 6/1/20	Fri 11/10/23	
3		City Issues Phase 1 Will Serve letter	0 days	Mon 6/1/20	Mon 6/1/20	2SS
4		River District PUD Phase 2	550 days	Mon 11/13/23	Fri 12/19/25	2
5		City Issues Phase 2 Will Serve letter	0 days	Mon 11/13/23	Mon 11/13/23	4SS
6		**Wastewater System Management**	**1280 days**	**Wed 1/1/20**	**Tue 11/26/24**	
7		Design and Implement Aeration Phase 1	120 days	Mon 6/1/20	Fri 11/13/20	3
8		Design and Implement Aeration Phase 2	120 days	Mon 11/13/23	Fri 4/26/24	5
9		Collect Data in compliance with IPDES Permit	260 days	Wed 1/1/20	Tue 12/29/20	
10		Submit Letter of Interest for DEQ Funding	20 days	Wed 12/30/20	Tue 1/26/21	9
11		Prepare Facility Planning Study	250 days	Wed 7/14/21	Tue 6/28/22	10FS+120 days
12		Design System Expansion	380 days	Wed 6/29/22	Tue 12/12/23	11
13		Implement System Expansion	250 days	Wed 12/13/23	Tue 11/26/24	12
14		**Drinking Water System Management**	**510 days**	**Wed 1/1/20**	**Tue 12/14/21**	
15		Submit Letter of Interest for DEQ Funding	20 days	Wed 1/1/20	Tue 1/28/20	
16		Implement Conservation Measures	0 days	Wed 1/1/20	Wed 1/1/20	
17		Prepare Facility Planning Study	120 days	Wed 7/15/20	Tue 12/29/20	15FS+120 days
18		Develop Additional Supply Well	250 days	Wed 12/30/20	Tue 12/14/21	17
19		Develop Additonal Storage as needed	250 days	Wed 12/30/20	Tue 12/14/21	17



Wed 1/22/20

EXHIBIT D

EXHIBIT E

CASCADE RURAL FIRE PROTECTION DISTRICT
P.O. BOX 825
CASCADE, ID 83611-0825
109 EAST PINE STREET
(208) 382-3200
FAX
(208)382-4222

November 13, 2019

RE: The River District

Is there a plan in place for reviewing the current water supply and storage capacity for the City of Cascade? The River District is a large proposed development. The Cascade Rural Fire Protection Districts concern is the current water storage for fire suppression. The water storage the City of Cascade currently has may not be sufficient for the proposed additional infrastructure.

Steven Hull
Fire Chief
Cascade Rural Fire Protection District
steve@cascaderuralfire.com

EXHIBIT F

Peggy Breski

From: Sarah Arjona <Sarah.Arjona@itd.idaho.gov>
Sent: Thursday, January 16, 2020 9:50 AM
To: Peggy Breski
Subject: RE: [EXTERNAL] RE: Cascade River District ITD Comments

Peggy,
Thank you for reaching out to us. We have received the Traffic Impact Study for The River District and it is scheduled for review January 30th. Our review times are not too far out at this time however I don't think we will be able to provide comments before your next meeting. Comments for the TIS should be available shortly after.

Thanks again for reaching out,

Sarah Arjona
Development Services Coordinator
ITD District 3
(208) 334-8338

From: Peggy Breski <peggyb@horrocks.com>
Sent: Monday, January 13, 2020 10:29 AM
To: Sarah Arjona <Sarah.Arjona@itd.idaho.gov>; Heather Soelberg <clerk@cascadeid.us>
Subject: [EXTERNAL] RE: Cascade River District ITD Comments

--- This email is from an external sender. Be cautious and DO NOT open links or attachments if the sender is unknown. ---
Sarah,

I wanted to give you a heads up that we received the TIS for The River District in Cascade this morning. Steve Arnold said he was sending to you this morning too. We are very eager to hear ITD's comments.

The applicant didn't give City a lot of time for review (City Council is 2 weeks from tonight), and I'm pretty sure ITD won't be done by then with review/comment. I was hoping you could give us an idea of what ITD current review timelines are lately…?

Thanks so much!

Peggy Breski
Senior Planner | Project Manager

HORROCKS
ENGINEERS

2775 W. Navigator Dr., Suite 210
Meridian, Idaho 83642

Phone 208-895-2520, ext. 435
Email peggyb@horrocks.com
Web www.horrocks.com

EXHIBIT G

105 S. Main
PO Box 649
Cascade, ID 83611

Phone: 208-382-4279
Fax: 208-382-7204
Email: clerk@cascadeid.us
Web: www.cascadeid.us

Red font indicates determinations made by P&Z Commissioners at the June 17, 2019 Public Hearing.

DATE: June 6, 2019

TO: Steve Arnold, A-Team

FROM: City of Cascade

SUBJECT: **The River District (formerly Cascade River Ranch)**

The City of Cascade has reviewed the A-Team's Submittal of Requested Exceptions for [now] The River District Planned Unit Development [formerly Cascade River Ranch]. The following determinations and comments apply:

1) **Cul-de-sac length for "Resort Court" and "Cascade Court"**: P&Z Approved this 6/17/19.

a) Cascade Rural Fire Department ("CRFD") is not in favor of allowing cul-de-sac lengths *in excess* of 750-feet, and as the responding agency the City yields to their discretion. Request for any cul-de-sac to exceed 750-feet in length is therefore denied.

b) CRFD and the City will allow for an exception of cul-de-sac length from 500-feet up to 750-feet, so long as all related requirements are also met: Per Appendix D "Fire Apparatus Access Roads, Table D103.4", any cul-de-sac exceeding 500-feet in length, up to 750-feet, are required to be 26-feet wide, edge of pavement to edge of pavement. Additionally, the cul-de-sac bulb will be required to be 96-feet in diameter, per D103.1 of the same document.

2) **Building Height**: Applicant rescinded this 6/17/19.

a) This request must be denied due to the fact that CRFD is not equipped to respond to fires or emergencies exceeding 25-feet in height. The Department has 35-foot ladders, and per IFSTA (International Fire Service Training Association), responders are required to have no less than 3-5 rungs above the roofline; this means CRFD would be required to have 40+-foot ladders (giving allowance to roof pitches). Additionally, assuming CRFD had 40+-foot ladders the volunteer firefighters have not received the specialized

In addition, Cascade City Code 3(1)(8)(F) dictates that R-3 Zoning only allows 2-story structures.

training required to serve at this level, nor do they have the auxiliary equipment necessary to support the 40+-foot ladder service.

3) **Parking**: Applications are now in compliance.

a) The City will need to revisit this Exception Request once all other details are adequately addressed and represented in the Plat (most specifically roadways, lot sizes and setbacks).

4) **Lot Sizes**: P&Z Commissioners determined changes as shown below:

a) The Townhome lot widths have already been recommended for approval at 30-feet wide as requested; as long as there is adequate depth to the lot to allow for the ~~20-foot~~ 10-foot deep driveway in addition to complying with the setbacks as recommended in the City Comments dated May 17, 2019, a 3,000 sq.ft. lot would be considered for approval.

b) The City had requested an exhibit showing lot lines as required by Code (during May 20, 2019 meeting), and how the lot lines would cross over and intersect in the given area; this document was requested and is still being requested to demonstrate the need for the City to approve a request that contradicts Code. Staff created exhibit and recommended approval.

c) The City will not rezone residential areas to Zone C.

5) **Setbacks**:

a) The setback table as provided by the City in the City Comments dated May 17, 2019 (and as shown below) shows the request for Townhomes specifically being allowed.

b) The City acknowledges the request for Exception on other setbacks but **the table as shown below illustrates the minimum the City is willing to recommend for approval**; allowing the setbacks as requested for exception would go directly against the Comprehensive Plan components and would create potentially unsafe, and unsightly community design.

c) The Riverside Setback is still under review with outside Agencies; this item is TBD.

d) The City will not rezone residential areas to Zone C.

Setbacks: Commissioners approved the following changes:

UNIT TYPE	FRONT/Street	REAR/Yard	SIDE
Single Family	20’	20’	15’
Cottage	15’	15’	5’
Townhome	~~15’~~ 10'	10’[a]	0’ inside / 5’ outside[b]
Multi-family	15’	10’	10’

Commercial	15’	0’	0’
Riverside	-	TBD	

[a] Except where rear setback is riverside, then riverside setback applies

[b] Updated from first set of City Comments

6) **Storage Areas**: P& Z Commissioners waived this Code requirement.

a) Storage areas may not be “typical” in non-resort areas like the Treasure Valley, however due to the lifestyle of residents of the City of Cascade, storage area requirements are a pertinent City Code. With good planning and design there is no reason the integration of storage would be “aesthetically awkward”; the City Staff have contemplated numerous options in design as solutions to this problem and can be available to provide recommendations if Application wishes.

b) A Planned Unit Development of this scale cannot depend upon off-site facilities to support the development; providing storage is a Code requirement and one that must be met for orderly growth and expansion of the community.

c) Given the above considerations, and given that other solutions have been identified and are available, this exception request must be denied.

Thank you.