WCE

Whipple Consulting Engineers, Inc.

WCE No. 14-1166
December 23, 2015

City of Spokane Valley
11707 E Sprague Avenue Suite 106
Spokane Valley WA 99206

Attn: Gabe Gallinger, P.E.
Sean Messner, P.E.

Re Painted Hills Traffic Impact Analysis – Response to TIA Comments

Dear Sean

We have completed and revised the TIA per your letter dated October 2, 2015 and offer the following revisions and responses.

1. General: Analysis of the site access points should be included in the LOS tables with the study intersections. Please revise the report and include the access points proposed in the LOS tables with appropriate information.

All proposed and anticipated access roadways and driveways have been included and analyzed for LOS. Many of these access driveways were not defined at the time of the writing of the TIA as the development was still in the pre-design stage.

2. General: Include tum lane warrant analysis at site driveways and intersections that do not currently have tum lanes, based on WSDOT tum lane criteria.

Turn lanes are addressed in the year 2020 scenario section of the report.

3. General: Queue analysis at intersections and access points was requested but not included in report. Please revise report and provide accordingly.

The documentation of the TIA scope does not include a request for queue analysis. However in order to move the traffic study through the review process a queue analysis has been included within the study.

4. General: There was no discussion of provisions for pedestrians or bicyclists within the report. Provide accordingly.

A description of the pedestrian and bicycle facilities are included within the roadway descriptions.

5. General: Cut-through traffic was identified by the public. The executive summary and conclusions (one in the same) provide recommendations, however the report does not

contain any analysis or discussion of cut-through traffic via 40th/Woodlawn. The appendix provides data, please provide appropriate analysis and document accordingly.

As the cut through traffic comment was a request of the public the response to the public is included in that section. As this was a request made to WCE, we have provided the analysis that is appropriate to this request. In other words we are reporting the "news", not trying to create new "news"

6. General: Traffic counts should not be conducted during the weeks of holidays. This is common practice as weeks that contain holidays impact the travel patterns of many workers. This is well documented by FHWA, ITE, and included in many DOT data collection guidelines including WSDOT. Additionally, traffic counts shall not be conducted during weather events, including snowfall.
    a. Martin Luther King Jr. holiday was on Monday January 20th, 2015. Therefore traffic counts conducted during this week are invalid and shall be recounted. This includes the following intersections:
        i. 32nd / University
        ii. Dishman Mica / University
        iii. Dishman Mica / Bowdish
        iv. Dishman Mica / Thorpe
    b. The study also includes traffic counts performed for another project during the first week of July in 2014. These counts coincided with the July 4th holiday, which occurred that Friday. Therefore, traffic counts conducted during this week are invalid and shall be recounted. This includes the following intersections:
        i. 32nd / Evergreen (PM)
        ii. 32nd / Sullivan (PM)
        iii. 16th / Pines (PM)
        iv. 16th / SR 27 (PM)
        v. 32nd / SR 27 (PM)
    c. Lastly, snowfall occurred on January 22, 2015 with 2.1 inches in the region. Therefore, traffic counts on 1/22/ 15 are invalid and shall be recounted. This includes the following intersections:
        i. 32nd / Bowdish
        ii. 32nd / Pines
        iii. 32nd / SR 27 (AM)

The comment is noted and the counts have been redone in accordance with the City of Spokane Valley Street standards. These were provided to the City of Spokane on October 19th and 22nd 2015

7. General: Review of the executive summary, conclusions, and recommendations did not occur due to the comments provided herein. These will be reviewed upon resubmittal of the TIA with comments addressed.

So noted

8. General: Per our standards, the TIA shall analyze all access points proposed as part of the development. The TIA analyzes 5 access points: 1 to Dishman Mica and 4 to Madison. Based on this, the development shall only have 5 access points as described and analyzed within the TIA.

As per comment number 1 all proposed accesses have been included.

9. General: Include discussion of existing pedestrian and bicycle facilities in the study area.

A description of the pedestrian and bicycle facilities are included within the roadway descriptions.

10. General: Detailed reviews of the LOS calculations throughout the report were not performed based on the traffic count comment previously provided. The change in traffic volumes will impact the LOS throughout the report, and will be reviewed upon submission of a revised TIA addressing comments accordingly.

So noted

11. Page 8 - Multifamily Residential and Commercial: No access points to Dishman Mica were analyzed, and therefore are not permitted. Dishman Mica is classified as a Minor Arterial. As such, only I access is allowed per our Street Standards, Section 7.8.2, unless the additional access provides:
    a. Minimum spacing requirements between access points is met; and,
    b. The applicant demonstrates that additional access points will result in an improvement to safety or traffic flow both on-site and off-site; and,
    c. One of the following exist:
        i. The PM peak hour volume exceeds 100 peak hour vehicles on both directions, or
        ii. Traffic volumes using the driveway exceed the capacity of a stop controlled intersection during the peak hour, or
        iii. The ADT using the one access exceed 1,000 vehicles both directions.

The two commercial accesses to Dishman-Mica Road have been placed on the preliminary site plan since the submittal of the TIA and maintain a minimum of 120' CL to CL separation per Table 7.8. The two intersections were added to the level of service analysis in the "with project" scenarios. The Multi-Family Access has yet to be designed at this stage however a Right-in Right-out access on Dishman-Mica Road for the multifamily use has been included within the Study.

12. Page 8 - Project Access to Existing Transportation System: This description does not match the analyses provided nor have the proposed access points been approved. Revise accordingly.

The access description has been revised.

13. Page 10 - University Road: University Road has several cross-sections along its length. It also has bike lanes. Revise the report to reflect the conditions accordingly.

The road description has been revised

14. Page 11 - Bowdish Road: The portion of Bowdish Road that is classified as a minor arterial is 35 mph along its entirety. Revise the report accordingly.

The road description has been revised

15. Page 11- State Route 27: SR 27 is 4-5 lanes within the City of Spokane Valley. Revise accordingly.

The road description has been revised

16. Page 11 - 16th Avenue: 16th Avenue is a collector from Carnahan to Dickey (25 mph), a minor arterial between Dishman Mica and Sullivan (35 mph), and a local roadway east of Sullivan (25 mph). It's not a 3-lane roadway in the collector or local roadway areas. There are school zone beacons (20 mph) at McDonald Elementary and Evergreen Middle school. Bike lanes are also present. Revise accordingly.

It is a general practice to not include discontinuous sections of roadway that do not connect to the study area as their inclusion would confuse and distract the reader (i.e. general public) The road description has been revised to address the other comments

17. Page 11 – 32nd Avenue: Bike lanes are present. Revise accordingly.

The road description has been revised.

18. Page 11 - Pines Road: Pines is a 3-lane minor arterial between 16th & 32nd and a 2-lane collector south of 32nd School zone beacons (20 mph) are present at Pines Elementary. SR 27 extends from Trent to 32' d. Revise accordingly.

Please update the online Arterial map with that roadway classification. The road description has been revised.

19. Page 11- Evergreen Road: Evergreen is a 3-lane road from 4th to 16th and a 2-lane road from 16th to 32nd. Bike lanes are also present. Revise accordingly.

The road description has been revised

20. Page 12 - Sullivan Road: Bike lanes are present in certain sections. Revise accordingly.

The road description has been revised

21. Page 12 - Thorpe Road: Thorpe is a collector between Dishman Mica and Madison. Revise accordingly.

The road description has been revised

22. Page 12 – 32nd Avenue & University Road: Revise " ... east and westbound ... "

The road description has been revised

23. Page 13 - Madison Road & Thorpe Road: This is not a 4-way stop controlled intersection. There is one stop sign for the EB direction only. Revise accordingly.

The intersection description has been revised

24. Page 14 – 32nd Avenue & Evergreen Road: The southbound approach has a left-turn lane and a right turn lane. If SB through volumes are present, they likely align in the left-turn lane. Revise accordingly.

The intersection description has been revised

25. Page 16 - Traffic Volumes and Peak Hours of Operation: This study also included traffic counts from 2014. Please see previous comments regarding traffic counts.

The count description has been revised

26. Page 16 - Public Transit and School Bus Transportation: There are also bus stops on 32nd east of Pines. Revise accordingly.

The bus stop description has been revised

27. Page 17 - It should be noted that City staff requested the meeting be moved from a Council meeting night.

The notation was added per your request.

28. Page 19 - Turn lane discussion: Analysis was not completed at the time of the meeting, therefore the response of "Per this study, turn lanes on Dishman Mica Road and Madison Road are not included to allow level of service to dictate the need for a turn lane" was not the response given. Provide the analysis and documentation within this study. Please also note that LOS is not the only consideration for turn lanes, as there are turn lane warrants separate from LOS.

The comment has been removed as it no longer applies.

29. Page 20 - The responses on this sheet were not the original responses. Rather, the responses that are depicted should be incorporated into a section of the report providing the analysis that validates the recommendation. This is not provided and shall be included. Revise accordingly.

Please specify.

30. Page 21 - See Comment #29.

Please specify.

31. Page 22 - Pedestrian counts should be number of pedestrians, not the call for groups of pedestrians. Revise, document, and provide accordingly.

The statement has been revised to clarify how pedestrian counts are used.

32. Page 23 - Street lights: Provide street lighting design as part of the plans submitted to the City. Please note photometric analyses may also be required. Also, provide separate signing and marking plans for frontage improvements for review, including sight distance lines/measurements.

As you state street lighting is to be determined as a part of the plan submittal

33. Page 26 & 27 - LOS discussion: Include City of Spokane Valley as we have our own standards.

The description has been revised.

34. Figure 3 & 4: Signal timings were provided. The note "LOS based upon cycle and split optimization within Synchro 9" is not valid. Revise accordingly.

The old note has been removed.

35. Page 32 - Background Project Traffic: Please provide a table within body of report showing the added trips from background developments. The tables in the appendix are helpful, but providing one in the body aids in review and documentation.

A table has been provided in the document.

36. Page 36 - Table 5: No internal capture calculations are provided. Provide accordingly.

The internal capture calculations are now included in appendix

37. Page 37 - Table 7: No internal capture calculations are provided. Provide accordingly.

The internal capture calculations are now included in appendix

38. Page 37 - Table 8: One would expect internal capture from the mixed use portion. Provide internal capture calculations. Provide accordingly.

The internal capture calculations are now included in appendix

39. Page 38 - Table 9: No internal capture calculations are provided. Provide accordingly. Additionally, there is no pass-by reduction for the AM peak hour per the ITE handbook, Table 5.6. Revise pass-by trip reduction accordingly.

The internal capture calculations are now included in appendix. The AM pass –by Rate has been removed per your comment.

40. Page 39 - Table 11: Revise per comment #39.

Table 11 has been revised, as well as Tables 12 and 13

41. Page 39 - Table 12: The internal capture summary is incorrect. The summary double counts the internal capture, and shall be revised accordingly. Please refer to the ITE Trip Handbook for guidance on calculations of internal capture and the application of appropriate trip reductions.

The summary table reports the internal or shared trips from previous tables.

42. Page 40 - Trip distribution discussion: The residential distribution south on Bowdish/Sands should be zero percent. There are no attractions (employment or retail) that would attract residents to this street. Revise distribution at Dishman Mica / Bowdish accordingly.

The distribution has remained as shown in the photo, the Chester Store access and parking is located off Bowdish Road, and the Chester Self-Storage has its main access on Bowdish Road so it is reasonable that trips would follow existing patterns with 10% of trips turning left in the AM Peak Hour and 2% of trips turning left in the PM Peak Hour onto Bowdish Road and then into the driveway of the convenience store. By observation it is more common that trips complete this movement as the majority of

parking for the business is located on the Bowdish side and congestion at the pumps during peak hours will deter drivers from entering in on the Dishman-Mica side

43. Figure 9: Revise pass-by figure per comment #39.

The Figure has been revised.

44. Page 54: Future improvements may require proportionate share of costs from the Painted Hills development.

The project is willing to mitigate any intersection level of service discrepancies identified in the year 2020 buildout year as discussed, but will not mitigate a supposed impact 25 years in the future.

If you have any questions or comments in regard to this letter please feel free to contact us at (509) 893-2617.

Thank You

For

Todd R. Whipple, P.E.

TRW/bng
Encl:
.

TRAFFIC IMPACT ANALYSIS

Painted Hills PRD

Spokane Valley, Washington

December 23, 2015

2013-1166

Prepared by:

Whipple Consulting Engineers, Inc.
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This report has been prepared by the staff of Whipple Consulting Engineers, Inc. under the direction of the undersigned professional engineer whose seal and signature appears hereon.

25462

12/23/15

Todd R. Whipple, P.E.

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EXECUTIVE SUMMARY

This Traffic Impact analysis has been prepared to supplement the SEPA process for the proposed Painted Hills planned residential development (PRD) the following traffic impact analysis has been completed and includes the following land uses: 52 Cottage Style Single Family Lots, 206 Single Family Residential Lots, 42 Estate Type Single Family Lots, 228 Apartment Units, a commercial development and a mixed use commercial/residential development.

1. The City of Spokane Valley and the Washington State Department of Transportation (WSDOT) have established Level of Service (LOS) D as the minimum acceptable level of service at signalized intersections and level of service E at unsignalized intersections within the study area.

2. The project proposes to develop 99.7 acres +/- into the following: 52 Cottage Style Single Family Lots, 206 Single Family Residential Lots, 42 Estate Type Single Family Lots, 228 Apartment Units, and a commercial development complex, which is anticipated to include a total of 26,400 SF of commercial buildings with 52 apartment units located above the retail space in the mixed use.

3. The project site lies within the SE ¼ of Section 33, T25N R44E W.M., within the City of Spokane Valley, Washington. And is located north of Thorpe Road, east of Dishman-Mica Road, and west of Madison Road. A vicinity map is included as Figure 1.

4. The project site is currently listed on the comprehensive plan and zoned Residential 3. The parcels to be developed by the project are 45336.9191, 44041.9144, 45334.9135, 45334.0110, 45334.0109, 45334.0108, 45334.0114, 45334.0113, and 45334.0106. Please see Figure 2, Site Plan.

5. The project study area intersections were identified through a neighborhood traffic scoping meeting and discussions with the City of Spokane Valley, the Washington State Department of Transportation (WSDOT), and Spokane County. The study encompasses twelve existing intersections and five proposed intersections.

    - 32nd Ave & University Rd (AM & PM)
    - Dishman-Mica Rd & University/Schafer Rd (AM & PM)
    - 32nd Ave & Bowdish Rd (AM & PM)
    - Dishman-Mica Rd & Bowdish Rd (AM & PM)
    - Dishman-Mica Rd & Apt. Access (AM & PM) (Proposed)
    - Dishman-Mica Rd & Sundown Dr. (AM & PM) (Proposed)
    - Dishman-Mica Rd & N. Comm. Access (AM & PM) (Proposed)
    - Dishman-Mica Rd & S. Comm. Access (AM & PM) (Proposed)
    - Dishman-Mica Rd & Thorpe Rd (AM & PM)
    - Thorpe Rd & Comm. Access (AM & PM) (Proposed)
    - 16th Ave & Pines Rd (AM & PM)
    - 16th Ave & SR 27 (AM & PM)
    - 32nd Ave & Pines Rd (AM & PM)
    - Madison Rd & Painted Hills Ave (AM & PM) (Proposed)

- Madison Rd & 41st Ave (AM & PM) (Proposed)
- Madison Rd & 43rd Ave (AM & PM) (Proposed)
- Madison Rd & 44th Ave (AM & PM) (Proposed)
- Madison Rd & Thorpe Rd (AM & PM)
- 32nd Ave & SR 27 (AM & PM)
- 32nd Ave & Evergreen Rd (AM & PM)
- 32nd Ave & Sullivan Rd (AM & PM)

6. This traffic impact analysis utilizes level of service analysis for the year 2015 (existing) to establish a baseline of performance and identify any existing concerns in the exiting transportation system. Future year scenarios were completed for the buildout year (2020) both without the project and also with the project. These scenarios are used to determine traffic concurrency or to determine if the added trips of the project on the transportation system would reduce the scoped intersections level of service below the standard. Finally, the horizon year (buildout year + 20 years) scenarios were completed at the request of City of Spokane Valley to provide a planning level analysis of the scoped intersections. An Additional analysis of Peak Hours and cut-through traffic per public comment were included in the public involvement section to respond to a concern that the Midilome East residents had.

7. Conclusion

Based upon the analysis, field observations, assumptions, methodologies and results which are provided in the body of this report, it is concluded that the development of the proposed project will generate new trips on the existing transportation system and that those trips while affecting level of service will generally not degrade LOS below concurrency levels, except at the intersection of 16th Avenue & Pines Road. Additionally the queue deficiencies identified carry through the scenarios from the existing condition to the future conditions, and the project only adds to an already existing condition. This conclusion was reached and has been documented within the body of this report.

Existing Condition

- There are no Level of Service deficiencies identified for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- There are three queue deficiencies identified at three of the scoped intersections that have acceptable levels of service, there is no public improvement project identified to mitigate these discrepancies.

Year 2020, without project, with background projects

- There are no Level of Service deficiencies caused by the background projects and growth rate, for level of service as understand Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- There are five queue deficiencies identified at three intersections with acceptable levels of service. These deficiencies were identified as the result of the background growth rate and the background projects as identified at scoping. There is no public improvement

project identified to mitigate these discrepancies. Please see the analysis for the details of the found discrepancies.

Year 2020, with project, with background projects

- There is a Level of Service deficiency identified at the intersection of 16th Avenue & Pines Road, for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- The Level of Service deficiency identified at the intersection of 16th Avenue & Pines Road, originally caused by the background trips and worsened by this project, can be brought back to an acceptable level of service by removing the southbound approach to the intersection and redirecting trips through the SB right turn movement of the intersection of 16th Avenue & State Route 27, This project proposes to remedy this anticipated deficiency.
- There are the same five queue deficiencies previously identified at three intersections with two of those intersections operating at acceptable levels of service. These deficiencies were the result of the background growth rate and the background projects as identified within this study and are only incrementally worsened or kept the same by this project. There is no public improvement project identified to mitigate these discrepancies. Please see the analysis for the details of the found discrepancies.

Horizon Year 2040, without project, with background projects (Planning Level)

- There are planning level, Levels of Service deficiencies identified at the intersections of; 16th Avenue & Pines Road, for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- The Level of Service deficiency at the intersection of 16th Avenue & Pines Road can be improved by the agencies considering a public improvement project that would redefine the layout of the closely spaced intersections. We have included for the agency consideration, a plan that utilizes a roundabout and a traffic circle.
- There are seven queue deficiencies identified. These are the extensions of known queue deficiencies or are the results of deficiencies in Levels of Service.

Horizon Year 2040, with project, with background projects (Planning Level)

- There are planning level, Levels of Service deficiencies identified at the intersections of 16th Avenue & Pines Road, for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- As previously stated the Level of Service deficiency at the intersection of 16th Avenue & Pines Road can be improved by the agencies considering a public improvement project that would redefine the layout of the closely spaced intersections. We have included for the agency consideration, a plan that utilizes a roundabout and a traffic circle.
- There are queue deficiencies identified. These are the extensions of known queue deficiencies or are the results of deficiencies in Levels of Service.

8. Recommendations

Based upon the conclusions within this study the proposed project is recommended to provide frontage improvements to Dishman-Mica Road, Thorpe Road, and Madison Road per the City of Spokane Valley development process and add a two-way-left-turn-lane north of the Chester Creek Bridge to the property boundary. We also recommend that when warranted prior to buildout that the project removes the southbound approach to the intersection of 16th Avenue & Pines Road.

At this time we are not making any turn lane proposals at the intersection of 32nd Avenue & Pines Road due to extenuating circumstances associated with traffic operations of the signal and University High School and student safety in the area.

INTRODUCTION

Introduction, Purpose of Report and Study Area

This traffic impact analysis is required by the City of Spokane Valley as part of the traffic concurrency and SEPA process for the proposed Painted Hills planned residential development (PRD). The proposed development includes 52 Cottage Style Single Family Lots, 206 Single Family Residential Lots, 42 Estate Type Single Family Lots, 228 Apartment Units, and a commercial development and a mixed use commercial/residential development (4.26 ± ac), with a total of 99.7 acres +/- . Please see Figure 1-Vicinity Map and Figure 2-Preliminary Site Plan.

The purpose of this analysis is to review, assess, and identify the potential traffic related impacts that the proposed project may have on the transportation network and where possible minimize any impact. This TIA will be completed in accordance with the current traffic guidelines from the City of Spokane Valley, Washington State Department of Transportation (WSDOT), Spokane County, and the Institute of Transportation Engineers (A Recommended Practice – Traffic Access and Impact Studies for Site Development, 2010).

Site Location and Development Description

The proposed development is located on approximately 99.7 acres +/-. The site was previously a privately held golf course open to the public. The site is proposed to be separated into six (6) different land uses within the PRD. A description of each proposed land use is provided below.

Cottages Style Single Family (Townhouses)

The 52 "Cottage Style Single Family Lots" are intended to be a combination of cottage style homes and common wall buildings or townhouses within a gated community, which is located at the north end of the project site. The lots are accessed by a single gated access from Madison Road to the east that runs east/west, and also a gated emergency fire access road at the west end that leads into the Single Family Residential development.

Single Family Residential

The 206 Single Family Residential lot development lies in the middle of the site, and also makes up a majority of the site in land area, besides the open space. It has three main accesses: two from Madison Road to the east and one from Dishman-Mica Road to the west. The development has two north/south internal roads, as well as 5 east/west internal roads each with a traffic circle in the middle to provide traffic calming throughout the development.

Estate Type Single Family (Large Lot Single Family Residential)

The 42 Estate Type Single Family lots are large, single family residential lots located at the south end of the project site. There is a single gated access road from Madison Road to the east that runs east/west. The Estate Type Single Family also has an internal loop road that makes a rectangular loop off the proposed main road. There is also a gated emergency fire access road at the northwest corner that runs north into the southern traffic circle of the Single Family Residential development.

Multi-Family Residential

The 228 unit apartment complex is located at the northwest end of the project site. There may be two accesses for this development: one to/from Dishman-Mica Road to the west, via a new alignment out to Wilbur Road, and one to/from an internal project road located to the south. As apartment complexes differ in design, the internal circulation, building locations, and parking will be provided under a separate submittal.

Commercial

The 4.26 acre (26.4 KSF) commercial development is located along Dishman-Mica Road and at the southwest end of the project site. There may be one or more accesses from Dishman-Mica Road and/or an internal access to the proposed road and the other land uses to the north and east of the commercial development. Currently the southernmost commercial property has an existing access to Thorpe Road which will be retained.

Apartments (Mixed Use)

The 52 apartment units are proposed to be located over the retail space of the commercial development. There may be a single access from Dishman-Mica Road or an internal access to the proposed road as the apartments will use the commercial development access.

Development Open Spaces

The proposed development incorporates flood control facilities within and under the large open space area to the south. The 10 acre open space of the development not only includes the park setting at the south but also a trail system that weaves through every corner of the development.

Project Access to Existing Transportation System

The PRD is anticipated to have 3 public Accesses (1 on Dishman-Mica Road, 2 on Madison Road), 2 private roadway accesses on Madison Road, 3 commercial driveways (1 Thorpe Road, 2 Dishman-Mica Road) , and 1 apartment driveway on Dishman-Mica Road. The PRD is anticipated to have a total of 9 points of access on and off the existing transportation system.

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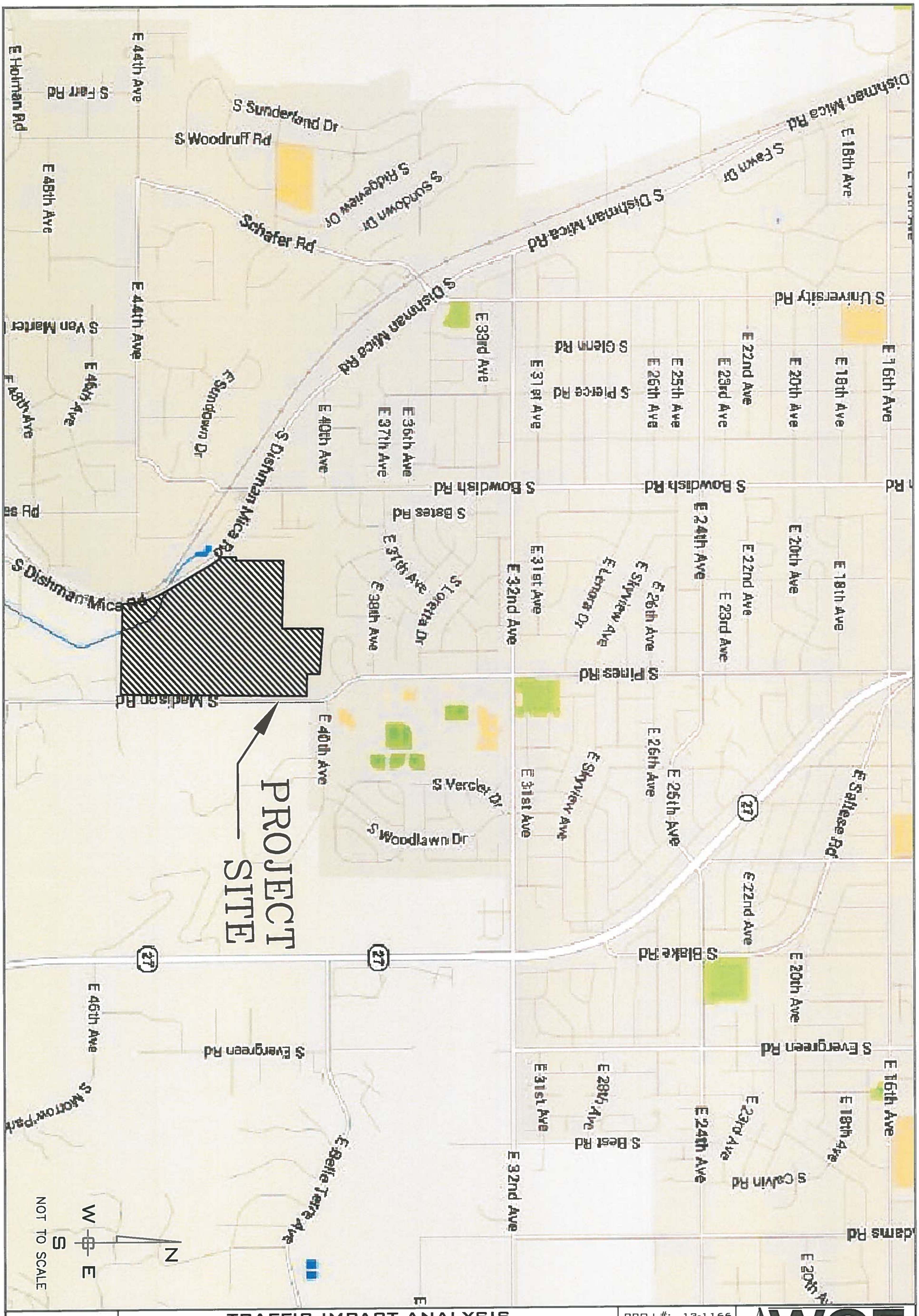

FIGURE 1	TRAFFIC IMPACT ANALYSIS PAINTED HILLS PRD MADISON ROAD & THORPE ROAD SPOKANE VALLEY, WASHINGTON VICINITY MAP	PROJ #: 13-1166 DATE: 03/25/15 DRAWN: RMA APPROVED: TRW	WCE WHIPPLE CONSULTING ENGINEERS CIVIL, STRUCTURAL AND TRANSPORTATION ENGINEERING 2528 NORTH SULLIVAN ROAD SPOKANE VALLEY, WASHINGTON 99216 PH: 509-893-2617 FAX: 509-926-0227

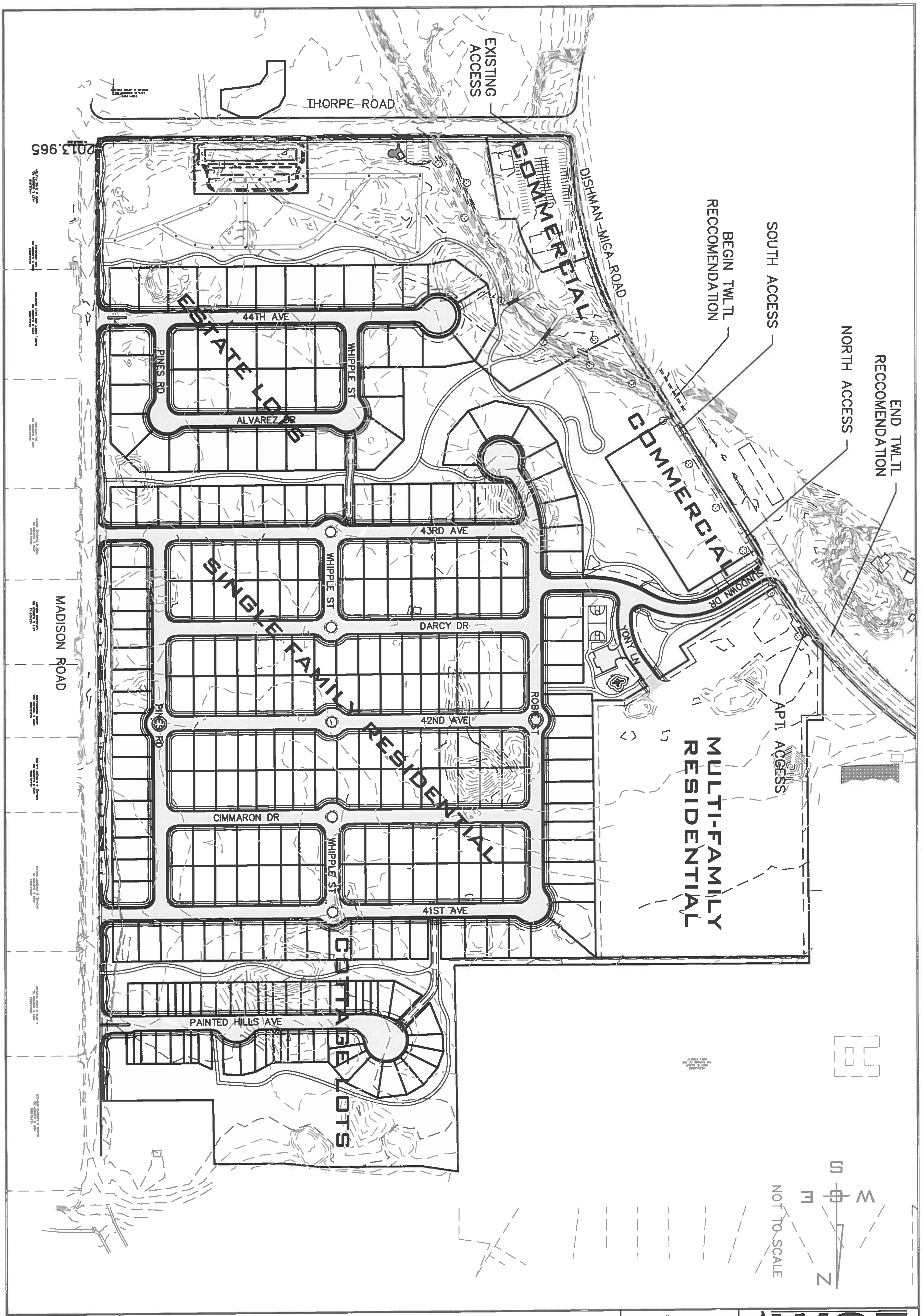

FIGURE
2

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

PRELIMINARY SITE PLAN

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

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EXISTING CONDITIONS

Existing Conditions within the Study Area

Land Use & Zoning

The site is located north of Thorpe Road east of Dishman-Mica Road and west of Madison Road in a portion of the SE ¼ of Section 33, T25N R44E W.M., within Spokane Valley, Washington. A vicinity map is included as Figure 1. The project site is currently zoned as Residential 3, and is the previous Painted Hills General Commercial/ Golf Course Site. The parcels to be developed by the project are 45336.9191, 44041.9144, 45334.9135, 45334.0110, 45334.0109, 45334.0108, 45334.0114, 45334.0113, and 45334.0106. Please see Figure 2-Site Plan.

Existing Roadways

The overall transportation network in this area consists of a state route, urban principle arterials, collectors, and local access roads.

Dishman-Mica Road extends south, southeast from Sprague Avenue to State Route 27, Approximately 7.4 miles in length. Dishman-Mica Road is a northwest/southeast two-way, two- and five-lane minor-principal arterial. Dishman-Mica Road is an arterial that serves the residential neighborhoods that extend from Sprague Avenue to Bowdish Road. Dishman-Mica Road intersects with 8th Avenue, 16th Avenue, 32nd Avenue, University/Schafer Road and Bowdish Road with small commercial uses located at or near the intersections of 16th Avenue, University Road and Bowdish Road. Dishman-Mica Road then winds through a rural area before intersecting with State Route 27. Within the study area the posted speed limit on Dishman-Mica Road is 45 MPH.

University Road is a north/south, two-way, 2-, 3-, 4-, & 5-lane minor arterial that serves a large residential area south of Interstate 90. It runs south from Nora Avenue, and crosses several major arterials, until it intersects with Dishman-Mica Road. University Road, between Mission Avenue and Sprague Avenue is a three-lane roadway. From Sprague Avenue to 4th Avenue, it changes to become a five-lane roadway. South of 4th Avenue to Dishman-Mica Road, it reduces to a four-lane roadway and continues to Dishman-Mica Road where the roadway transitions into Schafer Road. Dishman-Mica Road is posted at 35 MPH speed limit within the study area. The University Road section includes bike lanes from 16th Avenue to Mission Avenue, and sidewalks for pedestrians from Dishman-Mica Road to Mission Avenue.

Schafer Road is a north/south, two-way, 2-lane, collector that serves a large residential area south of Dishman-Mica Road. Schafer Road runs south from Dishman-Mica Road to 44th Avenue. Schafer Road, between Dishman-Mica Road and 44th Avenue is a two lane roadway with shoulders, but no sidewalk or bike lanes. Schafer Road is posted at 35 MPH within the study area.

Bowdish Road is a north/south, two-way, 2-lane, minor arterial serving a large residential area south of Interstate 90. Bowdish Road runs south from Mission Avenue, and crosses several major arterials, until it intersects with Sands Road. Bowdish Road, between Mission Avenue and Dishman-Mica Road is a two-lane roadway. South of Dishman-Mica Road, Bowdish Road crosses the Union Pacific Railway and becomes a local access roadway. Sands Road branches off of Bowdish Road and continues the arterial to 44th Avenue. Bowdish Road is posted at 25 MPH on the local access portion, and is posted on the minor arterial as 35 MPH.

State Route 27 is a north/south, two-way, 2-, 3-, 4-, & 5-Lane State Highway. State Route 27 extends south from Spokane Valley to Pullman, Washington and serves the many small farming communities of the Palouse. Within the City of Spokane Valley, State Route 27 follows the Pines Road alignment between Trent Avenue and 16th Avenue. South of 16th Avenue, State Route 27 shifts to the Blake road alignment serves the surrounding urban residential uses to 32nd Avenue where it serves a small cluster of commercial uses at the intersection of State Route 27 & 32nd Avenue. From Trent Avenue to 16th Avenue the posted speed limit is 35 MPH. From 16th Avenue to the 41st Avenue Alignment the posted speed limit is 45 MPH, beyond 41st Avenue SR 27 generally has a speed limit of 55 MPH.

16th Avenue is an east/west, two-way, 2- & 3-lane minor arterial that extends east from Bluff Drive (west of Dishman-Mica Road). Through the City of Spokane Valley to Shamrock Street (South of Shelley Lake). 16th Avenue generally serves residential land uses and commercial land uses located at the intersections of arterials. The posted speed limit on 16th Avenue is 35 MPH with the exception of the University Elementary, the McDonald Elementary, and the Evergreen Jr. High School zones where the posted speed limit is 20 MPH with beacons. The 16th Avenue Road section from Dishman-Mica Road to Sullivan Road includes sidewalks and bike lanes.

32nd Avenue is an east/west, two-way, 2-, 3- & 4-lane principle arterial. 32nd Avenue extends east from Dishman-Mica Road to Sullivan Road and serves mostly urban residential uses, but also provides access for commercial uses and University High School. The posted speed limit is 35 MPH with the exception of University High School zone where the speed limit is 20 MPH when children are present. The 32nd Avenue Road section has sidewalk from Dishman-Mica Road to SR 27, and bike lanes from University Road to SR 27. Additional sidewalk and bike lanes are from Evergreen Road to Best Road.

Pines Road is a north/south two-way, 2-, 3-, & 5-lane state route and collector that extends south from Trent Avenue to 40th Avenue. From 16th Avenue to 32nd Avenue Pines Road is a proposed Collector. From 32nd Avenue, to 40th Avenue Pines Road is a collector. Pines Road serves residential uses and a commercial land use located on the northwest corner of Pines Road & 32nd Avenue. The speed limit on Pines Road is 35 MPH, with the exception of the South Pines Elementary school zone where the speed limit is 20 MPH with flashing beacons. The Pines Road Roadway section includes sidewalk along its entire length, and includes bike lanes from 22nd avenue to 32nd Avenue.

Evergreen Road is a north/south, two-way, 2-, 3-, 5- & 6-lane urban principle arterial. Evergreen Road extends south from Indiana Avenue to 32nd Avenue and intersects with eight other minor and major arterials in the City of Spokane Valley. From Indiana Avenue to Interstate 90 Evergreen Road has six-lanes. From Interstate 90 to 4th Avenue, Evergreen Road is a five-lane road. From 4th Avenue to 16th Avenue, Evergreen is a three-lane road. From 16th Avenue to

32nd Avenue Evergreen Road is a two-lane roadway The area surrounding Evergreen Road is generally single family residential uses and small pockets of commercial uses located at or near the arterial intersections. The posted speed limit on Evergreen is 35 MPH. Evergreen Road includes sidewalk from 32nd Avenue to 24th Avenue and from 16th to Indiana. Evergreen Road has a bike lane from 32nd Avenue to Sprague Avenue.

Sullivan Road is a north/south, two-way, 2-, 3- & 5-lane urban principal arterial that extends south from Wellesley Avenue to just beyond 32nd Avenue. Sullivan Road serves East Valley High School and Central Valley High School, residential, and commercial uses. The posted speed limit is 35 MPH. The Sullivan Road Roadway section includes sidewalk and bike lanes from 16th Avenue to 32nd Avenue, and sidewalk from 16th Avenue to Wellesley Avenue.

Madison Road is a north/south, two-way, 2-lane collector road that extends south from the intersection of Pines Road & 40th Avenue, which is northeast of the site, through Thorpe Road, until eventually changing into Mohawk Drive. Madison Road is posted at 35 MPH and provides access to residential roads on its east and west side. Madison Road has no Sidewalk or bike lanes.

Thorpe Road is an east/west, two-way, 2-lane collector road that extends east from Dishman-Mica Road to Madison Road. Thorpe Road generally serves commercial land uses. The posted speed limit on Thorpe Road is 35 MPH.

Study Area Intersections

The project study area intersections were identified through a neighborhood traffic scoping meeting and discussions with the City of Spokane Valley, Spokane County, and the Washington State Department of Transportation (WSDOT). The scope of the study encompasses the AM and PM peak hours of twelve existing intersections and five proposed intersections.

- 32nd Ave & University Rd
- Dishman-Mica Rd & University/Schafer Rd
- 32nd Ave & Bowdish Rd
- Dishman-Mica Rd & Bowdish Rd
- Dishman-Mica Rd & Sundown Dr. (Proposed)
- Dishman-Mica Rd & Thorpe Rd
- 16th Ave & Pines Rd
- 16th Ave & SR 27
- 32nd Ave & Pines Rd
- Madison Rd & Painted Hills Ave (Proposed)
- Madison Rd & 41st Ave (Proposed)
- Madison Rd & 43rd Ave (Proposed)
- Madison Rd & 44th Ave (Proposed)
- Madison Rd & Thorpe Rd
- 32nd Ave & SR 27
- 32nd Ave & Evergreen Rd
- 32nd Ave & Sullivan Rd

Traffic Control and Descriptions

32nd Avenue & University Road is a signalized intersection. The intersection has the following lane configuration: the east and westbound approaches have a left-through lane, a through-right lane, and two receiving lanes that immediately reduces to one lane. The north and southbound approaches have a left turn lane, a through lane, a through-right lane, and two receiving lanes.

Dishman-Mica Road & University/Schafer Road is a signalized intersection. The intersection has the following lane configuration: the Dishman-Mica Road westbound approach has a left turn lane, a through lane, a through-right lane, and a single receiving lane. The Dishman-Mica Road eastbound approach has a left turn lane, a through lane, a right turn lane, and two receiving lanes. The Schafer Road northbound approach has a left turn lane, a through-right lane, and a single receiving lane. The University Road southbound approach has a left turn lane, a through lane, a right turn lane, and two receiving lanes.

32nd Avenue & Bowdish Road is a signalized intersection. The intersection has the following lane configuration: the east and westbound approaches have a left turn lane, a through-right lane, and a single receiving lane. The north and bound approaches have a left-through-right lane, and a single receiving lane.

Dishman-Mica Road & Bowdish Road is a signalized intersection. The intersection has the following lane configuration: the Dishman-Mica Road eastbound & westbound approaches have a left turn lane, a through-right lane, and a single receiving lane. The Bowdish Road northbound approach has a left-through-right lane, and a single receiving lane. The Bowdish Road southbound approach has a left-through lane, a right turn lane, and a single receiving lane.

Dishman-Mica Road & Thorpe Road is an unsignalized "T" type intersection with stop control on the Thorpe Road. The intersection has the following lane configuration: the westbound approach has a left-right turn lane, and a single receiving lane. The northbound approach has a through-right lane, and a single receiving lane. The southbound approach has a left-through lane, and a single receiving lane.

16th Avenue & Pines Road is an unsignalized intersection with stop control on Pines Road. The intersection has the following lane configuration: The eastbound approach has a through-right lane, and a single receiving lane. the westbound approach has a left-through lane, and two receiving lanes. The northbound approach has a left-right turn lane, and a single receiving lane. The southbound approach has a left-through-right lane, and <u>no</u> receiving lanes.

16th Avenue & State Route 27 is a signalized intersection. The intersection has the following lane configuration: The eastbound approach has a left-through lane, a right turn lane, and a single receiving lane. The westbound approach has a left-through-right lane and a single receiving lane, with an additional channelized right turn lane that yields to northbound traffic. The northbound & southbound approaches have a left turn lane, a through lane, a through-right lane, and two receiving lanes.

32nd Avenue & Pines Road is a signalized intersection. The intersection has the following lane configuration: all approaches have a left turn lane, a through-right lane, and a single receiving lane.

Madison Road & Thorpe Road is an unsignalized 2-way stop control intersection. There is one stop sign on the eastbound approach and the opposing driveway is obligated to stop on the approach. The intersection has the following lane configuration: the eastbound approach has a left-through- right turn lane, and a single receiving lane. The Westbound approach is a private driveway and includes a left-through-right lane and a single receiving lane The northbound and south bound approaches have a left-through-right lane, and a single receiving lane.

32nd Avenue & State Route 27 is a signalized intersection. The intersection has the following lane configuration: The eastbound approach has a left turn lane, a through lane, a through-right turn lane, and a single receiving lane. the westbound approach has a left turn lane, a through-right lane, and two receiving lanes. The north and southbound approaches have a left turn lane, a through lane, a through-right lane, and two receiving lanes.

32nd Avenue & Evergreen Road is an unsignalized intersection with stop control on Evergreen Road. The intersection has the following lane configuration: The eastbound approach has a left turn lane, a through-right lane, and a single receiving lane. the west, and northbound approaches have a left-through-right lane, and a single receiving lane. The Southbound approach has a right turn lane, a left-through lane, and a single receiving lane.

32nd Avenue & Sullivan Road is an unsignalized "T" type intersection with stop control on 32nd Avenue. The intersection has the following lane configuration: the eastbound approach has a left-right turn lane, and a single receiving lane. The northbound approach has a left-through lane, and a single receiving lane. The southbound approach has a through lane, a right turn lane, and a single receiving lane. There was a westbound approach that was a driveway entrance but has been blocked off for several years.

Traffic Safety

For the intersections within the study area accident report summaries were received from City of Spokane Valley and WSDOT. Generally accidents are documented by type of occurrence, such as property damage or injury. No fatalities were reported for the study intersections during the last three years.

$$Rate\ per\ MEV = \frac{number\ of\ accidents\ in\ three\ years\ X\ 1\ million}{PM\ Peak\ hour\ volume\ X\ 10\ \ X\ 365\ X\ 3\ years}$$

Equation 4-2 of ITE manual of traffic engineering studies (fourth edition) (modified given the available data, for 3 years and utilizes PM peak hour volumes ~ 10% of ADT)

In this analysis accidents are measured based on frequency per million entering vehicles (MEV). This ratio is a function of the average daily traffic entering the intersection and the annual frequency of accidents. This method of analysis is also considered as an "exposure" analysis. This method of analysis is used to identify areas that need further review. A typical review threshold for accidents at an intersection is 1.00 accidents per MEV. The accident data for the intersections within the study area are shown in Table 1.

Table 1 – Accident Data for Intersections within the Study Area

ACCIDENT DATA								
Intersection	**2011**		**2012**		**2013**		**INTX**	**Per**
	PDO	**INJ**	**PDO**	**INJ**	**PDO**	**INJ**	**ADT**	**MEV**
32nd Ave & University Rd	1	0	1	0	0	0	10,120	0.18
Dishman-Mica Rd & University/Schafer Rd	0	0	2	0	0	2	9,570	0.38
32nd Ave & Bowdish Rd	2	1	2	0	0	0	12,660	0.36
Dishman-Mica Rd & Bowdish Rd	1	2	0	0	0	1	8,190	0.45
Dishman-Mica Rd & Thorpe Rd	0	0	0	0	0	0	4,690	0.00
16th Ave & Pines Rd	4	0	2	2	3	1	10,430	**1.05**
16th Ave & SR 27	1	1	1	2	1	0	13,160	0.41
32nd Ave & Pines Rd	1	0	2	1	2	0	12,510	0.44
Madison Rd & Thorpe Rd	0	0	0	0	0	0	2,190	0.00
32nd Ave & SR 27	1	0	0	0	0	0	16,960	0.11
32nd Ave & Evergreen Rd	0	0	0	0	0	0	10,570	0.00
32nd Ave & Sullivan Rd	0	0	0	0	0	0	7,090	0.00

As shown in the table above most intersections within the study area do not meet or exceed the threshold for further review. However, the intersection of 16th Avenue & Pines Road does exceed the threshold for further analysis.

16th Avenue & Pines Road

A review of the accident data shows that 9 of the 12 accidents reported were accidents that occurred at an angle, typical of a T-bone accident or a failure to yield the ROW by a turning vehicle. The other accidents include a rear-end collision, a fixed object, and a pedestrian incident. For the accidents that occur at an angle, 6 out of the 9 accidents occurred when a SB through vehicle entered the intersection. We recommend that the number of conflict points at the intersection be reduced and that additional warning of an intersection be provided to WB vehicles.

Traffic Volumes and Peak Hours of Operation

Traffic counts were collected as required by scoping under the direction of WCE in the months of January through March 2015, however for technical reason associated with the requirements of chapter 3 of the COV Road standards they were mostly recounted in October 2015. Counts were completed at the following intersections for the peak hour (AM/PM) time listed below:

- 32nd Ave & University Rd (AM & PM)
- Dishman-Mica Rd & University/Schafer Rd (AM & PM)
- 32nd Ave & Bowdish Rd (AM & PM)
- Dishman-Mica Rd & Bowdish Rd (AM & PM)
- Dishman-Mica Rd & Thorpe Rd (AM & PM)
- 16th Ave & Pines Rd (AM & PM)
- 16th Ave & SR 27 (AM & PM)
- 32nd Ave & Pines Rd (AM & PM)
- Madison Rd & Thorpe Rd (AM & PM)
- 32nd Ave & SR 27 (AM & PM)
- 32nd Ave & Evergreen Rd (AM & PM)
- 32nd Ave & Sullivan Rd (AM & PM)

The peak hour from these counts are shown on Figures 3 and 4. The raw data for these counts are located in the technical appendix.

Public Transit and School Bus Transportation

The Spokane Transit Authority (STA) currently provides service routes to this area. Key Bus stops are located at the following intersections: 16th Avenue & Pines Road, 32nd Ave Avenue & University Road, 32nd Avenue & Pines Road, 32nd Avenue & SR 27, and 32nd Avenue & Evergreen Road. There are additional stops located along the STA routes located about every quarter mile. The STA Stop at the intersection of 32nd Avenue & Pines Road is the closest to the project and is located approximately 3,160 feet +/- or 0.6 mi from the projects northern border on Madison Road.

The Central Valley School District currently provides student bus service to the area.

Public Involvement

On March 3, 2015 a community and traffic scoping meeting was held at the Chester Elementary School located at 3525 S Pines Road, Spokane Valley, WA 99206. The following is a list of questions and concerns raised by the community at the meeting, and our responses at that time.

The responses provided here, are compiled from the meeting notes and are paraphrased for clarity and brevity. Additional information/responses from the traffic study or other source have been provided in order to answer the publics comment to the best of our ability.

Community Meeting

The project was presented as depicted in the preliminary site plan of the TGDL. All phases of the project were described, the proposed units of each phase were stated and the accesses were described. During the pre-amble & opening, Todd Whipple noted the following: That this is an outright permitted use, which this project will not go before city council, but will go before the hearing examiner.

- Question: Who is the developer?

The developer is Dave Black.

- Question: Why was this meeting scheduled on a Tuesday night when no City Council members can attend?

We picked this night, with no intention to not allow Council members to attend. ***City staff wanted it noted here: that after the meeting had been scheduled. They requested that the meeting be moved to a non council night, Since the meeting had already been advertised it would have required another reschedule and confusion to the public.***

- Question: If this is not the right venue to discuss school overload issues, then what is?

If one would like to present his or her concerns about overloading school issues, then he or she is more than welcome to attend the hearing that comes later after these meetings. One is also encouraged to write a letter to the school district, because they will be able to give one a more accurate answer.

- Question: Why are there four accesses to the project to/from Madison Road and only one to/from Dishman-Mica Road?

We tried to keep all of the commercial and apartment development on Dishman-Mica Road.

- Question: Based on the International Fire Code, are you not allowed to place 30 lots on a single access?

We have met with the Fire Department and we have a modified map (attached) that will allow us emergency accesses as required, we did not change the plan for this meeting as this was the plan that was advertised.

- Question: What plan do you have to mitigate the fire safety issue around the Painted Hills area when you are proposing to introduce about 1,300 cars into the mix?

We do not have an answer for this at this time, but the question has been noted. Following up with the agencies, a specific fire safety issue was not identified at this time. If a member of the public has a specific fire safety concern, then we recommend that he/she take that specific concern to the Commissioners of Fire Districts #1 and #8.

- Question: With the current zoning of R3 for this Painted Hills area, don't you have to leave about 30% of the acreage for open space?

According to Spokane Valley zoning codes, if we stay with the R3 zoning, then we are not required to leave any open space at all. However, a Planned Residential Development (PRD) is required to have 30% open space; therefore we have left 30% open.

- Question: How will this area, all of a sudden, not become a flood plain?

This area is technically only a flood plain, because it is Compensatory Storage. Compensatory Storage means that water that comes onto your land (or this site) sits there and filters through the ground. We will be working with the City and FEMA to address this issue.

- Question: What do you do with the flood plain?

We have to take every drop of water that comes to the site, and we will be coming up with ways to collect it and discharge it into the ground.

- Question: Is this area an AE Zone?

Yes, this area is an AE zone as it relates to Compensatory Storage. We can discharge the water throughout the site in many different ways.

- Question: All of these forms of discharging are shown on the FEMA map?

Yes they are located on the FEMA map.

- Question: When do we all get the chance to ask the questions we want to ask?

We will talk to the developers after this meeting. Your only chance may come at the Hearing. However, we currently do not know when the Hearing will be.

- Question: Will there be notices sent out about these meetings?

Yes there will be notices sent out about these meetings.

- Question: Since the school district is not allowed to project how many new kids will be coming out of this new development, as they must give an exact amount, when will this bond go up?

We will move through the process this year. As of this moment, it is projected that the development will be built out over the next 5 to 10 years depending on market conditions, as well as other factors. (Checked with the developer buildout may be completed in 10-15 years.)

Traffic

- Question: Are the accesses off of Madison Road set in stone or can they be changed?

This is our proposal as of now and it is set to be designed this way unless traffic provisions do not allow us to do so.

- It was addressed that the school hours are outside of the AM & PM peak hours.

WCE Completed counts around the three schools here are those results: Traffic counts are usually done between 6:30-9:30AM & 3:30-6:30PM. The commuter traffic is where the peak hour is located, not generally during school hours. Tube counts were placed around each of the three schools (Chester Elementary, Horizon Middle, and University High) with the peak hours reported as follows:

Type of Peak Hour	**High School**		**Middle School**		**Elem. School**	
	Vol.	**Time**	**Vol.**	**Time**	**Vol.**	**Time**
AM Commuter	806	7:00AM	269	7:15AM	179	7:15AM
AM School	806	7:00AM	269	7:15AM	179	7:15AM
PM School	788	2:15PM	209	2:30PM	139	2:30PM
PM Commuter	966	5:00PM	210	5:00PM	140	5:00PM

As the above table shows, the AM Commuter & AM School peak hours occur at the same time for the High School, Middle School, and Elementary School. The traffic volumes are shared between AM commuters and school travelers, due to the identical peak hour.
Unlike the AM peak hour traffic, the PM Commuter traffic is higher than the PM School traffic for the High School, Middle School, and Elementary School. The traffic volumes are not shared between PM commuters and school travelers, because the peak hours occur at different times. Therefore if we mitigate or maintain an acceptable level of service for the PM peak hour commuter, the time of greatest impact, then we also mitigate or maintain an acceptable level of service for the other peak hours.

- Question: Who is conducting the Traffic Impact Analysis? Are there going to be turn lanes put in on Dishman-Mica & Madison Road, due to this project?

WCE will be conducting the Traffic Impact Analysis. There will most likely be a widening of these streets for this project.

- Question: Will you take into account that Thorpe Road floods and closes sometimes during the spring?

Yes we will. This will be considered and included in our flood control plans and reports. This will not be addressed in this report.

- Question: If the study shows that center turn lanes will need to be added to Madison Road, will that be funded by the developer?

Yes, the developer will fund that work.

- Question: Will you be adding a 3-way stop at Madison Road & 40th Avenue? Recently, walking down on 38th Avenue, we were not able to cross the street due to the high volume of traffic.

The concern has been submitted to the City of Spokane Valley Traffic Engineer.

- Question: Will you be studying Woodlawn Road as well? For some reason, people are cutting through Woodlawn Road in order to get to 32nd Avenue.

WCE will study Woodlawn Cut through for the neighborhood, that study is included here:

Tube counters were placed on Woodlawn Road at 32nd Avenue and 40th Avenue, per the public's request. We have reviewed the counts at both ends of the Woodlawn Road, we have considered the 15 single family residences located to the south of 40th Avenue and after considering the trips from those residents a difference of entering and exiting trips can be seen. This difference during the three peak hours are trips that travel between 32nd Avenue & 40th Avenue and are as follows:

> **In the AM peak hour beginning at 7 AM there may possibly be 79 southbound cut-through trips and 38 northbound cut-through trips. For the 2 PM peak hour there may be 66 southbound cut-through trips and 57 northbound cut-through trips. For the 5 PM peak hour there may be 39 southbound cut-through trips and 29 northbound cut-through trips.**

As some of these trips primarily coincide with the School Peak hours, the reasons for these trips may be from congestion on 32nd Avenue in front of the High School, or from parents that are picking up and dropping off students at the middle or elementary schools, desiring a northbound orientation. However, this type of tube count study is limited as trips will sometimes double back on the anticipated route

Therefore a video of each end of Woodlawn was conducted simultaneously. A member of the staff then reviewed the tapes noting vehicle type, color, and time to identify vehicle. During the AM peak hour there were 5 cut-through trips identified, and in the PM peak hour there were 7 cut-through trips identified.

Considering this information and given the volumes of traffic counted on Woodlawn Road there is no roadway capacity issue as a local access roadway can support the traffic volumes counted. Therefore we must conclude that the main concern is speeding on Woodlawn Road, an element that we have not measured, and is not a part of this study. From our experience not all cut-through traffic speeds through a cut-through route. But speeding can be done by even those that live within the neighborhood. Therefore we are going to leave this as an enforcement issue with the City of Spokane Valley.

We recommend that the neighborhood association invite a representative of the Spokane Valley Police department to attend one of their meetings in order to discuss the speeding issue. We also recommend that the neighborhood association talk to the public works director, and the traffic engineer of the City of Spokane Valley to discuss how they may incorporate traffic calming measures that will not interfere with road maintenance, such as curb extensions or traffic circles.

- Question: As a board member of Midlome East (neighborhood association) , we have tried to talk to the agencies about the high traffic volumes on Woodlawn Road for the last 10 years, and have gotten nowhere. Will this issue get addressed?

We are aware of some of the issues with cut-through traffic. We will talk to the jurisdictions about this issue and see how they would like us to proceed.

- Question: Why is Pines Road shown as a Minor route for a portion of the road instead of a Major route throughout?

This issue will be addressed through the traffic counts, which will give us the necessary data to possibly consider Pines Road a major route throughout.

- Question: Will the developer pay for the mitigations?

The developer will pay for anything that he breaks (yes, he will mitigate to project impacts).

- There was a comment that someone lived on Woodlawn Road and eventually moved due to the extremely high traffic volumes.

This comment has been noted, Counts of Woodlawn do not seem excessive for a roadway utilized as a collector in the City of Spokane Valley.

- There was a comment that the intersection of Pines Road & 24th Avenue should be included in this study due to the high amount of people who travel through this intersection.

This comment has been noted; however, the agencies did not include this intersection into the study.

- Question: How long does the traffic study last?

Traffic studies are based on traffic counts. Counts are done on Tuesdays, Wednesdays, & Thursdays during the previously mentioned peak hours. These days have proven to be the most reliable and most accurate for showing true traffic volumes on the streets. In commercial areas, counts are performed from 10AM to 2PM. We do not count Sundays, unless there is a church problem. We can do a combination of tube counts and individual counts.

- There was a comment made that Chester School, on Thursdays, starts at 10:10AM.

This comment has been noted. See the previous response with regard to school peak hours.

- There was a comment made that tomorrow at 6PM, there is a community vision meeting at Mirabeau.

Our advice was to pay close attention to Growth Management and Growth Management meetings.

- Question: When will the traffic study start?

The traffic counts will begin next week.

- Question: Is each intersection scoped only counted once?

Yes, once in the AM and once in the PM.

- Question: Will the congestion, due to the school traffic on Pines Road, be accounted for in the traffic counts?

If the congestion falls within the time that the counts occur, then yes it will be counted in.

- Question: Will you count pedestrians?

Pedestrians were counted at the intersections. For the signalized intersections the pedestrians are grouped and queued at the corner where they push the crosswalk button and then cross the roadway this action is call a pedestrian call by the traffic software and is included as such. For pedestrians at an unsignalized intersection pedestrians are recorded, but are not used by the traffic software to model the intersection.

- Question: Where can we go to affect change?

One can go to the Growth Management meeting and participate in the Growth Planning Processes, and one can also attend the Hearing and speak to the Hearing Examiner.

- Question: How do you calculate the traffic volumes based on the number of new units to be installed?

Prior to this meeting, WCE turned in a Trip Generation & Distribution Letter to the jurisdictions that allowed us to have this meeting. We use the ITE Trip Generation Manual 9th Edition.

- Question: Can you describe an intersection? What is an intersection to you?

An intersection is where two streets come together or when a driveway and a street come together.

- Question: How many apartment projects are going in? How many people are there going to be? Who is paying the taxes on this new project to help build the new schools?

There is only the one apartment complex that is being proposed. There is also a mixed-use apartment land use. Studies show that about 1.77 people live in each unit. Also, the owner of the apartment complex pays property taxes that go to help fund the local schools.

- Question: If we live on 32nd Ave & McDonald Street and it is already hard for us to get onto 32nd Ave, doesn't it make sense that this problem will only get worse?

When we perform the traffic counts on certain intersections, we will calculate Level of Service for each intersection. Level of Service is based on a letter grade A-F, with F being the worst case. Todd Whipple then described the Levels of service with the delays and experiences of the driver.

- Question: Will you be studying where there are children school crosswalks?

A review of school crosswalks was not included, as this review would be between the school district and the City of Spokane Valley.

- Question: If it is decided that Madison Road needs further expansion, how will the traffic flow operate during construction?

The road will most likely not be closed if under construction, but after talks with the school districts and the City, construction will most likely be conducted throughout normal traffic hours.

- Question: Who decides which intersections will be counted in the study?

The agencies of the City of Spokane Valley, Spokane County, and WSDOT. You can also contact the City to see when the scoping meeting will take place in order to be a part of that.

- Question: What is your goal for LOS when conducting a traffic study?

It depends on the intersection and the Level of Service. If further mitigation has to be done to fix an intersection than that will occur. However, if the jurisdictions decide that, for instance, at

an intersection where a Level of Service "E" is existing and will continue to be this way, there might not be any change.

- Question: Are there any plans to run 40th Avenue over to Highway 27?

There used to be plans or Right-of-way, but there are no such plans anymore.

- Question: Are you planning for sidewalks & streetlights on Dishman-Mica Road & Madison Road?

Yes, as part of the frontage improvements to the streets, sidewalks and streetlights will be added or improved.

- Question: For the cottages, will there be one or two accesses?

There will be two accesses.

- Question: Are you familiar with Robie Street? Is there any chance that there could be access to the cottages using Robie Street?

WCE is not familiar with this intersection, but this question of an additional access to the north has been noted. *After finding Robie Street, it was determined that the development will not pursue an access to the north.*

- Question: If from the traffic study, it is found that the intersection of 32nd Ave & Pines Road becomes highly congested, what is your solution?

We do not have a solution at this time. Through further study, it is our responsibility to find a solution if there happens to be a high congestion problem.

- Question: Will any changes that come from the traffic study be done before or after the construction?

Any changes in traffic will be concurrent with construction.

- Question: How far out, geographically, is the study responsible for?

The City of Spokane Valley & Spokane County have standards that we follow when performing the study. They will tell us which intersections to study, and before the study is completed, further intersections could be studied based on previous observations & data.

- Question: What would be needed to expand Dishman-Mica Road from two lanes to four lanes from University Road to Madison Road?

It would take a large additional traffic impact in order to expand the road in these areas.

- Question: Could you add a traffic count on the intersection of Woodlawn Road & 40th Ave?

Please see previous response regarding the additional traffic study to Woodlawn Road.

- Question: How much increase in traffic volume would warrant the installation of a new traffic signal?

Once intersections move towards a LOS "F", we move to a section called "Warrants". If an intersection moves towards two to four warrants, then a traffic signal could be installed.

- Question: How long is the time span for the traffic study, as the volume will grow over time as developments go up?

We will perform the traffic study for each phase of construction, and if a certain phase requires work to be done to improve a traffic problem, then the work will be done during that phase.

- There was a comment made that it seems like a conflict of interest for WCE to say that "we" are performing the traffic study.

The jurisdictions make the developer hire a traffic engineer to perform the study. The traffic engineer turns the work into the City, who then reviews it and makes necessary comments. Then, the traffic engineer makes the changes and eventually the City accepts the study as their own traffic study for the developer and his or her project, all as part of the SEPA and concurrency process.

- Question: How many cars does it take to determine a certain Level of Service?

LOS is determined by average delay, not the numeric number of cars waiting or using an intersection.

- Question: How many phases will there be for this project?

At this time, WCE has not decided the number of phases for the proposed project.

- Question: Living on Dishman-Mica Road, I'm wondering how long the left turn lanes would be off of the proposed center turn lane, because some turns are tight and short?

Left turns lanes are usually no less than 100 feet long, and not longer than 300 feet.

- Question: Do you consider projects that have already been approved by the County into your study?

Yes, we do consider these background projects into our traffic study. Further analysis is performed on projects that have been approved, but not fully built out. We treat all background projects to be fully built out to account for the most conservative results. Please see the background project section of this report.

- Question: Are you aware that there are developments along Madison Road that have been previously permitted by the County?

Please see the background project section of this report.

Note: WCE observed that many of the school congestion questions were from directly affected parents and seniors, that have a history of leaving and returning to their residence from 9 AM to 3 PM. WCE believes that this non-commuter perspective has skewed their perspective of the Peak hour. This being said the provided tube counts have established the peak traffic around the schools.

LEVEL OF SERVICE

Level of service (LOS) is an empirical premise developed by the transportation profession to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles afforded to drivers who utilize the transportation network. It has been defined by the Transportation Research Board in the *2010 Highway Capacity Manual.* This document has quantified level of service into a range from "A" which indicates little, if any, vehicle delay, to "F" which indicates significant vehicle delay and traffic congestion that may lead to system breakdown due to volumes that may exceed capacity.

Signalized Intersections

For signalized intersections, research has determined that average stopped delay per vehicle is the best available measure of level of service. The following tables identify the relationships between level of service and average stopped delay per vehicle. City of Spokane Valley (Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan), and WSDOT have adopted level of service D as the minimum acceptable level for all signalized intersections.

Level of Service Criteria and Descriptions - Signalized

LOS	Delay Range (sec)	General Description
A	10	• Very low delay at intersection. • All signal cycles clear. • No vehicles wait through more than one signal cycle.
B	10 to 20	• Operating speeds beginning to be affected by other traffic. • Short traffic delays at intersections. • Higher average intersections delays resulting from more vehicles stopping.
C	20 to 35	• Operating speeds and maneuverability closely controlled by other traffic. • Higher delays at intersections than for LOS B due to a significant number of vehicles stopping. • Not all signal cycles clear the waiting vehicles.
D	35 to 55	• Tolerable operating speeds, but long traffic delays occur at intersections • The influence of congestion is noticeable. • Many vehicles stop and the proportion of vehicles not stopping declines. • The number of signal cycle failures, for which vehicles must wait through more than one signal cycle are noticeable.
E	55 to 80	• Speeds are restricted, very long traffic delays are experienced and traffic volumes are near capacity. • Traffic flow is unstable, any interruption, no matter how minor, will cause queues to form and service to deteriorate. • Traffic signal cycle failures are frequent occurrences.
F	80	• Extreme delays resulting in long queues which may interfere with other traffic movements • Stoppages of long duration and speeds may drop to zero. • Vehicle arrival rates are greater than capacity. • Considered unacceptable by most drivers.

Unsignalized Intersections

The calculation of level of service (LOS) at an unsignalized one/two-way stop-controlled intersection is examined in the Transportation Research Board's *2010 Highway Capacity Manual*. For unsignalized intersections, level of service is based on the delay experienced by each movement and approach within the intersection. The concept of delay as presented for unsignalized intersections in the Highway Capacity Manual is based on the amount of time a vehicle must spend at the intersection. Vehicles passing straight through the intersection on the major (uncontrolled) street experience no delay at the intersection. On the other hand, vehicles which are turning left from the minor street, because they must yield the right of way to all right turning vehicles, all left turning vehicles from the major street and all through vehicles on both the minor and major streets, must spend more time at the intersection. Levels of service are assigned to individual movements within the intersection, and are based upon the delay experienced by each movement or approach.

The Transportation Research Board has determined what levels of service for unsignalized intersections should be, by designating level of service A through F, where level of service A represents a facility where no vehicle in any movement is delayed very long and level of service F which represents a facility where there is excessive delay for the average vehicle in at least one movement in the intersection. City of Spokane Valley (Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan), and WSDOT have adopted level of service E for all unsignalized intersections within the study area.

Level of Service Criteria and Descriptions - unsignalized

LOS	Delay Range (sec)	Expected Delay to Minor Street Traffic	General Description
A	10	Little to No Delay	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in the queue.
B	10 to 15	Short Traffic Delays	• Some drivers begin to consider the delay an inconvenience • Occasionally there is more than one vehicle in the queue.
C	15 to 25	Average Traffic Delays	• Many times there is more than one vehicle in the queue. • Most drivers feel restricted, but not objectionably so.
D	25 to 35	Long Traffic Delays	• Often there is more than one vehicle in the queue. • Drivers feel quite restricted.
E	35 to 50	Very Long Traffic Delays	• Represents conditions in which, demand is near or equal capacity. • There is almost always more than one vehicle in the queue. • Drivers find the delays approaching intolerable levels.
F	50	Stop-and-Go Condition Delays Generally Longer than Acceptable	• Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection

Roundabout Intersections

The calculation of level of service (LOS) at an unsignalized one/two-way Roundabout is examined in the Transportation Research Board's *2010 Highway Capacity Manual*. For Roundabout intersections, level of service is based on the delay experienced by each movement and approach within the intersection. The concept of delay as presented for unsignalized intersections in the Highway Capacity Manual is based on the amount of time a vehicle must spend at the intersection. Vehicles on an approach must yield to the vehicle within the roundabout and wait for a gap before entering the roundabout. This time that a vehicle yields or waits for a gap is calculated and averaged. Levels of service are assigned to individual movements within the intersection, and are based upon the delay experienced by each movement or approach.

The Transportation Research Board has determined what levels of service for roundabouts should be, by designating level of service A through F, where level of service A represents a facility where no vehicle in any movement is delayed very long and level of service F which represents a facility where there is excessive delay for the average vehicle in at least one movement in the intersection. City of Spokane Valley (Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan), and WSDOT have adopted level of service E for all roundabout/unsignalized intersections within the study area.

Level of Service Criteria and Descriptions - Roundabout

LOS	Delay Range (sec)	Expected Delay to Minor Street Traffic	General Description
A	15	Little to No Delay	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in the queue.
B	15 to 25	Short Traffic Delays	• Some drivers begin to consider the delay an inconvenience • Occasionally there is more than one vehicle in the queue.
C	25 to 35	Average Traffic Delays	• Many times there is more than one vehicle in the queue. • Most drivers feel restricted, but not objectionably so.
D	35 to 50	Long Traffic Delays	• Often there is more than one vehicle in the queue. • Multiple vehicles are in the roundabout and few gaps are available. • Drivers feel quite restricted.
E	50 to 75	Very Long Traffic Delays	• Represents conditions in which, demand is near or equal to capacity. • There is almost always more than one vehicle in the queue waiting for a gap. • Drivers find the delays approaching intolerable levels.
F	75	Stop-and-Go Condition Delays Generally Longer than Acceptable	• Forced flow, vehicle movements are slow to circulate, drivers wedge into the line. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection

All level of service analyses described in this report were performed in accordance with the procedures described above. As a final note, the Highway Capacity Manual (HCM) analysis and procedures are based upon worst case conditions. Therefore, most of each weekday and the weekends will experience traffic conditions better than those described within this document, which are only for the peak hours of operation.

LEVEL OF SERVICE AND TRAFFIC ANALYSIS

Existing Level of Service and Traffic Analysis

The existing levels of service at the existing intersections were calculated using the methods from the *2010 Highway Capacity Manual* as implemented in Synchro, *version 9 - Build 902*. The existing levels of service for the intersections within the study area are summarized on the following table. The existing traffic volumes used for this report are shown on Figures 3 & 4.

Table 2 - Existing Intersections Levels of Service

INTERSECTION	**(S)ignalized (U)nsignalized**	**AM Peak Hour**		**PM Peak Hour**	
		Delay (sec)	**LOS**	**Delay (sec)**	**LOS**
32nd Ave & University Rd***	S	11.2	B	11.4	B
Dishman-Mica Rd &University/Schafer Rd***	S	15.8	B	16.6	B
32nd Ave & Bowdish Rd***	S	13.1	B	11.6	B
Dishman-Mica Rd & Bowdish Rd***	S	12.0	B	11.2	B
Dishman-Mica Rd & Thorpe Rd***	U	10.7	B	10.5	B
16th Ave & Pines Rd (AM* PM***)	U	20.5	C	31.8	D
16th Ave & SR 27(AM* PM***)	S	26.5	C	25.4	C
32nd Ave & Pines Rd***	S	22.2	C	17.9	B
Madison Rd & Thorpe Rd**	U	11.0	B	9.5	A
32nd Ave & SR 27***	S	19.5	B	23.2	C
32nd Ave & Evergreen Rd(AM* PM***)	U	10.6	B	14.1	B
32nd Ave & Sullivan Rd(AM* PM***)	U	11.1	B	12.1	B

Intersections Counted: * January 2015 ** March 2015 *** October 2015

Intersection Level of Service - Deficiency Evaluation

There are no deficiencies identified for intersection level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.

Intersection Movement Queue –Deficiency Evaluation for Existing Condition

The existing queue deficiencies are identified on Table 3 and described as follows; all noted intersections are currently functioning at acceptable levels of service.

- The EB Thru approach of the intersection of 16th Avenue & Highway 27. Where the existing queue of 452 feet exceeds the available space of 60 feet by 392 feet.

- The WB Thru approach of the intersection of 16th Avenue & Highway 27, Where the existing queue of 260 feet exceeds the available space of 170 feet by 90 feet.

- The WB Thru approach of the intersection of 32nd Avenue & Highway 27 Where the existing queue of 322 feet exceeds the available space of 165 feet by 157 feet.

- The WB left turn approach of the intersection of 32nd Avenue & Highway 27 Where the existing queue of 169 feet exceeds the available space of 150 feet by 19 feet.

Table 3 – Existing PM Peak Intersection Individual Movement Queue Lengths 95th Percentile

INTERSECTION (A)vailable Lane Storage (Q)ueue within the Storage Lane		EB			WB			NB			SB		
		L	T	R	L	T	R	L	T	R	L	T	R
32nd Ave & University Rd	A		345			582		100	400		100	265	
	Q		85			66		22	25		65	32	
Dishman-Mica Rd & University/Schafer Rd	A	150	1,213	1,213	60	1,978		130	280		90	550	550
	Q	75	57	0	42	53		49	123		28	209	40
32nd Ave & Bowdish Rd	A	200	590		200	990			445			280	
	Q	9	273		31	152			96			116	
Dishman-Mica Rd & Bowdish Rd	A	100	863		100	680			360			290	135
	Q	16	160		27	84			91			81	0
Dishman-Mica Rd & Thorpe Rd	A					1,303						700	
	Q					10						5	
16th Ave & Pines Rd*	A				60				662			300	
	Q				5				50			145	
16th Ave & SR 27*	A		**60**	60		**170**		240	3,708		325	630	
	Q		**452**	16		**260**		49	168		131	180	
32nd Ave & Pines Rd*	A	240	490		240	980		130	425		160	700	
	Q	21	401		36	254		39	66		44	88	
Madison Rd & Thorpe Rd	A		1,303						400				
	Q		7.5						2.5				
32nd Ave & SR 27*	A	170	900		**150**	**165**		200	460		265	1,240	
	Q	109	190		**169**	**322**		141	98		66	135	
32nd Ave & Evergreen Rd	A	100									75	75	
	Q	15									30	10	
32nd Ave & Sullivan Rd	A		600										
	Q		40										
A = Available Space (ft) Q = 95th Percentile Queue Length					Apparent Deficiency								🟨

*A graphical exhibit of these Queue lengths are shown on Figures 13A through 13c.

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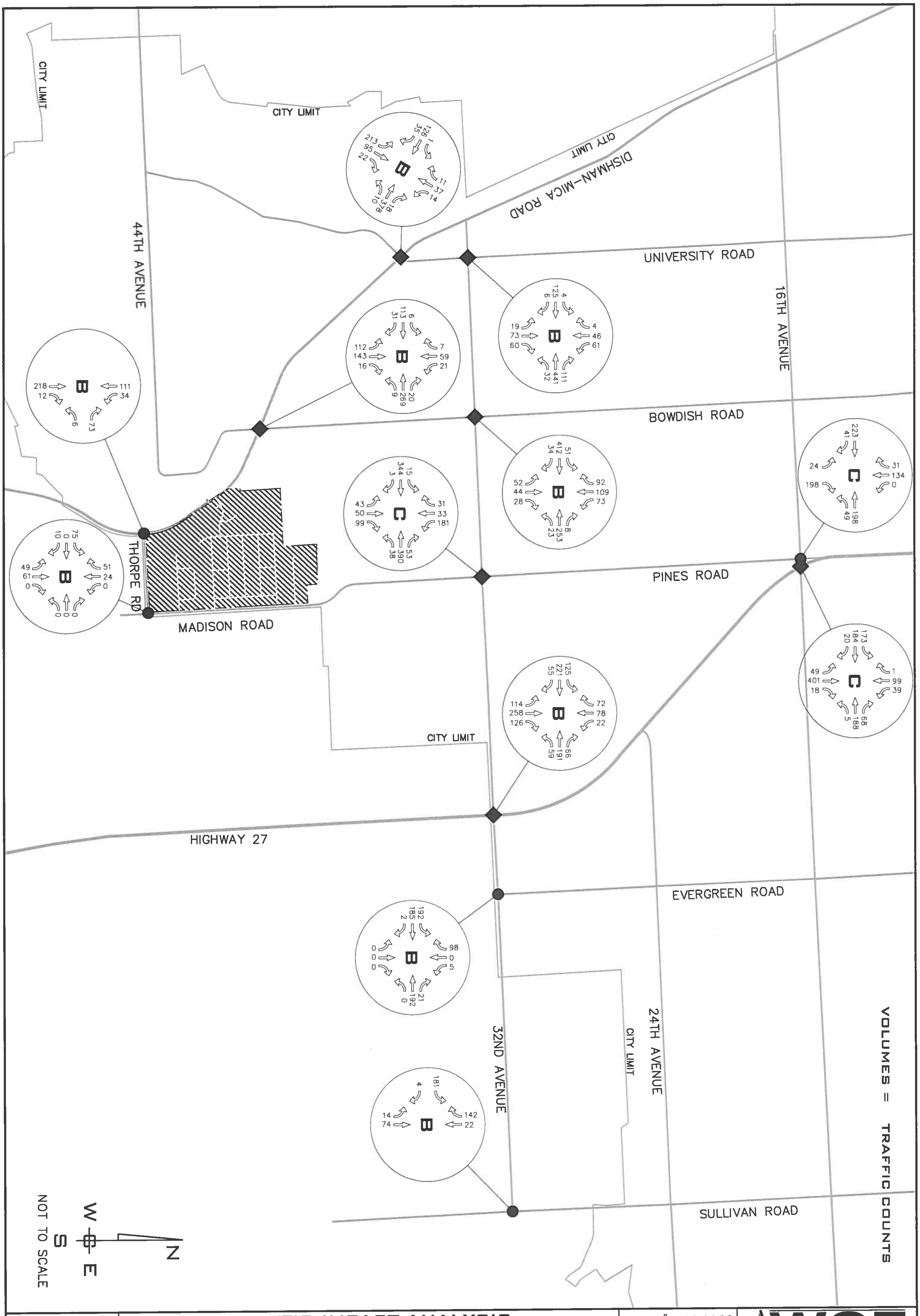

FIGURE 3

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

2015 AM TRAFFIC VOLUMES & LOS

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

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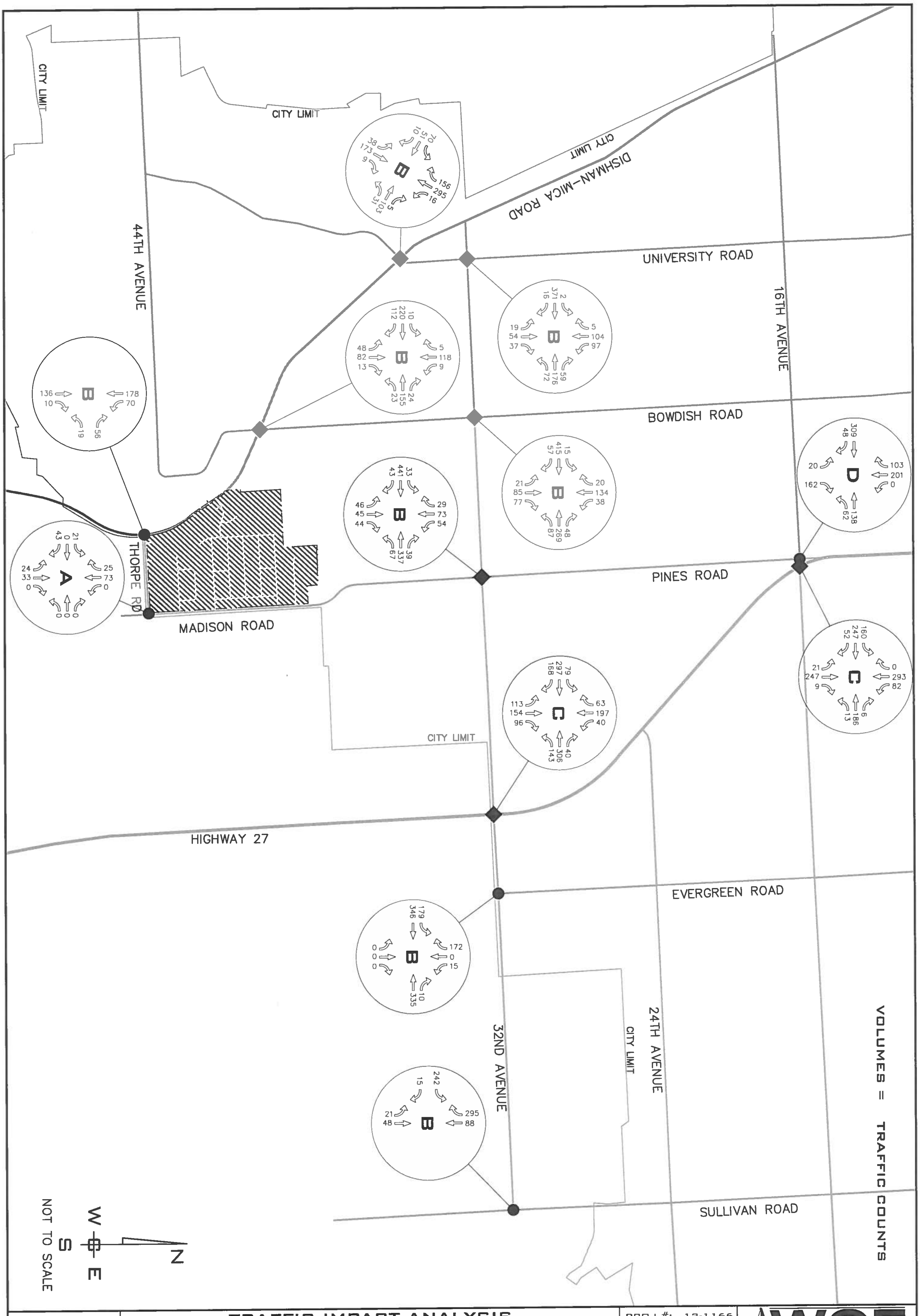

FIGURE 4	TRAFFIC IMPACT ANALYSIS PAINTED HILLS PRD MADISON ROAD & THORPE ROAD SPOKANE VALLEY, WASHINGTON 2015 PM TRAFFIC VOLUMES & LOS	PROJ #: 13-1166 DATE: 12/14/15 DRAWN: BNG APPROVED: TRW	WCE WHIPPLE CONSULTING ENGINEERS CIVIL, STRUCTURAL AND TRANSPORTATION ENGINEERING 2528 NORTH SULLIVAN ROAD SPOKANE VALLEY, WASHINGTON 99216 PH: 509-893-2617 FAX: 509-926-0227

Background Traffic Growth

Background traffic growth is an anticipated increase in traffic volume from year to year. As the existing land uses that surround a transportation facility mature, an increase in traffic results may be due to either an increase in drivers per household or a household's purchase of an additional vehicle. Many things can cause an increase in the traffic volumes of a facility. The objective of the background traffic growth rate is to anticipate what the traffic volumes may be in the future. The background traffic growth rate for an area or street is determined by means of physical counts collected by local governmental agencies. The counts are compared on a yearly basis and a rate of increase is calculated from the data.

For the study area, the background growth rate was determined by the City of Spokane Valley to be 1.1% per year. Based on a five-year build out (2020), compounded annually, the total increase in traffic is anticipated to total 5.6%. For the horizon year (2040) the total increase in traffic is anticipated to total 31.5%

Background Project Traffic

In addition to the increase in background growth, background projects that have already been approved or have made application and vested before this project have been included. The following projects have been scoped by the City of Spokane Valley, Spokane County, and WSDOT.

Table 4 – Background projects and Vested AM & PM Trips

Background Project	Remaining Lots/ units	AM Peak Hour Trips			PM Peak Hour Trips		
		Total	In	Out	Total	In	Out
Paxton Addition	13 lots	10	3	7	13	8	9
The Creek at Chester	44 lots	33	9	24	44	29	15
Pine Valley Ranch Apts.	132 units	69	14	55	90	59	31
Elk Ridge Heights	78 lots	59	15	44	79	51	28
Total Vested	-	**171**	**41**	**130**	**226**	**147**	**83**

Since the traffic from these background projects are not currently included in the existing traffic counts/volumes, the AM & PM trips anticipated from these developments are added to the future projected traffic volumes. Please see the anticipated increase of traffic due to the build out of these background projects per intersection on Figures 5 & 6.

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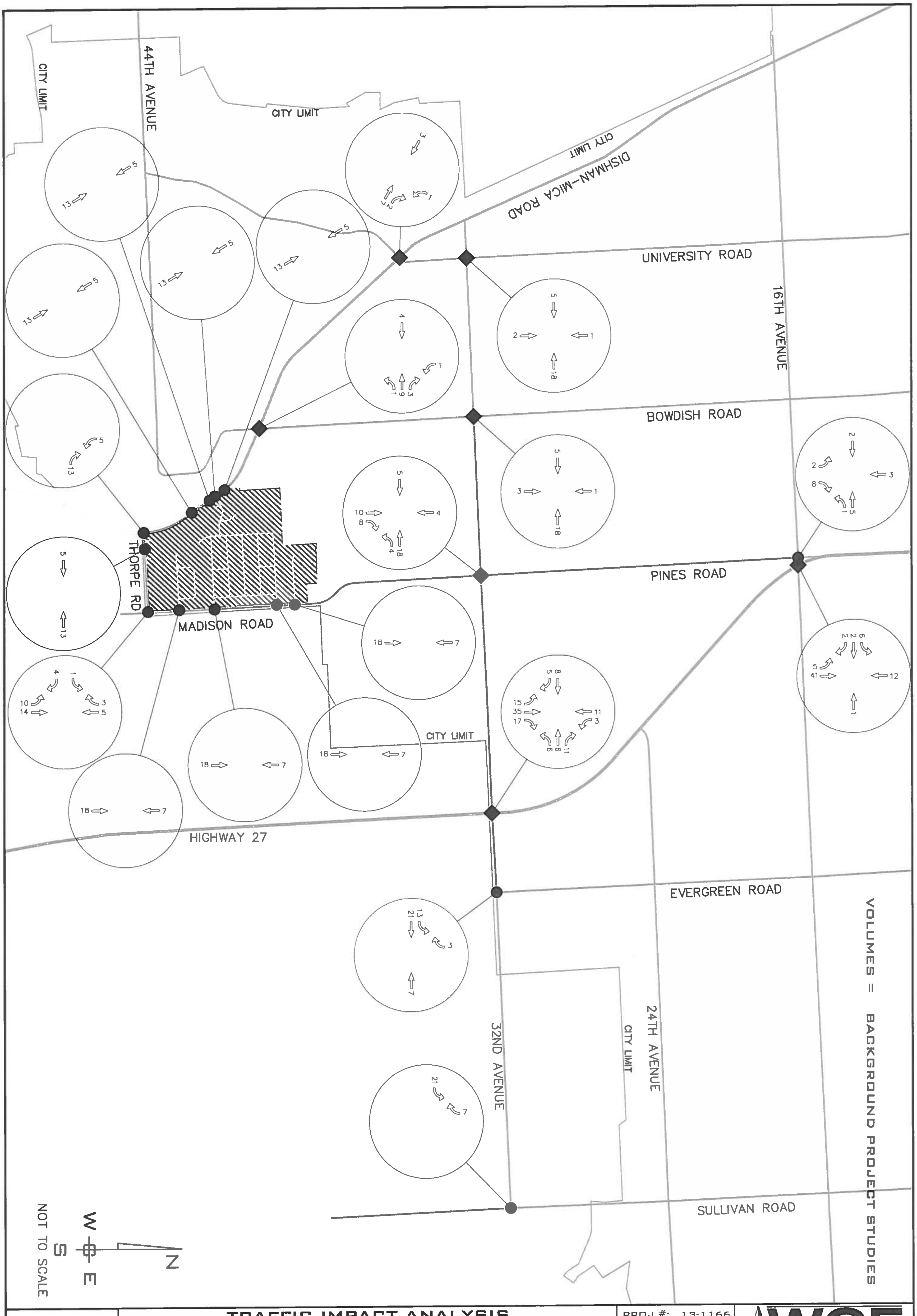

FIGURE 5

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

AM BACKGROUND TRIPS

PROJ #: 13-1166
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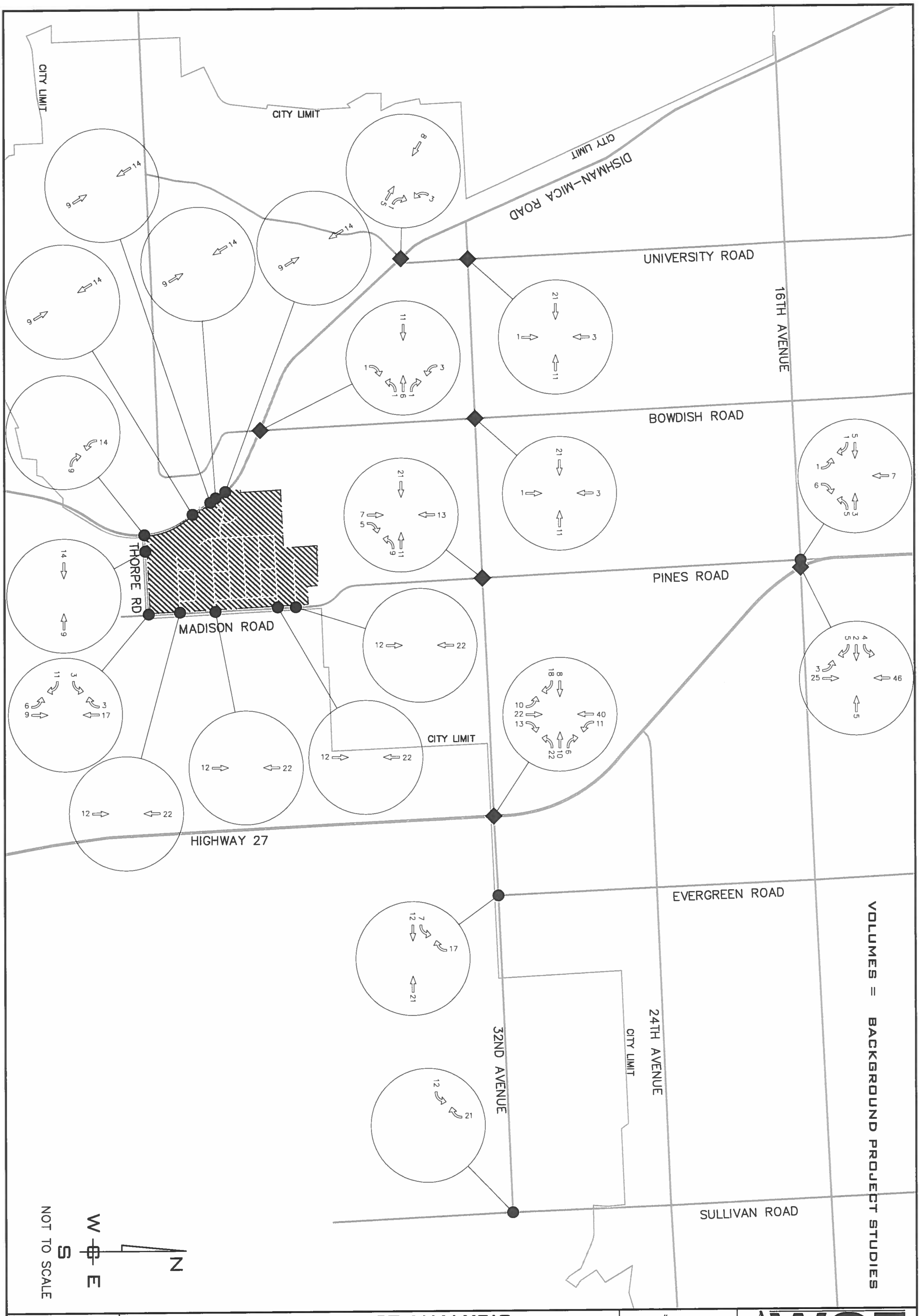

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD

SPOKANE VALLEY, WASHINGTON

PM BACKGROUND TRIPS

FIGURE

6

PROJ #: 13-1166
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TRIP GENERATION AND DISTRIBUTION

Trip generation rates for the AM and PM peak hours are determined by the use of the *Trip Generation Manual, 9th Edition* published by the Institute of Transportation Engineers (ITE). The purpose of the *Trip Generation Manual* is to compile and quantify empirical data into trip generation rates for specific land uses within the US, UK and Canada.

For the proposed development that includes 52 Cottage Style Single Family Lots, 206 Single Family Residential Lots, 42 Estate Type Single Family Lots, 228 Apartment Units, and a commercial development (4.26 ± ac), with a total square footage of 26,400 sf (26.4 KSF) and also 52 mixed use apartment units. The ITE Trip Generation Land Use Code (LUC) for each land use is listed below in Table 5.

Table 5 – Description of Land Use Code

Description	Number of Units / KSF	Land Use Code (LUC)
Cottage Style Single Family Lots	52 Units	Residential Townhouses – 230
Single Family Residential	206 Units	Single Family Residential – 210
Single Family Residential Estate Type	42 Units	Single Family Residential – 210
Apartments	228 Units	Apartments – 220
Apartments (mixed use)	52 units	Apartments – 220
Commercial Development	26.4 KSF	Shopping Center – 820

While the Commercial Development is anticipated to be developed more as a strip mall, (LUC 826 Specialty Retail), it was important that the existing restaurant not be excluded, hence the use of LUC 820 Shopping Center

Cottage Style Single Family Lots

For the 52 Cottage Style Single Family lots, Land Use Code #230, Residential Condominium/Townhouses was used to determine the trips generated by the proposed land use. The trips generated by the cottage Style Single Family land use are shown in Table 6.

Table 6 - Trip Generation Rates for Cottage Style Single Family Lots LUC #230 Residential Townhouses

Number of Lots	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.44 trips/ Unit	Directional Distribution		Vol. @ 0.52 trips/ Unit	Directional Distribution	
		17% In	83% Out		67% In	33% Out
52	23	4	19	28	19	9
Average Daily Trip Ends (ADT)						
Lots	Rate	ADT				
52	5.81	303				

As shown in Table 6, in the AM peak hour the Cottage lots are anticipated to generate 23 driveway trips, with 4 trips entering the site, and 19 trips exiting the site. In the PM peak hour the project is anticipated to generate 28 driveway trips; with 19 trips entering the site, and 9 trips exiting the site. The Cottage Lots are anticipated to have an Average Daily Trips (ADT) of 303 trips to/from the site per day.

Single Family Residential

For the 206 single family units, Land Use Code #210, Single Family Residential, was used to determine the trips generated by the proposed land use. The trips generated by the single family residential land use are shown in Table 7.

Table 7 - Trip Generation Rates for Single Family Lots LUC #210 Single Family Residential

Number of Lots	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.75 Trips/Unit	Directional Distribution		Vol. @ 1.0 Trips/Unit	Directional Distribution	
		25% In	75% Out		63% In	37% Out
206	155	39	116	206	130	76
Internal	2	1	1	10	6	4
Driveway	153	38	115	196	124	72

Average Daily Trip Ends (ADT)		
Lots	Rate	ADT
206	9.52	1,962

As shown in Table 7, in the AM peak hour the Single Family Residential lots are anticipated to generate 153 driveway trips, with 38 driveway trips entering the site, and 115 driveway trips exiting the site. In the PM peak hour the project is anticipated to generate 196 driveway trips; with 124 driveway trips entering the site, and 72 driveway trips exiting the site. The Single Family Residential Lots are anticipated to have an Average Daily Trips (ADT) of 1,962 trips to/from the site per day.

Estate Type Single Family Lots – Single Family Residential

For the 42 Estate Type Single Family lots, Land Use Code #210, Single Family Residential, was used to determine the trips generated by the proposed land use. The trips generated by the Estate type lots land use are shown in Table 8.

Table 8 - Trip Generation Rates for Estate Type Single Family Lots LUC #210 Single Family Residential

Number of Units	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.75 Trips/Unit	Directional Distribution		Vol. @ 1.0 Trips/Unit	Directional Distribution	
		25% In	75% Out		63% In	37% Out
42	32	8	24	42	26	16

Average Daily Trip Ends (ADT)		
Units	Rate	ADT
42	9.52	400

As shown in Table 8, in the AM peak hour the Estate Type Single Family lots are anticipated to generate 32 driveway trips, with 8 trips entering the site, and 24 trips exiting the site. In the PM peak hour the project is anticipated to generate 42 driveway trips; with 26 trips entering the site, and 16 trips exiting the site. The Estate Type Single Family Lots are anticipated to have an Average Daily Trips (ADT) of 400 trips to/from the site per day.

Apartments – Multi-Family Residential

For the 228 unit Multi-Family Apartment Complex, Land Use Code #220, Apartment was used to determine the trips generated by the proposed land use. The trips generated by the apartment land use are shown in Table 9.

Table 9 - Trip Generation Rates for Apartment Units LUC #220 Apartment

Number of Units	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.51 Trips/Unit	Directional Distribution		Vol. @ 0.62 Trips/Unit	Directional Distribution	
		20% In	80% Out		65% In	35% Out
228	117	23	94	142	92	50
Internal	1	0	1	10	6	4
Driveway	116	23	93	132	86	46
Average Daily Trip Ends (ADT)						
Units	**Rate**	**ADT**				
228	6.65	1,517				

As shown in Table 7, in the AM peak hour the Apartment Complex is anticipated to generate 116 driveway trips, with 23 driveway trips entering the site, and 93 driveway trips exiting the site. In the PM peak hour the project is anticipated to generate 132 driveway trips; with 86 driveway trips entering the site, and 46 driveway trips exiting the site. The Apartment Complex is expected to have an Average Daily Trips (ADT) of 1,517 trips to/from the site per day.

52 Apartments (Mixed Use) – Multi-Family Residential

For the Multi-Family Apartment Units (Mixed Use) located above the commercial development, Land Use Code #220, Apartment was used to determine the trips generated for the proposed land use. The trips generated by the Apartment (Mixed Use) land use are shown in Table 10.

Table 10 - Trip Generation Rates for LUC #220 Apartment (Mixed Use)

Number of Units	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.51 Trips/Unit	Directional Distribution		Vol. @ 0.62 Trips/Unit	Directional Distribution	
		20% In	80% Out		65% In	35% Out
52	27	5	22	33	21	12
Average Daily Trip Ends (ADT)						
Units	**Rate**	**ADT**				
52	6.65	346				

As shown in Table 10, in the AM peak hour the Multi-Family Apartment Units, above the commercial development, are anticipated to generate 27 driveway trips, with 5 trips entering the site, and 22 trips exiting the site. In the PM peak hour the project is anticipated to generate 33 driveway trips; with 21 trips entering the site, and 12 trips exiting the site. These Apartment Units are expected to have an Average Daily Trips (ADT) of 346 trips to/from the site per day.

Commercial

For the 26,400 sf (26.4 KSF) of commercial development Land Use Code #820, Shopping Center was used to determine the trips generated by the proposed land use. The trips generated by the commercial development land use are shown in Table 11.

Table 11 - Trip Generation Rates for LUC #820 Shopping Center

Thousand Square Feet KSF (Max)	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.96 Trips/KSF	Directional Distribution		Vol. @ 3.71 Trips/KSF	Directional Distribution	
		62% In	38% Out		48% In	52% Out
26.4	26	16	10	98	47	51
Internal	3	2	1	20	9	11
Driveway	23	14	9	78	38	40
Pass By	-	-	-	27	13	14
New	23	14	9	51	25	26
Average Daily Trip Ends (ADT)				PM Pass-by 34% per ITE Trip handbook Table 5.6		
KSF	Rate	ADT				
26.4	42.7	1,128				

As shown in Table 11, in the AM peak hour the Shopping Center is anticipated to generate 23 new trips, with 14 new trips entering the site, and 9 new trips exiting the site. In the PM peak hour the project is anticipated to generate 51 new trips; with 25 new trips entering the site, and 26 new trips exiting the site. The Commercial Development is anticipated to have an Average Daily Trips (ADT) of 1,128 trips to/from the site per day.

Driveway Trips

The proposed development driveway trips generated on the transportation system are shown in the table below.

Table 12 – Driveway Trips Generation Summary

Land Use Code (LUC)	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. per LUC	Directional Distribution		Vol. per LUC	Directional Distribution	
		In	Out		In	Out
LUC #230 Townhouses (Cottage Style) (Table 6)	23	4	19	28	19	9
LUC #210 Single Family Residential (Table 7)	153	38	115	196	124	72
LUC #210 SFR (Estate Lots) (Table 8)	32	8	24	42	26	16
LUC #220 Apartment (Table 9)	116	23	93	132	86	46
LUC #220 Apartment (mixed use)(Table 10)	27	5	22	33	21	12
LUC #820 Shopping Center (Table 11)	23	14	9	78	38	40
Total	374	92	282	482	301	181
Average Daily Trip Ends (ADT)						
Land Use Code (LUC)	Rate	ADT				
LUC #230 Townhouses (Cottage Style) (Table 6)	-	303				
LUC #210 Single Family Residential (Table 7)	-	1,962				
LUC #210 SFR (Estate Lots) (Table 8)	-	400				
LUC #220 Apartment (Table 9)	-	1,516				
LUC #220 Apartment (mixed use)(Table 10)	-	346				
LUC #820 Shopping Center (Table 11)	-	1,128				
Total	-	5,655				

As shown in Table 12, in the AM peak hour the project is anticipated to generate 374 driveway trips, with 92 trips entering the site, and 282 trips exiting the site via the nine access opportunities previously noted. In the PM peak hour the project is anticipated to generate 482 driveway trips; with 301 trips entering the site, and 181 trips exiting the site via the nine access opportunities previously noted. The site is anticipated to have an Average Daily Trips (ADT) of 5,655 trips to/from the site per day, via the 9 access opportunities previously noted.

Pass-by Trips

The pass-by trip, as shown on Table 13, is a trip that is currently on the adjacent roadway and turns into the land use as a matter of convenience on the way to their final destination (work/home). The internal trip is a trip that is generated within the proposed land uses when a vehicle/consumer will stop at more than one place on the site. The proposed development pass-by trips generated on the transportation system are shown in the table below. Please see the map of pass-by trips on Figure 9.

Table 13 – Pass-by Trips Generation Summary

Land Use Code (LUC)	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. per LUC	Directional Distribution		Vol. per LUC	Directional Distribution	
		In	Out		In	Out
LUC #820 Shopping Center (Table 11)	-	-	-	27	13	14

As shown in Table 13, in the AM peak hour the commercial development is anticipated to generate 8 pass-by trips, with 5 trips entering the site, and 3 trips exiting the site. In the PM peak hour the commercial development is anticipated to generate 27 pass-by trips; with 13 trips entering the site, and 14 trips exiting the site.

Internal Trips

The internal trip generation was established using the methodology set forth in ITE Trip Generation Handbook Chapter 7. The proposed development internal trips generation on the internal road network between the Single Family Residential, Apartments, and Commercial land uses are summarized in the table below.

Table 14 – Internal Trips Generation Summary

Land Use Code (LUC)	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. per LUC	Directional Distribution		Vol. per LUC	Directional Distribution	
		In	Out		In	Out
LUC #210 Single Family Residential (Table 7)	2	1	1	10	6	4
LUC #220 Apartment (Table 9)	1	0	1	10	6	4
LUC #820 Shopping Center (Table 11)	3	2	1	20	8	12
Total	6	3	3	40	20	20

As shown in Table 14, in the AM peak hour the project is anticipated to generate 6 internal trips, with 3 trips entering the site, and 3 trips exiting the site. In the PM peak hour the project is anticipated to generate 40 internal trips; with 20 trips entering the site, and 20 trips exiting the site.

Trip Distribution Characteristics for the Proposed Project

Considering many factors such as the development surrounding the proposed project, the general commuter traffic in the area, the geography in the vicinity of the site, and the existing transportation facilities in the surrounding area, the following distribution from the proposed project applies:

Cottages Style Single Family (Townhouses)
It is anticipated that 100% of the trips will go to/from the north via Madison Road towards 32nd Avenue. At 32nd Avenue, traffic will follow the existing traffic patterns of the intersection, In the AM peak hour from the intersection of 32nd Avenue.& Pines Road 57% of the trips will be traveling to/from the east, 29% of the trips will be traveling to/from the north, and 14% of the trips will be traveling to/from the west. Please see Figure 7A in the appendix. In the PM peak hour from the intersection of 32nd Avenue & Pines Road 44% of the trips will be traveling to/from the east, 32% of the trips will be traveling to/from the north, and 24% of the trips will be traveling to/from the west. Please see Figure 8A in the appendix.

Estate Type Single Family
It is anticipated that 50% of the trips will go to/from the north on Madison Road towards 32nd Avenue, and 50% of the trips will go to/from the south on Madison Road towards Thorpe Road, then towards Dishman-Mica Road, where 45% of trips go to/from the north, and 5% of trips go to/from the south. Please see Figures 7B and 8B in the appendix.

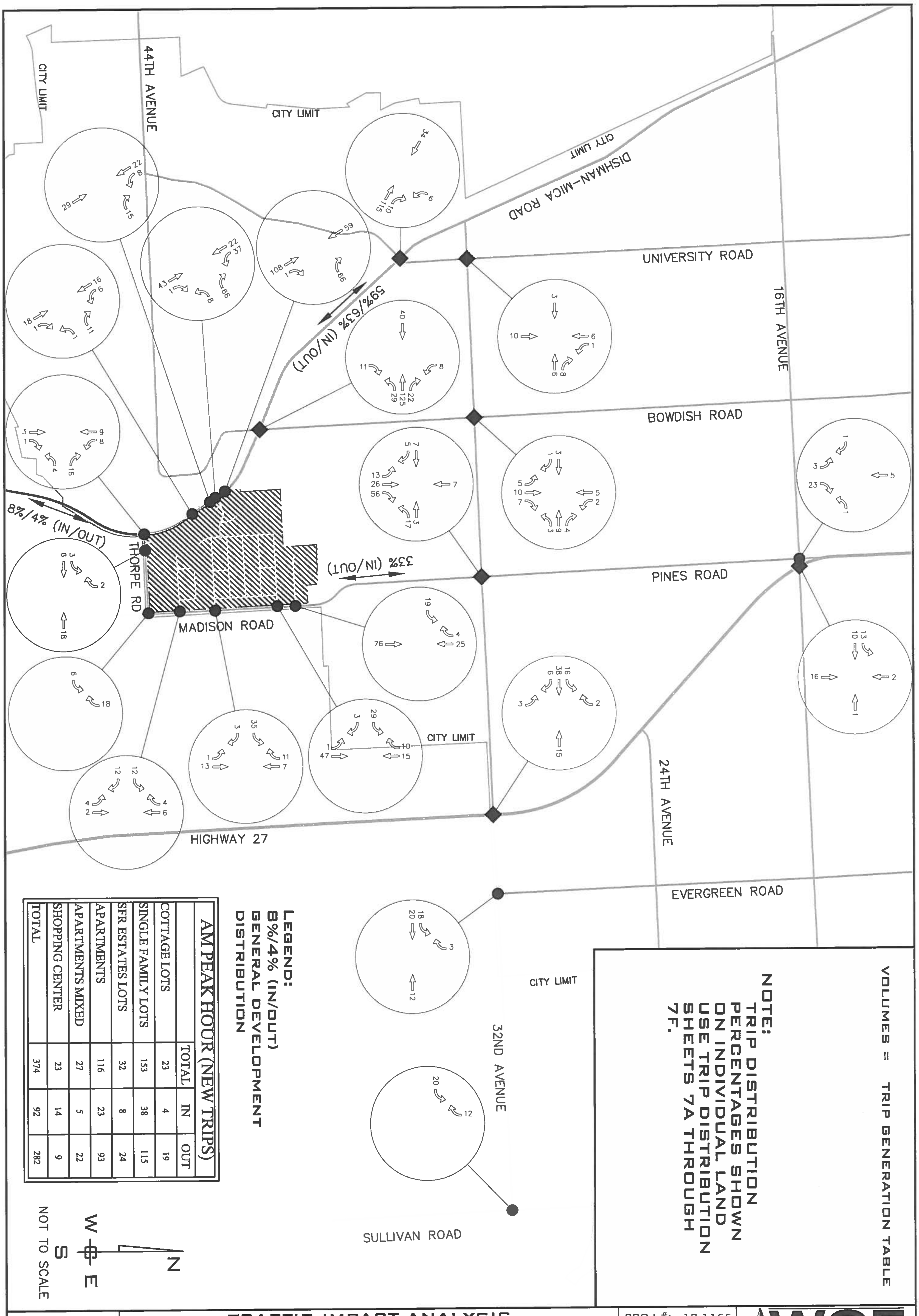
> At the intersection of Dishman-Mica Road & Bowdish Road In the AM peak hour 5% will go to/from the north 31% will go to/from the west and 9% will go to/from the south. In the PM peak hour 5% will go to/from the north 38% will go to/from the west and 2% will go to/from the south.
>
> At the intersection of 32nd Avenue & Pines Road In the AM peak hour 9% will go to/from the west, 16% will go to/from the north and 25% will go to/from the east. In the PM peak hour 12% will go to/from the west, 16% will go to/from the north and 22% will go to/from the east.

Single Family Residential
It is anticipated that the trips will be split 50/50 with half of the trips going to Madison Road, and half of the trips going to Dishman-Mica Road where 45% go to/from the north and 5% go to/from the south. Please see Figures 7C and 8C in the appendix.

> At the intersection of Dishman-Mica Road & Bowdish Road In the AM peak hour 5% will go to/from the north 31% will go to/from the west and 9% will go to/from the south. In the PM peak hour 5% will go to/from the north 38% will go to/from the west and 2% will go to/from the south.
>
> At the intersection of 32nd Avenue & Pines Road In the AM peak hour 9% will go to/from the west, 16% will go to/from the north and 25% will go to/from the east. In the

PM peak hour 12% will go to/from the west, 16% will go to/from the north and 22% will go to/from the east.

Apartments - Apartments (Mixed Use) –Land uses Commercial
It is anticipated that 100% of the trips will go to/from Dishman-Mica Road, where 5% of trips go to/from the south, and 5% of trips will go east around to Madison Road and 90% of trips go to/from the north, where in the AM peak hour 11% will go to/from the north 61% will go to/from the west and 18% will go to/from the south. In the PM peak hour 10% will go to/from the north 76% will go to/from the west and 4% will go to/from the south. Beyond this distribution trips will follow existing traffic patterns. For Apartments Please see Figures 7D and 8D in the appendix. For Apartments (Mixed Use) please see Figures 7E and 8E in the appendix. For Commercial Please see Figures 7F and 8F in the appendix.



LEGEND:
8%/4% (IN/OUT)
GENERAL DEVELOPMENT
DISTRIBUTION

AM PEAK HOUR (NEW TRIPS)			
	TOTAL	IN	OUT
COTTAGE LOTS	23	4	19
SINGLE FAMILY LOTS	153	38	115
SFR ESTATES LOTS	32	8	24
APARTMENTS	116	23	93
APARTMENTS MIXED	27	5	22
SHOPPING CENTER	23	14	9
TOTAL	374	92	282

VOLUMES = TRIP GENERATION TABLE

NOTE:
TRIP DISTRIBUTION
PERCENTAGES SHOWN
ON INDIVIDUAL LAND
USE TRIP DISTRIBUTION
SHEETS 7A THROUGH
7F.

FIGURE
7

TRAFFIC IMPACT ANALYSIS
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MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

AM PEAK HOUR TRIP DISTRIBUTION

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APPROVED: TRW

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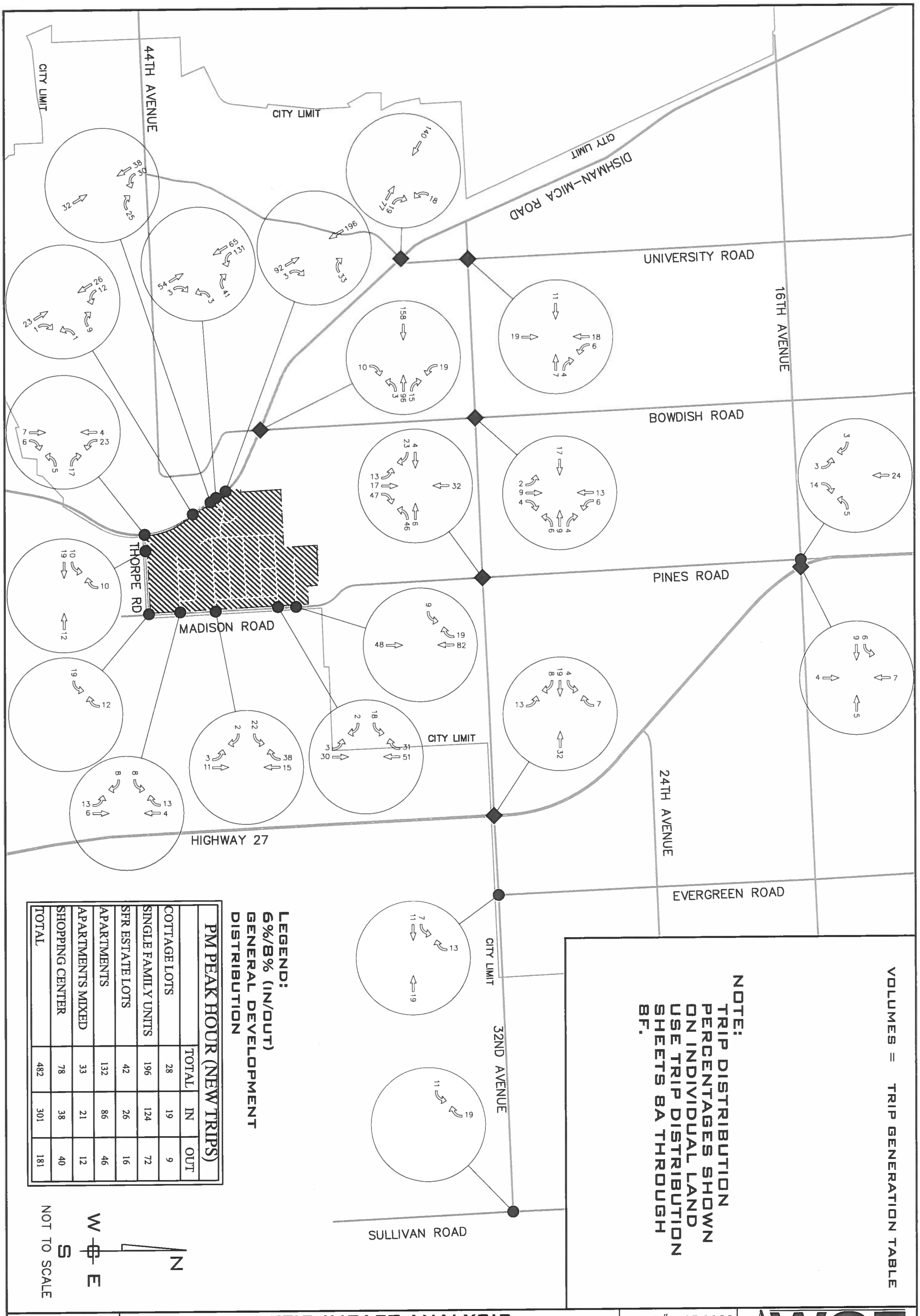

LEGEND:
6%/8% (IN/OUT)
GENERAL DEVELOPMENT
DISTRIBUTION

PM PEAK HOUR (NEW TRIPS)			
	TOTAL	IN	OUT
COTTAGE LOTS	28	19	9
SINGLE FAMILY UNITS	196	124	72
SFR ESTATE LOTS	42	26	16
APARTMENTS	132	86	46
APARTMENTS MIXED	33	21	12
SHOPPING CENTER	78	38	40
TOTAL	482	301	181

VOLUMES = TRIP GENERATION TABLE

NOTE:
TRIP DISTRIBUTION
PERCENTAGES SHOWN
ON INDIVIDUAL LAND
USE TRIP DISTRIBUTION
SHEETS 8A THROUGH
8F.

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

PM PEAK HOUR TRIP DISTRIBUTION

PROJ #: 13-1166
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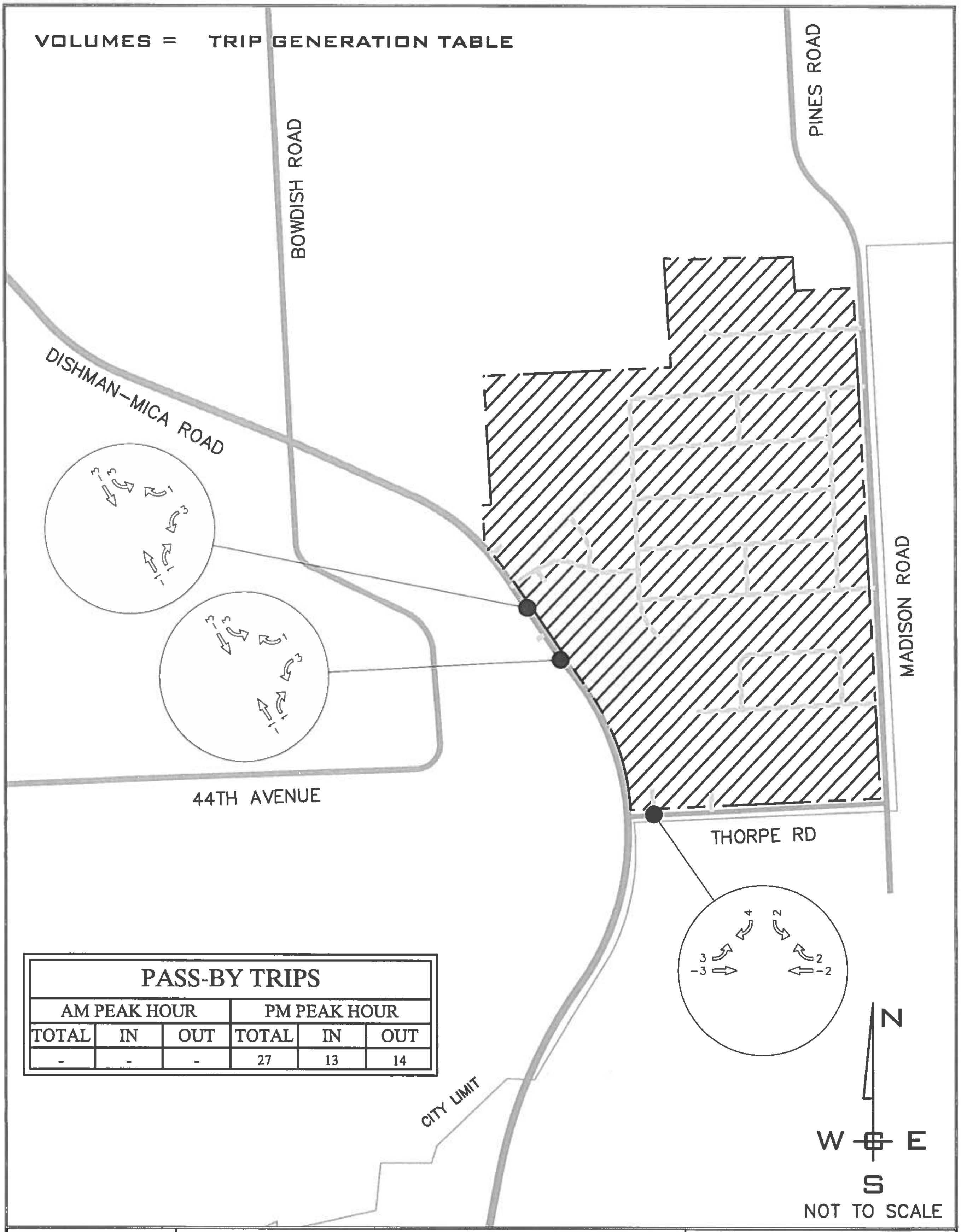
FIGURE
8



PASS-BY TRIPS					
AM PEAK HOUR			PM PEAK HOUR		
TOTAL	IN	OUT	TOTAL	IN	OUT
-	-	-	27	13	14

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

TRAFFIC IMPACT ANALYSIS
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FIGURE 9

PM PASS-BY TRIPS

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FUTURE YEAR TRAFFIC IMPACT ANALYSIS

Future Year Traffic Impact Analysis

Level of service calculations for the Year 2020 & 2040 conditions assumed that the existing traffic volumes as shown on Figures 3 & 4 experience an increase above the 2015 volumes at the established background rate. Two scenarios were examined for the year 2020 (buildout) analysis, as well as the horizon year 2040 (planning level study). The first scenario assumes that the development has not moved forward and analyzes the scoped intersections with the background growth rate and the background project trips. The second scenario assumes that the development has moved forward to completion and is builtout. The scenario analyzes the scoped intersections with the background growth rate, the background projects, and the project trips. These scenarios will allow a determination to be made of what the future conditions may be with and without the project.

Left Turn lanes on Dishman-Mica Road, Thorpe Road & Madison Road along Project Frontage

Per the request of the City of Spokane Valley we have analyzed the proposed accesses to determine if a left turn is warranted based upon the WSDOT design manual Exhibit 1310-7a. The results are summarized here and the exhibits are shown in the appendix:

Table 15 - Left Turn Analysis at Proposed Project Accesses.

Intersection:	Results
Dishman-Mica Road & Apt. Access	NA – no left turns allowed (RI-RO)
Dishman-Mica Road & Sundown Drive	Plots above the line and warrants left turn lane
Dishman-Mica Road & N. Comm. Access	Plots below the line
Dishman-Mica Road & S. Comm. Access	Plots below the line
Thorpe Road & Comm. Access	Plots below the line
Madison Road & Painted Hills Avenue	Plots below the line
Madison Road & 41st Avenue	Plots below the line
Madison Road & 43rd Avenue	Plots below the line
Madison Road & 44th Avenue	Plots below the line

As shown in the results only the intersection of Dishman-Mica Road & Sundown Drive meets the threshold to consider a left turn storage lane.

Based upon these results and discussions with the developer regarding the developments frontage improvements, we recommend that on Dishman Mica Road a Two-Way-Left-Turn-Lane (TWLTL) be provided to accommodate the proposed access roads and driveways. The TWLTL is proposed to begin north of the Chester Creek Bridge and end before the extension of the project boundary. Additionally based upon the City of Spokane Valleys classification of Madison Road as a collector we recommend that that the developer includes the widening of Madison Road for a future TWLTL. These recommendations are incorporated with the analysis of the intersections.

Study Area Intersections Left and Right turn Warrants
Per the request of the City of Spokane Valley a review of the study intersections was completed for the Year 2020 with and without the project in the AM and PM peak hours. The left and right turn movements of each intersection were screened using a rule of thumb consideration to identify potential turn lane needs. The rule of thumb is a movements that exceeded a volume of 300 vehicles for a left turn movement, and 100 vehicles for a right turn movement. This rule of thumb is only used as an indicator, as the decision to install a turn lane is based upon multiple variables including Intersection Level of Service, Signal Timing, Pedestrian needs, and Movement Queue.

Table 15A Turn Analysis at Study Area Intersections

Intersection	Scenario	Proj. Trips	Mvmt	Existing Condition	Recommendation
32nd Ave. & University Rd.	AM Peak Hour W- & W-O Proj.	8	WB Rt	4-lane Roadway	None
Dishman-Mica Rd & University/Schafer	PM Peak Hour W- & W-O Proj.	0	SB Rt	Existing Right turn Lane	None
Dishman-Mica Rd & Bowdish	PM Peak Hour W- & W-O Proj.	0	EB Rt	No turn lane.	Agency Consideration
16th Ave. & Pines Rd	AM Peak Hour W- & W-O Proj.	23	NB Rt	Slight Flare	See 2020 W-Proj Recommendation
16th Ave. & Pines Rd	PM Peak Hour W- & W-O Proj.	14 0	NB Rt SB Rt	Slight Flare	See 2020 W-Proj Recommendation
32nd Ave. & Pines Rd	AM Peak Hour W- & W-O Proj	56	NB Rt	No turn lane.	See Below
32nd Ave. & State Route 27	AM & PM Peak Hr W- & W-O Proj	0 0	NB Rt	Full 50' Flare	None
32nd Ave. & State Route 27	PM Peak Hour W- & W-O Proj	8	EB Rt	Existing Right turn Lane	None
32nd Ave. & Evergreen Rd	AM & PM Peak Hr W- & W-O Proj	3 13	SB Rt	Existing Right turn Lane	None
32nd Ave. & Sullivan Rd	AM & PM Peak Hr W- & W-O Proj	12 20	SB Rt	Existing Right turn Lane	None

The intersection of Dishman-Mica Road & Bowdish Road eastbound right movement meets the rule of thumb in the Year 2020 both with and without the project. As the project contributes no trips to this movement, the decision to install a right turn lane rests with the City of Spokane.

The Intersection of 16th Avenue & Pines Road northbound and southbound right turn movements meet the rule of thumb in the Year 2020 Both With and without the project, see the year 2020 With the project scenario.

The intersection of 32nd Avenue & Pines Road northbound right turn movement meets the rule of thumb and the project anticipates adding 56 trips to the movement. Therefore considering the installation of a right turn movement; per the intersection level of service analysis the intersection is anticipated to function at Level of Service "C" for both the AM and PM Peak

Hours and With and Without the Project. Additionally for those scenarios the northbound approach Queue does not spillback into the preceding intersection. As the volume occurs only in the AM peak hour when the intersection receives the most amount of pedestrians, that are students, we do not recommend that a right turn lane be installed as the installation would encourage additional Right turn on red movements that would conflict with the pedestrian phase of the signal timing.

At this time we are not making any turn lane proposals at the intersection of 32nd Avenue & Pines Road due to extenuating circumstances associated with traffic operations of the signal and University High School and student safety in the area.

Year 2020 without the Project, with the Background Projects

This scenario assumes that the development has not moved forward and the background projects have been completed. The traffic volumes for this condition include the existing traffic, as shown on Figures 3 & 4 multiplied by the background growth rate, plus the traffic from the original background projects as shown on Figures 5 & 6. Please see Figures 10 & 11 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 16 - Year 2020 Levels of Service, without the Project, with the Background Projects

INTERSECTION	(S)ignalized (U)nsignalized	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
32nd Ave & University Rd	S	23.6	C	11.6	B
Dishman-Mica Rd & University/Schafer Rd	S	16.1	B	17.0	B
32nd Ave & Bowdish Rd	S	14.1	B	12.5	B
Dishman-Mica Rd & Bowdish Rd	S	12.5	B	11.6	B
Dishman-Mica Rd & Thorpe Rd	U	11.1	B	10.8	B
16th Ave & Pines Rd	U	23.6	C	47.0	E
16th Ave & SR 27	S	29.5	C	28.0	C
32nd Ave & Pines Rd	S	24.1	C	20.6	C
Madison Rd & Thorpe Rd	U	11.7	B	9.8	A
32nd Ave & SR 27	S	22.5	C	26.9	C
32nd Ave & Evergreen Rd	U	10.9	B	15.7	C
32nd Ave & Sullivan Rd	U	11.6	B	12.7	B

Intersection Level of Service - Deficiency Evaluation

There are no deficiencies identified for intersection level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.

Intersection Movement Queue - Deficiency Evaluation for 2020 Without the Project

The queue deficiencies are identified on Table 17 and described as follows; These deficiencies are solely based upon the Background trips (unmitigated) reported within this report. All noted intersections are anticipated to function at acceptable levels of service.
Year 2015 Existing vs. Year 2020 w-o Proj,

16th Avenue & State Route 27

- The EB through approach as reported is expected to go from a queue length of 452 feet to a queue length of 522 feet or an increase of 70 feet. And the reported queue exceeds the available space by 462 feet.
- The WB thru approach as reported is expected to go from a queue length of 260 feet to a queue length of 290 feet or an increase of 30 feet. And the reported queue exceeds the available space by 120 feet.

32nd Avenue & Pines Road

- The EB through approach as reported is expected to go from a queue length of 401 feet to a queue length of 496 feet or an increase of 95 feet. And the reported queue exceeds the available space by 6 feet.

32nd Avenue & State Route 27

- The WB through approach as reported is expected to go from a queue length of 322 feet to a queue length of 399 feet or an increase of 77feet. And the reported queue exceeds the available space by 234 feet.
- The WB left turn approach as reported is expected to go from a queue length of 169 feet to a queue length of 213 feet or an increase of 44 feet. And the reported queue exceeds the available space by 63 feet.

Table 17 – Year 2020 PM Peak W-O the Project, Intersection Queue Lengths 95th Percentile

INTERSECTION (A)vailable Lane Storage (Q)ueue within the Storage Lane		**EB**			**WB**			**NB**			**SB**		
		L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
32nd Ave & University Rd	A		345			582		100	400		100	265	
	Q		96			75		24	27		69	35	
Dishman-Mica Rd & University/Schafer Rd	A	150	1,213	1,213	60	1,978		130	280		90	550	550
	Q	78	67	0	45	57		51	133		33	227	42
32nd Ave & Bowdish Rd	A	200	590		200	990			445			280	
	Q	10	353		34	172			102			126	
Dishman-Mica Rd & Bowdish Rd	A	100	863		100	680			360			290	135
	Q	18	179		29	92			101			92	0
Dishman-Mica Rd & Thorpe Rd	A					1,303						700	
	Q					13						5	
16th Ave & Pines Rd*	A				60				662			300	
	Q				5				77.5			207.5	
16th Ave & SR 27*	A		**60**	60		**170**		240	3,708		325	630	
	Q		**522**	24		**290**		58	200		143	223	
32nd Ave & Pines Rd*	A	240	**490**		240	980		130	425		160	700	
	Q	23	**496**		44	294		42	81		46	105	
Madison Rd & Thorpe Rd	A		1,303						400				
	Q		2.5						10				
32nd Ave & SR 27*	A	170	900		**150**	**165**		200	460		265	1,240	
	Q	120	239		**213**	**399**		168	127		85	173	
32nd Ave & Evergreen Rd	A	100									75	75	
	Q	17.5									12.5	40	
32nd Ave & Sullivan Rd	A		600										
	Q		47.5										
A = Available Space (ft) Q = 95th Percentile Queue Length												Apparent Deficiency	🟨

*A graphical exhibit of these Queue lengths are shown on Figures 13A through 13c.

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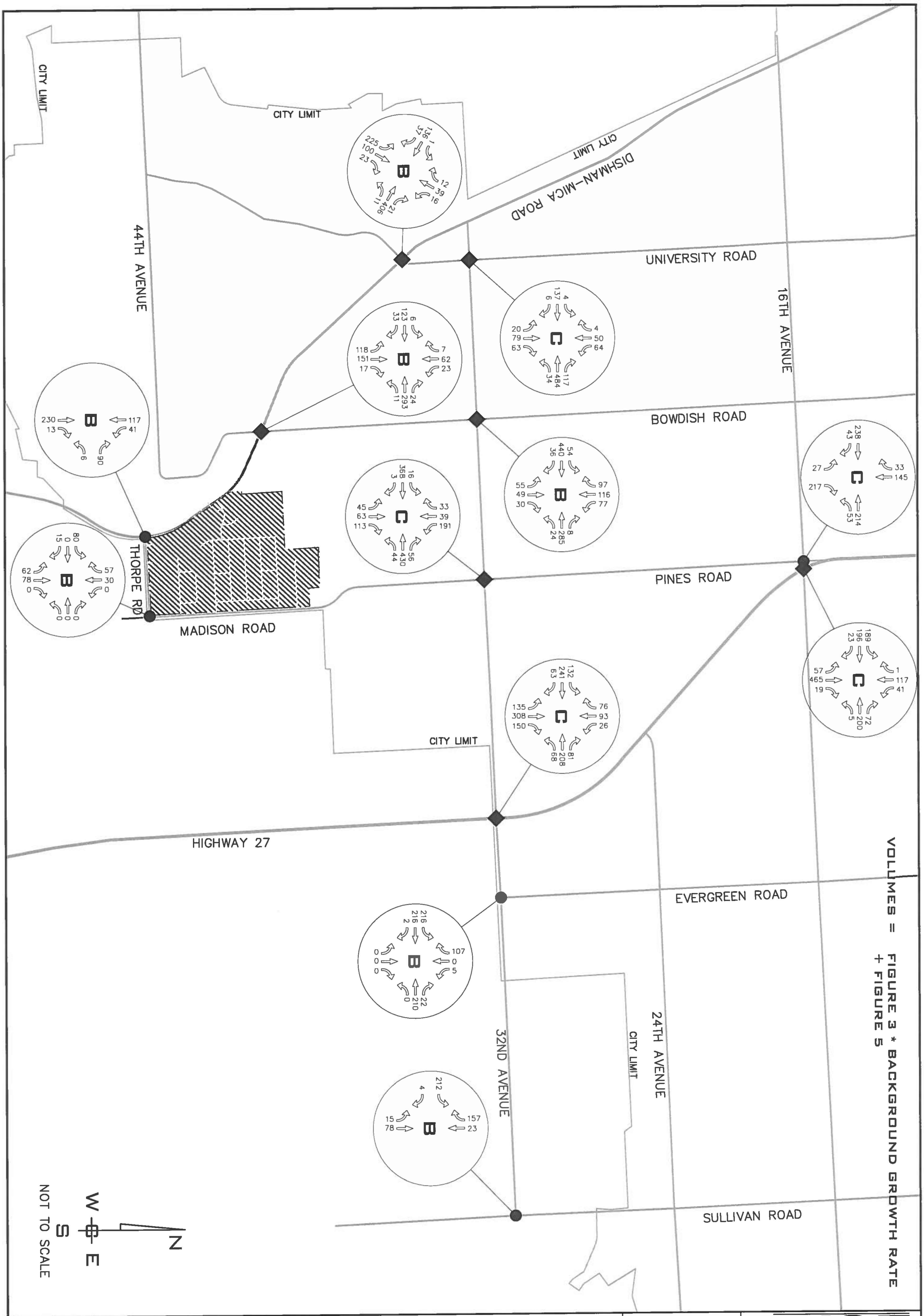

VOLUMES = FIGURE 3 * BACKGROUND GROWTH RATE + FIGURE 5

FIGURE
10

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

2020 AM W/O PROJECT VOLUMES & LOS

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

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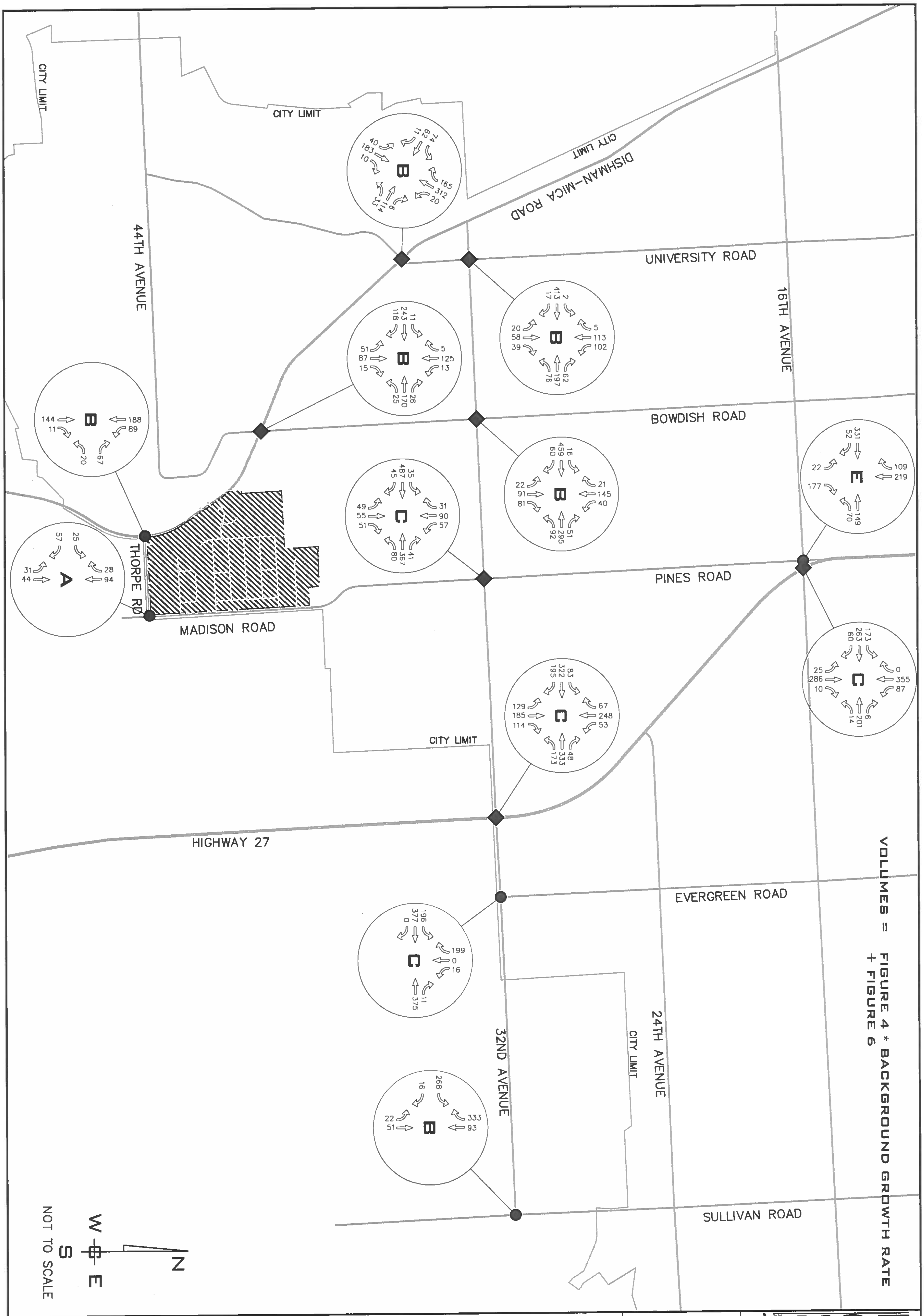

FIGURE

11

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD

SPOKANE VALLEY, WASHINGTON

2020 PM W/O PROJECT VOLUMES & LOS

PROJ #:	13-1166
DATE:	12/14/15
DRAWN:	BNG
APPROVED:	TRW

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Year 2020 with the Project, with the Background Projects

This scenario assumes that the development has moved forward to completion and the background projects have been completed. The traffic volumes for this condition include the existing traffic, as shown on Figures 10 & 11, plus the project trips as shown on Figures 7 & 8. Please see Figures 12 & 13 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 18 - Year 2020 Levels of Service, with the Project, with the Background Projects

INTERSECTION		**AM Peak Hour**		**PM Peak Hour**	
	(S)ignalized (U)nsignalized	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**
32nd Ave & University Rd	S	12.2	B	12.1	B
Dishman-Mica Rd & University/Schafer Rd	S	17.1	B	19.3	B
32nd Ave & Bowdish Rd	S	14.5	B	13.4	B
Dishman-Mica Rd & Bowdish Rd	S	15.2	B	12.6	B
Dishman-Mica Rd & Apt. Access	U	11.9	B	10.3	B
Dishman-Mica Rd & Sundown Drive	U	11.3	B	10.4	B
Dishman- Mica Rd & N. Comm. Access	U	10.5	B	9.9	A
Dishman- Mica Rd & S. Comm. Access	U	10.6	B	10.7	B
Dishman-Mica Rd & Thorpe Rd	U	11.5	B	11.4	B
Thorpe Rd & Comm. Access	U	8.9	A	9.0	A
16th Ave & Pines Rd • Remove SB Approach	U	24.5 (16.4)	C (C)	**66.2** (23.3)	**F** (C)
16th Ave & SR 27 • Redirected trips from SB Approach	S	30.8 (26.1)	C (C)	28.9 (32.4)	C (C)
32nd Ave & Pines Rd	S	30.3	C	27.8	C
Madison Rd & Painted Hills Ave.	U	11.0	B	10.7	B
Madison Rd & 41st Ave.	U	10.4	B	10.2	B
Madison Rd & 43rd Ave.	U	10.3	B	10.0	B
Madison Rd & 44th Ave.	U	9.5	A	9.5	A
Madison Rd & Thorpe Rd	U	12.0	B	10.3	B
32nd Ave & SR 27	S	22.0	C	28.3	C
32nd Ave & Evergreen Rd	U	11.2	B	16.5	C
32nd Ave & Sullivan Rd	U	11.9	B	12.9	B

Intersection Level of Service - Deficiency Evaluation

There is a deficiency identified for intersection level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan, at the intersection of 16th Avenue & Pines Road. The deficiency in LOS can be remedied by reducing conflicts at the intersection by removing the southbound slip ramp approach to the intersection and redirecting the displaced trips to the SB right movement of the intersection of 16th Avenue & State Route 27. We therefore recommend that the project remove the SB slip ramp approach of the intersection.

Intersection Movement Queue - Deficiency Evaluation for 2020 with the project

The queue deficiencies are identified on Table 19 and described as follows; These deficiencies are solely based upon the proposed project as documented within this report. All noted intersections are anticipated to function at acceptable levels of service, except for the intersection of 16th Avenue & Pines Road

.

Year 2020 w-o Proj. vs. Year 2020 w- Proj.,
16th Avenue & State Route 27

- The EB through approach as reported is expected to go from a queue length of 522 feet to a queue length of 547 feet or an increase of 25 feet. And the reported queue exceeds the available space by 487 feet.
- The WB thru approach as reported is expected to go from a queue length of 290 feet to a queue length of 299 feet or an increase of 9 feet. And the reported queue exceeds the available space by 129 feet.

32nd Avenue & Pines Road

- The EB through approach as reported is expected to go from a queue length of 496 feet to a queue length of 617 feet or an increase of 121 feet. And the reported queue exceeds the available space by 127 feet.

32nd Avenue & State Route 27

- The WB through approach as reported is expected to go from a queue length of 399 feet to a queue length of 457 feet or an increase of 58 feet. And the reported queue exceeds the available space by 290 feet.
- The WB left turn approach as reported is expected to go from a queue length of 213 feet to a queue length of 223 feet or an increase of 10 feet. And the reported queue exceeds the available space by 73 feet.

Table 19 – Year 2020 PM w- project Intersection Movement Queue Lengths 95th Percentile

INTERSECTION (A)vailable Lane Storage (Q)ueue within the Storage Lane		EB			WB			NB			SB		
		L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
32nd Ave & University Rd	A		345			582		100	400		100	265	
	Q		102			80		24	33		75	40	
Dishman-Mica Rd & University/Schafer Rd	A	150	1,213	1,213	60	1,978		130	280		90	550	550
	Q	86	182	0	48	93		56	157		54	260	46
32nd Ave & Bowdish Rd	A	200	590		200	990			445			280	
	Q	10	386		37	185			112			138	
Dishman-Mica Rd & Bowdish Rd	A	100	863		100	680			360			290	135
	Q	18	329		31	146			106			104	0
Dishman-Mica Rd & Apt. Access	A						100						
	Q						5						
Dishman-Mica Rd & Sundown Dr.	A				150						150		
	Q				5						10		

Table 19 (continued)

INTERSECTION (A)vailable Lane Storage (Q)ueue within the Storage Lane		**EB**			**WB**			**NB**			**SB**		
		L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
Dishman-Mica Rd & N Comm.	A					50					50		
						2.5					2.5		
Dishman-Mica Rd & S Comm.						50							
	Q					2.5							
Dishman-Mica Rd & Thorpe Rd	A					1,303						700	
	Q					15						7.5	
Thorpe Rd & Comm. Access	A											50	
	Q											2.5	
16th Ave & Pines Rd	A				60				662			300	
	Q				5				127			270	
16th Ave & SR 27*	A		**60**	60		**170**		240	3,708		325	630	
	Q		**547**	24		**299**		58	203		143	227	
32nd Ave & Pines Rd*	A	240	**490**		240	980		130	425		160	700	
	Q	26	**617**		80	323		52	129		49	141	
Madison Rd & Painted Hills Ave	A		100					50					
	Q		0					0					
Madison Rd & 41st Ave	A		100					50					
	Q		2.5					0					
Madison Rd & 43rd Ave	A		100					50					
	Q		2.5					0					
Madison Rd & 44th Ave	A		100										
	Q		2.5										
Madison Rd & Thorpe Rd	A		1,303						400				
			12.5						2.5				
32nd Ave & SR 27*	A	170	900		**150**	**165**		200	460		265	1,240	
	Q	128	262		**223**	**457**		187	130		89	182	
32nd Ave & Evergreen Rd	A	100									75	75	
	Q	20									12.5	45	
32nd Ave & Sullivan Rd	A		600										
	Q		52.5										
A = Available Space (ft) Q = 95th Percentile Queue Length					Apparent Deficiency								🟨

*A graphical exhibit of these Queue lengths are shown on Figures 13A through 13c.

There are <u>no</u> new deficiencies identified with the proposed project, only the extension of known deficiencies.

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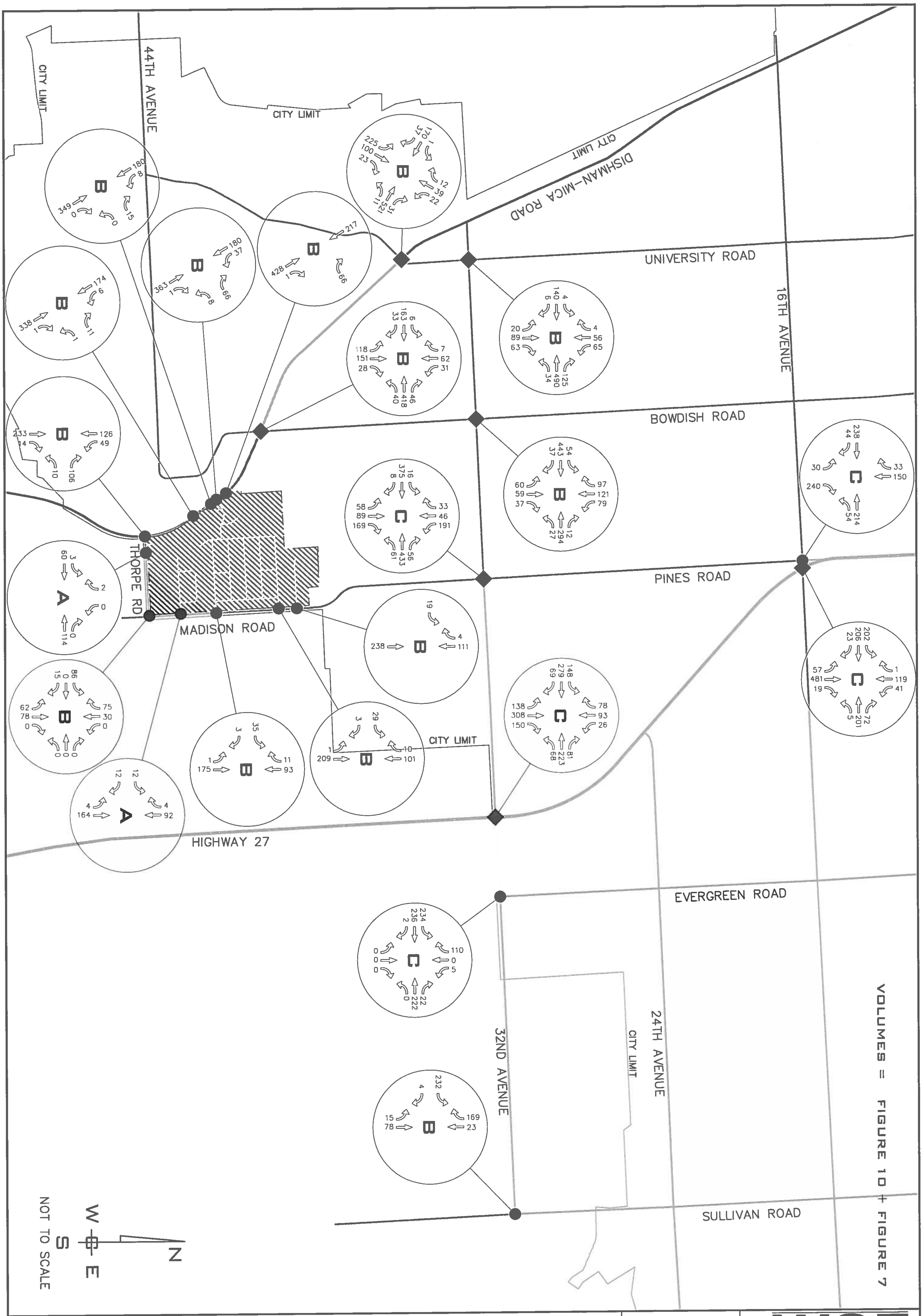

FIGURE 12

TRAFFIC IMPACT ANALYSIS
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MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

2020 AM W/ PROJECT VOLUMES & LOS

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

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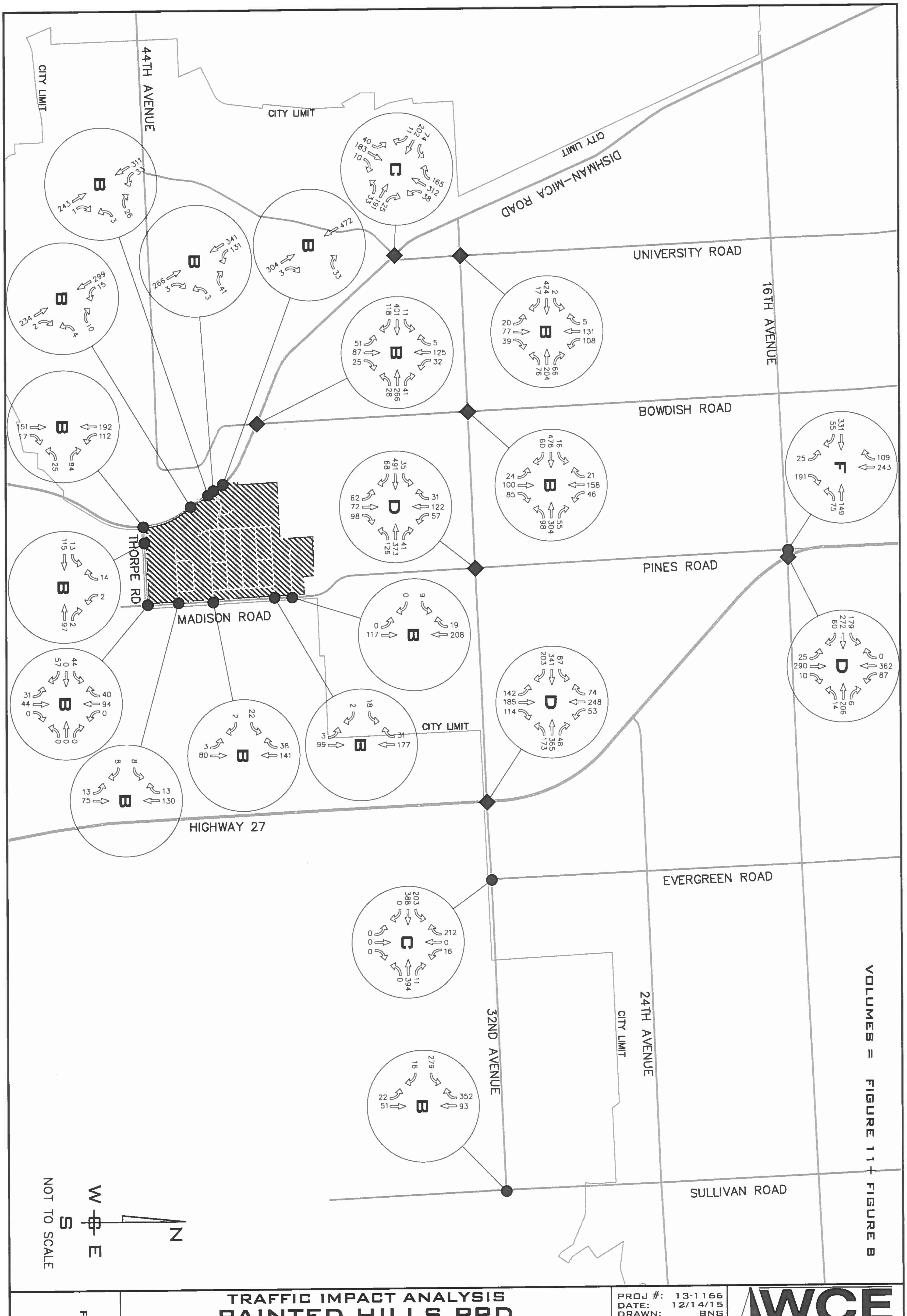

FIGURE 13

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD

SPOKANE VALLEY, WASHINGTON

2020 PM W/ PROJECT VOLUMES & LOS

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

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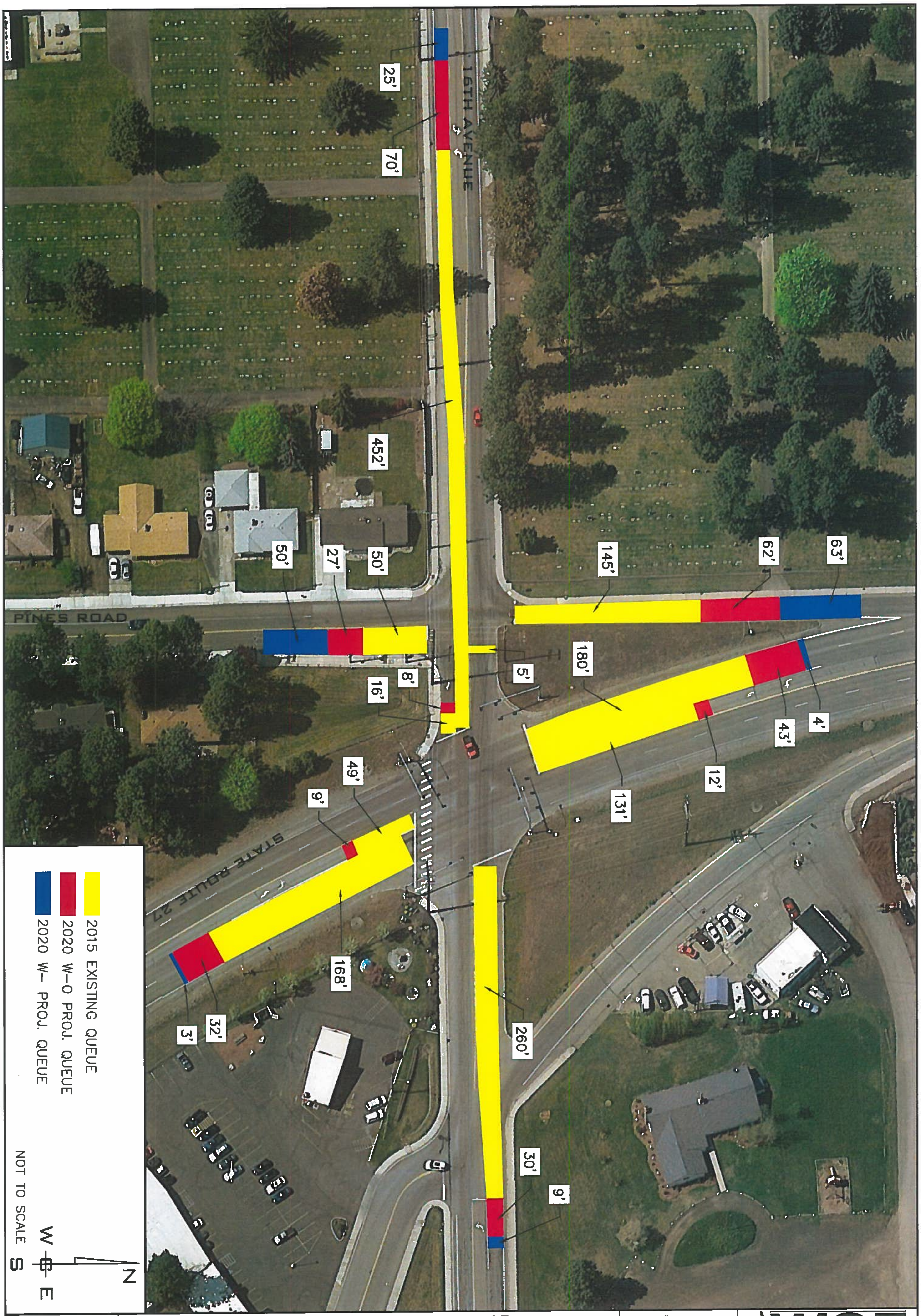

FIGURE
13A

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

QUEUE SUMMARY EXHIBIT

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

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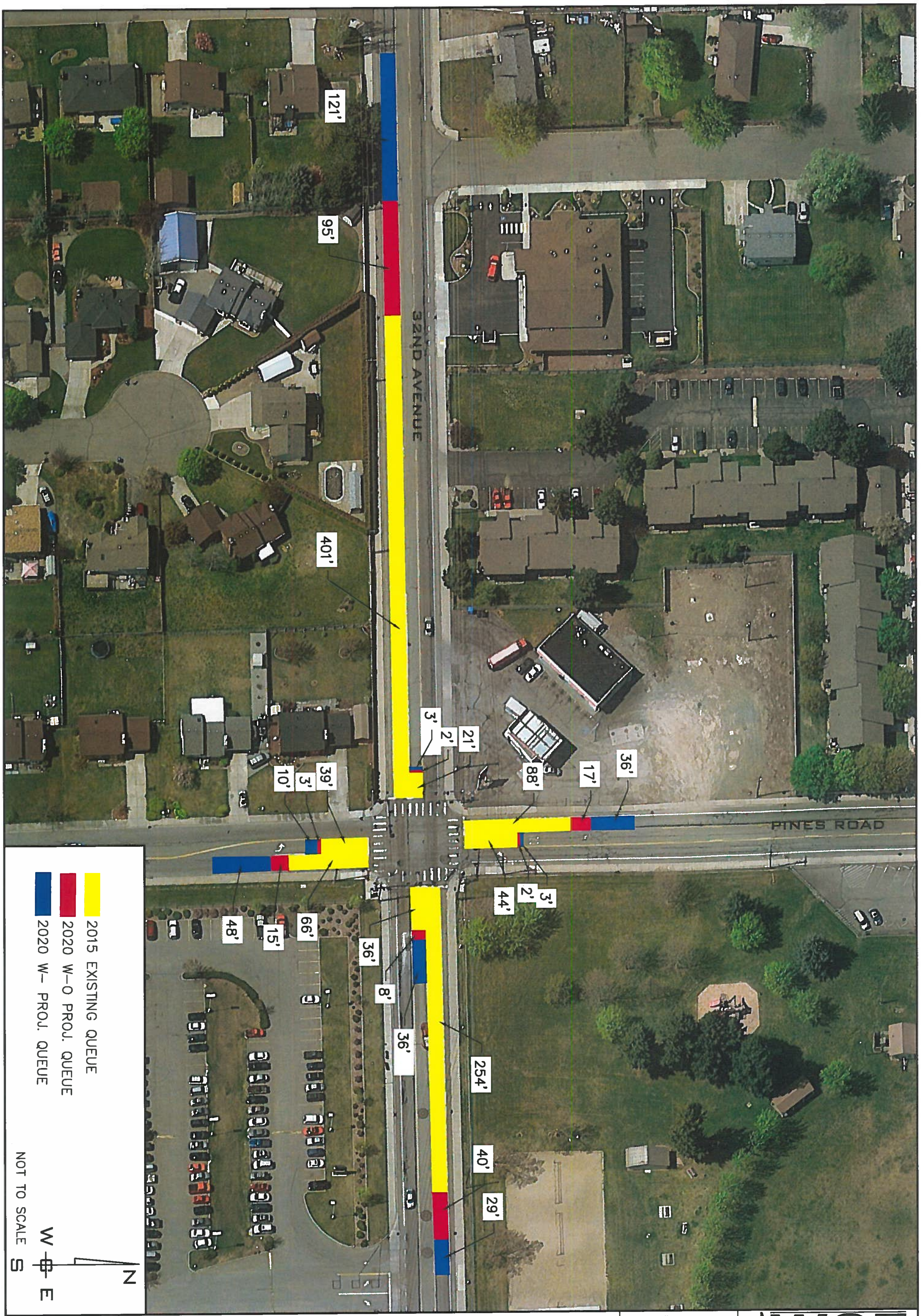

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

QUEUE SUMMARY EXHIBIT

PROJ #:	13-1166
DATE:	12/14/15
DRAWN:	BNG
APPROVED:	TRW

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FIGURE
13B

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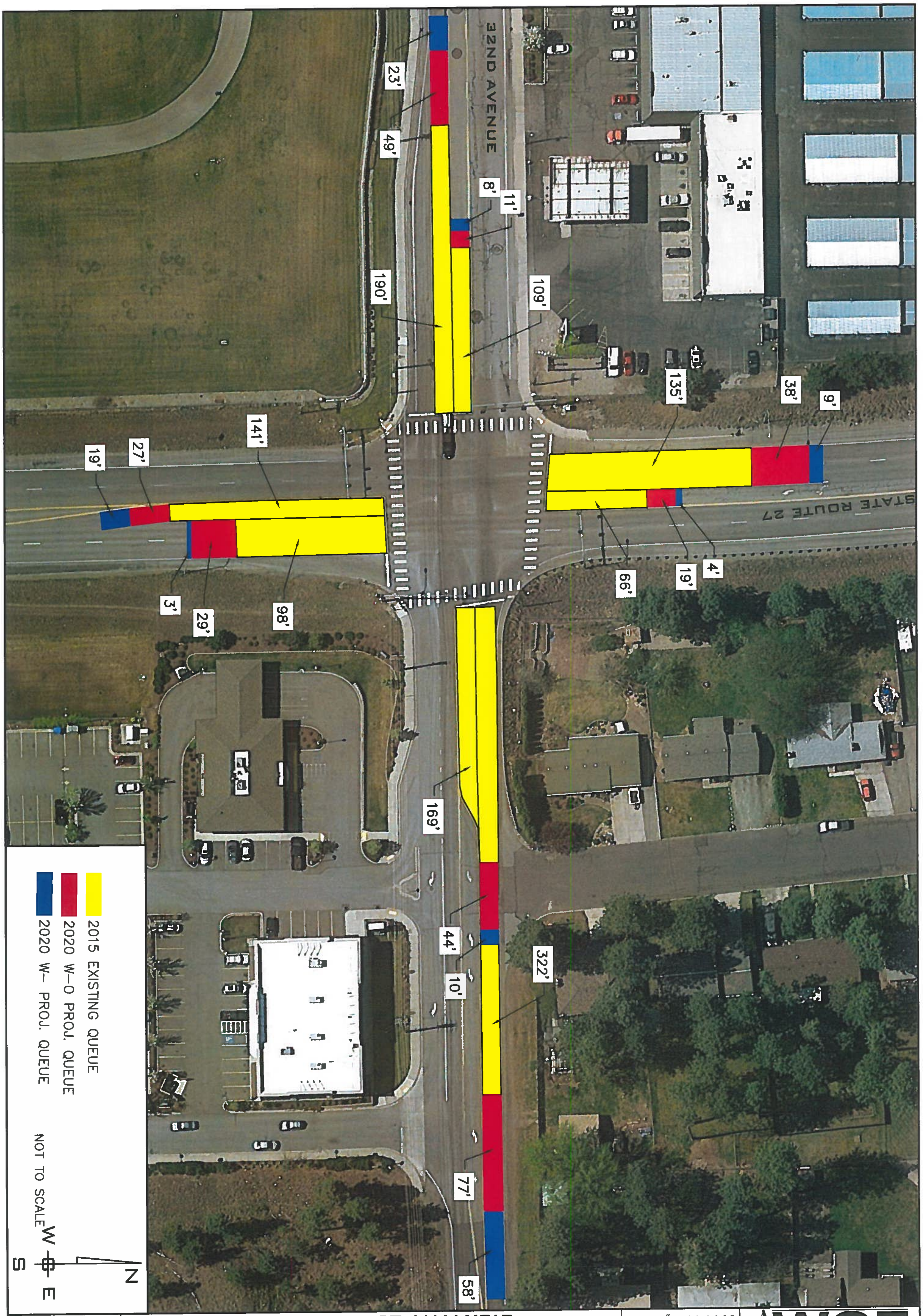

FIGURE
13C

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

QUEUE SUMMARY EXHIBIT

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DATE: 12/14/15
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Horizon Year Traffic Impact Analysis (Buildout + 20 Years)

The Horizon Year analysis is not a requirement of the project per the COV street standards as the project mitigation does not include a signal or roundabout to meet level of service standards, but is provided as a planning level analysis.

Planning Level Considerations

As this section is reserved to consider planning level operations of the transportation system it is appropriate to consider the land uses of this area. As previously noted the proposed property is listed and zoned as low density residential, as are most of the remaining undeveloped properties within the basin both in the City of Spokane Valley and Spokane. It has been shown that from a traffic perspective that a concentration of like land uses can cause an in balance in the directional travel of the road system. This should be considered as development continues in the future.

When understanding the strain that intersections endure under the daily loads, it is the responsibility of the City planners to consider the directional load that land uses can place on an intersection and work to provide that balance. Otherwise facilities will need to be overbuilt to accommodate high directional imbalance.

Intersection Level of Service

Level of service calculations for the Year 2040 conditions assumed that the existing traffic volumes as shown on Figure 3 experience an increase above the 2015 volumes at the established background rate. Two scenarios were examined for the year 2040 analysis. The first scenario assumes that the development has not moved forward and analyzes the scoped intersections with the background growth rate and the background project trips. The second scenario assumes the same but adds the project trips.

Horizon Year 2040 without the Project, with the Background Projects (Planning Level)

This scenario assumes that the development has not moved forward and the background projects have been completed. The traffic volumes for this condition include the existing traffic, as shown on Figures 3 & 4 multiplied by the background growth rate, plus the traffic from the original background projects as shown on Figures 5 & 6. Please see Figures 14 & 15 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 20 - Year 2040 Levels of Service, without the Project, with the Background Projects

INTERSECTION	**(S)ignalized (U)nsignalized (R)oundabout**	**AM Peak Hour**		**PM Peak Hour**	
		Delay (sec)	**LOS**	**Delay (sec)**	**LOS**
32nd Ave & University Rd	S	12.8	B	13.1	B
Dishman-Mica Rd & University/Schafer Rd	S	17.9	B	18.5	B
32nd Ave & Bowdish Rd	S	20.7	C	17.7	B
Dishman-Mica Rd & Bowdish Rd	S	15.0	B	13.1	B
Dishman-Mica Rd & Thorpe Rd	U	12.3	B	11.8	B
16th Ave & Pines Rd	U	**56.4**	**F**	**198.8**	**F**
• Remove SB Approach	(U)	(24.4)	(C)	**(52.0)**	**(F)**
• Roundabout/ circle (ALT. IMP)	(R)	(10.7)	(B)	(12.1)	(B)
16th Ave & SR 27	S	45.0	D	40.8	D
• Redirected Trips from SB Approach	(S)	(33.2)	(C)	**(56.5)**	**(E)**
• Roundabout/ circle (ALT. IMP)	(R)	(11.5)	(B)	(11.1)	(B)
32nd Ave & Pines Rd	S	30.1	C	37.6	D
Madison Rd & Thorpe Rd	U	13.2	B	10.3	B
32nd Ave & SR 27	S	25.7	C	35.7	D
32nd Ave & Evergreen Rd	U	12.2	B	22.0	C
32nd Ave & Sullivan Rd	U	13.1	B	15.5	C

Intersection Level of Service - Deficiency Evaluation

The only deficiencies identified for intersection level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan is anticipated to be at the intersection 16th Avenue & Pines Road even with the proposed removal of the SB approach by the project at buildout.

Based upon this analysis we recommend that the City of Spokane Valley and WSDOT work on a permanent solution to these closely spaced intersections. We would like the agencies to consider a two lane roundabout with a following traffic circle at this location. The intersection of 16th Avenue & Pines Road being a single lane traffic circle with three approaches, and the intersection of 16th Avenue & State Route 27 being a 2 lane roundabout with four approaches.

Intersection Movement Queue - Deficiency Evaluation for 2040 without the Project

The queue deficiencies are identified on Table 21 and described as follows; These deficiencies are solely based upon the Background trips (unmitigated) reported within this report. And have assumed that there is no major change in the dynamics of the existing transportation system over a 25 year period. It is noted that most intersections are anticipated to function at acceptable levels of service.

Year 2040 w-o Proj vs. Year 2020 w-o Proj,

16th Avenue & Pines Road

- The SB through approach as reported is expected to go from a queue length of 207 ft. to a queue length of 530 feet or an increase of 323 feet. And the reported queue exceeds the available space by 230 feet.

16th Avenue & State Route 27

- The EB through approach as reported is expected to go from a queue length of 522 feet to a queue length of 817 feet or an increase of 295 feet. And the reported queue exceeds the available space by 757 feet.
- The WB thru approach as reported is expected to go from a queue length of 290 feet to a queue length of 406 feet or an increase of 116 feet. And the reported queue exceeds the available space by 236 feet.

32nd Avenue & Pines Road

- The EB through approach as reported is expected to go from a queue length of 617 feet to a queue length of 729 feet or an increase of 112 feet. And the reported queue exceeds the available space by 239 feet.

32nd Avenue & State Route 27

- The WB through approach as reported is expected to go from a queue length of 457 feet to a queue length of 644 feet or an increase of 187 feet. And the reported queue exceeds the available space by 479 feet.
- The WB left turn approach as reported is expected to go from a queue length of 213 feet to a queue length of 299 feet or an increase of 86 feet. And the reported queue exceeds the available space by 149 feet.
- The NB left turn approach as reported is expected to go from a queue length of 168 feet to a queue length of 223 feet or an increase of 55 feet. And the reported queue exceeds the available space by 23 feet.

Table 21 – Year 2040 PM w-o project Intersection Movement Queue Lengths 95th Percentile

INTERSECTION (A)vailable Lane Storage (Q)ueue within the Storage Lane		**EB**			**WB**			**NB**			**SB**		
		L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
32nd Ave & University Rd	A		345			582		100	400		100	265	
	Q		127			102		31	37		98	50	
Dishman-Mica Rd & University/Schafer Rd	A	150	1,213	1,213	60	1,978		130	280		90	550	550
	Q	96	79	0	54	71		62	174		37	311	48
32nd Ave & Bowdish Rd	A	200	590		200	990			445			280	
	Q	13	546		48	251			131			159	
Dishman-Mica Rd & Bowdish Rd	A	100	863		100	680			360			290	135
	Q	20	234		34	114			125			111	0
Dishman-Mica Rd & Thorpe Rd	A					1,303						700	
	Q					17.5						7.5	
16th Ave & Pines Rd	A				60				662			**300**	
	Q				7.5				-			**530**	
16th Ave & SR 27	A		**60**	60		**170**		240	3,708		325	630	
	Q		**817**	38		**406**		69	248		176	272	
32nd Ave & Pines Rd	A	240	**490**		240	980		130	425		160	700	
	Q	29	**729**		56	454		49	101		56	129	
Madison Rd & Thorpe Rd	A		1,303						400				
	Q		12.5						2.5				
32nd Ave & SR 27	A	170	900		**150**	**165**		**200**	460		265	1,240	
	Q	159	340		**299**	**644**		**223**	172		110	232	
32nd Ave & Evergreen Rd	A	100									75	75	
	Q	25									27.5	65	
32nd Ave & Sullivan Rd	A		600						1,266				
	Q		80						2.5				
A = Available Space (ft) Q = 95th Percentile Queue Length					Apparent Deficiency								🟨

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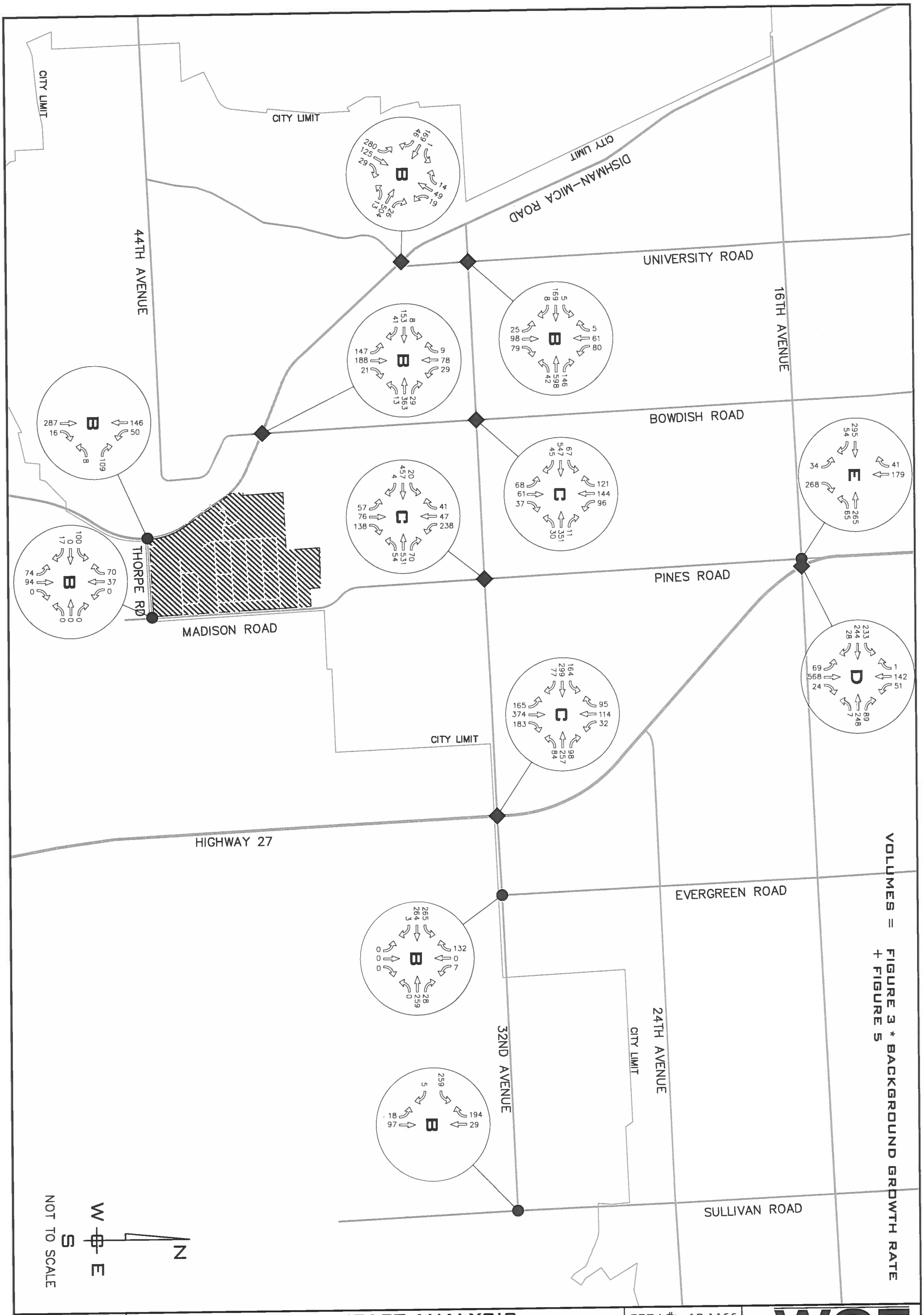

FIGURE
14

TRAFFIC IMPACT ANALYSIS
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SPOKANE VALLEY, WASHINGTON

2040 AM W/O PROJECT VOLUMES & LOS

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

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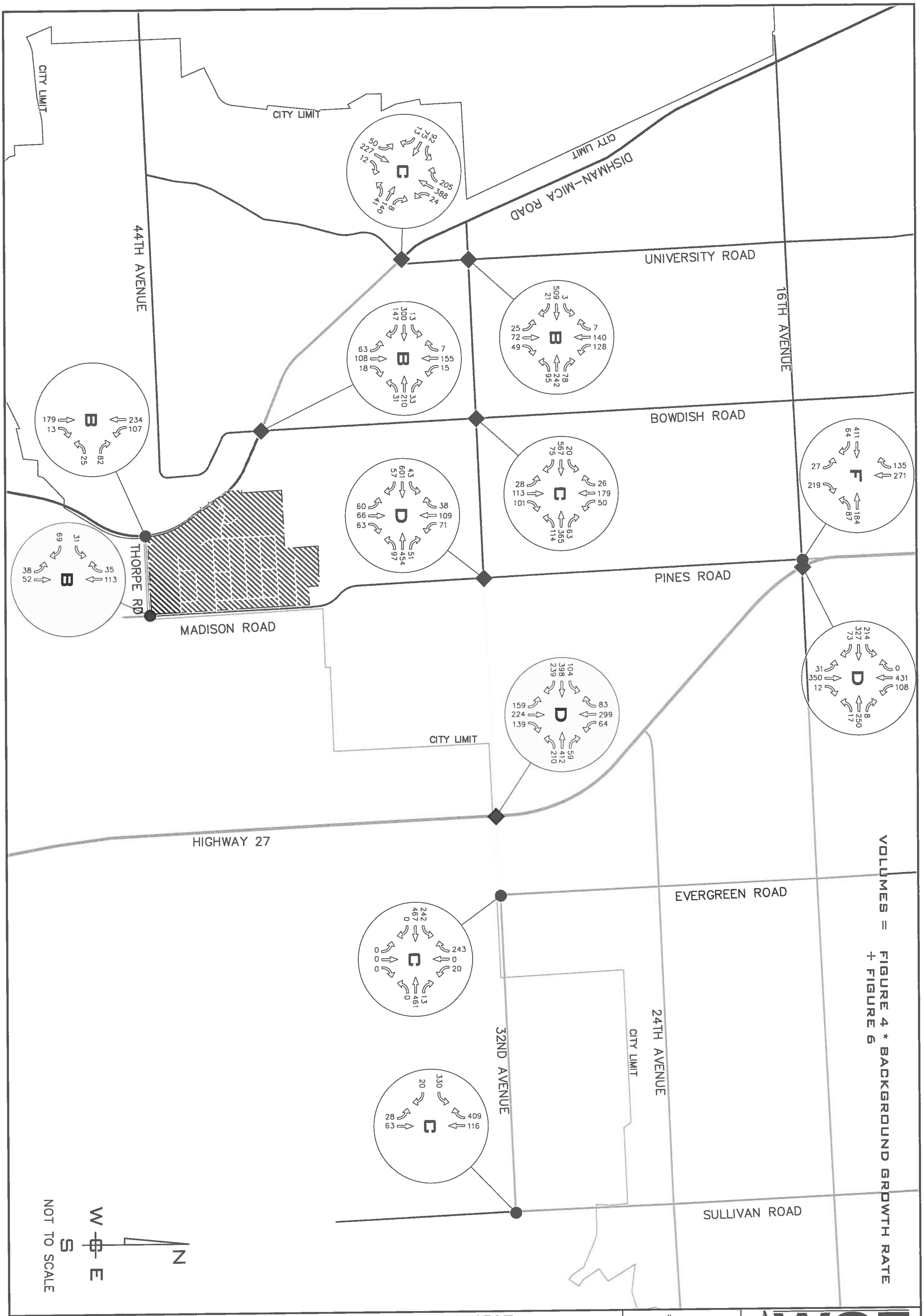

VOLUMES = FIGURE 4 * BACKGROUND GROWTH RATE + FIGURE 6

FIGURE

15

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

2040 PM W/D PROJECT VOLUMES & LOS

PROJ #: 13-1166
DATE: 12/14/15
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Horizon Year 2040 with the Project, with the Background Projects

This scenario assumes that the development has moved forward to completion and the background projects have been completed. The traffic volumes for this condition include the future traffic, as shown on Figures 14 & 15, plus the project trips as shown on Figures 7 & 8. Please see Figures 16 & 17 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 22 - Year 2040 Levels of Service, with the Project, with the Background Projects

INTERSECTION	**(S)ignalized (U)nsignalized (R)oundabout**	**AM Peak Hour**		**PM Peak Hour**	
		Delay (sec)	**LOS**	**Delay (sec)**	**LOS**
32nd Ave & University Rd	S	13.0	B	13.6	B
Dishman-Mica Rd & University/Schafer Rd	S	18.5	B	21.0	C
32nd Ave & Bowdish Rd	S	21.3	C	19.8	B
Dishman-Mica Rd & Bowdish Rd	S	20.8	C	15.7	B
Dishman-Mica Rd & Apt. Access	U	12.8	B	10.7	B
Dishman-Mica Rd & Sundown Drive	U	12.1	B	10.9	B
Dishman- Mica Rd & N. Comm. Access	U	11.2	B	10.2	B
Dishman- Mica Rd & S. Comm. Access	U	11.3	B	11.4	B
Dishman-Mica Rd & Thorpe Rd	U	13.0	B	12.7	B
Thorpe Rd & Comm. Access	U	9.0	A	9.2	A
16th Ave & Pines Rd	U	**82.8**	**F**	**256.1**	**F**
• Remove SB Approach	(U)	(28.0)	(D)	**(84.3)**	**(F)**
• Roundabout/ circle (ALT. IMP)	(R)	(11.0)	(B)	(19.0)	(C)
16th Ave & SR 27	S	49.3	D	42.8	D
• Redirected Trips from SB Approach	(S)	(34.7)	(C)	**(59.4)**	**(E)**
• Roundabout/ circle (ALT. IMP)	(R)	(12.0)	(B)	(16.0)	(C)
32nd Ave & Pines Rd	S	36.4	D	61.6	E
Adjust PM Timing Plan for More EB Green				(52.8)	(D)
Madison Rd & Painted Hills Ave.	U	11.5	B	11.1	B
Madison Rd & 41st Ave.	U	10.7	B	10.4	B
Madison Rd & 43rd Ave.	U	10.5	B	10.2	B
Madison Rd & 44th Ave.	U	9.7	A	9.7	A
Madison Rd & Thorpe Rd	U	13.5	B	10.8	B
32nd Ave & SR 27	S	26.7	C	38.5	D
32nd Ave & Evergreen Rd	U	12.6	B	23.7	C
32nd Ave & Sullivan Rd	U	13.6	B	15.9	C

Intersection Level of Service - Deficiency Evaluation

The only deficiencies identified for intersection level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan is anticipated to be at the intersection 16th Avenue & Pines Road even with the proposed removal of the SB approach by the project at buildout.

Based upon this analysis we recommend that the City of Spokane Valley and WSDOT work on a permanent solution to these closely spaced intersections. We would like the agencies to consider a two lane roundabout with a following traffic circle at this location. The intersection of 16th Avenue & Pines Road being a single lane traffic circle with three approaches, and the intersection of 16th Avenue & State Route 27 being a 2 lane roundabout with four approaches.

Intersection Movement Queue - Deficiency Evaluation for 2040 with the Project

The queue deficiencies are identified on Table 23 and described as follows; these deficiencies are based upon the project trips plus the background trips and growth rate. And have assumed that there is no major change in the dynamics of the existing transportation system over a 25 year period. It is noted that most intersections are anticipated to function at acceptable levels of service.

Year 2040 w-Proj vs. Year 2040 w-o Proj,

16th Avenue & Pines Road

- The SB through approach as reported is expected to go from a queue length of 530 ft. to a queue length of 630 feet or an increase of 100 feet. And the reported queue exceeds the available space by 330 feet.

16th Avenue & State Route 27

- The EB through approach as reported is expected to go from a queue length of 547 feet to a queue length of 853 feet or an increase of 306 feet. And the reported queue exceeds the available space by 793 feet.
- The WB thru approach as reported is expected to go from a queue length of 299 feet to a queue length of 420 feet or an increase of 121 feet. And the reported queue exceeds the available space by 250 feet.

32nd Avenue & Pines Road

- The EB through approach as reported is expected to go from a queue length of 617 feet to a queue length of 855 feet or an increase of 238 feet. And the reported queue exceeds the available space by 127 feet.

32nd Avenue & State Route 27

- The WB through approach as reported is expected to go from a queue length of 457 feet to a queue length of 744 feet or an increase of 287 feet. And the reported queue exceeds the available space by 579 feet.
- The WB left turn approach as reported is expected to go from a queue length of 233 feet to a queue length of 314 feet or an increase of 81 feet. And the reported queue exceeds the available space by 164 feet.
- The NB left turn approach as reported is expected to go from a queue length of 223 feet to a queue length of 240 feet or an increase of 7 feet. And the reported queue exceeds the available space by 40 feet.

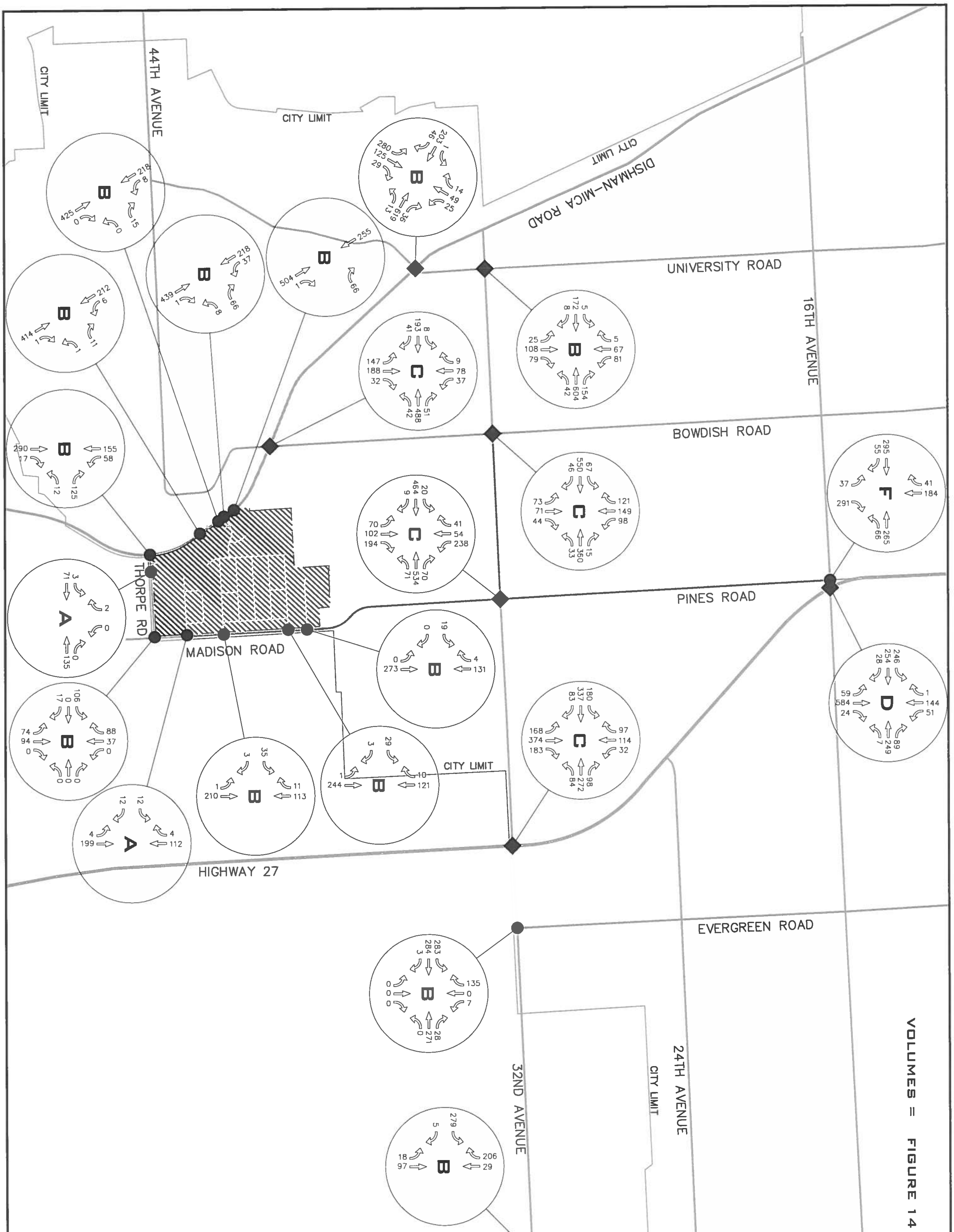
Table 23 – Year 2020 PM w- project Intersection Movement Queue Lengths 95th Percentile

INTERSECTION (A)vailable Lane Storage (Q)ueue within the Storage Lane		EB			WB			NB			SB		
		L	T	R	L	T	R	L	T	R	L	T	R
32nd Ave & University Rd	A		345			582		100	400		100	265	
	Q		133			107		32	44		104	56	
Dishman-Mica Rd & University/Schafer Rd	A	150	1,213	1,213	60	1,978		130	280		90	550	550
	Q	104	197	0	58	108		67	202		60	377	52
32nd Ave & Bowdish Rd	A	200	590		200	990			445			280	
	Q	13	567		50	262			143			174	
Dishman-Mica Rd & Bowdish Rd	A	100	863		100	680			360			290	135
	Q	20	420		36	173			130			124	0
Dishman-Mica Rd & Apt. Access	A						100						
	Q						5						
Dishman-Mica Rd & Sundown Dr.	A				150						150		
	Q				5						10		
Dishman-Mica Rd & N Comm.	A					50					50		
	Q					2.5					2.5		
Dishman-Mica Rd & S Comm.	A					50							
	Q					2.5							
Dishman-Mica Rd & Thorpe Rd	A					1,303						700	
	Q					22.5						10	
Thorpe Rd & Comm. Access	A											50	
	Q											2.5	
16th Ave & Pines Rd	A				60				662			**300**	
	Q				7.5				-			**630**	
16th Ave & SR 27	A		**60**	60		**170**		240	3,708		325	630	
	Q		**853**	38		**420**		69	251		176	277	
32nd Ave & Pines Rd	A	240	**490**		240	980		130	425		160	700	
	Q	31	**855**		95	442		62	155		60	170	
Madison Rd & Painted Hills Ave	A		100					50					
	Q		0					0					
Madison Rd & 41st Ave	A		100					50					
	Q		2.5					0					
Madison Rd & 43rd Ave	A		100					50					
	Q		2.5					0					
Madison Rd & 44th Ave	A		100										
	Q		2.5										
Madison Rd & Thorpe Rd	A		1,303						400				
			17.5						2.5				
32nd Ave & SR 27	A	170	900		**150**	**165**		**200**	460		265	1,240	
	Q	167	369		**314**	**744**		**240**	171		112	238	
32nd Ave & Evergreen Rd	A	100									75	75	
	Q	27.5									32.5	75	

Table 23 Continued…

INTERSECTION **(A)vailable Lane Storage** **(Q)ueue within the Storage Lane**		**EB**			**WB**			**NB**			**SB**		
		L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
32nd Ave & Sullivan Rd	A		600										
	Q		85						2.5				
A = Available Space (ft) Q = 95th Percentile Queue Length												Apparent Deficiency	▨

:\WCE_WORK\2013 WCE PROJECTS\2013-1166 Walker - Painted Hills GC\DWG\TRAFFIC 10-9-15.dwg, TIA (AM & PM), 12/16/2015 4:55:57 PM



FIGURE

16

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD

SPOKANE VALLEY, WASHINGTON

2040 AM W/ PROJECT VOLUMES & LOS

PROJ #:	13-1166
DATE:	12/14/15
DRAWN:	BNG
APPROVED:	TRW

WCE
WHIPPLE CONSULTING ENGINEERS
CIVIL, STRUCTURAL AND
TRANSPORTATION ENGINEERING
2528 NORTH SULLIVAN ROAD
SPOKANE VALLEY, WASHINGTON 99216
PH: 509-893-2617 FAX: 509-926-0227

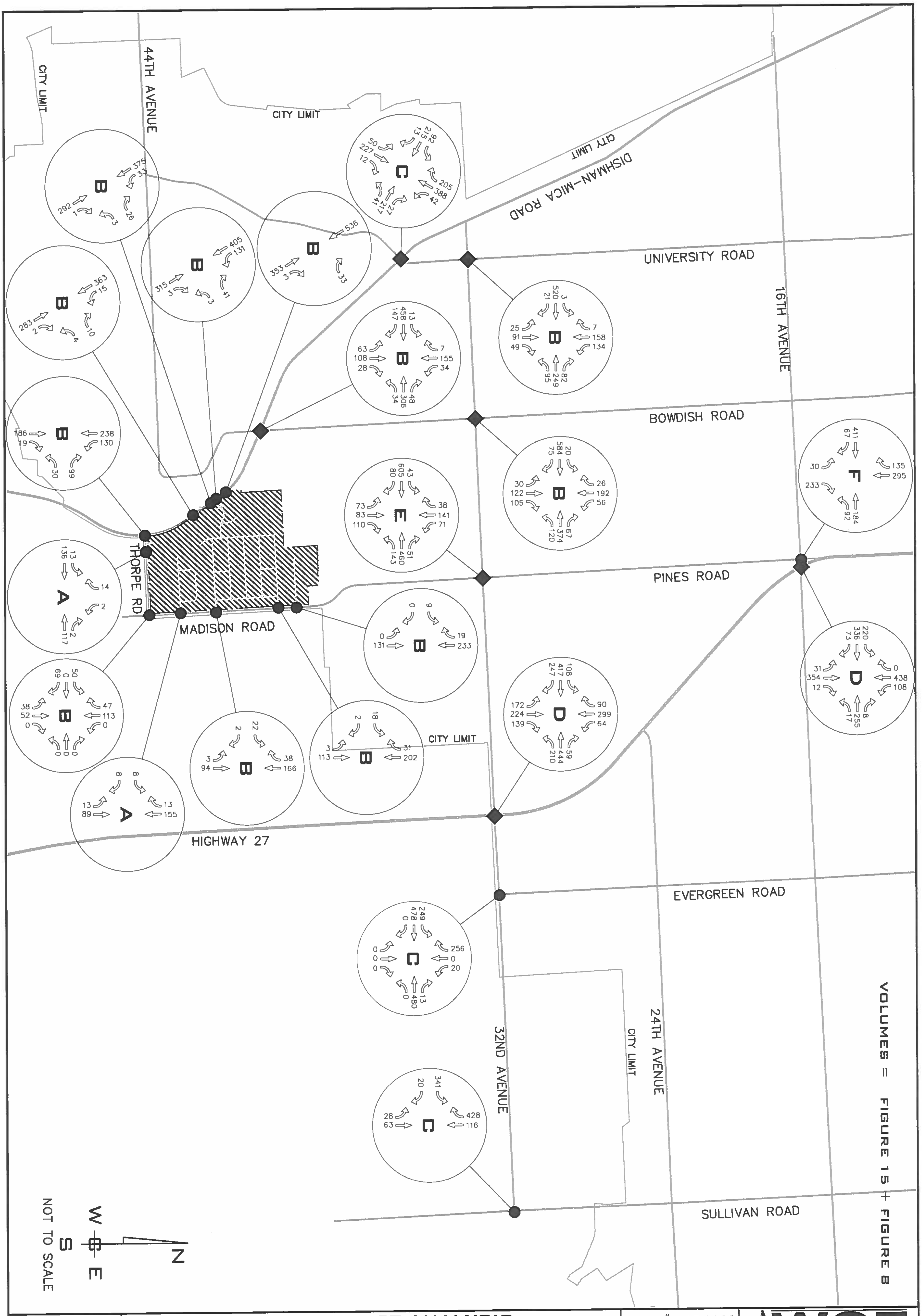


FIGURE
17

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

2040 PM W/ PROJECT VOLUMES & LOS

PROJ #: 13-1166
DATE: 12/14/15
DRAWN: BNG
APPROVED: TRW

WCE
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Conclusions

Based upon the analysis, field observations, assumptions, methodologies and results which are provided in the body of this report, it is concluded that the development of the proposed project will generate new trips on the existing transportation system and that those trips while affecting level of service will generally not degrade LOS below concurrency levels, except at the intersection of 16th Avenue & Pines Road. Additionally the queue deficiencies identified, carry through the scenarios from the existing condition to the future conditions, and the project only adds to an already existing condition. This conclusion was reached and has been documented within the body of this report.

Existing Condition

- There are <u>no</u> Level of Service deficiencies identified for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- There are three queue deficiencies identified at three of the scoped intersections that have acceptable levels of service, there is no public improvement project identified to mitigate these discrepancies.
    - 16th Avenue & State Route 27, EB Thru, WB Thru
    - 32nd Avenue & State Route 27, WB Thru

Year 2020, without project, with background projects

- There are no Level of Service deficiencies caused by the background projects and growth rate, for level of service as understand Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- There are five queue deficiencies identified at three intersections with acceptable levels of service. These deficiencies were identified as the result of the background growth rate and the background projects as identified at scoping. There is no public improvement project identified to mitigate these discrepancies. Please see the analysis for the details of the found discrepancies.
    - 16th Avenue & State Route 27, EB Thru, WB Thru
    - 32nd Avenue & Pines Road, EB Thru
    - 32nd Avenue & State Route 27, WB Thru, WB Left Turn

Year 2020, with project, with background projects

- There is a Level of Service deficiency identified at the intersection of 16th Avenue & Pines Road, for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- The Level of Service deficiency identified at the intersection of 16th Avenue & Pines Road, originally caused by the background trips and worsened by this project, can be brought back to an acceptable level of service by removing the southbound approach to

the intersection and redirecting trips through the SB right turn movement of the intersection of 16th Avenue & State Route 27 This project proposes to remedy this anticipated deficiency.
  - The cost to remedy the intersection deficiency is estimated at $10,000.
- There are the same five queue deficiencies previously identified at three intersections with two of those intersections operating at acceptable levels of service. These deficiencies were the result of the background growth rate and the background projects as identified within this study and are only incrementally worsened or kept the same by this project. There is no public improvement project identified to mitigate these discrepancies. Please see the analysis for the details of the found discrepancies.
  - 16th Avenue & State Route 27, EB Thru, WB Thru
  - 32nd Avenue & Pines Road, EB Thru
  - 32nd Avenue & State Route 27, WB Thru, WB Left Turn

Horizon Year 2040, without project, with background projects (Planning Level)

- There are planning level, Levels of Service deficiencies identified at the intersections of; 16th Avenue & Pines Road, for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- The Level of Service deficiency at the intersection of 16th Avenue & Pines Road can be improved by the agencies considering a public improvement project that would redefine the layout of the closely spaced intersections. We have included for the agency consideration, a plan that utilizes a roundabout and a traffic circle.
- There are seven queue deficiencies identified, and are the extensions of known queue deficiencies or are the results of deficiencies in Levels of Service.
  - 16th Avenue & Pines Road, SB Thru
  - 16th Avenue & State Route 27, EB Thru, WB Thru
  - 32nd Avenue & Pines Road, EB Thru
  - 32nd Avenue & State Route 27, WB Thru, WB left Turn, NB Left turn

Horizon Year 2040, with project, with background projects (Planning Level)

- There are planning level, Levels of Service deficiencies identified at the intersections of 16th Avenue & Pines Road, for level of service as described in Chapter 3 of the Spokane Valley Street Standards, and the Level of Service Table 4.3 of the City of Spokane Valley Comprehensive Plan.
- As previously stated the Level of Service deficiency at the intersection of 16th Avenue & Pines Road can be improved by the agencies considering a public improvement project that would redefine the layout of the closely spaced intersections. We have included for the agency consideration, a plan that utilizes a roundabout and a traffic circle.
- There are queue deficiencies identified, and are the extension of known queue deficiencies or are the result of deficiencies in Levels of Service.
  - 16th Avenue & Pines Road, SB Thru
  - 16th Avenue & State Route 27, EB Thru, WB Thru
  - 32nd Avenue & Pines Road, EB Thru
  - 32nd Avenue & State Route 27, WB Thru, WB left Turn, NB Left turn

Recommendations

Based upon the conclusions within this study the proposed project is recommended to provide frontage improvements to Dishman-Mica Road, Thorpe Road, and Madison Road per the City of Spokane Valley development process and add a two-way-left-turn-lane north of the Chester Creek Bridge to the property boundary. We also recommend that when warranted prior to buildout that the project removes the southbound approach to the intersection of 16th Avenue & Pines Road.

At this time we are not making any turn lane proposals at the intersection of 32nd Avenue & Pines Road due to extenuating circumstances associated with traffic operations of the signal and University High School and student safety in the area.

TECHNICAL APPENDIX

LEVEL OF SERVICE
METHODS AND CRITERIA

Unsignalized Intersection
Level of Service Criteria

Level of Service	Delay Range (sec)	Expected Delay to Minor Street Traffic
A	≤ 10	Little to No Delay
B	> 10 and ≤ 15	Short Traffic Delays
C	>15 and ≤ 25	Average Traffic Delays
D	>25 and ≤ 35	Long Traffic Delays
E	> 35 and ≤ 50	Very Long Traffic Delays
F	> 50	Stop-and-Go Condition Delays Generally Longer than Acceptable

Unsignalized Intersections
Level of Service Descriptions

LOS	General Description
A	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in the queue.
B	• Some drivers begin to consider the delay an inconvenience • Occasionally there is more than one vehicle in the queue.
C	• Many times there is more than one vehicle in the queue. • Most drivers feel restricted, but not objectionably so.
D	• Often there is more than one vehicle in the queue. • Drivers feel quite restricted.
E	• Represents conditions in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. • There is almost always more than one vehicle in the queue. • Drivers find the delays approaching intolerable levels.
F	• Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection

Signalized Intersection
Level of Service Criteria

Level of Service	Delay Range (sec)
A	≤ 10
B	> 10 and ≤ 20
C	>20 and ≤ 35
D	>35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Signalized Intersections
Level of Service Descriptions

LOS	General Description
A	• Very low delay at intersection. • All signal cycles clear. • No vehicles wait through more than one signal cycle.
B	• Operating speeds beginning to be affected by other traffic. • Short traffic delays at intersections. • Higher average intersections delays resulting from more vehicles stopping.
C	• Operating speeds and maneuverability closely controlled by other traffic. • Higher delays at intersections than for LOS B due to a significant number of vehicles stopping. • Not all signal cycles clear the waiting vehicles.
D	• Tolerable operating speeds, but long traffic delays occur at intersections • The influence of congestion is noticeable. • Many vehicles stop and the proportion of vehicles not stopping declines. • The number of signal cycle failures, for which vehicles must wait through more than one signal cycle are noticeable.
E	• Speeds are restricted, very long traffic delays are experienced and traffic volumes are near capacity. • Traffic flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate. • Traffic signal cycle failures are frequent occurrences.
F	• Extreme delays resulting in long queues which may interfere with other traffic movements • Stoppages of long duration and speeds may drop to zero. • There may be frequent signal failures. • Vehicle arrival rates are greater than capacity. • Considered unacceptable by most drivers.

ACCIDENT DATA

JURISDICTION	PRIMARY TRAFFICWAY	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	REFERENCE POINT NAME	REPORT NUMBER	DATE	MOST SEVERE SOBRIETY TYPE	MOST SEVERE INJURY TYPE	FIRST COLLISION TYPE	FIRST OBJECT STRUCK	SECOND COLLISION TYPE	SECOND OBJECT STRUCK	# FATALITIES	TOTAL # INJURIES	# VEHICLES	# PEDESTRIANS	# PEDALCYCLISTS	JUNCTION RELATIONSHIP	WEATHER	ROADWAY CHARACTERISTIC	ROADWAY SURFACE CONDITIONS
16th Avenue & Pines Road																						
City Street	16	PINES				2900389	4/10/2012	Had NOT B	Possible Inj	Entering at angle				0	1	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
City Street	E 16TH AV	S PINES RD				E242266	5/5/2013	Had NOT B	Evident Inj	Entering at angle		Fixed objec	Retaining V	0	3	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
City Street	E 16TH AV	S PINES RD				2908876	12/31/2012	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
City Street	E 16TH AV	S PINES RD				E138193	11/21/2011	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Wet
City Street	E 16TH AV	S PINES RD				E095353	3/7/2011	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
City Street	E 16TH AV	S PINES RD				E092870	2/22/2011	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Overcast	Straight &	Wet
City Street	S PINES RD	E 16TH AVE				3471561	8/13/2013	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
City Street	S PINES RD	E 16TH AVE				E236753	4/5/2013	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
City Street	S PINES RD	E 16TH AVE				E213887	12/15/2012	HBD - Abili	No Injury	Fixed objec	Retaining Wall (concrete, rock, bri			0	0	1	0	0	At Intersec	Clear or Pa	Straight &	Wet
City Street	S PINES RD	E 16TH AVE				2450642	7/3/2012	Had NOT B	Serious Inj	Vehicle turning right hits pedestrian				0	1	1	1	0	At Intersec	Overcast	Straight &	Dry
City Street	S PINES RD	E 16TH AVE				E161046	3/25/2012	Had NOT B	Possible Inj	Entering at angle				0	1	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
City Street	S PINES RD	E 16 AVE				E122427	8/28/2011	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
															2011	2012	2013					
														PDO	4	2	3	12				
														INJ	—	2	1					
16th Avenue & SR 27																						
State Rout	27					3357859	6/1/2013	HBD - Abili	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
State Rout	27					E180273	7/6/2012	Had NOT B	Possible Inj	Entering at angle		From same direction -		0	1	3	0	0	At Intersec	Clear or Pa	Straight &	Dry
State Rout	27					E170726	5/16/2012	Had NOT B	Possible Inj	Entering at angle				0	1	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
State Rout	27					E153399	2/7/2012	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Wet
State Rout	27					E129934	10/3/2011	Had NOT B	Evident Inj	Entering at angle				0	1	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
State Rout	27					2909115	6/28/2011	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
															2011	2012	2013					
														PDO	1	1	1	6				
														INJ	1	2	—					
32nd Avenue & Pines Road																						
City Street	E 32ND AVE		88	F	S PINES RD	E289399	11/26/2013	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	Intersectio	Clear or Pa	Straight &	Dry
City Street	E 32ND AV	S PINES RD				2901253	1/1/2011	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Ice
City Street	E 32ND AV	S PINES RD				E205151	11/10/2012	HBD - Abili	No Injury	From opposite direction - one left turn - one s				0	0	2	0	0	At Drivewa	Clear or Pa	Straight &	Dry
City Street	E 32ND AV	S PINES RD				3471886	11/9/2012	Had NOT B	No Injury	From opposite direction - one left turn - one s				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Wet
City Street	E 32ND AV	S PINES RD				E172189	5/24/2012	Had NOT B	Possible Inj	From same direction -		From same direction -		0	2	3	0	0	At Intersec	Clear or Pa	Straight &	Dry
															2011	2012	2013					
														PDO	1	2	1	5				
														INJ	—	1	—					
Thorpe Road & Madison Road																						
32nd Avenue & SR 27																						
State Rout	27					2904294	5/18/2011	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
State Rout	27					2900818	10/4/2011	HBD - Abili	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Clear or Pa	Straight &	Dry
32nd Avenue & Evergreen Road																						
															2011	2012	2013					
														PDO	2	—	—	2				
														INJ	—	—	—					

JURISDICTION	PRIMARY TRAFFICWAY	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	REFERENCE POINT NAME	REPORT NUMBER	DATE	MOST SEVERE SOBRIETY TYPE	MOST SEVERE INJURY TYPE	FIRST COLLISION TYPE	FIRST OBJECT STRUCK	SECOND COLLISION TYPE	SECOND OBJECT STRUCK	# FATALITIES	TOTAL # INJURIES	# VEHICLES	# PEDESTRIANS	# PEDALCYCLISTS	JUNCTION RELATIONSHIP	WEATHER	ROADWAY CHARACTERISTIC	ROADWAY SURFACE CONDITIONS
32nd Avenue & University Road																						
City Street	E 32ND AV	S UNIVERSITY RD				E135292	11/7/2011	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	E 32ND AV	S UNIVERSITY RD				2901831	5/8/2012	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
															2011	2012	2013					
														PDO	1	1	–	2				
														INJ	–	–	–					
Dishman-Mica Road & University Road																						
City Street	S DISHMAN	S UNIVERSITY RD				E289398	11/28/2013	Had NOT B	Possible Inj	Entering at angle				0	2	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	S DISHMAN	S SCHAFER RD				E234058	3/22/2013	Had NOT B	Possible Inj	Entering at angle				0	1	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	S DISHMAN	S SCHAFER RD				E186100	8/12/2012	HBD - Abilit	No Injury	Fixed objec	Signal Pole			0	0	1	0	0	At Intersec	Clear or Pa	Curve & Le	Dry
City Street	S DISHMAN MICA RD		110	F	S SCHAFER	E180738	7/13/2012	Had NOT B	No Injury	From same direction - both going straight - bc				0	0	2	0	0	Not at Inte	Clear or Pa	Straight & I	Dry
															2011	2012	2013					
														PDO	–	2	–	4				
														INJ	–	–	2					
32nd Avenue & Bowdish Road																						
City Street	E 32 AV	S BOWDISH RD				E131740	10/19/2011	Had NOT B	No Injury	From opposite directio		From opposite directio		0	0	3	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	S BOWDISH	E 32ND AVE				2900393	6/28/2012	Had NOT B	No Injury	From opposite direction - one left turn - one s				0	0	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	S BOWDISH	E 32 AV				2909563	8/21/2011	Had NOT B	Possible Inj	Entering at angle				0	2	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	S BOWDISH	E 32ND AVE				2909102	4/22/2011	Had NOT B	No Injury	Entering at angle				0	0	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	E 32 RD	S BOWDISH RD		M		E154327	2/14/2012	Had NOT B	No Injury	From same direction - both going straight - on				0	0	2	0	0	At Intersec	Overcast	Straight & I	Wet
															2011	2012	2013					
														PDO	2	2	–	5				
														INJ	1	–						
Dishman-Mica Road & Bowdish Road																						
City Street	E 32ND AV	S BOWDISH RD				2900382	12/9/2011	Had NOT B	No Injury	From same direction - both going straight - bc				0	0	2	0	0	At Intersec	Clear or Pa	Straight & I	Unknown
City Street	S BOWDISH	S DISHMAN MICA RD				2900890	9/11/2013	Had NOT B	Possible Inj	From opposite direction - one left turn - one s				0	1	2	0	0	At Intersec	Clear or Pa	Straight & I	Dry
City Street	E 32ND AV	S BOWDISH RD				E093682	2/24/2011	Had NOT B	Evident Inj	From opposite direction - one stopped - head				0	1	2	0	0	At Intersec	Clear or Pa	Straight & I	Ice
City Street	S DISHMAN	S BOWDISH RD				3358375	12/23/2011	HBD - Abilit	Evident Inj	From same direction -		Entering at angle		0	2	3	0	0	At Intersec	Overcast	Straight & I	Dry
															2011	2012	2013					
														PDO	1	–	–	4				
														INJ	2	–	1					
Dishman-Mica Road & Thorpe Road																						

RAW TRAFFIC COUNTS

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & University

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/20/2015
Counter JDK
Analyst BNG

AM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left			0		1		0		1		2		1											
	Through			20		38		38		26	1	35		25											
	Right			0		0		1		0		2	1	2											
	App. Total	0	0	20	0	39	0	39	0	27	1	39	1	28	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0		0		0.036		0.025		0										
Westbound	Left			4		4		7		3	1	6		15											
	Through			63		94		116		124		113		88											
	Right			11		5	1	24	1	26	2	28		29	1										
	App. Total	0	0	78	0	103	1	147	1	153	3	147	0	132	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0.01		0.007		0.019		0		0.008										
Northbound	Left			5		1		4		7		4		4											
	Through			12		13		22		19		19		13											
	Right			11		18		10	1	19		13		16	1										
	App. Total	0	0	28	0	32	0	36	1	45	0	36	0	33	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0		0.027		0		0		0.029										
Southbound	Left			6		17	3	10	2	19	2	11		16	1										
	Through			3		6	1	4		15		13	1	13											
	Right			0		0		0	1	1		1		1											
	App. Total	0	0	9	0	23	4	14	3	35	2	25	1	30	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0.148		0.176		0.054		0.038		0.032										
Total Intersection Volume		0	0	135	0	197	5	236	5	260	6	247	2	223	3	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks				0.0%		2.5%		2.1%		2.3%		0.8%		1.3%											

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	578	1.7%
6:45 AM	844	1.9%
7:00 AM	958	1.9%
7:15 AM	982	1.6%
7:30 AM	741	1.5%
7:45 AM	475	1.1%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	226	1.3%
8:15 AM	0	
8:30 AM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & University

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/20/2015
Counter Analyst
JDK BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	0		1		2		1		4	0.50	0%
	Through	38		26	1	35		25		125	0.82	1%
	Right	1		0		2	1	2		6	0.50	17%
	App. Total	39	0	27	1	39	1	28	0	135	0.84	
	Pct Trucks		0		0.035714		0.025		0			
Westbound	Left	7		3	1	6		15		32	0.53	3%
	Through	116		124		113		88		441	0.89	0%
	Right	24	1	26	2	28		29	1	111	0.93	4%
	App. Total	147	1	153	3	147	0	132	1	584	0.94	
	Pct Trucks		0.006757		0.019231		0		0.007519			
Northbound	Left	4		7		4		4		19	0.68	0%
	Through	22		19		19		13		73	0.83	0%
	Right	10	1	19		13		16	1	60	0.79	3%
	App. Total	36	1	45	0	36	0	33	1	152	0.84	
	Pct Trucks		0.027027		0		0		0.029412			
Southbound	Left	10	2	19	2	11		16	1	61	0.73	8%
	Through	4		15		13	1	13		46	0.77	2%
	Right	0	1	1		1		1		4	1.00	25%
	App. Total	14	3	35	2	25	1	30	1	111	0.75	
	Pct Trucks		0.176471		0.054054		0.038462		0.032258			
Total Intersection Volume		236	5	260	6	247	2	223	3	982	0.92	
Intersection Pct Trucks			2.1%		2.3%		0.8%		1.3%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through			1		1		1		3
Southbound	Through									0
	App. Total	0	0	1	0	1	0	1	0	3

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & University

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015

Counter	Analyst
JDK	BNG

PM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					1		1		1		0		1		0									
	Through					75		75	1	80		85	1	106	1	96	2								
	Right					8		4		5	1	3		3		4									
	App. Total	0	0	0	0	84	0	80	1	86	1	88	1	110	1	100	2	0	0	0	0	0	0	0	0
	Pct Trucks						0		0.012		0.011		0.011		0.009		0.02								
Westbound	Left					13	1	12		23		13		21		15									
	Through					37	2	40		48		35		37		56									
	Right					8	1	10		13	1	13		15	1	16									
	App. Total	0	0	0	0	58	4	62	0	84	1	61	0	73	1	87	0	0	0	0	0	0	0	0	0
	Pct Trucks						0.065		0		0.012		0		0.014		0								
Northbound	Left					2	1	10	1	1		13		2		3									
	Through					11	1	17		10	1	13		21		9									
	Right					14				12		0		11		14									
	App. Total	0	0	0	0	27	2	27	1	23	1	26	0	34	0	26	0	0	0	0	0	0	0	0	0
	Pct Trucks						0.069		0.036		0.042		0		0		0								
Southbound	Left					27	2	24	1	16	1	27		22	1	30									
	Through					22	1	20		22		24		26		32									
	Right					2		1		2		0		1		2									
	App. Total	0	0	0	0	51	3	45	1	40	1	51	0	49	1	64	0	0	0	0	0	0	0	0	0
	Pct Trucks						0.056		0.022		0.024		0		0.02		0								
Total Intersection Volume		0	0	0	0	220	9	214	3	233	4	226	1	266	3	277	2	0	0	0	0	0	0	0	0
Intersection Pct Trucks						3.9%		1.4%		1.7%		0.4%		1.1%		0.7%									

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	446	2.7%
3:45 PM	683	2.3%
4:00 PM	910	1.9%
4:15 PM	950	1.2%
4:30 PM	1012	1.0%
4:45 PM	775	0.8%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	548	0.9%
5:15 PM	279	0.7%
5:30 PM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & University

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
JDK BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:30 PM		4:45 PM		5:00 PM		5:15 PM				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	1		0		1		0		2	0.50	0%
	Through	80		85	1	106	1	96	2	371	0.87	1%
	Right	5	1	3		3		4		16	0.67	6%
	App. Total	86	1	88	1	110	1	100	2	389	0.88	
	Pct Trucks		0.011494		0.011236		0.009009		0.019608			
Westbound	Left	23		13		21		15		72	0.78	0%
	Through	48		35		37		56		176	0.79	0%
	Right	13	1	13		15	1	16		59	0.92	3%
	App. Total	84	1	61	0	73	1	87	0	307	0.88	
	Pct Trucks		0.011765		0		0.013514		0			
Northbound	Left	1		13		2		3		19	0.37	0%
	Through	10	1	13		21		9		54	0.64	2%
	Right	12		0		11		14		37	0.66	0%
	App. Total	23	1	26	0	34	0	26	0	110	0.81	
	Pct Trucks		0.041667		0		0		0			
Southbound	Left	16	1	27		22	1	30		97	0.81	2%
	Through	22		24		26		32		104	0.81	0%
	Right	2		0		1		2		5	0.63	0%
	App. Total	40	1	51	0	49	1	64	0	206	0.80	
	Pct Trucks		0.02439		0		0.02		0			
Total Intersection Volume		233	4	226	1	266	3	277	2	1012	0.91	
Intersection Pct Trucks			1.7%		0.4%		1.1%		0.7%			

Pedestrian Calls

APPROACH	MOVEMENT	4:30 PM		4:45 PM		5:00 PM		5:15 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through	1								1
N orthbound	Through	1								1
Southbound	Through							1		1
	App. Total	2	0	0	0	0	0	1	0	3

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Universty/Schafer

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/20/2015

AM PEAK HOURS

Counter	Analyst	15 Minute Period Beginning @																							
RMA	BNG																								
APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left			0		0		1		0		0		0											
	Through			22		21	1	29	3	22	4	45	1	26	1										
	Right			7	2	7		10		7		11		8	1										
	App. Total	0	0	29	2	28	1	40	3	29	4	56	1	34	2	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.065		0.034		0.07		0.121		0.018		0.056										
Westbound	Left			0		0		1		1		8		4											
	Through			58	2	81		89	1	116	1	86	4	67	1										
	Right			7		2		7		4		4	1	5											
	App. Total	0	0	65	2	83	0	97	1	121	1	98	5	76	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.03		0		0.01		0.008		0.049		0.013										
Northbound	Left			38		54		57		56		46		26											
	Through			14		19		23		26		26	1	18											
	Right			1		2		4		6		10		3											
	App. Total	0	0	53	0	75	0	84	0	88	0	82	1	47	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0		0		0		0.012		0										
Southbound	Left			2	1	1		2		6		5		4											
	Through			4		9	1	7		4	1	15		18											
	Right			1		1		4		5		1		1											
	App. Total	0	0	7	1	11	1	13	0	15	1	21	0	23	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.125		0.083		0		0.063		0		0										
Total Intersection Volume		0	0	154	5	197	2	234	4	253	6	257	7	180	3	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks				3.1%		1.0%		1.7%		2.3%		2.7%		1.6%											

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	596	1.8%
6:45 AM	855	2.0%
7:00 AM	960	2.0%
7:15 AM	944	2.1%
7:30 AM	706	2.3%
7:45 AM	447	2.2%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	183	1.6%
8:15 AM	0	
8:30 AM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Universty/Schafer

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/20/2015
Counter Analyst
RMA BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	0		1		0		0		1	0.25	0%
	Through	21	1	29	3	22	4	45	1	126	0.68	7%
	Right	7		10		7		11		35	0.80	0%
	App. Total	28	1	40	3	29	4	56	1	162	0.71	
	Pct Trucks		0.034483		0.069767		0.121212		0.017544			
Westbound	Left	0		1		1		8		10	0.31	0%
	Through	81		89	1	116	1	86	4	378	0.81	2%
	Right	2		7		4		4	1	18	0.64	6%
	App. Total	83	0	97	1	121	1	98	5	406	0.83	
	Pct Trucks		0		0.010204		0.008197		0.048544			
Northbound	Left	54		57		56		46		213	0.93	0%
	Through	19		23		26		26	1	95	0.88	1%
	Right	2		4		6		10		22	0.55	0%
	App. Total	75	0	84	0	88	0	82	1	330	0.94	
	Pct Trucks		0		0		0		0.012048			
Southbound	Left	1		2		6		5		14	0.58	0%
	Through	9	1	7		4	1	15		37	0.62	5%
	Right	1		4		5		1		11	0.55	0%
	App. Total	11	1	13	0	15	1	21	0	62	0.74	
	Pct Trucks		0.083333		0		0.0625		0			
Total Intersection Volume		197	2	234	4	253	6	257	7	960	0.91	
Intersection Pct Trucks			1.0%		1.7%		2.3%		2.7%			

Pedestrian Calls

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & University/Schafer

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/7/2015

PM PEAK HOURS

Counter	Analyst	15 Minute Period Beginning @																							
Fred	BNG																								
APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left									16		20		16		15		23		16					
	Through									7		13		14		14		12		11					
	Right									6		8		1		2		4		3					
	App. Total	0	0	0	0	0	0	0	0	29	0	41	0	31	0	31	0	39	0	30	0	0	0	0	0
	Pct Trucks										0		0		0		0		0		0				
Westbound	Left									4		0		4		9		11		7					
	Through									24		15		21		27		26		29					
	Right									5		0		0		1		2		2					
	App. Total	0	0	0	0	0	0	0	0	33	0	15	0	25	0	37	0	39	0	38	0	0	0	0	0
	Pct Trucks										0		0		0		0		0		0				
Northbound	Left									5		11		10		12		12		4					
	Through									41		26		38		49		45		41					
	Right									10		4		0		5		2		2					
	App. Total	0	0	0	0	0	0	0	0	56	0	41	0	48	0	66	0	59	0	47	0	0	0	0	0
	Pct Trucks										0		0		0		0		0		0				
Southbound	Left									8		3		1		8		2		5					
	Through									57		73		69		68		80		78					
	Right									28		38		29		35		44		48					
	App. Total	0	0	0	0	0	0	0	0	93	0	114	0	99	0	111	0	126	0	131	0	0	0	0	0
	Pct Trucks										0		0		0		0		0		0				
Total Intersection Volume		0	0	0	0	0	0	0	0	211	0	211	0	203	0	245	0	263	0	246	0	0	0	0	0
Intersection Pct Trucks										0.0%		0.0%		0.0%		0.0%		0.0%		0.0%					

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	0	
3:45 PM	211	0.0%
4:00 PM	422	0.0%
4:15 PM	625	0.0%
4:30 PM	870	0.0%
4:45 PM	922	0.0%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	957	0.0%
5:15 PM	754	0.0%
5:30 PM	509	0.0%

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & University/Schafer

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/7/2015
Counter Analyst
Fred BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	5:00 PM		5:15 PM		5:30 PM		5:45 PM				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	16		15		23		16		70	0.76	0%
	Through	14		14		12		11		51	0.91	0%
	Right	1		2		4		3		10	0.63	0%
	App. Total	31	0	31	0	39	0	30	0	131	0.84	
	Pct Trucks		0		0		0		0			
Westbound	Left	4		9		11		7		31	0.70	0%
	Through	21		27		26		29		103	0.89	0%
	Right	0		1		2		2		5	0.63	0%
	App. Total	25	0	37	0	39	0	38	0	139	0.89	
	Pct Trucks		0		0		0		0			
Northbound	Left	10		12		12		4		38	0.79	0%
	Through	38		49		45		41		173	0.88	0%
	Right	0		5		2		2		9	0.45	0%
	App. Total	48	0	66	0	59	0	47	0	220	0.83	
	Pct Trucks		0		0		0		0			
Southbound	Left	1		8		2		5		16	0.50	0%
	Through	69		68		80		78		295	0.92	0%
	Right	29		35		44		48		156	0.81	0%
	App. Total	99	0	111	0	126	0	131	0	467	0.89	
	Pct Trucks		0		0		0		0			
Total Intersection Volume		203	0	245	0	263	0	246	0	957	0.91	
Intersection Pct Trucks			0.0%		0.0%		0.0%		0.0%			

Pedestrian Calls

APPROACH	MOVEMENT	5:00 PM		5:15 PM		5:30 PM		5:45 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through							1		1
Southbound	Through									0
	App. Total	0	0	0	0	0	0	1	0	1

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Bowdish

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015
Counter CEL
Analyst BNG

AM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left			4		9		6	1	13		22		15											
	Through			49		91	1	91	2	125	1	92	9	90	1										
	Right			1		10		7		8		9		17											
	App. Total	0	0	54	0	110	1	104	3	146	1	123	9	122	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0.009		0.028		0.007		0.068		0.008										
Westbound	Left			4		5		5		8		5		2											
	Through			30	1	76	1	48	1	56	4	64	3	37	1										
	Right			2		2		1		1	1	3		0	1										
	App. Total	0	0	36	1	83	1	54	1	65	5	72	3	39	2	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.027		0.012		0.018		0.071		0.04		0.049										
Northbound	Left			0		1		13		14		22	2	13											
	Through			3		7	1	5		12		19		4											
	Right			2		9		6		9		4		5											
	App. Total	0	0	5	0	17	1	24	0	35	0	45	2	22	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0.056		0		0		0.043		0										
Southbound	Left			18		15		20		21		17		9											
	Through			19		25		24		33		26	1	19											
	Right			11		15		15		29	1	32		27											
	App. Total	0	0	48	0	55	0	59	0	83	1	75	1	55	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0		0		0.012		0.013		0										
Total Intersection Volume		0	0	143	1	265	3	241	4	329	7	315	15	238	3	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks				0.7%		1.1%		1.6%		2.1%		4.5%		1.2%											

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	657	1.2%
6:45 AM	993	1.5%
7:00 AM	1179	2.5%
7:15 AM	1152	2.5%
7:30 AM	907	2.8%
7:45 AM	571	3.2%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	241	1.2%
8:15 AM	0	
8:30 AM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Bowdish

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
CEL BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left	9		6	1	13		22		51	0.58	2%
	Through	91	1	91	2	125	1	92	9	412	0.82	3%
	Right	10		7		8		9		34	0.85	0%
	App. Total	110	1	104	3	146	1	123	9	497	0.85	
	Pct Trucks		0.009009		0.028037		0.006803		0.068182			
Westbound	Left	5		5		8		5		23	0.72	0%
	Through	76	1	48	1	56	4	64	3	253	0.82	4%
	Right	2		1		1	1	3		8	0.67	13%
	App. Total	83	1	54	1	65	5	72	3	284	0.85	
	Pct Trucks		0.011905		0.018182		0.071429		0.04			
Northbound	Left	1		13		14		22	2	52	0.54	4%
	Through	7	1	5		12		19		44	0.58	2%
	Right	9		6		9		4		28	0.78	0%
	App. Total	17	1	24	0	35	0	45	2	124	0.66	
	Pct Trucks		0.055556		0		0		0.042553			
Southbound	Left	15		20		21		17		73	0.87	0%
	Through	25		24		33		26	1	109	0.83	1%
	Right	15		15		29	1	32		92	0.72	1%
	App. Total	55	0	59	0	83	1	75	1	274	0.82	
	Pct Trucks		0		0		0.011905		0.013158			
Total Intersection Volume		265	3	241	4	329	7	315	15	1179	0.88	
Intersection Pct Trucks			1.1%		1.6%		2.1%		4.5%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Bowdish

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015

Counter	Analyst
RMA	BNG

PM PEAK HOURS

		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					8		8		4		4		2		5									
	Through					97	1	80	1	85	1	96	1	115	2	114	1								
	Right					18	1	10		14		11		12		20									
	App. Total	0	0	0	0	123	2	98	1	103	1	111	1	129	2	139	1	0	0	0	0	0	0	0	0
	Pct Trucks						0.016		0.01		0.01		0.009		0.015		0.007								
Westbound	Left					13		27	1	25		18		24		20									
	Through					55	2	50		76	1	56	1	63		72									
	Right					7		10		14		11		8		15									
	App. Total	0	0	0	0	75	2	87	1	115	1	85	1	95	0	107	0	0	0	0	0	0	0	0	0
	Pct Trucks						0.026		0.011		0.009		0.012		0		0								
Northbound	Left					11		4		8		2		6		5									
	Through					28	1	18		30		20		21		13	1								
	Right					19		22	1	24		18		13		22									
	App. Total	0	0	0	0	58	1	44	1	62	0	40	0	40	0	40	1	0	0	0	0	0	0	0	0
	Pct Trucks						0.017		0.022		0		0		0		0.024								
Southbound	Left					11		13		4		10		15		9									
	Through					27		14		25	1	29		39		40									
	Right					7		10		6		3		6		5									
	App. Total	0	0	0	0	45	0	37	0	35	1	42	0	60	0	54	0	0	0	0	0	0	0	0	0
	Pct Trucks						0		0		0.028		0		0		0								
Total Intersection Volume		0	0	0	0	301	5	266	3	315	3	278	2	324	2	340	2	0	0	0	0	0	0	0	0
Intersection Pct Trucks						1.6%		1.1%		0.9%		0.7%		0.6%		0.6%									

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	575	1.4%
3:45 PM	893	1.2%
4:00 PM	1173	1.1%
4:15 PM	1193	0.8%
4:30 PM	1266	0.7%
4:45 PM	948	0.6%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	668	0.6%
5:15 PM	342	0.6%
5:30 PM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Bowdish

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
RMA BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:30 PM		4:45 PM		5:00 PM		5:15 PM				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left	4		4		2		5		15	0.75	0%
	Through	85	1	96	1	115	2	114	1	415	0.89	1%
	Right	14		11		12		20		57	0.71	0%
	App. Total	103	1	111	1	129	2	139	1	487	0.87	
	Pct Trucks		0.009615		0.008929		0.015267		0.007143			
Westbound	Left	25		18		24		20		87	0.87	0%
	Through	76	1	56	1	63		72		269	0.87	1%
	Right	14		11		8		15		48	0.80	0%
	App. Total	115	1	85	1	95	0	107	0	404	0.87	
	Pct Trucks		0.008621		0.011628		0		0			
Northbound	Left	8		2		6		5		21	0.66	0%
	Through	30		20		21		13	1	85	0.71	1%
	Right	24		18		13		22		77	0.80	0%
	App. Total	62	0	40	0	40	0	40	1	183	0.74	
	Pct Trucks		0		0		0		0.02439			
Southbound	Left	4		10		15		9		38	0.63	0%
	Through	25	1	29		39		40		134	0.84	1%
	Right	6		3		6		5		20	0.83	0%
	App. Total	35	1	42	0	60	0	54	0	192	0.80	
	Pct Trucks		0.027778		0		0		0			
Total Intersection Volume		315	3	278	2	324	2	340	2	1266	0.93	
Intersection Pct Trucks			0.9%		0.7%		0.6%		0.6%			

Pedestrian Calls

APPROACH	MOVEMENT	4:30 PM		4:45 PM		5:00 PM		5:15 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Bowdish

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015
Counter: RMA
Analyst: BNG

AM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					0		3		2		0		1		1									
	Through					16		30	1	32	1	27		22		22									
	Right					4		10		6	1	7		7		7	1								
	App. Total	0	0	0	0	20	0	43	1	40	2	34	0	30	0	30	1	0	0	0	0	0	0	0	0
	Pct Trucks						0		0.023		0.048		0		0		0.032								
Westbound	Left					1		0		4		1		4		8	1								
	Through					46	3	73		72	2	60	1	60	1	53	1								
	Right							3		10		0		7		5									
	App. Total	0	0	0	0	47	3	76	0	86	2	61	1	71	1	66	2	0	0	0	0	0	0	0	0
	Pct Trucks						0.06		0		0.023		0.016		0.014		0.029								
Northbound	Left					21		26		33		23		30		14									
	Through					24		29		40		45	1	28		16									
	Right					4		4	1	3		3		5		4									
	App. Total	0	0	0	0	49	0	59	1	76	0	71	1	63	0	34	0	0	0	0	0	0	0	0	0
	Pct Trucks						0		0.017		0		0.014		0		0								
Southbound	Left					5	1	4		7		6		4		0									
	Through					7		7		12		25		15		6									
	Right					6		1		3		1		2		2									
	App. Total	0	0	0	0	18	1	12	0	22	0	32	0	21	0	8	0	0	0	0	0	0	0	0	0
	Pct Trucks						0.053		0		0		0		0		0								
Total Intersection Volume		0	0	0	0	134	4	190	2	224	4	198	2	185	1	138	3	0	0	0	0	0	0	0	0
Intersection Pct Trucks						2.9%		1.0%		1.8%		1.0%		0.5%		2.1%									

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	330	1.8%
6:45 AM	558	1.8%
7:00 AM	758	1.6%
7:15 AM	806	1.1%
7:30 AM	755	1.3%
7:45 AM	527	1.1%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	327	1.2%
8:15 AM	141	2.1%
8:30 AM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Bowdish

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
RMA BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	3		2		0		1		6	0.50	0%
	Through	30	1	32	1	27		22		113	0.86	2%
	Right	10		6	1	7		7		31	0.78	3%
	App. Total	43	1	40	2	34	0	30	0	150	0.85	
	Pct Trucks		0.022727		0.047619		0		0			
Westbound	Left	0		4		1		4		9	0.56	0%
	Through	73		72	2	60	1	60	1	269	0.91	1%
	Right	3		10		0		7		20	0.50	0%
	App. Total	76	0	86	2	61	1	71	1	298	0.85	
	Pct Trucks		0		0.022727		0.016129		0.013889			
Northbound	Left	26		33		23		30		112	0.85	0%
	Through	29		40		45	1	28		143	0.78	1%
	Right	4	1	3		3		5		16	0.80	6%
	App. Total	59	1	76	0	71	1	63	0	271	0.89	
	Pct Trucks		0.016667		0		0.013889		0			
Southbound	Left	4		7		6		4		21	0.75	0%
	Through	7		12		25		15		59	0.59	0%
	Right	1		3		1		2		7	0.58	0%
	App. Total	12	0	22	0	32	0	21	0	87	0.68	
	Pct Trucks		0		0		0		0			
Total Intersection Volume		190	2	224	4	198	2	185	1	806	0.88	
Intersection Pct Trucks			1.0%		1.8%		1.0%		0.5%			

Pedestrian Calls

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through	1								1
Southbound	Through									0
	App. Total	1	0	0	0	0	0	0	0	1

Wee Count LLC.
E. 1110 Excelsior Rd.
Spokane, Wa., 99224
(509) 979-3331

Turn Count Summary

Location: Bowdish Rd. at Dishman Mica Rd., Spokane Valley
GPS Coordinates: Lat=47.618556, Lon=-117.250896
Date: 2015-10-07
Day of week: Wednesday
Weather: Rain
Analyst: Mike McCluskey

Total vehicle traffic

Interval starts	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:45	5	34	0	4	21	3	14	20	10	2	54	29	196
17:00	1	36	0	15	37	7	8	31	4	1	48	28	216
17:15	2	26	3	2	41	8	14	9	4	3	56	38	206
17:30	3	25	0	4	42	5	13	19	1	4	56	24	196
17:45	3	31	2	2	35	4	13	23	4	2	60	22	201
18:00	5	35	1	1	31	0	10	21	2	1	42	26	175

Car traffic

Interval starts	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:45	5	34	0	4	21	3	14	20	9	2	53	29	194
17:00	1	36	0	14	36	7	8	31	4	1	47	28	213
17:15	2	26	3	2	41	8	14	9	4	3	56	38	206
17:30	3	25	0	4	42	5	13	19	1	4	56	24	196
17:45	3	31	2	2	34	4	13	23	4	2	60	22	200
18:00	5	35	1	1	31	0	10	21	2	1	42	26	175

Truck traffic

Interval starts	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:45	0	0	0	0	0	0	0	0	1	0	1	0	2
17:00	0	0	0	1	1	0	0	0	0	0	1	0	3
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	1	0	0	0	0	0	0	0	1
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0

Pedestrian volumes

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total	Left	Right	Total	Left	Right	Total	Left	Right	Total	
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0

Intersection Peak Hour

17:00 - 18:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	9	118	5	23	155	24	48	82	13	10	220	112	819
Factor	0.75	0.82	0.42	0.38	0.92	0.75	0.86	0.66	0.81	0.62	0.92	0.74	0.95
Approach Factor	0.89			0.86			0.83			0.88			

Peak Hour Vehicle Summary

Vehicle	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Car	9	118	5	22	153	24	48	82	13	10	219	112	815
Truck	0	0	0	1	2	0	0	0	0	0	1	0	4

722

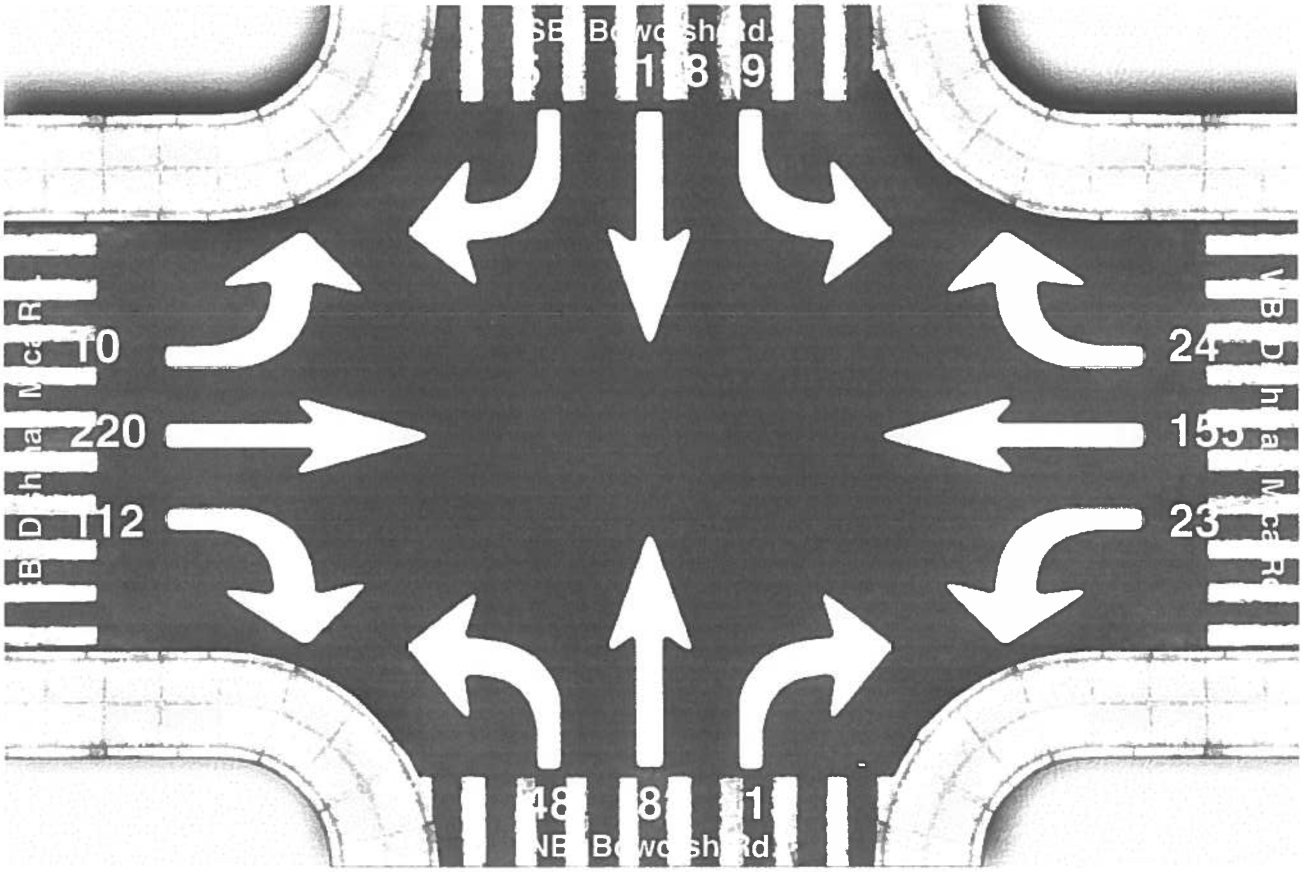
$$\frac{93}{722} = 0,128 \approx 13\%$$

Peak Hour Pedestrians

	NE			NW			SW			SE			Total
	Left	Right	Total	Left	Right	Total	Left	Right	Total	Left	Right	Total	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0

Intersection Peak Hour

Location: Bowdish Rd. at Dishman Mica Rd., Spokane Valley
GPS Coordinates: Lat=47.618556, Lon=-117.250896
Date: 2015-10-07
Day of week: Wednesday
Weather: Rain
Analyst: Mike McCluskey



Intersection Peak Hour

17:00 - 18:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	9	118	5	23	155	24	48	82	13	10	220	112	819
Factor	0.75	0.82	0.42	0.38	0.92	0.75	0.86	0.66	0.81	0.62	0.92	0.74	0.95
Approach Factor	0.89			0.86			0.83			0.88			

PROJECT: Barker & Sprague CPA
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Thorpe

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015
Counter Analyst
CEL BNG

AM PEAK HOURS

		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Westbound	Left					1		1		3		2		0		1									
	Through																								
	Right					13	1	21		21		23		8		15									
	App. Total	0	0	0	0	14	1	22	0	24	0	25	0	8	0	16	0	0	0	0	0	0	0	0	0
	Pct Trucks						0.067		0		0		0		0		0								
Northbound	Left																								
	Through					35	2	50	1	70	4	40	1	51	1	43	4								
	Right					3		3		3		3		3		1	1								
	App. Total	0	0	0	0	38	2	53	1	73	4	43	1	54	1	44	5	0	0	0	0	0	0	0	0
	Pct Trucks						0.05		0.019		0.052		0.023		0.018		0.102								
Southbound	Left					8		10		5	1	9		9		9									
	Through					22	1	25	2	34	2	23	2	23		16	1								
	Right																								
	App. Total	0	0	0	0	30	1	35	2	39	3	32	2	32	0	25	1	0	0	0	0	0	0	0	0
	Pct Trucks						0.032		0.054		0.071		0.059		0		0.038								
Total Intersection Volume		0	0	0	0	82	4	110	3	136	7	100	3	94	1	85	6	0	0	0	0	0	0	0	0
Intersection Pct Trucks						4.7%		2.7%		4.9%		2.9%		1.1%		6.6%									

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	199	3.5%
6:45 AM	342	4.1%
7:00 AM	445	3.8%
7:15 AM	454	3.1%
7:30 AM	432	3.9%
7:45 AM	289	3.5%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	186	3.8%
8:15 AM	91	6.6%
8:30 AM	0	

Notes:

PROJECT: Barker & Sprague CPA
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Thorpe

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
CEL BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Westbound	Left	1		3		2		0		6	0.50	0%
	Through									0		
	Right	21		21		23		8		73	0.79	0%
	App. Total	22	0	24	0	25	0	8	0	79	0.79	
	Pct Trucks		0		0		0		0			
Northbound	Left									0		
	Through	50	1	70	4	40	1	51	1	218	0.74	3%
	Right	3		3		3		3		12	1.00	0%
	App. Total	53	1	73	4	43	1	54	1	230	0.75	
	Pct Trucks		0.018519		0.051948		0.022727		0.018182			
Southbound	Left	10		5	1	9		9		34	0.85	3%
	Through	25	2	34	2	23	2	23		111	0.77	5%
	Right									0		
	App. Total	35	2	39	3	32	2	32	0	145	0.86	
	Pct Trucks		0.054054		0.071429		0.058824		0			
Total Intersection Volume		110	3	136	7	100	3	94	1	454	0.79	
Intersection Pct Trucks			2.7%		4.9%		2.9%		1.1%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Thorpe

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/7/2015
Counter Analyst
BNG BNG

PM PEAK HOURS

		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Westbound	Left											2		4		9		4		2		3			
	Through																								
	Right											14		25	1	11		5		10		9			
	App. Total	0	0	0	0	0	0	0	0	0	0	16	0	29	1	20	0	9	0	12	0	12	0	0	0
	Pct Trucks												0		0.033		0		0		0		0		
Northbound	Left																								
	Through											23		37	1	32		43		25	2	21			
	Right											2		1		4		3		1					
	App. Total	0	0	0	0	0	0	0	0	0	0	25	0	38	1	36	0	46	0	26	2	21	0	0	0
	Pct Trucks												0		0.026		0		0		0.071		0		
Southbound	Left											20	1	22		17		10		11		6			
	Through											46	1	37	1	42		51		45		45			
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	66	2	59	1	59	0	61	0	56	0	51	0	0	0
	Pct Trucks												0.029		0.017		0		0		0		0		
Total Intersection Volume		0	0	0	0	0	0	0	0	0	0	107	2	126	3	115	0	116	0	94	2	84	0	0	0
Intersection Pct Trucks												1.8%		2.3%		0.0%		0.0%		2.1%		0.0%			

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	0	
3:45 PM	0	
4:00 PM	109	1.8%
4:15 PM	238	2.1%
4:30 PM	353	1.4%
4:45 PM	469	1.1%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	456	1.1%
5:15 PM	411	0.5%
5:30 PM	296	0.7%

Notes:

PROJECT: Painted Hills
JOB NO. 13-1166
INTERSECTION: Dishman-Mica & Thorpe

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/7/2015
Counter Analyst
BNG BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:45 PM		5:00 PM		5:15 PM		5:30 PM				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Westbound	Left	2		4		9		4		19	0.53	0%
	Through									0		
	Right	14		25	1	11		5		56	0.54	2%
	App. Total	16	0	29	1	20	0	9	0	75	0.63	
	Pct Trucks		0		0.033333		0		0			
Northbound	Left									0		
	Through	23		37	1	32		43		136	0.79	1%
	Right	2		1		4		3		10	0.63	0%
	App. Total	25	0	38	1	36	0	46	0	146	0.79	
	Pct Trucks		0		0.025641		0		0			
Southbound	Left	20	1	22		17		10		70	0.80	1%
	Through	46	1	37	1	42		51		178	0.87	1%
	Right									0		
	App. Total	66	2	59	1	59	0	61	0	248	0.91	
	Pct Trucks		0.029412		0.016667		0		0			
Total Intersection Volume		107	2	126	3	115	0	116	0	469	0.91	
Intersection Pct Trucks			1.8%		2.3%		0.0%		0.0%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th & Pines

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/28/2015
Counter: JDK
Analyst: BNG

AM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left																								
	Through					35		53	1	56	1	55	3	51	3	41	5	35	1	64	3				
	Right					2	1	19		15		4		3		6		4		3					
	App. Total	0	0	0	0	37	1	72	1	71	1	59	3	54	3	47	5	39	1	67	3	0	0	0	0
	Pct Trucks						0.026		0.014		0.014		0.048		0.053		0.096		0.025		0.043				
Westbound	Left					5		16		13		11		9		8		1		13					
	Through					29	1	54		50	3	51	4	34	2	31		29		38					
	Right																								
	App. Total	0	0	0	0	34	1	70	0	63	3	62	4	43	2	39	0	30	0	51	0	0	0	0	0
	Pct Trucks						0.029		0		0.045		0.061		0.044		0		0		0				
Northbound	Left					7		6		8		5		5		2		5		5					
	Through																								
	Right					55		52	3	53		47		43		37	1	37	3	51					
	App. Total	0	0	0	0	62	0	58	3	61	0	52	0	48	0	39	1	42	3	56	0	0	0	0	0
	Pct Trucks						0		0.049		0		0		0		0.025		0.067		0				
Southbound	Left					1																			
	Through					21	2	41	1	38	1	24	1	28		13		28	2	35	1				
	Right					8		9	1	4		11	1	5		9	1	9		14					
	App. Total	0	0	0	0	30	2	50	2	42	1	35	2	33	0	22	1	37	2	49	1	0	0	0	0
	Pct Trucks						0.063		0.038		0.023		0.054		0		0.043		0.051		0.02				
Total Intersection Volume		0	0	0	0	163	4	250	6	237	5	208	9	178	5	147	7	148	6	223	4	0	0	0	0
Intersection Pct Trucks						2.4%		2.3%		2.1%		4.1%		2.7%		4.5%		3.9%		1.8%					

Intersection Total One Hour Volumes		Pct Trucks
6:30 AM	423	2.4%
6:45 AM	665	2.3%
7:00 AM	882	2.7%
7:15 AM	898	2.8%
7:30 AM	796	3.3%
7:45 AM	708	3.8%

Intersection Total One Hour Volumes		Pct Trucks
8:00 AM	718	3.1%
8:15 AM	535	3.2%
8:30 AM	381	2.6%

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th & Pines

Data Transfer
Intersection No. 1

DATE OF COUNT: 1/28/2015
Counter Analyst
JDK BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left									0		
	Through	53	1	56	1	55	3	51	3	223	0.96	4%
	Right	19		15		4		3		41	0.54	0%
	App. Total	72	1	71	1	59	3	54	3	264	0.90	
	Pct Trucks		0.013699		0.013889		0.048387		0.052632			
Westbound	Left	16		13		11		9		49	0.77	0%
	Through	54		50	3	51	4	34	2	198	0.90	5%
	Right									0		
	App. Total	70	0	63	3	62	4	43	2	247	0.88	
	Pct Trucks		0		0.045455		0.060606		0.044444			
Northbound	Left	6		8		5		5		24	0.75	0%
	Through									0		
	Right	52	3	53		47		43		198	0.90	2%
	App. Total	58	3	61	0	52	0	48	0	222	0.91	
	Pct Trucks		0.04918		0		0		0			
Southbound	Left									0		
	Through	41	1	38	1	24	1	28		134	0.80	2%
	Right	9	1	4		11	1	5		31	0.65	6%
	App. Total	50	2	42	1	35	2	33	0	165	0.79	
	Pct Trucks		0.038462		0.023256		0.054054		0			
Total Intersection Volume		250	6	237	5	208	9	178	5	898	0.88	
Intersection Pct Trucks			2.3%		2.1%		4.1%		2.7%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through					2				2
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	2	0	0	0	2

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th Avenue & Pines Road

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/6/2015

Counter: Judy
Analyst: BNG

PM PEAK HOURS

		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left																								
	Through			52	2	73	1	75	1	59		92	1	81											
	Right			9		12		11		6		14		17											
	App. Total	0	0	61	2	85	1	86	1	65	0	106	1	98	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.032		0.012		0.011		0		0.009		0										
Westbound	Left			13	1	13		19		12		15		16											
	Through			31	2	28		25		37		41		35											
	Right																								
	App. Total	0	0	44	3	41	0	44	0	49	0	56	0	51	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.064		0		0		0		0		0										
Northbound	Left			5		2		4		8		2		6											
	Through																								
	Right			31		34		38		44		36		44											
	App. Total	0	0	36	0	36	0	42	0	52	0	38	0	50	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0		0		0		0		0										
Southbound	Left					1																			
	Through			27	1	51		40		55		52		54											
	Right			14		16	1	29		20	1	24	1	27	1										
	App. Total	0	0	41	1	68	1	69	0	75	1	76	1	81	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.024		0.014		0		0.013		0.013		0.012										
Total Intersection Volume		0	0	182	6	230	2	241	1	241	1	276	2	280	1	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks				3.2%		0.9%		0.4%		0.4%		0.7%		0.4%											

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	662	1.4%
3:45 PM	904	1.1%
4:00 PM	994	0.6%
4:15 PM	1043	0.5%
4:30 PM	801	0.5%
4:45 PM	559	0.5%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	281	0.4%
5:15 PM	0	
5:30 PM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th Avenue & Pines Road

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/6/2015
Counter Analyst
Judy BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left									0		
	Through	75	1	59		92	1	81		309	0.83	1%
	Right	11		6		14		17		48	0.71	0%
	App. Total	86	1	65	0	106	1	98	0	357	0.83	
	Pct Trucks		0.011494		0		0.009346		0			
Westbound	Left	19		12		15		16		62	0.82	0%
	Through	25		37		41		35		138	0.84	0%
	Right									0		
	App. Total	44	0	49	0	56	0	51	0	200	0.89	
	Pct Trucks		0		0		0		0			
Northbound	Left	4		8		2		6		20	0.63	0%
	Through									0		
	Right	38		44		36		44		162	0.92	0%
	App. Total	42	0	52	0	38	0	50	0	182	0.88	
	Pct Trucks		0		0		0		0			
Southbound	Left									0		
	Through	40		55		52		54		201	0.91	0%
	Right	29		20	1	24	1	27	1	103	0.89	3%
	App. Total	69	0	75	1	76	1	81	1	304	0.93	
	Pct Trucks		0		0.013158		0.012987		0.012195			
Total Intersection Volume		241	1	241	1	276	2	280	1	1043	0.93	
Intersection Pct Trucks			0.4%		0.4%		0.7%		0.4%			

Pedestrian Calls

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th & SR27

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/28/2015

Counter	Analyst
BNG	BNG

AM PEAK HOURS

		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					51		2		68		47		55	1	35	1	34		81	1				
	Through					28		41	1	48		52		41	1	32		24		53	1				
	Right					4		2		6		6		6		7	1	2		5					
	App. Total	0	0	0	0	83	0	45	1	122	0	105	0	102	2	74	2	60	0	139	2	0	0	0	0
	Pct Trucks						0		0.022		0		0		0.019		0.026		0		0.014				
Westbound	Left					2		3		1				1		2		2		1					
	Through					20	1	51		52	3	45	1	36		23		24		44					
	Right					10		21		17		16		14		14		27		17	1				
	App. Total	0	0	0	0	32	1	75	0	70	3	61	1	51	0	39	0	53	0	62	1	0	0	0	0
	Pct Trucks						0.03		0		0.041		0.016		0		0		0		0.016				
Northbound	Left					17		14		15		12		8		7		16		9					
	Through					80	1	100	1	125	1	92		81	1	74	1	48	1	69	4				
	Right					2		7		1		7		3		3									
	App. Total	0	0	0	0	99	1	121	1	141	1	111	0	92	1	84	1	64	1	78	4	0	0	0	0
	Pct Trucks						0.01		0.008		0.007		0		0.011		0.012		0.015		0.049				
Southbound	Left					5		8		8		16		7		8		8		10					
	Through					11	4	27	2	20		21	1	27	1	16		26		27	3				
	Right													1											
	App. Total	0	0	0	0	16	4	35	2	28	0	37	1	35	1	24	0	34	0	37	3	0	0	0	0
	Pct Trucks						0.2		0.054		0		0.026		0.028		0		0		0.075				
Total Intersection Volume		0	0	0	0	230	6	276	4	361	4	314	2	280	4	221	3	211	1	316	10	0	0	0	0
Intersection Pct Trucks						2.5%		1.4%		1.1%		0.6%		1.4%		1.3%		0.5%		3.1%					

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	516	1.9%
6:45 AM	881	1.6%
7:00 AM	1197	1.3%
7:15 AM	1245	1.1%
7:30 AM	1189	1.1%
7:45 AM	1036	1.0%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	1046	1.7%
8:15 AM	762	1.8%
8:30 AM	538	2.0%

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th & SR27

Data Transfer
Intersection No. 1

DATE OF COUNT: 1/28/2015
Counter Analyst
BNG BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	2		68		47		55	1	173	0.64	1%
	Through	41	1	48		52		41	1	184	0.88	1%
	Right	2		6		6		6		20	0.83	0%
	App. Total	45	1	122	0	105	0	102	2	377	0.77	
	Pct Trucks		0.021739		0		0		0.019231			
Westbound	Left	3		1				1		5	0.42	0%
	Through	51		52	3	45	1	36		188	0.85	2%
	Right	21		17		16		14		68	0.81	0%
	App. Total	75	0	70	3	61	1	51	0	261	0.87	
	Pct Trucks		0		0.041096		0.016129		0			
Northbound	Left	14		15		12		8		49	0.82	0%
	Through	100	1	125	1	92		81	1	401	0.80	1%
	Right	7		1		7		3		18	0.64	0%
	App. Total	121	1	141	1	111	0	92	1	468	0.82	
	Pct Trucks		0.008197		0.007042		0		0.010753			
Southbound	Left	8		8		16		7		39	0.61	0%
	Through	27	2	20		21	1	27	1	99	0.85	4%
	Right							1		1	0.25	0%
	App. Total	35	2	28	0	37	1	35	1	139	0.91	
	Pct Trucks		0.054054		0		0.026316		0.027778			
Total Intersection Volume		276	4	361	4	314	2	280	4	1245	0.85	
Intersection Pct Trucks			1.4%		1.1%		0.6%		1.4%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through					3				3
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	3	0	0	0	3

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th Avenue & SR 27

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/7/2015
Counter: RMA/JDK
Analyst: BNG

PM PEAK HOURS

		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left									42	1	40	1	42		37	1	39		40					
	Through									60		63	3	64		64	1	52		58	1				
	Right									10		13		9		15		15		9					
	App. Total	0	0	0	0	0	0	0	0	112	1	116	4	115	0	116	2	106	0	107	1	0	0	0	0
	Pct Trucks										0.009		0.033		0		0.017		0		0.009				
Westbound	Left									2		1		3		5		4		2					
	Through									59		39	1	42		48		56		41					
	Right									1		1		4		1		0		1					
	App. Total	0	0	0	0	0	0	0	0	62	0	41	1	49	0	54	0	60	0	44	0	0	0	0	0
	Pct Trucks										0		0.024		0		0		0		0				
Northbound	Left									4		2		6		5		8		7					
	Through									59	1	59		82	1	51	1	52	1	55					
	Right									1		1		1		4			3	0					
	App. Total	0	0	0	0	0	0	0	0	64	1	62	0	89	1	60	1	60	4	62	0	0	0	0	0
	Pct Trucks										0.015		0		0.011		0.016		0.063		0				
Southbound	Left									13		27		24		14		17		16					
	Through									48		55		88		79		71		67					
	Right									0		0		0				0		0					
	App. Total	0	0	0	0	0	0	0	0	61	0	82	0	112	0	93	0	88	0	83	0	0	0	0	0
	Pct Trucks										0		0		0		0		0		0				
Total Intersection Volume		0	0	0	0	0	0	0	0	299	2	301	5	365	1	323	3	314	4	296	1	0	0	0	0
Intersection Pct Trucks										0.7%		1.6%		0.3%		0.9%		1.3%		0.3%					

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	0	
3:45 PM	301	0.7%
4:00 PM	607	1.2%
4:15 PM	973	0.8%
4:30 PM	1299	0.8%
4:45 PM	1316	1.0%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	1307	0.7%
5:15 PM	941	0.9%
5:30 PM	615	0.8%

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th Avenue & SR 27

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/7/2015
Counter Analyst
RMA/JDK BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:45 PM		5:00 PM		5:15 PM		5:30 PM				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	40	1	42		37	1	39		160	0.95	1%
	Through	63	3	64		64	1	52		247	0.94	2%
	Right	13		9		15		15		52	0.87	0%
	App. Total	116	4	115	0	116	2	106	0	459	0.96	
	Pct Trucks		0.033333		0		0.016949		0			
Westbound	Left	1		3		5		4		13	0.65	0%
	Through	39	1	42		48		56		186	0.83	1%
	Right	1		4		1		0		6	0.38	0%
	App. Total	41	1	49	0	54	0	60	0	205	0.85	
	Pct Trucks		0.02381		0		0		0			
Northbound	Left	2		6		5		8		21	0.66	0%
	Through	59		82	1	51	1	52	1	247	0.74	1%
	Right	1		1		4			3	9	0.56	33%
	App. Total	62	0	89	1	60	1	60	4	277	0.77	
	Pct Trucks		0		0.011111		0.016393		0.0625			
Southbound	Left	27		24		14		17		82	0.76	0%
	Through	55		88		79		71		293	0.83	0%
	Right	0		0				0		0		
	App. Total	82	0	112	0	93	0	88	0	375	0.84	
	Pct Trucks		0		0		0		0			
Total Intersection Volume		301	5	365	1	323	3	314	4	1316	0.90	
Intersection Pct Trucks			1.6%		0.3%		0.9%		1.3%			

Pedestrian Calls

APPROACH	MOVEMENT	4:45		5:00		5:15		5:30		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through							1		1
Southbound	Through									0
	App. Total	0	0	0	0	0	0	1	0	1

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Pines Road

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015
Counter JDK
Analyst BNG

AM PEAK HOURS

		15 Minute Period Beginning @																					
APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					7		3		5		2		5		4									
	Through					74	1	82	1	67	3	97	6	87	1	46									
	Right					1		0		0		1		2		4									
	App. Total	0	0	0	0	82	1	85	1	72	3	100	6	94	1	54	0	0	0	0	0	0	0	0	0
	Pct Trucks						0.012		0.012		0.04		0.057		0.011		0								
Westbound	Left					3		7		8		9	1	13		11									
	Through					75		93	2	93		94	7	100	1	48	2								
	Right					2		8	1	16	1	11	1	15		6									
	App. Total	0	0	0	0	80	0	108	3	117	1	114	9	128	1	65	2	0	0	0	0	0	0	0	0
	Pct Trucks						0		0.027		0.008		0.073		0.008		0.03								
Northbound	Left					9		13		13		8		9		10									
	Through					11		14		14		11		11		9									
	Right					9		14		22	3	29		31		15	1								
	App. Total	0	0	0	0	29	0	41	0	49	3	48	0	51	0	34	1	0	0	0	0	0	0	0	0
	Pct Trucks						0		0		0.058		0		0		0.029								
Southbound	Left					17		24		30	2	54	1	70		14									
	Through					3		10		2		10		11		5									
	Right					6		7		12		4		8		7									
	App. Total	0	0	0	0	26	0	41	0	44	2	68	1	89	0	26	0	0	0	0	0	0	0	0	0
	Pct Trucks						0		0		0.043		0.014		0		0								
Total Intersection Volume		0	0	0	0	217	1	275	4	282	9	330	16	362	2	179	3	0	0	0	0	0	0	0	0
Intersection Pct Trucks						0.5%		1.4%		3.1%		4.6%		0.5%		1.6%									

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	497	1.0%
6:45 AM	788	1.8%
7:00 AM	1134	2.6%
7:15 AM	1280	2.4%
7:30 AM	1183	2.5%
7:45 AM	892	2.4%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	546	0.9%
8:15 AM	182	1.6%
8:30 AM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Pines Road

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
JDK BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left	3		5		2		5		15	0.75	0%
	Through	82	1	67	3	97	6	87	1	344	0.83	3%
	Right	0		0		1		2		3	0.38	0%
	App. Total	85	1	72	3	100	6	94	1	362	0.85	
	Pct Trucks		0.011628		0.04		0.056604		0.010526			
Westbound	Left	7		8		9	1	13		38	0.73	3%
	Through	93	2	93		94	7	100	1	390	0.97	3%
	Right	8	1	16	1	11	1	15		53	0.78	6%
	App. Total	108	3	117	1	114	9	128	1	481	0.93	
	Pct Trucks		0.027027		0.008475		0.073171		0.007752			
Northbound	Left	13		13		8		9		43	0.83	0%
	Through	14		14		11		11		50	0.89	0%
	Right	14		22	3	29		31		99	0.80	3%
	App. Total	41	0	49	3	48	0	51	0	192	0.92	
	Pct Trucks		0		0.057692		0		0			
Southbound	Left	24		30	2	54	1	70		181	0.65	2%
	Through	10		2		10		11		33	0.75	0%
	Right	7		12		4		8		31	0.65	0%
	App. Total	41	0	44	2	68	1	89	0	245	0.69	
	Pct Trucks		0		0.043478		0.014493		0			
Total Intersection Volume		275	4	282	9	330	16	362	2	1280	0.88	
Intersection Pct Trucks			1.4%		3.1%		4.6%		0.5%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through	6		9		3		2		20
Westbound	Through	2		5		6		5		18
N orthbound	Through	4		5		8		8		25
Southbound	Through	4		6		3				13
	App. Total	16	0	25	0	20	0	15	0	76

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Pines Road

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/6/2015
Counter BNG
Analyst BNG

PM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left			15		7		10		7		11		5											
	Through			119	1	70	2	131	1	88	2	141		77	1										
	Right			8		5		13		10		11		9											
	App. Total	0	0	142	1	82	2	154	1	105	2	163	0	91	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.007		0.024		0.006		0.019		0		0.011										
Westbound	Left			10		16		18		13		23		13											
	Through			72	2	58	1	94	1	70		110		62											
	Right			7		10		13		6		12		8											
	App. Total	0	0	89	2	84	1	125	1	89	0	145	0	83	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.022		0.012		0.008		0		0		0										
Northbound	Left			7	1	6		7		12		19		8											
	Through			9		4		16		6		12		11											
	Right			12		18		15		5		12		12											
	App. Total	0	0	28	1	28	0	38	0	23	0	43	0	31	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.034		0		0		0		0		0										
Southbound	Left			24		9		13		15		18		8											
	Through			13		12		20		17		23		13											
	Right			9		10		6		6		8		9											
	App. Total	0	0	46	0	31	0	39	0	38	0	49	0	30	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0		0		0		0		0		0										
Total Intersection Volume		0	0	305	4	225	3	356	2	255	2	400	0	235	1	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks				1.3%		1.3%		0.6%		0.8%		0.0%		0.4%											

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	895	1.0%
3:45 PM	1152	1.0%
4:00 PM	1243	0.6%
4:15 PM	1251	0.4%
4:30 PM	893	0.3%
4:45 PM	636	0.2%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	236	0.4%
5:15 PM	0	
5:30 PM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Pines Road

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/6/2015
Counter Analyst
BNG BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left	10		7		11		5		33	0.75	0%
	Through	131	1	88	2	141		77	1	441	0.78	1%
	Right	13		10		11		9		43	0.83	0%
	App. Total	154	1	105	2	163	0	91	1	517	0.79	
	Pct Trucks		0.006452		0.018692		0		0.01087			
Westbound	Left	18		13		23		13		67	0.73	0%
	Through	94	1	70		110		62		337	0.77	0%
	Right	13		6		12		8		39	0.75	0%
	App. Total	125	1	89	0	145	0	83	0	443	0.76	
	Pct Trucks		0.007937		0		0		0			
Northbound	Left	7		12		19		8		46	0.61	0%
	Through	16		6		12		11		45	0.70	0%
	Right	15		5		12		12		44	0.73	0%
	App. Total	38	0	23	0	43	0	31	0	135	0.78	
	Pct Trucks		0		0		0		0			
Southbound	Left	13		15		18		8		54	0.75	0%
	Through	20		17		23		13		73	0.79	0%
	Right	6		6		8		9		29	0.81	0%
	App. Total	39	0	38	0	49	0	30	0	156	0.80	
	Pct Trucks		0		0		0		0			
Total Intersection Volume		356	2	255	2	400	0	235	1	**1251**	**0.78**	
Intersection Pct Trucks			0.6%		0.8%		0.0%		0.4%			

Pedestrian Calls

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through	1			1			1		3
N orthbound	Through	2				1	1	1		5
Southbound	Through					1				1
	App. Total	3	0	0	1	2	1	2	0	9

PROJECT: Painted Hills PRD
JOB NO. 13-1166
INTERSECTION: Madison & Thorpe

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 3/11/2015

Counter RMA
Analyst RMA

AM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left							19		21		24	3	8											
	Through																								
	Right							3		3		3		1											
	App. Total	0	0	0	0	0	0	22	0	24	0	27	3	9	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks								0		0		0.1		0										
Westbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Northbound	Left							15		15	1	10		8											
	Through							15		18		19		9											
	Right																								
	App. Total	0	0	0	0	0	0	30	0	33	1	29	0	17	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks								0		0.029		0		0										
Southbound	Left																								
	Through							3		9		6		6											
	Right							8		13		17		13											
	App. Total	0	0	0	0	0	0	11	0	22	0	23	0	19	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks								0		0		0		0										
Total Intersection Volume		0	0	0	0	0	0	63	0	79	1	79	3	45	0	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks								0.0%		1.3%		3.7%		0.0%											

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	63	0.0%
6:45 AM	143	0.7%
7:00 AM	225	1.8%
7:15 AM	270	1.5%
7:30 AM	207	1.9%
7:45 AM	127	2.4%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	45	0.0%
8:15 AM	0	
8:30 AM	0	

Notes:

PROJECT: Painted Hills PRD
JOB NO. 13-1166
INTERSECTION: Madison & Thorpe

Data Transfer
Intersection No. 1

DATE OF COUNT: 3/11/2015
Counter Analyst
RMA RMA

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	19		21		24	3	8		75	0.69	4%
	Through									0		
	Right	3		3		3		1		10	0.83	0%
	App. Total	22	0	24	0	27	3	9	0	85	0.71	
	Pct Trucks		0		0		0.1		0			
Westbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Northbound	Left	15		15	1	10		8		49	0.77	2%
	Through	15		18		19		9		61	0.80	0%
	Right									0		
	App. Total	30	0	33	1	29	0	17	0	110	0.81	
	Pct Trucks		0		0.029412		0		0			
Southbound	Left									0		
	Through	3		9		6		6		24	0.67	0%
	Right	8		13		17		13		51	0.75	0%
	App. Total	11	0	22	0	23	0	19	0	75	0.82	
	Pct Trucks		0		0		0		0			
Total Intersection Volume		63	0	79	1	79	3	45	0	270	0.82	
Intersection Pct Trucks			0.0%		1.3%		3.7%		0.0%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills PRD
JOB NO. 13-1166
INTERSECTION: Madison & Thorpe

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 3/11/2015
Counter Analyst
RMA RMA

PM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left													8	1	5		3		4					
	Through																								
	Right													10		11		9		13					
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	18	1	16	0	12	0	17	0	0	0	0	0
	Pct Trucks														0.053		0		0		0				
Westbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Northbound	Left													3		7		8		6					
	Through													5		12		11		5					
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	8	0	19	0	19	0	11	0	0	0	0	0
	Pct Trucks														0		0		0		0				
Southbound	Left																								
	Through													24		17		18		14					
	Right													13		6		2		4					
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	37	0	23	0	20	0	18	0	0	0	0	0
	Pct Trucks														0		0		0		0				
Total Intersection Volume		0	0	0	0	0	0	0	0	0	0	0	0	63	1	58	0	51	0	46	0	0	0	0	0
Intersection Pct Trucks														1.6%		0.0%		0.0%		0.0%					

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	0	
3:45 PM	0	
4:00 PM	0	
4:15 PM	64	1.6%
4:30 PM	122	0.8%
4:45 PM	173	0.6%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	219	0.5%
5:15 PM	155	0.0%
5:30 PM	97	0.0%

Notes:

PROJECT: Painted Hills PRD
JOB NO. 13-1166
INTERSECTION: Madison & Thorpe

Data Transfer
Intersection No. 1

DATE OF COUNT: 3/11/2015
Counter Analyst
RMA RMA

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	5:00 PM		5:15 PM		5:30 PM		5:45 PM				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left	8	1	5		3		4		21	0.58	5%
	Through									0		
	Right	10		11		9		13		43	0.83	0%
	App. Total	18	1	16	0	12	0	17	0	64	0.84	
	Pct Trucks		0.052632		0		0		0			
Westbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Northbound	Left	3		7		8		6		24	0.75	0%
	Through	5		12		11		5		33	0.69	0%
	Right									0		
	App. Total	8	0	19	0	19	0	11	0	57	0.75	
	Pct Trucks		0		0		0		0			
Southbound	Left									0		
	Through	24		17		18		14		73	0.76	0%
	Right	13		6		2		4		25	0.48	0%
	App. Total	37	0	23	0	20	0	18	0	98	0.66	
	Pct Trucks		0		0		0		0			
Total Intersection Volume		63	1	58	0	51	0	46	0	**219**	**0.86**	
Intersection Pct Trucks			1.6%		0.0%		0.0%		0.0%			

Pedestrian Calls

APPROACH	MOVEMENT	5:00 PM		5:15 PM		5:30 PM		5:45 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & HWY 27

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015

Counter	Analyst
BNG	BNG

AM PEAK HOURS

		15 Minute Period Beginning @																							
APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					9		28	1	31		36		28	1	25	1								
	Through					37	1	45		55	2	55	2	59	3	44									
	Right					13		13		12	1	6	2	21		18	1								
	App. Total	0	0	0	0	59	1	86	1	98	3	97	4	108	4	87	2	0	0	0	0	0	0	0	0
	Pct Trucks						0.017		0.011		0.03		0.04		0.036		0.022								
Westbound	Left					7		17	1	13	2	21		5		10	2								
	Through					37		48	3	36		48	2	54		30	1								
	Right					5		11		20	1	22		12		16									
	App. Total	0	0	0	0	49	0	76	4	69	3	91	2	71	0	56	3	0	0	0	0	0	0	0	0
	Pct Trucks						0		0.05		0.042		0.022		0		0.051								
Northbound	Left					16		35	1	21	2	24		31		22									
	Through					38		67		82	1	46	5	56	1	46	2								
	Right					25		23		48	1	24		30		31									
	App. Total	0	0	0	0	79	0	125	1	151	4	94	5	117	1	99	2	0	0	0	0	0	0	0	0
	Pct Trucks						0		0.008		0.026		0.051		0.008		0.02								
Southbound	Left					1		3		7		8		4		5									
	Through					20	1	22	2	18	1	15	1	19		21	2								
	Right					4		14		15	2	16	3	22		8									
	App. Total	0	0	0	0	25	1	39	2	40	3	39	4	45	0	34	2	0	0	0	0	0	0	0	0
	Pct Trucks						0.038		0.049		0.07		0.093		0		0.056								
Total Intersection Volume		0	0	0	0	212	2	326	8	358	13	321	15	341	5	276	9	0	0	0	0	0	0	0	0
Intersection Pct Trucks						0.9%		2.4%		3.5%		4.5%		1.4%		3.2%									

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	548	1.8%
6:45 AM	919	2.5%
7:00 AM	1255	3.0%
7:15 AM	1387	3.0%
7:30 AM	1338	3.1%
7:45 AM	967	3.0%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	631	2.2%
8:15 AM	285	3.2%
8:30 AM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & HWY 27

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
BNG BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left	28	1	31		36		28	1	125	0.87	2%
	Through	45		55	2	55	2	59	3	221	0.89	3%
	Right	13		12	1	6	2	21		55	0.65	5%
	App. Total	86	1	98	3	97	4	108	4	401	0.90	
	Pct Trucks		0.011494		0.029703		0.039604		0.035714			
Westbound	Left	17	1	13	2	21		5		59	0.70	5%
	Through	48	3	36		48	2	54		191	0.88	3%
	Right	11		20	1	22		12		66	0.75	2%
	App. Total	76	4	69	3	91	2	71	0	316	0.85	
	Pct Trucks		0.05		0.041667		0.021505		0			
Northbound	Left	35	1	21	2	24		31		114	0.79	3%
	Through	67		82	1	46	5	56	1	258	0.78	3%
	Right	23		48	1	24		30		126	0.64	1%
	App. Total	125	1	151	4	94	5	117	1	498	0.80	
	Pct Trucks		0.007937		0.025806		0.050505		0.008475			
Southbound	Left	3		7		8		4		22	0.69	0%
	Through	22	2	18	1	15	1	19		78	0.81	5%
	Right	14		15	2	16	3	22		72	0.82	7%
	App. Total	39	2	40	3	39	4	45	0	172	0.96	
	Pct Trucks		0.04878		0.069767		0.093023		0			
Total Intersection Volume		326	8	358	13	321	15	341	5	1387	0.93	
Intersection Pct Trucks			2.4%		3.5%		4.5%		1.4%			

Pedestrian Calls

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through	1		3						4
Southbound	Through									0
	App. Total	1	0	3	0	0	0	0	0	4

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & HWY 27

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/6/2015

Counter	Analyst
RMA/JDK	BNG

PM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left			11		9		20		19		21		19											
	Through			66	3	70	2	69	1	60	2	81	2	81	1										
	Right			33		20		35		33		54		46											
	App. Total	0	0	110	3	99	2	124	1	112	2	156	2	146	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.027		0.02		0.008		0.018		0.013		0.007										
Westbound	Left			30		30	1	31	1	31		43		36	1										
	Through			65	2	69	2	50	1	71	1	92		90	1										
	Right			7		8		10		6		14		10											
	App. Total	0	0	102	2	107	3	91	2	108	1	149	0	136	2	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.019		0.027		0.022		0.009		0		0.014										
Northbound	Left			21		18	1	23		28		31		31											
	Through			39	1	32		25	2	39	1	45		41	1										
	Right			26		19	1	22	2	15	2	37	2	16											
	App. Total	0	0	86	1	69	2	70	4	82	3	113	2	88	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.011		0.028		0.054		0.035		0.017		0.011										
Southbound	Left			9		9		9		10		10		11											
	Through			48	2	51		44	1	51		48		52	1										
	Right			7		20		11		20		17		15											
	App. Total	0	0	64	2	80	0	64	1	81	0	75	0	78	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.03		0		0.015		0		0		0.013										
Total Intersection Volume		0	0	362	8	355	7	349	8	383	6	493	4	448	5	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks				2.2%		1.9%		2.2%		1.5%		0.8%		1.1%											

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	1089	2.1%
3:45 PM	1478	2.0%
4:00 PM	1605	1.6%
4:15 PM	1696	1.4%
4:30 PM	1339	1.1%
4:45 PM	950	0.9%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	453	1.1%
5:15 PM	0	
5:30 PM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & HWY 27

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/6/2015
Counter Analyst
RMA/JDK BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	20		19		21		19		79	0.94	0%
	Through	69	1	60	2	81	2	81	1	297	0.89	2%
	Right	35		33		54		46		168	0.78	0%
	App. Total	124	1	112	2	156	2	146	1	544	0.86	
	Pct Trucks		0.008		0.017544		0.012658		0.006803			
Westbound	Left	31	1	31		43		36	1	143	0.83	1%
	Through	50	1	71	1	92		90	1	306	0.83	1%
	Right	10		6		14		10		40	0.71	0%
	App. Total	91	2	108	1	149	0	136	2	489	0.82	
	Pct Trucks		0.021505		0.009174		0		0.014493			
Northbound	Left	23		28		31		31		113	0.91	0%
	Through	25	2	39	1	45		41	1	154	0.86	3%
	Right	22	2	15	2	37	2	16		96	0.62	6%
	App. Total	70	4	82	3	113	2	88	1	363	0.79	
	Pct Trucks		0.054054		0.035294		0.017391		0.011236			
Southbound	Left	9		10		10		11		40	0.91	0%
	Through	44	1	51		48		52	1	197	0.93	1%
	Right	11		20		17		15		63	0.79	0%
	App. Total	64	1	81	0	75	0	78	1	300	0.93	
	Pct Trucks		0.015385		0		0		0.012658			
Total Intersection Volume		349	8	383	6	493	4	448	5	1696	0.85	
Intersection Pct Trucks			2.2%		1.5%		0.8%		1.1%			

Pedestrian Calls

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through	1		1		2		2		6
Westbound	Through									0
N orthbound	Through									0
Southbound	Through			1		1		1		3
	App. Total	1	0	2	0	3	0	3	0	9

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Evergreen

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/27/2015

AM PEAK HOURS

Counter	Analyst	15 Minute Period Beginning @																					
BNG	BNG																						
APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					19	1	35		50	3	55		44	1	39		32	1	29	1				
	Through					33	1	34		46	2	43	1	48		45		35	1	49					
	Right															2									
	App. Total	0	0	0	0	52	2	69	0	96	5	98	1	92	1	86	0	67	2	78	1	0	0	0	0
	Pct Trucks						0.037		0		0.05		0.01		0.011		0		0.029		0.013				
Westbound	Left																								
	Through					46		40		52	2	44		47	3	40	4	30		44					
	Right					8		7		6		3		8		4		2		2					
	App. Total	0	0	0	0	54	0	47	0	58	2	47	0	55	3	44	4	32	0	46	0	0	0	0	0
	Pct Trucks						0		0		0.033		0		0.052		0.083		0		0				
Northbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Southbound	Left					1				2		1		2				1	1						
	Through																								
	Right					21		13	3	30		24	1	25		15	3	13	1	25	1				
	App. Total	0	0	0	0	22	0	13	3	32	0	25	1	27	0	15	3	14	2	25	1	0	0	0	0
	Pct Trucks						0		0.188		0		0.038		0		0.167		0.125		0.038				
Total Intersection Volume		0	0	0	0	128	2	129	3	186	7	170	2	174	4	145	7	113	4	149	2	0	0	0	0
Intersection Pct Trucks						1.5%		2.3%		3.6%		1.2%		2.2%		4.6%		3.4%		1.3%					

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	262	1.9%
6:45 AM	455	2.6%
7:00 AM	627	2.2%
7:15 AM	675	2.4%
7:30 AM	695	2.9%
7:45 AM	619	2.7%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	598	2.8%
8:15 AM	420	3.1%
8:30 AM	268	2.2%

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Evergreen

Data Transfer
Intersection No. 1

DATE OF COUNT: 1/27/2015
Counter Analyst
BNG BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	50	3	55		44	1	39		192	0.87	2%
	Through	46	2	43	1	48		45		185	0.96	2%
	Right							2		2	0.25	0%
	App. Total	96	5	98	1	92	1	86	0	379	0.94	
	Pct Trucks		0.049505		0.010101		0.010753		0			
Westbound	Left									0		
	Through	52	2	44		47	3	40	4	192	0.89	5%
	Right	6		3		8		4		21	0.66	0%
	App. Total	58	2	47	0	55	3	44	4	213	0.89	
	Pct Trucks		0.033333		0		0.051724		0.083333			
Northbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Southbound	Left	2		1		2				5	0.63	0%
	Through									0		
	Right	30		24	1	25		15	3	98	0.82	4%
	App. Total	32	0	25	1	27	0	15	3	103	0.80	
	Pct Trucks		0		0.038462		0		0.166667			
Total Intersection Volume		186	7	170	2	174	4	145	7	695	0.90	
Intersection Pct Trucks			3.6%		1.2%		2.2%		4.6%			

Pedestrian Calls

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Evergreen Road

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015
Counter
Analyst
BNG

PM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @																							
		3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left									37	1	45		41	1	42		49	1	28					
	Through									44		82	1	74	2	105		82		71	1				
	Right																								
	App. Total	0	0	0	0	0	0	0	0	81	1	127	1	115	3	147	0	131	1	99	1	0	0	0	0
	Pct Trucks										0.012		0.008		0.025		0		0.008		0.01				
Westbound	Left																								
	Through									79	1	73		91	1	94		76		74	1				
	Right									2		6		1		2		1		3					
	App. Total	0	0	0	0	0	0	0	0	81	1	79	0	92	1	96	0	77	0	77	1	0	0	0	0
	Pct Trucks										0.012		0		0.011		0		0		0.013				
Northbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Southbound	Left									2		1		2		7	5			5					
	Through																								
	Right									41	1	47	1	43		44	36	1		49	1				
	App. Total	0	0	0	0	0	0	0	0	43	1	48	1	45	0	51	41	1	0	54	1	0	0	0	0
	Pct Trucks										0.023		0.02		0		0.446		0		0.018				
Total Intersection Volume		0	0	0	0	0	0	0	0	205	3	254	2	252	4	294	41	209	1	230	3	0	0	0	0
Intersection Pct Trucks										1.4%		0.8%		1.6%		12.2%		0.5%		1.3%					

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	0	
3:45 PM	208	1.4%
4:00 PM	464	1.1%
4:15 PM	720	1.3%
4:30 PM	1055	4.7%
4:45 PM	1057	4.5%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	1034	4.7%
5:15 PM	778	5.8%
5:30 PM	443	0.9%

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Evergreen Road

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
0 BNG

Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:45 PM		5:00 PM		5:15 PM		5:30 PM				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	45		41	1	42		49	1	179	0.90	1%
	Through	82	1	74	2	105		82		346	0.82	1%
	Right									0		
	App. Total	127	1	115	3	147	0	131	1	525	0.89	
	Pct Trucks		0.007813		0.025424		0		0.007576			
Westbound	Left									0		
	Through	73		91	1	94		76		335	0.89	0%
	Right	6		1		2		1		10	0.42	0%
	App. Total	79	0	92	1	96	0	77	0	345	0.90	
	Pct Trucks		0		0.010753		0		0			
Northbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Southbound	Left	1		2		7	5			15	0.31	33%
	Through									0		
	Right	47	1	43		44	36	1		172	0.54	22%
	App. Total	48	1	45	0	51	41	1	0	187	0.51	
	Pct Trucks		0.020408		0		0.445652		0			
Total Intersection Volume		254	2	252	4	294	41	209	1	1057	0.79	
Intersection Pct Trucks			0.8%		1.6%		12.2%		0.5%			

Pedestrian Calls

APPROACH	MOVEMENT	4:45		5:00		5:15		5:30		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through							1		1
Southbound	Through									0
	App. Total	0	0	0	0	0	0	1	0	1

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Sullivan

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/27/2015

Counter	Analyst
JDK	BNG

AM PEAK HOURS

15 Minute Period Beginning @

APPROACH	MOVEMENT	6:30		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left					33	1	26	2	56	1	38	1	38	1	46		26	1	45	1				
	Through											1		4						1					
	Right					1				1						3		1							
	App. Total	0	0	0	0	34	1	26	2	57	1	39	1	42	1	49	0	27	1	46	1	0	0	0	0
	Pct Trucks						0.029		0.071		0.017		0.025		0.023		0		0.036		0.021				
Westbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Northbound	Left					4		5		4		4		2		4		7		6					
	Through					13		19		26		21		12		15		26		14	1				
	Right																								
	App. Total	0	0	0	0	17	0	24	0	30	0	25	0	14	0	19	0	33	0	20	1	0	0	0	0
	Pct Trucks						0		0		0		0		0		0		0		0.048				
Southbound	Left																								
	Through					2		8		5		6		5		6		4		13	1				
	Right					33	1	30		44	3	27	1	36	4	23	4	28		27	3				
	App. Total	0	0	0	0	35	1	38	0	49	3	33	1	41	4	29	4	32	0	40	4	0	0	0	0
	Pct Trucks						0.028		0		0.058		0.029		0.089		0.121		0		0.091				
Total Intersection Volume		0	0	0	0	86	2	88	2	136	4	97	2	97	5	97	4	92	1	106	6	0	0	0	0
Intersection Pct Trucks						2.3%		2.2%		2.9%		2.0%		4.9%		4.0%		1.1%		5.4%					

Intersection Total		Pct
One Hour Volumes		Trucks
6:30 AM	178	2.2%
6:45 AM	318	2.5%
7:00 AM	417	2.4%
7:15 AM	431	3.0%
7:30 AM	442	3.4%
7:45 AM	395	3.0%

Intersection Total		Pct
One Hour Volumes		Trucks
8:00 AM	408	3.9%
8:15 AM	306	3.6%
8:30 AM	205	3.4%

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd & Sullivan

Data Transfer
Intersection No. 1

DATE OF COUNT: 1/27/2015
Counter Analyst
JDK BNG

Whipple Consulting Engineers, Inc
AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15				Pct
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	Trucks
Eastbound	Left	56	1	38	1	38	1	46		181	0.79	2%
	Through			1		4				5	0.31	0%
	Right	1						3		4	0.33	0%
	App. Total	57	1	39	1	42	1	49	0	190	0.82	
	Pct Trucks		0.017241		0.025		0.023256		0			
Westbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Northbound	Left	4		4		2		4		14	0.88	0%
	Through	26		21		12		15		74	0.71	0%
	Right									0		
	App. Total	30	0	25	0	14	0	19	0	88	0.73	
	Pct Trucks		0		0		0		0			
Southbound	Left									0		
	Through	5		6		5		6		22	0.92	0%
	Right	44	3	27	1	36	4	23	4	142	0.76	8%
	App. Total	49	3	33	1	41	4	29	4	164	0.79	
	Pct Trucks		0.057692		0.029412		0.088889		0.121212			
Total Intersection Volume		136	4	97	2	97	5	97	4	442	0.79	
Intersection Pct Trucks			2.9%		2.0%		4.9%		4.0%			

Pedestrian Calls

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Sullivan Road

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 10/8/2015

PM PEAK HOURS

Counter	Analyst	15 Minute Period Beginning @																							
BNG	BNG																								
APPROACH	MOVEMENT	3:30 PM		3:45 PM		4:00 PM		4:15 PM		4:30 PM		4:45 PM		5:00 PM		5:15 PM		5:30 PM		5:45 PM		6:00 PM		6:15 PM	
		pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk
Eastbound	Left			54	3	50	2	45	1	66	2	63	1	63	1										
	Through																								
	Right			6		5		3		1		6		5											
	App. Total	0	0	60	3	55	2	48	1	67	2	69	1	68	1	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.048		0.035		0.02		0.029		0.014		0.014										
Westbound	Left																								
	Through																								
	Right																								
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																								
Northbound	Left			1		3		5		2		5		9											
	Through			13	2	17		10	1	17		9		11											
	Right																								
	App. Total	0	0	14	2	20	0	15	1	19	0	14	0	20	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.125		0		0.063		0		0		0										
Southbound	Left																								
	Through			30		18		21		19		24		24											
	Right			63	1	50	2	72	1	79		61	1	81											
	App. Total	0	0	93	1	68	2	93	1	98	0	85	1	105	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks				0.011		0.029		0.011		0		0.012		0										
Total Intersection Volume		0	0	167	6	143	4	156	3	184	2	168	2	193	1	0	0	0	0	0	0	0	0	0	0
Intersection Pct Trucks				3.5%		2.7%		1.9%		1.1%		1.2%		0.5%											

Intersection Total		Pct
One Hour Volumes		Trucks
3:30 PM	479	2.7%
3:45 PM	665	2.3%
4:00 PM	662	1.7%
4:15 PM	709	1.1%
4:30 PM	550	0.9%
4:45 PM	364	0.8%

Intersection Total		Pct
	One Hour Volumes	Trucks
5:00 PM	194	0.5%
5:15 PM	0	
5:30 PM	0	

Notes:

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 32nd Avenue & Sullivan Road

Data Transfer
Intersection No. 1

DATE OF COUNT: 10/8/2015
Counter Analyst
BNG BNG

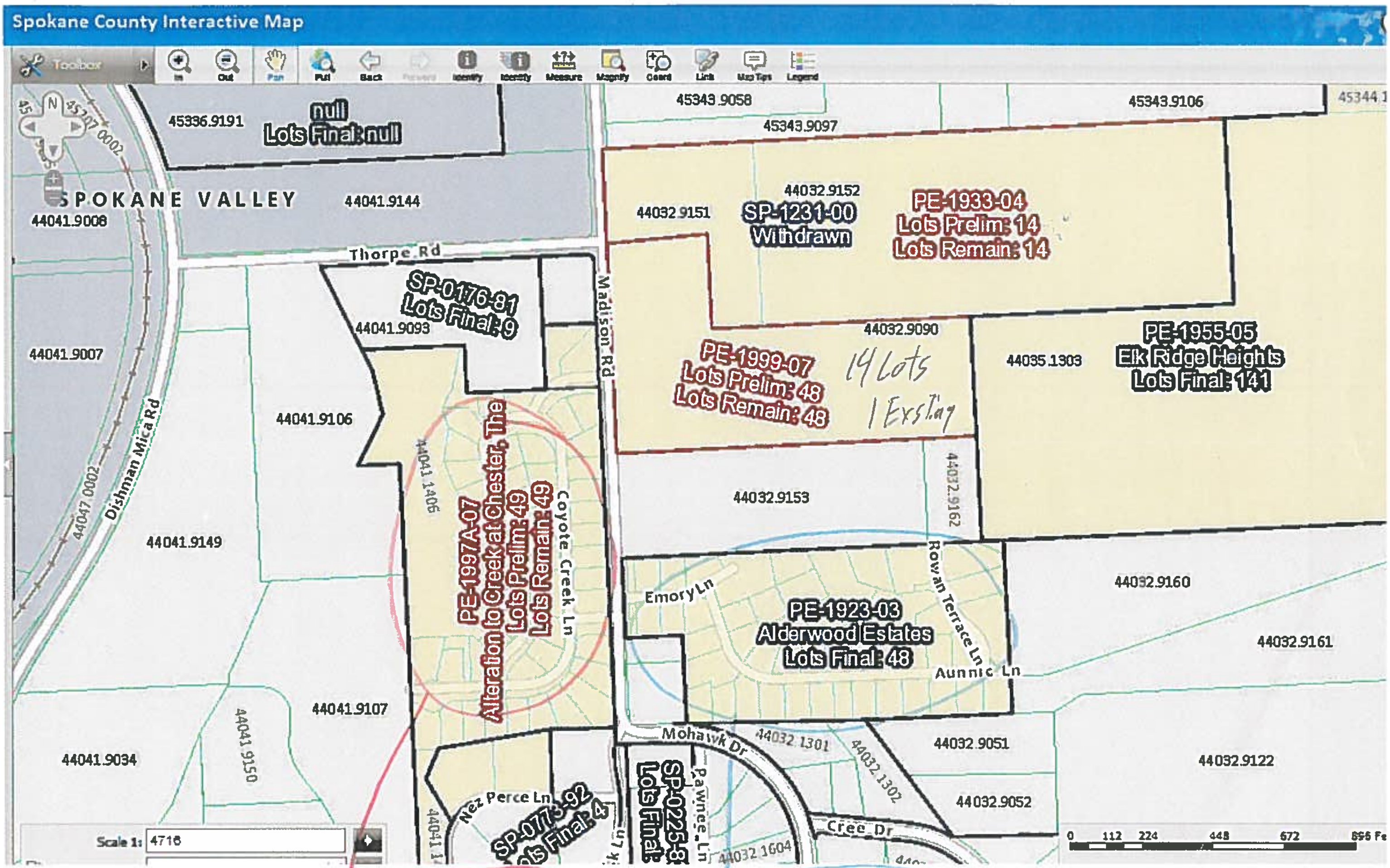
Whipple Consulting Engineers, Inc
PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM				Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk	TOTAL	P.H.F.	
Eastbound	Left	45	1	66	2	63	1	63	1	242	0.89	2%
	Through									0		
	Right	3		1		6		5		15	0.63	0%
	App. Total	48	1	67	2	69	1	68	1	257	0.92	
	Pct Trucks		0.020408		0.028986		0.014286		0.014493			
Westbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Northbound	Left	5		2		5		9		21	0.58	0%
	Through	10	1	17		9		11		48	0.71	2%
	Right									0		
	App. Total	15	1	19	0	14	0	20	0	69	0.86	
	Pct Trucks		0.0625		0		0		0			
Southbound	Left									0		
	Through	21		19		24		24		88	0.92	0%
	Right	72	1	79		61	1	81		295	0.91	1%
	App. Total	93	1	98	0	85	1	105	0	383	0.91	
	Pct Trucks		0.010638		0		0.011628		0			
Total Intersection Volume		156	3	184	2	168	2	193	1	709	0.91	
Intersection Pct Trucks			1.9%		1.1%		1.2%		0.5%			

Pedestrian Calls

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM		
		ped	bike	ped	bike	ped	bike	ped	bike	TOTAL
Eastbound	Through									0
Westbound	Through									0
N orthbound	Through							1		1
Southbound	Through									0
	App. Total	0	0	0	0	0	0	1	0	1

BACKGROUND PROJECTS



All: 49

Done: 5

Remain: 44

All: 49

Done: 38

Remain: 11

Elk Ridge

All: 119

Done: 41

Remain: 78

Thursday, Jan 15, 2015 01:41 PM

Paxton Addition

14 single family residential lots platted
1 lots built out
13 single family residential lots remain

Trip Generation

Table 1 - Trip Generation Rates for LUC # 210 – Single Family Residential Detached Housing

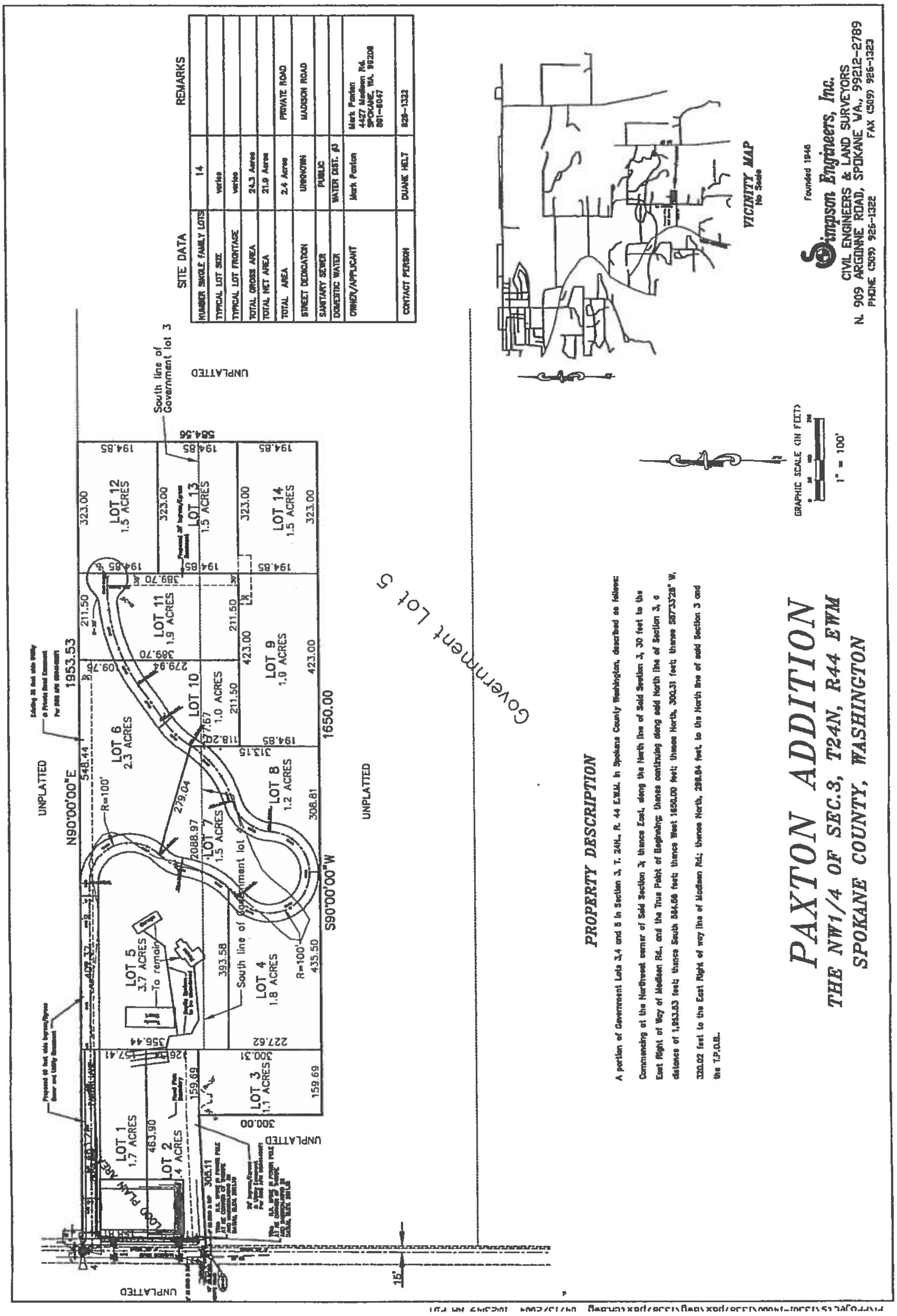
Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. @ 0.76 trips per Unit	Directional Distribution		Vol. @ 1.01 trips per Unit	Directional Distribution	
		26% In	74% Out		65% In	35% Out
13	10	3	7	13	8	5

Average Daily Trip Ends (ADT)		
Units	Rate	ADT
13	11.66	152

Trip Distribution

60% north on Madison Road towards 32nd Avenue
    34% east on 32nd Avenue
    17% north on Pines Road
    9% west on 32nd Avenue

40% west on Thorpe Road towards Dishman-Mica Road
    36% north on Dishman-Mica Road
    4% south on Dishman-Mica Road



PAXTON ADDITION

THE NW1/4 OF SEC.3, T24N, R44 EWM
SPOKANE COUNTY, WASHINGTON

SITE DATA

SITE DATA		REMARKS
NUMBER SINGLE FAMILY LOTS	14	
TYPICAL LOT SIZE	varies	
TYPICAL LOT FRONTAGE	varies	
TOTAL GROSS AREA	24.3 Acres	
TOTAL NET AREA	21.9 Acres	
TOTAL AREA	2.4 Acres	PRIVATE ROAD
STREET DEDICATION	UNKNOWN	MADISON ROAD
SANITARY SEWER	PUBLIC	
DOMESTIC WATER	WATER DIST. #3	
OWNER/APPLICANT	Mark Paxton	Mark Paxton 4427 Madison Rd. SPOKANE, WA. 99206 891-6047
CONTACT PERSON	DUANE HELT	926-1322

PROPERTY DESCRIPTION

A portion of Government Lots 3,4 and 5 in Section 3, T. 24N., R. 44 E.W.M. in Spokane County Washington, described as follows:

Commencing at the Northwest corner of Said Section 3; thence East, along the North line of Said Section 3, 30 feet to the East Right of Way of Madison Rd., and the True Point of Beginning; thence continuing along said North line of Section 3, a distance of 1,953.53 feet; thence South 584.56 feet; thence West 1650.00 feet; thence North, 300.31 feet; thence S87°33'28" W, 320.02 feet to the East Right of way line of Madison Rd.; thence North, 288.84 feet, to the North line of said Section 3 and the T.P.O.B.

Founded 1946
Simpson Engineers, Inc.
CIVIL ENGINEERS & LAND SURVEYORS
N. 909 ARGONNE ROAD, SPOKANE WA., 99212-2789
PHONE (509) 926-1322 FAX (509) 926-1323

N.T.S.

Site plan provided by Simpson Engineers

Sunburst Engineering
4310 S. Ball Dr. (509) 924-2155
Veradale, WA 99037 (509) 228-9440 (fax)

Paxton Addition
Trip Distribution Letter
Project Number 0407

Figure 2
Site Plan

The trip generation characteristics of the site are expected to be represented by the characteristics found in the Institute of Transportation Engineers Manual, *Trip Generation, 7th Edition* for Single-Family Detached Housing, Land Use Category 210. These characteristics are summarized on Table 1.

Table 1 - Trip Generation Characteristics for Paxton Addition

Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol @ 0.77 Trips per Unit	Directional Distribution		Vol @ 1.02 Trips per Unit	Directional Distribution	
		26% In	74% Out		64% In	36% Out
14	11	3	8	14	9	5

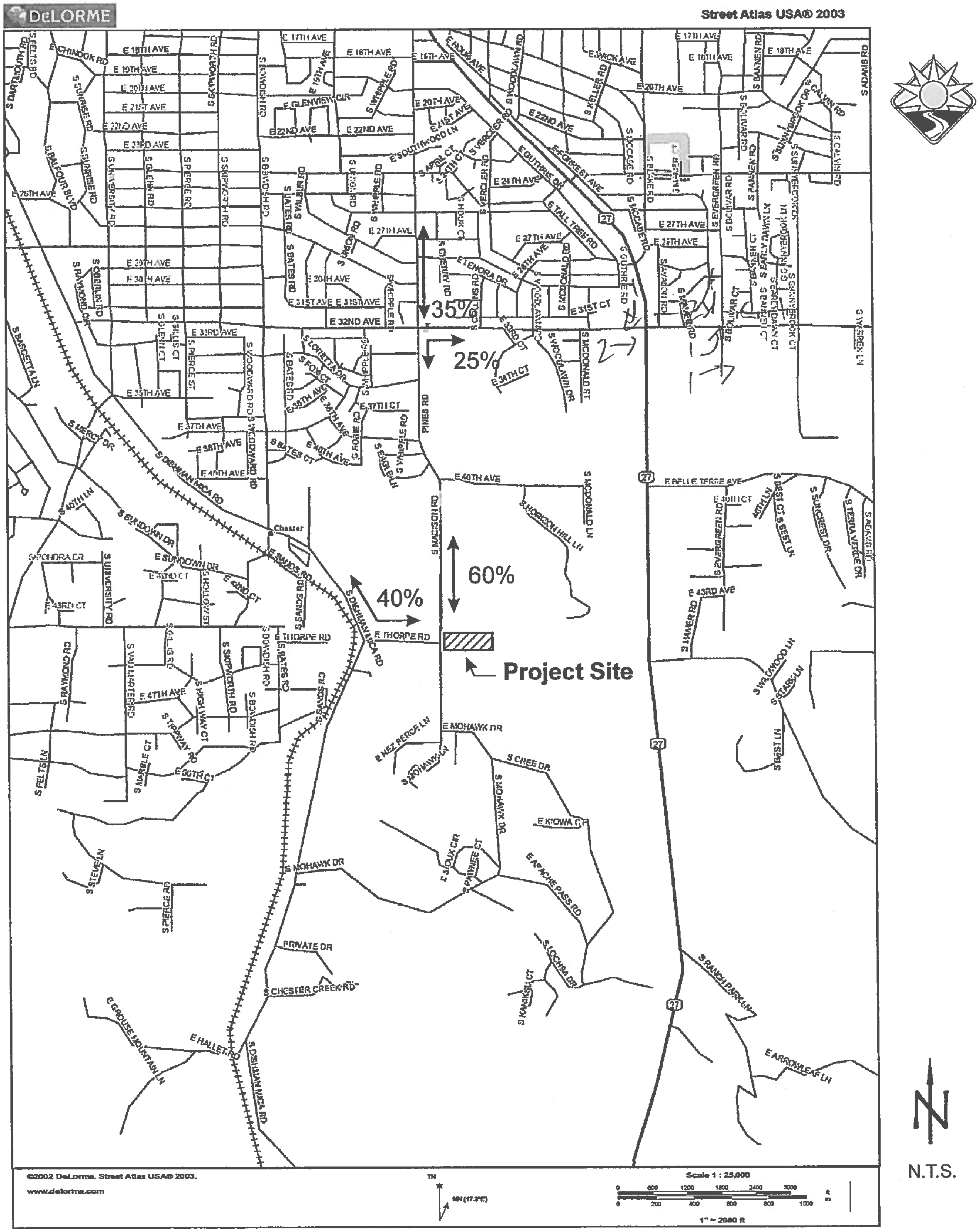
Average Daily Trip Ends (ADT)		
Unit	Rate	Total ADT
14	11.66	163

This site is served by one driveway to Madison Road. Nearly all destinations from the site will be north. However, with the proximity of Dishman-Mica Road, trips headed northwest will go to Dishman-Mica Road and then proceed northwest on that street. Trips destined to the north or northeast are expected to take Madison Road, and some will turn east on 32nd Avenue.

Overall distribution is expected to be 60% north on Madison Road, and 40% to Dishman-Mica. Of the northbound traffic on Madison, 25% will turn east on 32nd Avenue, while the remaining 35% will continue north on Pines Road. These percentages are percentages of the total. Figure 3, Trip Distribution, shows the anticipated distribution of traffic to/from this site.

Based upon this distribution, the site will add four vehicles to Dishman-Mica, and seven to Madison Road, three of which will use 32nd Avenue and four use Pines Road north of 32nd Avenue during the AM peak hour. During the PM peak hour, the site will add six vehicles to Dishman-Mica, five to 32nd Avenue and three to Pines Road north of 32nd Avenue although in the opposite direction.

The traffic from this project will have no identifiable impacts to the surrounding transportation system. The intersection of Pines Road / 32nd Avenue was recently signalized, is generally functioning at high levels of service and can easily accommodate additional traffic volume. The intersection of Thorpe Road / Dishman-



Sunburst Engineering

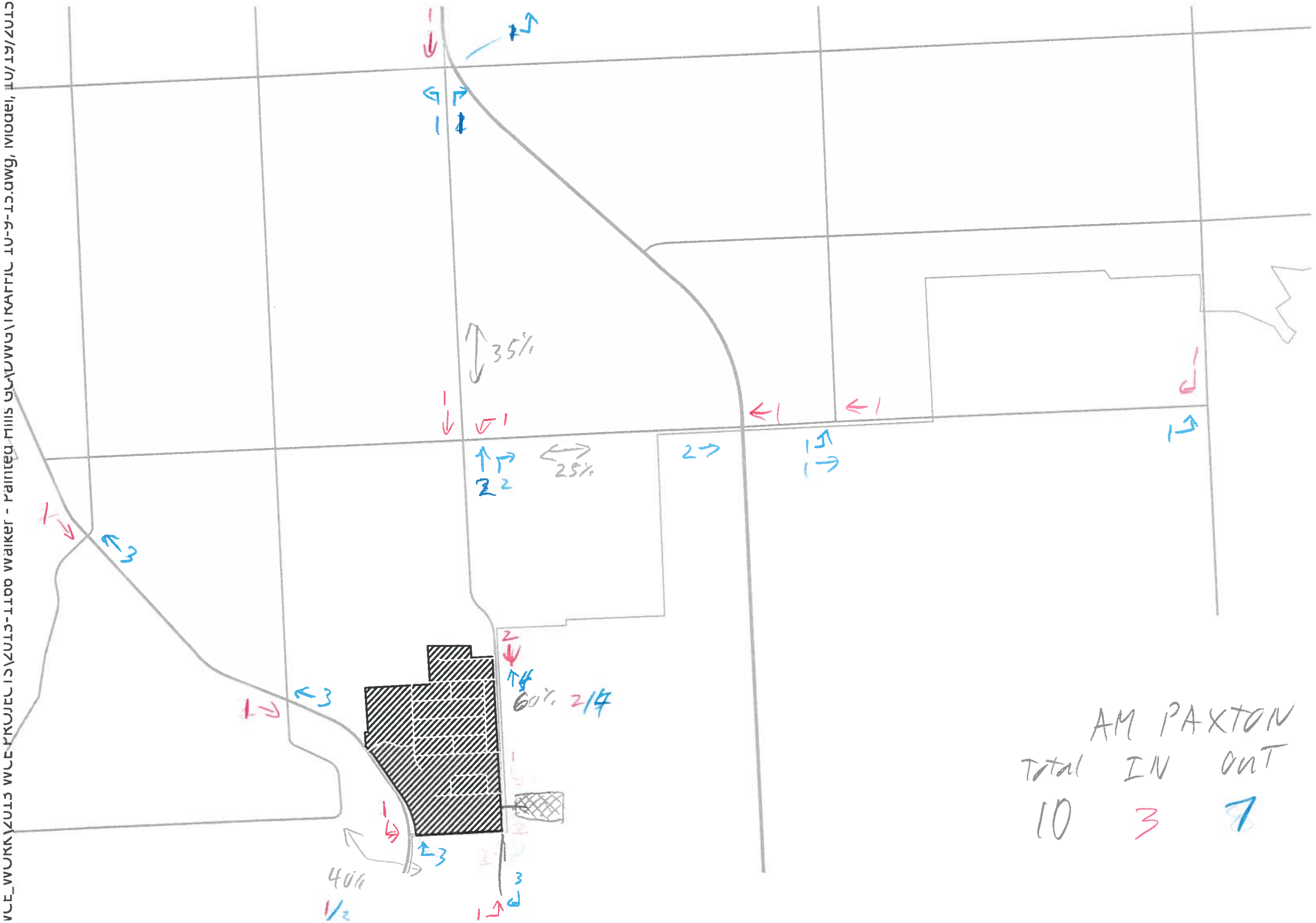
4310 S. Ball Dr. (509) 924-2155
Veradale, WA 99037 (509) 228-9440 (fax)

Paxton Addition

Trip Distribution Letter
Project Number 0407

Figure 3

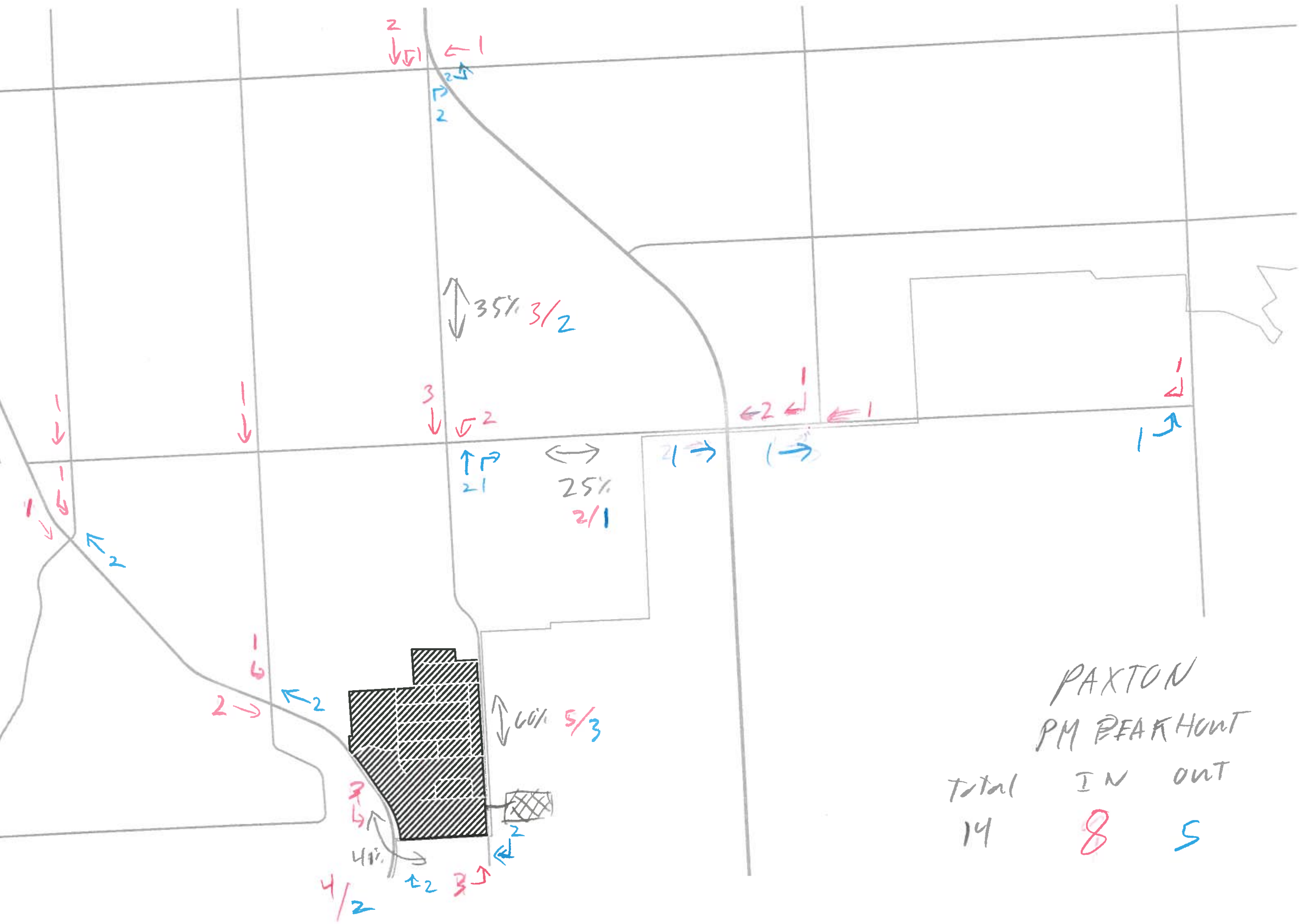
Trip Distribution



AM PAXTON

Total	IN	OUT
10	3	7

WCE_WORK\2015 WCE PROJECTS\2015-1186 Walker - Painted Hills GC\DWG\TRAFFIC 10-9-15.dwg, Model, 10/19/2015 10:52:1



CE_WORK\2015 WCE-PROJECTS\2015-1166 Walker - Painted Hills GC\DWG\TRAFFIC 10-9-15.dwg, Model, 10/19/2015 10:52:1

The Creek at Chester

49 single family residential lots platted
5 lots built out
44 single family residential lots remain

Trip Generation

Table 2 - Trip Generation Rates for LUC # 210 – Single Family Residential Detached Housing

Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. @ 0.76 trips per Unit	Directional Distribution		Vol. @ 1.01 trips per Unit	Directional Distribution	
		26% In	74% Out		65% In	35% Out
44	33	9	24	44	29	15

Average Daily Trip Ends (ADT)		
Units	Rate	ADT
44	11.66	513

Trip Distribution

60% north on Madison Road towards 32nd Avenue
- 34% east on 32nd Avenue
- 17% north on Pines Road
- 9% west on 32nd Avenue

40% west on Thorpe Road towards Dishman-Mica Road
- 36% north on Dishman-Mica Road
- 4% south on Dishman-Mica Road

IV. Trip Generation

The trip generation characteristics of the site are expected to be represented by the characteristics found in the Institute of Transportation Engineers Manual, *Trip Generation, 7th Edition* for Single-Family Detached Housing, Land Use Category 210. Local data is available for average daily traffic from a report prepared by NuStats on behalf of SRTC, and for non-incorporated parts of Spokane County, the rate is 11.55 trips per household per day. The trip making characteristics for the site are summarized on Table 1.

Table 1 - Trip Generation Characteristics for The Creek at Chester

Units	AM Peak Hour			PM Peak Hour			ADT
	Vol @ 0.77 Trips per Unit	Directional Distribution		Vol @ 1.02 Trips per Unit	Directional Distribution		Vol @ 11.55 Trips per Unit
		26% In	74% Out		64% In	36% Out	
49	38	10	28	50	32	18	566

Based on the information on Table 1 the site will generate 38 new trips during the a.m. peak hour and 50 new trips in the p.m. peak hour. During an average day, the site will generate 566 trips.

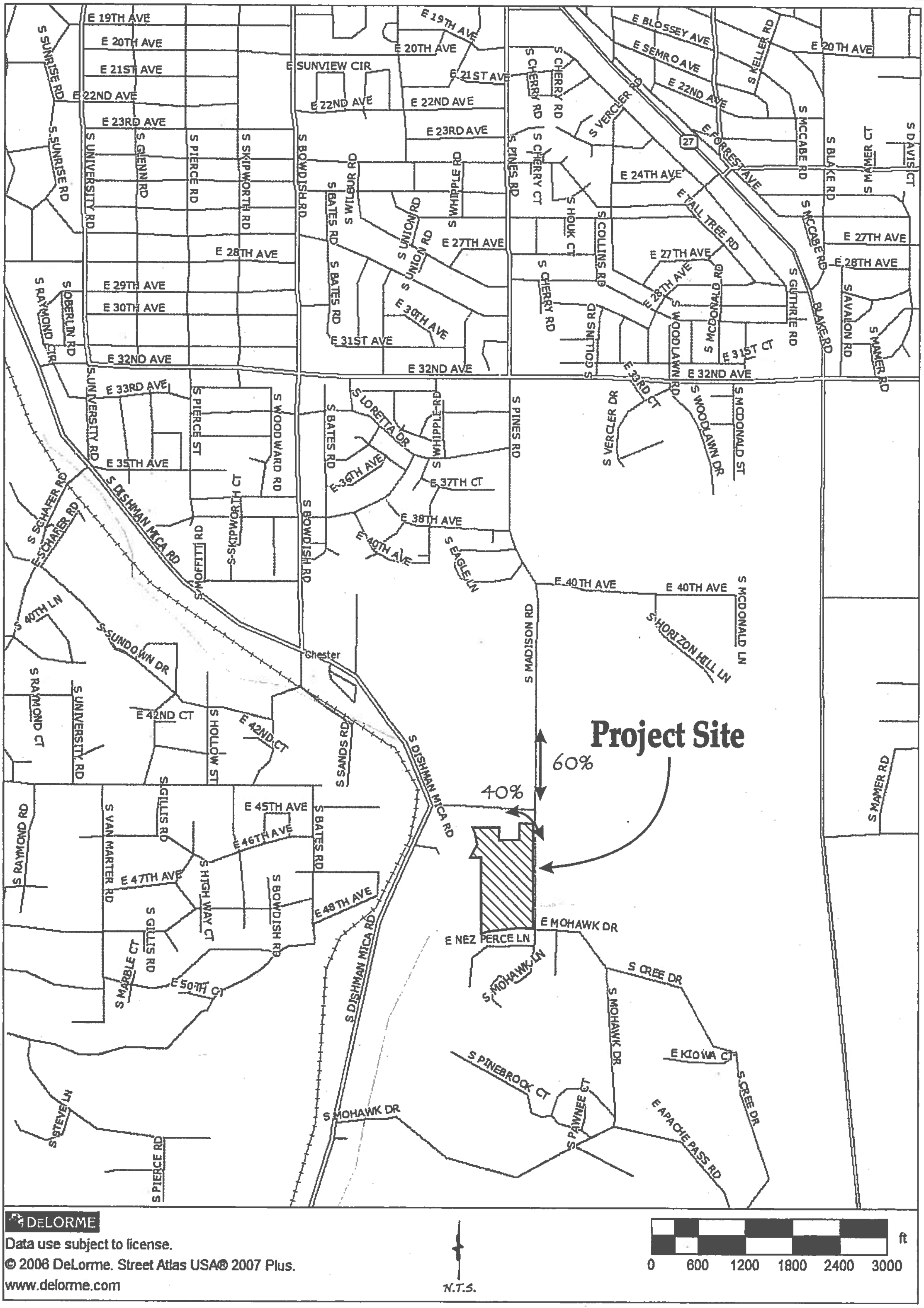
V. Trip Distribution

Overall distribution from the site is expected to be 40% west on Thorpe Road, and 60% north on Madison Road as shown on Figure 5, Trip Distribution. This is substantially different than the distribution contained in the trip distribution letter prepared for this project. However, the field counts at the Thorpe Road / Madison Road intersection indicate that this distribution is more reflective of residential distribution in the area. It is likely that more trips from the area have ends within the Valley and closer to the site than anticipated in the trip distribution letter. This discrepancy was brought to Spokane County and Spokane Valley personnel's attention as soon as it was discovered.

Note that all of the traffic generated by the project is assumed to use the Thorpe Road / Madison Road intersection. A small amount of traffic may go south from the site. However, this is expected to be a very small amount, and was therefore neglected, in part to ensure that the Thorpe Road / Madison Road intersection is functioning at acceptable levels of service. The traffic on Thorpe Road is expected to use Dishman-Mica Road to/from the north, with very limited traffic using Dishman-Mica Road to the south. The site generated traffic volumes are shown on the lower left corner of Figure 3 for the a.m. peak hour and Figure 4 for the p.m. peak hour.

VI. Level of Service Analysis

Intersection levels of service are expressed by using letter designations from A to F, whereby LOS A represents the best operating conditions and LOS F the worst (saturated flow or over-capacity) conditions. The levels are designed to determine how well an intersection is functioning with respect to variables such as traffic flow and delay.



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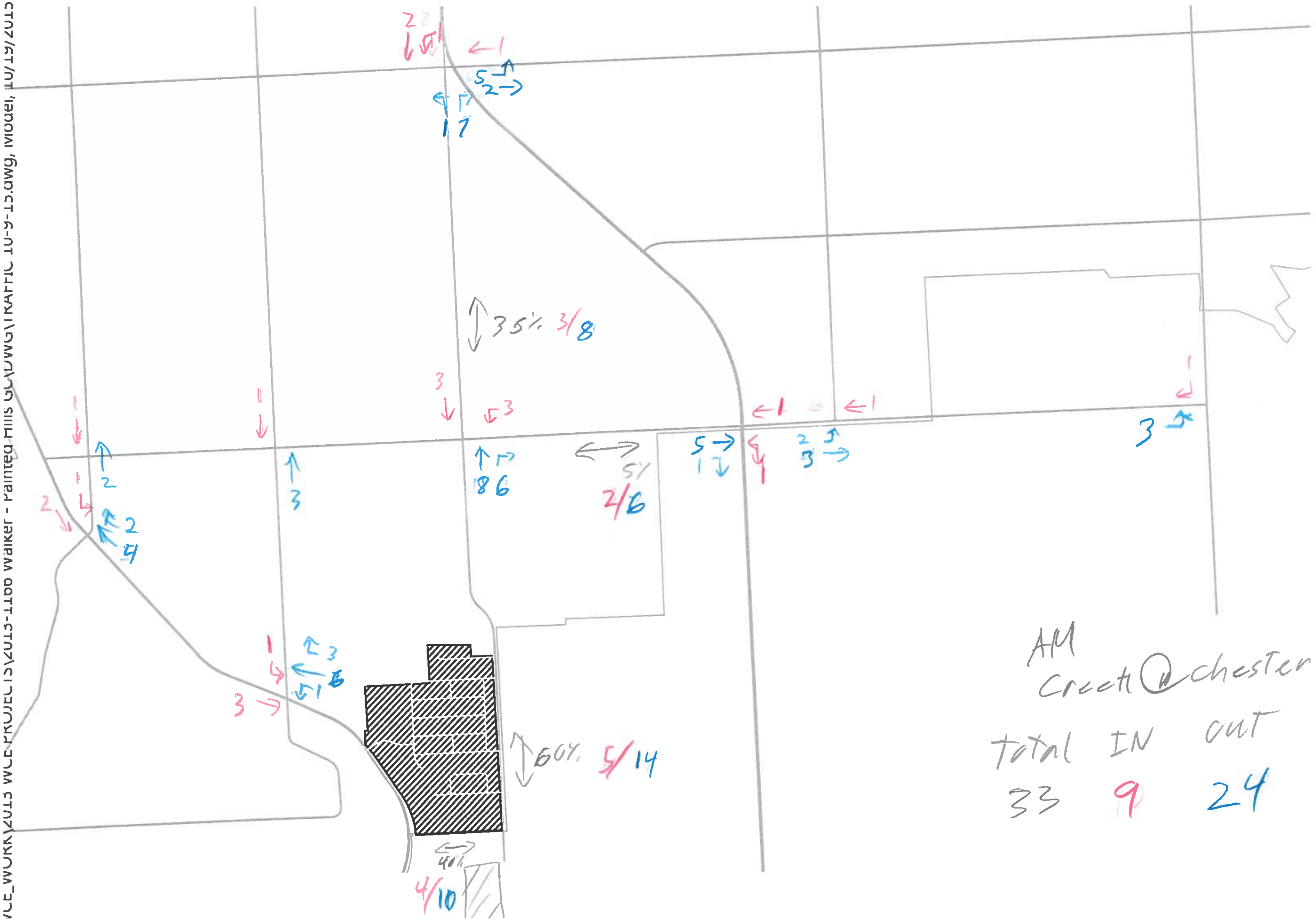
SUNBURST ENGINEERING
4310 S Ball Dr
Veradale, WA 99037
(509) 924-2155
(509) 228-9440 (Fax)
www.sunburstengr.com

The Creek at Chester

Threshold Traffic Study

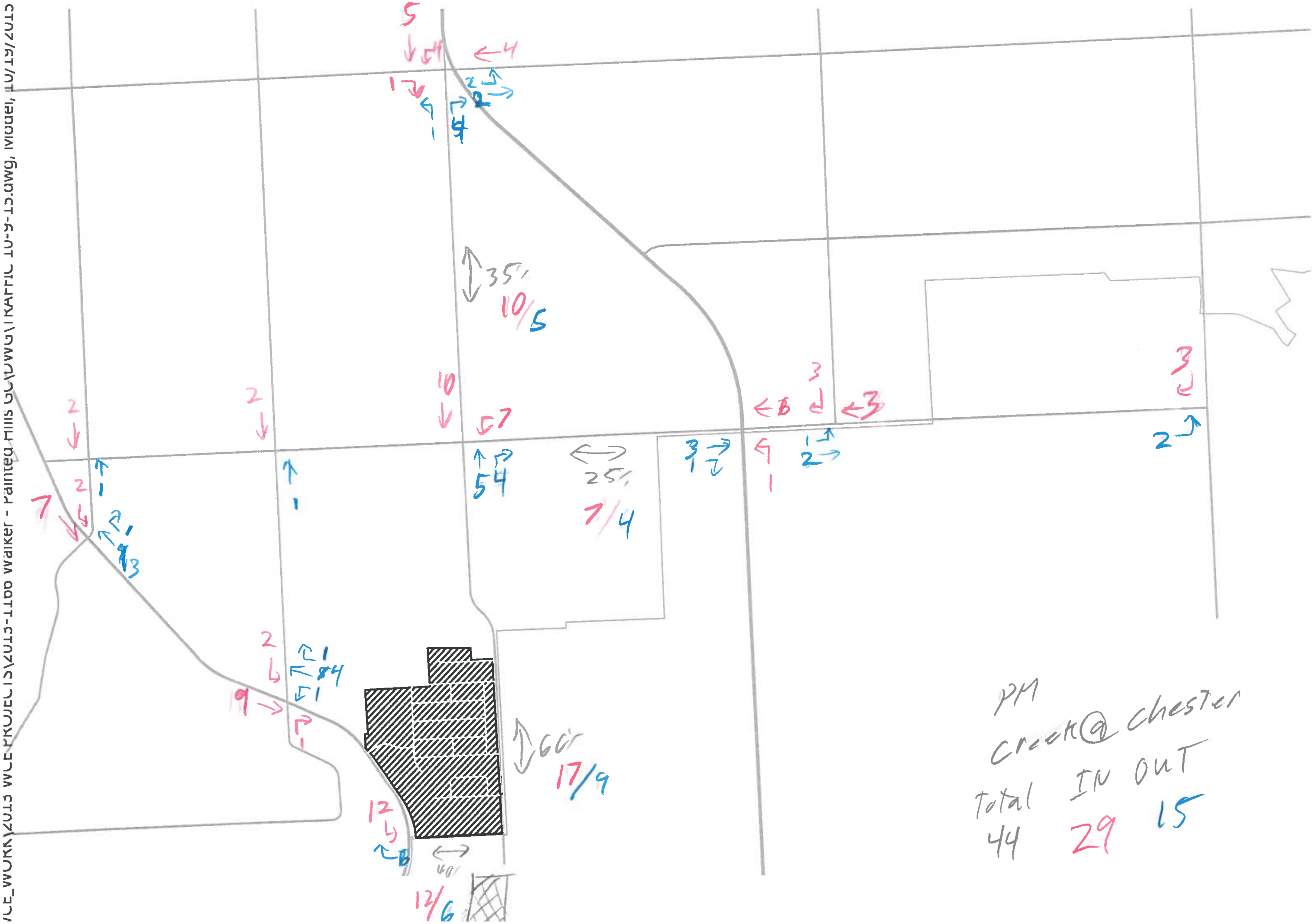
Figure 5
Distribution Map



AM
Creek @ chester

Total IN OUT
33 9 24

PM
Creek@Chester
Total IN OUT
44 29 15



Pine Valley Ranch

132 single family residential lots platted
__0 lots built out
132 single family residential lots

Trip Generation

Table 4 - Trip Generation Rates for LUC # 220 – Apartments

Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. per * equation	Directional Distribution		Vol. per ** equation	Directional Distribution	
		20% In	80% Out		65% In	35% Out
132	69	14	55	90	59	31

Average Daily Trip Ends (ADT)			
Units	Rate	ADT	*AM Vol. eqn: T=0.49(X)+3.73 **PM Vol. eqn: T=0.55(X)+17.65
132	6.65	878	

Trip Distribution

15% west on 32nd Avenue towards Dishman-Mica Road
35% north on State Route 27
20% east on 32nd Avenue, then north on Sullivan Road
15% east on 32nd Avenue, then north on Evergreen Road
5% north on State Route 27, then west on 16th Avenue
5% south on State Route 27
5% internal

Project Impacts

This section documents the impacts which the proposed project would have on the transportation network in the surrounding vicinity. First, trips to be generated by the proposed project are estimated and assigned to the transportation network. With-project levels of service at identified study intersections are evaluated and compared to the baseline condition and local agency standards. Any potential traffic safety impacts and transit and non-motorized impacts are discussed.

Trip Generation

Weekday PM peak hour trip generation for the proposed project was calculated based on trip rates published in the Institute of Transportation Engineer's *Trip Generation Manual* (9th Edition, 2012). The trip generation rates are based on hundreds of studies for different land uses. For this study, the apartments land use (#220) was study with the regression equation used based on the size of the development and recommendations in the *Trip Generation Handbook* (ITE, 2nd Edition, 2004).

The resulting trip generation estimate for the proposed development during the average weekday PM peak hour is shown in Table 3. As shown, the proposed residential development is anticipated to generate 90 net new project trips (59 inbound trips and 31 outbound trips) during the weekday PM peak hour.

Table 3. Weekday PM Peak Hour Trip Generation Summary

			Net New Project Trips[2]		
Land Use	**Size**	**Rate[1]**	**In**	**Out**	**Total**
Apartments (LU 220)	132 DU	eqn	59	31	90

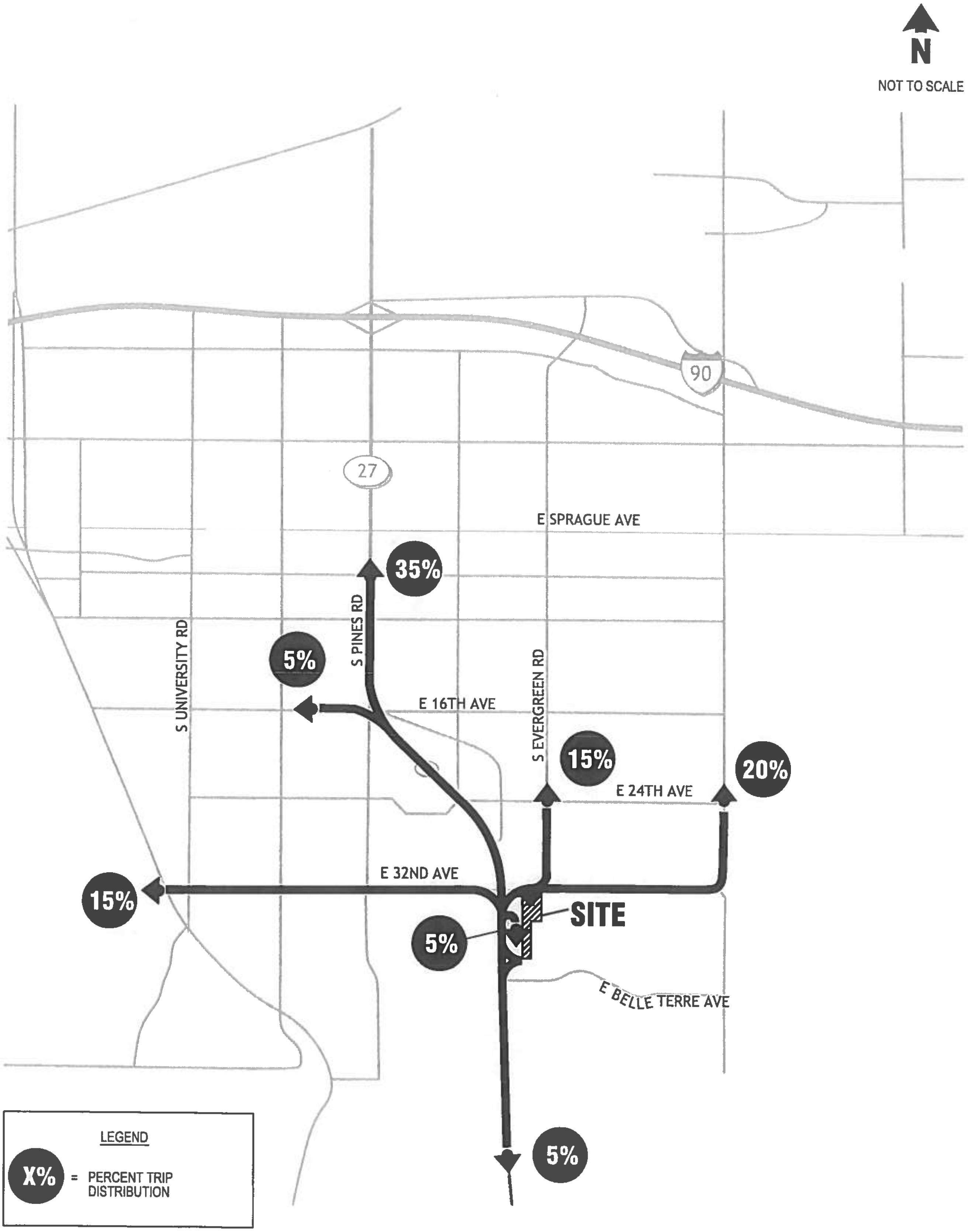
1. Rate derived from equation provided for LU 220 within the ITE *Trip Generation Manual*, 9th Edition.
2. In/out percentages based on ITE *Trip Generation Manual*, 9th Edition.

As shown in Table 3, the proposed residential development is anticipated to generate 90 vehicle trips during the weekday PM peak hour. Of these trips, it is estimated that 59 will be oriented towards the site while 31 leave the site during the weekday PM peak hour.

Trip Distribution and Assignment

The distribution of project traffic is based on a review of local travel patterns and coordination with Spokane Valley, Spokane County, and WSDOT staff. Based on the trip distribution patterns shown in Figure 5, weekday PM peak-hour project traffic was assigned to each of the study intersections as shown in Figure 6.

The project traffic volumes were added to the future baseline 2017 traffic volumes to form the basis of the with-project analysis. Figure 7 shows the weekday PM peak hour with-project traffic volumes. The future with-project traffic volumes and project share are summarized in Table 4.



Project Trip Distribution

Pine Valley Ranch Phase II

FIGURE

5

transpoGROUP

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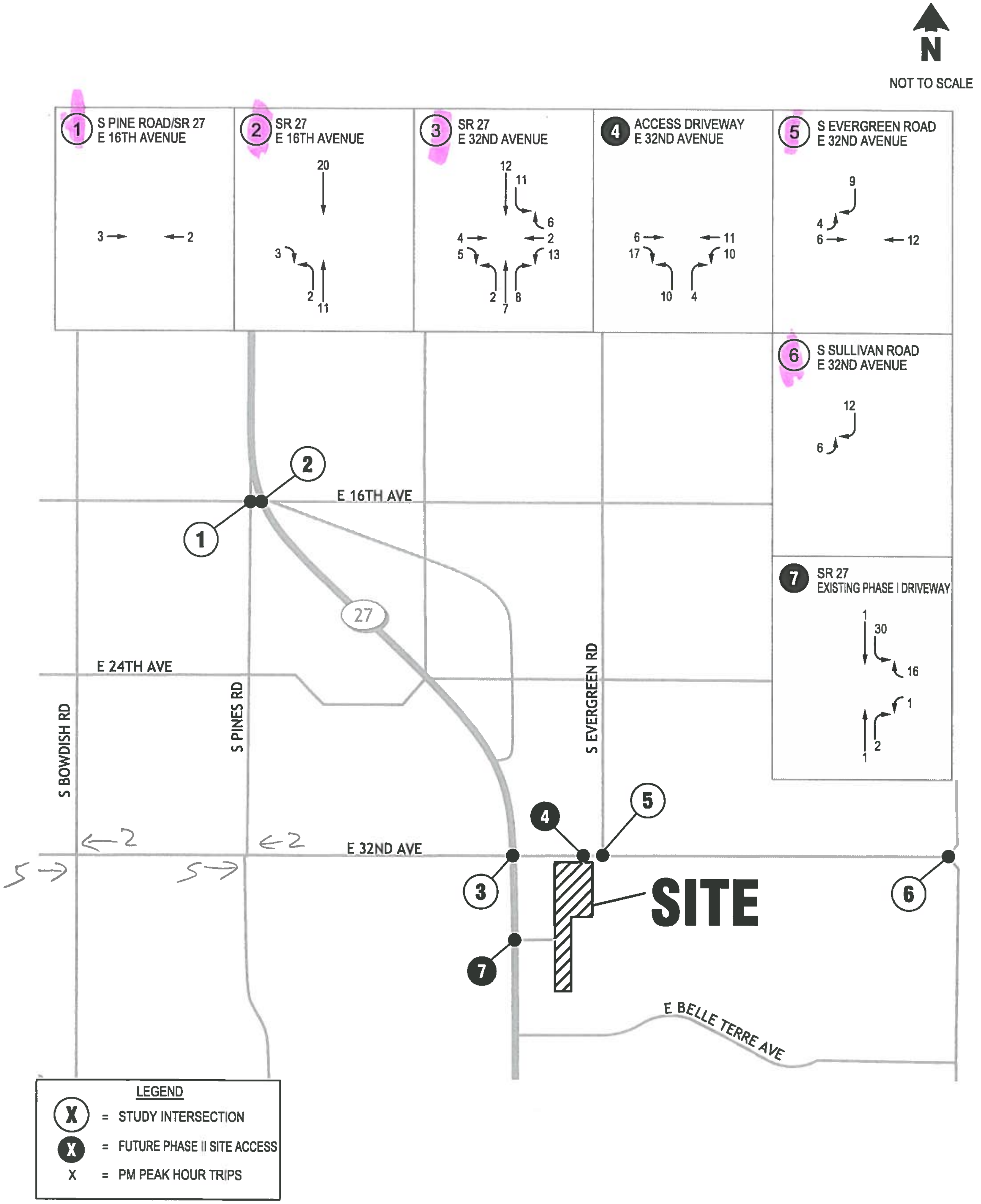

PM Peak Hour Project Trip Assignment

FIGURE

6

Pine Valley Ranch Phase II

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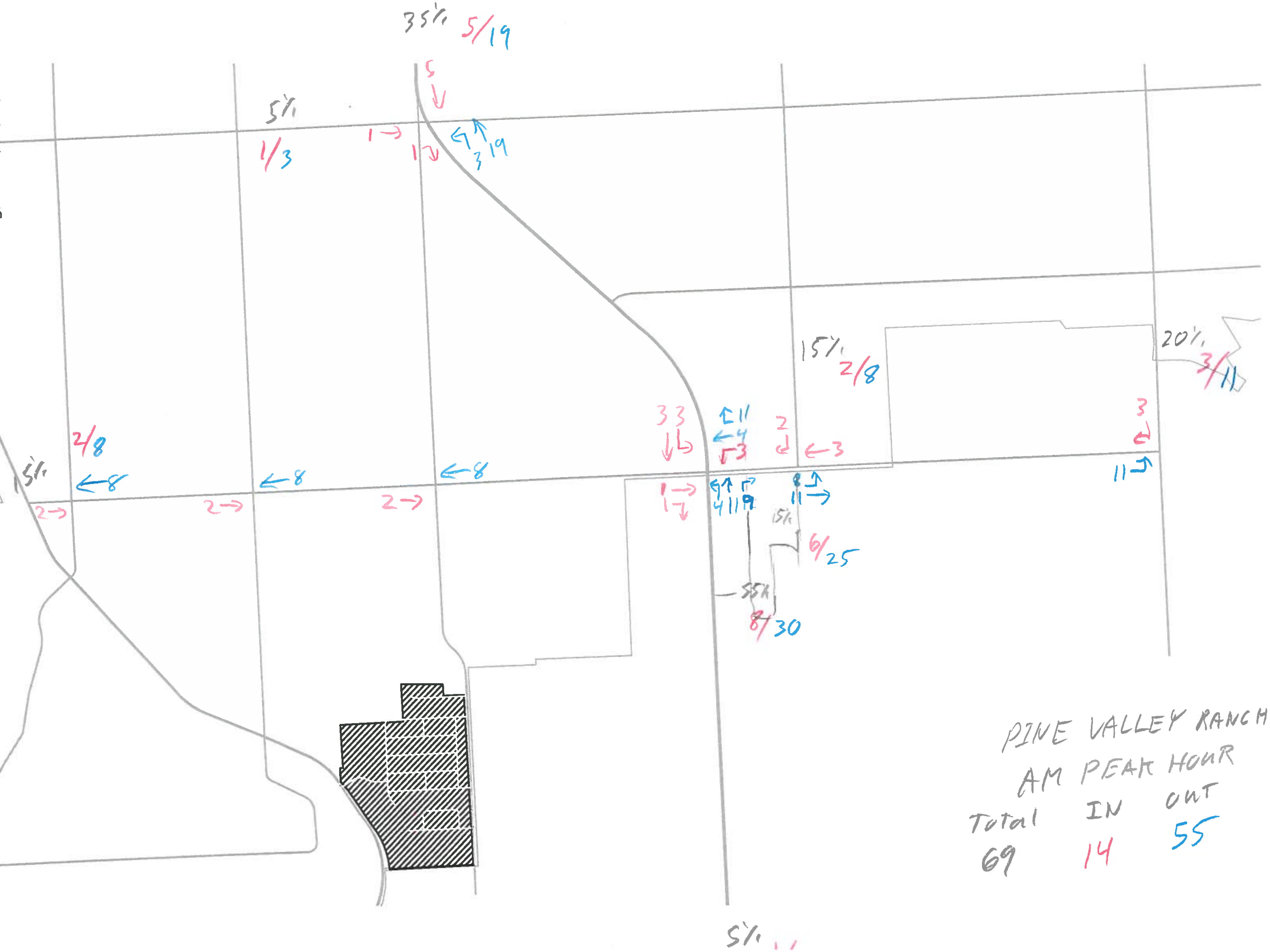
transpogroup
WHAT TRANSPORTATION CAN BE.



PINE VALLEY RANCH
AM PEAK HOUR

Total	IN	OUT
69	14	55

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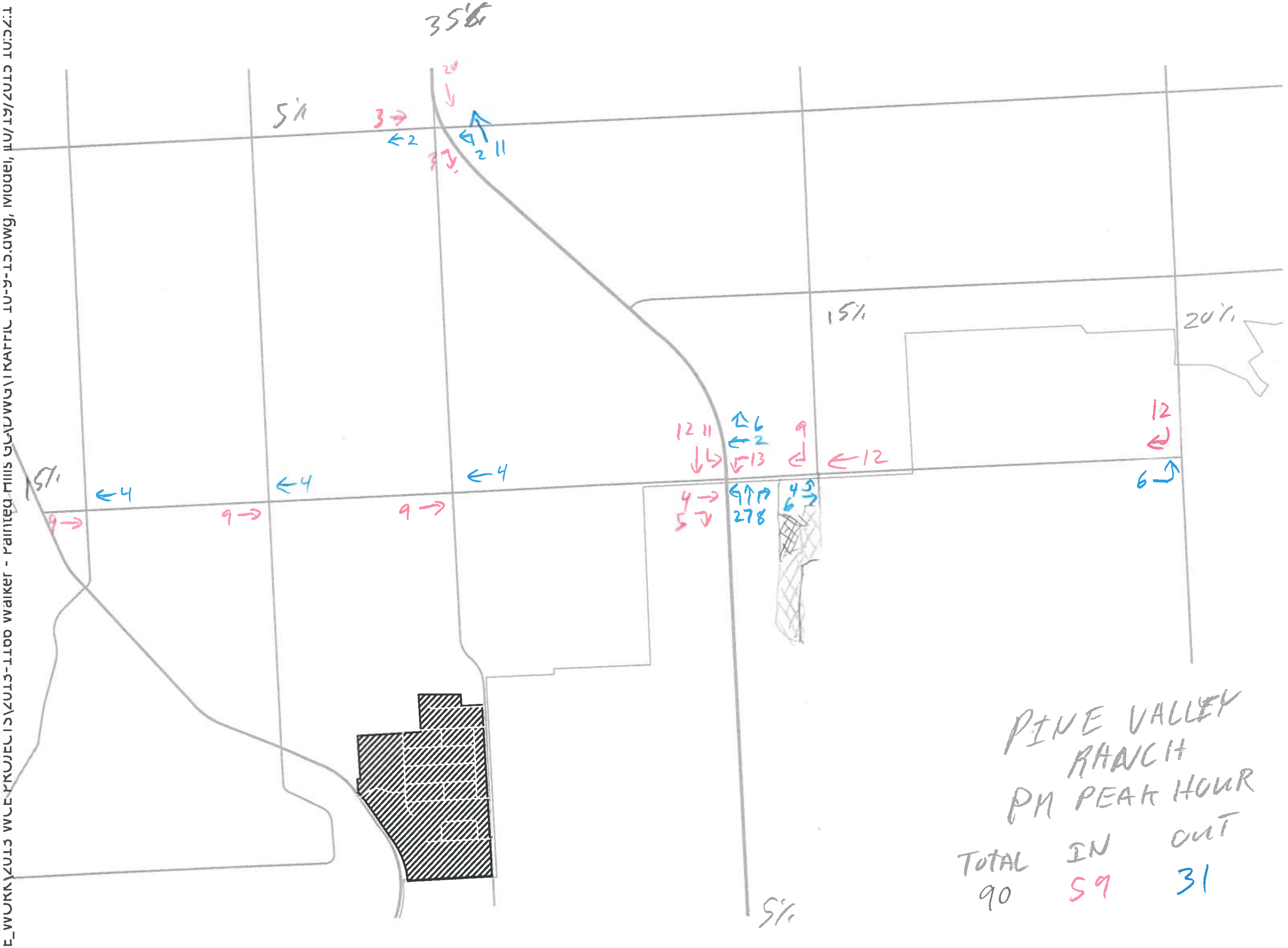


PINE VALLEY
RANCH
PM PEAK HOUR

TOTAL IN OUT
90 59 31

CE_WORK\2015 WCE PROJECTS\2015-1186 Walker - Painted Hills GC\DWG\TRAFFIC 10-9-15.dwg, Model, 10/19/2015 10:52:1

Elk Ridge Heights

119 single family residential lots platted
41 lots built out
78 single family residential lots

Trip Generation

Table 3 - Trip Generation Rates for LUC # 210 – Single Family Residential Detached Housing

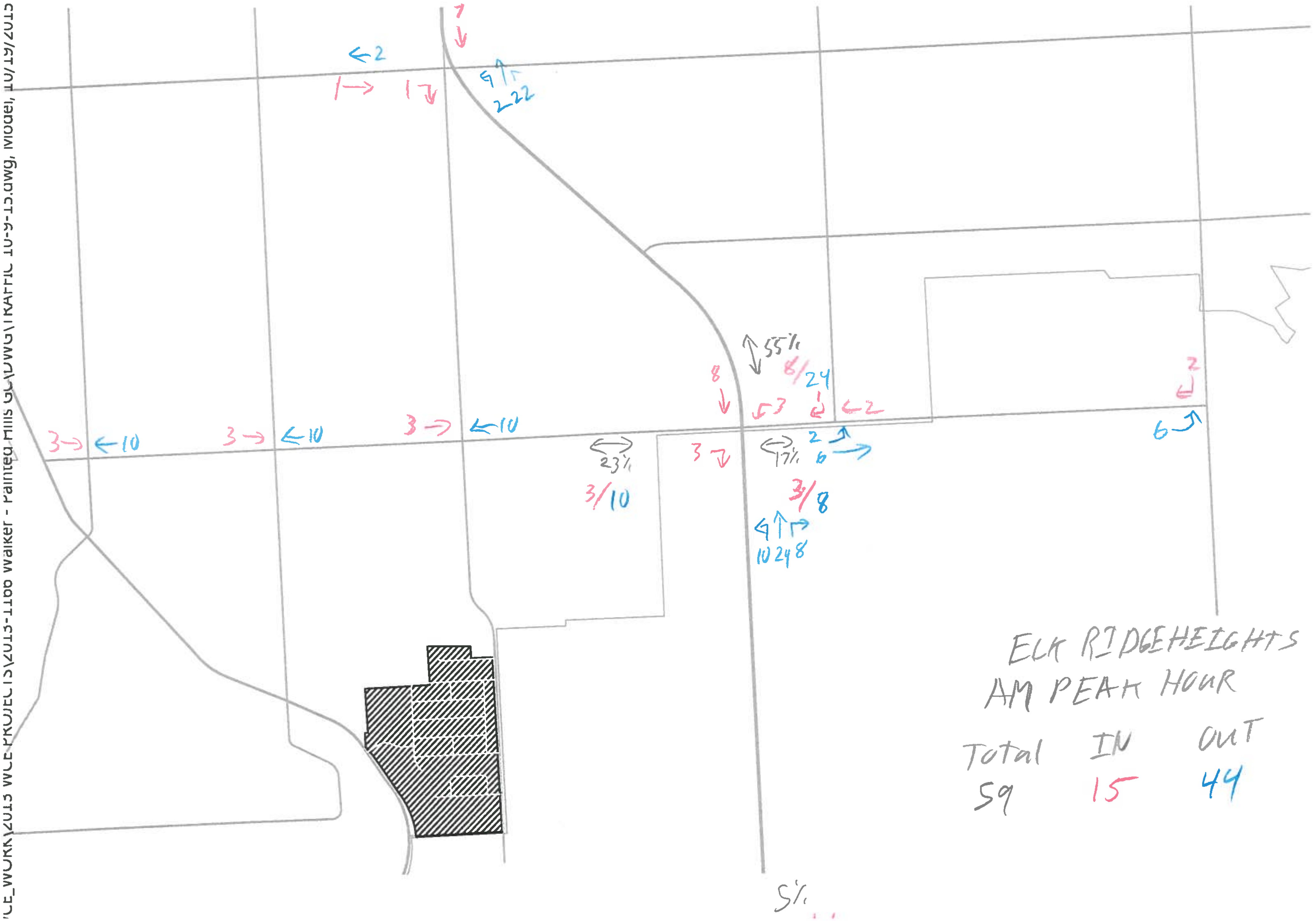
Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. @ 0.76 trips per Unit	Directional Distribution		Vol. @ 1.01 trips per Unit	Directional Distribution	
		26% In	74% Out		65% In	35% Out
78	59	15	44	79	51	28

Average Daily Trip Ends (ADT)		
Units	Rate	ADT
78	11.66	909

Trip Distribution

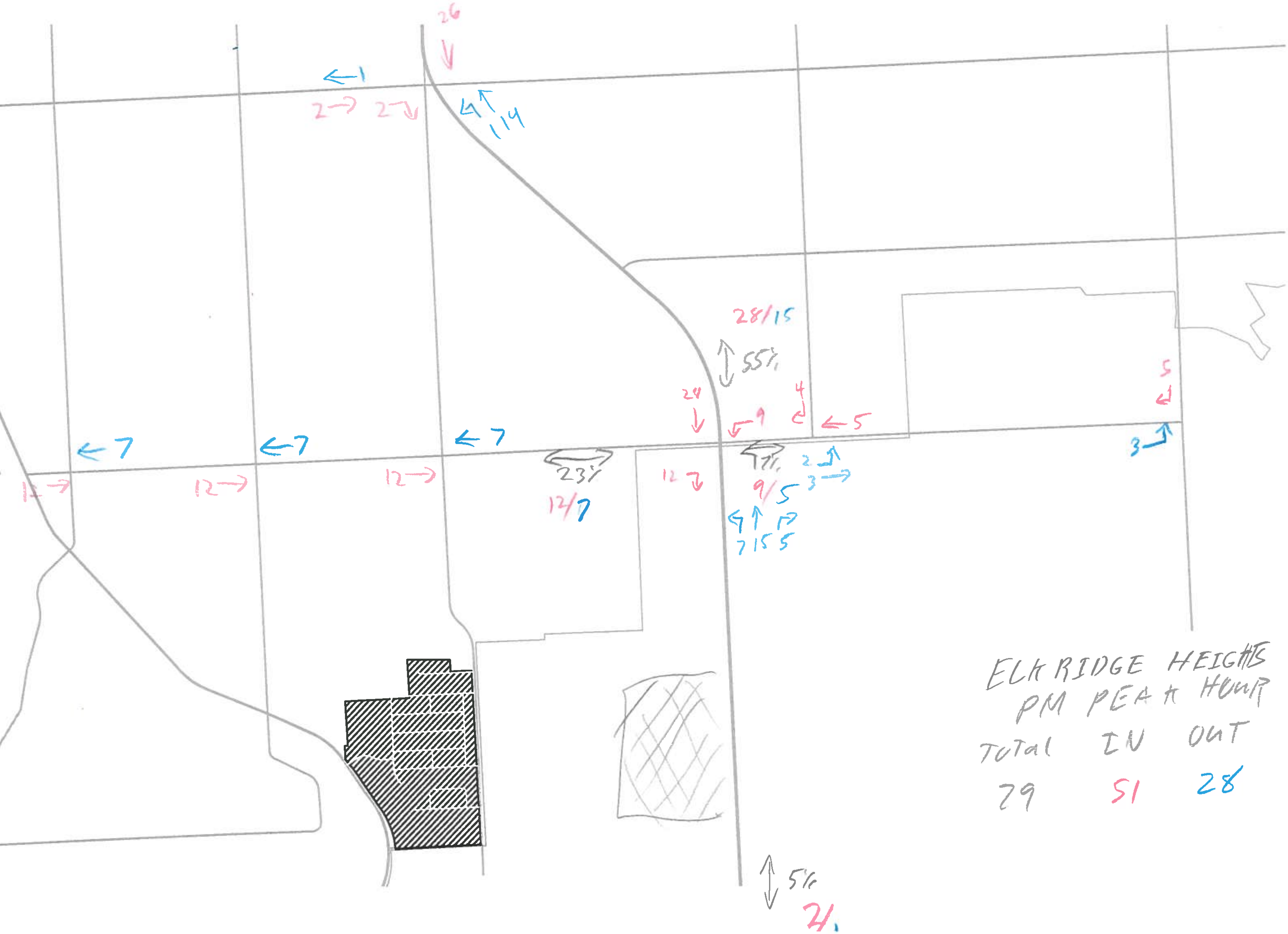
95% north on State Route 27 towards 32nd Avenue
- 55% north on State Route 27
- 23% west on 32nd Avenue
- 17% east on 32nd Avenue

5% south on State Route 27



ELK RIDGEHEIGHTS
AM PEAK HOUR

Total	IN	OUT
59	15	44



ELK RIDGE HEIGHTS
PM PEAK HOUR

Total	IN	OUT
79	51	28

LEVEL OF SERVICE CALCULATIONS EXISTING CONDITIONS

HCM 2010 Signalized Intersection Summary
1: University Rd & 32nd Ave

2015 AM Existing
12/4/2015

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	4	125	6	32	441	111	19	73	60	61	46	4
Future Volume (veh/h)	4	125	6	32	441	111	19	73	60	61	46	4
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	4	136	7	35	479	121	21	79	65	66	50	4
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	1406	71	143	1129	276	37	287	214	94	600	47
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.02	0.15	0.15	0.05	0.18	0.18
Sat Flow, veh/h	19	3317	167	86	2663	651	1774	1932	1445	1774	3323	263
Grp Volume(v), veh/h	77	0	70	341	0	294	21	72	72	66	26	28
Grp Sat Flow(s),veh/h/ln	1838	0	1666	1820	0	1580	1774	1770	1608	1774	1770	1816
Q Serve(g_s), s	0.0	0.0	0.9	0.0	0.0	4.9	0.4	1.3	1.5	1.4	0.5	0.5
Cycle Q Clear(g_c), s	0.9	0.0	0.9	4.8	0.0	4.9	0.4	1.3	1.5	1.4	0.5	0.5
Prop In Lane	0.05		0.10	0.10		0.41	1.00		0.90	1.00		0.14
Lane Grp Cap(c), veh/h	881	0	706	878	0	670	37	262	238	94	319	328
V/C Ratio(X)	0.09	0.00	0.10	0.39	0.00	0.44	0.56	0.27	0.30	0.70	0.08	0.08
Avail Cap(c_a), veh/h	1542	0	1337	1549	0	1269	949	1421	1291	949	1421	1458
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.5	0.0	6.5	7.6	0.0	7.6	18.1	14.1	14.2	17.4	12.7	12.7
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.6	0.0	1.0	17.7	1.2	1.5	12.6	0.2	0.2
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	0.5	0.0	0.5	2.6	0.0	2.3	0.4	0.7	0.8	1.0	0.2	0.3
LnGrp Delay(d),s/veh	6.6	0.0	6.6	8.2	0.0	8.6	35.8	15.3	15.7	30.0	13.0	13.0
LnGrp LOS	A		A	A		A	D	B	B	C	B	B
Approach Vol, veh/h		147			635			165			120	
Approach Delay, s/veh		6.6			8.4			18.1			22.3	
Approach LOS		A			A			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.8	4.8	11.7		20.8	6.0	10.5
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		2.9	2.4	2.5		6.9	3.4	3.5
Green Ext Time (p_c), s		9.6	0.0	2.1		8.9	0.2	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	1	126	35	10	378	18	213	95	22	14	37	11
Future Volume (veh/h)	1	126	35	10	378	18	213	95	22	14	37	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1	138	38	11	415	20	234	104	24	15	41	12
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	468	398	20	900	43	322	311	72	27	86	73
Arrive On Green	0.00	0.25	0.25	0.01	0.26	0.26	0.18	0.21	0.21	0.02	0.05	0.05
Sat Flow, veh/h	1774	1863	1583	1774	3438	165	1774	1465	338	1774	1863	1583
Grp Volume(v), veh/h	1	138	38	11	213	222	234	0	128	15	41	12
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1834	1774	0	1803	1774	1863	1583
Q Serve(g_s), s	0.0	2.4	0.7	0.2	4.0	4.0	4.9	0.0	2.4	0.3	0.8	0.3
Cycle Q Clear(g_c), s	0.0	2.4	0.7	0.2	4.0	4.0	4.9	0.0	2.4	0.3	0.8	0.3
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	5	468	398	20	463	480	322	0	383	27	86	73
V/C Ratio(X)	0.22	0.29	0.10	0.54	0.46	0.46	0.73	0.00	0.33	0.55	0.47	0.16
Avail Cap(c_a), veh/h	1129	1185	1007	903	1126	1167	903	0	1285	903	1327	1128
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	11.9	11.3	19.3	12.2	12.2	15.2	0.0	13.1	19.2	18.3	18.0
Incr Delay (d2), s/veh	32.0	0.5	0.1	27.9	1.0	1.0	4.4	0.0	0.7	22.4	5.7	1.5
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	1.3	0.3	0.3	2.0	2.1	2.7	0.0	1.3	0.3	0.6	0.2
LnGrp Delay(d),s/veh	51.6	12.4	11.4	47.2	13.2	13.2	19.6	0.0	13.8	41.6	23.9	19.5
LnGrp LOS	D	B	B	D	B	B	B		B	D	C	B
Approach Vol, veh/h		177			446			362			68	
Approach Delay, s/veh		12.4			14.0			17.5			27.0	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.5	15.9	11.1	7.8	4.0	16.3	4.6	14.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	2.2	4.4	6.9	2.8	2.0	6.0	2.3	4.4
Green Ext Time (p_c), s	0.0	4.4	0.9	1.3	0.0	4.3	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	51	412	34	23	253	8	52	44	28	73	109	92
Future Volume (veh/h)	51	412	34	23	253	8	52	44	28	73	109	92
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	58	468	39	26	288	9	59	50	32	83	124	105
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	495	661	55	333	671	21	256	204	102	190	215	154
Arrive On Green	0.03	0.39	0.39	0.02	0.37	0.37	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1774	1696	141	1774	1797	56	510	728	364	315	769	550
Grp Volume(v), veh/h	58	0	507	26	0	297	141	0	0	312	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1838	1774	0	1853	1602	0	0	1633	0	0
Q Serve(g_s), s	0.9	0.0	10.4	0.4	0.0	5.4	0.0	0.0	0.0	4.2	0.0	0.0
Cycle Q Clear(g_c), s	0.9	0.0	10.4	0.4	0.0	5.4	2.8	0.0	0.0	7.5	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.03	0.42		0.23	0.27		0.34
Lane Grp Cap(c), veh/h	495	0	716	333	0	692	562	0	0	559	0	0
V/C Ratio(X)	0.12	0.00	0.71	0.08	0.00	0.43	0.25	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	1166	0	983	1032	0	991	927	0	0	965	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.5	0.0	11.5	9.5	0.0	10.5	12.6	0.0	0.0	14.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	2.0	0.1	0.0	0.6	0.3	0.0	0.0	1.2	0.0	0.0
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	5.6	0.2	0.0	2.8	1.4	0.0	0.0	3.6	0.0	0.0
LnGrp Delay(d),s/veh	8.6	0.0	13.5	9.6	0.0	11.1	13.0	0.0	0.0	15.5	0.0	0.0
LnGrp LOS	A		B	A		B	B			B		
Approach Vol, veh/h		565			323			141			312	
Approach Delay, s/veh		13.0			11.0			13.0			15.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	22.5		17.6	5.5	21.8		17.6
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	2.4	12.4		9.5	2.9	7.4		4.8
Green Ext Time (p_c), s	0.0	5.0		3.4	0.1	6.3		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰↑↱			↰↑	↱
Traffic Volume (veh/h)	6	113	31	9	269	20	112	143	16	21	59	7
Future Volume (veh/h)	6	113	31	9	269	20	112	143	16	21	59	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	7	128	35	10	306	23	127	162	18	24	67	8
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	428	117	19	525	39	293	263	25	196	410	425
Arrive On Green	0.01	0.30	0.30	0.01	0.31	0.31	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1774	1409	385	1774	1711	129	547	979	95	243	1527	1583
Grp Volume(v), veh/h	7	0	163	10	0	329	307	0	0	91	0	8
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	0	1840	1621	0	0	1770	0	1583
Q Serve(g_s), s	0.1	0.0	2.4	0.2	0.0	5.2	4.3	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.1	0.0	2.4	0.2	0.0	5.2	5.8	0.0	0.0	1.3	0.0	0.1
Prop In Lane	1.00		0.21	1.00		0.07	0.41		0.06	0.26		1.00
Lane Grp Cap(c), veh/h	13	0	545	19	0	564	581	0	0	606	0	425
V/C Ratio(X)	0.52	0.00	0.30	0.53	0.00	0.58	0.53	0.00	0.00	0.15	0.00	0.02
Avail Cap(c_a), veh/h	766	0	1292	1277	0	1271	885	0	0	918	0	729
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	9.3	17.1	0.0	10.2	11.3	0.0	0.0	9.8	0.0	9.3
Incr Delay (d2), s/veh	38.8	0.0	0.4	29.4	0.0	1.4	1.1	0.0	0.0	0.2	0.0	0.0
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	0.2	0.0	1.2	0.2	0.0	2.9	2.8	0.0	0.0	0.7	0.0	0.1
LnGrp Delay(d),s/veh	56.0	0.0	9.7	46.5	0.0	11.5	12.4	0.0	0.0	9.9	0.0	9.4
LnGrp LOS	E		A	D		B	B			A		A
Approach Vol, veh/h		170			339			307			99	
Approach Delay, s/veh		11.6			12.6			12.4			9.9	
Approach LOS		B			B			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.4	16.0		14.3	4.3	16.2		14.3
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	2.2	4.4		3.3	2.1	7.2		7.8
Green Ext Time (p_c), s	0.0	3.7		2.7	0.0	3.4		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	6	73	218	12	34	111
Future Vol, veh/h	6	73	218	12	34	111
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	92	276	15	43	141

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	511	284	0	0	291	0
Stage 1	284	-	-	-	-	-
Stage 2	227	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	523	755	-	-	1271	-
Stage 1	764	-	-	-	-	-
Stage 2	811	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	504	755	-	-	1271	-
Mov Cap-2 Maneuver	504	-	-	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	781	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	727	1271	-
HCM Lane V/C Ratio	-	-	0.138	0.034	-
HCM Control Delay (s)	-	-	10.7	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	223	41	49	198	0	24	0	198	0	134	31
Future Vol, veh/h	0	223	41	49	198	0	24	0	198	0	134	31
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	253	47	56	225	0	27	0	225	0	152	35

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	225	0	0	300	0	0	707	613	277	725	636	225
Stage 1	-	-	-	-	-	-	277	277	-	336	336	-
Stage 2	-	-	-	-	-	-	430	336	-	389	300	-
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	1344	-	-	1261	-	-	350	408	762	340	395	814
Stage 1	-	-	-	-	-	-	729	681	-	678	642	-
Stage 2	-	-	-	-	-	-	603	642	-	635	666	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1344	-	-	1261	-	-	221	387	762	230	375	814
Mov Cap-2 Maneuver	-	-	-	-	-	-	221	387	-	230	375	-
Stage 1	-	-	-	-	-	-	729	681	-	678	609	-
Stage 2	-	-	-	-	-	-	411	609	-	448	666	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	15.2	20.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	603	1344	-	-	1261	-	-	417
HCM Lane V/C Ratio	0.418	-	-	-	0.044	-	-	0.45
HCM Control Delay (s)	15.2	0	-	-	8	0	-	20.5
HCM Lane LOS	C	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	2.1	0	-	-	0.1	-	-	2.3

	⤴	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	173	184	20	5	188	68	49	401	18	39	99	1
Future Volume (veh/h)	173	184	20	5	188	68	49	401	18	39	99	1
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	204	216	24	6	221	0	58	472	21	46	116	1
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	255	270	456	8	294	257	89	684	30	77	689	6
Arrive On Green	0.29	0.29	0.29	0.16	0.16	0.00	0.05	0.20	0.20	0.04	0.19	0.19
Sat Flow, veh/h	883	935	1583	49	1811	1583	1774	3452	153	1774	3596	31
Grp Volume(v), veh/h	420	0	24	227	0	0	58	242	251	46	57	60
Grp Sat Flow(s),veh/h/ln	1819	0	1583	1860	0	1583	1774	1770	1836	1774	1770	1857
Q Serve(g_s), s	13.9	0.0	0.7	7.6	0.0	0.0	2.1	8.2	8.3	1.7	1.7	1.8
Cycle Q Clear(g_c), s	13.9	0.0	0.7	7.6	0.0	0.0	2.1	8.2	8.3	1.7	1.7	1.8
Prop In Lane	0.49		1.00	0.03		1.00	1.00		0.08	1.00		0.02
Lane Grp Cap(c), veh/h	524	0	456	302	0	257	89	351	364	77	339	356
V/C Ratio(X)	0.80	0.00	0.05	0.75	0.00	0.00	0.65	0.69	0.69	0.60	0.17	0.17
Avail Cap(c_a), veh/h	1400	0	1219	860	0	732	820	818	848	820	818	858
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	0.0	16.7	26.0	0.0	0.0	30.3	24.2	24.2	30.5	21.9	21.9
Incr Delay (d2), s/veh	2.9	0.0	0.0	3.8	0.0	0.0	7.9	1.8	1.8	7.2	0.1	0.1
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	7.3	0.0	0.3	4.2	0.0	0.0	1.2	4.2	4.4	1.0	0.9	0.9
LnGrp Delay(d),s/veh	24.3	0.0	16.7	29.7	0.0	0.0	38.2	26.0	25.9	37.7	22.0	22.0
LnGrp LOS	C		B	C			D	C	C	D	C	C
Approach Vol, veh/h		444			227			551			163	
Approach Delay, s/veh		23.9			29.7			27.2			26.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.2	17.4		15.5	7.8	17.9		23.7
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	4.1	3.8		9.6	3.7	10.3		15.9
Green Ext Time (p_c), s	0.1	2.7		1.1	0.1	2.6		2.8

Intersection Summary			
HCM 2010 Ctrl Delay			26.5
HCM 2010 LOS			C

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	15	344	3	38	390	53	43	50	99	181	33	31
Future Volume (veh/h)	15	344	3	38	390	53	43	50	99	181	33	31
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	17	391	3	43	443	60	49	57	112	206	38	35
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	392	925	7	483	823	112	328	81	159	351	207	191
Arrive On Green	0.01	0.50	0.50	0.02	0.51	0.51	0.03	0.14	0.14	0.12	0.23	0.23
Sat Flow, veh/h	1774	1846	14	1774	1607	218	1774	562	1105	1774	894	823
Grp Volume(v), veh/h	17	0	394	43	0	503	49	0	169	206	0	73
Grp Sat Flow(s),veh/h/ln	1774	0	1860	1774	0	1824	1774	0	1668	1774	0	1717
Q Serve(g_s), s	0.4	0.0	12.0	1.1	0.0	16.7	2.1	0.0	8.7	8.4	0.0	3.1
Cycle Q Clear(g_c), s	0.4	0.0	12.0	1.1	0.0	16.7	2.1	0.0	8.7	8.4	0.0	3.1
Prop In Lane	1.00		0.01	1.00		0.12	1.00		0.66	1.00		0.48
Lane Grp Cap(c), veh/h	392	0	932	483	0	935	328	0	240	351	0	398
V/C Ratio(X)	0.04	0.00	0.42	0.09	0.00	0.54	0.15	0.00	0.70	0.59	0.00	0.18
Avail Cap(c_a), veh/h	767	0	932	1035	0	935	665	0	594	631	0	478
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	12.2	0.0	14.2	11.3	0.0	14.7	31.3	0.0	36.6	26.6	0.0	27.7
Incr Delay (d2), s/veh	0.0	0.0	1.4	0.1	0.0	2.2	0.2	0.0	7.8	1.6	0.0	0.5
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	0.2	0.0	6.5	0.5	0.0	9.0	1.0	0.0	4.5	4.2	0.0	1.5
LnGrp Delay(d),s/veh	12.2	0.0	15.6	11.4	0.0	17.0	31.5	0.0	44.4	28.2	0.0	28.2
LnGrp LOS	B		B	B		B	C		D	C		C
Approach Vol, veh/h		411			546			218			279	
Approach Delay, s/veh		15.5			16.5			41.5			28.2	
Approach LOS		B			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	51.0	15.3	17.9	6.6	50.0	7.4	25.8
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	25.0	32.0	30.0	45.0	20.0	25.0
Max Q Clear Time (g_c+I1), s	2.4	18.7	10.4	10.7	3.1	14.0	4.1	5.1
Green Ext Time (p_c), s	0.0	6.7	0.5	2.5	0.1	12.4	0.1	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	22.2
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	75	0	10	0	0	0	49	61	0	0	24	51
Future Vol, veh/h	75	0	10	0	0	0	49	61	0	0	24	51
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	92	82	92	92	92	82	82	92	92	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	91	0	12	0	0	0	60	74	0	0	29	62

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	254	254	60	260	285	74	91	0	0	74	0	0
Stage 1	60	60	-	194	194	-	-	-	-	-	-	-
Stage 2	194	194	-	66	91	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	699	650	1005	693	624	988	1504	-	-	1526	-	-
Stage 1	951	845	-	808	740	-	-	-	-	-	-	-
Stage 2	808	740	-	945	820	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	677	623	1005	663	598	988	1504	-	-	1526	-	-
Mov Cap-2 Maneuver	677	623	-	663	598	-	-	-	-	-	-	-
Stage 1	911	845	-	774	709	-	-	-	-	-	-	-
Stage 2	774	709	-	934	820	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	0	3.3	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1504	-	-	704	-	1526	-	-
HCM Lane V/C Ratio	0.04	-	-	0.147	-	-	-	-
HCM Control Delay (s)	7.5	0	-	11	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	125	221	55	59	191	66	114	258	126	22	78	72
Future Volume (veh/h)	125	221	55	59	191	66	114	258	126	22	78	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	134	238	59	63	205	71	123	277	135	24	84	77
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	179	818	199	105	328	114	165	484	230	51	264	218
Arrive On Green	0.10	0.29	0.29	0.06	0.25	0.25	0.09	0.21	0.21	0.03	0.14	0.14
Sat Flow, veh/h	1774	2825	686	1774	1323	458	1774	2331	1106	1774	1840	1524
Grp Volume(v), veh/h	134	147	150	63	0	276	123	208	204	24	80	81
Grp Sat Flow(s),veh/h/ln	1774	1770	1742	1774	0	1782	1774	1770	1668	1774	1770	1594
Q Serve(g_s), s	3.5	3.1	3.2	1.7	0.0	6.6	3.3	5.1	5.3	0.6	2.0	2.2
Cycle Q Clear(g_c), s	3.5	3.1	3.2	1.7	0.0	6.6	3.3	5.1	5.3	0.6	2.0	2.2
Prop In Lane	1.00		0.39	1.00		0.26	1.00		0.66	1.00		0.96
Lane Grp Cap(c), veh/h	179	513	504	105	0	441	165	367	346	51	253	228
V/C Ratio(X)	0.75	0.29	0.30	0.60	0.00	0.63	0.75	0.57	0.59	0.47	0.32	0.35
Avail Cap(c_a), veh/h	920	1469	1446	920	0	1479	1105	1469	1384	1105	1469	1323
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	13.3	13.3	22.1	0.0	16.1	21.3	17.1	17.2	23.0	18.5	18.6
Incr Delay (d2), s/veh	6.1	0.3	0.3	5.4	0.0	1.5	6.6	1.0	1.2	6.8	0.6	0.8
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	2.0	1.6	1.6	1.0	0.0	3.4	1.9	2.6	2.5	0.4	1.0	1.0
LnGrp Delay(d),s/veh	27.1	13.6	13.6	27.5	0.0	17.6	27.9	18.2	18.4	29.8	19.1	19.4
LnGrp LOS	C	B	B	C		B	C	B	B	C	B	B
Approach Vol, veh/h		431			339			535			185	
Approach Delay, s/veh		17.8			19.4			20.5			20.6	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	15.5	7.3	18.5	10.0	12.4	9.4	16.4
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	2.6	7.3	3.7	5.2	5.3	4.2	5.5	8.6
Green Ext Time (p_c), s	0.0	2.7	0.1	3.6	0.3	2.7	0.3	3.6

Intersection Summary			
HCM 2010 Ctrl Delay			19.5
HCM 2010 LOS			B

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	192	185	2	0	192	21	0	0	0	5	0	98
Future Vol, veh/h	192	185	2	0	192	21	0	0	0	5	0	98
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	213	206	2	0	213	23	0	0	0	6	0	109

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	237	0	0	208	0	0	912	870	207	858	859	225
Stage 1	-	-	-	-	-	-	633	633	-	225	225	-
Stage 2	-	-	-	-	-	-	279	237	-	633	634	-
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	1330	-	-	1363	-	-	255	290	833	277	294	814
Stage 1	-	-	-	-	-	-	468	473	-	778	718	-
Stage 2	-	-	-	-	-	-	728	709	-	468	473	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1330	-	-	1363	-	-	194	244	833	243	247	814
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	244	-	243	247	-
Stage 1	-	-	-	-	-	-	393	397	-	653	718	-
Stage 2	-	-	-	-	-	-	631	709	-	393	397	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.2	0	0	10.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1330	-	-	1363	-	-	243	814
HCM Lane V/C Ratio	-	0.16	-	-	-	-	-	0.023	0.134
HCM Control Delay (s)	0	8.2	-	-	0	-	-	20.2	10.1
HCM Lane LOS	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	-	0.6	-	-	0	-	-	0.1	0.5

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	181	4	14	74	22	142
Future Vol, veh/h	181	4	14	74	22	142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	229	5	18	94	28	180

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	157	28	28	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	129	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	834	1047	1585	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	824	1047	1585	-	-	-
Mov Cap-2 Maneuver	824	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	886	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1585	-	828	-	-
HCM Lane V/C Ratio	0.011	-	0.283	-	-
HCM Control Delay (s)	7.3	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	2	371	16	72	176	59	19	54	37	97	104	5
Future Volume (veh/h)	2	371	16	72	176	59	19	54	37	97	104	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	2	408	18	79	193	65	21	59	41	107	114	5
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	1301	57	325	700	240	37	303	192	144	712	31
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.02	0.15	0.15	0.08	0.21	0.21
Sat Flow, veh/h	3	3378	148	466	1818	623	1774	2079	1321	1774	3455	151
Grp Volume(v), veh/h	225	0	203	172	0	165	21	49	51	107	58	61
Grp Sat Flow(s),veh/h/ln	1861	0	1669	1321	0	1585	1774	1770	1630	1774	1770	1836
Q Serve(g_s), s	0.0	0.0	3.1	0.1	0.0	2.6	0.4	0.9	1.0	2.1	1.0	1.0
Cycle Q Clear(g_c), s	3.1	0.0	3.1	3.2	0.0	2.6	0.4	0.9	1.0	2.1	1.0	1.0
Prop In Lane	0.01		0.09	0.46		0.39	1.00		0.81	1.00		0.08
Lane Grp Cap(c), veh/h	817	0	643	654	0	611	37	258	237	144	365	378
V/C Ratio(X)	0.28	0.00	0.32	0.26	0.00	0.27	0.56	0.19	0.21	0.74	0.16	0.16
Avail Cap(c_a), veh/h	1642	0	1387	1233	0	1317	983	1470	1354	983	1470	1525
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.8	0.0	7.8	7.5	0.0	7.6	17.5	13.6	13.6	16.2	11.8	11.8
Incr Delay (d2), s/veh	0.4	0.0	0.6	0.5	0.0	0.5	17.5	0.8	0.9	10.1	0.4	0.4
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	1.7	0.0	1.5	1.2	0.0	1.2	0.4	0.5	0.5	1.4	0.5	0.5
LnGrp Delay(d),s/veh	8.2	0.0	8.4	8.0	0.0	8.1	35.0	14.3	14.5	26.3	12.2	12.2
LnGrp LOS	A		A	A		A	D	B	B	C	B	B
Approach Vol, veh/h		428			337			121			226	
Approach Delay, s/veh		8.3			8.1			18.0			18.9	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.9	4.8	12.4		18.9	6.9	10.3
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		5.1	2.4	3.0		5.2	4.1	3.0
Green Ext Time (p_c), s		9.0	0.0	2.3		9.0	0.3	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

	→	←	↖	↑	↘	↓
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	428	337	21	100	107	119
v/c Ratio	0.39	0.38	0.07	0.14	0.28	0.09
Control Delay	13.6	12.8	19.8	12.6	18.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	12.8	19.8	12.6	18.9	10.5
Queue Length 50th (ft)	45	32	5	6	24	7
Queue Length 95th (ft)	85	66	22	25	65	32
Internal Link Dist (ft)	112	93		1057		1152
Turn Bay Length (ft)			94		102	
Base Capacity (vph)	2356	1872	856	2343	856	2472
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.18	0.02	0.04	0.13	0.05

Intersection Summary
Description: Changed from City controller phase to E-W NEMA Phase to get 2010 HCM Analysis

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	70	51	10	31	103	5	38	173	9	16	295	156
Future Volume (veh/h)	70	51	10	31	103	5	38	173	9	16	295	156
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	77	56	11	34	113	5	42	190	10	18	324	171
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	247	210	55	369	16	66	586	31	32	587	499
Arrive On Green	0.06	0.13	0.13	0.03	0.11	0.11	0.04	0.33	0.33	0.02	0.32	0.32
Sat Flow, veh/h	1774	1863	1583	1774	3454	152	1774	1754	92	1774	1863	1583
Grp Volume(v), veh/h	77	56	11	34	58	60	42	0	200	18	324	171
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1836	1774	0	1846	1774	1863	1583
Q Serve(g_s), s	1.8	1.1	0.3	0.8	1.2	1.3	1.0	0.0	3.3	0.4	6.0	3.4
Cycle Q Clear(g_c), s	1.8	1.1	0.3	0.8	1.2	1.3	1.0	0.0	3.3	0.4	6.0	3.4
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	101	247	210	55	189	196	66	0	617	32	587	499
V/C Ratio(X)	0.76	0.23	0.05	0.61	0.30	0.31	0.64	0.00	0.32	0.56	0.55	0.34
Avail Cap(c_a), veh/h	1073	1127	958	858	1070	1110	858	0	1251	858	1262	1073
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	16.0	15.7	19.8	17.0	17.0	19.6	0.0	10.3	20.1	11.7	10.9
Incr Delay (d2), s/veh	15.3	0.7	0.1	14.6	1.3	1.3	13.8	0.0	0.4	20.1	1.2	0.6
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	1.3	0.6	0.1	0.6	0.7	0.7	0.7	0.0	1.7	0.4	3.2	1.6
LnGrp Delay(d),s/veh	34.5	16.7	15.8	34.4	18.3	18.3	33.4	0.0	10.7	40.2	12.9	11.4
LnGrp LOS	C	B	B	C	B	B	C		B	D	B	B
Approach Vol, veh/h		144			152			242			513	
Approach Delay, s/veh		26.1			21.9			14.6			13.4	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.3	11.5	5.5	19.0	6.4	10.4	4.7	19.8
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	2.8	3.1	3.0	8.0	3.8	3.3	2.4	5.3
Green Ext Time (p_c), s	0.1	1.2	0.1	5.1	0.2	1.2	0.0	5.4

Intersection Summary		
HCM 2010 Ctrl Delay		16.6
HCM 2010 LOS		B

	↗	→	↘	↙	←	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	77	56	11	34	118	42	200	18	324	171
v/c Ratio	0.23	0.13	0.02	0.12	0.19	0.14	0.27	0.07	0.52	0.27
Control Delay	28.9	25.2	0.1	30.7	27.3	30.1	13.9	31.6	21.9	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	25.2	0.1	30.7	27.3	30.1	13.9	31.6	21.9	4.8
Queue Length 50th (ft)	28	15	0	12	22	15	44	7	111	0
Queue Length 95th (ft)	75	57	0	42	53	49	123	28	209	40
Internal Link Dist (ft)		1207			123		264		1057	
Turn Bay Length (ft)	134			61		70		100		
Base Capacity (vph)	953	1178	1038	762	1897	762	1179	762	1124	1023
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.05	0.01	0.04	0.06	0.06	0.17	0.02	0.29	0.17

Intersection Summary

Description: Changed to NEMA phasing, adjust min errors to allow 2010 HCS report

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	15	415	57	87	269	48	21	85	77	38	134	20
Future Volume (veh/h)	15	415	57	87	269	48	21	85	77	38	134	20
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	16	437	60	92	283	51	22	89	81	40	141	21
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	533	652	90	435	688	124	118	175	143	149	269	36
Arrive On Green	0.01	0.41	0.41	0.05	0.45	0.45	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	1604	220	1774	1537	277	104	874	714	219	1343	181
Grp Volume(v), veh/h	16	0	497	92	0	334	192	0	0	202	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1824	1774	0	1814	1692	0	0	1744	0	0
Q Serve(g_s), s	0.2	0.0	9.2	1.2	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	9.2	1.2	0.0	5.1	4.1	0.0	0.0	4.1	0.0	0.0
Prop In Lane	1.00		0.12	1.00		0.15	0.11		0.42	0.20		0.10
Lane Grp Cap(c), veh/h	533	0	741	435	0	812	436	0	0	454	0	0
V/C Ratio(X)	0.03	0.00	0.67	0.21	0.00	0.41	0.44	0.00	0.00	0.44	0.00	0.00
Avail Cap(c_a), veh/h	1308	0	1062	1136	0	1056	1063	0	0	1086	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.2	0.0	10.0	7.5	0.0	7.7	14.8	0.0	0.0	14.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.5	0.2	0.0	0.5	1.0	0.0	0.0	1.0	0.0	0.0
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	4.9	0.6	0.0	2.6	2.0	0.0	0.0	2.1	0.0	0.0
LnGrp Delay(d),s/veh	7.2	0.0	11.5	7.7	0.0	8.2	15.8	0.0	0.0	15.8	0.0	0.0
LnGrp LOS	A		B	A		A	B			B		
Approach Vol, veh/h		513			426			192			202	
Approach Delay, s/veh		11.3			8.1			15.8			15.8	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	21.8		13.3	4.5	23.5		13.3
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	3.2	11.2		6.1	2.2	7.1		6.1
Green Ext Time (p_c), s	0.2	5.6		3.1	0.0	6.6		3.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

	↗	→	↙	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	16	497	92	334	192	202
v/c Ratio	0.03	0.66	0.19	0.34	0.44	0.50
Control Delay	5.6	19.7	6.2	9.5	18.2	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	19.7	6.2	9.5	18.2	23.2
Queue Length 50th (ft)	2	128	11	46	43	59
Queue Length 95th (ft)	9	#273	31	152	96	116
Internal Link Dist (ft)		2316		2595	3508	1148
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	876	863	763	1050	811	793
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.58	0.12	0.32	0.24	0.25

Intersection Summary

Description: Changed City controller phase to E-W NEMA phase

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Signalized Intersection Summary
4: Bowdish Rd & Dishman-Mica Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰↑↱			↰↑	↱
Traffic Volume (veh/h)	10	220	112	23	155	24	48	82	13	9	118	5
Future Volume (veh/h)	10	220	112	23	155	24	48	82	13	9	118	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	11	232	118	24	163	25	51	86	14	9	124	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	21	408	208	43	572	88	207	151	21	132	296	263
Arrive On Green	0.01	0.35	0.35	0.02	0.36	0.36	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1774	1165	593	1774	1578	242	327	907	126	64	1781	1583
Grp Volume(v), veh/h	11	0	350	24	0	188	151	0	0	133	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1758	1774	0	1820	1361	0	0	1844	0	1583
Q Serve(g_s), s	0.2	0.0	5.1	0.4	0.0	2.3	1.6	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.2	0.0	5.1	0.4	0.0	2.3	3.6	0.0	0.0	2.0	0.0	0.1
Prop In Lane	1.00		0.34	1.00		0.13	0.34		0.09	0.07		1.00
Lane Grp Cap(c), veh/h	21	0	616	43	0	660	379	0	0	428	0	263
V/C Ratio(X)	0.53	0.00	0.57	0.56	0.00	0.28	0.40	0.00	0.00	0.31	0.00	0.02
Avail Cap(c_a), veh/h	844	0	1394	1406	0	1385	918	0	0	1045	0	803
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.5	0.0	8.3	15.2	0.0	7.1	12.5	0.0	0.0	11.8	0.0	11.0
Incr Delay (d2), s/veh	27.0	0.0	1.2	15.5	0.0	0.3	1.0	0.0	0.0	0.6	0.0	0.0
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	0.2	0.0	2.6	0.4	0.0	1.2	1.3	0.0	0.0	1.1	0.0	0.0
LnGrp Delay(d),s/veh	42.5	0.0	9.5	30.7	0.0	7.5	13.4	0.0	0.0	12.4	0.0	11.0
LnGrp LOS	D		A	C		A	B			B		B
Approach Vol, veh/h		361			212			151			138	
Approach Delay, s/veh		10.5			10.1			13.4			12.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	16.5		10.2	4.4	16.9		10.2
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	2.4	7.1		4.0	2.2	4.3		5.6
Green Ext Time (p_c), s	0.0	3.9		1.7	0.0	4.1		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Queues
4: Bowdish Rd & Dishman-Mica Rd

2015 PM Existing
12/8/2015

	↗	→	↙	←	↑	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	11	350	24	188	151	133	5
v/c Ratio	0.03	0.39	0.07	0.20	0.34	0.26	0.01
Control Delay	18.5	10.7	18.0	9.5	15.3	14.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	10.7	18.0	9.5	15.3	14.4	0.0
Queue Length 50th (ft)	2	38	3	19	19	17	0
Queue Length 95th (ft)	16	160	27	84	91	81	0
Internal Link Dist (ft)		3473		1032	470	3508	
Turn Bay Length (ft)	61		75				135
Base Capacity (vph)	755	1267	1259	1650	702	823	798
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.28	0.02	0.11	0.22	0.16	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	19	56	136	10	70	178
Future Vol, veh/h	19	56	136	10	70	178
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	62	149	11	77	196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	504	155	0	0	160	0
Stage 1	155	-	-	-	-	-
Stage 2	349	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	528	891	-	-	1419	-
Stage 1	873	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	496	891	-	-	1419	-
Mov Cap-2 Maneuver	496	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	670	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	741	1419	-
HCM Lane V/C Ratio	-	-	0.111	0.054	-
HCM Control Delay (s)	-	-	10.5	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

10' 5'

Intersection	
Int Delay, s/veh	12.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	309	48	62	138	0	20	0	162	0	201	103
Future Vol, veh/h	0	309	48	62	138	0	20	0	162	0	201	103
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	332	52	67	148	0	22	0	174	0	216	111

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	148	0	0	384	0	0	803	640	358	727	666	148
Stage 1	-	-	-	-	-	-	358	358	-	282	282	-
Stage 2	-	-	-	-	-	-	445	282	-	445	384	-
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	1434	-	-	1174	-	-	302	393	686	339	380	899
Stage 1	-	-	-	-	-	-	660	628	-	725	678	-
Stage 2	-	-	-	-	-	-	592	678	-	592	611	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1434	-	-	1174	-	-	131	369	686	241	356	899
Mov Cap-2 Maneuver	-	-	-	-	-	-	131	369	-	241	356	-
Stage 1	-	-	-	-	-	-	660	628	-	725	636	-
Stage 2	-	-	-	-	-	-	321	636	-	442	611	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	18.1	31.8
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	468	1434	-	-	1174	-	-	448
HCM Lane V/C Ratio	0.418	-	-	-	0.057	-	-	0.73
HCM Control Delay (s)	18.1	0	-	-	8.3	0	-	31.8
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	2	0	-	-	0.2	-	-	5.8
	50'				5'			145'

HCM 2010 Signalized Intersection Summary
12: Hwy 27 & 16th Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑	↱	↰	↑↑↱		↰	↑↑↱	
Traffic Volume (veh/h)	160	247	52	13	186	6	21	247	9	82	293	0
Future Volume (veh/h)	160	247	52	13	186	6	21	247	9	82	293	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	178	274	58	14	207	0	23	274	10	91	326	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	343	490	19	278	253	47	509	19	121	665	0
Arrive On Green	0.31	0.31	0.31	0.16	0.16	0.00	0.03	0.15	0.15	0.07	0.19	0.00
Sat Flow, veh/h	719	1107	1583	118	1739	1583	1774	3483	127	1774	3632	0
Grp Volume(v), veh/h	452	0	58	221	0	0	23	139	145	91	326	0
Grp Sat Flow(s),veh/h/ln	1827	0	1583	1857	0	1583	1774	1770	1840	1774	1770	0
Q Serve(g_s), s	14.3	0.0	1.7	7.2	0.0	0.0	0.8	4.6	4.6	3.2	5.2	0.0
Cycle Q Clear(g_c), s	14.3	0.0	1.7	7.2	0.0	0.0	0.8	4.6	4.6	3.2	5.2	0.0
Prop In Lane	0.39		1.00	0.06		1.00	1.00		0.07	1.00		0.00
Lane Grp Cap(c), veh/h	565	0	490	296	0	253	47	259	269	121	665	0
V/C Ratio(X)	0.80	0.00	0.12	0.75	0.00	0.00	0.49	0.54	0.54	0.75	0.49	0.00
Avail Cap(c_a), veh/h	1447	0	1254	882	0	752	843	841	874	843	1682	0
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.0	0.0	15.6	25.3	0.0	0.0	30.3	25.0	25.0	28.9	22.9	0.0
Incr Delay (d2), s/veh	2.7	0.0	0.1	3.7	0.0	0.0	7.8	1.3	1.3	9.1	0.2	0.0
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	7.6	0.0	0.7	4.0	0.0	0.0	0.5	2.3	2.4	1.9	2.6	0.0
LnGrp Delay(d),s/veh	22.7	0.0	15.7	29.0	0.0	0.0	38.2	26.3	26.2	38.0	23.1	0.0
LnGrp LOS	C		B	C			D	C	C	D	C	
Approach Vol, veh/h		510			221			307			417	
Approach Delay, s/veh		21.9			29.0			27.1			26.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	16.9		15.1	9.3	14.2		24.5
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	2.8	7.2		9.2	5.2	6.6		16.3
Green Ext Time (p_c), s	0.0	2.6		1.1	0.2	2.6		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C

Queues
12: Hwy 27 & 16th Ave

	→	↘	←	↖	↖	↑	↘	↓
Lane Group	**EBT**	**EBR**	**WBT**	**WBR**	**NBL**	**NBT**	**SBL**	**SBT**
Lane Group Flow (vph)	452	58	221	7	23	284	91	326
v/c Ratio	0.76	0.10	0.62	0.06	0.17	0.55	0.44	0.37
Control Delay	39.6	3.0	47.4	1.0	54.3	46.0	52.7	36.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	3.0	47.4	1.0	54.3	46.0	52.7	36.6
Queue Length 50th (ft)	240	0	123	0	13	84	52	92
Queue Length 95th (ft)	452	16	260	0	49	168	131	180
Internal Link Dist (ft)	49		154			343		461
Turn Bay Length (ft)				25	157		232	
Base Capacity (vph)	1002	905	611	116	582	1160	582	1164
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.06	0.36	0.06	0.04	0.24	0.16	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	33	441	43	67	337	39	46	45	44	54	73	29
Future Volume (veh/h)	33	441	43	67	337	39	46	45	44	54	73	29
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	42	565	55	86	432	50	59	58	56	69	94	37
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	476	801	78	396	833	96	242	94	91	255	146	58
Arrive On Green	0.03	0.48	0.48	0.06	0.51	0.51	0.04	0.11	0.11	0.05	0.11	0.11
Sat Flow, veh/h	1774	1671	163	1774	1640	190	1774	872	842	1774	1273	501
Grp Volume(v), veh/h	42	0	620	86	0	482	59	0	114	69	0	131
Grp Sat Flow(s),veh/h/ln	1774	0	1834	1774	0	1829	1774	0	1714	1774	0	1774
Q Serve(g_s), s	0.7	0.0	16.6	1.5	0.0	11.0	1.8	0.0	4.0	2.1	0.0	4.4
Cycle Q Clear(g_c), s	0.7	0.0	16.6	1.5	0.0	11.0	1.8	0.0	4.0	2.1	0.0	4.4
Prop In Lane	1.00		0.09	1.00		0.10	1.00		0.49	1.00		0.28
Lane Grp Cap(c), veh/h	476	0	879	396	0	930	242	0	184	255	0	204
V/C Ratio(X)	0.09	0.00	0.71	0.22	0.00	0.52	0.24	0.00	0.62	0.27	0.00	0.64
Avail Cap(c_a), veh/h	984	0	879	853	0	930	737	0	603	738	0	624
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	8.3	0.0	12.8	9.4	0.0	10.3	23.6	0.0	26.7	23.4	0.0	26.5
Incr Delay (d2), s/veh	0.1	0.0	4.7	0.3	0.0	2.1	0.5	0.0	4.7	0.6	0.0	4.8
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	0.4	0.0	9.4	0.7	0.0	6.0	0.9	0.0	2.1	1.1	0.0	2.4
LnGrp Delay(d),s/veh	8.4	0.0	17.5	9.7	0.0	12.3	24.2	0.0	31.4	23.9	0.0	31.2
LnGrp LOS	A		B	A		B	C		C	C		C
Approach Vol, veh/h		662			568			173			200	
Approach Delay, s/veh		17.0			11.9			29.0			28.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	36.8	7.5	11.7	8.4	35.0	7.0	12.2
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	20.0	22.0	20.0	30.0	20.0	22.0
Max Q Clear Time (g_c+I1), s	2.7	13.0	4.1	6.0	3.5	18.6	3.8	6.4
Green Ext Time (p_c), s	0.1	10.8	0.1	1.6	0.2	7.9	0.1	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

13: Pines Rd & 32nd Ave

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	620	86	482	59	114	69	131
v/c Ratio	0.08	0.66	0.22	0.47	0.17	0.40	0.20	0.38
Control Delay	9.0	25.2	9.9	18.1	19.6	25.3	20.0	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	25.2	9.9	18.1	19.6	25.3	20.0	29.0
Queue Length 50th (ft)	8	250	17	170	19	31	23	49
Queue Length 95th (ft)	21	#401	36	254	39	66	44	88
Internal Link Dist (ft)		2595		1832		2145		5230
Turn Bay Length (ft)	168		166		79		113	
Base Capacity (vph)	764	945	653	1023	573	575	566	579
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.66	0.13	0.47	0.10	0.20	0.12	0.23

Intersection Summary

Description: Plan 1

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

18: Madison Rd & Thorpe Rd

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	21	0	43	0	0	0	24	33	0	0	73	25
Future Vol, veh/h	21	0	43	0	0	0	24	33	0	0	73	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	0	50	0	0	0	28	38	0	0	85	29

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	193	193	99	218	208	38	114	0	0	38	0	0
Stage 1	99	99	-	94	94	-	-	-	-	-	-	-
Stage 2	94	94	-	124	114	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	767	702	957	738	689	1034	1475	-	-	1572	-	-
Stage 1	907	813	-	913	817	-	-	-	-	-	-	-
Stage 2	913	817	-	880	801	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	756	689	957	689	676	1034	1475	-	-	1572	-	-
Mov Cap-2 Maneuver	756	689	-	689	676	-	-	-	-	-	-	-
Stage 1	890	813	-	896	801	-	-	-	-	-	-	-
Stage 2	896	801	-	834	801	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	0	3.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1475	-	-	880	-	1572	-	-
HCM Lane V/C Ratio	0.019	-	-	0.085	-	-	-	-
HCM Control Delay (s)	7.5	0	-	9.5	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	-	0	-	-

2.5'   7.5'

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	79	297	168	143	306	40	113	154	96	40	197	63
Future Volume (veh/h)	79	297	168	143	306	40	113	154	96	40	197	63
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	93	349	198	168	360	47	133	181	113	47	232	74
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	618	344	219	542	71	176	464	276	80	433	135
Arrive On Green	0.07	0.28	0.28	0.12	0.34	0.34	0.10	0.22	0.22	0.05	0.16	0.16
Sat Flow, veh/h	1774	2194	1223	1774	1615	211	1774	2138	1270	1774	2659	827
Grp Volume(v), veh/h	93	280	267	168	0	407	133	148	146	47	152	154
Grp Sat Flow(s),veh/h/ln	1774	1770	1647	1774	0	1826	1774	1770	1639	1774	1770	1717
Q Serve(g_s), s	3.1	8.1	8.3	5.5	0.0	11.5	4.4	4.3	4.6	1.6	4.7	4.9
Cycle Q Clear(g_c), s	3.1	8.1	8.3	5.5	0.0	11.5	4.4	4.3	4.6	1.6	4.7	4.9
Prop In Lane	1.00		0.74	1.00		0.12	1.00		0.78	1.00		0.48
Lane Grp Cap(c), veh/h	123	498	464	219	0	613	176	384	356	80	288	279
V/C Ratio(X)	0.76	0.56	0.58	0.77	0.00	0.66	0.75	0.39	0.41	0.59	0.53	0.55
Avail Cap(c_a), veh/h	738	1177	1096	738	0	1215	885	1177	1090	885	1177	1142
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	18.4	18.5	25.5	0.0	17.1	26.4	20.1	20.2	28.1	23.1	23.1
Incr Delay (d2), s/veh	9.0	1.0	1.1	5.5	0.0	1.2	6.4	0.5	0.6	6.6	1.3	1.4
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	1.8	4.1	3.9	3.0	0.0	6.0	2.5	2.2	2.1	0.9	2.4	2.5
LnGrp Delay(d),s/veh	36.5	19.4	19.6	31.0	0.0	18.3	32.8	20.6	20.8	34.8	24.3	24.6
LnGrp LOS	D	B	B	C		B	C	C	C	C	C	C
Approach Vol, veh/h		640			575			427			353	
Approach Delay, s/veh		22.0			22.0			24.5			25.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	18.5	11.9	21.4	11.5	15.3	8.7	24.7
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	3.6	6.6	7.5	10.3	6.4	6.9	5.1	13.5
Green Ext Time (p_c), s	0.1	2.8	0.4	6.6	0.3	2.8	0.2	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	23.2
HCM 2010 LOS	C

	↗	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	547	168	407	133	294	47	306
v/c Ratio	0.41	0.59	0.54	0.64	0.49	0.32	0.27	0.54
Control Delay	44.2	27.1	41.9	30.7	43.0	22.3	45.0	35.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	27.1	41.9	30.7	43.0	22.3	45.0	35.8
Queue Length 50th (ft)	45	112	80	183	64	47	23	70
Queue Length 95th (ft)	109	190	169	322	141	98	66	135
Internal Link Dist (ft)		140		200		6700		1848
Turn Bay Length (ft)	108		112		131		184	
Base Capacity (vph)	556	1717	556	922	667	1717	667	1728
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.32	0.30	0.44	0.20	0.17	0.07	0.18

Intersection Summary

HCM 2010 TWSC
20: 32nd Ave & Evergreen Rd

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	179	346	0	0	335	10	0	0	0	15	0	172
Future Vol, veh/h	179	346	0	0	335	10	0	0	0	15	0	172
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	100	-	-	-	-	-	-	-	-	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	199	384	0	0	372	11	0	0	0	17	0	191

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	383	0	0	384	0	0	1255	1165	384	1160	1160	378
Stage 1	-	-	-	-	-	-	782	782	-	378	378	-
Stage 2	-	-	-	-	-	-	473	383	-	782	782	-
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	1175	-	-	1174	-	-	148	194	664	172	195	669
Stage 1	-	-	-	-	-	-	387	405	-	644	615	-
Stage 2	-	-	-	-	-	-	572	612	-	387	405	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1175	-	-	1174	-	-	92	161	664	150	162	669
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	161	-	150	162	-
Stage 1	-	-	-	-	-	-	321	336	-	535	615	-
Stage 2	-	-	-	-	-	-	409	612	-	321	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0	0	14.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1175	-	-	1174	-	-	150	669
HCM Lane V/C Ratio	-	0.169	-	-	-	-	-	0.111	0.286
HCM Control Delay (s)	0	8.7	-	-	0	-	-	32	12.5
HCM Lane LOS	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	-	0.6	-	-	0	-	-	0.4	1.2
		15'						10'	30'

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	242	15	21	48	88	295
Future Vol, veh/h	242	15	21	48	88	295
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	266	16	23	53	97	324

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	196	97	97	0	-	0
Stage 1	97	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	793	959	1496	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	780	959	1496	-	-	-
Mov Cap-2 Maneuver	780	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1496	-	789	-	-
HCM Lane V/C Ratio	0.015	-	0.358	-	-
HCM Control Delay (s)	7.4	0	12.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.6	-	-

40'

LEVEL OF SERVICE CALCULATIONS

YEAR 2020

WITHOUT PROJECT

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	4	137	6	34	484	117	20	79	63	64	50	4
Future Volume (veh/h)	4	137	6	34	484	117	20	79	63	64	50	4
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	4	149	7	37	526	127	22	86	68	70	54	4
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	1464	67	139	1179	276	39	294	213	97	611	45
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.02	0.15	0.15	0.05	0.18	0.18
Sat Flow, veh/h	17	3336	154	86	2687	629	1774	1963	1419	1774	3344	245
Grp Volume(v), veh/h	84	0	76	370	0	320	22	77	77	70	28	30
Grp Sat Flow(s),veh/h/ln	1839	0	1668	1818	0	1584	1774	1770	1612	1774	1770	1820
Q Serve(g_s), s	0.0	0.0	1.1	0.0	0.0	5.6	0.5	1.5	1.7	1.5	0.5	0.5
Cycle Q Clear(g_c), s	1.0	0.0	1.1	5.5	0.0	5.6	0.5	1.5	1.7	1.5	0.5	0.5
Prop In Lane	0.05		0.09	0.10		0.40	1.00		0.88	1.00		0.13
Lane Grp Cap(c), veh/h	903	0	732	899	0	695	39	265	242	97	323	332
V/C Ratio(X)	0.09	0.00	0.10	0.41	0.00	0.46	0.57	0.29	0.32	0.73	0.09	0.09
Avail Cap(c_a), veh/h	1473	0	1276	1476	0	1212	905	1354	1233	905	1354	1392
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.5	0.0	6.5	7.7	0.0	7.7	19.0	14.8	14.9	18.3	13.3	13.3
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.6	0.0	1.0	17.5	1.3	1.6	13.6	0.2	0.2
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	0.6	0.0	0.5	2.9	0.0	2.6	0.4	0.8	0.9	1.1	0.3	0.3
LnGrp Delay(d),s/veh	6.6	0.0	6.6	8.4	0.0	8.8	36.5	16.1	16.5	31.9	13.6	13.6
LnGrp LOS	A		A	A		A	D	B	B	C	B	B
Approach Vol, veh/h		160			690			176			128	
Approach Delay, s/veh		6.6			8.5			18.8			23.6	
Approach LOS		A			A			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		22.2	4.9	12.2		22.2	6.1	10.9
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		3.1	2.5	2.5		7.6	3.5	3.7
Green Ext Time (p_c), s		10.6	0.0	2.2		9.6	0.2	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	1	136	37	11	406	21	225	100	23	16	39	12
Future Volume (veh/h)	1	136	37	11	406	21	225	100	23	16	39	12
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1	149	41	12	446	23	247	110	25	18	43	13
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	484	412	22	929	48	336	325	74	32	92	78
Arrive On Green	0.00	0.26	0.26	0.01	0.27	0.27	0.19	0.22	0.22	0.02	0.05	0.05
Sat Flow, veh/h	1774	1863	1583	1774	3425	176	1774	1470	334	1774	1863	1583
Grp Volume(v), veh/h	1	149	41	12	230	239	247	0	135	18	43	13
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1832	1774	0	1804	1774	1863	1583
Q Serve(g_s), s	0.0	2.6	0.8	0.3	4.5	4.5	5.4	0.0	2.6	0.4	0.9	0.3
Cycle Q Clear(g_c), s	0.0	2.6	0.8	0.3	4.5	4.5	5.4	0.0	2.6	0.4	0.9	0.3
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	4	484	412	22	480	497	336	0	399	32	92	78
V/C Ratio(X)	0.23	0.31	0.10	0.54	0.48	0.48	0.73	0.00	0.34	0.56	0.47	0.17
Avail Cap(c_a), veh/h	1083	1137	967	867	1080	1118	867	0	1233	867	1274	1083
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	12.2	11.5	20.1	12.5	12.5	15.6	0.0	13.4	19.9	18.9	18.6
Incr Delay (d2), s/veh	34.9	0.5	0.1	26.4	1.1	1.0	4.4	0.0	0.7	20.0	5.1	1.4
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	1.4	0.4	0.3	2.3	2.4	3.0	0.0	1.4	0.4	0.6	0.2
LnGrp Delay(d),s/veh	55.3	12.7	11.7	46.5	13.6	13.5	20.0	0.0	14.1	40.0	24.1	20.0
LnGrp LOS	E	B	B	D	B	B	C		B	D	C	C
Approach Vol, veh/h		191			481			382			74	
Approach Delay, s/veh		12.7			14.4			17.9			27.2	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.5	16.6	11.8	8.0	4.0	17.1	4.7	15.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	2.3	4.6	7.4	2.9	2.0	6.5	2.4	4.6
Green Ext Time (p_c), s	0.0	4.8	0.9	1.4	0.0	4.6	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
3: Bowdish Rd & 32nd Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✣			✣	
Traffic Volume (veh/h)	54	440	36	24	285	8	55	49	30	77	116	97
Future Volume (veh/h)	54	440	36	24	285	8	55	49	30	77	116	97
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	61	500	41	27	324	9	62	56	34	88	132	110
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	471	676	55	312	687	19	248	210	101	188	221	157
Arrive On Green	0.04	0.40	0.40	0.02	0.38	0.38	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1774	1699	139	1774	1804	50	489	728	350	320	765	543
Grp Volume(v), veh/h	61	0	541	27	0	333	152	0	0	330	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1838	1774	0	1854	1567	0	0	1629	0	0
Q Serve(g_s), s	1.0	0.0	11.9	0.4	0.0	6.4	0.0	0.0	0.0	5.1	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	11.9	0.4	0.0	6.4	3.2	0.0	0.0	8.4	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.03	0.41		0.22	0.27		0.33
Lane Grp Cap(c), veh/h	471	0	732	312	0	706	559	0	0	566	0	0
V/C Ratio(X)	0.13	0.00	0.74	0.09	0.00	0.47	0.27	0.00	0.00	0.58	0.00	0.00
Avail Cap(c_a), veh/h	1098	0	928	969	0	936	868	0	0	909	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.8	0.0	12.2	10.0	0.0	11.1	13.1	0.0	0.0	14.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	2.9	0.1	0.0	0.7	0.4	0.0	0.0	1.4	0.0	0.0
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	0.5	0.0	6.6	0.2	0.0	3.4	1.6	0.0	0.0	4.1	0.0	0.0
LnGrp Delay(d),s/veh	9.0	0.0	15.1	10.1	0.0	11.8	13.5	0.0	0.0	16.3	0.0	0.0
LnGrp LOS	A		B	B		B	B			B		
Approach Vol, veh/h		602			360			152			330	
Approach Delay, s/veh		14.5			11.7			13.5			16.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.9	23.9		18.7	5.7	23.1		18.7
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	2.4	13.9		10.4	3.0	8.4		5.2
Green Ext Time (p_c), s	0.0	5.0		3.5	0.1	6.6		4.1

Intersection Summary		
HCM 2010 Ctrl Delay		14.1
HCM 2010 LOS		B

HCM 2010 Signalized Intersection Summary
4: Bowdish Rd & Dishman-Mica Rd

2020 AM W-O Proj.
12/16/2015

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Volume (veh/h)	6	123	33	11	293	24	118	151	17	23	62	7
Future Volume (veh/h)	6	123	33	11	293	24	118	151	17	23	62	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	7	140	38	12	333	27	134	172	19	26	70	8
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	445	121	22	545	44	291	270	26	198	417	439
Arrive On Green	0.01	0.32	0.32	0.01	0.32	0.32	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1774	1412	383	1774	1701	138	549	974	95	266	1503	1583
Grp Volume(v), veh/h	7	0	178	12	0	360	325	0	0	96	0	8
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	0	1838	1618	0	0	1769	0	1583
Q Serve(g_s), s	0.1	0.0	2.8	0.2	0.0	6.1	5.0	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.1	0.0	2.8	0.2	0.0	6.1	6.6	0.0	0.0	1.4	0.0	0.1
Prop In Lane	1.00		0.21	1.00		0.08	0.41		0.06	0.27		1.00
Lane Grp Cap(c), veh/h	13	0	566	22	0	589	587	0	0	615	0	439
V/C Ratio(X)	0.53	0.00	0.31	0.54	0.00	0.61	0.55	0.00	0.00	0.16	0.00	0.02
Avail Cap(c_a), veh/h	725	0	1222	1208	0	1202	837	0	0	871	0	690
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	9.6	18.0	0.0	10.5	11.9	0.0	0.0	10.1	0.0	9.6
Incr Delay (d2), s/veh	39.0	0.0	0.4	25.9	0.0	1.5	1.2	0.0	0.0	0.2	0.0	0.0
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	0.2	0.0	1.4	0.3	0.0	3.2	3.1	0.0	0.0	0.7	0.0	0.1
LnGrp Delay(d),s/veh	57.2	0.0	10.0	43.9	0.0	12.0	13.0	0.0	0.0	10.3	0.0	9.7
LnGrp LOS	E		A	D		B	B			B		A
Approach Vol, veh/h		185			372			325			104	
Approach Delay, s/veh		11.8			13.0			13.0			10.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	17.1		15.2	4.3	17.3		15.2
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	2.2	4.8		3.4	2.1	8.1		8.6
Green Ext Time (p_c), s	0.0	4.1		2.8	0.0	3.7		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.5
HCM 2010 LOS	B

HCM 2010 TWSC
9: Dishman-Mica Rd & Thorpe Rd

2020 AM W-O Proj.
12/16/2015

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	6	90	230	13	41	117
Future Vol, veh/h	6	90	230	13	41	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	114	291	16	52	148

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	551	299	0	0	308	0
Stage 1	299	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	495	741	-	-	1253	-
Stage 1	752	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	473	741	-	-	1253	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	754	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	716	1253	-
HCM Lane V/C Ratio	-	-	0.17	0.041	-
HCM Control Delay (s)	-	-	11.1	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	238	43	53	214	0	27	0	217	0	145	33
Future Vol, veh/h	0	238	43	53	214	0	27	0	217	0	145	33
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	270	49	60	243	0	31	0	247	0	165	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	243	0	0	319	0	0	760	659	295	782	683	243
Stage 1	-	-	-	-	-	-	295	295	-	364	364	-
Stage 2	-	-	-	-	-	-	465	364	-	418	319	-
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	1323	-	-	1241	-	-	323	384	744	312	372	796
Stage 1	-	-	-	-	-	-	713	669	-	655	624	-
Stage 2	-	-	-	-	-	-	578	624	-	612	653	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1323	-	-	1241	-	-	187	362	744	200	351	796
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	362	-	200	351	-
Stage 1	-	-	-	-	-	-	713	669	-	655	589	-
Stage 2	-	-	-	-	-	-	374	589	-	409	653	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	17.6	23.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	560	1323	-	-	1241	-	-	392
HCM Lane V/C Ratio	0.495	-	-	-	0.049	-	-	0.516
HCM Control Delay (s)	17.6	0	-	-	8	0	-	23.6
HCM Lane LOS	C	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	2.7	0	-	-	0.2	-	-	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	189	196	23	5	200	72	57	465	19	41	117	1
Future Volume (veh/h)	189	196	23	5	200	72	57	465	19	41	117	1
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	222	231	27	6	235	0	67	547	22	48	138	1
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	280	477	8	302	264	90	746	30	76	745	5
Arrive On Green	0.30	0.30	0.30	0.17	0.17	0.00	0.05	0.22	0.22	0.04	0.21	0.21
Sat Flow, veh/h	891	927	1583	46	1814	1583	1774	3468	139	1774	3602	26
Grp Volume(v), veh/h	453	0	27	241	0	0	67	279	290	48	68	71
Grp Sat Flow(s),veh/h/ln	1818	0	1583	1860	0	1583	1774	1770	1838	1774	1770	1858
Q Serve(g_s), s	16.9	0.0	0.9	9.1	0.0	0.0	2.7	10.7	10.7	1.9	2.3	2.3
Cycle Q Clear(g_c), s	16.9	0.0	0.9	9.1	0.0	0.0	2.7	10.7	10.7	1.9	2.3	2.3
Prop In Lane	0.49		1.00	0.02		1.00	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	548	0	477	310	0	264	90	381	396	76	366	384
V/C Ratio(X)	0.83	0.00	0.06	0.78	0.00	0.00	0.74	0.73	0.73	0.63	0.19	0.19
Avail Cap(c_a), veh/h	1246	0	1085	765	0	651	729	727	756	729	727	764
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	18.1	29.1	0.0	0.0	34.2	26.7	26.7	34.4	23.9	23.9
Incr Delay (d2), s/veh	3.2	0.0	0.0	4.2	0.0	0.0	11.3	2.0	2.0	8.5	0.1	0.1
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	8.9	0.0	0.4	5.0	0.0	0.0	1.6	5.4	5.6	1.1	1.1	1.2
LnGrp Delay(d),s/veh	26.9	0.0	18.2	33.3	0.0	0.0	45.4	28.7	28.7	42.9	24.0	24.0
LnGrp LOS	C		B	C			D	C	C	D	C	C
Approach Vol, veh/h		480			241			636			187	
Approach Delay, s/veh		26.5			33.3			30.5			28.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	20.1		17.2	8.1	20.7		27.0
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	4.7	4.3		11.1	3.9	12.7		18.9
Green Ext Time (p_c), s	0.1	3.2		1.2	0.1	3.0		3.1

Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	16	368	3	44	430	56	45	63	113	191	39	33
Future Volume (veh/h)	16	368	3	44	430	56	45	63	113	191	39	33
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	18	418	3	50	489	64	51	72	128	217	44	38
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	892	6	443	803	105	352	99	176	355	234	202
Arrive On Green	0.01	0.48	0.48	0.03	0.50	0.50	0.03	0.16	0.16	0.12	0.25	0.25
Sat Flow, veh/h	1774	1847	13	1774	1614	211	1774	603	1071	1774	924	798
Grp Volume(v), veh/h	18	0	421	50	0	553	51	0	200	217	0	82
Grp Sat Flow(s),veh/h/ln	1774	0	1860	1774	0	1825	1774	0	1674	1774	0	1722
Q Serve(g_s), s	0.5	0.0	14.1	1.3	0.0	20.4	2.2	0.0	10.6	9.0	0.0	3.5
Cycle Q Clear(g_c), s	0.5	0.0	14.1	1.3	0.0	20.4	2.2	0.0	10.6	9.0	0.0	3.5
Prop In Lane	1.00		0.01	1.00		0.12	1.00		0.64	1.00		0.46
Lane Grp Cap(c), veh/h	336	0	898	443	0	908	352	0	275	355	0	436
V/C Ratio(X)	0.05	0.00	0.47	0.11	0.00	0.61	0.14	0.00	0.73	0.61	0.00	0.19
Avail Cap(c_a), veh/h	695	0	898	967	0	908	673	0	575	613	0	462
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	14.0	0.0	16.1	12.7	0.0	16.9	30.9	0.0	37.0	26.5	0.0	27.3
Incr Delay (d2), s/veh	0.1	0.0	1.8	0.1	0.0	3.0	0.2	0.0	7.7	1.7	0.0	0.4
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	0.2	0.0	7.7	0.7	0.0	10.9	1.1	0.0	5.5	4.5	0.0	1.7
LnGrp Delay(d),s/veh	14.1	0.0	17.9	12.8	0.0	19.9	31.1	0.0	44.6	28.2	0.0	27.7
LnGrp LOS	B		B	B		B	C		D	C		C
Approach Vol, veh/h		439			603			251			299	
Approach Delay, s/veh		17.7			19.3			41.9			28.1	
Approach LOS		B			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	51.4	15.9	20.3	7.0	50.0	7.6	28.6
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	25.0	32.0	30.0	45.0	20.0	25.0
Max Q Clear Time (g_c+I1), s	2.5	22.4	11.0	12.6	3.3	16.1	4.2	5.5
Green Ext Time (p_c), s	0.0	5.2	0.5	2.8	0.1	13.3	0.1	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	24.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	80	0	15	0	0	0	62	78	0	0	30	57
Future Vol, veh/h	80	0	15	0	0	0	62	78	0	0	30	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	92	82	92	92	92	82	82	92	92	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	0	18	0	0	0	76	95	0	0	37	70

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	317	317	71	326	352	95	106	0	0	95	0	0
Stage 1	71	71	-	246	246	-	-	-	-	-	-	-
Stage 2	246	246	-	80	106	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	636	599	991	627	573	962	1485	-	-	1499	-	-
Stage 1	939	836	-	758	703	-	-	-	-	-	-	-
Stage 2	758	703	-	929	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	610	567	991	590	542	962	1485	-	-	1499	-	-
Mov Cap-2 Maneuver	610	567	-	590	542	-	-	-	-	-	-	-
Stage 1	888	836	-	717	665	-	-	-	-	-	-	-
Stage 2	717	665	-	912	807	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	0	3.3	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1485	-	-	649	-	1499	-	-
HCM Lane V/C Ratio	0.051	-	-	0.179	-	-	-	-
HCM Control Delay (s)	7.6	0	-	11.7	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	132	241	63	68	208	81	135	308	150	26	93	76
Future Volume (veh/h)	132	241	63	68	208	81	135	308	150	26	93	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	152	277	72	78	239	93	155	354	172	30	107	87
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	911	233	109	351	137	205	545	260	59	294	220
Arrive On Green	0.11	0.33	0.33	0.06	0.27	0.27	0.12	0.23	0.23	0.03	0.15	0.15
Sat Flow, veh/h	1774	2793	713	1774	1278	497	1774	2326	1111	1774	1932	1445
Grp Volume(v), veh/h	152	174	175	78	0	332	155	268	258	30	97	97
Grp Sat Flow(s),veh/h/ln	1774	1770	1737	1774	0	1775	1774	1770	1667	1774	1770	1608
Q Serve(g_s), s	4.8	4.3	4.4	2.5	0.0	9.7	4.9	7.9	8.1	1.0	2.9	3.2
Cycle Q Clear(g_c), s	4.8	4.3	4.4	2.5	0.0	9.7	4.9	7.9	8.1	1.0	2.9	3.2
Prop In Lane	1.00		0.41	1.00		0.28	1.00		0.67	1.00		0.90
Lane Grp Cap(c), veh/h	200	577	566	109	0	488	205	415	391	59	269	244
V/C Ratio(X)	0.76	0.30	0.31	0.71	0.00	0.68	0.76	0.65	0.66	0.51	0.36	0.40
Avail Cap(c_a), veh/h	765	1221	1198	765	0	1224	918	1221	1150	918	1221	1109
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	14.6	14.6	26.7	0.0	18.8	24.9	20.0	20.1	27.6	22.1	22.2
Incr Delay (d2), s/veh	5.8	0.3	0.3	8.3	0.0	1.7	5.7	1.3	1.4	6.7	0.7	0.9
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	2.7	2.1	2.1	1.5	0.0	4.9	2.7	4.0	3.9	0.6	1.5	1.5
LnGrp Delay(d),s/veh	30.7	14.9	15.0	35.0	0.0	20.4	30.5	21.3	21.5	34.3	22.8	23.1
LnGrp LOS	C	B	B	C		C	C	C	C	C	C	C
Approach Vol, veh/h		501			410			681			224	
Approach Delay, s/veh		19.7			23.2			23.5			24.4	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	19.1	8.1	23.4	12.2	14.3	11.1	20.4
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	3.0	10.1	4.5	6.4	6.9	5.2	6.8	11.7
Green Ext Time (p_c), s	0.0	3.5	0.2	4.5	0.4	3.5	0.4	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	216	216	2	0	210	22	0	0	0	5	0	107
Future Vol, veh/h	216	216	2	0	210	22	0	0	0	5	0	107
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	240	240	2	0	233	24	0	0	0	6	0	119

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	258	0	0	242	0	0	1026	979	241	967	968	246
Stage 1	-	-	-	-	-	-	721	721	-	246	246	-
Stage 2	-	-	-	-	-	-	305	258	-	721	722	-
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	1307	-	-	1324	-	-	213	250	798	234	254	793
Stage 1	-	-	-	-	-	-	419	432	-	758	703	-
Stage 2	-	-	-	-	-	-	705	694	-	419	431	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1307	-	-	1324	-	-	156	204	798	201	207	793
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	204	-	201	207	-
Stage 1	-	-	-	-	-	-	342	353	-	619	703	-
Stage 2	-	-	-	-	-	-	599	694	-	342	352	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.2	0	0	10.9
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1307	-	-	1324	-	-	201	793
HCM Lane V/C Ratio	-	0.184	-	-	-	-	-	0.028	0.15
HCM Control Delay (s)	0	8.4	-	-	0	-	-	23.4	10.3
HCM Lane LOS	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	-	0.7	-	-	0	-	-	0.1	0.5

HCM 2010 TWSC
21: Sullivan Rd & 32nd Ave

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	212	4	15	78	23	157
Future Vol, veh/h	212	4	15	78	23	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	268	5	19	99	29	199

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	166	29	29	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	137	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	824	1046	1584	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	1046	1584	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	878	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1584	-	816	-	-
HCM Lane V/C Ratio	0.012	-	0.335	-	-
HCM Control Delay (s)	7.3	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↱			↰↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	2	413	17	76	197	62	20	58	39	102	113	5
Future Volume (veh/h)	2	413	17	76	197	62	20	58	39	102	113	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	2	454	19	84	216	68	22	64	43	112	124	5
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	95	1371	57	317	734	237	39	306	189	152	726	29
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.02	0.15	0.15	0.09	0.21	0.21
Sat Flow, veh/h	3	3387	141	447	1815	586	1774	2105	1298	1774	3469	139
Grp Volume(v), veh/h	250	0	225	183	0	185	22	53	54	112	63	66
Grp Sat Flow(s),veh/h/ln	1861	0	1670	1256	0	1592	1774	1770	1634	1774	1770	1838
Q Serve(g_s), s	0.0	0.0	3.6	0.4	0.0	3.0	0.5	1.0	1.1	2.4	1.1	1.1
Cycle Q Clear(g_c), s	3.5	0.0	3.6	4.0	0.0	3.0	0.5	1.0	1.1	2.4	1.1	1.1
Prop In Lane	0.01		0.08	0.46		0.37	1.00		0.79	1.00		0.08
Lane Grp Cap(c), veh/h	848	0	676	645	0	644	39	257	238	152	371	385
V/C Ratio(X)	0.29	0.00	0.33	0.28	0.00	0.29	0.57	0.21	0.23	0.74	0.17	0.17
Avail Cap(c_a), veh/h	1543	0	1303	1120	0	1242	923	1380	1274	923	1380	1434
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	0.0	7.9	7.6	0.0	7.7	18.6	14.5	14.5	17.2	12.5	12.5
Incr Delay (d2), s/veh	0.4	0.0	0.6	0.5	0.0	0.5	17.4	0.8	1.0	9.4	0.5	0.4
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	1.9	0.0	1.7	1.4	0.0	1.4	0.4	0.5	0.6	1.5	0.6	0.6
LnGrp Delay(d),s/veh	8.3	0.0	8.5	8.1	0.0	8.2	36.0	15.3	15.6	26.6	12.9	12.9
LnGrp LOS	A		A	A		A	D	B	B	C	B	B
Approach Vol, veh/h		475			368			129			241	
Approach Delay, s/veh		8.4			8.2			18.9			19.3	
Approach LOS		A			A			B			B	
Timer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.6	4.8	13.1		20.6	7.3	10.6				
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0				
Max Q Clear Time (g_c+I1), s		5.6	2.5	3.1		6.0	4.4	3.1				
Green Ext Time (p_c), s		10.0	0.0	2.5		9.9	0.4	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			11.6									
HCM 2010 LOS			B									

Queues
1: University Rd & 32nd Ave

	→	←	↰	↑	↳	↓
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	475	368	22	107	112	129
v/c Ratio	0.43	0.41	0.07	0.15	0.29	0.09
Control Delay	14.0	13.4	20.6	13.1	19.6	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	13.4	20.6	13.1	19.6	10.9
Queue Length 50th (ft)	51	36	5	7	26	8
Queue Length 95th (ft)	96	75	24	27	69	35
Internal Link Dist (ft)	112	93		1057		1152
Turn Bay Length (ft)			94		102	
Base Capacity (vph)	2310	1812	836	2304	836	2424
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.03	0.05	0.13	0.05

Intersection Summary

HCM 2010 Signalized Intersection Summary
2: Schafer Rd/University Rd & Dishman-Mica Rd

2020 PM W-O Proj.
12/7/2015

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	74	62	11	33	114	6	40	183	10	20	312	165
Future Volume (veh/h)	74	62	11	33	114	6	40	183	10	20	312	165
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	81	68	12	36	125	7	44	201	11	22	343	181
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	261	222	58	382	21	67	596	33	38	604	513
Arrive On Green	0.06	0.14	0.14	0.03	0.11	0.11	0.04	0.34	0.34	0.02	0.32	0.32
Sat Flow, veh/h	1774	1863	1583	1774	3409	190	1774	1750	96	1774	1863	1583
Grp Volume(v), veh/h	81	68	12	36	64	68	44	0	212	22	343	181
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1829	1774	0	1846	1774	1863	1583
Q Serve(g_s), s	1.9	1.4	0.3	0.9	1.4	1.5	1.1	0.0	3.7	0.5	6.6	3.8
Cycle Q Clear(g_c), s	1.9	1.4	0.3	0.9	1.4	1.5	1.1	0.0	3.7	0.5	6.6	3.8
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	107	261	222	58	198	205	67	0	629	38	604	513
V/C Ratio(X)	0.75	0.26	0.05	0.62	0.32	0.33	0.65	0.00	0.34	0.58	0.57	0.35
Avail Cap(c_a), veh/h	1032	1083	921	825	1029	1064	825	0	1202	825	1213	1031
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	16.5	16.0	20.5	17.6	17.6	20.4	0.0	10.6	20.8	12.0	11.1
Incr Delay (d2), s/veh	14.1	0.7	0.1	14.7	1.3	1.3	14.1	0.0	0.4	18.1	1.2	0.6
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	1.4	0.8	0.1	0.7	0.8	0.8	0.8	0.0	1.9	0.4	3.5	1.7
LnGrp Delay(d),s/veh	34.0	17.2	16.2	35.2	18.9	18.9	34.5	0.0	11.0	38.9	13.2	11.7
LnGrp LOS	C	B	B	D	B	B	C		B	D	B	B
Approach Vol, veh/h		161			168			256			546	
Approach Delay, s/veh		25.6			22.4			15.0			13.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.4	12.0	5.6	19.9	6.6	10.8	4.9	20.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	2.9	3.4	3.1	8.6	3.9	3.5	2.5	5.7
Green Ext Time (p_c), s	0.1	1.4	0.1	5.4	0.3	1.4	0.0	5.7

Intersection Summary			
HCM 2010 Ctrl Delay			17.0
HCM 2010 LOS			B

Queues
2: Schafer Rd/University Rd & Dishman-Mica Rd

	↗	→	↘	↙	←	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	81	68	12	36	132	44	212	22	343	181
v/c Ratio	0.27	0.16	0.03	0.14	0.23	0.16	0.32	0.09	0.57	0.29
Control Delay	30.5	27.2	0.1	31.6	28.6	31.4	17.5	32.5	23.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	27.2	0.1	31.6	28.6	31.4	17.5	32.5	23.8	4.8
Queue Length 50th (ft)	30	25	0	14	25	17	48	8	120	0
Queue Length 95th (ft)	78	67	0	45	57	51	133	33	227	42
Internal Link Dist (ft)		1207			123		264		1057	
Turn Bay Length (ft)	134			61		70		100		
Base Capacity (vph)	852	1061	946	682	1693	682	1028	682	1005	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.06	0.01	0.05	0.08	0.06	0.21	0.03	0.34	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✣			✣	
Traffic Volume (veh/h)	16	459	60	92	295	51	22	91	81	40	145	21
Future Volume (veh/h)	16	459	60	92	295	51	22	91	81	40	145	21
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	17	483	63	97	311	54	23	96	85	42	153	22
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	515	676	88	407	713	124	112	186	148	142	284	37
Arrive On Green	0.01	0.42	0.42	0.06	0.46	0.46	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	1615	211	1774	1547	269	100	888	706	213	1355	177
Grp Volume(v), veh/h	17	0	546	97	0	365	204	0	0	217	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1826	1774	0	1815	1694	0	0	1745	0	0
Q Serve(g_s), s	0.2	0.0	11.0	1.3	0.0	6.0	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	11.0	1.3	0.0	6.0	4.6	0.0	0.0	4.7	0.0	0.0
Prop In Lane	1.00		0.12	1.00		0.15	0.11		0.42	0.19		0.10
Lane Grp Cap(c), veh/h	515	0	764	407	0	837	446	0	0	463	0	0
V/C Ratio(X)	0.03	0.00	0.71	0.24	0.00	0.44	0.46	0.00	0.00	0.47	0.00	0.00
Avail Cap(c_a), veh/h	1234	0	990	1050	0	984	991	0	0	1013	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.4	0.0	10.7	8.0	0.0	8.0	15.7	0.0	0.0	15.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.2	0.3	0.0	0.5	1.0	0.0	0.0	1.1	0.0	0.0
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	5.9	0.7	0.0	3.1	2.3	0.0	0.0	2.5	0.0	0.0
LnGrp Delay(d),s/veh	7.4	0.0	12.9	8.3	0.0	8.6	16.7	0.0	0.0	16.7	0.0	0.0
LnGrp LOS	A		B	A		A	B			B		
Approach Vol, veh/h		563			462			204			217	
Approach Delay, s/veh		12.7			8.5			16.7			16.7	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	23.5		14.3	4.6	25.4		14.3
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	2.2	13.0		6.7	2.2	8.0		6.6
Green Ext Time (p_c), s	0.2	5.5		3.3	0.0	7.1		3.3

Intersection Summary	
HCM 2010 Ctrl Delay	12.5
HCM 2010 LOS	B

	↗	→	↙	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	546	97	365	204	217
v/c Ratio	0.03	0.69	0.22	0.36	0.47	0.54
Control Delay	5.9	21.6	6.6	10.0	19.0	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	21.6	6.6	10.0	19.0	24.7
Queue Length 50th (ft)	2	150	12	53	47	65
Queue Length 95th (ft)	10	#353	34	172	102	126
Internal Link Dist (ft)		2316		2595	3508	1148
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	862	803	723	1017	759	731
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.68	0.13	0.36	0.27	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Volume (veh/h)	11	243	118	25	170	26	51	87	15	13	125	5
Future Volume (veh/h)	11	243	118	25	170	26	51	87	15	13	125	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	12	256	124	26	179	27	54	92	16	14	132	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	431	209	46	595	90	200	165	24	134	309	281
Arrive On Green	0.01	0.36	0.36	0.03	0.38	0.38	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	1187	575	1774	1582	239	318	931	137	91	1744	1583
Grp Volume(v), veh/h	12	0	380	26	0	206	162	0	0	146	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1761	1774	0	1821	1386	0	0	1835	0	1583
Q Serve(g_s), s	0.2	0.0	5.9	0.5	0.0	2.7	1.6	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.2	0.0	5.9	0.5	0.0	2.7	3.9	0.0	0.0	2.3	0.0	0.1
Prop In Lane	1.00		0.33	1.00		0.13	0.33		0.10	0.10		1.00
Lane Grp Cap(c), veh/h	22	0	639	46	0	684	390	0	0	444	0	281
V/C Ratio(X)	0.54	0.00	0.59	0.57	0.00	0.30	0.42	0.00	0.00	0.33	0.00	0.02
Avail Cap(c_a), veh/h	797	0	1318	1328	0	1308	865	0	0	982	0	758
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.4	0.0	8.6	16.1	0.0	7.3	12.9	0.0	0.0	12.3	0.0	11.3
Incr Delay (d2), s/veh	25.5	0.0	1.3	15.0	0.0	0.3	1.0	0.0	0.0	0.6	0.0	0.0
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	0.3	0.0	3.0	0.4	0.0	1.4	1.5	0.0	0.0	1.3	0.0	0.0
LnGrp Delay(d),s/veh	41.9	0.0	9.9	31.1	0.0	7.7	13.9	0.0	0.0	12.9	0.0	11.4
LnGrp LOS	D		A	C		A	B			B		B
Approach Vol, veh/h		392			232			162			151	
Approach Delay, s/veh		10.9			10.3			13.9			12.8	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.9	17.6		10.9	4.4	18.1		10.9
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	2.5	7.9		4.3	2.2	4.7		5.9
Green Ext Time (p_c), s	0.1	4.3		1.8	0.0	4.5		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Queues
4: Bowdish Rd & Dishman-Mica Rd

2020 PM W-O Proj.
12/8/2015

	↗	→	↙	←	↑	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	12	380	26	206	162	146	5
v/c Ratio	0.04	0.41	0.07	0.22	0.37	0.29	0.01
Control Delay	19.4	11.0	18.8	9.5	16.1	15.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	11.0	18.8	9.5	16.1	15.3	0.0
Queue Length 50th (ft)	2	45	4	22	21	20	0
Queue Length 95th (ft)	18	176	29	92	101	92	0
Internal Link Dist (ft)		3473		1032	470	3508	
Turn Bay Length (ft)	61		75				135
Base Capacity (vph)	731	1292	1219	1629	678	784	777
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.29	0.02	0.13	0.24	0.19	0.01

Intersection Summary

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	20	67	144	11	89	188
Future Vol, veh/h	20	67	144	11	89	188
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	74	158	12	98	207

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	566	164	0	0	170	0
Stage 1	164	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	486	881	-	-	1407	-
Stage 1	865	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	448	881	-	-	1407	-
Mov Cap-2 Maneuver	448	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	623	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	721	1407	-
HCM Lane V/C Ratio	-	-	0.133	0.07	-
HCM Control Delay (s)	-	-	10.8	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

Intersection	
Int Delay, s/veh	18.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	331	52	70	149	0	22	0	177	0	219	109
Future Vol, veh/h	0	331	52	70	149	0	22	0	177	0	219	109
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	356	56	75	160	0	24	0	190	0	235	117

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	412	0	0	871	695	384	790	723	160
Stage 1	-	-	-	-	-	-	384	384	-	311	311	-
Stage 2	-	-	-	-	-	-	487	311	-	479	412	-
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	1419	-	-	1147	-	-	271	366	664	308	352	885
Stage 1	-	-	-	-	-	-	639	611	-	699	658	-
Stage 2	-	-	-	-	-	-	562	658	-	568	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1419	-	-	1147	-	-	93	340	664	208	327	885
Mov Cap-2 Maneuver	-	-	-	-	-	-	93	340	-	208	327	-
Stage 1	-	-	-	-	-	-	639	611	-	699	611	-
Stage 2	-	-	-	-	-	-	278	611	-	405	594	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.7	24.3	47
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	396	1419	-	-	1147	-	-	414
HCM Lane V/C Ratio	0.54	-	-	-	0.066	-	-	0.852
HCM Control Delay (s)	24.3	0	-	-	8.4	0	-	47
HCM Lane LOS	C	A	-	-	A	A	-	E
HCM 95th %tile Q(veh)	3.1	0	-	-	0.2	-	-	8.3

77.5 5 207.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	173	263	60	14	201	6	25	286	10	87	355	0
Future Volume (veh/h)	173	263	60	14	201	6	25	286	10	87	355	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	192	292	67	16	223	0	28	318	11	97	394	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	355	509	21	289	264	53	548	19	128	706	0
Arrive On Green	0.32	0.32	0.32	0.17	0.17	0.00	0.03	0.16	0.16	0.07	0.20	0.00
Sat Flow, veh/h	725	1102	1583	124	1732	1583	1774	3491	120	1774	3632	0
Grp Volume(v), veh/h	484	0	67	239	0	0	28	161	168	97	394	0
Grp Sat Flow(s),veh/h/ln	1827	0	1583	1857	0	1583	1774	1770	1841	1774	1770	0
Q Serve(g_s), s	17.3	0.0	2.1	8.7	0.0	0.0	1.1	6.0	6.0	3.8	7.1	0.0
Cycle Q Clear(g_c), s	17.3	0.0	2.1	8.7	0.0	0.0	1.1	6.0	6.0	3.8	7.1	0.0
Prop In Lane	0.40		1.00	0.07		1.00	1.00		0.07	1.00		0.00
Lane Grp Cap(c), veh/h	588	0	509	310	0	264	53	278	289	128	706	0
V/C Ratio(X)	0.82	0.00	0.13	0.77	0.00	0.00	0.53	0.58	0.58	0.75	0.56	0.00
Avail Cap(c_a), veh/h	1288	0	1117	786	0	670	751	749	779	751	1498	0
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.2	0.0	17.0	28.2	0.0	0.0	33.9	27.7	27.7	32.3	25.6	0.0
Incr Delay (d2), s/veh	3.0	0.0	0.1	4.1	0.0	0.0	7.9	1.4	1.4	8.6	0.3	0.0
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	9.2	0.0	0.9	4.8	0.0	0.0	0.7	3.0	3.1	2.2	3.5	0.0
LnGrp Delay(d),s/veh	25.2	0.0	17.1	32.3	0.0	0.0	41.8	29.1	29.1	40.9	25.8	0.0
LnGrp LOS	C		B	C			D	C	C	D	C	
Approach Vol, veh/h		551			239			357			491	
Approach Delay, s/veh		24.2			32.3			30.1			28.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.1	19.1		16.8	10.1	16.1		27.8
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	3.1	9.1		10.7	5.8	8.0		19.3
Green Ext Time (p_c), s	0.0	3.1		1.2	0.2	3.1		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	28.0
HCM 2010 LOS	C

Queues
12: Hwy 27 & 16th Ave

	→	↘	←	↖	↖	↑	↘	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	484	67	239	7	28	329	97	394
v/c Ratio	0.78	0.11	0.67	0.06	0.22	0.61	0.48	0.45
Control Delay	42.7	4.6	52.1	1.0	58.8	49.8	57.5	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	4.6	52.1	1.0	58.8	49.8	57.5	39.8
Queue Length 50th (ft)	287	0	150	0	18	109	62	126
Queue Length 95th (ft)	522	24	290	0	58	200	143	223
Internal Link Dist (ft)	49		154			343		461
Turn Bay Length (ft)				25	157		232	
Base Capacity (vph)	918	836	560	116	533	1063	533	1067
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.08	0.43	0.06	0.05	0.31	0.18	0.37

Intersection Summary

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	35	487	45	80	367	41	49	55	51	57	90	31
Future Volume (veh/h)	35	487	45	80	367	41	49	55	51	57	90	31
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	45	624	58	103	471	53	63	71	65	73	115	40
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	428	780	72	338	814	92	250	114	104	264	177	62
Arrive On Green	0.03	0.46	0.46	0.07	0.50	0.50	0.04	0.13	0.13	0.05	0.13	0.13
Sat Flow, veh/h	1774	1679	156	1774	1645	185	1774	897	821	1774	1322	460
Grp Volume(v), veh/h	45	0	682	103	0	524	63	0	136	73	0	155
Grp Sat Flow(s),veh/h/ln	1774	0	1835	1774	0	1830	1774	0	1718	1774	0	1782
Q Serve(g_s), s	0.8	0.0	20.5	1.9	0.0	13.1	2.0	0.0	4.9	2.3	0.0	5.3
Cycle Q Clear(g_c), s	0.8	0.0	20.5	1.9	0.0	13.1	2.0	0.0	4.9	2.3	0.0	5.3
Prop In Lane	1.00		0.09	1.00		0.10	1.00		0.48	1.00		0.26
Lane Grp Cap(c), veh/h	428	0	852	338	0	906	250	0	218	264	0	238
V/C Ratio(X)	0.11	0.00	0.80	0.30	0.00	0.58	0.25	0.00	0.62	0.28	0.00	0.65
Avail Cap(c_a), veh/h	916	0	852	772	0	906	723	0	585	725	0	607
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	9.3	0.0	14.8	11.4	0.0	11.5	23.3	0.0	26.8	23.0	0.0	26.6
Incr Delay (d2), s/veh	0.1	0.0	7.8	0.5	0.0	2.7	0.5	0.0	4.1	0.6	0.0	4.2
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	0.4	0.0	12.1	0.9	0.0	7.2	1.0	0.0	2.6	1.1	0.0	2.9
LnGrp Delay(d),s/veh	9.4	0.0	22.6	11.9	0.0	14.2	23.8	0.0	30.9	23.6	0.0	30.8
LnGrp LOS	A		C	B		B	C		C	C		C
Approach Vol, veh/h		727			627			199			228	
Approach Delay, s/veh		21.7			13.8			28.7			28.5	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	37.0	7.7	13.2	8.7	35.0	7.3	13.6
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	20.0	22.0	20.0	30.0	20.0	22.0
Max Q Clear Time (g_c+I1), s	2.8	15.1	4.3	6.9	3.9	22.5	4.0	7.3
Green Ext Time (p_c), s	0.1	10.6	0.1	1.9	0.2	5.9	0.1	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

	↗	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	682	103	524	63	136	73	155
v/c Ratio	0.11	0.86	0.34	0.59	0.18	0.43	0.20	0.50
Control Delay	9.8	36.5	12.4	21.4	19.6	27.0	19.8	33.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	36.5	12.4	21.4	19.6	27.0	19.8	33.2
Queue Length 50th (ft)	9	304	21	197	21	43	24	62
Queue Length 95th (ft)	23	#496	44	294	42	81	46	105
Internal Link Dist (ft)		2595		1832		2145		5230
Turn Bay Length (ft)	168		166		79		113	
Base Capacity (vph)	679	797	565	883	571	558	576	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.86	0.18	0.59	0.11	0.24	0.13	0.28

Intersection Summary

Description: Plan 1

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	25	0	57	0	0	0	31	44	0	0	94	28
Future Vol, veh/h	25	0	57	0	0	0	31	44	0	0	94	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	0	66	0	0	0	36	51	0	0	109	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	249	249	126	282	265	51	142	0	0	51	0	0
Stage 1	126	126	-	123	123	-	-	-	-	-	-	-
Stage 2	123	123	-	159	142	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	705	654	924	670	640	1017	1441	-	-	1555	-	-
Stage 1	878	792	-	881	794	-	-	-	-	-	-	-
Stage 2	881	794	-	843	779	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	691	637	924	610	623	1017	1441	-	-	1555	-	-
Mov Cap-2 Maneuver	691	637	-	610	623	-	-	-	-	-	-	-
Stage 1	855	792	-	858	773	-	-	-	-	-	-	-
Stage 2	858	773	-	783	779	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	0	3.1	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1441	-	-	838	-	1555	-	-
HCM Lane V/C Ratio	0.025	-	-	0.114	-	-	-	-
HCM Control Delay (s)	7.6	0	-	9.8	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	-	0	-	-
	2.5'			10				

	⤴	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	83	322	195	173	333	48	129	185	114	53	248	67
Future Volume (veh/h)	83	322	195	173	333	48	129	185	114	53	248	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	98	379	229	204	392	56	152	218	134	62	292	79
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	615	366	255	571	82	197	509	300	88	488	130
Arrive On Green	0.07	0.29	0.29	0.14	0.36	0.36	0.11	0.24	0.24	0.05	0.18	0.18
Sat Flow, veh/h	1774	2136	1272	1774	1595	228	1774	2144	1265	1774	2767	736
Grp Volume(v), veh/h	98	313	295	204	0	448	152	178	174	62	185	186
Grp Sat Flow(s),veh/h/ln	1774	1770	1638	1774	0	1823	1774	1770	1640	1774	1770	1733
Q Serve(g_s), s	3.8	10.9	11.1	7.9	0.0	14.9	5.9	6.1	6.4	2.4	6.8	7.0
Cycle Q Clear(g_c), s	3.8	10.9	11.1	7.9	0.0	14.9	5.9	6.1	6.4	2.4	6.8	7.0
Prop In Lane	1.00		0.78	1.00		0.13	1.00		0.77	1.00		0.42
Lane Grp Cap(c), veh/h	129	509	471	255	0	653	197	420	389	88	312	306
V/C Ratio(X)	0.76	0.61	0.63	0.80	0.00	0.69	0.77	0.42	0.45	0.70	0.59	0.61
Avail Cap(c_a), veh/h	625	997	923	625	0	1027	749	997	923	749	997	976
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	21.9	22.0	29.4	0.0	19.4	30.7	23.0	23.1	33.2	26.9	27.0
Incr Delay (d2), s/veh	8.7	1.2	1.4	5.8	0.0	1.3	6.4	0.5	0.6	9.8	1.5	1.7
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	2.2	5.5	5.2	4.3	0.0	7.7	3.3	3.0	3.0	1.4	3.5	3.5
LnGrp Delay(d),s/veh	41.0	23.1	23.3	35.2	0.0	20.7	37.1	23.5	23.7	43.0	28.4	28.7
LnGrp LOS	D	C	C	D		C	D	C	C	D	C	C
Approach Vol, veh/h		706			652			504			433	
Approach Delay, s/veh		25.7			25.2			27.6			30.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	22.4	14.7	24.9	13.4	18.0	9.7	30.0
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	4.4	8.4	9.9	13.1	7.9	9.0	5.8	16.9
Green Ext Time (p_c), s	0.1	3.5	0.5	7.3	0.4	3.5	0.2	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.9
HCM 2010 LOS	C

Queues
19: Hwy 27 & 32nd Ave

	↗	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	608	204	448	152	352	62	371
v/c Ratio	0.46	0.61	0.63	0.71	0.57	0.38	0.36	0.62
Control Delay	50.8	30.3	48.0	36.1	49.1	26.1	51.4	41.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	30.3	48.0	36.1	49.1	26.1	51.4	41.6
Queue Length 50th (ft)	56	143	115	226	86	72	36	104
Queue Length 95th (ft)	120	239	213	399	168	127	85	173
Internal Link Dist (ft)		140		200		6700		1848
Turn Bay Length (ft)	108		112		131		184	
Base Capacity (vph)	480	1497	480	799	577	1497	577	1501
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.41	0.42	0.56	0.26	0.24	0.11	0.25

Intersection Summary

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	196	377	0	0	375	11	0	0	0	16	0	199
Future Vol, veh/h	196	377	0	0	375	11	0	0	0	16	0	199
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	218	419	0	0	417	12	0	0	0	18	0	221

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	429	0	0	419	0	0	1387	1283	419	1277	1277	423
Stage 1	-	-	-	-	-	-	854	854	-	423	423	-
Stage 2	-	-	-	-	-	-	533	429	-	854	854	-
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	1130	-	-	1140	-	-	120	165	634	143	166	631
Stage 1	-	-	-	-	-	-	353	375	-	609	588	-
Stage 2	-	-	-	-	-	-	531	584	-	353	375	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1130	-	-	1140	-	-	66	133	634	122	134	631
Mov Cap-2 Maneuver	-	-	-	-	-	-	66	133	-	122	134	-
Stage 1	-	-	-	-	-	-	285	303	-	492	588	-
Stage 2	-	-	-	-	-	-	345	584	-	285	303	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.1	0	0	15.7
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1130	-	-	1140	-	-	122	631
HCM Lane V/C Ratio	-	0.193	-	-	-	-	-	0.146	0.35
HCM Control Delay (s)	0	8.9	-	-	0	-	-	39.5	13.8
HCM Lane LOS	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	-	0.7	-	-	0	-	-	0.5	1.6

17.5 12.5 40

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	268	16	22	51	93	333
Future Vol, veh/h	268	16	22	51	93	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	295	18	24	56	102	366

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	206	102	102	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	782	953	1490	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	769	953	1490	-	-	-
Mov Cap-2 Maneuver	769	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1490	-	777	-	-
HCM Lane V/C Ratio	0.016	-	0.402	-	-
HCM Control Delay (s)	7.5	0	12.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.9	-	-

47.5

LEVEL OF SERVICE CALCULATIONS

YEAR 2020

WITH PROJECT

HCM 2010 Signalized Intersection Summary
1: University Rd & 32nd Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	4	140	6	34	490	125	20	89	63	65	56	4
Future Volume (veh/h)	4	140	6	34	490	125	20	89	63	65	56	4
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	5	165	7	40	576	147	24	105	74	76	66	5
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	1511	63	133	1200	298	41	327	213	99	640	48
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.02	0.16	0.16	0.06	0.19	0.19
Sat Flow, veh/h	23	3336	139	87	2650	657	1774	2054	1342	1774	3338	250
Grp Volume(v), veh/h	93	0	84	410	0	353	24	89	90	76	35	36
Grp Sat Flow(s),veh/h/ln	1827	0	1671	1815	0	1579	1774	1770	1626	1774	1770	1819
Q Serve(g_s), s	0.0	0.0	1.2	0.0	0.0	6.6	0.6	1.9	2.1	1.8	0.7	0.7
Cycle Q Clear(g_c), s	1.2	0.0	1.2	6.5	0.0	6.6	0.6	1.9	2.1	1.8	0.7	0.7
Prop In Lane	0.05		0.08	0.10		0.42	1.00		0.83	1.00		0.14
Lane Grp Cap(c), veh/h	918	0	757	916	0	715	41	281	259	99	339	349
V/C Ratio(X)	0.10	0.00	0.11	0.45	0.00	0.49	0.58	0.32	0.35	0.77	0.10	0.10
Avail Cap(c_a), veh/h	1362	0	1189	1374	0	1124	842	1259	1157	842	1259	1294
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.6	0.0	6.6	8.1	0.0	8.1	20.4	15.7	15.8	19.6	14.0	14.1
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.7	0.0	1.1	17.1	1.4	1.7	15.9	0.3	0.3
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	0.6	0.0	0.6	3.5	0.0	3.1	0.5	1.0	1.0	1.3	0.4	0.4
LnGrp Delay(d),s/veh	6.7	0.0	6.8	8.8	0.0	9.3	37.5	17.1	17.5	35.5	14.3	14.3
LnGrp LOS	A		A	A		A	D	B	B	D	B	B
Approach Vol, veh/h		177			763			203			147	
Approach Delay, s/veh		6.8			9.0			19.7			25.3	
Approach LOS		A			A			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		24.1	5.0	13.1		24.1	6.4	11.7
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		3.2	2.6	2.7		8.6	3.8	4.1
Green Ext Time (p_c), s		11.8	0.0	2.7		10.5	0.2	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	1	170	37	11	521	31	225	100	23	22	39	12
Future Volume (veh/h)	1	170	37	11	521	31	225	100	23	22	39	12
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1	200	44	13	613	36	265	118	27	26	46	14
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	576	490	24	1093	64	349	332	76	43	100	85
Arrive On Green	0.00	0.31	0.31	0.01	0.32	0.32	0.20	0.23	0.23	0.02	0.05	0.05
Sat Flow, veh/h	1774	1863	1583	1774	3398	199	1774	1468	336	1774	1863	1583
Grp Volume(v), veh/h	1	200	44	13	319	330	265	0	145	26	46	14
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1828	1774	0	1803	1774	1863	1583
Q Serve(g_s), s	0.0	3.9	0.9	0.3	7.0	7.0	6.6	0.0	3.2	0.7	1.1	0.4
Cycle Q Clear(g_c), s	0.0	3.9	0.9	0.3	7.0	7.0	6.6	0.0	3.2	0.7	1.1	0.4
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	4	576	490	24	569	588	349	0	408	43	100	85
V/C Ratio(X)	0.26	0.35	0.09	0.55	0.56	0.56	0.76	0.00	0.36	0.60	0.46	0.17
Avail Cap(c_a), veh/h	946	994	845	757	944	975	757	0	1078	757	1113	946
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	12.5	11.5	23.0	13.2	13.2	17.8	0.0	15.3	22.6	21.5	21.2
Incr Delay (d2), s/veh	46.1	0.5	0.1	25.6	1.2	1.2	4.8	0.0	0.7	17.3	4.7	1.3
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	2.1	0.4	0.3	3.6	3.7	3.7	0.0	1.7	0.5	0.7	0.2
LnGrp Delay(d),s/veh	69.5	13.0	11.6	48.6	14.4	14.4	22.5	0.0	16.0	39.9	26.2	22.5
LnGrp LOS	E	B	B	D	B	B	C		B	D	C	C
Approach Vol, veh/h		245			662			410			86	
Approach Delay, s/veh		13.0			15.0			20.2			29.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	20.5	13.2	8.5	4.1	21.1	5.1	16.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	2.3	5.9	8.6	3.1	2.0	9.0	2.7	5.2
Green Ext Time (p_c), s	0.0	6.6	0.9	1.5	0.0	6.1	0.0	1.5

Intersection Summary			
HCM 2010 Ctrl Delay			17.1
HCM 2010 LOS			B

HCM 2010 Signalized Intersection Summary
3: Bowdish Rd & 32nd Ave

2020 AM W- Proj.
12/16/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	54	443	37	27	294	12	60	59	37	79	121	97
Future Volume (veh/h)	54	443	37	27	294	12	60	59	37	79	121	97
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	61	503	42	31	334	14	68	67	42	90	138	110
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	458	673	56	308	679	28	237	219	110	189	229	156
Arrive On Green	0.04	0.40	0.40	0.02	0.38	0.38	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1774	1696	142	1774	1775	74	456	746	374	323	778	531
Grp Volume(v), veh/h	61	0	545	31	0	348	177	0	0	338	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1838	1774	0	1850	1576	0	0	1632	0	0
Q Serve(g_s), s	1.0	0.0	12.4	0.5	0.0	7.0	0.0	0.0	0.0	4.9	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	12.4	0.5	0.0	7.0	3.9	0.0	0.0	8.7	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.04	0.38		0.24	0.27		0.33
Lane Grp Cap(c), veh/h	458	0	729	308	0	707	566	0	0	573	0	0
V/C Ratio(X)	0.13	0.00	0.75	0.10	0.00	0.49	0.31	0.00	0.00	0.59	0.00	0.00
Avail Cap(c_a), veh/h	1070	0	908	946	0	914	854	0	0	890	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.0	0.0	12.6	10.2	0.0	11.4	13.5	0.0	0.0	15.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	3.2	0.1	0.0	0.8	0.4	0.0	0.0	1.4	0.0	0.0
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	0.5	0.0	6.8	0.3	0.0	3.6	1.9	0.0	0.0	4.2	0.0	0.0
LnGrp Delay(d),s/veh	9.2	0.0	15.7	10.4	0.0	12.2	13.9	0.0	0.0	16.5	0.0	0.0
LnGrp LOS	A		B	B		B	B			B		
Approach Vol, veh/h		606			379			177			338	
Approach Delay, s/veh		15.1			12.0			13.9			16.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	24.3		19.3	5.7	23.6		19.3
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	2.5	14.4		10.7	3.0	9.0		5.9
Green Ext Time (p_c), s	0.0	4.9		3.7	0.1	6.6		4.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
4: Bowdish Rd & Dishman-Mica Rd

2020 AM W- Proj.
12/16/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰↑↱			↰↑	↱
Traffic Volume (veh/h)	6	163	33	40	418	46	118	151	28	31	62	7
Future Volume (veh/h)	6	163	33	40	418	46	118	151	28	31	62	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	7	187	38	46	480	53	136	174	32	36	71	8
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	13	543	110	69	647	71	258	250	41	214	362	437
Arrive On Green	0.01	0.36	0.36	0.04	0.39	0.39	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1774	1503	305	1774	1649	182	526	907	148	387	1312	1583
Grp Volume(v), veh/h	7	0	225	46	0	533	342	0	0	107	0	8
Grp Sat Flow(s),veh/h/ln	1774	0	1809	1774	0	1831	1581	0	0	1699	0	1583
Q Serve(g_s), s	0.2	0.0	4.1	1.1	0.0	11.2	7.0	0.0	0.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.2	0.0	4.1	1.1	0.0	11.2	8.9	0.0	0.0	2.0	0.0	0.2
Prop In Lane	1.00		0.17	1.00		0.10	0.40		0.09	0.34		1.00
Lane Grp Cap(c), veh/h	13	0	653	69	0	718	549	0	0	577	0	437
V/C Ratio(X)	0.53	0.00	0.34	0.67	0.00	0.74	0.62	0.00	0.00	0.19	0.00	0.02
Avail Cap(c_a), veh/h	595	0	1011	991	0	982	677	0	0	703	0	566
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	10.4	21.2	0.0	11.7	14.9	0.0	0.0	12.4	0.0	11.8
Incr Delay (d2), s/veh	39.8	0.0	0.4	14.6	0.0	2.6	1.7	0.0	0.0	0.2	0.0	0.0
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	0.2	0.0	2.1	0.8	0.0	6.0	4.1	0.0	0.0	1.0	0.0	0.1
LnGrp Delay(d),s/veh	61.9	0.0	10.9	35.8	0.0	14.2	16.6	0.0	0.0	12.7	0.0	11.8
LnGrp LOS	E		B	D		B	B			B		B
Approach Vol, veh/h		232			579			342			115	
Approach Delay, s/veh		12.4			16.0			16.6			12.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	21.6		17.4	4.3	23.1		17.4
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	3.1	6.1		4.0	2.2	13.2		10.9
Green Ext Time (p_c), s	0.1	6.0		3.0	0.0	4.4		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.1

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	0	217	428	1	0	66
Future Vol, veh/h	0	217	428	1	0	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	236	465	1	0	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	466	0	-	0	702	466
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	236	-
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	1095	-	-	-	404	597
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1095	-	-	-	404	597
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	803	-

Approach	SE	NW	SW
HCM Control Delay, s	0	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1095	-	597
HCM Lane V/C Ratio	-	-	-	-	0.12
HCM Control Delay (s)	-	-	0	-	11.9
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.4

HCM 2010 TWSC
6: Dishman-Mica Rd & Sundown Drive

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	8	66	363	1	37	180
Future Vol, veh/h	8	66	363	1	37	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	72	395	1	40	196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	671	395	0	0	396	0
Stage 1	395	-	-	-	-	-
Stage 2	276	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	422	654	-	-	1163	-
Stage 1	681	-	-	-	-	-
Stage 2	771	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	407	654	-	-	1163	-
Mov Cap-2 Maneuver	509	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	744	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	1.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	509	654	1163	-
HCM Lane V/C Ratio	-	-	0.017	0.11	0.035	-
HCM Control Delay (s)	-	-	12.2	11.2	8.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.4	0.1	-

7: Dishman-Mica Rd & N. Comm Access

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	SEL	SET	NWT	NWR
Traffic Vol, veh/h	0	15	8	180	349	0
Future Vol, veh/h	0	15	8	180	349	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	9	196	379	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	379	379	379	0	-	0
Stage 1	379	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	623	668	1179	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	618	668	1179	-	-	-
Mov Cap-2 Maneuver	641	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	10.5	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	668	1179	-
HCM Lane V/C Ratio	-	-	0.024	0.007	-
HCM Control Delay (s)	-	-	10.5	8.1	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
8: Dishman-Mica Rd & S. Comm. Access

2020 AM W- Proj.
12/16/2015

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	1	11	338	1	6	174
Future Vol, veh/h	1	11	338	1	6	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	12	367	1	7	189

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	570	368	0	0	368	0
Stage 1	368	-	-	-	-	-
Stage 2	202	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	483	677	-	-	1191	-
Stage 1	700	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	480	677	-	-	1191	-
Mov Cap-2 Maneuver	480	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	827	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	655	1191	-
HCM Lane V/C Ratio	-	-	0.02	0.005	-
HCM Control Delay (s)	-	-	10.6	8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	10	106	233	14	49	126
Future Vol, veh/h	10	106	233	14	49	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	134	295	18	62	159

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	588	304	0	0	313	0
Stage 1	304	-	-	-	-	-
Stage 2	284	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	471	736	-	-	1247	-
Stage 1	748	-	-	-	-	-
Stage 2	764	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	445	736	-	-	1247	-
Mov Cap-2 Maneuver	445	-	-	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	722	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	697	1247	-
HCM Lane V/C Ratio	-	-	0.211	0.05	-
HCM Control Delay (s)	-	-	11.5	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	3	60	114	0	0	2
Future Vol, veh/h	3	60	114	0	0	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	65	124	0	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	124	0	-	0	196	124
Stage 1	-	-	-	-	124	-
Stage 2	-	-	-	-	72	-
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	1463	-	-	-	793	927
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	951	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1463	-	-	-	791	927
Mov Cap-2 Maneuver	-	-	-	-	791	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	949	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1463	-	-	-	927
HCM Lane V/C Ratio	0.002	-	-	-	0.002
HCM Control Delay (s)	7.5	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	238	44	54	214	0	30	0	240	0	150	33
Future Vol, veh/h	0	238	44	54	214	0	30	0	240	0	150	33
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	270	50	61	243	0	34	0	273	0	170	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	243	0	0	320	0	0	765	661	295	798	686	243
Stage 1	-	-	-	-	-	-	295	295	-	366	366	-
Stage 2	-	-	-	-	-	-	470	366	-	432	320	-
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	1323	-	-	1240	-	-	320	383	744	304	370	796
Stage 1	-	-	-	-	-	-	713	669	-	653	623	-
Stage 2	-	-	-	-	-	-	574	623	-	602	652	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1323	-	-	1240	-	-	180	361	744	184	349	796
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	361	-	184	349	-
Stage 1	-	-	-	-	-	-	713	669	-	653	587	-
Stage 2	-	-	-	-	-	-	366	587	-	381	652	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	19.4	24.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	552	1323	-	-	1240	-	-	388
HCM Lane V/C Ratio	0.556	-	-	-	0.049	-	-	0.536
HCM Control Delay (s)	19.4	0	-	-	8.1	0	-	24.5
HCM Lane LOS	C	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	3.4	0	-	-	0.2	-	-	3.1

Intersection	
Int Delay, s/veh	6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	238	44	204	247	30	240
Future Vol, veh/h	238	44	204	247	30	240
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	253	47	217	263	32	255

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	300	0	974	277
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	697	-
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	-	-	1261	-	279	762
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	494	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1261	-	223	762
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	394	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	601	-	-	1261	-
HCM Lane V/C Ratio	0.478	-	-	0.172	-
HCM Control Delay (s)	16.4	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.6	-	-	0.6	-

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↑↱		↰	↑↑↱	
Traffic Volume (veh/h)	202	206	23	5	201	72	57	481	19	41	119	1
Future Volume (veh/h)	202	206	23	5	201	72	57	481	19	41	119	1
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	238	242	27	6	236	0	67	566	22	48	140	1
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	288	498	8	300	262	88	756	29	74	756	5
Arrive On Green	0.31	0.31	0.31	0.17	0.17	0.00	0.05	0.22	0.22	0.04	0.21	0.21
Sat Flow, veh/h	901	916	1583	46	1814	1583	1774	3474	135	1774	3602	26
Grp Volume(v), veh/h	480	0	27	242	0	0	67	288	300	48	69	72
Grp Sat Flow(s),veh/h/ln	1818	0	1583	1860	0	1583	1774	1770	1839	1774	1770	1858
Q Serve(g_s), s	18.9	0.0	0.9	9.6	0.0	0.0	2.9	11.7	11.7	2.0	2.5	2.5
Cycle Q Clear(g_c), s	18.9	0.0	0.9	9.6	0.0	0.0	2.9	11.7	11.7	2.0	2.5	2.5
Prop In Lane	0.50		1.00	0.02		1.00	1.00		0.07	1.00		0.01
Lane Grp Cap(c), veh/h	572	0	498	308	0	262	88	385	400	74	371	390
V/C Ratio(X)	0.84	0.00	0.05	0.79	0.00	0.00	0.76	0.75	0.75	0.65	0.19	0.19
Avail Cap(c_a), veh/h	1183	0	1031	727	0	618	693	691	718	693	691	726
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	0.0	18.3	30.7	0.0	0.0	36.1	28.1	28.1	36.2	24.9	24.9
Incr Delay (d2), s/veh	3.4	0.0	0.0	4.4	0.0	0.0	12.7	2.2	2.1	9.2	0.1	0.1
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	10.0	0.0	0.4	5.3	0.0	0.0	1.7	5.9	6.2	1.2	1.2	1.3
LnGrp Delay(d),s/veh	27.9	0.0	18.4	35.2	0.0	0.0	48.7	30.2	30.2	45.4	25.0	25.0
LnGrp LOS	C		B	D			D	C	C	D	C	C
Approach Vol, veh/h		507			242			655			189	
Approach Delay, s/veh		27.4			35.2			32.1			30.2	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.8	21.1		17.7	8.2	21.7		29.2
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	4.9	4.5		11.6	4.0	13.7		20.9
Green Ext Time (p_c), s	0.1	3.4		1.2	0.1	3.0		3.3

Intersection Summary			
HCM 2010 Ctrl Delay			30.8
HCM 2010 LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑	↱	↰	↑↑↱		↰	↑↑↱	
Traffic Volume (veh/h)	202	206	23	5	201	72	57	481	19	41	119	184
Future Volume (veh/h)	202	206	23	5	201	72	57	481	19	41	119	184
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	208	212	24	5	207	0	59	496	20	42	123	190
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	264	455	7	277	241	89	747	30	72	365	326
Arrive On Green	0.29	0.29	0.29	0.15	0.15	0.00	0.05	0.22	0.22	0.04	0.21	0.21
Sat Flow, veh/h	900	918	1583	44	1817	1583	1774	3468	140	1774	1770	1583
Grp Volume(v), veh/h	420	0	24	212	0	0	59	253	263	42	123	190
Grp Sat Flow(s),veh/h/ln	1818	0	1583	1861	0	1583	1774	1770	1838	1774	1770	1583
Q Serve(g_s), s	14.1	0.0	0.7	7.2	0.0	0.0	2.2	8.6	8.6	1.5	3.9	7.1
Cycle Q Clear(g_c), s	14.1	0.0	0.7	7.2	0.0	0.0	2.2	8.6	8.6	1.5	3.9	7.1
Prop In Lane	0.50		1.00	0.02		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	523	0	455	283	0	241	89	381	396	72	365	326
V/C Ratio(X)	0.80	0.00	0.05	0.75	0.00	0.00	0.66	0.66	0.66	0.58	0.34	0.58
Avail Cap(c_a), veh/h	1381	0	1203	848	0	722	809	807	838	809	807	722
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	0.0	17.0	26.7	0.0	0.0	30.7	23.6	23.6	31.0	22.3	23.6
Incr Delay (d2), s/veh	2.9	0.0	0.0	3.9	0.0	0.0	8.2	1.5	1.4	7.2	0.2	0.6
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	7.4	0.0	0.3	4.0	0.0	0.0	1.3	4.4	4.5	0.9	1.9	3.2
LnGrp Delay(d),s/veh	24.7	0.0	17.0	30.6	0.0	0.0	38.9	25.1	25.1	38.2	22.5	24.2
LnGrp LOS	C		B	C			D	C	C	D	C	C
Approach Vol, veh/h		444			212			575			355	
Approach Delay, s/veh		24.2			30.6			26.5			25.3	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.3	18.6		15.0	7.7	19.2		23.9
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	4.2	9.1		9.2	3.5	10.6		16.1
Green Ext Time (p_c), s	0.1	3.6		1.1	0.1	3.5		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.1
HCM 2010 LOS	C

13: Pines Rd & 32nd Ave

12/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	16	375	8	61	433	56	58	89	169	191	46	33
Future Volume (veh/h)	16	375	8	61	433	56	58	89	169	191	46	33
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	19	452	10	73	522	67	70	107	204	230	55	40
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	793	18	369	748	96	435	127	243	328	298	217
Arrive On Green	0.01	0.44	0.44	0.04	0.46	0.46	0.04	0.22	0.22	0.12	0.30	0.30
Sat Flow, veh/h	1774	1815	40	1774	1618	208	1774	574	1095	1774	1004	730
Grp Volume(v), veh/h	19	0	462	73	0	589	70	0	311	230	0	95
Grp Sat Flow(s),veh/h/ln	1774	0	1856	1774	0	1826	1774	0	1669	1774	0	1734
Q Serve(g_s), s	0.6	0.0	19.3	2.3	0.0	26.4	3.1	0.0	18.4	9.8	0.0	4.2
Cycle Q Clear(g_c), s	0.6	0.0	19.3	2.3	0.0	26.4	3.1	0.0	18.4	9.8	0.0	4.2
Prop In Lane	1.00		0.02	1.00		0.11	1.00		0.66	1.00		0.42
Lane Grp Cap(c), veh/h	262	0	810	369	0	844	435	0	370	328	0	515
V/C Ratio(X)	0.07	0.00	0.57	0.20	0.00	0.70	0.16	0.00	0.84	0.70	0.00	0.18
Avail Cap(c_a), veh/h	584	0	810	817	0	844	701	0	518	546	0	515
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	18.6	0.0	21.8	16.7	0.0	22.0	29.0	0.0	38.4	26.8	0.0	26.9
Incr Delay (d2), s/veh	0.1	0.0	2.9	0.3	0.0	4.8	0.2	0.0	12.5	2.7	0.0	0.4
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	0.3	0.0	10.5	1.1	0.0	14.4	1.5	0.0	9.7	5.0	0.0	2.1
LnGrp Delay(d),s/veh	18.7	0.0	24.7	17.0	0.0	26.7	29.1	0.0	50.8	29.5	0.0	27.3
LnGrp LOS	B		C	B		C	C		D	C		C
Approach Vol, veh/h		481			662			381			325	
Approach Delay, s/veh		24.5			25.7			46.9			28.8	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	52.7	16.8	27.8	8.4	50.0	9.0	35.6
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	25.0	32.0	30.0	45.0	20.0	25.0
Max Q Clear Time (g_c+I1), s	2.6	28.4	11.8	20.4	4.3	21.3	5.1	6.2
Green Ext Time (p_c), s	0.0	1.3	0.5	2.5	0.2	13.0	0.1	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	19	0	0	238	111	4
Future Vol, veh/h	19	0	0	238	111	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	0	0	259	121	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	382	123	125	0	-	0
Stage 1	123	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	620	928	1462	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	784	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	620	928	1462	-	-	-
Mov Cap-2 Maneuver	620	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	784	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1462	-	620	-	-
HCM Lane V/C Ratio	-	-	0.033	-	-
HCM Control Delay (s)	0	-	11	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	29	3	1	209	101	10
Future Vol, veh/h	29	3	1	209	101	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	3	1	227	110	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	344	115	121	0	-	0
Stage 1	115	-	-	-	-	-
Stage 2	229	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	652	937	1467	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	809	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	652	937	1467	-	-	-
Mov Cap-2 Maneuver	684	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1467	-	702	-	-
HCM Lane V/C Ratio	0.001	-	0.05	-	-
HCM Control Delay (s)	7.5	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	35	3	1	175	93	11
Future Vol, veh/h	35	3	1	175	93	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	3	1	190	101	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	299	107	113	0	-	0
Stage 1	107	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	692	947	1476	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	841	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	692	947	1476	-	-	-
Mov Cap-2 Maneuver	713	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	840	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1476	-	727	-	-
HCM Lane V/C Ratio	0.001	-	0.057	-	-
HCM Control Delay (s)	7.4	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	12	12	4	164	92	4
Future Vol, veh/h	12	12	4	164	92	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	13	4	178	100	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	289	102	104	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	187	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	702	953	1488	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	700	953	1488	-	-	-
Mov Cap-2 Maneuver	718	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	843	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1488	-	819	-	-
HCM Lane V/C Ratio	0.003	-	0.032	-	-
HCM Control Delay (s)	7.4	-	9.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	86	0	15	0	0	0	62	78	0	0	30	75
Future Vol, veh/h	86	0	15	0	0	0	62	78	0	0	30	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	92	82	92	92	92	82	82	92	92	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	0	18	0	0	0	76	95	0	0	37	91

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	328	328	82	337	374	95	128	0	0	95	0	0
Stage 1	82	82	-	246	246	-	-	-	-	-	-	-
Stage 2	246	246	-	91	128	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	625	591	978	617	557	962	1458	-	-	1499	-	-
Stage 1	926	827	-	758	703	-	-	-	-	-	-	-
Stage 2	758	703	-	916	790	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	599	558	978	580	526	962	1458	-	-	1499	-	-
Mov Cap-2 Maneuver	599	558	-	580	526	-	-	-	-	-	-	-
Stage 1	875	827	-	716	664	-	-	-	-	-	-	-
Stage 2	716	664	-	899	790	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	0	3.4	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1458	-	-	636	-	1499	-	-
HCM Lane V/C Ratio	0.052	-	-	0.194	-	-	-	-
HCM Control Delay (s)	7.6	0	-	12	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	-	0	-	-

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	148	279	69	68	223	81	138	308	150	26	93	78
Future Volume (veh/h)	148	279	69	68	223	81	138	308	150	26	93	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	159	300	74	73	240	87	148	331	161	28	100	84
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	209	942	229	107	360	130	196	520	248	56	275	212
Arrive On Green	0.12	0.33	0.33	0.06	0.28	0.28	0.11	0.22	0.22	0.03	0.14	0.14
Sat Flow, veh/h	1774	2825	686	1774	1306	473	1774	2327	1110	1774	1907	1466
Grp Volume(v), veh/h	159	186	188	73	0	327	148	250	242	28	92	92
Grp Sat Flow(s),veh/h/ln	1774	1770	1742	1774	0	1779	1774	1770	1667	1774	1770	1604
Q Serve(g_s), s	4.9	4.5	4.6	2.3	0.0	9.3	4.6	7.3	7.5	0.9	2.7	3.0
Cycle Q Clear(g_c), s	4.9	4.5	4.6	2.3	0.0	9.3	4.6	7.3	7.5	0.9	2.7	3.0
Prop In Lane	1.00		0.39	1.00		0.27	1.00		0.67	1.00		0.91
Lane Grp Cap(c), veh/h	209	590	581	107	0	490	196	396	373	56	255	232
V/C Ratio(X)	0.76	0.32	0.32	0.68	0.00	0.67	0.75	0.63	0.65	0.50	0.36	0.40
Avail Cap(c_a), veh/h	779	1244	1224	779	0	1251	935	1244	1172	935	1244	1128
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	14.1	14.2	26.2	0.0	18.3	24.6	20.0	20.1	27.1	22.0	22.1
Incr Delay (d2), s/veh	5.6	0.3	0.3	7.5	0.0	1.6	5.8	1.2	1.4	6.8	0.7	0.9
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	2.8	2.2	2.2	1.3	0.0	4.8	2.6	3.7	3.6	0.5	1.4	1.4
LnGrp Delay(d),s/veh	29.9	14.4	14.5	33.7	0.0	19.9	30.3	21.2	21.5	33.9	22.7	23.0
LnGrp LOS	C	B	B	C		B	C	C	C	C	C	C
Approach Vol, veh/h		533			400			640			212	
Approach Delay, s/veh		19.1			22.4			23.4			24.3	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	18.2	7.9	23.5	11.8	13.7	11.2	20.2
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	2.9	9.5	4.3	6.6	6.6	5.0	6.9	11.3
Green Ext Time (p_c), s	0.0	3.2	0.1	4.6	0.4	3.3	0.4	4.5

Intersection Summary			
HCM 2010 Ctrl Delay			22.0
HCM 2010 LOS			C

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	234	236	2	0	222	22	0	0	0	5	0	110
Future Vol, veh/h	234	236	2	0	222	22	0	0	0	5	0	110
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	260	262	2	0	247	24	0	0	0	6	0	122

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	271	0	0	264	0	0	1103	1054	263	1042	1043	259
Stage 1	-	-	-	-	-	-	783	783	-	259	259	-
Stage 2	-	-	-	-	-	-	320	271	-	783	784	-
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	1292	-	-	1300	-	-	189	226	776	208	229	780
Stage 1	-	-	-	-	-	-	387	404	-	746	694	-
Stage 2	-	-	-	-	-	-	692	685	-	387	404	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1292	-	-	1300	-	-	135	181	776	176	183	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	135	181	-	176	183	-
Stage 1	-	-	-	-	-	-	309	323	-	596	694	-
Stage 2	-	-	-	-	-	-	584	685	-	309	323	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.2	0	0	11.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1292	-	-	1300	-	-	176	780
HCM Lane V/C Ratio	-	0.201	-	-	-	-	-	0.032	0.157
HCM Control Delay (s)	0	8.5	-	-	0	-	-	26.1	10.5
HCM Lane LOS	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	-	0.8	-	-	0	-	-	0.1	0.6

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	232	4	15	78	23	169
Future Vol, veh/h	232	4	15	78	23	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	294	5	19	99	29	214

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	166	29	29	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	137	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	824	1046	1584	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	1046	1584	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	878	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1584	-	816	-	-
HCM Lane V/C Ratio	0.012	-	0.366	-	-
HCM Control Delay (s)	7.3	0	11.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.7	-	-

HCM 2010 Signalized Intersection Summary
1: University Rd & 32nd Ave

2020 PM W- Proj.
12/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	2	424	17	76	204	66	20	77	39	108	131	5
Future Volume (veh/h)	2	424	17	76	204	66	20	77	39	108	131	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	2	466	19	84	224	73	22	85	43	119	144	5
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	1372	56	303	730	244	38	365	173	163	791	27
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.02	0.16	0.16	0.09	0.23	0.23
Sat Flow, veh/h	3	3391	138	431	1806	604	1774	2329	1108	1774	3490	121
Grp Volume(v), veh/h	256	0	231	189	0	192	22	63	65	119	73	76
Grp Sat Flow(s),veh/h/ln	1861	0	1671	1252	0	1589	1774	1770	1667	1774	1770	1841
Q Serve(g_s), s	0.0	0.0	3.8	0.6	0.0	3.3	0.5	1.3	1.4	2.6	1.3	1.3
Cycle Q Clear(g_c), s	3.8	0.0	3.8	4.4	0.0	3.3	0.5	1.3	1.4	2.6	1.3	1.3
Prop In Lane	0.01		0.08	0.44		0.38	1.00		0.66	1.00		0.07
Lane Grp Cap(c), veh/h	843	0	676	636	0	642	38	277	261	163	401	417
V/C Ratio(X)	0.30	0.00	0.34	0.30	0.00	0.30	0.57	0.23	0.25	0.73	0.18	0.18
Avail Cap(c_a), veh/h	1472	0	1244	1067	0	1183	880	1317	1241	880	1317	1371
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.3	0.0	8.3	8.1	0.0	8.1	19.5	14.9	14.9	17.8	12.6	12.6
Incr Delay (d2), s/veh	0.4	0.0	0.6	0.6	0.0	0.6	17.7	0.9	1.0	8.7	0.5	0.4
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	2.0	0.0	1.8	1.6	0.0	1.5	0.4	0.7	0.7	1.7	0.7	0.7
LnGrp Delay(d),s/veh	8.7	0.0	8.9	8.6	0.0	8.7	37.2	15.8	16.0	26.5	13.0	13.0
LnGrp LOS	A		A	A		A	D	B	B	C	B	B
Approach Vol, veh/h		487			381			150			268	
Approach Delay, s/veh		8.8			8.7			19.0			19.0	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.3	4.9	14.1		21.3	7.7	11.3
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		5.8	2.5	3.3		6.4	4.6	3.4
Green Ext Time (p_c), s		10.2	0.0	2.9		10.1	0.4	2.9

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Queues
1: University Rd & 32nd Ave

	→	←	↰	↑	↘	↓
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	487	381	22	128	119	149
v/c Ratio	0.43	0.42	0.08	0.18	0.31	0.11
Control Delay	14.2	13.7	21.4	14.3	20.2	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	13.7	21.4	14.3	20.2	11.0
Queue Length 50th (ft)	54	38	5	10	29	11
Queue Length 95th (ft)	102	80	24	33	75	40
Internal Link Dist (ft)	112	93		1057		1152
Turn Bay Length (ft)			94		102	
Base Capacity (vph)	2267	1780	819	2286	819	2381
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.03	0.06	0.15	0.06

Intersection Summary

HCM 2010 Signalized Intersection Summary
2: Schafer Rd/University Rd & Dishman-Mica Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	74	202	11	33	191	25	40	183	10	38	312	165
Future Volume (veh/h)	74	202	11	33	191	25	40	183	10	38	312	165
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	81	222	12	36	210	27	44	201	11	42	343	181
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	108	398	338	56	582	74	65	538	29	63	570	485
Arrive On Green	0.06	0.21	0.21	0.03	0.18	0.18	0.04	0.31	0.31	0.04	0.31	0.31
Sat Flow, veh/h	1774	1863	1583	1774	3160	401	1774	1750	96	1774	1863	1583
Grp Volume(v), veh/h	81	222	12	36	116	121	44	0	212	42	343	181
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1792	1774	0	1846	1774	1863	1583
Q Serve(g_s), s	2.2	5.2	0.3	1.0	2.8	2.9	1.2	0.0	4.4	1.1	7.6	4.3
Cycle Q Clear(g_c), s	2.2	5.2	0.3	1.0	2.8	2.9	1.2	0.0	4.4	1.1	7.6	4.3
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	108	398	338	56	326	330	65	0	567	63	570	485
V/C Ratio(X)	0.75	0.56	0.04	0.64	0.36	0.37	0.67	0.00	0.37	0.66	0.60	0.37
Avail Cap(c_a), veh/h	913	959	815	731	911	923	731	0	1064	731	1074	913
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	17.1	15.1	23.2	17.3	17.3	23.1	0.0	13.2	23.1	14.3	13.2
Incr Delay (d2), s/veh	13.8	1.7	0.1	16.0	0.9	1.0	15.7	0.0	0.6	15.7	1.5	0.7
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	1.5	2.8	0.1	0.7	1.4	1.5	0.9	0.0	2.3	0.8	4.1	2.0
LnGrp Delay(d),s/veh	36.2	18.8	15.2	39.2	18.2	18.3	38.8	0.0	13.7	38.9	15.8	13.9
LnGrp LOS	D	B	B	D	B	B	D		B	D	B	B
Approach Vol, veh/h		315			273			256			566	
Approach Delay, s/veh		23.1			21.0			18.1			16.9	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	16.4	5.8	20.9	7.0	14.9	5.7	20.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	3.0	7.2	3.2	9.6	4.2	4.9	3.1	6.4
Green Ext Time (p_c), s	0.1	3.2	0.1	5.3	0.3	3.3	0.1	5.6

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

2: Schafer Rd/University Rd & Dishman-Mica Rd

	↗	→	↘	↙	←	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	81	222	12	36	237	44	212	42	343	181
v/c Ratio	0.28	0.43	0.02	0.15	0.32	0.18	0.36	0.17	0.59	0.29
Control Delay	34.1	28.3	0.1	35.5	26.9	35.1	23.1	35.2	27.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	28.3	0.1	35.5	26.9	35.1	23.1	35.2	27.1	5.4
Queue Length 50th (ft)	34	91	0	15	47	19	76	18	135	0
Queue Length 95th (ft)	86	182	0	48	93	56	157	54	260	46
Internal Link Dist (ft)		1207			123		264		1057	
Turn Bay Length (ft)	134			61		70		100		
Base Capacity (vph)	787	994	892	629	1554	629	922	629	928	879
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.22	0.01	0.06	0.15	0.07	0.23	0.07	0.37	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	16	476	60	98	304	55	24	100	85	46	158	21
Future Volume (veh/h)	16	476	60	98	304	55	24	100	85	46	158	21
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	17	501	63	103	320	58	25	105	89	48	166	22
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	500	678	85	391	711	129	109	202	154	144	301	36
Arrive On Green	0.01	0.42	0.42	0.06	0.46	0.46	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1774	1623	204	1774	1535	278	102	905	689	229	1349	162
Grp Volume(v), veh/h	17	0	564	103	0	378	219	0	0	236	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1827	1774	0	1814	1697	0	0	1740	0	0
Q Serve(g_s), s	0.3	0.0	12.1	1.5	0.0	6.6	0.0	0.0	0.0	0.2	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	12.1	1.5	0.0	6.6	5.2	0.0	0.0	5.3	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.15	0.11		0.41	0.20		0.09
Lane Grp Cap(c), veh/h	500	0	763	391	0	840	464	0	0	481	0	0
V/C Ratio(X)	0.03	0.00	0.74	0.26	0.00	0.45	0.47	0.00	0.00	0.49	0.00	0.00
Avail Cap(c_a), veh/h	1183	0	944	994	0	937	946	0	0	964	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.8	0.0	11.4	8.5	0.0	8.5	16.1	0.0	0.0	16.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.9	0.4	0.0	0.5	1.1	0.0	0.0	1.1	0.0	0.0
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	6.6	0.8	0.0	3.4	2.6	0.0	0.0	2.8	0.0	0.0
LnGrp Delay(d),s/veh	7.9	0.0	14.3	8.9	0.0	9.0	17.1	0.0	0.0	17.2	0.0	0.0
LnGrp LOS	A		B	A		A	B			B		
Approach Vol, veh/h		581			481			219			236	
Approach Delay, s/veh		14.1			9.0			17.1			17.2	
Approach LOS		B			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	24.4		15.3	4.6	26.5		15.3
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	3.5	14.1		7.3	2.3	8.6		7.2
Green Ext Time (p_c), s	0.2	5.3		3.5	0.0	7.2		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Queues
3: Bowdish Rd & 32nd Ave

	↗	→	↙	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	564	103	378	219	236
v/c Ratio	0.03	0.72	0.24	0.38	0.50	0.59
Control Delay	6.2	23.4	7.2	10.5	19.6	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	23.4	7.2	10.5	19.6	25.7
Queue Length 50th (ft)	2	162	13	58	53	72
Queue Length 95th (ft)	10	#386	37	185	112	138
Internal Link Dist (ft)		2334		2595	3508	1148
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	849	786	702	1001	739	701
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.72	0.15	0.38	0.30	0.34

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✣			↰	↱
Traffic Volume (veh/h)	11	401	118	28	266	41	51	87	25	32	125	5
Future Volume (veh/h)	11	401	118	28	266	41	51	87	25	32	125	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	12	422	124	29	280	43	54	92	26	34	132	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	600	176	49	708	109	168	166	39	148	293	294
Arrive On Green	0.01	0.43	0.43	0.03	0.45	0.45	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1774	1384	407	1774	1578	242	282	893	209	226	1578	1583
Grp Volume(v), veh/h	12	0	546	29	0	323	172	0	0	166	0	5
Grp Sat Flow(s),veh/h/ln	1774	0	1791	1774	0	1820	1384	0	0	1804	0	1583
Q Serve(g_s), s	0.3	0.0	10.2	0.7	0.0	4.9	1.9	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.3	0.0	10.2	0.7	0.0	4.9	5.1	0.0	0.0	3.3	0.0	0.1
Prop In Lane	1.00		0.23	1.00		0.13	0.31		0.15	0.20		1.00
Lane Grp Cap(c), veh/h	22	0	777	49	0	817	372	0	0	440	0	294
V/C Ratio(X)	0.54	0.00	0.70	0.60	0.00	0.40	0.46	0.00	0.00	0.38	0.00	0.02
Avail Cap(c_a), veh/h	648	0	1091	1081	0	1064	694	0	0	788	0	617
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	9.5	19.7	0.0	7.6	15.6	0.0	0.0	14.9	0.0	13.7
Incr Delay (d2), s/veh	26.4	0.0	1.7	15.5	0.0	0.4	1.3	0.0	0.0	0.8	0.0	0.0
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	0.3	0.0	5.4	0.5	0.0	2.5	1.9	0.0	0.0	1.8	0.0	0.0
LnGrp Delay(d),s/veh	46.5	0.0	11.1	35.2	0.0	8.0	16.8	0.0	0.0	15.7	0.0	13.7
LnGrp LOS	D		B	D		A	B			B		B
Approach Vol, veh/h		558			352			172			171	
Approach Delay, s/veh		11.9			10.3			16.8			15.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	23.3		12.6	4.5	23.9		12.6
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	2.7	12.2		5.3	2.3	6.9		7.1
Green Ext Time (p_c), s	0.1	5.6		2.0	0.0	6.6		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

4: Bowdish Rd & Dishman-Mica Rd

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	12	546	29	323	172	166	5
v/c Ratio	0.05	0.62	0.11	0.34	0.48	0.42	0.01
Control Delay	24.3	16.7	23.9	9.6	22.6	22.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	16.7	23.9	9.6	22.6	22.1	0.0
Queue Length 50th (ft)	3	81	7	41	36	37	0
Queue Length 95th (ft)	18	#329	31	146	106	104	0
Internal Link Dist (ft)		3473		778	470	3508	
Turn Bay Length (ft)	61		75				135
Base Capacity (vph)	533	913	889	1300	499	551	605
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.60	0.03	0.25	0.34	0.30	0.01

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	0	472	304	3	0	33
Future Vol, veh/h	0	472	304	3	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	513	330	3	0	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	334	0	-	0	845	332
Stage 1	-	-	-	-	332	-
Stage 2	-	-	-	-	513	-
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	1225	-	-	-	333	710
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	601	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1225	-	-	-	333	710
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	601	-

Approach	SE	NW	SW
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1225	-	710
HCM Lane V/C Ratio	-	-	-	-	0.051
HCM Control Delay (s)	-	-	0	-	10.3
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.2

5

HCM 2010 TWSC
6: Dishman-Mica Rd & Sundown Drive

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	3	41	266	3	131	341
Future Vol, veh/h	3	41	266	3	131	341
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	45	289	3	142	371

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	946	291	0	0	292	0
Stage 1	291	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	290	748	-	-	1270	-
Stage 1	759	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	258	748	-	-	1270	-
Mov Cap-2 Maneuver	366	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	459	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	366	748	1270	-
HCM Lane V/C Ratio	-	-	0.009	0.06	0.112	-
HCM Control Delay (s)	-	-	14.9	10.1	8.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0.2	0.4	-

5 10

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	SEL	SET	NWT	NWR
Traffic Vol, veh/h	3	26	33	311	243	1
Future Vol, veh/h	3	26	33	311	243	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	28	36	338	264	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	265	265	265	0	-	0
Stage 1	265	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	724	774	1299	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	704	774	1299	-	-	-
Mov Cap-2 Maneuver	719	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	9.9	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	768	1299	-
HCM Lane V/C Ratio	-	-	0.041	0.028	-
HCM Control Delay (s)	-	-	9.9	7.8	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

25 2.5

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	4	10	234	2	15	299
Future Vol, veh/h	4	10	234	2	15	299
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	11	254	2	16	325

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	613	255	0	0	257	0
Stage 1	255	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	456	784	-	-	1308	-
Stage 1	788	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	450	784	-	-	1308	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	788	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	647	1308	-
HCM Lane V/C Ratio	-	-	0.024	0.012	-
HCM Control Delay (s)	-	-	10.7	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	25	84	151	17	112	192
Future Vol, veh/h	25	84	151	17	112	192
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	92	166	19	123	211

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	632	175	0	0	185	0
Stage 1	175	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	444	868	-	-	1390	-
Stage 1	855	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	400	868	-	-	1390	-
Mov Cap-2 Maneuver	400	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	574	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	684	1390	-
HCM Lane V/C Ratio	-	-	0.175	0.089	-
HCM Control Delay (s)	-	-	11.4	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.3	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	115	97	2	2	14
Future Vol, veh/h	13	115	97	2	2	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	125	105	2	2	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	108	0	-	0	260	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	153	-
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	1483	-	-	-	729	947
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	875	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1483	-	-	-	722	947
Mov Cap-2 Maneuver	-	-	-	-	722	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	866	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	911
HCM Lane V/C Ratio	0.01	-	-	-	0.019
HCM Control Delay (s)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	27.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	331	55	75	149	0	25	0	191	0	243	109
Future Vol, veh/h	0	331	55	75	149	0	25	0	191	0	243	109
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	356	59	81	160	0	27	0	205	0	261	117

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	415	0	0	896	707	385	810	737	160
Stage 1	-	-	-	-	-	-	385	385	-	322	322	-
Stage 2	-	-	-	-	-	-	511	322	-	488	415	-
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	1419	-	-	1144	-	-	261	360	663	298	346	885
Stage 1	-	-	-	-	-	-	638	611	-	690	651	-
Stage 2	-	-	-	-	-	-	545	651	-	561	592	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1419	-	-	1144	-	-	68	332	663	193	319	885
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	332	-	193	319	-
Stage 1	-	-	-	-	-	-	638	611	-	690	600	-
Stage 2	-	-	-	-	-	-	246	600	-	387	592	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.8	38.4	66.2
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	329	1419	-	-	1144	-	-	398
HCM Lane V/C Ratio	0.706	-	-	-	0.07	-	-	0.951
HCM Control Delay (s)	38.4	0	-	-	8.4	0	-	66.2
HCM Lane LOS	E	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	5.1	0	-	-	0.2	-	-	10.8
	127.5				5			270'

Intersection	
Int Delay, s/veh	6.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	331	55	318	258	25	191
Future Vol, veh/h	331	55	318	258	25	191
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	352	59	338	274	27	203

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	411	0	1332	381
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	951	-
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	-	-	1148	-	170	666
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	375	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1148	-	111	666
Mov Cap-2 Maneuver	-	-	-	-	111	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	245	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.2	23.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	422	-	-	1148	-
HCM Lane V/C Ratio	0.545	-	-	0.295	-
HCM Control Delay (s)	23.3	-	-	9.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	3.2	-	-	1.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	179	272	60	14	206	6	25	290	10	87	362	0
Future Volume (veh/h)	179	272	60	14	206	6	25	290	10	87	362	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	199	302	67	16	229	0	28	322	11	97	402	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	239	363	522	21	293	268	53	546	19	128	704	0
Arrive On Green	0.33	0.33	0.33	0.17	0.17	0.00	0.03	0.16	0.16	0.07	0.20	0.00
Sat Flow, veh/h	725	1101	1583	121	1735	1583	1774	3492	119	1774	3632	0
Grp Volume(v), veh/h	501	0	67	245	0	0	28	163	170	97	402	0
Grp Sat Flow(s),veh/h/ln	1826	0	1583	1857	0	1583	1774	1770	1842	1774	1770	0
Q Serve(g_s), s	18.6	0.0	2.2	9.3	0.0	0.0	1.1	6.3	6.3	3.9	7.5	0.0
Cycle Q Clear(g_c), s	18.6	0.0	2.2	9.3	0.0	0.0	1.1	6.3	6.3	3.9	7.5	0.0
Prop In Lane	0.40		1.00	0.07		1.00	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	602	0	522	314	0	268	53	277	288	128	704	0
V/C Ratio(X)	0.83	0.00	0.13	0.78	0.00	0.00	0.53	0.59	0.59	0.76	0.57	0.00
Avail Cap(c_a), veh/h	1245	0	1079	759	0	647	725	724	753	725	1447	0
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.7	0.0	17.2	29.2	0.0	0.0	35.1	28.8	28.8	33.4	26.6	0.0
Incr Delay (d2), s/veh	3.1	0.0	0.1	4.2	0.0	0.0	8.1	1.5	1.4	8.7	0.3	0.0
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	9.8	0.0	1.0	5.1	0.0	0.0	0.7	3.2	3.3	2.2	3.7	0.0
LnGrp Delay(d),s/veh	25.8	0.0	17.3	33.4	0.0	0.0	43.2	30.2	30.2	42.1	26.8	0.0
LnGrp LOS	C		B	C			D	C	C	D	C	
Approach Vol, veh/h		568			245			361			499	
Approach Delay, s/veh		24.8			33.4			31.2			29.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	19.6		17.4	10.3	16.5		29.2
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	3.1	9.5		11.3	5.9	8.3		20.6
Green Ext Time (p_c), s	0.0	3.1		1.2	0.2	3.2		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	28.9
HCM 2010 LOS	C

	→	↘	←	↖	↖	↑	↘	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	501	67	245	7	28	333	97	402
v/c Ratio	0.79	0.11	0.68	0.06	0.22	0.62	0.49	0.46
Control Delay	43.3	4.5	53.7	1.0	60.1	51.2	59.2	41.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	4.5	53.7	1.0	60.1	51.2	59.2	41.0
Queue Length 50th (ft)	307	0	160	0	19	115	65	135
Queue Length 95th (ft)	547	24	299	0	58	203	143	227
Internal Link Dist (ft)	49		154			343		461
Turn Bay Length (ft)				25	157		232	
Base Capacity (vph)	893	815	544	116	519	1034	519	1037
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.08	0.45	0.06	0.05	0.32	0.19	0.39

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	179	272	68	14	206	6	25	290	10	87	362	352
Future Volume (veh/h)	179	272	68	14	206	6	25	290	10	87	362	352
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	185	280	70	14	212	0	26	299	10	90	373	363
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	332	478	18	267	243	48	834	28	118	492	441
Arrive On Green	0.30	0.30	0.30	0.15	0.15	0.00	0.03	0.24	0.24	0.07	0.28	0.28
Sat Flow, veh/h	727	1100	1583	115	1742	1583	1774	3495	117	1774	1770	1583
Grp Volume(v), veh/h	465	0	70	226	0	0	26	151	158	90	373	363
Grp Sat Flow(s),veh/h/ln	1826	0	1583	1857	0	1583	1774	1770	1842	1774	1770	1583
Q Serve(g_s), s	19.9	0.0	2.7	9.8	0.0	0.0	1.2	5.9	6.0	4.2	16.1	17.9
Cycle Q Clear(g_c), s	19.9	0.0	2.7	9.8	0.0	0.0	1.2	5.9	6.0	4.2	16.1	17.9
Prop In Lane	0.40		1.00	0.06		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	551	0	478	285	0	243	48	422	440	118	492	441
V/C Ratio(X)	0.84	0.00	0.15	0.79	0.00	0.00	0.54	0.36	0.36	0.76	0.76	0.82
Avail Cap(c_a), veh/h	1093	0	948	667	0	569	637	636	662	637	636	569
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	21.3	34.1	0.0	0.0	40.1	26.5	26.5	38.3	27.6	28.2
Incr Delay (d2), s/veh	3.6	0.0	0.1	5.0	0.0	0.0	9.1	0.4	0.4	9.5	2.7	5.9
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	10.6	0.0	1.2	5.4	0.0	0.0	0.7	2.9	3.1	2.4	8.2	8.5
LnGrp Delay(d),s/veh	31.0	0.0	21.5	39.0	0.0	0.0	49.2	26.9	26.9	47.9	30.2	34.2
LnGrp LOS	C		C	D			D	C	C	D	C	C
Approach Vol, veh/h		535			226			335			826	
Approach Delay, s/veh		29.7			39.0			28.6			33.9	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.3	28.2		17.8	10.6	24.9		30.2
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	3.2	19.9		11.8	6.2	8.0		21.9
Green Ext Time (p_c), s	0.0	3.3		1.1	0.2	4.5		3.3

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	35	491	68	126	373	41	62	72	98	57	122	31
Future Volume (veh/h)	35	491	68	126	373	41	62	72	98	57	122	31
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	45	629	87	162	478	53	79	92	126	73	156	40
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	379	678	94	278	773	86	285	130	178	257	255	65
Arrive On Green	0.03	0.42	0.42	0.08	0.47	0.47	0.05	0.18	0.18	0.05	0.18	0.18
Sat Flow, veh/h	1774	1602	222	1774	1648	183	1774	713	977	1774	1431	367
Grp Volume(v), veh/h	45	0	716	162	0	531	79	0	218	73	0	196
Grp Sat Flow(s),veh/h/ln	1774	0	1824	1774	0	1831	1774	0	1690	1774	0	1798
Q Serve(g_s), s	1.0	0.0	26.4	3.5	0.0	15.4	2.5	0.0	8.6	2.4	0.0	7.1
Cycle Q Clear(g_c), s	1.0	0.0	26.4	3.5	0.0	15.4	2.5	0.0	8.6	2.4	0.0	7.1
Prop In Lane	1.00		0.12	1.00		0.10	1.00		0.58	1.00		0.20
Lane Grp Cap(c), veh/h	379	0	772	278	0	858	285	0	307	257	0	320
V/C Ratio(X)	0.12	0.00	0.93	0.58	0.00	0.62	0.28	0.00	0.71	0.28	0.00	0.61
Avail Cap(c_a), veh/h	821	0	772	639	0	858	694	0	525	672	0	558
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	19.4	15.5	0.0	14.1	22.4	0.0	27.2	22.7	0.0	26.9
Incr Delay (d2), s/veh	0.1	0.0	18.9	1.9	0.0	3.3	0.5	0.0	4.3	0.6	0.0	2.7
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	0.5	0.0	17.2	1.8	0.0	8.5	1.3	0.0	4.4	1.2	0.0	3.8
LnGrp Delay(d),s/veh	12.0	0.0	38.3	17.5	0.0	17.4	22.9	0.0	31.5	23.3	0.0	29.6
LnGrp LOS	B		D	B		B	C		C	C		C
Approach Vol, veh/h		761			693			297			269	
Approach Delay, s/veh		36.8			17.4			29.2			27.9	
Approach LOS		D			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	38.2	7.9	17.9	10.1	35.0	8.2	17.6
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	20.0	22.0	20.0	30.0	20.0	22.0
Max Q Clear Time (g_c+I1), s	3.0	17.4	4.4	10.6	5.5	28.4	4.5	9.1
Green Ext Time (p_c), s	0.1	9.5	0.1	2.5	0.3	1.4	0.1	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	27.8
HCM 2010 LOS	C

Queues
13: Pines Rd & 32nd Ave

	↗	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	716	162	531	79	218	73	196
v/c Ratio	0.11	1.02	0.52	0.59	0.24	0.61	0.23	0.58
Control Delay	11.3	69.0	18.7	22.7	20.9	30.8	20.9	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	69.0	18.7	22.7	20.9	30.8	20.9	37.4
Queue Length 50th (ft)	10	~407	38	217	27	76	25	88
Queue Length 95th (ft)	26	#617	80	323	52	129	49	141
Internal Link Dist (ft)		2595		1832		2145		2663
Turn Bay Length (ft)	168		166		79		113	
Base Capacity (vph)	665	701	513	894	532	515	527	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	1.02	0.32	0.59	0.15	0.42	0.14	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	9	0	0	117	208	19
Future Vol, veh/h	9	0	0	117	208	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	0	0	127	226	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	363	236	247	0	-	0
Stage 1	236	-	-	-	-	-
Stage 2	127	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	636	803	1319	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	899	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	636	803	1319	-	-	-
Mov Cap-2 Maneuver	636	-	-	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	899	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1319	-	636	-	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Control Delay (s)	0	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	18	2	3	99	177	31
Future Vol, veh/h	18	2	3	99	177	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	2	3	108	192	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	323	209	226	0	-	0
Stage 1	209	-	-	-	-	-
Stage 2	114	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	671	831	1342	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	911	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	670	831	1342	-	-	-
Mov Cap-2 Maneuver	698	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1342	-	709	-	-
HCM Lane V/C Ratio	0.002	-	0.031	-	-
HCM Control Delay (s)	7.7	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	22	2	3	80	141	38
Future Vol, veh/h	22	2	3	80	141	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	2	3	87	153	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	267	174	195	0	-	0
Stage 1	174	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	722	869	1378	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	720	869	1378	-	-	-
Mov Cap-2 Maneuver	732	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1378	-	742	-	-
HCM Lane V/C Ratio	0.002	-	0.035	-	-
HCM Control Delay (s)	7.6	-	10	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

17: Madison Rd & 44th Ave

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	8	8	13	75	130	13
Future Vol, veh/h	8	8	13	75	130	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	9	14	82	141	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	258	148	155	0	-	0
Stage 1	148	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	731	899	1425	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	724	899	1425	-	-	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	906	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1425	-	811	-	-
HCM Lane V/C Ratio	0.01	-	0.021	-	-
HCM Control Delay (s)	7.6	-	9.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 2010 TWSC
18: Madison Rd & Thorpe Rd

2020 PM W- Proj.
12/7/2015

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	44	0	57	0	0	0	31	44	0	0	94	40
Future Vol, veh/h	44	0	57	0	0	0	31	44	0	0	94	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	51	0	66	0	0	0	36	51	0	0	109	47

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	256	256	133	289	279	51	156	0	0	51	0	0
Stage 1	133	133	-	123	123	-	-	-	-	-	-	-
Stage 2	123	123	-	166	156	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	697	648	916	663	629	1017	1424	-	-	1555	-	-
Stage 1	870	786	-	881	794	-	-	-	-	-	-	-
Stage 2	881	794	-	836	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	683	631	916	603	613	1017	1424	-	-	1555	-	-
Mov Cap-2 Maneuver	683	631	-	603	613	-	-	-	-	-	-	-
Stage 1	847	786	-	858	773	-	-	-	-	-	-	-
Stage 2	858	773	-	776	769	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	0	3.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1424	-	-	797	-	1555	-	-
HCM Lane V/C Ratio	0.025	-	-	0.147	-	-	-	-
HCM Control Delay (s)	7.6	0	-	10.3	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	-	0	-	-

25 125

HCM 2010 Signalized Intersection Summary
19: Hwy 27 & 32nd Ave

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	87	341	203	173	365	48	142	185	114	53	248	74
Future Volume (veh/h)	87	341	203	173	365	48	142	185	114	53	248	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	102	401	239	204	429	56	167	218	134	62	292	87
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	134	634	374	252	585	76	212	530	312	86	475	139
Arrive On Green	0.08	0.30	0.30	0.14	0.36	0.36	0.12	0.25	0.25	0.05	0.18	0.18
Sat Flow, veh/h	1774	2145	1264	1774	1615	211	1774	2144	1265	1774	2702	790
Grp Volume(v), veh/h	102	330	310	204	0	485	167	178	174	62	189	190
Grp Sat Flow(s),veh/h/ln	1774	1770	1640	1774	0	1826	1774	1770	1640	1774	1770	1723
Q Serve(g_s), s	4.2	12.1	12.3	8.4	0.0	17.3	6.9	6.3	6.7	2.6	7.4	7.6
Cycle Q Clear(g_c), s	4.2	12.1	12.3	8.4	0.0	17.3	6.9	6.3	6.7	2.6	7.4	7.6
Prop In Lane	1.00		0.77	1.00		0.12	1.00		0.77	1.00		0.46
Lane Grp Cap(c), veh/h	134	523	485	252	0	661	212	437	405	86	311	303
V/C Ratio(X)	0.76	0.63	0.64	0.81	0.00	0.73	0.79	0.41	0.43	0.72	0.61	0.63
Avail Cap(c_a), veh/h	592	944	875	592	0	974	710	944	875	710	944	919
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	22.9	22.9	31.2	0.0	20.8	32.1	23.6	23.8	35.2	28.5	28.6
Incr Delay (d2), s/veh	8.5	1.3	1.4	6.1	0.0	1.6	6.3	0.5	0.5	10.9	1.6	1.8
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	2.4	6.0	5.8	4.5	0.0	8.9	3.7	3.1	3.1	1.5	3.8	3.8
LnGrp Delay(d),s/veh	42.5	24.1	24.4	37.2	0.0	22.4	38.4	24.1	24.3	46.1	30.2	30.4
LnGrp LOS	D	C	C	D		C	D	C	C	D	C	C
Approach Vol, veh/h		742			689			519			441	
Approach Delay, s/veh		26.7			26.8			28.8			32.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	24.0	15.2	26.7	14.5	18.7	10.2	31.7
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	4.6	8.7	10.4	14.3	8.9	9.6	6.2	19.3
Green Ext Time (p_c), s	0.1	3.5	0.5	7.8	0.4	3.5	0.2	7.2

Intersection Summary		
HCM 2010 Ctrl Delay		28.3
HCM 2010 LOS		C

19: Hwy 27 & 32nd Ave

	↗	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	640	204	485	167	352	62	379
v/c Ratio	0.51	0.56	0.68	0.69	0.63	0.40	0.39	0.67
Control Delay	55.5	29.8	54.4	35.6	54.2	27.8	55.8	46.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	29.8	54.4	35.6	54.2	27.8	55.8	46.1
Queue Length 50th (ft)	64	158	128	260	105	80	39	117
Queue Length 95th (ft)	128	262	223	457	187	130	89	182
Internal Link Dist (ft)		150		1250		6700		1848
Turn Bay Length (ft)	108		112		131		184	
Base Capacity (vph)	431	1348	431	723	517	1350	517	1347
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.47	0.47	0.67	0.32	0.26	0.12	0.28

Intersection Summary

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	203	388	0	0	394	11	0	0	0	16	0	212
Future Vol, veh/h	203	388	0	0	394	11	0	0	0	16	0	212
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	226	431	0	0	438	12	0	0	0	18	0	236

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	450	0	0	431	0	0	1444	1332	431	1326	1326	444
Stage 1	-	-	-	-	-	-	882	882	-	444	444	-
Stage 2	-	-	-	-	-	-	562	450	-	882	882	-
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	1110	-	-	1129	-	-	110	154	624	133	156	614
Stage 1	-	-	-	-	-	-	341	364	-	593	575	-
Stage 2	-	-	-	-	-	-	512	572	-	341	364	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1110	-	-	1129	-	-	57	123	624	112	124	614
Mov Cap-2 Maneuver	-	-	-	-	-	-	57	123	-	112	124	-
Stage 1	-	-	-	-	-	-	272	290	-	472	575	-
Stage 2	-	-	-	-	-	-	316	572	-	272	290	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.1	0	0	16.5
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1110	-	-	1129	-	-	112	614
HCM Lane V/C Ratio	-	0.203	-	-	-	-	-	0.159	0.384
HCM Control Delay (s)	0	9.1	-	-	0	-	-	43.1	14.5
HCM Lane LOS	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	-	0.8	-	-	0	-	-	0.5	1.8

20 12.5 45

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	280	16	22	51	93	353
Future Vol, veh/h	280	16	22	51	93	353
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	308	18	24	56	102	388

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	206	102	102	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	782	953	1490	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	769	953	1490	-	-	-
Mov Cap-2 Maneuver	769	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1490	-	777	-	-
HCM Lane V/C Ratio	0.016	-	0.419	-	-
HCM Control Delay (s)	7.5	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	2.1	-	-

LEVEL OF SERVICE CALCULATIONS

YEAR 2040

WITHOUT PROJECT

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↑↱		↰	↑↑↱	
Traffic Volume (veh/h)	5	169	8	42	598	146	25	98	79	80	61	5
Future Volume (veh/h)	5	169	8	42	598	146	25	98	79	80	61	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	5	184	9	46	650	159	27	107	86	87	66	5
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	92	1552	75	132	1246	297	45	309	228	116	663	50
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.03	0.16	0.16	0.07	0.20	0.20
Sat Flow, veh/h	20	3315	159	96	2661	634	1774	1942	1437	1774	3338	250
Grp Volume(v), veh/h	104	0	94	458	0	397	27	97	96	87	35	36
Grp Sat Flow(s),veh/h/ln	1827	0	1667	1808	0	1583	1774	1770	1609	1774	1770	1819
Q Serve(g_s), s	0.0	0.0	1.4	0.0	0.0	8.1	0.7	2.2	2.4	2.2	0.7	0.7
Cycle Q Clear(g_c), s	1.4	0.0	1.4	7.9	0.0	8.1	0.7	2.2	2.4	2.2	0.7	0.7
Prop In Lane	0.05		0.10	0.10		0.40	1.00		0.89	1.00		0.14
Lane Grp Cap(c), veh/h	939	0	781	934	0	741	45	281	256	116	352	361
V/C Ratio(X)	0.11	0.00	0.12	0.49	0.00	0.54	0.60	0.34	0.38	0.75	0.10	0.10
Avail Cap(c_a), veh/h	1266	0	1099	1270	0	1043	779	1166	1061	779	1166	1199
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	6.8	8.5	0.0	8.6	22.0	17.0	17.1	20.9	14.9	14.9
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.9	0.0	1.3	16.8	1.5	2.0	13.0	0.3	0.3
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	0.7	0.0	0.7	4.2	0.0	3.8	0.5	1.2	1.2	1.5	0.4	0.4
LnGrp Delay(d),s/veh	6.9	0.0	7.0	9.4	0.0	9.9	38.7	18.6	19.1	33.9	15.2	15.2
LnGrp LOS	A		A	A		A	D	B	B	C	B	B
Approach Vol, veh/h		198			855			220			158	
Approach Delay, s/veh		6.9			9.6			21.3			25.5	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.3	5.2	14.0		26.3	7.0	12.2
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		3.4	2.7	2.7		10.1	4.2	4.4
Green Ext Time (p_c), s		13.4	0.0	2.9		11.2	0.3	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B

	↰	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations	↰	↑	↱	↰	↑↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	1	169	46	13	504	26	280	125	29	18	49	14
Future Volume (veh/h)	1	169	46	13	504	26	280	125	29	18	49	14
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1	186	51	14	554	29	308	137	32	20	54	15
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	524	446	25	1008	53	396	391	91	35	120	102
Arrive On Green	0.00	0.28	0.28	0.01	0.29	0.29	0.22	0.27	0.27	0.02	0.06	0.06
Sat Flow, veh/h	1774	1863	1583	1774	3422	179	1774	1461	341	1774	1863	1583
Grp Volume(v), veh/h	1	186	51	14	286	297	308	0	169	20	54	15
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1831	1774	0	1803	1774	1863	1583
Q Serve(g_s), s	0.0	3.8	1.1	0.4	6.5	6.5	7.8	0.0	3.6	0.5	1.3	0.4
Cycle Q Clear(g_c), s	0.0	3.8	1.1	0.4	6.5	6.5	7.8	0.0	3.6	0.5	1.3	0.4
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	4	524	446	25	521	539	396	0	483	35	120	102
V/C Ratio(X)	0.27	0.35	0.11	0.56	0.55	0.55	0.78	0.00	0.35	0.58	0.45	0.15
Avail Cap(c_a), veh/h	925	971	825	740	922	954	740	0	1052	740	1087	924
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	13.8	12.8	23.5	14.2	14.2	17.5	0.0	14.2	23.3	21.6	21.2
Incr Delay (d2), s/veh	48.4	0.6	0.2	24.6	1.3	1.3	4.7	0.0	0.6	19.9	3.7	0.9
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	2.0	0.5	0.4	3.4	3.5	4.3	0.0	1.9	0.5	0.8	0.2
LnGrp Delay(d),s/veh	72.3	14.3	13.0	48.1	15.5	15.5	22.2	0.0	14.8	43.2	25.4	22.1
LnGrp LOS	E	B	B	D	B	B	C		B	D	C	C
Approach Vol, veh/h		238			597			477			89	
Approach Delay, s/veh		14.3			16.3			19.6			28.8	
Approach LOS		B			B			B			C	

Timer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	19.5	14.7	9.1	4.1	20.1	4.9	18.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	2.4	5.8	9.8	3.3	2.0	8.5	2.5	5.6
Green Ext Time (p_c), s	0.0	6.0	1.1	1.8	0.0	5.6	0.0	1.7

Intersection Summary		
HCM 2010 Ctrl Delay		17.9
HCM 2010 LOS		B

3: Bowdish Rd & 32nd Ave

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	67	547	45	30	351	11	68	61	37	96	144	121
Future Volume (veh/h)	67	547	45	30	351	11	68	61	37	96	144	121
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	76	622	51	34	399	12	77	69	42	109	164	138
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	414	698	57	220	700	21	235	200	99	191	237	176
Arrive On Green	0.04	0.41	0.41	0.02	0.39	0.39	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1774	1699	139	1774	1799	54	453	626	310	347	742	550
Grp Volume(v), veh/h	76	0	673	34	0	411	188	0	0	411	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1838	1774	0	1853	1390	0	0	1639	0	0
Q Serve(g_s), s	1.4	0.0	19.3	0.7	0.0	9.9	0.0	0.0	0.0	7.3	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	19.3	0.7	0.0	9.9	5.3	0.0	0.0	12.6	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.03	0.41		0.22	0.27		0.34
Lane Grp Cap(c), veh/h	414	0	755	220	0	721	534	0	0	605	0	0
V/C Ratio(X)	0.18	0.00	0.89	0.15	0.00	0.57	0.35	0.00	0.00	0.68	0.00	0.00
Avail Cap(c_a), veh/h	916	0	780	761	0	786	679	0	0	769	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	0.0	15.5	13.0	0.0	13.6	14.7	0.0	0.0	17.2	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	12.6	0.3	0.0	1.1	0.6	0.0	0.0	2.2	0.0	0.0
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	0.7	0.0	12.4	0.3	0.0	5.2	2.3	0.0	0.0	6.1	0.0	0.0
LnGrp Delay(d),s/veh	10.7	0.0	28.1	13.3	0.0	14.7	15.3	0.0	0.0	19.4	0.0	0.0
LnGrp LOS	B		C	B		B	B			B		
Approach Vol, veh/h		749			445			188			411	
Approach Delay, s/veh		26.3			14.6			15.3			19.4	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	28.2		23.1	6.5	27.0		23.1
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	2.7	21.3		14.6	3.4	11.9		7.3
Green Ext Time (p_c), s	0.0	2.0		3.5	0.1	7.0		5.0

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✣			↰	↱
Traffic Volume (veh/h)	8	153	41	13	363	29	147	188	21	28	78	9
Future Volume (veh/h)	8	153	41	13	363	29	147	188	21	28	78	9
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	9	174	47	15	412	33	167	214	24	32	89	10
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	17	483	131	27	592	47	288	285	29	192	456	501
Arrive On Green	0.01	0.34	0.34	0.02	0.35	0.35	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1774	1414	382	1774	1702	136	547	902	91	283	1440	1583
Grp Volume(v), veh/h	9	0	221	15	0	445	405	0	0	121	0	10
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	0	1839	1540	0	0	1723	0	1583
Q Serve(g_s), s	0.2	0.0	4.1	0.4	0.0	9.3	8.8	0.0	0.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.2	0.0	4.1	0.4	0.0	9.3	10.9	0.0	0.0	2.1	0.0	0.2
Prop In Lane	1.00		0.21	1.00		0.07	0.41		0.06	0.26		1.00
Lane Grp Cap(c), veh/h	17	0	614	27	0	639	602	0	0	648	0	501
V/C Ratio(X)	0.54	0.00	0.36	0.56	0.00	0.70	0.67	0.00	0.00	0.19	0.00	0.02
Avail Cap(c_a), veh/h	599	0	1011	999	0	994	670	0	0	718	0	570
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.9	0.0	11.0	21.7	0.0	12.5	14.1	0.0	0.0	11.1	0.0	10.4
Incr Delay (d2), s/veh	32.9	0.0	0.5	23.0	0.0	2.0	2.7	0.0	0.0	0.2	0.0	0.0
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	0.3	0.0	2.1	0.4	0.0	4.9	5.0	0.0	0.0	1.1	0.0	0.1
LnGrp Delay(d),s/veh	54.8	0.0	11.5	44.7	0.0	14.4	16.9	0.0	0.0	11.3	0.0	10.5
LnGrp LOS	D		B	D		B	B			B		B
Approach Vol, veh/h		230			460			405			131	
Approach Delay, s/veh		13.2			15.4			16.9			11.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	20.7		19.1	4.4	20.9		19.1
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	2.4	6.1		4.1	2.2	11.3		12.9
Green Ext Time (p_c), s	0.0	5.1		3.5	0.0	4.2		1.3

Intersection Summary			
HCM 2010 Ctrl Delay			15.0
HCM 2010 LOS			B

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	8	109	287	16	50	146
Future Vol, veh/h	8	109	287	16	50	146
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	138	363	20	63	185

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	684	373	0	0	384	0
Stage 1	373	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	414	673	-	-	1174	-
Stage 1	696	-	-	-	-	-
Stage 2	743	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	389	673	-	-	1174	-
Mov Cap-2 Maneuver	389	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	641	1174	-
HCM Lane V/C Ratio	-	-	0.231	0.054	-
HCM Control Delay (s)	-	-	12.3	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.2	-

Intersection	
Int Delay, s/veh	23.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	295	54	65	265	0	34	0	268	0	179	41
Future Vol, veh/h	0	295	54	65	265	0	34	0	268	0	179	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	335	61	74	301	0	39	0	305	0	203	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	301	0	0	397	0	0	940	815	366	967	846	301
Stage 1	-	-	-	-	-	-	366	366	-	449	449	-
Stage 2	-	-	-	-	-	-	574	449	-	518	397	-
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	1260	-	-	1162	-	-	244	312	679	234	299	739
Stage 1	-	-	-	-	-	-	653	623	-	589	572	-
Stage 2	-	-	-	-	-	-	504	572	-	541	603	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1260	-	-	1162	-	-	87	288	679	122	276	739
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	288	-	122	276	-
Stage 1	-	-	-	-	-	-	653	623	-	589	529	-
Stage 2	-	-	-	-	-	-	269	529	-	298	603	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	56.4	50.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	384	1260	-	-	1162	-	-	312
HCM Lane V/C Ratio	0.894	-	-	-	0.064	-	-	0.801
HCM Control Delay (s)	56.4	0	-	-	8.3	0	-	50.3
HCM Lane LOS	F	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	9.1	0	-	-	0.2	-	-	6.6

Intersection	
Int Delay, s/veh	7.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	295	54	244	306	34	268
Future Vol, veh/h	295	54	244	306	34	268
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	314	57	260	326	36	285

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	371	0	1188	343
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	845	-
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	-	-	1188	-	208	700
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1188	-	152	700
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	309	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	24.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	498	-	-	1188	-
HCM Lane V/C Ratio	0.645	-	-	0.218	-
HCM Control Delay (s)	24.4	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	4.5	-	-	0.8	-

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Approach	EB	NB	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	396	344	625
Demand Flow Rate, veh/h	404	351	638
Vehicles Circulating, veh/h	283	342	40
Vehicles Exiting, veh/h	395	345	653
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	10.5	10.3	11.0
Approach LOS	B	B	B

Lane	Left	Left	Left
Designated Moves	LR	LR	LR
Assumed Moves	LR	LR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	404	351	638
Cap Entry Lane, veh/h	851	803	1086
Entry HV Adj Factor	0.980	0.980	0.980
Flow Entry, veh/h	396	344	625
Cap Entry, veh/h	835	787	1064
V/C Ratio	0.474	0.437	0.588
Control Delay, s/veh	10.5	10.3	11.0
LOS	B	B	B
95th %tile Queue, veh	3	2	4

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations		↰↑	↱		↰↑	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	233	244	28	7	248	89	69	568	24	51	142	1
Future Volume (veh/h)	233	244	28	7	248	89	69	568	24	51	142	1
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	274	287	33	8	292	0	81	668	28	60	167	1
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	307	321	547	9	340	297	106	796	33	79	775	5
Arrive On Green	0.35	0.35	0.35	0.19	0.19	0.00	0.06	0.23	0.23	0.04	0.21	0.21
Sat Flow, veh/h	888	930	1583	50	1811	1583	1774	3462	145	1774	3607	22
Grp Volume(v), veh/h	561	0	33	300	0	0	81	341	355	60	82	86
Grp Sat Flow(s),veh/h/ln	1818	0	1583	1860	0	1583	1774	1770	1837	1774	1770	1859
Q Serve(g_s), s	30.3	0.0	1.4	16.2	0.0	0.0	4.7	19.1	19.1	3.5	4.0	4.0
Cycle Q Clear(g_c), s	30.3	0.0	1.4	16.2	0.0	0.0	4.7	19.1	19.1	3.5	4.0	4.0
Prop In Lane	0.49		1.00	0.03		1.00	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	628	0	547	349	0	297	106	407	423	79	380	399
V/C Ratio(X)	0.89	0.00	0.06	0.86	0.00	0.00	0.77	0.84	0.84	0.76	0.22	0.22
Avail Cap(c_a), veh/h	876	0	763	538	0	458	513	512	531	513	512	537
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	0.0	22.7	40.8	0.0	0.0	48.1	38.1	38.1	49.0	33.5	33.5
Incr Delay (d2), s/veh	8.9	0.0	0.0	8.5	0.0	0.0	10.9	9.0	8.8	14.1	0.1	0.1
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	16.7	0.0	0.6	9.2	0.0	0.0	2.6	10.3	10.7	2.0	1.9	2.0
LnGrp Delay(d),s/veh	41.0	0.0	22.8	49.4	0.0	0.0	59.0	47.1	46.9	63.1	33.6	33.6
LnGrp LOS	D		C	D			E	D	D	E	C	C
Approach Vol, veh/h		594			300			777			228	
Approach Delay, s/veh		40.0			49.4			48.2			41.4	
Approach LOS		D			D			D			D	

Timer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.2	27.3		24.5	9.6	28.9		40.8
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	6.7	6.0		18.2	5.5	21.1		32.3
Green Ext Time (p_c), s	0.2	4.1		1.3	0.1	2.8		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	45.0
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	233	244	28	7	248	89	69	568	24	51	142	221
Future Volume (veh/h)	233	244	28	7	248	89	69	568	24	51	142	221
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	240	252	29	7	256	0	71	586	25	53	146	228
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	281	295	502	9	316	276	93	790	34	75	386	345
Arrive On Green	0.32	0.32	0.32	0.17	0.17	0.00	0.05	0.23	0.23	0.04	0.22	0.22
Sat Flow, veh/h	887	931	1583	50	1811	1583	1774	3459	147	1774	1770	1583
Grp Volume(v), veh/h	492	0	29	263	0	0	71	300	311	53	146	228
Grp Sat Flow(s),veh/h/ln	1818	0	1583	1860	0	1583	1774	1770	1837	1774	1770	1583
Q Serve(g_s), s	21.3	0.0	1.1	11.4	0.0	0.0	3.3	13.2	13.2	2.5	5.9	11.1
Cycle Q Clear(g_c), s	21.3	0.0	1.1	11.4	0.0	0.0	3.3	13.2	13.2	2.5	5.9	11.1
Prop In Lane	0.49		1.00	0.03		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	576	0	502	324	0	276	93	404	420	75	386	345
V/C Ratio(X)	0.85	0.00	0.06	0.81	0.00	0.00	0.76	0.74	0.74	0.71	0.38	0.66
Avail Cap(c_a), veh/h	1082	0	942	664	0	565	633	632	656	633	632	565
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	20.0	33.4	0.0	0.0	39.3	30.1	30.1	39.7	28.0	30.0
Incr Delay (d2), s/veh	3.7	0.0	0.0	4.8	0.0	0.0	11.9	2.0	2.0	11.5	0.2	0.8
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	11.3	0.0	0.5	6.3	0.0	0.0	1.9	6.6	6.9	1.4	2.9	4.9
LnGrp Delay(d),s/veh	30.6	0.0	20.0	38.2	0.0	0.0	51.1	32.1	32.1	51.3	28.2	30.8
LnGrp LOS	C		C	D			D	C	C	D	C	C
Approach Vol, veh/h		521			263			682			427	
Approach Delay, s/veh		30.0			38.2			34.1			32.5	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.4	23.3		19.7	8.5	24.2		31.6
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	5.3	13.1		13.4	4.5	15.2		23.3
Green Ext Time (p_c), s	0.1	4.2		1.3	0.1	4.0		3.3

Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Approach	WB	NB	SB	NE
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	405	782	487	592
Demand Flow Rate, veh/h	413	798	496	604
Vehicles Circulating, veh/h	1043	631	389	239
Vehicles Exiting, veh/h	386	212	1067	646
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	17.1	14.3	7.5	7.3
Approach LOS	C	B	A	A

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR	LTR	R
Assumed Moves	L	TR	LT	TR	LT	R	LTR	R
RT Channelized								
Lane Util	0.741	0.259	0.470	0.530	0.466	0.534	0.470	0.530
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	306	107	375	423	231	265	284	320
Cap Entry Lane, veh/h	517	544	704	726	844	861	945	956
Entry HV Adj Factor	0.980	0.981	0.980	0.979	0.981	0.981	0.980	0.981
Flow Entry, veh/h	300	105	367	414	227	260	278	314
Cap Entry, veh/h	506	534	690	712	828	844	925	937
V/C Ratio	0.592	0.197	0.533	0.582	0.274	0.308	0.301	0.335
Control Delay, s/veh	19.9	9.4	13.7	14.8	7.3	7.7	7.1	7.4
LOS	C	A	B	B	A	A	A	A
95th %tile Queue, veh	4	1	3	4	1	1	1	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	20	457	4	54	531	70	57	76	138	238	47	41
Future Volume (veh/h)	20	457	4	54	531	70	57	76	138	238	47	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	23	519	5	61	603	80	65	86	157	270	53	47
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	832	8	337	757	100	382	108	196	375	258	229
Arrive On Green	0.01	0.45	0.45	0.03	0.47	0.47	0.04	0.18	0.18	0.14	0.28	0.28
Sat Flow, veh/h	1774	1842	18	1774	1611	214	1774	592	1080	1774	912	808
Grp Volume(v), veh/h	23	0	524	61	0	683	65	0	243	270	0	100
Grp Sat Flow(s),veh/h/ln	1774	0	1860	1774	0	1825	1774	0	1672	1774	0	1720
Q Serve(g_s), s	0.7	0.0	21.4	1.8	0.0	31.6	2.9	0.0	13.9	11.7	0.0	4.4
Cycle Q Clear(g_c), s	0.7	0.0	21.4	1.8	0.0	31.6	2.9	0.0	13.9	11.7	0.0	4.4
Prop In Lane	1.00		0.01	1.00		0.12	1.00		0.65	1.00		0.47
Lane Grp Cap(c), veh/h	213	0	840	337	0	857	382	0	304	375	0	487
V/C Ratio(X)	0.11	0.00	0.62	0.18	0.00	0.80	0.17	0.00	0.80	0.72	0.00	0.21
Avail Cap(c_a), veh/h	544	0	840	813	0	857	663	0	537	566	0	487
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	19.0	0.0	20.9	16.2	0.0	22.4	31.1	0.0	39.0	26.8	0.0	27.2
Incr Delay (d2), s/veh	0.2	0.0	3.5	0.3	0.0	7.6	0.2	0.0	9.8	2.6	0.0	0.4
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	0.3	0.0	11.7	0.9	0.0	17.6	1.4	0.0	7.2	5.9	0.0	2.1
LnGrp Delay(d),s/veh	19.2	0.0	24.3	16.5	0.0	30.0	31.3	0.0	48.8	29.4	0.0	27.6
LnGrp LOS	B		C	B		C	C		D	C		C
Approach Vol, veh/h		547			744			308			370	
Approach Delay, s/veh		24.1			28.9			45.1			28.9	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	51.8	18.8	23.1	7.7	50.0	8.7	33.2
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	25.0	32.0	30.0	45.0	20.0	25.0
Max Q Clear Time (g_c+I1), s	2.7	33.6	13.7	15.9	3.8	23.4	4.9	6.4
Green Ext Time (p_c), s	0.0	0.0	0.6	2.3	0.1	14.0	0.1	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	100	0	17	0	0	0	74	94	0	0	37	70
Future Vol, veh/h	100	0	17	0	0	0	74	94	0	0	37	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	122	0	21	0	0	0	90	115	0	0	45	85

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	383	383	88	393	425	115	130	0	0	115	0	0
Stage 1	88	88	-	295	295	-	-	-	-	-	-	-
Stage 2	295	295	-	98	130	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	575	550	970	566	521	937	1455	-	-	1474	-	-
Stage 1	920	822	-	713	669	-	-	-	-	-	-	-
Stage 2	713	669	-	908	789	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	546	514	970	526	487	937	1455	-	-	1474	-	-
Mov Cap-2 Maneuver	546	514	-	526	487	-	-	-	-	-	-	-
Stage 1	859	822	-	666	625	-	-	-	-	-	-	-
Stage 2	666	625	-	889	789	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	0	3.4	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1455	-	-	583	-	1474	-	-
HCM Lane V/C Ratio	0.062	-	-	0.245	-	-	-	-
HCM Control Delay (s)	7.6	0	-	13.2	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	164	299	77	84	257	98	165	374	183	32	114	95
Future Volume (veh/h)	164	299	77	84	257	98	165	374	183	32	114	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	176	322	83	90	276	105	177	402	197	34	123	102
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	993	252	119	380	145	227	575	279	62	297	228
Arrive On Green	0.13	0.36	0.36	0.07	0.30	0.30	0.13	0.25	0.25	0.03	0.16	0.16
Sat Flow, veh/h	1774	2797	710	1774	1287	490	1774	2314	1120	1774	1910	1464
Grp Volume(v), veh/h	176	202	203	90	0	381	177	306	293	34	113	112
Grp Sat Flow(s),veh/h/ln	1774	1770	1737	1774	0	1776	1774	1770	1665	1774	1770	1604
Q Serve(g_s), s	6.5	5.6	5.8	3.4	0.0	13.1	6.6	10.7	10.9	1.3	3.9	4.3
Cycle Q Clear(g_c), s	6.5	5.6	5.8	3.4	0.0	13.1	6.6	10.7	10.9	1.3	3.9	4.3
Prop In Lane	1.00		0.41	1.00		0.28	1.00		0.67	1.00		0.91
Lane Grp Cap(c), veh/h	225	628	617	119	0	525	227	440	414	62	276	250
V/C Ratio(X)	0.78	0.32	0.33	0.76	0.00	0.73	0.78	0.70	0.71	0.55	0.41	0.45
Avail Cap(c_a), veh/h	653	1042	1023	653	0	1046	783	1042	980	783	1042	945
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	15.9	16.0	31.2	0.0	21.5	28.7	23.2	23.3	32.3	25.9	26.0
Incr Delay (d2), s/veh	5.9	0.3	0.3	9.4	0.0	1.9	5.8	1.5	1.7	7.4	0.8	1.1
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	3.5	2.8	2.8	2.0	0.0	6.6	3.6	5.4	5.2	0.8	2.0	2.0
LnGrp Delay(d),s/veh	34.6	16.2	16.3	40.5	0.0	23.4	34.5	24.7	24.9	39.7	26.7	27.1
LnGrp LOS	C	B	B	D		C	C	C	C	D	C	C
Approach Vol, veh/h		581			471			776			259	
Approach Delay, s/veh		21.8			26.7			27.0			28.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	22.4	9.1	28.6	14.2	16.1	13.1	24.6
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	3.3	12.9	5.4	7.8	8.6	6.3	8.5	15.1
Green Ext Time (p_c), s	0.1	4.0	0.2	5.3	0.4	4.1	0.4	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	265	264	3	0	259	28	0	0	0	7	0	132
Future Vol, veh/h	265	264	3	0	259	28	0	0	0	7	0	132
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	100	-	-	-	-	-	-	-	-	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	294	293	3	0	288	31	0	0	0	8	0	147

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	319	0	0	297	0	0	1261	1203	295	1187	1189	303
Stage 1	-	-	-	-	-	-	884	884	-	303	303	-
Stage 2	-	-	-	-	-	-	377	319	-	884	886	-
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	1241	-	-	1264	-	-	147	184	744	165	188	737
Stage 1	-	-	-	-	-	-	340	363	-	706	664	-
Stage 2	-	-	-	-	-	-	644	653	-	340	363	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1241	-	-	1264	-	-	96	140	744	135	143	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	96	140	-	135	143	-
Stage 1	-	-	-	-	-	-	259	277	-	539	664	-
Stage 2	-	-	-	-	-	-	516	653	-	259	277	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.4	0	0	12.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1241	-	-	1264	-	-	135	737
HCM Lane V/C Ratio	-	0.237	-	-	-	-	-	0.058	0.199
HCM Control Delay (s)	0	8.8	-	-	0	-	-	33.3	11.1
HCM Lane LOS	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	-	0.9	-	-	0	-	-	0.2	0.7

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	259	5	18	97	29	194
Future Vol, veh/h	259	5	18	97	29	194
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	328	6	23	123	37	246

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	205	37	37	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	168	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	783	1035	1574	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	1035	1574	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	848	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1574	-	774	-	-
HCM Lane V/C Ratio	0.014	-	0.432	-	-
HCM Control Delay (s)	7.3	0	13.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	2.2	-	-

HCM 2010 Signalized Intersection Summary

1: University Rd & 32nd Ave

2040 PM W-O Proj.

12/7/2015

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	3	509	21	95	242	78	25	72	49	128	140	7
Future Volume (veh/h)	3	509	21	95	242	78	25	72	49	128	140	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	3	559	23	104	266	86	27	79	54	141	154	8
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	1517	62	305	745	253	45	305	192	193	786	41
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.03	0.15	0.15	0.11	0.23	0.23
Sat Flow, veh/h	3	3389	139	427	1664	565	1774	2086	1314	1774	3424	177
Grp Volume(v), veh/h	308	0	277	213	0	243	27	66	67	141	79	83
Grp Sat Flow(s),veh/h/ln	1860	0	1671	1060	0	1595	1774	1770	1631	1774	1770	1832
Q Serve(g_s), s	0.0	0.0	5.2	2.9	0.0	4.7	0.7	1.6	1.7	3.6	1.7	1.7
Cycle Q Clear(g_c), s	5.1	0.0	5.2	8.1	0.0	4.7	0.7	1.6	1.7	3.6	1.7	1.7
Prop In Lane	0.01		0.08	0.49		0.35	1.00		0.81	1.00		0.10
Lane Grp Cap(c), veh/h	910	0	748	588	0	714	45	258	238	193	406	420
V/C Ratio(X)	0.34	0.00	0.37	0.36	0.00	0.34	0.60	0.26	0.28	0.73	0.19	0.20
Avail Cap(c_a), veh/h	1261	0	1065	808	0	1017	754	1128	1040	754	1128	1167
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.6	0.0	8.6	9.1	0.0	8.5	22.7	17.8	17.9	20.3	14.6	14.6
Incr Delay (d2), s/veh	0.5	0.0	0.7	0.8	0.0	0.6	17.1	1.1	1.4	7.3	0.5	0.5
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	2.7	0.0	2.4	2.1	0.0	2.1	0.6	0.8	0.9	2.2	0.9	0.9
LnGrp Delay(d),s/veh	9.1	0.0	9.3	9.9	0.0	9.1	39.8	18.9	19.3	27.6	15.1	15.1
LnGrp LOS	A		A	A		A	D	B	B	C	B	B
Approach Vol, veh/h		585			456			160			303	
Approach Delay, s/veh		9.2			9.5			22.6			20.9	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.1	5.2	15.8		26.1	9.1	11.9
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		7.2	2.7	3.7		10.1	5.6	3.7
Green Ext Time (p_c), s		12.1	0.0	3.1		11.1	0.5	3.1

Intersection Summary			
HCM 2010 Ctrl Delay			13.1
HCM 2010 LOS			B

Queues
1: University Rd & 32nd Ave

2040 PM W-O Proj.
12/8/2015

	→	←	↖	↑	↘	↓
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	585	456	27	133	141	162
v/c Ratio	0.46	0.48	0.10	0.20	0.36	0.14
Control Delay	14.2	14.3	24.8	15.5	23.3	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	14.3	24.8	15.5	23.3	15.1
Queue Length 50th (ft)	71	52	7	11	38	13
Queue Length 95th (ft)	127	102	31	37	98	50
Internal Link Dist (ft)	112	93		1057		1152
Turn Bay Length (ft)			94		102	
Base Capacity (vph)	2105	1539	740	2104	740	2206
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.30	0.04	0.06	0.19	0.07

Intersection Summary

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	92	75	13	41	140	8	50	227	12	24	388	205
Future Volume (veh/h)	92	75	13	41	140	8	50	227	12	24	388	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	101	82	14	45	154	9	55	249	13	26	426	225
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	292	248	66	397	23	76	663	35	43	669	569
Arrive On Green	0.08	0.16	0.16	0.04	0.12	0.12	0.04	0.38	0.38	0.02	0.36	0.36
Sat Flow, veh/h	1774	1863	1583	1774	3400	197	1774	1755	92	1774	1863	1583
Grp Volume(v), veh/h	101	82	14	45	80	83	55	0	262	26	426	225
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1828	1774	0	1847	1774	1863	1583
Q Serve(g_s), s	2.8	1.9	0.4	1.2	2.1	2.1	1.5	0.0	5.1	0.7	9.4	5.3
Cycle Q Clear(g_c), s	2.8	1.9	0.4	1.2	2.1	2.1	1.5	0.0	5.1	0.7	9.4	5.3
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	137	292	248	66	207	214	76	0	697	43	669	569
V/C Ratio(X)	0.74	0.28	0.06	0.68	0.39	0.39	0.72	0.00	0.38	0.60	0.64	0.40
Avail Cap(c_a), veh/h	896	940	799	716	893	923	716	0	1044	716	1053	895
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	18.4	17.8	23.5	20.2	20.2	23.4	0.0	11.2	23.9	13.2	11.9
Incr Delay (d2), s/veh	10.3	0.7	0.1	16.1	1.7	1.7	16.8	0.0	0.5	17.8	1.4	0.6
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	1.7	1.0	0.2	0.9	1.1	1.1	1.1	0.0	2.6	0.6	5.0	2.4
LnGrp Delay(d),s/veh	32.7	19.1	17.9	39.6	21.9	21.9	40.2	0.0	11.7	41.7	14.6	12.5
LnGrp LOS	C	B	B	D	C	C	D		B	D	B	B
Approach Vol, veh/h		197			208			317			677	
Approach Delay, s/veh		26.0			25.7			16.6			15.0	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	13.8	6.1	23.8	7.8	11.8	5.2	24.7
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	3.2	3.9	3.5	11.4	4.8	4.1	2.7	7.1
Green Ext Time (p_c), s	0.1	1.7	0.1	6.4	0.3	1.7	0.0	7.1

Intersection Summary			
HCM 2010 Ctrl Delay			18.5
HCM 2010 LOS			B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	101	82	14	45	163	55	262	26	426	225
v/c Ratio	0.35	0.20	0.03	0.20	0.31	0.23	0.33	0.12	0.59	0.30
Control Delay	34.3	29.3	0.2	34.9	31.7	34.8	17.7	35.2	24.6	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	29.3	0.2	34.9	31.7	34.8	17.7	35.2	24.6	4.5
Queue Length 50th (ft)	45	35	0	20	37	25	65	12	167	0
Queue Length 95th (ft)	96	79	0	54	71	62	174	37	311	48
Internal Link Dist (ft)		1207			123		264		1057	
Turn Bay Length (ft)	134			61		70		100		
Base Capacity (vph)	702	887	807	562	1397	562	901	562	828	828
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.09	0.02	0.08	0.12	0.10	0.29	0.05	0.51	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	20	567	75	114	365	63	28	113	101	50	179	26
Future Volume (veh/h)	20	567	75	114	365	63	28	113	101	50	179	26
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	21	597	79	120	384	66	29	119	106	53	188	27
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	450	688	91	322	739	127	102	212	170	137	320	42
Arrive On Green	0.02	0.43	0.43	0.06	0.48	0.48	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1774	1612	213	1774	1549	266	105	884	709	228	1339	176
Grp Volume(v), veh/h	21	0	676	120	0	450	254	0	0	268	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1825	1774	0	1816	1699	0	0	1743	0	0
Q Serve(g_s), s	0.3	0.0	17.6	1.9	0.0	9.0	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	17.6	1.9	0.0	9.0	6.7	0.0	0.0	6.8	0.0	0.0
Prop In Lane	1.00		0.12	1.00		0.15	0.11		0.42	0.20		0.10
Lane Grp Cap(c), veh/h	450	0	779	322	0	866	484	0	0	500	0	0
V/C Ratio(X)	0.05	0.00	0.87	0.37	0.00	0.52	0.53	0.00	0.00	0.54	0.00	0.00
Avail Cap(c_a), veh/h	1054	0	841	837	0	866	845	0	0	862	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.6	0.0	13.6	10.6	0.0	9.5	17.6	0.0	0.0	17.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	9.5	0.7	0.0	0.8	1.3	0.0	0.0	1.3	0.0	0.0
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	0.2	0.0	10.7	1.0	0.0	4.6	3.4	0.0	0.0	3.6	0.0	0.0
LnGrp Delay(d),s/veh	8.6	0.0	23.1	11.4	0.0	10.2	18.9	0.0	0.0	18.9	0.0	0.0
LnGrp LOS	A		C	B		B	B			B		
Approach Vol, veh/h		697			570			254			268	
Approach Delay, s/veh		22.7			10.5			18.9			18.9	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.4	27.2		17.5	4.8	29.8		17.5
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	3.9	19.6		8.8	2.3	11.0		8.7
Green Ext Time (p_c), s	0.2	2.7		3.9	0.0	7.7		4.0

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

	↗	→	↙	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	21	676	120	450	254	268
v/c Ratio	0.04	0.89	0.35	0.46	0.54	0.63
Control Delay	7.2	37.1	9.6	12.5	20.3	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	37.1	9.6	12.5	20.3	26.6
Queue Length 50th (ft)	3	228	17	79	65	85
Queue Length 95th (ft)	13	#546	48	251	131	159
Internal Link Dist (ft)		2316		2595	3508	1148
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	805	759	631	979	712	665
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.89	0.19	0.46	0.36	0.40

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✛			↰	↱
Traffic Volume (veh/h)	13	300	147	31	210	33	63	108	18	15	155	7
Future Volume (veh/h)	13	300	147	31	210	33	63	108	18	15	155	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	14	316	155	33	221	35	66	114	19	16	163	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	26	467	229	54	646	102	186	203	28	114	371	334
Arrive On Green	0.01	0.40	0.40	0.03	0.41	0.41	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	1181	579	1774	1570	249	311	961	134	75	1761	1583
Grp Volume(v), veh/h	14	0	471	33	0	256	199	0	0	179	0	7
Grp Sat Flow(s),veh/h/ln	1774	0	1761	1774	0	1819	1406	0	0	1835	0	1583
Q Serve(g_s), s	0.3	0.0	8.8	0.7	0.0	3.8	2.2	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.3	0.0	8.8	0.7	0.0	3.8	5.6	0.0	0.0	3.3	0.0	0.1
Prop In Lane	1.00		0.33	1.00		0.14	0.33		0.10	0.09		1.00
Lane Grp Cap(c), veh/h	26	0	696	54	0	748	417	0	0	485	0	334
V/C Ratio(X)	0.55	0.00	0.68	0.61	0.00	0.34	0.48	0.00	0.00	0.37	0.00	0.02
Avail Cap(c_a), veh/h	667	0	1103	1111	0	1094	713	0	0	824	0	635
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.5	0.0	10.0	19.1	0.0	8.0	14.5	0.0	0.0	13.7	0.0	12.5
Incr Delay (d2), s/veh	23.5	0.0	1.7	14.5	0.0	0.4	1.2	0.0	0.0	0.7	0.0	0.0
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	0.3	0.0	4.5	0.6	0.0	2.0	2.1	0.0	0.0	1.8	0.0	0.1
LnGrp Delay(d),s/veh	43.1	0.0	11.6	33.6	0.0	8.4	15.7	0.0	0.0	14.4	0.0	12.5
LnGrp LOS	D		B	C		A	B			B		B
Approach Vol, veh/h		485			289			199			186	
Approach Delay, s/veh		12.5			11.3			15.7			14.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	21.3		13.4	4.6	21.9		13.4
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	2.7	10.8		5.3	2.3	5.8		7.6
Green Ext Time (p_c), s	0.1	5.0		2.2	0.0	5.6		1.9

Intersection Summary		
HCM 2010 Ctrl Delay		13.1
HCM 2010 LOS		B

Queues
4: Bowdish Rd & Dishman-Mica Rd

	⤴	→	⤶	←	↑	↓	↲
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	14	471	33	256	199	179	7
v/c Ratio	0.05	0.65	0.11	0.32	0.45	0.36	0.01
Control Delay	24.3	17.3	23.6	10.2	20.9	19.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	17.3	23.6	10.2	20.9	19.5	0.0
Queue Length 50th (ft)	3	74	7	36	35	32	0
Queue Length 95th (ft)	20	234	34	114	125	111	0
Internal Link Dist (ft)		3473		1032	470	3508	
Turn Bay Length (ft)	61		75				135
Base Capacity (vph)	601	1016	1002	1418	558	649	664
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.46	0.03	0.18	0.36	0.28	0.01

Intersection Summary

9: Dishman-Mica Rd & Thorpe Rd

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	25	82	179	13	107	234
Future Vol, veh/h	25	82	179	13	107	234
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	90	197	14	118	257

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	696	204	0	0	211	0
Stage 1	204	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	408	837	-	-	1360	-
Stage 1	830	-	-	-	-	-
Stage 2	615	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	367	837	-	-	1360	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	830	-	-	-	-	-
Stage 2	553	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	644	1360	-
HCM Lane V/C Ratio	-	-	0.183	0.086	-
HCM Control Delay (s)	-	-	11.8	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-

Intersection	
Int Delay, s/veh	58.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	411	64	87	184	0	27	0	219	0	271	135
Future Vol, veh/h	0	411	64	87	184	0	27	0	219	0	271	135
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	442	69	94	198	0	29	0	235	0	291	145

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	198	0	0	511	0	0	1079	861	476	979	896	198
Stage 1	-	-	-	-	-	-	476	476	-	385	385	-
Stage 2	-	-	-	-	-	-	603	385	-	594	511	-
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	1375	-	-	1054	-	-	196	293	589	229	~ 280	843
Stage 1	-	-	-	-	-	-	570	557	-	638	611	-
Stage 2	-	-	-	-	-	-	486	611	-	491	537	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1375	-	-	1054	-	-	-	264	589	127	~ 252	843
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	264	-	127	~ 252	-
Stage 1	-	-	-	-	-	-	570	557	-	638	550	-
Stage 2	-	-	-	-	-	-	170	550	-	295	537	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.8		198.8
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1375	-	-	1054	-	-	329
HCM Lane V/C Ratio	-	-	-	-	0.089	-	-	1.327
HCM Control Delay (s)	-	0	-	-	8.7	0	-	198.8
HCM Lane LOS	-	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	-	0	-	-	0.3	-	-	21.2

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

Intersection	
Int Delay, s/veh	11.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	411	64	358	319	27	219
Future Vol, veh/h	411	64	358	319	27	219
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	437	68	381	339	29	233

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	505	0	1572	471
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	1101	-
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	-	-	1060	-	121	593
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	318	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1060	-	67	593
Mov Cap-2 Maneuver	-	-	-	-	67	-
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	177	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.4	52
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	319	-	-	1060	-
HCM Lane V/C Ratio	0.82	-	-	0.359	-
HCM Control Delay (s)	52	-	-	10.3	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	7	-	-	1.6	-

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Approach	EB	NB	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	411	230	612
Demand Flow Rate, veh/h	419	235	624
Vehicles Circulating, veh/h	345	359	28
Vehicles Exiting, veh/h	307	405	566
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	12.1	8.1	10.5
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	LR	LR	LR
Assumed Moves	LR	LR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	419	235	624
Cap Entry Lane, veh/h	800	789	1099
Entry HV Adj Factor	0.981	0.979	0.981
Flow Entry, veh/h	411	230	612
Cap Entry, veh/h	785	772	1078
V/C Ratio	0.524	0.298	0.568
Control Delay, s/veh	12.1	8.1	10.5
LOS	B	A	B
95th %tile Queue, veh	3	1	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	214	327	73	17	250	8	31	350	12	108	431	0
Future Volume (veh/h)	214	327	73	17	250	8	31	350	12	108	431	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	238	363	81	19	278	0	34	389	13	120	479	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	266	406	583	22	325	296	54	564	19	152	767	0
Arrive On Green	0.37	0.37	0.37	0.19	0.19	0.00	0.03	0.16	0.16	0.09	0.22	0.00
Sat Flow, veh/h	723	1103	1583	119	1738	1583	1774	3495	117	1774	3632	0
Grp Volume(v), veh/h	601	0	81	297	0	0	34	197	205	120	479	0
Grp Sat Flow(s),veh/h/ln	1827	0	1583	1857	0	1583	1774	1770	1842	1774	1770	0
Q Serve(g_s), s	31.4	0.0	3.4	15.7	0.0	0.0	1.9	10.6	10.7	6.7	12.4	0.0
Cycle Q Clear(g_c), s	31.4	0.0	3.4	15.7	0.0	0.0	1.9	10.6	10.7	6.7	12.4	0.0
Prop In Lane	0.40		1.00	0.06		1.00	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	672	0	583	348	0	296	54	286	297	152	767	0
V/C Ratio(X)	0.89	0.00	0.14	0.85	0.00	0.00	0.63	0.69	0.69	0.79	0.62	0.00
Avail Cap(c_a), veh/h	903	0	782	551	0	469	526	525	546	526	1049	0
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.1	0.0	21.3	39.8	0.0	0.0	48.5	40.0	40.0	45.4	35.9	0.0
Incr Delay (d2), s/veh	9.0	0.0	0.1	7.6	0.0	0.0	11.5	2.2	2.1	8.7	0.3	0.0
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	17.4	0.0	1.5	8.7	0.0	0.0	1.1	5.4	5.6	3.7	6.1	0.0
LnGrp Delay(d),s/veh	39.2	0.0	21.4	47.4	0.0	0.0	60.0	42.2	42.2	54.1	36.2	0.0
LnGrp LOS	D		C	D			E	D	D	D	D	
Approach Vol, veh/h		682			297			436			599	
Approach Delay, s/veh		37.0			47.4			43.6			39.8	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	26.9		23.9	13.7	21.3		42.2
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	3.9	14.4		17.7	8.7	12.7		33.4
Green Ext Time (p_c), s	0.1	3.5		1.3	0.3	3.7		3.9

Intersection Summary	
HCM 2010 Ctrl Delay	40.8
HCM 2010 LOS	D

	→	↘	←	↖	↖	↑	↘	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	601	81	297	9	34	402	120	479
v/c Ratio	0.85	0.12	0.81	0.08	0.31	0.75	0.62	0.57
Control Delay	51.6	6.8	69.1	1.2	69.9	62.9	71.1	48.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	6.8	69.1	1.2	69.9	62.9	71.1	48.3
Queue Length 50th (ft)	475	0	242	0	29	175	100	202
Queue Length 95th (ft)	#817	38	#406	0	69	248	176	272
Internal Link Dist (ft)	49		154			343		461
Turn Bay Length (ft)				25	157		232	
Base Capacity (vph)	705	661	430	116	410	817	410	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.12	0.69	0.08	0.08	0.49	0.29	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Signalized Intersection Summary
12: Hwy 27 & 16th Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑	↱	↰	↑↑↱		↰	↑↑↱	
Traffic Volume (veh/h)	240	327	73	17	250	8	31	350	12	108	431	406
Future Volume (veh/h)	240	327	73	17	250	8	31	350	12	108	431	406
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	247	337	75	18	258	0	32	361	12	111	444	419
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	372	559	21	299	273	50	758	25	140	474	424
Arrive On Green	0.35	0.35	0.35	0.17	0.17	0.00	0.03	0.22	0.22	0.08	0.27	0.27
Sat Flow, veh/h	772	1053	1583	121	1736	1583	1774	3496	116	1774	1770	1583
Grp Volume(v), veh/h	584	0	75	276	0	0	32	182	191	111	444	419
Grp Sat Flow(s),veh/h/ln	1824	0	1583	1857	0	1583	1774	1770	1842	1774	1770	1583
Q Serve(g_s), s	34.1	0.0	3.6	16.2	0.0	0.0	2.0	10.1	10.1	6.9	27.5	29.5
Cycle Q Clear(g_c), s	34.1	0.0	3.6	16.2	0.0	0.0	2.0	10.1	10.1	6.9	27.5	29.5
Prop In Lane	0.42		1.00	0.07		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	644	0	559	320	0	273	50	384	400	140	474	424
V/C Ratio(X)	0.91	0.00	0.13	0.86	0.00	0.00	0.64	0.48	0.48	0.79	0.94	0.99
Avail Cap(c_a), veh/h	814	0	707	497	0	424	475	474	493	475	474	424
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	0.0	24.6	45.1	0.0	0.0	53.9	38.3	38.3	50.7	40.1	40.9
Incr Delay (d2), s/veh	11.8	0.0	0.1	9.2	0.0	0.0	12.9	0.7	0.7	9.6	26.1	40.5
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	19.3	0.0	1.6	9.1	0.0	0.0	1.2	5.0	5.2	3.8	16.9	17.7
LnGrp Delay(d),s/veh	46.3	0.0	24.7	54.3	0.0	0.0	66.8	39.0	39.0	60.3	66.2	81.3
LnGrp LOS	D		C	D			E	D	D	E	E	F
Approach Vol, veh/h		659			276			405			974	
Approach Delay, s/veh		43.8			54.3			41.2			72.0	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.2	35.0		24.3	13.8	29.3		44.6
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	4.0	31.5		18.2	8.9	12.1		36.1
Green Ext Time (p_c), s	0.1	0.0		1.1	0.3	5.2		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	56.5
HCM 2010 LOS	E

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Approach	WB	NB	SB	NE
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	265	382	942	602
Demand Flow Rate, veh/h	270	390	961	613
Vehicles Circulating, veh/h	593	645	293	555
Vehicles Exiting, veh/h	442	523	570	699
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.6	8.5	11.1	10.2
Approach LOS	A	A	B	B

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR	LTR	R
Assumed Moves	L	TR	LT	TR	LT	TR	LTR	R
RT Channelized								
Lane Util	0.974	0.026	0.469	0.531	0.470	0.530	0.470	0.530
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	263	7	183	207	452	509	288	325
Cap Entry Lane, veh/h	724	746	697	719	907	920	745	766
Entry HV Adj Factor	0.980	1.000	0.982	0.979	0.980	0.981	0.982	0.982
Flow Entry, veh/h	258	7	180	203	443	500	283	319
Cap Entry, veh/h	710	746	684	704	889	903	732	752
V/C Ratio	0.363	0.009	0.263	0.288	0.498	0.553	0.386	0.424
Control Delay, s/veh	9.8	4.9	8.4	8.6	10.5	11.6	9.9	10.4
LOS	A	A	A	A	B	B	A	B
95th %tile Queue, veh	2	0	1	1	3	3	2	2

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	43	601	57	97	454	51	60	66	63	71	109	38
Future Volume (veh/h)	43	601	57	97	454	51	60	66	63	71	109	38
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	55	771	73	124	582	65	77	85	81	91	140	49
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	742	70	225	776	87	267	131	124	285	209	73
Arrive On Green	0.04	0.44	0.44	0.07	0.47	0.47	0.05	0.15	0.15	0.06	0.16	0.16
Sat Flow, veh/h	1774	1676	159	1774	1646	184	1774	878	837	1774	1319	462
Grp Volume(v), veh/h	55	0	844	124	0	647	77	0	166	91	0	189
Grp Sat Flow(s),veh/h/ln	1774	0	1835	1774	0	1830	1774	0	1715	1774	0	1781
Q Serve(g_s), s	1.1	0.0	30.0	2.5	0.0	19.6	2.5	0.0	6.2	2.9	0.0	6.8
Cycle Q Clear(g_c), s	1.1	0.0	30.0	2.5	0.0	19.6	2.5	0.0	6.2	2.9	0.0	6.8
Prop In Lane	1.00		0.09	1.00		0.10	1.00		0.49	1.00		0.26
Lane Grp Cap(c), veh/h	316	0	813	225	0	863	267	0	255	285	0	282
V/C Ratio(X)	0.17	0.00	1.04	0.55	0.00	0.75	0.29	0.00	0.65	0.32	0.00	0.67
Avail Cap(c_a), veh/h	773	0	813	630	0	863	699	0	557	700	0	579
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	11.9	0.0	18.9	15.4	0.0	14.6	22.9	0.0	27.2	22.6	0.0	26.9
Incr Delay (d2), s/veh	0.3	0.0	42.0	2.1	0.0	5.9	0.6	0.0	3.9	0.6	0.0	3.9
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	0.6	0.0	24.4	1.3	0.0	11.1	1.2	0.0	3.2	1.4	0.0	3.6
LnGrp Delay(d),s/veh	12.1	0.0	60.9	17.5	0.0	20.6	23.5	0.0	31.1	23.2	0.0	30.8
LnGrp LOS	B		F	B		C	C		C	C		C
Approach Vol, veh/h		899			771			243			280	
Approach Delay, s/veh		57.9			20.1			28.7			28.3	
Approach LOS		E			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	36.9	8.6	15.1	9.0	35.0	8.0	15.7
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	20.0	22.0	20.0	30.0	20.0	22.0
Max Q Clear Time (g_c+I1), s	3.1	21.6	4.9	8.2	4.5	32.0	4.5	8.8
Green Ext Time (p_c), s	0.1	7.4	0.2	2.3	0.3	0.0	0.1	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

Queues

13: Pines Rd & 32nd Ave

	⤴	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	844	124	647	77	166	91	189
v/c Ratio	0.17	1.11	0.42	0.76	0.22	0.48	0.24	0.55
Control Delay	11.6	93.9	15.0	28.8	19.9	28.6	20.3	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	93.9	15.0	28.8	19.9	28.6	20.3	34.9
Queue Length 50th (ft)	12	~525	28	288	26	57	31	80
Queue Length 95th (ft)	29	#729	56	#454	49	101	56	129
Internal Link Dist (ft)		2595		1832		2145		5230
Turn Bay Length (ft)	168		166		79		113	
Base Capacity (vph)	596	763	546	856	574	550	580	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	1.11	0.23	0.76	0.13	0.30	0.16	0.34

Intersection Summary

Description: Plan 1

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	31	0	69	0	0	0	38	52	0	0	113	35
Future Vol, veh/h	31	0	69	0	0	0	38	52	0	0	113	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	0	80	0	0	0	44	60	0	0	131	41

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	301	301	152	341	321	60	172	0	0	60	0	0
Stage 1	152	152	-	149	149	-	-	-	-	-	-	-
Stage 2	149	149	-	192	172	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	651	612	894	613	596	1005	1405	-	-	1544	-	-
Stage 1	850	772	-	854	774	-	-	-	-	-	-	-
Stage 2	854	774	-	810	756	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	635	592	894	544	577	1005	1405	-	-	1544	-	-
Mov Cap-2 Maneuver	635	592	-	544	577	-	-	-	-	-	-	-
Stage 1	823	772	-	827	749	-	-	-	-	-	-	-
Stage 2	827	749	-	737	756	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	0	3.2	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1405	-	-	794	-	1544	-	-
HCM Lane V/C Ratio	0.031	-	-	0.146	-	-	-	-
HCM Control Delay (s)	7.6	0	-	10.3	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	-	0	-	-

HCM 2010 Signalized Intersection Summary
19: Hwy 27 & 32nd Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	104	398	239	210	412	59	159	224	139	64	299	83
Future Volume (veh/h)	104	398	239	210	412	59	159	224	139	64	299	83
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	122	468	281	247	485	69	187	264	164	75	352	98
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	155	656	392	287	610	87	227	555	334	98	518	142
Arrive On Green	0.09	0.31	0.31	0.16	0.38	0.38	0.13	0.26	0.26	0.06	0.19	0.19
Sat Flow, veh/h	1774	2133	1274	1774	1596	227	1774	2127	1280	1774	2745	754
Grp Volume(v), veh/h	122	388	361	247	0	554	187	218	210	75	225	225
Grp Sat Flow(s),veh/h/ln	1774	1770	1638	1774	0	1823	1774	1770	1637	1774	1770	1730
Q Serve(g_s), s	6.3	18.2	18.3	12.7	0.0	25.2	9.6	9.7	10.2	3.9	11.1	11.3
Cycle Q Clear(g_c), s	6.3	18.2	18.3	12.7	0.0	25.2	9.6	9.7	10.2	3.9	11.1	11.3
Prop In Lane	1.00		0.78	1.00		0.12	1.00		0.78	1.00		0.44
Lane Grp Cap(c), veh/h	155	544	504	287	0	696	227	462	427	98	334	326
V/C Ratio(X)	0.78	0.71	0.72	0.86	0.00	0.80	0.82	0.47	0.49	0.76	0.67	0.69
Avail Cap(c_a), veh/h	474	757	701	474	0	780	569	757	700	569	757	740
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	28.7	28.8	38.1	0.0	25.6	39.8	29.1	29.3	43.5	35.3	35.4
Incr Delay (d2), s/veh	8.4	1.9	2.1	8.4	0.0	5.2	7.4	0.6	0.7	11.4	2.0	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	3.4	9.1	8.5	6.8	0.0	13.6	5.2	4.8	4.7	2.2	5.6	5.6
LnGrp Delay(d),s/veh	50.2	30.6	30.9	46.5	0.0	30.8	47.1	29.7	29.9	55.0	37.3	37.6
LnGrp LOS	D	C	C	D		C	D	C	C	D	D	D
Approach Vol, veh/h		871			801			615			525	
Approach Delay, s/veh		33.5			35.7			35.1			40.0	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	29.9	19.7	33.3	17.5	23.1	12.7	40.2
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	5.9	12.2	14.7	20.3	11.6	13.3	8.3	27.2
Green Ext Time (p_c), s	0.2	4.3	0.5	8.4	0.4	4.3	0.3	6.6

Intersection Summary	
HCM 2010 Ctrl Delay	35.7
HCM 2010 LOS	D

	↗	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	122	749	247	554	187	428	75	450
v/c Ratio	0.58	0.71	0.74	0.82	0.68	0.45	0.46	0.73
Control Delay	61.6	37.8	60.1	45.9	60.2	31.1	62.3	50.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	37.8	60.1	45.9	60.2	31.1	62.3	50.9
Queue Length 50th (ft)	85	240	166	363	130	112	53	156
Queue Length 95th (ft)	159	340	#299	#644	223	172	110	232
Internal Link Dist (ft)		140		200		6700		1848
Turn Bay Length (ft)	108		112		131		184	
Base Capacity (vph)	392	1237	392	679	471	1239	471	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.61	0.63	0.82	0.40	0.35	0.16	0.37

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	242	467	0	0	461	13	0	0	0	20	0	243
Future Vol, veh/h	242	467	0	0	461	13	0	0	0	20	0	243
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	269	519	0	0	512	14	0	0	0	22	0	270

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	527	0	0	519	0	0	1711	1584	519	1576	1576	519
Stage 1	-	-	-	-	-	-	1057	1057	-	519	519	-
Stage 2	-	-	-	-	-	-	654	527	-	1057	1057	-
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	1040	-	-	1047	-	-	71	108	557	89	110	557
Stage 1	-	-	-	-	-	-	272	302	-	540	533	-
Stage 2	-	-	-	-	-	-	456	528	-	272	302	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1040	-	-	1047	-	-	29	80	557	71	82	557
Mov Cap-2 Maneuver	-	-	-	-	-	-	29	80	-	71	82	-
Stage 1	-	-	-	-	-	-	202	224	-	400	533	-
Stage 2	-	-	-	-	-	-	235	528	-	202	224	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.3	0	0	22
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1040	-	-	1047	-	-	71	557
HCM Lane V/C Ratio	-	0.259	-	-	-	-	-	0.313	0.485
HCM Control Delay (s)	0	9.7	-	-	0	-	-	77.3	17.4
HCM Lane LOS	A	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	-	1	-	-	0	-	-	1.1	2.6
		25						27.5	65

21: Sullivan Rd & 32nd Ave

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	330	20	28	63	116	409
Future Vol, veh/h	330	20	28	63	116	409
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	363	22	31	69	127	449

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	258	127	127	0	-	0
Stage 1	127	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	731	923	1459	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	715	923	1459	-	-	-
Mov Cap-2 Maneuver	715	-	-	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	875	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.5	2.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1459	-	724	-	-
HCM Lane V/C Ratio	0.021	-	0.531	-	-
HCM Control Delay (s)	7.5	0	15.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	3.2	-	-

2,5

LEVEL OF SERVICE CALCULATIONS

YEAR 2040

WITH PROJECT

HCM 2010 Signalized Intersection Summary

2040 AM W- Proj.

1: University Rd & 32nd Ave

12/16/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	5	172	8	42	604	154	25	108	79	81	67	5
Future Volume (veh/h)	5	172	8	42	604	154	25	108	79	81	67	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	5	187	9	46	657	167	27	117	86	88	73	5
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	1555	74	130	1237	306	45	329	225	117	687	47
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.03	0.16	0.16	0.07	0.20	0.20
Sat Flow, veh/h	20	3318	157	95	2639	654	1774	2015	1375	1774	3364	228
Grp Volume(v), veh/h	105	0	96	466	0	404	27	102	101	88	38	40
Grp Sat Flow(s),veh/h/ln	1827	0	1667	1808	0	1580	1774	1770	1620	1774	1770	1822
Q Serve(g_s), s	0.0	0.0	1.5	0.0	0.0	8.5	0.7	2.4	2.6	2.3	0.8	0.8
Cycle Q Clear(g_c), s	1.5	0.0	1.5	8.2	0.0	8.5	0.7	2.4	2.6	2.3	0.8	0.8
Prop In Lane	0.05		0.09	0.10		0.41	1.00		0.85	1.00		0.13
Lane Grp Cap(c), veh/h	937	0	781	932	0	740	45	289	265	117	361	372
V/C Ratio(X)	0.11	0.00	0.12	0.50	0.00	0.55	0.60	0.35	0.38	0.75	0.11	0.11
Avail Cap(c_a), veh/h	1244	0	1079	1247	0	1022	765	1145	1048	765	1145	1179
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	0.0	6.9	8.7	0.0	8.8	22.4	17.2	17.3	21.3	15.0	15.0
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.9	0.0	1.3	16.9	1.6	1.9	12.8	0.3	0.3
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	0.8	0.0	0.7	4.4	0.0	3.9	0.5	1.3	1.3	1.5	0.4	0.4
LnGrp Delay(d),s/veh	7.1	0.0	7.1	9.6	0.0	10.1	39.3	18.8	19.2	34.1	15.3	15.3
LnGrp LOS	A		A	A		B	D	B	B	C	B	B
Approach Vol, veh/h		201			870			230			166	
Approach Delay, s/veh		7.1			9.9			21.4			25.2	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.7	5.2	14.5		26.7	7.1	12.6
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		3.5	2.7	2.8		10.5	4.3	4.6
Green Ext Time (p_c), s		13.6	0.0	3.1		11.3	0.3	3.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

2: Schafer Rd/University Rd & Dishman-Mica Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	1	203	46	13	619	36	280	125	29	25	49	14
Future Volume (veh/h)	1	203	46	13	619	36	280	125	29	25	49	14
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1	223	51	14	680	40	308	137	32	27	54	15
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	590	501	25	1119	66	389	377	88	44	119	101
Arrive On Green	0.00	0.32	0.32	0.01	0.33	0.33	0.22	0.26	0.26	0.02	0.06	0.06
Sat Flow, veh/h	1774	1863	1583	1774	3397	200	1774	1461	341	1774	1863	1583
Grp Volume(v), veh/h	1	223	51	14	354	366	308	0	169	27	54	15
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1828	1774	0	1803	1774	1863	1583
Q Serve(g_s), s	0.0	4.8	1.2	0.4	8.7	8.7	8.5	0.0	4.0	0.8	1.4	0.5
Cycle Q Clear(g_c), s	0.0	4.8	1.2	0.4	8.7	8.7	8.5	0.0	4.0	0.8	1.4	0.5
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	3	590	501	25	583	602	389	0	466	44	119	101
V/C Ratio(X)	0.29	0.38	0.10	0.56	0.61	0.61	0.79	0.00	0.36	0.61	0.46	0.15
Avail Cap(c_a), veh/h	857	899	764	685	854	882	685	0	975	685	1007	856
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	13.7	12.5	25.4	14.5	14.6	19.1	0.0	15.7	25.0	23.4	22.9
Incr Delay (d2), s/veh	56.6	0.6	0.1	25.1	1.5	1.4	5.1	0.0	0.7	18.0	3.9	1.0
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	2.6	0.5	0.4	4.5	4.6	4.7	0.0	2.1	0.6	0.9	0.2
LnGrp Delay(d),s/veh	82.4	14.3	12.6	50.4	16.0	16.0	24.2	0.0	16.4	43.0	27.2	23.9
LnGrp LOS	F	B	B	D	B	B	C		B	D	C	C
Approach Vol, veh/h		275			734			477			96	
Approach Delay, s/veh		14.2			16.6			21.4			31.1	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	22.4	15.4	9.3	4.1	23.1	5.3	19.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	2.4	6.8	10.5	3.4	2.0	10.7	2.8	6.0
Green Ext Time (p_c), s	0.0	7.3	1.0	1.8	0.0	6.4	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✣			✣	
Traffic Volume (veh/h)	67	550	46	33	360	15	73	71	44	98	149	121
Future Volume (veh/h)	67	550	46	33	360	15	73	71	44	98	149	121
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	76	625	52	38	409	17	83	81	50	111	169	138
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	401	694	58	217	691	29	226	210	106	193	242	175
Arrive On Green	0.04	0.41	0.41	0.02	0.39	0.39	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1774	1697	141	1774	1776	74	430	651	330	351	751	543
Grp Volume(v), veh/h	76	0	677	38	0	426	214	0	0	418	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1838	1774	0	1850	1411	0	0	1646	0	0
Q Serve(g_s), s	1.5	0.0	19.7	0.7	0.0	10.5	0.0	0.0	0.0	6.6	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	19.7	0.7	0.0	10.5	6.2	0.0	0.0	12.8	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.04	0.39		0.23	0.27		0.33
Lane Grp Cap(c), veh/h	401	0	752	217	0	719	542	0	0	611	0	0
V/C Ratio(X)	0.19	0.00	0.90	0.18	0.00	0.59	0.39	0.00	0.00	0.68	0.00	0.00
Avail Cap(c_a), veh/h	897	0	771	748	0	776	678	0	0	762	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.7	0.0	15.8	13.3	0.0	13.9	15.1	0.0	0.0	17.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	13.8	0.4	0.0	1.4	0.7	0.0	0.0	2.4	0.0	0.0
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	0.7	0.0	12.8	0.4	0.0	5.6	2.7	0.0	0.0	6.3	0.0	0.0
LnGrp Delay(d),s/veh	10.9	0.0	29.6	13.6	0.0	15.2	15.7	0.0	0.0	19.7	0.0	0.0
LnGrp LOS	B		C	B		B	B			B		
Approach Vol, veh/h		753			464			214			418	
Approach Delay, s/veh		27.7			15.1			15.7			19.7	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.4	28.4		23.5	6.5	27.3		23.5
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	2.7	21.7		14.8	3.5	12.5		8.2
Green Ext Time (p_c), s	0.0	1.7		3.6	0.1	6.9		5.1

Intersection Summary	
HCM 2010 Ctrl Delay	21.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰↑↱			↰↑	↱
Traffic Volume (veh/h)	8	193	41	42	488	51	147	188	32	37	78	9
Future Volume (veh/h)	8	193	41	42	488	51	147	188	32	37	78	9
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	9	222	47	48	561	59	169	216	37	43	90	10
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	17	563	119	68	674	71	255	251	39	198	366	485
Arrive On Green	0.01	0.38	0.38	0.04	0.41	0.41	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1774	1491	316	1774	1658	174	516	820	128	348	1194	1583
Grp Volume(v), veh/h	9	0	269	48	0	620	422	0	0	133	0	10
Grp Sat Flow(s),veh/h/ln	1774	0	1807	1774	0	1832	1464	0	0	1541	0	1583
Q Serve(g_s), s	0.3	0.0	5.7	1.4	0.0	15.9	12.0	0.0	0.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.3	0.0	5.7	1.4	0.0	15.9	14.8	0.0	0.0	2.8	0.0	0.2
Prop In Lane	1.00		0.17	1.00		0.10	0.40		0.09	0.32		1.00
Lane Grp Cap(c), veh/h	17	0	682	68	0	745	545	0	0	563	0	485
V/C Ratio(X)	0.54	0.00	0.39	0.70	0.00	0.83	0.77	0.00	0.00	0.24	0.00	0.02
Avail Cap(c_a), veh/h	510	0	865	849	0	842	545	0	0	563	0	485
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	11.9	24.8	0.0	13.9	18.0	0.0	0.0	13.5	0.0	12.6
Incr Delay (d2), s/veh	33.8	0.0	0.5	17.2	0.0	7.0	7.3	0.0	0.0	0.3	0.0	0.0
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	0.3	0.0	2.9	1.0	0.0	9.4	7.0	0.0	0.0	1.5	0.0	0.1
LnGrp Delay(d),s/veh	59.5	0.0	12.4	42.0	0.0	20.9	25.3	0.0	0.0	13.8	0.0	12.7
LnGrp LOS	E		B	D		C	C			B		B
Approach Vol, veh/h		278			668			422			143	
Approach Delay, s/veh		13.9			22.4			25.3			13.8	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	25.2		21.0	4.5	26.7		21.0
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	3.4	7.7		4.8	2.3	17.9		16.8
Green Ext Time (p_c), s	0.1	6.9		3.6	0.0	3.4		0.0

Intersection Summary			
HCM 2010 Ctrl Delay			20.8
HCM 2010 LOS			C

Intersection	
Int Delay, s/veh	1

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	0	255	504	1	0	66
Future Vol, veh/h	0	255	504	1	0	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	277	548	1	0	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	549	0	-	0	825	548
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	277	-
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	1021	-	-	-	342	536
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1021	-	-	-	342	536
Mov Cap-2 Maneuver	-	-	-	-	342	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	770	-

Approach	SE	NW	SW
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1021	-	536
HCM Lane V/C Ratio	-	-	-	-	0.134
HCM Control Delay (s)	-	-	0	-	12.8
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.5

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	8	66	439	1	37	218
Future Vol, veh/h	8	66	439	1	37	218
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	72	477	1	40	237

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	795	478	0	0	478	0
Stage 1	478	-	-	-	-	-
Stage 2	317	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	357	587	-	-	1084	-
Stage 1	624	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	344	587	-	-	1084	-
Mov Cap-2 Maneuver	459	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	711	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	459	587	1084	-
HCM Lane V/C Ratio	-	-	0.019	0.122	0.037	-
HCM Control Delay (s)	-	-	13	12	8.4	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.4	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	SEL	SET	NWT	NWR
Traffic Vol, veh/h	0	15	8	218	425	0
Future Vol, veh/h	0	15	8	218	425	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	9	237	462	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	462	462	462	0	-	0
Stage 1	462	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	558	600	1099	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	553	600	1099	-	-	-
Mov Cap-2 Maneuver	591	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	11.2	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	600	1099	-
HCM Lane V/C Ratio	-	-	0.027	0.008	-
HCM Control Delay (s)	-	-	11.2	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	1	11	414	1	6	212
Future Vol, veh/h	1	11	414	1	6	212
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	12	450	1	7	230

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	694	451	0	0	451	0
Stage 1	451	-	-	-	-	-
Stage 2	243	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	409	608	-	-	1109	-
Stage 1	642	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	406	608	-	-	1109	-
Mov Cap-2 Maneuver	406	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	792	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	584	1109	-
HCM Lane V/C Ratio	-	-	0.022	0.006	-
HCM Control Delay (s)	-	-	11.3	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	12	125	290	17	58	155
Future Vol, veh/h	12	125	290	17	58	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	158	367	22	73	196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	721	378	0	0	389	0
Stage 1	378	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	394	669	-	-	1170	-
Stage 1	693	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	366	669	-	-	1170	-
Mov Cap-2 Maneuver	366	-	-	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	669	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	624	1170	-
HCM Lane V/C Ratio	-	-	0.278	0.063	-
HCM Control Delay (s)	-	-	13	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.2	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	3	71	135	0	0	2
Future Vol, veh/h	3	71	135	0	0	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	77	147	0	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	147	0	-	0	231	147
Stage 1	-	-	-	-	147	-
Stage 2	-	-	-	-	84	-
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	1435	-	-	-	757	900
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	939	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1435	-	-	-	755	900
Mov Cap-2 Maneuver	-	-	-	-	755	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	937	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1435	-	-	-	900
HCM Lane V/C Ratio	0.002	-	-	-	0.002
HCM Control Delay (s)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

11: Pines Rd & 16th Ave

Intersection	
Int Delay, s/veh	32.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	295	55	66	265	0	37	0	291	0	184	41
Future Vol, veh/h	0	295	55	66	265	0	37	0	291	0	184	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	335	63	75	301	0	42	0	331	0	209	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	301	0	0	398	0	0	945	817	366	983	849	301
Stage 1	-	-	-	-	-	-	366	366	-	451	451	-
Stage 2	-	-	-	-	-	-	579	451	-	532	398	-
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	1260	-	-	1161	-	-	242	311	679	228	298	739
Stage 1	-	-	-	-	-	-	653	623	-	588	571	-
Stage 2	-	-	-	-	-	-	501	571	-	531	603	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1260	-	-	1161	-	-	81	287	679	110	275	739
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	287	-	110	275	-
Stage 1	-	-	-	-	-	-	653	623	-	588	526	-
Stage 2	-	-	-	-	-	-	261	526	-	272	603	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.7	82.8	53.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	370	1260	-	-	1161	-	-	311
HCM Lane V/C Ratio	1.007	-	-	-	0.065	-	-	0.822
HCM Control Delay (s)	82.8	0	-	-	8.3	0	-	53.3
HCM Lane LOS	F	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	12	0	-	-	0.2	-	-	6.9

11: Pines Rd & 16th Ave

Intersection	
Int Delay, s/veh	9.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	295	55	249	306	37	291
Future Vol, veh/h	295	55	249	306	37	291
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	314	59	265	326	39	310

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	372	0	1198	343
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	855	-
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	-	-	1186	-	205	700
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	417	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1186	-	149	700
Mov Cap-2 Maneuver	-	-	-	-	149	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	303	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	28
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	494	-	-	1186	-
HCM Lane V/C Ratio	0.706	-	-	0.223	-
HCM Control Delay (s)	28	-	-	8.9	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	5.5	-	-	0.9	-

Intersection	
Intersection Delay, s/veh	11.0
Intersection LOS	B

Approach	EB	NB	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	398	373	631
Demand Flow Rate, veh/h	406	381	644
Vehicles Circulating, veh/h	289	342	43
Vehicles Exiting, veh/h	398	353	680
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	10.7	11.0	11.2
Approach LOS	B	B	B

Lane	Left	Left	Left
Designated Moves	LR	LR	LR
Assumed Moves	LR	LR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	406	381	644
Cap Entry Lane, veh/h	846	803	1082
Entry HV Adj Factor	0.980	0.979	0.980
Flow Entry, veh/h	398	373	631
Cap Entry, veh/h	830	786	1061
V/C Ratio	0.480	0.475	0.595
Control Delay, s/veh	10.7	11.0	11.2
LOS	B	B	B
95th %tile Queue, veh	3	3	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑	↱	↰	↑↑↱		↰	↑↑↱	
Traffic Volume (veh/h)	246	254	28	7	249	89	59	584	24	51	144	1
Future Volume (veh/h)	246	254	28	7	249	89	59	584	24	51	144	1
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	289	299	33	8	293	0	69	687	28	60	169	1
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	319	330	565	9	337	295	90	800	33	79	809	5
Arrive On Green	0.36	0.36	0.36	0.19	0.19	0.00	0.05	0.23	0.23	0.04	0.22	0.22
Sat Flow, veh/h	894	924	1583	49	1811	1583	1774	3466	141	1774	3607	21
Grp Volume(v), veh/h	588	0	33	301	0	0	69	351	364	60	83	87
Grp Sat Flow(s),veh/h/ln	1818	0	1583	1860	0	1583	1774	1770	1838	1774	1770	1859
Q Serve(g_s), s	33.8	0.0	1.5	17.3	0.0	0.0	4.2	20.9	20.9	3.7	4.2	4.2
Cycle Q Clear(g_c), s	33.8	0.0	1.5	17.3	0.0	0.0	4.2	20.9	20.9	3.7	4.2	4.2
Prop In Lane	0.49		1.00	0.03		1.00	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	648	0	565	346	0	295	90	409	424	79	397	417
V/C Ratio(X)	0.91	0.00	0.06	0.87	0.00	0.00	0.76	0.86	0.86	0.76	0.21	0.21
Avail Cap(c_a), veh/h	827	0	720	508	0	432	484	483	502	484	483	508
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	23.2	43.4	0.0	0.0	51.5	40.5	40.5	51.9	34.7	34.7
Incr Delay (d2), s/veh	11.6	0.0	0.0	10.6	0.0	0.0	12.5	12.1	11.8	14.1	0.1	0.1
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	19.1	0.0	0.7	9.9	0.0	0.0	2.4	11.6	12.0	2.1	2.1	2.2
LnGrp Delay(d),s/veh	45.2	0.0	23.3	54.0	0.0	0.0	64.0	52.6	52.3	66.1	34.8	34.8
LnGrp LOS	D		C	D			E	D	D	E	C	C
Approach Vol, veh/h		621			301			784			230	
Approach Delay, s/veh		44.0			54.0			53.5			42.9	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.6	29.6		25.5	9.9	30.4		44.2
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	6.2	6.2		19.3	5.7	22.9		35.8
Green Ext Time (p_c), s	0.1	4.2		1.2	0.1	2.5		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	49.3
HCM 2010 LOS	D

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	246	254	28	7	249	89	69	584	24	51	144	226
Future Volume (veh/h)	246	254	28	7	249	89	69	584	24	51	144	226
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	254	262	29	7	257	0	71	602	25	53	148	233
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	303	520	9	314	275	93	796	33	73	386	346
Arrive On Green	0.33	0.33	0.33	0.17	0.17	0.00	0.05	0.23	0.23	0.04	0.22	0.22
Sat Flow, veh/h	895	923	1583	49	1811	1583	1774	3463	144	1774	1770	1583
Grp Volume(v), veh/h	516	0	29	264	0	0	71	307	320	53	148	233
Grp Sat Flow(s),veh/h/ln	1818	0	1583	1860	0	1583	1774	1770	1837	1774	1770	1583
Q Serve(g_s), s	23.4	0.0	1.1	12.0	0.0	0.0	3.5	14.3	14.3	2.6	6.3	11.9
Cycle Q Clear(g_c), s	23.4	0.0	1.1	12.0	0.0	0.0	3.5	14.3	14.3	2.6	6.3	11.9
Prop In Lane	0.49		1.00	0.03		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	597	0	520	323	0	275	93	406	422	73	386	346
V/C Ratio(X)	0.86	0.00	0.06	0.82	0.00	0.00	0.76	0.76	0.76	0.72	0.38	0.67
Avail Cap(c_a), veh/h	1033	0	899	634	0	540	605	603	626	605	603	540
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	20.2	35.0	0.0	0.0	41.1	31.6	31.6	41.7	29.3	31.5
Incr Delay (d2), s/veh	3.9	0.0	0.0	5.1	0.0	0.0	11.9	2.4	2.3	12.7	0.2	0.9
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	12.4	0.0	0.5	6.6	0.0	0.0	2.0	7.2	7.5	1.5	3.1	5.3
LnGrp Delay(d),s/veh	31.6	0.0	20.3	40.2	0.0	0.0	53.0	34.0	33.9	54.4	29.6	32.4
LnGrp LOS	C		C	D			D	C	C	D	C	C
Approach Vol, veh/h		545			264			698			434	
Approach Delay, s/veh		31.0			40.2			35.9			34.1	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	24.2		20.3	8.6	25.2		33.9
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	5.5	13.9		14.0	4.6	16.3		25.4
Green Ext Time (p_c), s	0.1	4.2		1.3	0.1	3.9		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	12.0
Intersection LOS	B

Approach	WB	NB	SB	NE
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	406	796	495	621
Demand Flow Rate, veh/h	414	813	504	634
Vehicles Circulating, veh/h	1079	661	390	241
Vehicles Exiting, veh/h	395	214	1103	653
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	18.2	15.2	7.6	7.5
Approach LOS	C	C	A	A

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR	LTR	R
Assumed Moves	L	TR	LT	TR	LT	R	LTR	R
RT Channelized								
Lane Util	0.742	0.258	0.470	0.530	0.462	0.538	0.470	0.530
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	307	107	382	431	233	271	298	336
Cap Entry Lane, veh/h	503	531	688	711	843	860	943	955
Entry HV Adj Factor	0.980	0.981	0.980	0.979	0.981	0.982	0.979	0.980
Flow Entry, veh/h	301	105	374	422	229	266	292	329
Cap Entry, veh/h	493	521	674	697	828	844	924	935
V/C Ratio	0.610	0.202	0.555	0.606	0.276	0.315	0.316	0.352
Control Delay, s/veh	21.1	9.7	14.6	15.8	7.4	7.8	7.3	7.7
LOS	C	A	B	C	A	A	A	A
95th %tile Queue, veh	4	1	3	4	1	1	1	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	20	464	9	71	534	70	70	102	194	238	54	41
Future Volume (veh/h)	20	464	9	71	534	70	70	102	194	238	54	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	23	527	10	81	607	80	80	116	220	270	61	47
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	757	14	295	716	94	451	134	254	346	311	240
Arrive On Green	0.01	0.42	0.42	0.04	0.44	0.44	0.05	0.23	0.23	0.13	0.32	0.32
Sat Flow, veh/h	1774	1822	35	1774	1613	213	1774	576	1093	1774	977	753
Grp Volume(v), veh/h	23	0	537	81	0	687	80	0	336	270	0	108
Grp Sat Flow(s),veh/h/ln	1774	0	1857	1774	0	1825	1774	0	1670	1774	0	1730
Q Serve(g_s), s	0.8	0.0	25.7	2.8	0.0	36.3	3.7	0.0	20.9	11.9	0.0	4.9
Cycle Q Clear(g_c), s	0.8	0.0	25.7	2.8	0.0	36.3	3.7	0.0	20.9	11.9	0.0	4.9
Prop In Lane	1.00		0.02	1.00		0.12	1.00		0.65	1.00		0.44
Lane Grp Cap(c), veh/h	172	0	772	295	0	810	451	0	389	346	0	550
V/C Ratio(X)	0.13	0.00	0.70	0.27	0.00	0.85	0.18	0.00	0.86	0.78	0.00	0.20
Avail Cap(c_a), veh/h	475	0	772	712	0	810	692	0	494	517	0	550
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	23.1	0.0	26.0	19.9	0.0	26.9	29.3	0.0	39.9	27.2	0.0	26.8
Incr Delay (d2), s/veh	0.3	0.0	5.1	0.5	0.0	10.7	0.2	0.0	15.5	4.5	0.0	0.4
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	14.2	1.4	0.0	20.7	1.8	0.0	11.3	6.2	0.0	2.4
LnGrp Delay(d),s/veh	23.5	0.0	31.1	20.4	0.0	37.6	29.4	0.0	55.4	31.7	0.0	27.2
LnGrp LOS	C		C	C		D	C		E	C		C
Approach Vol, veh/h		560			768			416			378	
Approach Delay, s/veh		30.8			35.8			50.4			30.4	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	53.0	19.0	30.2	9.0	50.0	9.8	39.4
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	25.0	32.0	30.0	45.0	20.0	25.0
Max Q Clear Time (g_c+I1), s	2.8	38.3	13.9	22.9	4.8	27.7	5.7	6.9
Green Ext Time (p_c), s	0.0	0.0	0.6	2.3	0.2	12.0	0.1	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	36.4
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	19	0	0	273	131	4
Future Vol, veh/h	19	0	0	273	131	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	0	0	297	142	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	442	145	147	0	-	0
Stage 1	145	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	573	902	1435	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	573	902	1435	-	-	-
Mov Cap-2 Maneuver	573	-	-	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	754	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1435	-	573	-	-
HCM Lane V/C Ratio	-	-	0.036	-	-
HCM Control Delay (s)	0	-	11.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	29	3	1	244	121	10
Future Vol, veh/h	29	3	1	244	121	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	3	1	265	132	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	404	137	142	0	-	0
Stage 1	137	-	-	-	-	-
Stage 2	267	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	603	911	1441	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	603	911	1441	-	-	-
Mov Cap-2 Maneuver	649	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	777	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1441	-	667	-	-
HCM Lane V/C Ratio	0.001	-	0.052	-	-
HCM Control Delay (s)	7.5	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	35	3	1	210	113	11
Future Vol, veh/h	35	3	1	210	113	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	3	1	228	123	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	359	129	135	0	-	0
Stage 1	129	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	640	921	1449	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	640	921	1449	-	-	-
Mov Cap-2 Maneuver	677	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1449	-	691	-	-
HCM Lane V/C Ratio	0.001	-	0.06	-	-
HCM Control Delay (s)	7.5	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	12	12	4	199	112	4
Future Vol, veh/h	12	12	4	199	112	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	13	4	216	122	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	349	124	126	0	-	0
Stage 1	124	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	648	927	1460	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	646	927	1460	-	-	-
Mov Cap-2 Maneuver	681	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1460	-	785	-	-
HCM Lane V/C Ratio	0.003	-	0.033	-	-
HCM Control Delay (s)	7.5	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	106	0	17	0	0	0	74	94	0	0	37	88
Future Vol, veh/h	106	0	17	0	0	0	74	94	0	0	37	88
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	92	82	92	92	92	82	82	92	92	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	129	0	21	0	0	0	90	115	0	0	45	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	394	394	99	404	447	115	152	0	0	115	0	0
Stage 1	99	99	-	295	295	-	-	-	-	-	-	-
Stage 2	295	295	-	109	152	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	566	542	957	557	506	937	1429	-	-	1474	-	-
Stage 1	907	813	-	713	669	-	-	-	-	-	-	-
Stage 2	713	669	-	896	772	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	537	506	957	517	472	937	1429	-	-	1474	-	-
Mov Cap-2 Maneuver	537	506	-	517	472	-	-	-	-	-	-	-
Stage 1	846	813	-	665	624	-	-	-	-	-	-	-
Stage 2	665	624	-	877	772	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	0	3.4	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1429	-	-	572	-	1474	-	-
HCM Lane V/C Ratio	0.063	-	-	0.262	-	-	-	-
HCM Control Delay (s)	7.7	0	-	13.5	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	180	337	83	84	272	98	168	374	183	32	114	97
Future Volume (veh/h)	180	337	83	84	272	98	168	374	183	32	114	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	194	362	89	90	292	105	181	402	197	34	123	104
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	1056	256	119	397	143	230	567	275	61	284	222
Arrive On Green	0.14	0.37	0.37	0.07	0.30	0.30	0.13	0.25	0.25	0.03	0.15	0.15
Sat Flow, veh/h	1774	2825	686	1774	1309	471	1774	2314	1120	1774	1894	1478
Grp Volume(v), veh/h	194	225	226	90	0	397	181	306	293	34	114	113
Grp Sat Flow(s),veh/h/ln	1774	1770	1742	1774	0	1780	1774	1770	1665	1774	1770	1602
Q Serve(g_s), s	7.6	6.5	6.7	3.6	0.0	14.3	7.1	11.3	11.5	1.3	4.2	4.6
Cycle Q Clear(g_c), s	7.6	6.5	6.7	3.6	0.0	14.3	7.1	11.3	11.5	1.3	4.2	4.6
Prop In Lane	1.00		0.39	1.00		0.26	1.00		0.67	1.00		0.92
Lane Grp Cap(c), veh/h	243	661	651	119	0	540	230	434	408	61	265	240
V/C Ratio(X)	0.80	0.34	0.35	0.76	0.00	0.74	0.79	0.71	0.72	0.56	0.43	0.47
Avail Cap(c_a), veh/h	621	991	975	621	0	997	745	991	932	745	991	897
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	16.1	16.1	32.8	0.0	22.3	30.1	24.6	24.7	34.0	27.6	27.8
Incr Delay (d2), s/veh	5.9	0.3	0.3	9.4	0.0	2.0	5.9	1.6	1.8	7.8	0.9	1.2
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	4.1	3.2	3.3	2.1	0.0	7.2	3.8	5.7	5.5	0.8	2.1	2.1
LnGrp Delay(d),s/veh	35.7	16.4	16.4	42.2	0.0	24.3	36.1	26.2	26.5	41.7	28.5	29.0
LnGrp LOS	D	B	B	D		C	D	C	C	D	C	C
Approach Vol, veh/h		645			487			780			261	
Approach Delay, s/veh		22.2			27.6			28.6			30.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	23.0	9.3	31.2	14.7	16.2	14.3	26.2
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	3.3	13.5	5.6	8.7	9.1	6.6	9.6	16.3
Green Ext Time (p_c), s	0.1	4.0	0.2	5.7	0.4	4.1	0.4	5.4

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	283	284	3	0	271	28	0	0	0	7	0	135
Future Vol, veh/h	283	284	3	0	271	28	0	0	0	7	0	135
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	314	316	3	0	301	31	0	0	0	8	0	150

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	332	0	0	319	0	0	1338	1278	317	1263	1265	317
Stage 1	-	-	-	-	-	-	946	946	-	317	317	-
Stage 2	-	-	-	-	-	-	392	332	-	946	948	-
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	1227	-	-	1241	-	-	130	166	724	147	169	724
Stage 1	-	-	-	-	-	-	314	340	-	694	654	-
Stage 2	-	-	-	-	-	-	633	644	-	314	339	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1227	-	-	1241	-	-	83	124	724	118	126	724
Mov Cap-2 Maneuver	-	-	-	-	-	-	83	124	-	118	126	-
Stage 1	-	-	-	-	-	-	234	253	-	516	654	-
Stage 2	-	-	-	-	-	-	502	644	-	234	252	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.4	0	0	12.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1227	-	-	1241	-	-	118	724
HCM Lane V/C Ratio	-	0.256	-	-	-	-	-	0.066	0.207
HCM Control Delay (s)	0	8.9	-	-	0	-	-	37.7	11.3
HCM Lane LOS	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	-	1	-	-	0	-	-	0.2	0.8

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	279	5	18	97	29	206
Future Vol, veh/h	279	5	18	97	29	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	353	6	23	123	37	261

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	205	37	37	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	168	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	783	1035	1574	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	1035	1574	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	848	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1574	-	773	-	-
HCM Lane V/C Ratio	0.014	-	0.465	-	-
HCM Control Delay (s)	7.3	0	13.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	2.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	3	520	21	95	249	82	25	91	49	134	158	7
Future Volume (veh/h)	3	520	21	95	249	82	25	91	49	134	158	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	3	571	23	104	274	90	27	100	54	147	174	8
Adj No. of Lanes	0	2	0	0	2	0	1	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	1509	60	292	738	255	45	355	180	201	841	38
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.03	0.16	0.16	0.11	0.24	0.24
Sat Flow, veh/h	3	3392	136	413	1659	574	1774	2274	1154	1774	3447	158
Grp Volume(v), veh/h	314	0	283	218	0	250	27	76	78	147	89	93
Grp Sat Flow(s),veh/h/ln	1860	0	1671	1052	0	1594	1774	1770	1659	1774	1770	1835
Q Serve(g_s), s	0.0	0.0	5.5	3.2	0.0	5.1	0.7	1.9	2.0	3.9	2.0	2.0
Cycle Q Clear(g_c), s	5.5	0.0	5.5	8.8	0.0	5.1	0.7	1.9	2.0	3.9	2.0	2.0
Prop In Lane	0.01		0.08	0.48		0.36	1.00		0.70	1.00		0.09
Lane Grp Cap(c), veh/h	902	0	743	576	0	709	45	276	259	201	432	448
V/C Ratio(X)	0.35	0.00	0.38	0.38	0.00	0.35	0.61	0.28	0.30	0.73	0.21	0.21
Avail Cap(c_a), veh/h	1212	0	1024	771	0	977	725	1084	1017	725	1084	1124
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.1	0.0	9.1	9.7	0.0	9.0	23.6	18.2	18.3	21.0	14.7	14.7
Incr Delay (d2), s/veh	0.5	0.0	0.7	0.9	0.0	0.6	17.4	1.1	1.4	7.1	0.5	0.5
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	2.9	0.0	2.7	2.3	0.0	2.3	0.6	1.0	1.0	2.3	1.0	1.1
LnGrp Delay(d),s/veh	9.6	0.0	9.8	10.6	0.0	9.6	41.1	19.4	19.7	28.1	15.2	15.2
LnGrp LOS	A		A	B		A	D	B	B	C	B	B
Approach Vol, veh/h		597			468			181			329	
Approach Delay, s/veh		9.7			10.0			22.7			21.0	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.8	5.2	17.0		26.8	9.5	12.6
Change Period (Y+Rc), s		5.0	4.0	5.0		5.0	4.0	5.0
Max Green Setting (Gmax), s		30.0	20.0	30.0		30.0	20.0	30.0
Max Q Clear Time (g_c+I1), s		7.5	2.7	4.0		10.8	5.9	4.0
Green Ext Time (p_c), s		12.2	0.0	3.6		11.0	0.5	3.6

Intersection Summary			
HCM 2010 Ctrl Delay			13.6
HCM 2010 LOS			B

1: University Rd & 32nd Ave

	→	←	↖	↑	↘	↓
Lane Group	**EBT**	**WBT**	**NBL**	**NBT**	**SBL**	**SBT**
Lane Group Flow (vph)	597	468	27	154	147	182
v/c Ratio	0.47	0.50	0.10	0.23	0.38	0.15
Control Delay	14.6	14.8	25.8	16.7	24.1	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	14.8	25.8	16.7	24.1	15.4
Queue Length 50th (ft)	74	55	8	14	40	15
Queue Length 95th (ft)	133	107	32	44	104	56
Internal Link Dist (ft)	112	93		1057		1152
Turn Bay Length (ft)			94		102	
Base Capacity (vph)	2062	1497	725	2080	725	2161
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.31	0.04	0.07	0.20	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	92	215	13	41	217	27	50	227	12	42	388	205
Future Volume (veh/h)	92	215	13	41	217	27	50	227	12	42	388	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	101	236	14	45	238	30	55	249	13	46	426	225
Adj No. of Lanes	1	1	1	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	398	339	64	547	68	73	610	32	65	639	543
Arrive On Green	0.08	0.21	0.21	0.04	0.17	0.17	0.04	0.35	0.35	0.04	0.34	0.34
Sat Flow, veh/h	1774	1863	1583	1774	3168	395	1774	1755	92	1774	1863	1583
Grp Volume(v), veh/h	101	236	14	45	132	136	55	0	262	46	426	225
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1770	1793	1774	0	1847	1774	1863	1583
Q Serve(g_s), s	3.0	6.2	0.4	1.4	3.6	3.7	1.7	0.0	5.9	1.4	10.7	6.0
Cycle Q Clear(g_c), s	3.0	6.2	0.4	1.4	3.6	3.7	1.7	0.0	5.9	1.4	10.7	6.0
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	137	398	339	64	306	310	73	0	642	65	639	543
V/C Ratio(X)	0.74	0.59	0.04	0.70	0.43	0.44	0.75	0.00	0.41	0.71	0.67	0.41
Avail Cap(c_a), veh/h	811	851	723	648	809	819	648	0	945	648	953	810
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	19.4	17.1	26.1	20.2	20.3	25.9	0.0	13.6	26.1	15.3	13.8
Incr Delay (d2), s/veh	10.4	2.0	0.1	17.8	1.4	1.4	19.2	0.0	0.6	17.9	1.7	0.7
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	1.9	3.4	0.2	1.0	1.9	1.9	1.2	0.0	3.1	1.0	5.7	2.7
LnGrp Delay(d),s/veh	35.1	21.4	17.1	43.9	21.6	21.7	45.1	0.0	14.2	44.0	17.0	14.5
LnGrp LOS	D	C	B	D	C	C	D		B	D	B	B
Approach Vol, veh/h		351			313			317			697	
Approach Delay, s/veh		25.1			24.8			19.5			18.0	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	17.7	6.3	24.8	8.2	15.4	6.0	25.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	28.0	25.0	25.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	3.4	8.2	3.7	12.7	5.0	5.7	3.4	7.9
Green Ext Time (p_c), s	0.1	3.5	0.1	6.1	0.3	3.7	0.1	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Queues
2: Schafer Rd/University Rd & Dishman-Mica Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	101	236	14	45	268	55	262	46	426	225
v/c Ratio	0.37	0.49	0.03	0.21	0.39	0.24	0.38	0.21	0.62	0.31
Control Delay	37.4	31.5	0.1	38.0	30.4	37.9	23.3	38.1	28.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	31.5	0.1	38.0	30.4	37.9	23.3	38.1	28.6	5.0
Queue Length 50th (ft)	48	112	0	22	63	26	100	22	184	0
Queue Length 95th (ft)	104	197	0	58	108	67	202	60	#377	52
Internal Link Dist (ft)		1207			123		264		1057	
Turn Bay Length (ft)	134			61		70		100		
Base Capacity (vph)	658	831	763	526	1300	526	778	526	776	790
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.28	0.02	0.09	0.21	0.10	0.34	0.09	0.55	0.28

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	20	584	75	120	374	67	30	122	105	56	192	26
Future Volume (veh/h)	20	584	75	120	374	67	30	122	105	56	192	26
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	21	615	79	126	394	71	32	128	111	59	202	27
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	429	679	87	302	726	131	103	224	175	142	335	41
Arrive On Green	0.02	0.42	0.42	0.07	0.47	0.47	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	1618	208	1774	1537	277	112	893	697	242	1334	163
Grp Volume(v), veh/h	21	0	694	126	0	465	271	0	0	288	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1826	1774	0	1814	1702	0	0	1740	0	0
Q Serve(g_s), s	0.4	0.0	19.0	2.0	0.0	9.7	0.0	0.0	0.0	0.2	0.0	0.0
Cycle Q Clear(g_c), s	0.4	0.0	19.0	2.0	0.0	9.7	7.3	0.0	0.0	7.5	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.15	0.12		0.41	0.20		0.09
Lane Grp Cap(c), veh/h	429	0	766	302	0	857	503	0	0	518	0	0
V/C Ratio(X)	0.05	0.00	0.91	0.42	0.00	0.54	0.54	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	1016	0	819	795	0	857	823	0	0	838	0	0
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	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.1	0.0	14.5	11.5	0.0	10.0	17.8	0.0	0.0	17.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	13.5	0.9	0.0	0.9	1.3	0.0	0.0	1.3	0.0	0.0
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	0.2	0.0	12.3	1.0	0.0	5.0	3.7	0.0	0.0	4.0	0.0	0.0
LnGrp Delay(d),s/veh	9.2	0.0	28.0	12.5	0.0	10.9	19.1	0.0	0.0	19.1	0.0	0.0
LnGrp LOS	A		C	B		B	B			B		
Approach Vol, veh/h		715			591			271			288	
Approach Delay, s/veh		27.5			11.3			19.1			19.1	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	27.5		18.4	4.8	30.3		18.4
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0
Max Green Setting (Gmax), s	18.5	24.0		24.0	18.5	24.0		24.0
Max Q Clear Time (g_c+I1), s	4.0	21.0		9.5	2.4	11.7		9.3
Green Ext Time (p_c), s	0.2	1.4		4.2	0.0	7.6		4.2

Intersection Summary			
HCM 2010 Ctrl Delay			19.8
HCM 2010 LOS			B

	↗	→	↙	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	21	694	126	465	271	288
v/c Ratio	0.04	0.93	0.38	0.48	0.56	0.67
Control Delay	7.4	42.8	10.3	13.1	21.2	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	42.8	10.3	13.1	21.2	27.9
Queue Length 50th (ft)	3	249	19	88	73	95
Queue Length 95th (ft)	13	#567	50	262	143	174
Internal Link Dist (ft)		2334		2595	3508	1148
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	786	748	616	965	695	640
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.93	0.20	0.48	0.39	0.45

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Volume (veh/h)	13	458	147	34	306	48	63	108	28	34	155	7
Future Volume (veh/h)	13	458	147	34	306	48	63	108	28	34	155	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	14	482	155	36	322	51	66	114	29	36	163	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	25	606	195	56	732	116	160	194	41	131	352	344
Arrive On Green	0.01	0.45	0.45	0.03	0.47	0.47	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1774	1351	435	1774	1570	249	280	892	189	192	1620	1583
Grp Volume(v), veh/h	14	0	637	36	0	373	209	0	0	199	0	7
Grp Sat Flow(s),veh/h/ln	1774	0	1786	1774	0	1819	1360	0	0	1812	0	1583
Q Serve(g_s), s	0.4	0.0	14.7	1.0	0.0	6.6	2.8	0.0	0.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.4	0.0	14.7	1.0	0.0	6.6	7.3	0.0	0.0	4.5	0.0	0.2
Prop In Lane	1.00		0.24	1.00		0.14	0.32		0.14	0.18		1.00
Lane Grp Cap(c), veh/h	25	0	801	56	0	847	394	0	0	482	0	344
V/C Ratio(X)	0.56	0.00	0.80	0.64	0.00	0.44	0.53	0.00	0.00	0.41	0.00	0.02
Avail Cap(c_a), veh/h	556	0	932	926	0	911	576	0	0	682	0	529
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	11.3	22.9	0.0	8.6	17.4	0.0	0.0	16.4	0.0	14.7
Incr Delay (d2), s/veh	24.6	0.0	4.7	15.8	0.0	0.5	1.6	0.0	0.0	0.8	0.0	0.0
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	8.1	0.7	0.0	3.3	2.7	0.0	0.0	2.4	0.0	0.1
LnGrp Delay(d),s/veh	48.0	0.0	16.0	38.7	0.0	9.1	19.0	0.0	0.0	17.2	0.0	14.8
LnGrp LOS	D		B	D		A	B			B		B
Approach Vol, veh/h		651			409			209			206	
Approach Delay, s/veh		16.7			11.7			19.0			17.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	27.0		15.4	4.7	27.8		15.4
Change Period (Y+Rc), s	4.0	5.5		5.0	4.0	5.5		5.0
Max Green Setting (Gmax), s	25.0	25.0		16.0	15.0	24.0		16.0
Max Q Clear Time (g_c+I1), s	3.0	16.7		6.5	2.4	8.6		9.3
Green Ext Time (p_c), s	0.1	4.8		2.3	0.0	7.4		1.8

Intersection Summary		
HCM 2010 Ctrl Delay		15.7
HCM 2010 LOS		B

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	14	637	36	373	209	199	7
v/c Ratio	0.06	0.75	0.15	0.40	0.52	0.44	0.01
Control Delay	25.2	22.6	24.9	11.0	23.3	22.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	22.6	24.9	11.0	23.3	22.0	0.0
Queue Length 50th (ft)	4	134	10	63	47	46	0
Queue Length 95th (ft)	20	#420	36	173	130	124	0
Internal Link Dist (ft)		3473		778	470	3508	
Turn Bay Length (ft)	61		75				135
Base Capacity (vph)	489	845	815	1193	454	507	566
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.75	0.04	0.31	0.46	0.39	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	0	536	353	3	0	33
Future Vol, veh/h	0	536	353	3	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	583	384	3	0	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	387	0	-	0	968	385
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	583	-
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	1171	-	-	-	282	663
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	558	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1171	-	-	-	282	663
Mov Cap-2 Maneuver	-	-	-	-	282	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	558	-

Approach	SE	NW	SW
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1171	-	663
HCM Lane V/C Ratio	-	-	-	-	0.054
HCM Control Delay (s)	-	-	0	-	10.7
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.2

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	3	41	315	3	131	405
Future Vol, veh/h	3	41	315	3	131	405
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	45	342	3	142	440

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1069	344	0	0	346	0
Stage 1	344	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	245	699	-	-	1213	-
Stage 1	718	-	-	-	-	-
Stage 2	479	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	216	699	-	-	1213	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	423	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	331	699	1213	-
HCM Lane V/C Ratio	-	-	0.01	0.064	0.117	-
HCM Control Delay (s)	-	-	16	10.5	8.4	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0.2	0.4	-

7: Dishman-Mica Rd & N. Comm Access

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	SEL	SET	NWT	NWR
Traffic Vol, veh/h	3	26	33	375	292	1
Future Vol, veh/h	3	26	33	375	292	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	28	36	408	317	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	318	318	318	0	-	0
Stage 1	318	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	675	723	1242	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	655	723	1242	-	-	-
Mov Cap-2 Maneuver	685	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	10.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	719	1242	-
HCM Lane V/C Ratio	-	-	0.044	0.029	-
HCM Control Delay (s)	-	-	10.2	8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	4	10	283	2	15	363
Future Vol, veh/h	4	10	283	2	15	363
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	11	308	2	16	395

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	736	309	0	0	310	0
Stage 1	309	-	-	-	-	-
Stage 2	427	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	386	731	-	-	1250	-
Stage 1	745	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	381	731	-	-	1250	-
Mov Cap-2 Maneuver	381	-	-	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	650	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	579	1250	-
HCM Lane V/C Ratio	-	-	0.026	0.013	-
HCM Control Delay (s)	-	-	11.4	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	30	99	186	19	130	238
Future Vol, veh/h	30	99	186	19	130	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	109	204	21	143	262

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	762	215	0	0	225	0
Stage 1	215	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	373	825	-	-	1344	-
Stage 1	821	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	327	825	-	-	1344	-
Mov Cap-2 Maneuver	327	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	508	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	609	1344	-
HCM Lane V/C Ratio	-	-	0.233	0.106	-
HCM Control Delay (s)	-	-	12.7	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.4	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	136	117	2	2	14
Future Vol, veh/h	13	136	117	2	2	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	148	127	2	2	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	129	0	-	0	304	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	176	-
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	1457	-	-	-	688	922
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	855	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1457	-	-	-	681	922
Mov Cap-2 Maneuver	-	-	-	-	681	-
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	846	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1457	-	-	-	883
HCM Lane V/C Ratio	0.01	-	-	-	0.02
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	76.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	411	67	92	184	0	30	0	233	0	295	135
Future Vol, veh/h	0	411	67	92	184	0	30	0	233	0	295	135
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	442	72	99	198	0	32	0	251	0	317	145

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	198	0	0	514	0	0	1105	874	478	999	910	198
Stage 1	-	-	-	-	-	-	478	478	-	396	396	-
Stage 2	-	-	-	-	-	-	627	396	-	603	514	-
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	1375	-	-	1052	-	-	188	288	587	222	~ 275	843
Stage 1	-	-	-	-	-	-	568	556	-	629	604	-
Stage 2	-	-	-	-	-	-	471	604	-	486	535	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1375	-	-	1052	-	-	-	257	587	117	~ 246	843
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	257	-	117	~ 246	-
Stage 1	-	-	-	-	-	-	568	556	-	629	540	-
Stage 2	-	-	-	-	-	-	144	540	-	279	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.9		256.1
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1375	-	-	1052	-	-	316
HCM Lane V/C Ratio	-	-	-	-	0.094	-	-	1.463
HCM Control Delay (s)	-	0	-	-	8.8	0	-	256.1
HCM Lane LOS	-	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	-	0	-	-	0.3	-	-	25.2

Notes

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

Intersection	
Int Delay, s/veh	18.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	411	67	387	315	30	233
Future Vol, veh/h	411	67	387	315	30	233
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	437	71	412	335	32	248

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	509	0	1632	473
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	1159	-
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	-	-	1056	-	111	591
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	299	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1056	-	58	591
Mov Cap-2 Maneuver	-	-	-	-	58	-
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	156	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.8	84.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	289	-	-	1056	-
HCM Lane V/C Ratio	0.968	-	-	0.39	-
HCM Control Delay (s)	84.3	-	-	10.6	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	9.7	-	-	1.9	-

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Approach	EB	NB	SW
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	508	280	747
Demand Flow Rate, veh/h	518	286	762
Vehicles Circulating, veh/h	420	446	33
Vehicles Exiting, veh/h	375	492	699
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	19.0	10.3	14.2
Approach LOS	C	B	B

Lane	Left	Left	Left
Designated Moves	LR	LR	LR
Assumed Moves	LR	LR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	518	286	762
Cap Entry Lane, veh/h	742	723	1093
Entry HV Adj Factor	0.981	0.979	0.980
Flow Entry, veh/h	508	280	747
Cap Entry, veh/h	728	708	1072
V/C Ratio	0.698	0.395	0.697
Control Delay, s/veh	19.0	10.3	14.2
LOS	C	B	B
95th %tile Queue, veh	6	2	6

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	220	336	73	17	255	8	31	354	12	108	438	0
Future Volume (veh/h)	220	336	73	17	255	8	31	354	12	108	438	0
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	244	373	81	19	283	0	34	393	13	120	487	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	413	593	22	328	299	53	562	19	151	765	0
Arrive On Green	0.37	0.37	0.37	0.19	0.19	0.00	0.03	0.16	0.16	0.09	0.22	0.00
Sat Flow, veh/h	722	1104	1583	117	1740	1583	1774	3497	115	1774	3632	0
Grp Volume(v), veh/h	617	0	81	302	0	0	34	199	207	120	487	0
Grp Sat Flow(s),veh/h/ln	1827	0	1583	1857	0	1583	1774	1770	1842	1774	1770	0
Q Serve(g_s), s	33.5	0.0	3.5	16.5	0.0	0.0	2.0	11.1	11.2	7.0	13.1	0.0
Cycle Q Clear(g_c), s	33.5	0.0	3.5	16.5	0.0	0.0	2.0	11.1	11.2	7.0	13.1	0.0
Prop In Lane	0.40		1.00	0.06		1.00	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	684	0	593	350	0	299	53	285	296	151	765	0
V/C Ratio(X)	0.90	0.00	0.14	0.86	0.00	0.00	0.64	0.70	0.70	0.79	0.64	0.00
Avail Cap(c_a), veh/h	871	0	755	531	0	453	508	506	527	508	1013	0
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.0	0.0	21.6	41.2	0.0	0.0	50.3	41.6	41.6	47.0	37.3	0.0
Incr Delay (d2), s/veh	10.6	0.0	0.1	9.1	0.0	0.0	12.1	2.3	2.2	8.9	0.3	0.0
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	18.8	0.0	1.6	9.4	0.0	0.0	1.2	5.6	5.9	3.8	6.5	0.0
LnGrp Delay(d),s/veh	41.6	0.0	21.7	50.3	0.0	0.0	62.3	43.9	43.8	55.9	37.7	0.0
LnGrp LOS	D		C	D			E	D	D	E	D	
Approach Vol, veh/h		698			302			440			607	
Approach Delay, s/veh		39.3			50.3			45.3			41.3	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	27.7		24.8	14.0	21.9		44.2
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	4.0	15.1		18.5	9.0	13.2		35.5
Green Ext Time (p_c), s	0.1	3.5		1.3	0.3	3.7		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	42.8
HCM 2010 LOS	D

Queues
12: Hwy 27 & 16th Ave

2040 PM W- Proj.
12/8/2015

	→	↘	←	↖	↖	↑	↘	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	617	81	302	9	34	406	120	487
v/c Ratio	0.88	0.12	0.82	0.08	0.31	0.75	0.62	0.58
Control Delay	54.7	6.8	69.2	1.2	70.2	63.3	71.4	48.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	6.8	69.2	1.2	70.2	63.3	71.4	48.6
Queue Length 50th (ft)	501	0	247	0	29	178	101	207
Queue Length 95th (ft)	#853	38	#420	0	69	251	176	277
Internal Link Dist (ft)	49		154			343		461
Turn Bay Length (ft)				25	157		232	
Base Capacity (vph)	701	658	427	116	408	813	408	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.12	0.71	0.08	0.08	0.50	0.29	0.56

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	220	336	73	17	255	8	31	354	12	108	438	430
Future Volume (veh/h)	220	336	73	17	255	8	31	354	12	108	438	430
Number	3	8	18	7	4	14	1	6	16	5	2	12
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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	227	346	75	18	263	0	32	365	12	111	452	443
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	383	550	21	305	278	50	765	25	140	477	427
Arrive On Green	0.35	0.35	0.35	0.18	0.18	0.00	0.03	0.22	0.22	0.08	0.27	0.27
Sat Flow, veh/h	724	1103	1583	119	1738	1583	1774	3497	115	1774	1770	1583
Grp Volume(v), veh/h	573	0	75	281	0	0	32	184	193	111	452	443
Grp Sat Flow(s),veh/h/ln	1827	0	1583	1857	0	1583	1774	1770	1842	1774	1770	1583
Q Serve(g_s), s	33.2	0.0	3.6	16.4	0.0	0.0	2.0	10.1	10.2	6.8	27.9	30.0
Cycle Q Clear(g_c), s	33.2	0.0	3.6	16.4	0.0	0.0	2.0	10.1	10.2	6.8	27.9	30.0
Prop In Lane	0.40		1.00	0.06		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	635	0	550	326	0	278	50	387	403	140	477	427
V/C Ratio(X)	0.90	0.00	0.14	0.86	0.00	0.00	0.64	0.48	0.48	0.79	0.95	1.04
Avail Cap(c_a), veh/h	820	0	711	500	0	427	478	477	496	478	477	427
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	24.9	44.6	0.0	0.0	53.5	37.9	38.0	50.4	39.9	40.7
Incr Delay (d2), s/veh	11.1	0.0	0.1	9.4	0.0	0.0	12.8	0.7	0.7	9.6	28.2	53.9
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	18.7	0.0	1.6	9.3	0.0	0.0	1.2	5.0	5.3	3.7	17.3	19.4
LnGrp Delay(d),s/veh	45.7	0.0	25.0	54.1	0.0	0.0	66.3	38.6	38.6	59.9	68.1	94.6
LnGrp LOS	D		C	D			E	D	D	E	E	F
Approach Vol, veh/h		648			281			409			1006	
Approach Delay, s/veh		43.3			54.1			40.8			78.9	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	35.0		24.5	13.8	29.3		43.7
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	30.0	30.0		30.0	30.0	30.0		50.0
Max Q Clear Time (g_c+I1), s	4.0	32.0		18.4	8.8	12.2		35.2
Green Ext Time (p_c), s	0.1	0.0		1.2	0.3	5.3		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	59.4
HCM 2010 LOS	E

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Approach	WB	NB	SB	NE
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	329	466	1148	740
Demand Flow Rate, veh/h	335	475	1171	755
Vehicles Circulating, veh/h	725	797	363	675
Vehicles Exiting, veh/h	547	633	697	859
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	13.3	11.1	16.0	14.2
Approach LOS	B	B	C	B

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR	LTR	R
Assumed Moves	L	TR	LT	TR	LT	TR	LTR	R
RT Channelized								
Lane Util	0.973	0.027	0.469	0.531	0.470	0.530	0.470	0.530
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	326	9	223	252	550	621	355	400
Cap Entry Lane, veh/h	656	680	622	647	861	876	681	704
Entry HV Adj Factor	0.980	1.000	0.981	0.979	0.981	0.980	0.980	0.981
Flow Entry, veh/h	320	9	219	247	539	608	348	392
Cap Entry, veh/h	643	680	610	633	844	858	667	691
V/C Ratio	0.497	0.013	0.359	0.390	0.639	0.709	0.521	0.568
Control Delay, s/veh	13.5	5.4	11.0	11.2	14.7	17.2	13.7	14.7
LOS	B	A	B	B	B	C	B	B
95th %tile Queue, veh	3	0	2	2	5	6	3	4

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	43	605	80	143	460	51	73	83	110	71	141	38
Future Volume (veh/h)	43	605	80	143	460	51	73	83	110	71	141	38
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	55	776	103	183	590	65	94	106	141	91	181	49
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	275	647	86	251	746	82	293	144	191	269	277	75
Arrive On Green	0.04	0.40	0.40	0.09	0.45	0.45	0.06	0.20	0.20	0.06	0.20	0.20
Sat Flow, veh/h	1774	1611	214	1774	1649	182	1774	726	966	1774	1413	382
Grp Volume(v), veh/h	55	0	879	183	0	655	94	0	247	91	0	230
Grp Sat Flow(s),veh/h/ln	1774	0	1825	1774	0	1831	1774	0	1692	1774	0	1795
Q Serve(g_s), s	1.3	0.0	30.0	4.2	0.0	22.8	3.1	0.0	10.2	3.0	0.0	8.8
Cycle Q Clear(g_c), s	1.3	0.0	30.0	4.2	0.0	22.8	3.1	0.0	10.2	3.0	0.0	8.8
Prop In Lane	1.00		0.12	1.00		0.10	1.00		0.57	1.00		0.21
Lane Grp Cap(c), veh/h	275	0	733	251	0	828	293	0	335	269	0	352
V/C Ratio(X)	0.20	0.00	1.20	0.73	0.00	0.79	0.32	0.00	0.74	0.34	0.00	0.65
Avail Cap(c_a), veh/h	686	0	733	572	0	828	661	0	499	640	0	529
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	14.8	0.0	22.3	16.7	0.0	17.4	22.3	0.0	28.1	22.6	0.0	27.7
Incr Delay (d2), s/veh	0.4	0.0	102.3	4.1	0.0	7.6	0.6	0.0	4.5	0.7	0.0	2.9
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	0.7	0.0	35.7	2.3	0.0	13.2	1.6	0.0	5.2	1.5	0.0	4.6
LnGrp Delay(d),s/veh	15.1	0.0	124.6	20.8	0.0	25.0	23.0	0.0	32.6	23.3	0.0	30.6
LnGrp LOS	B		F	C		C	C		C	C		C
Approach Vol, veh/h		934			838			341			321	
Approach Delay, s/veh		118.1			24.1			29.9			28.5	
Approach LOS		F			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	38.8	8.9	19.8	11.0	35.0	9.0	19.6
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	20.0	30.0	20.0	22.0	20.0	30.0	20.0	22.0
Max Q Clear Time (g_c+I1), s	3.3	24.8	5.0	12.2	6.2	32.0	5.1	10.8
Green Ext Time (p_c), s	0.1	4.8	0.2	2.6	0.4	0.0	0.2	2.9

Intersection Summary	
HCM 2010 Ctrl Delay	61.6
HCM 2010 LOS	E

HCM 2010 Signalized Intersection Summary
13: Pines Rd & 32nd Ave

2040 PM W- Proj. IMP
12/16/2015

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	43	605	80	143	460	51	73	83	110	71	141	38
Future Volume (veh/h)	43	605	80	143	460	51	73	83	110	71	141	38
Number	1	6	16	5	2	12	7	4	14	3	8	18
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	55	776	103	183	590	65	94	106	141	91	181	49
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	291	683	91	238	777	86	283	141	187	259	272	74
Arrive On Green	0.04	0.42	0.42	0.08	0.47	0.47	0.06	0.19	0.19	0.06	0.19	0.19
Sat Flow, veh/h	1774	1611	214	1774	1649	182	1774	726	966	1774	1413	382
Grp Volume(v), veh/h	55	0	879	183	0	655	94	0	247	91	0	230
Grp Sat Flow(s),veh/h/ln	1774	0	1825	1774	0	1831	1774	0	1692	1774	0	1795
Q Serve(g_s), s	1.4	0.0	33.5	4.3	0.0	23.3	3.3	0.0	10.9	3.2	0.0	9.4
Cycle Q Clear(g_c), s	1.4	0.0	33.5	4.3	0.0	23.3	3.3	0.0	10.9	3.2	0.0	9.4
Prop In Lane	1.00		0.12	1.00		0.10	1.00		0.57	1.00		0.21
Lane Grp Cap(c), veh/h	291	0	774	238	0	863	283	0	328	259	0	345
V/C Ratio(X)	0.19	0.00	1.14	0.77	0.00	0.76	0.33	0.00	0.75	0.35	0.00	0.67
Avail Cap(c_a), veh/h	666	0	774	462	0	863	624	0	471	604	0	500
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	14.5	0.0	22.8	17.7	0.0	17.2	23.9	0.0	30.1	24.2	0.0	29.6
Incr Delay (d2), s/veh	0.3	0.0	76.7	5.2	0.0	6.2	0.7	0.0	5.4	0.8	0.0	3.1
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	0.7	0.0	33.3	2.4	0.0	13.1	1.6	0.0	5.6	1.6	0.0	5.0
LnGrp Delay(d),s/veh	14.8	0.0	99.5	22.8	0.0	23.4	24.6	0.0	35.5	25.0	0.0	32.7
LnGrp LOS	B		F	C		C	C		D	C		C
Approach Vol, veh/h		934			838			341			321	
Approach Delay, s/veh		94.5			23.3			32.5			30.5	
Approach LOS		F			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	42.2	9.1	20.3	11.1	38.5	9.3	20.2
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Green Setting (Gmax), s	19.5	30.5	20.0	22.0	16.5	33.5	20.0	22.0
Max Q Clear Time (g_c+I1), s	3.4	25.3	5.2	12.9	6.3	35.5	5.3	11.4
Green Ext Time (p_c), s	0.1	4.8	0.2	2.5	0.3	0.0	0.2	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	52.8
HCM 2010 LOS	D

	↗	→	↙	←	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	55	879	183	655	94	247	91	230
v/c Ratio	0.19	1.30	0.56	0.79	0.29	0.66	0.29	0.65
Control Delay	13.1	171.8	21.2	32.2	21.8	34.1	21.9	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	171.8	21.2	32.2	21.8	34.1	21.9	40.1
Queue Length 50th (ft)	13	~630	47	316	34	95	33	109
Queue Length 95th (ft)	31	#855	95	#442	62	155	60	170
Internal Link Dist (ft)		2595		1832		2145		2663
Turn Bay Length (ft)	168		166		79		113	
Base Capacity (vph)	553	678	500	832	519	501	514	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	1.30	0.37	0.79	0.18	0.49	0.18	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	9	0	0	131	233	19
Future Vol, veh/h	9	0	0	131	233	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	0	0	142	253	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	406	264	274	0	-	0
Stage 1	264	-	-	-	-	-
Stage 2	142	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	601	775	1289	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	601	775	1289	-	-	-
Mov Cap-2 Maneuver	601	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	885	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1289	-	601	-	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	0	-	11.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

15: Madison Rd & 41st Ave

12/16/2015

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	18	2	3	113	202	31
Future Vol, veh/h	18	2	3	113	202	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	2	3	123	220	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	365	236	253	0	-	0
Stage 1	236	-	-	-	-	-
Stage 2	129	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	635	803	1312	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	634	803	1312	-	-	-
Mov Cap-2 Maneuver	672	-	-	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	895	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1312	-	683	-	-
HCM Lane V/C Ratio	0.002	-	0.032	-	-
HCM Control Delay (s)	7.8	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	22	2	3	94	166	38
Future Vol, veh/h	22	2	3	94	166	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	2	3	102	180	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	310	201	222	0	-	0
Stage 1	201	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	682	840	1347	-	-	-
Stage 1	833	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	680	840	1347	-	-	-
Mov Cap-2 Maneuver	705	-	-	-	-	-
Stage 1	833	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1347	-	715	-	-
HCM Lane V/C Ratio	0.002	-	0.036	-	-
HCM Control Delay (s)	7.7	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	8	8	13	89	155	13
Future Vol, veh/h	8	8	13	89	155	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	9	14	97	168	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	301	176	183	0	-	0
Stage 1	176	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	691	867	1392	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	684	867	1392	-	-	-
Mov Cap-2 Maneuver	710	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	892	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1392	-	781	-	-
HCM Lane V/C Ratio	0.01	-	0.022	-	-
HCM Control Delay (s)	7.6	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

18: Madison Rd & Thorpe Rd

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	50	0	69	0	0	0	38	52	0	0	113	47
Future Vol, veh/h	50	0	69	0	0	0	38	52	0	0	113	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	0	80	0	0	0	44	60	0	0	131	55

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	308	308	159	348	335	60	186	0	0	60	0	0
Stage 1	159	159	-	149	149	-	-	-	-	-	-	-
Stage 2	149	149	-	199	186	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	644	606	886	607	585	1005	1388	-	-	1544	-	-
Stage 1	843	766	-	854	774	-	-	-	-	-	-	-
Stage 2	854	774	-	803	746	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	628	586	886	538	566	1005	1388	-	-	1544	-	-
Mov Cap-2 Maneuver	628	586	-	538	566	-	-	-	-	-	-	-
Stage 1	815	766	-	826	748	-	-	-	-	-	-	-
Stage 2	826	748	-	730	746	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	0	3.2	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1388	-	-	756	-	1544	-	-
HCM Lane V/C Ratio	0.032	-	-	0.183	-	-	-	-
HCM Control Delay (s)	7.7	0	-	10.8	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	108	417	247	210	444	59	172	224	139	64	299	90
Future Volume (veh/h)	108	417	247	210	444	59	172	224	139	64	299	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	127	491	291	247	522	69	202	264	164	75	352	106
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	669	395	285	617	82	241	571	344	98	507	151
Arrive On Green	0.09	0.31	0.31	0.16	0.38	0.38	0.14	0.27	0.27	0.06	0.19	0.19
Sat Flow, veh/h	1774	2143	1266	1774	1612	213	1774	2127	1280	1774	2692	799
Grp Volume(v), veh/h	127	405	377	247	0	591	202	218	210	75	230	228
Grp Sat Flow(s),veh/h/ln	1774	1770	1639	1774	0	1825	1774	1770	1637	1774	1770	1722
Q Serve(g_s), s	6.9	20.1	20.2	13.4	0.0	29.1	10.9	10.1	10.6	4.1	11.9	12.2
Cycle Q Clear(g_c), s	6.9	20.1	20.2	13.4	0.0	29.1	10.9	10.1	10.6	4.1	11.9	12.2
Prop In Lane	1.00		0.77	1.00		0.12	1.00		0.78	1.00		0.46
Lane Grp Cap(c), veh/h	160	552	512	285	0	698	241	475	440	98	333	324
V/C Ratio(X)	0.79	0.73	0.74	0.87	0.00	0.85	0.84	0.46	0.48	0.76	0.69	0.70
Avail Cap(c_a), veh/h	450	719	666	450	0	741	540	719	665	540	719	699
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	30.2	30.3	40.3	0.0	27.7	41.5	30.0	30.2	45.9	37.3	37.4
Incr Delay (d2), s/veh	8.5	2.8	3.1	10.2	0.0	8.6	7.7	0.5	0.6	11.5	2.2	2.4
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	3.8	10.2	9.5	7.3	0.0	16.3	5.9	5.0	4.9	2.3	6.0	6.1
LnGrp Delay(d),s/veh	52.4	33.0	33.3	50.5	0.0	36.3	49.2	30.6	30.8	57.4	39.5	39.8
LnGrp LOS	D	C	C	D		D	D	C	C	E	D	D
Approach Vol, veh/h		909			838			630			533	
Approach Delay, s/veh		35.8			40.5			36.6			42.1	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	31.9	20.3	35.2	18.9	24.0	13.4	42.2
Change Period (Y+Rc), s	5.5	5.5	4.5	4.5	5.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	30.0	40.0	25.0	40.0	30.0	40.0	25.0	40.0
Max Q Clear Time (g_c+I1), s	6.1	12.6	15.4	22.2	12.9	14.2	8.9	31.1
Green Ext Time (p_c), s	0.2	4.4	0.5	8.5	0.5	4.3	0.3	5.4

Intersection Summary			
HCM 2010 Ctrl Delay			38.5
HCM 2010 LOS			D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	782	247	591	202	428	75	458
v/c Ratio	0.60	0.73	0.75	0.87	0.70	0.44	0.47	0.74
Control Delay	64.0	39.9	63.0	52.0	62.2	31.3	64.9	52.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	39.9	63.0	52.0	62.2	31.3	64.9	52.6
Queue Length 50th (ft)	94	266	176	417	148	117	56	167
Queue Length 95th (ft)	167	369	#314	#744	240	171	112	238
Internal Link Dist (ft)		150		1250		6700		1848
Turn Bay Length (ft)	108		112		131		184	
Base Capacity (vph)	381	1201	381	676	458	1211	458	1194
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.65	0.65	0.87	0.44	0.35	0.16	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	249	478	0	0	480	13	0	0	0	20	0	256
Future Vol, veh/h	249	478	0	0	480	13	0	0	0	20	0	256
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	100	-	-	-	-	-	-	-	-	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	277	531	0	0	533	14	0	0	0	22	0	284

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	548	0	0	531	0	0	1767	1632	531	1625	1625	541
Stage 1	-	-	-	-	-	-	1084	1084	-	541	541	-
Stage 2	-	-	-	-	-	-	683	548	-	1084	1084	-
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	1021	-	-	1036	-	-	65	101	548	82	102	541
Stage 1	-	-	-	-	-	-	263	293	-	525	521	-
Stage 2	-	-	-	-	-	-	439	517	-	263	293	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1021	-	-	1036	-	-	24	74	548	65	74	541
Mov Cap-2 Maneuver	-	-	-	-	-	-	24	74	-	65	74	-
Stage 1	-	-	-	-	-	-	192	214	-	383	521	-
Stage 2	-	-	-	-	-	-	208	517	-	192	214	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	0	0	23.7
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1021	-	-	1036	-	-	65	541
HCM Lane V/C Ratio	-	0.271	-	-	-	-	-	0.342	0.526
HCM Control Delay (s)	0	9.8	-	-	0	-	-	86.8	18.8
HCM Lane LOS	A	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	-	1.1	-	-	0	-	-	1.3	3

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	342	20	28	63	116	429
Future Vol, veh/h	342	20	28	63	116	429
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	175
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	376	22	31	69	127	471

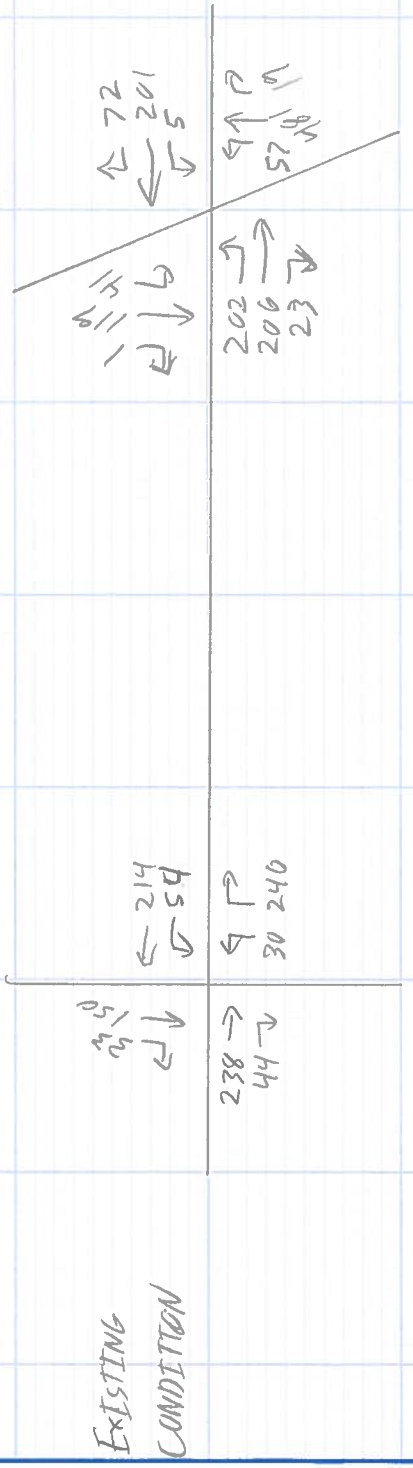
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	258	127	127	0	-	0
Stage 1	127	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	731	923	1459	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	715	923	1459	-	-	-
Mov Cap-2 Maneuver	715	-	-	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	875	-	-	-	-	-

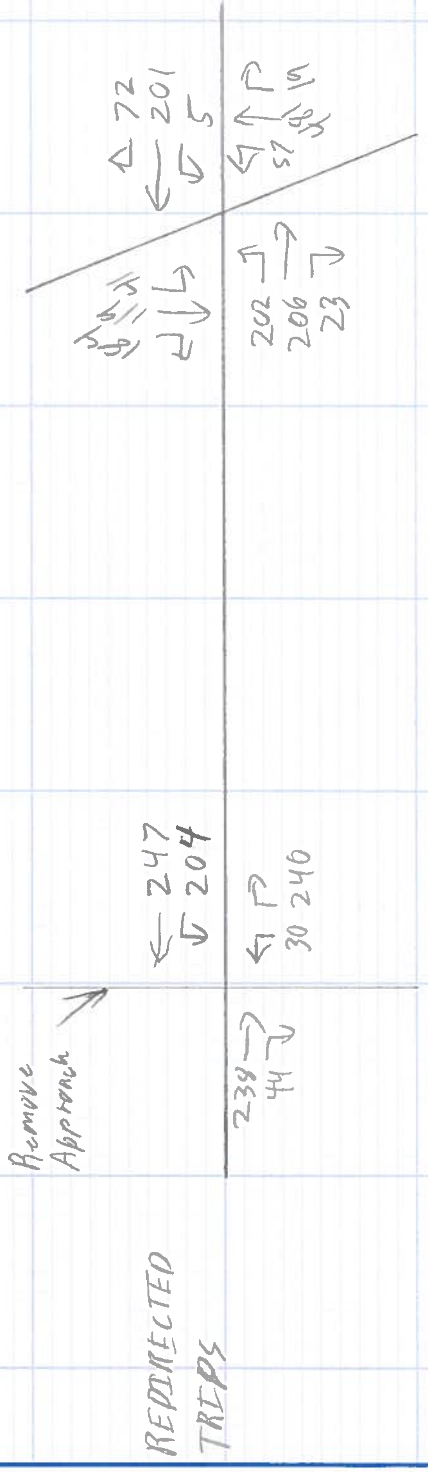
Approach	EB	NB	SB
HCM Control Delay, s	15.9	2.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1459	-	724	-	-
HCM Lane V/C Ratio	0.021	-	0.549	-	-
HCM Control Delay (s)	7.5	0	15.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	3.4	-	-

16TH AVE & PINES RD REDIRECTION OF TRIPS

AM PEAK
Year 2020
W-project

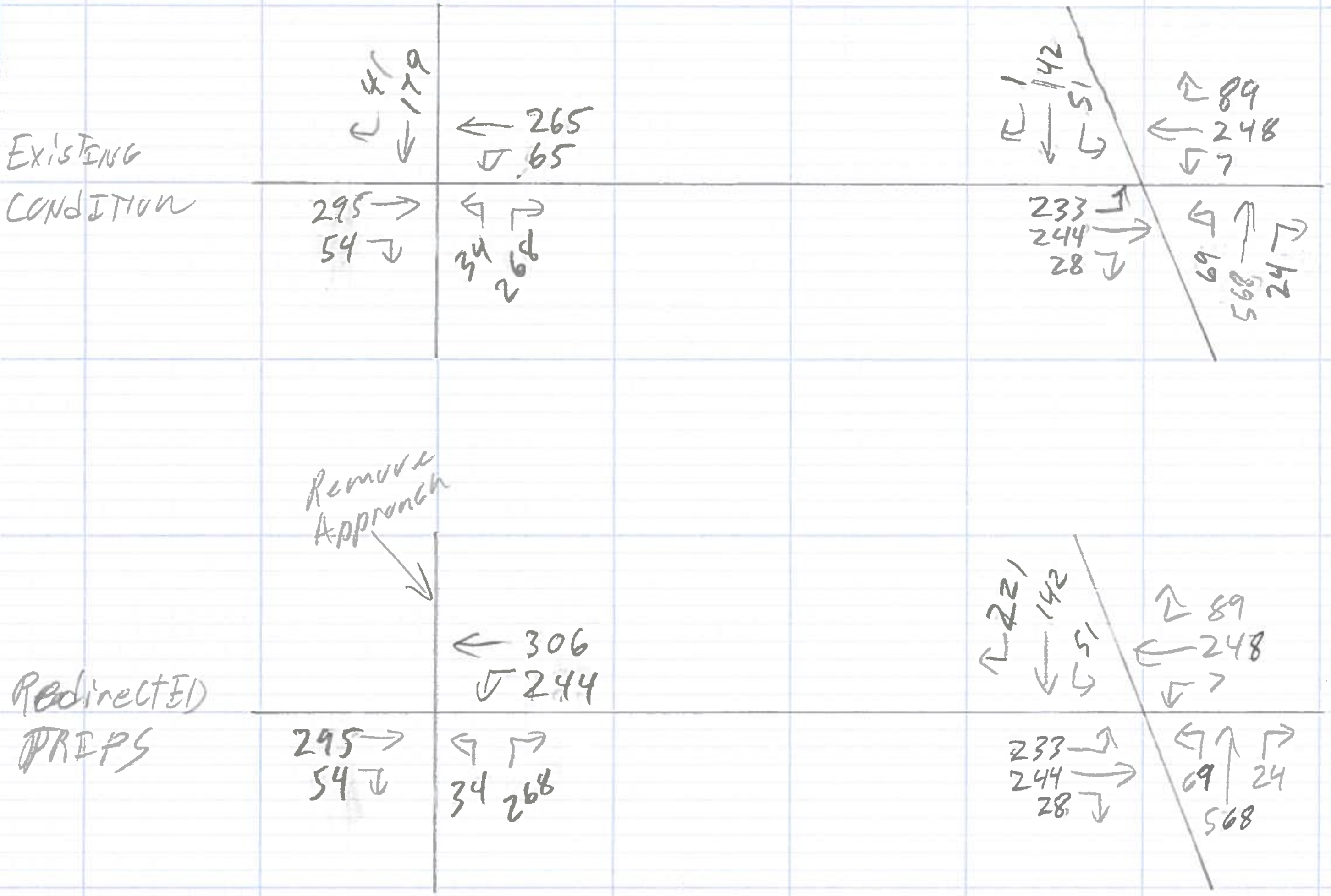




WCE Whipple Consulting Engineers, Inc.
2528 N. Sullivan Rd. • Spokane Valley, WA 99216
Phone 509-893-2617 • Fax 509-926-0227

NAME OF PROJECT Painted HILLS			SHEET NUMBER 1 OF 6
COMPUTED BY BNG	CHECKED BY	JOB NUMBER 1166	DATE 12-9-15

AM PEAK
Year 2040
W-O ProJ



WCE Whipple Consulting Engineers, Inc.
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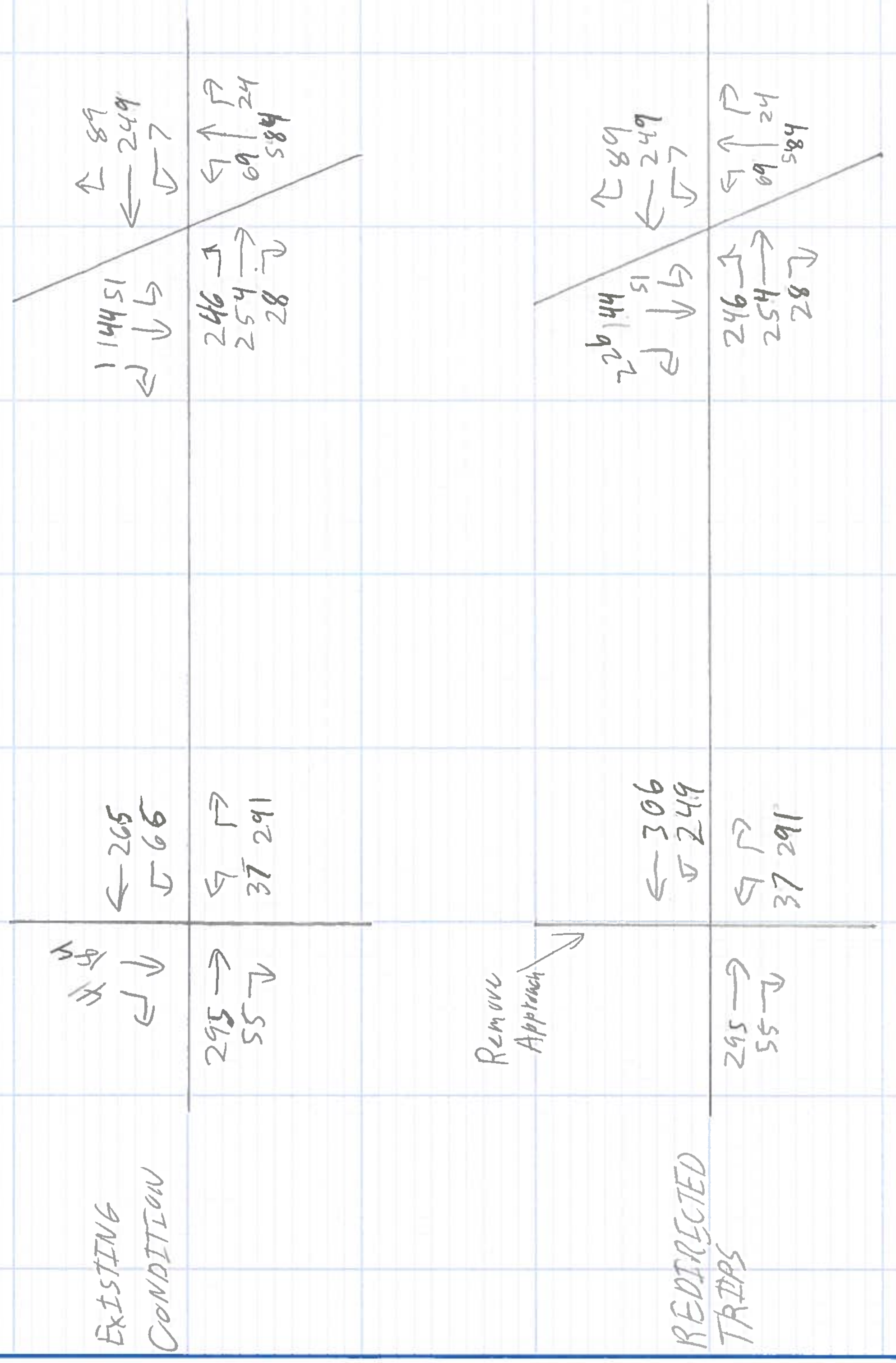
Phone 509-893-2617 • Fax 509-926-0227

NAME OF PROJECT			SHEET NUMBER 2 OF 6
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

AM PEAK
Year 2040
W-PROJ



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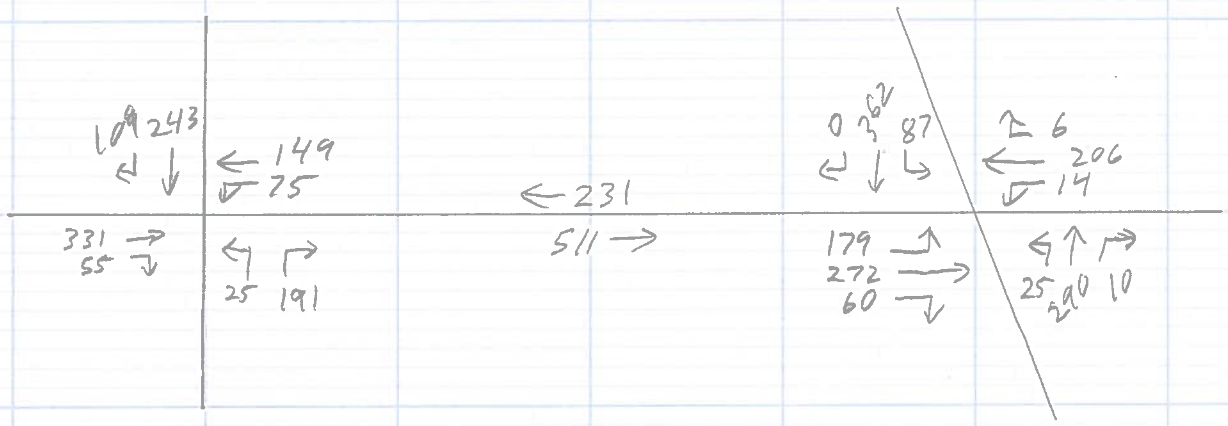
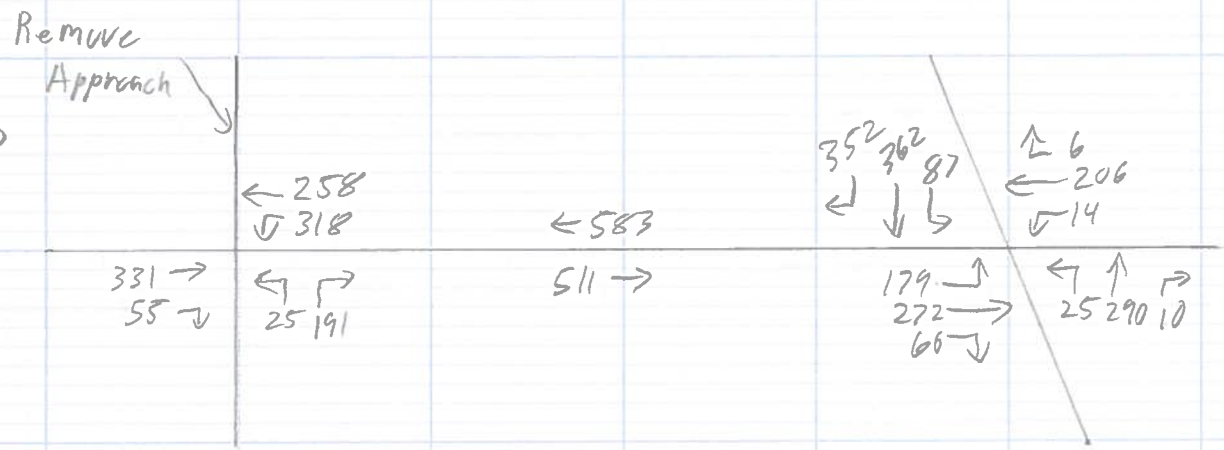
NAME OF PROJECT			SHEET NUMBER
Painted Hills			3 OF 6
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE
BING		1166	12-9-15

PM.PEAK
Year 2020
w/ Project

EXISTING
CONDITION

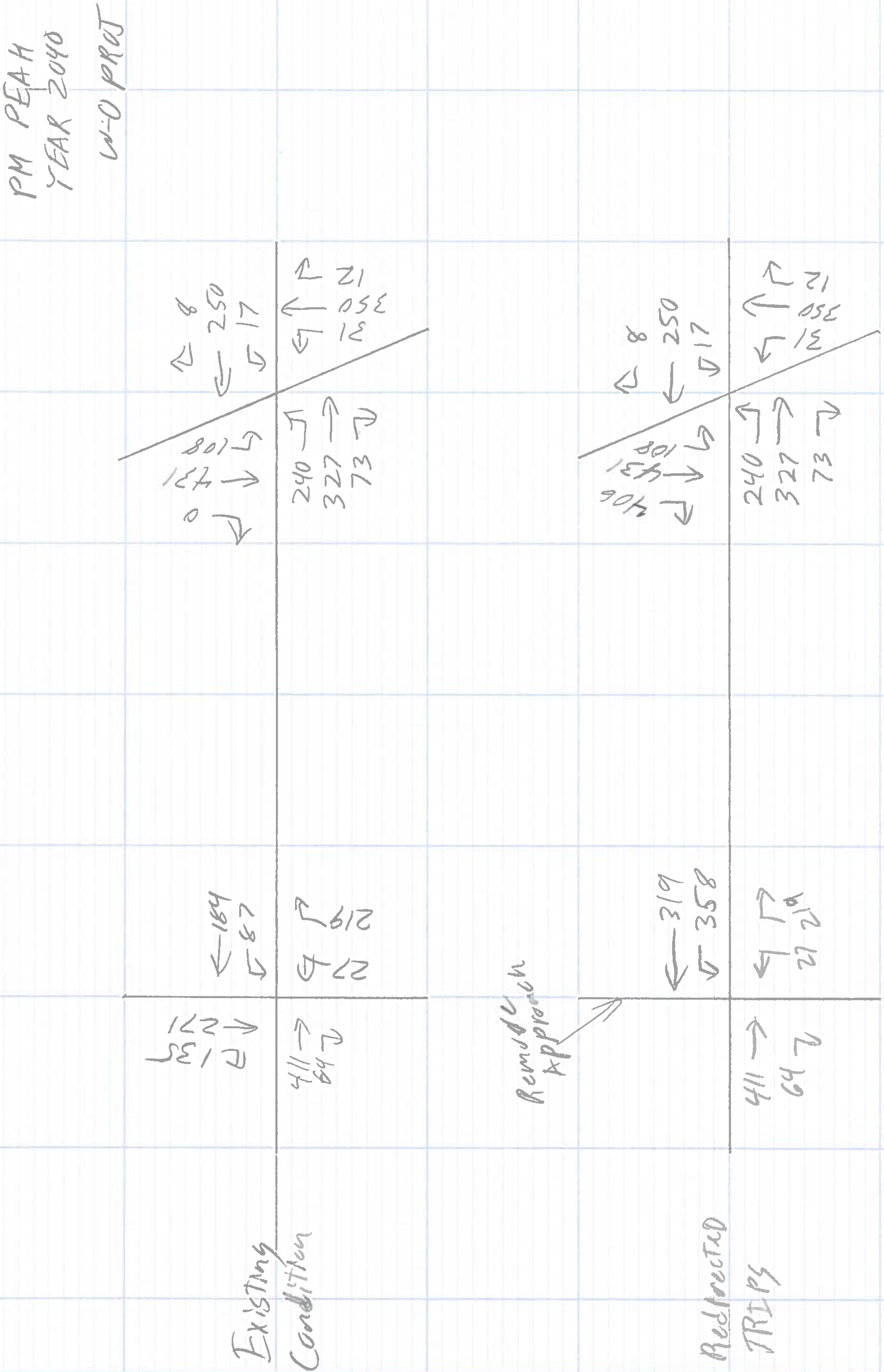


REDIRECTED
TRIPS



WCE Whipple Consulting Engineers, Inc.
2528 N. Sullivan Rd. • Spokane Valley, WA 99216
Phone 509-893-2617 • Fax 509-926-0227

NAME OF PROJECT	Painted HILLS
SHEET NUMBER	4 OF 6
COMPUTED BY	BNG
CHECKED BY	
JOB NUMBER	1166
DATE	12-9-15



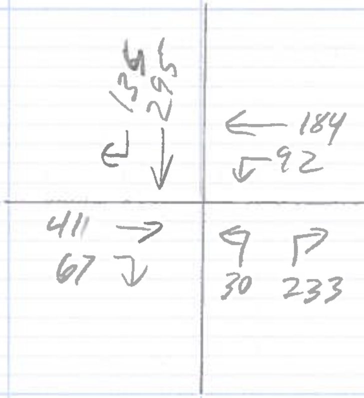
Whipple Consulting Engineers, Inc.

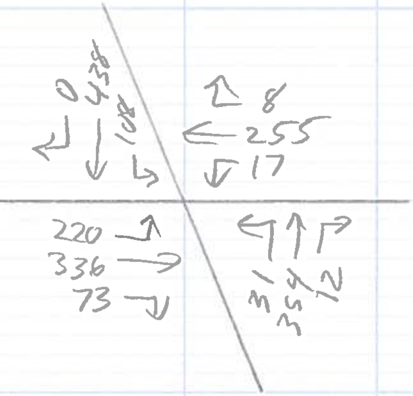
2528 N. Sullivan Rd. • Spokane Valley, WA 99216
Phone 509-893-2617 • Fax 509-926-0227

NAME OF PROJECT			SHEET NUMBER
			5 OF 6
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

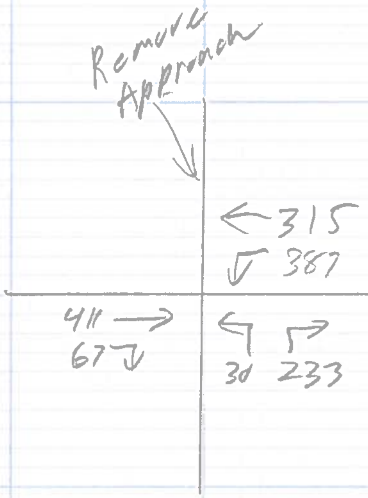
PM PEAK
Year 2040
W-PROJ

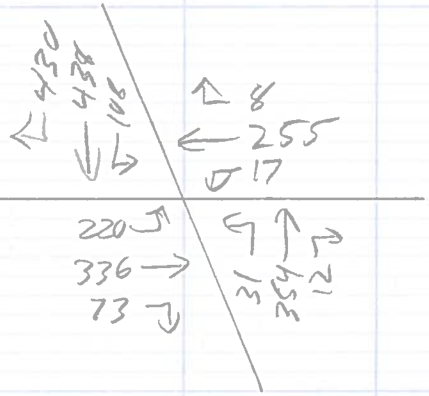
Existing
Condition





REDIRECTED
TRIPS





WCE Whipple Consulting Engineers, Inc.

2528 N. Sullivan Rd. • Spokane Valley, WA 99216
Phone 509-893-2617 • Fax 509-926-0227

NAME OF PROJECT

COMPUTED BY

CHECKED BY

JOB NUMBER

SHEET NUMBER 6 OF 6

DATE

LEFT TURN WSDOT ANALYSIS

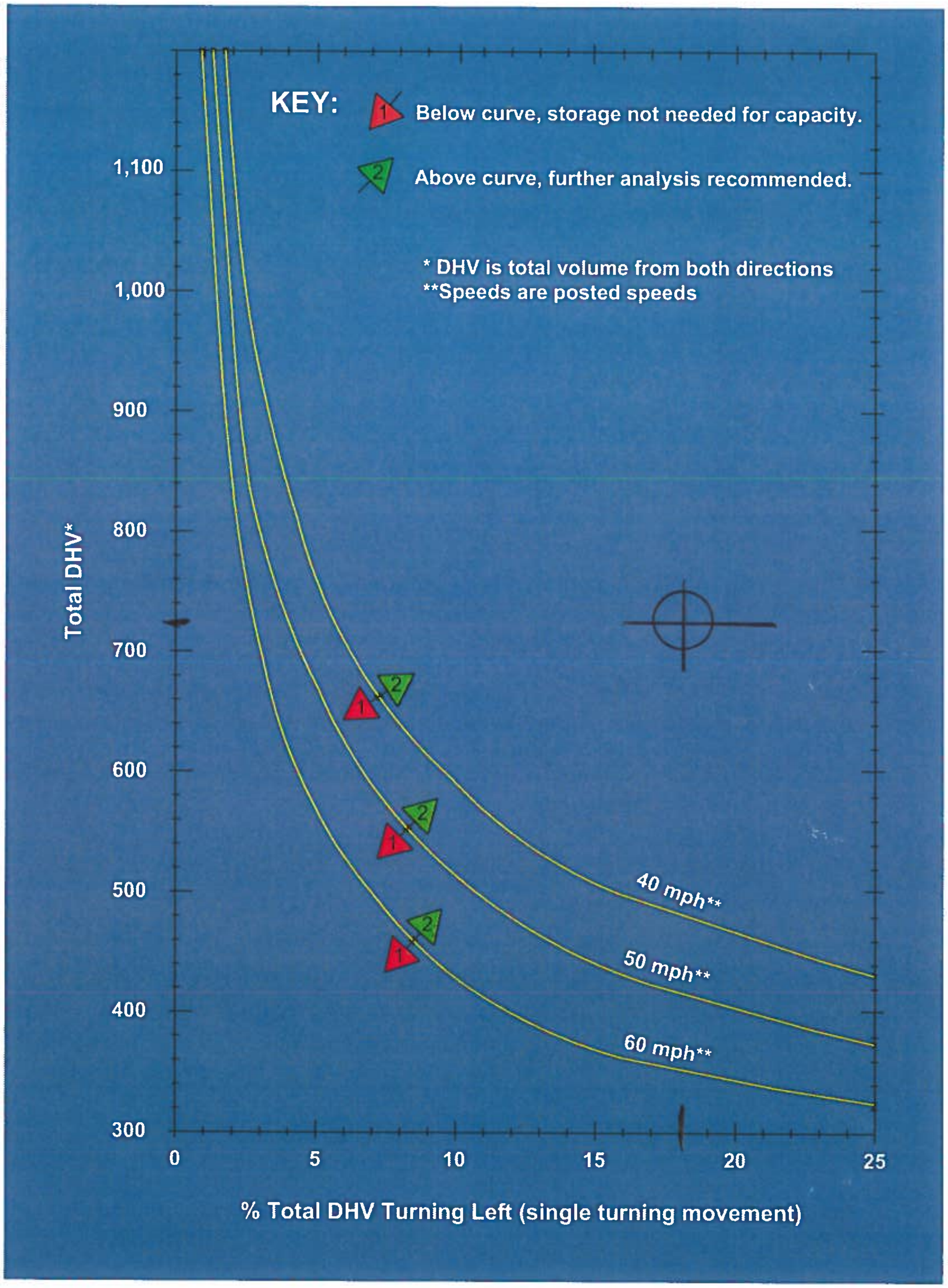
PROJECT ACCESS DRIVEWAYS

DISHMAN-MICA & SUNDOWN DR.

SBL = 131
DHV = 722
% ttl DHV turning Left

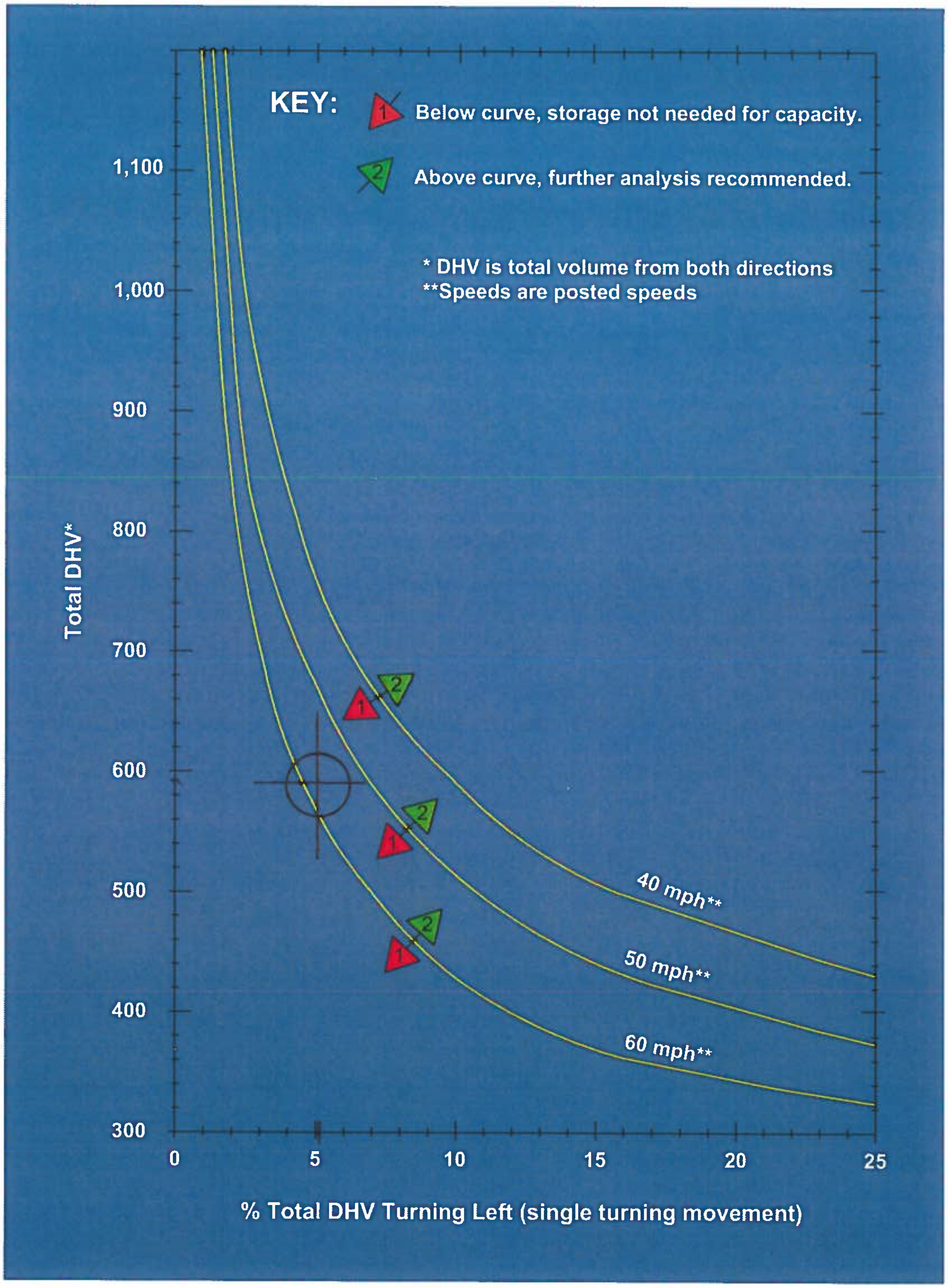
$\frac{131}{722} = 0.18$

≈ 18.1



Left-Turn Storage Guidelines: Two-Lane, Unsignalized
Exhibit 1310-7a

DISHMAN-MICA & N Comm Access

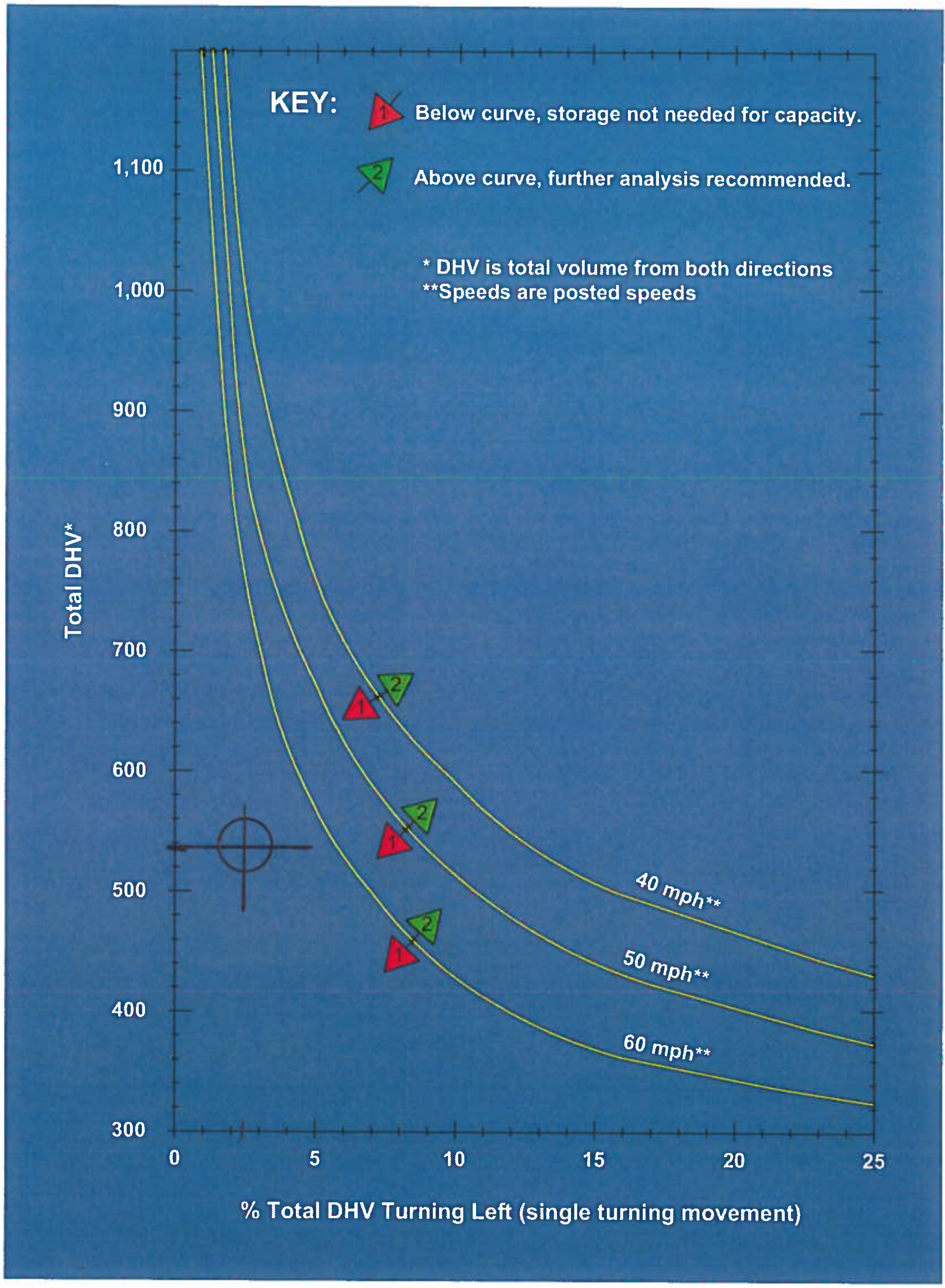


SBL = 30
DHV = 588
% DHV TURNING
$\frac{30}{588}$ = 0,051
≈ 5.1%

Left-Turn Storage Guidelines: Two-Lane, Unsignalized

Exhibit 1310-7a

DISHMAN-MICA & S COMM ACCESS

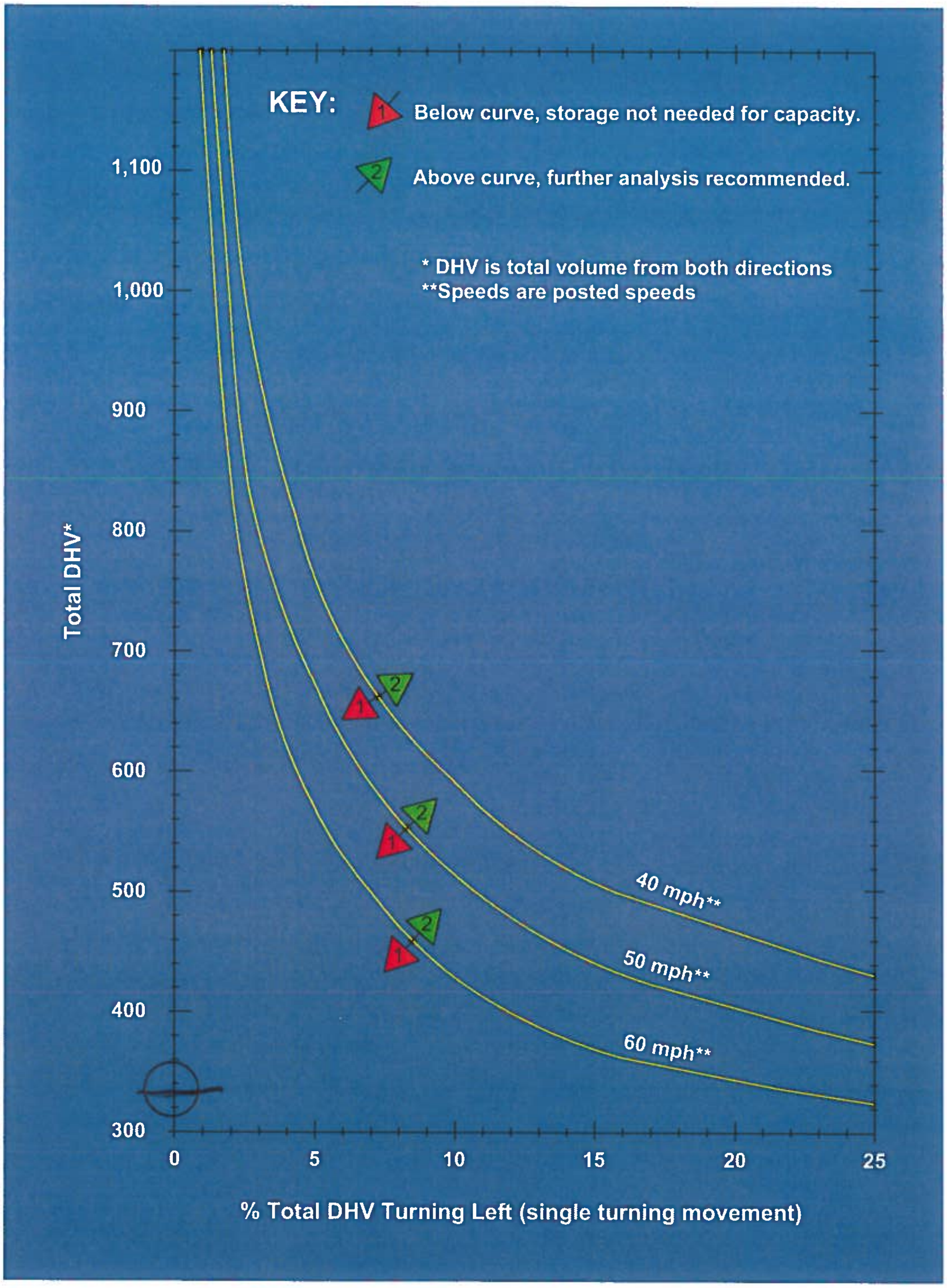


SBL = 12
DHV = 537
% DHV TURNL
$\frac{12}{537} = 0,022$
≈ 2,23

Left-Turn Storage Guidelines: Two-Lane, Unsignalized
Exhibit 1310-7a

MADISON RD & PAINTED HILLS AVE

NBL = 0
DHV = 336
% DHV turnin
$\frac{0}{336} = 0$

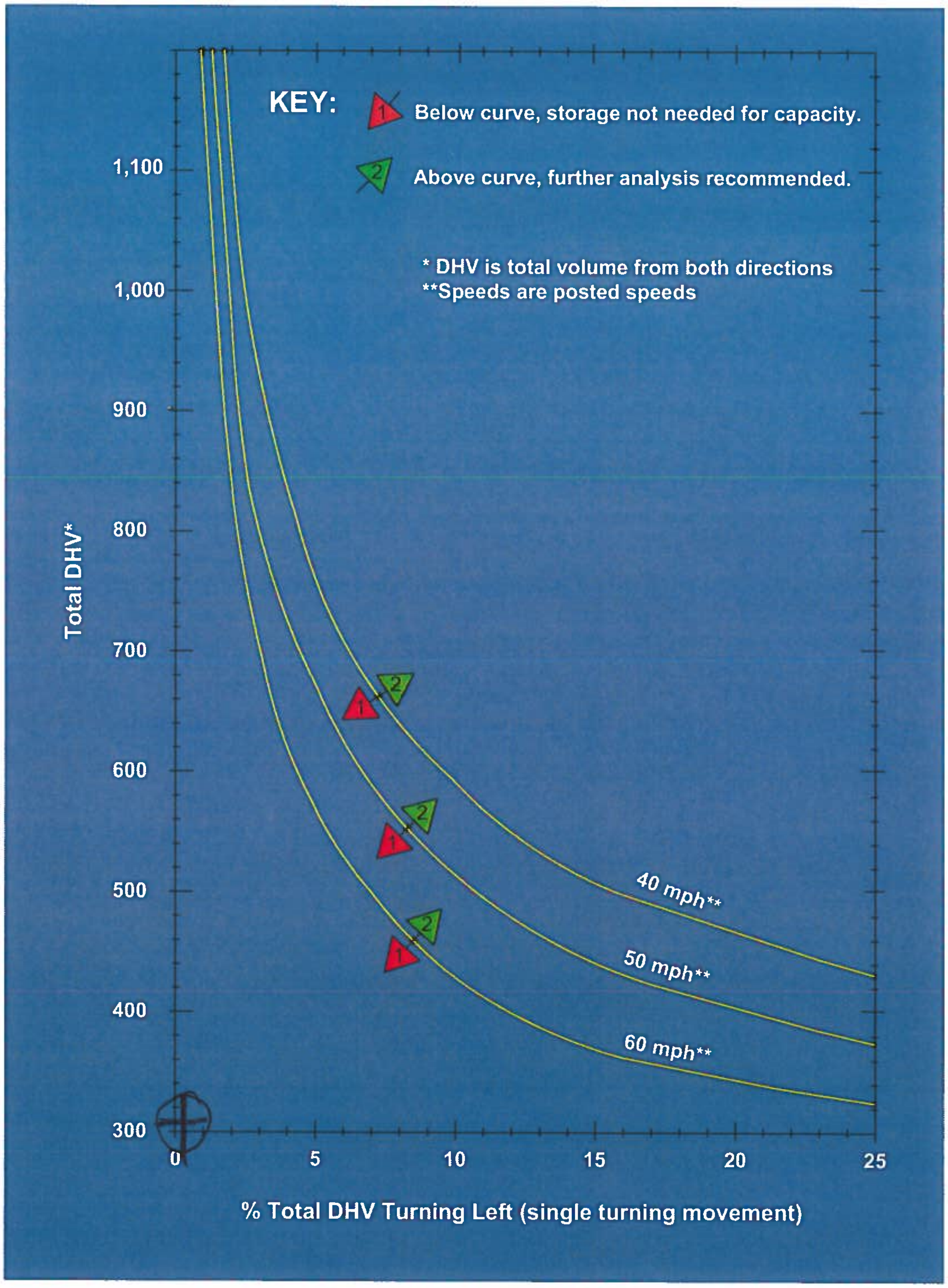


Left-Turn Storage Guidelines: Two-Lane, Unsignalized

Exhibit 1310-7a

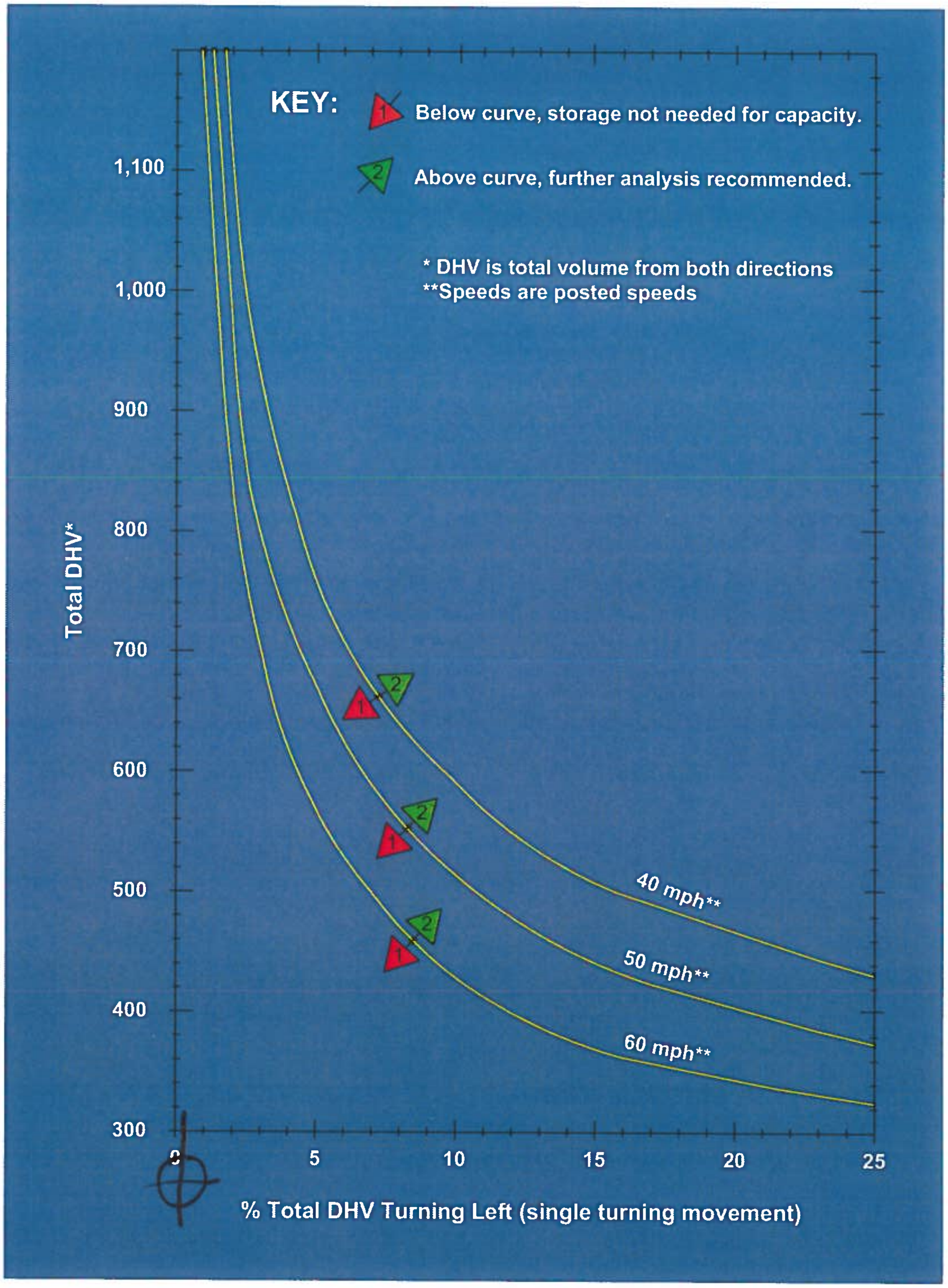
MADISON RD & 41ST AVE

NBL = 3
DHV = 302
% DHVTURNI
$\frac{3}{302}$ = 0,009
≈ 0,99%



Left-Turn Storage Guidelines: Two-Lane, Unsignalized
Exhibit 1310-7a

MADISON RD & 43rd AVE



NBL = 3

DHV = 254

% DHV turnin

$\frac{3}{254} = 0.0118$

≈ 1.18%

Left-Turn Storage Guidelines: Two-Lane, Unsignalized

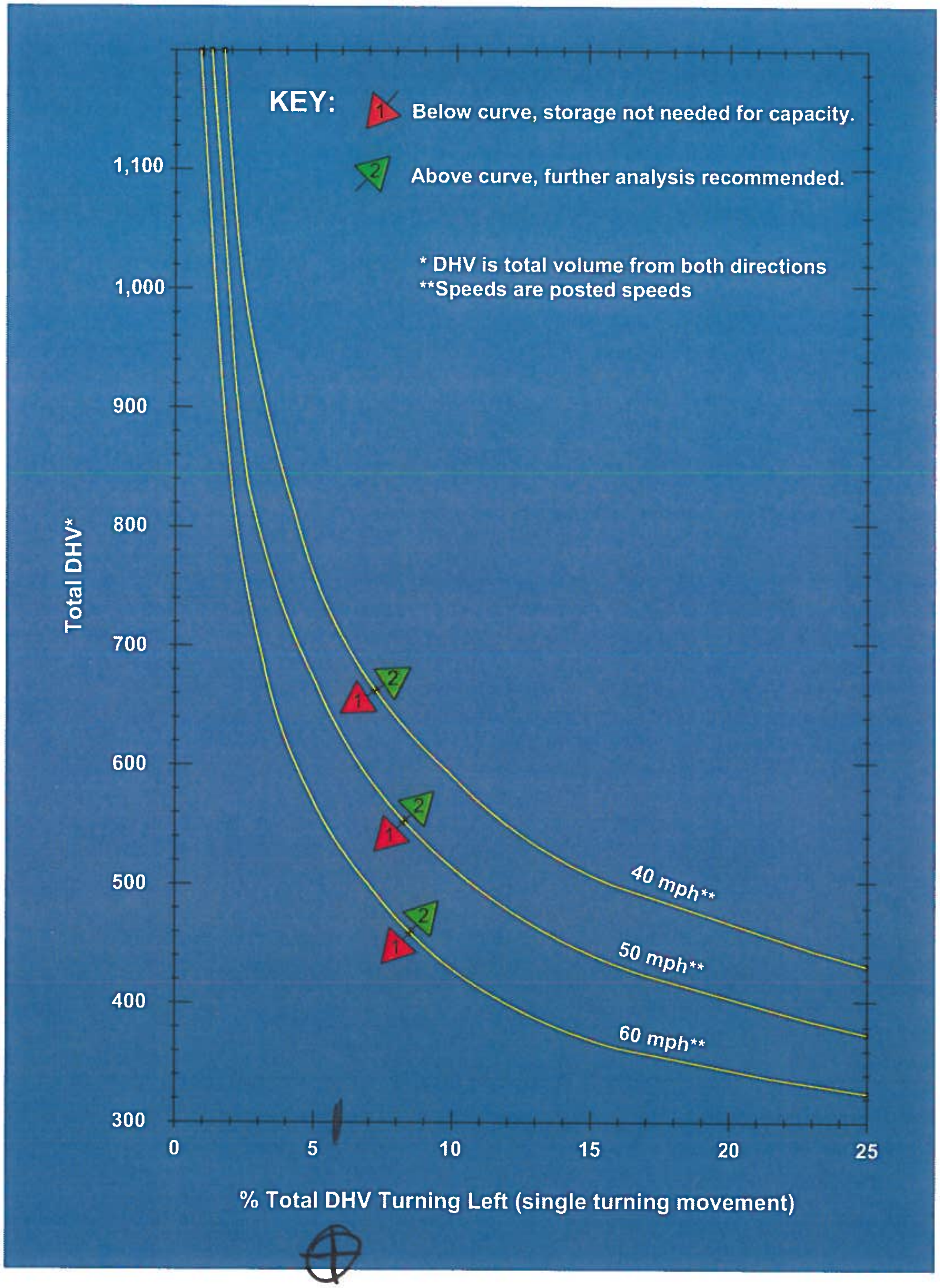
Exhibit 1310-7a

MADISON RD & 44th AVE

NBL = 13
DHV = 223
% DHV TURNIN

$\frac{13}{223} = 0,058$

≈ 5,8%



Left-Turn Storage Guidelines: Two-Lane, Unsignalized
Exhibit 1310-7a

WOODLAWN DRIVE
TUBE COUNTS

MIKE McCLUSKEY - WEE COUNT LLC
1110 E. EXCELSIOR RD.
SP0KANE WA. 99224
(509) 979-3331

WOODLAWN DR. :
S. OF 32TH :
35 MPH :

Site: SPOKANE VALLEY
3/11/2015
Wednesday

Daily Volume

Interval Start	SB		NB		Combined	
12:00 AM	1	1	0	1	1	2
12:15 AM	0		0		0	
12:30 AM	0		1		1	
12:45 AM	0		0		0	
1:00 AM	0	0	0	0	0	0
1:15 AM	0		0		0	
1:30 AM	0		0		0	
1:45 AM	0		0		0	
2:00 AM	0	1	1	2	1	3
2:15 AM	0		1		1	
2:30 AM	1		0		1	
2:45 AM	0		0		0	
3:00 AM	0	1	0	0	0	1
3:15 AM	1		0		1	
3:30 AM	0		0		0	
3:45 AM	0		0		0	
4:00 AM	0	0	1	6	1	6
4:15 AM	0		1		1	
4:30 AM	0		1		1	
4:45 AM	0		3		3	
5:00 AM	2	5	2	13	4	18
5:15 AM	1		2		3	
5:30 AM	1		4		5	
5:45 AM	1		5		6	
6:00 AM	0	8	8	43	8	51
6:15 AM	1		7		8	
6:30 AM	1		13		14	
6:45 AM	6		15		21	
7:00 AM	9	83	21	113	30	196
7:15 AM	18	115	26	67	44	
7:30 AM	36		28		64	
7:45 AM	20		38		58	
8:00 AM	13	25	17	56	30	81
8:15 AM	4		16		20	
8:30 AM	5		11		16	
8:45 AM	3		12		15	
9:00 AM	4	19	10	43	14	62
9:15 AM	9		12		21	
9:30 AM	4		12		16	
9:45 AM	2		9		11	
10:00 AM	3	19	13	37	16	56
10:15 AM	5		8		13	
10:30 AM	3		8		11	
10:45 AM	8		8		16	
11:00 AM	4	35	8	30	12	65
11:15 AM	10		9		19	
11:30 AM	8		9		17	
11:45 AM	13		4		17	

Interval Start	SB		NB		Combined	
12:00 PM	17	38	12	45	29	83
12:15 PM	10		5		15	
12:30 PM	6		15		21	
12:45 PM	5		13		18	
1:00 PM	5	39	8	28	13	67
1:15 PM	14		7		21	
1:30 PM	6		6		12	
1:45 PM	14		7		21	
2:00 PM	13	91	7	63	20	154
2:15 PM	41		11		52	
2:30 PM	26		16		42	
2:45 PM	11		29		40	
3:00 PM	20	56	11	42	31	98
3:15 PM	16		13		29	
3:30 PM	11		12		23	
3:45 PM	9		6		15	
4:00 PM	19	67	10	45	29	112
4:15 PM	12		9		21	
4:30 PM	18		12		30	
4:45 PM	18		14		32	
5:00 PM	32	109	14	52	46	161
5:15 PM	26		12		38	
5:30 PM	19		15		34	
5:45 PM	32		11		43	
6:00 PM	17	66	11	49	28	115
6:15 PM	13		14		27	
6:30 PM	17		12		29	
6:45 PM	19		12		31	
7:00 PM	7	41	6	26	13	67
7:15 PM	6		5		11	
7:30 PM	11		9		20	
7:45 PM	17		6		23	
8:00 PM	10	35	0	12	10	47
8:15 PM	11		4		15	
8:30 PM	6		5		11	
8:45 PM	8		3		11	
9:00 PM	9	24	4	8	13	32
9:15 PM	9		2		11	
9:30 PM	4		1		5	
9:45 PM	2		1		3	
10:00 PM	1	8	0	5	1	13
10:15 PM	4		3		7	
10:30 PM	3		1		4	
10:45 PM	0		1		1	
11:00 PM	2	5	0	3	2	8
11:15 PM	1		1		2	
11:30 PM	1		1		2	
11:45 PM	1		1		2	

7AM

SB	NB
83	46

Volume Totals

	SB	NB	Combined
12:00 AM - 12:00 PM	197 (36.4%)	344 (63.6%)	541
12:00 PM - 12:00 AM	579 (60.5%)	378 (39.5%)	957
24 Hours	776 (51.8%)	722 (48.2%)	1498

Peak Hours

	SB	NB	Combined
12:00 AM - 12:00 PM	7:15 AM	7:00 AM	7:00 AM
Volume	87	113	196
Factor	0.60	0.74	0.77
12:00 PM - 12:00 AM	5:00 PM	2:30 PM	2:15 PM
Volume	109	69	165
Factor	0.85	0.59	0.79

MIKE McCLUSKEY - WEE COUNT LLC
1110 E. EXCELSIOR RD.
SPOKANE WA. 99224
(509) 979-3331

WOODLAWN DR. :
N. OF 40TH :

Site: SPOKANE VALLEY
3/11/2015
Wednesday

Daily Volume

Interval Start	SB		NB		Combined		Interval Start	SB		NB		Combined	
12:00 AM	0	0	0	0	0	0	12:00 PM	9	23	7	21	16	44
12:15 AM	0		0		0		12:15 PM	7		5		12	
12:30 AM	0		0		0		12:30 PM	4		5		9	
12:45 AM	0		0		0		12:45 PM	3		4		7	
1:00 AM	0	0	0	0	0	0	1:00 PM	5	21	9	18	14	39
1:15 AM	0		0		0		1:15 PM	5		3		8	
1:30 AM	0		0		0		1:30 PM	2		2		4	
1:45 AM	0		0		0		1:45 PM	9		4		13	
2:00 AM	0	0	0	0	0	0	2:00 PM	5	66	4	57	9	123
2:15 AM	0		0		0		2:15 PM	27		4		31	
2:30 AM	0		0		0		2:30 PM	29		17		46	
2:45 AM	0		0		0		2:45 PM	5		32		37	
3:00 AM	0	0	0	0	0	0	3:00 PM	17	29	9	41	26	70
3:15 AM	0		0		0		3:15 PM	5		12		17	
3:30 AM	0		0		0		3:30 PM	1		13		14	
3:45 AM	0		0		0		3:45 PM	6		7		13	
4:00 AM	0	0	0	0	0	0	4:00 PM	11	40	7	40	18	80
4:15 AM	0		0		0		4:15 PM	6		8		14	
4:30 AM	0		0		0		4:30 PM	15		14		29	
4:45 AM	0		0		0		4:45 PM	8		11		19	
5:00 AM	0	2	0	1	0	3	5:00 PM	18	41	15	32	33	73
5:15 AM	1		0		1		5:15 PM	10		8		18	
5:30 AM	1		0		1		5:30 PM	7		7		14	
5:45 AM	0		1		1		5:45 PM	6		2		8	
6:00 AM	1	7	2	3	3	10	6:00 PM	5	17	6	13	11	30
6:15 AM	2		1		3		6:15 PM	2		3		5	
6:30 AM	1		0		1		6:30 PM	5		2		7	
6:45 AM	3		0		3		6:45 PM	5		2		7	
7:00 AM	8	115	7	67	15	182	7:00 PM	1	14	6	20	7	34
7:15 AM	24		6		30		7:15 PM	5		3		8	
7:30 AM	49		24		73		7:30 PM	2		8		10	
7:45 AM	34		30		64		7:45 PM	6		3		9	
8:00 AM	16	50	12	36	28	86	8:00 PM	1	6	0	5	1	11
8:15 AM	2		8		10		8:15 PM	3		1		4	
8:30 AM	12		6		18		8:30 PM	0		0		0	
8:45 AM	20		10		30		8:45 PM	2		4		6	
9:00 AM	12	21	7	21	19	42	9:00 PM	0	4	5	9	5	13
9:15 AM	4		4		8		9:15 PM	3		1		4	
9:30 AM	2		3		5		9:30 PM	1		2		3	
9:45 AM	3		7		10		9:45 PM	0		1		1	
10:00 AM	3	8	5	18	8	26	10:00 PM	0	1	0	3	0	4
10:15 AM	1		2		3		10:15 PM	1		1		2	
10:30 AM	1		7		8		10:30 PM	0		1		1	
10:45 AM	3		4		7		10:45 PM	0		1		1	
11:00 AM	0	15	2	15	2	30	11:00 PM	0	1	0	1	0	2
11:15 AM	4		4		8		11:15 PM	0		0		0	
11:30 AM	6		5		11		11:30 PM	1		0		1	
11:45 AM	5		4		9		11:45 PM	0		1		1	

Volume Totals

	SB	NB	Combined
12:00 AM - 12:00 PM	218 (57.5%)	161 (42.5%)	379
12:00 PM - 12:00 AM	263 (50.3%)	260 (49.7%)	523
24 Hours	481 (53.3%)	421 (46.7%)	902

Peak Hours

	SB	NB	Combined
12:00 AM - 12:00 PM	7:15 AM	7:30 AM	7:15 AM
Volume	123	74	195
Factor	0.63	0.62	0.67
12:00 PM - 12:00 AM	2:15 PM	2:30 PM	2:15 PM
Volume	78	70	140
Factor	0.67	0.55	0.76

MIKE McCLUSKEY - WEE COUNT LLC
1110 E. EXCELSIOR RD.
SPOKANE WA. 99224
(509) 979-3331

32TH :
W. OF WOODLAWN :
20 MPH :

Site: SPOKANE VALLEY
3/11/2015
Wednesday

Daily Volume

Interval Start	WB		EB		Combined	
12:00 AM	4	16	3	20	7	36
12:15 AM	6		3		9	
12:30 AM	3		8		11	
12:45 AM	3		6		9	
1:00 AM	1	9	1	8	2	17
1:15 AM	2		4		6	
1:30 AM	5		1		6	
1:45 AM	1		2		3	
2:00 AM	2	4	3	11	5	15
2:15 AM	1		2		3	
2:30 AM	1		4		5	
2:45 AM	0		2		2	
3:00 AM	3	7	2	8	5	15
3:15 AM	1		1		2	
3:30 AM	3		2		5	
3:45 AM	0		3		3	
4:00 AM	1	22	1	19	2	41
4:15 AM	5		4		9	
4:30 AM	10		7		17	
4:45 AM	6		7		13	
5:00 AM	12	54	12	68	24	122
5:15 AM	12		13		25	
5:30 AM	14		24		38	
5:45 AM	16		19		35	
6:00 AM	31	165	24	131	55	296
6:15 AM	36		36		72	
6:30 AM	41		38		79	
6:45 AM	57		33		90	
7:00 AM	99	464	54	342	153	806
7:15 AM	151		102		253	
7:30 AM	142		131		273	
7:45 AM	72		55		127	
8:00 AM	53	247	49	213	102	460
8:15 AM	50		41		91	
8:30 AM	75		46		121	
8:45 AM	69		77		146	
9:00 AM	60	209	83	246	143	455
9:15 AM	49		60		109	
9:30 AM	41		48		89	
9:45 AM	59		55		114	
10:00 AM	36	161	48	188	84	349
10:15 AM	42		43		85	
10:30 AM	44		39		83	
10:45 AM	39		58		97	
11:00 AM	51	232	61	255	112	487
11:15 AM	76		55		131	
11:30 AM	57		67		124	
11:45 AM	48		72		120	

Interval Start	WB		EB		Combined	
12:00 PM	45	222	59	232	104	454
12:15 PM	73		55		128	
12:30 PM	52		56		108	
12:45 PM	52		62		114	
1:00 PM	38	213	60	245	98	458
1:15 PM	59		57		116	
1:30 PM	48		58		106	
1:45 PM	68		70		138	
2:00 PM	83	287	73	476	156	763
2:15 PM	66		199		265	
2:30 PM	65		116		181	
2:45 PM	73		88		161	
3:00 PM	99	326	82	387	181	713
3:15 PM	70		114		184	
3:30 PM	70		103		173	
3:45 PM	87		88		175	
4:00 PM	81	343	100	413	181	756
4:15 PM	81		86		167	
4:30 PM	83		110		193	
4:45 PM	98		117		215	
5:00 PM	91	468	123	498	214	966
5:15 PM	119		135		254	
5:30 PM	140		116		256	
5:45 PM	118		124		242	
6:00 PM	77	308	92	326	169	634
6:15 PM	106		75		181	
6:30 PM	65		91		156	
6:45 PM	60		68		128	
7:00 PM	65	211	57	353	122	564
7:15 PM	55		168		223	
7:30 PM	35		69		104	
7:45 PM	56		59		115	
8:00 PM	38	189	38	189	76	378
8:15 PM	51		49		100	
8:30 PM	45		50		95	
8:45 PM	55		52		107	
9:00 PM	33	112	38	99	71	211
9:15 PM	33		26		59	
9:30 PM	28		12		40	
9:45 PM	18		23		41	
10:00 PM	20	42	21	55	41	97
10:15 PM	10		16		26	
10:30 PM	5		15		20	
10:45 PM	7		3		10	
11:00 PM	10	40	13	34	23	74
11:15 PM	16		12		28	
11:30 PM	6		3		9	
11:45 PM	8		6		14	

Volume Totals

	WB	EB	Combined
12:00 AM - 12:00 PM	1590 (51.3%)	1509 (48.7%)	3099
12:00 PM - 12:00 AM	2761 (45.5%)	3307 (54.5%)	6068
24 Hours	4351 (47.5%)	4816 (52.5%)	9167

Peak Hours

	WB	EB	Combined
12:00 AM - 12:00 PM	7:00 AM	7:00 AM	7:00 AM
Volume	464	342	806
Factor	0.77	0.65	0.74
12:00 PM - 12:00 AM	5:00 PM	5:00 PM	5:00 PM
Volume	468	498	966
Factor	0.84	0.92	0.94

IKE McCLUSKEY - WEE COUNT LLC
1110 E. EXCELSIOR RD.
SPOKANE WA. 99224
(509) 979-3331

PINES :
N. OF 38TH :
20 MPH :

Site: SPOKANE VALLEY
3/18/2015
Wednesday

Daily Volume

Interval Start	SB		NB		Combined	
12:00 AM	4	7	4	16	8	23
12:15 AM	2		12		14	
12:30 AM	1		0		1	
12:45 AM	0		0		0	
1:00 AM	0	0	0	1	0	1
1:15 AM	0		0		0	
1:30 AM	0		1		1	
1:45 AM	0		0		0	
2:00 AM	0	5	1	1	1	6
2:15 AM	0		0		0	
2:30 AM	4		0		4	
2:45 AM	1		0		1	
3:00 AM	0	0	1	1	1	1
3:15 AM	0		0		0	
3:30 AM	0		0		0	
3:45 AM	0		0		0	
4:00 AM	0	1	0	2	0	3
4:15 AM	0		0		0	
4:30 AM	1		2		3	
4:45 AM	0		0		0	
5:00 AM	0	1	0	16	0	17
5:15 AM	0		5		5	
5:30 AM	0		5		5	
5:45 AM	1		6		7	
6:00 AM	4	21	3	31	7	52
6:15 AM	5		9		14	
6:30 AM	8		10		18	
6:45 AM	4		9		13	
7:00 AM	20	103	41	207	61	310
7:15 AM	13		46		59	
7:30 AM	34		64		98	
7:45 AM	36		56		92	
8:00 AM	24	67	45	124	69	191
8:15 AM	12		19		31	
8:30 AM	15		26		41	
8:45 AM	16		34		50	
9:00 AM	23	49	27	78	50	127
9:15 AM	4		18		22	
9:30 AM	12		18		30	
9:45 AM	10		15		25	
10:00 AM	9	39	9	48	18	87
10:15 AM	14		10		24	
10:30 AM	7		16		23	
10:45 AM	9		13		22	
11:00 AM	12	69	18	76	30	145
11:15 AM	18		21		39	
11:30 AM	15		21		36	
11:45 AM	24		16		40	

— 318

Interval Start	SB		NB		Combined	
12:00 PM	19	69	11	52	30	121
12:15 PM	16		14		30	
12:30 PM	16		17		33	
12:45 PM	18		10		28	
1:00 PM	15	60	24	71	39	131
1:15 PM	15		16		31	
1:30 PM	14		18		32	
1:45 PM	16		13		29	
2:00 PM	15	105	13	97	28	202
2:15 PM	29		16		45	
2:30 PM	38		24		62	
2:45 PM	23		44		67	
3:00 PM	29	129	30	88	59	217
3:15 PM	36		19		55	
3:30 PM	34		12		46	
3:45 PM	30		27		57	
4:00 PM	23	112	24	86	47	198
4:15 PM	26		29		55	
4:30 PM	30		19		49	
4:45 PM	33		14		47	
5:00 PM	40	109	31	83	71	192
5:15 PM	23		20		43	
5:30 PM	22		13		35	
5:45 PM	24		19		43	
6:00 PM	18	80	16	80	34	160
6:15 PM	24		29		53	
6:30 PM	19		20		39	
6:45 PM	19		15		34	
7:00 PM	13	48	18	32	31	80
7:15 PM	14		5		19	
7:30 PM	11		2		13	
7:45 PM	10		7		17	
8:00 PM	16	47	5	19	21	66
8:15 PM	10		5		15	
8:30 PM	10		4		14	
8:45 PM	11		5		16	
9:00 PM	11	33	5	15	16	48
9:15 PM	2		3		5	
9:30 PM	7		3		10	
9:45 PM	13		4		17	
10:00 PM	7	16	3	7	10	23
10:15 PM	5		1		6	
10:30 PM	3		2		5	
10:45 PM	1		1		2	
11:00 PM	5	8	1	4	6	12
11:15 PM	0		2		2	
11:30 PM	2		0		2	
11:45 PM	1		1		2	

Volume Totals

	SB	NB	Combined
12:00 AM - 12:00 PM	362 (37.6%)	601 (62.4%)	963
12:00 PM - 12:00 AM	816 (56.3%)	634 (43.7%)	1450
24 Hours	1178 (48.8%)	1235 (51.2%)	2413

318
129
447. x .6 = 269 MS
.4 = 179 ES

Peak Hours

	SB	NB	Combined
12:00 AM - 12:00 PM	7:15 AM	7:15 AM	7:15 AM
Volume	107	211	318
Factor	0.74	0.82	0.81
12:00 PM - 12:00 AM	3:00 PM	2:30 PM	2:30 PM
Volume	129	117	243
Factor	0.90	0.66	0.91

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1110 E. EXCELSIOR RD.
SPOKANE WA. 99224
(509) 979-3331

PINES :
N. OF 38TH :
20 MPH :

Site: SPOKANE VALLEY
3/19/2015
Thursday

Daily Volume

Interval Start	SB		NB		Combined	
12:00 AM	0	4	0	1	0	5
12:15 AM	1		0		1	
12:30 AM	1		0		1	
12:45 AM	2		1		3	
1:00 AM	1	1	0	1	1	2
1:15 AM	0		0		0	
1:30 AM	0		1		1	
1:45 AM	0		0		0	
2:00 AM	0	3	0	2	0	5
2:15 AM	1		2		3	
2:30 AM	2		0		2	
2:45 AM	0		0		0	
3:00 AM	2	2	1	2	3	4
3:15 AM	0		0		0	
3:30 AM	0		1		1	
3:45 AM	0		0		0	
4:00 AM	0	2	0	1	0	3
4:15 AM	0		1		1	
4:30 AM	0		0		0	
4:45 AM	2		0		2	
5:00 AM	0	2	4	17	4	19
5:15 AM	0		1		1	
5:30 AM	0		7		7	
5:45 AM	2		5		7	
6:00 AM	2	12	7	50	9	62
6:15 AM	5		14		19	
6:30 AM	4		11		15	
6:45 AM	1		18		19	
7:00 AM	9	41	9	81	18	122
7:15 AM	9		21		30	
7:30 AM	10		25		35	
7:45 AM	13		26		39	
8:00 AM	9	86	32	133	41	219
8:15 AM	10		17		27	
8:30 AM	33		31		64	
8:45 AM	34		53		87	
9:00 AM	26	66	31	110	57	176
9:15 AM	12		16		28	
9:30 AM	10		35		45	
9:45 AM	18		28		46	
10:00 AM	16	57	26	75	42	132
10:15 AM	9		13		22	
10:30 AM	17		22		39	
10:45 AM	15		14		29	
11:00 AM	13	54	18	66	31	120
11:15 AM	18		18		36	
11:30 AM	10		15		25	
11:45 AM	13		15		28	

Interval Start	SB		NB		Combined	
12:00 PM	23	88	16	74	39	162
12:15 PM	24		19		43	
12:30 PM	19		19		38	
12:45 PM	22		20		42	
1:00 PM	13	58	20	67	33	125
1:15 PM	15		15		30	
1:30 PM	13		20		33	
1:45 PM	17		12		29	
2:00 PM	13	120	12	98	25	218
2:15 PM	30		14		44	
2:30 PM	50		14		64	
2:45 PM	27		58		85	282
3:00 PM	34	145	21	77	55	222
3:15 PM	49		29		78	
3:30 PM	34		12		46	
3:45 PM	28		15		43	
4:00 PM	35	127	18	128	53	255
4:15 PM	33		36		69	
4:30 PM	33		46		79	
4:45 PM	26		28		54	
5:00 PM	40	156	24	134	64	290
5:15 PM	43		44		87	
5:30 PM	37		27		64	290
5:45 PM	36		39		75	
6:00 PM	39	153	23	81	62	234
6:15 PM	31		32		63	
6:30 PM	41		14		55	
6:45 PM	42		12		54	
7:00 PM	17	70	32	62	49	132
7:15 PM	18		7		25	
7:30 PM	14		11		25	
7:45 PM	21		12		33	
8:00 PM	19	49	49	83	68	132
8:15 PM	20		22		42	
8:30 PM	5		9		14	
8:45 PM	5		3		8	
9:00 PM	11	26	3	10	14	36
9:15 PM	4		4		8	
9:30 PM	4		1		5	
9:45 PM	7		2		9	
10:00 PM	5	15	2	7	7	22
10:15 PM	3		1		4	
10:30 PM	5		2		7	
10:45 PM	2		2		4	
11:00 PM	1	5	2	4	3	9
11:15 PM	1		0		1	
11:30 PM	2		2		4	
11:45 PM	1		0		1	

Volume Totals

	SB	NB	Combined
12:00 AM - 12:00 PM	330 (38.0%)	539 (62.0%)	869
12:00 PM - 12:00 AM	1012 (55.1%)	825 (44.9%)	1837
24 Hours	1342 (49.6%)	1364 (50.4%)	2706

282
65
347 x .6 = 209 MS
x .4 = 139 ES

Peak Hours

	SB	NB	Combined
12:00 AM - 12:00 PM	8:30 AM	8:45 AM	8:30 AM
Volume	105	135	236
Factor	0.77	0.64	0.68
12:00 PM - 12:00 AM	2:30 PM	4:30 PM	5:00 PM
Volume	160	142	290
Factor	0.80	0.77	0.83

290
60
350 x .6 = 210 MS
x .4 = 140 ES

IIKE McCLUSKEY - WEE COUNT LLC
1110 E. EXCELSIOR RD.
SPOKANE WA. 99224
(509) 979-3331

40TH :
W. OF WOODLAWN :
25 MPH :

Site: SPOKANE VALLEY
3/12/2015
Thursday

Daily Volume

Interval Start	WB		EB		Combined	
12:00 AM	0	0	0	0	0	0
12:15 AM	0		0		0	
12:30 AM	0		0		0	
12:45 AM	0		0		0	
1:00 AM	0	0	0	0	0	0
1:15 AM	0		0		0	
1:30 AM	0		0		0	
1:45 AM	0		0		0	
2:00 AM	0	0	0	0	0	0
2:15 AM	0		0		0	
2:30 AM	0		0		0	
2:45 AM	0		0		0	
3:00 AM	1	1	0	0	1	1
3:15 AM	0		0		0	
3:30 AM	0		0		0	
3:45 AM	0		0		0	
4:00 AM	0	2	0	2	0	4
4:15 AM	1		0		1	
4:30 AM	0		1		1	
4:45 AM	1		1		2	
5:00 AM	1	3	0	0	1	3
5:15 AM	1		0		1	
5:30 AM	1		0		1	
5:45 AM	0		0		0	
6:00 AM	6	43	4	18	10	61
6:15 AM	8		3		11	
6:30 AM	15		5		20	
6:45 AM	14		6		20	
7:00 AM	18	78	8	54	26	132
7:15 AM	9		6		15	
7:30 AM	12		11		23	129
7:45 AM	39		29		68	
8:00 AM	9	32	14	33	23	65
8:15 AM	6		3		9	
8:30 AM	6		5		11	
8:45 AM	11		11		22	
9:00 AM	15	22	10	21	25	43
9:15 AM	3		5		8	
9:30 AM	1		2		3	
9:45 AM	3		4		7	
10:00 AM	1	12	8	23	9	35
10:15 AM	4		5		9	
10:30 AM	4		7		11	
10:45 AM	3		3		6	
11:00 AM	9	22	6	23	15	45
11:15 AM	8		7		15	
11:30 AM	2		5		7	
11:45 AM	3		5		8	

Interval Start	WB		EB		Combined	
12:00 PM	8	27	3	13	11	40
12:15 PM	5		4		9	
12:30 PM	10		2		12	
12:45 PM	4		4		8	
1:00 PM	3	74	7	49	10	123
1:15 PM	36		4		40	
1:30 PM	22		11		33	
1:45 PM	13		27		40	
2:00 PM	19	50	8	41	27	91
2:15 PM	12		17		29	
2:30 PM	10		8		18	−65
2:45 PM	9		8		17	
3:00 PM	6	33	8	48	14	81
3:15 PM	7		9		16	
3:30 PM	5		13		18	
3:45 PM	15		18		33	
4:00 PM	8	26	13	56	21	82
4:15 PM	5		14		19	
4:30 PM	6		4		10	
4:45 PM	7		25		32	
5:00 PM	7	28	14	32	21	60
5:15 PM	4		9		13	
5:30 PM	6		5		11	−60
5:45 PM	11		4		15	
6:00 PM	5	21	7	35	12	56
6:15 PM	5		4		9	
6:30 PM	3		11		14	
6:45 PM	8		13		21	
7:00 PM	4	13	2	5	6	18
7:15 PM	2		1		3	
7:30 PM	4		2		6	
7:45 PM	3		0		3	
8:00 PM	2	11	4	6	6	17
8:15 PM	4		1		5	
8:30 PM	3		0		3	
8:45 PM	2		1		3	
9:00 PM	3	5	1	3	4	8
9:15 PM	0		1		1	
9:30 PM	2		0		2	
9:45 PM	0		1		1	
10:00 PM	0	0	0	1	0	1
10:15 PM	0		0		0	
10:30 PM	0		0		0	
10:45 PM	0		1		1	
11:00 PM	0	0	0	1	0	1
11:15 PM	0		0		0	
11:30 PM	0		1		1	
11:45 PM	0		0		0	

Volume Totals

	WB	EB	Combined
12:00 AM - 12:00 PM	215 (55.3%)	174 (44.7%)	389
12:00 PM - 12:00 AM	288 (49.8%)	290 (50.2%)	578
24 Hours	503 (52.0%)	464 (48.0%)	967

129
318
447 x .6 = 269 MS
.4 = 179 ES

65
282
347 x .6 = 209 MS
x.4 = 139 ES

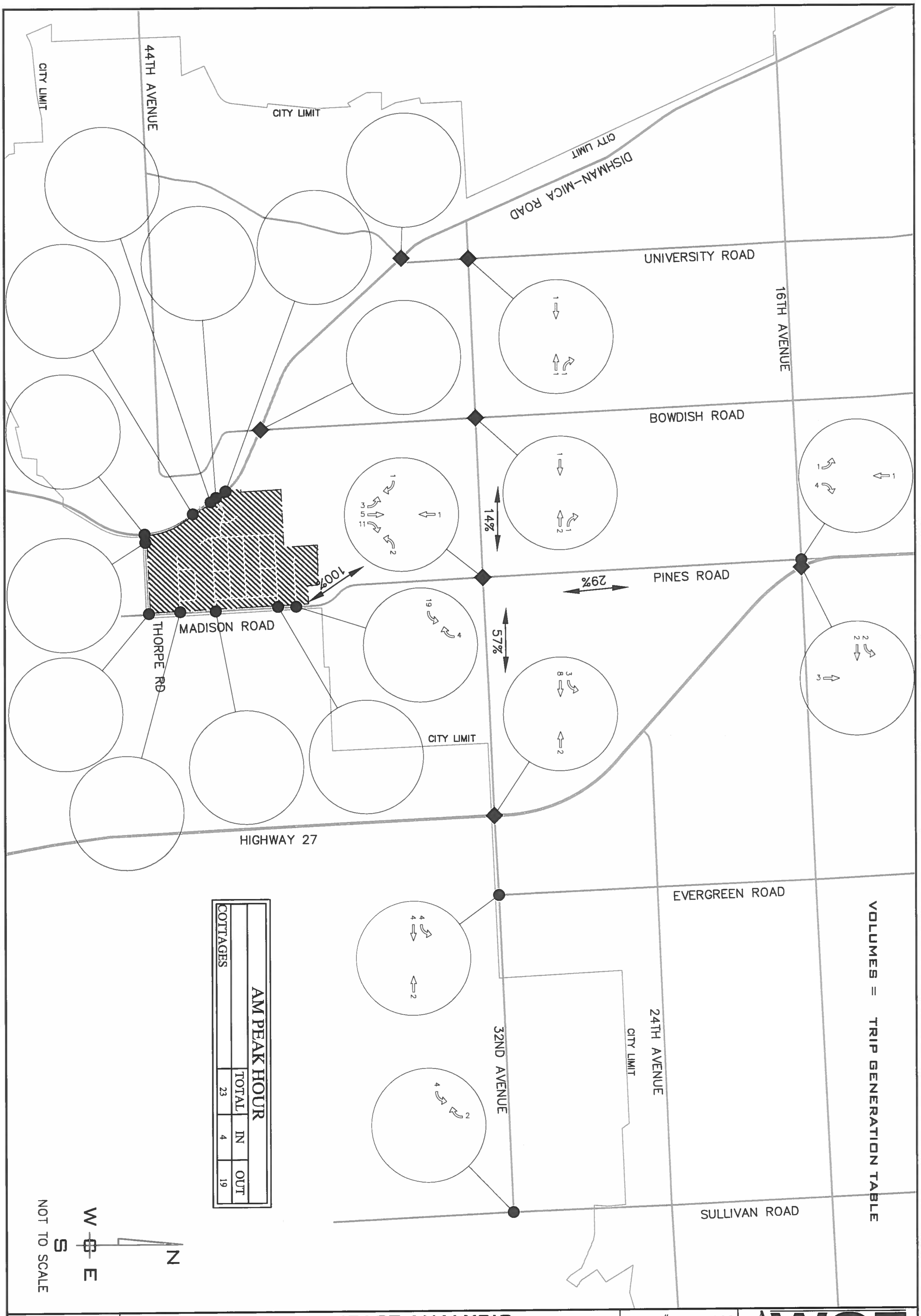
Peak Hours

	WB	EB	Combined
12:00 AM - 12:00 PM	7:00 AM	7:15 AM	7:00 AM
Volume	78	60	132
Factor	0.50	0.52	0.49
12:00 PM - 12:00 AM	1:15 PM	1:30 PM	1:15 PM
Volume	90	63	140
Factor	0.63	0.58	0.88

60
290
350 x .6 = 210 MS
X.4 = 140 ES

PRD LANDUSE DISTRIBUTION FIGURES

7A THROUGH 7F
8A THROUGH 8F



AM PEAK HOUR			
	TOTAL	IN	OUT
COTTAGES	23	4	19

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

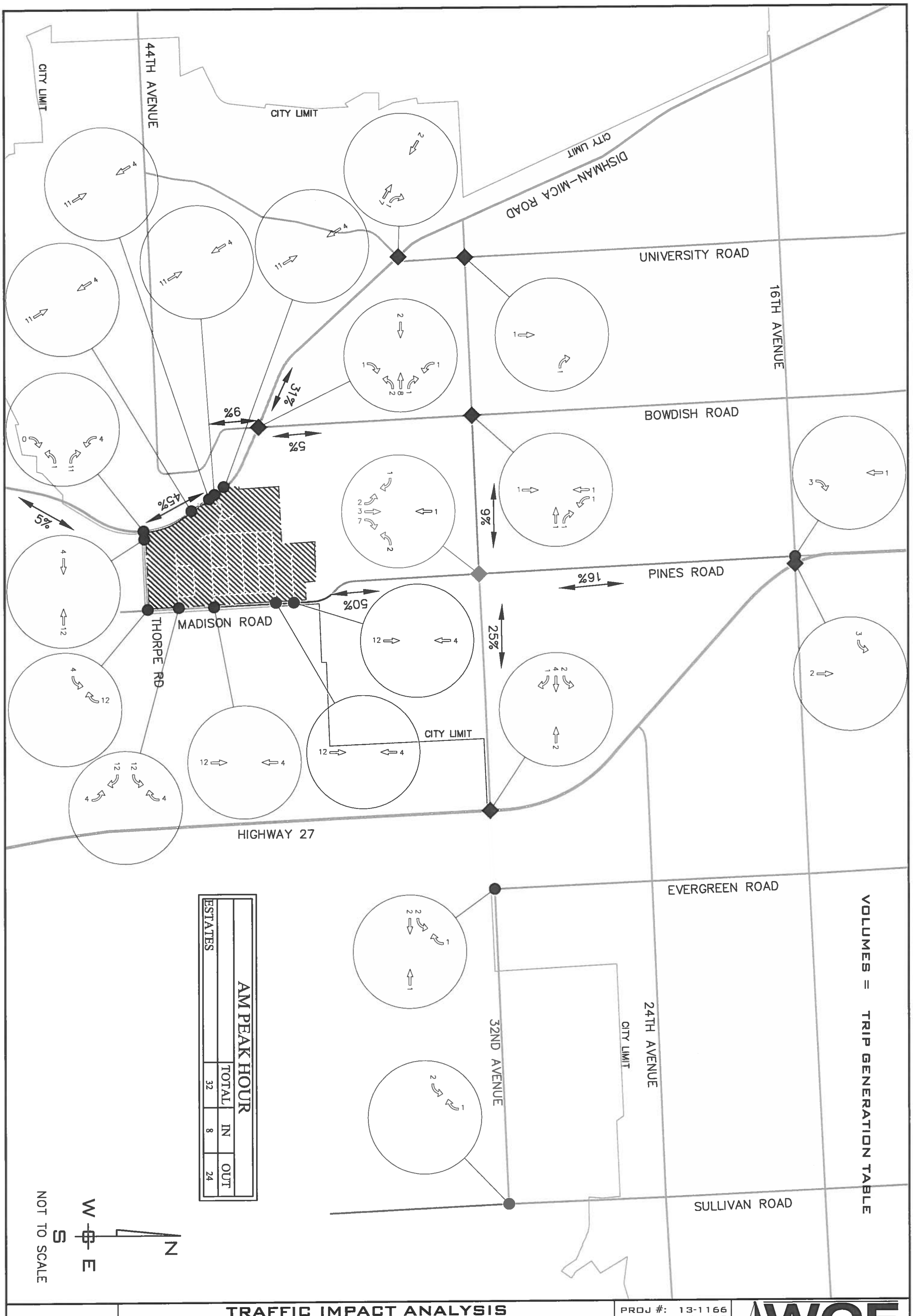
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

AM COTTAGES TRIP DISTRIBUTION

PROJ #: 13-1166
DATE: 04/13/15
DRAWN: RMA
APPROVED: TRW

WCE
WHIPPLE CONSULTING ENGINEERS
CIVIL, STRUCTURAL AND
TRANSPORTATION ENGINEERING
2528 NORTH SULLIVAN ROAD
SPOKANE VALLEY, WASHINGTON 99216
PH: 509-893-2617 FAX: 509-926-0227

FIGURE
7A



AM PEAK HOUR			
	TOTAL	IN	OUT
ESTATES	32	8	24

FIGURE
7B

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

AM ESTATES TRIP DISTRIBUTION

PROJ #: 13-1166
DATE: 04/13/15
DRAWN: RMA
APPROVED: TRW

WCE
WHIPPLE CONSULTING ENGINEERS
CIVIL, STRUCTURAL AND
TRANSPORTATION ENGINEERING
2528 NORTH SULLIVAN ROAD
SPOKANE VALLEY, WASHINGTON 99216
PH: 509-893-2617 FAX: 509-926-0227

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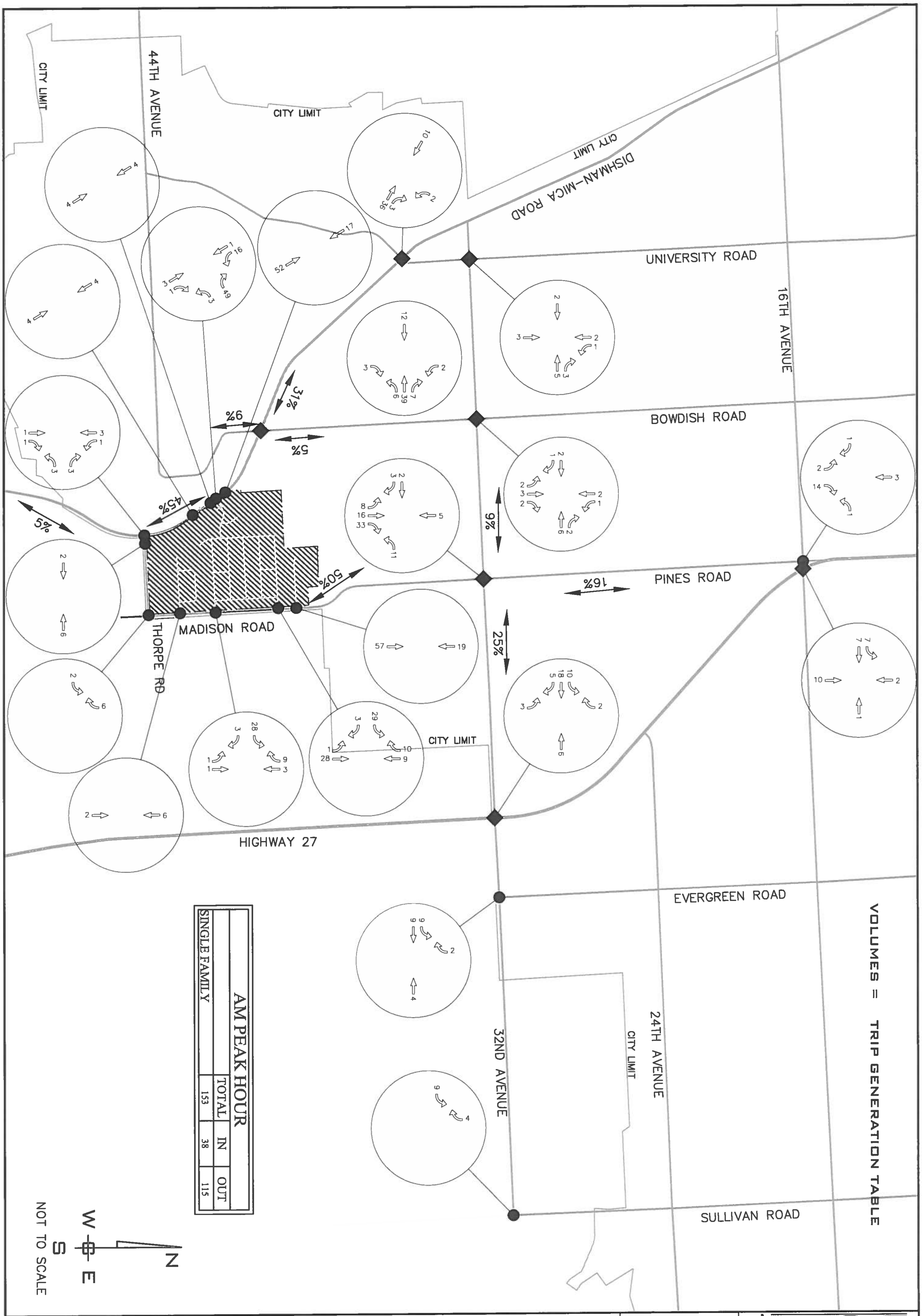

AM PEAK HOUR	TOTAL	IN	OUT
SINGLE FAMILY	153	38	115

FIGURE
7C

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

AM SINGLE FAMILY TRIP DISTRIBUTION

PROJ #: 13-1166
DATE: 04/13/15
DRAWN: RMA
APPROVED: TRW

WCE
WHIPPLE CONSULTING ENGINEERS
CIVIL, STRUCTURAL AND
TRANSPORTATION ENGINEERING
2528 NORTH SULLIVAN ROAD
SPOKANE VALLEY, WASHINGTON 99216
PH: 509-893-2617 FAX: 509-926-0227

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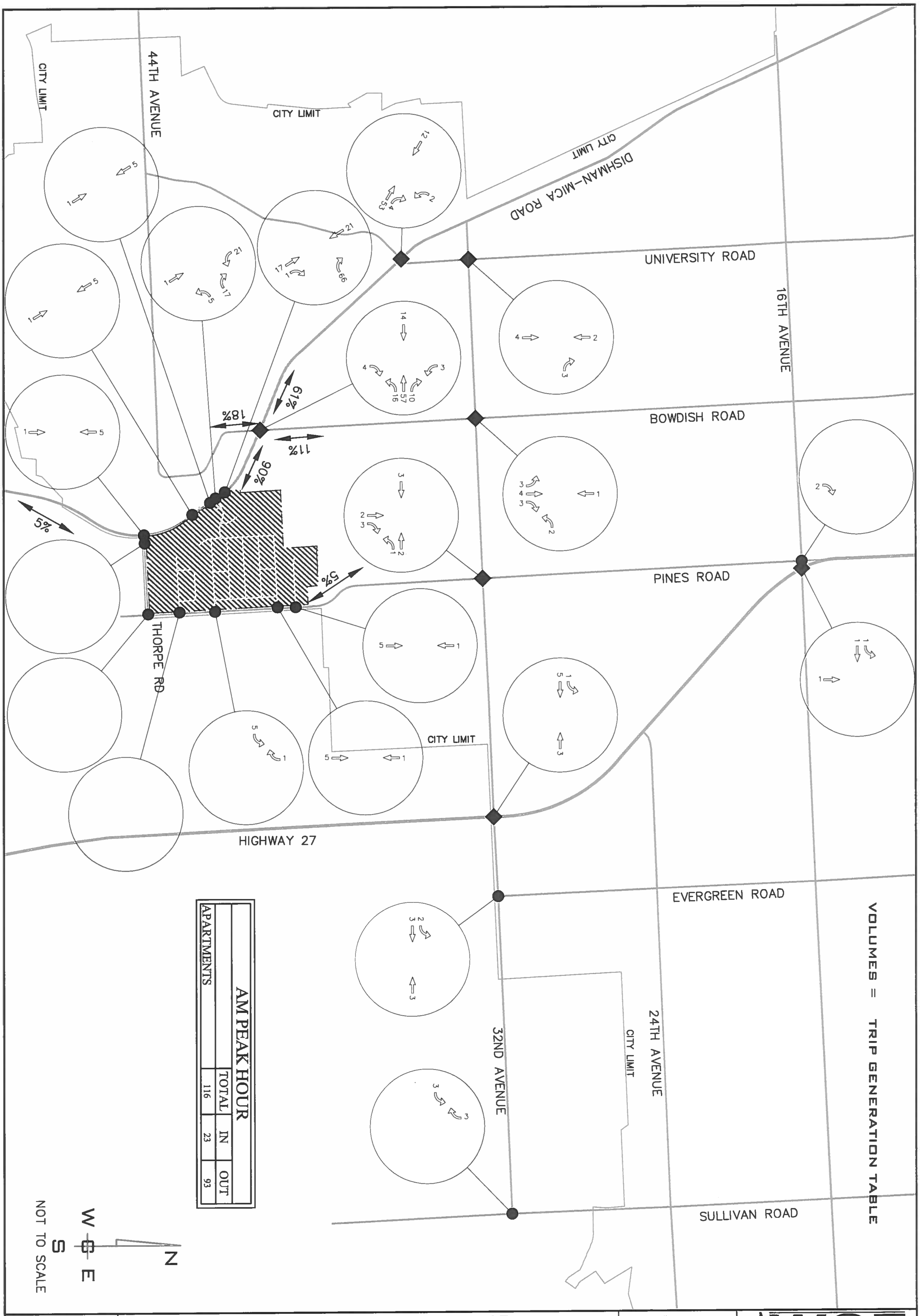

AM PEAK HOUR		
	TOTAL	IN	OUT
APARTMENTS	116	23	93

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD

SPOKANE VALLEY, WASHINGTON

AM APARTMENTS TRIP DISTRIBUTION

PROJ #: 13-1166
DATE: 04/13/15
DRAWN: RMA
APPROVED: TRW

WCE
WHIPPLE CONSULTING ENGINEERS
CIVIL, STRUCTURAL AND
TRANSPORTATION ENGINEERING
2528 NORTH SULLIVAN ROAD
SPOKANE VALLEY, WASHINGTON 99216
PH: 509-893-2617 FAX: 509-926-0227

FIGURE
7D

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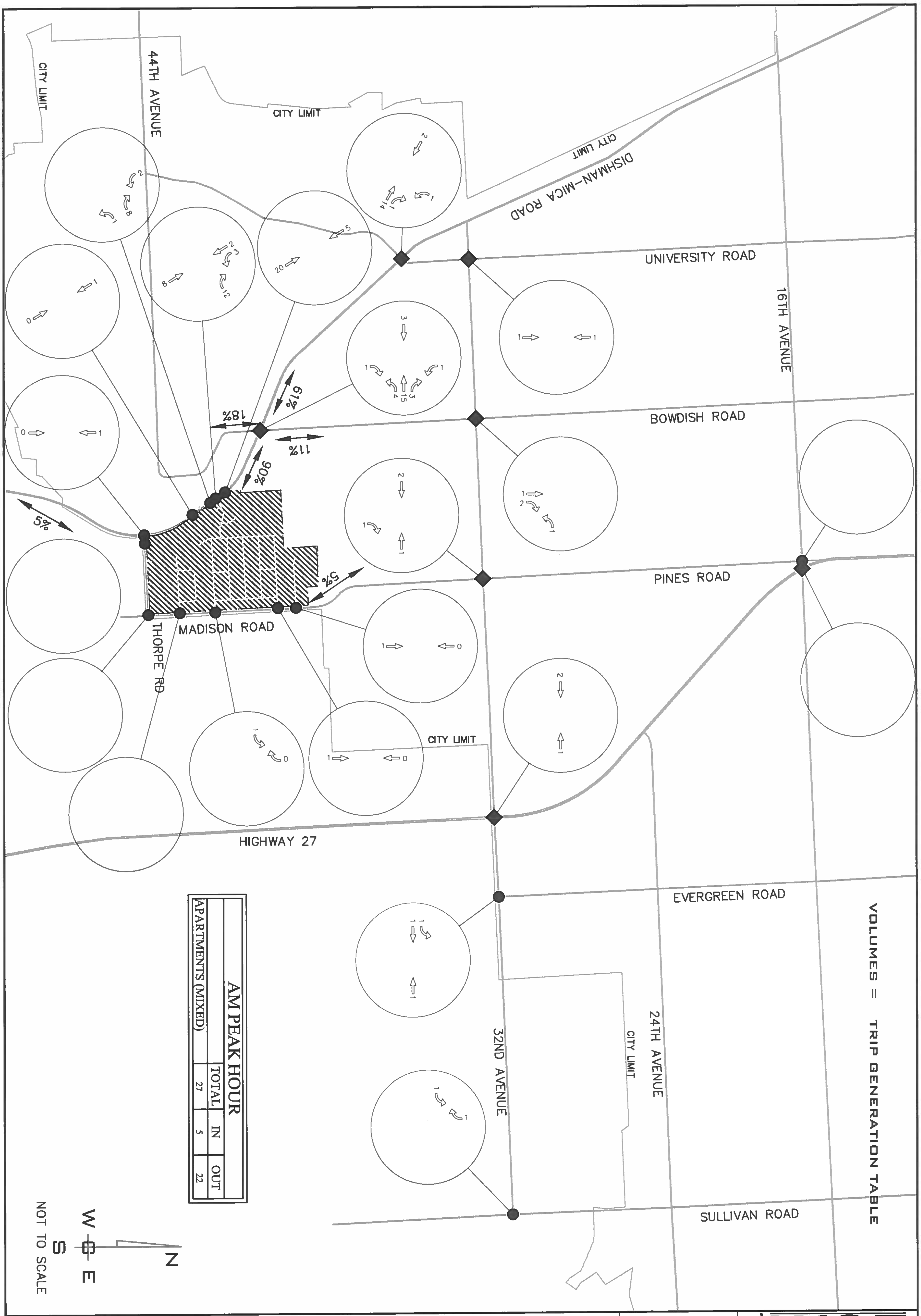

AM PEAK HOUR	TOTAL	IN	OUT
APARTMENTS (MIXED)	27	5	22

FIGURE
7E

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

AM APARTMENTS (MIXED) TRIP DISTRIBUTION

PROJ #: 13-1166
DATE: 04/13/15
DRAWN: RMA
APPROVED: TRW

WCE
WHIPPLE CONSULTING ENGINEERS
CIVIL, STRUCTURAL AND
TRANSPORTATION ENGINEERING
2528 NORTH SULLIVAN ROAD
SPOKANE VALLEY, WASHINGTON 99216
PH: 509-893-2617 FAX: 509-926-0227

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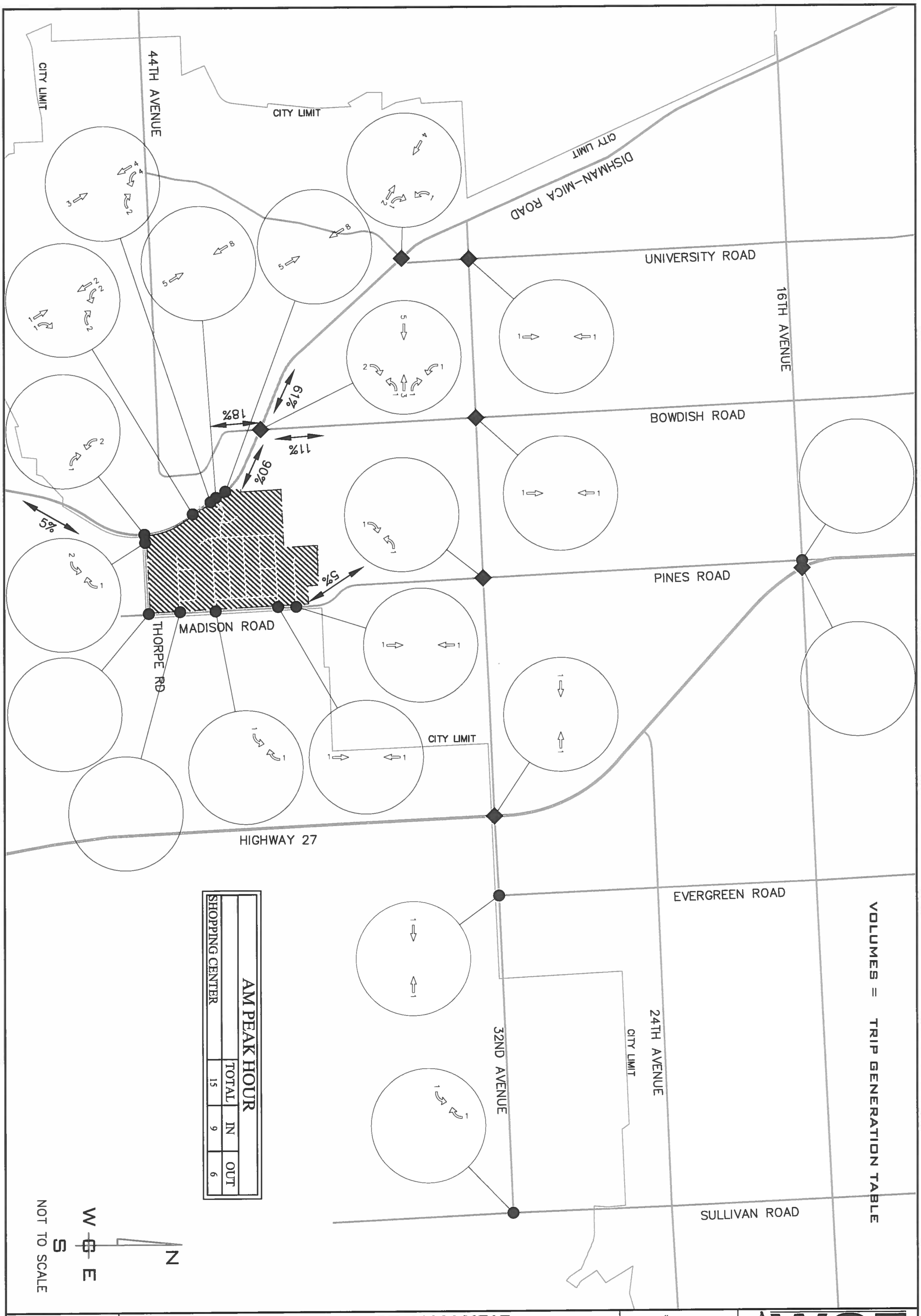

AM PEAK HOUR		
	TOTAL	IN	OUT
SHOPPING CENTER	15	9	6

FIGURE
7F

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

AM SHOPPING CENTER TRIP DISTRIBUTION

PROJ #: 13-1166
DATE: 04/13/15
DRAWN: RMA
APPROVED: TRW

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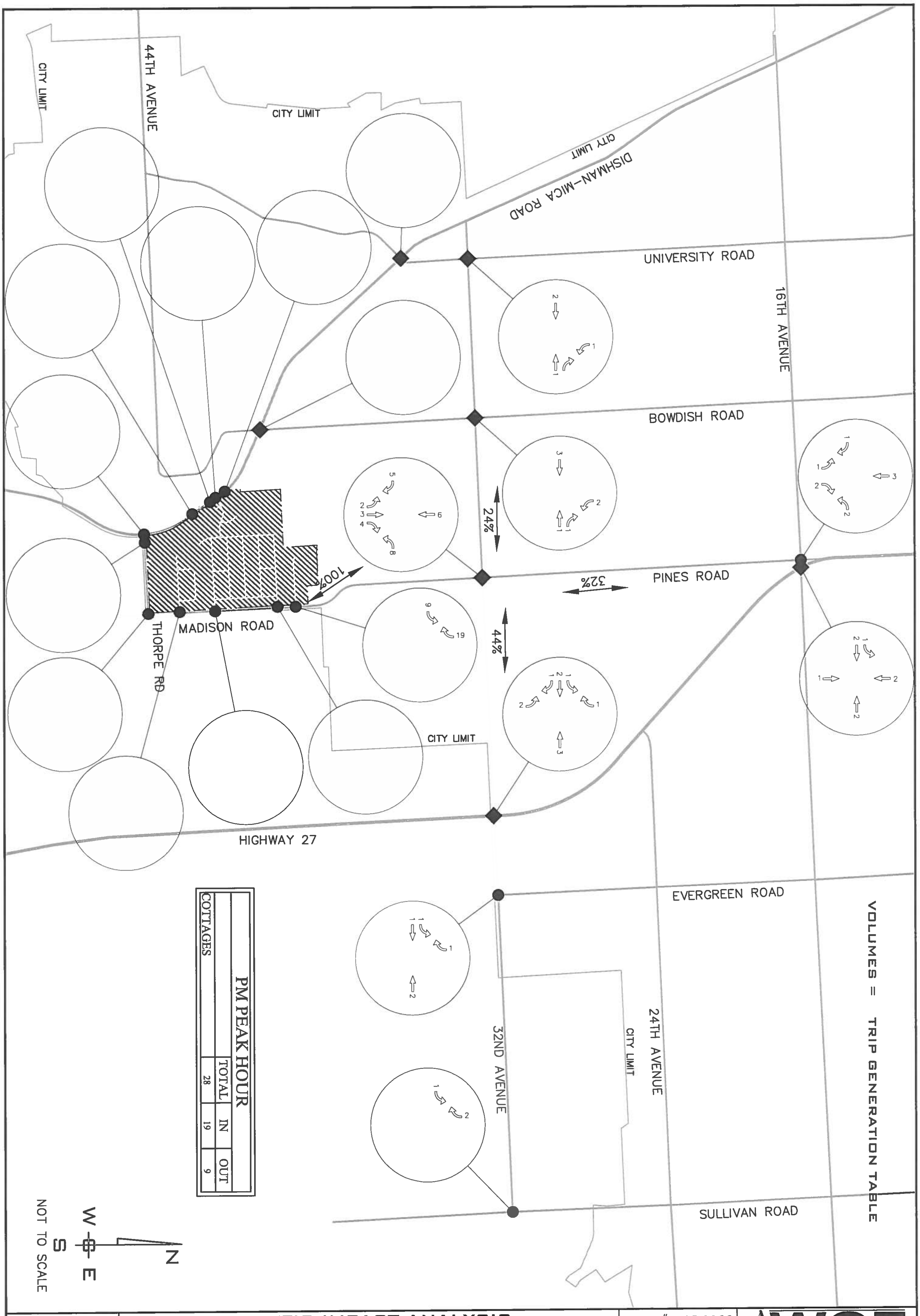

PM PEAK HOUR			
	TOTAL	IN	OUT
COTTAGES	28	19	9

FIGURE
8A

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

PM COTTAGES TRIP DISTRIBUTION

PROJ #: 13-1166
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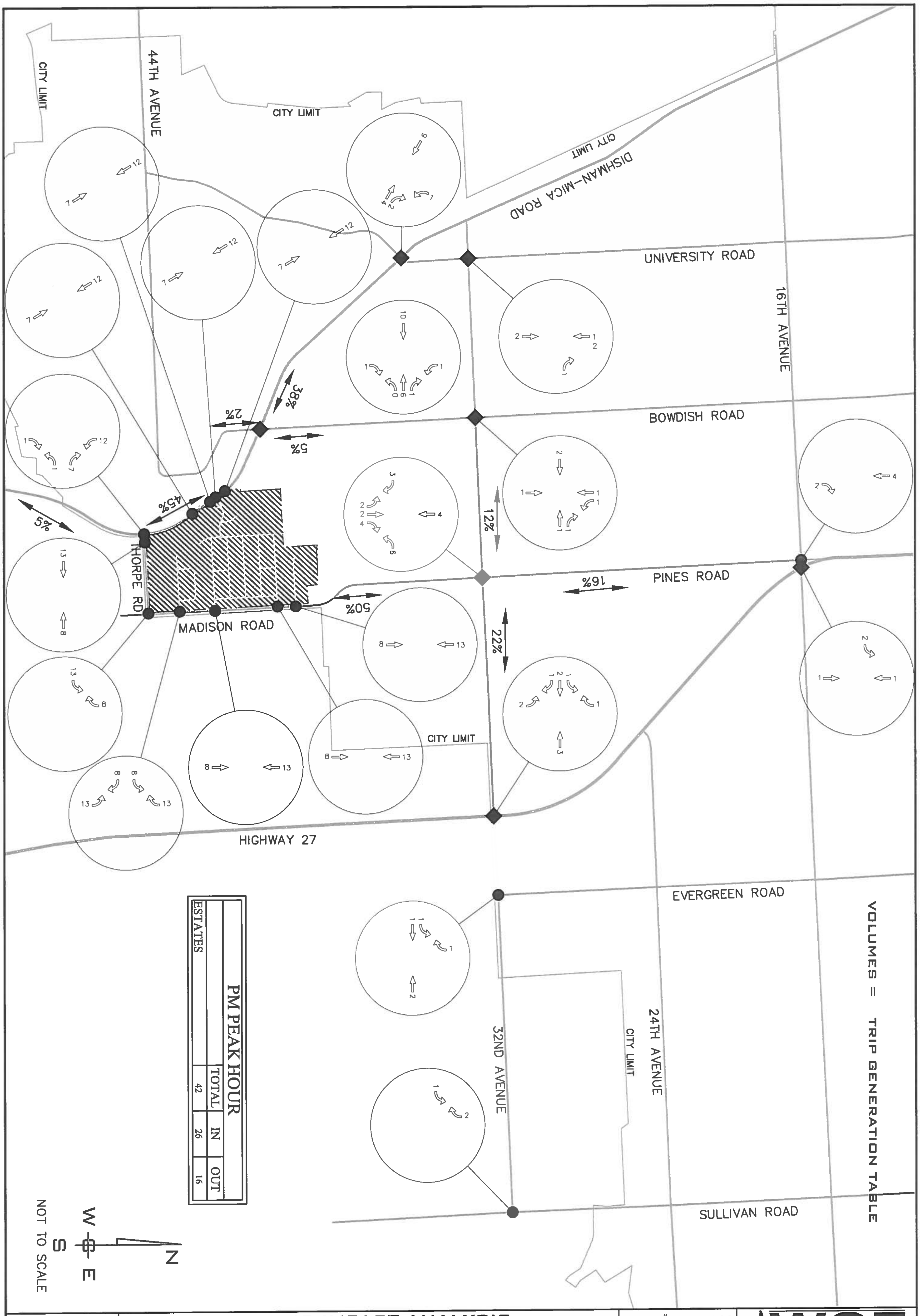

PM PEAK HOUR	TOTAL	IN	OUT
ESTATES	42	26	16

TRAFFIC IMPACT ANALYSIS
PAINTED HILLS PRD
MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

PM ESTATES TRIP DISTRIBUTION

PROJ #: 13-1166
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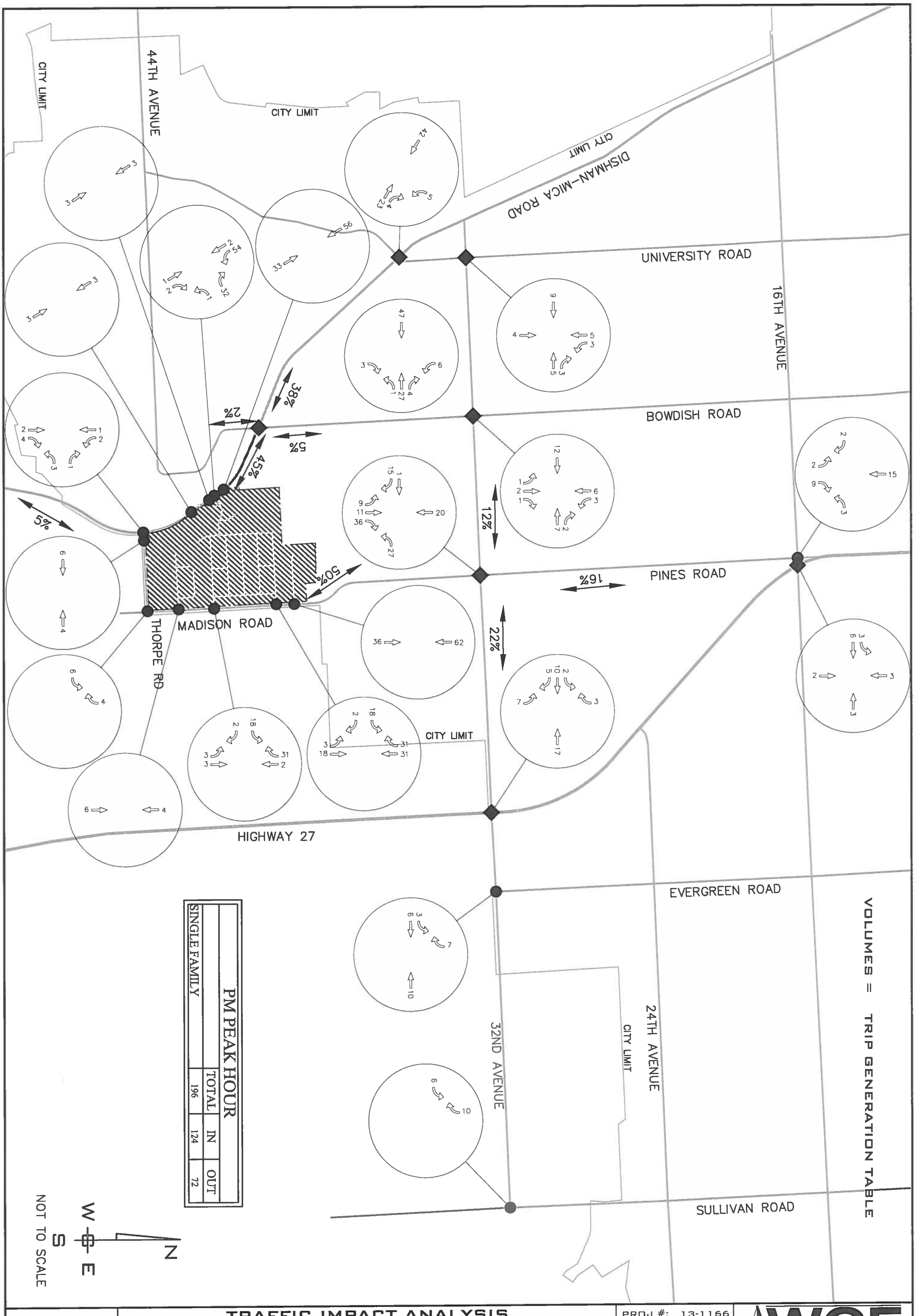
FIGURE
8B

:\WCE_WORK\2013 WCE PROJECTS\2013-1166 Walker - Painted Hills GC\DWG\TRAFFIC 10-9-15.dwg, TIA (AM & PM), 12/16/2015 10:16:31 AM



PM PEAK HOUR

	TOTAL	IN	OUT
SINGLE FAMILY	196	124	72

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD

SPOKANE VALLEY, WASHINGTON

PM SINGLE FAMILY TRIP DISTRIBUTION

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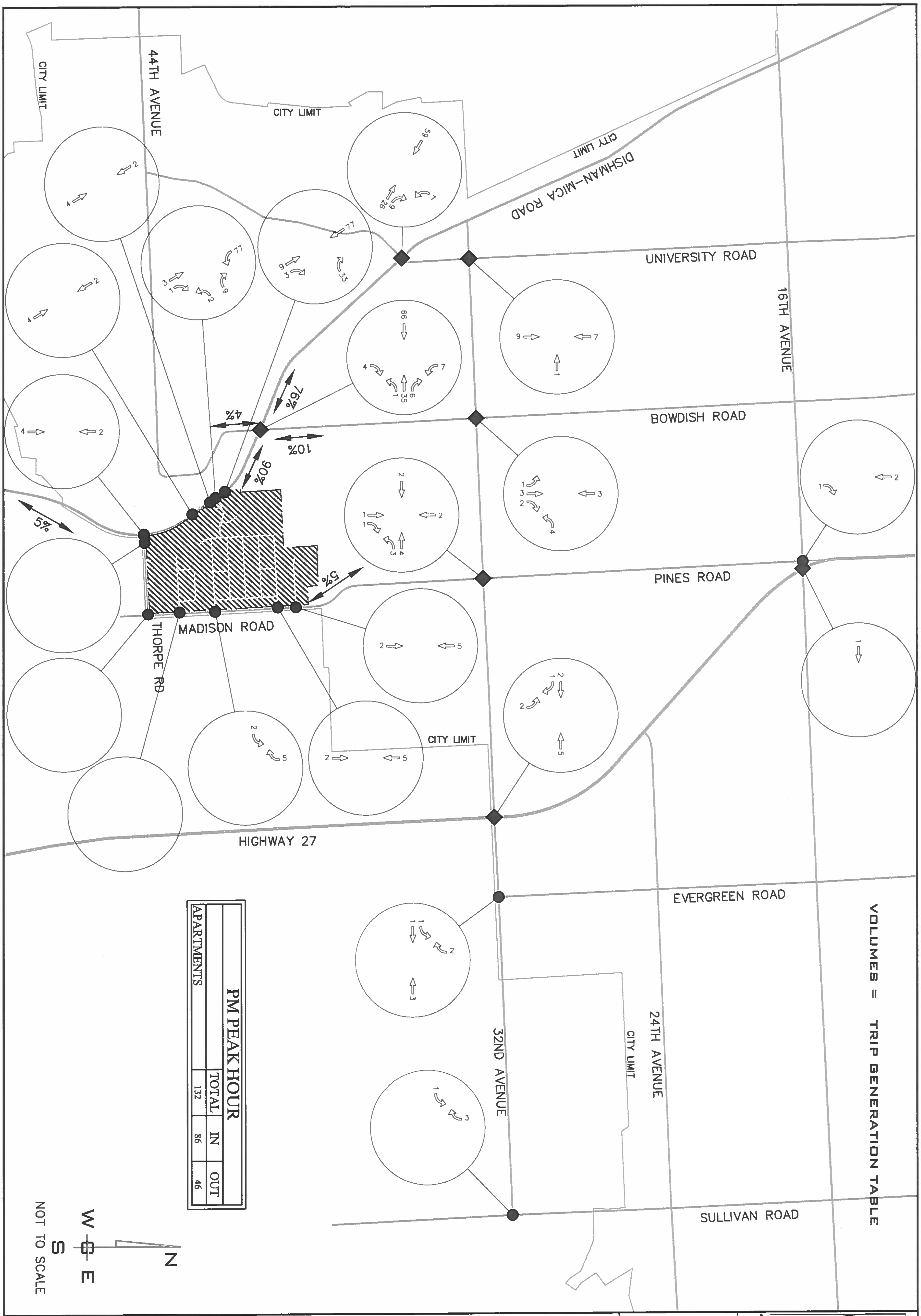
FIGURE
8C

:\WCE_WORK\2013 WCE PROJECTS\2013-1166 Walker - Painted Hills GC\DWG\TRAFFIC 10-9-15.dwg, TIA (AM & PM), 12/16/2015 10:16:51 AM



PM PEAK HOUR			
	TOTAL	IN	OUT
APARTMENTS	132	86	46

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

PM APARTMENTS TRIP DISTRIBUTION

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FIGURE
8D

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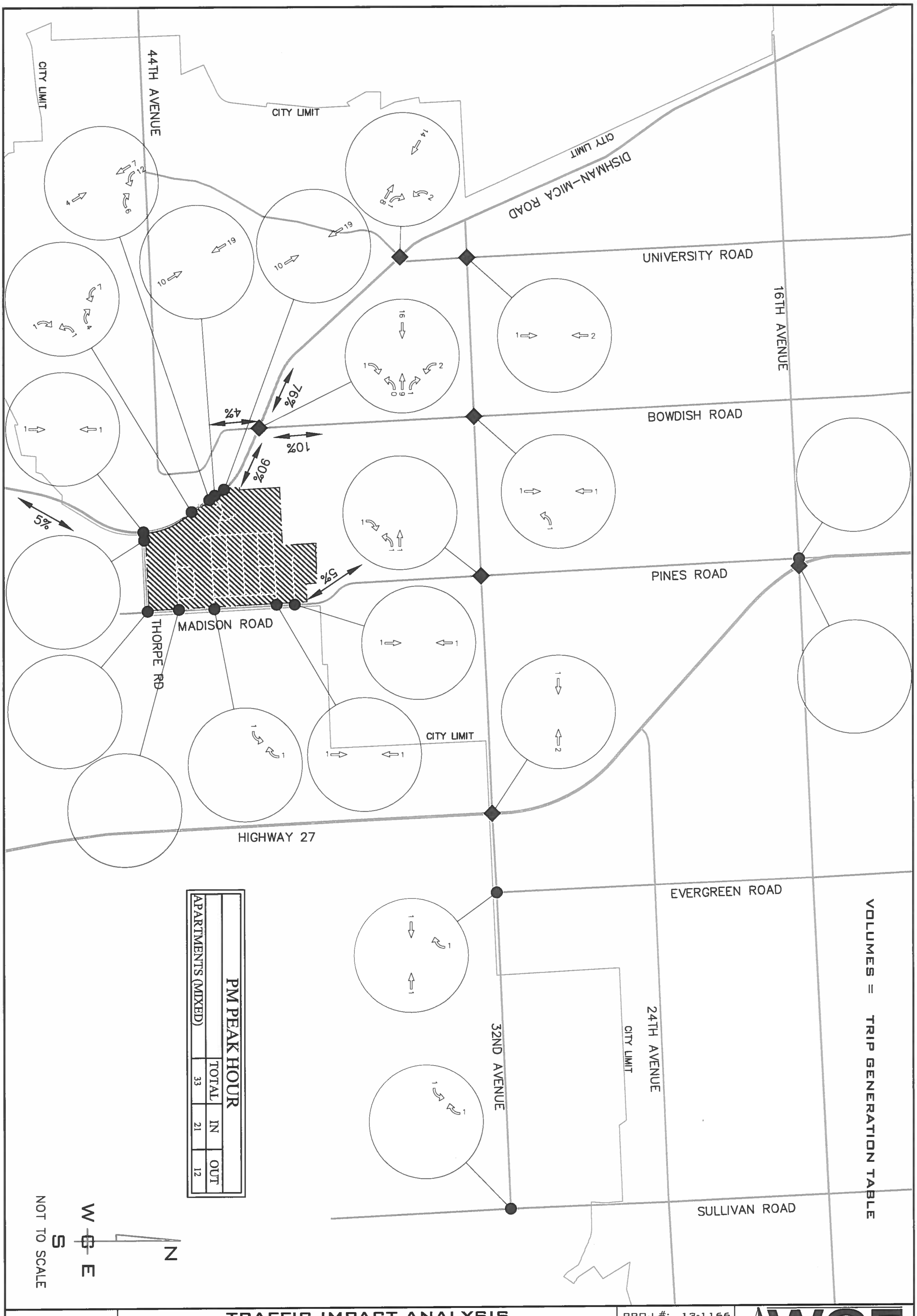

PM PEAK HOUR			
	TOTAL	IN	OUT
APARTMENTS (MIXED)	33	21	12

FIGURE

8E

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

PM APARTMENTS (MIXED) TRIP DISTRIBUTION

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DATE: 04/13/15
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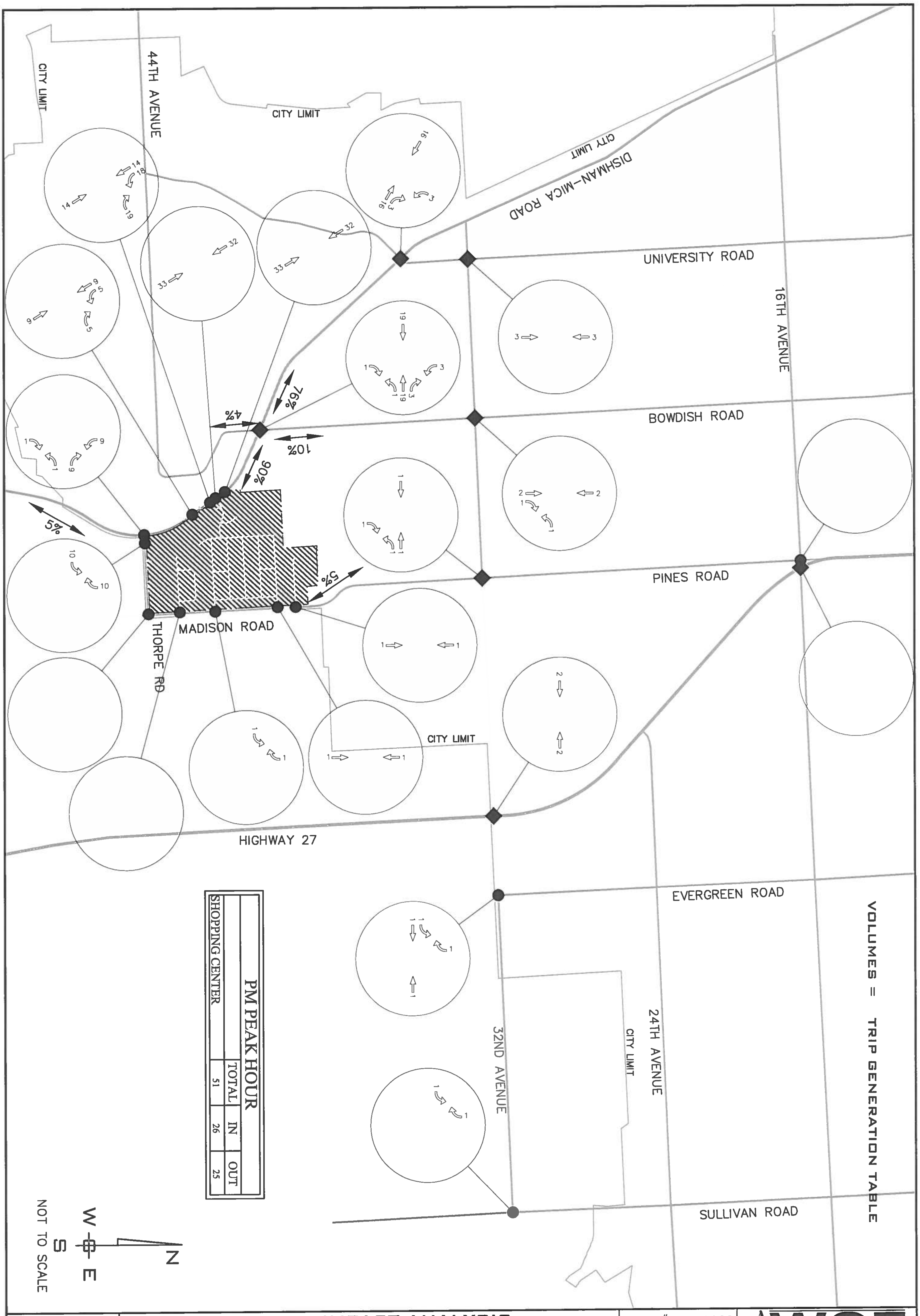

PM PEAK HOUR	TOTAL	IN	OUT
SHOPPING CENTER	51	26	25

TRAFFIC IMPACT ANALYSIS

PAINTED HILLS PRD

MADISON ROAD & THORPE ROAD
SPOKANE VALLEY, WASHINGTON

PM SHOPPING CENTER TRIP DISTRIBUTION

PROJ #: 13-1166
DATE: 04/13/15
DRAWN: RMA
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FIGURE
8F