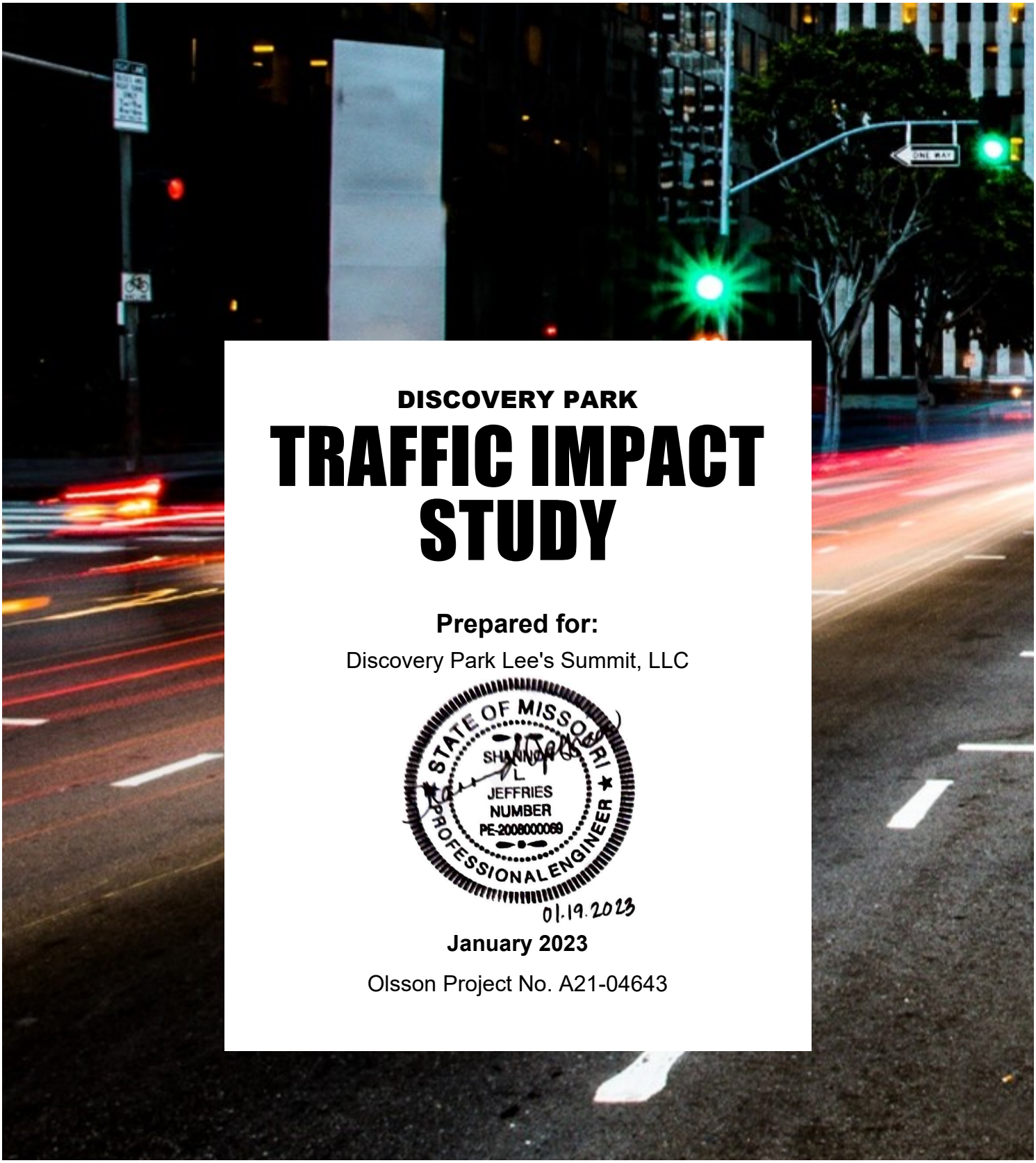

DISCOVERY PARK

TRAFFIC IMPACT STUDY

Prepared for:

Discovery Park Lee's Summit, LLC

STATE OF MISSOURI
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NUMBER
PE-2008000069
PROFESSIONAL ENGINEER

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TABLE OF CONTENTS

1. Introduction 1
2. Data Collection 3
3. Existing plus Approved Development Conditions 7
   3.1. Network Characteristics 7
   3.2. Existing Site Characteristics 11
   3.3. Existing plus Approved Development Warrant Analysis 12
   3.4. Existing plus Approved Capacity Analysis 16
   3.4.1 Existing plus Approved Development Simulation 18
4. Proposed Land Use and Site Characteristics 21
   4.1. Proposed Development Trip Generation and Distribution 24
   4.2. Proposed Access Characteristics 26
   4.2.1 Access Spacing 26
   4.2.2. Access Characteristics 28
5. Existing Plus Phase 1 Development Conditions 30
   5.1 Phase 1 Development Trip Generation and Distribution 30
   5.2 Existing Plus Phase 1 Development Warrant Analysis 35
   5.3 Existing Plus Phase 1 Development Recommendations 36
   5.4 Existing Plus Phase 1 Development Capacity Analysis 37
   5.4.1 Existing plus Phase 1 Development Simulation 38
6. Build Year 2027 Plus Phases 1 and 2 Development Conditions 44
   6.1 Phase 2 Development Trip Generation and Distribution 44
   6.2 Build Year Plus Phases 1 and 2 Development Warrant Analysis 50
   6.3 Build Year Plus Phases 1 and 2 Development Recommendations 51
   6.4 Build Year Plus Phases 1 and 2 Development Capacity Analysis 53
   6.4.1 Build Year plus Phases 1 and 2 Development Simulation 55
7. Build Year 2032 Plus Full Build Development Conditions 61
   7.1 Phase 3 Development Trip Generation and Distribution 61
   7.2 Build Year Plus Full Build Development Warrant Analysis 67

7.3 Build Year Plus Full Build Development Recommendations 68
7.4 Build Year Plus Full Build Development Capacity Analysis 70
7.4.1 Build Year plus Full Build Development Simulation.....72
8. Future Year 2040 Plus Full Build Development Conditions.....78
8.1 Future Year Plus Full Build Development Warrant Analysis.....78
8.2 Future Year Plus Full Build Development Capacity Analysis.....81
8.2.1 Future Year Plus Full Build Development Simulation 83
9. Conclusions and Recommendations 88
9.1 Conclusions.....88
9.2 Recommendations.....89

LIST OF FIGURES

FIGURE 1. VICINITY MAP 2
FIGURE 2. EXISTING PLUS APPROVED PEAK HOUR VOLUMES 6
FIGURE 3. EXISTING PLUS APPROVED DEVELOPMENT LANE CONFIGURATION AND TRAFFIC CONTROL .. 15
FIGURE 4. EXISTING PLUS APPROVED DEVELOPMENT CAPACITY ANALYSIS 20
FIGURE 5. SITE PLAN 23
FIGURE 6. PHASE 1 DEVELOPMENT TRIP DISTRIBUTION 31
FIGURE 6A. PHASE 1 DEVELOPMENT TRIP DISTRIBUTION 32
FIGURE 7. EXISTING PLUS PHASE 1 DEVELOPMENT PEAK HOUR VOLUMES 33
FIGURE 7A. EXISTING PLUS PHASE 1 DEVELOPMENT PEAK HOUR VOLUMES 34
FIGURE 8. EXISTING PLUS PHASE 1 DEVELOPMENT LANE CONFIGURATIONS & TRAFFIC CONTROL 40
FIGURE 8A. EXISTING PLUS PHASE 1 DEVELOPMENT LANE CONFIGURATIONS & TRAFFIC CONTROL 41
FIGURE 9. EXISTING PLUS PHASE 1 DEVELOPMENT CAPACITY ANALYSIS 42
FIGURE 9A. EXISTING PLUS PHASE 1 DEVELOPMENT CAPACITY ANALYSIS 43
FIGURE 10. PHASE 2 DEVELOPMENT TRIP DISTRIBUTION 46
FIGURE 10A. PHASE 2 DEVELOPMENT TRIP DISTRIBUTION 47
FIGURE 11. BUILD YEAR PLUS PHASES 1 AND 2 DEVELOPMENT PEAK HOUR VOLUMES 48
FIGURE 11A. BUILD YEAR PLUS PHASES 1 AND 2 DEVELOPMENT PEAK HOUR VOLUMES 49
FIGURE 12. BUILD YEAR PLUS PHASES 1 AND 2 LANE CONFIGURATIONS & TRAFFIC CONTROL 57
FIGURE 12A. BUILD YEAR PLUS PHASES 1 AND 2 LANE CONFIGURATIONS & TRAFFIC CONTROL 58
FIGURE 13. BUILD YEAR PLUS PHASES 1 AND 2 DEVELOPMENT CAPACITY ANALYSIS 59
FIGURE 13A. BUILD YEAR PLUS PHASES 1 AND 2 DEVELOPMENT CAPACITY ANALYSIS 60
FIGURE 14. PHASE 3 DEVELOPMENT TRIP DISTRIBUTION 63
FIGURE 14A. PHASE 3 DEVELOPMENT TRIP DISTRIBUTION 64
FIGURE 15. BUILD YEAR PLUS FULL BUILD DEVELOPMENT PEAK HOUR VOLUMES 65
FIGURE 15A. BUILD YEAR PLUS FULL BUILD DEVELOPMENT PEAK HOUR VOLUMES 66
FIGURE 16. BUILD YEAR PLUS FULL BUILD LANE CONFIGURATIONS & TRAFFIC CONTROL 74
FIGURE 16A. BUILD YEAR PLUS FULL BUILD LANE CONFIGURATIONS & TRAFFIC CONTROL 75
FIGURE 17. BUILD YEAR PLUS FULL BUILD DEVELOPMENT CAPACITY ANALYSIS 76
FIGURE 17A. BUILD YEAR PLUS FULL BUILD DEVELOPMENT CAPACITY ANALYSIS 77
FIGURE 18. FUTURE YEAR PLUS FULL BUILD DEVELOPMENT PEAK HOUR VOLUMES 79
FIGURE 18A. FUTURE YEAR PLUS FULL BUILD DEVELOPMENT PEAK HOUR VOLUMES 80
FIGURE 19. FUTURE PLUS FULL BUILD DEVELOPMENT LANE CONFIGURATIONS & TRAFFIC CONTROL 84
FIGURE 19A. FUTURE PLUS FULL BUILD DEVELOPMENT LANE CONFIGURATIONS & TRAFFIC CONTROL 85
FIGURE 20. FUTURE YEAR PLUS FULL BUILD DEVELOPMENT CAPACITY ANALYSIS 86
FIGURE 20A. FUTURE YEAR PLUS FULL BUILD DEVELOPMENT CAPACITY ANALYSIS 87

LIST OF TABLES

TABLE 1. APPROVED TRAFFIC IMPACT STUDIES. 4
TABLE 2. EXISTING NETWORK SUMMARY. 8
TABLE 2A. EXISTING NETWORK SUMMARY, CONTINUED. 9
TABLE 3. EXISTING LEE'S SUMMIT ROADWAY CONDITIONS. 10
TABLE 4. EXISTING STUDY INTERSECTION SUMMARY. 11
TABLE 5. INTERSECTION LOS CRITERIA. 16
TABLE 6. EXISTING PLUS APPROVED DEVELOPMENT CONDITIONS CAPACITY ANALYSIS. 17
TABLE 7. PROPOSED DEVELOPMENT SUMMARY. 22
TABLE 8. PROPOSED DEVELOPMENT TRIP GENERATION SUMMARY. 24
TABLE 9. PROPOSED DEVELOPMENT TRIP GENERATION SUMMARY, WITH INTERNAL CAPTURE. 25
TABLE 10. PROPOSED DEVELOPMENT TRIP DISTRIBUTION. 25
TABLE 11. PROPOSED ACCESS SUMMARY. 26
TABLE 12. ACCESS CHARACTERISTICS 29
TABLE 13. PHASE 1 (ZONE 1) DEVELOPMENT TRIP GENERATION. 30
TABLE 14. EXISTING PLUS PHASE 1 DEVELOPMENT CONDITIONS CAPACITY ANALYSIS. 38
TABLE 15. PHASE 2 (ZONES 2-3) DEVELOPMENT TRIP GENERATION. 45
TABLE 16. BUILD YEAR PLUS PHASE 2 DEVELOPMENT CONDITIONS CAPACITY ANALYSIS. 54
TABLE 17. PHASE 3 (ZONES 4-5) DEVELOPMENT TRIP GENERATION. 62
TABLE 18. BUILD YEAR PLUS FULL BUILD DEVELOPMENT CONDITIONS CAPACITY ANALYSIS. 71
TABLE 18A. BUILD YEAR PLUS FULL BUILD DEVELOPMENT CONDITIONS CAPACITY ANALYSIS, CONTINUED. 72
TABLE 19. FUTURE YEAR PLUS FULL BUILD DEVELOPMENT CONDITIONS CAPACITY ANALYSIS. 81
TABLE 19A. FUTURE YEAR PLUS FULL BUILD DEVELOPMENT CONDITIONS CAPACITY ANALYSIS, CONTINUED. 82

APPENDICES

Appendix A: Data Collection

Appendix B: Existing Plus Approved Development Conditions

Appendix C: Existing Plus Approved Plus Phase 1 Development Conditions

Appendix D: Build Year 2027 Plus Phases 1 and 2 Development Conditions

Appendix E: Build Year 2032 Plus Phases 1, 2 and 3 Development Conditions

Appendix F: Future Year 2040 Plus Full Build Development Conditions

1. INTRODUCTION

This report studies traffic impacts regarding the proposed construction of a multi-use development located in the northwest quadrant of the intersection of I-470 and Douglas Street in Lee's Summit, Missouri. This report will review the impacts of the proposed Discovery Park development on the existing roadway network and, as appropriate, recommend additional turn lanes, storage bays, and intersection control methods per the City of Lee's Summit *Access Management Code* (AMC), City of Lee's Summit Level of Service and Unimproved Road Policies, City of Kansas City Traffic Engineer and Operations Manual, and Missouri Department of Transportation's (MoDOT's) *Engineering Policy Guide* (EPG). Study intersections identified for this report are:

- Lee's Summit Road and Gregory Boulevard
- Lee's Summit Road and Strother Road
- Lee's Summit Road and 85th Street/St. Michael's High School Drive
- Lee's Summit Road and Douglas Street
- Douglas Street and Colbern Road
- Douglas Street and I-470 Westbound Ramps
- Douglas Street and I-470 Eastbound Ramps
- Colbern Road and Pryor Road
- Colbern Road and M-350 Southbound Ramps
- Colbern Road and M-350 Northbound Ramps
- Colbern Road and Main Street
- Colbern Road and Blue Parkway

For this study, the following scenarios were analyzed considering weekday AM and PM peak hour operations:

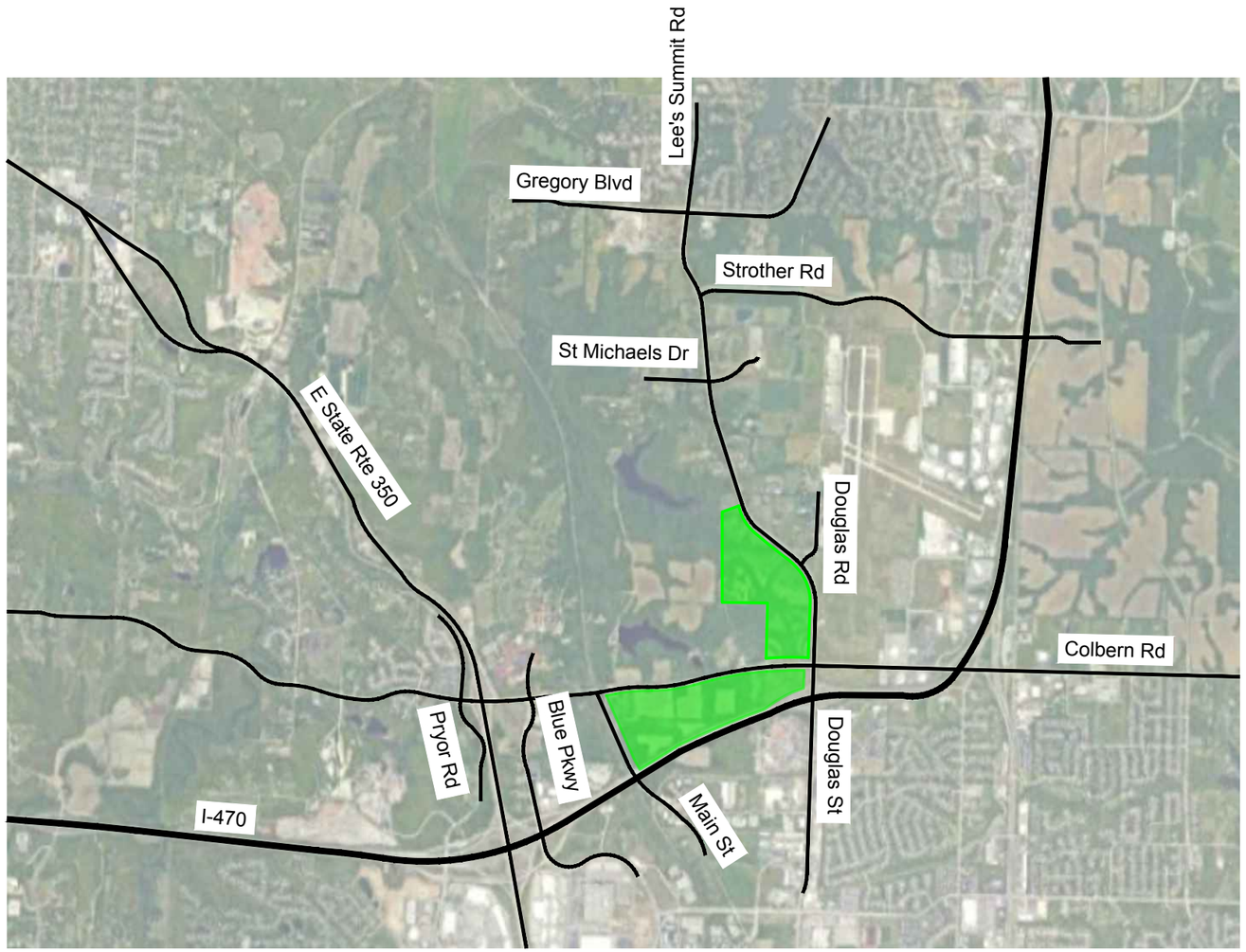
- Existing plus Approved Development Conditions
- Existing plus Phase 1 Development Conditions
- Build Year 2027 plus Phases 1 and 2 Development Conditions
- Build Year 2032 plus Full Build Development Conditions (Phases 1, 2 and 3)
- Future Year 2040 plus Full Build Development Conditions

The approximate location of the development is shown on the vicinity map in **Figure 1**.

FIGURE 1

Vicinity Map

Discovery Park TIS
Lee's Summit, MO



LEGEND

Develpoment Site

Source: Google Earth

2. DATA COLLECTION

The data collection effort included acquiring peak-hour vehicular turning movement counts, intersection signal timings, documentation of current roadway geometrics, identification of planned roadway projects, and identification of approved development studies.

Traffic Counts: Traffic counts were collected on Tuesday, January 8th, 2019 at the following study intersections:

- Lee's Summit Road and Gregory Boulevard
- Lee's Summit Road and Strother Road
- Lee's Summit Road and 85th Street/St. Michael's High School Drive
- Lee's Summit Road and Douglas Street
- Colbern Road and Main Street
- Colbern Road and Blue Parkway

Traffic counts were collected on Tuesday, January 18th, 2022 at the following study intersections:

- Douglas Street and Colbern Road
- Douglas Street and I-470 Westbound Ramps
- Douglas Street and I-470 Eastbound Ramps
- Colbern Road and Pryor Road
- Colbern Road and M-350 Southbound Ramps
- Colbern Road and M-350 Northbound Ramps

All counts were conducted during a typical weekday AM and PM peak period from 7:00-9:00 AM and 4:00-6:00 PM. The study area represents several intersections separated along miles of road network. The peak hour periods of study intersections are generally occurring around 7:15-8:15 AM and 4:30-5:30 PM, although slight adjustments in peak hour were observed throughout the network. For the purposes of this study, a consistent peak hour period is presented for all intersections. Traffic count data collected for this study is provided in **Appendix A**.

Collected peak hour data was reviewed and balanced considering the time period between the data collection dates. Traffic volumes were balanced along Colbern Road to the west and Douglas Street/Lee's Summit Road to the north of the intersection of Colbern Road and Douglas Street. The approach to traffic volume balancing was reviewed and approved by agency staff.

Approved Development: Several approved development studies were identified by the City of Lee's Summit. After reviewing the provided information, the following studies were considered as constructed for the purposes of this study. If traffic volumes were not provided through a

study intersection, approved development trips were distributed through the network based on existing gravity. The approved studies proposed for inclusion in this study as well as the approved trip distribution process was reviewed and approved by agency staff.

Table 1. Approved Traffic Impact Studies.

Approved Development Study	Submittal Date	General Location	Considered in TIS	Additional Notes
Cable Dahmer KIA	December 2015	NW quadrant Colbern Road and Town Center Boulevard	Yes, Partial	Phase 1 complete, Phase 2 considered
St. Michael's High School	June 2016	SE quadrant Lee's Summit Road and Tudor Road	No	Phase 1 considered complete and accounted for in count data. Phase 2 construction date undetermined.
Oakview Storage	March 2018	NW quadrant Douglas Street and Victoria Drive	Yes, Partial	Development partially complete, considered unbuilt portions
Aria/Summit Village North	April 2019	Same site location	No	Superseded by this study.
Automotive Detail Center	May 2020	NW quadrant of Town Center Boulevard and Independence Avenue	No	Expected to have minor influence on study area
Douglas Station Apartments	April 2021	SE quadrant Sycamore Street and Sloan Road	Yes	-
Scannell LS	July 2021	NW quadrant Tudor Road and Main Street	Yes	-
Lot 1 Town Center	November 2021	NE quadrant Town Center Boulevard and Independence Avenue	No	Expected to have minor influence on study area

Approved traffic volumes were added to the existing traffic volumes. The existing plus approved development peak hour traffic volumes are illustrated in **Figure 2**.

Signal Timing: Existing signal timing information for the intersection of Lee's Summit Road and Gregory Boulevard was provided by the City of Kansas City, Missouri. Signal timing information for the intersections of Colbern Road and the M-350 Ramps were provided by MoDOT. Signal

timing information for the intersections along Douglas Street from the I-470 Eastbound Ramp to Colbern Road were obtained from the Mid America Regional Council's (MARC) Central Traffic Control System (TranSuite). Signal timing information is provided in **Appendix A**.

Planned Roadway Projects: The City of Lee's Summit provided schematic design plans (dated December 2022) for a planned roadway improvement project along Colbern Road. For the purposes of this study, the planned project was considered as constructed under existing conditions analysis. The project will improve Colbern Road from Blue Parkway to Douglas Street to a four-lane, median divided roadway with curb and gutter. A median break is illustrated at the intersection of Colbern Road and Main Street, although no turn lanes along Colbern Road at Main Street are planned. Turn lane improvements at the intersection of Colbern Road and Douglas Street include an extended eastbound left-turn lane, eastbound right-turn lane, and a southbound left-turn lane. Two through lanes in the northbound and southbound directions will be provided along Douglas Street through the intersection with Colbern Road. The design plans illustrate the four-lane section will transitioning to the existing three-lane section along Douglas Street/Lee's Summit Road approximately 900 feet north of Colbern Road.

Field Review: A field review was conducted Wednesday, March 9th, 2022, during the AM and PM peak hour periods. The purpose of the field review was to observe existing traffic conditions within the study area, specifically monitoring the M-350 and I-470 interchanges.

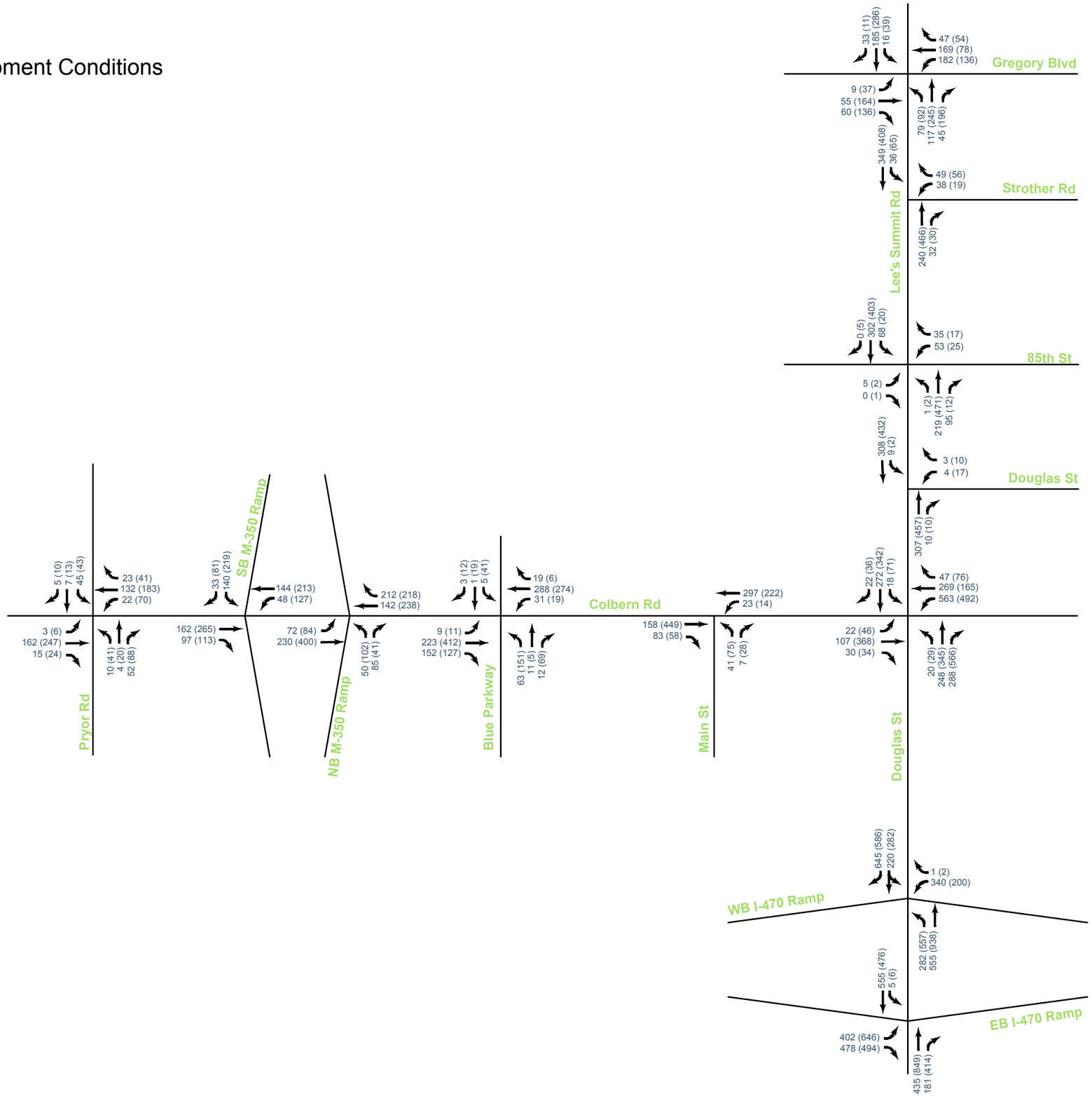
During the AM and PM peak hour periods, Colbern Road within the vicinity of the M-350 interchange was observed to operate well. Operations were observed to be acceptable, with minimal queuing and delay noted at study intersections.

The Douglas Street corridor was observed from south of the I-470 interchange north through Colbern Road. During the AM peak hour period, long queues were observed for the westbound left turn movement along Colbern Road at Douglas Street. In most cases, vehicles that were stopped at the signal were observed to clear within one cycle length. The vehicles moved south through the interchange efficiently and no additional queuing was noted with the movement. During the PM peak hour period, queuing was observed for the northbound movement along Douglas Street at Colbern Road. At times, the queue was noted to extend to the I-470 Westbound Ramp terminal, with all vehicles clearing within one cycle. The queue was noted to extend past the I-470 Westbound Ramp terminal a limited number of times; when this occurred, vehicles were noted to not block the ramp intersection. Queuing was also observed for the southbound right-turn movement along Douglas Street between Colbern Road and the I-470 Westbound Ramp terminal. Although heavy movements experienced longer queueing during both peak hours, the majority of vehicles entering the study area were serviced within a reasonable period of time.

FIGURE 2

Existing Plus Approved Development Conditions
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO



3. EXISTING PLUS APPROVED DEVELOPMENT CONDITIONS

Existing plus approved development traffic conditions were evaluated to identify any existing deficiencies and to provide a baseline for comparative purposes. As noted in **Section 2.0**, this section includes the consideration of several approved development studies. Additionally, planned improvements to Colbern Road are represented as existing and consider the proposed ultimate road configuration.

With planned improvements to Colbern Road, it is anticipated that existing traffic patterns may adapt to better utilize the improved road network. Movements that may change to better utilize the improved network include the westbound left-turn movement at the intersection of Colbern Road and Douglas Street (transition from a left-turn movement to a westbound through) as well as the northbound right-turn movement at Douglas Street and Colbern Road (transition to an eastbound through). These changes to travel patterns could potentially impact operations at other study intersections throughout the network. For the purposes of this study, and to provide a more conservative estimate of operations (based on existing characteristics), potential re-distribution of trips was not represented.

3.1. Network Characteristics

Twelve roadways/drives within the study area were considered during analysis: Gregory Boulevard/Little Blue Road, Strother Road, 85th Street/St. Michael's High School Drive, Lee's Summit Road, Douglas Street, Douglas Road, Colbern Road, I-470, Main Street, Blue Parkway/Unity Way, M-350 and Pryor Road. Gregory Boulevard is referenced as Little Blue Road in Kansas City, Missouri (KCMO) to the west of Lee's Summit Road. For the purposes of this report, the roadway will be referenced as Gregory Boulevard.

Within the study area, the north/south roadway changes naming convention from Douglas Street to Lee's Summit Road. North of Colbern Road, Douglas Street forms a T-intersection with Lee's Summit Road. The street naming convention of the main road changes at this location, with Douglas Street forming the minor (east) leg and the major (south) leg at the intersection and Lee's Summit Road forming the other major (north) leg at the intersection. For the purposes of this report, the minor (east) leg of this intersection is referred to as Douglas Road.

Maintenance of portions of Gregory Boulevard, Lee's Summit Road, Colbern Road and Pryor Road is split between Kansas City and Lee's Summit. Gregory Boulevard west of Lee's Summit Road is called Little Blue Road and is maintained by Kansas City. Gregory Boulevard east of Lee's Summit Road is maintained by Lee's Summit. The maintenance transition of Lee's Summit Road occurs between 85th Street and Douglas Road. The north portion is maintained by Kansas City. The south portion is maintained by Lee's Summit. Colbern Road is maintained by the City of Lee's Summit through the study area from Pryor Road east. West of Pryor Road,

Colbern Road is maintained by Kansas City. Pryor Road in the vicinity of Colbern Road is maintained by Kansas City. South of Colbern Road (approximately ¼ mile), Pryor Road is maintained by Lee's Summit.

Functional classification for roadways maintained by MoDOT was acquired referencing MoDOT's *Functional Classification Map.* Functional classification for roadways maintained by Kansas City was acquired referencing Kansas City's *Major Street Plan.* Functional classification for roadways maintained by Lee's Summit was acquired referencing the City of Lee's Summit *Existing Functional Classification Map*.

Current network characteristics were determined and are summarized in **Table 2**.

Table 2. Existing Network Summary.

Roadway	Functional Classification	Maintaining Jurisdiction	Typical Section	Median Type	Posted Speed
I-470	Interstate	MoDOT	4-Lane	Divided	65 mph
Gregory Boulevard (East of Lee's Summit Road)	Minor Arterial	Lee's Summit	2-Lane	Undivided	35 mph
Gregory Boulevard (Little Blue Road)	Local Link	Kansas City	2-Lane	Undivided	40 mph
Strother Road	Minor Arterial	Lee's Summit	2-Lane	Undivided	45 mph
85th Street	Local Link	Kansas City	2-Lane	Undivided	25 mph*
St. Michael's High School	Private Drive	Private	2-Lane	Undivided	25 mph*
Lee's Summit Road	Major Arterial	Transitions between Douglas St and 85th St; North – Kansas City; South – Lee's Summit	4-Lane north of Strother Rd, 3-Lane south of Strother Rd	Divided north of Strother Rd, undivided south of Strother Rd	40 mph north of Gregory; 45 mph south of Gregory
Douglas Road	Local	Lee's Summit	2-Lane	Undivided	25 mph
Douglas Street	Major Arterial	Lee's Summit	3-Lane	Undivided	45 mph
Colbern Road (east of Pryor Road)	Major Arterial	Lee's Summit	4-Lane	Divided	45 mph
Colbern Road (west of Pryor Road)	Local Link	Kansas City	4-Lane	Undivided	45 mph

**Speed limit not posted, assumed 25 mph for analysis purposes.*
***Planned roadway project*
****Not illustrated on Kansas City mapping*

Table 3a. Existing Network Summary, continued.

Roadway	Functional Classification	Maintaining Jurisdiction	Typical Section	Median Type	Posted Speed
Main Street	Commercial or Industrial Collector	Lee's Summit	2-Lane	Undivided	35 mph
Blue Parkway	Major Arterial	Lee's Summit	4-Lane	Divided	40 mph
Unity Way	Private Drive	Private	2-Lane	Undivided	25 mph*
M-350	Other Freeway and Expressway	MoDOT	4-Lane	Divided	60 mph
Pryor Road	***	Kansas City	2-Lane	Undivided	35 mph

**Speed limit not posted, assumed 25 mph for analysis purposes.*
***Planned roadway project*
****Not illustrated on Kansas City mapping*

The roadway typical section for Lee's Summit Road is a three-lane section for the majority of the study area. A two-way left-turn lane (TWLTL) is provided along the roadway from north of Colbern Road to north of Strother Road. North of Strother Road, the roadway section transitions to a four-lane, median divided to Gregory Road.

The City of Lee's Summit has adopted an Unimproved Road Policy to provide design guidelines for development activity impacting roadways that are constructed to unimproved/interim standards. The policy identifies an unimproved road as being narrow in width (<22 feet of pavement) consistent with a rural character, while an interim road is generally defined as a minimum of two 12-foot lanes with six-foot paved shoulders. According to this policy, no new residential subdivision, industrial, or commercial development will be permitted on unimproved roads. Development may be permitted on roadways improved to the interim standard until the roadway reaches its allowable capacity. Deviations to the policy are permitted with approval of the City Engineer. The current conditions of the study roadways under Lee's Summit jurisdiction are summarized in **Table 3**, as referenced from *Exhibit 6 – Existing Unimproved and Interim Roadways and Network Gaps* provided in the City of Lee's Summit *Thoroughfare Master Plan (TMP) 2015-2040*. Roadways that are neither illustrated as unimproved nor interim condition are labeled "street".

Table 4. Existing Lee's Summit Roadway Conditions.

Roadway	Pavement Width	Condition	Proximity to Development
Gregory Boulevard	15-foot lanes plus 6-foot shoulders	Street	1.3 mi north of project area
Strother Road	11-foot lanes plus 6-foot shoulders	Interim	0.9 mi north of project area
Lee's Summit Road	11-foot lanes plus 13-foot TWLTL plus 6-foot shoulders	Interim	East side of project area
Douglas Road	11-foot lanes plus 4-foot shoulders	Interim*	Northeast of project area
Douglas Street	11-foot lanes plus 13-foot TWLTL plus 6-foot shoulders	Interim	East side of project area
Colbern Road	12-foot lanes	Street**	Bisects project area
Main Street	11-foot lanes	Unimproved	West side of project area
Blue Parkway	11-foot lanes	Street	1.2 mi west of project area

**Identified as "unimproved" in the City's TMP but was recently constructed to interim standards at the intersection of Lee's Summit Road.*
***Identified as "interim" in the City's TMP, anticipated to meet street standards with planned project.*

Table 4 illustrates control type for each study intersection as well as basic intersection characteristics. Planned improvements associated with the Colbern Road project are reflected in the table.

Table 5. Existing Study Intersection Summary.

Intersection	Maintaining Jurisdiction	Traffic Control Method	Dedicated Left-Turn Lanes	Dedicated Right-Turn Lanes
Lee's Summit Road at Gregory Boulevard	Kansas City	Signalized	All directions	Eastbound, westbound, northbound
Lee's Summit Road at Strother Road	Kansas City	Unsignalized	Southbound	Northbound
Lee's Summit Road at 85th Street/St. Michael's High School Drive	Kansas City	Unsignalized	Northbound, southbound, westbound	Northbound
Lee's Summit Road/ Douglas Street at Douglas Road	Lee's Summit	Unsignalized	Southbound	-
Douglas Street at Colbern Road	Lee's Summit	Signalized	All directions; dual westbound	All directions
Douglas Street at I-470 Westbound Ramp	MoDOT	Signalized	Dual northbound, westbound	Dual southbound
Douglas Street at I-470 Eastbound Ramp	MoDOT	Signalized	Southbound, dual eastbound	Eastbound, northbound
Colbern Road at Main Street	Lee's Summit	Unsignalized	-	-
Colbern Road at Blue Parkway/Unity Way	Lee's Summit	Roundabout	-	Eastbound, northbound
Colbern Road at M-350 Northbound Ramp	MoDOT	Signalized	Eastbound	Northbound
Colbern Road at M-350 Southbound Ramp	MoDOT	Signalized	Westbound	Southbound
Colbern Road at Pryor Road	Kansas City	Unsignalized	-	-

3.2. Existing Site Characteristics

The majority of the proposed development site is currently vacant. The property is bordered by vacant property to the west, I-470 to the south, large lot single family residential to the north, and the Lee's Summit Municipal Airport to the east.

3.3. Existing plus Approved Development Warrant Analysis

***Turn Lane Warrants*:** City of Lee's Summit Access Management Code (AMC) guidelines were reviewed for turn lanes along study area roadways under Lee's Summit jurisdiction. MoDOT's EPG was reviewed for turn lanes along study area roadways under MoDOT and KCMO jurisdiction.

Left-turn Lanes:

Lee's Summit (based on AMC): *Left-turn lanes shall be provided on all approaches to intersections controlled by a signal.* Turn lanes are provided as recommended at signalized intersections.

Left-turn lanes shall be required at all median openings. Reviewing design plans for the Colbern Road corridor, a left-turn lane is not planned to be provided westbound at the intersection of Colbern Road and Main Street.

Left-turn lanes shall be provided on all arterial streets at the intersection with another arterial or collector street. Turn lanes are provided as recommended.

Left-turn lanes shall be provided on collector streets at the intersection with a connector serving non-residential development where the left-turn volume is at least 30 vehicles in any hour. Left-turn lanes are provided as recommended. Reviewing Colbern Road design plans, it appears that road width along Main Street at the intersection approach will support a dedicated northbound left turn lane.

Left-turn lanes should be provided on non-residential connectors intersecting with arterial streets where the left turn volume is at least 20 vehicles in any hour. Left-turn lanes will be monitored as access is provided for development in later study phases.

Dual left-turn lanes should be planned for all approaches on an arterial/arterial intersection. Reviewing the intersection of Colbern Road and Douglas Street, dual left-turn lanes are currently provided for the westbound approach. Accommodating dual left-turn lanes for the northbound and southbound approaches may be limited due to the proximity of the intersection to I-470 and the airport. The intersection will be monitored under development scenarios for turn lane needs.

Existing turn bay lengths do not meet the recommended turn bay length for an arterial intersecting an arterial at the intersection of Douglas Street and Colbern Road. Based on the AMC, a 250-foot left-turn lane should be provided at an arterial/arterial intersection. The existing northbound left-turn lane at the intersection does not meet the recommended minimum length. The planned reconstruction of the eastbound left-turn lane is for a length of 200-feet. This does not meet the minimum turn lane requirement for an arterial roadway. It appears that the design

plans for the southbound and westbound left-turn lanes will meet recommended minimum storage length.

Kansas City/MoDOT (based on EPG): Left-turn lanes are currently provided at all intersections except for Colbern Road and Pryor Road. No left-turn lanes are warranted under existing conditions.

Right-turn Lanes:

Lee's Summit (based on AMC): *Right-turn lanes shall be provided on major arterial streets with a right turn movement of 30 vehicles in any hour, and along minor arterial streets with a right turn movement of 60 vehicles in any hour at each intersecting street or driveway.* Based on this criteria, an eastbound right-turn lane is recommended at the intersection of Colbern Road and Main Street. Reviewing design plans, a right-turn lane is not planned for this location. Westbound and southbound right-turn lanes are planned to be provided at the intersection of Colbern Road and Douglas Street under the Colbern Road improvement project.

Existing turn bay lengths do not meet the recommended turn bay length for an arterial intersecting an arterial at the intersection of Douglas Street and Colbern Road. Based on the AMC, a 250-foot right-turn lane should be provided at an arterial/arterial intersection. The existing northbound right-turn lane at the intersection does not meet the recommended minimum length. The planned reconstruction of the eastbound, southbound and westbound right-turn lanes appears to be for a length of 200-feet. This does not meet the minimum turn lane requirement for an arterial roadway. All other existing turn bays meet recommended turn bay length.

Kansas City/MoDOT (based on MoDOT EPG): Right-turn lane warrants were reviewed for movements with a turn lane not currently provided. Reviewing warrant criteria, no right-turn lanes are currently warranted at intersections under KCMO or MoDOT jurisdiction.

Capacity analysis is presented in **Section 3.4** for existing plus approved development conditions to determine if additional turn lanes and/or storage length is recommended based on expected operations. Turn lane warrant analysis sheets are provided in **Appendix B**.

Signal Warrants: A traffic signal may be justified if traffic conditions meet any of the applicable nine signal warrants described in the 2009 Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides criteria for conducting an engineering study to determine whether a traffic signal is appropriate at any intersection. At locations where the speed limit on the major street exceeds 40 mph, the 70% factor was utilized as directed within the MUTCD. Based on the data available, the Peak Hour Signal Warrant (Warrant 3) was evaluated for the following existing unsignalized study intersections. Signal warrant evaluation is limited to the

peak hour warrant due to balancing existing volumes along the network and the addition of approved development trips to the network.

- Lee's Summit Road and Strother Road
- Lee's Summit Road and 85th Street/St. Michael's High School Drive
- Lee's Summit Road and Douglas Road
- Colbern Road and Main Street
- Colbern Road and Pryor Road

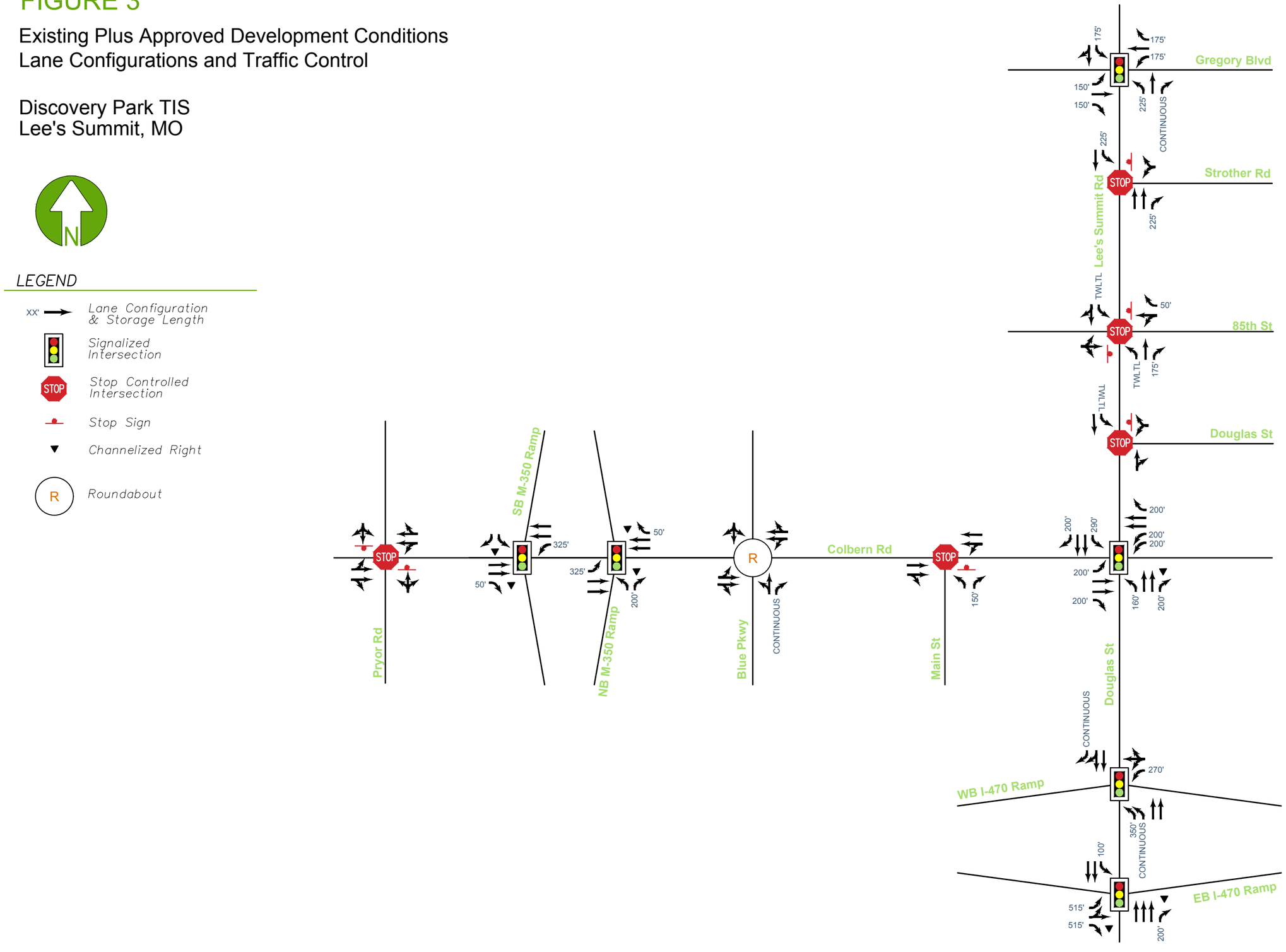
Based on existing plus approved development traffic volumes, the unsignalized study intersections do not currently warrant signalization. Signal warrant analysis sheets are provided in **Appendix B**.

Existing plus approved development lane configuration and traffic control for the study network are illustrated in **Figure 3**.

FIGURE 3

Existing Plus Approved Development Conditions
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO



3.4. Existing plus Approved Capacity Analysis

Capacity analysis was conducted for the study intersections utilizing the planned lane configurations and traffic control as presented in **Section 3.1**. Adjacent signalized intersections south of I-470 were included in analysis to reflect Douglas Street as a coordinated system; operational results of those intersections are not provided with this study. Existing base signal timings were retained with the additional geometrics. Analysis was conducted using Synchro Version 11 and SIDRA Version 9.0 based on the Highway Capacity Manual (HCM) delay methodologies. The latest HCM 6th Edition methodology was used for this study when possible, which included all study intersections with the exception of Douglas Street with the I-470 Westbound and Eastbound Ramps. These two intersections were analyzed using HCM 2000 methodology because the 6th Edition does not support analysis for turning movements with both shared and exclusive lanes.

For simplicity, the amount of control delay is equated to a grade of Level of Service (LOS) based on thresholds of driver acceptance. The amount of delay is assigned a letter grade A through F, LOS A representing little or no delay and LOS F representing very high delay. **Table 5** illustrates the delays associated with each LOS grade for signalized and unsignalized intersections. Queueing is evaluated considering the 95th percentile queue length. The 95th-percentile queue represents the queue length that has a 5 percent probability of being exceeded during the peak hour.

Table 6. Intersection LOS Criteria.

Level-of-Service	Average Control Delay (seconds)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50
Highway Capacity Manual		

The City of Lee's Summit references a Level of Service Policy to provide guidelines for acceptable traffic operations on its roadways. According to the policy, an overall LOS C is desirable at signalized intersections, and a LOS D may be acceptable under extraordinary circumstances. Based on discussions with City staff, individual signalized movements with a LOS D or E are considered acceptable. A LOS C is desirable at unsignalized intersections, and lower levels of service may be acceptable depending on the situation. The City of Kansas City

typically considers an intersection LOS D as being acceptable. MoDOT considers an overall LOS C acceptable at intersections, with LOS D acceptable under peak conditions.

All signalized study intersections are expected to operate at a LOS C or better overall except Douglas Street and Colbern Road during the PM peak hour period, as illustrated in **Table 6**. The individual signalized movements that are expected to operate at a LOS E or worse are listed in **Table 6** below. Unsignalized movements are expected to operate at LOS D or better with acceptable queues during the AM and PM peak hour periods.

Table 6. Existing plus Approved Development Conditions Capacity Analysis.

Intersection *(Movement)*	AM Peak Hour Period		PM Peak Hour Period	
	LOS (Delay, sec)	95th-Percentile Queue (ft)	LOS (Delay, sec)	95th-Percentile Queue (ft)
Douglas Street and Colbern Road	**C (26.5)**	**-**	**D (42.8)**	**-**
Westbound Left-Turn	*B (18.9)*	*314*	*F (115.7)*	*#392*
Douglas Street and I-470 Westbound Ramp	**C (30.8)**	**-**	**C (23.5)**	**-**
Southbound Right-Turn	*E (63.9)*	*109*	*D (40.1)*	*m75*
Douglas Street and I-470 Eastbound Ramp	**B (17.1)**	**-**	**B (17.3)**	**-**
Southbound Left-Turn	*D (46.4)*	*m<25*	*E (57.6)*	*m<25*
Lee's Summit Road and Gregory Boulevard	**B (17.3)**	**-**	**B (19.0)**	**-**
Colbern Road and M-350 Southbound Ramp	**B (13.4)**	**-**	**B (17.1)**	**-**
Colbern Road and M-350 Northbound Ramp	**A (5.8)**	**-**	**A (6.5)**	**-**
Colbern Road and Blue Parkway (Roundabout)	**A (3.9)**	**-**	**A (5.0)**	**-**

- 95th-percentile queue exceeds capacity.

m – Volume for 95th-percentile queue is metered by upstream signal.

The westbound left turn movement at the intersection of Douglas Street and Colbern Road currently operates with a lower level of service, with similar operations expected with the addition of approved development trips. This analysis scenario considers planned improvements along Colbern Road; consideration should be given to extending the westbound left turn bay storage under the planned improvement project if feasible. **Section 3.3** identifies locations that do not meet turn lane standards under existing conditions. Capacity analysis was reviewed, and it was determined that no additional turn lanes and/or storage length are recommended at this time based on existing operations.

The existing plus approved development conditions capacity analysis summary is illustrated in **Figure 4**. Detailed capacity analysis results are provided in **Appendix B**.

3.4.1 Existing plus Approved Development Simulation

A simulation model was developed for both the M-350 Interchange as well as the I-470 Interchange with a specific focus on the interaction of I-470 with the intersection of Colbern Road and Douglas Street. The simulation model was developed as a tool to supplement capacity analysis conducted using Synchro and to provide a visual representation of the corridor. The simulation model was developed using SimTraffic software and calibrated based on visual observations noted during field review. For the purposes of development of the I-470 and Douglas Street simulation model, two additional intersections, one along Douglas Street south of the interchange and one along Colbern Road east of Douglas Street, were included in the model to better represent arrival patterns into the network. The simulation represents AM and PM peak hour periods considering the existing volumes and existing signal timings. Lane utilization within the network was considered and adjusted based on field observations of the study area.

Simulation models were adjusted consistent with MoDOT EPG Section 905.3.5.3.1, including lane alignment, origin destination, and simulation modeling run parameters. The simulation represents AM and PM peak hour periods considering the existing volumes and existing signal timings. Simulation models were recorded for 5 runs during each AM and PM peak period for a one-hour period with 15-minutes for network seeding. Lane utilization within the network was considered and adjusted based on field observations of the study area.

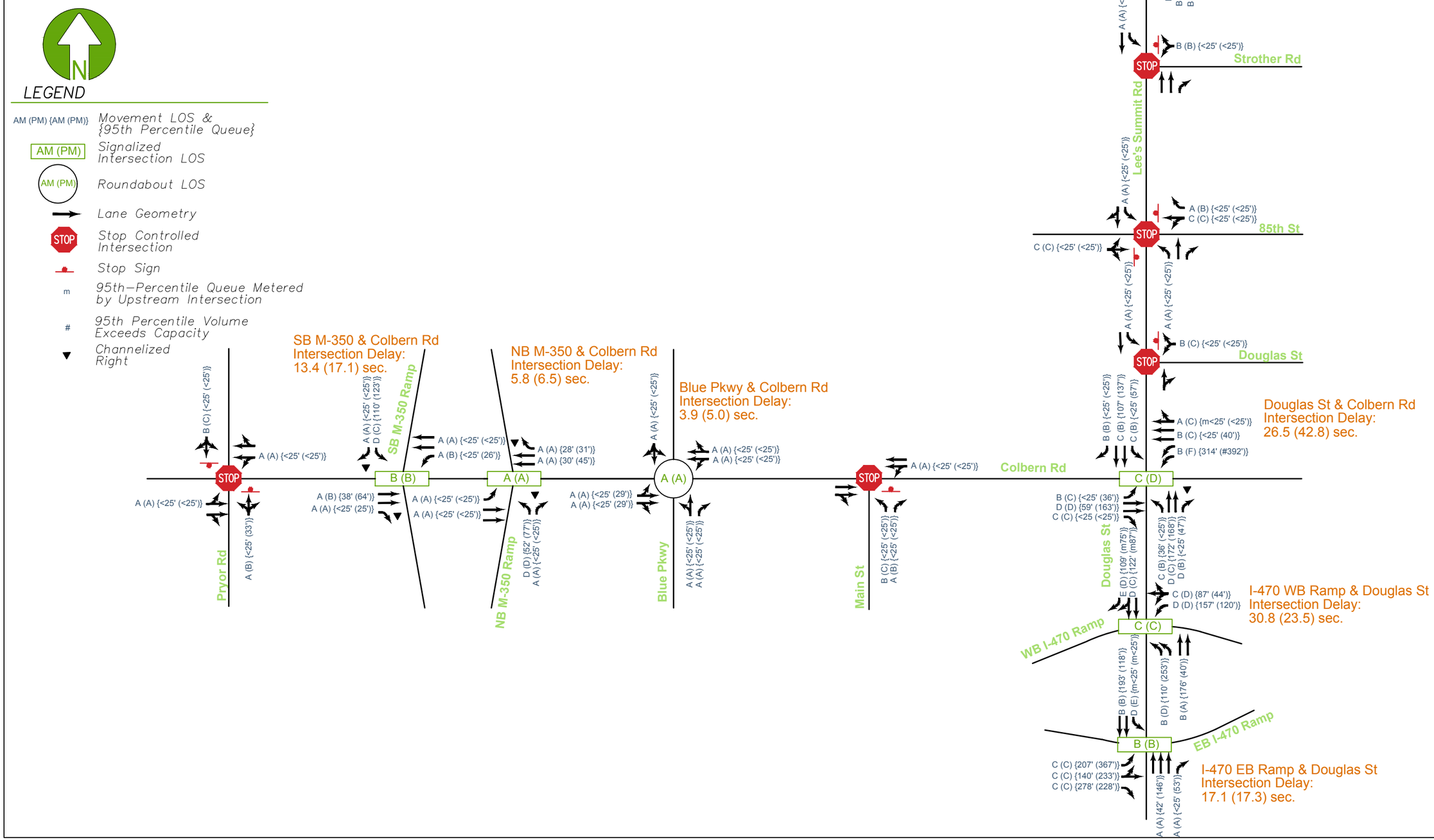
The existing conditions simulation model was compared to field observations to set a baseline for model calibration. The simulation model for M-350 and Colbern Road was noted to operate similarly to observed conditions. The simulation model for I-470 and Douglas Street appeared to operate slightly better than conditions observed in the field. Aspects of the simulation model were then further adjusted based on guidance included within the MoDOT EPG and conversations with MoDOT staff to better replicate field conditions, including driver parameters. In addition to driver parameter changes, two 15-minute run periods were coded to consider peak hour factor traffic characteristics in alignment with peaking characteristics of the study interchange areas. These adjustments were seen to result in more accurate simulation runs at the Douglas Street and I-470 interchange area, where drivers are generally more cautious, slower to react, and more courteous than the default simulation values. As congestion within the study area occurs, these driver parameters may be adjusted to reflect more aggressive driver tendencies which are typically associated with increased congestion and delay. Simulation results for the existing scenario and a summary of simulation adjustment factors is provided in **Appendix B**.

Approved development trips were added to the existing scenario to develop a simulation model for existing plus approved development conditions. The simulation model represents the consideration of approved development and planned improvements to Colbern Road, thus field observations of the study area under existing conditions may not directly reflect what may occur with the addition of approved development. Reviewing operations of the existing plus approved development simulation model, operational improvements are expected with the planned improvements to Colbern Road. Similar operations are expected at the interchange as observed under existing conditions. Simulation results for the existing plus approved scenario is provided in **Appendix B**.

FIGURE 4

Existing Plus Approved Development Conditions Capacity Analysis

Discovery Park TIS
Lee's Summit, MO



4. PROPOSED LAND USE AND SITE CHARACTERISTICS

The proposed development is a mixed-use site with planned development in three phases. The proposed site plan is shown in **Figure 5** with planned phasing noted. Phase 1 will be considered under existing year conditions. Phase 2 will be considered under a build year of 2027 (plus 5 years of background traffic growth). Phase 3 will be considered under a build year of 2032 (plus 10 years of background traffic growth).

The planned development considers five zones. Phase 1 considers zone 1, phase 2 considers zones 2 and 3, and phase 3 considers zones 4 and 5. A detailed development plan for planned development in the northwest quadrant of Lee's Summit Road and Douglas Road has not been established. Based on conversations with the development team, this area is expected to be developed under residential and senior living uses. **Table 7** summarizes the land uses considered in each phase of development. Land uses may represent several different buildings within the development phase. A detailed development plan for zones 1 and 2 is provided in **Appendix C**.

Table 7. Proposed Development Summary.

Development Phase	Land Use	Square Footage/Units
Phase 1 (Zone 1)	Multi-Family Housing	1,094 Units
	Single-Family Housing	16 Units
	Health/Fitness Club	6,500 SF
	Retail	19,000 SF
	General Office	13,800 SF
	Sit-Down Restaurant	22,700 SF
	Hotel	219 Rooms
Phase 2 (Zones 2 and 3)	Multi-Family Housing	332 Units
	Grocer	50,000 SF
	Retail	59,000 SF
	General Office	20,000 SF
	Convenience Store/Gas Station	5,700 SF, 16 Pumps
	Sit-Down Restaurant	52,000 SF
	Fast-Food Restaurant (with Drive-Through)	5,700 SF
	Car Wash	5,700 SF
	Entertainment Venue	50,000 SF
	Medical Office Building	36,000 SF
Phase 3 (Zones 4 and 5)	Multi-Family Housing	1,600 Units
	Single-Family Housing	120 Units
	Retail	66,000 SF
	General Office	40,000 SF
	Medical Office Building	90,000 SF
	Sit-Down Restaurant	18,000 SF
	Retirement Community	30 Units
	Senior Living	250 Units

FIGURE 5

Master Plan

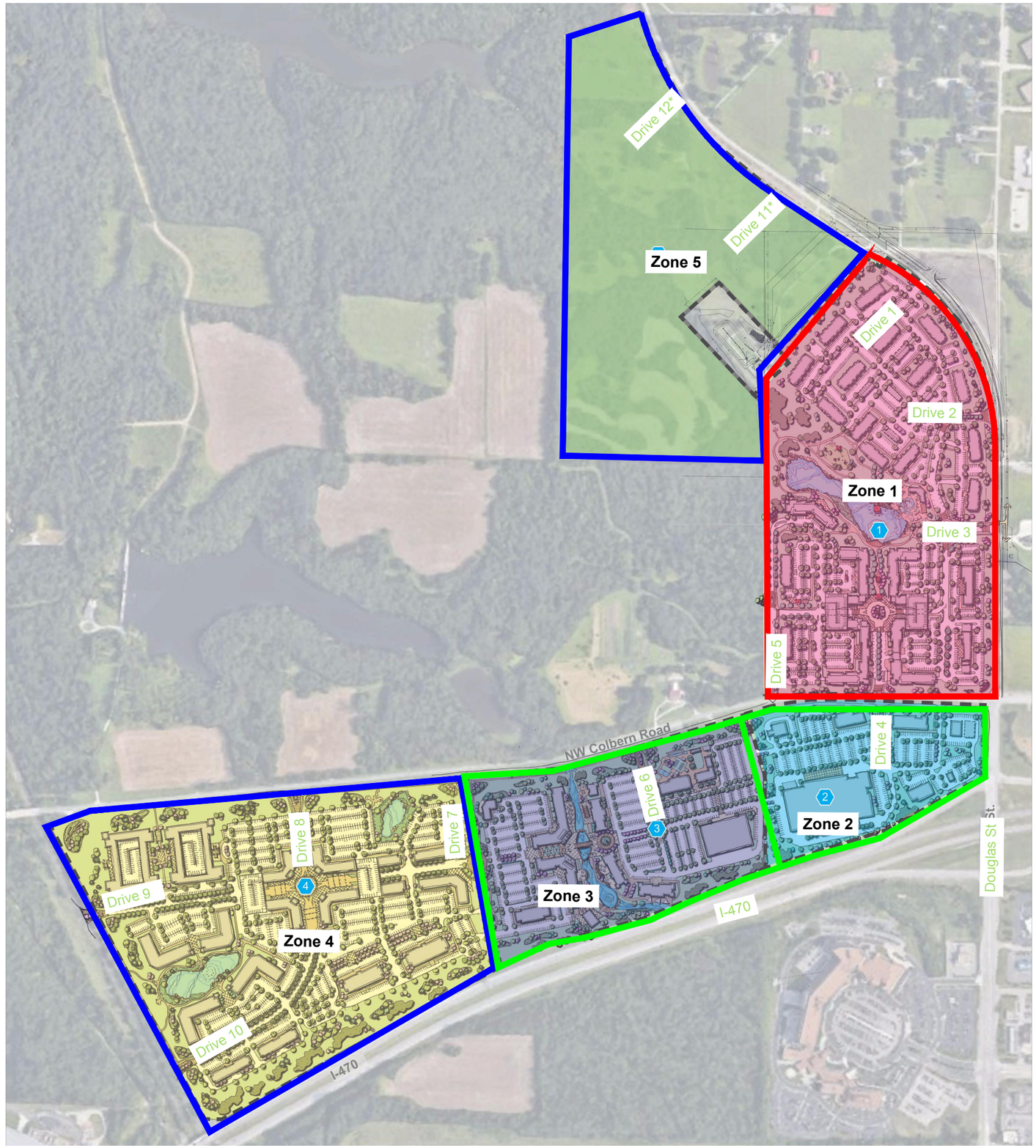
Discovery Park TIS
Lee's Summit, MO

N

LEGEND

- *Phase 1 Development*
- *Phase 2 Development*
- *Phase 3 Development*

* **General Location, access not defined**



NOT TO SCALE

4.1. Proposed Development Trip Generation and Distribution

To determine the impact of potential site traffic on the roadway network, expected trips associated with the proposed development were generated and applied to the study network. The Institute of Transportation Engineers (ITE) provides methods for estimating traffic volumes of common land uses in the Trip Generation Manual (11th Edition).

Based on the *ITE Trip Generation Manual*, trip generation characteristics were developed for the proposed site. Trip generation characteristics expected for each phase of the site are shown in **Table 8**. This table represents a summary of the trip generation; detailed ITE trip generation information for each phase is provided in subsequent sections.

Table 8. Proposed Development Trip Generation Summary.

Phase	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
		Total	Enter	Exit	Total	Enter	Exit
Phase 1	11,682	850	334	516	1,040	607	433
Phase 2	29,511	1,817	959	858	2,617	1,355	1,262
Phase 3	18,501	1,483	663	820	2,058	1,038	1,020
TOTAL	**59,694**	**4,150**	**1,956**	**2,194**	**5,715**	**3,000**	**2,715**

As illustrated in **Section 3.0**, the proposed site is a mixed-use development consisting of a variety of residential, office, retail, and entertainment uses. When a site supports multiple uses, internal capture can be considered. Internal capture represents the portion of trips generated within a site that begin and end within the development; the trips stay within the site and do not access the external road network. Within each phase of development for this site, there are designated 'zones', or specific development areas. For the purposes of this study, internal capture was not considered between zones, as it is anticipated that the external road network will need to be used to travel between developments. However, internal capture was considered within each zone, representing trips that may stay within a specific area. This approach was presented to reviewing agencies and approved. **Table 9** summarizes total trip generation considering internal capture. Internal capture processes are not applicable to daily trips, thus internal capture was only applied to AM and PM peak hour trips. Internal capture was not considered for the zone 5 area proposed as senior living, retirement community, single and multifamily housing, as the only use supported in that area is residential.

Pass-by is another consideration when reviewing trip generation for a site. Pass-by trips represent those trips associated with a site that are already on the roadway network; these trips do not represent new trips to a roadway system. Reviewing the proposed uses for the site,

proposed access, and existing trips on the roadway network, pass-by was not considered for the purposes of this study.

Table 9. Proposed Development Trip Generation Summary, with Internal Capture.

Phase	AM Peak Hour Trips			PM Peak Hour Trips		
	Total	Enter	Exit	Total	Enter	Exit
Phase 1	746	283	463	817	498	319
Phase 2	1,761	930	831	1,902	997	905
Phase 3	1,179	521	658	1,650	827	823
TOTAL	**3,686**	**1,734**	**1,952**	**4,369**	**2,322**	**2,047**

Trips were distributed through the network based on the existing gravity, anticipated land use, and review of the surrounding area. Directional trip distribution percentages expected for the site are illustrated in **Table 10**.

Table 10. Proposed Development Trip Distribution.

Direction	Trip Distribution
Colbern Road (West)	5%
Pryor Road (South)	3%
M-350 (North)	10%
M-350 (South)	10%
Blue Parkway (South)	5%
Main Street (South)	2%
Douglas Street (South)	10%
I-470 (West)	15%
I-470 (East)	10%
Colbern Road (East)	15%
Strother Road (East)	3%
Lee's Summit Road (North)	5%
Gregory Boulevard (West)	2%
Gregory Boulevard (East)	5%
TOTAL	**100%**

Detailed trip generation and distribution associated with each phase of development is provided under each scenario reviewed, later in this report.

4.2. Proposed Access Characteristics

4.2.1 Access Spacing

Eleven access points are proposed with the development project. Operational analysis of each access will be presented under relevant scenarios. This section presents a review of proposed access for compliance with applicable agency standards. **Table 11** illustrates planned access for the site including access type as proposed on the site plan. **Figure 6** illustrates access to the site with proposed access spacing.

Table 11. Proposed Access Summary.

Access Point	Public Roadway Intersected	Proposed Access Type	Notes
Drive 1	Lee's Summit Road/Douglas Street	Full Access	Aligns with Douglas Road, services Phase 1
Drive 2	Douglas Street	Full Access	Services Phase 1
Drive 3	Douglas Street	Full Access	Services Phase 1
Drive 4	Colbern Road	Right-In / Right-Out	Services Phases 1 and 2 Development
Drive 5	Colbern Road	Full Access	Services Phases 1 and 2
Drive 6	Colbern Road	Full Access	Services Phase 2
Drive 7	Colbern Road	Full Access	Services Phases 2 and 3
Drive 8	Colbern Road	Full Access	Services Phases 2 and 3
Drive 9	Main Street	Full Access	Services Phase 3
Drive 10	Main Street	Full Access	Services Phase 3
Drive 11*	Douglas Street	Full Access	Services Phase 3
Drive 12*	Douglas Street	Full Access	Services Phase 3

**Drives 11 and 12 represent a general presentation of access to service the senior living and residential portion of Zone 5 development. Location, access type, and geometric characteristics of these drives were not available at the time of writing of this report.*

All access is proposed along City of Lee's Summit maintained roadways; thus, review of proposed access spacing was conducted under consideration of the City of Lee's Summit Access Management Code (AMC).

Per the City of Lee's Summit AMC, *Section 15* provides guidance on connection spacing standards. *Section 15.1* presents criteria relevant to proposed access along Lee's Summit Road

and Main Street. Referencing that section, the following criteria were considered when reviewing access along Lee's Summit Road and Main Street:

- Connections shall be outside the functional area of an intersection.
- Connection spacing shall support any warranted and/or recommended right or left-turn lanes.
- Connectors shall align across the public roadway unless a restrictive median is in place.
- Spacing along the roadway (centerline to centerline):
    - Major arterial (Lee's Summit Road) – 660 feet
    - Industrial/Commercial Collector (Main Street) – 300 feet

Section 13 of the Lee's Summit AMC discusses median opening standards. Colbern Road is planned to be constructed with a center median within the limits of the proposed development. Referencing *Section 13.1*, the following criteria were considered when reviewing access along Colbern Road:

- No median openings within the functional area of an intersection.
- Full median openings along arterial roadways (Colbern Road) must meet ¼ mile (1,320 feet) spacing
- Directional median openings may be provided at any drive location that meets connection spacing requirements.

Functional area of intersections, recommendation of turn lanes, and operational analysis will be considered under each analysis scenario. The following summarizes proposed access spacing and location. Intersection measurements are measured from center to center of intersection.

Drive 1: Drive 1 is located along Lee's Summit Road/Douglas Street and is proposed to align at the intersection with Douglas Road. Alignment of the access across the main public roadway is a preferred access management consideration. Drive 1 is located approximately 620 feet southeast of an existing private drive; this private drive is gated and is expected to service a low volume of traffic. Based on previous conversations with agency staff, private gated drives were not considered when reviewing access spacing compliance.

Drive 2: Drive 2 is located along Douglas Street approximately 890 feet south of Drive 1/Douglas Road. The drive is proposed approximately 250 feet north of an existing, gated access associated with the Lee's Summit airport. The existing drive is expected to service a low volume of traffic and was not considered when reviewing access spacing compliance.

Drive 3: Drive 3 is located along Douglas Street approximately 650 feet south of Drive 2 and 960 feet north of Colbern Road. Drive 3 is located in the general proximity of an existing, gated access; the drive is expected to service a low volume of traffic and was not considered when

reviewing access spacing compliance. However, design of Drive 3 and any improvements along Lee's Summit Road should consider the existing gated drive.

Drive 4: Drive 4 is located along Colbern Road approximately 650 feet west of Douglas Street. The access is proposed as a right-in/right-out intersection servicing phase 1 and 2 development. The proposed access was restricted in order to meet Lee's Summit recommended minimum spacing and reduce conflict with the signalized intersection of Colbern Road and Douglas Street.

Drive 5: Drive 5 is located along Colbern Road approximately 610 feet west of Drive 4. The access is proposed as a full access intersection servicing phase 1 and 2 development. The proposed drive is located approximately 1,260 feet west of the intersection of Colbern Road and Douglas Street, slightly under the recommended minimum spacing of 1,320 feet. Reviewing the proposed site plan, Drive 5 is located along the western edge of the property line for the north property (phase 1 development). Alignment of drives servicing phase 1 and 2 development across Colbern Road is preferred.

Drive 6: Drive 6 is located along Colbern Road approximately 800 feet west of Drive 5. The proposed full access spacing/median break does not meet Lee's Summit recommended minimum spacing.

Drive 7: Drive 7 is located along Colbern Road approximately 1,020 feet west of Drive 6. The proposed full access spacing/median break does not meet Lee's Summit recommended minimum spacing.

Drive 8: Drive 8 is located along Colbern Road approximately 940 feet west of Drive 7 and 1,290 feet east of Main Street. The proposed full access spacing/median break does not meet Lee's Summit recommended minimum spacing.

Drive 9: Drive 9 is located along Main Street approximately 620 feet south of Colbern Road. Access spacing meets recommended guidance.

Drive 10: Drive 10 is located along Main Street approximately 960 feet south of Drive 9. Access spacing meets recommended guidance.

Drives 11/12: At the time of the writing of this report, location of Drives 11 and 12 were not available. Access spacing should follow relevant agency guidance.

4.2.2. Access Characteristics

Access Throat Length and Driveway Width

Throat length of an access point refers to the length of approach provided within the development site approaching the intersection with the public roadway. The proposed width was

measured at the intersection of the access with the public street network. **Table 12** summarizes proposed characteristics of planned development.

Table 12. Access Characteristics

Proposed Access	Public Roadway Intersected	Access Type	Proposed Throat Length	Proposed Width	Median Divided
Drive 1	Lee's Summit Road/Douglas Street	Full Access	90 feet	42 feet	No
Drive 2	Douglas Street	Full Access	380 feet	64 feet	Yes
Drive 3	Douglas Street	Full Access	60 feet entering/220 feet exiting	64 feet	Yes
Drive 4 (north side)	Colbern Road	Right-In / Right-Out	70 feet	50 feet	Yes
Drive 4 (south side)	Colbern Road	Right-In / Right-Out	90 feet	30 feet	Yes
Drive 5 (north side)	Colbern Road	Full Access	165 feet	56 feet	Yes
Drive 5 (south side)	Colbern Road	Full Access	135 feet	56 feet	Yes
Drive 6	Colbern Road	Full Access	135 feet	56 feet	Yes
Drive 7	Colbern Road	Full Access	120 feet	39 feet	Yes
Drive 8	Colbern Road	Full Access	195 feet	51 feet	Yes
Drive 9	Main Street	Full Access	245 feet	60 feet	Yes
Drive 10	Main Street	Full Access	270 feet	48 feet	Yes
Drives 11/12	Douglas Street	Geometric design not available.	-	-	-

All proposed drives are located along City of Lee's Summit roadways, thus access characteristics were reviewed referencing the City of Lee's Summit AMC. Lee's Summit driveway width criteria is based on projected peak hour and daily traffic volumes. Driveway width will be reviewed under capacity analysis for each scenario to determine if recommended agency guidance is followed.

Throat length standards for a proposed access is based on projected peak hour volumes, per the City of Lee's Summit AMC. Driveway throat length will be reviewed under capacity analysis for each scenario to determine if recommended agency guidance is followed.

Sight Distance

During design, sight distance should be reviewed for all proposed drive locations. Adequate sight distance should be provided.

5. EXISTING PLUS PHASE 1 DEVELOPMENT CONDITIONS

Conditions with phase 1 of the proposed development in place were evaluated to identify any potential geometric improvements that could be attributed to the additional traffic associated with phase 1 of the proposed development. Analysis of phase 1 conditions includes the existing year volumes plus approved development.

Phase 1 development is proposed to consist of a multi-family residential, single-family residential, health/fitness club, retail, office, restaurant, and hotel uses. **Figure 5** illustrates the phase 1 development plan.

5.1 Phase 1 Development Trip Generation and Distribution

Trip generation and proposed trip distribution for the site was presented in **Section 4.1**. To conduct trip distribution for phase 1, site generated trips were distributed to the network using the proposed access points. A detailed summary of peak hour trip generation by land use type and zone, considering internal capture, is shown in **Table 13**. Trip generation calculations by building and internal capture information for phase 1 are provided in **Appendix C.**

Table 13. Phase 1 (Zone 1) Development Trip Generation.

Land Use	Zone	Size	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Multifamily Housing	1	1,094 Units	409	95	314	445	291	154
Single-Family Housing	1	16 Units	8	2	6	6	4	2
Heath/Fitness Club	1	13,500 SF	8	4	4	18	11	7
Strip Retail Plaza	1	48,000 SF	39	23	16	96	51	45
Office Building	1	13,800 SF	27	23	4	25	5	20
Sit Down Restaurant	1	40,500 SF	189	101	88	164	104	60
All Suites Hotel	1	219 Units	66	35	31	63	32	31
Total Trips (All Zone 1)			**746**	**283**	**463**	**817**	**498**	**319**

The expected trip distribution and site trips for phase 1 are shown in **Figure 7.** The resulting existing plus phase 1 development volumes are illustrated in **Figure 8**.

FIGURE 6

Phase 1 Development Trip Distribution

Discovery Park TIS
Lee's Summit, MO

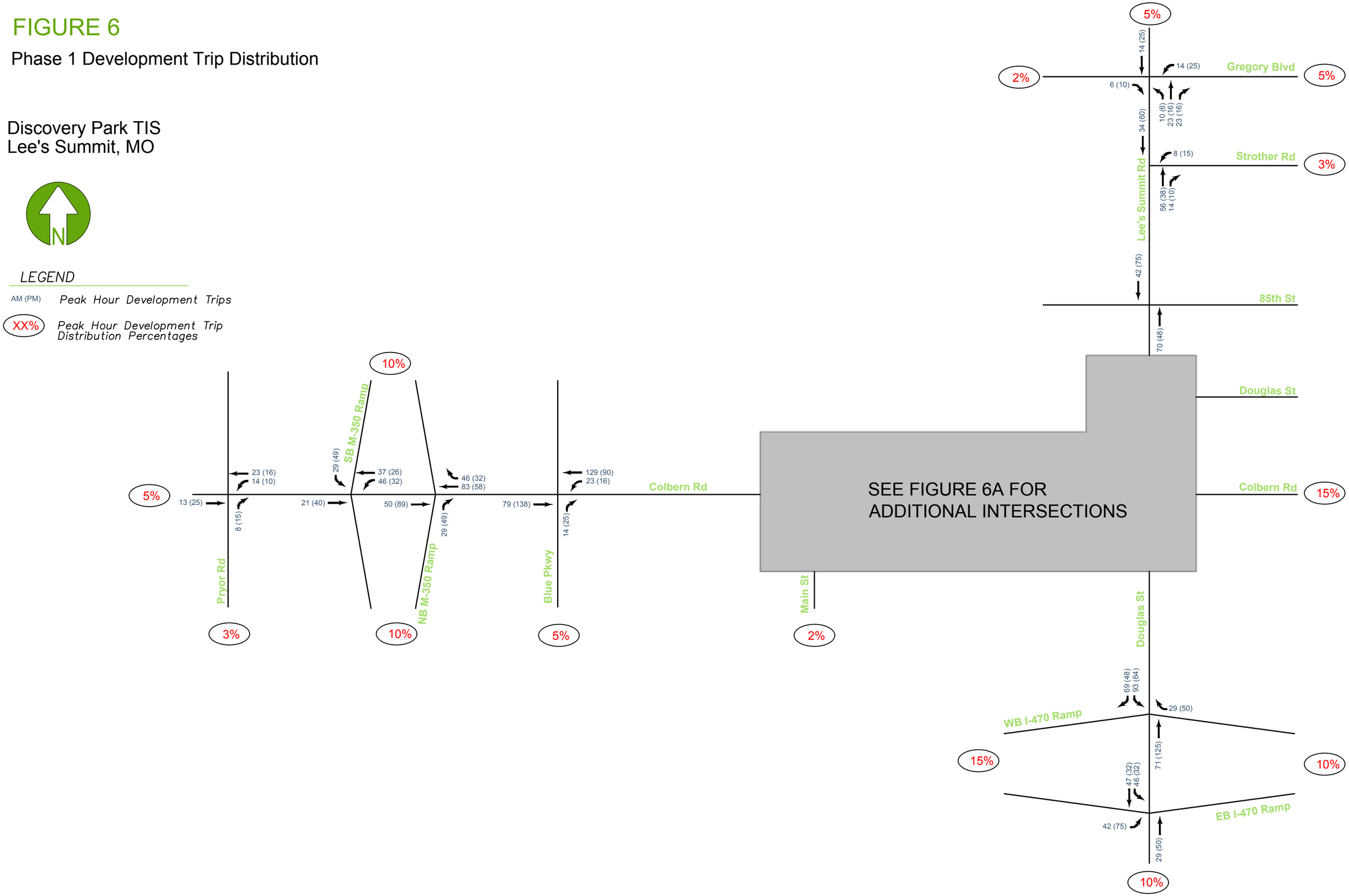


FIGURE 6A

Phase 1 Development Trip Distribution

Discovery Park TIS
Lee's Summit, MO

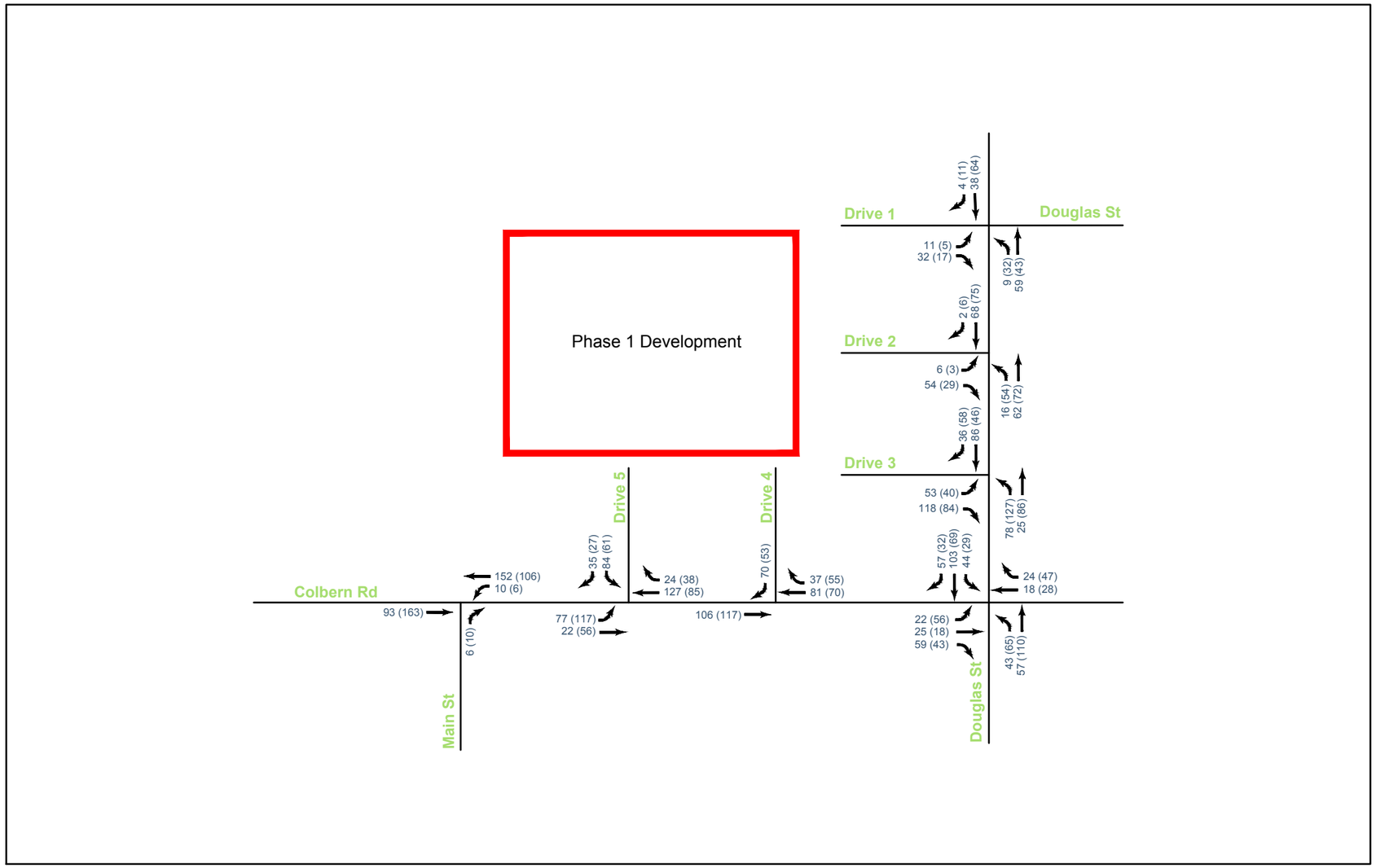


FIGURE 7

Existing Plus Phase 1 Development
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

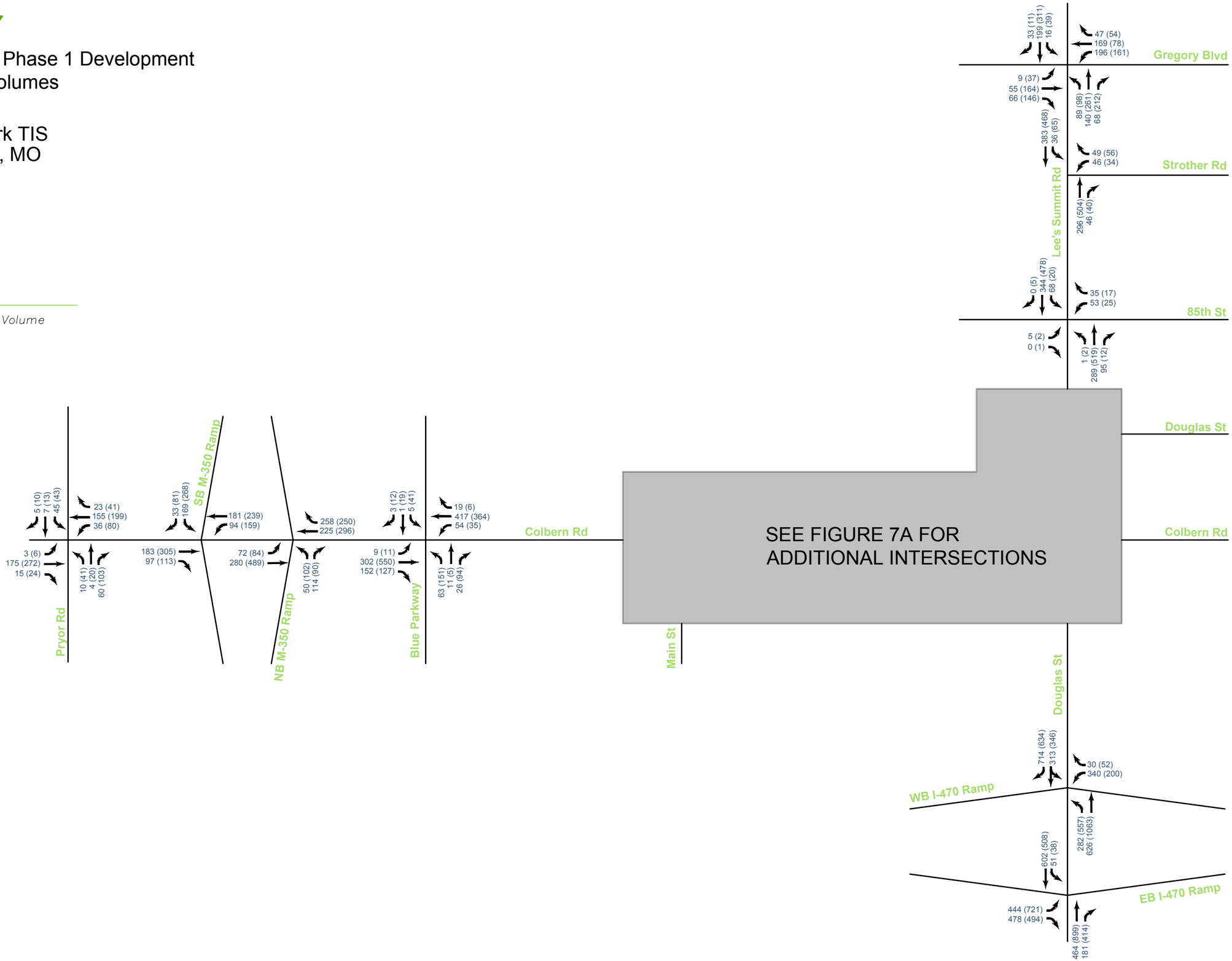


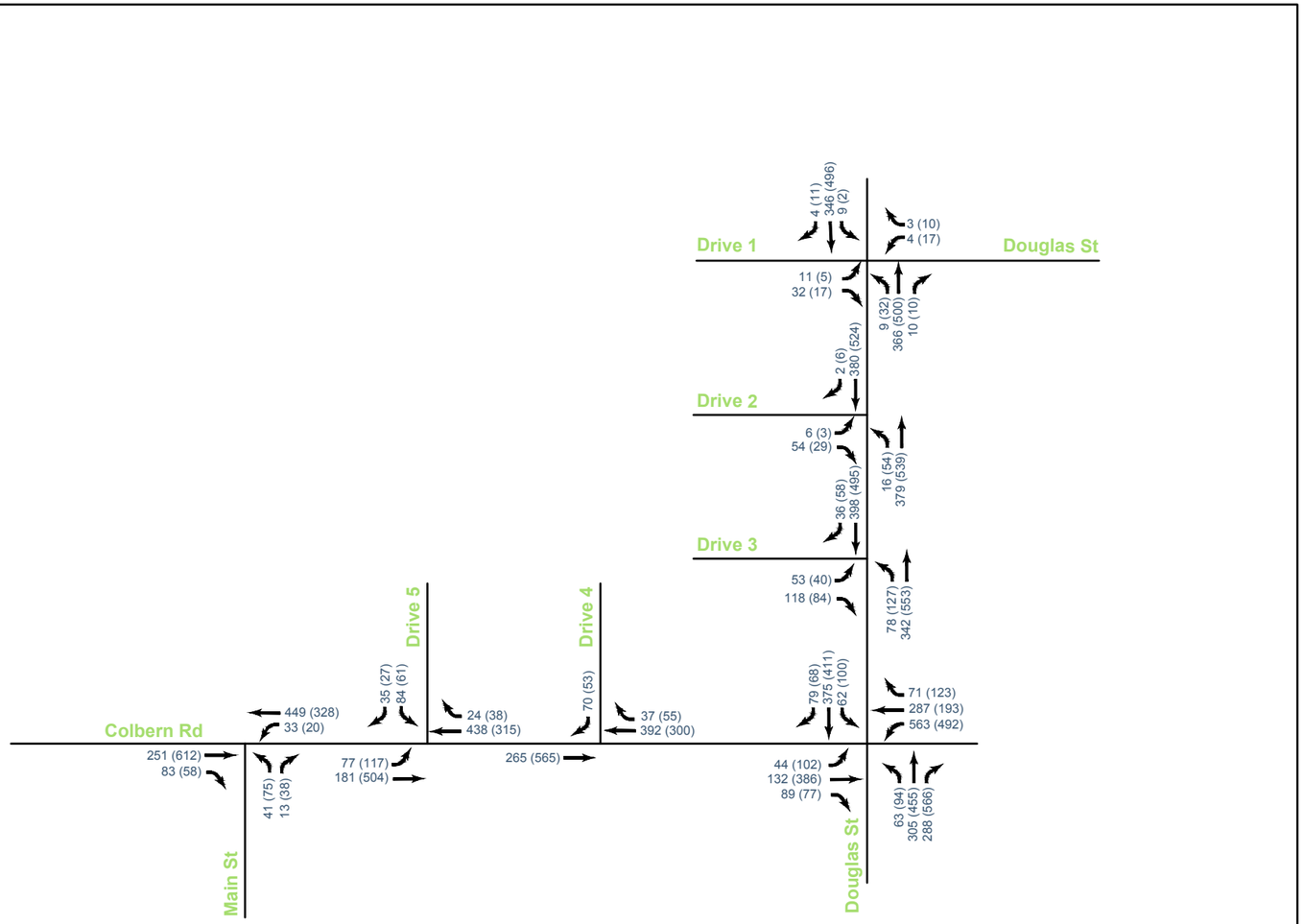
FIGURE 7A

Existing Plus Phase 1 Development
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

LEGEND

AM (PM) *Peak Hour Volume*



5.2 Existing Plus Phase 1 Development Warrant Analysis

Turn Lane Warrants: Turn lane analysis was conducted as stated in **Section 3.3.**

Left-turn Lanes:

Lee's Summit (based on AMC): The following additional dedicated left-turn lanes are warranted under existing plus phase 1 development conditions as detailed in **Section 3.3**:

- Northbound and eastbound at the intersection of Douglas Street and Drive 2.
- Northbound and eastbound at the intersection of Douglas Street and Drive 3.
- Eastbound and southbound at the intersection of Colbern Road and Drive 5.

Kansas City/MoDOT (based on MoDOT EPG): No additional left-turn lanes are warranted under existing plus phase 1 development conditions.

Right-turn Lanes:

Lee's Summit (based on AMC): The following additional dedicated right-turn lanes are warranted under existing plus phase 1 development conditions as detailed in **Section 3.3**:

- Westbound at the intersection of Colbern Road and Drive 5 (PM only).
- Westbound at the intersection of Colbern Road and Drive 4.
- Southbound and eastbound (AM only) at the intersection of Douglas Street and Drive 3.

Kansas City/MoDOT (based on MoDOT EPG): No additional right-turn lanes are warranted under existing plus phase 1 development conditions.

Turn lane warrant analysis sheets are provided in **Appendix C.**

Signal Warrants: The peak hour signal warrant (Warrant 3) was evaluated for the study intersections considering existing plus phase 1 development conditions. Per MUTCD guidance, intersections with dedicated right turn lanes for the minor street were evaluated using a 50% reduction in right turning traffic. Reduced warrants included the intersections of Colbern Road and Main Street, Colbern Road and Drive 5, and Douglas Road and Drive 3. The intersection of Douglas Road and Drive 3 is expected to meet Warrant 3 during the PM peak hour period only. Due to acceptable operations and only meeting one hour of the warrant, signalization is not recommended at this time.

Several additional study intersections are on the threshold of warranting signalization under existing plus phase 1 development conditions. Volumes and operations will be monitored under future scenarios to determine if and when signalization will be recommended for any study intersections. Signal warrant analysis sheets for existing plus phase 1 development conditions are provided in **Appendix C**.

Existing plus phase 1 development lane configurations and traffic control for the study network are illustrated in **Figure 9**.

5.3 Existing Plus Phase 1 Development Recommendations

Phase 1 development includes the construction of several site access driveways. Site driveways associated with phase 1 development include Drives 1 through 5. The location and allowed movements for site driveways were reviewed in a holistic way considering the ultimate build out of the site. Intersection traffic control was determined with the future phases in mind.

Drives 1 and 2 are expected to meet access spacing standards. Drive 3 is located 650 feet south of Drive 2, slightly under the 660-foot spacing requirement. These access points are proposed as full access unsignalized intersections.

Drive 4 is approximately 650 feet west of the signalized intersection of Colbern Road and Douglas Street. Drive 4 is proposed as a right-in/right-out only access due to expected eastbound queuing at the intersection of Colbern Road and Douglas Street and to support efficient operations between the signalized intersection and Drive 4. The proposed spacing of Drive 4 is expected to be outside the downstream functional area of the intersection of Colbern Road and Douglas Street.

Drive 5 is located approximately 610 feet west of Drive 4, and 1,260 feet west of Douglas Street. The location of Drive 5 is bound by alignment along the west edge of the phase 1 property line, limiting opportunities to achieve recommended access spacing. Although Drive 5 does not meet the 1,320-foot recommended spacing from Douglas Street (full median break spacing), limiting full access for the site along Colbern Road to a point furthest from Douglas Street is preferred. Additionally, access for the site has been considered under full development; Drive 5 is proposed to align with access on the south side of Colbern Road, providing aligned and shared access along Colbern Road.

The limitation of Drive 4 from a full access to a right-in/right-out is an access management strategy that would be expected to provide acceptable access to the site while supporting the through movement of vehicles along Colbern Road.

Based on a review of expected operations and turn lane warrants, the following improvements are recommended under existing plus phase 1 development conditions. Turn lanes should be provided with recommended storage plus taper.

- Lee's Summit Road and Douglas Road/Drive 1
    - Provide northbound left-turn lane (utilize existing TWLTL).
- Douglas Street and Drive 2
    - Provide northbound left-turn lane (utilize existing TWLTL).

- Douglas Street and Drive 3
  - Construct a 150-foot northbound left-turn lane.
    - Drive 3 is proposed near the planned terminus of the northbound taper transitioning from two northbound lanes to one along Douglas Street. It is recommended to transition the lanes prior to Drive 3. A potential transition design could be to provide a 200-foot buffer and 495-foot taper between Colbern Road and Drive 3 to merge from two lanes to one. This would terminate the lane transition prior to Drive 3.
    - To support the lane transition, the northbound left turn lane storage is recommended to be 150 feet, less than the 200-foot recommended length in the AMC. The recommended turn lane is expected to be adequate to support expected vehicular queuing.
  - Construct a 250-foot southbound right-turn lane.
  - Provide two lanes exiting the site. Proposed throat length is expected to support operations.
- Colbern Road and Drive 4
  - Construct a 150-foot westbound right-turn lane.
- Colbern Road and Drive 5
  - Construct a 250-foot westbound right-turn lane.
  - Construct a 200-foot eastbound left-turn lane.
  - Provide two lanes exiting the site. Proposed throat length is expected to support operations.

5.4 Existing Plus Phase 1 Development Capacity Analysis

Capacity analysis was conducted for existing plus phase 1 development conditions using the methodologies described in **Section 3.4**. Recommended phase 1 improvements noted in **Section 5.3** were considered complete for the purposes of capacity analysis. Signal timings were not adjusted from the previous scenario. Peak hour factors at new and existing intersections approaches were adjusted referencing MODOT guidance to 0.92 for all intersections, approaches, and movements.

Results of the capacity analysis indicate that intersections are expected to operate similar to existing conditions. All signalized study intersections are expected to operate at a LOS C or better overall, as shown on **Table 14,** except Douglas Street and Colbern Road which is expected to operate at a LOS D in the PM peak hour, consistent with expected existing plus approved development conditions. The individual signalized movements that are expected to operate at a LOS E or worse are listed in **Table 14** below. Unsignalized movements are expected to operate at LOS D or better with acceptable queues during the AM and PM peak hour periods.

Table 14. Existing plus Phase 1 Development Conditions Capacity Analysis.

Intersection *(Movement)*	AM Peak Hour Period		PM Peak Hour Period	
	LOS (Delay, sec)	95th-Percentile Queue (ft)	LOS (Delay, sec)	95th-Percentile Queue (ft)
Douglas Street and Colbern Road	**C (29.1)**	**-**	**D (42.8)**	**-**
Eastbound Right-Turn	*E (58.2)*	*<25*	*C (25.8)*	*<25*
Westbound Left-Turn	*C (21.5)*	*327*	*F (128.4)*	*#422*
Douglas Street and I-470 Westbound Ramp	**C (29.4)**	**-**	**C (24.2)**	**-**
Southbound Right-Turn	*E (60.4)*	*140*	*D (51.6)*	*m90*
Douglas Street and I-470 Eastbound Ramp	**B (17.7)**	**-**	**C (20.4)**	**-**
Lee's Summit Road and Gregory Boulevard	**B (17.7)**	**-**	**C (20.2)**	**-**
Colbern Road and M-350 Southbound Ramp	**B (12.3)**	**-**	**B (17.8)**	**-**
Colbern Road and M-350 Northbound Ramp	**A (5.1)**	**-**	**A (7.0)**	**-**
Colbern Road and Blue Parkway (Roundabout)	**A (4.4)**	**-**	**A (5.5)**	**-**

- 95th-percentile queue exceeds capacity.

m – Volume for 95th-percentile queue is metered by upstream signal.

The existing plus phase 1 development capacity analysis summary is illustrated in **Figure 10**. Detailed results are provided in **Appendix C.**

5.4.1 Existing plus Phase 1 Development Simulation

The simulation model developed for the Colbern Road and I-470 as well as the Douglas Street and I-470 interchange areas were updated to include expected phase 1 development trips. Based on a review of the simulation model and comparison to Synchro reported results, the simulation model is operating similar to the Synchro reported results and as expected based on existing operations, consideration of planned improvements, and addition of development traffic. For this scenario, driver parameters and lane utilization noted under existing conditions was maintained. As geometric improvements to the network are made and traffic volumes change, driver characteristics may change.

Observing the simulation, vehicles are expected to move through the network similar to existing plus approved conditions. Consistent with existing conditions, the westbound left turn movement at the intersection of Colbern Road and Douglas Street will continue to experience queuing, although vehicles were observed to be serviced typically within one cycle. The simulation model indicates a northbound queue length along Douglas Street and Colbern Road approaching the westbound ramp, which is similar to observed existing conditions. As with the existing condition,

this queue is expected to be serviced within a cycle. SimTraffic model results and max queue reports were used to fine-tune recommendations to turn bay lengths at the study intersections to reduce spillback where possible and improve operations to be similar to existing conditions. Overall the network is expected to operate acceptably. Simulation results for the existing plus phase 1 development scenario is provided in **Appendix C**.

FIGURE 8

Existing Plus Phase 1 Development
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

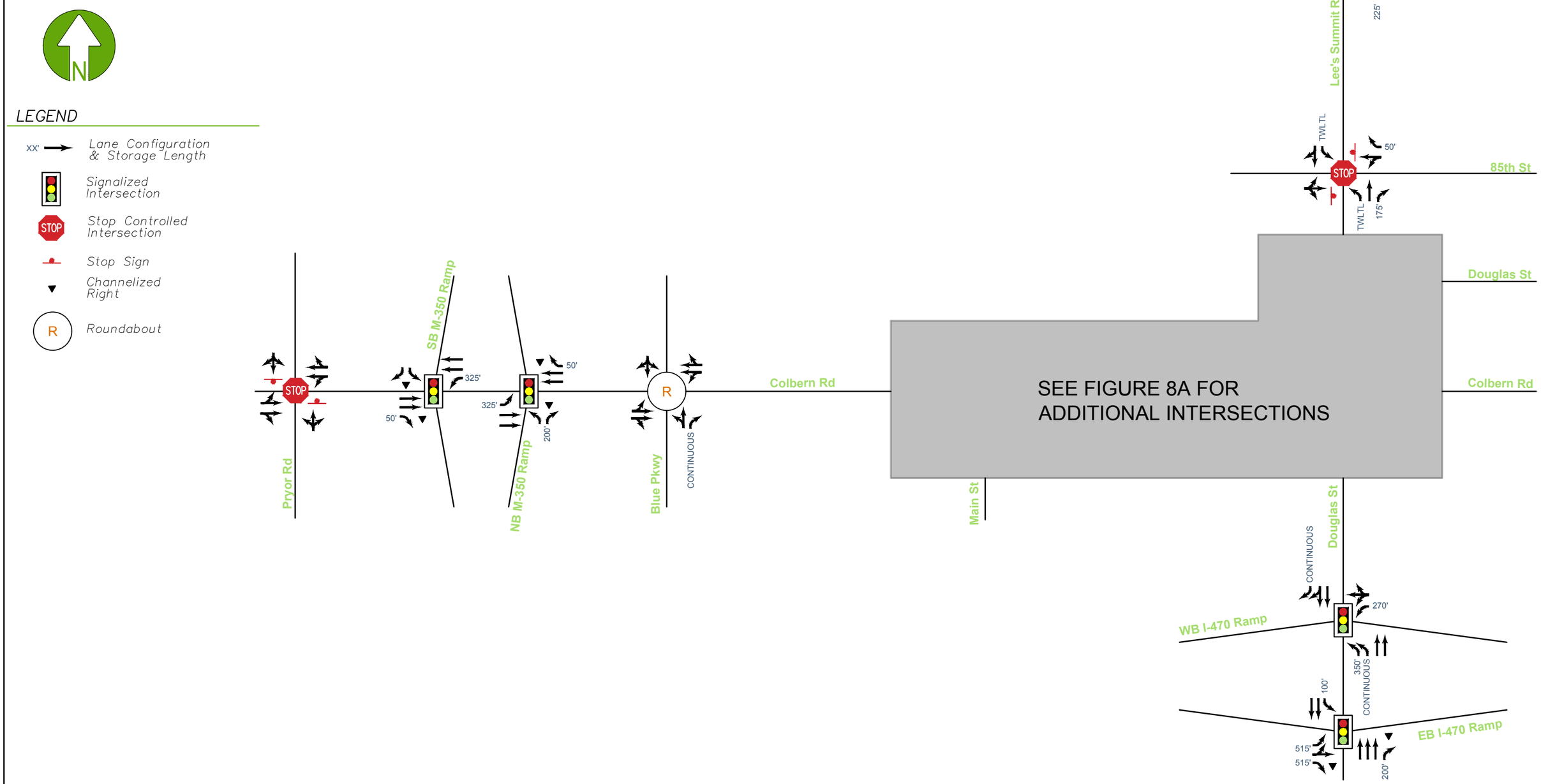


FIGURE 8A

Existing Plus Phase 1 Development
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

LEGEND

- XX' — *Lane Configuration & Storage Length*
- XX' — *Proposed Lane Configuration & Storage Length*
- *Signalized Intersection*
- STOP — *Stop Controlled Intersection*
- *Stop Sign*
- *Channelized Right*

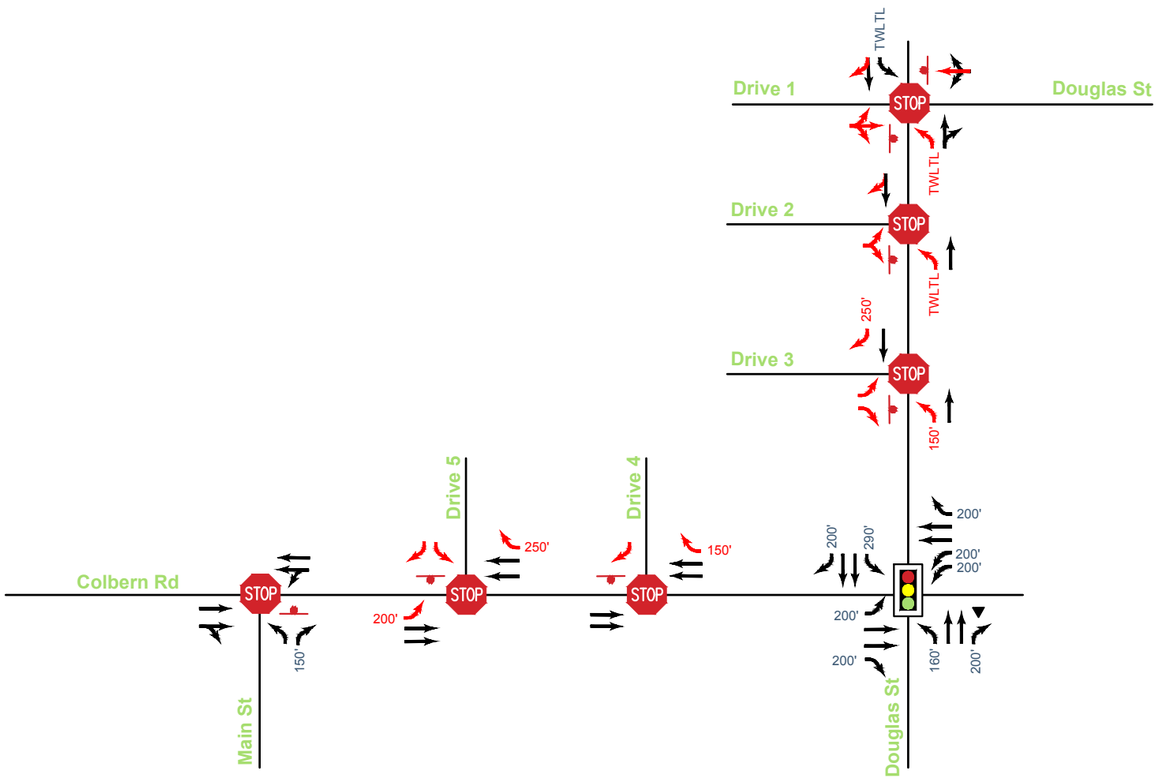


FIGURE 9

Existing Plus Phase 1 Development Capacity Analysis

Discovery Park TIS
Lee's Summit, MO

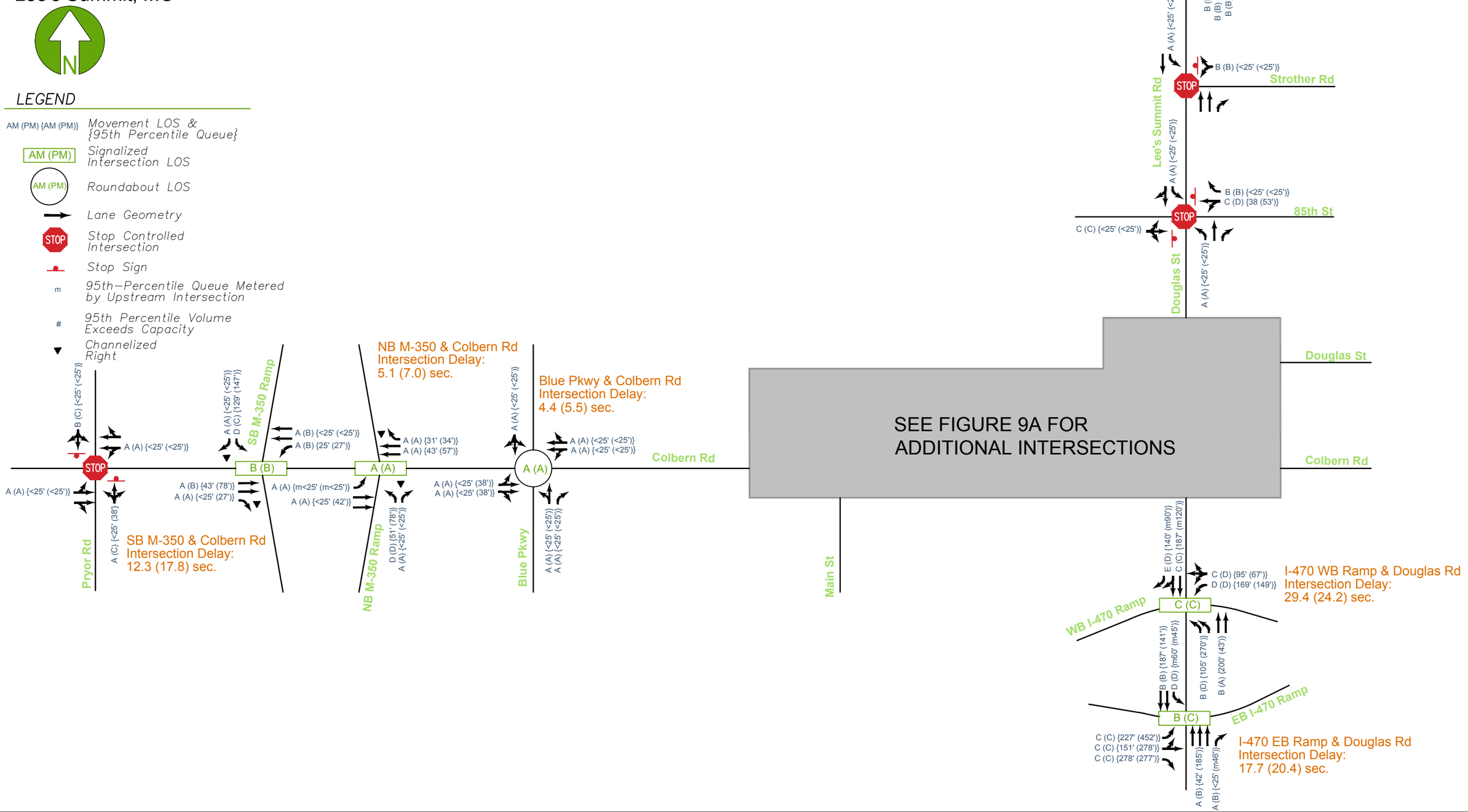


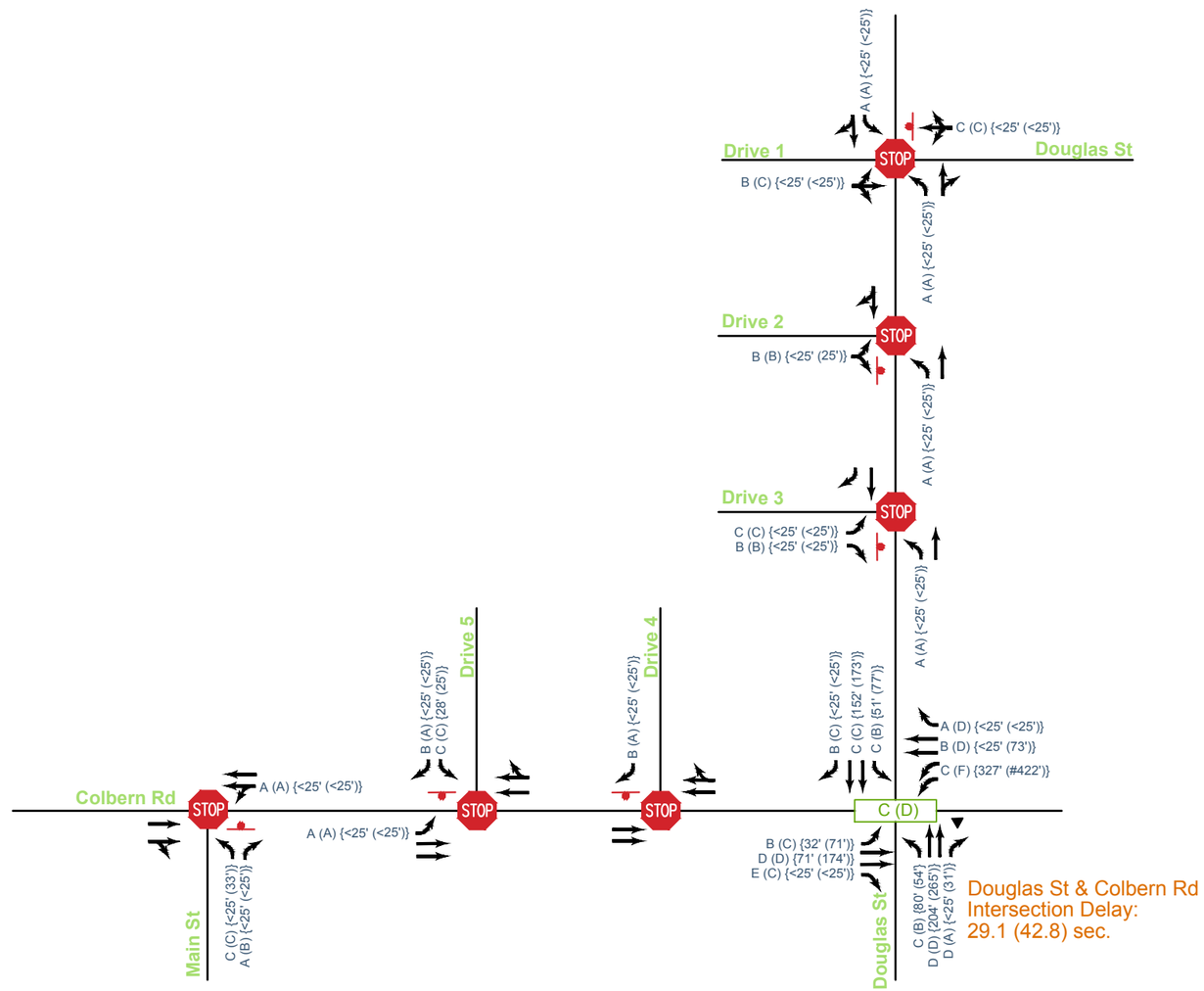
FIGURE 9A

Existing Plus Phase 1 Development
Capacity Analysis

Discovery Park TIS
Lee's Summit, MO

LEGEND

- AM (PM) {AM (PM)} — Movement LOS & {95th Percentile Queue}
- AM (PM) — Signalized Intersection LOS
- Lane Geometry
- STOP — Stop Controlled Intersection
- Stop Sign
- m — 95th-Percentile Queue Metered by Upstream Intersection
- # — 95th Percentile Volume Exceeds Capacity
- Channelized Right



6. BUILD YEAR 2027 PLUS PHASES 1 AND 2 DEVELOPMENT CONDITIONS

Conditions with phase 2 of the proposed development in place were evaluated to identify any potential geometric improvements that could be attributed to the additional traffic associated with phase 2 of the proposed development. Analysis of phase 2 conditions includes the background growth of existing traffic to the build year 2027 plus the approved and phase 1 proposed development volumes. Through volumes were grown along the Colbern Road and Douglas Street corridors by 1% and distributed at the ramps following existing gravity. Background traffic growth information is provided in **Appendix D**.

Phase 2 development is proposed to consist of a supermarket, retail, restaurant, convenience store/gas station, car wash, multifamily housing, medical, recreational facility, and office uses. **Figure 5** illustrates the phase 2 development plan.

6.1 Phase 2 Development Trip Generation and Distribution

Trip generation and proposed trip distribution for the site was presented in **Section 4.1**. To conduct trip distribution for phase 2, site generated trips were distributed to the network using the proposed access points. A detailed summary of trip generation by land use type and zone, considering internal capture, is shown in **Table 15**. Trip generation calculations by building and internal capture information for phase 2 are provided in **Appendix D**.

Table 15. Phase 2 (Zones 2-3) Development Trip Generation.

Land Use	Zone	Size	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Supermarket	2	50,000 SF	138	81	57	383	192	191
Strip Retail Plaza	2	15,000 SF	35	21	14	90	45	45
Convivence Store/Gas Station	2	5,700 SF	505	253	252	393	197	196
Sit Down Restaurant	2	7,000 SF	65	36	29	56	34	22
Fast-Food Restaurant	2	5,700 SF	295	150	145	167	88	79
Car Wash	2	5,700 SF	-	-	-	68	34	34
Sit Down Restaurant	3	45,000 SF	326	180	146	241	152	89
Multifamily Housing	3	332 Units	158	38	120	104	66	38
Strip Retail Plaza	3	44,000 SF	104	60	44	190	100	90
General Office	3	20,000 SF	41	36	5	24	4	20
Recreational Center	3	50,000 SF	-	-	-	104	59	45
Medical Office	3	36,000 SF	94	75	19	82	26	56
Zone 2 Trips			**1,038**	**541**	**497**	**1,157**	**590**	**567**
Zone 3 Trips			**723**	**389**	**334**	**745**	**407**	**338**
Phase 2 Total Trips			**1,761**	**930**	**831**	**1,902**	**997**	**905**

The expected trip distribution and site trips for phase 2 are shown in **Figure 11.** The resulting build year plus phase 2 development volumes are illustrated in **Figure 12**.

FIGURE 10

Phase 2 Development Trip Distribution

Discovery Park TIS
Lee's Summit, MO

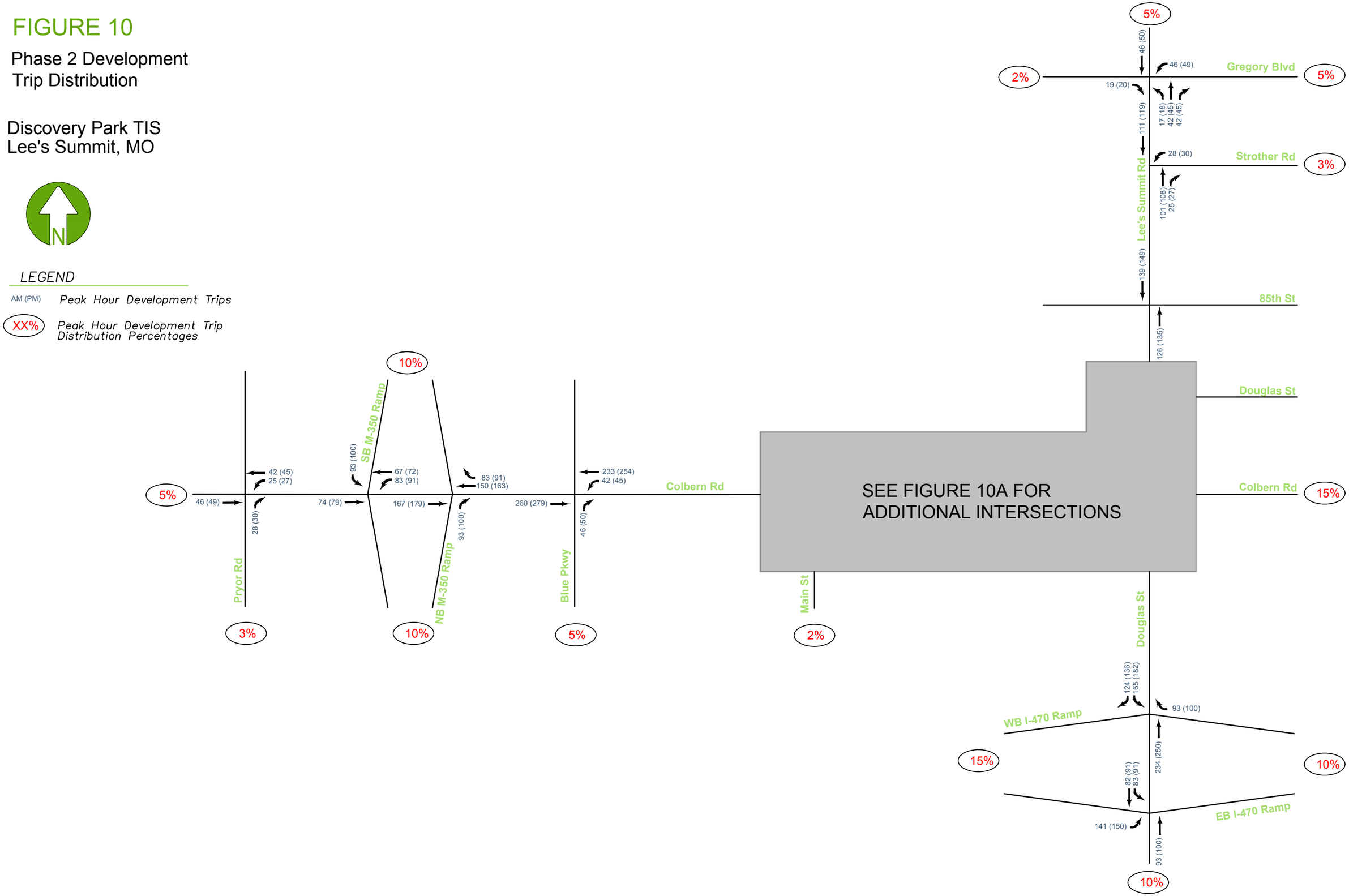


FIGURE 10A

Phase 2 Development
Trip Distribution

Discovery Park TIS
Lee's Summit, MO

LEGEND

AM (PM) *Peak Hour Development Trips*

Phase 2 Development

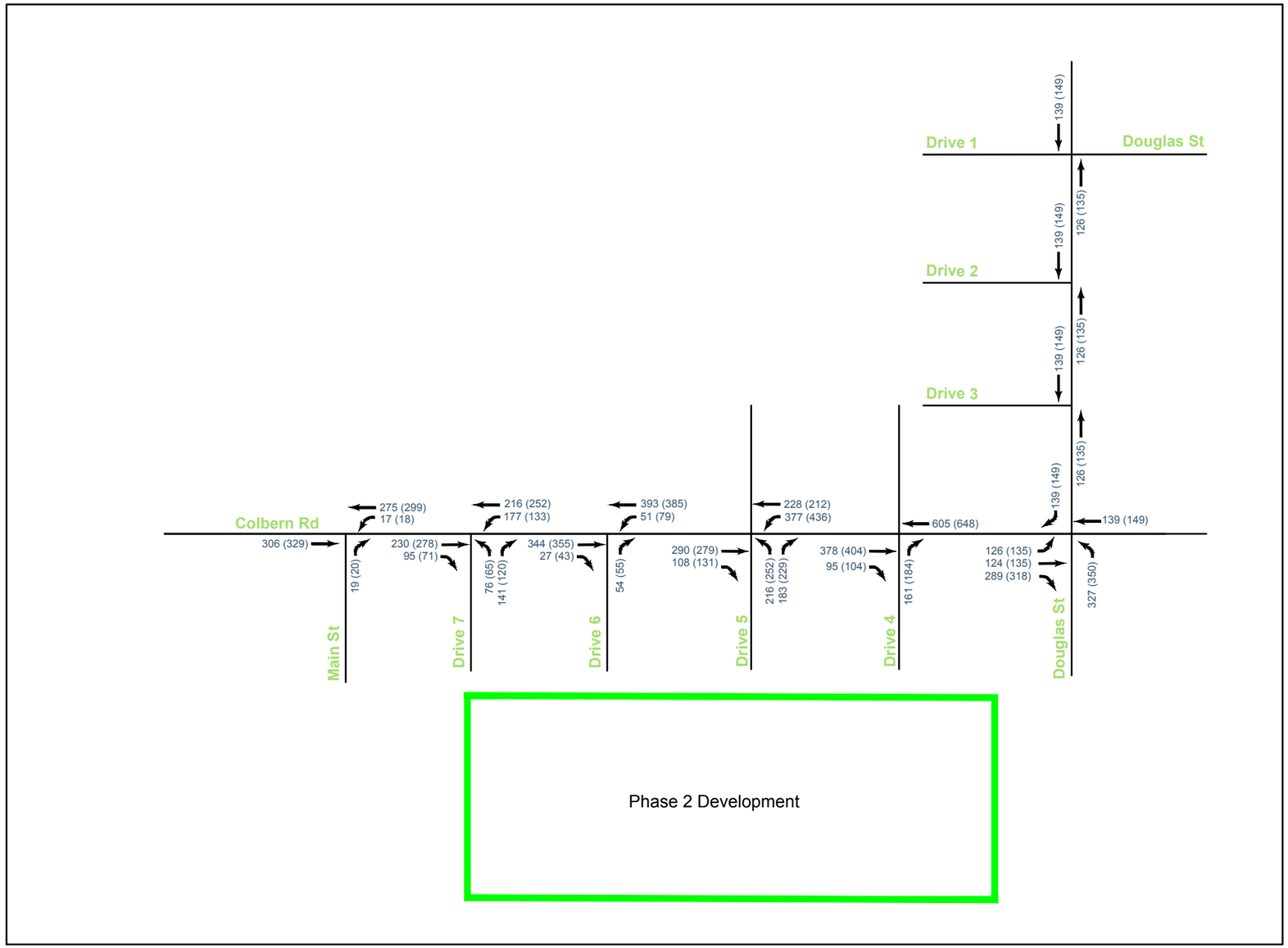


FIGURE 11

Build Year Plus Phase 1 and 2 Development
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

LEGEND

AM (PM) Peak Hour Volume

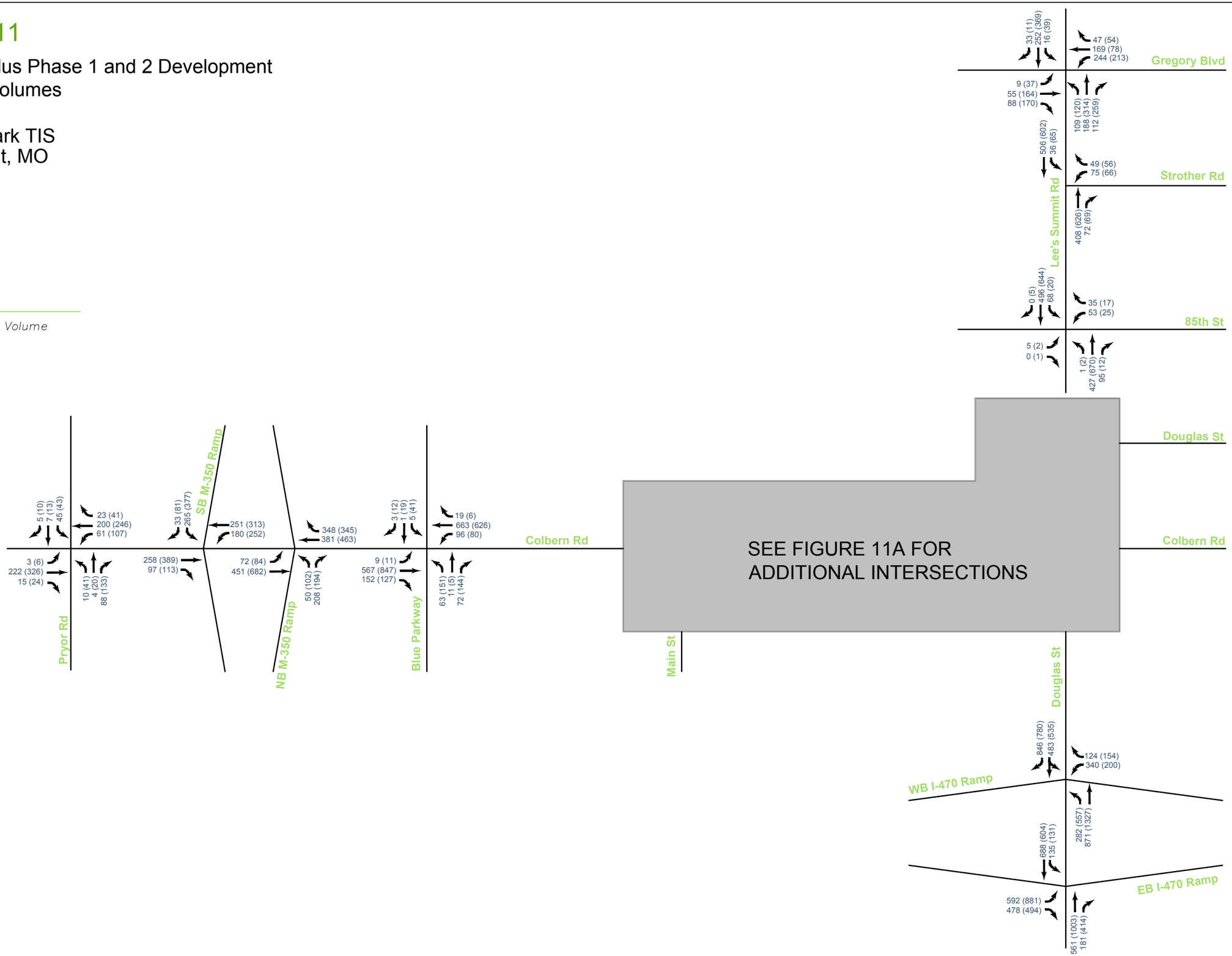


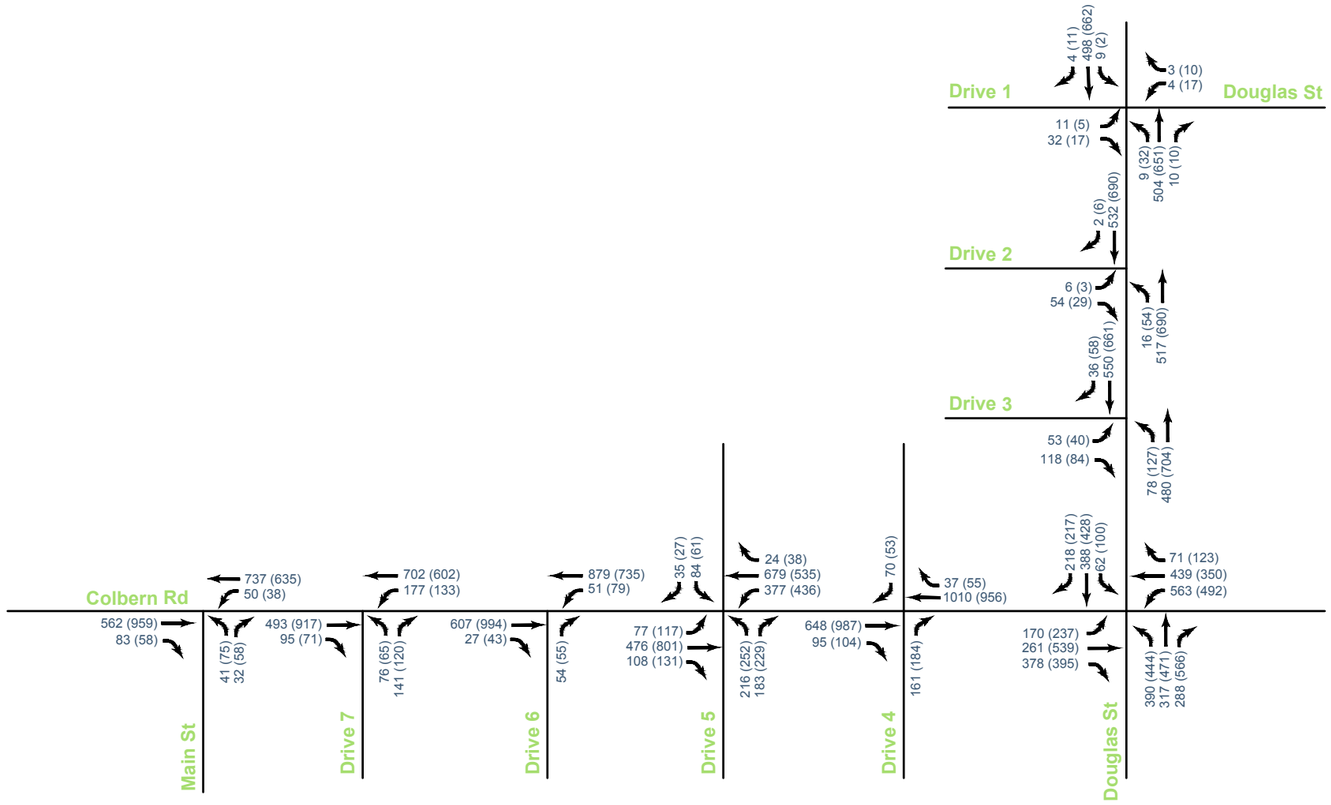
FIGURE 11A

Build Year Plus Phase 1 and 2 Development
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

LEGEND

AM (PM) Peak Hour Volume



6.2 Build Year Plus Phases 1 and 2 Development Warrant Analysis

Turn Lane Warrants: Turn lane analysis was conducted as stated in **Section 3.3.**

Left-Turn Lanes:

Lee's Summit (based on AMC): The following additional dedicated left-turn lanes are warranted under build year plus phases 1 and 2 development conditions as detailed in **Section 3.3**:

- Northbound and westbound at the intersection of Colbern Road and Drive 5.
- Westbound at the intersection of Colbern Road and Drive 6.
- Northbound and westbound at the intersection of Colbern Road and Drive 7.

Kansas City/MoDOT (based on MoDOT EPG): No additional left-turn lanes are warranted under build year plus phases 1 and 2 development conditions.

Right-Turn Lanes:

Lee's Summit (based on AMC): The following additional dedicated right-turn lanes are warranted under build year plus phases 1 and 2 development conditions as detailed in **Section 3.3**:

- Eastbound at the intersection of Colbern Road and Drive 4.
- Northbound and eastbound at the intersection of Colbern Road and Drive 5.
- Eastbound at the intersection of Colbern Road and Drive 6.
- Northbound and eastbound at the intersection of Colbern Road and Drive 7.

Kansas City/MoDOT (based on MoDOT EPG): The westbound right-turn movement at the intersection of Douglas Street and the Westbound I-470 Ramps meets during the AM peak hour period only. No additional right-turn lanes are warranted under build year plus phases 1 and 2 development conditions.

Turn lane warrant analysis sheets are provided in **Appendix D.**

Signal Warrants: The peak hour signal warrant (Warrant 3) was evaluated for the study intersections considering build year plus phases 1 and 2 development conditions. Signal warrants were reduced as outlined in Section 5.2 for the following study intersections: Colbern and Main, Colbern and Pryor, Lee's Summit and Strother, Colbern and Drive 5, Douglas and Drive 3, as well as Colbern and Drive 7. The following intersections meet Warrant 3 during as least one peak hour:

- Lee's Summit Road and Strother Road (AM and PM)
- Douglas Street and Drive 3 (AM and PM)

- Colbern Road and Main Street (PM only)
- Colbern Road and Drive 5 (AM and PM)
- Colbern Road and Drive 7 (AM and PM)
- Colbern Road and Pryor Road (PM only)

Signal warrants were only conducted for full access intersections. Several study intersections are on the threshold or warrant signalization under build year plus phases 1 and 2 development conditions. Given review of warrants under future year/build conditions, it is recommended to monitor intersections and signalize based on actual volumes. Reviewing the expected trips for the site, circulation, development area serviced, and expected operations, signalization was considered under analysis conditions for the intersection of Colbern Road and Drive 5. No additional signals were considered at this time. Traffic volumes and expected operations will be monitored under future scenarios to determine if and when additional signalization will be recommended for study intersections. Signal warrant analysis sheets for build year plus phases 1 and 2 development conditions are provided in **Appendix D**.

Build year plus phases 1 and 2 development lane configurations and traffic control for the study network are illustrated in **Figure 13**.

6.3 Build Year Plus Phases 1 and 2 Development Recommendations

Site driveways associated with phase 2 development include Drives 4 through 7. The location and allowed movements for site driveways were reviewed in a holistic way considering the ultimate build out of the site. Intersection traffic control was determined with the future phases in mind.

Upon review of the proposed site plan, several site driveways are recommended to be limited to partial access. The determination of partial access was based on a review of proposed access spacing, understanding of expected operations of the site and driveways, and consideration of potential signal warrants under future year conditions.

Drive 4 was proposed to be limited to a right-in/right-out under phase 1 conditions. The location of Drive 4, servicing phase 2 development, is expected to be outside the influence of turn lanes for the intersection of Douglas Street and Colbern Road. The access is expected to be within the upstream functional area of the intersection of Douglas Street and Colbern Road when considering expected queuing of eastbound movements along Colbern Road at the intersection. Eastbound queuing at the intersection is not expected to block the proposed drive location. Drive 4 is recommended to provide additional eastbound right-in ingress into phase 2, as well as to relieve egress traffic from Drive 5 by supporting trips exiting the development to travel east.

Drive 5 was presented as a full access intersection under phase 1 conditions. With phase 2 development, this access will become a four-leg intersection serving both phase 1 and phase 2 development areas. Under phase 2, this intersection is recommended for signalization based on expected operations. As acknowledged in **Section 6.3**, proposed spacing of Drive 5 is slightly under recommended spacing guidance; however, the drive is located along the west side of phase 1 property and is aligning across Colbern Road, which is a preferred condition when providing full access to both phase 1 and phase 2 development sites.

Given the spacing of Drive 6 from Drive 5 and considering the ultimate full build condition of the site, Drive 6 is proposed as a three-quarter access (left-in/right-in/right-out). Allowing left in movements allows for better dispersal of trips into the site and improves site circulation. Without left in access at this location, all left in movements would need to access via Drive 5 which would be expected to result in poor operations at that intersection. Drive 6 meets recommended spacing guidance of 660 feet along Colbern Road.

Under phase 2 conditions, Drive 7 must remain a full access intersection because it is the only access point west of the water feature with no internal connection between zone 2 and zone 3. Drive 7 is proposed 1,020 feet west of Drive 6 (recommended to be limited to a left-in/right-in/right-out) and 1,820 feet west of the full access intersection of Drive 5. This meets recommended spacing guidance for full access intersections along Colbern Road.

Based on a review of expected operations and turn lane warrants, the following improvements are recommended under build year plus phases 1 and 2 development conditions. Turn lanes should be provided with recommended storage plus taper. It is acknowledged that these recommendations are based on future year conditions considering approved development, proposed development, background traffic growth, and planned roadway projects. Improvements, specifically signalization, should be based on actual/realized conditions.

- Signal timings along the Douglas Street corridor should be reviewed. It is anticipated that a review of signal timings will be needed based on traffic growth associated with approved and proposed development as well as background traffic growth.
- Colbern Road and Douglas Street
    - Construct dual 250-foot northbound left-turn lanes. This storage length is based on expected turn lane storage availability. Turn lane storage should be maximized; final storage length should be based on field conditions.
    - Extend the eastbound left and right turn bay storage to 300 feet.
    - Extend the southbound right turn bay storage to 300 feet.
    - Signal modification.
- Colbern Road and Drive 4
    - Construct 150-foot eastbound right-turn lane.

- Colbern Road and Drive 5
  - Signalize intersection. Provide signal communications along Colbern Road.
  - Construct a 300-foot eastbound right-turn lane.
  - Construct dual 300-foot westbound left-turn lanes.
  - Extend the eastbound left turn bay storage to 300 feet.
  - Provide four northbound lanes exiting the site, two left-turn, one through and one right. A minimum of 200 feet of throat length should be provided along the drive approach.
- Colbern Road and Drive 6
  - Construct a 150-foot eastbound right-turn lane.
  - Construct a 200-foot westbound left-turn lane.
- Colbern Road and Drive 7
  - Construct a 150-foot eastbound right-turn lane.
  - Construct a 200-foot westbound left-turn lane.
  - Provide two lanes exiting the site. A minimum of 150 feet of throat length should be provided along the drive approach.

6.4 Build Year Plus Phases 1 and 2 Development Capacity Analysis

Capacity analysis was conducted for build year plus phases 1 and 2 development conditions using the methodologies described in **Section 3.4**. Recommended phase 2 improvements noted in **Section 6.3** were considered complete for the purposes of capacity analysis. Signal timings were adjusted. Per MDOT standards, all existing and proposed intersection peak hour factors were set to 0.92 for both approach and movement.

Results of the capacity analysis indicate that several intersections are expected to operate at a lower level of service with the consideration of expected phase 2 development trips. All signalized study intersections are expected to operate at a LOS C or better overall, as illustrated in **Table 16,** except the intersection of Douglas Street and Colbern Road which is expected to operate at a LOS D during both peak hours. Expected operations and intersection delay are similar to phase 1 conditions. The individual signalized movements that are expected to operate at a LOS E or worse are listed in **Table 16** below. Unsignalized movements are primarily expected to operate at LOS D or better with acceptable queues during the AM and PM peak hour periods. The individual unsignalized movements that are expected to operate at LOS E or worse are listed in **Table 16**.

Table 16. Build Year plus Phase 2 Development Conditions Capacity Analysis.

Intersection *(Movement)*	AM Peak Hour Period		PM Peak Hour Period	
	LOS (Delay, sec)	95th-Percentile Queue (ft)	LOS (Delay, sec)	95th-Percentile Queue (ft)
Douglas Street and Colbern Road	**D (40.7)**	**-**	**D (40.4)**	**-**
Eastbound Right-Turn	*E (55.1)*	*224*	*C (32.5)*	*57*
Southbound Right-Turn	*F (83.3)*	*66*	*E (62.3)*	*66*
Douglas Street and I-470 Westbound Ramp	**B (18.7)**	**-**	**B (10.4)**	**-**
Douglas Street and I-470 Eastbound Ramp	**B (19.9)**	**-**	**C (22.6)**	**-**
Colbern Road and Drive 5	**C (21.6)**	**-**	**C (29.9)**	**-**
Lee's Summit Road and Gregory Boulevard	**B (19.3)**	**-**	**C (22.9)**	**-**
Colbern Road and M-350 Southbound Ramp	**B (16.3)**	**-**	**C (23.3)**	**-**
Colbern Road and M-350 Northbound Ramp	**A (4.1)**	**-**	**A (8.3)**	**-**
Colbern Road and Blue Parkway (Roundabout)	**A (5.8)**	**-**	**A (7.5)**	**-**
Lee's Summit Road and St. Michael's Drive (unsignalized)	**-**	**-**	**-**	**-**
Westbound Left-Turn	*E (38.4)*	*38*	*F (52.6)*	*25*
Colbern Road and Main Street (unsignalized)	**-**	**-**	**-**	**-**
Northbound Left-Turn	*D (34.2)*	25	*F (119.0)*	110
Lee's Summit Road and Douglas Road/Drive 1 (unsignalized)	**-**	**-**	**-**	**-**
Westbound Left/Thru/Right	*C (21.3)*	*<25*	*E (41.7)*	<25
Colbern Road and Drive 7 (unsignalized)	**-**	**-**	**-**	**-**
Northbound Left-Turn	*F (82.7)*	*93*	*F (188.4)*	123

Referencing Section 20.7 of the HCM (6th Edition) for Two-Way Stop-Controlled Intersections, minor street approaches with movements operating at a lower level of service during peak hour periods are not uncommon at an unsignalized intersection. This is more prevalent for stop-controlled left-turn movements in urban areas, as higher volumes on the main road are accommodated. The HCM cautions the use of LOS thresholds as the sole measure to determine the design adequacy of a two-way stop-controlled intersection. It is encouraged to consider measures of effectiveness including the volume-to-capacity (v/c) ratios for individual movements and queue lengths in addition to delay. At the unsignalized minor street approaches

listed above, the v/c ratios and 95th-percentile queues are expected to be acceptable during the peak hour periods for all movements except the northbound left turn movement at Colbern Road and Drive 7 which is expected to exceed a v/c ratio of 0.95 during the PM peak hour period. Signalization could be considered but would be recommended only when conditions in the field warrant the installation of a signal.

The I-470 interchange at Douglas Street is part of a coordinated signal system and supports a high volume of traffic. The configuration of Colbern Road as a signalized intersection within close proximity to the I-470 ramps is not an optimal condition. However, the location of Colbern Road is bound due to the presence of the airport along the north side of the road alignment. Providing dual northbound left-turn lanes at the intersection is expected to support planned development within the restrictions of the current intersection. Future development phases will investigate alternative mitigations to the interchange area to address capacity issues.

The build year plus phases 1 and 2 development capacity analysis summary is illustrated in **Figure 14**. Detailed results are provided in **Appendix D.**

6.4.1 Build Year plus Phases 1 and 2 Development Simulation

The simulation model developed for the Douglas Street corridor was updated to include expected phase 2 development trips and recommended geometric improvements. For this scenario, driver parameters and lane utilization noted under existing conditions was maintained. As geometric improvements to the network are made and traffic volumes change, driver characteristics would be expected to change. The simulation model considers signal timing adjustments to existing split times and phase sequences to accommodate the changes to travel patterns and geometric improvements to support expected phase 2 conditions.

Observing the simulation, vehicles are expected to experience moderate queueing and delay at movements during the peak periods, specifically the westbound and northbound left-turn movements as well as the southbound and eastbound through movements at the Douglas Street and Colbern Road intersection during the PM peak period. Reviewing the simulation, although queuing is expected the vehicular flow through the network is constant and the coordinated signal timings are efficient in moving vehicles through the network. North/south queuing along Douglas Street between Colbern Road and the I-470 interchange is expected to operate similarly to existing conditions with brief periods of queueing between Colbern Road and the I-470 westbound interchange ramp. SimTraffic model results and max queue reports were used to fine-tune recommendations to turn bay lengths at the study intersections to reduce spillback where possible and improve operations to be similar to existing conditions.

As previously presented, the simulation model is built on planned roadway improvements, realization of approved and proposed development conditions, background traffic growth, and maintenance of driver parameters. Monitoring of the network is recommended before implementing geometric or signal timing changes. Simulation results for the build year plus phases 1 and 2 scenario is provided in **Appendix D**.

FIGURE 12

Build Year 2027 Plus Phase 1 and 2 Development
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

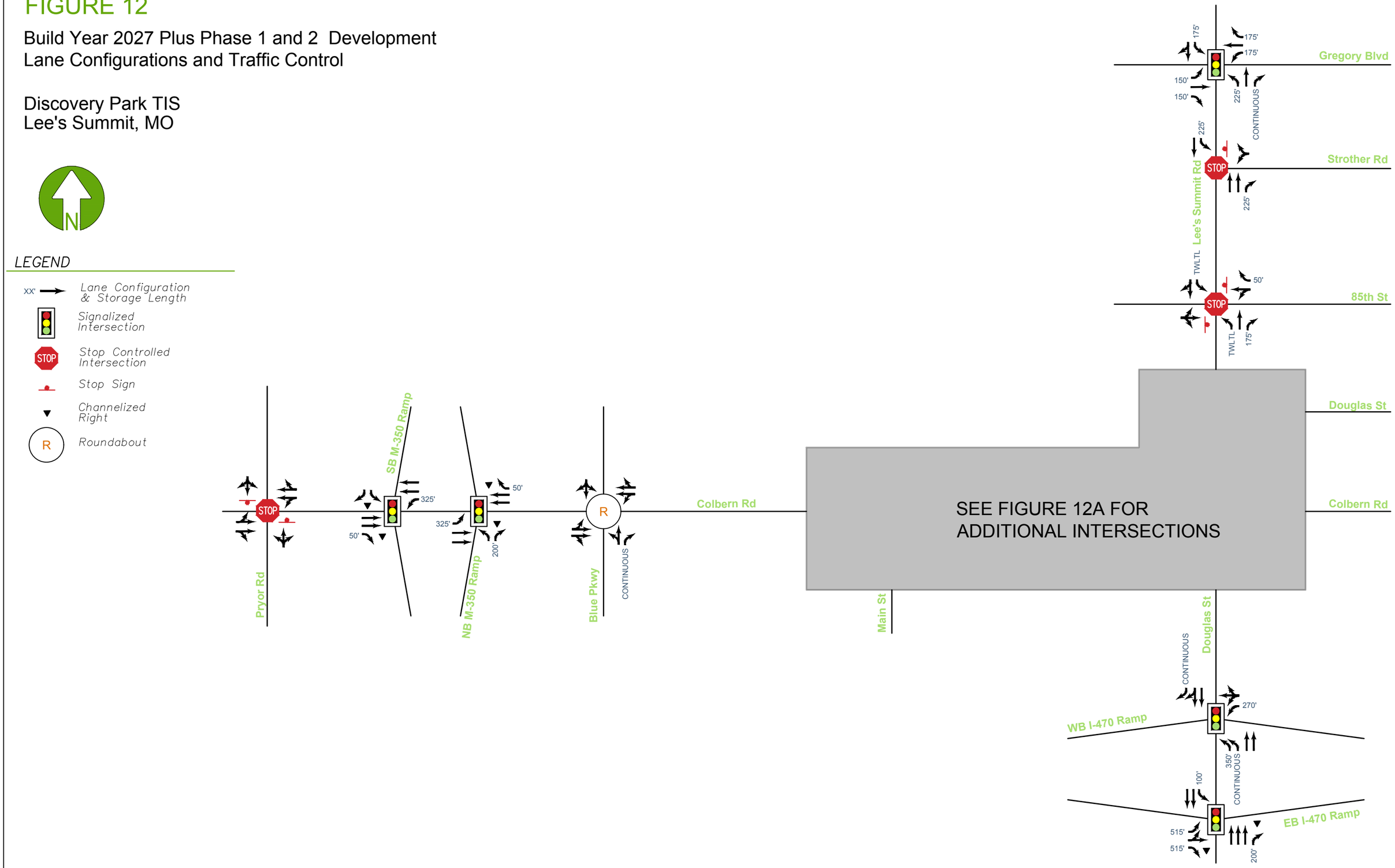


FIGURE 12A

Build Year 2027 Plus Phase 1 and 2 Development
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

LEGEND

- XX' — *Lane Configuration & Storage Length*
- XX' — *Proposed Lane Configuration & Storage Length*
- *Signalized Intersection*
- STOP — *Stop Controlled Intersection*
- *Stop Sign*
- *Channelized Right*

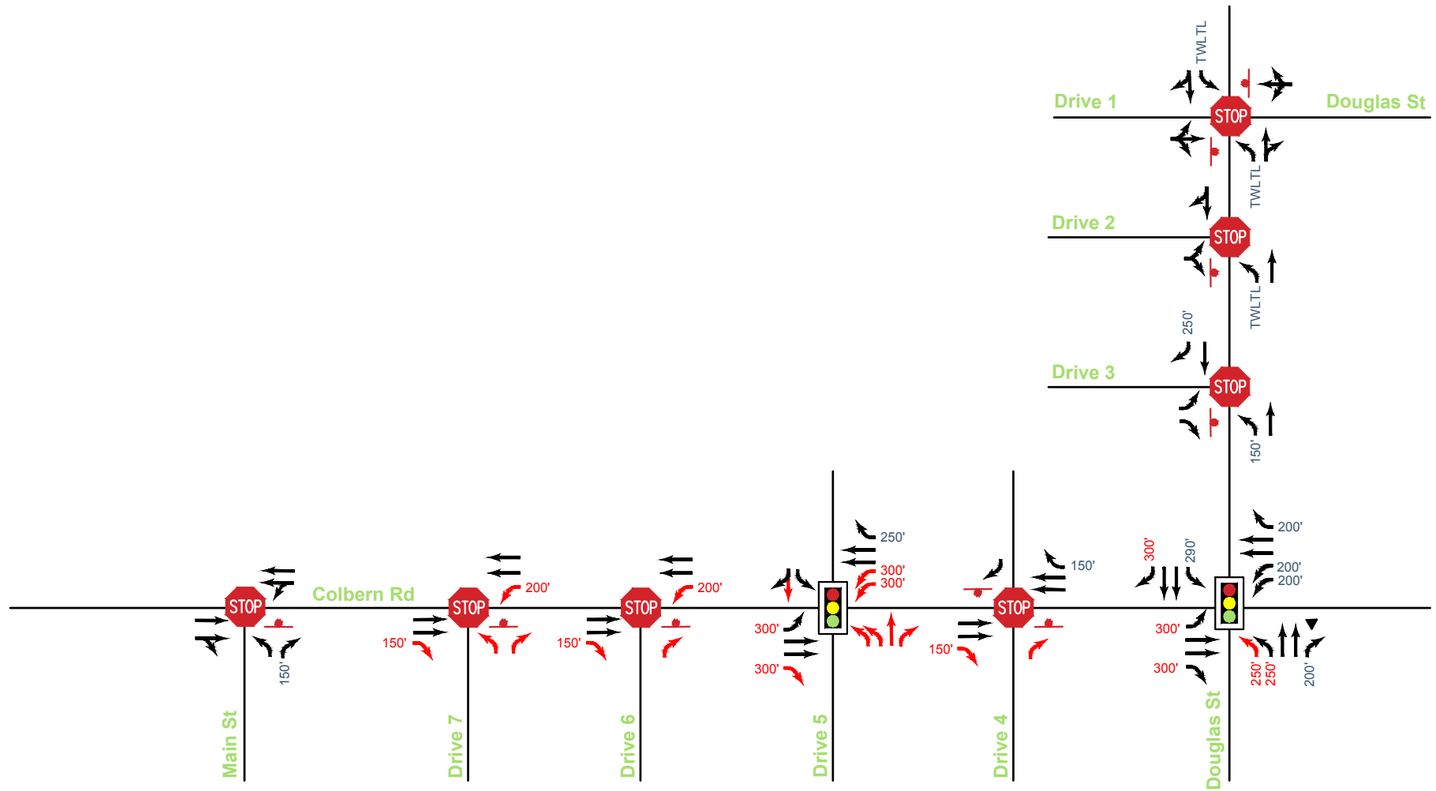


FIGURE 13

Build Year 2027 Plus Phase 1 and 2 Development Capacity Analysis

Discovery Park TIS
Lee's Summit, MO

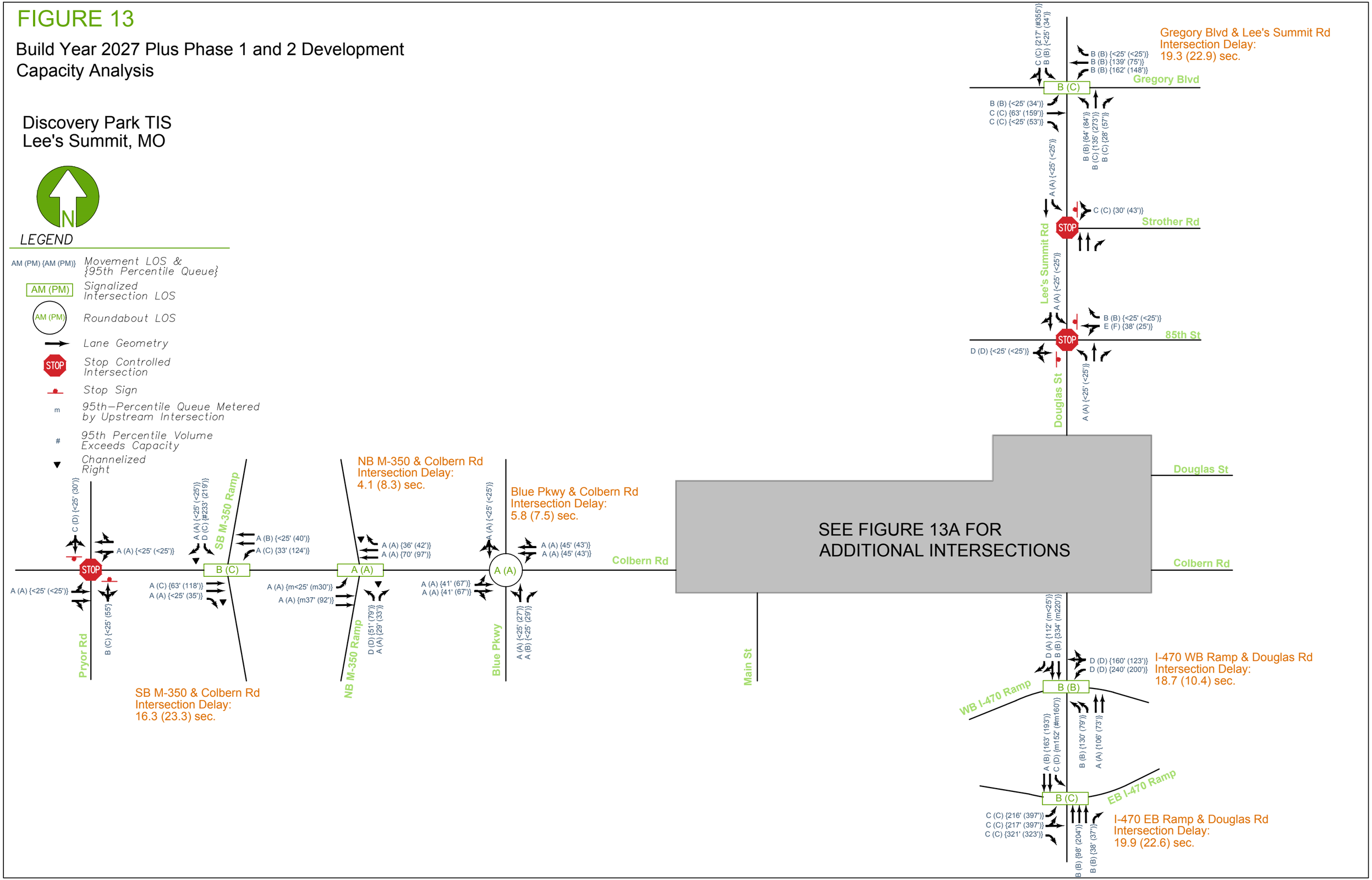


FIGURE 13A

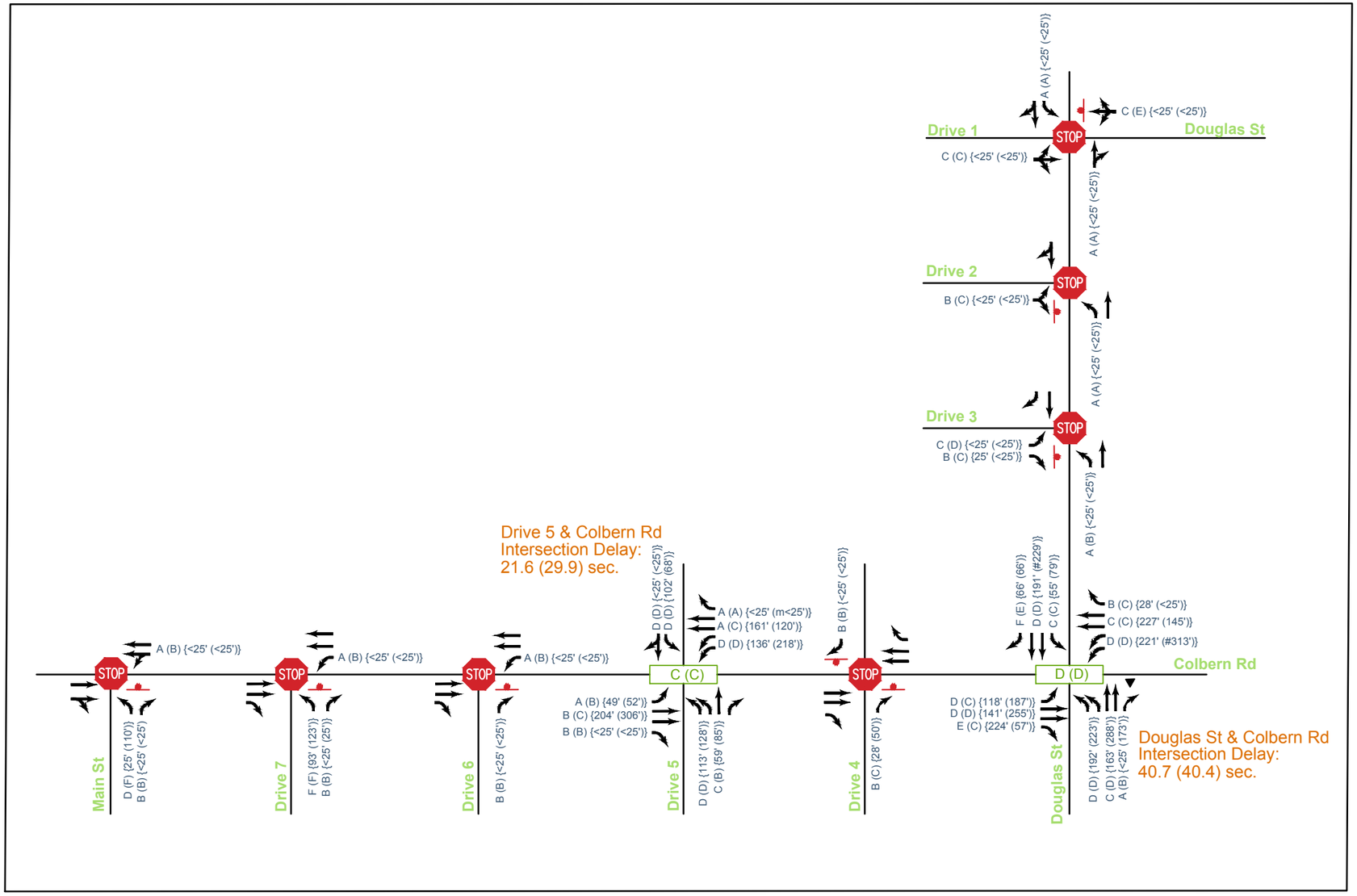
Build Year 2027 Plus Phase 1 and 2 Development
Capacity Analysis

Discovery Park TIS
Lee's Summit, MO

N

LEGEND

- AM (PM) {AM (PM)} — Movement LOS & {95th Percentile Queue}
- AM (PM) — Signalized Intersection LOS
- Lane Geometry
- STOP — Stop Controlled Intersection
- Stop Sign
- m — 95th–Percentile Queue Metered by Upstream Intersection
- # — 95th Percentile Volume Exceeds Capacity
- Channelized Right



7. BUILD YEAR 2032 PLUS FULL BUILD DEVELOPMENT CONDITIONS

Conditions with phase 3 of the proposed development in place were evaluated to identify any potential geometric improvements that could be attributed to the additional traffic associated with phase 3 of the proposed development. Analysis of phase 3 conditions includes the background growth of existing traffic to the build year 2032 plus the approved and phases 1 and 2 proposed development volumes. Through volumes were grown along Colbern Road and Douglas Street corridors by 1% and distributed at the ramps using existing gravity. Background traffic growth information is provided in **Appendix E**.

Phase 3 development is proposed to consist of retail, restaurant, single family housing, multifamily housing, medical, office, and retirement community/senior living uses. **Figure 5** illustrates the phase 3 development plan.

7.1 Phase 3 Development Trip Generation and Distribution

Trip generation and proposed trip distribution for the site was presented in **Section 4.1**. To conduct trip distribution for phase 3, site generated trips were distributed to the network using the proposed access points. A detailed summary of trip generation by land use type and zone is shown in **Table 17**. Trip generation calculations by building and internal capture information for phase 3 are provided in **Appendix E**.

Table 17. Phase 3 (Zones 4-5) Development Trip Generation.

Land Use	Zone	Size	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Multifamily Housing	4	1,360 Units	457	106	351	486	297	189
Strip Retail Plaza	4	66,000 SF	124	74	50	396	198	198
Medical Office	4	90,000 SF	186	146	40	288	86	202
Sit Down Restaurant	4	18,000 SF	136	72	64	130	80	50
General Office	4	40,000 SF	66	58	8	72	12	60
Senior Housing	5	250 Units	39	13	26	50	28	22
Retirement Housing	5	30 Units	26	17	9	60	23	37
Multifamily Housing	5	240 Units	75	17	58	75	45	30
Single Family Housing	5	120 Units	70	18	52	93	58	35
Zone 4 Trips			**969**	**456**	**513**	**1,372**	**673**	**699**
Zone 5 Trips			**210**	**65**	**145**	**278**	**154**	**124**
Phase 3 Total Trips			**1,179**	**521**	**658**	**1,650**	**827**	**823**

The expected trip distribution and site trips for phase 3 are shown in **Figure 15.** The resulting build year plus phase 3 development volumes are illustrated in **Figure 16**.

FIGURE 14

Phase 3 Development Trip Distribution

Discovery Park TIS
Lee's Summit, MO

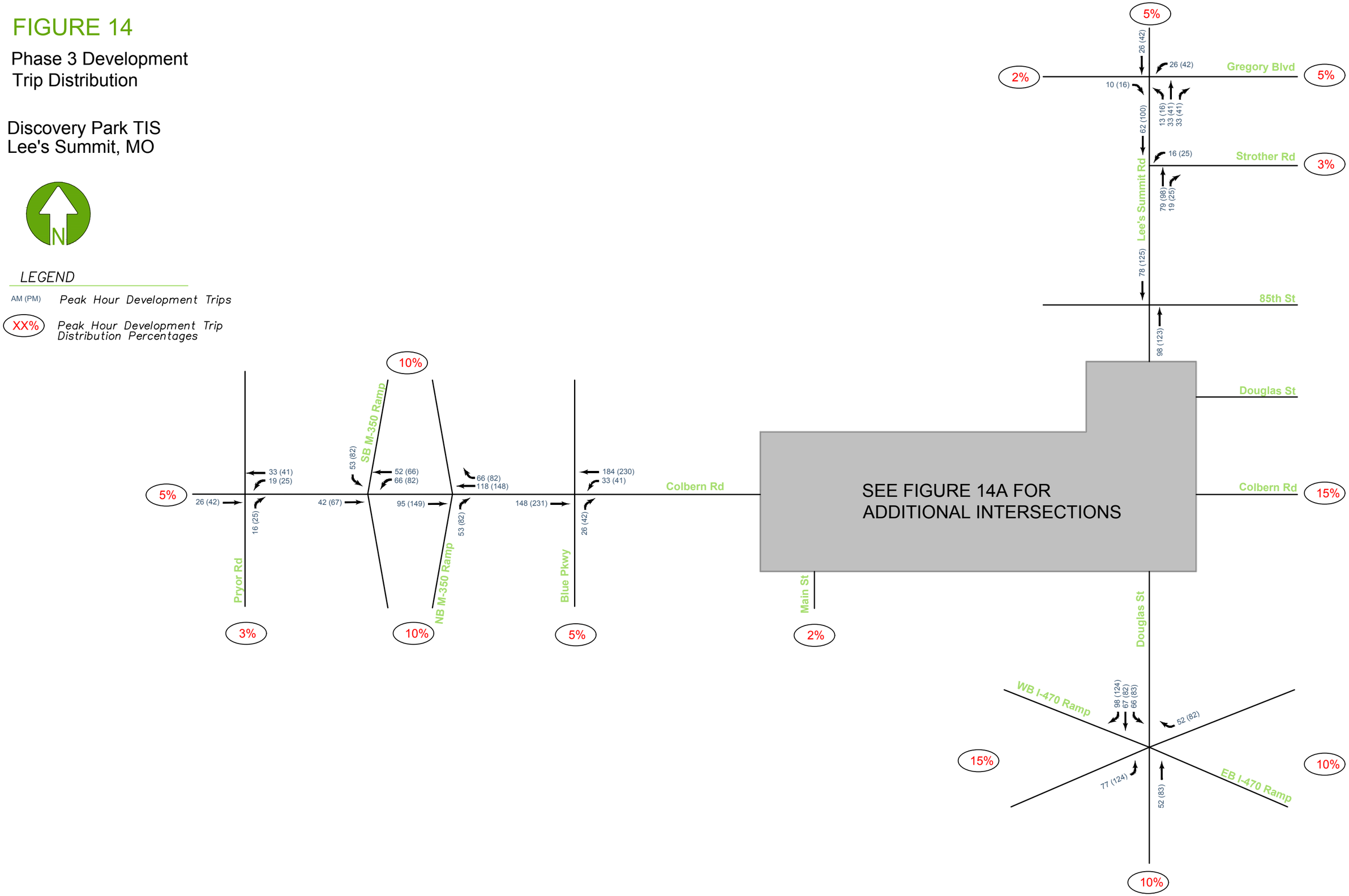


FIGURE 14A

Phase 3 Development
Trip Distribution

Discovery Park TIS
Lee's Summit, MO

LEGEND

AM (PM) *Peak Hour Development Trips*

Phase 3 Development

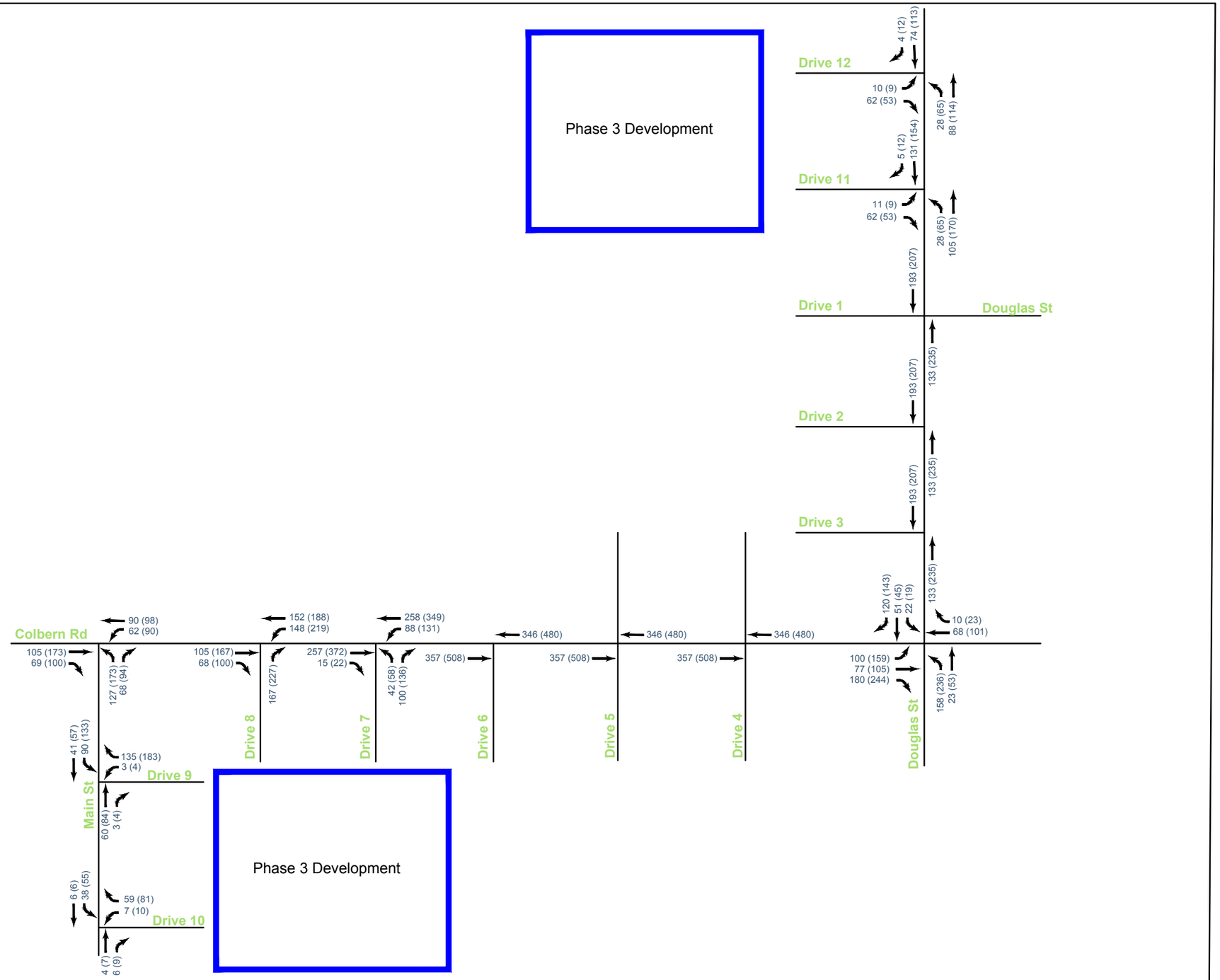


FIGURE 15

Build Year 2032 Plus Full Build Developement
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

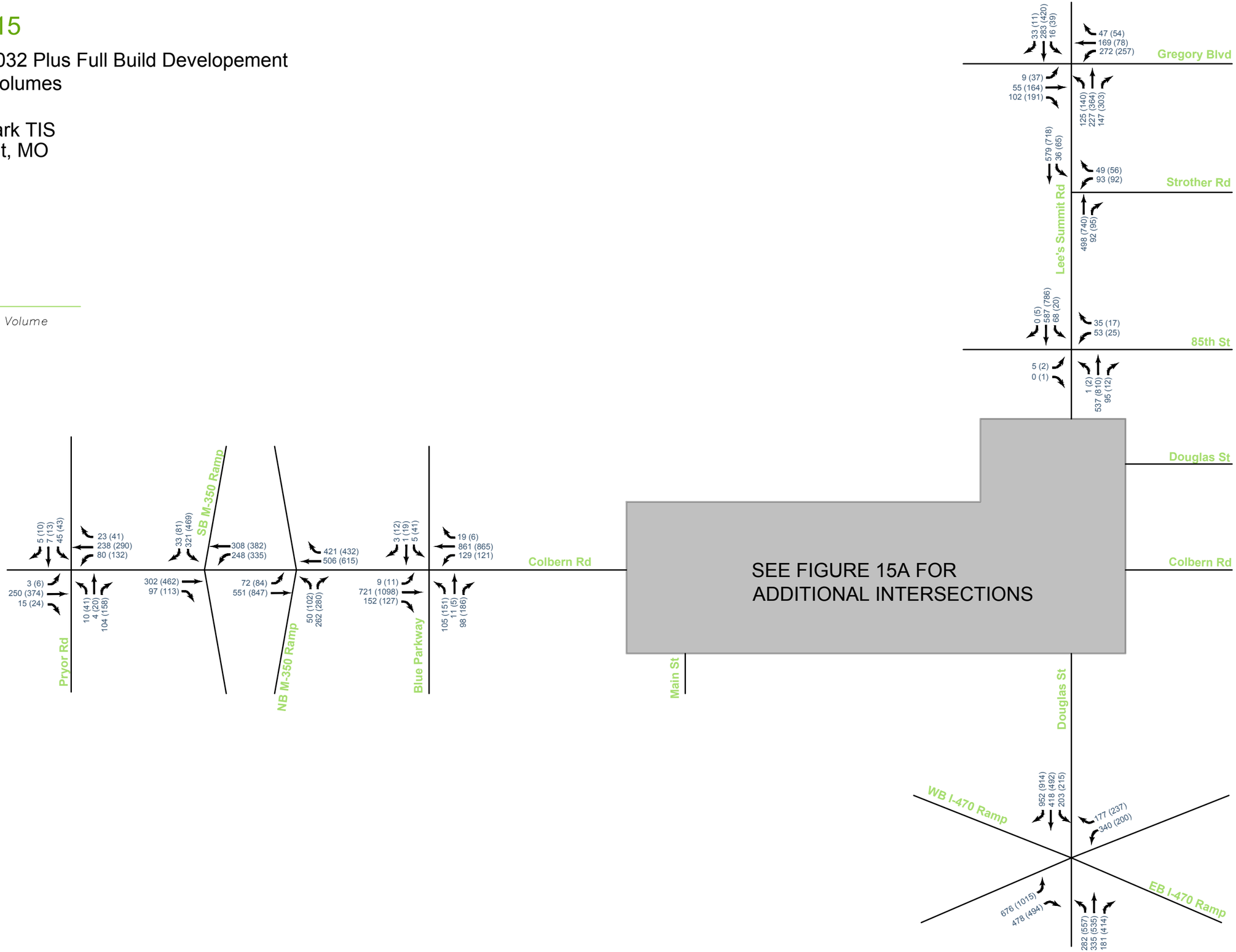


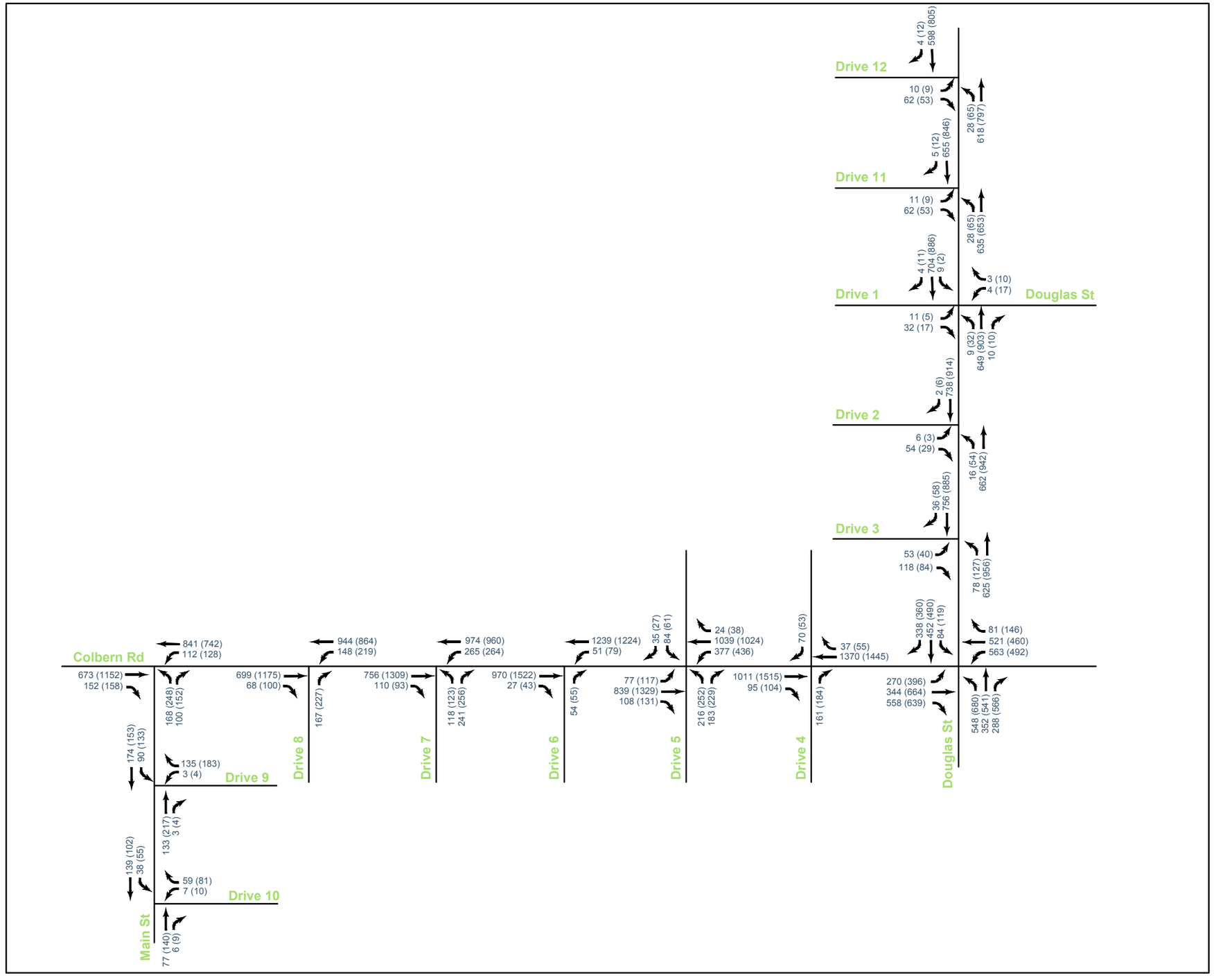
FIGURE 15A

Build Year 2032 Plus Full Build Development
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

LEGEND

AM (PM) *Peak Hour Volume*



7.2 Build Year Plus Full Build Development Warrant Analysis

Turn Lane Warrants: Turn lane analysis was conducted as stated in **Section 3.3.**

Left-Turn Lanes:

Lee's Summit (based on AMC): Based on the Lee's Summit AMC, no additional left-turn lanes are warranted under build year plus full build development conditions.

Kansas City/MoDOT (based on MoDOT EPG): Based on the MoDOT EPG, no additional left-turn lanes are warranted under build year plus full build development conditions.

Right-Turn Lanes:

Lee's Summit (based on AMC): Based on the Lee's Summit AMC, no additional right-turn lanes are required under build year plus full build development conditions.

Kansas City/MoDOT (based on MoDOT EPG): Based on the MoDOT EPG, no additional right-turn lanes are warranted under build year plus full build development conditions.

Turn lane warrant analysis sheets are provided in **Appendix E.**

Signal Warrants: The peak hour signal warrant (Warrant 3) was evaluated for the study intersections considering build year plus full build development conditions. The following intersections meet Warrant 3 during as least one peak hour:

- Lee's Summit Road and Strother Road (AM and PM)
- Douglas Street and Drive 3 (AM and PM)
- Colbern Road and Main Street (AM and PM)
- Colbern Road and Drive 7 (AM and PM)
- Colbern Road and Pryor Road (PM only)
- Lee's Summit Road and 85th Street (AM only)

Signal warrants were only conducted for full access intersections. Several study intersections are on the threshold or warrant signalization under build year plus full build development conditions. It is recommended to signalize the intersection of Colbern Road and Drive 7, as well as the intersection of Colbern Road and Main Street based on expected operations. No additional signals are recommended at this time. Volumes and operations will be monitored under future scenarios to determine if and when additional signalization will be recommended for any study intersections. Signal warrant analysis sheets for build year plus full build development conditions are provided in **Appendix E**.

Build year plus phase 3 development lane configurations and traffic control for the study network are illustrated in **Figure 17**.

7.3 Build Year Plus Full Build Development Recommendations

Site driveways associated with phase 3 development include Drives 8 through 12. The location and allowed movements for site driveways were reviewed in a holistic way considering the ultimate build out of the site.

Several site driveways are recommended to be partial access. In order to provide adequate ingress and egress to the site, it is recommended to signalize the intersections of Colbern Road and Main Street, as well as Colbern Road and Drive 7. All new signals require left-turn lanes in all directions per the City of Lee's Summit AMC. The proposed signals meet access spacing and promote best access management practices. Drive 8 is proposed to be limited to a three-quarter access (right-in/left-in/right-out) and meets recommended access spacing. Drives 8 and 9 are proposed along Main Street as full access unsignalized intersections and are expected to meet recommended access spacing.

Detailed spacing and geometrics of Drives 10 and 11 were not available at the time of the writing of this report. Both drives are expected to be full access unsignalized intersections. As plans for this area develop, proposed access should be provided consistent with guidance in the City of Lee's Summit AMC.

With the completion of full build development and consideration of future year traffic volumes, the intersection of Douglas Street and Colbern Road is expected to operate at a poor level of service with queuing expected to impact the operations of the Douglas Street and I-470 interchange. The primary conflict within the study area is the northbound queue and lack of intersection spacing from the westbound ramp of the interchange to Colbern Road. As discussed in **Section 7.4**, opportunities for improvement at the intersection of Douglas Street and Colbern Road are limited due to the inability to improve spacing of Colbern Road from the interchange.

For the purposes of this study, potential improvements to the I-470 and Douglas Street interchange were considered. This is not intended to be an interchange feasibility study and only presents one possible solution to address expected operations. This study considered several approved development projects, the proposed development project, background traffic growth, and planned roadway projects for the phase 3 scenario; as planned roadway projects are completed and approved projects develop, actual operations should be reviewed and considered.

Reviewing expected future year volumes and considering the constraints of the roadway network at Colbern Road, a single point interchange was considered as an option to increase spacing between the I-470 ramp terminals and Colbern Road. A single point interchange will combine the eastbound and westbound I-470 ramps into one signal, which will increase the

spacing along Douglas Street between the I-470 ramps and Colbern Road. A single point interchange is expected to operate acceptably under full build conditions.

If traffic volumes develop within the study area (based on approved development, proposed development, and background traffic growth), four through lanes along Douglas Street north of Colbern Road may be needed to support operations. Reviewing the City of Lee's Summit Thoroughfare Master Plan, Douglas Street is planned as a future year five-lane section. Volumes along the corridor should be monitored; under build year plus full build conditions improvement of Douglas Street along the frontage of the proposed development property to a five-lane section should be considered.

Based on a review of expected operations and turn lane warrants, the following improvements are recommended under build year plus full build development conditions. Turn lanes should be provided with recommended storage plus taper. It is acknowledged that these recommendations are based on future year conditions considering approved development, proposed development, background traffic growth, and planned roadway projects. Improvements, specifically signalization, should be based on actual/realized conditions.

- Signal timings along the Douglas Street corridor should be reviewed. It is anticipated that a review of signal timings will be needed based on traffic growth associated with approved and proposed development as well as background traffic growth.
- Colbern Road and Douglas Street
    - Construct additional 300-foot (dual) eastbound left-turn lanes.
    - Construct 300-foot (dual) eastbound right-turn lanes.
    - Extend storage of one northbound dual left-turn lane to 375-feet. Storage length should be maximized dependent upon actual conditions. The other left turn lane should be continuous.
    - Extend storage of the westbound dual left-turn lanes to 500 feet. The potential for this improvement may be limited by property constraints east of the site.
    - Extend storage of the southbound right-turn lane to 500 feet.
    - Provide an additional southbound through lane at the intersection with a storage of 500 feet.
    - Signal modification.
- Colbern Road and Drive 7
    - Signalize intersection. Provide signal communications to intersection.
- Colbern Road and Drive 8
    - Construct a 150-foot eastbound right-turn lane.
    - Construct a 200-foot westbound left-turn lane.

- Colbern Road and Main Street
  - Signalize intersection. Provide signal communications to intersection.
  - Construct a 200-foot westbound left-turn lane.
- Lee's Summit Road and Drive 11
  - Provide northbound left-turn lane (utilize existing TWLTL).
- Lee's Summit Road and Drive 12
  - Provide northbound left-turn lane (utilize existing TWLTL).
- I-470 Interchange
  - Reconstruction to support modification of interchange to a single point interchange configuration. The following intersection geometrics are recommended. Two northbound and southbound through lanes should be maintained through the interchange.
    - Construct dual northbound left-turn lanes, one with storage of 400-feet and one continuous.
    - Construct a 200-foot northbound channelized right-turn lane.
    - Construct eastbound triple left-turn lanes (Transition from one lane extending from interstate to three lanes).
    - Construct a channelized 400-foot right-turn lane.
    - Construct a southbound 225-foot left-turn lane.
    - Construct dual southbound channelized right-turn lanes, one with storage of 400-feet and one continuous.
    - Construct dual westbound left-turn lanes (Transition from one lane extending from interstate to two lanes)
    - Construct a 400-foot channelized right-turn lane.
- Colbern Road and M-350 Southbound Ramp
  - Construct dual southbound left-turn lanes (200-foot storage for one left lane, one continuous extending to interstate).
  - Signal modification.

7.4 Build Year Plus Full Build Development Capacity Analysis

Capacity analysis was conducted for build year plus full build development conditions using the methodologies described in **Section 3.4**. Recommended phase 3 improvements noted in **Section 7.3** were considered complete for the purposes of capacity analysis. Signal timings were adjusted. Per MDOT standards, all existing and proposed intersection peak hour factors were set to 0.92 for both approach and movement.

Results of the capacity analysis indicate that several intersections are expected to operate at a lower level of service with consideration of the full build development. All signalized study intersections are expected to operate at a LOS C or better overall as illustrated in **Table 18**,

except the intersections of Douglas Street with Colbern Road (PM peak) and Douglas Street with I-470 Ramps. While the queueing and delay are not acceptable by City standards, the recommendation of a new interchange improves spacing between I-470 and Colbern Road along Douglas Street to reduce the potential for queuing to extend between intersections. Simulation files were reviewed to observe operations of the network with the suggested interchange improvement and operations were indicated to be better. The individual signalized movements that are expected to operate at a LOS E or worse are listed in **Table 18** below. Unsignalized movements are primarily expected to operate at LOS D or better with acceptable queues during the AM and PM peak hour periods. The individual unsignalized movements that are expected to operate at a LOS E or worse are listed in **Table 18**.

Table 18. Build Year plus Full Build Development Conditions Capacity Analysis.

Intersection *(Movement)*	AM Peak Hour Period		PM Peak Hour Period	
	LOS (Delay, sec)	95th-Percentile Queue (ft)	LOS (Delay, sec)	95th-Percentile Queue (ft)
Colbern Road and M-350 Southbound Ramps	***B (11.8)***	**-**	***C (21.5)***	**-**
Colbern Road and M-350 Northbound Ramps	***A (4.0)***	**-**	***A (8.3)***	**-**
Colbern Road and Blue Parkway (Roundabout)	**A (7.2)**	**-**	**B (10.1)**	**-**
Douglas Street and Colbern Road	***C (33.4)***	**-**	***D (41.0)***	**-**
Eastbound Left-Turn	*D (39.3)*	*57*	*E (55.7)*	*m167*
Eastbound Through	*D (50.4)*	*136*	*E (59.3)*	*#343*
Northbound Left-Turn	*D (47.1)*	*#285*	*E (56.3)*	*#330*
Southbound Right-Turn	*E (56.1)*	*102*	*D (46.8)*	*270*
Douglas Street and I-470 Single Point Interchange	***E (63.0)***	**-**	***D (44.2)***	**-**
Northbound Right-Turn	*E (55.4)*	*123*	*D (43.2)*	*137*
Southbound Left-Turn	*D (39.3)*	*m200*	*E (58.2)*	*m199*
Southbound Right-Turn	*E (74.9)*	*142*	*F (82.3)*	*m89*
Eastbound Right-Turn	*F (196.3)*	*#486*	*E (58.6)*	*#404*
Colbern Road and Drive 5	***C (28.2)***	**-**	***C (33.9)***	**-**
Westbound Left-Turn	*E (56.6)*	*m178*	*E (56.7)*	*m185*
Northbound Right-Turn	*C (35.0)*	*18*	*F (134.0)*	*84*
Colbern Road and Drive 7	***B (18.0)***	**-**	***B (17.3)***	**-**
Northbound Right-Turn	*E (59.6)*	*66*	*F (135.5)*	*81*
Colbern Road and Main Street	***B (17.6)***	**-**	***B (18.4)***	**-**
Northbound Left-Turn	*D (49.3)*	*172*	*E (67.7)*	*303*
Lee's Summit Road and Gregory Boulevard	***C (20.6)***	**-**	***C (27.3)***	**-**

Table 18A. Build Year plus Full Build Development Conditions Capacity Analysis, continued.

Intersection *(Movement)*	AM Peak Hour Period		PM Peak Hour Period	
	LOS (Delay, sec)	95th-Percentile Queue (ft)	LOS (Delay, sec)	95th-Percentile Queue (ft)
Lee's Summit Road and St. Michael's Drive (unsignalized)	-	-	-	-
Westbound Left-Turn	*F (64.3)*	*58*	*F (104.8)*	*43*
Eastbound Left/Thru/Right	*E (45.2)*	*<25*	*E (52.5)*	*<25*
Lee's Summit Road and Douglas Road/Drive 1 (unsignalized)	-	-	-	-
Westbound Left/Thru/Right	*C (22.1)*	*<25*	*F (51.5)*	*25*
Colbern Road and Pryor Road (unsignalized)	-	-	-	-
Southbound Left/Thru/Right	*C (18.2)*	*<25*	*E (36.3)*	*43*
Lee's Summit Road and Strother Road (unsignalized)	-	-	-	-
Westbound Left/Right	*C (20.5)*	*48*	*E (35.0)*	*85*

- 95th-percentile queue exceeds capacity.

m – Volume for 95th-percentile queue is metered by upstream signal.

As stated in **Section 5.4**, some unsignalized side street movements may operate poorly during the peak hour periods. Unsignalized movements may operate with a lower level of service but are expected to have acceptable queuing and v/c ratios under full build development conditions.

The reconstruction of the I-470 and Douglas Street interchange is presented as an alternative to address potential future year operations if background and proposed development trips materialize. As future year phases develop, updated traffic counts and a review of actual operations should be conducted to determine needed improvements.

The build year plus full build development capacity analysis summary is illustrated in **Figure 18**. Detailed results are provided in **Appendix E.**

7.4.1 Build Year plus Full Build Development Simulation

The simulation model developed for the Douglas Street corridor was updated to include expected phase 3 development trips and geometric improvements. For this scenario, driver parameters and lane utilization noted was adjusted to better represent expected driver behavior as traffic volumes increase and geometric improvements to the area are made. The simulation model considers signal timing adjustments to accommodate the changes to travel patterns and geometric improvements to support expected phase 3 conditions.

Observing the simulation, vehicles are expected to experience moderate queueing and delay at movements during the peak periods, specifically the westbound and northbound left-turn movements as well as the southbound and eastbound through movements at the Douglas Street and Colbern Road intersection during the PM peak period. Reviewing the simulation, although queuing is expected the vehicular flow through the network is constant and the coordinated signal timings are efficient in moving vehicles through the network. The improvement of the interchange to a SPUI indicates acceptable operations and improved conditions north/south along Douglas Street. SimTraffic model results and max queue reports were used to fine-tune recommendations to turn bay lengths at the study intersections to reduce spillback where possible and improve operations to be similar to existing conditions.

As previously presented, the simulation model is built on planned roadway improvements, realization of approved and proposed development conditions, background traffic growth, and maintenance of driver parameters. Monitoring of the network is recommended before implementing geometric or signal timing changes. Simulation results for the build year plus full build scenario is provided in **Appendix E**.

FIGURE 16

Build Year 2032 Plus Full Build Developement
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

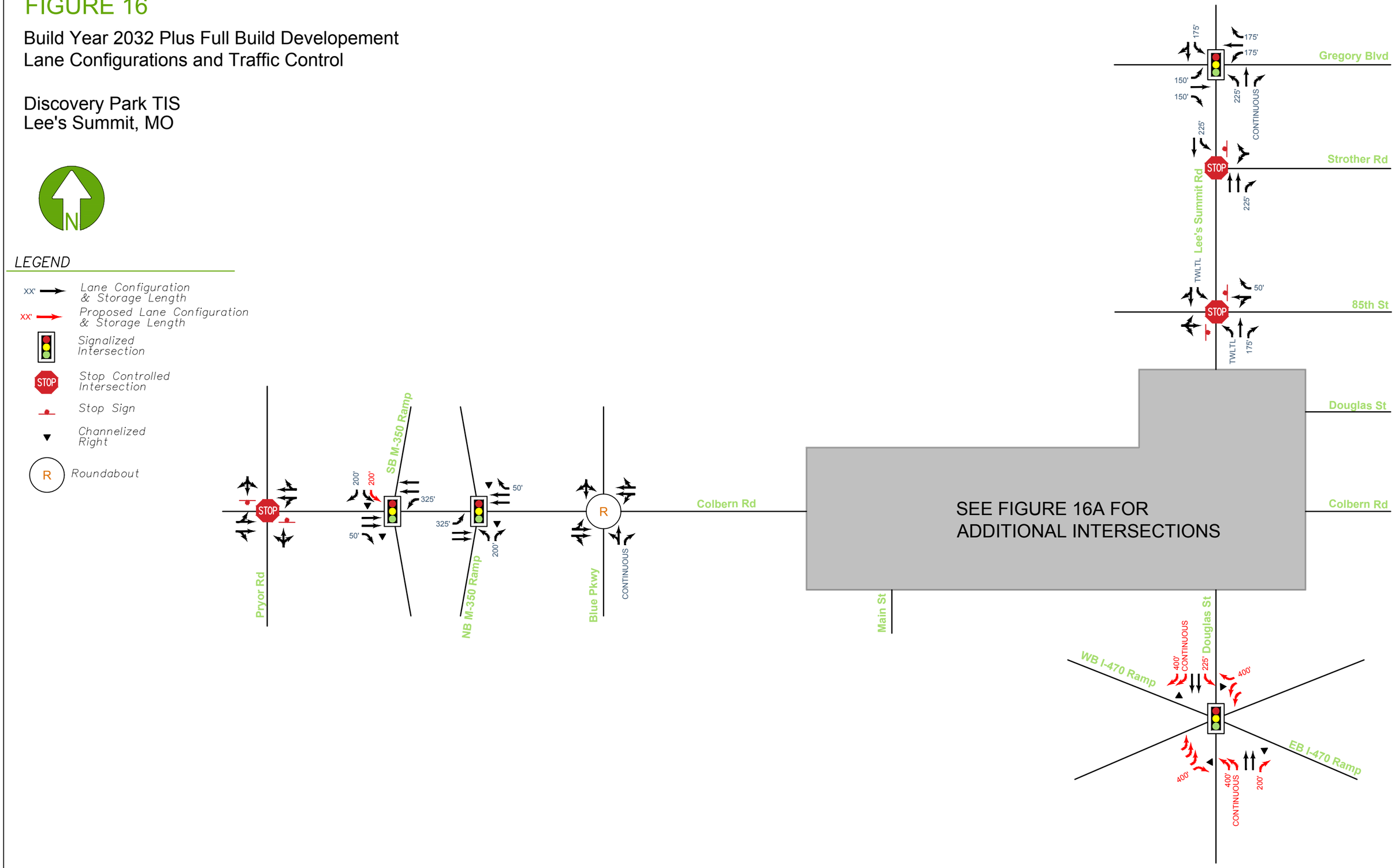


FIGURE 16A

Build Year 2032 Plus Full Build Development
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

LEGEND

- XX' — *Lane Configuration & Storage Length*
- XX' — *Proposed Lane Configuration & Storage Length*
- *Signalized Intersection*
- STOP — *Stop Controlled Intersection*
- *Stop Sign*
- *Channelized Right*

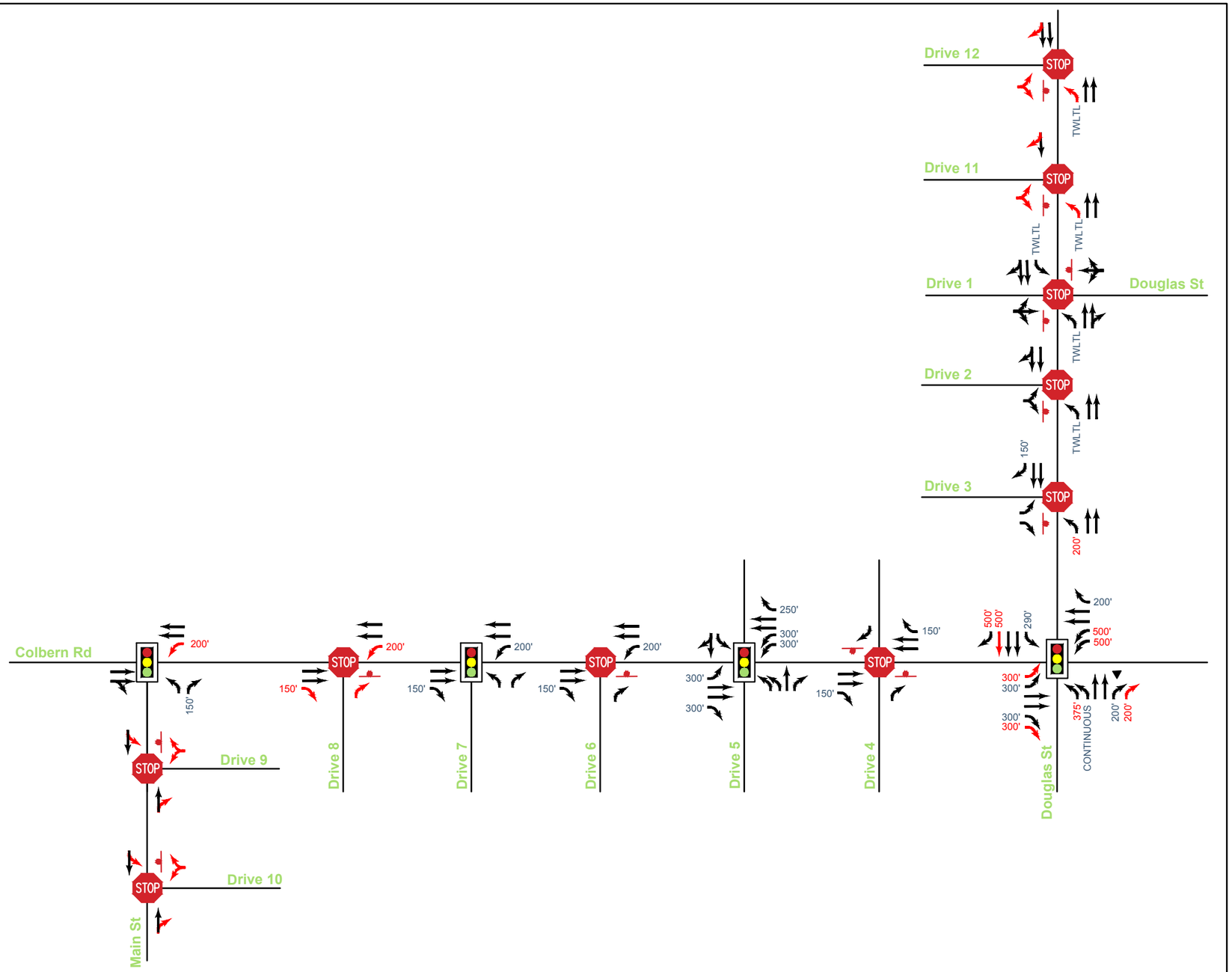


FIGURE 17

Build Year 2032 Plus Full Build Development Capacity Analysis

Discovery Park TIS
Lee's Summit, MO

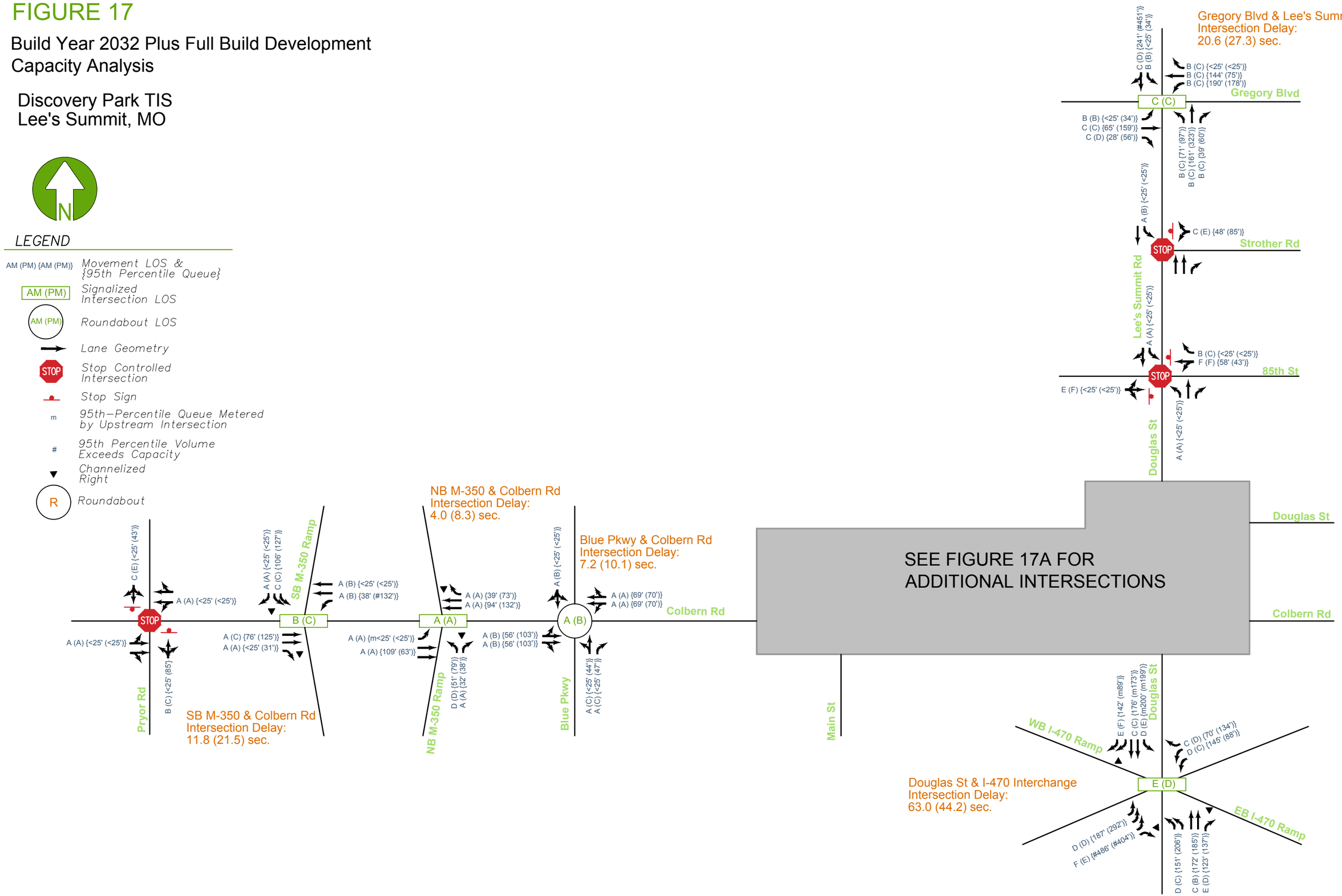


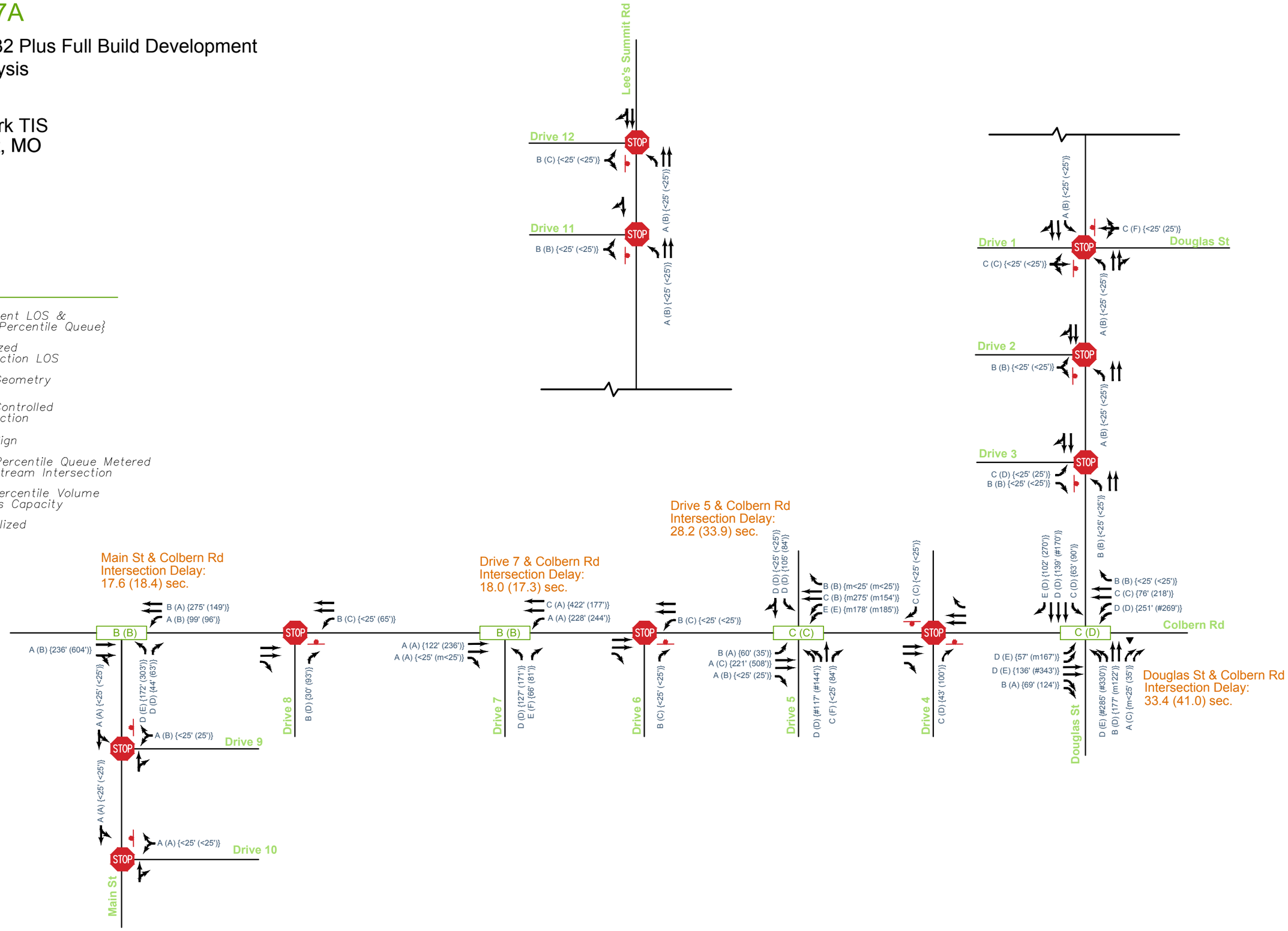
FIGURE 17A

Build Year 2032 Plus Full Build Development Capacity Analysis

Discovery Park TIS
Lee's Summit, MO

LEGEND

- AM (PM) {AM (PM)} — *Movement LOS & {95th Percentile Queue}*
- AM (PM) — *Signalized Intersection LOS*
- *Lane Geometry*
- STOP — *Stop Controlled Intersection*
- *Stop Sign*
- m — *95th–Percentile Queue Metered by Upstream Intersection*
- # — *95th Percentile Volume Exceeds Capacity*
- *Channelized Right*



8. FUTURE YEAR 2040 PLUS FULL BUILD DEVELOPMENT CONDITIONS

Future year conditions with the proposed development in place was evaluated to identify any potential geometric improvements that could be attributed to the additional traffic associated with future background traffic growth. Analysis of future year conditions includes the background growth of existing traffic to the year 2040 as well as full build of the proposed development. Through volumes were grown along Colbern Road and Douglas Street corridors by 1% and distributed at the ramps using existing gravity. The resulting future year peak hour volumes are illustrated in **Figure 19**. Background traffic growth information is provided in **Appendix F**.

8.1 Future Year Plus Full Build Development Warrant Analysis

Turn Lane Warrants: Turn lane analysis was not conducted for future year 2040 plus full build development conditions. Future year traffic growth was applied to through movements and select turning movements at the I-470 ramps; no additional turn lanes are expected to warrant from previous scenarios.

Signal Warrants: The peak hour signal warrant (Warrant 3) was evaluated for the study intersections considering future year plus full build development conditions. The following intersections meet Warrant 3 during as least one peak hour:

- Lee's Summit Road and Strother Road (AM and PM)
- Douglas Street and Drive 3 (AM and PM)
- Colbern Road and Pryor Road (PM only)
- Lee's Summit Road and 85th Street (AM only)

Signal warrants were only conducted for full access intersections. Several study intersections are on the threshold or warrant signalization under future year plus full build development conditions. No additional signals are recommended at this time. Signal warrant analysis sheets for future year plus full build development conditions are provided in **Appendix F**.

Future year plus full build development lane configurations and traffic control for the study network are illustrated in **Figure 20**.

FIGURE 18

Future Year 2040 Plus Full Build Development
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

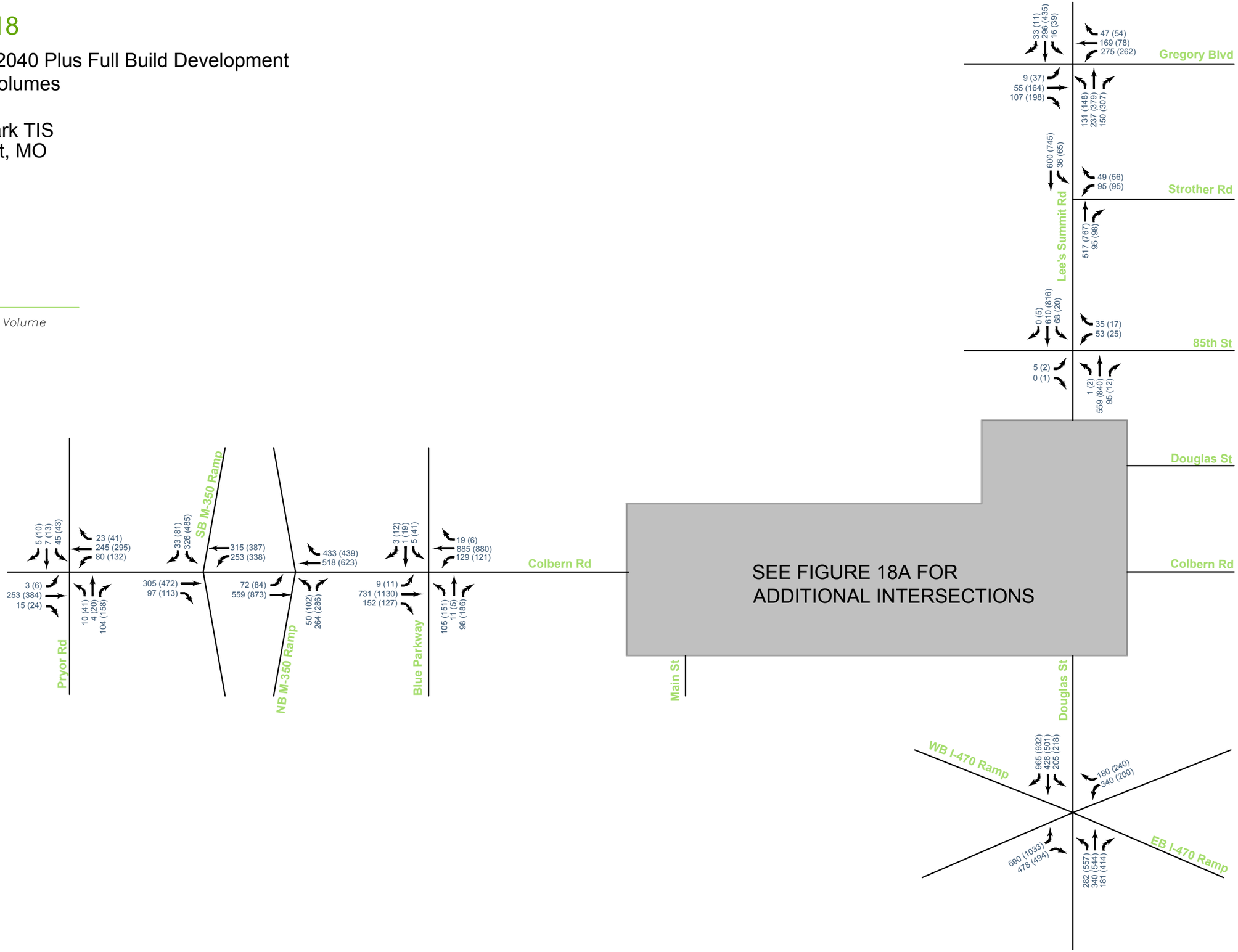


FIGURE 18A

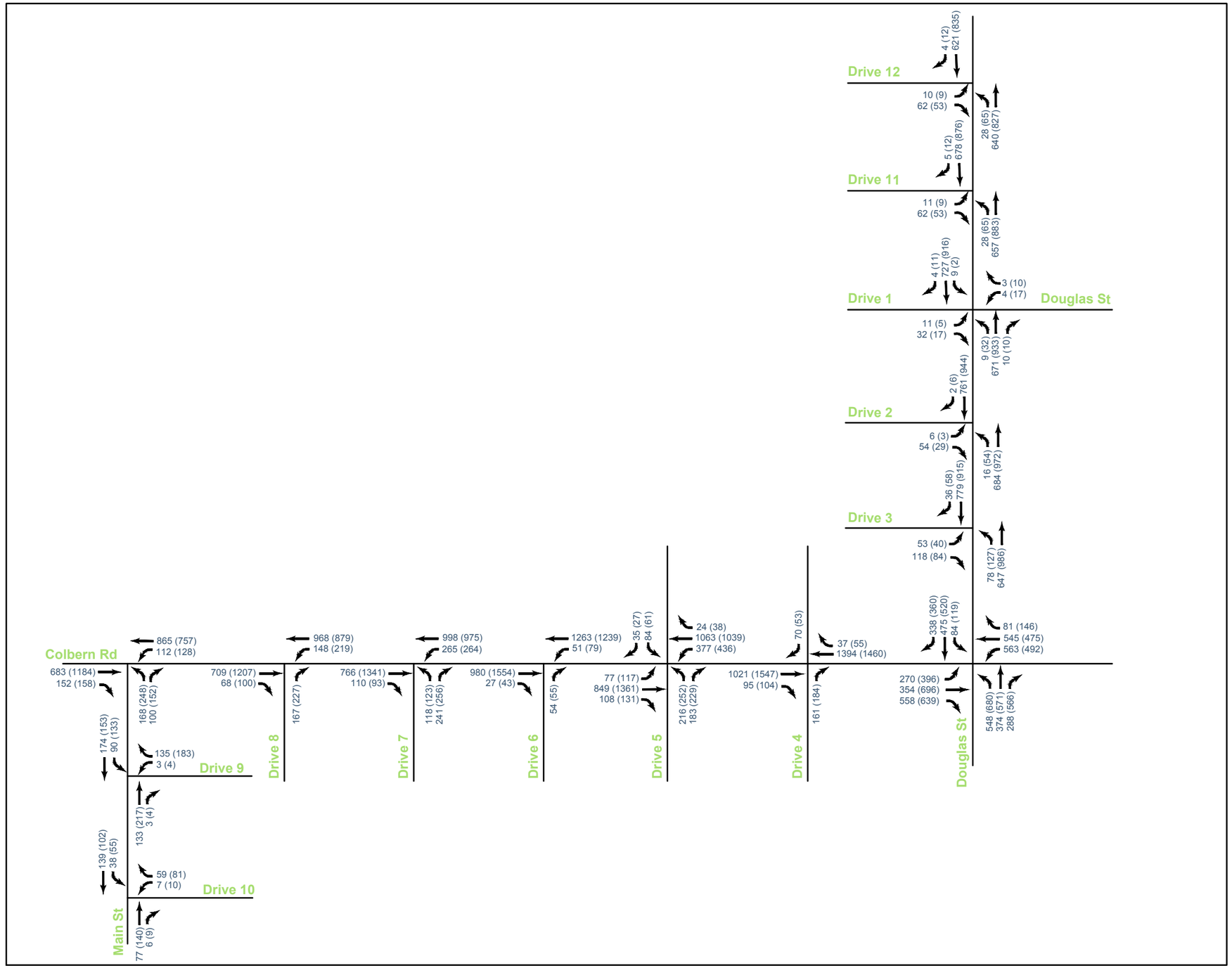
Future Year 2040 Plus Full Build Development
Peak Hour Volumes

Discovery Park TIS
Lee's Summit, MO

N

LEGEND

AM (PM) *Peak Hour Volume*



8.2 Future Year Plus Full Build Development Capacity Analysis

Capacity analysis was conducted for future year plus full build development conditions using the methodologies described in **Section 3.4**. Signal timings were not adjusted from the previous scenario.

Results of the capacity analysis indicate the study network is expected to operate similar to build year plus full build development conditions. **Table 19** illustrates overall intersection level of service for signalized intersections. The individual signalized movements that are expected to operate at a LOS E or worse are listed in **Table 19** below. Unsignalized movements are primarily expected to operate at LOS D or better with acceptable queues during the AM and PM peak hour periods. The individual unsignalized movements that are expected to operate at a LOS E or worse are listed in **Table 19**.

Table 19. Future Year plus Full Build Development Conditions Capacity Analysis.

Intersection *(Movement)*	AM Peak Hour Period		PM Peak Hour Period	
	LOS (Delay, sec)	95th-Percentile Queue (ft)	LOS (Delay, sec)	95th-Percentile Queue (ft)
Colbern Road and M-350 Southbound Ramps	***B (11.8)***	**-**	***C (21.7)***	**-**
Colbern Road and M-350 Northbound Ramps	***A (4.0)***	**-**	***A (8.4)***	**-**
Colbern Road and Blue Parkway (Roundabout)	**A (7.3)**	**-**	**B (10.4)**	**-**
Douglas Street and Colbern Road	***C (32.5)***	**-**	***D (41.9)***	**-**
Eastbound Left-Turn	*D (39.1)*	*57*	*E (55.7)*	*m163*
Eastbound Through	*D (50.9)*	*104*	*E (63.7)*	*#370*
Northbound Left-Turn	*D (46.9)*	*#285*	*E (56.2)*	*#331*
Southbound Right-Turn	*E (56.1)*	*102*	*D (47.8)*	*270*
Douglas Street and I-470 Single Point Interchange	***E (64.6)***	**-**	***D (43.5)***	**-**
Northbound Right-Turn	*E (56.9)*	*123*	*D (43.2)*	*133*
Southbound Left-Turn	*D (39.8)*	*m202*	*E (58.5)*	*m196*
Southbound Right-Turn	*E (79.7)*	*144*	*F (77.3)*	*m83*
Eastbound Right-Turn	*F (201.3)*	*#490*	*E (59.8)*	*#407*
Colbern Road and Drive 5	***C (28.3)***	**-**	***C (34.0)***	**-**
Westbound Left-Turn	*E (56.6)*	*m179*	*E (56.7)*	*m186*
Northbound Right-Turn	*C (35.0)*	*<25*	*F (134.0)*	*86*
Colbern Road and Drive 7	***B (18.1)***	**-**	***B (17.1)***	**-**
Northbound Right-Turn	*E (59.6)*	*66*	*F (135.5)*	*81*
Colbern Road and Main Street	***B (17.7)***	**-**	***B (18.5)***	**-**
Northbound Left-Turn	*D (49.3)*	*172*	*E (67.7)*	*303*

Table 19A. Future Year plus Full Build Development Conditions Capacity Analysis, continued.

Intersection *(Movement)*	AM Peak Hour Period		PM Peak Hour Period	
	LOS (Delay, sec)	95th-Percentile Queue (ft)	LOS (Delay, sec)	95th-Percentile Queue (ft)
Lee's Summit Road and Gregory Boulevard	***C (20.9)***	***-***	***C (28.7)***	***-***
Lee's Summit Road and St. Michael's Drive (unsignalized)	***-***	***-***	***-***	***-***
Westbound Left-Turn	*F (72.4)*	*63*	*F (122.5)*	*48*
Eastbound Left/Thru/Right	*E (48.6)*	*<25*	*F (58.1)*	*<25*
Lee's Summit Road and Douglas Road/Drive 1 (unsignalized)	***-***	***-***	***-***	***-***
Westbound Left/Thru/Right	*C (23.1)*	*<25*	*F (56.0)*	*28*
Colbern Road and Pryor Road (unsignalized)	***-***	***-***	***-***	***-***
Southbound Left/Thru/Right	*C (18.5)*	*<25*	*E (37.7)*	*45*
Lee's Summit Road and Strother Road (unsignalized)	***-***	***-***	***-***	***-***
Westbound Left/Right	*C (21.6)*	*50*	*E (39.5)*	*115*
Colbern Road and Drive 4 (unsignalized)	***-***	***-***	***-***	***-***
Northbound Right-Turn	*C (16.9)*	*43*	*E (36.0)*	*105*

- 95th-percentile queue exceeds capacity.

m – Volume for 95th-percentile queue is metered by upstream signal.

As with previous scenarios, some unsignalized side street movements may operate poorly during the peak hour periods. Unsignalized movements may operate with a lower level of service but are expected to have acceptable queuing and v/c ratios under future year plus full build development conditions.

No additional improvements are recommended under future year plus full build development conditions. Future traffic volumes should continue to be monitored for increased congestion and delay, and mitigations taken only when actual volumes are realized.

The future year plus full build development capacity analysis summary is illustrated in **Figure 21**. Detailed results are provided in **Appendix F.**

8.2.1 Future Year Plus Full Build Development Simulation

The simulation model was updated to reflect future year conditions. Observing the simulation, vehicles are expected to experience delay and queueing through the study area similar to conditions noted under previous Build Year plus Full Build Development conditions. Reviewing the simulation, although queuing is expected the vehicular flow through the network is constant and the coordinated signal timings are efficient in moving vehicles through the network. The improvement of the interchange to a SPUI indicates acceptable operations and improved conditions north/south along Douglas Street. Simulation results for the future year plus full build scenario is provided in **Appendix F**.

FIGURE 19

Future Year 2040 Plus Full Build Development
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

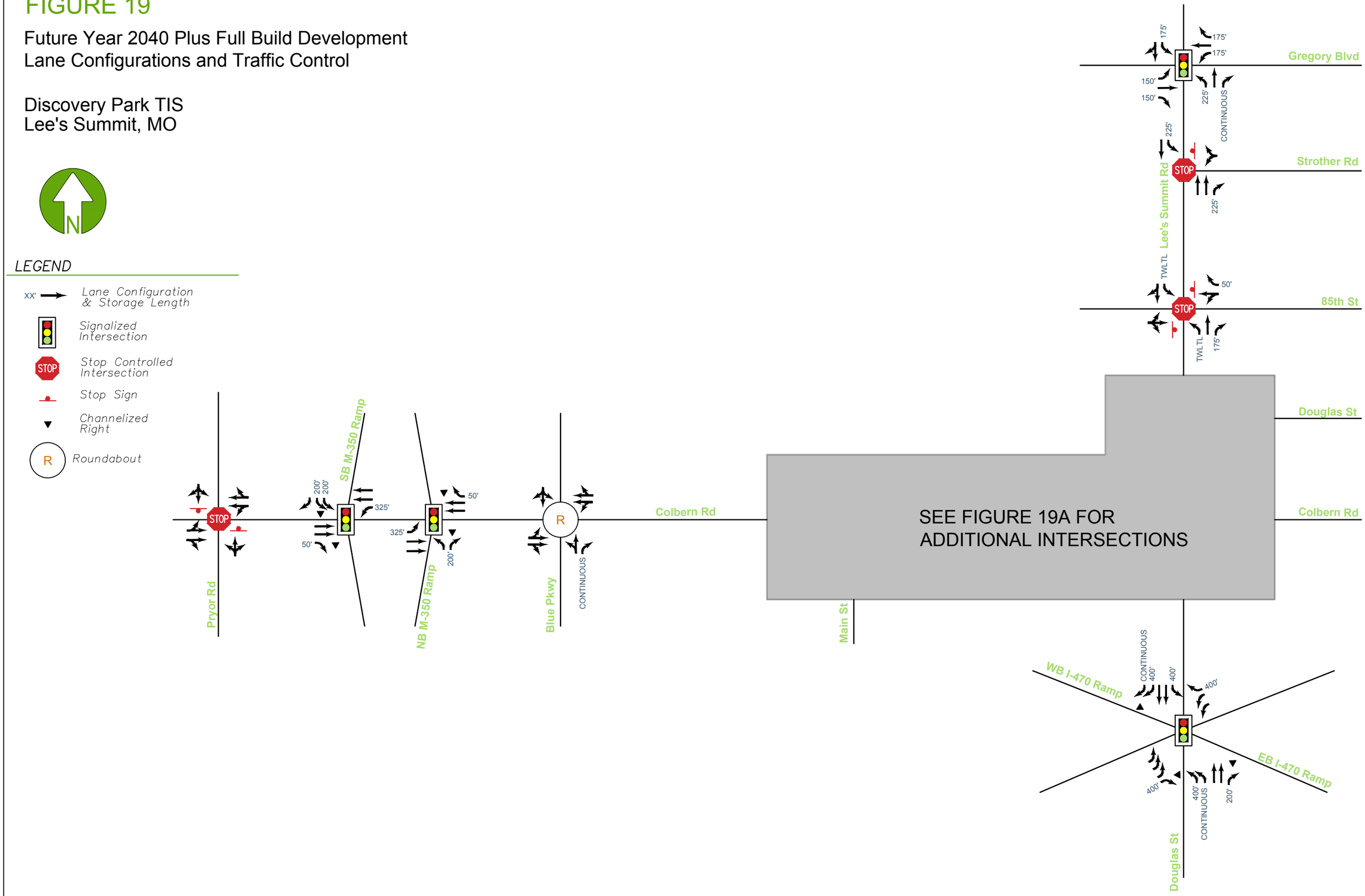


FIGURE 19A

Future Year 2040 Plus Full Build Development
Lane Configurations and Traffic Control

Discovery Park TIS
Lee's Summit, MO

LEGEND

- XX' → *Lane Configuration & Storage Length*
- *Signalized Intersection*
- STOP *Stop Controlled Intersection*
- *Stop Sign*
- ▼ *Channelized Right*

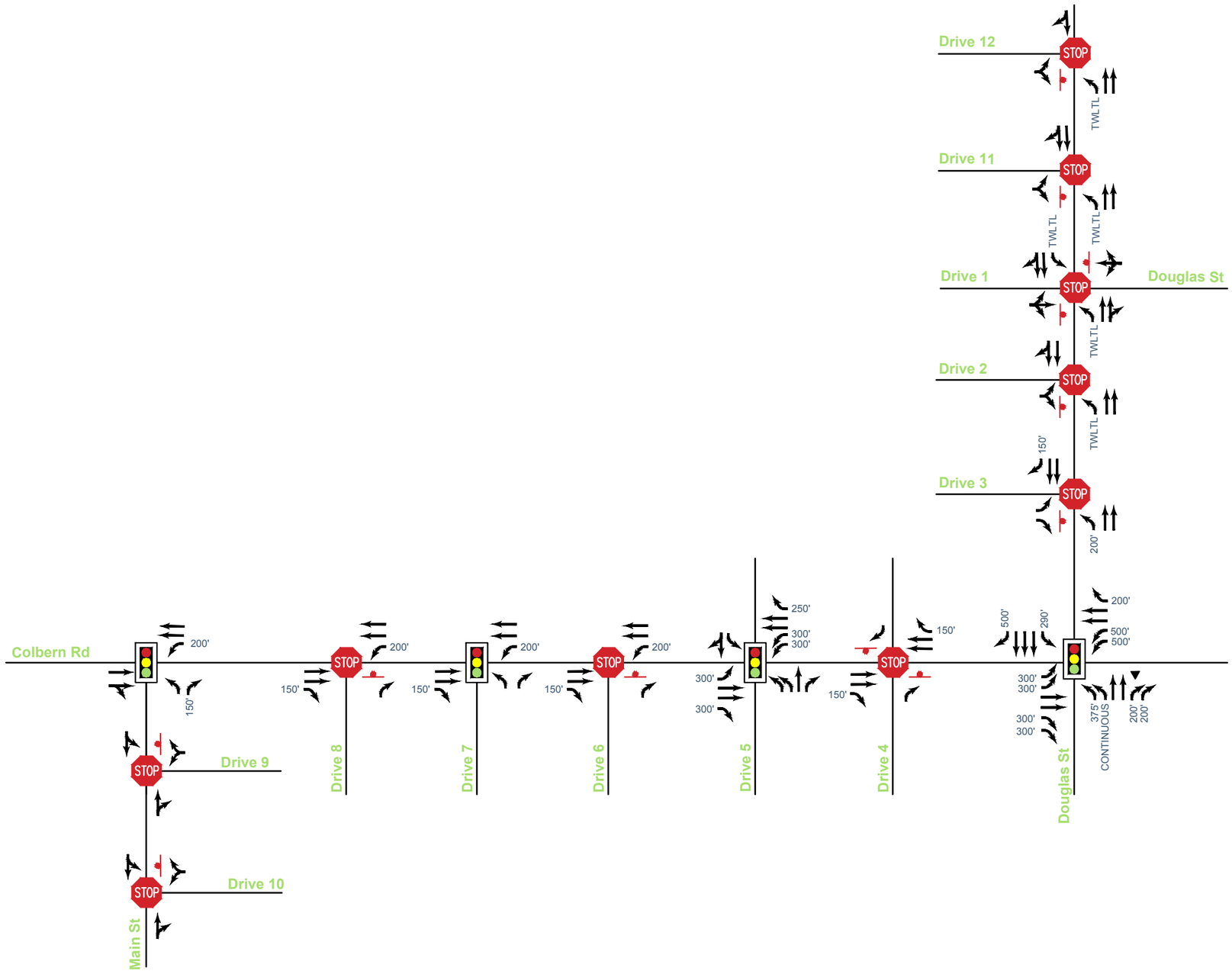


FIGURE 20

Future Year 2040 Plus Full Build Development Capacity Analysis

Discovery Park TIS
Lee's Summit, MO

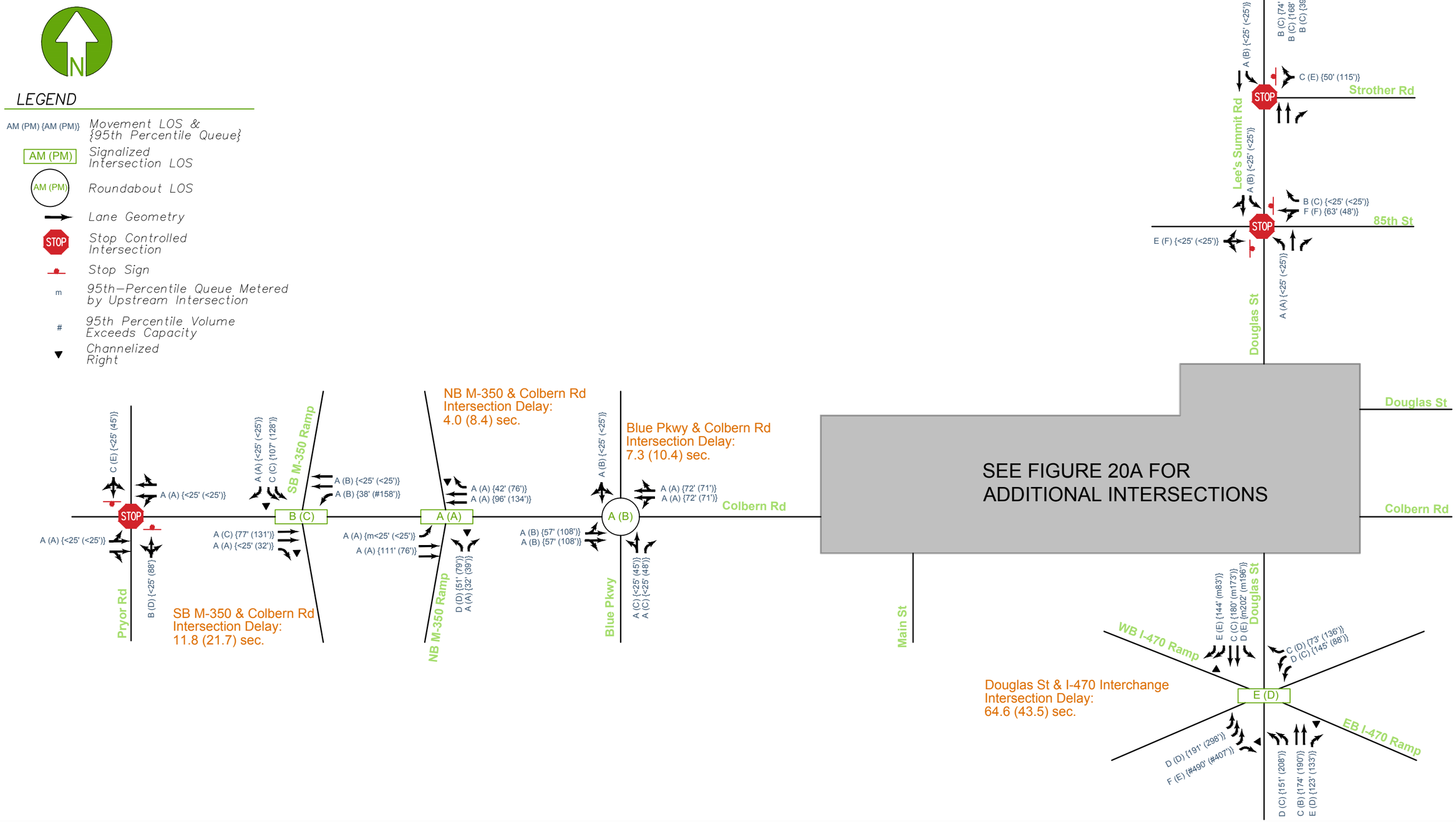
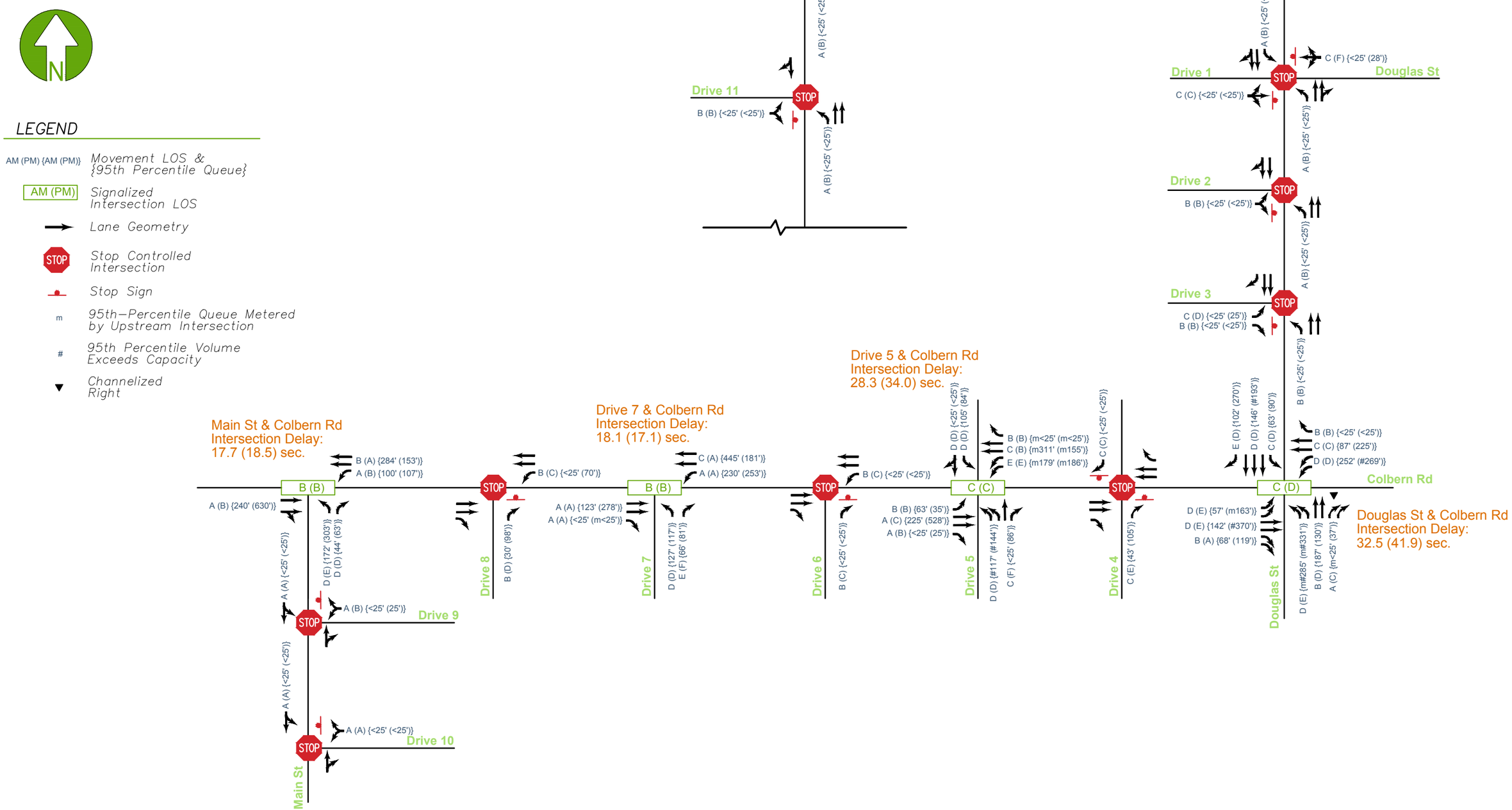


FIGURE 20A

Build Year 2040 Plus Full Build Development Capacity Analysis

Discovery Park TIS
Lee's Summit, MO



9. CONCLUSIONS AND RECOMMENDATIONS

This report summarizes analysis conducted for the proposed Discovery Park development project, located in the northwest quadrant of the intersection of Colbern Road and Douglas Street in Lee's Summit, Missouri.

9.1 Conclusions

The general findings to note for the traffic impact study include the following:

1. Colbern Road is planned to be widened to a four-lane divided roadway with turn lanes at select locations. This is a planned City project and was modeled under the existing plus approved development scenario. When planning intersection improvements, consideration should be given to increasing the provided turn lane storage to accommodate existing and anticipated queue lengths. The roundabout at Blue Parkway was assumed to provide two east-west through lanes as shown on plans.
    - With planned improvements to Colbern Road, existing traffic patterns at the intersection of Colbern Road and Douglas Street and the Douglas Street interchange with I-470 may change. For the purposes of this study and to provide a conservative representation based on existing patterns, potential adjustments to traffic patterns are not presented in this report.
2. Several study intersections are expected to satisfy or be on the threshold to warrant a traffic signal. However, based on a review of the capacity analysis for all conditions, these intersections are expected to operate acceptably under stop control. It is noted that based on the intersection turning movement data available, only the peak hour warrant was reviewed for signalization (due to consideration of approved development trips onto the study area network). Intersection operations should be monitored as future year volumes develop.
3. A simulation model was developed for both the M-350 Interchange as well as the I-470 Interchange with a specific focus on the interaction of I-470 with the intersection of Colbern Road and Douglas Street. The simulation model was developed as a tool to supplement capacity analysis conducted using Synchro and to provide a visual representation of the corridor. The simulation model was developed using SimTraffic software and calibrated based on visual observations noted during field review. The M-350 interchange is expected to operate at acceptable levels through future year periods. The I-470 interchange at Douglas Street will see decreasing operations during peak hour periods as future year and development volumes increase along the network. To address potential future year operations, an alternative interchange configuration is presented in this study.

4. The operations presented in this report consider several factors, including approved development, proposed development, planned roadway projects, and future year traffic growth. Review of the network prior to phase 2 and 3 development is recommended to ensure that improvements to the roadway network support actual conditions.

9.2 Recommendations

Based on review and analysis of the studied scenarios, the following improvements are recommended. Recommended improvements are based on the conditions presented in this study associated with approved and proposed development, the growth of existing traffic volumes, and consideration of planned roadway improvements. As future year scenarios develop, additional study is recommended to determine if recommended improvements are needed to support the network.

Turn lanes should be provided with recommended storage plus taper.

Right-of-way along public area roadways should be retained along the frontage of development property to support potential future year improvements.

During design, sight distance should be reviewed for all proposed drive locations. Adequate sight distance should be provided.

<u>Existing plus Approved Development Conditions</u>

- For the purposes of this study, the planned City of Lee's Summit capital improvement project to improve Colbern Road to a four-lane section from Blue Parkway to Douglas Street was considered complete.

<u>Existing plus Phase 1 Development Conditions</u>

Build three full access drives along Douglas Street and two drives along Colbern Road.

- Lee's Summit Road and Douglas Road/Drive 1
    - Provide northbound left-turn lane (utilize existing TWLTL).
- Douglas Street and Drive 2
    - Provide northbound left-turn lane (utilize existing TWLTL).
- Douglas Street and Drive 3
    - Construct a 150-foot northbound left-turn lane.
    - Construct a 250-foot southbound right-turn lane.
    - Provide two lanes exiting the site. Proposed throat length is expected to support operations.
- Colbern Road and Drive 4
    - Construct a 150-foot westbound right-turn lane.

- Colbern Road and Drive 5
    - Construct a 250-foot westbound right-turn lane.
    - Construct a 200-foot eastbound left-turn lane.
    - Provide two lanes exiting the site. Proposed throat length is expected to support operations.

<u>Build Year 2027 plus Phase 2 Development Conditions</u>

Build two new drives and add south legs to two existing drives along Colbern Road.

- Review network signal timings.
- Colbern Road and Douglas Street
    - Construct dual 250-foot northbound left-turn lanes. This storage length is based on expected turn lane storage availability. Turn lane storage should be maximized; final storage length should be based on field conditions.
    - Extend the eastbound left and right turn bay storage to 300 feet.
    - Extend the southbound right turn bay storage to 300 feet.
    - Signal modification.
- Colbern Road and Drive 4
    - Construct 150-foot eastbound right-turn lane.
- Colbern Road and Drive 5
    - Signalize intersection. Provide signal communications along Colbern Road.
    - Construct a 300-foot eastbound right-turn lane.
    - Construct dual 300-foot westbound left-turn lanes.
    - Extend the eastbound left turn bay storage to 300 feet.
    - Provide four northbound lanes exiting the site, two left-turn, one through and one right. A minimum of 200 feet of throat length should be provided along the drive approach.
- Colbern Road and Drive 6
    - Construct a 150-foot eastbound right-turn lane.
    - Construct a 200-foot westbound left-turn lane.
- Colbern Road and Drive 7
    - Construct a 150-foot eastbound right-turn lane.
    - Construct a 200-foot westbound left-turn lane.
    - Provide two lanes exiting the site. A minimum of 150 feet of throat length should be provided along the drive approach.

<u>Build Year 2032 plus Phase 3 Development Conditions</u>

Build one new drive along Colbern Road, two along Main Street, and two along Lee's Summit Road. This report presents a possible future alternative to improve spacing between Colbern Road and the I-470 ramp terminals along Douglas Street.

- Review network signal timings
- Colbern Road and Douglas Street
    - Construct additional 300-foot (dual) eastbound left-turn lanes.
    - Construct 300-foot (dual) eastbound right-turn lanes.
    - Extend storage of one northbound dual left-turn lane to 375-feet. Storage length should be maximized dependent upon actual conditions. The other left turn lane should be continuous.
    - Extend storage of the westbound dual left-turn lanes to 500 feet. The potential for this improvement may be limited by property constraints east of the site.
    - Extend storage of the southbound right-turn lane to 500 feet.
    - Provide an additional southbound through lane at the intersection with a storage of 500 feet.
    - Signal modification.
- Colbern Road and Drive 7
    - Signalize intersection. Provide signal communications to intersection.
- Colbern Road and Drive 8
    - Construct a 150-foot eastbound right-turn lane.
    - Construct a 200-foot westbound left-turn lane.
- Colbern Road and Main Street
    - Signalize intersection. Provide signal communications to intersection.
    - Construct a 200-foot westbound left-turn lane.
- Lee's Summit Road and Drive 11
    - Provide northbound left-turn lane (utilize existing TWLTL).
- Lee's Summit Road and Drive 12
    - Provide northbound left-turn lane (utilize existing TWLTL).
- I-470 Interchange
    - Reconstruction to support modification of interchange to a single point interchange configuration. The following intersection geometrics are recommended. Two northbound and southbound through lanes should be maintained through the interchange.
        - Construct dual northbound left-turn lanes, one with storage of 400-feet and one continuous.
        - Construct a 200-foot northbound channelized right-turn lane.

        - Construct eastbound triple left-turn lanes (Transition from one lane extending from interstate to three lanes).
        - Construct a channelized 400-foot right-turn lane.
        - Construct a southbound 225-foot left-turn lane.
        - Construct dual southbound channelized right-turn lanes, one with storage of 400-feet and one continuous.
        - Construct dual westbound left-turn lanes (Transition from one lane extending from interstate to two lanes)
        - Construct a 400-foot channelized right-turn lane.
- Colbern Road and M-350 Southbound Ramp
    - Construct dual southbound left-turn lanes (200-foot storage for one left lane, one continuous extending to interstate).
    - Signal modification.

<u>Future Year 2040 plus Full Build Development Conditions</u>

No additional improvements identified.

APPENDIX A

Data Collection

Count Data

Colbern Road and M-350 Northbound Ramp - TMC

Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915260, Location: 38.94425, -94.40812

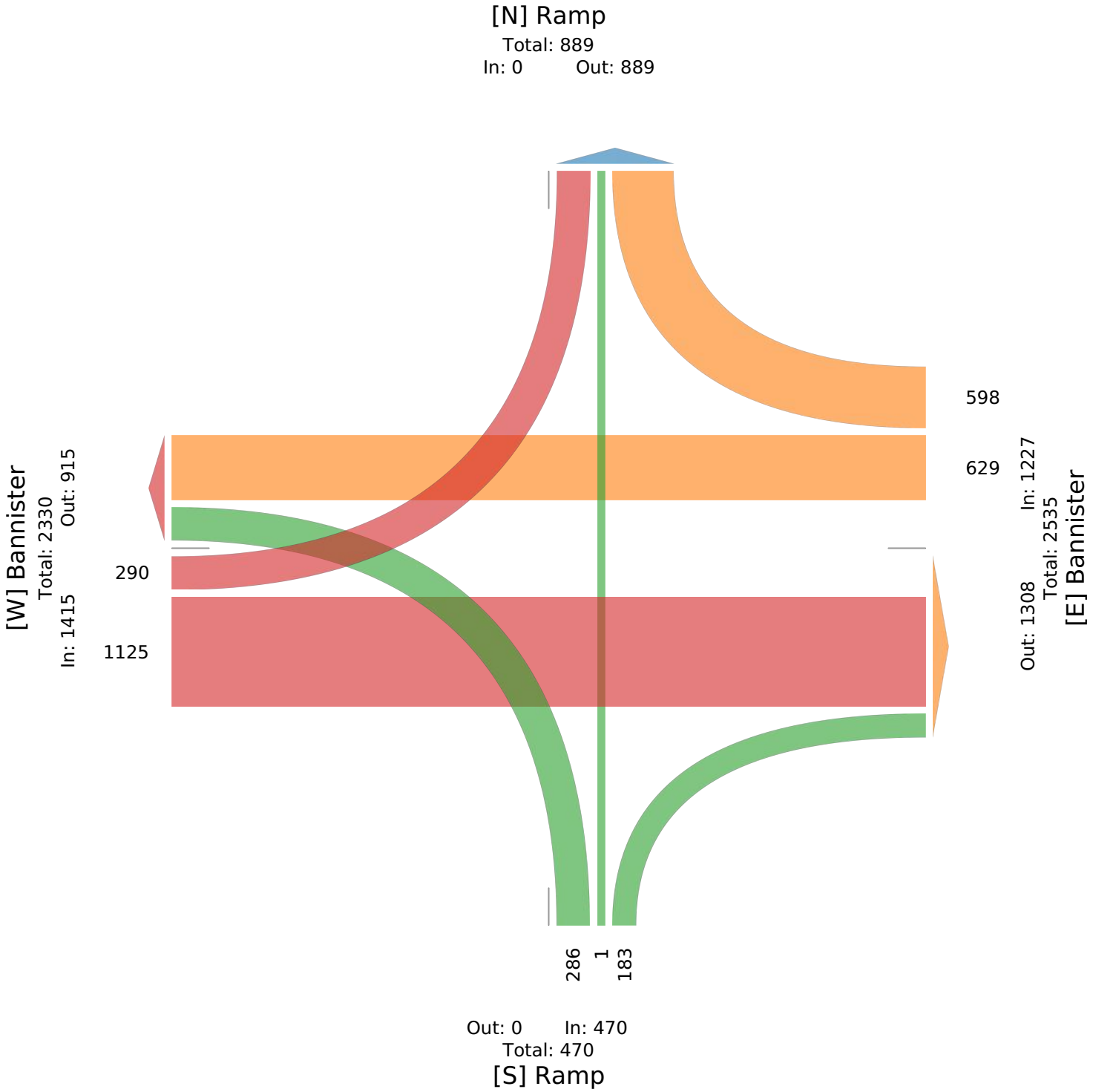
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Ramp					Bannister					Ramp					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-01-18 7:00AM	0	0	0	0	**0**	24	23	0	0	**47**	9	0	6	0	**15**	0	29	14	0	**43**	**105**
7:15AM	0	0	0	0	**0**	45	33	0	0	**78**	11	0	10	0	**21**	0	43	15	0	**58**	**157**
7:30AM	0	0	0	0	**0**	39	27	0	0	**66**	20	0	15	0	**35**	0	42	24	0	**66**	**167**
7:45AM	0	0	0	0	**0**	36	24	0	0	**60**	26	0	12	0	**38**	0	68	18	0	**86**	**184**
Hourly Total	0	0	0	0	**0**	144	107	0	0	**251**	66	0	43	0	**109**	0	182	71	0	**253**	**613**
8:00AM	0	0	0	0	**0**	28	15	0	0	**43**	19	0	13	0	**32**	0	50	15	0	**65**	**140**
8:15AM	0	0	0	0	**0**	20	19	0	0	**39**	11	0	11	0	**22**	0	52	7	0	**59**	**120**
8:30AM	0	0	0	0	**0**	19	30	0	0	**49**	13	0	9	0	**22**	0	52	23	0	**75**	**146**
8:45AM	0	0	0	0	**0**	29	30	0	0	**59**	18	0	10	0	**28**	0	47	15	0	**62**	**149**
Hourly Total	0	0	0	0	**0**	96	94	0	0	**190**	61	0	43	0	**104**	0	201	60	0	**261**	**555**
4:00PM	0	0	0	0	**0**	44	50	0	0	**94**	5	0	15	0	**20**	0	85	18	0	**103**	**217**
4:15PM	0	0	0	0	**0**	33	52	0	0	**85**	12	1	25	0	**38**	0	81	18	0	**99**	**222**
4:30PM	0	0	0	0	**0**	62	68	0	0	**130**	10	0	18	0	**28**	0	97	25	0	**122**	**280**
4:45PM	0	0	0	0	**0**	44	66	0	0	**110**	3	0	18	0	**21**	0	103	21	0	**124**	**255**
Hourly Total	0	0	0	0	**0**	183	236	0	0	**419**	30	1	76	0	**107**	0	366	82	0	**448**	**974**
5:00PM	0	0	0	0	**0**	59	45	0	0	**104**	4	0	19	0	**23**	0	87	19	0	**106**	**233**
5:15PM	0	0	0	0	**0**	44	51	0	0	**95**	12	0	47	0	**59**	0	106	19	0	**125**	**279**
5:30PM	0	0	0	0	**0**	44	53	0	0	**97**	7	0	30	0	**37**	0	106	18	0	**124**	**258**
5:45PM	0	0	0	0	**0**	28	43	0	0	**71**	3	0	28	0	**31**	0	77	21	0	**98**	**200**
Hourly Total	0	0	0	0	**0**	175	192	0	0	**367**	26	0	124	0	**150**	0	376	77	0	**453**	**970**
Total	0	0	0	0	**0**	598	629	0	0	**1227**	183	1	286	0	**470**	0	1125	290	0	**1415**	**3112**
% Approach	0%	0%	0%	0%	**-**	48.7%	51.3%	0%	0%	**-**	38.9%	0.2%	60.9%	0%	**-**	0%	79.5%	20.5%	0%	**-**	-
% Total	0%	0%	0%	0%	**0%**	19.2%	20.2%	0%	0%	**39.4%**	5.9%	0%	9.2%	0%	**15.1%**	0%	36.2%	9.3%	0%	**45.5%**	-
Lights	0	0	0	0	**0**	592	620	0	0	**1212**	177	1	278	0	**456**	0	1114	285	0	**1399**	3067
% Lights	0%	0%	0%	0%	**-**	99.0%	98.6%	0%	0%	**98.8%**	96.7%	100%	97.2%	0%	**97.0%**	0%	99.0%	98.3%	0%	**98.9%**	98.6%
Articulated Trucks	0	0	0	0	**0**	3	1	0	0	**4**	0	0	0	0	**0**	0	1	2	0	**3**	7
% Articulated Trucks	0%	0%	0%	0%	**-**	0.5%	0.2%	0%	0%	**0.3%**	0%	0%	0%	0%	**0%**	0%	0.1%	0.7%	0%	**0.2%**	0.2%
Buses and Single-Unit Trucks	0	0	0	0	**0**	3	8	0	0	**11**	6	0	8	0	**14**	0	10	3	0	**13**	38
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**-**	0.5%	1.3%	0%	0%	**0.9%**	3.3%	0%	2.8%	0%	**3.0%**	0%	0.9%	1.0%	0%	**0.9%**	1.2%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and M-350 Northbound Ramp - TMC
Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915260, Location: 38.94425, -94.40812

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and M-350 Northbound Ramp - TMC

Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915260, Location: 38.94425, -94.40812

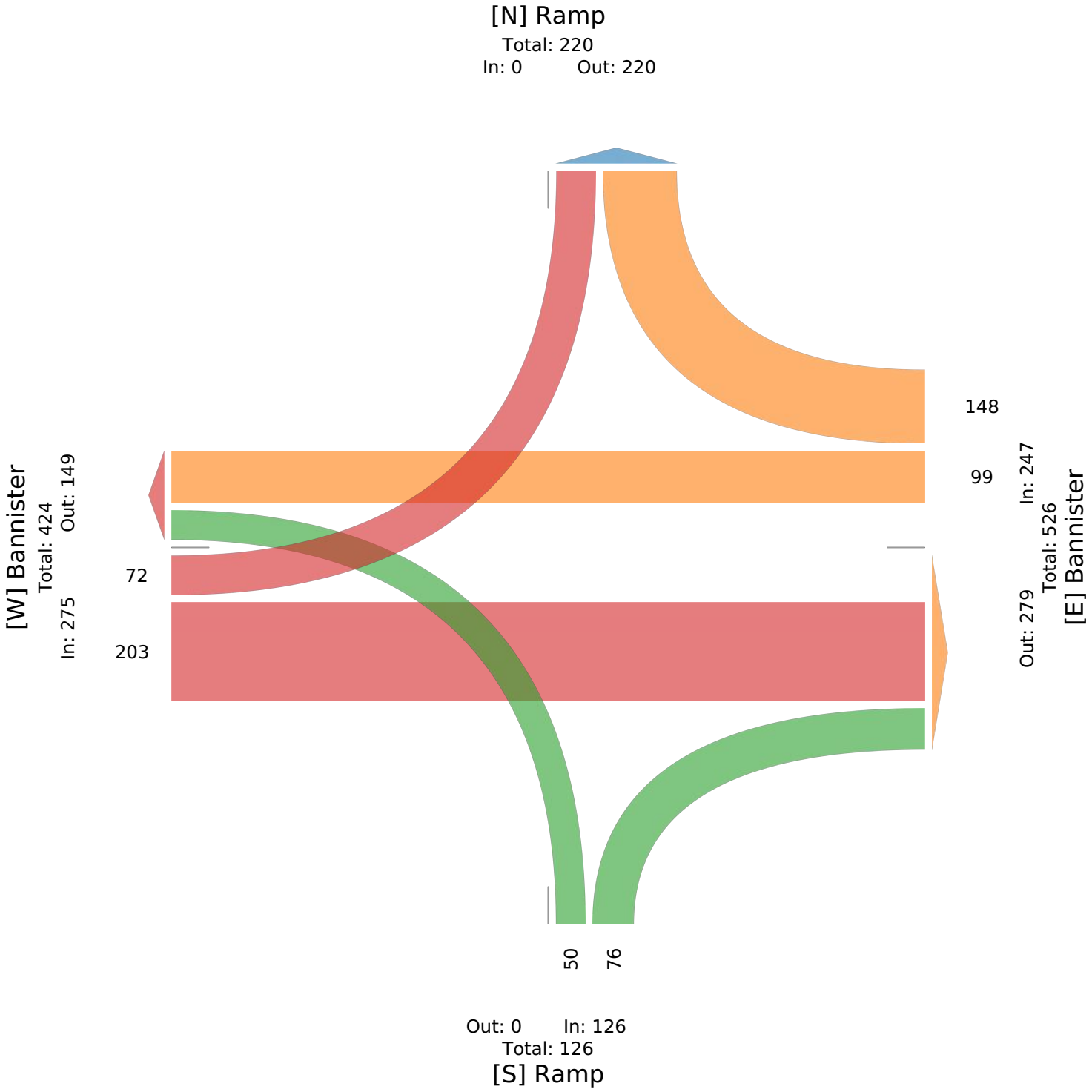
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Ramp					Bannister					Ramp					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:15AM	0	0	0	0	**0**	45	33	0	0	**78**	11	0	10	0	**21**	0	43	15	0	**58**	**157**
7:30AM	0	0	0	0	**0**	39	27	0	0	**66**	20	0	15	0	**35**	0	42	24	0	**66**	**167**
7:45AM	0	0	0	0	**0**	36	24	0	0	**60**	26	0	12	0	**38**	0	68	18	0	**86**	**184**
8:00AM	0	0	0	0	**0**	28	15	0	0	**43**	19	0	13	0	**32**	0	50	15	0	**65**	**140**
Total	0	0	0	0	**0**	148	99	0	0	**247**	76	0	50	0	**126**	0	203	72	0	**275**	**648**
% Approach	0%	0%	0%	0%	**-**	59.9%	40.1%	0%	0%	**-**	60.3%	0%	39.7%	0%	**-**	0%	73.8%	26.2%	0%	**-**	-
% Total	0%	0%	0%	0%	**0%**	22.8%	15.3%	0%	0%	**38.1%**	11.7%	0%	7.7%	0%	**19.4%**	0%	31.3%	11.1%	0%	**42.4%**	-
PHF	-	-	-	-	**-**	0.822	0.750	-	-	**0.792**	0.731	-	0.833	-	**0.829**	-	0.746	0.750	-	**0.799**	0.880
Lights	0	0	0	0	**0**	148	97	0	0	**245**	75	0	46	0	**121**	0	199	68	0	**267**	633
% Lights	0%	0%	0%	0%	**-**	100%	98.0%	0%	0%	**99.2%**	98.7%	0%	92.0%	0%	**96.0%**	0%	98.0%	94.4%	0%	**97.1%**	97.7%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	2	0	**3**	3
% Articulated Trucks	0%	0%	0%	0%	**-**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0.5%	2.8%	0%	**1.1%**	0.5%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	2	0	0	**2**	1	0	4	0	**5**	0	3	2	0	**5**	12
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**-**	0%	2.0%	0%	0%	**0.8%**	1.3%	0%	8.0%	0%	**4.0%**	0%	1.5%	2.8%	0%	**1.8%**	1.9%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and M-350 Northbound Ramp - TMC
Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915260, Location: 38.94425, -94.40812

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and M-350 Northbound Ramp - TMC

Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915260, Location: 38.94425, -94.40812

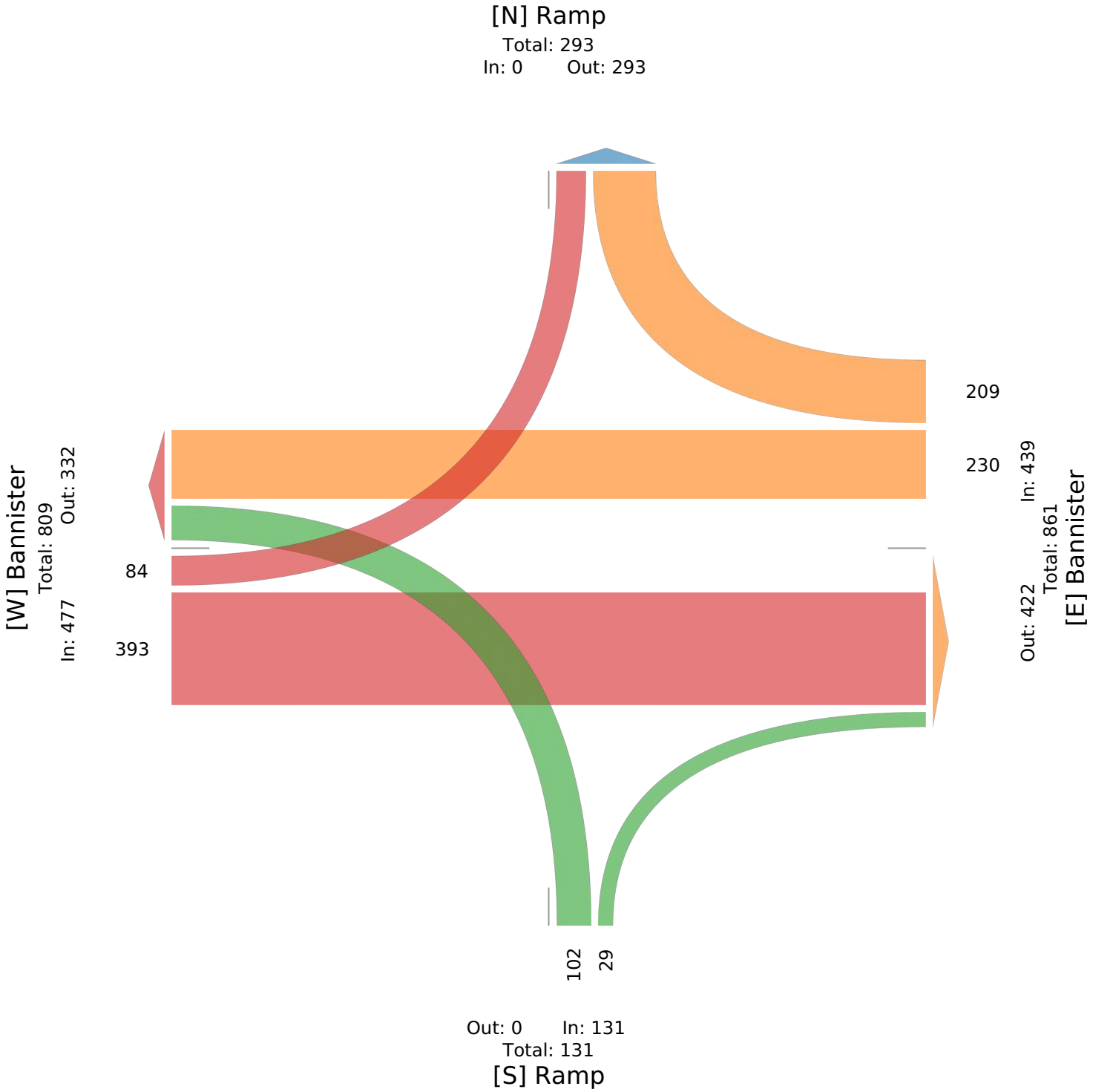
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Ramp					Bannister					Ramp					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 4:30PM	0	0	0	0	**0**	62	68	0	0	**130**	10	0	18	0	**28**	0	97	25	0	**122**	**280**
4:45PM	0	0	0	0	**0**	44	66	0	0	**110**	3	0	18	0	**21**	0	103	21	0	**124**	**255**
5:00PM	0	0	0	0	**0**	59	45	0	0	**104**	4	0	19	0	**23**	0	87	19	0	**106**	**233**
5:15PM	0	0	0	0	**0**	44	51	0	0	**95**	12	0	47	0	**59**	0	106	19	0	**125**	**279**
Total	0	0	0	0	**0**	209	230	0	0	**439**	29	0	102	0	**131**	0	393	84	0	**477**	**1047**
% Approach	0%	0%	0%	0%	**-**	47.6%	52.4%	0%	0%	**-**	22.1%	0%	77.9%	0%	**-**	0%	82.4%	17.6%	0%	**-**	-
% Total	0%	0%	0%	0%	**0%**	20.0%	22.0%	0%	0%	**41.9%**	2.8%	0%	9.7%	0%	**12.5%**	0%	37.5%	8.0%	0%	**45.6%**	-
PHF	-	-	-	-	**-**	0.843	0.846	-	-	**0.844**	0.604	-	0.543	-	**0.555**	-	0.927	0.840	-	**0.954**	0.935
Lights	0	0	0	0	**0**	206	226	0	0	**432**	28	0	100	0	**128**	0	390	84	0	**474**	1034
% Lights	0%	0%	0%	0%	**-**	98.6%	98.3%	0%	0%	**98.4%**	96.6%	0%	98.0%	0%	**97.7%**	0%	99.2%	100%	0%	**99.4%**	98.8%
Articulated Trucks	0	0	0	0	**0**	2	0	0	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	2
% Articulated Trucks	0%	0%	0%	0%	**-**	1.0%	0%	0%	0%	**0.5%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.2%
Buses and Single-Unit Trucks	0	0	0	0	**0**	1	4	0	0	**5**	1	0	2	0	**3**	0	3	0	0	**3**	11
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**-**	0.5%	1.7%	0%	0%	**1.1%**	3.4%	0%	2.0%	0%	**2.3%**	0%	0.8%	0%	0%	**0.6%**	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and M-350 Northbound Ramp - TMC
Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915260, Location: 38.94425, -94.40812

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and M-350 Southbound Ramp - TMC

Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915259, Location: 38.944247, -94.409828

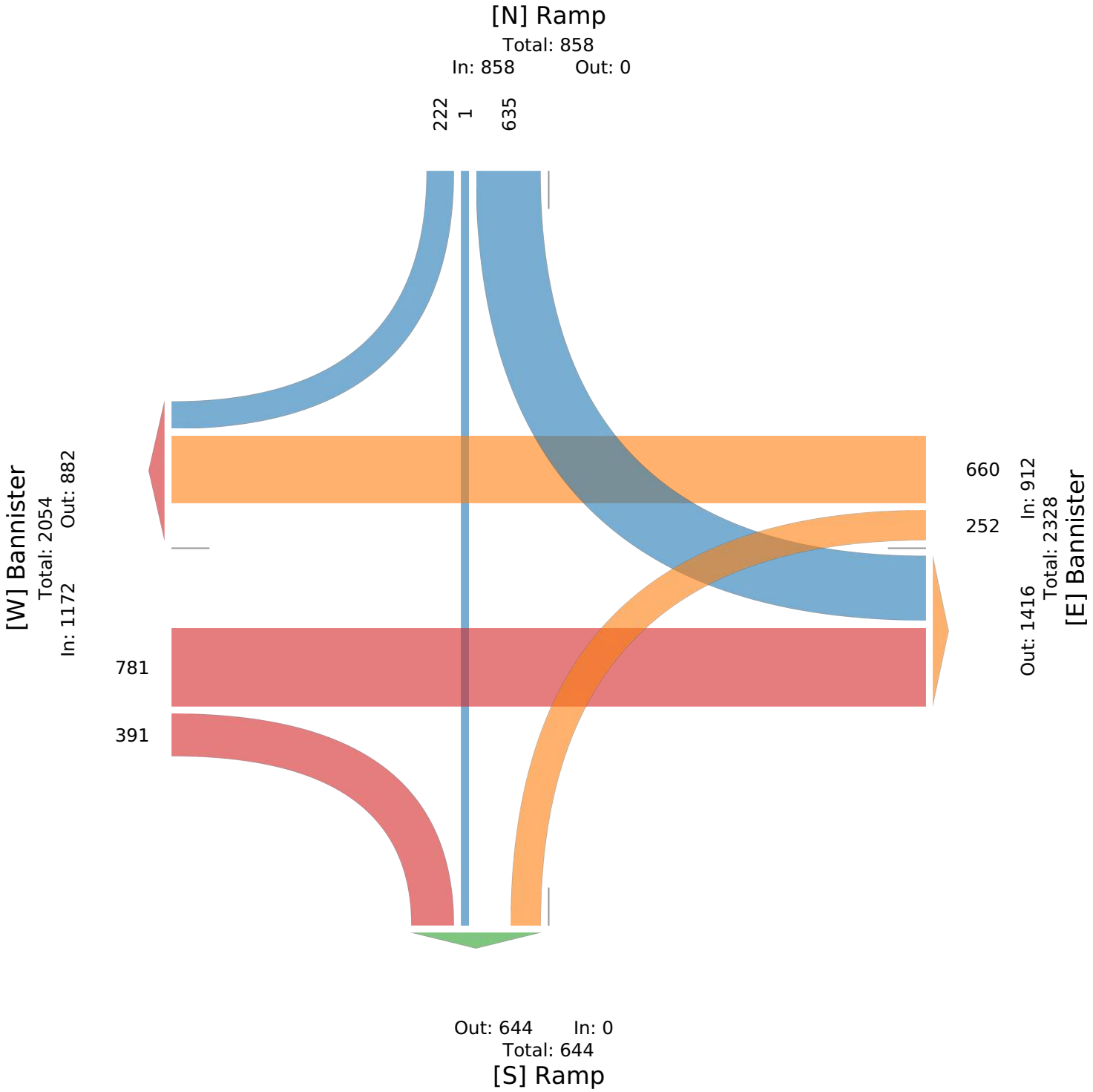
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Ramp					Bannister					Ramp					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-01-18 7:00AM	9	0	22	0	**31**	0	23	7	0	**30**	0	0	0	0	**0**	15	21	0	0	**36**	**97**
7:15AM	10	0	25	0	**35**	0	32	11	0	**43**	0	0	0	0	**0**	18	31	0	0	**49**	**127**
7:30AM	10	0	27	0	**37**	0	30	10	0	**40**	0	0	0	0	**0**	22	39	0	0	**61**	**138**
7:45AM	7	0	46	0	**53**	0	29	8	0	**37**	0	0	0	0	**0**	25	41	0	0	**66**	**156**
Hourly Total	36	0	120	0	**156**	0	114	36	0	**150**	0	0	0	0	**0**	80	132	0	0	**212**	**518**
8:00AM	6	0	25	0	**31**	0	25	3	0	**28**	0	0	0	0	**0**	32	39	0	0	**71**	**130**
8:15AM	4	0	25	0	**29**	0	23	8	0	**31**	0	0	0	0	**0**	14	35	0	0	**49**	**109**
8:30AM	7	0	32	0	**39**	0	26	12	0	**38**	0	0	0	0	**0**	25	44	0	0	**69**	**146**
8:45AM	14	0	28	0	**42**	0	37	4	0	**41**	0	0	0	0	**0**	15	33	0	0	**48**	**131**
Hourly Total	31	0	110	0	**141**	0	111	27	0	**138**	0	0	0	0	**0**	86	151	0	0	**237**	**516**
4:00PM	18	1	48	0	**67**	0	47	16	0	**63**	0	0	0	0	**0**	31	56	0	0	**87**	**217**
4:15PM	15	0	46	0	**61**	0	59	18	0	**77**	0	0	0	0	**0**	28	53	0	0	**81**	**219**
4:30PM	21	0	51	0	**72**	0	46	43	0	**89**	0	0	0	0	**0**	31	70	0	0	**101**	**262**
4:45PM	18	0	59	0	**77**	0	51	34	0	**85**	0	0	0	0	**0**	26	65	0	0	**91**	**253**
Hourly Total	72	1	204	0	**277**	0	203	111	0	**314**	0	0	0	0	**0**	116	244	0	0	**360**	**951**
5:00PM	23	0	50	0	**73**	0	41	19	0	**60**	0	0	0	0	**0**	30	59	0	0	**89**	**222**
5:15PM	19	0	49	0	**68**	0	69	28	0	**97**	0	0	0	0	**0**	26	75	0	0	**101**	**266**
5:30PM	15	0	52	0	**67**	0	61	19	0	**80**	0	0	0	0	**0**	27	71	0	0	**98**	**245**
5:45PM	26	0	50	0	**76**	0	61	12	0	**73**	0	0	0	0	**0**	26	49	0	0	**75**	**224**
Hourly Total	83	0	201	0	**284**	0	232	78	0	**310**	0	0	0	0	**0**	109	254	0	0	**363**	**957**
Total	222	1	635	0	**858**	0	660	252	0	**912**	0	0	0	0	**0**	391	781	0	0	**1172**	**2942**
% Approach	25.9%	0.1%	74.0%	0%	**-**	0%	72.4%	27.6%	0%	**-**	0%	0%	0%	0%	**-**	33.4%	66.6%	0%	0%	**-**	-
% Total	7.5%	0%	21.6%	0%	**29.2%**	0%	22.4%	8.6%	0%	**31.0%**	0%	0%	0%	0%	**0%**	13.3%	26.5%	0%	0%	**39.8%**	-
Lights	216	1	628	0	**845**	0	652	244	0	**896**	0	0	0	0	**0**	388	771	0	0	**1159**	2900
% Lights	97.3%	100%	98.9%	0%	**98.5%**	0%	98.8%	96.8%	0%	**98.2%**	0%	0%	0%	0%	**-**	99.2%	98.7%	0%	0%	**98.9%**	98.6%
Articulated Trucks	2	0	3	0	**5**	0	0	1	0	**1**	0	0	0	0	**0**	1	2	0	0	**3**	9
% Articulated Trucks	0.9%	0%	0.5%	0%	**0.6%**	0%	0%	0.4%	0%	**0.1%**	0%	0%	0%	0%	**-**	0.3%	0.3%	0%	0%	**0.3%**	0.3%
Buses and Single-Unit Trucks	4	0	4	0	**8**	0	8	7	0	**15**	0	0	0	0	**0**	2	8	0	0	**10**	33
% Buses and Single-Unit Trucks	1.8%	0%	0.6%	0%	**0.9%**	0%	1.2%	2.8%	0%	**1.6%**	0%	0%	0%	0%	**-**	0.5%	1.0%	0%	0%	**0.9%**	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and M-350 Southbound Ramp - TMC
Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915259, Location: 38.944247, -94.409828

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and M-350 Southbound Ramp - TMC

Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915259, Location: 38.944247, -94.409828

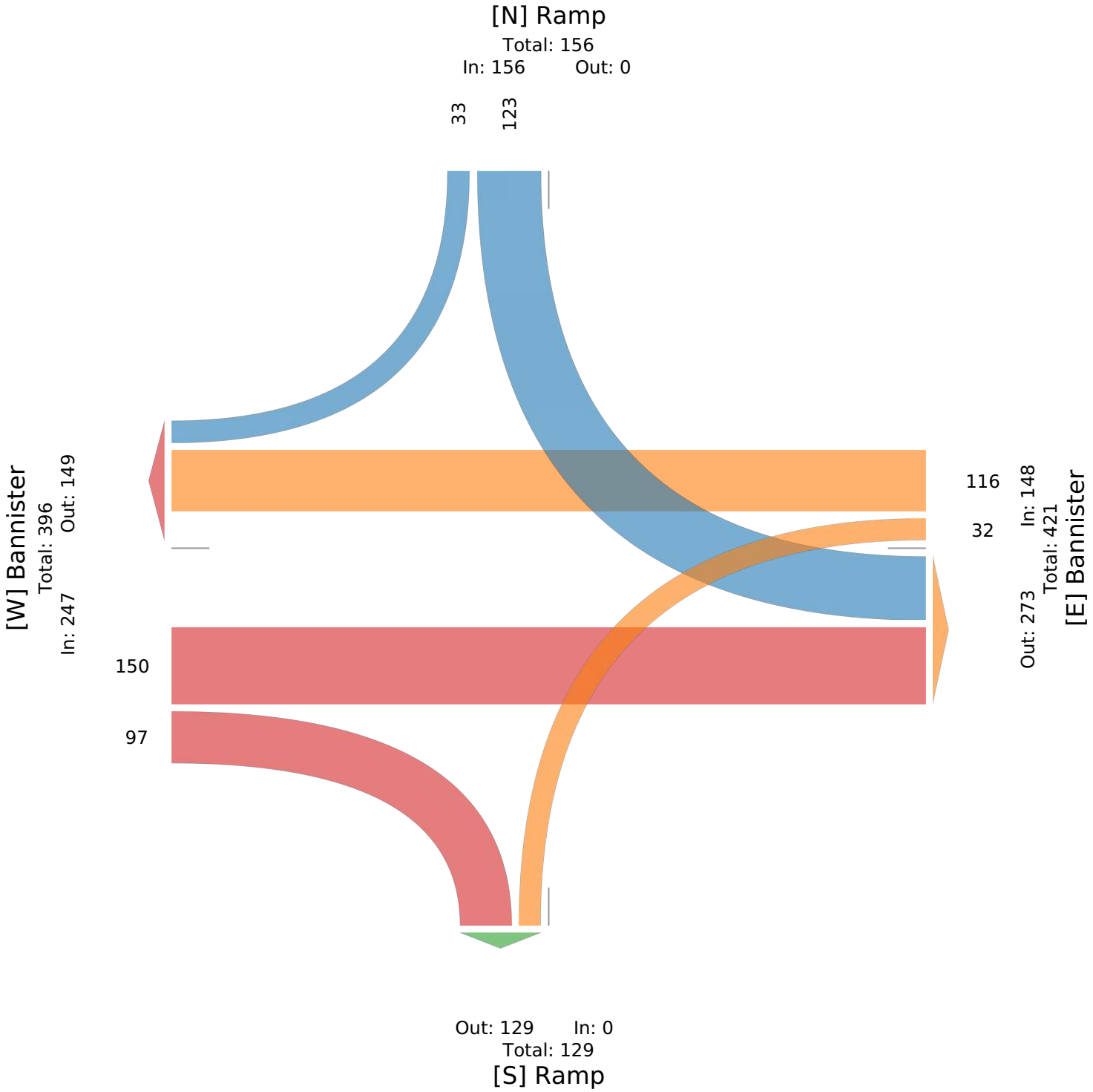
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Ramp					Bannister					Ramp					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:15AM	10	0	25	0	**35**	0	32	11	0	**43**	0	0	0	0	**0**	18	31	0	0	**49**	**127**
7:30AM	10	0	27	0	**37**	0	30	10	0	**40**	0	0	0	0	**0**	22	39	0	0	**61**	**138**
7:45AM	7	0	46	0	**53**	0	29	8	0	**37**	0	0	0	0	**0**	25	41	0	0	**66**	**156**
8:00AM	6	0	25	0	**31**	0	25	3	0	**28**	0	0	0	0	**0**	32	39	0	0	**71**	**130**
Total	33	0	123	0	**156**	0	116	32	0	**148**	0	0	0	0	**0**	97	150	0	0	**247**	**551**
% Approach	21.2%	0%	78.8%	0%	**-**	0%	78.4%	21.6%	0%	**-**	0%	0%	0%	0%	**-**	39.3%	60.7%	0%	0%	**-**	-
% Total	6.0%	0%	22.3%	0%	**28.3%**	0%	21.1%	5.8%	0%	**26.9%**	0%	0%	0%	0%	**0%**	17.6%	27.2%	0%	0%	**44.8%**	-
PHF	0.825	-	0.668	-	**0.736**	-	0.906	0.727	-	**0.860**	-	-	-	-	**-**	0.758	0.915	-	-	**0.870**	0.883
Lights	30	0	120	0	**150**	0	112	30	0	**142**	0	0	0	0	**0**	96	145	0	0	**241**	533
% Lights	90.9%	0%	97.6%	0%	**96.2%**	0%	96.6%	93.8%	0%	**95.9%**	0%	0%	0%	0%	**-**	99.0%	96.7%	0%	0%	**97.6%**	96.7%
Articulated Trucks	1	0	1	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	1	2	0	0	**3**	5
% Articulated Trucks	3.0%	0%	0.8%	0%	**1.3%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**-**	1.0%	1.3%	0%	0%	**1.2%**	0.9%
Buses and Single-Unit Trucks	2	0	2	0	**4**	0	4	2	0	**6**	0	0	0	0	**0**	0	3	0	0	**3**	13
% Buses and Single-Unit Trucks	6.1%	0%	1.6%	0%	**2.6%**	0%	3.4%	6.3%	0%	**4.1%**	0%	0%	0%	0%	**-**	0%	2.0%	0%	0%	**1.2%**	2.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and M-350 Southbound Ramp - TMC
Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915259, Location: 38.944247, -94.409828

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and M-350 Southbound Ramp - TMC

Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915259, Location: 38.944247, -94.409828

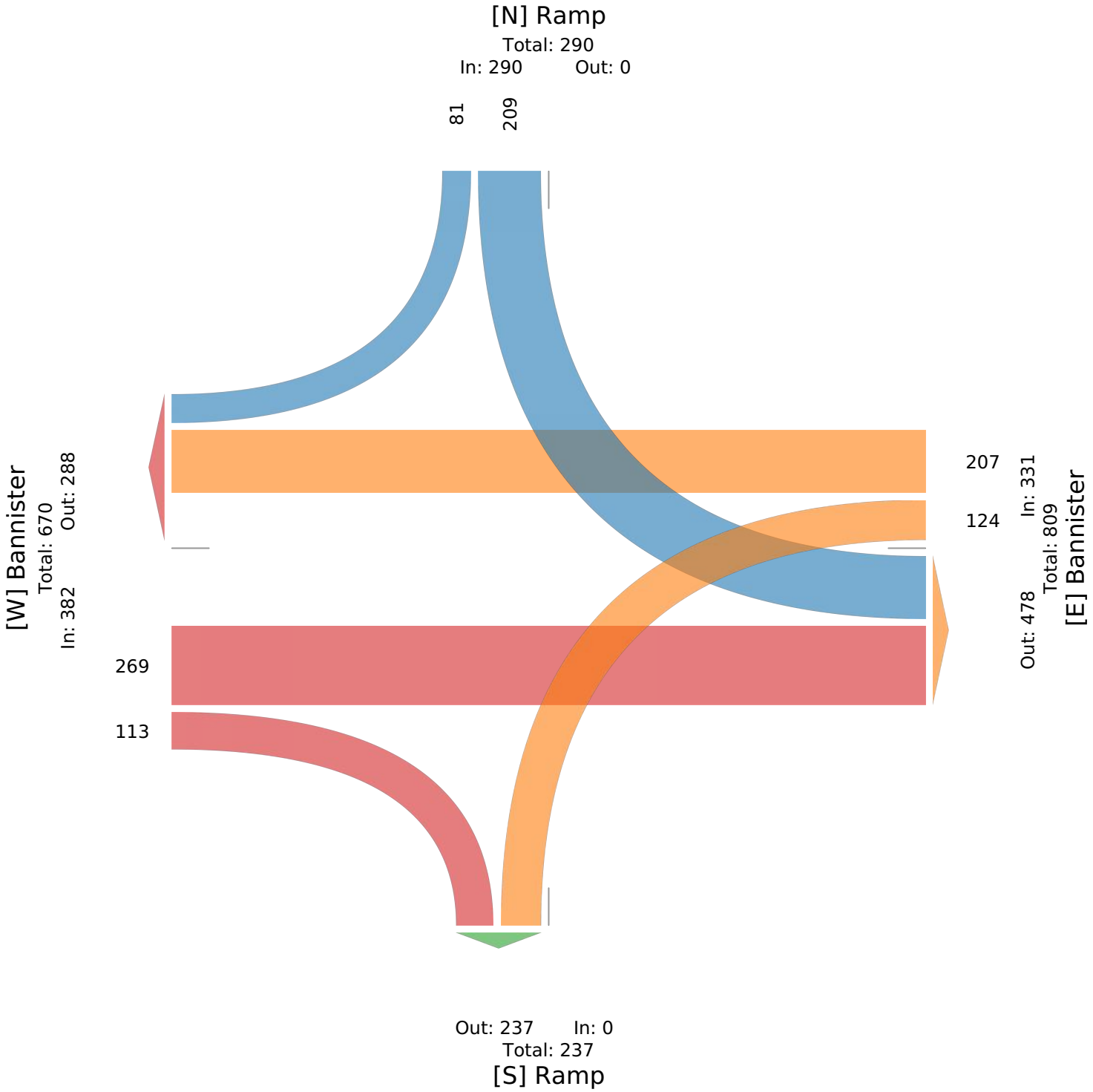
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Ramp					Bannister					Ramp					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 4:30PM	21	0	51	0	**72**	0	46	43	0	**89**	0	0	0	0	**0**	31	70	0	0	**101**	**262**
4:45PM	18	0	59	0	**77**	0	51	34	0	**85**	0	0	0	0	**0**	26	65	0	0	**91**	**253**
5:00PM	23	0	50	0	**73**	0	41	19	0	**60**	0	0	0	0	**0**	30	59	0	0	**89**	**222**
5:15PM	19	0	49	0	**68**	0	69	28	0	**97**	0	0	0	0	**0**	26	75	0	0	**101**	**266**
Total	81	0	209	0	**290**	0	207	124	0	**331**	0	0	0	0	**0**	113	269	0	0	**382**	**1003**
% Approach	27.9%	0%	72.1%	0%	**-**	0%	62.5%	37.5%	0%	**-**	0%	0%	0%	0%	**-**	29.6%	70.4%	0%	0%	**-**	-
% Total	8.1%	0%	20.8%	0%	**28.9%**	0%	20.6%	12.4%	0%	**33.0%**	0%	0%	0%	0%	**0%**	11.3%	26.8%	0%	0%	**38.1%**	-
PHF	0.880	-	0.886	-	**0.942**	-	0.750	0.721	-	**0.853**	-	-	-	-	**-**	0.911	0.897	-	-	**0.946**	0.943
Lights	81	0	205	0	**286**	0	206	119	0	**325**	0	0	0	0	**0**	113	268	0	0	**381**	992
% Lights	100%	0%	98.1%	0%	**98.6%**	0%	99.5%	96.0%	0%	**98.2%**	0%	0%	0%	0%	**-**	100%	99.6%	0%	0%	**99.7%**	98.9%
Articulated Trucks	0	0	2	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	2
% Articulated Trucks	0%	0%	1.0%	0%	**0.7%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**-**	0%	0%	0%	0%	**0%**	0.2%
Buses and Single-Unit Trucks	0	0	2	0	**2**	0	1	5	0	**6**	0	0	0	0	**0**	0	1	0	0	**1**	9
% Buses and Single-Unit Trucks	0%	0%	1.0%	0%	**0.7%**	0%	0.5%	4.0%	0%	**1.8%**	0%	0%	0%	0%	**-**	0%	0.4%	0%	0%	**0.3%**	0.9%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and M-350 Southbound Ramp - TMC
Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915259, Location: 38.944247, -94.409828

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and Pryor Road - TMC

Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915258, Location: 38.944253, -94.411015

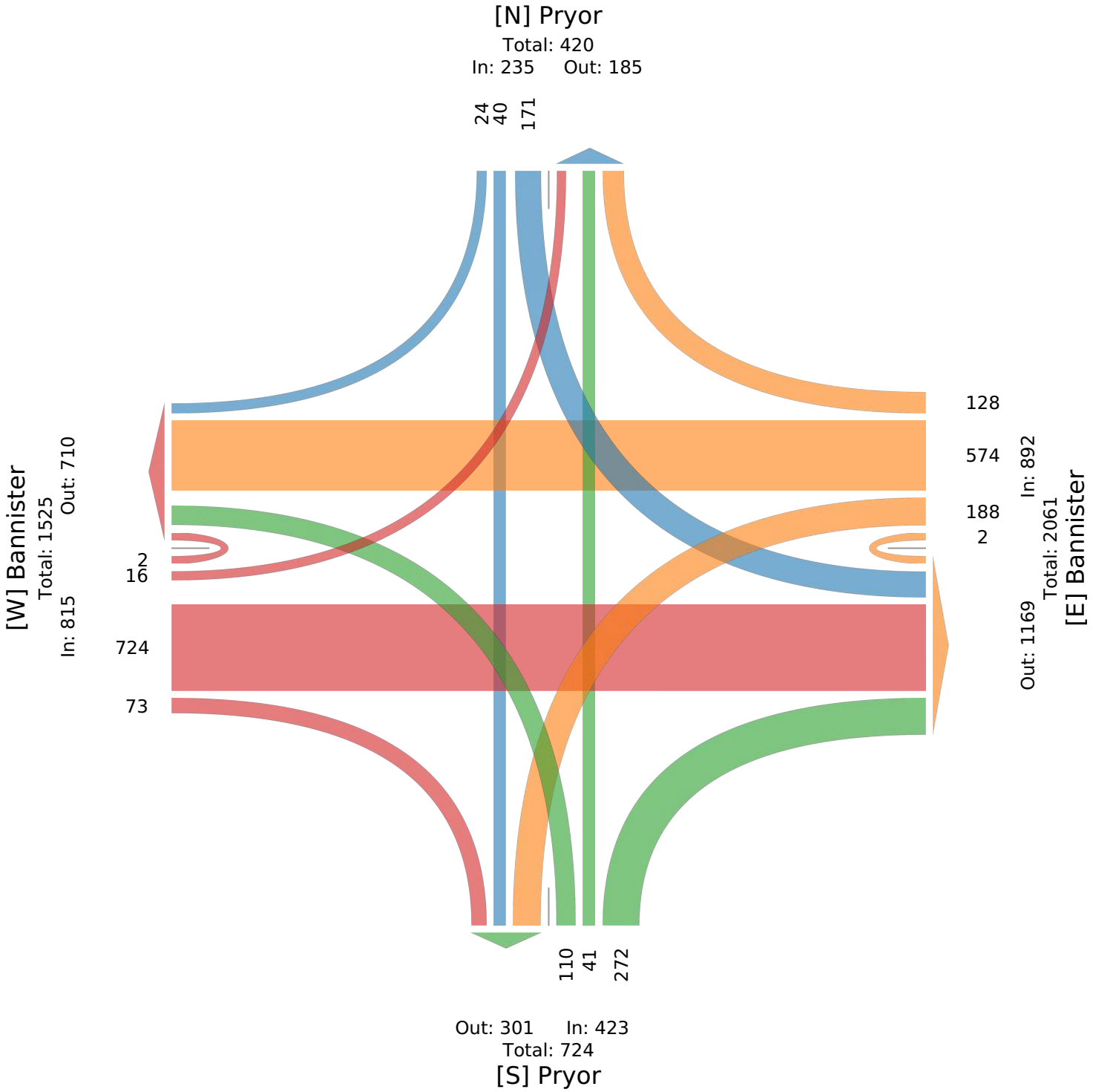
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Pryor					Bannister					Pryor					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-01-18 7:00AM	0	4	9	0	**13**	1	26	6	0	**33**	4	0	1	0	**5**	3	24	0	0	**27**	**78**
7:15AM	0	0	9	0	**9**	5	28	9	0	**42**	8	1	0	0	**9**	3	32	0	0	**35**	**95**
7:30AM	0	4	12	0	**16**	4	31	6	0	**41**	20	2	2	0	**24**	6	28	0	2	**36**	**117**
7:45AM	2	2	12	0	**16**	7	26	4	0	**37**	15	1	6	0	**22**	2	39	0	0	**41**	**116**
Hourly Total	2	10	42	0	**54**	17	111	25	0	**153**	47	4	9	0	**60**	14	123	0	2	**139**	**406**
8:00AM	3	1	12	0	**16**	7	21	2	1	**31**	9	0	2	0	**11**	4	50	1	0	**55**	**113**
8:15AM	0	2	10	0	**12**	5	14	5	0	**24**	10	2	3	0	**15**	2	28	0	0	**30**	**81**
8:30AM	4	3	14	0	**21**	4	22	8	0	**34**	23	3	5	0	**31**	2	33	2	0	**37**	**123**
8:45AM	0	3	12	0	**15**	4	31	17	0	**52**	7	2	3	0	**12**	4	29	0	0	**33**	**112**
Hourly Total	7	9	48	0	**64**	20	88	32	1	**141**	49	7	13	0	**69**	12	140	3	0	**155**	**429**
4:00PM	2	4	11	0	**17**	9	41	15	0	**65**	19	3	11	0	**33**	5	55	1	0	**61**	**176**
4:15PM	2	2	13	0	**17**	9	51	15	0	**75**	17	2	11	0	**30**	3	51	2	0	**56**	**178**
4:30PM	3	4	12	0	**19**	9	39	20	0	**68**	28	7	6	0	**41**	1	63	1	0	**65**	**193**
4:45PM	0	3	19	0	**22**	10	42	15	1	**68**	16	4	10	0	**30**	3	52	2	0	**57**	**177**
Hourly Total	7	13	55	0	**75**	37	173	65	1	**276**	80	16	38	0	**134**	12	221	6	0	**239**	**724**
5:00PM	2	1	5	0	**8**	10	37	17	0	**64**	24	3	13	0	**40**	12	64	2	0	**78**	**190**
5:15PM	5	5	7	0	**17**	12	60	17	0	**89**	20	6	12	0	**38**	8	71	1	0	**80**	**224**
5:30PM	0	2	7	0	**9**	14	52	13	0	**79**	23	2	15	0	**40**	7	67	4	0	**78**	**206**
5:45PM	1	0	7	0	**8**	18	53	19	0	**90**	29	3	10	0	**42**	8	38	0	0	**46**	**186**
Hourly Total	8	8	26	0	**42**	54	202	66	0	**322**	96	14	50	0	**160**	35	240	7	0	**282**	**806**
Total	24	40	171	0	**235**	128	574	188	2	**892**	272	41	110	0	**423**	73	724	16	2	**815**	**2365**
% Approach	10.2%	17.0%	72.8%	0%	**-**	14.3%	64.3%	21.1%	0.2%	**-**	64.3%	9.7%	26.0%	0%	**-**	9.0%	88.8%	2.0%	0.2%	**-**	-
% Total	1.0%	1.7%	7.2%	0%	**9.9%**	5.4%	24.3%	7.9%	0.1%	**37.7%**	11.5%	1.7%	4.7%	0%	**17.9%**	3.1%	30.6%	0.7%	0.1%	**34.5%**	-
Lights	22	39	168	0	**229**	125	566	184	2	**877**	269	40	110	0	**419**	73	716	16	1	**806**	2331
% Lights	91.7%	97.5%	98.2%	0%	**97.4%**	97.7%	98.6%	97.9%	100%	**98.3%**	98.9%	97.6%	100%	0%	**99.1%**	100%	98.9%	100%	50.0%	**98.9%**	98.6%
Articulated Trucks	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	2	0	0	**2**	4
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0.3%	0%	0%	**0.2%**	0%	0%	0%	0%	**0%**	0%	0.3%	0%	0%	**0.2%**	0.2%
Buses and Single-Unit Trucks	2	1	3	0	**6**	3	6	4	0	**13**	3	1	0	0	**4**	0	6	0	1	**7**	30
% Buses and Single-Unit Trucks	8.3%	2.5%	1.8%	0%	**2.6%**	2.3%	1.0%	2.1%	0%	**1.5%**	1.1%	2.4%	0%	0%	**0.9%**	0%	0.8%	0%	50.0%	**0.9%**	1.3%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and Pryor Road - TMC
Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915258, Location: 38.944253, -94.411015

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and Pryor Road - TMC

Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915258, Location: 38.944253, -94.411015

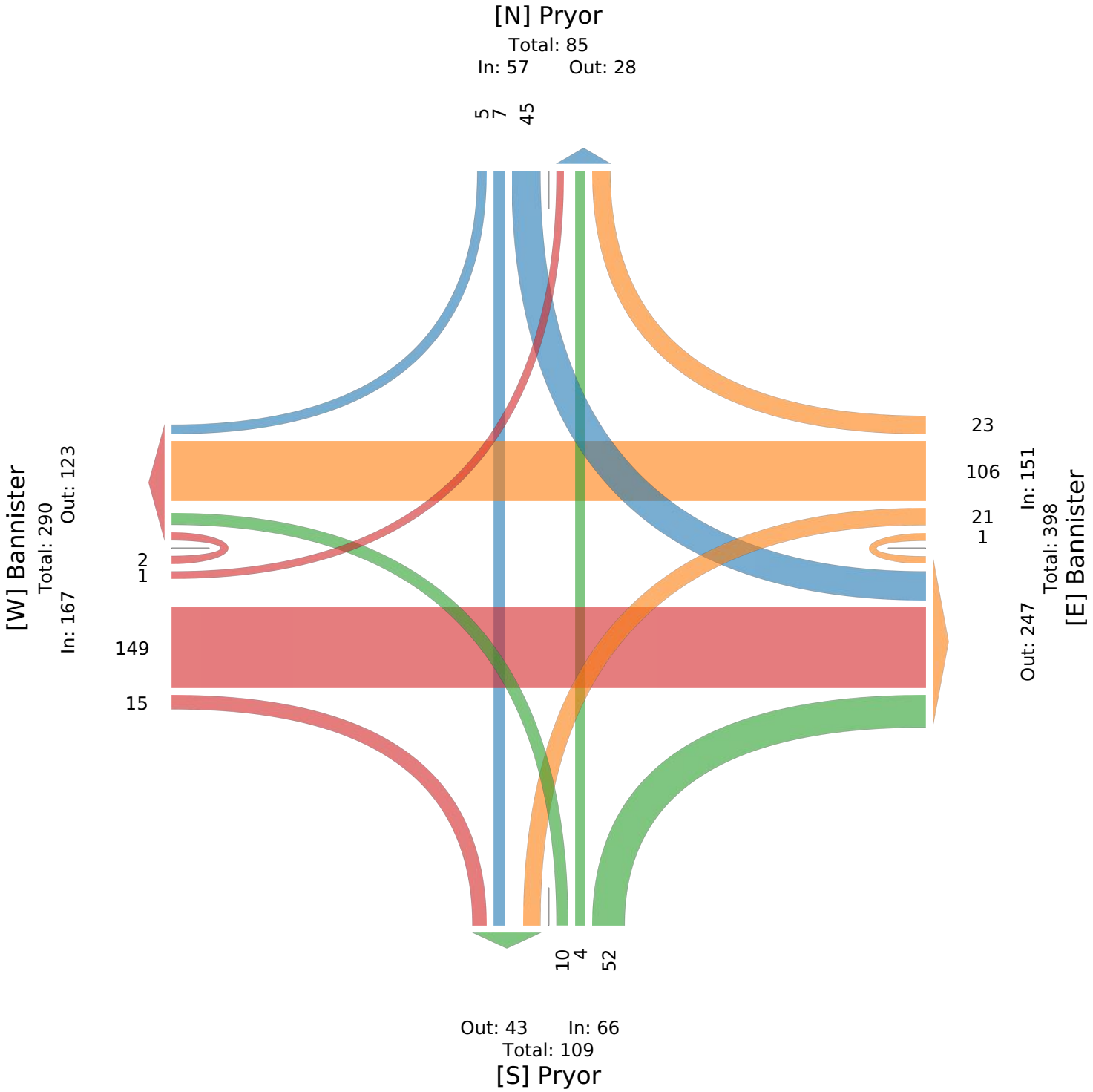
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Pryor					Bannister					Pryor					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:15AM	0	0	9	0	**9**	5	28	9	0	**42**	8	1	0	0	**9**	3	32	0	0	**35**	**95**
7:30AM	0	4	12	0	**16**	4	31	6	0	**41**	20	2	2	0	**24**	6	28	0	2	**36**	**117**
7:45AM	2	2	12	0	**16**	7	26	4	0	**37**	15	1	6	0	**22**	2	39	0	0	**41**	**116**
8:00AM	3	1	12	0	**16**	7	21	2	1	**31**	9	0	2	0	**11**	4	50	1	0	**55**	**113**
Total	5	7	45	0	**57**	23	106	21	1	**151**	52	4	10	0	**66**	15	149	1	2	**167**	**441**
% Approach	8.8%	12.3%	78.9%	0%	**-**	15.2%	70.2%	13.9%	0.7%	**-**	78.8%	6.1%	15.2%	0%	**-**	9.0%	89.2%	0.6%	1.2%	**-**	-
% Total	1.1%	1.6%	10.2%	0%	**12.9%**	5.2%	24.0%	4.8%	0.2%	**34.2%**	11.8%	0.9%	2.3%	0%	**15.0%**	3.4%	33.8%	0.2%	0.5%	**37.9%**	-
PHF	0.417	0.438	0.938	-	**0.891**	0.821	0.855	0.583	0.250	**0.899**	0.650	0.500	0.417	-	**0.688**	0.625	0.745	0.250	0.250	**0.759**	0.942
Lights	4	6	45	0	**55**	20	103	20	1	**144**	50	3	10	0	**63**	15	145	1	1	**162**	424
% Lights	80.0%	85.7%	100%	0%	**96.5%**	87.0%	97.2%	95.2%	100%	**95.4%**	96.2%	75.0%	100%	0%	**95.5%**	100%	97.3%	100%	50.0%	**97.0%**	96.1%
Articulated Trucks	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	2	0	0	**2**	3
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0.9%	0%	0%	**0.7%**	0%	0%	0%	0%	**0%**	0%	1.3%	0%	0%	**1.2%**	0.7%
Buses and Single-Unit Trucks	1	1	0	0	**2**	3	2	1	0	**6**	2	1	0	0	**3**	0	2	0	1	**3**	14
% Buses and Single-Unit Trucks	20.0%	14.3%	0%	0%	**3.5%**	13.0%	1.9%	4.8%	0%	**4.0%**	3.8%	25.0%	0%	0%	**4.5%**	0%	1.3%	0%	50.0%	**1.8%**	3.2%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and Pryor Road - TMC
Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915258, Location: 38.944253, -94.411015

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Road and Pryor Road - TMC

Tue Jan 18, 2022
PM Peak (5 PM - 6 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915258, Location: 38.944253, -94.411015

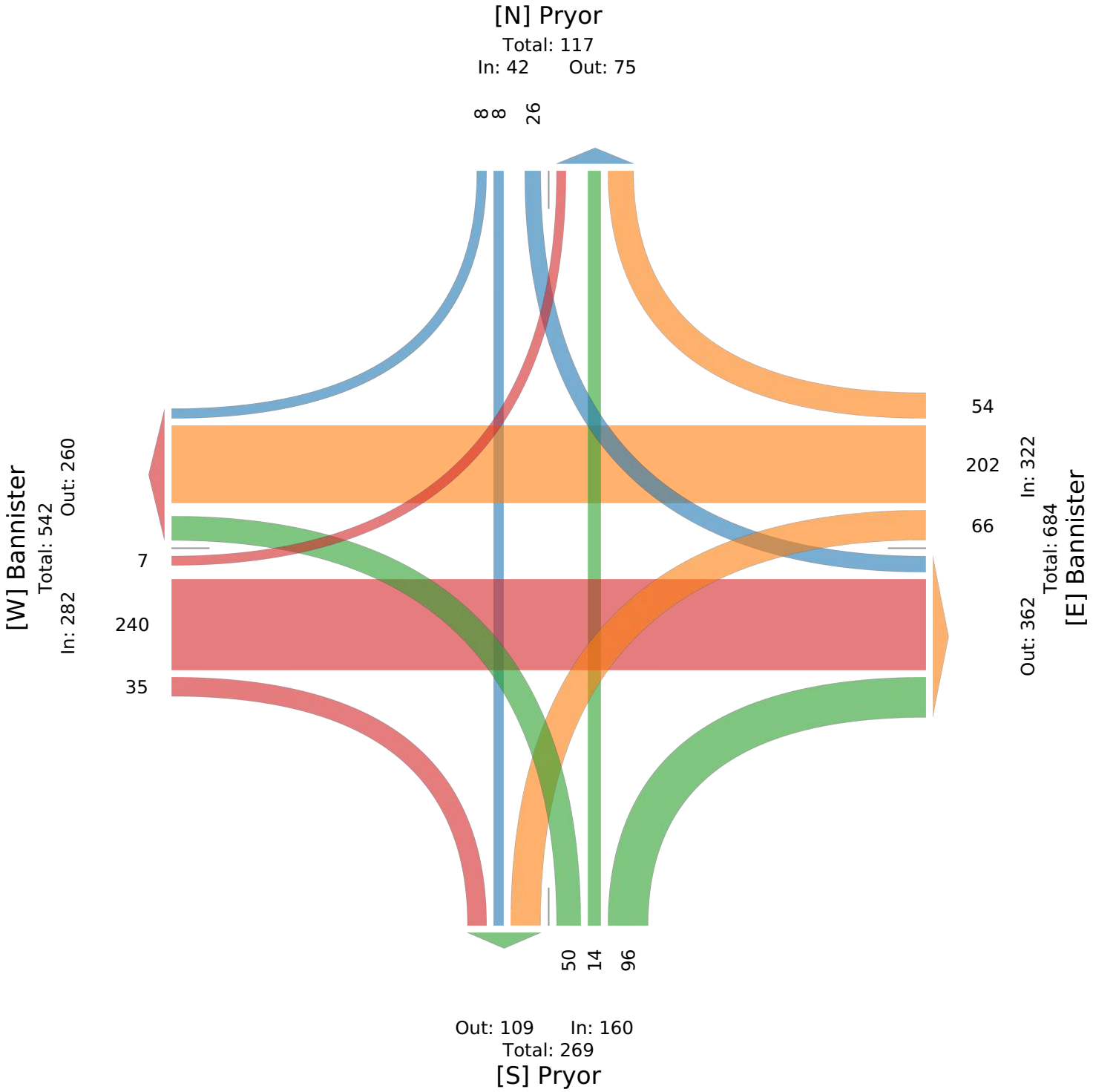
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Pryor					Bannister					Pryor					Bannister					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 5:00PM	2	1	5	0	**8**	10	37	17	0	**64**	24	3	13	0	**40**	12	64	2	0	**78**	**190**
5:15PM	5	5	7	0	**17**	12	60	17	0	**89**	20	6	12	0	**38**	8	71	1	0	**80**	**224**
5:30PM	0	2	7	0	**9**	14	52	13	0	**79**	23	2	15	0	**40**	7	67	4	0	**78**	**206**
5:45PM	1	0	7	0	**8**	18	53	19	0	**90**	29	3	10	0	**42**	8	38	0	0	**46**	**186**
Total	8	8	26	0	**42**	54	202	66	0	**322**	96	14	50	0	**160**	35	240	7	0	**282**	**806**
% Approach	19.0%	19.0%	61.9%	0%	**-**	16.8%	62.7%	20.5%	0%	**-**	60.0%	8.8%	31.3%	0%	**-**	12.4%	85.1%	2.5%	0%	**-**	-
% Total	1.0%	1.0%	3.2%	0%	**5.2%**	6.7%	25.1%	8.2%	0%	**40.0%**	11.9%	1.7%	6.2%	0%	**19.9%**	4.3%	29.8%	0.9%	0%	**35.0%**	-
PHF	0.400	0.400	0.929		**- 0.618**	0.750	0.842	0.868		**- 0.894**	0.828	0.583	0.833		**- 0.952**	0.729	0.845	0.438		**- 0.881**	0.900
Lights	8	8	26	0	**42**	54	202	66	0	**322**	96	14	50	0	**160**	35	239	7	0	**281**	805
% Lights	100%	100%	100%	0%	**100%**	100%	100%	100%	0%	**100%**	100%	100%	100%	0%	**100%**	100%	99.6%	100%	0%	**99.6%**	99.9%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	1
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0.4%	0%	0%	**0.4%**	0.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Road and Pryor Road - TMC
Tue Jan 18, 2022
PM Peak (5 PM - 6 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915258, Location: 38.944253, -94.411015

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and Colbern Road - TMC

Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915255, Location: 38.946566, -94.378116

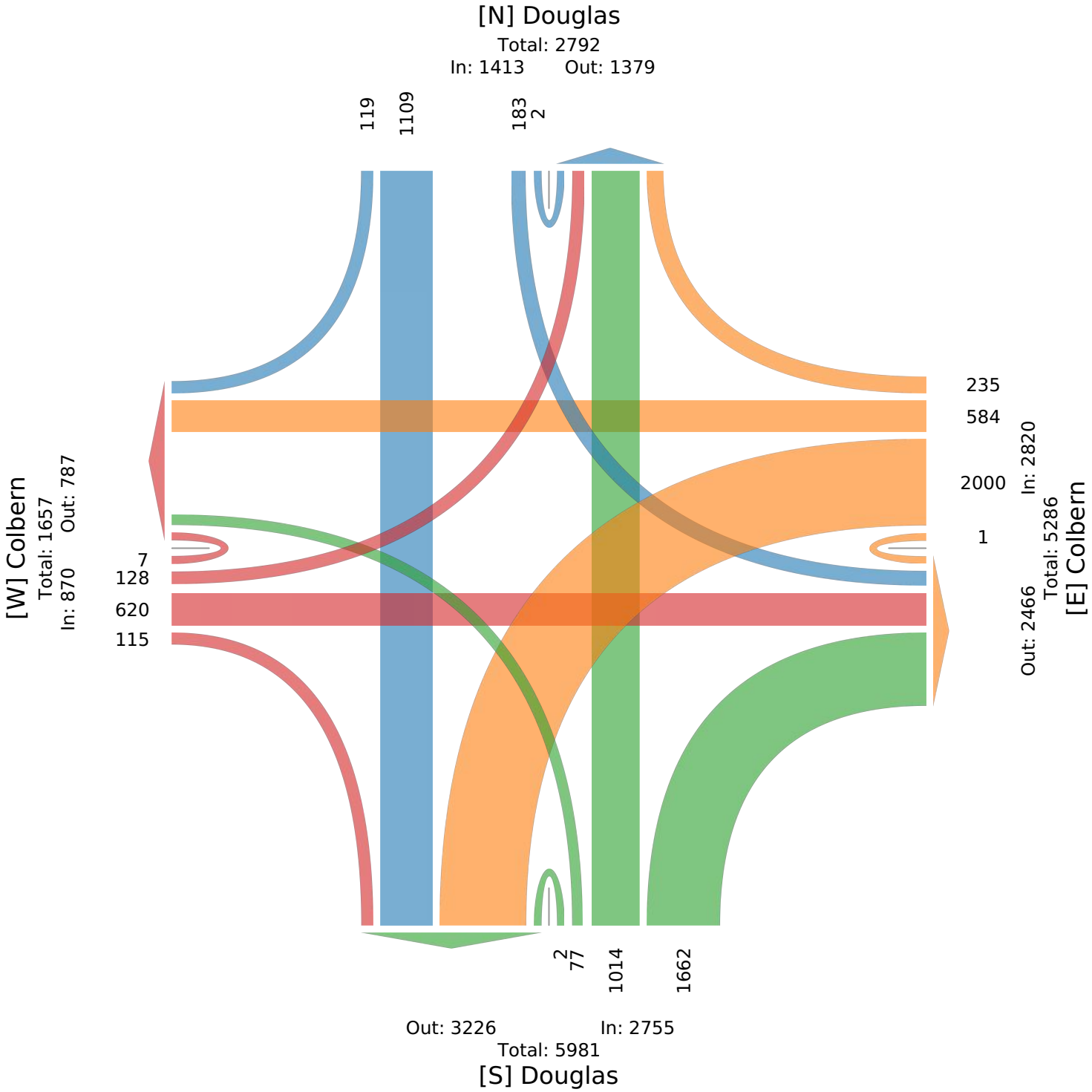
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Colbern					Douglas					Colbern					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:00AM	5	46	4	0	**55**	10	30	122	0	**162**	43	31	0	0	**74**	2	10	2	0	**14**	**305**
7:15AM	8	62	7	1	**78**	6	39	133	0	**178**	59	67	5	0	**131**	9	21	4	0	**34**	**421**
7:30AM	5	61	1	0	**67**	11	49	135	0	**195**	78	54	7	0	**139**	10	20	6	1	**37**	**438**
7:45AM	6	48	5	0	**59**	18	40	173	0	**231**	76	52	5	0	**133**	5	23	2	1	**31**	**454**
Hourly Total	24	217	17	1	**259**	45	158	563	0	**766**	256	204	17	0	**477**	26	74	14	2	**116**	**1618**
8:00AM	3	76	4	0	**83**	11	34	109	0	**154**	70	60	2	1	**133**	6	21	8	0	**35**	**405**
8:15AM	5	50	13	0	**68**	13	26	125	0	**164**	83	49	5	0	**137**	7	22	6	0	**35**	**404**
8:30AM	2	66	6	0	**74**	7	30	136	0	**173**	80	46	3	0	**129**	6	25	5	0	**36**	**412**
8:45AM	6	64	15	0	**85**	20	36	112	0	**168**	87	91	1	1	**180**	5	19	10	0	**34**	**467**
Hourly Total	16	256	38	0	**310**	51	126	482	0	**659**	320	246	11	2	**579**	24	87	29	0	**140**	**1688**
4:00PM	14	81	18	0	**113**	14	40	134	0	**188**	130	61	4	0	**195**	10	50	12	0	**72**	**568**
4:15PM	10	83	20	0	**113**	18	33	112	1	**164**	144	56	7	0	**207**	5	52	6	0	**63**	**547**
4:30PM	10	81	18	0	**109**	20	48	126	0	**194**	129	89	12	0	**230**	8	72	14	0	**94**	**627**
4:45PM	9	78	13	1	**101**	16	41	95	0	**152**	153	63	4	0	**220**	3	60	12	2	**77**	**550**
Hourly Total	43	323	69	1	**436**	68	162	467	1	**698**	556	269	27	0	**852**	26	234	44	2	**306**	**2292**
5:00PM	7	84	18	0	**109**	19	37	135	0	**191**	136	83	6	0	**225**	11	64	9	0	**84**	**609**
5:15PM	10	84	20	0	**114**	21	35	126	0	**182**	134	75	7	0	**216**	12	63	9	0	**84**	**596**
5:30PM	13	81	12	0	**106**	11	35	128	0	**174**	147	62	6	0	**215**	10	58	18	1	**87**	**582**
5:45PM	6	64	9	0	**79**	20	31	99	0	**150**	113	75	3	0	**191**	6	40	5	2	**53**	**473**
Hourly Total	36	313	59	0	**408**	71	138	488	0	**697**	530	295	22	0	**847**	39	225	41	3	**308**	**2260**
Total	119	1109	183	2	**1413**	235	584	2000	1	**2820**	1662	1014	77	2	**2755**	115	620	128	7	**870**	**7858**
% Approach	8.4%	78.5%	13.0%	0.1%	**-**	8.3%	20.7%	70.9%	0%	**-**	60.3%	36.8%	2.8%	0.1%	**-**	13.2%	71.3%	14.7%	0.8%	**-**	-
% Total	1.5%	14.1%	2.3%	0%	**18.0%**	3.0%	7.4%	25.5%	0%	**35.9%**	21.2%	12.9%	1.0%	0%	**35.1%**	1.5%	7.9%	1.6%	0.1%	**11.1%**	-
Lights	118	1099	180	2	**1399**	229	576	1969	1	**2775**	1639	1007	75	2	**2723**	115	612	125	6	**858**	7755
% Lights	99.2%	99.1%	98.4%	100%	**99.0%**	97.4%	98.6%	98.5%	100%	**98.4%**	98.6%	99.3%	97.4%	100%	**98.8%**	100%	98.7%	97.7%	85.7%	**98.6%**	98.7%
Articulated Trucks	0	0	0	0	**0**	1	0	8	0	**9**	5	1	1	0	**7**	0	0	1	0	**1**	17
% Articulated Trucks	0%	0%	0%	0%	**0%**	0.4%	0%	0.4%	0%	**0.3%**	0.3%	0.1%	1.3%	0%	**0.3%**	0%	0%	0.8%	0%	**0.1%**	0.2%
Buses and Single-Unit Trucks	1	10	3	0	**14**	5	8	23	0	**36**	18	6	1	0	**25**	0	8	2	1	**11**	86
% Buses and Single-Unit Trucks	0.8%	0.9%	1.6%	0%	**1.0%**	2.1%	1.4%	1.2%	0%	**1.3%**	1.1%	0.6%	1.3%	0%	**0.9%**	0%	1.3%	1.6%	14.3%	**1.3%**	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and Colbern Road - TMC
Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915255, Location: 38.946566, -94.378116

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and Colbern Road - TMC

Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915255, Location: 38.946566, -94.378116

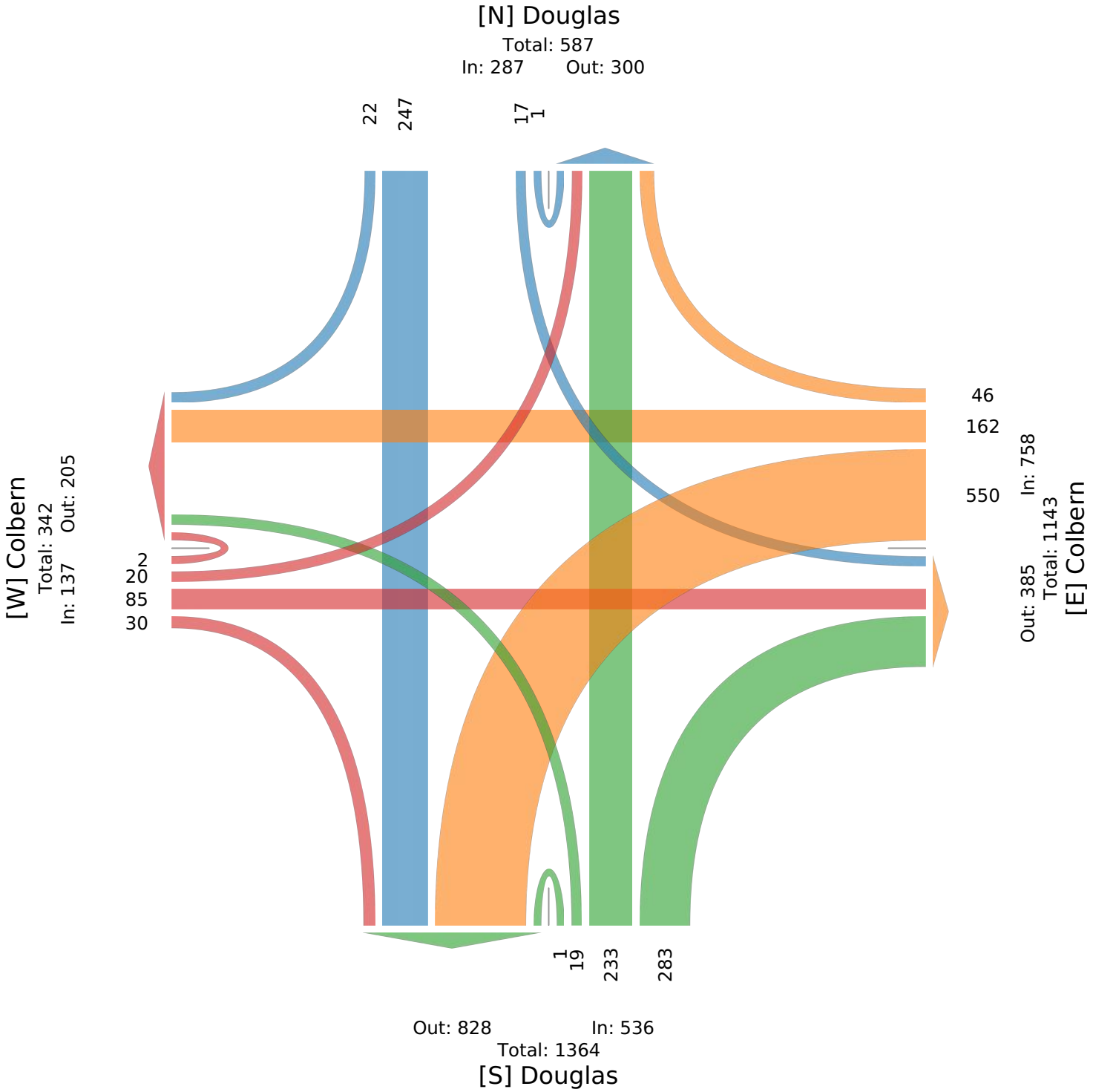
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Colbern					Douglas					Colbern					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:15AM	8	62	7	1	**78**	6	39	133	0	**178**	59	67	5	0	**131**	9	21	4	0	**34**	**421**
7:30AM	5	61	1	0	**67**	11	49	135	0	**195**	78	54	7	0	**139**	10	20	6	1	**37**	**438**
7:45AM	6	48	5	0	**59**	18	40	173	0	**231**	76	52	5	0	**133**	5	23	2	1	**31**	**454**
8:00AM	3	76	4	0	**83**	11	34	109	0	**154**	70	60	2	1	**133**	6	21	8	0	**35**	**405**
Total	22	247	17	1	**287**	46	162	550	0	**758**	283	233	19	1	**536**	30	85	20	2	**137**	**1718**
% Approach	7.7%	86.1%	5.9%	0.3%	**-**	6.1%	21.4%	72.6%	0%	**-**	52.8%	43.5%	3.5%	0.2%	**-**	21.9%	62.0%	14.6%	1.5%	**-**	-
% Total	1.3%	14.4%	1.0%	0.1%	**16.7%**	2.7%	9.4%	32.0%	0%	**44.1%**	16.5%	13.6%	1.1%	0.1%	**31.2%**	1.7%	4.9%	1.2%	0.1%	**8.0%**	-
PHF	0.688	0.813	0.607	0.250	**0.864**	0.639	0.827	0.795	-	**0.820**	0.907	0.869	0.679	0.250	**0.964**	0.750	0.924	0.625	0.500	**0.926**	0.946
Lights	22	246	17	1	**286**	43	160	538	0	**741**	276	231	18	1	**526**	30	79	19	1	**129**	1682
% Lights	100%	99.6%	100%	100%	**99.7%**	93.5%	98.8%	97.8%	0%	**97.8%**	97.5%	99.1%	94.7%	100%	**98.1%**	100%	92.9%	95.0%	50.0%	**94.2%**	97.9%
Articulated Trucks	0	0	0	0	**0**	1	0	2	0	**3**	3	1	1	0	**5**	0	0	0	0	**0**	8
% Articulated Trucks	0%	0%	0%	0%	**0%**	2.2%	0%	0.4%	0%	**0.4%**	1.1%	0.4%	5.3%	0%	**0.9%**	0%	0%	0%	0%	**0%**	0.5%
Buses and Single-Unit Trucks	0	1	0	0	**1**	2	2	10	0	**14**	4	1	0	0	**5**	0	6	1	1	**8**	28
% Buses and Single-Unit Trucks	0%	0.4%	0%	0%	**0.3%**	4.3%	1.2%	1.8%	0%	**1.8%**	1.4%	0.4%	0%	0%	**0.9%**	0%	7.1%	5.0%	50.0%	**5.8%**	1.6%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and Colbern Road - TMC
Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915255, Location: 38.946566, -94.378116

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and Colbern Road - TMC

Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915255, Location: 38.946566, -94.378116

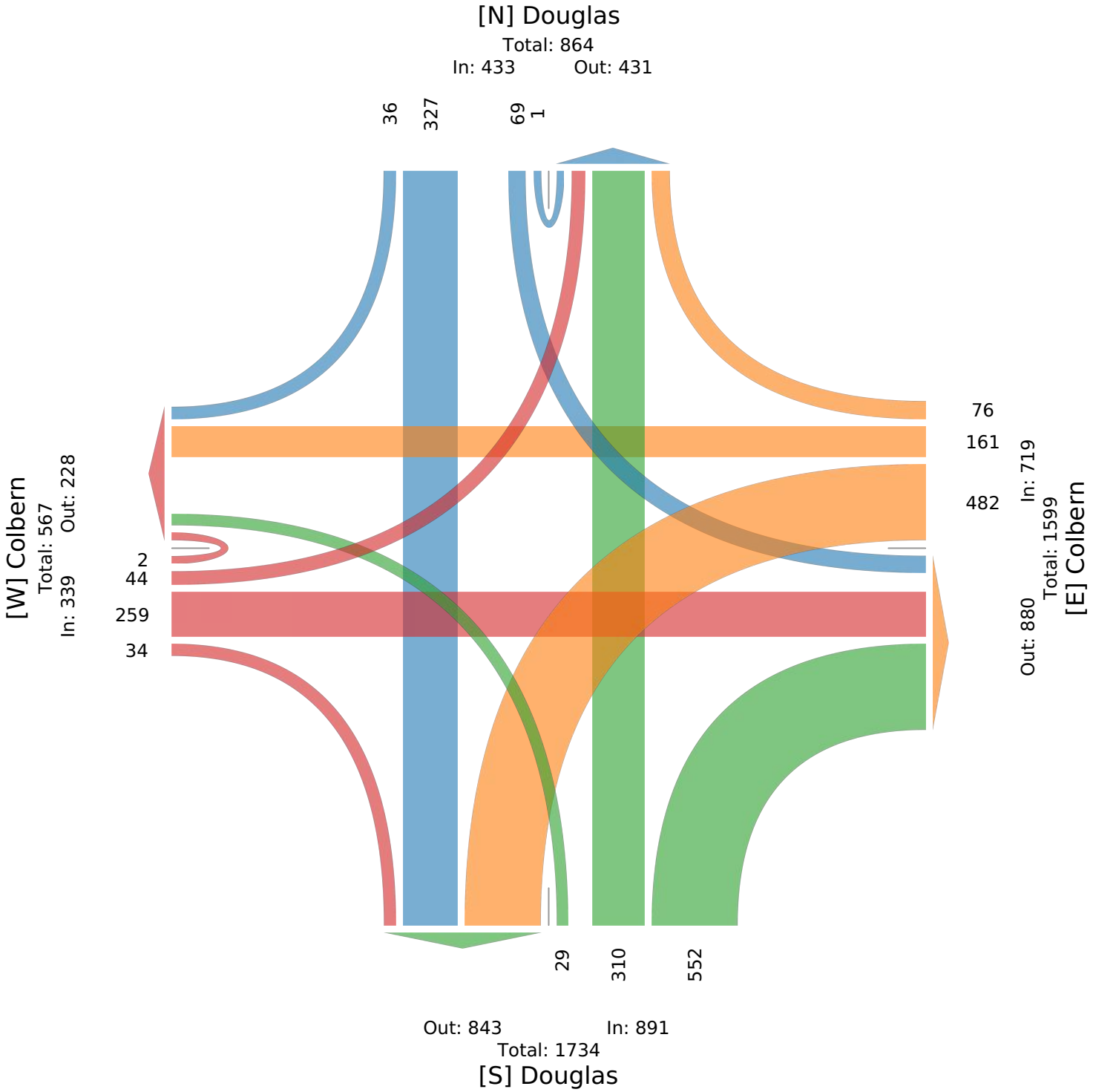
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Douglas Southbound					Colbern Westbound					Douglas Northbound					Colbern Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 4:30PM	10	81	18	0	**109**	20	48	126	0	**194**	129	89	12	0	**230**	8	72	14	0	**94**	**627**
4:45PM	9	78	13	1	**101**	16	41	95	0	**152**	153	63	4	0	**220**	3	60	12	2	**77**	**550**
5:00PM	7	84	18	0	**109**	19	37	135	0	**191**	136	83	6	0	**225**	11	64	9	0	**84**	**609**
5:15PM	10	84	20	0	**114**	21	35	126	0	**182**	134	75	7	0	**216**	12	63	9	0	**84**	**596**
Total	36	327	69	1	**433**	76	161	482	0	**719**	552	310	29	0	**891**	34	259	44	2	**339**	**2382**
% Approach	8.3%	75.5%	15.9%	0.2%	**-**	10.6%	22.4%	67.0%	0%	**-**	62.0%	34.8%	3.3%	0%	**-**	10.0%	76.4%	13.0%	0.6%	**-**	-
% Total	1.5%	13.7%	2.9%	0%	**18.2%**	3.2%	6.8%	20.2%	0%	**30.2%**	23.2%	13.0%	1.2%	0%	**37.4%**	1.4%	10.9%	1.8%	0.1%	**14.2%**	-
PHF	0.900	0.973	0.863	0.250	**0.950**	0.905	0.839	0.893	-	**0.927**	0.902	0.871	0.604	-	**0.968**	0.708	0.899	0.786	0.250	**0.902**	0.950
Lights	36	320	69	1	**426**	74	157	478	0	**709**	548	310	29	0	**887**	34	258	44	2	**338**	2360
% Lights	100%	97.9%	100%	100%	**98.4%**	97.4%	97.5%	99.2%	0%	**98.6%**	99.3%	100%	100%	0%	**99.6%**	100%	99.6%	100%	100%	**99.7%**	99.1%
Articulated Trucks	0	0	0	0	**0**	0	0	1	0	**1**	1	0	0	0	**1**	0	0	0	0	**0**	2
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0.2%	0%	**0.1%**	0.2%	0%	0%	0%	**0.1%**	0%	0%	0%	0%	**0%**	0.1%
Buses and Single-Unit Trucks	0	7	0	0	**7**	2	4	3	0	**9**	3	0	0	0	**3**	0	1	0	0	**1**	20
% Buses and Single-Unit Trucks	0%	2.1%	0%	0%	**1.6%**	2.6%	2.5%	0.6%	0%	**1.3%**	0.5%	0%	0%	0%	**0.3%**	0%	0.4%	0%	0%	**0.3%**	0.8%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and Colbern Road - TMC
Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915255, Location: 38.946566, -94.378116

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and I470 EB Ramp - TMC

Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915257, Location: 38.943656, -94.378207

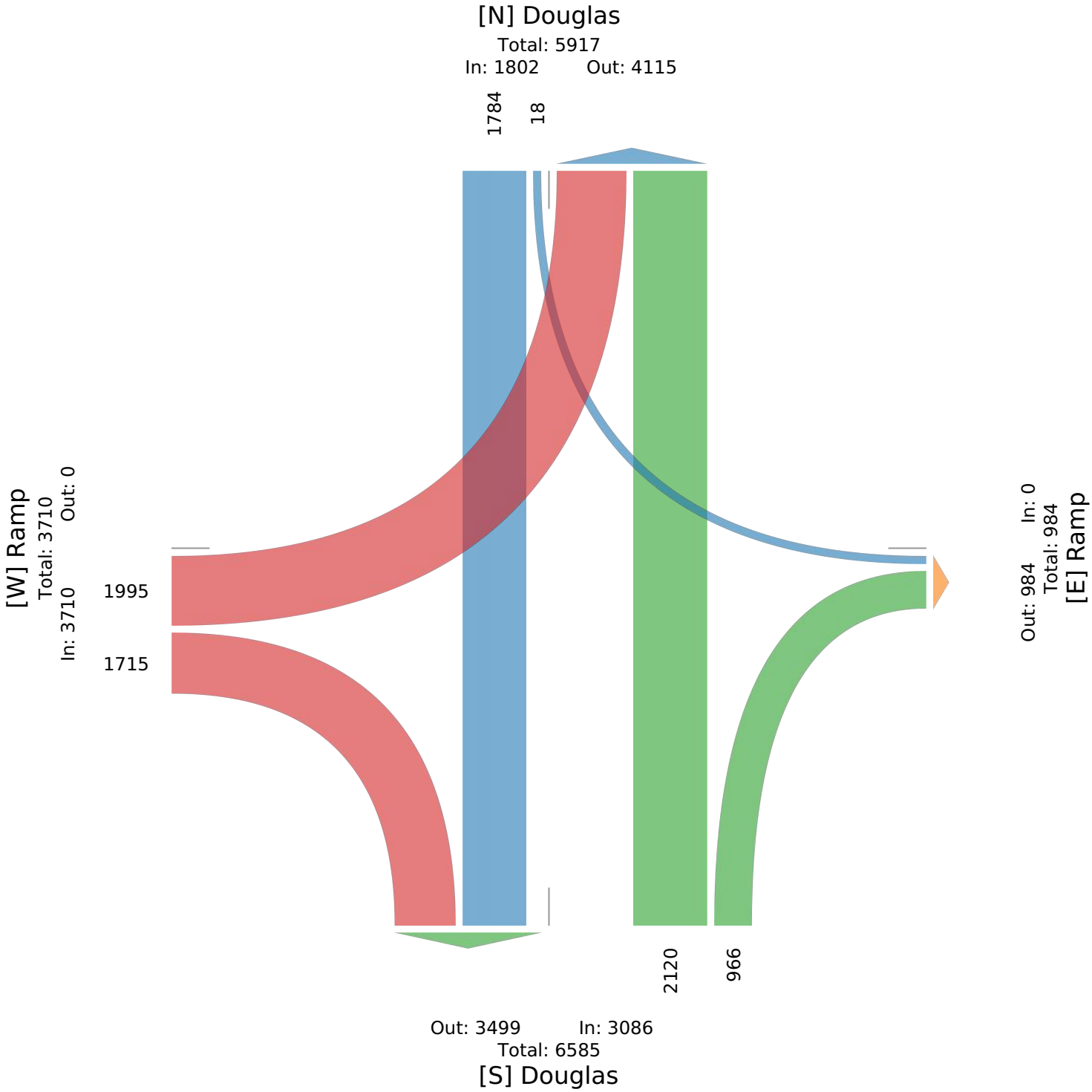
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Ramp					Douglas					Ramp					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-01-18 7:00AM	0	100	0	0	**100**	0	0	0	0	**0**	29	78	0	0	**107**	74	0	52	0	**126**	**333**
7:15AM	0	104	0	0	**104**	0	0	0	0	**0**	47	106	0	0	**153**	74	0	101	0	**175**	**432**
7:30AM	0	117	1	0	**118**	0	0	0	0	**0**	34	101	0	0	**135**	97	0	99	0	**196**	**449**
7:45AM	0	154	2	0	**156**	0	0	0	0	**0**	41	87	0	0	**128**	121	0	108	0	**229**	**513**
Hourly Total	0	475	3	0	**478**	0	0	0	0	**0**	151	372	0	0	**523**	366	0	360	0	**726**	**1727**
8:00AM	0	119	1	0	**120**	0	0	0	0	**0**	37	84	0	0	**121**	125	0	90	0	**215**	**456**
8:15AM	0	117	0	0	**117**	0	0	0	0	**0**	29	87	0	0	**116**	102	0	99	0	**201**	**434**
8:30AM	0	109	1	0	**110**	0	0	0	0	**0**	34	71	0	0	**105**	117	0	112	0	**229**	**444**
8:45AM	0	110	0	0	**110**	0	0	0	0	**0**	32	93	0	0	**125**	113	0	129	0	**242**	**477**
Hourly Total	0	455	2	0	**457**	0	0	0	0	**0**	132	335	0	0	**467**	457	0	430	0	**887**	**1811**
4:00PM	0	109	1	0	**110**	0	0	0	0	**0**	107	204	0	0	**311**	103	0	136	0	**239**	**660**
4:15PM	0	126	2	0	**128**	0	0	0	0	**0**	86	188	0	0	**274**	120	0	142	0	**262**	**664**
4:30PM	0	97	1	0	**98**	0	0	0	0	**0**	116	215	0	0	**331**	109	0	154	0	**263**	**692**
4:45PM	0	101	2	0	**103**	0	0	0	0	**0**	73	160	0	0	**233**	107	0	172	0	**279**	**615**
Hourly Total	0	433	6	0	**439**	0	0	0	0	**0**	382	767	0	0	**1149**	439	0	604	0	**1043**	**2631**
5:00PM	0	108	0	0	**108**	0	0	0	0	**0**	112	225	0	0	**337**	103	0	137	0	**240**	**685**
5:15PM	0	102	2	0	**104**	0	0	0	0	**0**	82	160	0	0	**242**	135	0	172	0	**307**	**653**
5:30PM	0	102	3	0	**105**	0	0	0	0	**0**	55	135	0	0	**190**	102	0	160	0	**262**	**557**
5:45PM	0	109	2	0	**111**	0	0	0	0	**0**	52	126	0	0	**178**	113	0	132	0	**245**	**534**
Hourly Total	0	421	7	0	**428**	0	0	0	0	**0**	301	646	0	0	**947**	453	0	601	0	**1054**	**2429**
Total	0	1784	18	0	**1802**	0	0	0	0	**0**	966	2120	0	0	**3086**	1715	0	1995	0	**3710**	**8598**
% Approach	0%	99.0%	1.0%	0%	**-**	0%	0%	0%	0%	**-**	31.3%	68.7%	0%	0%	**-**	46.2%	0%	53.8%	0%	**-**	-
% Total	0%	20.7%	0.2%	0%	**21.0%**	0%	0%	0%	0%	**0%**	11.2%	24.7%	0%	0%	**35.9%**	19.9%	0%	23.2%	0%	**43.1%**	-
Lights	0	1762	17	0	**1779**	0	0	0	0	**0**	948	2100	0	0	**3048**	1698	0	1969	0	**3667**	8494
% Lights	0%	98.8%	94.4%	0%	**98.7%**	0%	0%	0%	0%	**-**	98.1%	99.1%	0%	0%	**98.8%**	99.0%	0%	98.7%	0%	**98.8%**	98.8%
Articulated Trucks	0	6	0	0	**6**	0	0	0	0	**0**	8	3	0	0	**11**	4	0	5	0	**9**	26
% Articulated Trucks	0%	0.3%	0%	0%	**0.3%**	0%	0%	0%	0%	**-**	0.8%	0.1%	0%	0%	**0.4%**	0.2%	0%	0.3%	0%	**0.2%**	0.3%
Buses and Single-Unit Trucks	0	16	1	0	**17**	0	0	0	0	**0**	10	17	0	0	**27**	13	0	21	0	**34**	78
% Buses and Single-Unit Trucks	0%	0.9%	5.6%	0%	**0.9%**	0%	0%	0%	0%	**-**	1.0%	0.8%	0%	0%	**0.9%**	0.8%	0%	1.1%	0%	**0.9%**	0.9%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and I470 EB Ramp - TMC
Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915257, Location: 38.943656, -94.378207

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and I470 EB Ramp - TMC

Tue Jan 18, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915257, Location: 38.943656, -94.378207

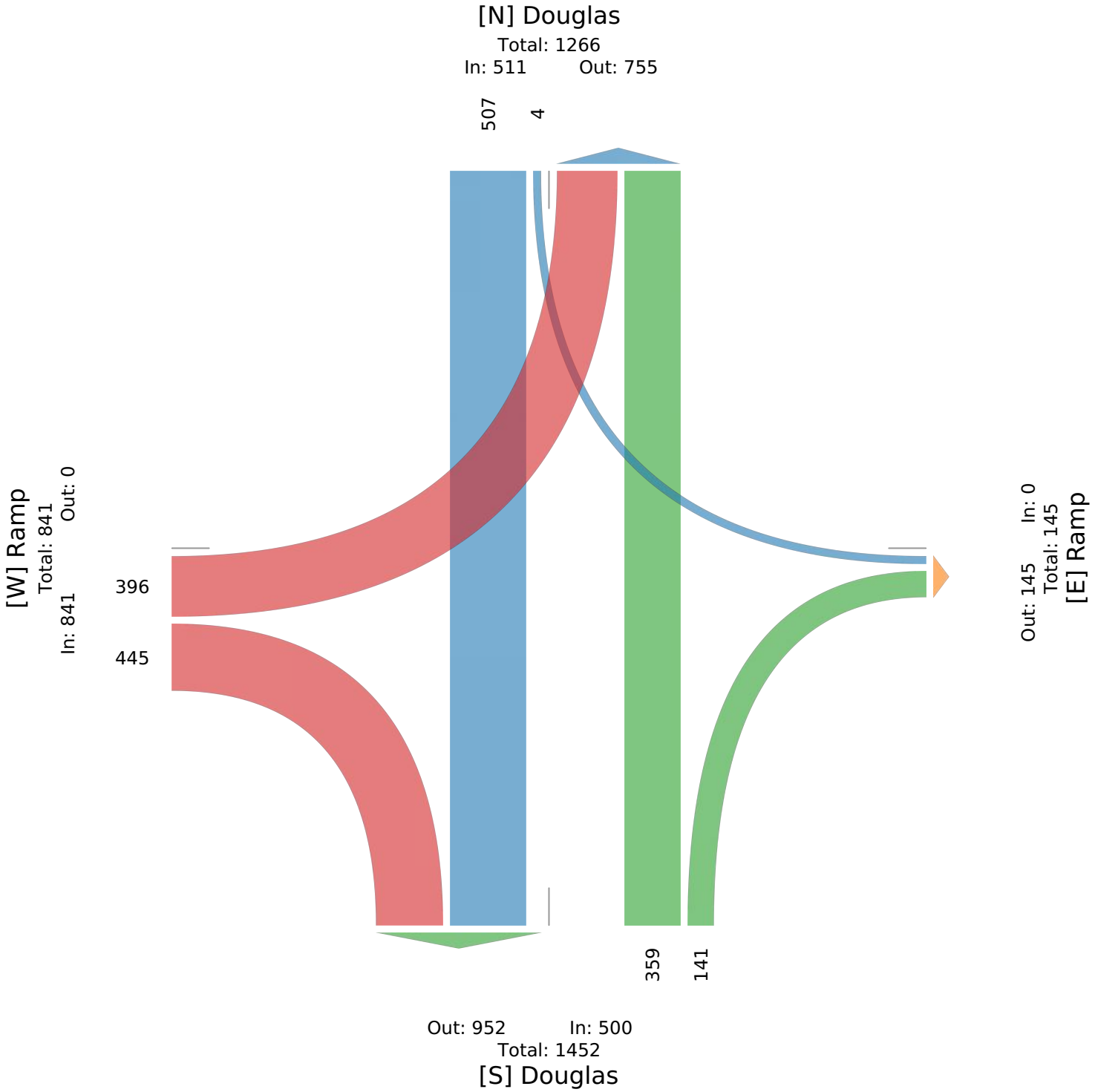
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Ramp					Douglas					Ramp					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:30AM	0	117	1	0	**118**	0	0	0	0	**0**	34	101	0	0	**135**	97	0	99	0	**196**	**449**
7:45AM	0	154	2	0	**156**	0	0	0	0	**0**	41	87	0	0	**128**	121	0	108	0	**229**	**513**
8:00AM	0	119	1	0	**120**	0	0	0	0	**0**	37	84	0	0	**121**	125	0	90	0	**215**	**456**
8:15AM	0	117	0	0	**117**	0	0	0	0	**0**	29	87	0	0	**116**	102	0	99	0	**201**	**434**
Total	0	507	4	0	**511**	0	0	0	0	**0**	141	359	0	0	**500**	445	0	396	0	**841**	**1852**
% Approach	0%	99.2%	0.8%	0%	**-**	0%	0%	0%	0%	**-**	28.2%	71.8%	0%	0%	**-**	52.9%	0%	47.1%	0%	**-**	-
% Total	0%	27.4%	0.2%	0%	**27.6%**	0%	0%	0%	0%	**0%**	7.6%	19.4%	0%	0%	**27.0%**	24.0%	0%	21.4%	0%	**45.4%**	-
PHF	-	0.823	0.500	-	**0.819**	-	-	-	-	**-**	0.860	0.889	-	-	**0.926**	0.890	-	0.917	-	**0.918**	0.903
Lights	0	501	4	0	**505**	0	0	0	0	**0**	139	354	0	0	**493**	440	0	388	0	**828**	1826
% Lights	0%	98.8%	100%	0%	**98.8%**	0%	0%	0%	0%	**-**	98.6%	98.6%	0%	0%	**98.6%**	98.9%	0%	98.0%	0%	**98.5%**	98.6%
Articulated Trucks	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	2	0	2	0	**4**	5
% Articulated Trucks	0%	0.2%	0%	0%	**0.2%**	0%	0%	0%	0%	**-**	0%	0%	0%	0%	**0%**	0.4%	0%	0.5%	0%	**0.5%**	0.3%
Buses and Single-Unit Trucks	0	5	0	0	**5**	0	0	0	0	**0**	2	5	0	0	**7**	3	0	6	0	**9**	21
% Buses and Single-Unit Trucks	0%	1.0%	0%	0%	**1.0%**	0%	0%	0%	0%	**-**	1.4%	1.4%	0%	0%	**1.4%**	0.7%	0%	1.5%	0%	**1.1%**	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and I470 EB Ramp - TMC
Tue Jan 18, 2022
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915257, Location: 38.943656, -94.378207

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and I470 EB Ramp - TMC

Tue Jan 18, 2022
PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915257, Location: 38.943656, -94.378207

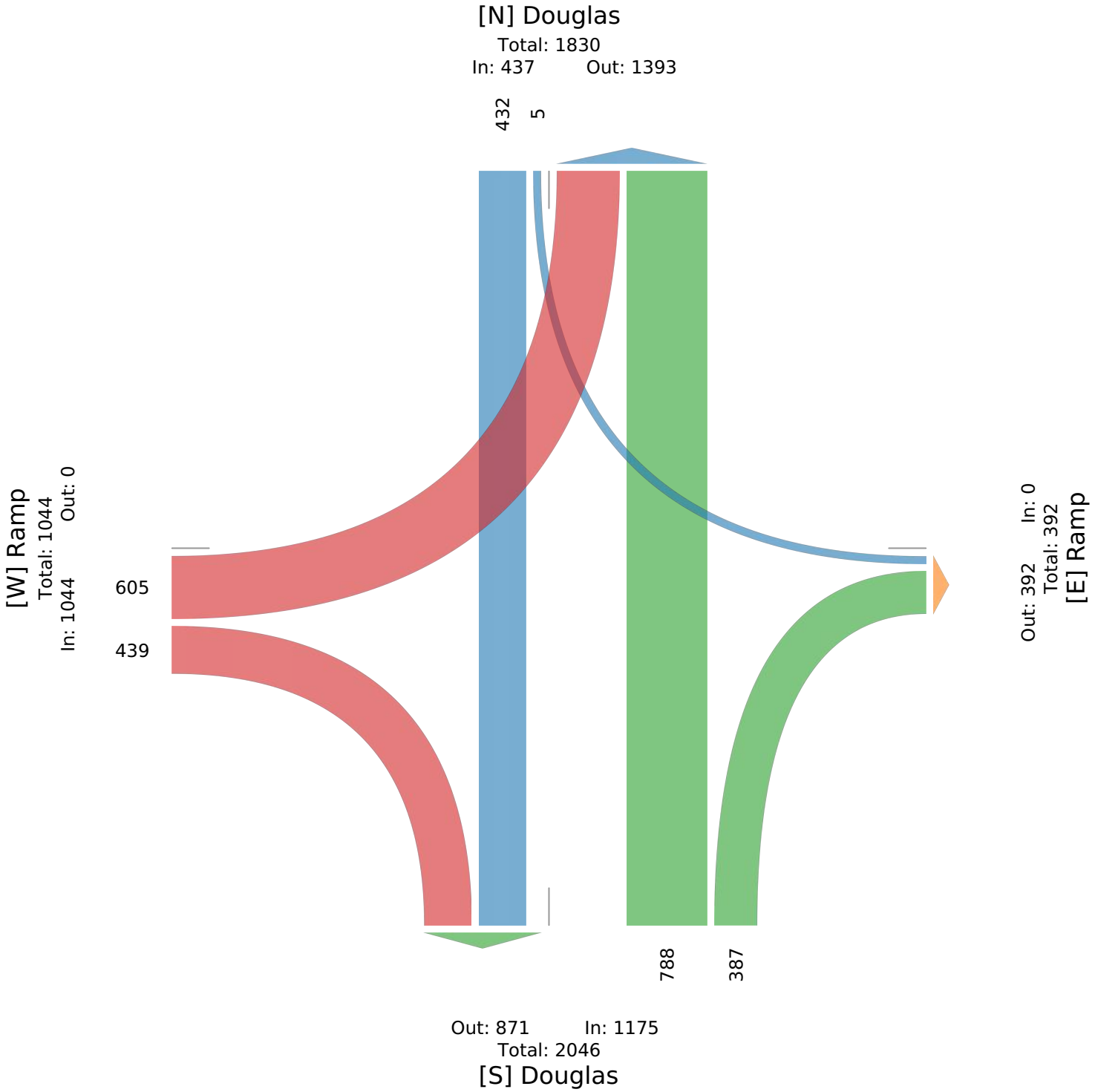
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Ramp					Douglas					Ramp					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 4:15PM	0	126	2	0	**128**	0	0	0	0	**0**	86	188	0	0	**274**	120	0	142	0	**262**	**664**
4:30PM	0	97	1	0	**98**	0	0	0	0	**0**	116	215	0	0	**331**	109	0	154	0	**263**	**692**
4:45PM	0	101	2	0	**103**	0	0	0	0	**0**	73	160	0	0	**233**	107	0	172	0	**279**	**615**
5:00PM	0	108	0	0	**108**	0	0	0	0	**0**	112	225	0	0	**337**	103	0	137	0	**240**	**685**
Total	0	432	5	0	**437**	0	0	0	0	**0**	387	788	0	0	**1175**	439	0	605	0	**1044**	**2656**
% Approach	0%	98.9%	1.1%	0%	**-**	0%	0%	0%	0%	**-**	32.9%	67.1%	0%	0%	**-**	42.0%	0%	58.0%	0%	**-**	-
% Total	0%	16.3%	0.2%	0%	**16.5%**	0%	0%	0%	0%	**0%**	14.6%	29.7%	0%	0%	**44.2%**	16.5%	0%	22.8%	0%	**39.3%**	-
PHF	-	0.857	0.625	-	**0.854**	-	-	-	-	**-**	0.834	0.876	-	-	**0.872**	0.915	-	0.879	-	**0.935**	0.960
Lights	0	428	4	0	**432**	0	0	0	0	**0**	383	783	0	0	**1166**	435	0	600	0	**1035**	2633
% Lights	0%	99.1%	80.0%	0%	**98.9%**	0%	0%	0%	0%	**-**	99.0%	99.4%	0%	0%	**99.2%**	99.1%	0%	99.2%	0%	**99.1%**	99.1%
Articulated Trucks	0	3	0	0	**3**	0	0	0	0	**0**	2	0	0	0	**2**	0	0	1	0	**1**	6
% Articulated Trucks	0%	0.7%	0%	0%	**0.7%**	0%	0%	0%	0%	**-**	0.5%	0%	0%	0%	**0.2%**	0%	0%	0.2%	0%	**0.1%**	0.2%
Buses and Single-Unit Trucks	0	1	1	0	**2**	0	0	0	0	**0**	2	5	0	0	**7**	4	0	4	0	**8**	17
% Buses and Single-Unit Trucks	0%	0.2%	20.0%	0%	**0.5%**	0%	0%	0%	0%	**-**	0.5%	0.6%	0%	0%	**0.6%**	0.9%	0%	0.7%	0%	**0.8%**	0.6%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and I470 EB Ramp - TMC
Tue Jan 18, 2022
PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915257, Location: 38.943656, -94.378207

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and I470 WB Ramp - TMC

Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915256, Location: 38.945249, -94.378173

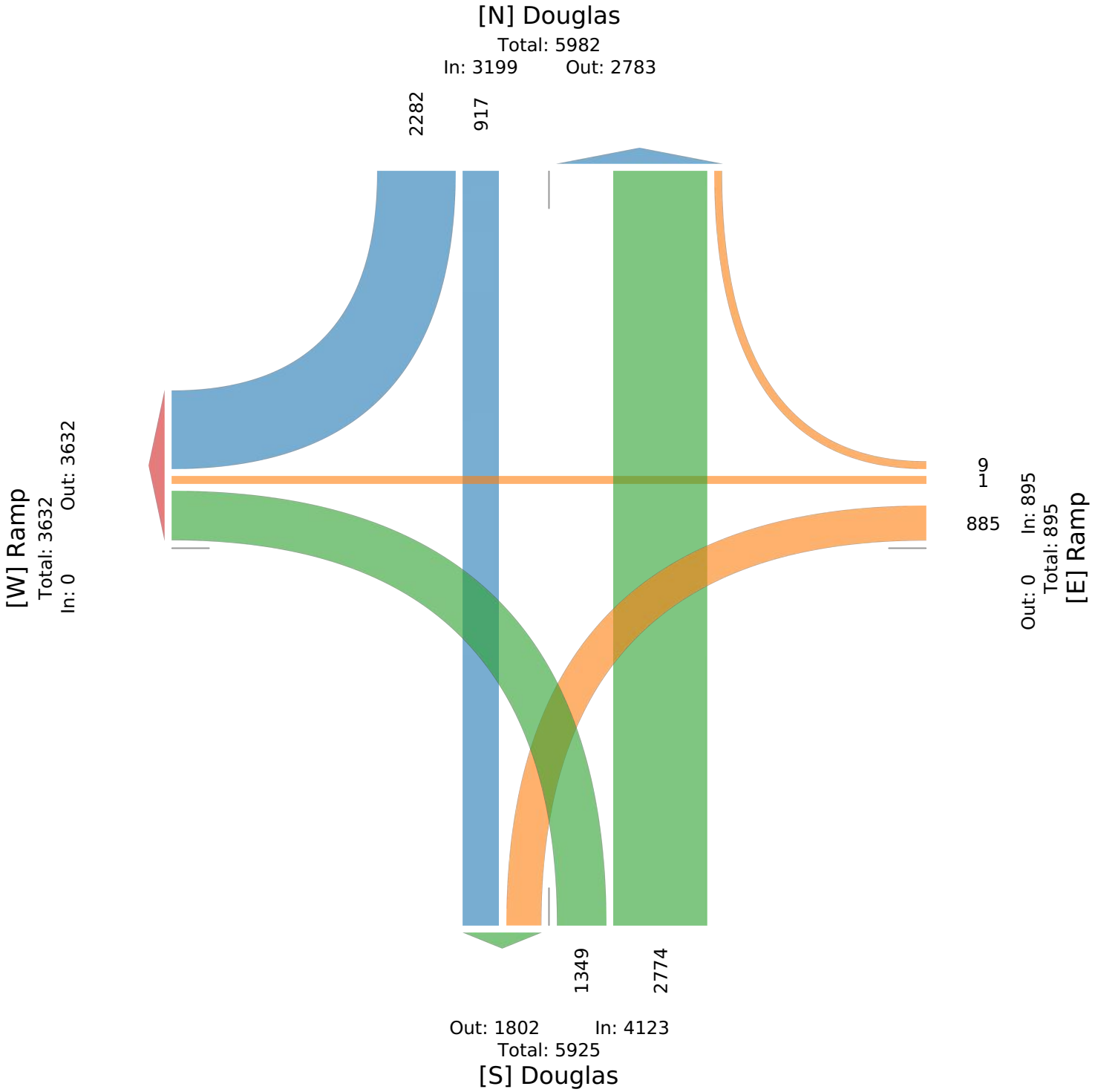
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Ramp					Douglas					Ramp					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:00AM	131	37	0	0	**168**	0	0	65	0	**65**	0	74	59	0	**133**	0	0	0	0	**0**	**366**
7:15AM	167	41	0	0	**208**	1	0	61	0	**62**	0	131	70	0	**201**	0	0	0	0	**0**	**471**
7:30AM	160	48	0	0	**208**	0	0	69	0	**69**	0	132	70	0	**202**	0	0	0	0	**0**	**479**
7:45AM	168	52	0	0	**220**	0	0	103	0	**103**	0	134	61	0	**195**	0	0	0	0	**0**	**518**
Hourly Total	626	178	0	0	**804**	1	0	298	0	**299**	0	471	260	0	**731**	0	0	0	0	**0**	**1834**
8:00AM	140	49	0	0	**189**	0	0	71	0	**71**	0	132	43	0	**175**	0	0	0	0	**0**	**435**
8:15AM	139	49	0	0	**188**	0	0	69	0	**69**	0	132	51	0	**183**	0	0	0	0	**0**	**440**
8:30AM	146	62	0	0	**208**	1	0	48	0	**49**	0	137	51	0	**188**	0	0	0	0	**0**	**445**
8:45AM	114	53	0	0	**167**	1	1	54	0	**56**	0	172	53	0	**225**	0	0	0	0	**0**	**448**
Hourly Total	539	213	0	0	**752**	2	1	242	0	**245**	0	573	198	0	**771**	0	0	0	0	**0**	**1768**
4:00PM	148	77	0	0	**225**	0	0	40	0	**40**	0	208	130	0	**338**	0	0	0	0	**0**	**603**
4:15PM	134	69	0	0	**203**	2	0	52	0	**54**	0	217	110	0	**327**	0	0	0	0	**0**	**584**
4:30PM	158	62	0	0	**220**	0	0	43	0	**43**	0	227	146	0	**373**	0	0	0	0	**0**	**636**
4:45PM	115	55	0	0	**170**	0	0	48	0	**48**	0	219	113	0	**332**	0	0	0	0	**0**	**550**
Hourly Total	555	263	0	0	**818**	2	0	183	0	**185**	0	871	499	0	**1370**	0	0	0	0	**0**	**2373**
5:00PM	156	65	0	0	**221**	2	0	45	0	**47**	0	230	131	0	**361**	0	0	0	0	**0**	**629**
5:15PM	149	65	0	0	**214**	0	0	42	0	**42**	0	223	110	0	**333**	0	0	0	0	**0**	**589**
5:30PM	153	67	0	0	**220**	1	0	34	0	**35**	0	211	82	0	**293**	0	0	0	0	**0**	**548**
5:45PM	104	66	0	0	**170**	1	0	41	0	**42**	0	195	69	0	**264**	0	0	0	0	**0**	**476**
Hourly Total	562	263	0	0	**825**	4	0	162	0	**166**	0	859	392	0	**1251**	0	0	0	0	**0**	**2242**
Total	2282	917	0	0	**3199**	9	1	885	0	**895**	0	2774	1349	0	**4123**	0	0	0	0	**0**	**8217**
% Approach	71.3%	28.7%	0%	0%	**-**	1.0%	0.1%	98.9%	0%	**-**	0%	67.3%	32.7%	0%	**-**	0%	0%	0%	0%	**-**	-
% Total	27.8%	11.2%	0%	0%	**38.9%**	0.1%	0%	10.8%	0%	**10.9%**	0%	33.8%	16.4%	0%	**50.2%**	0%	0%	0%	0%	**0%**	-
Lights	2250	910	0	0	**3160**	9	1	870	0	**880**	0	2743	1329	0	**4072**	0	0	0	0	**0**	8112
% Lights	98.6%	99.2%	0%	0%	**98.8%**	100%	100%	98.3%	0%	**98.3%**	0%	98.9%	98.5%	0%	**98.8%**	0%	0%	0%	0%	**-**	98.7%
Articulated Trucks	8	1	0	0	**9**	0	0	5	0	**5**	0	7	2	0	**9**	0	0	0	0	**0**	23
% Articulated Trucks	0.4%	0.1%	0%	0%	**0.3%**	0%	0%	0.6%	0%	**0.6%**	0%	0.3%	0.1%	0%	**0.2%**	0%	0%	0%	0%	**-**	0.3%
Buses and Single-Unit Trucks	24	6	0	0	**30**	0	0	10	0	**10**	0	24	18	0	**42**	0	0	0	0	**0**	82
% Buses and Single-Unit Trucks	1.1%	0.7%	0%	0%	**0.9%**	0%	0%	1.1%	0%	**1.1%**	0%	0.9%	1.3%	0%	**1.0%**	0%	0%	0%	0%	**-**	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and I470 WB Ramp - TMC
Tue Jan 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915256, Location: 38.945249, -94.378173

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and I470 WB Ramp - TMC

Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915256, Location: 38.945249, -94.378173

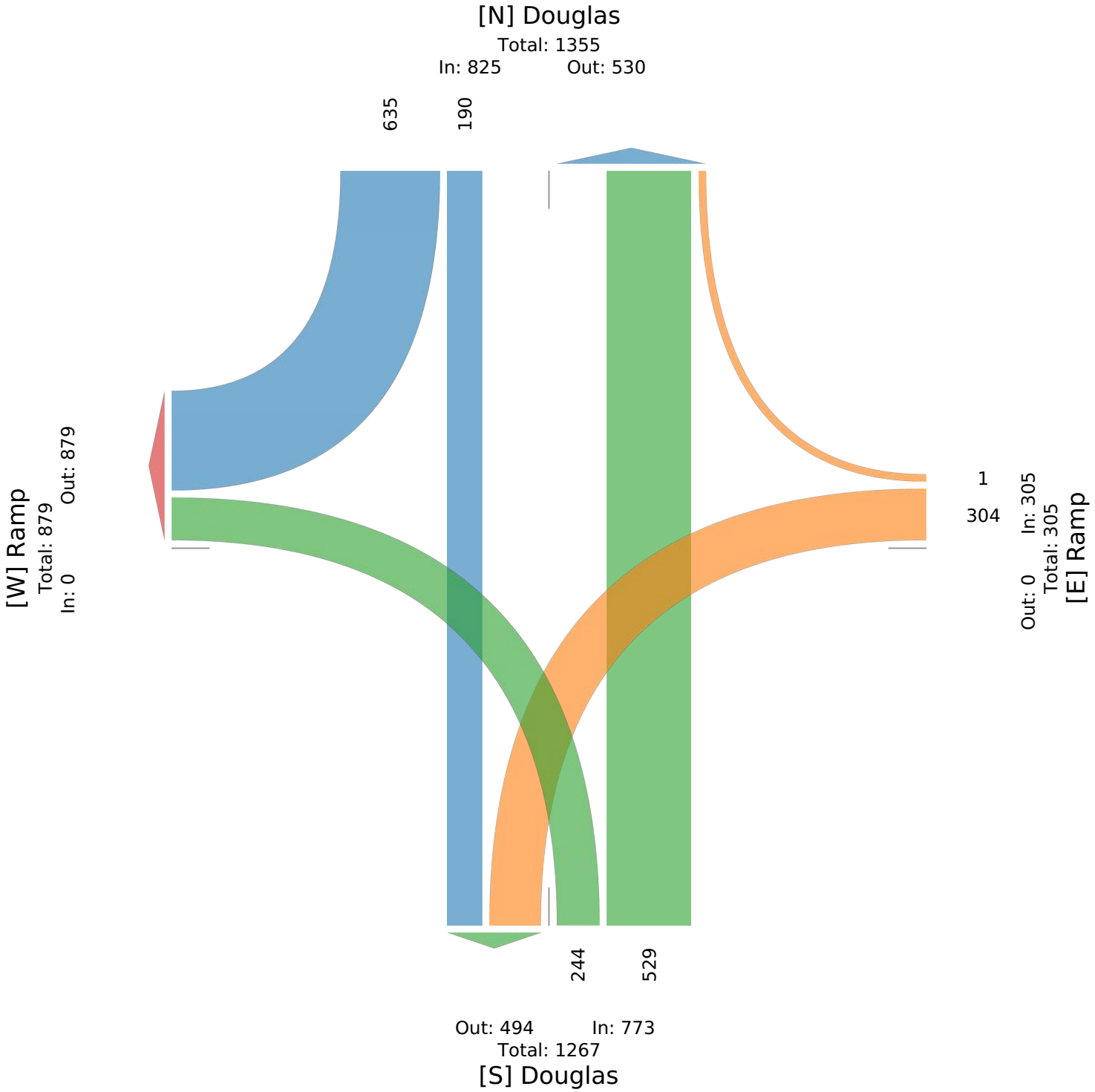
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Ramp					Douglas					Ramp					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 7:15AM	167	41	0	0	**208**	1	0	61	0	**62**	0	131	70	0	**201**	0	0	0	0	**0**	**471**
7:30AM	160	48	0	0	**208**	0	0	69	0	**69**	0	132	70	0	**202**	0	0	0	0	**0**	**479**
7:45AM	168	52	0	0	**220**	0	0	103	0	**103**	0	134	61	0	**195**	0	0	0	0	**0**	**518**
8:00AM	140	49	0	0	**189**	0	0	71	0	**71**	0	132	43	0	**175**	0	0	0	0	**0**	**435**
Total	635	190	0	0	**825**	1	0	304	0	**305**	0	529	244	0	**773**	0	0	0	0	**0**	**1903**
% Approach	77.0%	23.0%	0%	0%	**-**	0.3%	0%	99.7%	0%	**-**	0%	68.4%	31.6%	0%	**-**	0%	0%	0%	0%	**-**	-
% Total	33.4%	10.0%	0%	0%	**43.4%**	0.1%	0%	16.0%	0%	**16.0%**	0%	27.8%	12.8%	0%	**40.6%**	0%	0%	0%	0%	**0%**	-
PHF	0.945	0.913	-	-	**0.938**	0.250	-	0.738	-	**0.740**	-	0.987	0.871	-	**0.957**	-	-	-	-	**-**	0.918
Lights	625	188	0	0	**813**	1	0	302	0	**303**	0	520	242	0	**762**	0	0	0	0	**0**	1878
% Lights	98.4%	98.9%	0%	0%	**98.5%**	100%	0%	99.3%	0%	**99.3%**	0%	98.3%	99.2%	0%	**98.6%**	0%	0%	0%	0%	**-**	98.7%
Articulated Trucks	3	0	0	0	**3**	0	0	0	0	**0**	0	5	0	0	**5**	0	0	0	0	**0**	8
% Articulated Trucks	0.5%	0%	0%	0%	**0.4%**	0%	0%	0%	0%	**0%**	0%	0.9%	0%	0%	**0.6%**	0%	0%	0%	0%	**-**	0.4%
Buses and Single-Unit Trucks	7	2	0	0	**9**	0	0	2	0	**2**	0	4	2	0	**6**	0	0	0	0	**0**	17
% Buses and Single-Unit Trucks	1.1%	1.1%	0%	0%	**1.1%**	0%	0%	0.7%	0%	**0.7%**	0%	0.8%	0.8%	0%	**0.8%**	0%	0%	0%	0%	**-**	0.9%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and I470 WB Ramp - TMC
Tue Jan 18, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915256, Location: 38.945249, -94.378173

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Douglas Street and I470 WB Ramp - TMC

Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915256, Location: 38.945249, -94.378173

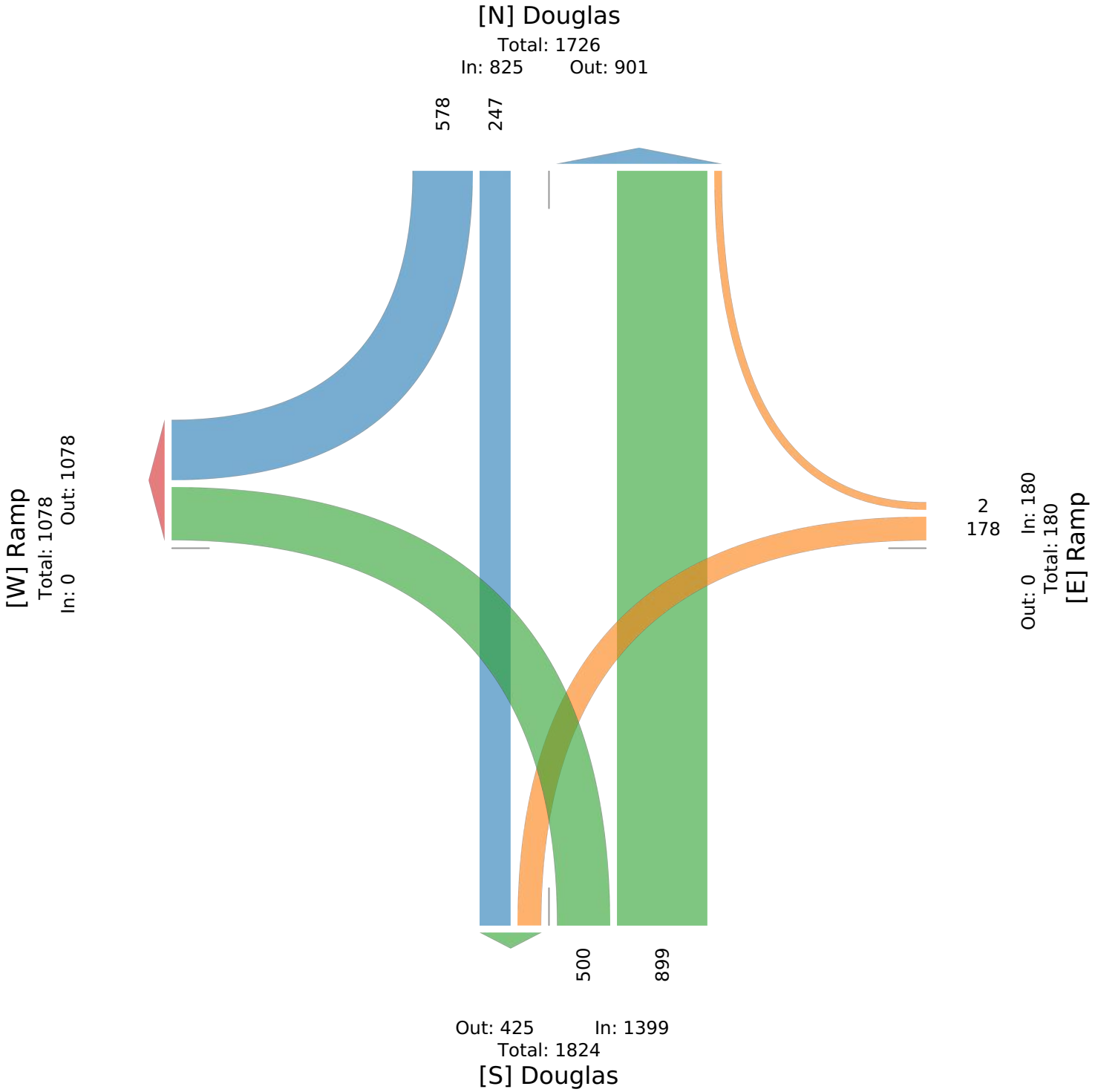
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas					Ramp					Douglas					Ramp					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2022-01-18 4:30PM	158	62	0	0	**220**	0	0	43	0	**43**	0	227	146	0	**373**	0	0	0	0	**0**	**636**
4:45PM	115	55	0	0	**170**	0	0	48	0	**48**	0	219	113	0	**332**	0	0	0	0	**0**	**550**
5:00PM	156	65	0	0	**221**	2	0	45	0	**47**	0	230	131	0	**361**	0	0	0	0	**0**	**629**
5:15PM	149	65	0	0	**214**	0	0	42	0	**42**	0	223	110	0	**333**	0	0	0	0	**0**	**589**
Total	578	247	0	0	**825**	2	0	178	0	**180**	0	899	500	0	**1399**	0	0	0	0	**0**	**2404**
% Approach	70.1%	29.9%	0%	0%	**-**	1.1%	0%	98.9%	0%	**-**	0%	64.3%	35.7%	0%	**-**	0%	0%	0%	0%	**-**	-
% Total	24.0%	10.3%	0%	0%	**34.3%**	0.1%	0%	7.4%	0%	**7.5%**	0%	37.4%	20.8%	0%	**58.2%**	0%	0%	0%	0%	**0%**	-
PHF	0.915	0.950	-	-	**0.933**	0.250	-	0.927	-	**0.938**	-	0.977	0.856	-	**0.938**	-	-	-	-	**-**	0.945
Lights	570	246	0	0	**816**	2	0	176	0	**178**	0	894	492	0	**1386**	0	0	0	0	**0**	2380
% Lights	98.6%	99.6%	0%	0%	**98.9%**	100%	0%	98.9%	0%	**98.9%**	0%	99.4%	98.4%	0%	**99.1%**	0%	0%	0%	0%	**-**	99.0%
Articulated Trucks	0	1	0	0	**1**	0	0	1	0	**1**	0	1	0	0	**1**	0	0	0	0	**0**	3
% Articulated Trucks	0%	0.4%	0%	0%	**0.1%**	0%	0%	0.6%	0%	**0.6%**	0%	0.1%	0%	0%	**0.1%**	0%	0%	0%	0%	**-**	0.1%
Buses and Single-Unit Trucks	8	0	0	0	**8**	0	0	1	0	**1**	0	4	8	0	**12**	0	0	0	0	**0**	21
% Buses and Single-Unit Trucks	1.4%	0%	0%	0%	**1.0%**	0%	0%	0.6%	0%	**0.6%**	0%	0.4%	1.6%	0%	**0.9%**	0%	0%	0%	0%	**-**	0.9%

*L: Left, R: Right, T: Thru, U: U-Turn

Douglas Street and I470 WB Ramp - TMC
Tue Jan 18, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 915256, Location: 38.945249, -94.378173

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & St. Michael's High School ... - TMC

Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610110, Location: 38.965192, -94.38805

GEWALT HAMILTON ASSOCIATES, INC.

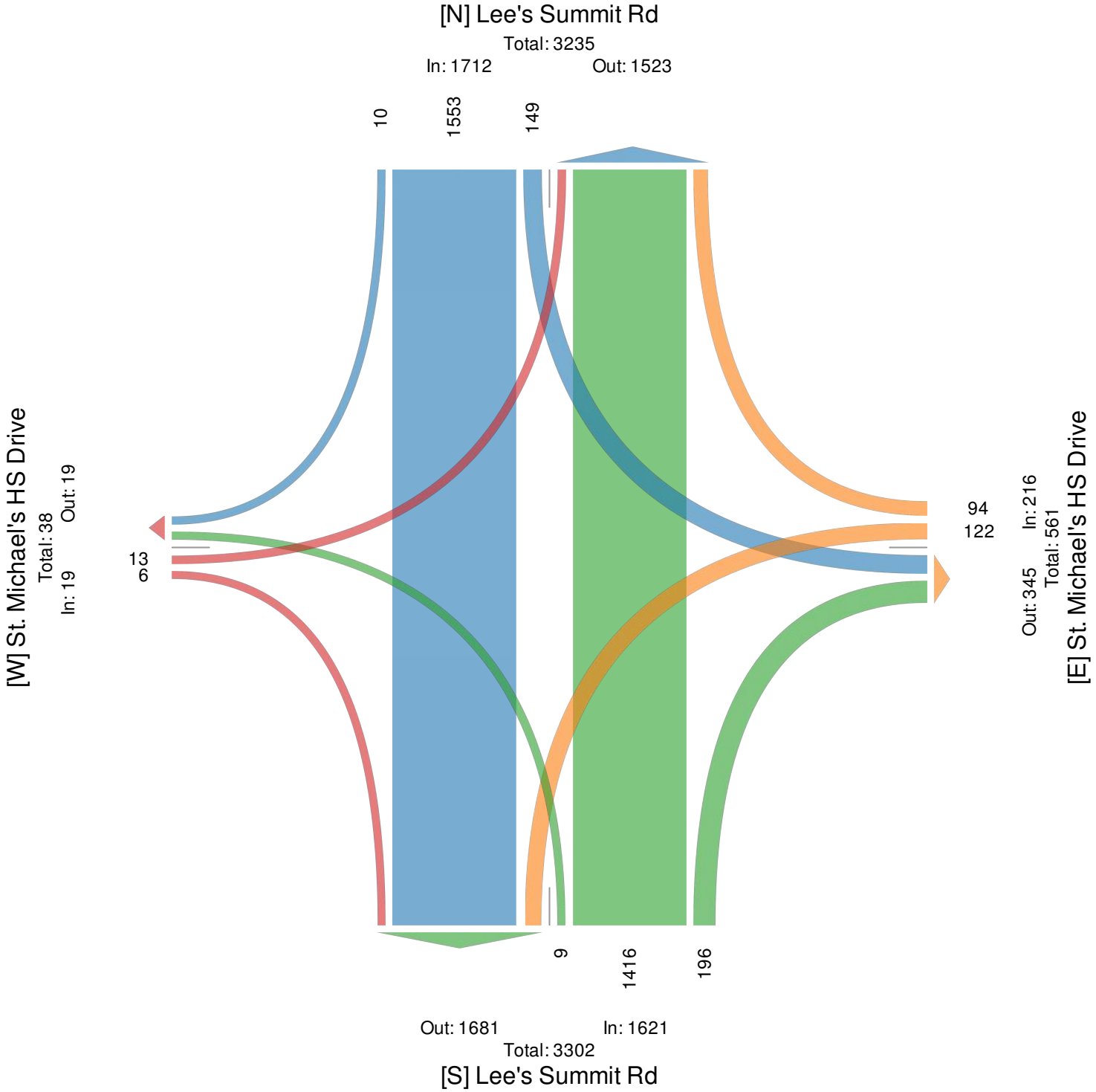
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	St. Michael's HS Drive Eastbound					St. Michael's HS Drive Westbound					Lee's Summit Rd Northbound					Lee's Summit Rd Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-01-08 7:00AM	1	0	1	0	**2**	5	0	1	0	**6**	0	42	11	0	**53**	7	125	0	0	**132**	**193**
7:15AM	3	0	0	0	**3**	6	0	3	0	**9**	1	67	14	0	**82**	9	114	0	0	**123**	**217**
7:30AM	0	0	0	0	**0**	9	0	8	0	**17**	0	80	14	0	**94**	17	107	0	0	**124**	**235**
7:45AM	1	0	0	0	**1**	20	0	15	0	**35**	0	79	32	0	**111**	23	97	0	0	**120**	**267**
Hourly Total	5	0	1	0	**6**	40	0	27	0	**67**	1	268	71	0	**340**	56	443	0	0	**499**	**912**
8:00AM	1	0	0	0	**1**	18	0	9	0	**27**	0	69	35	0	**104**	19	75	0	0	**94**	**226**
8:15AM	0	0	2	0	**2**	19	0	18	0	**37**	0	45	40	0	**85**	34	75	0	0	**109**	**233**
8:30AM	0	0	1	0	**1**	0	0	9	0	**9**	1	59	7	0	**67**	1	93	0	0	**94**	**171**
8:45AM	1	0	0	0	**1**	0	0	1	0	**1**	1	49	1	0	**51**	1	85	0	0	**86**	**139**
Hourly Total	2	0	3	0	**5**	37	0	37	0	**74**	2	222	83	0	**307**	55	328	0	0	**383**	**769**
4:00PM	0	0	0	0	**0**	15	0	11	0	**26**	2	126	12	0	**140**	1	100	3	0	**104**	**270**
4:15PM	2	0	0	0	**2**	3	0	1	0	**4**	1	98	2	0	**101**	6	97	1	0	**104**	**211**
4:30PM	1	0	0	0	**1**	4	0	5	0	**9**	1	115	3	0	**119**	2	117	2	0	**121**	**250**
4:45PM	0	0	1	0	**1**	1	0	3	0	**4**	0	102	2	0	**104**	8	103	0	0	**111**	**220**
Hourly Total	3	0	1	0	**4**	23	0	20	0	**43**	4	441	19	0	**464**	17	417	6	0	**440**	**951**
5:00PM	0	0	0	0	**0**	16	0	6	0	**22**	0	149	4	0	**153**	4	95	2	0	**101**	**276**
5:15PM	1	0	0	0	**1**	4	0	3	0	**7**	1	132	3	0	**136**	6	104	1	0	**111**	**255**
5:30PM	2	0	0	0	**2**	2	0	1	0	**3**	1	115	3	0	**119**	6	92	1	0	**99**	**223**
5:45PM	0	0	1	0	**1**	0	0	0	0	**0**	0	89	13	0	**102**	5	74	0	0	**79**	**182**
Hourly Total	3	0	1	0	**4**	22	0	10	0	**32**	2	485	23	0	**510**	21	365	4	0	**390**	**936**
Total	13	0	6	0	**19**	122	0	94	0	**216**	9	1416	196	0	**1621**	149	1553	10	0	**1712**	**3568**
% Approach	68.4%	0%	31.6%	0%	-	56.5%	0%	43.5%	0%	-	0.6%	87.4%	12.1%	0%	-	8.7%	90.7%	0.6%	0%	-	-
% Total	0.4%	0%	0.2%	0%	**0.5%**	3.4%	0%	2.6%	0%	**6.1%**	0.3%	39.7%	5.5%	0%	**45.4%**	4.2%	43.5%	0.3%	0%	**48.0%**	-
Lights	13	0	6	0	**19**	122	0	93	0	**215**	9	1391	195	0	**1595**	148	1522	10	0	**1680**	3509
% Lights	100%	0%	100%	0%	**100%**	100%	0%	98.9%	0%	**99.5%**	100%	98.2%	99.5%	0%	**98.4%**	99.3%	98.0%	100%	0%	**98.1%**	98.3%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	1
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0.1%	0%	0%	**0.1%**	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	1	0	**1**	0	25	1	0	**26**	1	30	0	0	**31**	58
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	1.1%	0%	**0.5%**	0%	1.8%	0.5%	0%	**1.6%**	0.7%	1.9%	0%	0%	**1.8%**	1.6%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & St. Michael's High School ... - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610110, Location: 38.965192, -94.38805

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & St. Michael's High School ... - TMC
Tue Jan 8, 2019
AM Peak (7:30AM - 8:30AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610110, Location: 38.965192, -94.38805

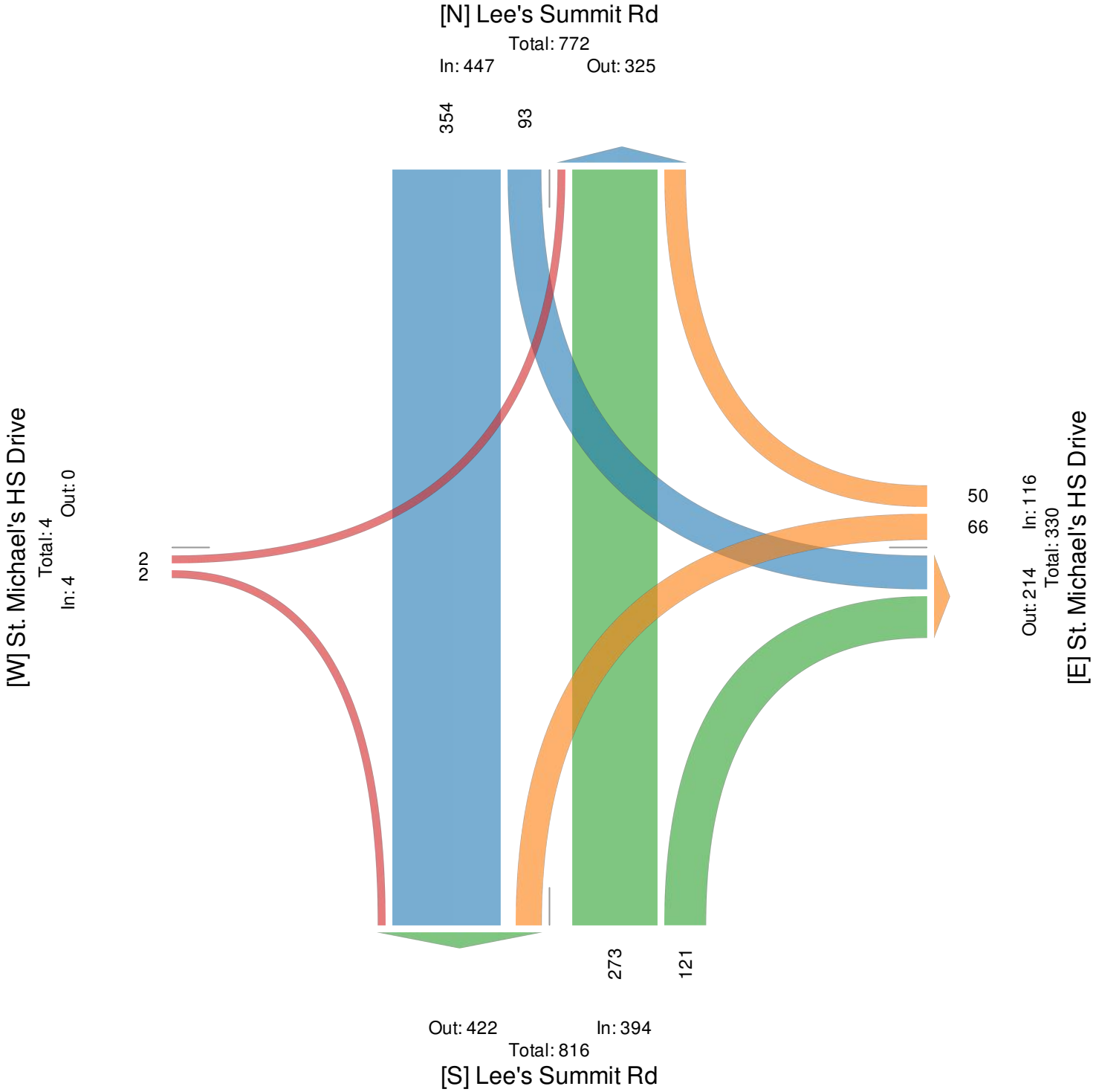
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	St. Michael's HS Drive					St. Michael's HS Drive					Lee's Summit Rd					Lee's Summit Rd					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-01-08 7:30AM	0	0	0	0	**0**	9	0	8	0	**17**	0	80	14	0	**94**	17	107	0	0	**124**	**235**
7:45AM	1	0	0	0	**1**	20	0	15	0	**35**	0	79	32	0	**111**	23	97	0	0	**120**	**267**
8:00AM	1	0	0	0	**1**	18	0	9	0	**27**	0	69	35	0	**104**	19	75	0	0	**94**	**226**
8:15AM	0	0	2	0	**2**	19	0	18	0	**37**	0	45	40	0	**85**	34	75	0	0	**109**	**233**
Total	2	0	2	0	**4**	66	0	50	0	**116**	0	273	121	0	**394**	93	354	0	0	**447**	**961**
% Approach	50.0%	0%	50.0%	0%	-	56.9%	0%	43.1%	0%	-	0%	69.3%	30.7%	0%	-	20.8%	79.2%	0%	0%	-	-
% Total	0.2%	0%	0.2%	0%	**0.4%**	6.9%	0%	5.2%	0%	**12.1%**	0%	28.4%	12.6%	0%	**41.0%**	9.7%	36.8%	0%	0%	**46.5%**	-
PHF	0.500	-	0.250	-	**0.500**	0.825	-	0.694	-	**0.784**	-	0.853	0.756	-	**0.887**	0.684	0.827	-	-	**0.901**	0.900
Lights	2	0	2	0	**4**	66	0	50	0	**116**	0	264	120	0	**384**	93	351	0	0	**444**	948
% Lights	100%	0%	100%	0%	**100%**	100%	0%	100%	0%	**100%**	0%	96.7%	99.2%	0%	**97.5%**	100%	99.2%	0%	0%	**99.3%**	98.6%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	9	1	0	**10**	0	3	0	0	**3**	13
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	3.3%	0.8%	0%	**2.5%**	0%	0.8%	0%	0%	**0.7%**	1.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & St. Michael's High School ... - TMC
Tue Jan 8, 2019
AM Peak (7:30AM - 8:30AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610110, Location: 38.965192, -94.38805

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & St. Michael's High School ... - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610110, Location: 38.965192, -94.38805

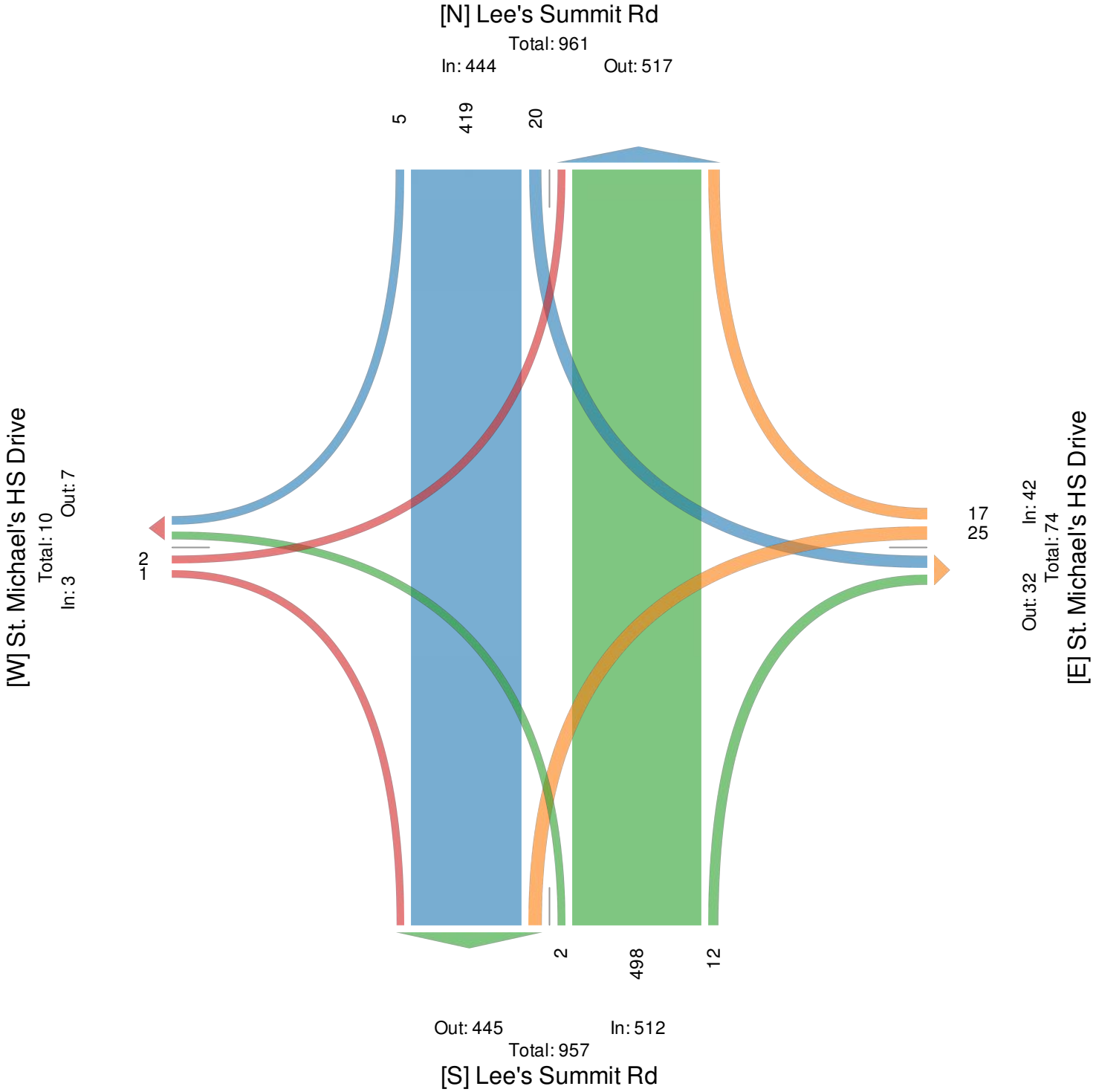
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	St. Michael's HS Drive Eastbound					St. Michael's HS Drive Westbound					Lee's Summit Rd Northbound					Lee's Summit Rd Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2019-01-08 4:30PM	1	0	0	0	**1**	4	0	5	0	**9**	1	115	3	0	**119**	2	117	2	0	**121**	**250**
4:45PM	0	0	1	0	**1**	1	0	3	0	**4**	0	102	2	0	**104**	8	103	0	0	**111**	**220**
5:00PM	0	0	0	0	**0**	16	0	6	0	**22**	0	149	4	0	**153**	4	95	2	0	**101**	**276**
5:15PM	1	0	0	0	**1**	4	0	3	0	**7**	1	132	3	0	**136**	6	104	1	0	**111**	**255**
Total	2	0	1	0	**3**	25	0	17	0	**42**	2	498	12	0	**512**	20	419	5	0	**444**	**1001**
% Approach	66.7%	0%	33.3%	0%	-	59.5%	0%	40.5%	0%	-	0.4%	97.3%	2.3%	0%	-	4.5%	94.4%	1.1%	0%	-	-
% Total	0.2%	0%	0.1%	0%	**0.3%**	2.5%	0%	1.7%	0%	**4.2%**	0.2%	49.8%	1.2%	0%	**51.1%**	2.0%	41.9%	0.5%	0%	**44.4%**	-
PHF	0.500	-	0.250	-	**0.750**	0.391	-	0.708	-	**0.477**	0.500	0.836	0.750	-	**0.837**	0.625	0.895	0.625	-	**0.917**	0.907
Lights	2	0	1	0	**3**	25	0	17	0	**42**	2	492	12	0	**506**	19	411	5	0	**435**	986
% Lights	100%	0%	100%	0%	**100%**	100%	0%	100%	0%	**100%**	100%	98.8%	100%	0%	**98.8%**	95.0%	98.1%	100%	0%	**98.0%**	98.5%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	6	0	0	**6**	1	8	0	0	**9**	15
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	1.2%	0%	0%	**1.2%**	5.0%	1.9%	0%	0%	**2.0%**	1.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & St. Michael's High School ... - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610110, Location: 38.965192, -94.38805

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NE Douglas St - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610113, Location: 38.95322, -94.379289

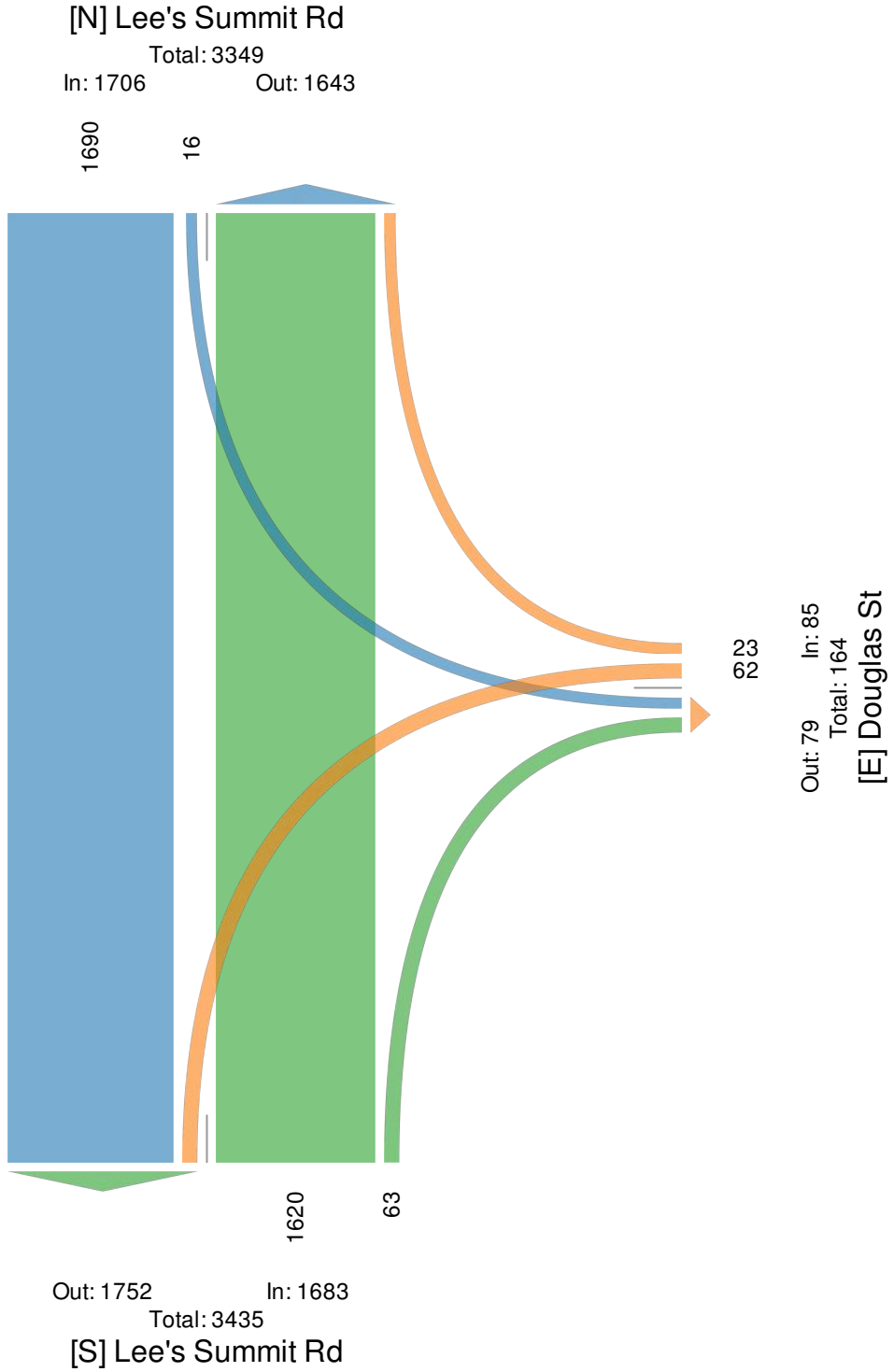
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Douglas St Westbound				Lee's Summit Rd Northbound				Lee's Summit Rd Southbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2019-01-08 7:00AM	2	0	0	**2**	53	3	0	**56**	0	128	0	**128**	**186**
7:15AM	1	0	0	**1**	76	3	0	**79**	1	128	0	**129**	**209**
7:30AM	1	2	0	**3**	101	4	0	**105**	1	110	0	**111**	**219**
7:45AM	2	0	0	**2**	105	5	0	**110**	4	117	0	**121**	**233**
Hourly Total	6	2	0	**8**	335	15	0	**350**	6	483	0	**489**	**847**
8:00AM	1	1	0	**2**	104	2	0	**106**	3	96	0	**99**	**207**
8:15AM	4	1	0	**5**	81	8	0	**89**	1	97	0	**98**	**192**
8:30AM	5	0	0	**5**	67	13	0	**80**	2	89	0	**91**	**176**
8:45AM	6	0	0	**6**	47	5	0	**52**	1	90	0	**91**	**149**
Hourly Total	16	2	0	**18**	299	28	0	**327**	7	372	0	**379**	**724**
4:00PM	6	2	0	**8**	148	4	0	**152**	1	109	0	**110**	**270**
4:15PM	10	4	0	**14**	102	2	0	**104**	0	105	0	**105**	**223**
4:30PM	6	1	0	**7**	124	2	0	**126**	0	120	0	**120**	**253**
4:45PM	6	3	0	**9**	110	2	0	**112**	0	107	0	**107**	**228**
Hourly Total	28	10	0	**38**	484	10	0	**494**	1	441	0	**442**	**974**
5:00PM	4	3	0	**7**	157	5	0	**162**	1	107	0	**108**	**277**
5:15PM	2	3	0	**5**	129	3	0	**132**	1	114	0	**115**	**252**
5:30PM	3	1	0	**4**	115	0	0	**115**	0	99	0	**99**	**218**
5:45PM	3	2	0	**5**	101	2	0	**103**	0	74	0	**74**	**182**
Hourly Total	12	9	0	**21**	502	10	0	**512**	2	394	0	**396**	**929**
Total	62	23	0	**85**	1620	63	0	**1683**	16	1690	0	**1706**	**3474**
% Approach	72.9%	27.1%	0%	-	96.3%	3.7%	0%	-	0.9%	99.1%	0%	-	-
% Total	1.8%	0.7%	0%	**2.4%**	46.6%	1.8%	0%	**48.4%**	0.5%	48.6%	0%	**49.1%**	-
Lights	60	22	0	**82**	1595	60	0	**1655**	16	1658	0	**1674**	3411
% Lights	96.8%	95.7%	0%	**96.5%**	98.5%	95.2%	0%	**98.3%**	100%	98.1%	0%	**98.1%**	98.2%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	1
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0.1%	0%	**0.1%**	0%
Buses and Single-Unit Trucks	2	1	0	**3**	25	3	0	**28**	0	31	0	**31**	62
% Buses and Single-Unit Trucks	3.2%	4.3%	0%	**3.5%**	1.5%	4.8%	0%	**1.7%**	0%	1.8%	0%	**1.8%**	1.8%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NE Douglas St - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610113, Location: 38.95322, -94.379289

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NE Douglas St - TMC
Tue Jan 8, 2019
AM Peak (7:15AM - 8:15AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610113, Location: 38.95322, -94.379289

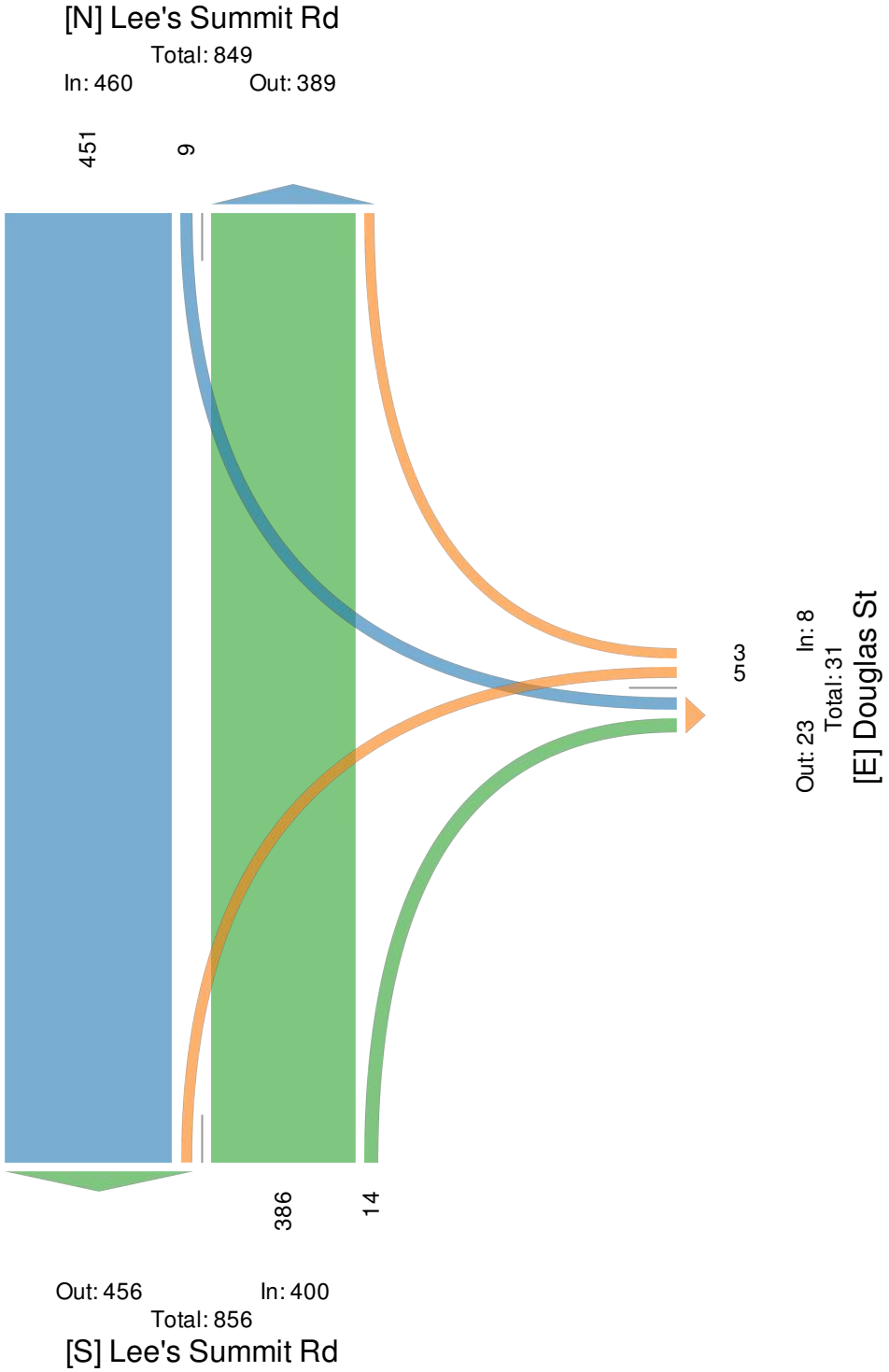
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Douglas St Westbound				Lee's Summit Rd Northbound				Lee's Summit Rd Southbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2019-01-08 7:15AM	1	0	0	**1**	76	3	0	**79**	1	128	0	**129**	**209**
7:30AM	1	2	0	**3**	101	4	0	**105**	1	110	0	**111**	**219**
7:45AM	2	0	0	**2**	105	5	0	**110**	4	117	0	**121**	**233**
8:00AM	1	1	0	**2**	104	2	0	**106**	3	96	0	**99**	**207**
Total	5	3	0	**8**	386	14	0	**400**	9	451	0	**460**	**868**
% Approach	62.5%	37.5%	0%	-	96.5%	3.5%	0%	-	2.0%	98.0%	0%	-	-
% Total	0.6%	0.3%	0%	**0.9%**	44.5%	1.6%	0%	**46.1%**	1.0%	52.0%	0%	**53.0%**	-
PHF	0.625	0.375	-	**0.667**	0.919	0.700	-	**0.909**	0.563	0.881	-	**0.891**	0.931
Lights	4	3	0	**7**	377	12	0	**389**	9	447	0	**456**	852
% Lights	80.0%	100%	0%	**87.5%**	97.7%	85.7%	0%	**97.3%**	100%	99.1%	0%	**99.1%**	98.2%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	1	0	0	**1**	9	2	0	**11**	0	4	0	**4**	16
% Buses and Single-Unit Trucks	20.0%	0%	0%	**12.5%**	2.3%	14.3%	0%	**2.8%**	0%	0.9%	0%	**0.9%**	1.8%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NE Douglas St - TMC
Tue Jan 8, 2019
AM Peak (7:15AM - 8:15AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610113, Location: 38.95322, -94.379289

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NE Douglas St - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610113, Location: 38.95322, -94.379289

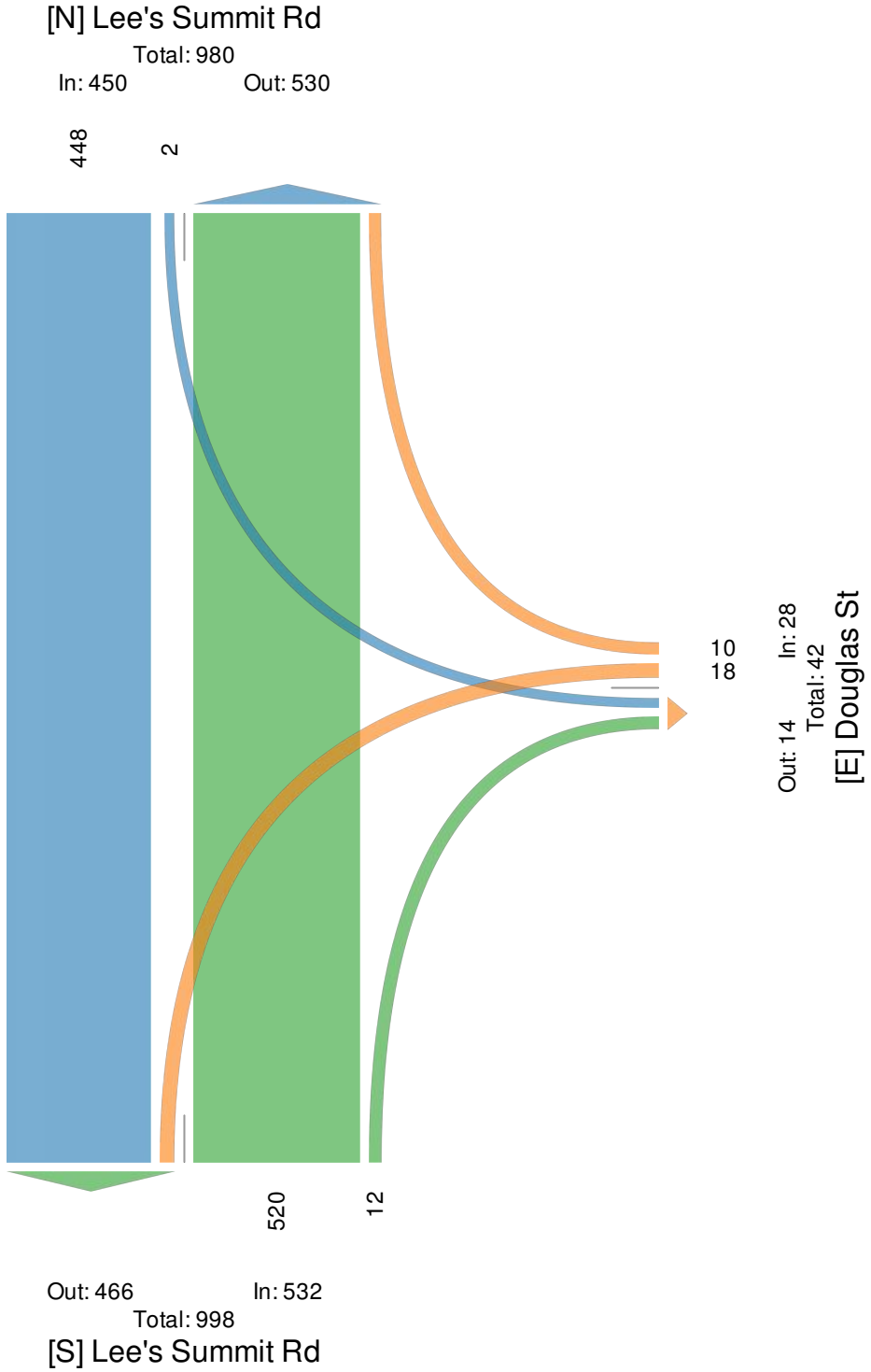
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Douglas St Westbound				Lee's Summit Rd Northbound				Lee's Summit Rd Southbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2019-01-08 4:30PM	6	1	0	**7**	124	2	0	**126**	0	120	0	**120**	**253**
4:45PM	6	3	0	**9**	110	2	0	**112**	0	107	0	**107**	**228**
5:00PM	4	3	0	**7**	157	5	0	**162**	1	107	0	**108**	**277**
5:15PM	2	3	0	**5**	129	3	0	**132**	1	114	0	**115**	**252**
Total	18	10	0	**28**	520	12	0	**532**	2	448	0	**450**	**1010**
% Approach	64.3%	35.7%	0%	-	97.7%	2.3%	0%	-	0.4%	99.6%	0%	-	-
% Total	1.8%	1.0%	0%	**2.8%**	51.5%	1.2%	0%	**52.7%**	0.2%	44.4%	0%	**44.6%**	-
PHF	0.750	0.833	-	**0.778**	0.828	0.600	-	**0.821**	0.500	0.933	-	**0.938**	0.912
Lights	18	10	0	**28**	514	12	0	**526**	2	440	0	**442**	996
% Lights	100%	100%	0%	**100%**	98.8%	100%	0%	**98.9%**	100%	98.2%	0%	**98.2%**	98.6%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	**0**	6	0	0	**6**	0	8	0	**8**	14
% Buses and Single-Unit Trucks	0%	0%	0%	**0%**	1.2%	0%	0%	**1.1%**	0%	1.8%	0%	**1.8%**	1.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NE Douglas St - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610113, Location: 38.95322, -94.379289

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NE Strother Rd - TMC

Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610108, Location: 38.970885, -94.388868

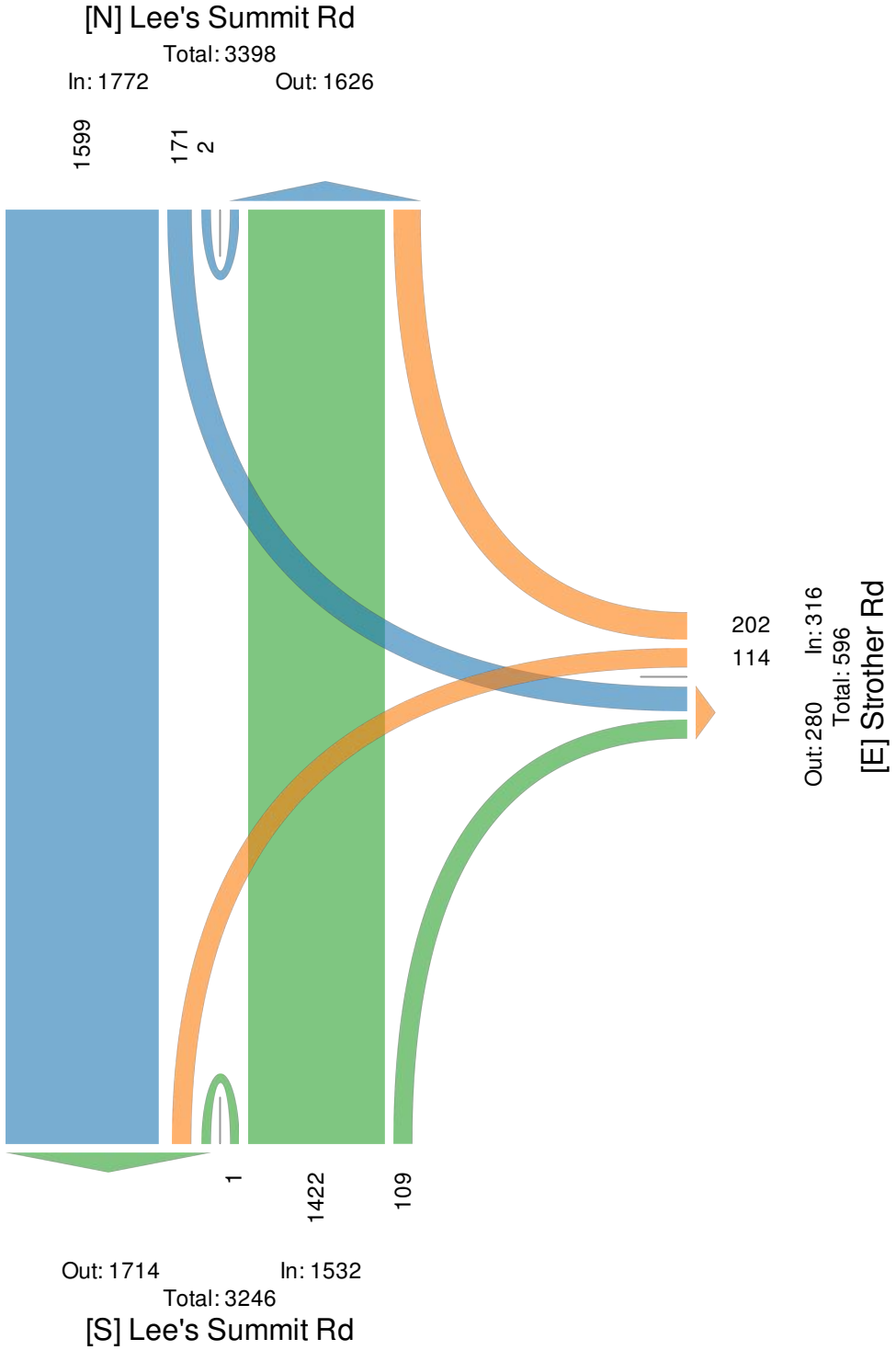
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Strother Rd Westbound				Lee's Summit Rd Northbound				Lee's Summit Rd Southbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2019-01-08 7:00AM	7	14	0	**21**	42	1	0	**43**	6	122	0	**128**	**192**
7:15AM	8	10	0	**18**	70	3	0	**73**	6	114	0	**120**	**211**
7:30AM	11	13	0	**24**	77	10	0	**87**	8	117	0	**125**	**236**
7:45AM	10	19	0	**29**	89	9	0	**98**	12	107	0	**119**	**246**
Hourly Total	36	56	0	**92**	278	23	0	**301**	32	460	0	**492**	**885**
8:00AM	9	7	0	**16**	70	10	0	**80**	10	88	0	**98**	**194**
8:15AM	15	10	0	**25**	55	6	0	**61**	0	90	0	**90**	**176**
8:30AM	5	5	0	**10**	60	6	0	**66**	3	87	1	**91**	**167**
8:45AM	1	5	0	**6**	49	3	0	**52**	4	90	0	**94**	**152**
Hourly Total	30	27	0	**57**	234	25	0	**259**	17	355	1	**373**	**689**
4:00PM	12	20	0	**32**	129	11	0	**140**	13	89	1	**103**	**275**
4:15PM	9	19	0	**28**	97	4	0	**101**	16	96	0	**112**	**241**
4:30PM	5	15	0	**20**	109	6	0	**115**	18	117	0	**135**	**270**
4:45PM	7	14	0	**21**	98	9	0	**107**	16	103	0	**119**	**247**
Hourly Total	33	68	0	**101**	433	30	0	**463**	63	405	1	**469**	**1033**
5:00PM	0	12	0	**12**	149	9	0	**158**	16	102	0	**118**	**288**
5:15PM	7	15	0	**22**	136	6	1	**143**	15	104	0	**119**	**284**
5:30PM	3	17	0	**20**	105	12	0	**117**	17	94	0	**111**	**248**
5:45PM	5	7	0	**12**	87	4	0	**91**	11	79	0	**90**	**193**
Hourly Total	15	51	0	**66**	477	31	1	**509**	59	379	0	**438**	**1013**
Total	114	202	0	**316**	1422	109	1	**1532**	171	1599	2	**1772**	**3620**
% Approach	36.1%	63.9%	0%	-	92.8%	7.1%	0.1%	-	9.7%	90.2%	0.1%	-	-
% Total	3.1%	5.6%	0%	**8.7%**	39.3%	3.0%	0%	**42.3%**	4.7%	44.2%	0.1%	**49.0%**	-
Lights	114	200	0	**314**	1399	107	0	**1506**	171	1567	2	**1740**	3560
% Lights	100%	99.0%	0%	**99.4%**	98.4%	98.2%	0%	**98.3%**	100%	98.0%	100%	**98.2%**	98.3%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	1
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0.1%	0%	**0.1%**	0%
Buses and Single-Unit Trucks	0	2	0	**2**	23	2	1	**26**	0	31	0	**31**	59
% Buses and Single-Unit Trucks	0%	1.0%	0%	**0.6%**	1.6%	1.8%	100%	**1.7%**	0%	1.9%	0%	**1.7%**	1.6%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NE Strother Rd - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610108, Location: 38.970885, -94.388868

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NE Strother Rd - TMC
Tue Jan 8, 2019
AM Peak (7:15AM - 8:15AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610108, Location: 38.970885, -94.388868

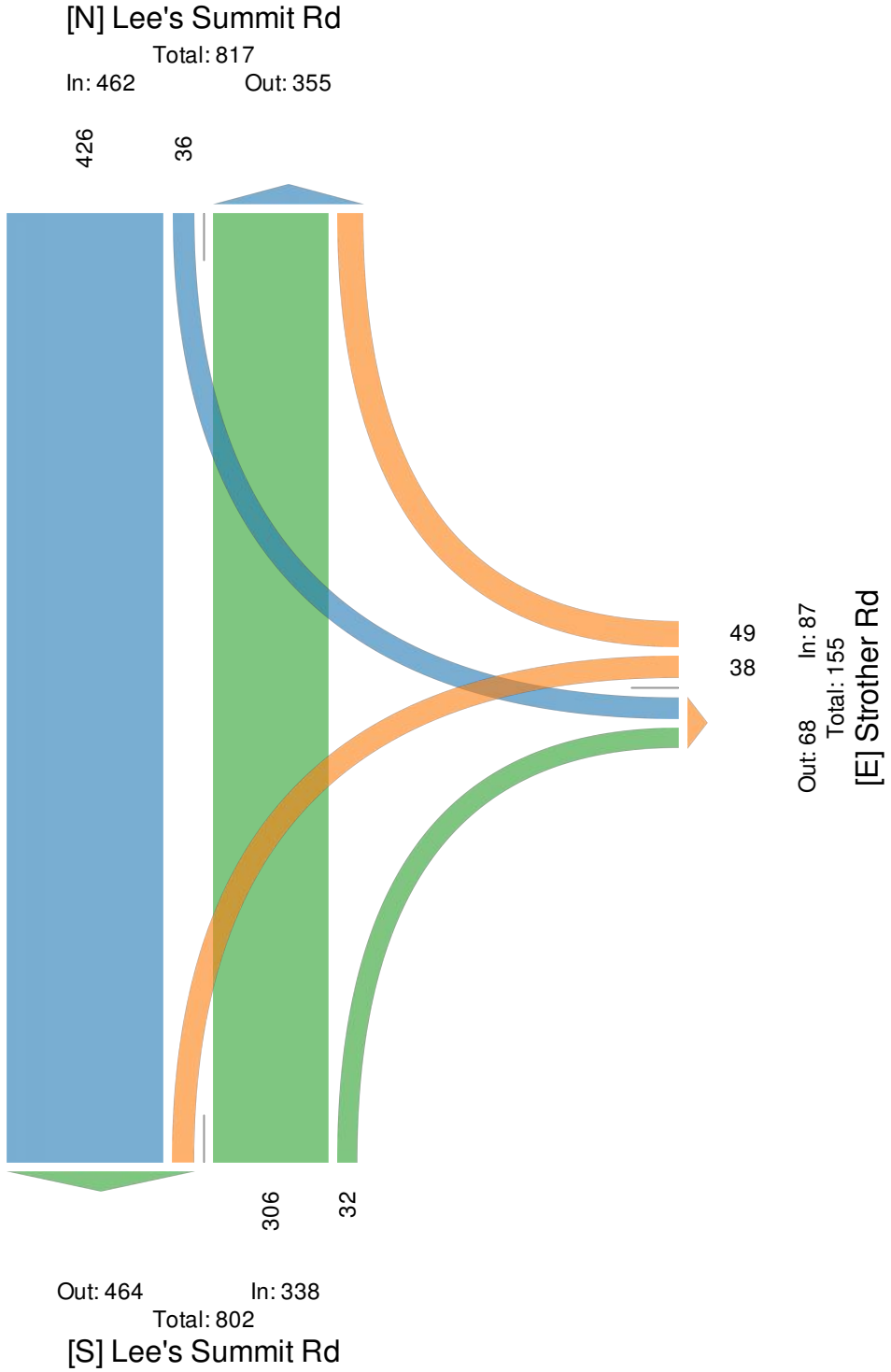
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Strother Rd Westbound				Lee's Summit Rd Northbound				Lee's Summit Rd Southbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2019-01-08 7:15AM	8	10	0	**18**	70	3	0	**73**	6	114	0	**120**	**211**
7:30AM	11	13	0	**24**	77	10	0	**87**	8	117	0	**125**	**236**
7:45AM	10	19	0	**29**	89	9	0	**98**	12	107	0	**119**	**246**
8:00AM	9	7	0	**16**	70	10	0	**80**	10	88	0	**98**	**194**
Total	38	49	0	**87**	306	32	0	**338**	36	426	0	**462**	**887**
% Approach	43.7%	56.3%	0%	-	90.5%	9.5%	0%	-	7.8%	92.2%	0%	-	-
% Total	4.3%	5.5%	0%	**9.8%**	34.5%	3.6%	0%	**38.1%**	4.1%	48.0%	0%	**52.1%**	-
PHF	0.864	0.645	-	**0.750**	0.860	0.800	-	**0.862**	0.750	0.910	-	**0.924**	0.901
Lights	38	48	0	**86**	298	32	0	**330**	36	422	0	**458**	874
% Lights	100%	98.0%	0%	**98.9%**	97.4%	100%	0%	**97.6%**	100%	99.1%	0%	**99.1%**	98.5%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	1
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0.2%	0%	**0.2%**	0.1%
Buses and Single-Unit Trucks	0	1	0	**1**	8	0	0	**8**	0	3	0	**3**	12
% Buses and Single-Unit Trucks	0%	2.0%	0%	**1.1%**	2.6%	0%	0%	**2.4%**	0%	0.7%	0%	**0.6%**	1.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NE Strother Rd - TMC
Tue Jan 8, 2019
AM Peak (7:15AM - 8:15AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610108, Location: 38.970885, -94.388868

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NE Strother Rd - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610108, Location: 38.970885, -94.388868

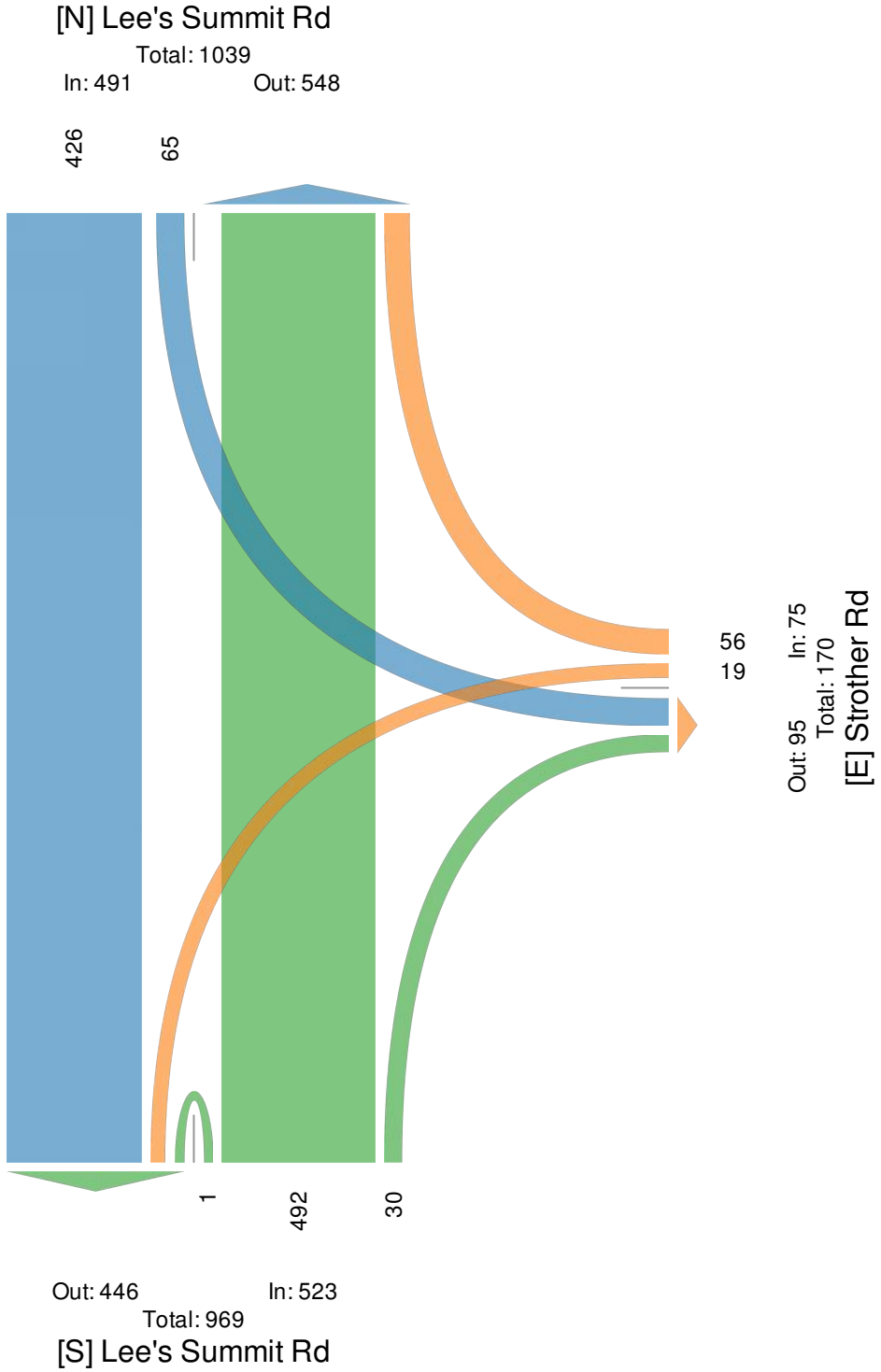
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Strother Rd Westbound				Lee's Summit Rd Northbound				Lee's Summit Rd Southbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2019-01-08 4:30PM	5	15	0	**20**	109	6	0	**115**	18	117	0	**135**	**270**
4:45PM	7	14	0	**21**	98	9	0	**107**	16	103	0	**119**	**247**
5:00PM	0	12	0	**12**	149	9	0	**158**	16	102	0	**118**	**288**
5:15PM	7	15	0	**22**	136	6	1	**143**	15	104	0	**119**	**284**
Total	19	56	0	**75**	492	30	1	**523**	65	426	0	**491**	**1089**
% Approach	25.3%	74.7%	0%	**-**	94.1%	5.7%	0.2%	**-**	13.2%	86.8%	0%	**-**	-
% Total	1.7%	5.1%	0%	**6.9%**	45.2%	2.8%	0.1%	**48.0%**	6.0%	39.1%	0%	**45.1%**	-
PHF	0.679	0.933	-	**0.852**	0.826	0.833	0.250	**0.828**	0.903	0.910	-	**0.909**	0.945
Lights	19	56	0	**75**	488	29	0	**517**	65	418	0	**483**	1075
% Lights	100%	100%	0%	**100%**	99.2%	96.7%	0%	**98.9%**	100%	98.1%	0%	**98.4%**	98.7%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	**0**	4	1	1	**6**	0	8	0	**8**	14
% Buses and Single-Unit Trucks	0%	0%	0%	**0%**	0.8%	3.3%	100%	**1.1%**	0%	1.9%	0%	**1.6%**	1.3%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NE Strother Rd - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610108, Location: 38.970885, -94.388868

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NW Gregory Blvd - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610107, Location: 38.97627, -94.390019

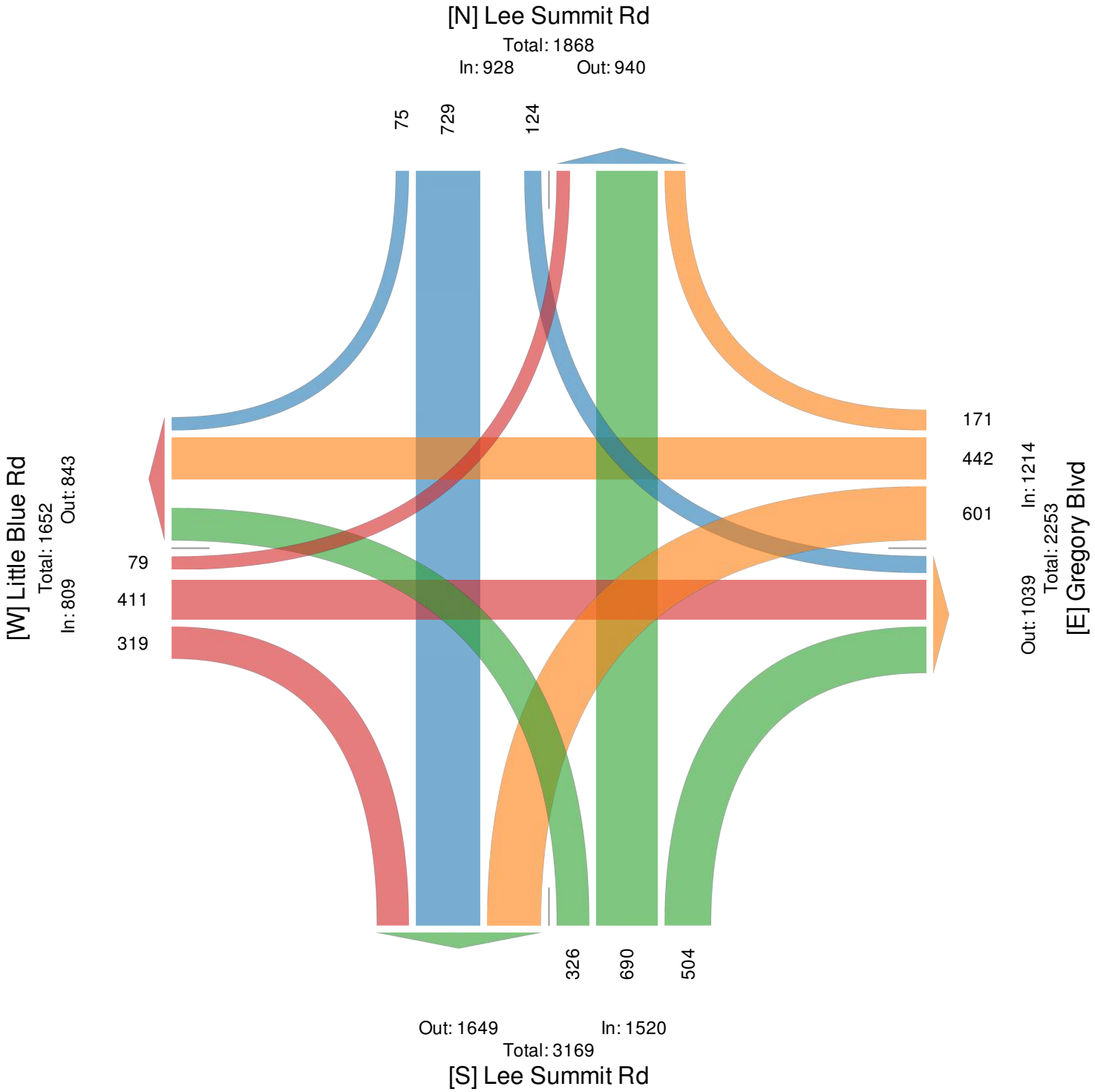
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Little Blue Rd Eastbound					Gregory Blvd Westbound					Lee Summit Rd Northbound					Lee Summit Rd Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2019-01-08 7:00AM	2	7	18	0	**27**	65	50	4	0	**119**	22	13	7	0	**42**	3	45	7	0	**55**	**243**
7:15AM	3	16	23	0	**42**	45	41	9	0	**95**	26	35	13	0	**74**	4	49	8	0	**61**	**272**
7:30AM	4	11	17	0	**32**	64	53	12	0	**129**	24	32	10	0	**66**	2	46	9	0	**57**	**284**
7:45AM	2	16	17	0	**35**	58	45	11	0	**114**	28	36	13	0	**77**	5	57	10	0	**72**	**298**
Hourly Total	11	50	75	0	**136**	232	189	36	0	**457**	100	116	43	0	**259**	14	197	34	0	**245**	**1097**
8:00AM	0	12	17	0	**29**	36	30	15	0	**81**	16	26	20	0	**62**	5	44	6	0	**55**	**227**
8:15AM	1	19	13	0	**33**	39	23	6	0	**68**	23	21	15	0	**59**	7	43	6	0	**56**	**216**
8:30AM	2	10	22	0	**34**	40	26	3	0	**69**	13	18	12	0	**43**	8	37	7	0	**52**	**198**
8:45AM	4	18	15	0	**37**	41	29	8	0	**78**	10	18	17	0	**45**	6	31	5	0	**42**	**202**
Hourly Total	7	59	67	0	**133**	156	108	32	0	**296**	62	83	64	0	**209**	26	155	24	0	**205**	**843**
4:00PM	10	43	21	0	**74**	27	18	20	0	**65**	25	80	48	0	**153**	8	42	2	0	**52**	**344**
4:15PM	6	35	19	0	**60**	27	19	13	0	**59**	16	59	45	0	**120**	15	47	1	0	**63**	**302**
4:30PM	11	42	29	0	**82**	20	18	10	0	**48**	20	58	52	0	**130**	11	51	4	0	**66**	**326**
4:45PM	5	39	23	0	**67**	25	26	17	0	**68**	19	56	41	0	**116**	11	58	4	0	**73**	**324**
Hourly Total	32	159	92	0	**283**	99	81	60	0	**240**	80	253	186	0	**519**	45	198	11	0	**254**	**1296**
5:00PM	12	35	25	0	**72**	24	14	14	0	**52**	31	68	66	0	**165**	8	53	2	0	**63**	**352**
5:15PM	9	48	27	0	**84**	35	20	13	0	**68**	22	63	64	0	**149**	9	36	1	0	**46**	**347**
5:30PM	5	35	19	0	**59**	24	16	10	0	**50**	17	61	49	0	**127**	11	48	1	0	**60**	**296**
5:45PM	3	25	14	0	**42**	31	14	6	0	**51**	14	46	32	0	**92**	11	42	2	0	**55**	**240**
Hourly Total	29	143	85	0	**257**	114	64	43	0	**221**	84	238	211	0	**533**	39	179	6	0	**224**	**1235**
Total	79	411	319	0	**809**	601	442	171	0	**1214**	326	690	504	0	**1520**	124	729	75	0	**928**	**4471**
% Approach	9.8%	50.8%	39.4%	0%	-	49.5%	36.4%	14.1%	0%	-	21.4%	45.4%	33.2%	0%	-	13.4%	78.6%	8.1%	0%	-	-
% Total	1.8%	9.2%	7.1%	0%	**18.1%**	13.4%	9.9%	3.8%	0%	**27.2%**	7.3%	15.4%	11.3%	0%	**34.0%**	2.8%	16.3%	1.7%	0%	**20.8%**	-
Lights	77	408	312	0	**797**	588	439	170	0	**1197**	318	683	494	0	**1495**	121	717	75	0	**913**	4402
% Lights	97.5%	99.3%	97.8%	0%	**98.5%**	97.8%	99.3%	99.4%	0%	**98.6%**	97.5%	99.0%	98.0%	0%	**98.4%**	97.6%	98.4%	100%	0%	**98.4%**	98.5%
Articulated Trucks	0	0	0	0	**0**	0	0	1	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	2
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0.6%	0%	**0.1%**	0%	0%	0%	0%	**0%**	0%	0.1%	0%	0%	**0.1%**	0%
Buses and Single-Unit Trucks	2	3	7	0	**12**	13	3	0	0	**16**	8	7	10	0	**25**	3	11	0	0	**14**	67
% Buses and Single-Unit Trucks	2.5%	0.7%	2.2%	0%	**1.5%**	2.2%	0.7%	0%	0%	**1.3%**	2.5%	1.0%	2.0%	0%	**1.6%**	2.4%	1.5%	0%	0%	**1.5%**	1.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NW Gregory Blvd - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610107, Location: 38.97627, -94.390019

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NW Gregory Blvd - TMC
Tue Jan 8, 2019
AM Peak (7AM - 8AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610107, Location: 38.97627, -94.390019

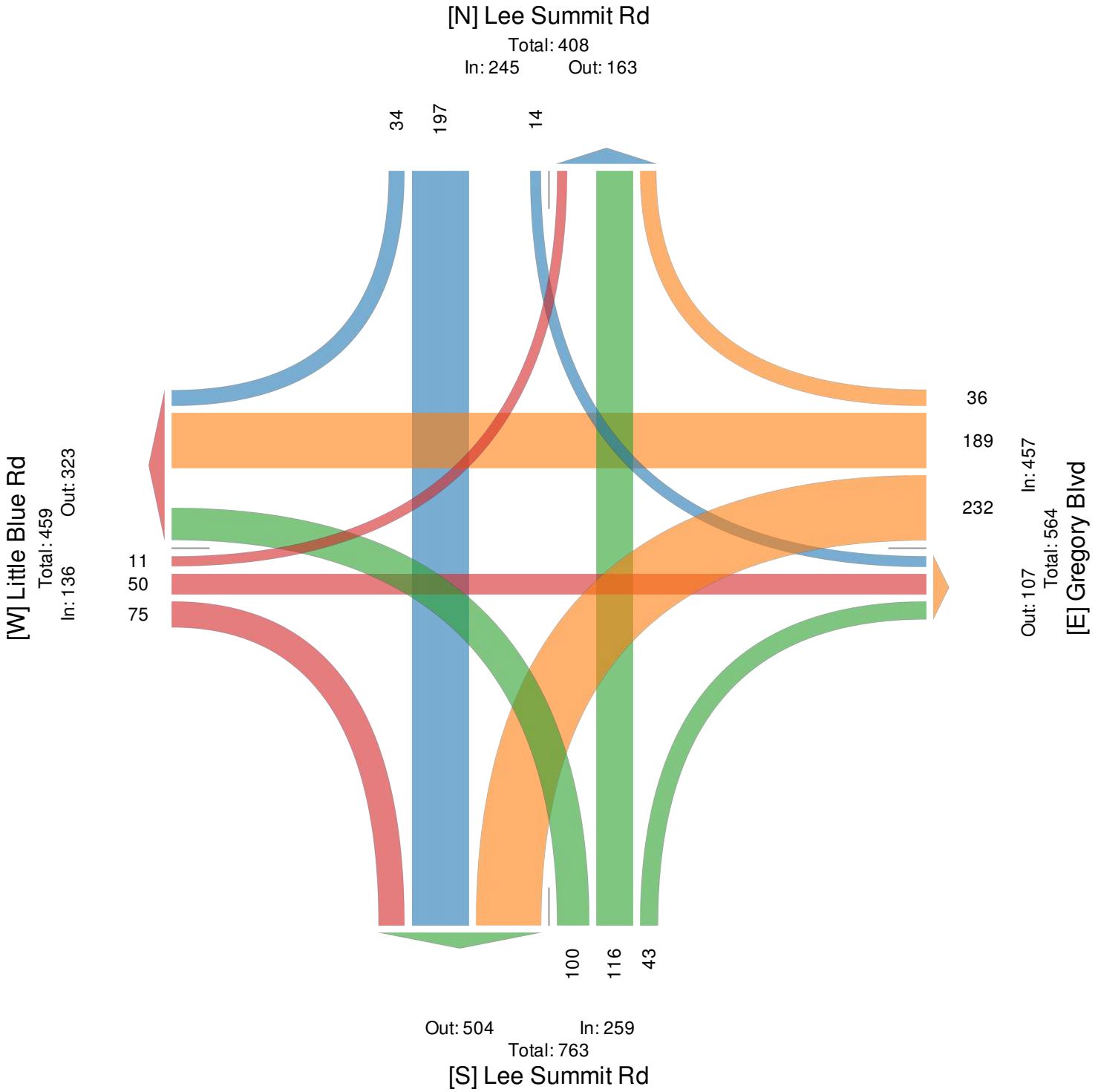
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Little Blue Rd					Gregory Blvd					Lee Summit Rd					Lee Summit Rd					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2019-01-08 7:00AM	2	7	18	0	**27**	65	50	4	0	**119**	22	13	7	0	**42**	3	45	7	0	**55**	**243**
7:15AM	3	16	23	0	**42**	45	41	9	0	**95**	26	35	13	0	**74**	4	49	8	0	**61**	**272**
7:30AM	4	11	17	0	**32**	64	53	12	0	**129**	24	32	10	0	**66**	2	46	9	0	**57**	**284**
7:45AM	2	16	17	0	**35**	58	45	11	0	**114**	28	36	13	0	**77**	5	57	10	0	**72**	**298**
Total	11	50	75	0	**136**	232	189	36	0	**457**	100	116	43	0	**259**	14	197	34	0	**245**	**1097**
% Approach	8.1%	36.8%	55.1%	0%	-	50.8%	41.4%	7.9%	0%	-	38.6%	44.8%	16.6%	0%	-	5.7%	80.4%	13.9%	0%	-	-
% Total	1.0%	4.6%	6.8%	0%	**12.4%**	21.1%	17.2%	3.3%	0%	**41.7%**	9.1%	10.6%	3.9%	0%	**23.6%**	1.3%	18.0%	3.1%	0%	**22.3%**	-
PHF	0.688	0.781	0.815	-	**0.810**	0.892	0.892	0.750	-	**0.886**	0.893	0.806	0.827	-	**0.841**	0.700	0.864	0.850	-	**0.851**	0.920
Lights	11	48	73	0	**132**	230	188	36	0	**454**	98	116	42	0	**256**	14	195	34	0	**243**	1085
% Lights	100%	96.0%	97.3%	0%	**97.1%**	99.1%	99.5%	100%	0%	**99.3%**	98.0%	100%	97.7%	0%	**98.8%**	100%	99.0%	100%	0%	**99.2%**	98.9%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	2	2	0	**4**	2	1	0	0	**3**	2	0	1	0	**3**	0	2	0	0	**2**	12
% Buses and Single-Unit Trucks	0%	4.0%	2.7%	0%	**2.9%**	0.9%	0.5%	0%	0%	**0.7%**	2.0%	0%	2.3%	0%	**1.2%**	0%	1.0%	0%	0%	**0.8%**	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NW Gregory Blvd - TMC
Tue Jan 8, 2019
AM Peak (7AM - 8AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610107, Location: 38.97627, -94.390019

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Lee's Summit Rd & NW Gregory Blvd - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610107, Location: 38.97627, -94.390019

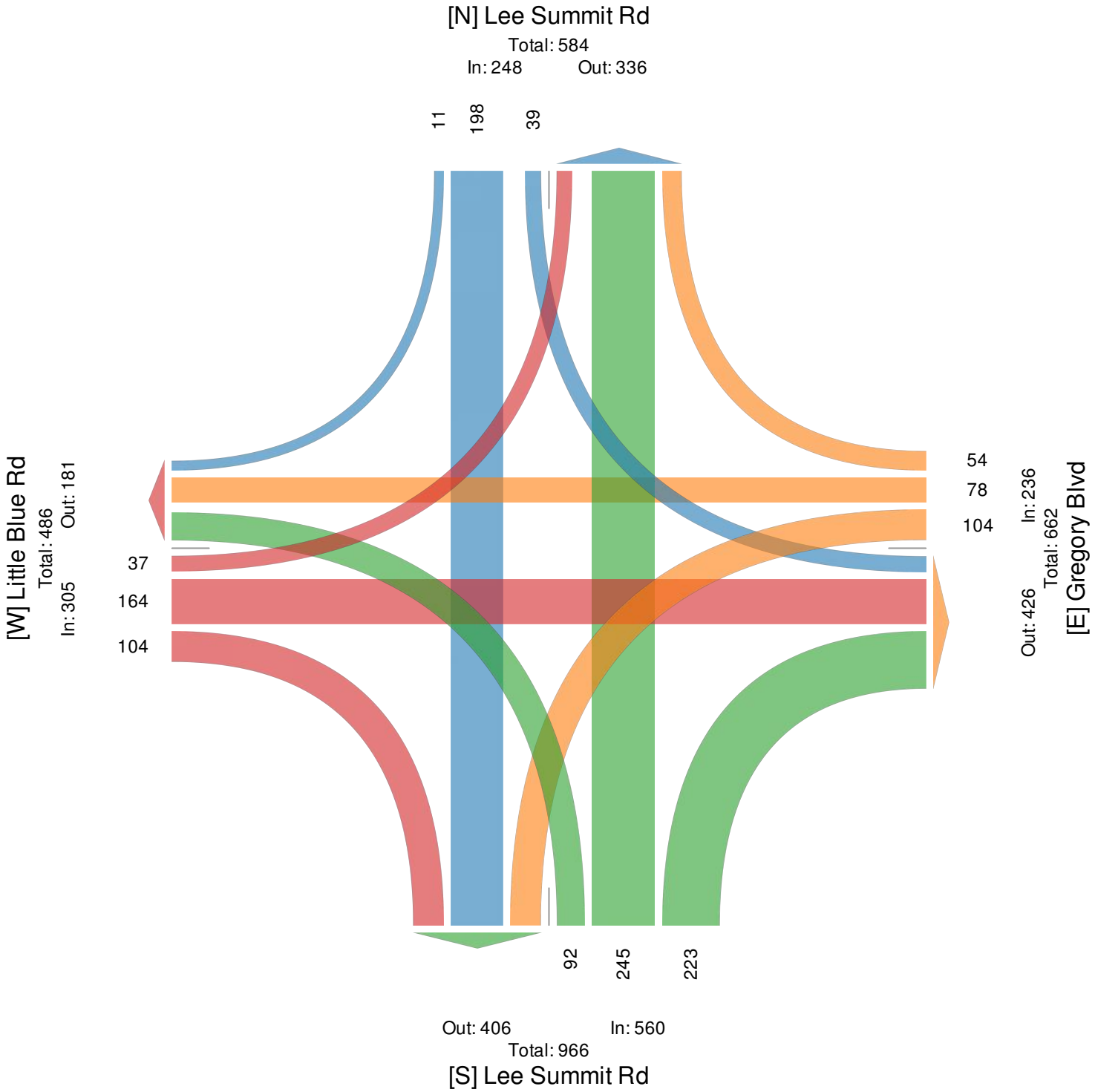
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Little Blue Rd					Gregory Blvd					Lee Summit Rd					Lee Summit Rd					
Direction	Eastbound					Westbound					Northbound					Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2019-01-08 4:30PM	11	42	29	0	**82**	20	18	10	0	**48**	20	58	52	0	**130**	11	51	4	0	**66**	**326**
4:45PM	5	39	23	0	**67**	25	26	17	0	**68**	19	56	41	0	**116**	11	58	4	0	**73**	**324**
5:00PM	12	35	25	0	**72**	24	14	14	0	**52**	31	68	66	0	**165**	8	53	2	0	**63**	**352**
5:15PM	9	48	27	0	**84**	35	20	13	0	**68**	22	63	64	0	**149**	9	36	1	0	**46**	**347**
Total	37	164	104	0	**305**	104	78	54	0	**236**	92	245	223	0	**560**	39	198	11	0	**248**	**1349**
% Approach	12.1%	53.8%	34.1%	0%	-	44.1%	33.1%	22.9%	0%	-	16.4%	43.8%	39.8%	0%	-	15.7%	79.8%	4.4%	0%	-	-
% Total	2.7%	12.2%	7.7%	0%	**22.6%**	7.7%	5.8%	4.0%	0%	**17.5%**	6.8%	18.2%	16.5%	0%	**41.5%**	2.9%	14.7%	0.8%	0%	**18.4%**	-
PHF	0.771	0.854	0.897	-	**0.908**	0.743	0.750	0.794	-	**0.868**	0.742	0.901	0.845	-	**0.848**	0.886	0.853	0.688	-	**0.849**	0.958
Lights	37	164	103	0	**304**	102	78	54	0	**234**	91	243	221	0	**555**	39	193	11	0	**243**	1336
% Lights	100%	100%	99.0%	0%	**99.7%**	98.1%	100%	100%	0%	**99.2%**	98.9%	99.2%	99.1%	0%	**99.1%**	100%	97.5%	100%	0%	**98.0%**	99.0%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	1	0	**1**	2	0	0	0	**2**	1	2	2	0	**5**	0	5	0	0	**5**	13
% Buses and Single-Unit Trucks	0%	0%	1.0%	0%	**0.3%**	1.9%	0%	0%	0%	**0.8%**	1.1%	0.8%	0.9%	0%	**0.9%**	0%	2.5%	0%	0%	**2.0%**	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Lee's Summit Rd & NW Gregory Blvd - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610107, Location: 38.97627, -94.390019

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



NW Colbern Rd & N Main St - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610115, Location: 38.94496, -94.397475

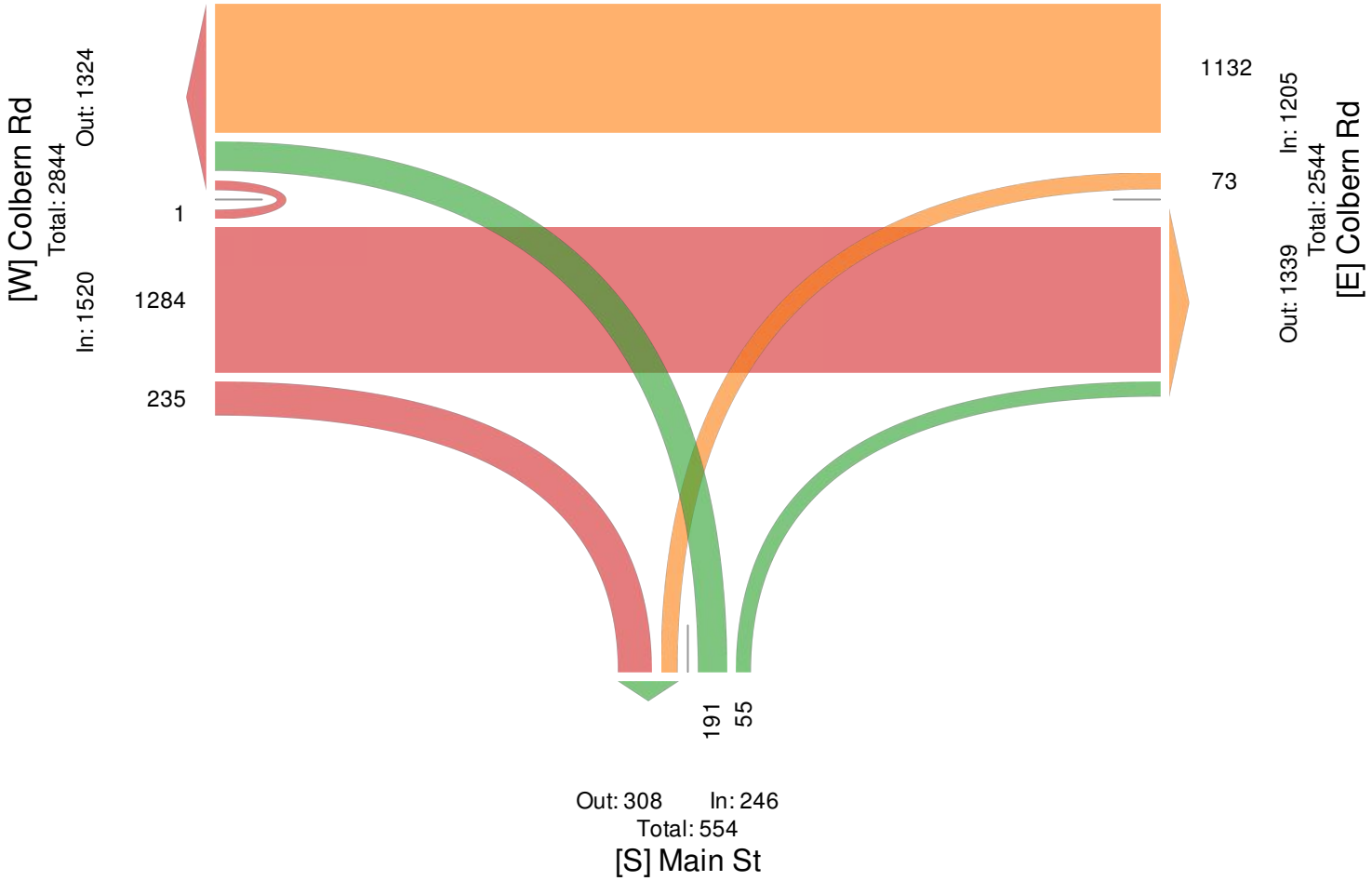
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Colbern Rd Eastbound				Colbern Rd Westbound				Main St Northbound				
Time	T	R	U	**App**	L	T	U	**App**	L	R	U	**App**	**Int**
2019-01-08 7:00AM	22	19	0	**41**	7	99	0	**106**	19	3	0	**22**	**169**
7:15AM	40	22	0	**62**	3	115	0	**118**	14	2	0	**16**	**196**
7:30AM	49	15	0	**64**	3	109	0	**112**	11	1	0	**12**	**188**
7:45AM	44	19	0	**63**	7	89	0	**96**	9	3	0	**12**	**171**
Hourly Total	155	75	0	**230**	20	412	0	**432**	53	9	0	**62**	**724**
8:00AM	44	12	0	**56**	6	81	0	**87**	4	0	0	**4**	**147**
8:15AM	40	10	0	**50**	7	84	0	**91**	9	0	0	**9**	**150**
8:30AM	32	14	0	**46**	2	76	0	**78**	10	2	0	**12**	**136**
8:45AM	50	18	0	**68**	11	61	0	**72**	7	4	0	**11**	**151**
Hourly Total	166	54	0	**220**	26	302	0	**328**	30	6	0	**36**	**584**
4:00PM	104	11	1	**116**	5	59	0	**64**	14	6	0	**20**	**200**
4:15PM	93	12	0	**105**	3	53	0	**56**	13	2	0	**15**	**176**
4:30PM	146	20	0	**166**	6	66	0	**72**	18	4	0	**22**	**260**
4:45PM	128	8	0	**136**	4	51	0	**55**	13	4	0	**17**	**208**
Hourly Total	471	51	1	**523**	18	229	0	**247**	58	16	0	**74**	**844**
5:00PM	140	16	0	**156**	1	57	0	**58**	23	11	0	**34**	**248**
5:15PM	131	10	0	**141**	2	45	0	**47**	7	4	0	**11**	**199**
5:30PM	122	17	0	**139**	3	47	0	**50**	10	4	0	**14**	**203**
5:45PM	99	12	0	**111**	3	40	0	**43**	10	5	0	**15**	**169**
Hourly Total	492	55	0	**547**	9	189	0	**198**	50	24	0	**74**	**819**
Total	1284	235	1	**1520**	73	1132	0	**1205**	191	55	0	**246**	**2971**
% Approach	84.5%	15.5%	0.1%	-	6.1%	93.9%	0%	-	77.6%	22.4%	0%	-	-
% Total	43.2%	7.9%	0%	**51.2%**	2.5%	38.1%	0%	**40.6%**	6.4%	1.9%	0%	**8.3%**	-
Lights	1264	233	1	**1498**	72	1115	0	**1187**	189	54	0	**243**	2928
% Lights	98.4%	99.1%	100%	**98.6%**	98.6%	98.5%	0%	**98.5%**	99.0%	98.2%	0%	**98.8%**	98.6%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	20	2	0	**22**	1	17	0	**18**	2	1	0	**3**	43
% Buses and Single-Unit Trucks	1.6%	0.9%	0%	**1.4%**	1.4%	1.5%	0%	**1.5%**	1.0%	1.8%	0%	**1.2%**	1.4%

*L: Left, R: Right, T: Thru, U: U-Turn

NW Colbern Rd & N Main St - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610115, Location: 38.94496, -94.397475

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



NW Colbern Rd & N Main St - TMC
Tue Jan 8, 2019
AM Peak (7AM - 8AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610115, Location: 38.94496, -94.397475

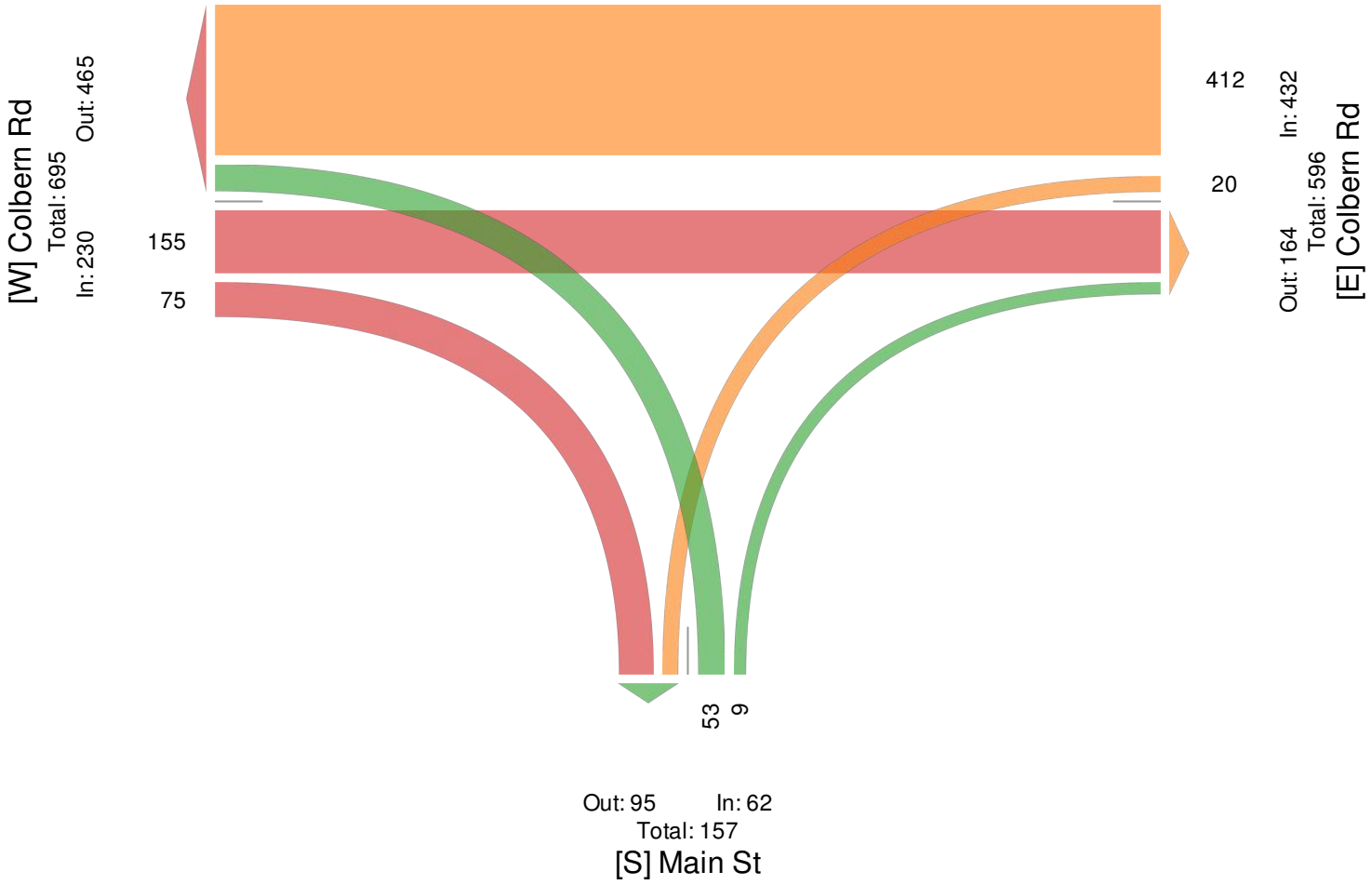
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Colbern Rd Eastbound				Colbern Rd Westbound				Main St Northbound				
Time	T	R	U	**App**	L	T	U	**App**	L	R	U	**App**	**Int**
2019-01-08 7:00AM	22	19	0	**41**	7	99	0	**106**	19	3	0	**22**	**169**
7:15AM	40	22	0	**62**	3	115	0	**118**	14	2	0	**16**	**196**
7:30AM	49	15	0	**64**	3	109	0	**112**	11	1	0	**12**	**188**
7:45AM	44	19	0	**63**	7	89	0	**96**	9	3	0	**12**	**171**
Total	155	75	0	**230**	20	412	0	**432**	53	9	0	**62**	**724**
% Approach	67.4%	32.6%	0%	-	4.6%	95.4%	0%	-	85.5%	14.5%	0%	-	-
% Total	21.4%	10.4%	0%	**31.8%**	2.8%	56.9%	0%	**59.7%**	7.3%	1.2%	0%	**8.6%**	-
PHF	0.791	0.852	-	**0.898**	0.714	0.896	-	**0.915**	0.697	0.750	-	**0.705**	0.923
Lights	152	75	0	**227**	20	409	0	**429**	52	9	0	**61**	717
% Lights	98.1%	100%	0%	**98.7%**	100%	99.3%	0%	**99.3%**	98.1%	100%	0%	**98.4%**	99.0%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	3	0	0	**3**	0	3	0	**3**	1	0	0	**1**	7
% Buses and Single-Unit Trucks	1.9%	0%	0%	**1.3%**	0%	0.7%	0%	**0.7%**	1.9%	0%	0%	**1.6%**	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

NW Colbern Rd & N Main St - TMC
Tue Jan 8, 2019
AM Peak (7AM - 8AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610115, Location: 38.94496, -94.397475

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



NW Colbern Rd & N Main St - TMC

Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610115, Location: 38.94496, -94.397475

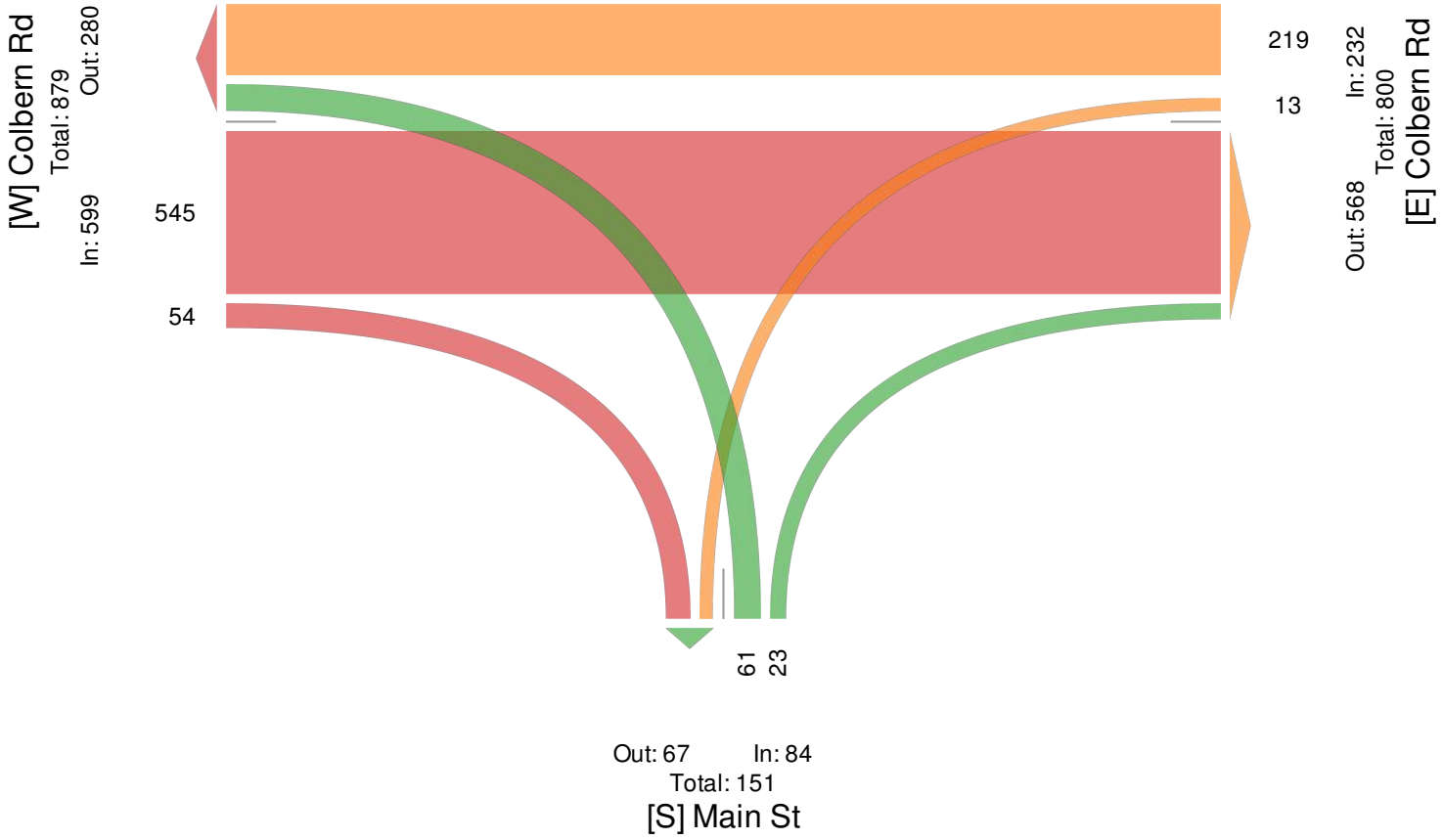
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Colbern Rd Eastbound				Colbern Rd Westbound				Main St Northbound				
Time	T	R	U	**App**	L	T	U	**App**	L	R	U	**App**	**Int**
2019-01-08 4:30PM	146	20	0	**166**	6	66	0	**72**	18	4	0	**22**	**260**
4:45PM	128	8	0	**136**	4	51	0	**55**	13	4	0	**17**	**208**
5:00PM	140	16	0	**156**	1	57	0	**58**	23	11	0	**34**	**248**
5:15PM	131	10	0	**141**	2	45	0	**47**	7	4	0	**11**	**199**
Total	545	54	0	**599**	13	219	0	**232**	61	23	0	**84**	**915**
% Approach	91.0%	9.0%	0%	-	5.6%	94.4%	0%	-	72.6%	27.4%	0%	-	-
% Total	59.6%	5.9%	0%	**65.5%**	1.4%	23.9%	0%	**25.4%**	6.7%	2.5%	0%	**9.2%**	-
PHF	0.933	0.675	-	**0.902**	0.542	0.830	-	**0.806**	0.663	0.523	-	**0.618**	0.880
Lights	543	54	0	**597**	12	218	0	**230**	61	23	0	**84**	911
% Lights	99.6%	100%	0%	**99.7%**	92.3%	99.5%	0%	**99.1%**	100%	100%	0%	**100%**	99.6%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	2	0	0	**2**	1	1	0	**2**	0	0	0	**0**	4
% Buses and Single-Unit Trucks	0.4%	0%	0%	**0.3%**	7.7%	0.5%	0%	**0.9%**	0%	0%	0%	**0%**	0.4%

*L: Left, R: Right, T: Thru, U: U-Turn

NW Colbern Rd & N Main St - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610115, Location: 38.94496, -94.397475

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



NW Colbern Rd & NW Blue Pkwy - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610116, Location: 38.944377, -94.404564

GEWALT HAMILTON ASSOCIATES, INC.

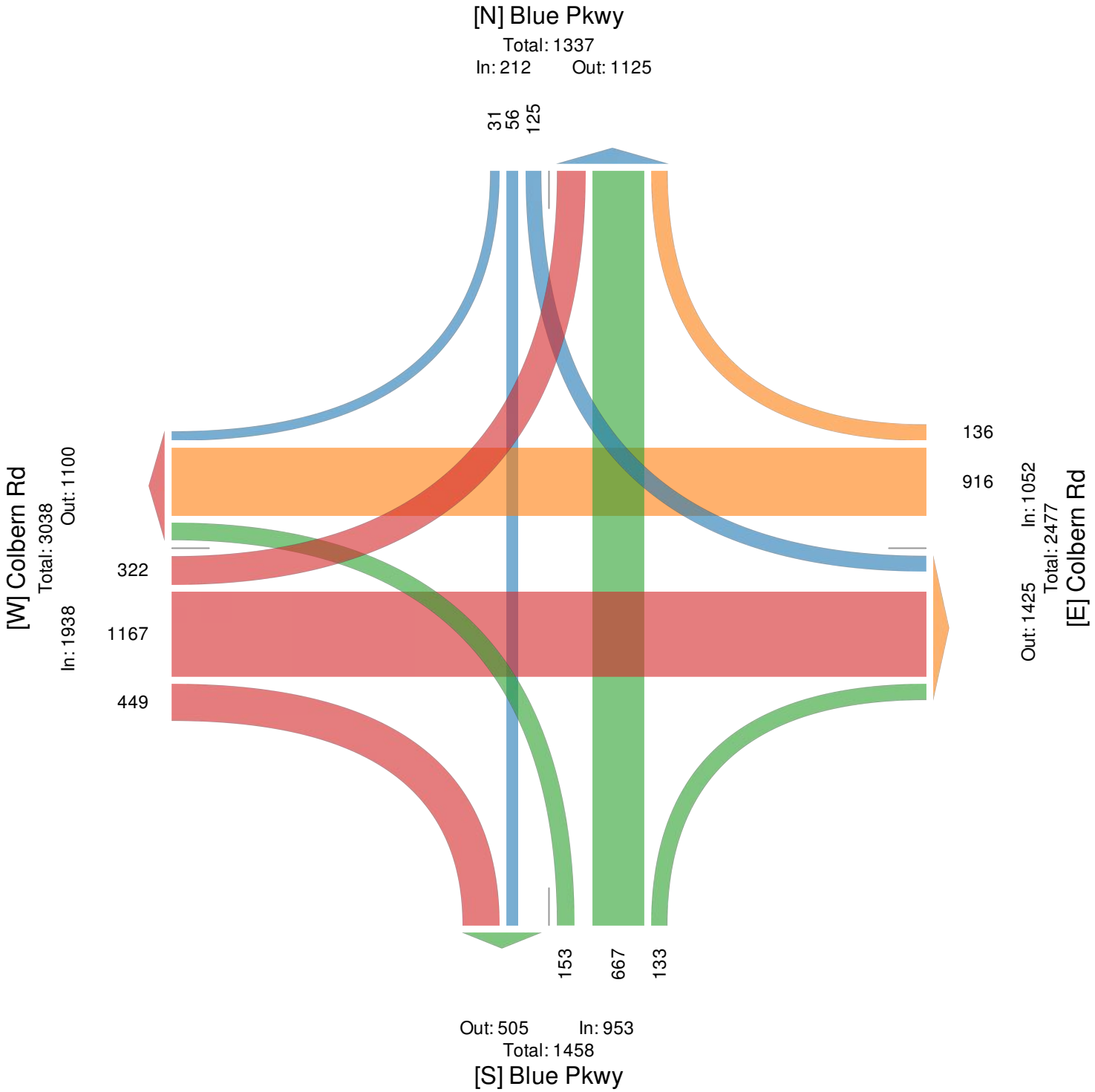
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Colbern Rd Eastbound					Colbern Rd Westbound					Blue Pkwy Northbound					Blue Pkwy Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-01-08 7:00AM	3	39	21	0	**63**	5	112	2	0	**119**	21	2	1	0	**24**	2	0	1	0	**3**	**209**
7:15AM	2	58	21	0	**81**	8	116	7	0	**131**	19	2	5	0	**26**	2	1	1	0	**4**	**242**
7:30AM	3	57	45	0	**105**	5	115	4	0	**124**	17	4	1	0	**22**	1	0	0	0	**1**	**252**
7:45AM	3	60	54	0	**117**	12	78	6	0	**96**	22	2	2	0	**26**	2	0	1	0	**3**	**242**
Hourly Total	11	214	141	0	**366**	30	421	19	0	**470**	79	10	9	0	**98**	7	1	3	0	**11**	**945**
8:00AM	1	52	32	0	**85**	6	76	2	0	**84**	5	3	4	0	**12**	0	0	1	0	**1**	**182**
8:15AM	1	46	23	0	**70**	5	89	1	0	**95**	12	3	5	0	**20**	1	0	1	0	**2**	**187**
8:30AM	0	42	24	0	**66**	10	76	3	0	**89**	9	3	5	0	**17**	1	1	3	0	**5**	**177**
8:45AM	0	60	15	0	**75**	11	55	4	0	**70**	16	2	5	0	**23**	2	1	1	0	**4**	**172**
Hourly Total	2	200	94	0	**296**	32	296	10	0	**338**	42	11	19	0	**72**	4	2	6	0	**12**	**718**
4:00PM	1	105	23	1	**130**	10	66	2	0	**78**	33	0	7	0	**40**	6	3	3	0	**12**	**260**
4:15PM	0	91	26	0	**117**	3	60	2	0	**65**	27	2	11	0	**40**	5	7	5	0	**17**	**239**
4:30PM	4	133	29	0	**166**	4	74	1	0	**79**	33	1	15	0	**49**	18	7	6	0	**31**	**325**
4:45PM	0	120	25	0	**145**	6	61	1	0	**68**	26	0	14	0	**40**	7	3	3	0	**13**	**266**
Hourly Total	5	449	103	1	**558**	23	261	6	0	**290**	119	3	47	0	**169**	36	20	17	0	**73**	**1090**
5:00PM	1	134	32	0	**167**	6	72	1	0	**79**	58	3	25	0	**86**	10	4	3	0	**17**	**349**
5:15PM	6	117	41	0	**164**	3	50	3	0	**56**	34	1	15	0	**50**	6	5	0	0	**11**	**281**
5:30PM	2	118	23	0	**143**	1	55	0	0	**56**	33	2	15	0	**50**	6	2	1	0	**9**	**258**
5:45PM	1	101	15	1	**118**	4	47	2	0	**53**	12	0	6	0	**18**	7	2	1	0	**10**	**199**
Hourly Total	10	470	111	1	**592**	14	224	6	0	**244**	137	6	61	0	**204**	29	13	5	0	**47**	**1087**
Total	28	1333	449	2	**1812**	99	1202	41	0	**1342**	377	30	136	0	**543**	76	36	31	0	**143**	**3840**
% Approach	1.5%	73.6%	24.8%	0.1%	-	7.4%	89.6%	3.1%	0%	-	69.4%	5.5%	25.0%	0%	-	53.1%	25.2%	21.7%	0%	-	-
% Total	0.7%	34.7%	11.7%	0.1%	**47.2%**	2.6%	31.3%	1.1%	0%	**34.9%**	9.8%	0.8%	3.5%	0%	**14.1%**	2.0%	0.9%	0.8%	0%	**3.7%**	-
Lights	27	1311	441	2	**1781**	98	1184	40	0	**1322**	372	30	136	0	**538**	76	35	31	0	**142**	3783
% Lights	96.4%	98.3%	98.2%	100%	**98.3%**	99.0%	98.5%	97.6%	0%	**98.5%**	98.7%	100%	100%	0%	**99.1%**	100%	97.2%	100%	0%	**99.3%**	98.5%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	3	0	0	0	**3**	0	0	0	0	**0**	3
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.8%	0%	0%	0%	**0.6%**	0%	0%	0%	0%	**0%**	0.1%
Buses and Single-Unit Trucks	1	22	8	0	**31**	1	18	1	0	**20**	2	0	0	0	**2**	0	1	0	0	**1**	54
% Buses and Single-Unit Trucks	3.6%	1.7%	1.8%	0%	**1.7%**	1.0%	1.5%	2.4%	0%	**1.5%**	0.5%	0%	0%	0%	**0.4%**	0%	2.8%	0%	0%	**0.7%**	1.4%

*L: Left, R: Right, T: Thru, U: U-Turn

NW Colbern Rd & NW Blue Pkwy - TMC
Tue Jan 8, 2019
Full Length (7AM-9AM, 4PM-6PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610116, Location: 38.944377, -94.404564

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



NW Colbern Rd & NW Blue Pkwy - TMC
Tue Jan 8, 2019
AM Peak (7AM - 8AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610116, Location: 38.944377, -94.404564

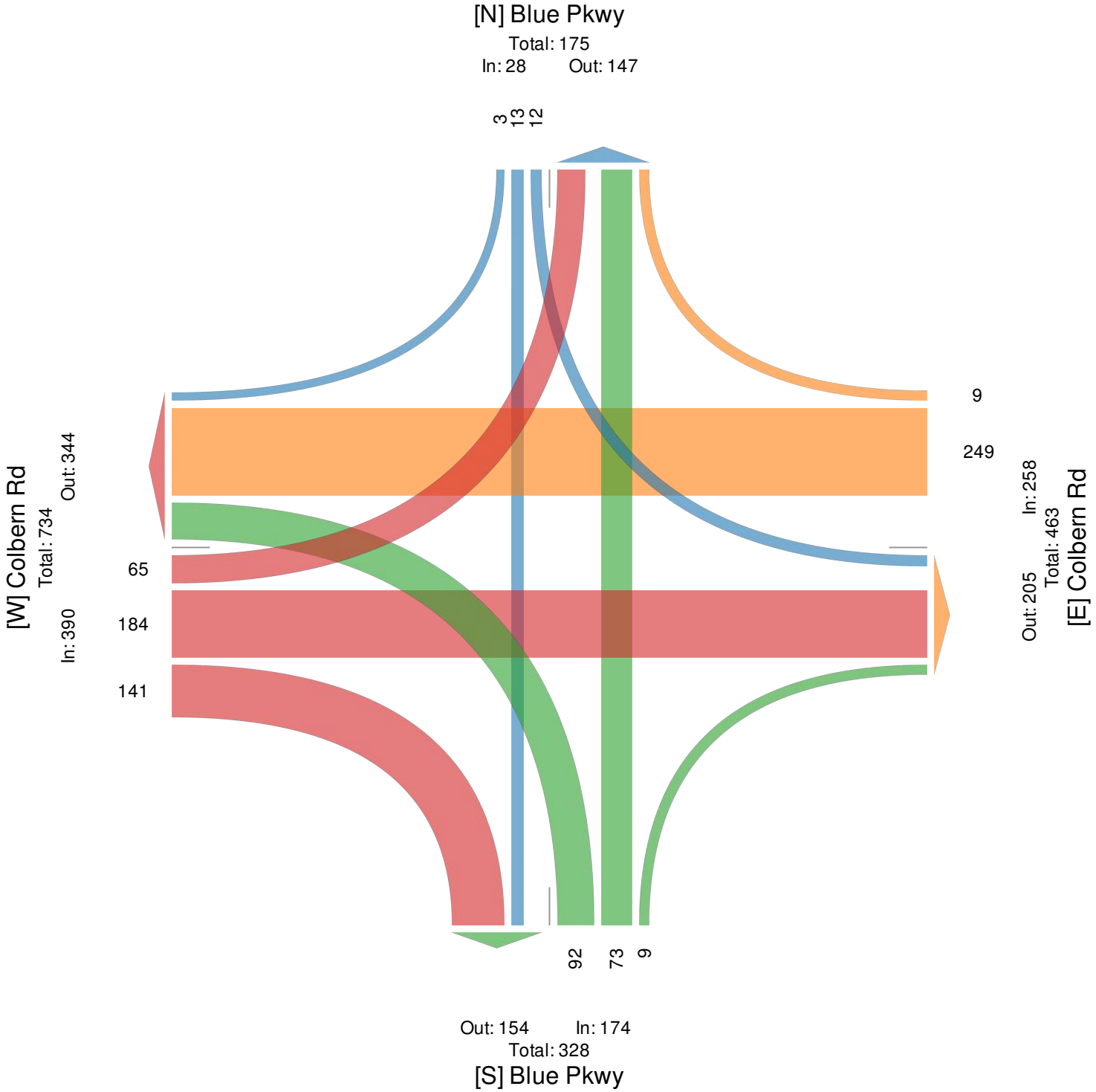
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Colbern Rd Eastbound					Colbern Rd Westbound					Blue Pkwy Northbound					Blue Pkwy Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2019-01-08 7:00AM	3	39	21	0	**63**	5	112	2	0	**119**	21	2	1	0	**24**	2	0	1	0	**3**	**209**
7:15AM	2	58	21	0	**81**	8	116	7	0	**131**	19	2	5	0	**26**	2	1	1	0	**4**	**242**
7:30AM	3	57	45	0	**105**	5	115	4	0	**124**	17	4	1	0	**22**	1	0	0	0	**1**	**252**
7:45AM	3	60	54	0	**117**	12	78	6	0	**96**	22	2	2	0	**26**	2	0	1	0	**3**	**242**
Total	11	214	141	0	**366**	30	421	19	0	**470**	79	10	9	0	**98**	7	1	3	0	**11**	**945**
% Approach	3.0%	58.5%	38.5%	0%	-	6.4%	89.6%	4.0%	0%	-	80.6%	10.2%	9.2%	0%	-	63.6%	9.1%	27.3%	0%	-	-
% Total	1.2%	22.6%	14.9%	0%	**38.7%**	3.2%	44.6%	2.0%	0%	**49.7%**	8.4%	1.1%	1.0%	0%	**10.4%**	0.7%	0.1%	0.3%	0%	**1.2%**	-
PHF	0.917	0.892	0.653	-	**0.782**	0.625	0.907	0.679	-	**0.897**	0.898	0.625	0.450	-	**0.942**	0.875	0.250	0.750	-	**0.688**	0.938
Lights	11	211	136	0	**358**	30	415	19	0	**464**	77	10	9	0	**96**	7	1	3	0	**11**	929
% Lights	100%	98.6%	96.5%	0%	**97.8%**	100%	98.6%	100%	0%	**98.7%**	97.5%	100%	100%	0%	**98.0%**	100%	100%	100%	0%	**100%**	98.3%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	1	0	0	0	**1**	0	0	0	0	**0**	1
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	1.3%	0%	0%	0%	**1.0%**	0%	0%	0%	0%	**0%**	0.1%
Buses and Single-Unit Trucks	0	3	5	0	**8**	0	6	0	0	**6**	1	0	0	0	**1**	0	0	0	0	**0**	15
% Buses and Single-Unit Trucks	0%	1.4%	3.5%	0%	**2.2%**	0%	1.4%	0%	0%	**1.3%**	1.3%	0%	0%	0%	**1.0%**	0%	0%	0%	0%	**0%**	1.6%

*L: Left, R: Right, T: Thru, U: U-Turn

NW Colbern Rd & NW Blue Pkwy - TMC
Tue Jan 8, 2019
AM Peak (7AM - 8AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610116, Location: 38.944377, -94.404564

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



NW Colbern Rd & NW Blue Pkwy - TMC

Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610116, Location: 38.944377, -94.404564

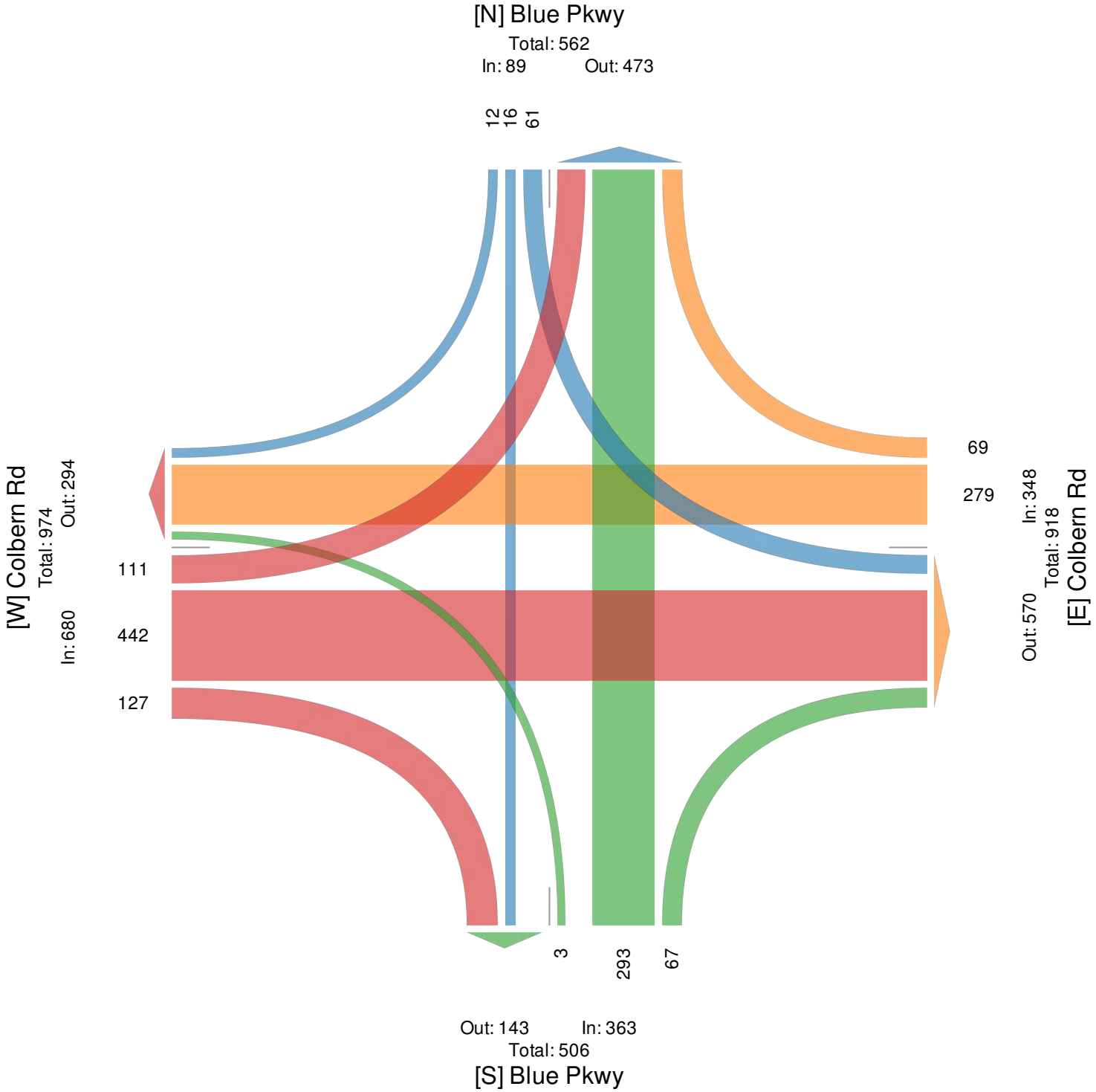
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Colbern Rd Eastbound					Colbern Rd Westbound					Blue Pkwy Northbound					Blue Pkwy Southbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2019-01-08 4:30PM	4	133	29	0	**166**	4	74	1	0	**79**	33	1	15	0	**49**	18	7	6	0	**31**	**325**
4:45PM	0	120	25	0	**145**	6	61	1	0	**68**	26	0	14	0	**40**	7	3	3	0	**13**	**266**
5:00PM	1	134	32	0	**167**	6	72	1	0	**79**	58	3	25	0	**86**	10	4	3	0	**17**	**349**
5:15PM	6	117	41	0	**164**	3	50	3	0	**56**	34	1	15	0	**50**	6	5	0	0	**11**	**281**
Total	11	504	127	0	**642**	19	257	6	0	**282**	151	5	69	0	**225**	41	19	12	0	**72**	**1221**
% Approach	1.7%	78.5%	19.8%	0%	-	6.7%	91.1%	2.1%	0%	-	67.1%	2.2%	30.7%	0%	-	56.9%	26.4%	16.7%	0%	-	-
% Total	0.9%	41.3%	10.4%	0%	**52.6%**	1.6%	21.0%	0.5%	0%	**23.1%**	12.4%	0.4%	5.7%	0%	**18.4%**	3.4%	1.6%	1.0%	0%	**5.9%**	-
PHF	0.458	0.940	0.774	-	**0.961**	0.792	0.868	0.500	-	**0.892**	0.651	0.417	0.690	-	**0.654**	0.569	0.679	0.500	-	**0.581**	0.875
Lights	10	503	127	0	**640**	19	257	6	0	**282**	151	5	69	0	**225**	41	19	12	0	**72**	1219
% Lights	90.9%	99.8%	100%	0%	**99.7%**	100%	100%	100%	0%	**100%**	100%	100%	100%	0%	**100%**	100%	100%	100%	0%	**100%**	99.8%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	1	1	0	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	2
% Buses and Single-Unit Trucks	9.1%	0.2%	0%	0%	**0.3%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.2%

*L: Left, R: Right, T: Thru, U: U-Turn

NW Colbern Rd & NW Blue Pkwy - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610116, Location: 38.944377, -94.404564

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Signal Timing Data

	1	2
Month	JAN,FEB,MAR,APR,M…	JAN,FEB,MAR,APR,M…
Date	1,2,3,4,5,6,7,8,9,10,11…	1,2,3,4,5,6,7,8,9,10,11…
Day	SU,SA	MO,TU,WE,TH,FR
Day Plan	1	2

Day Plan 1											
Number	Hour	Minute	Action	Number	Hour	Minute	Action	Number	Hour	Minute	Action
01	0	1	254	06	0	0	0	11	0	0	0
02	8	0	254	07	0	0	0	12	0	0	0
03	10	0	254	08	0	0	0	13	0	0	0
04	18	30	254	09	0	0	0	14	0	0	0
05	20	0	254	10	0	0	0	15	0	0	0
Day Plan 2											
01	0	1	254	06	20	30	254	11	0	0	0
02	6	0	254	07	0	0	0	12	0	0	0
03	11	30	254	08	0	0	0	13	0	0	0
04	15	0	254	09	0	0	0	14	0	0	0
05	19	0	254	10	0	0	0	15	0	0	0

Sequence Ring Number	1	2
Sequence 2 (Alt Seq 1)	1,2,3,4	6,5,8,7
Sequence 3 (Alt Seq 2)	2,1,4,3	5,6,7,8
Sequence 4 (Alt Seq 3)	1,2,4,3	5,6,7,8
Sequence 5 (Alt Seq 4)	2,1,4,3	6,5,7,8
Sequence 6 (Alt Seq 5)	1,2,4,3	6,5,7,8
Sequence 7 (Alt Seq 6)	2,1,3,4	5,6,8,7
Sequence 8 (Alt Seq 7)	1,2,4,3	5,6,7,8
Sequence 9 (Alt Seq 8)	1,2,4,3	5,6,7,8
Sequence 10 (Alt Seq 9)	1,2,4,3	5,6,7,8
Sequence 11 (Alt Seq 10)	1,2,4,3	5,6,7,8
Sequence 12 (Alt Seq 11)	1,2,4,3	5,6,7,8
Sequence 13 (Alt Seq 12)	1,2,4,3	5,6,7,8
Sequence 14 (Alt Seq 13)	1,2,4,3	5,6,7,8
Sequence 15 (Alt Seq 14)	1,2,4,3	5,6,7,8
Sequence 16 (Alt Seq 15)	1,2,4,3	5,6,7,8

Phase Number	1	2	3	4	5	6	7	8
Minimum Green	5	5	5	5	5	5	5	5
Passage (1/10 sec)	30	30	30	30	30	30	30	30
Maximum 1	25	25	25	25	25	25	25	25
Maximum 2	30	50	30	50	30	50	30	50
Yellow Change (1/10 sec)	30	42	30	40	30	42	40	30
Red Clearance (1/10 sec)	20	18	20	18	20	18	18	20
Added Initial (1/10 sec)	0	0	0	0	0	0	0	0
Maximum Initial	0	0	0	0	0	0	0	0
Time Before Reduction	0	0	0	0	0	0	0	0
Cars Before Reduction	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0
Minimum Gap (1/10 sec)	0	0	0	0	0	0	0	0
Walk	0	4	0	0	0	0	0	0
Pedestrian Clear	0	21	0	0	0	0	0	0
Phase Options	EP,NLDM	EP,AFE,NLDM,DE	EP,AFX,NLDM,DE	EP,NLDM	EP,NLDM	EP,AFE,NLDM,DE	EP,NLDM	EP,AFX,NLDM,DE
Vehicle Recall	None	None	None	None	None	None	None	None
Recall Delay	0	0	0	0	0	0	0	0
Ext Ped Clr	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green	Normal Green
Flash Walk	Steady	Steady	Steady	Steady	Steady	Steady	Steady	Steady
Pedestrian Recall	Ped Recall OFF	Ped Recall OFF	Ped Recall OFF	Ped Recall OFF	Ped Recall OFF	Ped Recall OFF	Ped Recall OFF	Ped Recall OFF
Phase Omit	0	0	0	0	0	0	0	0
Minus Yellow	0	0	0	0	0	0	0	0
Omit Call	0	0	0	0	0	0	0	0
Phase Walk Offset Time (1/10 sec)	0	0	0	0	0	0	0	0
Phase Walk Offset Mode	Advance Walk	Advance Walk	Advance Walk	Advance Walk	Advance Walk	Advance Walk	Advance Walk	Advance Walk
Phase Yellow Delay (1/10 sec)	0	0	0	0	0	0	0	0
Phase Green Delay (1/10 sec)	0	0	0	0	0	0	0	0
Phase Bike Green (1/10 sec)	0	0	0	0	0	0	0	0
Phase Bike Passage (1/10 sec)	0	0	0	0	0	0	0	0
Phase Walk2	0	0	0	0	0	0	0	0
Ped Clear2	0	0	0	0	0	0	0	0
Direction								

Dial/Split/Offset(NTCIP)	1/1/1 (1)
Cycle Time	90
Offset Time	55
Alt Sequence Number	5
Pattern Description	
Dial/Split/Offset(NTCIP)	1/4/1 (10)
Cycle Time	0
Offset Time	0
Alt Sequence Number	0
Pattern Description	
Dial/Split/Offset(NTCIP)	2/1/1 (19)
Cycle Time	90
Offset Time	62
Alt Sequence Number	6
Pattern Description	
Dial/Split/Offset(NTCIP)	2/4/1 (28)
Cycle Time	0
Offset Time	0
Alt Sequence Number	0
Pattern Description	
Dial/Split/Offset(NTCIP)	3/1/1 (37)
Cycle Time	100
Offset Time	91
Alt Sequence Number	4
Pattern Description	
Dial/Split/Offset(NTCIP)	3/4/1 (46)
Cycle Time	0
Offset Time	0
Alt Sequence Number	0
Pattern Description	

Dial 2 Split 1								
Phase	1	2	3	4	5	6	7	8
Coord PH	NO	NO	YES	NO	NO	NO	NO	YES
Mode	Actuated	Actuated	Actuated	Actuated	Actuated	Actuated	Actuated	Actuated
Time	13	27	36	14	13	27	14	36

Dial 3 Split 1								
Phase	1	2	3	4	5	6	7	8
Coord PH	NO	YES	NO	NO	NO	YES	NO	NO
Mode	Actuated	Actuated	Actuated	Actuated	Actuated	Actuated	Actuated	Actuated
Time	14	33	24	29	14	33	18	35

Schedule Number	1	2
Day Plan	1	2
Month	JAN,FEB,MAR,APR,M…	JAN,FEB,MAR,APR,M…
Day DOW	MON,TUE,WED,THU,FRI	SUN,SAT
Day DOM	1,2,3,4,5,6,7,8,9,10,11…	1,2,3,4,5,6,7,8,9,10,11…

Event	1	2	3	4	5	6	7	8
Hour	0	6	8	15	19	20	0	
Minute	1	30	30	0	0	30	0	
Action Plan	99	2	1	3	4	99	0	

Ring 1	1		2		3		4
Ring 2	6		5		7		8

Ring 1	1		2		3		4
Ring 2	5		6		7		8

Phase Number	1	2	3	4	5	6	7	8
Min Grn	0	8	0	8	5	8	0	0
Bike Min Grn	0	0	0	0	0	0	0	0
CS Min Grn	0	0	0	0	0	0	0	0
Delay Grn	0	0	0	0	0	0	0	0
Walk	0	0	0	7	0	7	0	0
Walk2	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	20	0	10	0	0
Ped Clear2	0	0	0	0	0	0	0	0
Ped Clr Max	0	0	0	0	0	0	0	0
Ped CO End	0	0	0	0	0	0	0	0
Veh Ext	0.0	4.0	0.0	4.0	3.5	4.0	0.0	0.0
Veh Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	0	35	0	45	15	35	0	0
Max 2	0	45	0	35	15	45	0	0
Max 3	0	0	0	0	0	0	0	0
Dyn Max	0	0	0	0	0	0	0	0
Dyn Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	0.0	4.3	0.0	3.9	4.3	4.3	0.0	0.0
Red Clear	0.0	1.7	0.0	1.7	1.7	2.2	0.0	0.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Before	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0
Time Before	0	0	0	0	0	0	0	0
Cars Before	0	0	0	0	0	0	0	0
Reduce By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TT Reduce	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Coordination	Data							
Use Split Pattern	2		Split Sum	90				
Cycle Time	90							
Offset Val	73							
Actuated Coord	YES							
Timing Plan	1							
Actuated Walk	NO							
Sequence	5							
Phase Reservice	NO							
Action Plan	0							
Split Preference Phases	1	2	3	4	5	6	7	8
Split	0	45	0	45	11	34	0	0
Mode	Phase Omitted	None	Phase Omitted	None	None	None	Phase Omitted	Phase Omitted
Preference 1	0	0	0	0	0	0	0	0
Preference 2	0	0	0	0	0	0	0	0

Coordination	Data							
Use Split Pattern	3		Split Sum	90				
Cycle Time	100							
Offset Val	16							
Actuated Coord	YES							
Timing Plan	1							
Actuated Walk	NO							
Sequence	1							
Phase Reservice	NO							
Action Plan	0							
Split Preference Phases	1	2	3	4	5	6	7	8
Split	0	50	0	50	15	35	0	0
Mode	Phase Omitted	None	Phase Omitted	None	None	None	Phase Omitted	Phase Omitted
Preference 1	0	0	0	0	0	0	0	0
Preference 2	0	0	0	0	0	0	0	0

Schedule Number	1	2
Day Plan	1	2
Month	JAN,FEB,MAR,APR,M…	JAN,FEB,MAR,APR,M…
Day DOW	MON,TUE,WED,THU,FRI	SUN,SAT
Day DOM	1,2,3,4,5,6,7,8,9,10,11…	1,2,3,4,5,6,7,8,9,10,11…

Event	1	2	3	4	5	6	7
Hour	0	6	8	15	19	20	0
Minute	1	0	30	0	0	30	0
Action Plan	99	2	1	3	4	99	0

Ring 1	2		1		3		4
Ring 2	5		6		7		8

Phase Number	1	2	3	4	5	6	7	8
Min Grn	8	8	0	0	0	8	0	8
Bike Min Grn	0	0	0	0	0	0	0	0
CS Min Grn	0	0	0	0	0	0	0	0
Delay Grn	0	0	0	0	0	0	0	0
Walk	0	0	0	0	0	7	0	0
Walk2	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	15	0	0
Ped Clear2	0	0	0	0	0	0	0	0
Ped Clr Max	0	0	0	0	0	0	0	0
Ped CO End	0	0	0	0	0	0	0	0
Veh Ext	3.5	4.0	0.0	0.0	0.0	4.0	0.0	4.0
Veh Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	25	35	0	0	0	35	0	35
Max 2	15	45	0	0	0	45	0	35
Max 3	0	0	0	0	0	0	0	0
Dyn Max	0	0	0	0	0	0	0	0
Dyn Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.3	4.3	0.0	0.0	0.0	4.3	0.0	4.3
Red Clear	1.6	2.2	0.0	0.0	0.0	2.2	0.0	1.6
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Before	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0
Time Before	0	0	0	0	0	0	0	0
Cars Before	0	0	0	0	0	0	0	0
Reduce By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TT Reduce	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Coordination	Data							
Use Split Pattern	2		Split Sum	90				
Cycle Time	90							
Offset Val	70							
Actuated Coord	YES							
Timing Plan	1							
Actuated Walk	NO							
Sequence	2							
Phase Reservice	NO							
Action Plan	0							
Split Preference Phases	1	2	3	4	5	6	7	8
Split	28	29	0	0	0	57	0	33
Mode	None	None	Phase Omitted	Phase Omitted	Phase Omitted	None	Phase Omitted	None
Preference 1	0	0	0	0	0	0	0	0
Preference 2	0	0	0	0	0	0	0	0

Coordination	Data							
Use Split Pattern	3		Split Sum	90				
Cycle Time	100							
Offset Val	48							
Actuated Coord	YES							
Timing Plan	1							
Actuated Walk	NO							
Sequence	1							
Phase Reservice	NO							
Action Plan	0							
Split Preference Phases	1	2	3	4	5	6	7	8
Split	37	39	0	0	0	76	0	24
Mode	Min Veh Recall	None	Phase Omitted	Phase Omitted	Phase Omitted	None	Phase Omitted	None
Preference 1	0	0	0	0	0	0	0	0
Preference 2	0	0	0	0	0	0	0	0

Intersection:	Lees Summit Rd @ Little Blue Rd/Gregory Blvd				
Controller ID:	416300790.2	**Channel:**	225	**Drop:**	15
System:	TransCore TransSuite TCS				
Controller Type:	Econolite ASC/3 2070-1C 32.62				
TransCore Unified Controller Manager 20.2.0					

Timing Plan 1

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Minimum Green	5	10	5	10	5	10	5	10	5	5	5	5	5	5	5	5
Bicycle Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Condition Service Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	7	0	10	0	10	0	10	0	10
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance	0	16	0	15	0	16	0	15	0	16	0	16	0	16	0	16
Pedestrian Clearance 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Carry Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Extension	2.0	5.0	2.0	3.0	2.0	5.0	2.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	20	35	15	35	15	35	20	35	35	35	35	35	35	35	35	35
Max 2	25	65	25	65	25	65	25	65	40	40	40	40	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow Change	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.5	1.5	2.0	2.0	1.5	1.5	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations Before Gap Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seconds Per Actions Added to Initial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Added Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time Before Gap Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Waiting Before Gap Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Step To Reduce	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce To Minimum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Action Plan (MM-5-2)20

Pattern	254	**System Override**	No
Timing Plan	1	**Sequence**	1
Vehicle Detector	1	**Detector Log**	NONE
Flash	No	**Red Rest**	No
Veh Det Diag Plan	0	**Ped Det Diag Plan**	0
Dimming Enable	No		

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Walk 2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vehicle Extension	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vehicle Recall	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Max Recall	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Max 2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Max 3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Conditional Service	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omitted	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Auxilliary Function	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 1 - 15	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh
LP 16 - 30	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh
LP 31 - 45	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh
LP 46 - 60	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh
LP 61 - 75	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh
LP 76 - 90	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh
LP 91 - 100	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh	Inh						

Day Plans

Day Plan 1

Event	1	2	3	4	5
Action	20	20	20	20	20
Hour	0	6	9	15	18
Minute	1	30	0	30	30

Day Plan 2

Event	1	2
Action	20	20
Hour	0	18
Minute	1	30

Time Base Schedule

Schedule Number	**1**
Day Plan	1
Month	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
Day DOW	MON, TUE, WED, THU, FRI
Day DOM	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31
Schedule Number	**2**
Day Plan	2
Month	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
Day DOW	SUN, SAT
Day DOM	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31

CONTROLLER OPTIONS / ACT PRE-TIMED / SIMULTANEOUS GAP TABLE

		Phase	Simultaneous Gap
Unit Red Revert	2.0		
Guaranteed Passage	NONE	**1**	NONE
NON-ACT I Phases	NONE	**2**	6
NON-ACT II Phases	NONE	**3**	NONE
Ped Reservice	NONE	**4**	8
Rest In Walk	NONE	**5**	NONE
Flashing Walk	NONE	**6**	2
Ped Clear Thru Yellow	NONE	**7**	NONE
Ped Clear Thru Red	NONE	**8**	4
IGrn + Veh Ext	NONE	**9**	NONE
		10	NONE
Pretimed Operation	FREEINPUTENABLES	**11**	NONE
Pretimed Phases	NONE	**12**	NONE
		13	NONE
Immediate Gap Reduction	NONE	**14**	NONE
Exclusive Ped Service	NONE	**15**	NONE
Simultaneous Gap Disable	NONE	**16**	NONE
Timing Plans	0		
Conditional Service Enable	NONE		

COORDINATOR OPTIONS

Manual Pattern	0	**Multi Sync**	NO
Interconnect Source	SYS	**Interconnect Format**	STD
Transition mode	SMOOTH	**ECPI Coordination**	YES
Offset Ref	LEAD	**Dwell/Add Time**	0
Delay Walk	NO	**Force Off**	FIXED
Force Off Add Initial	NO	**Use Ped Time**	NO
Ped Recall	NO	**Ped Re-Service**	NO
Man Sync Enable	N/A	**Local Zero Override**	NO
Resync Count	0	**Max Select**	MAXINH

PHASE RECALL OPTIONS

Phase Timing	1	2	3	4
Lock Det	NONE	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Veh Recall	2 6	NONE	NONE	NONE
Ped Recall	NONE	NONE	NONE	NONE
Max Recall	NONE	NONE	NONE	NONE
Soft Recall	NONE	NONE	NONE	NONE
No Rest Here	NONE	NONE	NONE	NONE
Added Init Calc	NONE	NONE	NONE	NONE

GUARANTEED MINIMUM TIME DATA

Phase Number	1	2	3	4	5	6	7	8
Min Green (1/10)	5	10	5	10	5	10	5	10
Min Walk	0	0	0	0	0	0	0	0
Min Ped Clr	7	16	7	15	7	16	7	15
Min Ylw Change	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Min Red Clr	1.5	1.5	2.0	2.0	1.5	1.5	2.0	2.0
Min Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Phase Number	9	10	11	12	13	14	15	16
Min Green	5	5	5	5	5	5	5	5
Min Walk	0	0	0	0	0	0	0	0
Min Ped Clr	7	7	7	7	7	7	7	7
Min Ylw Change	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Min Red Clr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

LOAD SWITCH ASSIGN (MMU CHANNEL)

LD Switch	Phase/Ovlp	Type	Dimming	Power	Auto	Together
1	1	Vehicle	NONE	Auto	Red	NONE
2	2	Vehicle	NONE	Auto	Red	NONE
3	3	Vehicle	NONE	Auto	Red	NONE
4	4	Vehicle	NONE	Auto	Red	TOGETHER
5	5	Vehicle	DAHLC	Auto	Red	NONE
6	6	Vehicle	DAHLC	Auto	Red	NONE
7	7	Vehicle	DAHLC	Auto	Red	NONE
8	8	Vehicle	DAHLC	Auto	Red	TOGETHER
9	1	Overlap	NONE	Auto	Red	NONE
10	2	Overlap	NONE	Auto	Red	TOGETHER
11	3	Overlap	DAHLC	Auto	Red	NONE
12	4	Overlap	DAHLC	Auto	Red	TOGETHER
13	2	Pedestrian	NONE	Auto	.	NONE
14	4	Pedestrian	DAHLC	Auto	.	NONE
15	6	Pedestrian	NONE	Auto	.	NONE
16	8	Pedestrian	DAHLC	Auto	.	NONE

SIGNAL PHASING AND TIMING - ACTUATED / COORDINATED OPERATION

TIMING DATE

ROUTE: MO 350 & Colbern (East) BY :

CITY: Unity Village

ACTUATED PLAN

	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6	PHASE 7	PHASE 8
RING	1	1	1	1	2	2	2	2
RING SEQUENCE (MM-1-1-1)								
MIN. INITIAL / GREEN (MM-2-1)	5	10	5			10		
UNIT EXTENSION/PASSAGE (MM-2-1)	3.0	5.0	3.0			5.0		
YELLOW CLEARANCE	4.0	3.9	3.9			3.9		
RED CLEARANCE	1.0	1.4	1.5			1.1		
MAX. 1 (MM-2-1)	15	45	20			45	15	
MAX. 2 (MM-2-1)								
NON-LOCK MEMORY (YES / NO) (MM-2-8)								
VEH. RECALL (MIN / MAX / SOFT) (MM-2-8)		MIN				MIN		
PED RECALL (MM-2-8)								
DUAL ENTRY (MM-2-6-1)		X				X		
PED WALK (MM-2-1)						5		
PED WALK CLEARANCE (MM-2-1)						13		
DETECTOR ASSIGNMENT (MM-6-1)	1	3,5,6	7			14,15,16		
VEH. DET. DELAY TIME (MM-6-2)								
P/P LT. DETECTOR SWITCH (MM-6-2)								
ADVANCE DETECTION								
INITIALIZATION STATE (MM-2-5)								
CABINET FLASH (MM-2-5)								

BEGIN OF GREEN-COORDINATION TIMING - DIAL PLAN

DAY PLN	EVNT	ACT. PLN	TIME								
				ACTION PLAN = 1 | CYCLE = 60 SECONDS | OFFSET = 43 SECONDS | SEQ : 1							
				12	26	22			38	22	
					Coord				Coord		
1	1	Free	0:01								
1	2	1	06:00	ACTION PLAN = 2 | CYCLE = 60 SECONDS | OFFSET = 54 SECONDS | SEQ : 1							
1	3	Free	21:00	15	30	15			45	15	
					Coord				Coord		
				ACTION PLAN = 3 | CYCLE = 1=60 SECONDS | OFFSET = 40 SECONDS | SEQ : 1							
				13	32	15			45	15	
					Coord				Coord		
2	1	Free	0:01								
2	2	4	06:30	ACTION PLAN = 4 | CYCLE = 70 SECONDS | OFFSET = 68 SECONDS | SEQ : 1							
2	3	1	08:45	12	38	20			50	20	
2	4	3	11:00								
2	5	2	12:00								
2	6	1	18:45								
2	7	Free	21:00								

DAY PLAN	#	S | M | T | W | T | F | S
DAY PLAN	1	S | M | T | W | T | F | S
DAY PLAN	2	S | M | T | W | T | F | S
DAY PLAN		S | M | T | W | T | F | S

COMMENTS

Seq 5 2 1 I 3 4
5 6 I 7 8

OL B (6) OL C (2,6)

CLEARANCE FORMULAS (EPG Section 902.5.36.2)

Change Period:

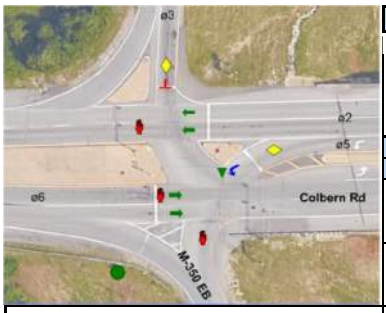
$$CP = t + \frac{V}{2a + 64.4g} + \frac{W + L}{V}$$

ITE Equation Yellow								
3 s <=YELLOW<=6 s								
ITE Equation Red								
Change Period Sum								

STARTUP OPERATION

CONTROLLER MAKE/MODEL | MASTER CONTROLLER @

DISTRIBUTION : CABINET SHOP DISTRICT OFFICE (FILE / BOOK)



SIGNAL PHASING AND TIMING - ACTUATED / COORDINATED OPERATION

TIMING DATE

ROUTE MO 350 & Colbern (West) BY :

CITY Unity Village

ACTUATED PLAN

	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6	PHASE 7	PHASE 8
		←	↳		↰	→		
RING	1	1	1	1	2	2	2	2
RING SEQUENCE (MM-1-1-1)								
MIN. INITIAL / GREEN (MM-2-1)		*10*	*5*		*5*	*10*		
UNIT EXTENSION/PASSAGE (MM-2-1)		*5.0*	*3.0*		*3.0*	*5.0*		
YELLOW CLEARANCE		*3.9*	*3.9*		*3.9*	*3.9*		
RED CLEARANCE		1.0	1.5		1.2	1.2		
MAX. 1 (MM-2-1)		*35*	*25*		*25*	*35*		
MAX. 2 (MM-2-1)								
NON-LOCK MEMORY (YES / NO) (MM-2-8)								
VEH. RECALL (MIN / MAX / SOFT) (MM-2-8)		*MIN*				*MIN*		
PED RECALL (MM-2-8)								
DUAL ENTRY (MM-2-6-1)		X				X		
PED WALK (MM-2-1)		*14*	*5*			*5*		
PED WALK CLEARANCE (MM-2-1)		*20*				*13*		
DETECTOR ASSIGNMENT (MM-6-1)		*3,4*	*7*		*12*	*14,15*		
VEH. DET. DELAY TIME (MM-6-2)								
P/P LT. DETECTOR SWITCH (MM-6-2)								
ADVANCE DETECTION								
INITIALIZATION STATE (MM-2-5)								
CABINET FLASH (MM-2-5)								

BEGIN OF GREEN-COORDINATION TIMING - DIAL PLAN

DAY PLN	EVNT	ACT. PLN	TIME								
				ACTION PLAN = 1 | CYCLE = 60 SECONDS | OFFSET = 40 SECONDS | SEQ : 5							
					37	*23*		*12*	*25*		
					Coord				*Coord*		
1	1	Free	0:01								
1	2	1	06:00	ACTION PLAN = 2 | CYCLE = 60 SECONDS | OFFSET = 5 SECONDS | SEQ : 5							
1	3	Free	21:00		*35*	*25*		*12*	*23*		
					Coord				*Coord*		
				ACTION PLAN = 3 | CYCLE = 1=60 SECONDS | OFFSET = 37 SECONDS | SEQ : 5							
					37	*23*		*12*	*25*		
					Coord				*Coord*		
2	1	Free	0:01								
2	2	4	06:30	ACTION PLAN = 4 | CYCLE = 70 SECONDS | OFFSET = 4 SECONDS | SEQ : 5							
2	3	1	08:45		*47*	*20*		*18*	*32*		
2	4	3	11:00								
2	5	2	12:00								
2	6	1	18:45								
2	7	Free	21:00								

DAY PLAN	#	S | M | T | W | T | F | S
DAY PLAN	1	S | M | T | W | T | F | S
DAY PLAN	2	S | M | T | W | T | F | S
DAY PLAN		S | M | T | W | T | F | S

COMMENTS

Seq 5 1 2 I 3 4
6 5 I 7 8

CLEARANCE FORMULAS (EPG Section 902.5.36.2)

Change Period:

$$CP = t + \frac{V}{2a + 64.4g} + \frac{W + L}{V}$$

ITE Equation Yellow								
3 s <=YELLOW<=6 s								
ITE Equation Red								
Change Period Sum								

STARTUP OPERATION

CONTROLLER MAKE/MODEL | MASTER CONTROLLER @

DISTRIBUTION : CABINET SHOP DISTRICT OFFICE (FILE / BOOK)

APPENDIX B

Existing Plus Approved Development Conditions

Turn Lane Warrants

16.1. Left-Turn Lane Standards

16.1.A. Left-turn lanes shall be provided on all approaches to intersections controlled by, or planned to be controlled by, traffic signals.

16.1.B. Left-turn lanes shall be provided on all arterial streets at the intersection with other arterial and collector streets. Left-turn lanes shall be provided on minor arterial streets at the intersection with any local street or driveway where the left-turn volume is at least 20 vehicles in any hour. On major arterial streets, left-turn lanes shall be at the intersection with all connectors (an exception may be granted for a singular, existing, residential lot).

16.1.C. Left-turn lanes shall be provided on collector streets at the intersection with a connector serving non-residential development where the left-turn volume is at least 30 vehicles in any hour and should be provided where the left-turn volume is less than 30 vehicles in any hour.

16.1.D. Left-turn lanes shall be provided on non-residential connectors intersecting with major arterial streets (where left-turn egress is permitted). Left-turn lanes shall be provided on non-residential connectors intersecting minor arterial streets (where left-turn egress is permitted) where the left-turn volume is at least 20 vehicles in any hour. Left-turn lanes should be provided on any connector at any location as recommended by a traffic study or where the left-turn lane provides design efficiencies desired by the owner/developer with exception of access associated with residential property.

16.1.E. Left-turn lanes shall be provided at all median openings on roadways with medians.

Left Turn Lane Warrants						
			Left Turn Volume			
Intersection	Movement	Street Classification	AM	PM	Other	Meets Warrant
Blue Parkway and Colbern Road (roundabout)	Southbound	Major Arterial	5	41	Arterial/Arterial	Roundabout
	Eastbound	Major Arterial	31	11	Arterial/Arterial	Roundabout
	Northbound	Major Arterial	63	151	Arterial/Arterial	Roundabout
	Westbound	Major Arterial	9	19	Arterial/Arterial	Roundabout
Main Street and Colbern Road	Northbound	Collector	41	75	Arterial/Collector	YES, 200' Required
	Westbound	Major Arterial	23	14	Arterial/Collector, Median	YES, 200' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	4	17	Arterial/Collector	YES, 200' Required

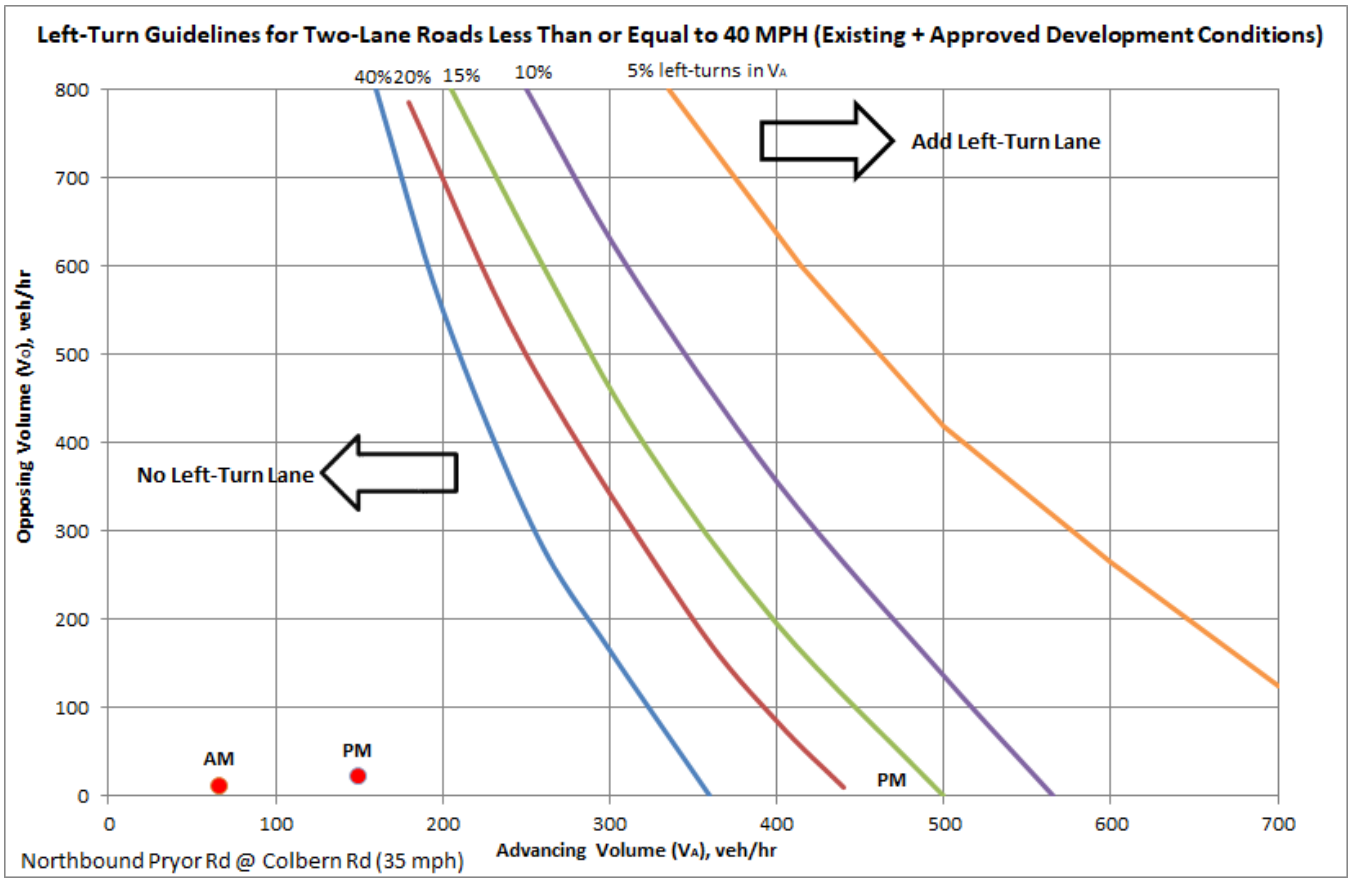
16.2. Right-Turn Lane Standards

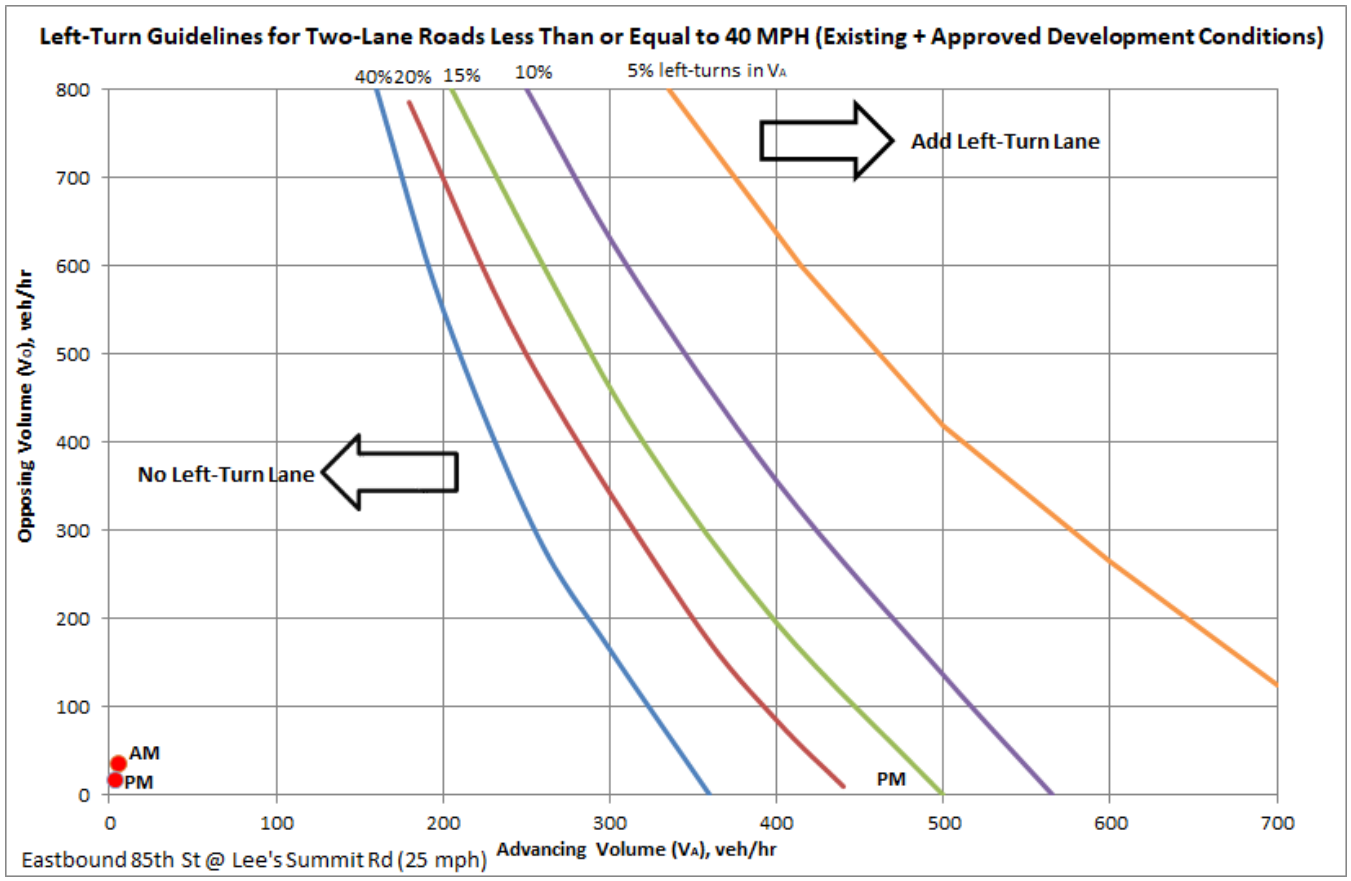
16.2.A. Required on arterial streets at each intersecting street or driveway where the right-turn volume on the major arterial street is or is projected to be at least 30 vehicles in any hour, or the right-turn volume on the minor arterial street is or is projected to be at least 60 vehicles in any hour. Minimum length should be 250 feet plus the taper on a major arterial at the intersection of another arterial street or 200 feet plus the taper on a minor arterial at the intersection with another arterial street or on a major arterial at the intersection of a collector and 150 feet plus the taper at other locations along arterial streets.

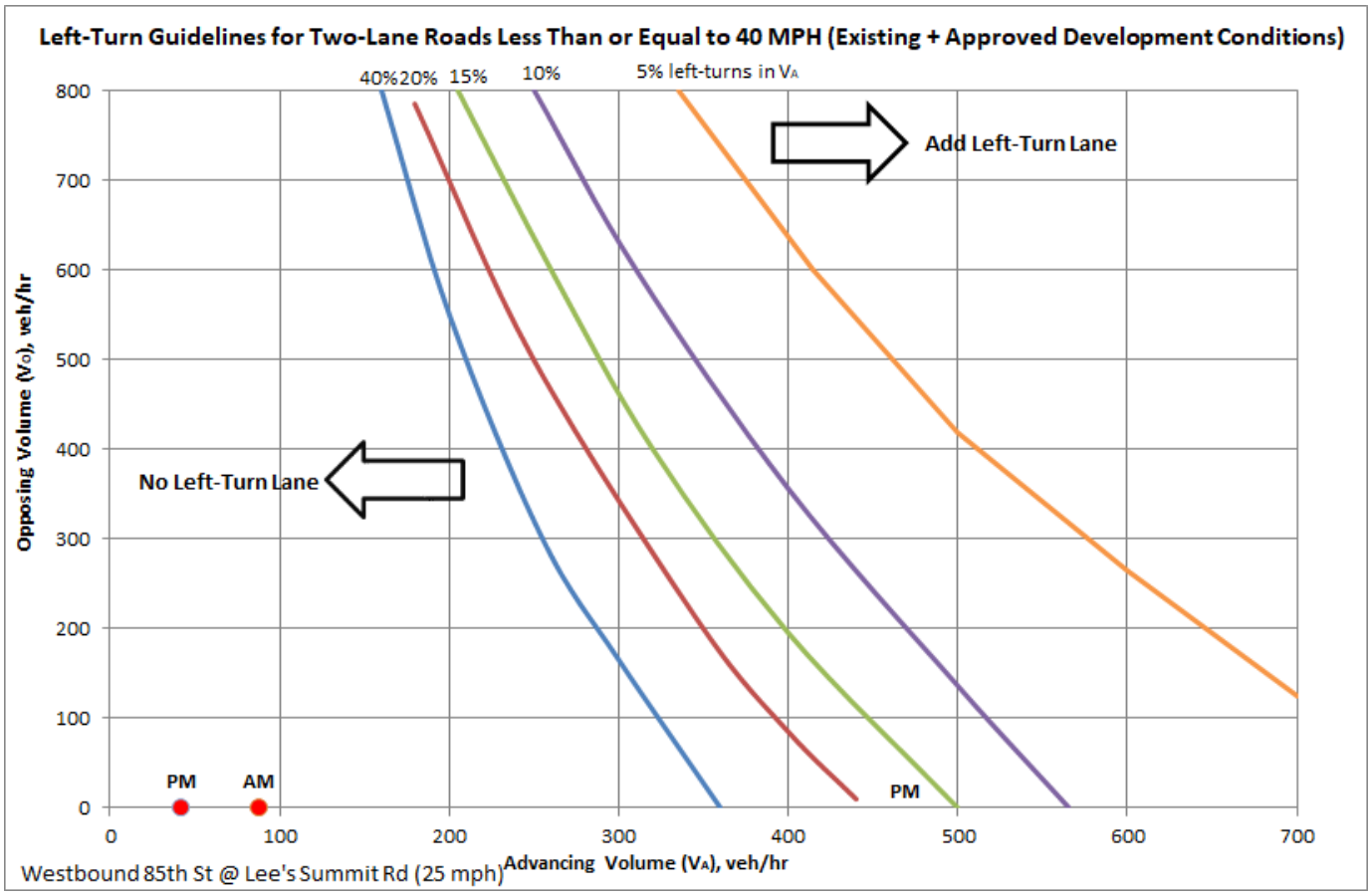
16.2.B. Required on collector streets in non-residential areas at the intersection with any street or driveway where the right-turn volume on the collector street is or is projected to be at least 100 vehicles in any hour. The minimum length should be 100 feet plus the taper.

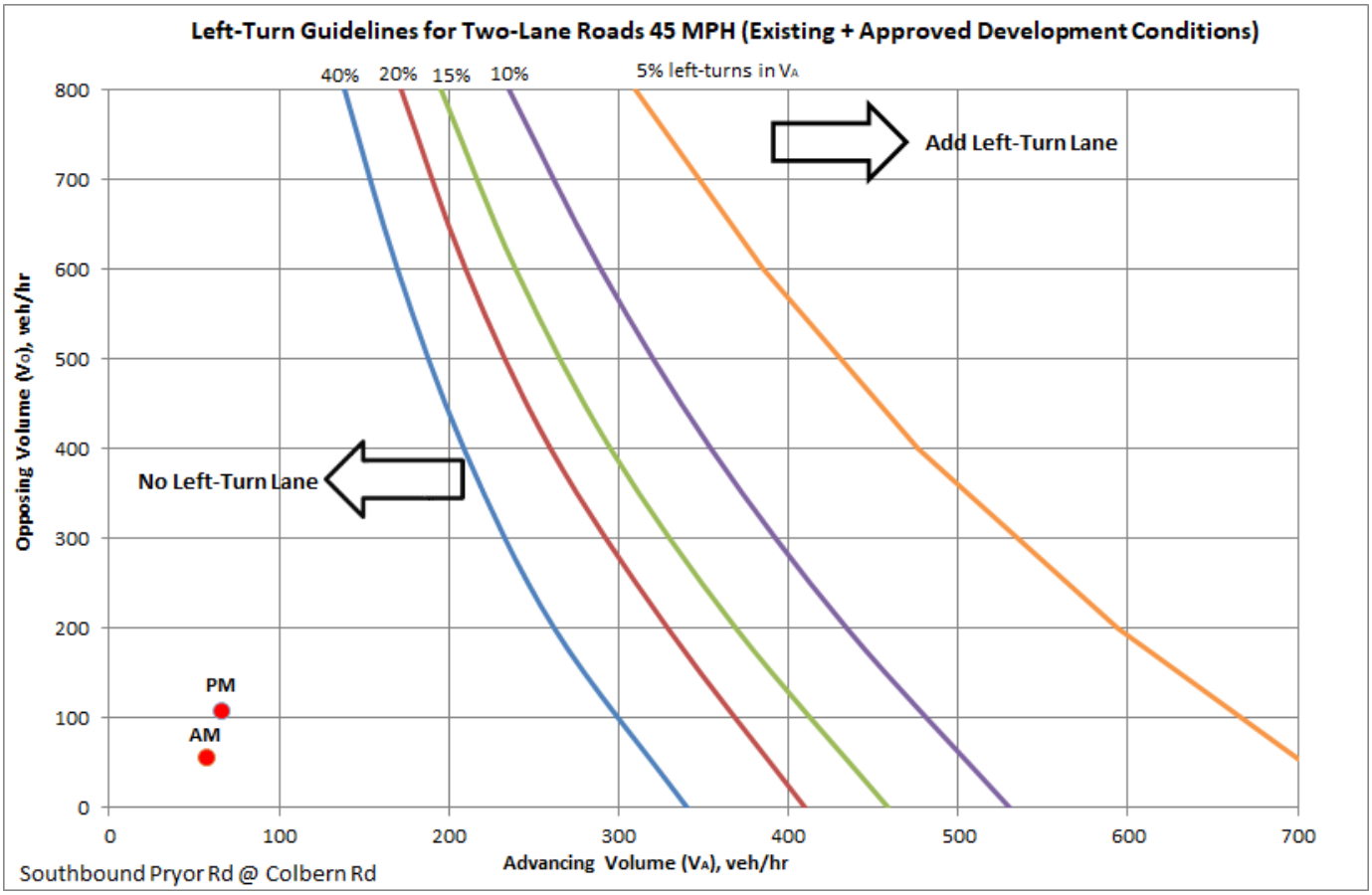
16.2.C. The length of the right-turn lane shall be increased as necessary to accommodate estimated queue length. The length of the right-turn lane at intersections controlled by traffic signals or roundabouts should be increased, if necessary, based on the longer of the queues in the turn lane or the adjacent through lane.

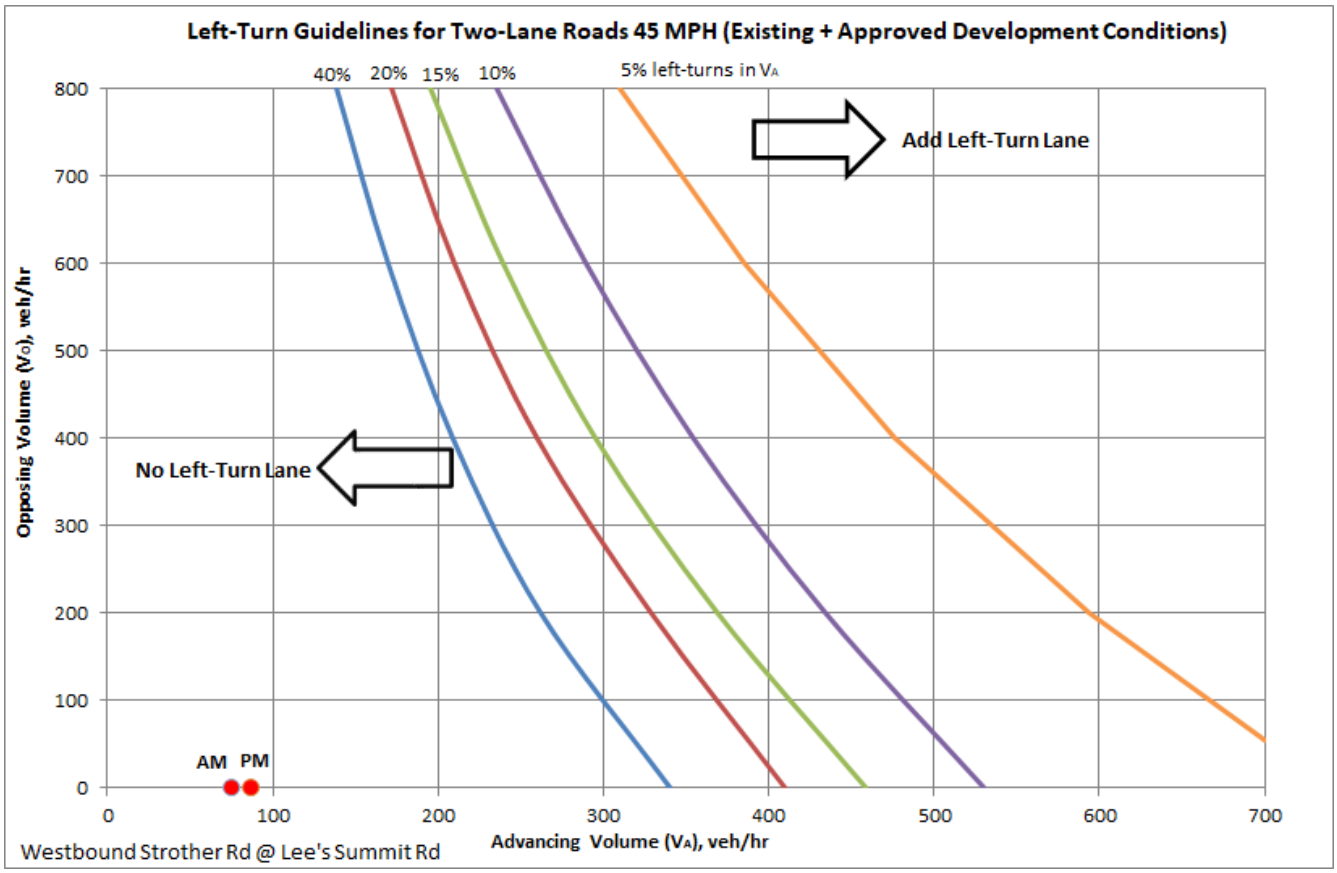
Right Turn Lane Warrants					
			Right Turn Volume		
Intersection	Movement	Street Classification	AM	PM	Meets Warrant
Blue Parkway and Colbern Road	Southbound	Major Arterial	3	12	NO
	Westbound	Major Arterial	19	6	NO
Main Street and Colbern Road	Northbound	Collector	7	28	NO
	Eastbound	Major Arterial	83	58	YES, 250' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	3	10	NO
	Northbound	Major Arterial	10	10	NO
Colbern Road and Douglas Street	Westbound	Major Arterial	47	76	YES, 250' Required
	Southbound	Major Arterial	22	36	PM Only

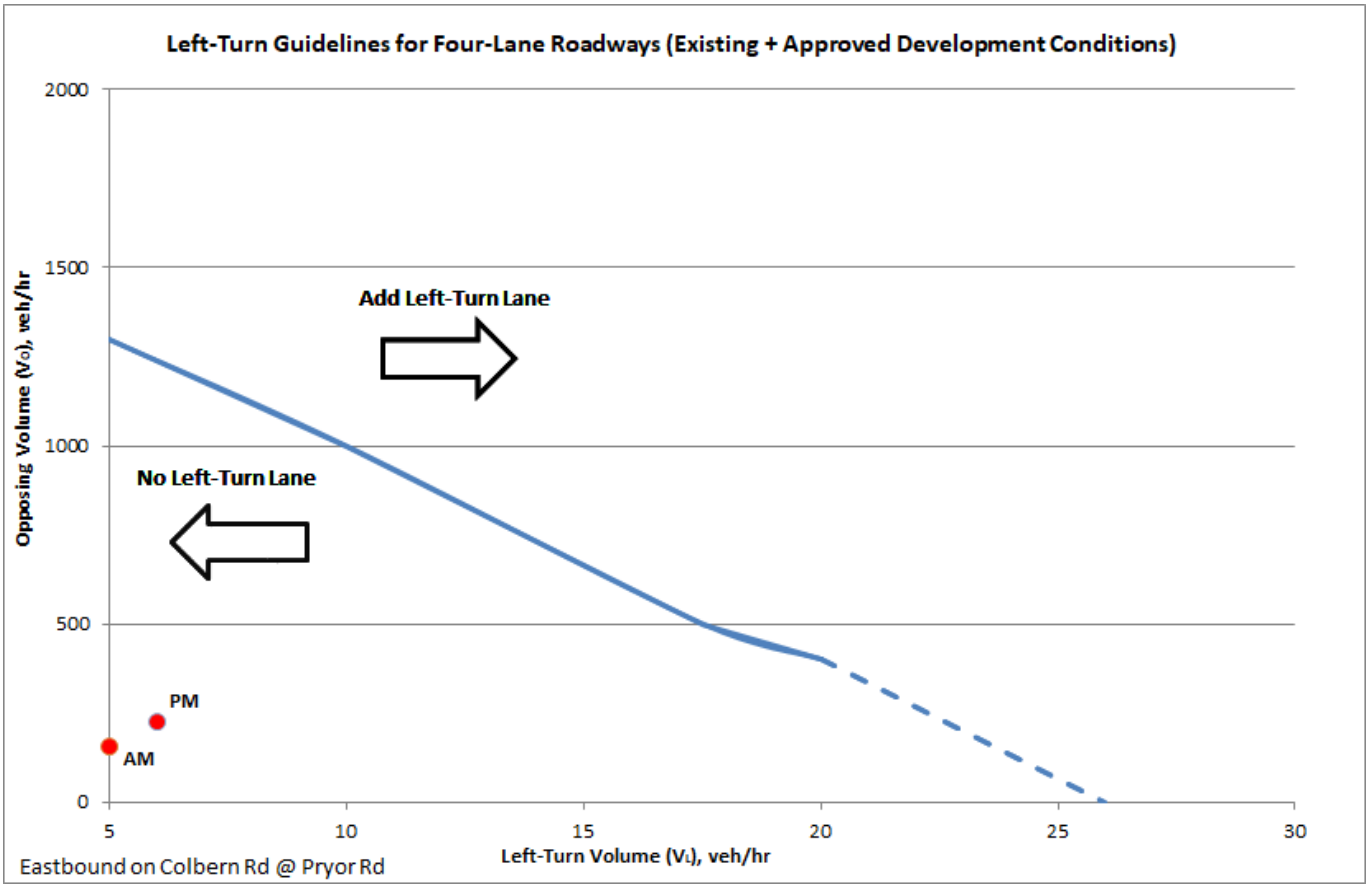

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Existing + Approved Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Northbound Pryor Rd @ Colbern Rd (35 mph)

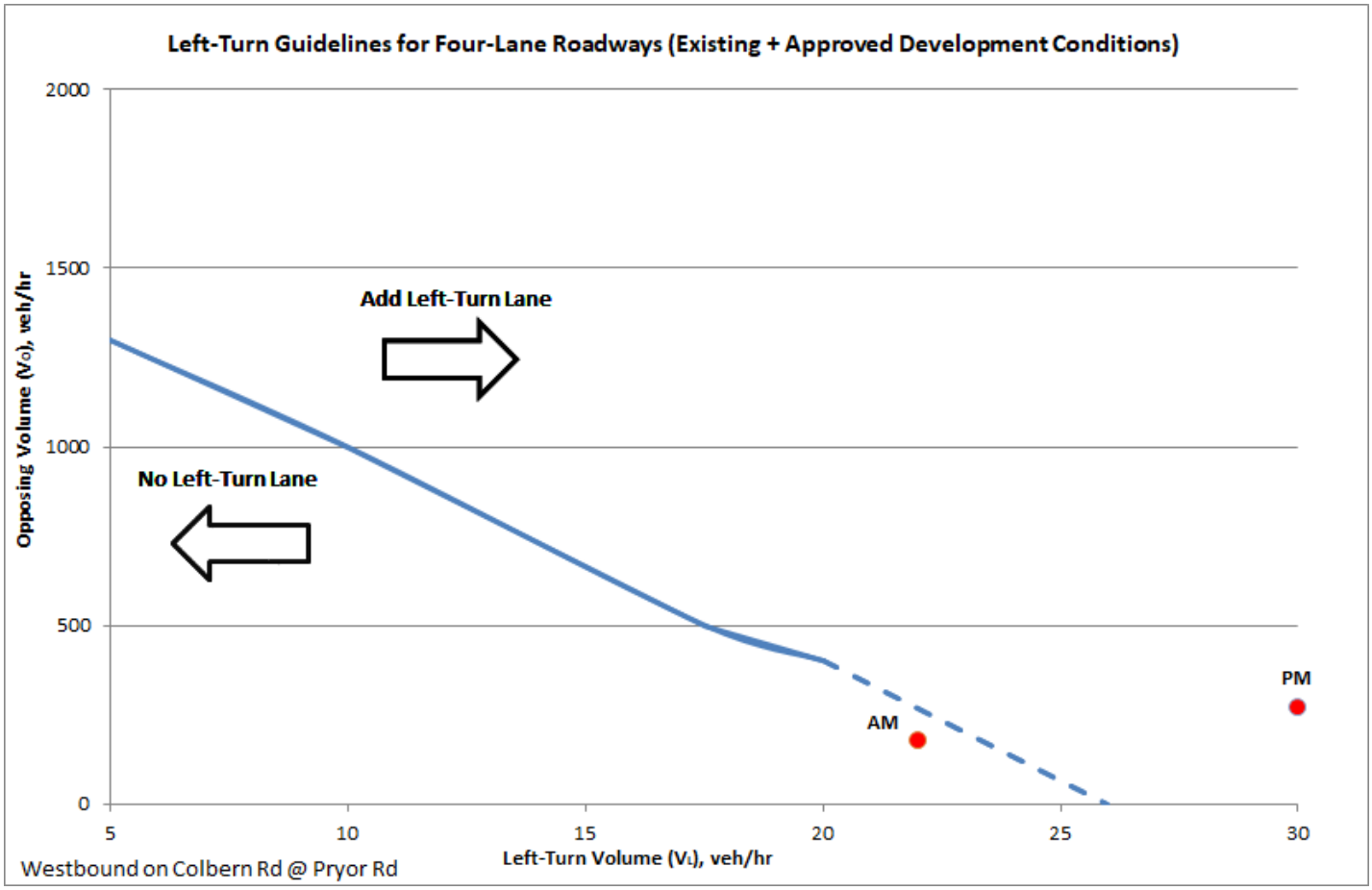

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Existing + Approved Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Eastbound 85th St @ Lee's Summit Rd (25 mph)

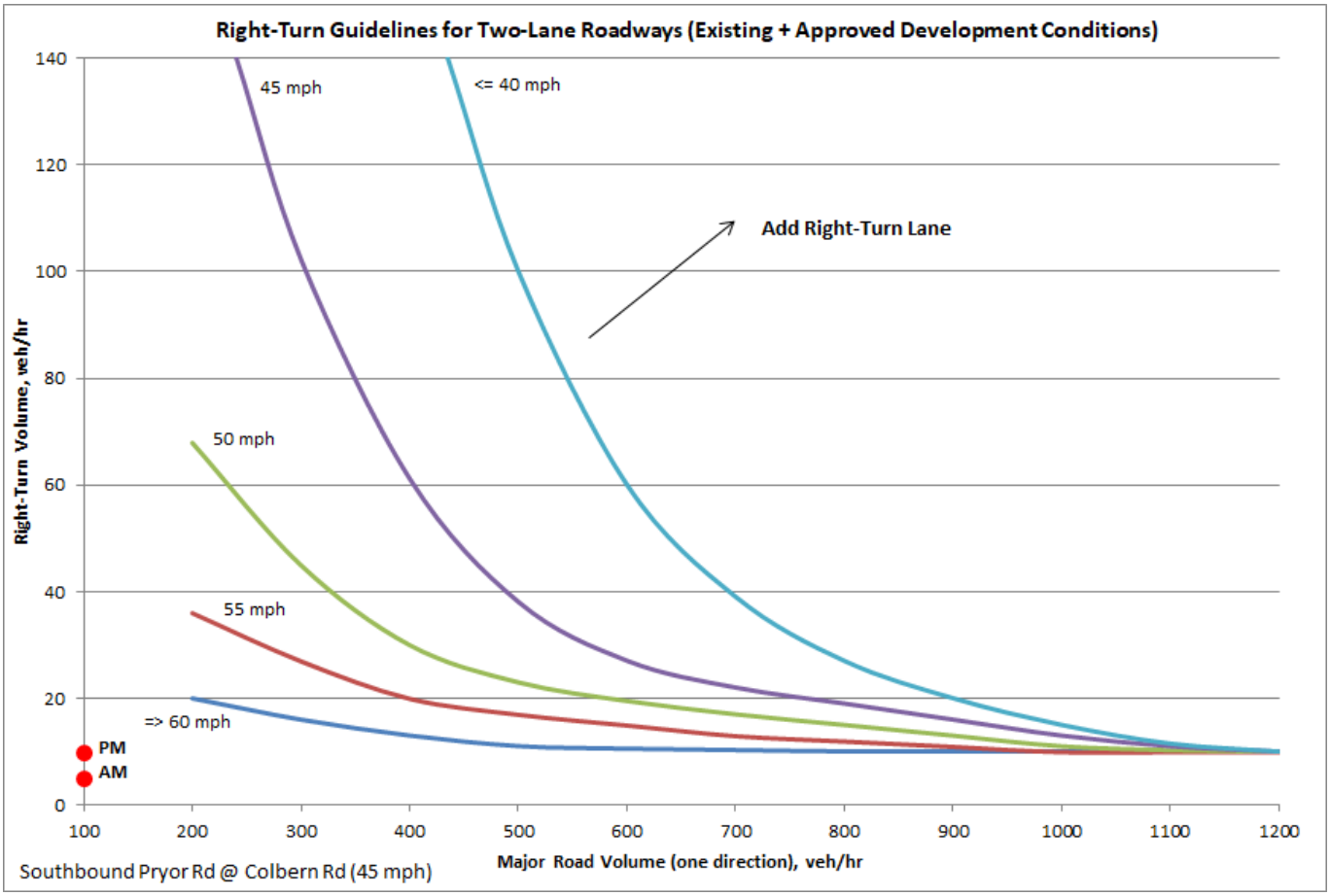

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Existing + Approved Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound 85th St @ Lee's Summit Rd (25 mph)

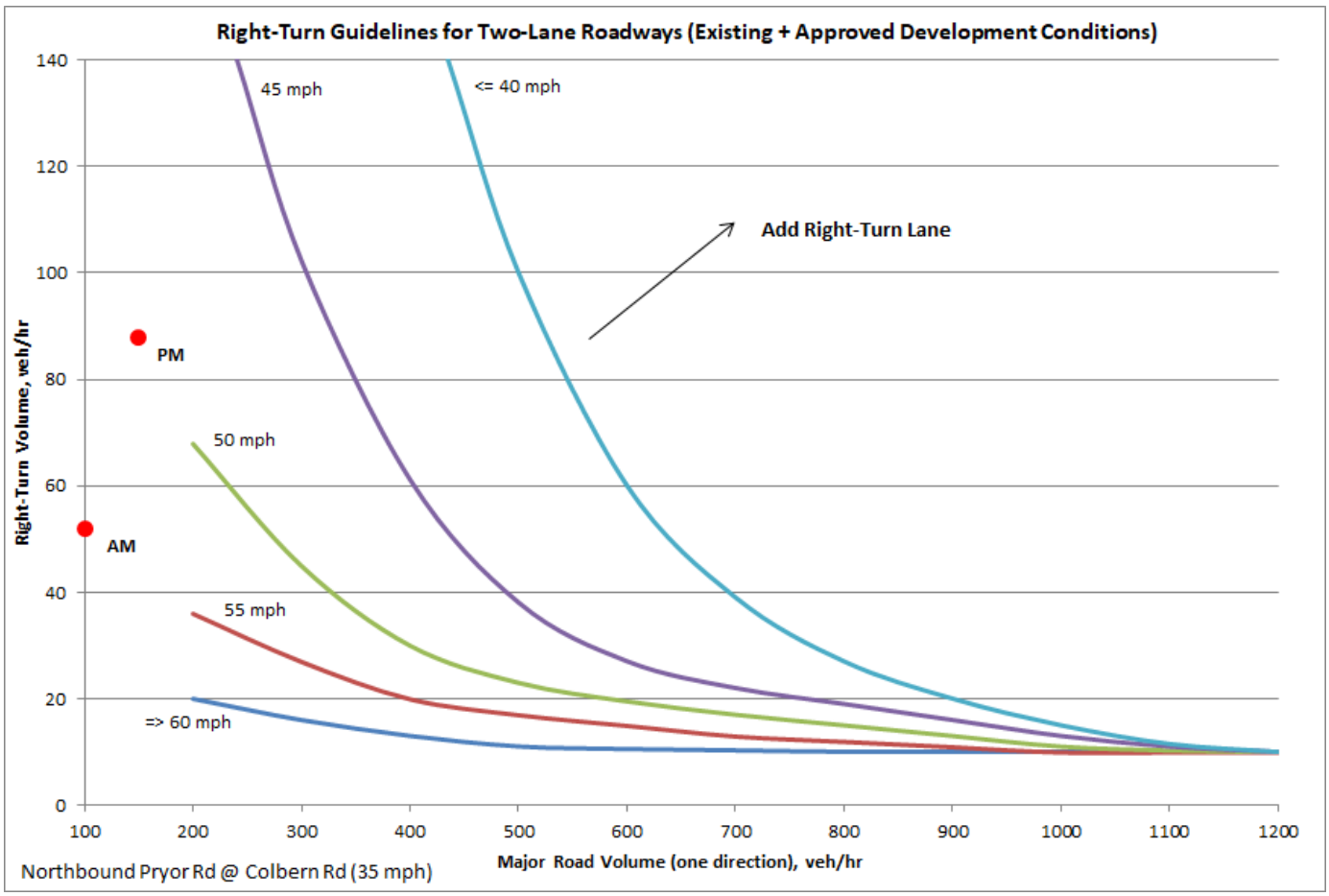

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Existing + Approved Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Southbound Pryor Rd @ Colbern Rd

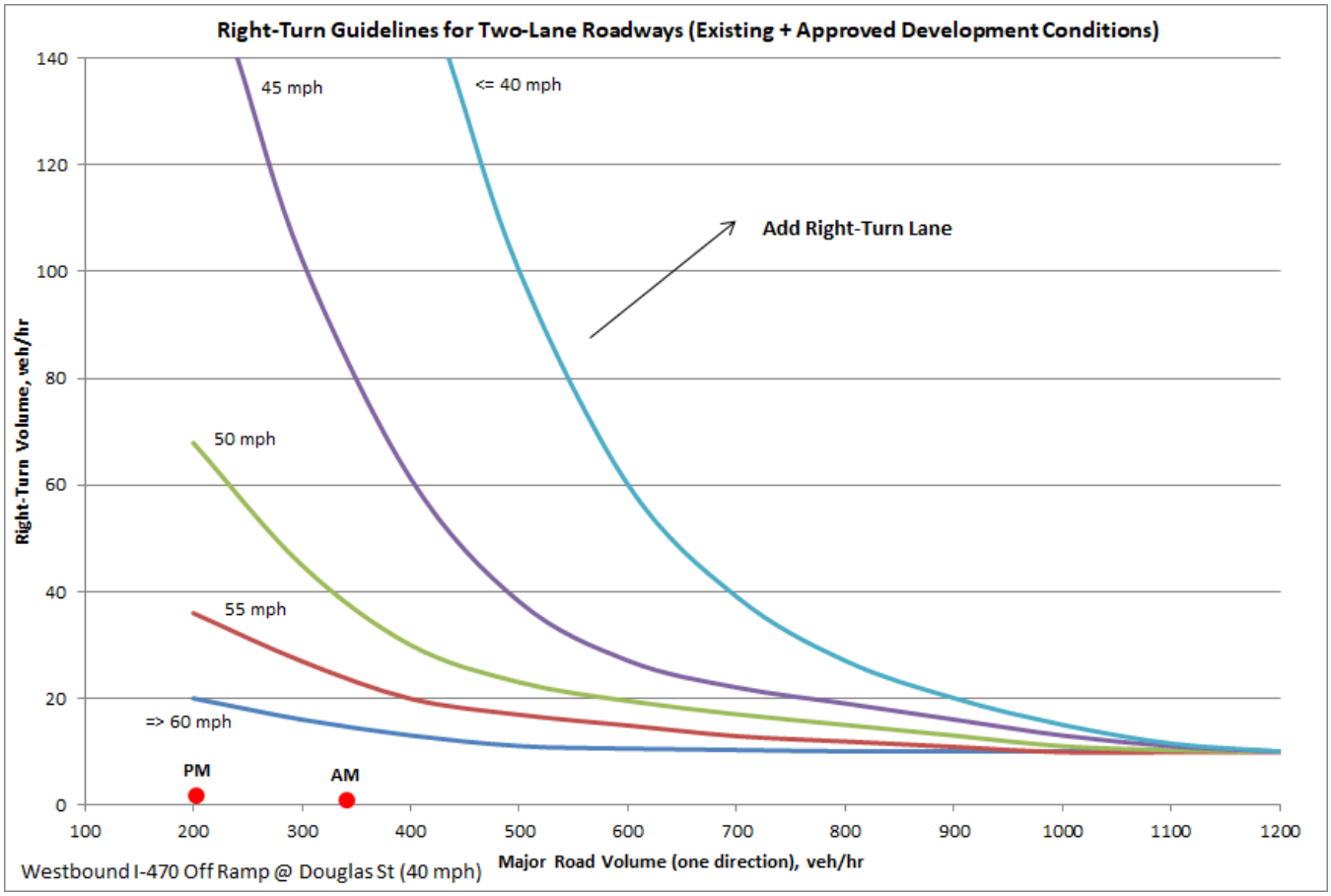

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Existing + Approved Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound Strother Rd @ Lee's Summit Rd

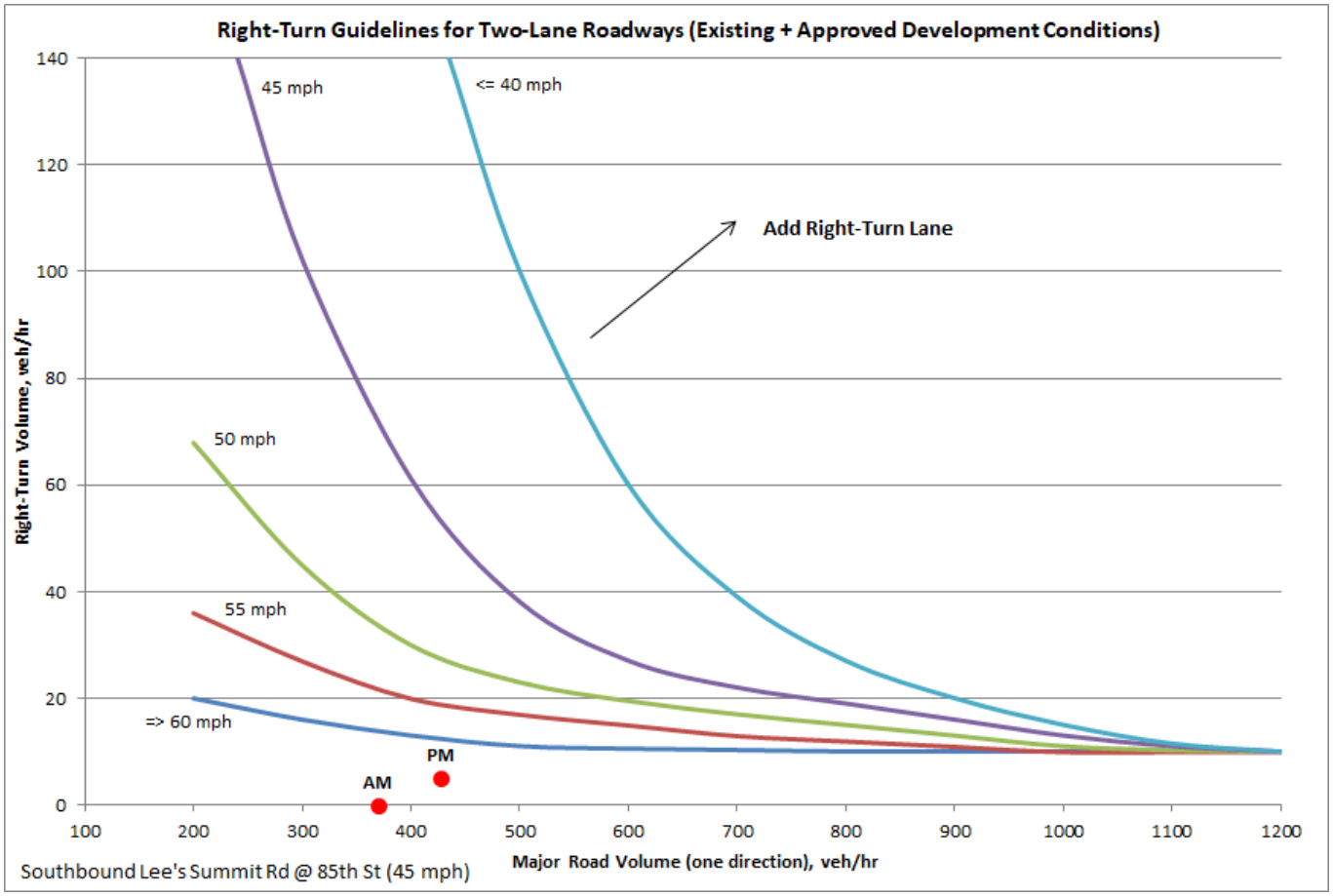

Left-Turn Guidelines for Four-Lane Roadways (Existing + Approved Development Conditions)
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Left-Turn Volume (VL), veh/hr
0
500
1000
1500
2000
5
10
15
20
25
30
Eastbound on Colbern Rd @ Pryor Rd

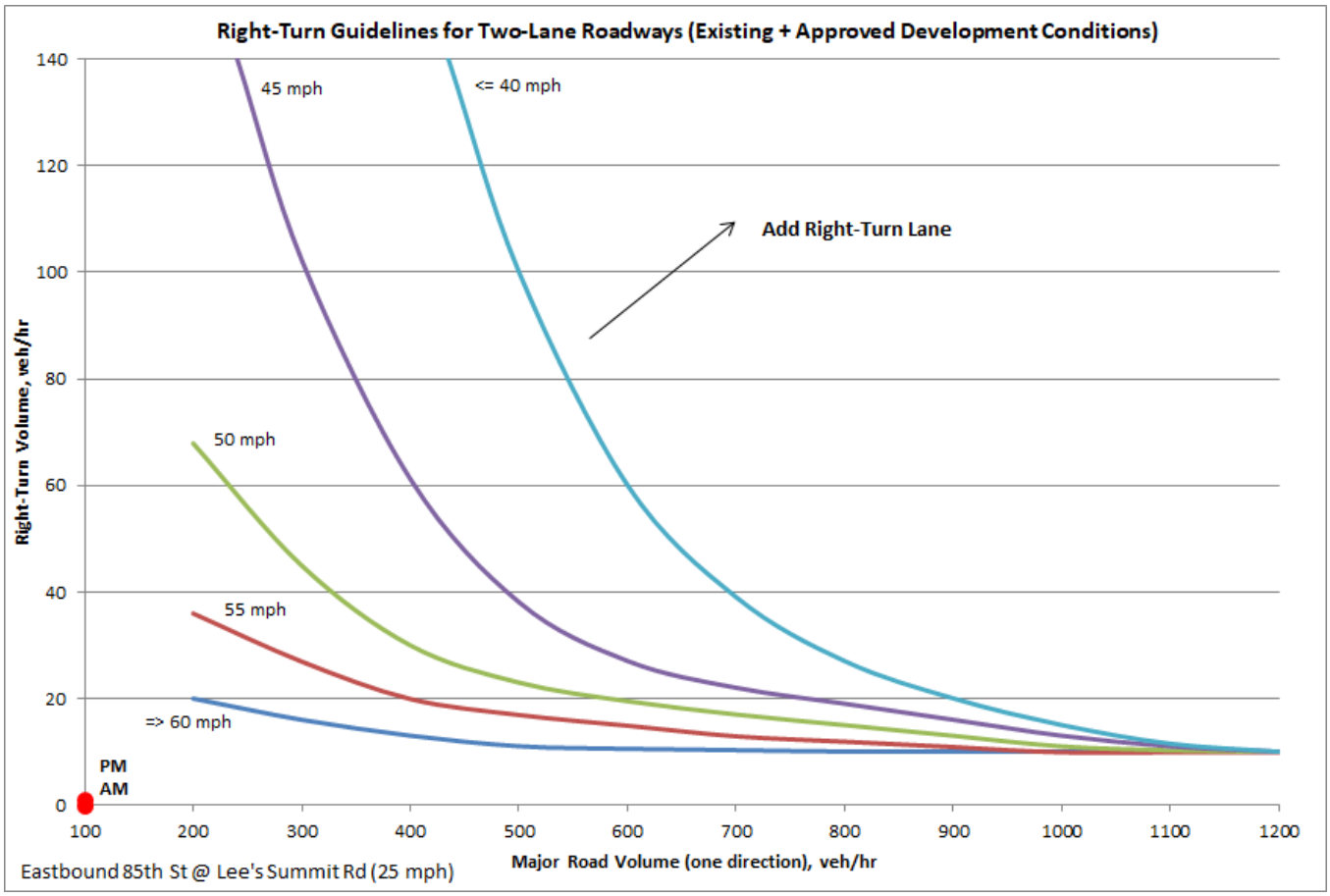

Left-Turn Guidelines for Four-Lane Roadways (Existing + Approved Development Conditions)
Opposing Volume (Vo), veh/hr
2000
1500
1000
500
0
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
5
10
15
20
25
30
Left-Turn Volume (VL), veh/hr
Westbound on Colbern Rd @ Pryor Rd

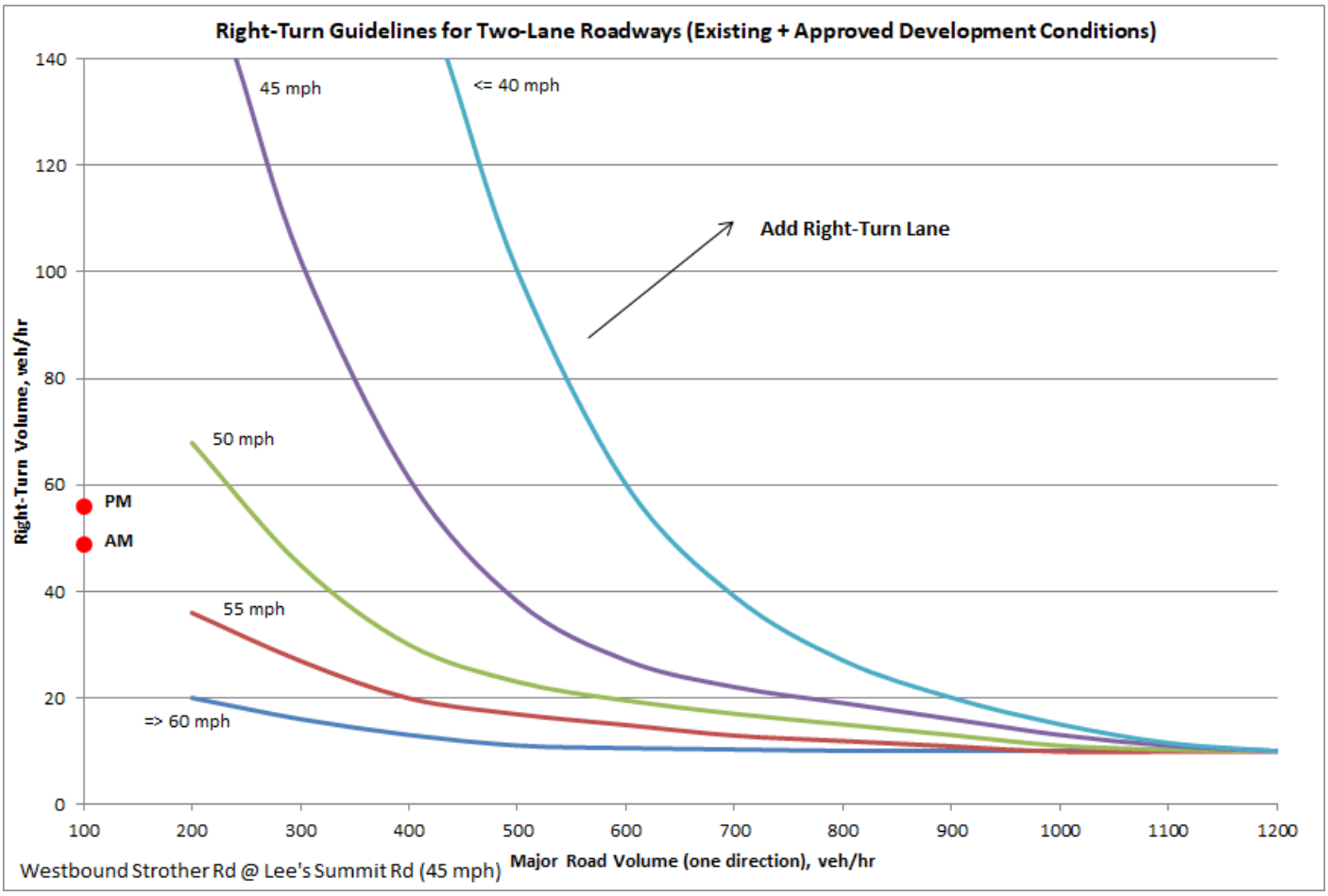

Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
=> 60 mph
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Southbound Pryor Rd @ Colbern Rd (45 mph)

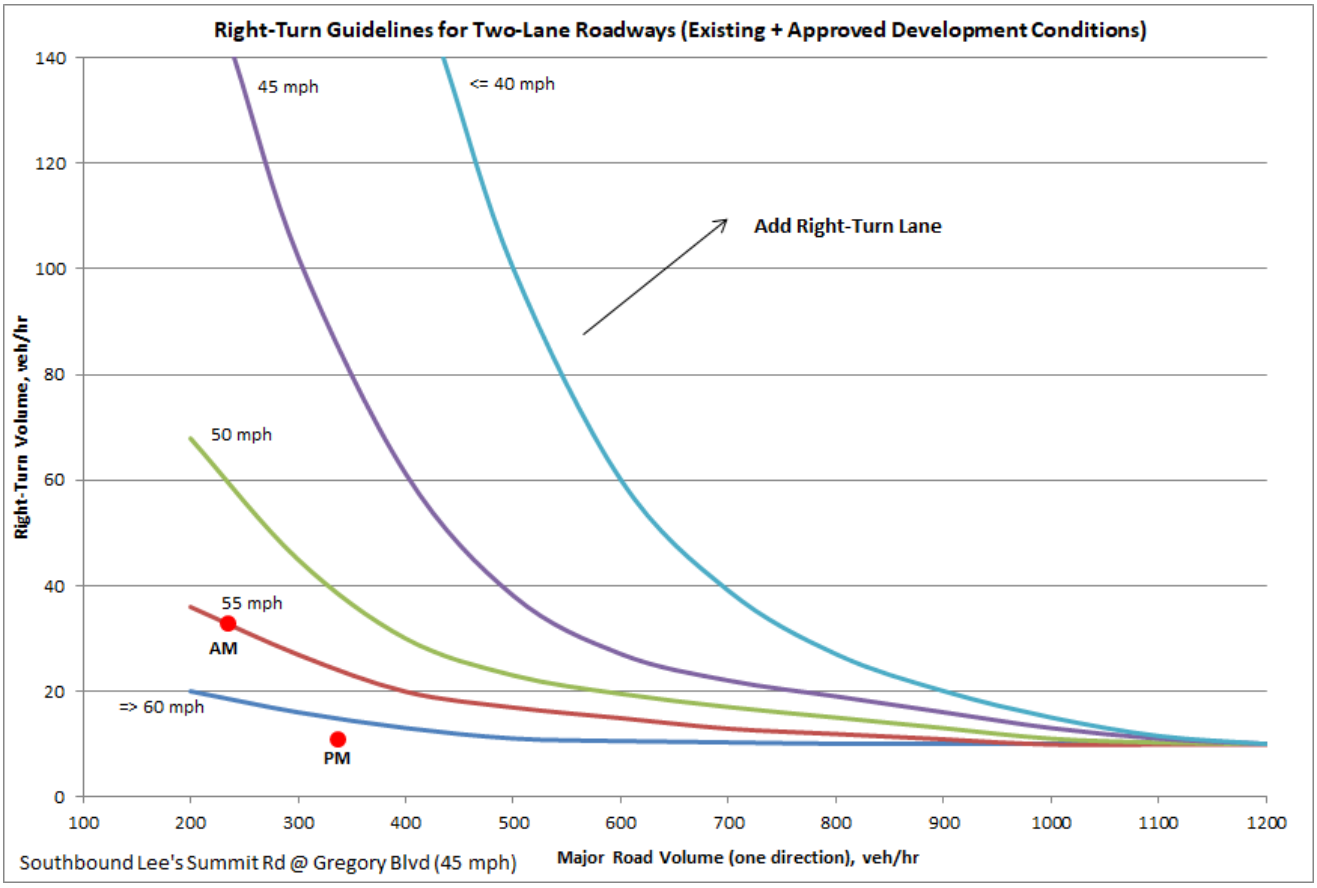

Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
PM
50 mph
AM
55 mph
=> 60 mph
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Northbound Pryor Rd @ Colbern Rd (35 mph)

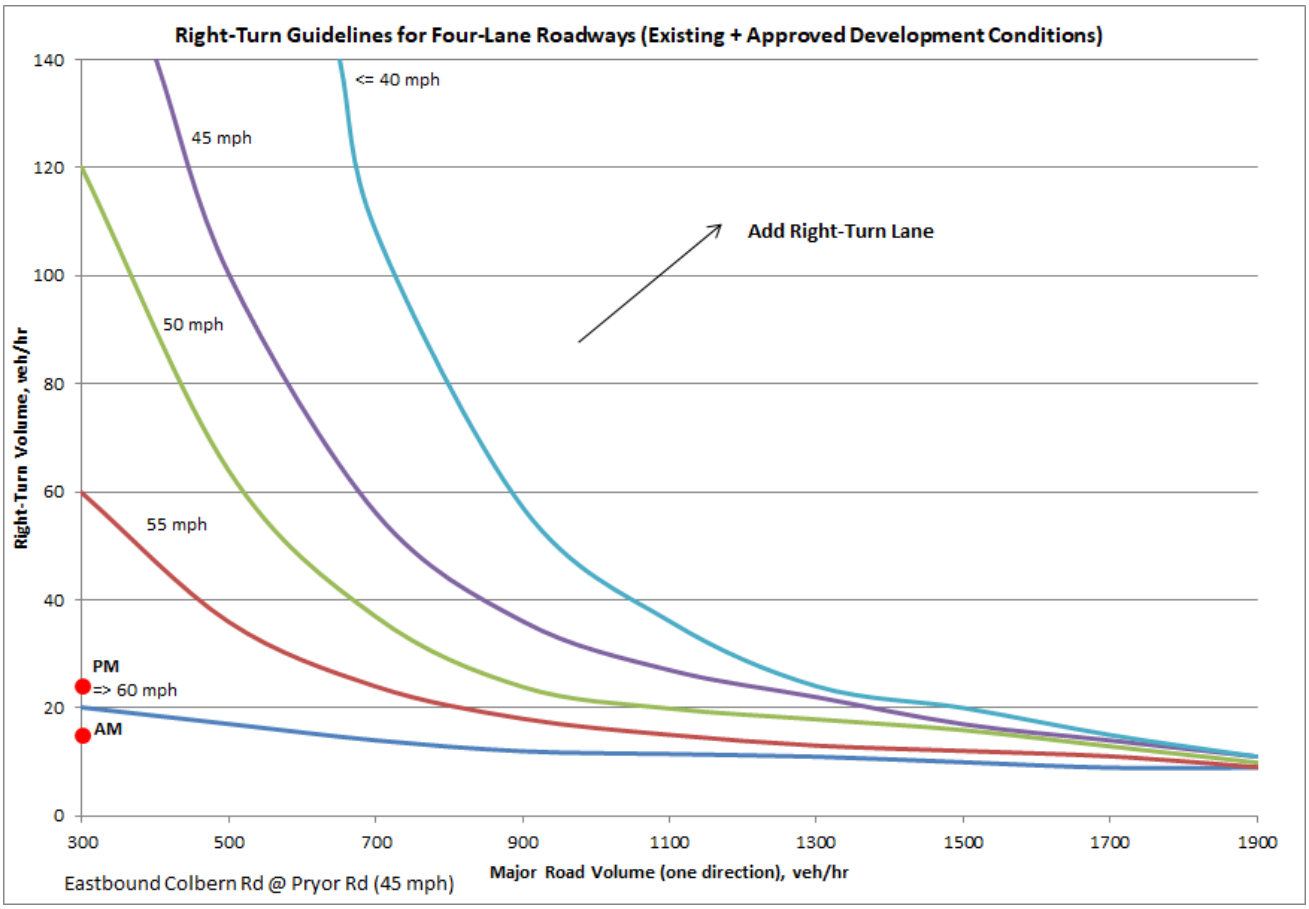

Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Westbound I-470 Off Ramp @ Douglas St (40 mph)

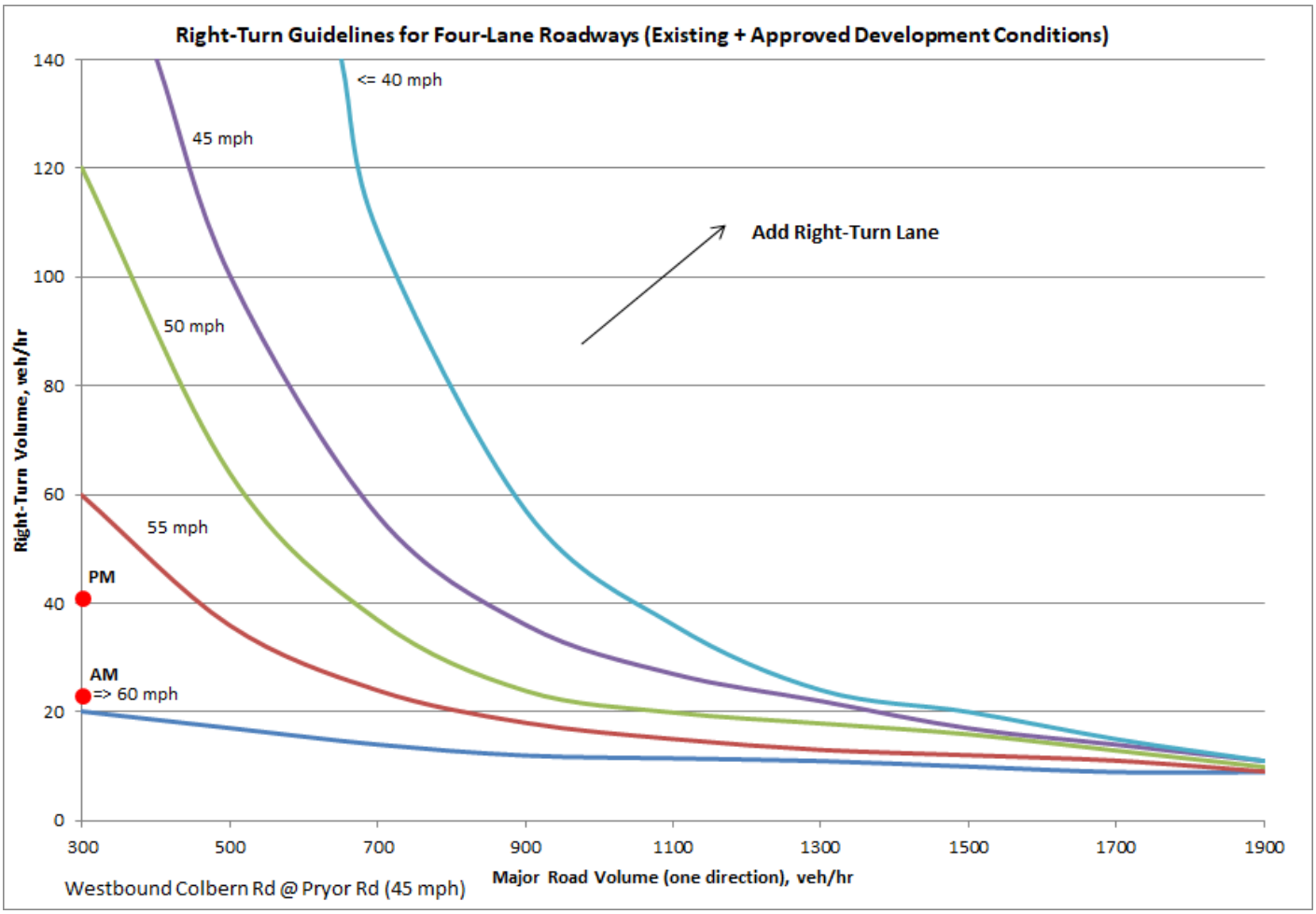

Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Southbound Lee's Summit Rd @ 85th St (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
=> 60 mph
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Eastbound 85th St @ Lee's Summit Rd (25 mph)


Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
PM
AM
55 mph
=> 60 mph
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Westbound Strother Rd @ Lee's Summit Rd (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
AM
=> 60 mph
PM
Southbound Lee's Summit Rd @ Gregory Blvd (45 mph)

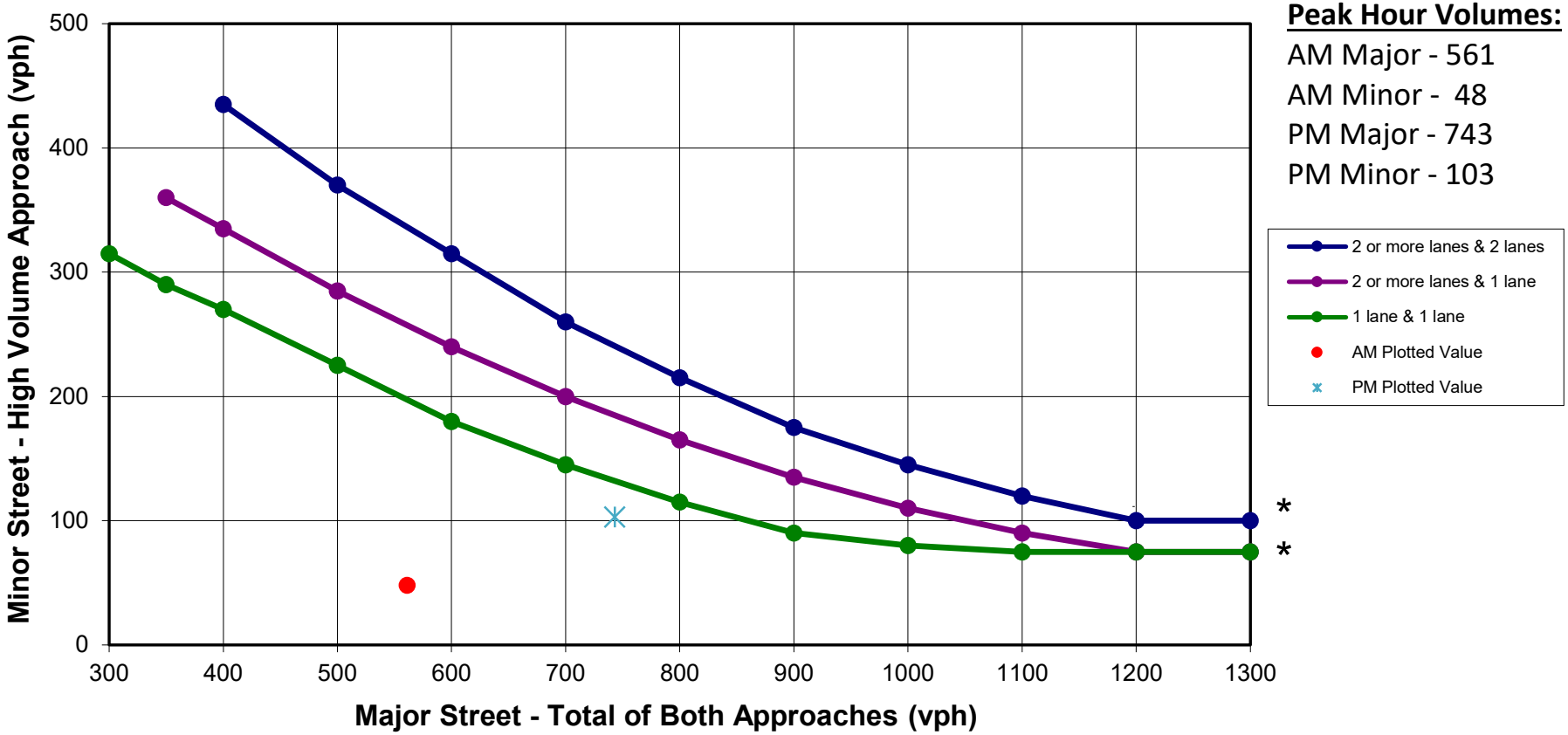

Right-Turn Guidelines for Four-Lane Roadways (Existing + Approved Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
<= 40 mph
45 mph
Add Right-Turn Lane
50 mph
55 mph
PM
=> 60 mph
AM
Eastbound Colbern Rd @ Pryor Rd (45 mph)


Right-Turn Guidelines for Four-Lane Roadways (Existing + Approved Development Conditions)
<= 40 mph
45 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
0
20
40
60
80
100
120
140
300
500
700
900
1100
1300
1500
1700
1900
Westbound Colbern Rd @ Pryor Rd (45 mph)

Signal Warrants

Peak Hour Volume Warrant (Existing + Approved)
Colbern Road & Main Street

(Community less than 10,000 population or above 40mph on major street)



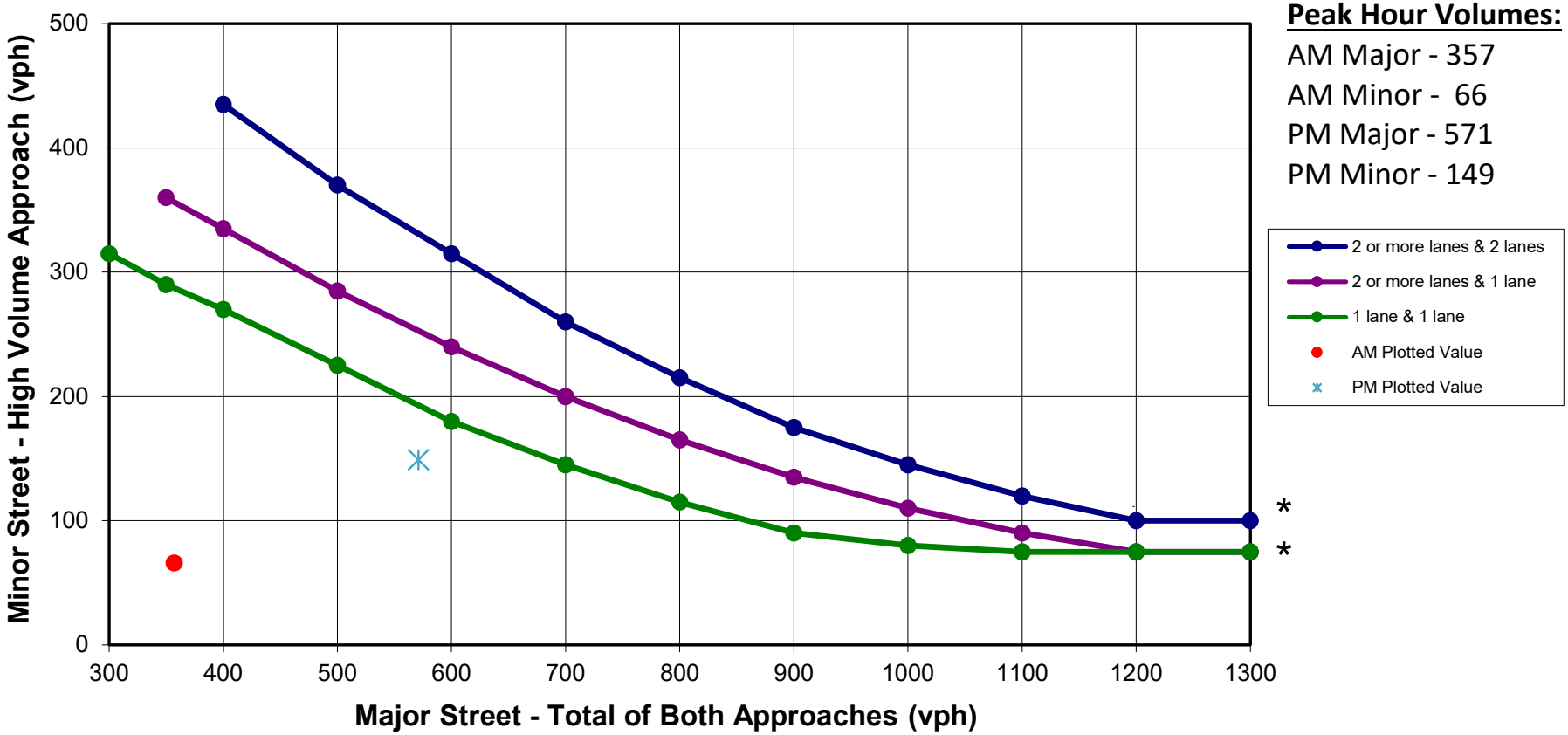
Peak Hour Volumes:

AM Major - 561
AM Minor - 48
PM Major - 743
PM Minor - 103

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Approved)
Colbern Road & Pryor Road

(Community less than 10,000 population or above 40mph on major street)



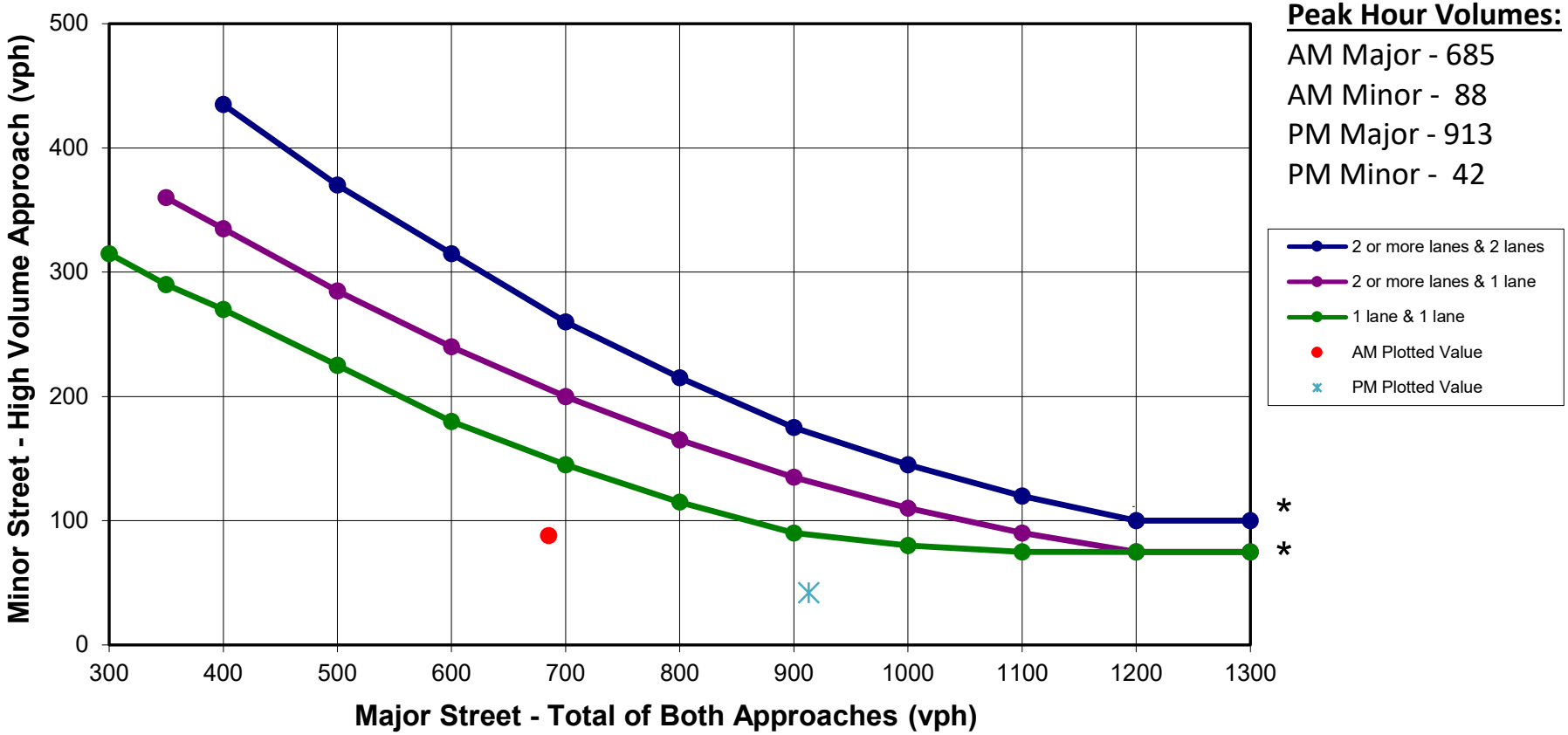
Peak Hour Volumes:

AM Major - 357
AM Minor - 66
PM Major - 571
PM Minor - 149

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Approved)
Lee's Summit Road & 85th Street

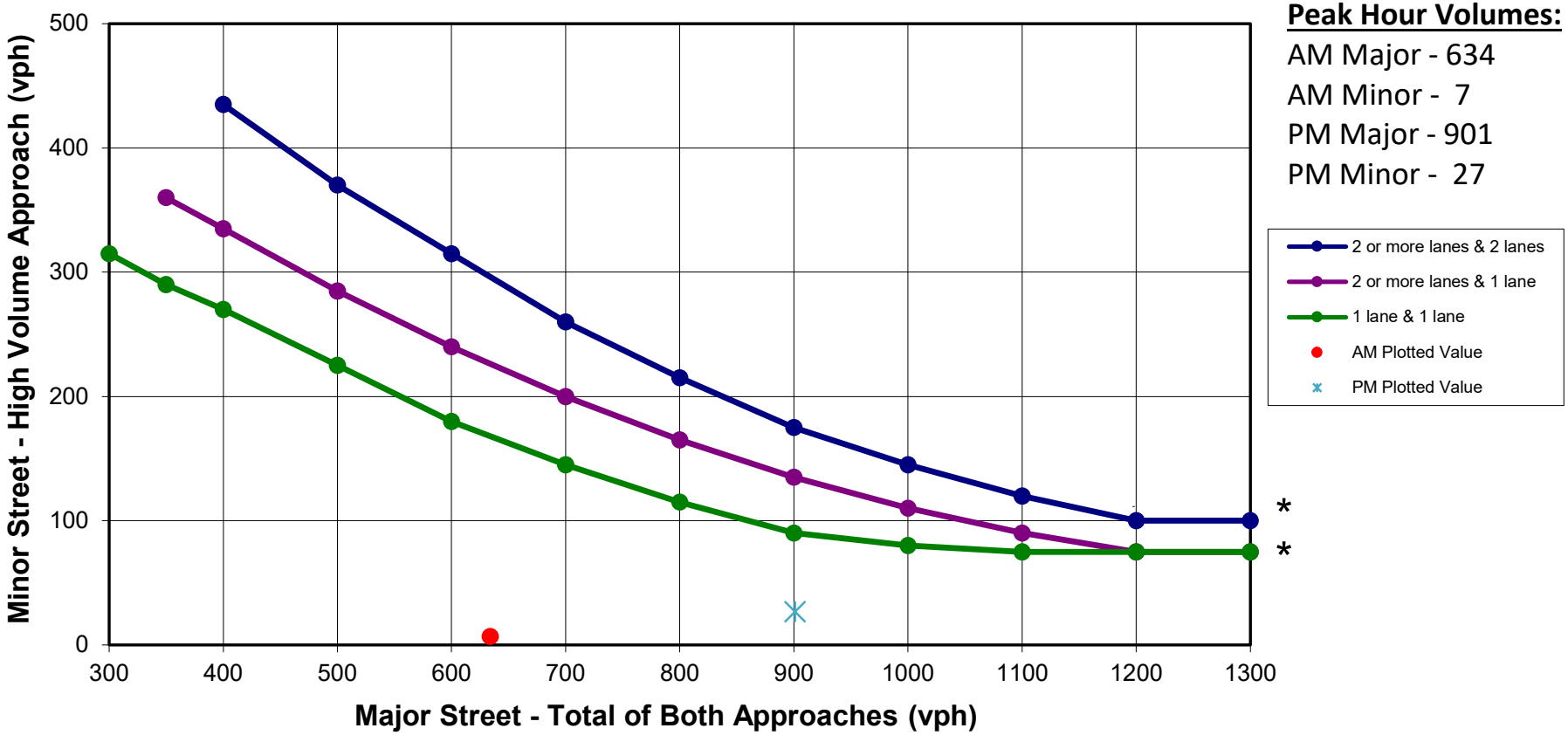
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Approved)
Lee's Summit Road & Douglas Road

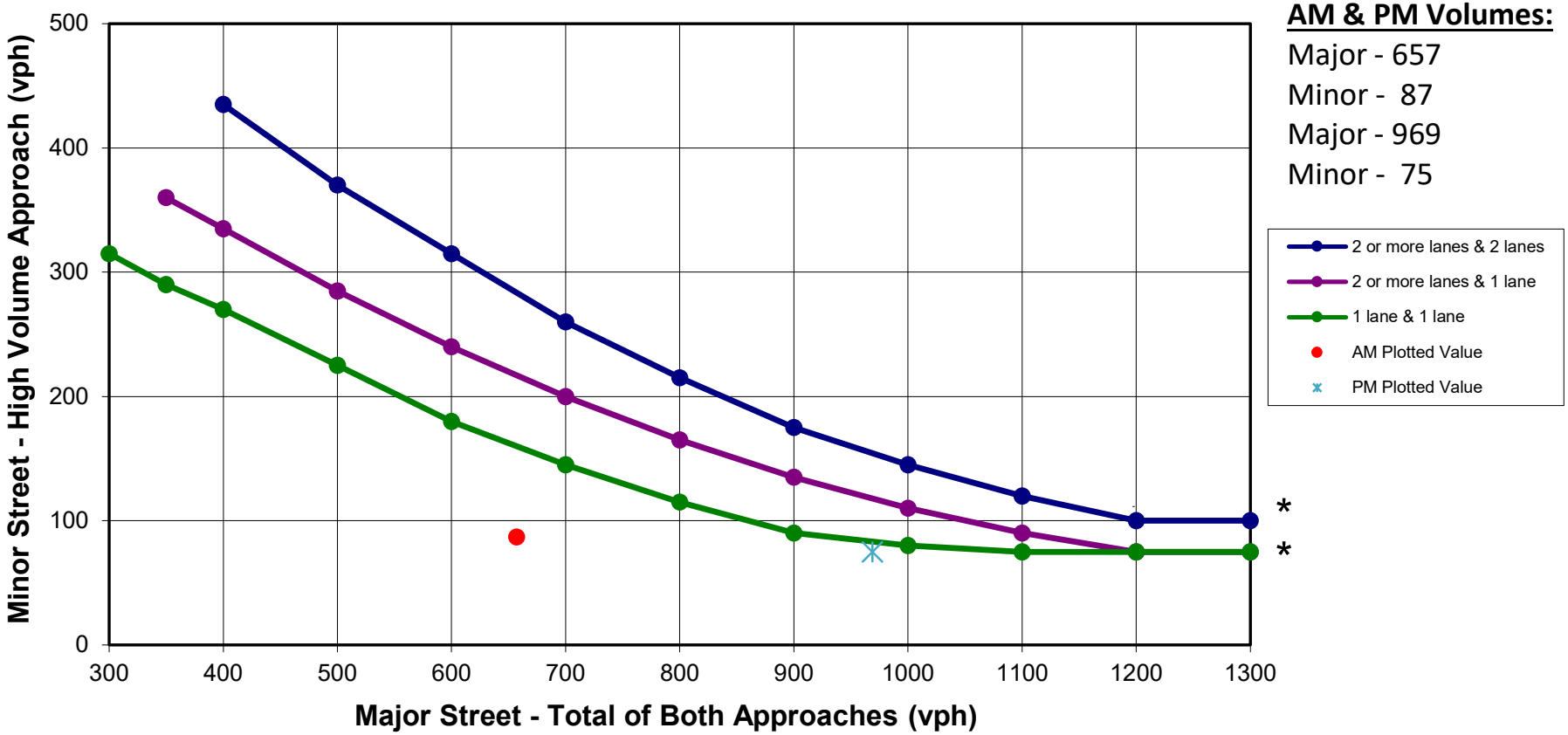
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Approved)
Lee's Summit Road & Strother Road

(Community less than 10,000 population or above 40mph on major street)



AM & PM Volumes:

Major - 657
Minor - 87
Major - 969
Minor - 75

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Capacity Analysis

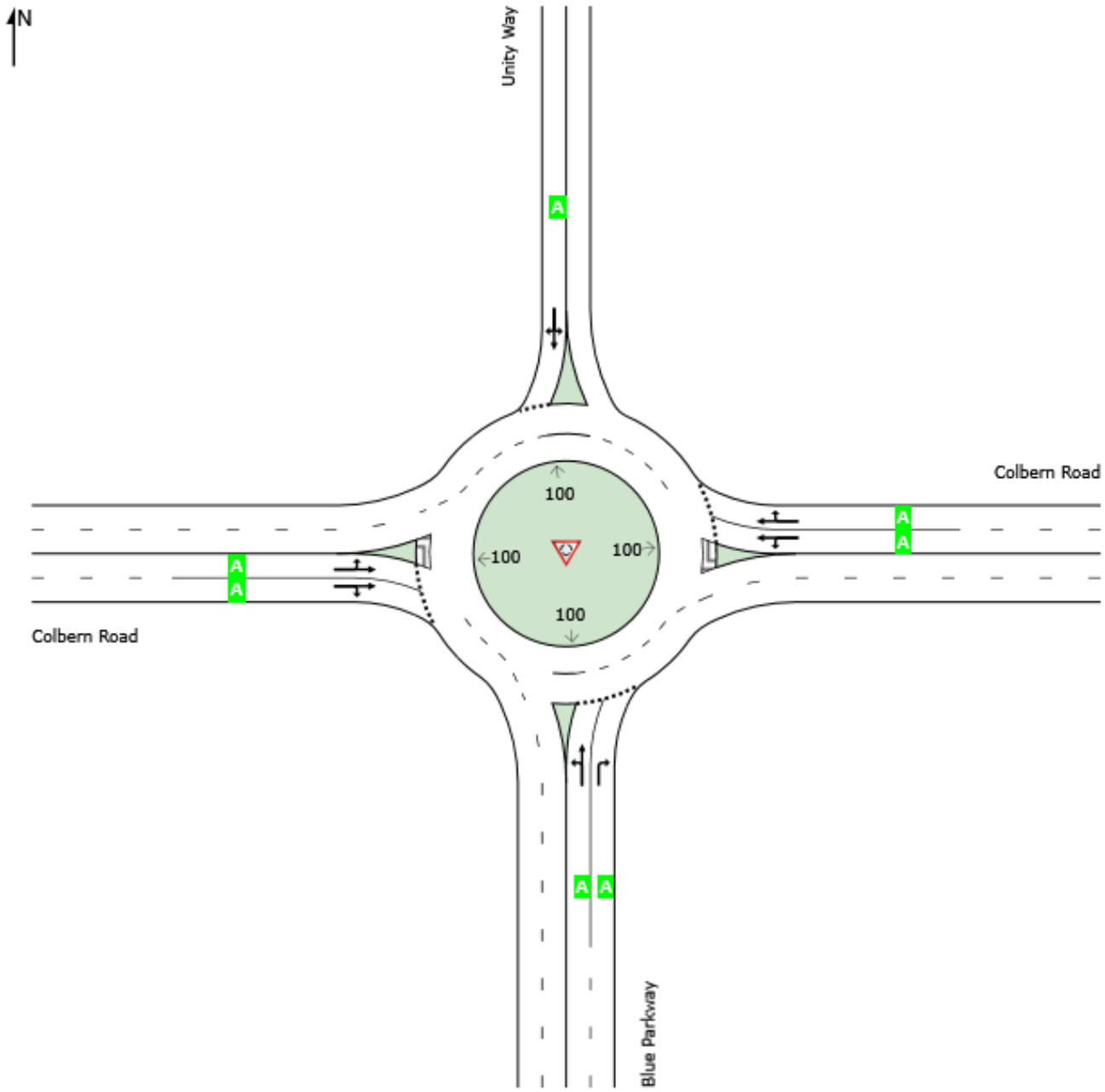
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	63	2.0	67	2.0	0.070	3.8	LOS A	0.3	6.5	0.33	0.21	0.33	21.0
8	T1	11	2.0	12	2.0	0.070	3.8	LOS A	0.3	6.5	0.33	0.21	0.33	18.3
18	R2	12	2.0	13	2.0	0.012	3.5	LOS A	0.0	1.1	0.33	0.18	0.33	21.0
Approach		86	2.0	91	2.0	0.070	3.8	LOS A	0.3	6.5	0.33	0.21	0.33	20.6
East: Colbern Road														
1	L2	31	2.0	33	2.0	0.140	4.0	LOS A	0.6	15.3	0.21	0.10	0.21	20.8
6	T1	288	2.0	306	2.0	0.140	4.0	LOS A	0.6	15.3	0.21	0.10	0.21	20.9
16	R2	19	2.0	20	2.0	0.140	4.0	LOS A	0.6	15.3	0.21	0.10	0.21	18.1
Approach		338	2.0	360	2.0	0.140	4.0	LOS A	0.6	15.3	0.21	0.10	0.21	20.7
North: Unity Way														
7	L2	5	2.0	5	2.0	0.010	3.8	LOS A	0.0	0.9	0.40	0.25	0.40	21.2
4	T1	1	2.0	1	2.0	0.010	3.8	LOS A	0.0	0.9	0.40	0.25	0.40	20.6
14	R2	3	2.0	3	2.0	0.010	3.8	LOS A	0.0	0.9	0.40	0.25	0.40	20.7
Approach		9	2.0	10	2.0	0.010	3.8	LOS A	0.0	0.9	0.40	0.25	0.40	20.9
West: Colbern Road														
5	L2	9	2.0	10	2.0	0.152	3.9	LOS A	0.7	17.0	0.14	0.05	0.14	18.8
2	T1	223	2.0	237	2.0	0.152	3.9	LOS A	0.7	17.0	0.14	0.05	0.14	20.9
12	R2	152	2.0	162	2.0	0.152	3.9	LOS A	0.7	17.0	0.14	0.05	0.14	20.5
Approach		384	2.0	409	2.0	0.152	3.9	LOS A	0.7	17.0	0.14	0.05	0.14	20.7
All Vehicles		817	2.0	869	2.0	0.152	3.9	LOS A	0.7	17.0	0.19	0.09	0.19	20.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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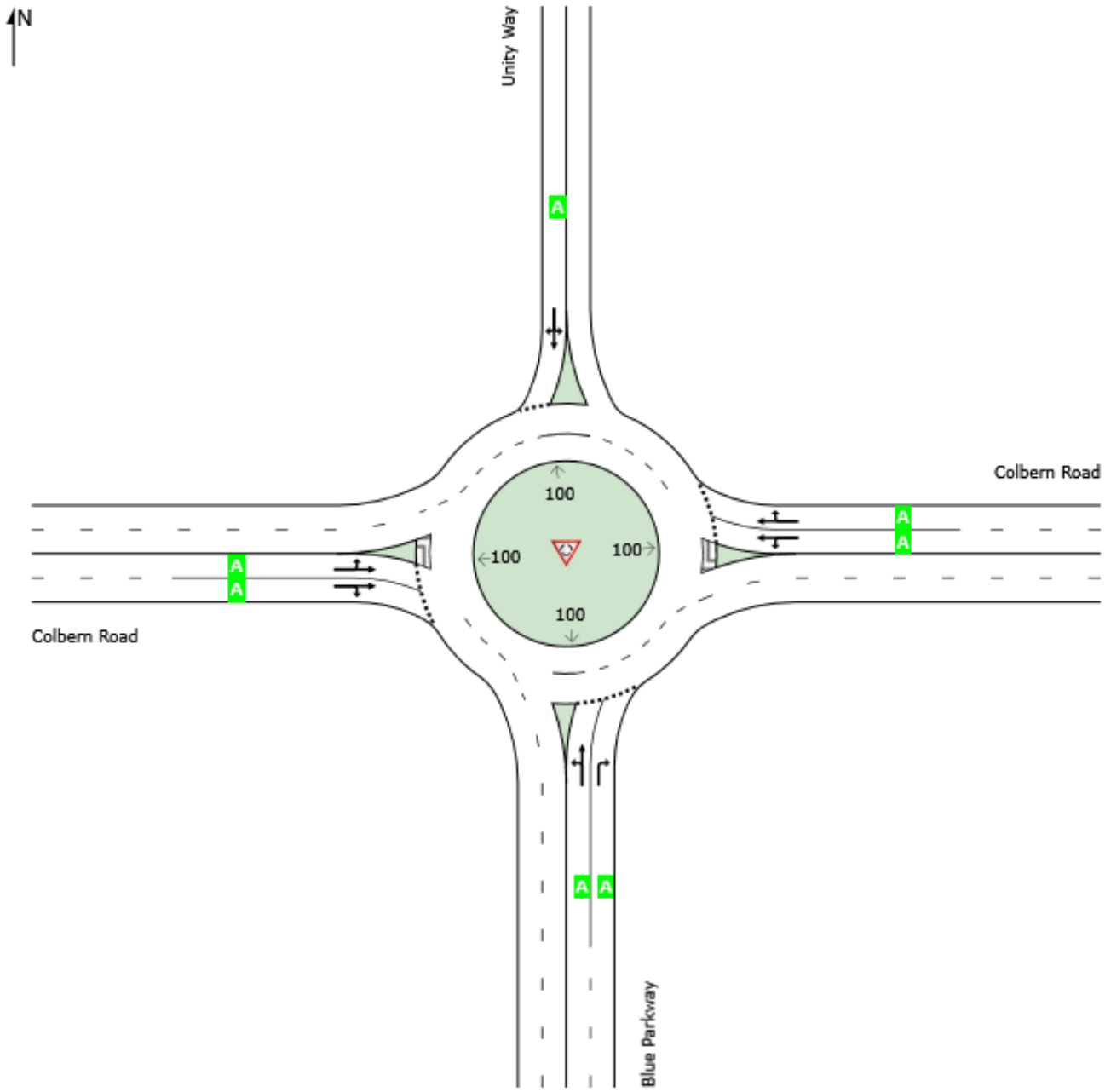
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	151	2.0	172	2.0	0.201	6.1	LOS A	0.8	19.7	0.52	0.48	0.52	20.6
8	T1	5	2.0	6	2.0	0.201	6.1	LOS A	0.8	19.7	0.52	0.48	0.52	18.0
18	R2	69	2.0	78	2.0	0.097	5.4	LOS A	0.4	9.0	0.50	0.44	0.50	20.6
Approach		225	2.0	256	2.0	0.201	5.9	LOS A	0.8	19.7	0.51	0.47	0.51	20.5
East: Colbern Road														
1	L2	19	2.0	22	2.0	0.146	4.3	LOS A	0.6	15.5	0.33	0.20	0.33	20.8
6	T1	274	2.0	311	2.0	0.146	4.3	LOS A	0.6	15.5	0.33	0.20	0.33	20.8
16	R2	6	2.0	7	2.0	0.146	4.3	LOS A	0.6	15.5	0.33	0.20	0.33	18.0
Approach		299	2.0	340	2.0	0.146	4.3	LOS A	0.6	15.5	0.33	0.20	0.33	20.8
North: Unity Way														
7	L2	41	2.0	47	2.0	0.091	4.9	LOS A	0.3	8.3	0.47	0.40	0.47	20.9
4	T1	19	2.0	22	2.0	0.091	4.9	LOS A	0.3	8.3	0.47	0.40	0.47	20.3
14	R2	12	2.0	14	2.0	0.091	4.9	LOS A	0.3	8.3	0.47	0.40	0.47	20.4
Approach		72	2.0	82	2.0	0.091	4.9	LOS A	0.3	8.3	0.47	0.40	0.47	20.7
West: Colbern Road														
5	L2	11	2.0	13	2.0	0.244	4.9	LOS A	1.2	29.7	0.24	0.12	0.24	18.6
2	T1	412	2.0	468	2.0	0.244	4.9	LOS A	1.2	29.7	0.24	0.12	0.24	20.8
12	R2	127	2.0	144	2.0	0.244	4.9	LOS A	1.2	29.7	0.24	0.12	0.24	20.2
Approach		550	2.0	625	2.0	0.244	4.9	LOS A	1.2	29.7	0.24	0.12	0.24	20.6
All Vehicles		1146	2.0	1302	2.0	0.244	5.0	LOS A	1.2	29.7	0.33	0.23	0.33	20.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: F:\2021\04501-05000\021-04643-A\40-Design\Reports\TFTC\2023 January Update\Sidra\Ex+App Blue Pkwy.sip9

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	162	15	22	132	23	10	4	52	45	7	5
Future Vol, veh/h	3	162	15	22	132	23	10	4	52	45	7	5
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	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	172	16	23	140	24	11	4	55	48	7	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	164	0	0	188	0	0	306	396	94	292	392	82
Stage 1	-	-	-	-	-	-	186	186	-	198	198	-
Stage 2	-	-	-	-	-	-	120	210	-	94	194	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1412	-	-	1384	-	-	623	540	944	638	542	961
Stage 1	-	-	-	-	-	-	798	745	-	785	736	-
Stage 2	-	-	-	-	-	-	872	727	-	902	739	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1412	-	-	1384	-	-	604	529	944	588	531	961
Mov Cap-2 Maneuver	-	-	-	-	-	-	604	529	-	588	531	-
Stage 1	-	-	-	-	-	-	796	744	-	783	723	-
Stage 2	-	-	-	-	-	-	843	714	-	843	738	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	9.7	11.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	833	1412	-	-	1384	-	-	601
HCM Lane V/C Ratio	0.084	0.002	-	-	0.017	-	-	0.101
HCM Control Delay (s)	9.7	7.6	0	-	7.6	0.1	-	11.7
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.3

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	184	110	55	164	159	38
v/c Ratio	0.09	0.11	0.07	0.07	0.56	0.04
Control Delay	8.5	2.5	4.3	4.0	34.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	2.5	4.3	4.0	34.3	0.1
Queue Length 50th (ft)	19	0	9	13	64	0
Queue Length 95th (ft)	38	21	20	23	110	0
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	2082	979	924	2449	369	979
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	0.09	0.11	0.06	0.07	0.43	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	162	97	48	144	0	0	0	0	140	0	33
Future Volume (veh/h)	0	162	97	48	144	0	0	0	0	140	0	33
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	184	0	55	164	0				159	0	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88				0.88	0.88	0.88
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	2193		902	2619	0				201	0	
Arrive On Green	0.00	0.62	0.00	0.05	0.74	0.00				0.11	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				1781	0	1585
Grp Volume(v), veh/h	0	184	0	55	164	0				159	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	1.5	0.0	0.7	0.9	0.0				6.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.5	0.0	0.7	0.9	0.0				6.1	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2193		902	2619	0				201	0	
V/C Ratio(X)	0.00	0.08		0.06	0.06	0.00				0.79	0.00	
Avail Cap(c_a), veh/h	0	2193		1147	2619	0				372	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	5.4	0.0	4.1	2.5	0.0				30.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.0				6.8	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
%ile BackOfQ(95%),veh/ln	0.0	0.7	0.0	0.3	0.3	0.0				5.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.5	0.0	4.1	2.6	0.0				37.0	0.0	0.0
LnGrp LOS	A	A		A	A	A				D	A	
Approach Vol, veh/h		184	A		219						159	A
Approach Delay, s/veh		5.5			3.0						37.0	
Approach LOS		A			A						D	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	56.7	8.4	48.3	13.3
Change Period (Y+Rc), s	* 5.1	* 5.1	* 5.1	5.4
Max Green Setting (Gmax), s	* 45	* 13	* 27	14.6
Max Q Clear Time (g_c+I1), s	2.9	2.7	3.5	8.1
Green Ext Time (p_c), s	1.9	0.1	1.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	13.4
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	82	261	161	241	57	97
v/c Ratio	0.09	0.09	0.07	0.21	0.29	0.09
Control Delay	2.7	2.3	6.5	1.8	31.9	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.7	2.3	6.5	1.8	31.9	1.7
Queue Length 50th (ft)	2	3	14	0	23	0
Queue Length 95th (ft)	17	22	30	28	52	14
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	972	2955	2424	1160	369	1120
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	0.08	0.09	0.07	0.21	0.15	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	230	0	0	142	212	50	0	85	0	0	0
Future Volume (veh/h)	72	230	0	0	142	212	50	0	85	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	82	261	0	0	161	0	57	0	0			
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	1007	2840	0	0	2384		85	0				
Arrive On Green	0.11	1.00	0.00	0.00	0.67	0.00	0.05	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	82	261	0	0	161	0	57	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	0.9	0.0	0.0	0.0	1.1	0.0	2.2	0.0	0.0			
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.0	1.1	0.0	2.2	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1007	2840	0	0	2384		85	0				
V/C Ratio(X)	0.08	0.09	0.00	0.00	0.07		0.67	0.00				
Avail Cap(c_a), veh/h	1084	2840	0	0	2384		372	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.96	0.96	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	2.6	0.0	0.0	0.0	4.0	0.0	32.8	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	8.7	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			
%ile BackOfQ(95%),veh/ln	0.3	0.0	0.0	0.0	0.5	0.0	2.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.6	0.1	0.0	0.0	4.0	0.0	41.5	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		343			161	A		57	A			
Approach Delay, s/veh		0.7			4.0			41.5				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	9.0	52.3				61.3		8.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	7.0	* 33				* 45		14.6				
Max Q Clear Time (g_c+I1), s	2.9	3.1				2.0		4.2				
Green Ext Time (p_c), s	0.0	1.7				3.2		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	5.8
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	158	83	23	297	41	7
Future Vol, veh/h	158	83	23	297	41	7
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	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	172	90	25	323	45	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	262	0	429	131
Stage 1	-	-	-	-	217	-
Stage 2	-	-	-	-	212	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1299	-	554	894
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1299	-	541	894
Mov Cap-2 Maneuver	-	-	-	-	541	-
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	541	894	-	-	1299	-
HCM Lane V/C Ratio	0.082	0.009	-	-	0.019	-
HCM Control Delay (s)	12.3	9.1	-	-	7.8	0.1
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	23	113	32	593	283	49	21	261	303	19	286	23
v/c Ratio	0.05	0.38	0.09	0.72	0.23	0.07	0.05	0.29	0.25	0.04	0.23	0.03
Control Delay	13.0	42.5	0.5	23.6	12.9	0.2	28.2	40.6	4.7	16.9	23.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	42.5	0.5	23.6	12.9	0.2	28.2	40.6	4.7	16.9	23.5	0.1
Queue Length 50th (ft)	7	32	0	222	59	0	12	112	117	6	53	0
Queue Length 95th (ft)	19	59	0	314	17	m1	36	172	2	20	107	0
Internal Link Dist (ft)		2564			2353			407			383	
Turn Bay Length (ft)	200		200	200		200	160		200	290		200
Base Capacity (vph)	514	322	351	853	1218	654	482	900	1171	454	1220	693
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.35	0.09	0.70	0.23	0.07	0.04	0.29	0.26	0.04	0.23	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	107	30	563	269	47	20	248	288	18	272	22
Future Volume (veh/h)	22	107	30	563	269	47	20	248	288	18	272	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	113	32	593	283	49	21	261	0	19	286	23
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	499	197	88	837	1224	546	298	615		274	829	370
Arrive On Green	0.06	0.06	0.06	0.56	0.58	0.58	0.01	0.08	0.00	0.02	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	2494	3554	1585	1781	2619	1585	1781	3554	1585
Grp Volume(v), veh/h	23	113	32	593	283	49	21	261	0	19	286	23
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1247	1777	1585	1781	1309	1585	1781	1777	1585
Q Serve(g_s), s	0.0	2.8	1.3	15.6	3.5	0.8	0.8	8.6	0.0	0.7	6.0	0.6
Cycle Q Clear(g_c), s	0.0	2.8	1.3	15.6	3.5	0.8	0.8	8.6	0.0	0.7	6.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	499	197	88	837	1224	546	298	615		274	829	370
V/C Ratio(X)	0.05	0.57	0.36	0.71	0.23	0.09	0.07	0.42		0.07	0.34	0.06
Avail Cap(c_a), veh/h	562	324	144	859	1224	546	416	615		395	829	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.89	0.89	0.98	0.98	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	41.5	22.5	16.6	13.3	5.3	25.8	35.7	0.0	25.6	28.8	10.4
Incr Delay (d2), s/veh	0.0	2.6	2.5	2.4	0.4	0.3	0.1	2.1	0.0	0.1	1.1	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(95%),veh/ln	0.5	2.2	1.3	6.0	2.4	0.8	0.6	5.4	0.0	0.5	4.6	0.7
Unsig. Movement Delay, s/veh									39.30			
LnGrp Delay(d),s/veh	18.8	44.1	25.0	18.9	13.7	5.6	25.9	37.8	39.3	25.7	29.9	10.8
LnGrp LOS	B	D	C	B	B	A	C	D	D	C	C	B
Approach Vol, veh/h		168			925			585	A		328	
Approach Delay, s/veh		37.0			16.6			38.1			28.3	
Approach LOS		D			B			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	27.0	36.0	10.8	6.9	27.2	10.8	36.0
Change Period (Y+Rc), s	5.0	* 6	* 5.8	* 5.8	5.0	* 6	5.8	* 5
Max Green Setting (Gmax), s	8.0	* 21	* 31	* 8.2	8.0	* 21	8.2	* 31
Max Q Clear Time (g_c+I1), s	2.8	8.0	17.6	4.8	2.7	10.6	2.0	5.5
Green Ext Time (p_c), s	0.0	1.3	1.8	0.2	0.0	1.0	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is included in calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	9	308	307	10	4	3
Future Vol, veh/h	9	308	307	10	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	331	330	11	4	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	341	0	-	0	687	336
Stage 1	-	-	-	-	336	-
Stage 2	-	-	-	-	351	-
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	1218	-	-	-	413	706
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1218	-	-	-	410	706
Mov Cap-2 Maneuver	-	-	-	-	410	-
Stage 1	-	-	-	-	718	-
Stage 2	-	-	-	-	713	-

Approach	SE	NW	SW
HCM Control Delay, s	0.2	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1218	-	500
HCM Lane V/C Ratio	-	-	0.008	-	0.015
HCM Control Delay (s)	-	-	8	-	12.3
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	0	53	0	35	1	219	95	68	302	0
Future Vol, veh/h	5	0	0	53	0	35	1	219	95	68	302	0
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	-	-	-	-	-	50	200	-	175	200	-	-
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	6	0	0	59	0	39	1	243	106	76	336	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	806	839	336	733	733	243	336	0	0	349	0	0
Stage 1	488	488	-	245	245	-	-	-	-	-	-	-
Stage 2	318	351	-	488	488	-	-	-	-	-	-	-
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	300	302	706	336	348	796	1223	-	-	1210	-	-
Stage 1	561	550	-	759	703	-	-	-	-	-	-	-
Stage 2	693	632	-	561	550	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	272	283	706	320	326	796	1223	-	-	1210	-	-
Mov Cap-2 Maneuver	272	283	-	320	326	-	-	-	-	-	-	-
Stage 1	560	515	-	758	702	-	-	-	-	-	-	-
Stage 2	659	631	-	526	515	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	15.2	0	1.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1223	-	-	272	320	796	1210	-	-
HCM Lane V/C Ratio	0.001	-	-	0.02	0.184	0.049	0.062	-	-
HCM Control Delay (s)	7.9	-	-	18.5	18.8	9.8	8.2	-	-
HCM Lane LOS	A	-	-	C	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	49	240	32	36	349
Future Vol, veh/h	38	49	240	32	36	349
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	-	-	225	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	54	267	36	40	388

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	735	134	0	0	303	0
Stage 1	267	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	370	891	-	-	1256	-
Stage 1	754	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	358	891	-	-	1256	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	609	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	638	1256	-
HCM Lane V/C Ratio	-	-	0.152	0.032	-
HCM Control Delay (s)	-	-	11.6	8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	60	65	198	184	51	86	127	49	17	237
v/c Ratio	0.02	0.18	0.16	0.39	0.25	0.07	0.22	0.19	0.08	0.03	0.57
Control Delay	13.1	27.5	0.9	16.3	17.4	0.2	14.0	16.4	0.2	12.2	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	27.5	0.9	16.3	17.4	0.2	14.0	16.4	0.2	12.2	28.3
Queue Length 50th (ft)	2	20	0	48	44	0	19	29	0	4	78
Queue Length 95th (ft)	12	59	0	109	128	0	50	89	0	15	164
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	595	925	858	642	1081	979	451	909	843	623	1044
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.06	0.08	0.31	0.17	0.05	0.19	0.14	0.06	0.03	0.23

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	55	60	182	169	47	79	117	45	16	185	33
Future Volume (veh/h)	9	55	60	182	169	47	79	117	45	16	185	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	60	65	198	184	51	86	127	49	17	201	36
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	410	353	299	555	554	470	333	440	373	390	291	52
Arrive On Green	0.01	0.19	0.19	0.12	0.30	0.30	0.07	0.24	0.24	0.02	0.19	0.19
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1544	277
Grp Volume(v), veh/h	10	60	65	198	184	51	86	127	49	17	0	237
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1821
Q Serve(g_s), s	0.2	1.4	1.8	4.6	4.1	1.2	2.0	2.9	1.3	0.4	0.0	6.4
Cycle Q Clear(g_c), s	0.2	1.4	1.8	4.6	4.1	1.2	2.0	2.9	1.3	0.4	0.0	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	410	353	299	555	554	470	333	440	373	390	0	343
V/C Ratio(X)	0.02	0.17	0.22	0.36	0.33	0.11	0.26	0.29	0.13	0.04	0.00	0.69
Avail Cap(c_a), veh/h	707	1042	883	829	1042	883	516	1025	868	824	0	997
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.9	18.0	18.2	14.2	14.5	13.5	15.8	16.6	16.0	14.9	0.0	20.0
Incr Delay (d2), s/veh	0.0	0.5	0.8	0.1	0.7	0.2	0.2	0.4	0.2	0.0	0.0	2.5
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(95%),veh/ln	0.1	1.0	1.1	2.9	2.9	0.7	1.2	2.0	0.7	0.2	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	18.5	18.9	14.4	15.3	13.8	16.0	17.0	16.1	14.9	0.0	22.5
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		135			433			262			254	
Approach Delay, s/veh		18.3			14.7			16.5			22.0	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	15.5	9.6	16.0	6.2	21.2	7.1	18.5
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	6.6	3.8	4.0	8.4	2.2	6.1	2.4	4.9
Green Ext Time (p_c), s	0.2	0.9	0.0	1.2	0.0	2.2	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	185	186	307	603	590	350
v/c Ratio	0.60	0.46	0.36	0.25	0.44	0.47
Control Delay	41.0	15.3	13.5	13.6	17.2	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	15.3	13.5	13.6	17.2	11.4
Queue Length 50th (ft)	103	33	77	128	80	41
Queue Length 95th (ft)	157	87	110	176	122	109
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	506	591	842	2400	1355	750
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	0.37	0.31	0.36	0.25	0.44	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	340	0	1	282	555	0	0	220	645
Future Volume (vph)	0	0	0	340	0	1	282	555	0	0	220	645
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	1.00		1.00	1.00			0.91	0.85
Flt Protected				0.95	0.95		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1684		3433	3539			3088	1441
Flt Permitted				0.95	0.95		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1684		3433	3539			3088	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	370	0	1	307	603	0	0	239	701
RTOR Reduction (vph)	0	0	0	0	99	0	0	0	0	0	222	222
Lane Group Flow (vph)	0	0	0	185	87	0	307	603	0	0	368	128
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				16.6	16.6		22.1	61.0			33.0	33.0
Effective Green, g (s)				16.6	16.6		22.1	61.0			33.0	33.0
Actuated g/C Ratio				0.18	0.18		0.25	0.68			0.37	0.37
Clearance Time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Vehicle Extension (s)				4.0	4.0		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				310	310		842	2398			1132	528
v/s Ratio Prot				c0.11	0.05		c0.09	0.17			c0.12	
v/s Ratio Perm												0.09
v/c Ratio				0.60	0.28		0.36	0.25			0.32	0.24
Uniform Delay, d1				33.6	31.6		28.1	5.6			20.5	19.8
Progression Factor				1.00	1.00		0.43	2.11			1.79	3.18
Incremental Delay, d2				3.6	0.7		0.3	0.2			0.7	1.0
Delay (s)				37.2	32.3		12.5	12.1			37.3	63.9
Level of Service				D	C		B	B			D	E
Approach Delay (s)		0.0			34.7			12.3			47.2	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	223	224	531	483	201	6	617
v/c Ratio	0.51	0.37	0.79	0.20	0.23	0.06	0.34
Control Delay	25.5	21.9	25.6	4.5	1.2	34.4	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	21.9	25.6	4.5	1.2	34.4	16.2
Queue Length 50th (ft)	134	93	178	15	0	3	152
Queue Length 95th (ft)	207	140	278	42	0	m8	193
Internal Link Dist (ft)		680		1067			491
Turn Bay Length (ft)	515		515		200	100	
Base Capacity (vph)	542	735	787	2465	871	98	1822
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	0.41	0.30	0.67	0.20	0.23	0.06	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	402	0	478	0	0	0	0	435	181	5	555	0
Future Volume (vph)	402	0	478	0	0	0	0	435	181	5	555	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Lane Util. Factor	*0.70	0.95	1.00					0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1239	1681	1583					5085	1583	1770	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1239	1681	1583					5085	1583	1770	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	1.00	1.00	1.00	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	447	0	531	0	0	0	0	483	201	6	617	0
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	114	0	0	0
Lane Group Flow (vph)	223	224	423	0	0	0	0	483	87	6	617	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	32.1	32.1	32.1					38.8	38.8	1.0	46.3	
Effective Green, g (s)	32.1	32.1	32.1					38.8	38.8	1.0	46.3	
Actuated g/C Ratio	0.36	0.36	0.36					0.43	0.43	0.01	0.51	
Clearance Time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0	4.0	3.5	4.0	
Lane Grp Cap (vph)	441	599	564					2192	682	19	1820	
v/s Ratio Prot	0.18	0.13						0.09		0.00	c0.17	
v/s Ratio Perm			c0.27						0.05			
v/c Ratio	0.51	0.37	0.75					0.22	0.13	0.32	0.34	
Uniform Delay, d1	22.7	21.5	25.4					16.1	15.4	44.2	12.9	
Progression Factor	1.00	1.00	1.00					0.28	0.20	0.82	1.09	
Incremental Delay, d2	1.2	0.5	5.8					0.2	0.4	10.1	0.5	
Delay (s)	24.0	22.0	31.2					4.7	3.4	46.4	14.5	
Level of Service	C	C	C					A	A	D	B	
Approach Delay (s)		27.5			0.0			4.3			14.8	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	247	24	70	183	41	41	20	88	43	13	10
Future Vol, veh/h	6	247	24	70	183	41	41	20	88	43	13	10
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	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	7	274	27	78	203	46	46	22	98	48	14	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	249	0	0	301	0	0	567	707	151	544	697	125
Stage 1	-	-	-	-	-	-	302	302	-	382	382	-
Stage 2	-	-	-	-	-	-	265	405	-	162	315	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1314	-	-	1257	-	-	406	359	868	422	363	902
Stage 1	-	-	-	-	-	-	682	663	-	612	611	-
Stage 2	-	-	-	-	-	-	717	597	-	824	654	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1314	-	-	1257	-	-	365	331	868	334	335	902
Mov Cap-2 Maneuver	-	-	-	-	-	-	365	331	-	334	335	-
Stage 1	-	-	-	-	-	-	678	659	-	608	567	-
Stage 2	-	-	-	-	-	-	640	554	-	702	650	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2	14.5	17.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	544	1314	-	-	1257	-	-	369
HCM Lane V/C Ratio	0.304	0.005	-	-	0.062	-	-	0.199
HCM Control Delay (s)	14.5	7.8	0	-	8.1	0.2	-	17.2
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.3	0	-	-	0.2	-	-	0.7

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	282	120	135	227	233	86
v/c Ratio	0.18	0.15	0.21	0.11	0.60	0.11
Control Delay	12.5	3.3	7.7	5.2	27.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	3.3	7.7	5.2	27.2	1.6
Queue Length 50th (ft)	33	0	11	8	76	0
Queue Length 95th (ft)	64	25	26	19	123	12
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	1580	782	660	2158	578	782
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	0.15	0.20	0.11	0.40	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	265	113	127	213	0	0	0	0	219	0	81
Future Volume (veh/h)	0	265	113	127	213	0	0	0	0	219	0	81
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	282	0	135	227	0				233	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1060		877	2351	0				291	0	
Arrive On Green	0.00	0.30	0.00	0.09	0.22	0.00				0.16	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				1781	0	1585
Grp Volume(v), veh/h	0	282	0	135	227	0				233	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	3.6	0.0	0.0	3.1	0.0				7.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.6	0.0	0.0	3.1	0.0				7.6	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1060		877	2351	0				291	0	
V/C Ratio(X)	0.00	0.27		0.15	0.10	0.00				0.80	0.00	
Avail Cap(c_a), veh/h	0	1060		877	2351	0				582	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.98	0.98	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	16.0	0.0	10.5	9.1	0.0				24.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.1	0.1	0.0				5.1	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
%ile BackOfQ(95%),veh/ln	0.0	2.5	0.0	1.8	1.4	0.0				6.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.7	0.0	10.5	9.2	0.0				29.2	0.0	0.0
LnGrp LOS	A	B		B	A	A				C	A	
Approach Vol, veh/h		282	A		362						233	A
Approach Delay, s/veh		16.7			9.7						29.2	
Approach LOS		B			A						C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		44.8			21.8	23.0		15.2				
Change Period (Y+Rc), s		* 5.1			* 5.1	* 5.1		5.4				
Max Green Setting (Gmax), s		* 30			* 6.9	* 18		19.6				
Max Q Clear Time (g_c+I1), s		5.1			2.0	5.6		9.6				
Green Ext Time (p_c), s		2.5			0.1	2.2		0.5				

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	89	426	253	232	109	44
v/c Ratio	0.11	0.16	0.12	0.23	0.45	0.05
Control Delay	2.0	1.6	8.7	2.3	29.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	1.6	8.7	2.3	29.4	0.1
Queue Length 50th (ft)	5	11	25	0	36	0
Queue Length 95th (ft)	10	16	45	31	77	0
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	887	2626	2053	1016	283	975
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	0.10	0.16	0.12	0.23	0.39	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	400	0	0	238	218	102	0	41	0	0	0
Future Volume (veh/h)	84	400	0	0	238	218	102	0	41	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	89	426	0	0	253	0	109	0	0			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	870	2638	0	0	2113		141	0				
Arrive On Green	0.09	0.99	0.00	0.00	0.59	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	89	426	0	0	253	0	109	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	1.1	0.1	0.0	0.0	1.9	0.0	3.6	0.0	0.0			
Cycle Q Clear(g_c), s	1.1	0.1	0.0	0.0	1.9	0.0	3.6	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	870	2638	0	0	2113		141	0				
V/C Ratio(X)	0.10	0.16	0.00	0.00	0.12		0.77	0.00				
Avail Cap(c_a), veh/h	1052	2638	0	0	2113		285	0				
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.94	0.94	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	3.6	0.1	0.0	0.0	5.3	0.0	27.1	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	8.6	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			
%ile BackOfQ(95%),veh/ln	0.4	0.1	0.0	0.0	1.0	0.0	3.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.7	0.2	0.0	0.0	5.4	0.0	35.7	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		515			253	A		109	A			
Approach Delay, s/veh		0.8			5.4			35.7				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	8.9	41.0				49.8		10.2				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	10.0	* 25				* 40		9.6				
Max Q Clear Time (g_c+I1), s	3.1	3.9				2.1		5.6				
Green Ext Time (p_c), s	0.1	2.6				5.8		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	449	58	14	222	75	28
Future Vol, veh/h	449	58	14	222	75	28
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	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	510	66	16	252	85	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	576	0	701	288
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	158	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	993	-	373	709
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	854	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	993	-	366	709
Mov Cap-2 Maneuver	-	-	-	-	366	-
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	838	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	366	709	-	-	993	-
HCM Lane V/C Ratio	0.233	0.045	-	-	0.016	-
HCM Control Delay (s)	17.8	10.3	-	-	8.7	0.1
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	48	387	36	518	174	80	31	363	596	75	360	38
v/c Ratio	0.09	0.67	0.10	0.81	0.12	0.11	0.07	0.46	0.58	0.22	0.30	0.06
Control Delay	15.0	45.0	0.5	42.6	15.3	1.1	8.9	18.7	5.7	19.5	26.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	15.0	45.0	0.5	42.6	15.3	1.1	8.9	18.7	5.9	19.5	26.7	0.2
Queue Length 50th (ft)	16	123	0	221	38	0	7	112	176	28	94	0
Queue Length 95th (ft)	36	163	0	#392	40	0	19	168	47	57	137	0
Internal Link Dist (ft)		2564			2353			407			383	
Turn Bay Length (ft)	200		200	200		200	160		200	290		200
Base Capacity (vph)	625	821	476	641	1412	722	445	792	1027	359	1191	667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	64	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.47	0.08	0.81	0.12	0.11	0.07	0.46	0.62	0.21	0.30	0.06

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)	46	368	34	492	165	76	29	345	566	71	342	36
Future Volume (veh/h)	46	368	34	492	165	76	29	345	566	71	342	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	387	36	518	174	80	31	363	0	75	360	38
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	428	505	225	474	1003	447	474	1063		435	1496	667
Arrive On Green	0.05	0.14	0.14	0.06	0.09	0.09	0.01	0.13	0.00	0.04	0.42	0.42
Sat Flow, veh/h	1781	3554	1585	2494	3554	1585	1781	2619	1585	1781	3554	1585
Grp Volume(v), veh/h	48	387	36	518	174	80	31	363	0	75	360	38
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1247	1777	1585	1781	1309	1585	1781	1777	1585
Q Serve(g_s), s	1.8	10.5	1.7	19.0	4.5	4.7	1.0	12.6	0.0	2.4	6.5	1.4
Cycle Q Clear(g_c), s	1.8	10.5	1.7	19.0	4.5	4.7	1.0	12.6	0.0	2.4	6.5	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	428	505	225	474	1003	447	474	1063		435	1496	667
V/C Ratio(X)	0.11	0.77	0.16	1.09	0.17	0.18	0.07	0.34		0.17	0.24	0.06
Avail Cap(c_a), veh/h	556	824	368	474	1066	476	583	1063		518	1496	667
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.94	0.94	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	41.3	26.6	46.9	34.6	34.7	15.9	31.2	0.0	16.7	18.7	17.2
Incr Delay (d2), s/veh	0.1	2.5	0.3	68.8	0.1	0.2	0.1	0.8	0.0	0.2	0.4	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(95%),veh/ln	1.3	8.1	1.4	16.9	3.5	3.2	0.7	7.9	0.0	1.7	4.7	0.9
Unsig. Movement Delay, s/veh									12.00			
LnGrp Delay(d),s/veh	23.1	43.8	26.9	115.7	34.7	34.8	16.0	32.0	12.0	16.8	19.0	17.3
LnGrp LOS	C	D	C	F	C	C	B	C	B	B	B	B
Approach Vol, veh/h		471			772			990	A		473	
Approach Delay, s/veh		40.4			89.1			19.5			18.6	
Approach LOS		D			F			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	48.1	24.0	20.0	9.4	46.6	10.8	33.2
Change Period (Y+Rc), s	5.0	* 6	* 5	5.8	5.0	* 6	* 5.8	5.0
Max Green Setting (Gmax), s	9.0	* 27	* 19	23.2	9.0	* 27	* 12	30.0
Max Q Clear Time (g_c+I1), s	3.0	8.5	21.0	12.5	4.4	14.6	3.8	6.7
Green Ext Time (p_c), s	0.0	2.1	0.0	1.7	0.0	1.7	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	42.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is included in calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.5

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	2	432	457	10	17	10
Future Vol, veh/h	2	432	457	10	17	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	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	2	475	502	11	19	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	513	0	-	0	987	508
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	479	-
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	1052	-	-	-	274	565
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1052	-	-	-	273	565
Mov Cap-2 Maneuver	-	-	-	-	273	-
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	623	-

Approach	SE	NW	SW
HCM Control Delay, s	0	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1	
Capacity (veh/h)	-	-	1052	-	338
HCM Lane V/C Ratio	-	-	0.002	-	0.088
HCM Control Delay (s)	-	-	8.4	-	16.7
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0	-	0.3

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	1	25	0	17	2	471	12	20	403	5
Future Vol, veh/h	2	0	1	25	0	17	2	471	12	20	403	5
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	27	0	19	2	518	13	22	443	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1028	1025	446	1012	1014	518	448	0	0	531	0	0
Stage 1	490	490	-	522	522	-	-	-	-	-	-	-
Stage 2	538	535	-	490	492	-	-	-	-	-	-	-
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	212	235	612	218	239	558	1112	-	-	1036	-	-
Stage 1	560	549	-	538	531	-	-	-	-	-	-	-
Stage 2	527	524	-	560	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	201	230	612	214	234	558	1112	-	-	1036	-	-
Mov Cap-2 Maneuver	201	230	-	214	234	-	-	-	-	-	-	-
Stage 1	559	537	-	537	530	-	-	-	-	-	-	-
Stage 2	508	523	-	547	536	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.1	19.2	0	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1112	-	-	259	214	558	1036	-	-
HCM Lane V/C Ratio	0.002	-	-	0.013	0.128	0.033	0.021	-	-
HCM Control Delay (s)	8.2	-	-	19.1	24.3	11.7	8.6	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	56	466	30	65	408
Future Vol, veh/h	19	56	466	30	65	408
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	-	-	225	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	59	491	32	68	429

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1056	246	0	0	523	0
Stage 1	491	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	235	755	-	-	1042	-
Stage 1	582	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	220	755	-	-	1042	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	531	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	587	1042	-
HCM Lane V/C Ratio	-	-	0.134	0.066	-
HCM Control Delay (s)	-	-	12.1	8.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	171	142	142	81	56	96	255	204	41	309
v/c Ratio	0.08	0.39	0.30	0.30	0.14	0.10	0.25	0.43	0.32	0.09	0.62
Control Delay	14.9	29.9	7.2	17.0	22.6	0.3	15.6	24.4	5.3	14.1	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	29.9	7.2	17.0	22.6	0.3	15.6	24.4	5.3	14.1	30.9
Queue Length 50th (ft)	10	64	0	38	27	0	24	92	0	10	118
Queue Length 95th (ft)	32	148	45	91	71	0	62	193	49	32	243
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	567	940	870	633	1064	966	442	925	889	621	1049
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.18	0.16	0.22	0.08	0.06	0.22	0.28	0.23	0.07	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	164	136	136	78	54	92	245	196	39	286	11
Future Volume (veh/h)	37	164	136	136	78	54	92	245	196	39	286	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	171	142	142	81	56	96	255	204	41	298	11
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	460	350	297	407	441	374	333	468	396	334	397	15
Arrive On Green	0.04	0.19	0.19	0.09	0.24	0.24	0.07	0.25	0.25	0.04	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1792	66
Grp Volume(v), veh/h	39	171	142	142	81	56	96	255	204	41	0	309
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1858
Q Serve(g_s), s	0.9	4.4	4.3	3.3	1.8	1.5	2.2	6.3	5.9	0.9	0.0	8.3
Cycle Q Clear(g_c), s	0.9	4.4	4.3	3.3	1.8	1.5	2.2	6.3	5.9	0.9	0.0	8.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	460	350	297	407	441	374	333	468	396	334	0	412
V/C Ratio(X)	0.08	0.49	0.48	0.35	0.18	0.15	0.29	0.55	0.51	0.12	0.00	0.75
Avail Cap(c_a), veh/h	703	1032	875	730	1032	875	506	1015	860	724	0	1008
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	19.4	19.4	15.4	16.3	16.2	14.8	17.4	17.2	14.1	0.0	19.4
Incr Delay (d2), s/veh	0.0	2.3	2.6	0.2	0.4	0.4	0.2	1.0	1.0	0.1	0.0	2.8
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(95%),veh/ln	0.5	3.3	2.8	2.1	1.3	0.9	1.3	4.2	3.4	0.5	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	21.7	21.9	15.6	16.7	16.6	15.0	18.4	18.3	14.1	0.0	22.2
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		352			279			555			350	
Approach Delay, s/veh		21.0			16.1			17.8			21.2	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	15.5	9.8	17.9	7.7	18.1	8.3	19.4
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	5.3	6.4	4.2	10.3	2.9	3.8	2.9	8.3
Green Ext Time (p_c), s	0.1	2.7	0.0	1.6	0.0	1.1	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	108	105	586	987	606	308
v/c Ratio	0.51	0.34	0.55	0.37	0.44	0.42
Control Delay	48.5	10.1	48.6	2.5	12.2	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	10.1	48.6	2.5	12.2	7.0
Queue Length 50th (ft)	68	0	204	48	47	35
Queue Length 95th (ft)	120	44	253	40	m87	m75
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	304	393	1067	2652	1362	738
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	0.36	0.27	0.55	0.37	0.44	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	0	2	557	938	0	0	282	586
Future Volume (vph)	0	0	0	200	0	2	557	938	0	0	282	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	1.00		1.00	1.00			0.92	0.85
Flt Protected				0.95	0.95		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1682		3433	3539			3131	1441
Flt Permitted				0.95	0.95		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1682		3433	3539			3131	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	211	0	2	586	987	0	0	297	617
RTOR Reduction (vph)	0	0	0	0	92	0	0	0	0	0	173	191
Lane Group Flow (vph)	0	0	0	108	13	0	586	987	0	0	433	117
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				12.6	12.6		31.1	75.0			38.0	38.0
Effective Green, g (s)				12.6	12.6		31.1	75.0			38.0	38.0
Actuated g/C Ratio				0.13	0.13		0.31	0.75			0.38	0.38
Clearance Time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Vehicle Extension (s)				4.0	4.0		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				211	211		1067	2654			1189	547
v/s Ratio Prot				c0.06	0.01		c0.17	c0.28			0.14	
v/s Ratio Perm												0.08
v/c Ratio				0.51	0.06		0.55	0.37			0.36	0.21
Uniform Delay, d1				40.8	38.5		28.6	4.3			22.3	20.9
Progression Factor				1.00	1.00		1.61	0.45			0.91	1.88
Incremental Delay, d2				2.8	0.2		0.6	0.4			0.7	0.7
Delay (s)				43.6	38.7		46.8	2.3			20.9	40.1
Level of Service				D	D		D	A			C	D
Approach Delay (s)		0.0			41.2			18.9			27.4	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	336	337	515	884	431	6	496
v/c Ratio	0.72	0.53	0.68	0.37	0.44	0.05	0.28
Control Delay	34.9	26.4	16.7	7.8	2.0	48.0	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	26.4	16.7	7.8	2.0	48.0	17.5
Queue Length 50th (ft)	242	163	128	50	5	3	84
Queue Length 95th (ft)	367	233	228	146	53	m4	118
Internal Link Dist (ft)		680		1067			491
Turn Bay Length (ft)	515		515		200	100	
Base Capacity (vph)	550	746	842	2413	977	159	1791
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	0.61	0.45	0.61	0.37	0.44	0.04	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	646	0	494	0	0	0	0	849	414	6	476	0
Future Volume (vph)	646	0	494	0	0	0	0	849	414	6	476	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Lane Util. Factor	*0.70	0.95	1.00					0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1239	1681	1583					5085	1583	1770	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1239	1681	1583					5085	1583	1770	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	1.00	1.00	1.00	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	673	0	515	0	0	0	0	884	431	6	496	0
RTOR Reduction (vph)	0	0	156	0	0	0	0	0	247	0	0	0
Lane Group Flow (vph)	336	337	359	0	0	0	0	884	184	6	496	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	37.8	37.8	37.8					42.6	42.6	1.5	50.6	
Effective Green, g (s)	37.8	37.8	37.8					42.6	42.6	1.5	50.6	
Actuated g/C Ratio	0.38	0.38	0.38					0.43	0.43	0.02	0.51	
Clearance Time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0	4.0	3.5	4.0	
Lane Grp Cap (vph)	468	635	598					2166	674	26	1790	
v/s Ratio Prot	c0.27	0.20						c0.17		0.00	c0.14	
v/s Ratio Perm			0.23						0.12			
v/c Ratio	0.72	0.53	0.60					0.41	0.27	0.23	0.28	
Uniform Delay, d1	26.5	24.2	25.0					19.9	18.6	48.7	14.2	
Progression Factor	1.00	1.00	1.00					0.39	0.38	1.08	1.09	
Incremental Delay, d2	5.6	1.1	2.0					0.4	0.7	5.2	0.4	
Delay (s)	32.1	25.3	27.0					8.3	7.7	57.6	15.9	
Level of Service	C	C	C					A	A	E	B	
Approach Delay (s)		28.0			0.0			8.1			16.4	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Simulation

Synchro Default

Group	Name	Unit	Default Value										Range	Description
			1	2	3	4	5	6	7	8	9	10	-	
	Yellow Decel	ft/s^2	12	12	12	12	12	11	10	9	8	7	7.0-12.0	Deceleration rate at Yellow Clearance Interval
	Speed Factor	%	0.85	0.88	0.92	0.95	0.98	1.02	1.05	1.08	1.12	1.15	0.85-1.15	Can be changed to increase or decrease the range of driver speeds
	Courtesy Decel	ft/s^2	10	9	8	7	6	5	4	4	3	3	3.0-10.0	Amount of deceleration a vehicle will accept in order to allow a vehicle ahead to make a mandatory lane change - higher value = more courteous drivers
	Yellow React	s	0.7	0.9	1	1	1.2	1.3	1.3	1.4	1.4	1.7	0.7-1.7	Amount of time it takes a driver to respond to a signal changing to yellow
	Green React	s	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.3	0.2	0.2-0.8	Amount of time it takes a driver to respond to a signal changing to greer
	Headway @ 0mph	s	1.8	1.7	1.6	1.5	1.4	1.2	1.1	1	0.9	0.8	0.35-0.65	
	Headway @ 20mph	s	2.2	2	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1	0.80-1.80	Interpolation used between these factors. The default headways provided a
	Headway @ 50mph	s	2.2	2	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1	1.0-2.2	Saturation Flow Rate similar to HCM from 25 to 50
	Headway @ 80mph	s	2	2	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1	1.0-2.2	
	Gap Acceptance Factor	-	1.15	1.12	1.1	1.05	1	1	0.95	0.9	0.88	0.85	0.85-1.15	Gap vehicles will accept at unsignalized intersections
Driver Parameters	Positioning Advantage	veh	15	15	15	15	15	2	2	2	1.2	1.2	1.2-15.0	When drivers will make a positioning lane change when there
	Optional Advantage	veh	2.3	2.3	2.3	1	1	1	1	1	0.5	0.5	0.5-2.3	When drivers will make a desired lane change when there
	Mandatory Dist Adj	%	200	170	150	135	110	90	80	70	60	50	50-200	Global modifier to local lane change settings
	Positioning Dist Adj	%	150	140	130	120	110	95	90	80	70	60	60-150	Global modifier to local lane change settings
	Avg Lane Change Time	s	55	50	45	40	35	3	25	20	15	10	10-55	Average time between lane change manuavers
	Lane Change Variance (+/-)	%	10	10	10	20	20	20	30	30	30	30	10-30	Adjustment similar to Average Lane Change Time, but based on driver type

Calibration Settings — Existing / Approved / Phase 1 / Phase 2 Conditions

Group	Name	Unit	Modified Values										Range	Adjusted?
			1	2	3	4	5	6	7	8	9	10	-	
	Yellow Decel	ft/s^2	**10**	**10**	**10**	**10**	**10**	**9.5**	**9**	**8.5**	**8**	**8**	**8.0-10.0**	**Yes - Increased to make drivers less prone to running red lights**
	Speed Factor	%	0.85	0.88	0.92	0.95	0.98	1.02	1.05	1.08	1.12	1.15	Varies	No
	Courtesy Decel	ft/s^2	**10.0**	**9.5**	**9.0**	**8.8**	**8.5**	**8.0**	**7.5**	**7.5**	**7.0**	**7.0**	**7.0-9.0**	**Yes - Increased to mirror driver behavior in midwest**
	Yellow React	s	0.7	0.9	1	1	1.2	1.3	1.3	1.4	1.4	1.7	N/A	No
	Green React	s	**2**	**1.8**	**1.6**	**1.4**	**1.2**	**1**	**0.8**	**0.7**	**0.6**	**0.5**	**0.5-2.0**	**Yes - Generally increased due to more distracted drivers**
	Headway @ 0mph	s	1.8	1.7	1.6	1.5	1.4	1.2	1.1	1	0.9	0.8	N/A	No
	Headway @ 20mph	s	**2.00**	**1.97**	**1.94**	**1.91**	**1.88**	**1.85**	**1.82**	**1.78**	**1.74**	**1.70**	**1.7-2.0**	**Yes**
	Headway @ 50mph	s	**2.50**	**2.40**	**2.35**	**2.30**	**2.25**	**2.20**	**2.15**	**2.10**	**2.05**	**2.00**	**2.0-2.5**	**Yes**
	Headway @ 80mph	s	**2.50**	**2.45**	**2.40**	**2.35**	**2.30**	**2.25**	**2.20**	**2.15**	**2.10**	**2.00**	**2.0-2.5**	**Yes**
	Gap Acceptance Factor	-	1.15	1.12	1.1	1.05	1	1	0.95	0.9	0.88	0.85	N/A	No
Driver Parameters	Positioning Advantage	veh	15	15	15	15	15	2	2	2	1.2	1.2	N/A	No
	Optional Advantage	veh	2.3	2.3	2.3	1	1	1	1	1	0.5	0.5	N/A	No
	Mandatory Dist Adj	%	200	170	150	135	110	90	80	70	60	50	N/A	Modified in Synchro
	Positioning Dist Adj	%	150	140	130	120	110	95	90	80	70	60	N/A	Modified in Synchro
	Avg Lane Change Time	s	55	50	45	40	35	3	25	20	15	10	N/A	No
	Lane Change Variance (+/-)	%	10	10	10	20	20	20	30	30	30	30	N/A	No

Calibration Settings — Phase 3 - Average of Base and Adjusted Parameters

Group	Name	Unit	Modified Values										Range	Adjusted?
			1	2	3	4	5	6	7	8	9	10	-	
	Yellow Decel	ft/s^2	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**	**10.3**	**9.5**	**8.8**	**8.0**	**7.5**	**7.5-11.0**	**Yes**
	Speed Factor	%	0.85	0.88	0.92	0.95	0.98	1.02	1.05	1.08	1.12	1.15	Varies	No
	Courtesy Decel	ft/s^2	**10.0**	**9.3**	**8.5**	**7.9**	**7.3**	**6.5**	**5.8**	**5.8**	**5.0**	**5.0**	**5.0-10.0**	**Yes**
	Yellow React	s	0.7	0.9	1	1	1.2	1.3	1.3	1.4	1.4	1.7	N/A	No
	Green React	s	**1.4**	**1.3**	**1.1**	**1.0**	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.35-1.4**	**Yes**
	Headway @ 0mph	s	1.8	1.7	1.6	1.5	1.4	1.2	1.1	1	0.9	0.8	N/A	No
	Headway @ 20mph	s	**2.10**	**1.99**	**1.92**	**1.86**	**1.79**	**1.68**	**1.61**	**1.54**	**1.47**	**1.35**	**1.35-2.1**	**Yes**
	Headway @ 50mph	s	**2.35**	**2.20**	**2.13**	**2.05**	**1.98**	**1.85**	**1.78**	**1.70**	**1.63**	**1.50**	**1.5-2.35**	**Yes**
	Headway @ 80mph	s	**2.25**	**2.23**	**2.15**	**2.08**	**2.00**	**1.88**	**1.80**	**1.73**	**1.65**	**1.50**	**1.5-2.25**	**Yes**
	Gap Acceptance Factor	-	1.15	1.12	1.1	1.05	1	1	0.95	0.9	0.88	0.85	N/A	No
Driver Parameters	Positioning Advantage	veh	15	15	15	15	15	2	2	2	1.2	1.2	N/A	No
	Optional Advantage	veh	2.3	2.3	2.3	1	1	1	1	1	0.5	0.5	N/A	No
	Mandatory Dist Adj	%	200	170	150	135	110	90	80	70	60	50	N/A	Modified in Synchro
	Positioning Dist Adj	%	150	140	130	120	110	95	90	80	70	60	N/A	Modified in Synchro
	Avg Lane Change Time	s	55	50	45	40	35	3	25	20	15	10	N/A	No
	Lane Change Variance (+/-)	%	10	10	10	20	20	20	30	30	30	30	N/A	No

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	4423	4538	4664	4631	4596	4574
Vehs Exited	4448	4522	4662	4629	4580	4570
Starting Vehs	105	87	113	108	99	101
Ending Vehs	80	103	115	110	115	101
Travel Distance (mi)	2464	2527	2579	2576	2520	2533
Travel Time (hr)	126.6	129.3	135.1	131.1	130.6	130.5
Total Delay (hr)	52.6	53.7	57.1	53.9	54.4	54.3
Total Stops	4888	5045	5326	5092	5125	5095
Fuel Used (gal)	103.3	106.4	108.6	108.3	106.0	106.5

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	915	929	1022	1021	932	964
Vehs Exited	893	909	1022	1015	936	955
Starting Vehs	105	87	113	108	99	101
Ending Vehs	127	107	113	114	95	111
Travel Distance (mi)	507	514	585	584	525	543
Travel Time (hr)	24.5	25.2	29.2	28.9	26.2	26.8
Total Delay (hr)	9.3	9.9	11.7	11.5	10.3	10.5
Total Stops	926	968	1160	1092	978	1025
Fuel Used (gal)	20.6	21.4	24.3	24.4	21.8	22.5

Interval #2 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1282	1313	1341	1317	1310	1314
Vehs Exited	1238	1277	1281	1280	1271	1268
Starting Vehs	127	107	113	114	95	111
Ending Vehs	171	143	173	151	134	152
Travel Distance (mi)	697	705	706	708	696	702
Travel Time (hr)	36.8	37.1	37.4	36.6	36.5	36.9
Total Delay (hr)	15.9	15.9	16.1	15.4	15.5	15.8
Total Stops	1477	1509	1482	1429	1439	1467
Fuel Used (gal)	29.3	29.9	29.8	29.9	29.5	29.7

Interval #3 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1301	1303	1328	1298	1316	1309
Vehs Exited	1338	1304	1345	1311	1267	1313
Starting Vehs	171	143	173	151	134	152
Ending Vehs	134	142	156	138	183	148
Travel Distance (mi)	726	730	724	702	702	717
Travel Time (hr)	38.4	38.4	39.9	36.9	37.0	38.1
Total Delay (hr)	16.5	16.5	17.8	15.7	15.7	16.4
Total Stops	1506	1500	1610	1458	1462	1508
Fuel Used (gal)	30.9	31.1	31.1	29.7	29.8	30.5

Interval #4 Information

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	925	993	973	995	1038	983
Vehs Exited	979	1032	1014	1023	1106	1030
Starting Vehs	134	142	156	138	183	148
Ending Vehs	80	103	115	110	115	101
Travel Distance (mi)	534	579	565	582	597	571
Travel Time (hr)	26.9	28.6	28.4	28.7	30.9	28.7
Total Delay (hr)	10.9	11.4	11.4	11.4	12.9	11.6
Total Stops	979	1068	1074	1113	1246	1096
Fuel Used (gal)	22.6	24.0	23.5	24.2	24.9	23.8

Intersection: 46: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	R	L	T	T	L
Maximum Queue (ft)	78	50	65	42	53	31	208
Average Queue (ft)	25	6	27	12	13	3	93
95th Queue (ft)	62	31	71	37	41	18	176
Link Distance (ft)	315	315			441	441	299
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	325			
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

Intersection: 49: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	50	37	11	53	88	72	74
Average Queue (ft)	14	7	0	12	23	56	34
95th Queue (ft)	41	28	6	41	72	64	67
Link Distance (ft)		441	441	985	985		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	2	
Queuing Penalty (veh)					1	2	

Intersection: 441: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	182	225	114	132	246	251	155	241	269
Average Queue (ft)	83	118	44	70	108	107	65	141	155
95th Queue (ft)	160	197	92	112	198	201	134	225	244
Link Distance (ft)		822		525	525	525	400	400	400
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300		230						
Storage Blk Time (%)		0							
Queuing Penalty (veh)		0							

Intersection: 444: Douglas St & Colbern Rd/Colbern

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	70	107	102	216	266	244	187	315	112	56	134	206
Average Queue (ft)	15	50	36	109	147	130	35	168	31	12	38	100
95th Queue (ft)	46	87	74	195	226	214	127	279	87	39	91	171
Link Distance (ft)		2586			1169	1169		400	400		2478	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200		200	200			190			290		290
Storage Blk Time (%)				0	1		0	7				0
Queuing Penalty (veh)				1	4		0	2				0

Intersection: 449: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	R	L	T	T
Maximum Queue (ft)	203	206	232	77	52	44	10	33	131	141
Average Queue (ft)	114	120	82	20	8	7	0	4	37	38
95th Queue (ft)	181	192	195	59	32	30	8	20	103	108
Link Distance (ft)		654		1054	1054	1054			525	525
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	515		515				200	80		
Storage Blk Time (%)									1	
Queuing Penalty (veh)									0	

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	123	282
Average Queue (ft)	5	31
95th Queue (ft)	52	144
Link Distance (ft)	329	329
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	84	121	37	69	40	109	60	105	129	130	171	121
Average Queue (ft)	33	39	7	23	6	48	32	24	66	62	76	28
95th Queue (ft)	70	87	26	50	25	93	54	74	116	113	142	85
Link Distance (ft)	1012	1012	1012			982				1267	1267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)								0	0	0	3	0
Queuing Penalty (veh)								0	0	0	2	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	146	168	109	123	87
Average Queue (ft)	57	82	39	58	40
95th Queue (ft)	112	130	89	103	72
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 12

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	5932	6096	6169	6114	6158	6094
Vehs Exited	5967	6070	6126	6139	6145	6090
Starting Vehs	168	136	142	172	144	154
Ending Vehs	133	162	185	147	157	158
Travel Distance (mi)	3405	3473	3508	3499	3484	3474
Travel Time (hr)	182.4	189.1	191.2	193.1	201.5	191.5
Total Delay (hr)	81.0	85.7	86.7	89.3	97.6	88.1
Total Stops	6393	6681	6830	6835	7264	6802
Fuel Used (gal)	142.0	145.0	145.6	146.6	146.6	145.2

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1249	1341	1376	1359	1308	1326
Vehs Exited	1302	1318	1380	1370	1319	1338
Starting Vehs	168	136	142	172	144	154
Ending Vehs	115	159	138	161	133	140
Travel Distance (mi)	746	772	806	781	747	770
Travel Time (hr)	38.1	39.6	41.3	41.4	37.6	39.6
Total Delay (hr)	15.8	16.6	17.5	18.0	15.3	16.7
Total Stops	1303	1318	1434	1411	1253	1343
Fuel Used (gal)	30.4	31.7	32.9	32.6	30.3	31.6

Interval #2 Information

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1729	1665	1683	1732	1761	1713
Vehs Exited	1637	1607	1614	1656	1652	1632
Starting Vehs	115	159	138	161	133	140
Ending Vehs	207	217	207	237	242	222
Travel Distance (mi)	945	925	930	967	961	946
Travel Time (hr)	52.7	50.9	51.5	54.1	53.7	52.6
Total Delay (hr)	24.7	23.4	23.7	25.6	25.2	24.5
Total Stops	1900	1830	1848	1924	1956	1889
Fuel Used (gal)	39.7	38.9	38.3	40.2	39.6	39.3

Interval #3 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1664	1723	1697	1660	1733	1692
Vehs Exited	1691	1744	1668	1687	1748	1707
Starting Vehs	207	217	207	237	242	222
Ending Vehs	180	196	236	210	227	207
Travel Distance (mi)	944	971	931	947	982	955
Travel Time (hr)	51.7	55.8	51.5	55.0	66.1	56.0
Total Delay (hr)	23.7	26.9	23.8	27.0	36.7	27.6
Total Stops	1839	2027	1873	2083	2499	2062
Fuel Used (gal)	39.9	41.1	39.1	40.5	43.4	40.8

Interval #4 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1290	1367	1413	1363	1356	1360
Vehs Exited	1337	1401	1464	1426	1426	1409
Starting Vehs	180	196	236	210	227	207
Ending Vehs	133	162	185	147	157	158
Travel Distance (mi)	771	805	841	804	795	803
Travel Time (hr)	39.9	42.7	46.9	42.6	44.1	43.2
Total Delay (hr)	16.8	18.8	21.7	18.7	20.4	19.3
Total Stops	1351	1506	1675	1417	1556	1502
Fuel Used (gal)	32.0	33.3	35.2	33.4	33.3	33.4

Intersection: 46: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	R	L	T	T	L
Maximum Queue (ft)	108	47	49	124	62	65	199
Average Queue (ft)	49	8	6	51	33	21	99
95th Queue (ft)	99	32	34	97	59	57	161
Link Distance (ft)	315	315			441	441	299
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	325			
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

Intersection: 49: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	60	71	37	104	53	63	184
Average Queue (ft)	19	22	4	33	7	20	72
95th Queue (ft)	50	58	21	79	32	65	137
Link Distance (ft)		441	441	985	985		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	0	0
Queuing Penalty (veh)					0	0	0

Intersection: 441: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	135	162	230	253	82	134	142	176	174
Average Queue (ft)	45	87	118	135	28	42	52	66	70
95th Queue (ft)	98	137	198	216	70	98	108	130	118
Link Distance (ft)		822		525	525	525	400	400	400
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300		230						
Storage Blk Time (%)			0	1					
Queuing Penalty (veh)			0	4					

Intersection: 444: Douglas St & Colbern Rd/Colbern

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	79	179	184	225	557	228	126	280	378	116	155	222
Average Queue (ft)	25	123	106	159	240	97	23	99	191	46	56	114
95th Queue (ft)	58	175	176	261	478	189	72	213	323	94	122	195
Link Distance (ft)		2586			1169	1169		400	400		2478	
Upstream Blk Time (%)								0	0			
Queuing Penalty (veh)								0	1			
Storage Bay Dist (ft)	200		200	200			190			290		290
Storage Blk Time (%)		0	0	11	15			3				
Queuing Penalty (veh)		0	0	33	45			1				

Intersection: 449: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	R	L	T	T
Maximum Queue (ft)	271	298	166	272	187	102	10	79	236	235
Average Queue (ft)	146	171	55	106	34	29	0	10	137	126
95th Queue (ft)	232	254	139	219	108	72	8	49	218	206
Link Distance (ft)		654		1054	1054	1054			525	525
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	515		515				200	80		
Storage Blk Time (%)								0	20	
Queuing Penalty (veh)								0	2	

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	314	358
Average Queue (ft)	46	115
95th Queue (ft)	223	345
Link Distance (ft)	329	329
Upstream Blk Time (%)	0	1
Queuing Penalty (veh)	2	7
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	235	278	77	106	128	244	222	33	174	266	287	140
Average Queue (ft)	117	139	20	48	30	89	95	3	39	130	161	51
95th Queue (ft)	209	245	54	92	84	178	184	19	115	223	269	143
Link Distance (ft)	1012	1012	1012			982				1267	1267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)						0	2		0	5	19	0
Queuing Penalty (veh)						0	3		0	2	15	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	111	124	136	147	44
Average Queue (ft)	42	72	68	79	12
95th Queue (ft)	87	109	125	129	38
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Network Summary

Network wide Queuing Penalty: 118

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	7867	7776	7819	7698	7730	7775
Vehs Exited	7742	7770	7852	7643	7738	7748
Starting Vehs	168	224	206	228	206	203
Ending Vehs	293	230	173	283	198	227
Travel Distance (mi)	4632	4609	4620	4567	4585	4603
Travel Time (hr)	276.7	257.7	250.3	278.7	262.3	265.2
Total Delay (hr)	140.4	122.1	114.3	143.6	127.4	129.6
Total Stops	9103	8908	8947	8932	8906	8956
Fuel Used (gal)	201.9	198.2	196.8	200.3	198.7	199.2

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1744	1765	1767	1762	1812	1770
Vehs Exited	1679	1786	1777	1787	1780	1760
Starting Vehs	168	224	206	228	206	203
Ending Vehs	233	203	196	203	238	207
Travel Distance (mi)	1018	1056	1036	1057	1080	1050
Travel Time (hr)	47.8	49.8	49.3	50.1	51.2	49.6
Total Delay (hr)	18.0	18.7	18.9	18.9	19.5	18.8
Total Stops	1801	1887	1870	1880	1941	1875
Fuel Used (gal)	41.0	43.2	42.4	43.1	44.2	42.8

Interval #2 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2194	2113	2185	2166	2090	2153
Vehs Exited	2160	2012	2095	2033	2039	2067
Starting Vehs	233	203	196	203	238	207
Ending Vehs	267	304	286	336	289	290
Travel Distance (mi)	1279	1237	1249	1249	1213	1245
Travel Time (hr)	70.8	64.3	64.7	69.3	66.6	67.1
Total Delay (hr)	32.9	27.9	27.8	32.3	30.8	30.3
Total Stops	2667	2475	2429	2517	2455	2504
Fuel Used (gal)	54.7	51.9	52.4	53.3	52.3	52.9

Interval #3 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2177	2133	2132	2033	2029	2102
Vehs Exited	2072	2100	2107	2041	2016	2066
Starting Vehs	267	304	286	336	289	290
Ending Vehs	372	337	311	328	302	325
Travel Distance (mi)	1242	1228	1268	1210	1188	1227
Travel Time (hr)	82.5	77.0	76.2	82.3	76.0	78.8
Total Delay (hr)	45.9	40.7	38.7	46.3	40.7	42.5
Total Stops	2598	2535	2665	2476	2443	2542
Fuel Used (gal)	56.7	54.9	55.8	55.0	53.1	55.1

Interval #4 Information

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1752	1765	1735	1737	1799	1760
Vehs Exited	1831	1872	1873	1782	1903	1852
Starting Vehs	372	337	311	328	302	325
Ending Vehs	293	230	173	283	198	227
Travel Distance (mi)	1092	1087	1067	1051	1104	1080
Travel Time (hr)	75.6	66.6	60.1	77.0	68.6	69.6
Total Delay (hr)	43.6	34.8	28.9	46.1	36.4	38.0
Total Stops	2037	2011	1983	2059	2067	2034
Fuel Used (gal)	49.6	48.1	46.2	48.9	49.1	48.4

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	R	L	T	T	L
Maximum Queue (ft)	71	44	61	50	51	31	177
Average Queue (ft)	24	5	15	15	15	3	84
95th Queue (ft)	59	26	56	43	42	16	146
Link Distance (ft)	346	346			441	441	299
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	325			
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	48	38	16	61	56	69	92
Average Queue (ft)	12	6	1	13	19	56	41
95th Queue (ft)	40	25	7	43	61	66	82
Link Distance (ft)		441	441	483	483		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	2	
Queuing Penalty (veh)					0	1	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	T
Maximum Queue (ft)	50	111	55	58	193	206	88	115	49	160	243	89
Average Queue (ft)	14	55	18	19	106	117	35	64	18	20	133	12
95th Queue (ft)	42	98	48	49	169	178	72	104	44	82	215	56
Link Distance (ft)		1066	1066				2339	2339			388	388
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			200	200	200			200	160		
Storage Blk Time (%)					0	0					5	
Queuing Penalty (veh)					0	0					1	

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	28	38	121	172	30
Average Queue (ft)	1	10	29	79	6
95th Queue (ft)	17	31	77	143	21
Link Distance (ft)			340	340	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	290			200
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 7: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	184	210	119	139	181	224	154	218	228
Average Queue (ft)	78	123	46	75	101	113	74	137	147
95th Queue (ft)	152	187	94	124	167	191	132	204	218
Link Distance (ft)		823		524	524	524	388	388	388
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	270		350						
Storage Blk Time (%)	0								
Queuing Penalty (veh)	0								

Intersection: 8: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	L	T	T
Maximum Queue (ft)	174	209	267	98	46	53	33	136	140
Average Queue (ft)	94	122	106	25	7	10	5	38	36
95th Queue (ft)	151	191	232	70	32	36	23	104	105
Link Distance (ft)		675			1054	1054		524	524
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	515		515	450			100		
Storage Blk Time (%)								1	
Queuing Penalty (veh)								0	

Intersection: 13: LSNHS Central Drive & Tudor Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	T	T	TR	LTR	LTR
Maximum Queue (ft)	70	85	96	138	112	35
Average Queue (ft)	27	29	38	51	54	9
95th Queue (ft)	56	65	76	103	92	31
Link Distance (ft)	892	892	1020	1020	376	533
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	63	190
Average Queue (ft)	3	22
95th Queue (ft)	34	112
Link Distance (ft)	334	334
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	100	90	39	57	46	102	57	141	156	201	199	117
Average Queue (ft)	38	34	7	26	5	39	23	26	79	94	83	21
95th Queue (ft)	78	73	26	50	26	80	45	93	142	175	164	66
Link Distance (ft)	1012	1012	1012			981				604	604	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)								0	1	1	3	0
Queuing Penalty (veh)								0	2	2	2	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	141	154	152	149	96
Average Queue (ft)	63	87	60	74	43
95th Queue (ft)	119	139	122	127	75
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7120: Douglas Street & Sycamore

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	44	63	31	44	19
Average Queue (ft)	16	19	4	5	1
95th Queue (ft)	43	52	22	26	8
Link Distance (ft)	534		454		1148
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		60		285	
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Intersection: 7121: Douglas Street & Tudor Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	UL	T	T	R	L
Maximum Queue (ft)	65	92	39	30	167	185	319	175	1209	1224	125	332
Average Queue (ft)	21	32	7	8	67	43	134	90	529	550	93	153
95th Queue (ft)	55	72	29	29	139	110	261	220	1254	1284	175	291
Link Distance (ft)		1041	1041			892	892		1938	1938		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	165			145	160			150			100	350
Storage Blk Time (%)					1	0		0	62	65	1	1
Queuing Penalty (veh)					1	0		0	32	86	2	1

Intersection: 7121: Douglas Street & Tudor Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	110	181
Average Queue (ft)	24	79
95th Queue (ft)	70	144
Link Distance (ft)	1148	1148
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7122: Douglas Street & Chipman Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	237	87	67	77	199	195	89	125	447	30	58	188
Average Queue (ft)	119	30	22	28	116	91	40	82	216	9	18	79
95th Queue (ft)	200	67	54	64	177	163	70	149	416	30	45	145
Link Distance (ft)		1090	1090		1843	1843			973	973	1938	1938
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	340			200			200	100				
Storage Blk Time (%)					0	0		2	36			0
Queuing Penalty (veh)					0	0		8	42			2

Intersection: 7122: Douglas Street & Chipman Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	187
Average Queue (ft)	64
95th Queue (ft)	129
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	175
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	39	64	91	31	168	132	66	47	69	53
Average Queue (ft)	8	8	23	6	82	38	22	14	27	15
95th Queue (ft)	26	33	64	25	156	101	55	41	59	44
Link Distance (ft)		2339	2339		1382	1382	404	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)					1					
Queuing Penalty (veh)					0					

Network Summary

Network wide Queuing Penalty: 182

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	10366	10544	10486	10197	10387	10391
Vehs Exited	10194	10387	10393	10052	10235	10250
Starting Vehs	309	338	323	294	318	312
Ending Vehs	481	495	416	439	470	454
Travel Distance (mi)	6211	6339	6307	6126	6257	6248
Travel Time (hr)	501.3	499.1	430.1	409.9	402.5	448.6
Total Delay (hr)	323.5	317.0	249.1	234.3	222.5	269.3
Total Stops	13930	14244	13559	12675	13306	13543
Fuel Used (gal)	301.7	306.0	288.1	277.8	280.9	290.9

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2411	2471	2429	2395	2401	2421
Vehs Exited	2356	2494	2429	2320	2398	2399
Starting Vehs	309	338	323	294	318	312
Ending Vehs	364	315	323	369	321	336
Travel Distance (mi)	1445	1503	1488	1449	1480	1473
Travel Time (hr)	78.2	80.4	83.4	79.9	78.3	80.0
Total Delay (hr)	36.6	37.4	40.8	38.4	35.8	37.8
Total Stops	2831	2951	2961	2731	2852	2863
Fuel Used (gal)	61.1	64.4	64.4	61.5	62.9	62.9

Interval #2 Information

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2854	2789	2829	2687	2857	2797
Vehs Exited	2708	2605	2712	2650	2718	2678
Starting Vehs	364	315	323	369	321	336
Ending Vehs	510	499	440	406	460	459
Travel Distance (mi)	1647	1631	1649	1585	1664	1635
Travel Time (hr)	124.0	109.8	105.1	102.5	102.3	108.7
Total Delay (hr)	76.8	62.8	57.6	57.1	54.3	61.7
Total Stops	3845	3693	3566	3435	3726	3655
Fuel Used (gal)	78.0	74.6	73.9	71.8	73.6	74.4

Interval #3 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2795	2884	2792	2691	2669	2765
Vehs Exited	2728	2781	2748	2611	2713	2715
Starting Vehs	510	499	440	406	460	459
Ending Vehs	577	602	484	486	416	507
Travel Distance (mi)	1638	1711	1661	1601	1618	1646
Travel Time (hr)	147.0	153.9	122.3	115.2	112.3	130.1
Total Delay (hr)	100.1	104.8	74.6	69.2	65.8	82.9
Total Stops	3829	4228	3803	3517	3564	3789
Fuel Used (gal)	83.6	86.4	77.7	74.2	74.4	79.3

Interval #4 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2306	2400	2436	2424	2460	2405
Vehs Exited	2402	2507	2504	2471	2406	2457
Starting Vehs	577	602	484	486	416	507
Ending Vehs	481	495	416	439	470	454
Travel Distance (mi)	1481	1494	1509	1491	1495	1494
Travel Time (hr)	152.2	155.1	119.2	112.3	109.5	129.7
Total Delay (hr)	110.0	112.0	76.1	69.5	66.5	86.8
Total Stops	3425	3372	3229	2992	3164	3237
Fuel Used (gal)	79.0	80.6	72.1	70.3	70.0	74.4

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	R	L	T	T	L
Maximum Queue (ft)	88	55	57	116	82	70	198
Average Queue (ft)	41	8	5	51	37	25	100
95th Queue (ft)	81	35	30	94	73	62	168
Link Distance (ft)	346	346			441	441	299
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	325			
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	71	89	49	88	105	72	115
Average Queue (ft)	23	29	7	32	7	22	62
95th Queue (ft)	55	69	31	76	40	68	101
Link Distance (ft)		441	441	483	483		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	1	
Queuing Penalty (veh)					0	1	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	T
Maximum Queue (ft)	69	206	172	52	211	223	302	100	57	59	202	158
Average Queue (ft)	26	139	93	18	143	147	42	43	22	15	86	18
95th Queue (ft)	58	196	161	46	215	226	161	88	50	44	165	79
Link Distance (ft)		1066	1066				2339	2339			388	388
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			200	200	200			200	160		
Storage Blk Time (%)		0	0		1	2	0				1	0
Queuing Penalty (veh)		0	0		1	2	0				0	0

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	216	82	102	193	39
Average Queue (ft)	98	34	37	89	10
95th Queue (ft)	179	70	78	159	29
Link Distance (ft)			340	340	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	290			200
Storage Blk Time (%)	0			0	
Queuing Penalty (veh)	1			0	

Intersection: 7: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	149	169	260	272	116	245	154	203	221
Average Queue (ft)	55	92	175	197	41	103	82	117	128
95th Queue (ft)	114	149	244	258	93	204	134	182	199
Link Distance (ft)		823		524	524	524	388	388	388
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	270		350						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 8: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	L	T	T
Maximum Queue (ft)	292	338	168	300	209	119	52	168	160
Average Queue (ft)	122	198	54	141	52	47	6	95	78
95th Queue (ft)	224	291	139	255	141	105	30	151	138
Link Distance (ft)		675			1054	1054		524	524
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	515		515	450			100		
Storage Blk Time (%)								9	
Queuing Penalty (veh)								1	

Intersection: 13: LSNHS Central Drive & Tudor Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	T	T	TR	LTR	LTR
Maximum Queue (ft)	80	89	78	76	73	31
Average Queue (ft)	22	28	22	27	33	7
95th Queue (ft)	60	74	60	63	61	29
Link Distance (ft)	892	892	1020	1020	376	533
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	314	338
Average Queue (ft)	62	156
95th Queue (ft)	237	371
Link Distance (ft)	334	334
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	3
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	224	224	65	130	114	156	198	33	174	413	425	140
Average Queue (ft)	119	119	18	45	23	73	88	3	49	208	214	62
95th Queue (ft)	199	199	51	88	68	123	166	19	144	376	378	160
Link Distance (ft)	1012	1012	1012			981				604	604	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)				0			0		0	21	28	0
Queuing Penalty (veh)				0			0		0	8	22	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	114	129	176	190	44
Average Queue (ft)	49	74	115	128	17
95th Queue (ft)	100	116	171	183	44
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 7120: Douglas Street & Sycamore

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	UL	R
Maximum Queue (ft)	94	79	89	42	30
Average Queue (ft)	30	39	12	5	4
95th Queue (ft)	69	76	57	24	19
Link Distance (ft)	534		454		1148
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		60		285	
Storage Blk Time (%)		6	0		
Queuing Penalty (veh)		0	0		

Intersection: 7121: Douglas Street & Tudor Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	T	R	UL
Maximum Queue (ft)	116	162	122	74	163	331	342	174	1415	1436	125	375
Average Queue (ft)	49	66	39	23	95	78	107	49	666	693	106	285
95th Queue (ft)	94	124	97	60	171	335	306	176	1461	1501	172	422
Link Distance (ft)		1041	1041			892	892		1938	1938		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	165			145	160			150			100	350
Storage Blk Time (%)	0	0	0		10	0			75	81	2	15
Queuing Penalty (veh)	0	0	0		3	0			13	126	3	50

Intersection: 7121: Douglas Street & Tudor Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	598	557
Average Queue (ft)	214	218
95th Queue (ft)	576	504
Link Distance (ft)	1148	1148
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	2	
Queuing Penalty (veh)	7	

Intersection: 7122: Douglas Street & Chipman Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	359	463	454	121	183	172	66	125	772	436	1213	1444
Average Queue (ft)	251	228	199	58	117	89	33	90	504	125	465	888
95th Queue (ft)	399	493	407	104	169	153	58	161	949	597	1568	1943
Link Distance (ft)		1090	1090		1843	1843			973	973	1938	1938
Upstream Blk Time (%)									8	4	2	5
Queuing Penalty (veh)									0	0	7	23
Storage Bay Dist (ft)	340			200			200	100				
Storage Blk Time (%)	14	0			0	0		5	69			47
Queuing Penalty (veh)	41	0			0	0		17	54			188

Intersection: 7122: Douglas Street & Chipman Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	181
95th Queue (ft)	267
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	175
Storage Blk Time (%)	1
Queuing Penalty (veh)	4

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	46	163	190	68	196	156	66	43	74	43
Average Queue (ft)	13	49	66	16	67	28	20	10	29	15
95th Queue (ft)	34	129	156	50	152	92	52	33	67	40
Link Distance (ft)		2339	2339		1382	1382	404	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)		0			1					
Queuing Penalty (veh)		0			0					

Network Summary

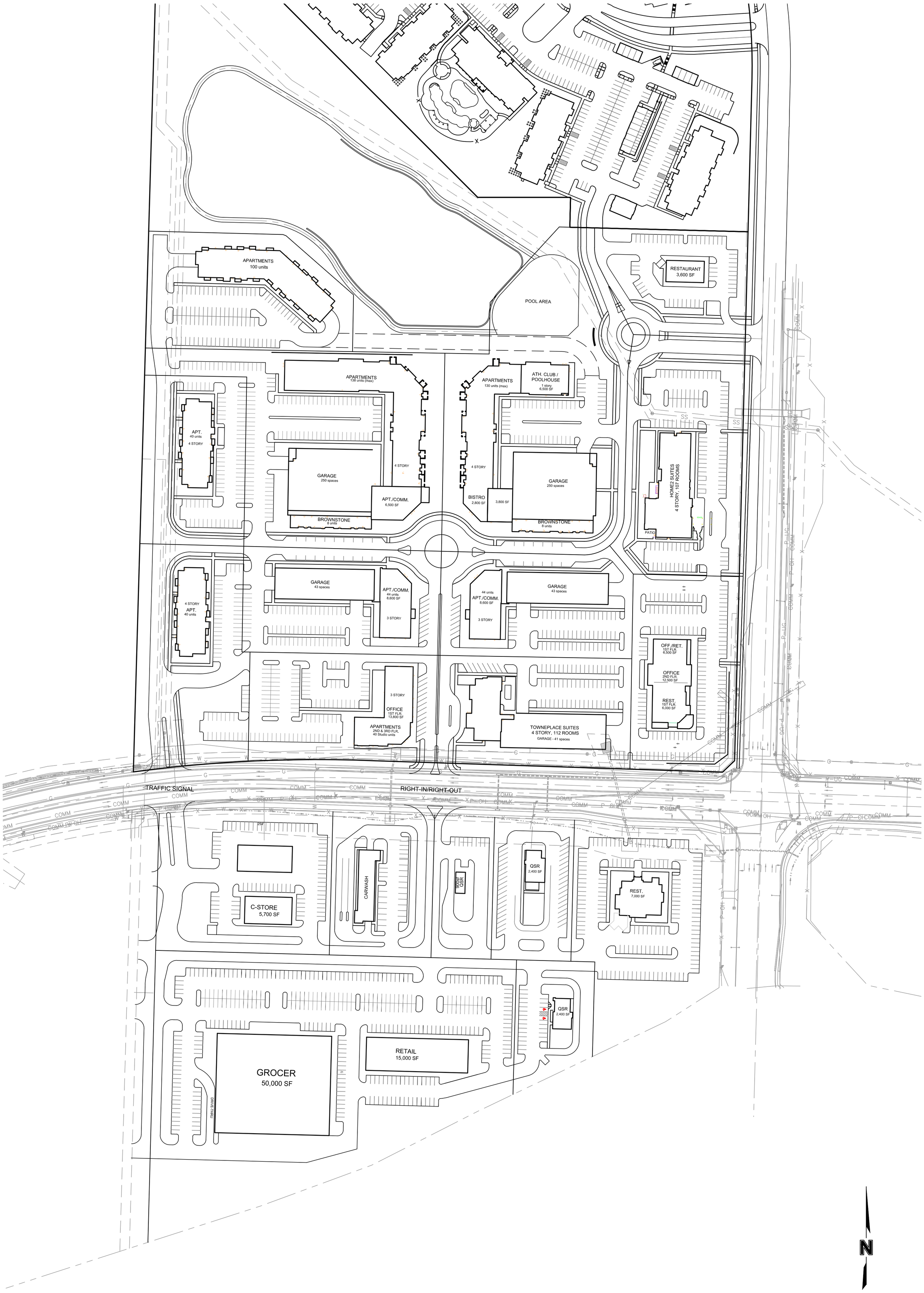
Network wide Queuing Penalty: 577

APPENDIX C

Existing Plus Approved Plus Phase 1 Development Conditions

Site Plan

DWG: F:\2021\04501-05000\021-04643-A\40-Design\AutoCAD\Preliminary Plans\Xref\L_PBASE01_A2104643.dwg USER: cholmquist
DATE: Oct 31, 2022 11:13am XREFS: C_FROAD_A2104643 C_XBASE_A2103436 C_PBASE01_B190012 F_PBASE_B190012 Discovery LS - Signature building 9-22-22 Discovery LS - Zone 2 revision 9-26-22 L_PBASE02_A2104643



SHEET 1 of 1

drawn by: CJH
checked by: JFE
approved by: ENG
QA/QC by: ENG
project no.: A21-04643
drawing no.: ABC.DWG
date: 2022.10.31

CONCEPT PLAN

DISCOVERY PARK
ZONES 1 & 2

LEE'S SUMMIT, MO 2022

REV. NO.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

olsson

Olsson - Civil Engineering
Missouri Certificate of Authority #001592
1301 Burlington Street
North Kansas City, MO 64116 TEL 816.361.1177 www.olsson.com

Trip Generation

Phase 1 (Area 1)

Daily Trip Generation

ITE Code	Zone	Description	Land Use	Size		Trip Gen. Avg. Rate/Eq.	Daily Trips	Trip Distribution Enter	Trip Distribution Exit	Daily Trips Enter	Daily Trips Exit	**Notes**
220	1	Building 1 (1C/1H)	Multifamily Housing (Low-Rise)	520	Units	Equation	3,409	50%	50%	1,705	1,704	
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	80	Units	Equation	589	50%	50%	295	294	
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	40	Units	Equation	332	50%	50%	166	166	
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	40	Units	Equation	332	50%	50%	166	166	
221	1	Residential (Mainstreet 1)	Multifamily Housing (Mid-Rise)	46	Units	Average Rate	209	50%	50%	105	104	
221	1	Residential (Mainstreet 2)	Multifamily Housing (Mid-Rise)	46	Units	Average Rate	209	50%	50%	105	104	
221	1	Residential (Mainstreet 3)	Multifamily Housing (Mid-Rise)	152	Units	Average Rate	691	50%	50%	346	345	
215	1	Brownstones (Mainstreet 3)	Single-Family Attached Housing	8	Units	Average Rate	58	50%	50%	29	29	
932	1	Restaurant (Mainstreet 3)	High-Turnover (Sit-Down) Restaurant	6,500	Sq. Ft.	Average Rate	697	50%	50%	349	348	
221	1	Residential (Mainstreet 4)	Multifamily Housing (Mid-Rise)	130	Units	Average Rate	591	50%	50%	296	295	
215	1	Brownstones (Mainstreet 4)	Single-Family Attached Housing	8	Units	Average Rate	58	50%	50%	29	29	
932	1	Retail/Restaurant (Mainstreet 4)	High-Turnover (Sit-Down) Restaurant	6,600	Sq. Ft.	Average Rate	708	50%	50%	354	354	
492	1	Fitness (Mainstreet 1)	Health/Fitness Club	6,500	Sq. Ft.	*	230	50%	50%	115	115	
311	1	Townplace Suites (1D)	All Suites Hotel	112	Rooms	Average Rate	493	50%	50%	247	246	
311	1	Home2 Suites (1B)	All Suites Hotel	107	Rooms	Average Rate	471	50%	50%	236	235	
822	1	Retail Center (1A)	Strip Retail Plaza (<40k)	19,000	Sq. Ft.	Average Rate	1,035	50%	50%	518	517	
932	1	Restaurant (1A)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	644	50%	50%	322	322	
220	1	South Residential/Office	Multifamily Housing (Low-Rise)	40	Units	Equation	332	50%	50%	166	166	
710	1	South Residential/Office	General Office Building	13,800	Sq. Ft.	Equation	208	50%	50%	104	104	
932	1	North Restaurant	High-Turnover (Sit-Down) Restaurant	3,600	Sq. Ft.	Average Rate	386	50%	50%	193	193	
Total							**11,682**			**5,846**	**5,836**	

*No daily rate provided, used 10x PM peak hour value.

AM Peak Hour Trip Generation

ITE Code			Land Use	Size		Trip Gen. Avg. Rate/Eq.	AM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	AM Peak Hour Trips Enter	AM Peak Hour Trips Exit	AM Capture Trips Enter	AM Capture Trips Exit
220	1	Building 1 (1C/1H)	Multifamily Housing (Low-Rise)	520	Units	Equation	185	24%	76%	44	141	37	127
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	80	Units	Equation	48	24%	76%	12	36	10	32
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	40	Units	Equation	36	24%	76%	9	27	8	24
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	40	Units	Equation	36	24%	76%	9	27	8	24
221	1	Residential (Mainstreet 1)	Multifamily Housing (Mid-Rise)	46	Units	Equation	9	23%	77%	2	7	2	6
221	1	Residential (Mainstreet 2)	Multifamily Housing (Mid-Rise)	46	Units	Equation	9	23%	77%	2	7	2	6
221	1	Residential (Mainstreet 3)	Multifamily Housing (Mid-Rise)	152	Units	Equation	56	23%	77%	13	43	11	39
215	1	Brownstones (Mainstreet 3)	Single-Family Attached Housing	8	Units	Average Rate	4	31%	69%	1	3	1	3
932	1	Restaurant (Mainstreet 3)	High-Turnover (Sit-Down) Restaurant	6,500	Sq. Ft.	Average Rate	63	55%	45%	35	28	29	25
221	1	Residential (Mainstreet 4)	Multifamily Housing (Mid-Rise)	130	Units	Equation	46	23%	77%	11	35	9	32
215	1	Brownstones (Mainstreet 4)	Single-Family Attached Housing	8	Units	Average Rate	4	31%	69%	1	3	1	3
932	1	Retail/Restaurant (Mainstreet 4)	High-Turnover (Sit-Down) Restaurant	6,600	Sq. Ft.	Average Rate	64	55%	45%	35	29	29	26
492	1	Fitness (Mainstreet 1)	Health/Fitness Club	6,500	Sq. Ft.	Average Rate	9	51%	49%	5	4	4	4
311	1	Townplace Suites (1D)	All Suites Hotel	112	Rooms	Average Rate	39	53%	47%	21	18	18	16
311	1	Home2 Suites (1B)	All Suites Hotel	107	Rooms	Average Rate	37	53%	47%	20	17	17	15
822	1	Retail Center (1A)	Strip Retail Plaza (<40k)	19,000	Sq. Ft.	Average Rate	45	60%	40%	27	18	23	16
932	1	Restaurant (1A)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	58	55%	45%	32	26	27	23
220	1	South Residential/Office	Multifamily Housing (Low-Rise)	40	Units	Equation	36	24%	76%	9	27	8	24
710	1	South Residential/Office	General Office Building	13,800	Sq. Ft.	Equation	31	88%	12%	27	4	23	4
932	1	North Restaurant	High-Turnover (Sit-Down) Restaurant	3,600	Sq. Ft.	Average Rate	35	55%	45%	19	16	16	14
Total							**850**			**334**	**516**	**283**	**463**

PM Peak Hour Trip Generation

ITE Code			Land Use	Size		Trip Gen. Avg. Rate/Eq.	PM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	PM Peak Hour Trips Enter	PM Peak Hour Trips Exit	PM Capture Trips Enter	PM Capture Trips Exit
220	1	Building 1 (1C/1H)	Multifamily Housing (Low-Rise)	520	Units	Equation	245	63%	37%	154	91	126	67
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	80	Units	Equation	55	63%	37%	35	20	29	15
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	40	Units	Equation	38	63%	37%	24	14	20	10
220	1	Buildings 2-12 (1C/1H)	Multifamily Housing (Low-Rise)	40	Units	Equation	38	63%	37%	24	14	20	10
221	1	Residential (Mainstreet 1)	Multifamily Housing (Mid-Rise)	46	Units	Equation	19	61%	39%	12	7	10	5
221	1	Residential (Mainstreet 2)	Multifamily Housing (Mid-Rise)	46	Units	Equation	19	61%	39%	12	7	10	5
221	1	Residential (Mainstreet 3)	Multifamily Housing (Mid-Rise)	152	Units	Equation	60	61%	39%	37	23	30	17
215	1	Brownstones (Mainstreet 3)	Single-Family Attached Housing	8	Units	Average Rate	5	57%	43%	3	2	2	1
932	1	Restaurant (Mainstreet 3)	High-Turnover (Sit-Down) Restaurant	6,500	Sq. Ft.	Average Rate	59	61%	39%	36	23	30	17
221	1	Residential (Mainstreet 4)	Multifamily Housing (Mid-Rise)	130	Units	Equation	52	61%	39%	32	20	26	15
215	1	Brownstones (Mainstreet 4)	Single-Family Attached Housing	8	Units	Average Rate	5	57%	43%	3	2	2	1
932	1	Retail/Restaurant (Mainstreet 4)	High-Turnover (Sit-Down) Restaurant	6,600	Sq. Ft.	Average Rate	60	61%	39%	37	23	30	17
492	1	Fitness (Mainstreet 1)	Health/Fitness Club	6,500	Sq. Ft.	Average Rate	23	57%	43%	13	10	11	7
311	1	Townplace Suites (1D)	All Suites Hotel	112	Rooms	Average Rate	41	49%	51%	20	21	16	16
311	1	Home2 Suites (1B)	All Suites Hotel	107	Rooms	Average Rate	39	49%	51%	19	20	16	15
822	1	Retail Center (1A)	Strip Retail Plaza (<40k)	19,000	Sq. Ft.	Equation	123	50%	50%	62	61	51	45
932	1	Restaurant (1A)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	55	61%	39%	34	21	28	16
220	1	South Residential/Office	Multifamily Housing (Low-Rise)	40	Units	Equation	38	63%	37%	24	14	20	10
710	1	South Residential/Office	General Office Building	13,800	Sq. Ft.	Equation	33	17%	83%	6	27	5	20
932	1	North Restaurant	High-Turnover (Sit-Down) Restaurant	3,600	Sq. Ft.	Average Rate	33	61%	39%	20	13	16	10
Total							**1,040**			**607**	**433**	**498**	**319**

Internal Capture Land Use Breakdown

			Land Use	AM Peak Enter	AM Peak Exit	PM Peak Enter	PM Peak Exit
		Zone 1	Office	27	4	6	27
			Retail	27	18	62	61
Internal Capture Rate			Restaurant	121	99	127	80
	AM	*PM*	Entertainment	-	-	-	-
Total	**13%**	**21%**	Residential	113	356	360	214
Entering	**16%**	**18%**	Hotel	41	35	39	41
Exiting	**10%**	**26%**	Other	5	4	13	10
Total				**334**	**516**	**607**	**433**

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 1 (Phase 1)	**Date:**	2-Dec-22
Analysis Year:	2022	**Checked By:**	
Analysis Period:	**AM Peak Hour Period**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				31	27	4
Retail				45	27	18
Restaurant				220	121	99
Cinema/Entertainment				0		
Residential				469	113	356
Hotel				76	41	35
All Other Land Uses[2]				9	5	4
Total				850	334	516

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		600	1200		2150	800
Retail	600		900		2100	400
Restaurant	1200	900			1600	1100
Cinema/Entertainment						
Residential	2150	2100	1600			2200
Hotel	800	400	1100		2200	

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	2	0	0	0
Retail	1		3	0	2	0
Restaurant	4	2		0	4	2
Cinema/Entertainment	0	0	0		0	0
Residential	1	4	27	0		0
Hotel	1	1	4	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	936	368	568
Internal Capture Percentage	13%	16%	10%
External Vehicle-Trips[3]	743	280	463
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	23%	75%
Retail	27%	30%
Restaurant	27%	11%
Cinema/Entertainment	N/A	N/A
Residential	5%	8%
Hotel	4%	15%

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 1 (Phase 1)	**Date:**	2-Dec-22
Analysis Year:	2022	**Checked By:**	
Analysis Period:	**PM Peak Hour Period**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				33	6	27
Retail				123	62	61
Restaurant				207	127	80
Cinema/Entertainment				0		
Residential				574	360	214
Hotel				80	39	41
All Other Land Uses[2]				23	13	10
Total				1040	607	433

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		600	1200		2150	800
Retail	600		900		2100	400
Restaurant	1200	900			1600	1100
Cinema/Entertainment						
Residential	2150	2100	1600			2200
Hotel	800	400	1100		2200	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	1	0	0	0
Retail	1		19	0	10	3
Restaurant	2	34		0	12	6
Cinema/Entertainment	0	0	0		0	0
Residential	3	2	11	0		5
Hotel	0	1	7	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,144	668	476
Internal Capture Percentage	21%	18%	26%
External Vehicle-Trips[3]	820	497	323
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	86%	20%
Retail	62%	49%
Restaurant	27%	61%
Cinema/Entertainment	N/A	N/A
Residential	6%	9%
Hotel	33%	18%

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Turn Lane Warrants

16.1. Left-Turn Lane Standards

16.1.A. Left-turn lanes shall be provided on all approaches to intersections controlled by, or planned to be controlled by, traffic signals.

16.1.B. Left-turn lanes shall be provided on all arterial streets at the intersection with other arterial and collector streets. Left-turn lanes shall be provided on minor arterial streets at the intersection with any local street or driveway where the left-turn volume is at least 20 vehicles in any hour. On major arterial streets, left-turn lanes shall be at the intersection with all connectors (an exception may be granted for a singular, existing, residential lot).

16.1.C. Left-turn lanes shall be provided on collector streets at the intersection with a connector serving non-residential development where the left-turn volume is at least 30 vehicles in any hour and should be provided where the left-turn volume is less than 30 vehicles in any hour.

16.1.D. Left-turn lanes shall be provided on non-residential connectors intersecting with major arterial streets (where left-turn egress is permitted). Left-turn lanes shall be provided on non-residential connectors intersecting minor arterial streets (where left-turn egress is permitted) where the left-turn volume is at least 20 vehicles in any hour. Left-turn lanes should be provided on any connector at any location as recommended by a traffic study or where the left-turn lane provides design efficiencies desired by the owner/developer with exception of access associated with residential property.

16.1.E. Left-turn lanes shall be provided at all median openings on roadways with medians.

Left Turn Lane Warrants						
			Left Turn Volume			
Intersection	Movement	Street Classification	AM	PM	Other	Meets Warrant
Blue Parkway and Colbern Road (roundabout)	Southbound	Major Arterial	5	41	Arterial/Arterial	Roundabout
	Eastbound	Major Arterial	9	11	Arterial/Arterial	Roundabout
	Northbound	Major Arterial	63	151	Arterial/Arterial	Roundabout
	Westbound	Major Arterial	54	35	Arterial/Arterial	Roundabout
Main Street and Colbern Road	Westbound	Major Arterial	33	20	Arterial/Collector, Median	YES, 200' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	4	17	Arterial/Collector	YES, 200' Required
	Eastbound	Driveway	11	5	Driveway/Arterial	NO
	Northbound	Major Arterial	9	32	Arterial/Driveway	PM Only
Colbern Road and Drive 5	Eastbound	Major Arterial	77	117	Arterial/Driveway, Median	YES, 200' Required
	Southbound	Driveway	84	61	Driveway/Arterial	YES, 150' Required
Douglas Street and Drive 2	Northbound	Major Arterial	16	54	Arterial/Driveway, Median	YES, 200' Required
	Eastbound	Driveway	6	3	Driveway/Arterial	YES, 150' Required
Douglas Street and Drive 3	Northbound	Major Arterial	78	127	Arterial/Driveway, Median	YES, 200' Required
	Eastbound	Driveway	53	40	Driveway/Arterial	YES, 150' Required

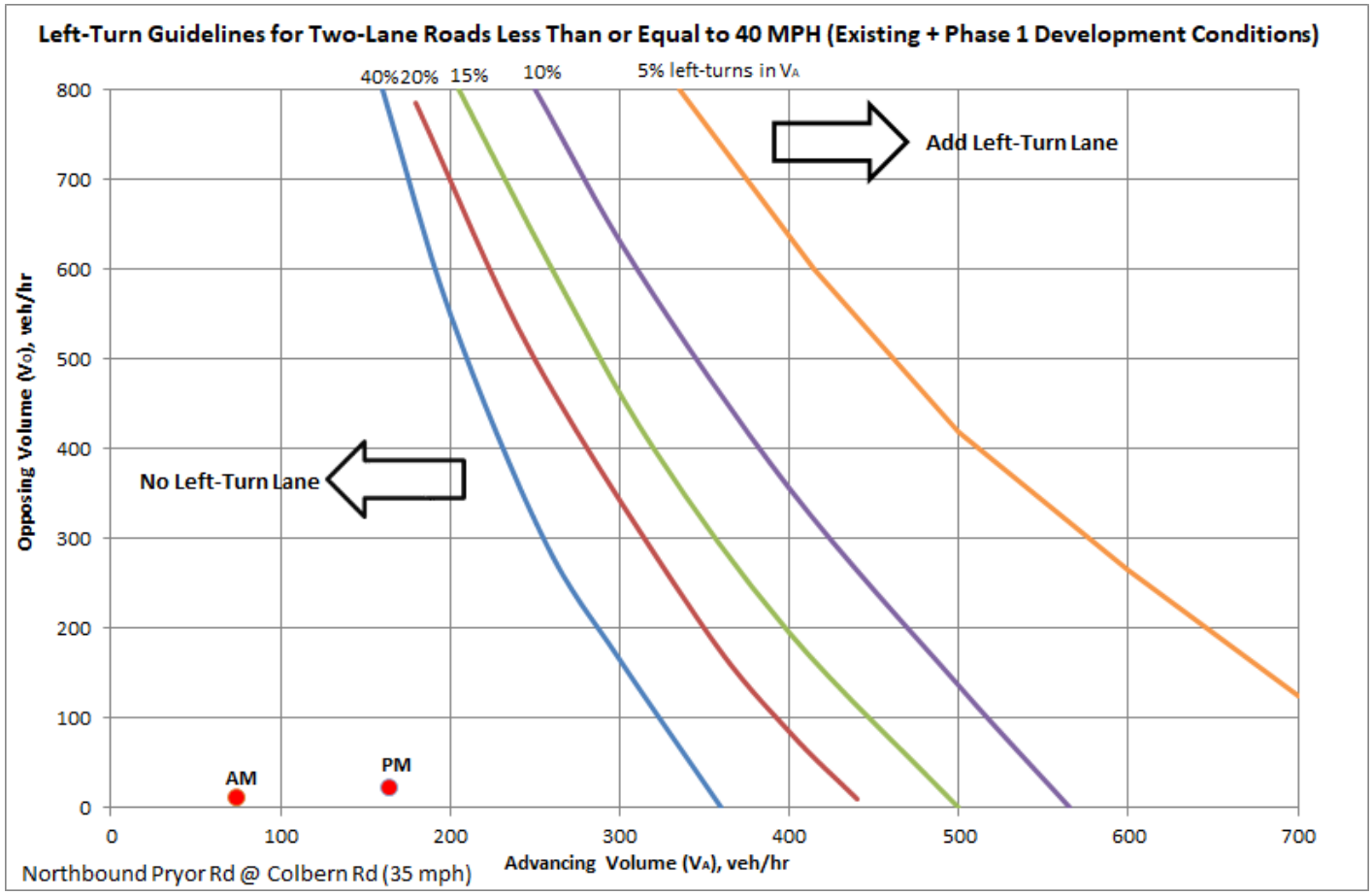
16.2. Right-Turn Lane Standards

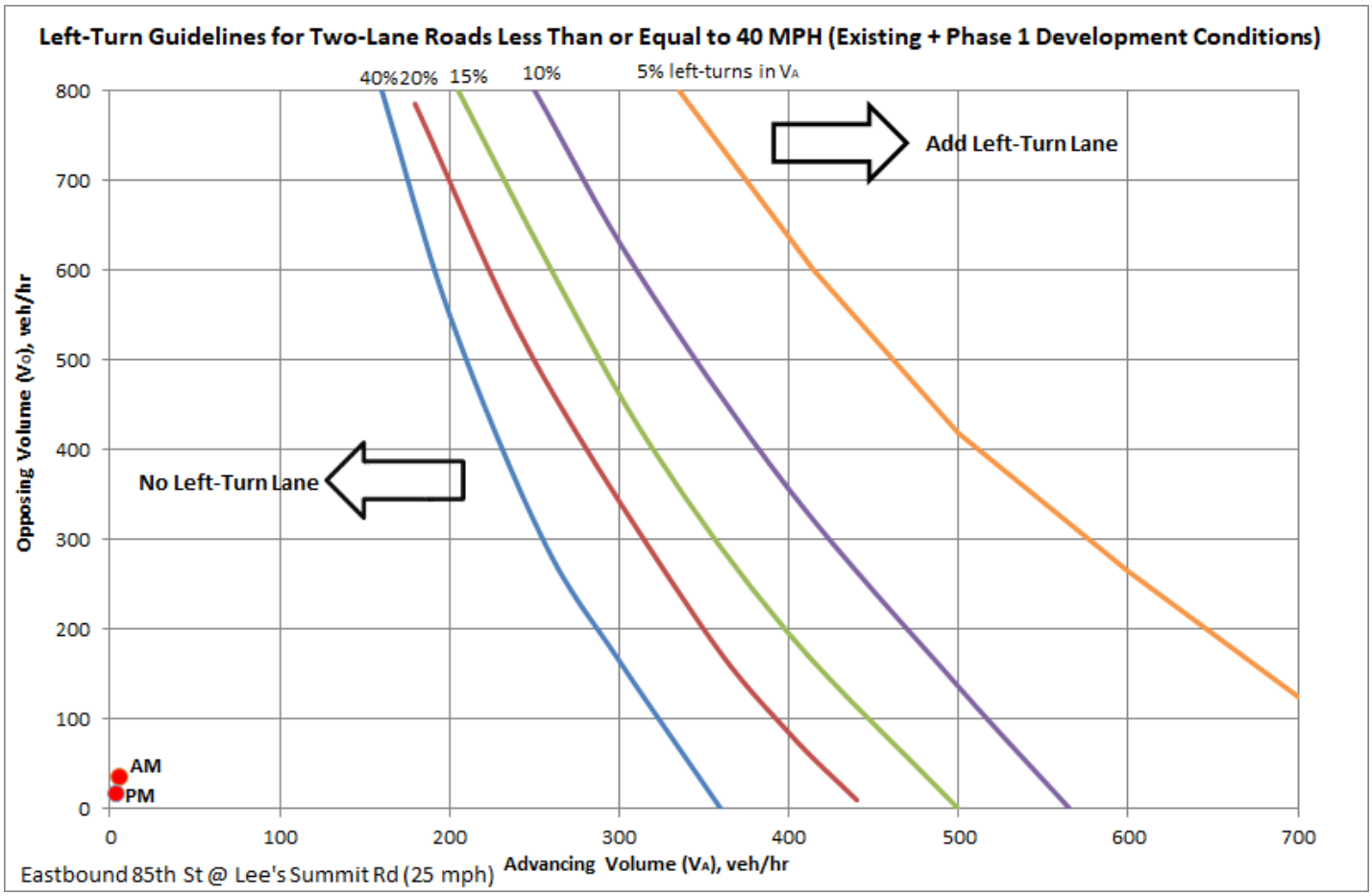
16.2.A. Required on arterial streets at each intersecting street or driveway where the right-turn volume on the major arterial street is or is projected to be at least 30 vehicles in any hour, or the right-turn volume on the minor arterial street is or is projected to be at least 60 vehicles in any hour. Minimum length should be 250 feet plus the taper on a major arterial at the intersection of another arterial street or 200 feet plus the taper on a minor arterial at the intersection with another arterial street or on a major arterial at the intersection of a collector and 150 feet plus the taper at other locations along arterial streets.

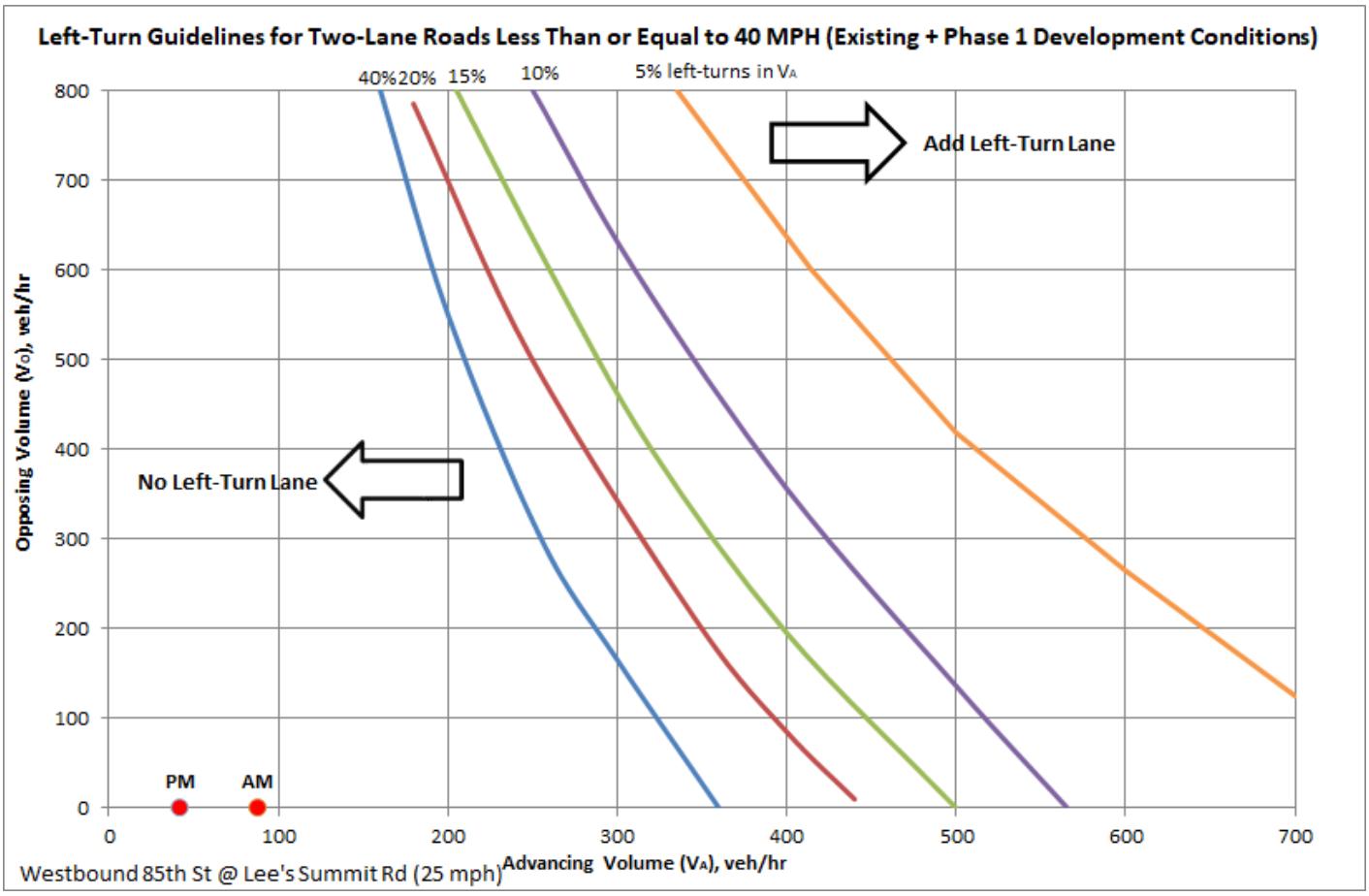
16.2.B. Required on collector streets in non-residential areas at the intersection with any street or driveway where the right-turn volume on the collector street is or is projected to be at least 100 vehicles in any hour. The minimum length should be 100 feet plus the taper.

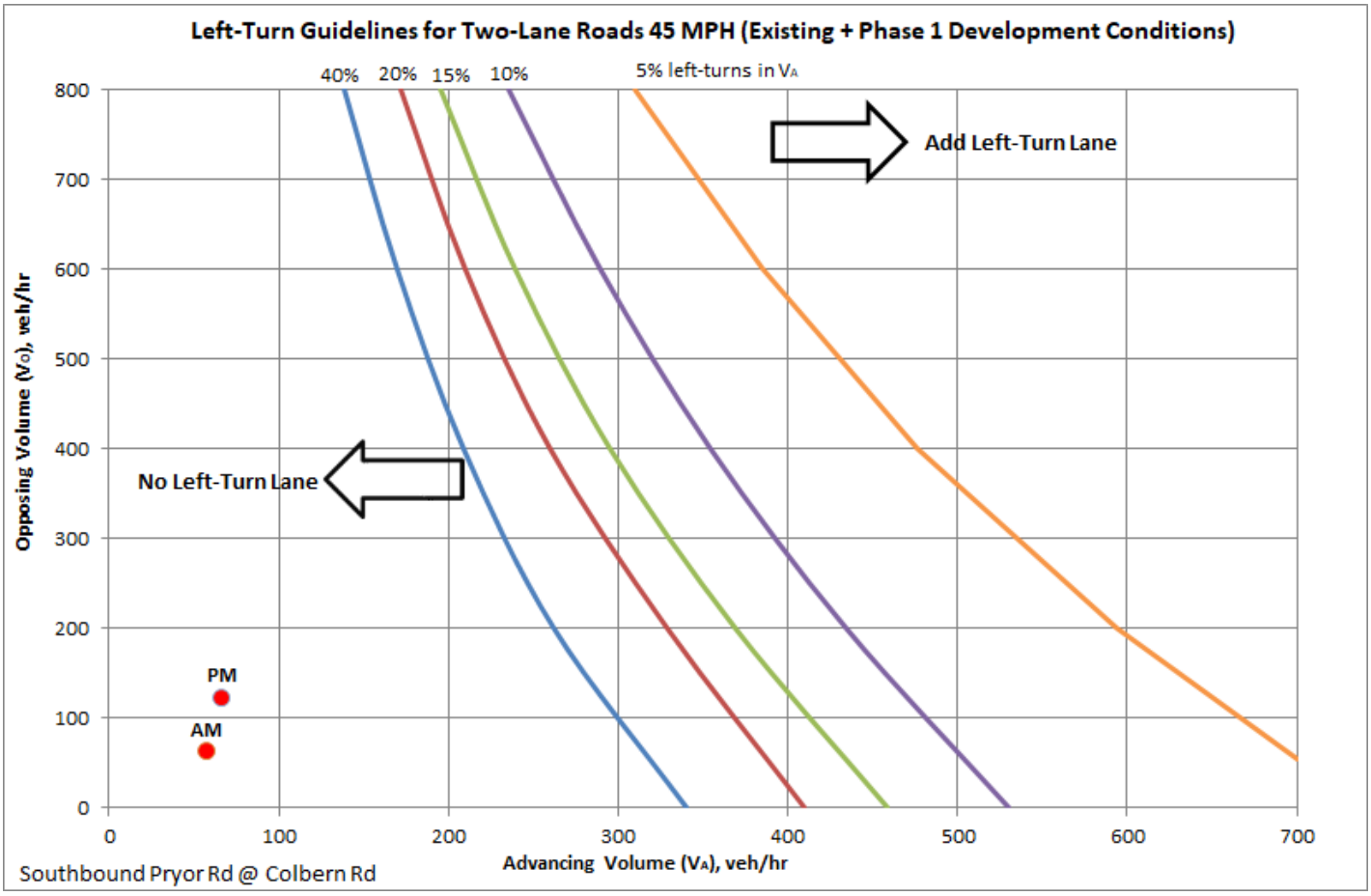
16.2.C. The length of the right-turn lane shall be increased as necessary to accommodate estimated queue length. The length of the right-turn lane at intersections controlled by traffic signals or roundabouts should be increased, if necessary, based on the longer of the queues in the turn lane or the adjacent through lane.

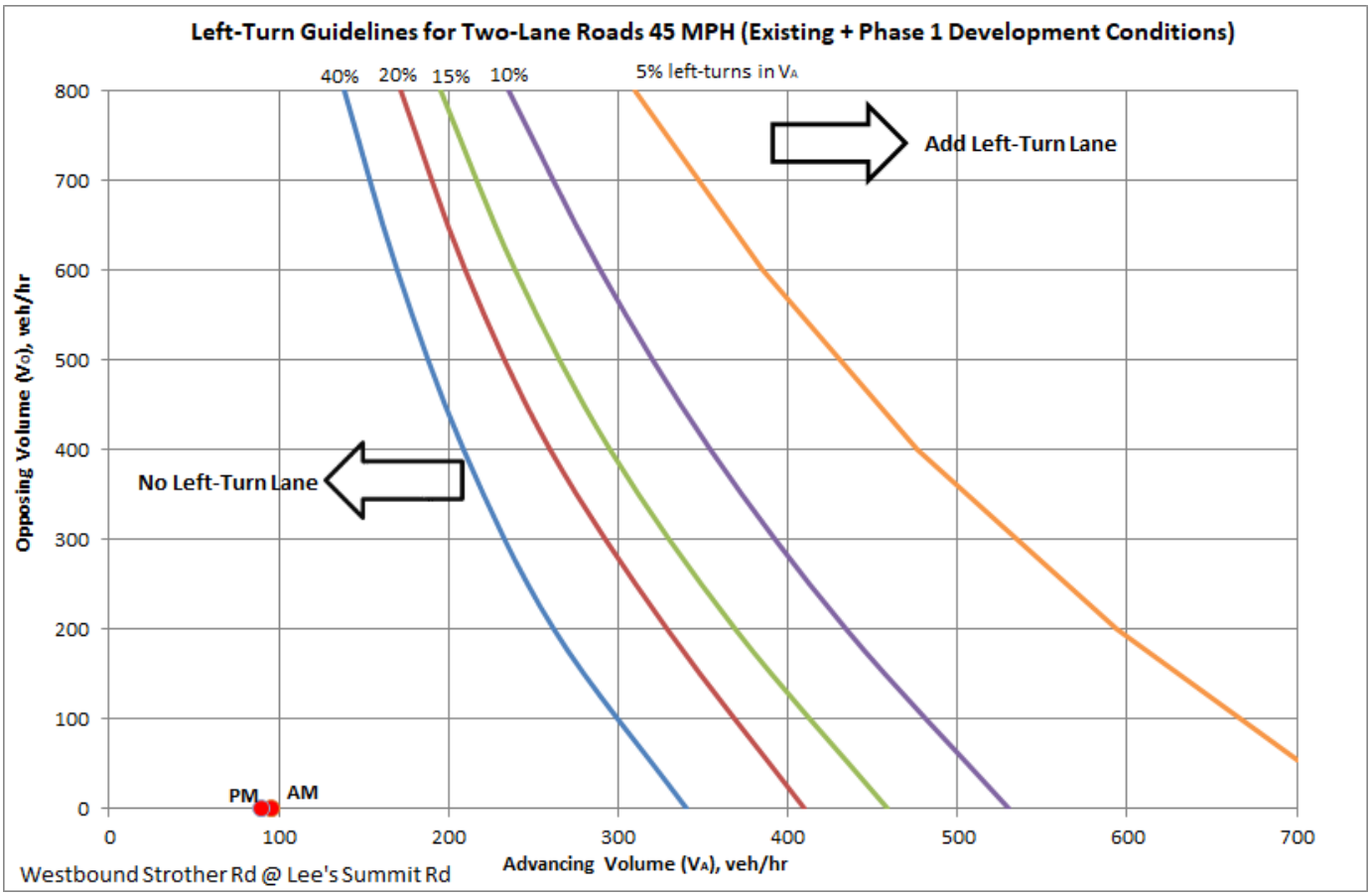
Right Turn Lane Warrants					
			Right Turn Volume		
Intersection	Movement	Street Classification	AM	PM	Meets Warrant
Blue Parkway and Colbern Road	Southbound	Major Arterial	3	12	NO
	Westbound	Major Arterial	19	6	NO
Main Street and Colbern Road	Eastbound	Major Arterial	83	58	YES, 250' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	3	10	NO
	Eastbound	Collector	32	17	NO
	Southbound	Major Arterial	4	11	NO
	Northbound	Major Arterial	10	10	NO
Colbern Road and Drive 5	Southbound	Driveway	35	27	NO
	Westbound	Major Arterial	24	38	PM Only
Colbern Road and Drive 4	Southbound	Driveway	70	53	RIRO
	Westbound	Major Arterial	37	55	YES, 250' Required
Douglas Street and Drive 2	Southbound	Major Arterial	2	6	NO
	Eastbound	Driveway	54	29	NO
Douglas Street and Drive 3	Southbound	Major Arterial	36	58	YES, 250' Required
	Eastbound	Driveway	118	84	AM Only

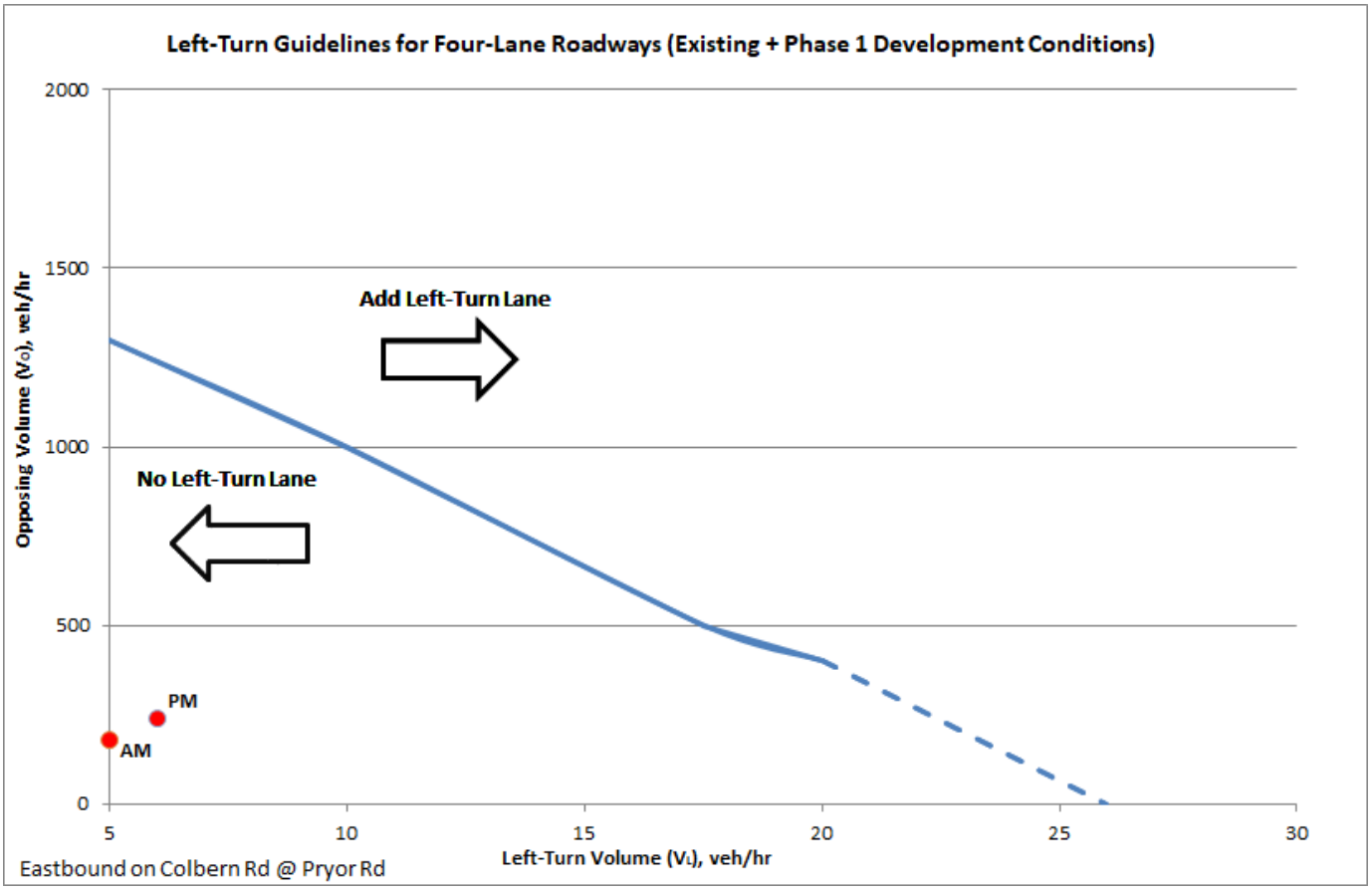

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Existing + Phase 1 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Northbound Pryor Rd @ Colbern Rd (35 mph)

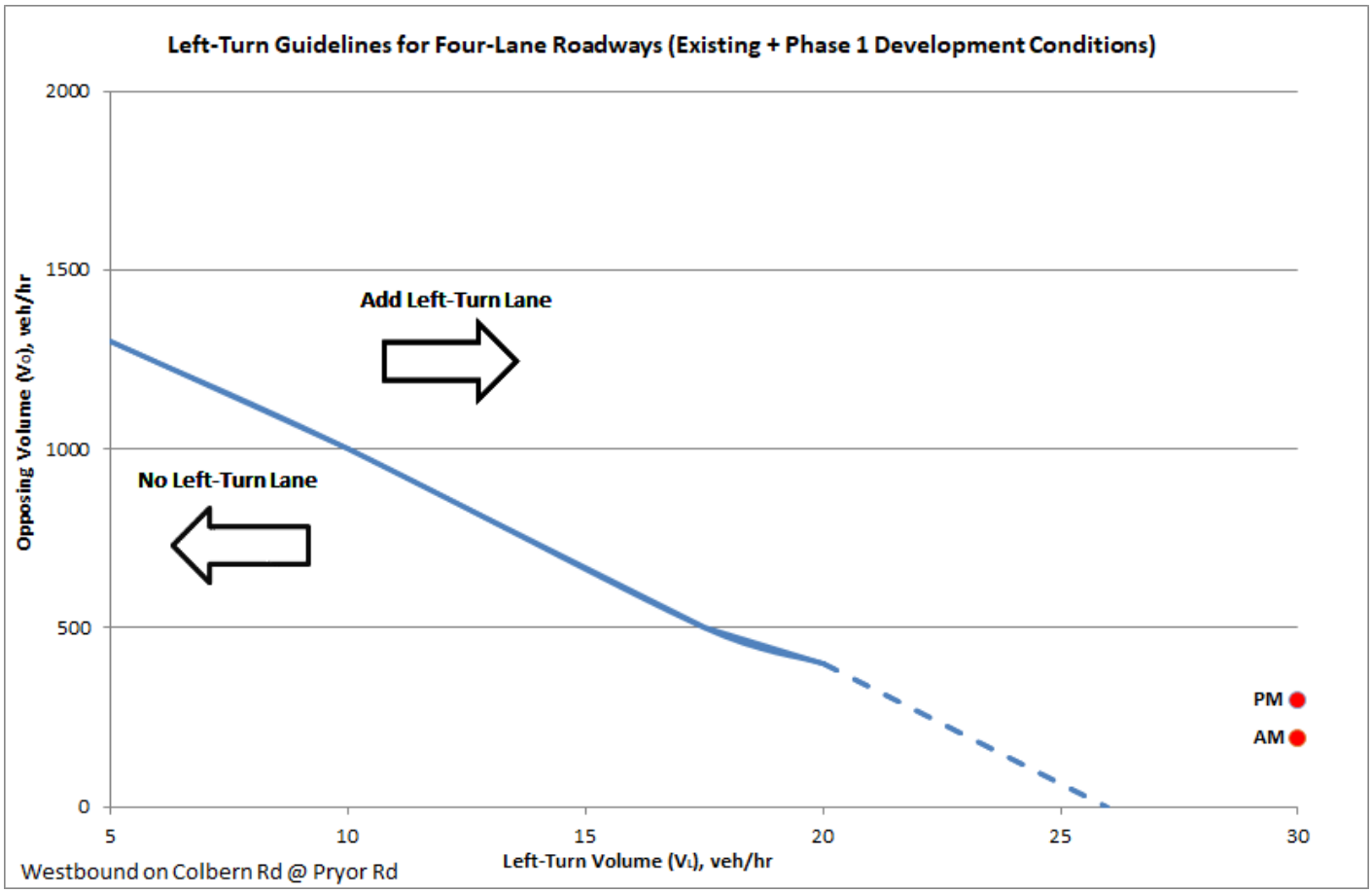

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Existing + Phase 1 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Eastbound 85th St @ Lee's Summit Rd (25 mph)

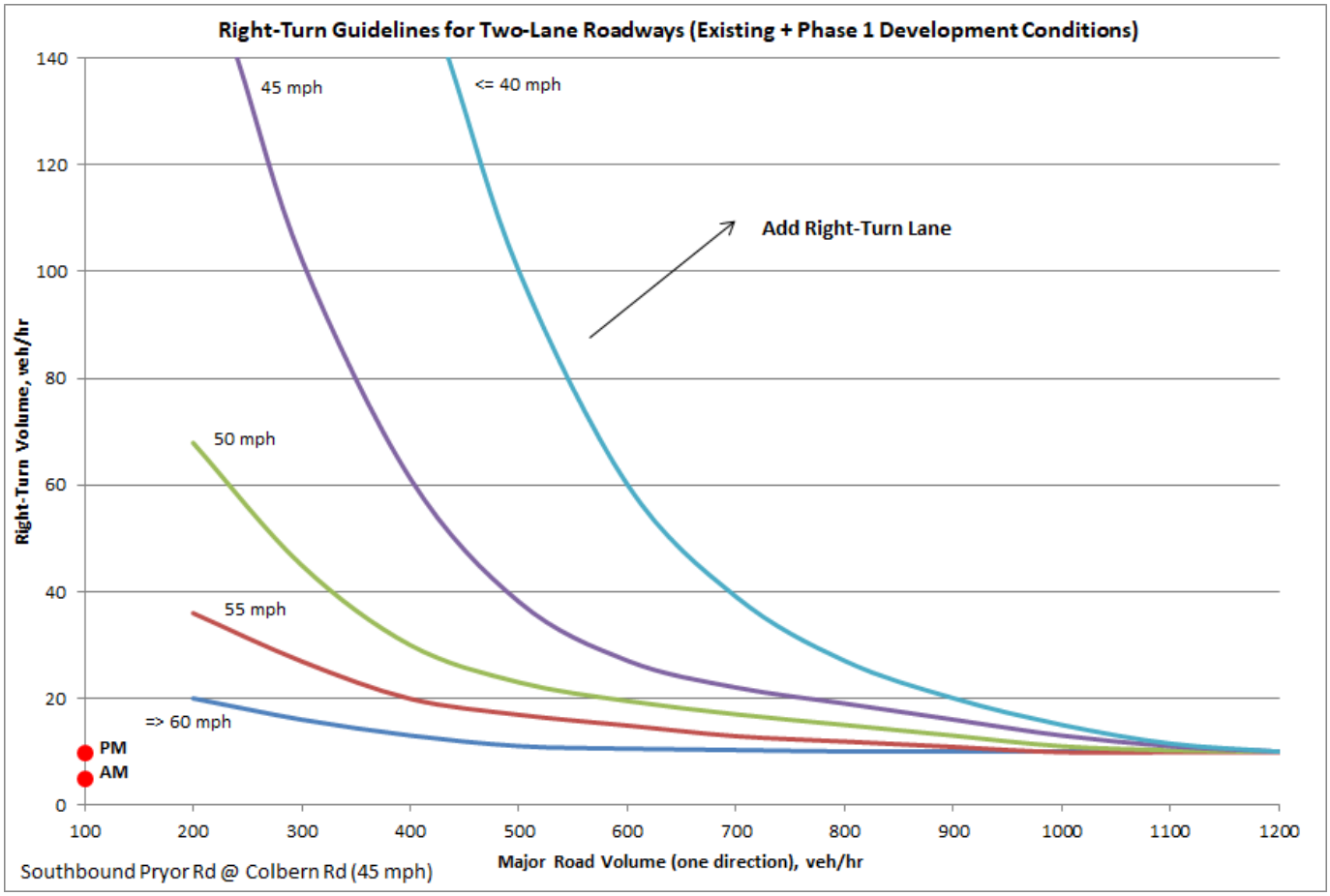

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Existing + Phase 1 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound 85th St @ Lee's Summit Rd (25 mph)

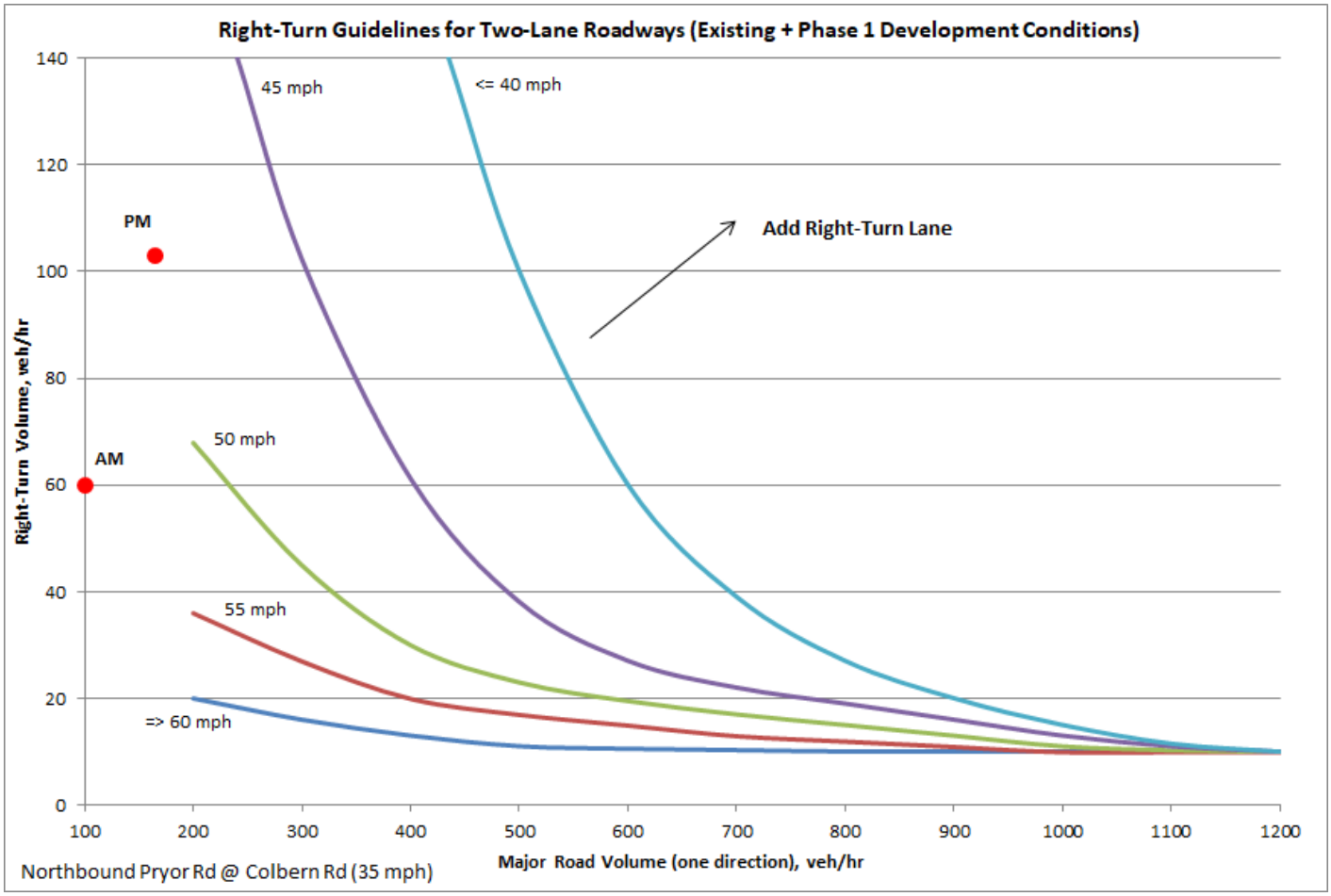

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Existing + Phase 1 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Southbound Pryor Rd @ Colbern Rd

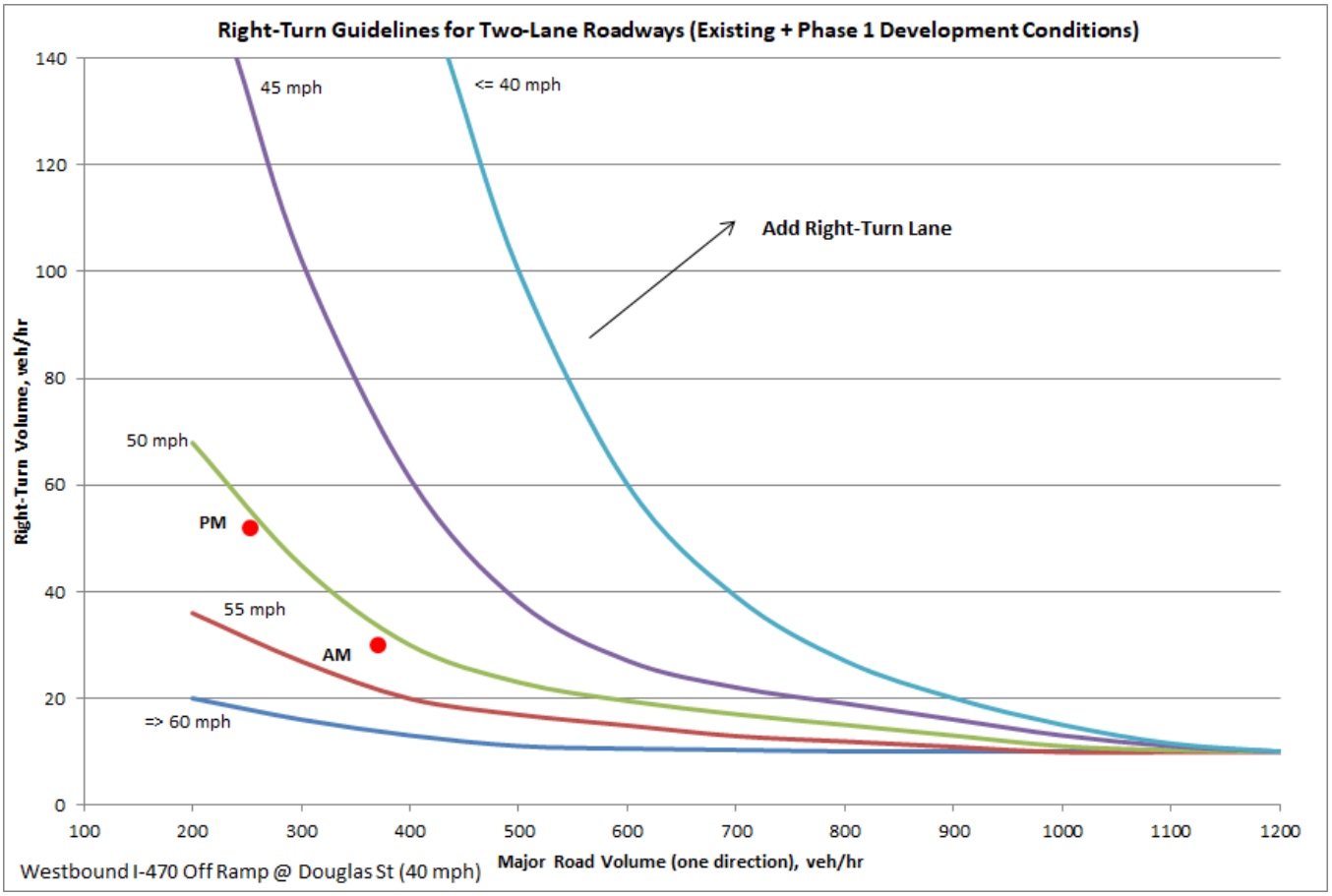

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Existing + Phase 1 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound Strother Rd @ Lee's Summit Rd

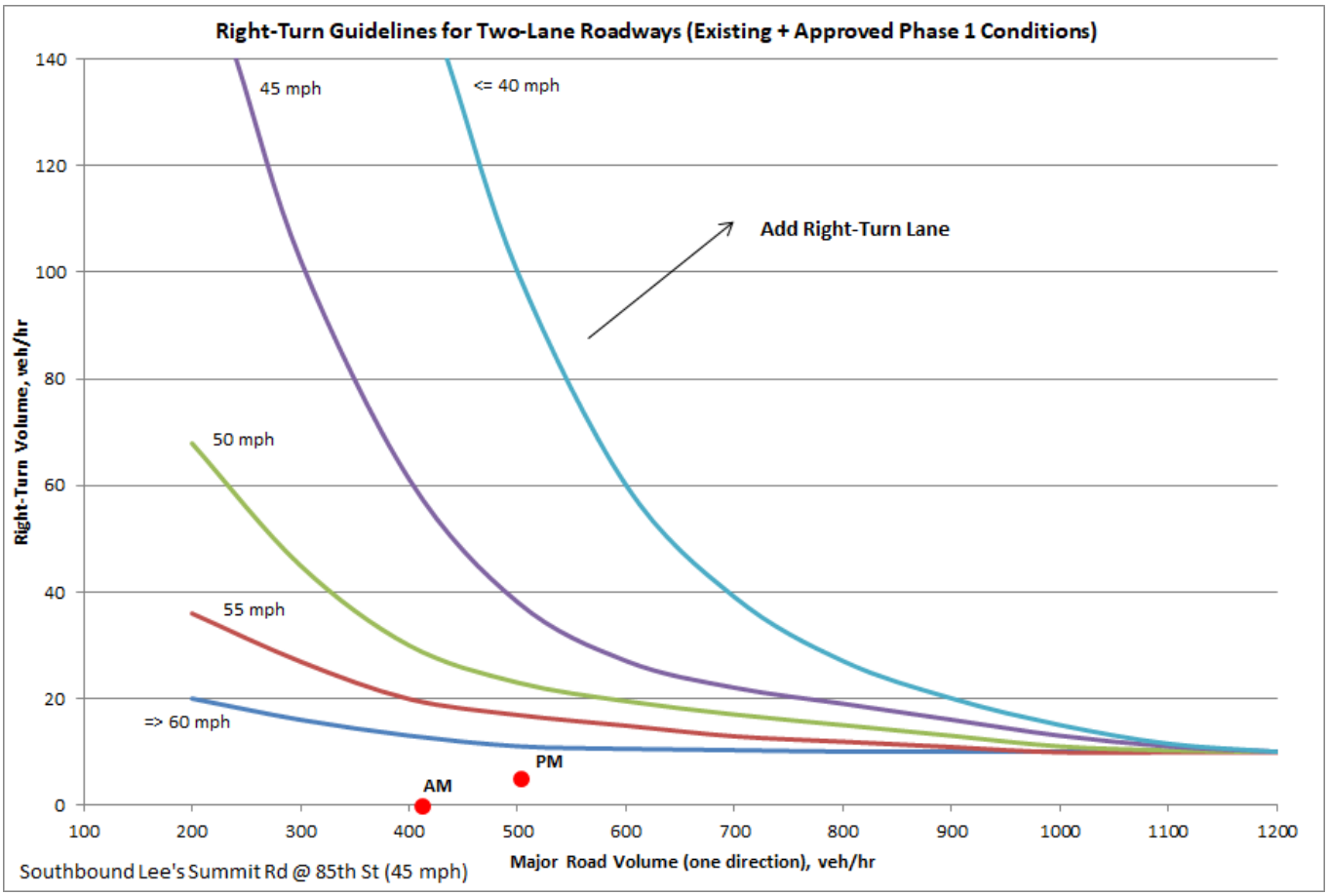

Left-Turn Guidelines for Four-Lane Roadways (Existing + Phase 1 Development Conditions)
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Left-Turn Volume (VL), veh/hr
0
500
1000
1500
2000
5
10
15
20
25
30
Eastbound on Colbern Rd @ Pryor Rd

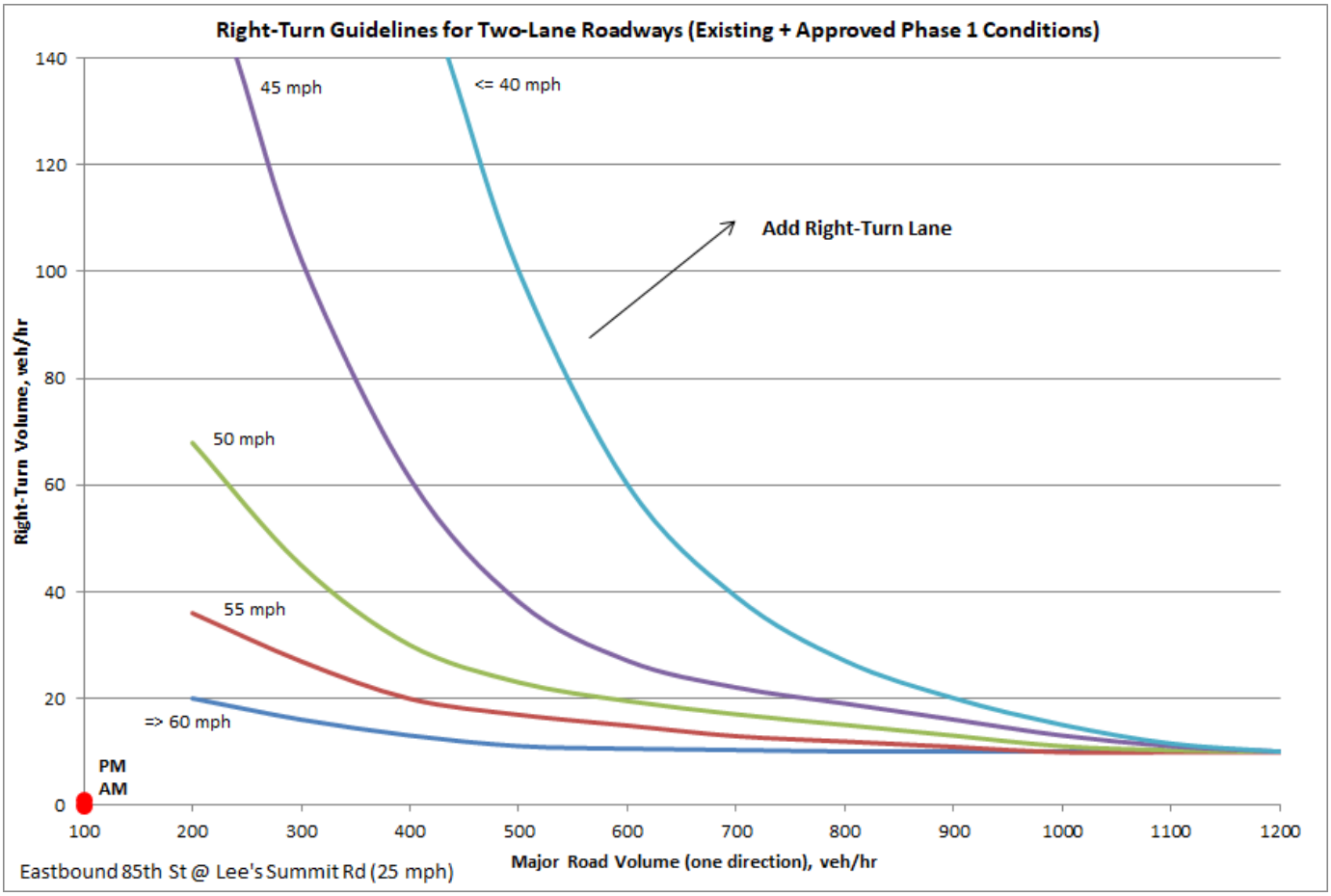

Left-Turn Guidelines for Four-Lane Roadways (Existing + Phase 1 Development Conditions)
2000
1500
1000
500
0
Opposing Volume (Vo), veh/hr
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
5
10
15
20
25
30
Left-Turn Volume (VL), veh/hr
Westbound on Colbern Rd @ Pryor Rd

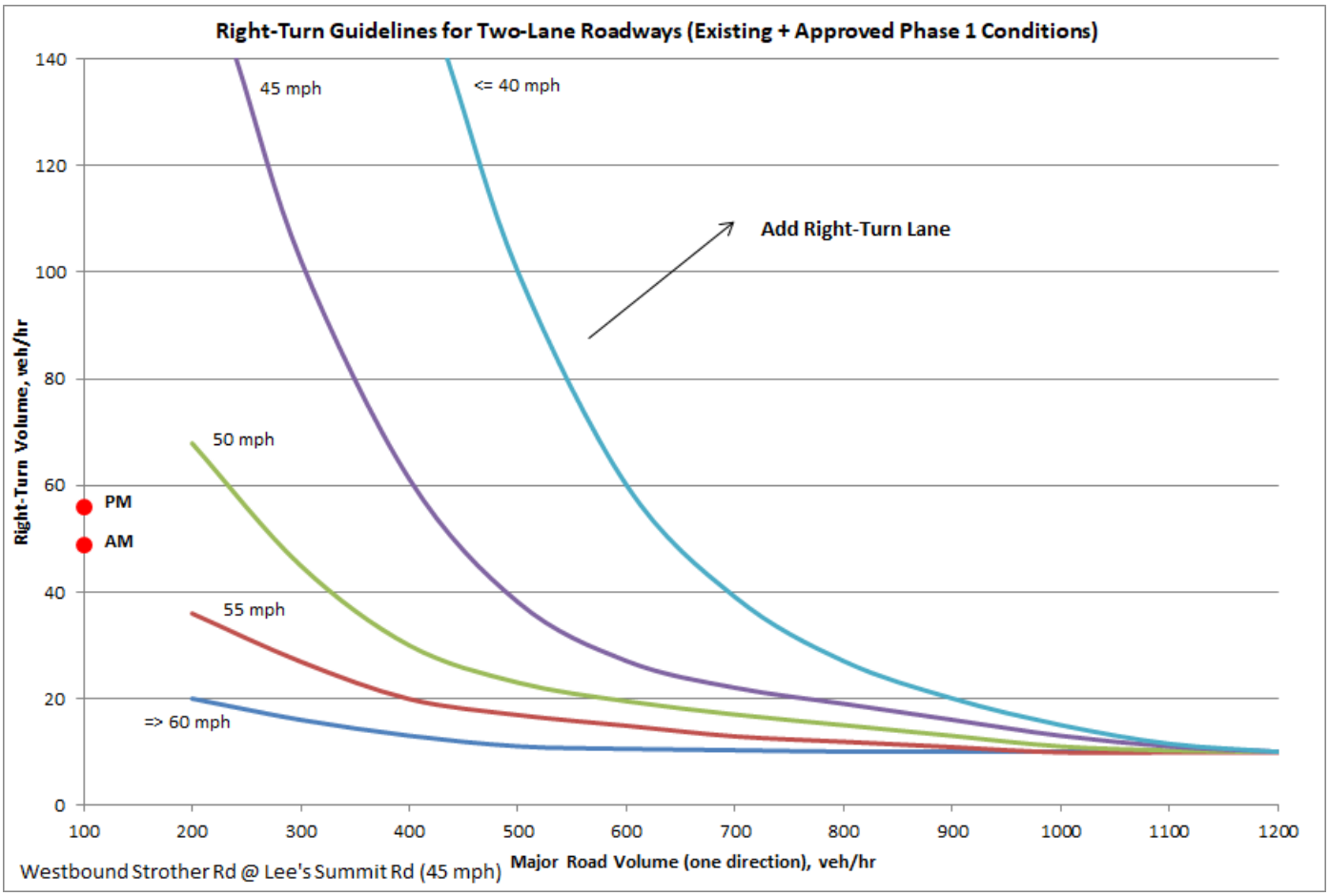

Right-Turn Guidelines for Two-Lane Roadways (Existing + Phase 1 Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
=> 60 mph
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Southbound Pryor Rd @ Colbern Rd (45 mph)

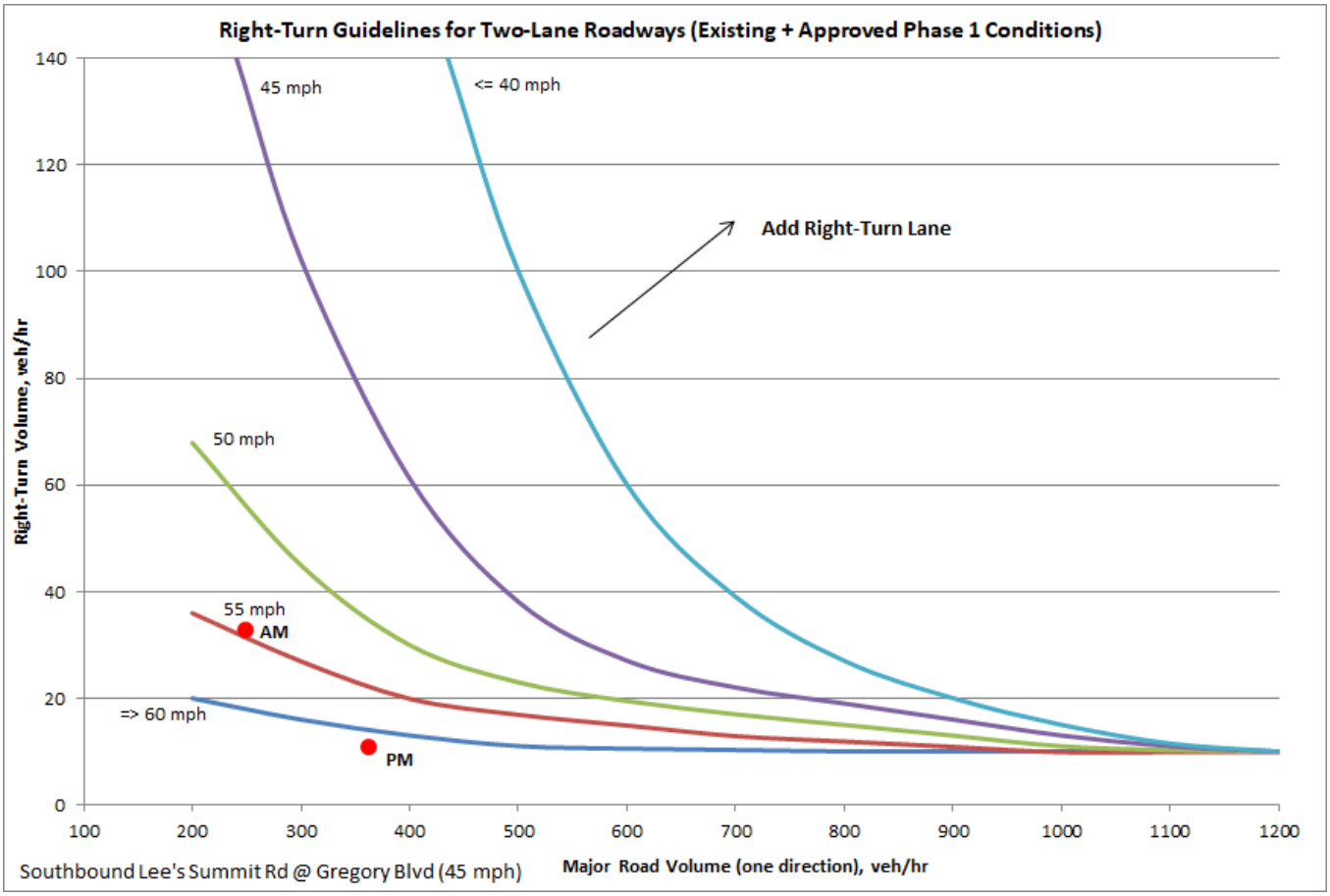

Right-Turn Guidelines for Two-Lane Roadways (Existing + Phase 1 Development Conditions)
45 mph
<= 40 mph
PM
Add Right-Turn Lane
50 mph
AM
55 mph
=> 60 mph
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Northbound Pryor Rd @ Colbern Rd (35 mph)

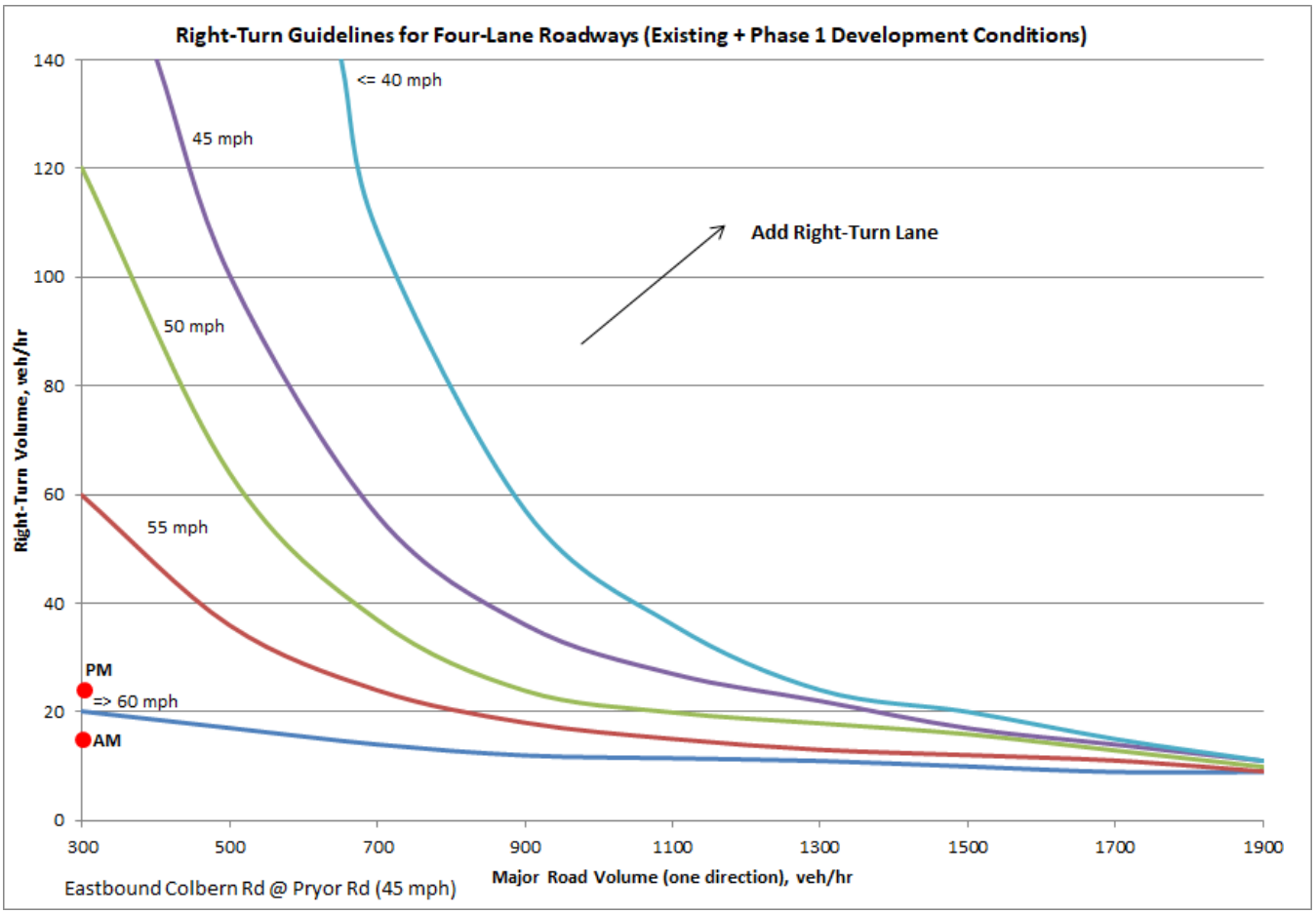

Right-Turn Guidelines for Two-Lane Roadways (Existing + Phase 1 Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
PM
55 mph
AM
=> 60 mph
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Westbound I-470 Off Ramp @ Douglas St (40 mph)

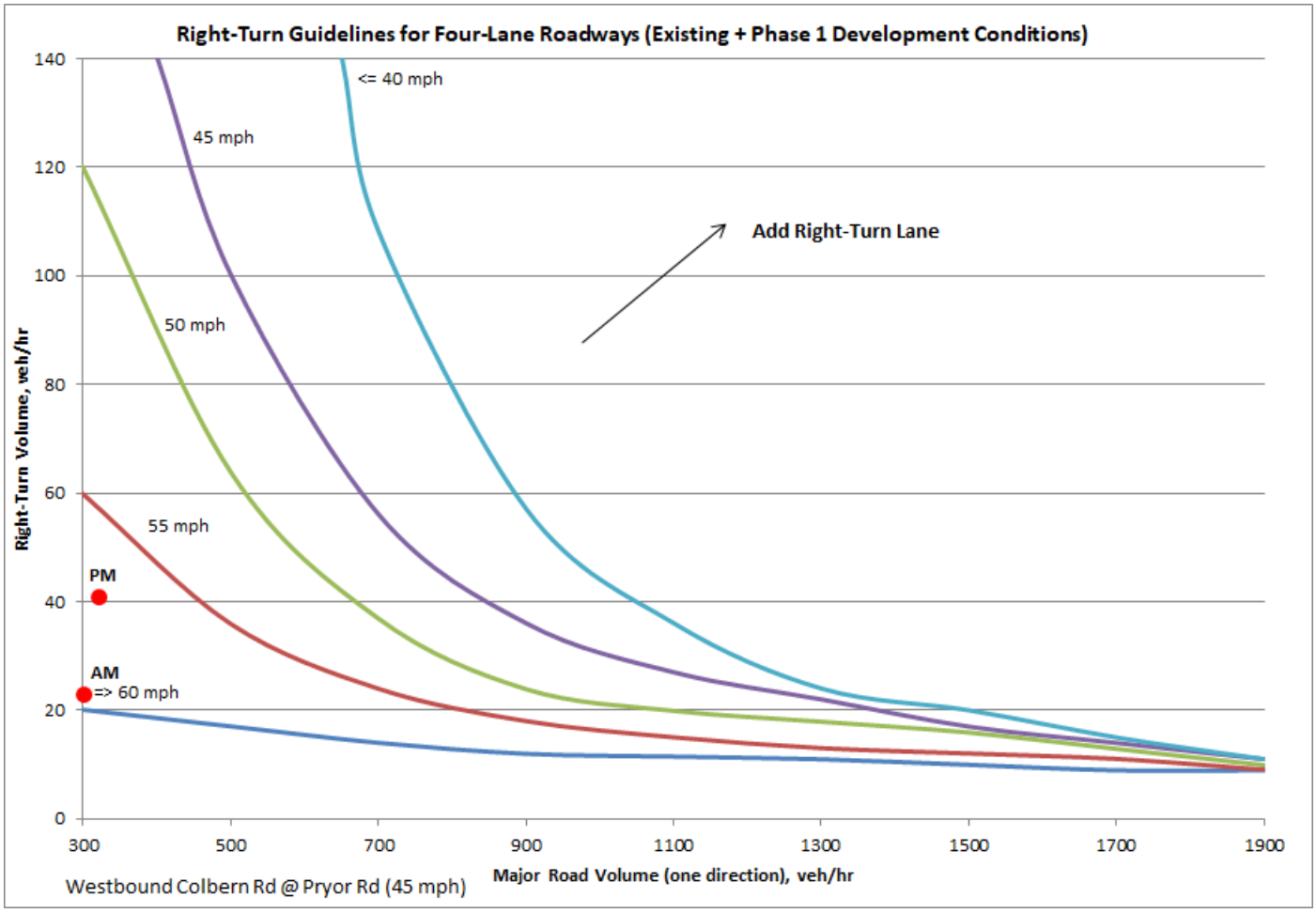

Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Phase 1 Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
=> 60 mph
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Southbound Lee's Summit Rd @ 85th St (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Phase 1 Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Eastbound 85th St @ Lee's Summit Rd (25 mph)


Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Phase 1 Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Westbound Strother Rd @ Lee's Summit Rd (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Existing + Approved Phase 1 Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
AM
PM
Add Right-Turn Lane
Southbound Lee's Summit Rd @ Gregory Blvd (45 mph)

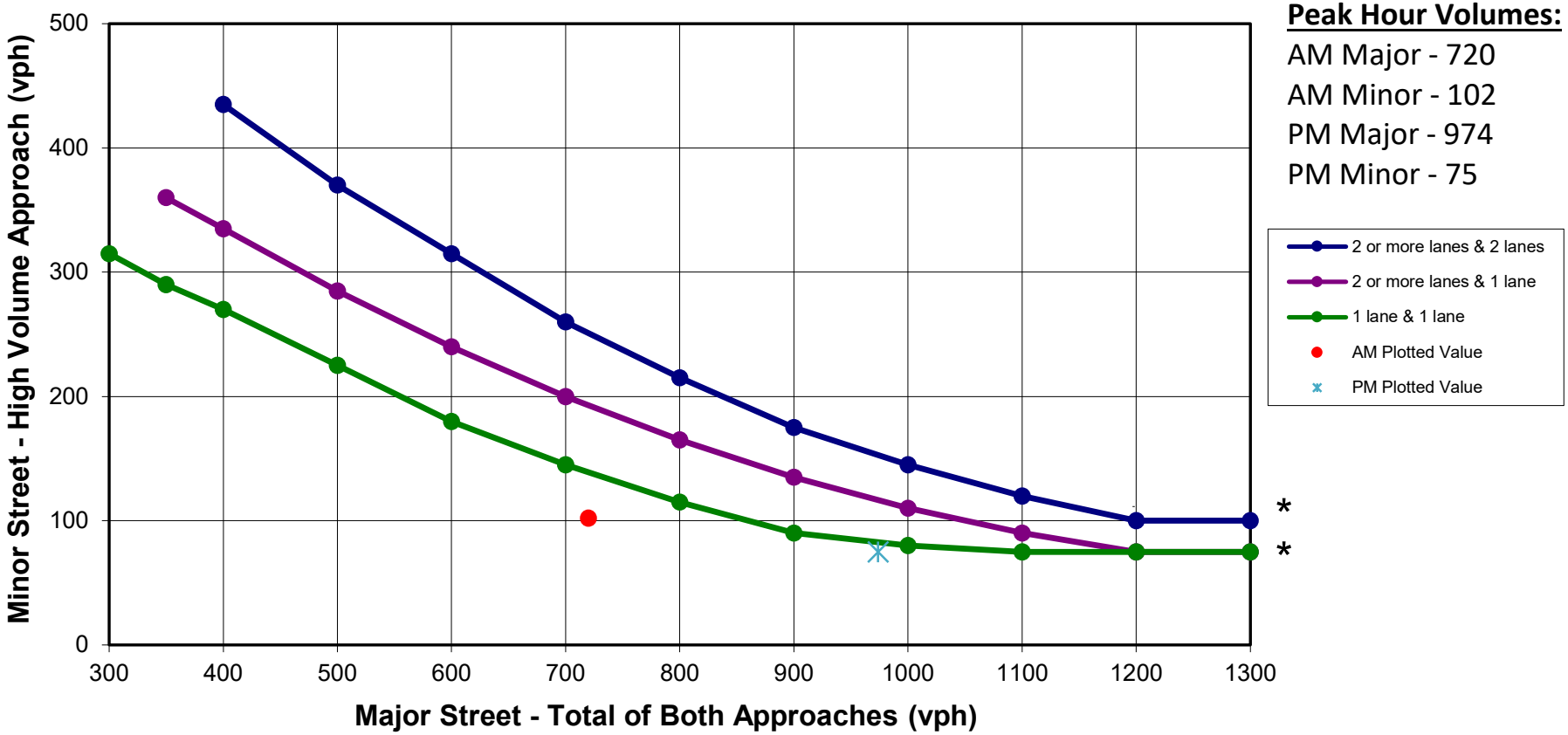

Right-Turn Guidelines for Four-Lane Roadways (Existing + Phase 1 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
<= 40 mph
45 mph
50 mph
55 mph
=> 60 mph
PM
AM
Add Right-Turn Lane
Eastbound Colbern Rd @ Pryor Rd (45 mph)


Right-Turn Guidelines for Four-Lane Roadways (Existing + Phase 1 Development Conditions)
<= 40 mph
45 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
0
20
40
60
80
100
120
140
300
500
700
900
1100
1300
1500
1700
1900
Westbound Colbern Rd @ Pryor Rd (45 mph)

Signal Warrants

Peak Hour Volume Warrant (Existing + Phase 1)
Colbern Road & Drive 5

(Community less than 10,000 population or above 40mph on major street)



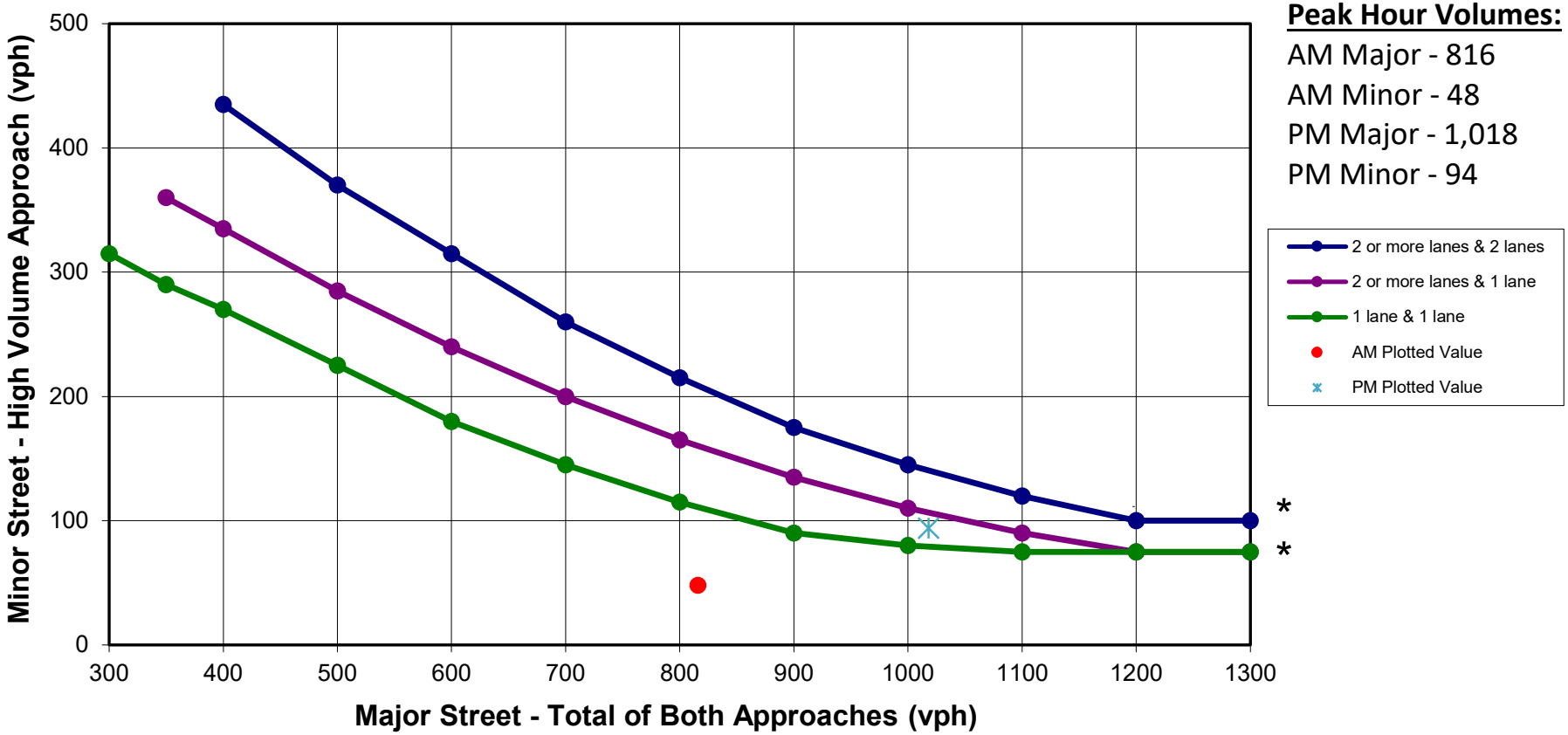
Peak Hour Volumes:

AM Major - 720
AM Minor - 102
PM Major - 974
PM Minor - 75

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Phase 1)
Colbern Road & Main Street

(Community less than 10,000 population or above 40mph on major street)



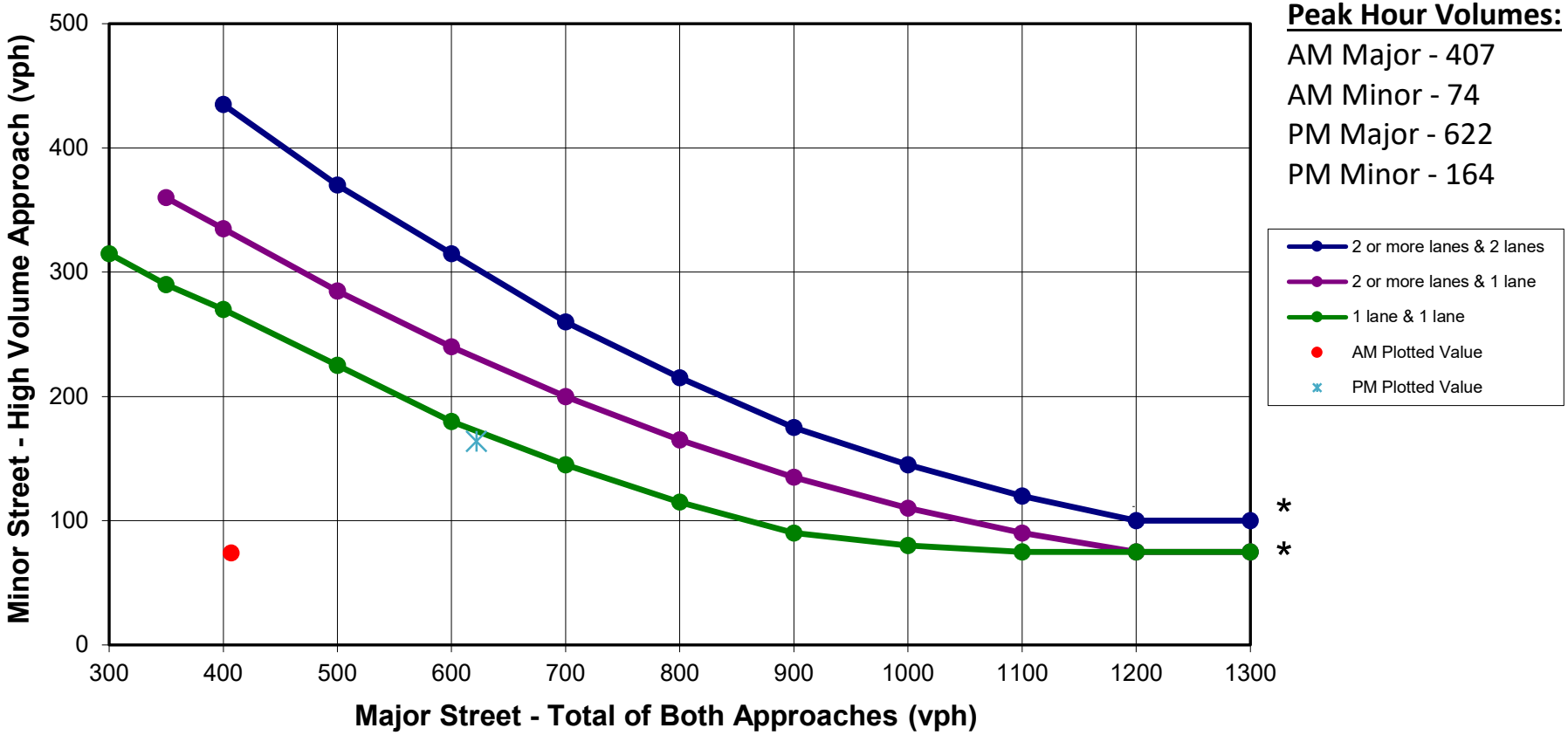
Peak Hour Volumes:

AM Major - 816
AM Minor - 48
PM Major - 1,018
PM Minor - 94

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Phase 1)
Colbern Road & Pryor Road

(Community less than 10,000 population or above 40mph on major street)



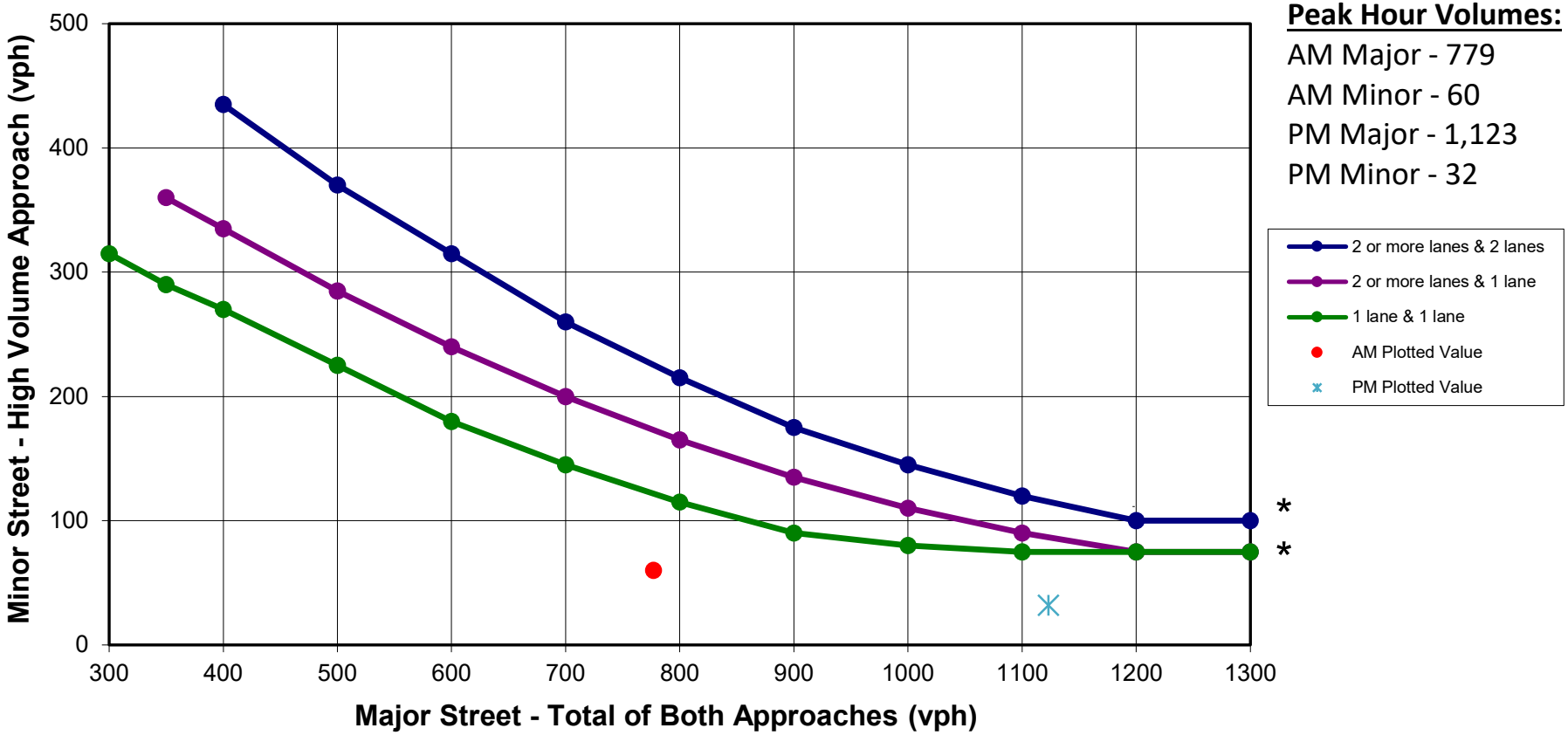
Peak Hour Volumes:

AM Major - 407
AM Minor - 74
PM Major - 622
PM Minor - 164

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Phase 1)
Douglas Street & Drive 2

(Community less than 10,000 population or above 40mph on major street)



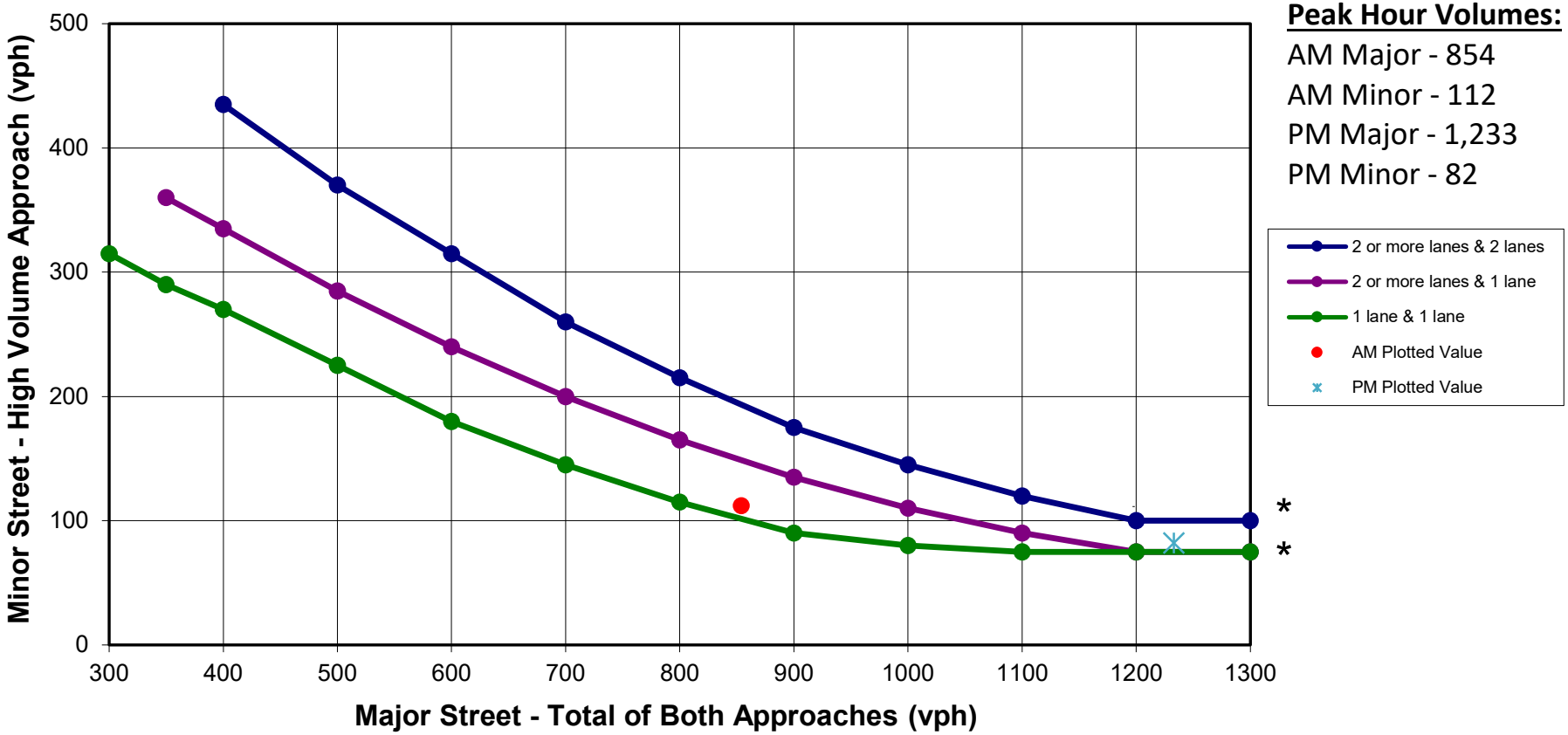
Peak Hour Volumes:

AM Major - 779
AM Minor - 60
PM Major - 1,123
PM Minor - 32

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Phase 1)
Douglas Street & Drive 3

(Community less than 10,000 population or above 40mph on major street)



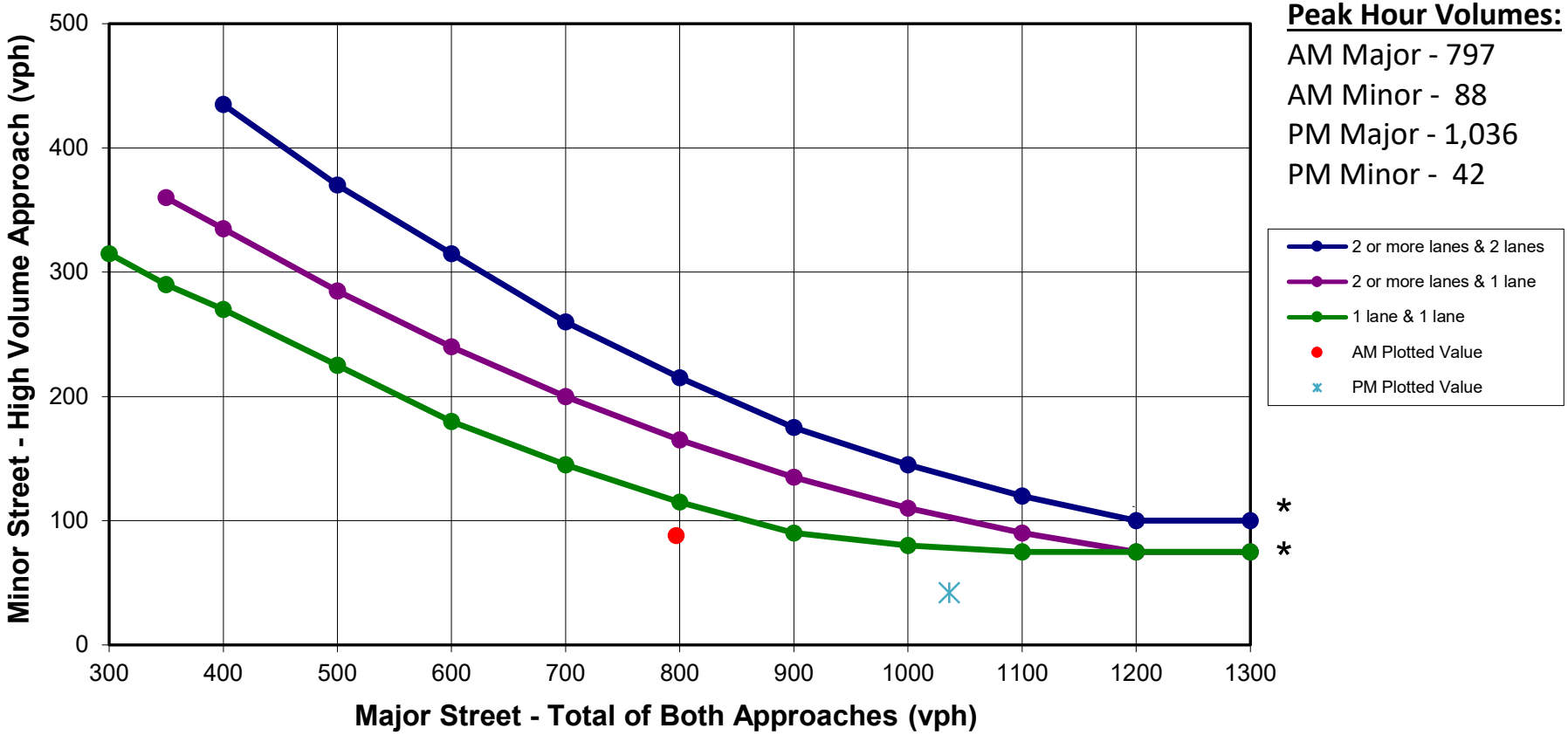
Peak Hour Volumes:

AM Major - 854
AM Minor - 112
PM Major - 1,233
PM Minor - 82

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Phase 1)
Lee's Summit Road & 85th Street

(Community less than 10,000 population or above 40mph on major street)



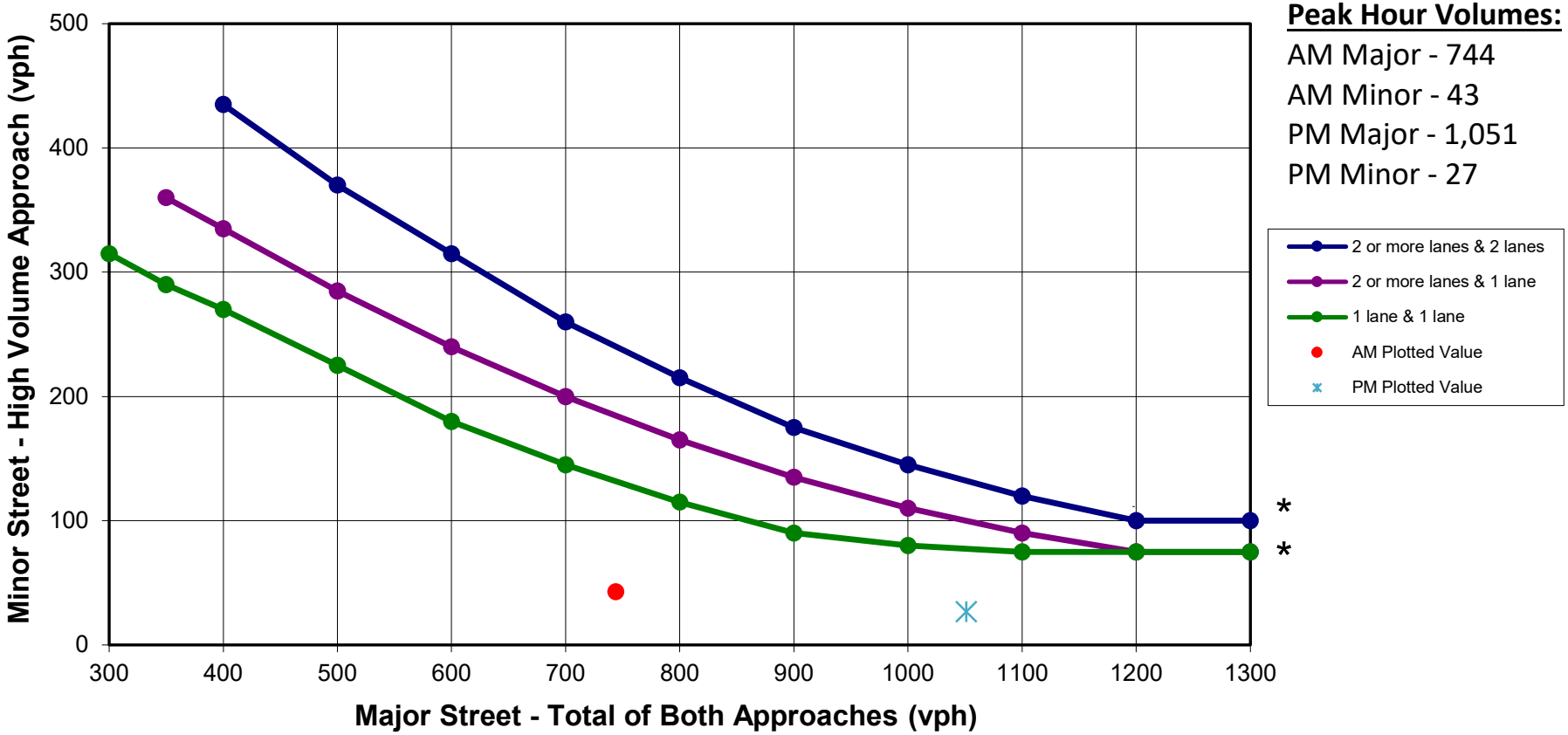
Peak Hour Volumes:

AM Major - 797
AM Minor - 88
PM Major - 1,036
PM Minor - 42

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Phase 1)
Lee's Summit Road & Douglas Road/Drive 1

(Community less than 10,000 population or above 40mph on major street)



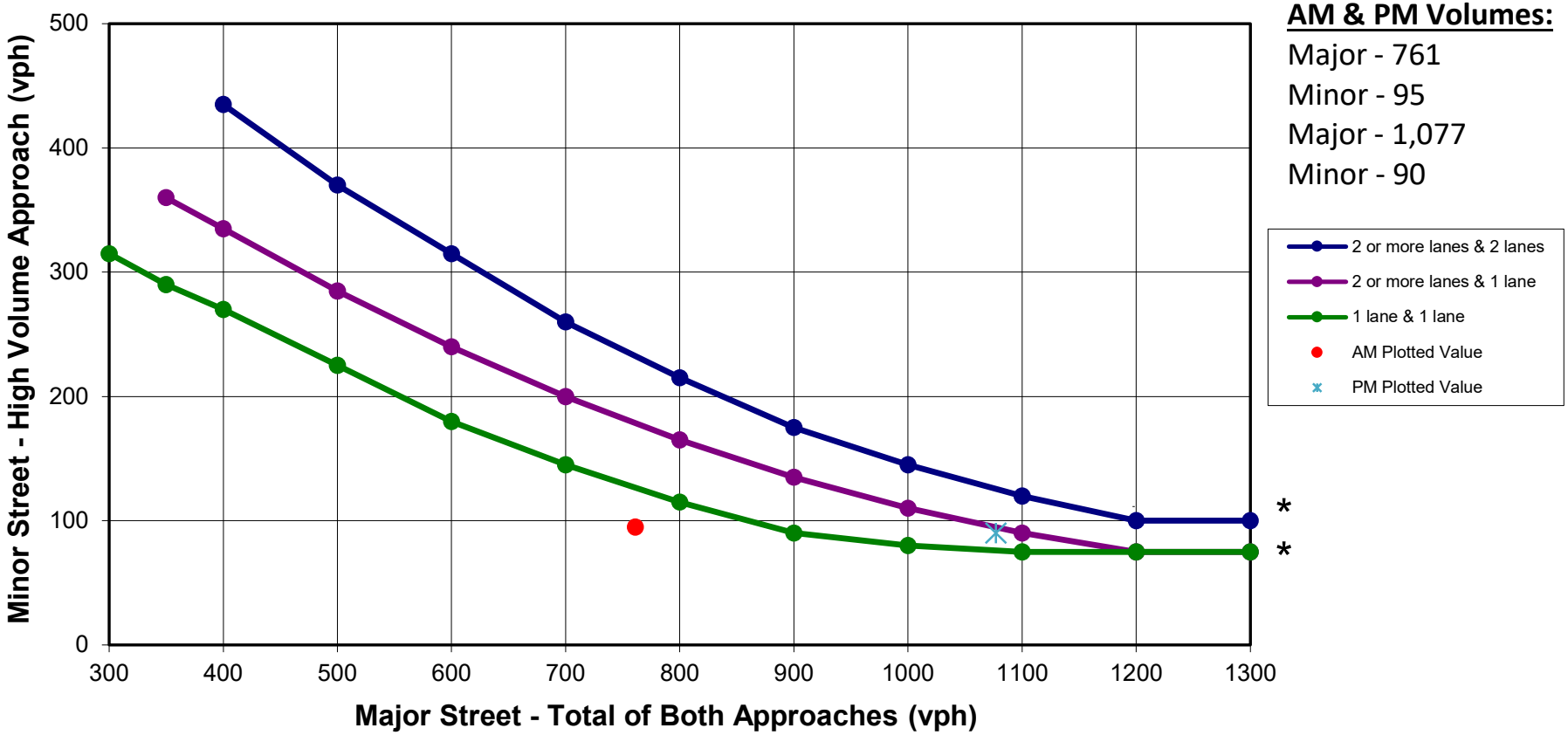
Peak Hour Volumes:

AM Major - 744
AM Minor - 43
PM Major - 1,051
PM Minor - 27

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Existing + Phase 1)
Lee's Summit Road & Strother Road

(Community less than 10,000 population or above 40mph on major street)



AM & PM Volumes:

Major - 761
Minor - 95
Major - 1,077
Minor - 90

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Capacity Analysis

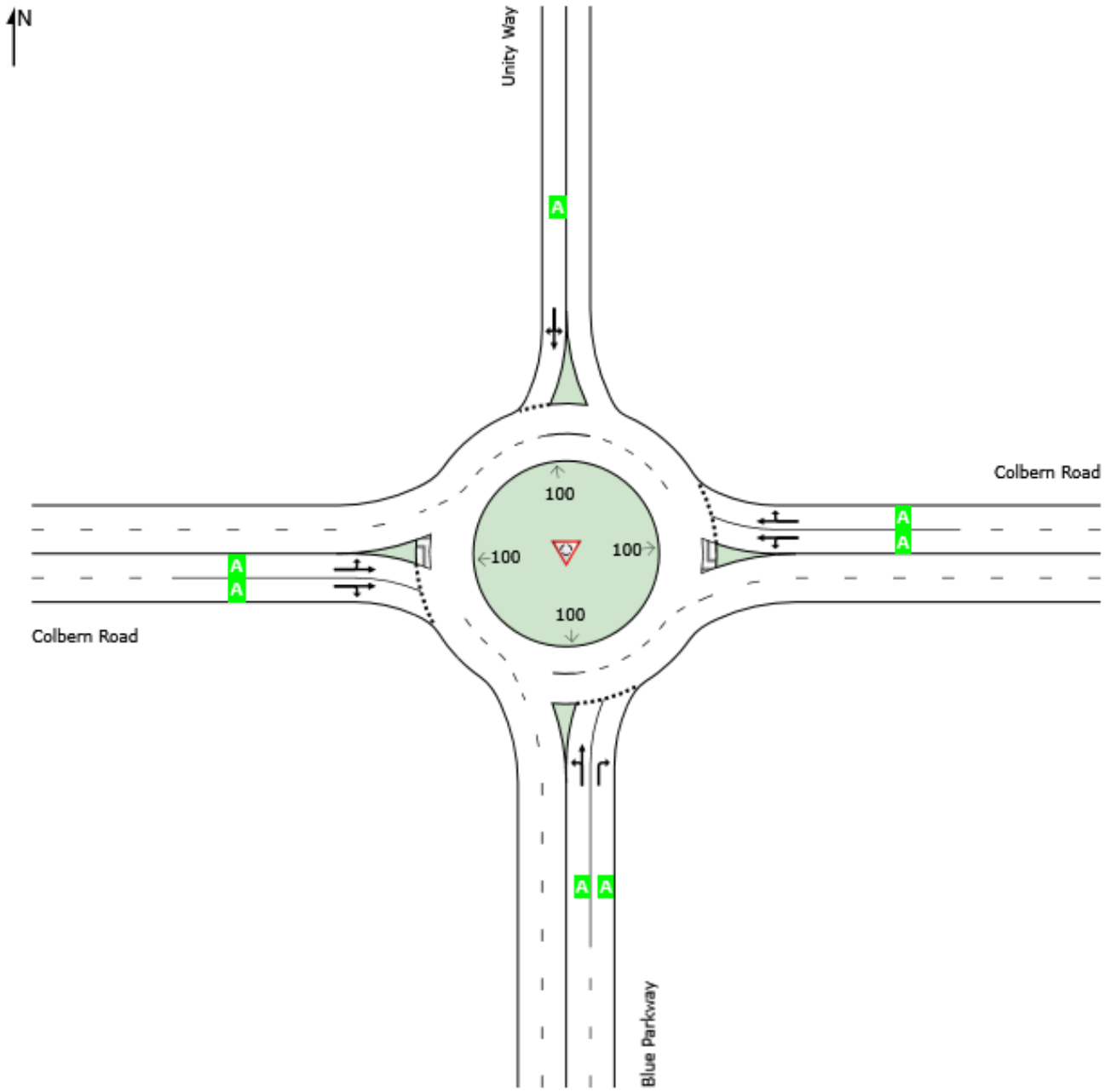
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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Organisation: OLSSON | Licence: PLUS / 1PC | Processed: Friday, December 9, 2022 10:50:37 AM
Project: F:\2021\04501-05000\021-04643-A\40-Design\Reports\TFTC\2023 January Update\Sidra\Ex+Phase 1 Blue Pkwy.sip9

MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	63	2.0	68	2.0	0.078	4.2	LOS A	0.3	7.2	0.39	0.28	0.39	20.9
8	T1	11	2.0	12	2.0	0.078	4.2	LOS A	0.3	7.2	0.39	0.28	0.39	18.3
18	R2	26	2.0	28	2.0	0.029	4.0	LOS A	0.1	2.7	0.40	0.27	0.40	20.9
Approach		100	2.0	109	2.0	0.078	4.1	LOS A	0.3	7.2	0.39	0.28	0.39	20.6
East: Colbern Road														
1	L2	54	2.0	59	2.0	0.208	4.6	LOS A	1.0	24.3	0.23	0.11	0.23	20.7
6	T1	417	2.0	453	2.0	0.208	4.6	LOS A	1.0	24.3	0.23	0.11	0.23	20.8
16	R2	19	2.0	21	2.0	0.208	4.6	LOS A	1.0	24.3	0.23	0.11	0.23	18.0
Approach		490	2.0	533	2.0	0.208	4.6	LOS A	1.0	24.3	0.23	0.11	0.23	20.6
North: Unity Way														
7	L2	5	2.0	5	2.0	0.012	4.4	LOS A	0.0	1.0	0.48	0.34	0.48	21.0
4	T1	1	2.0	1	2.0	0.012	4.4	LOS A	0.0	1.0	0.48	0.34	0.48	20.5
14	R2	3	2.0	3	2.0	0.012	4.4	LOS A	0.0	1.0	0.48	0.34	0.48	20.5
Approach		9	2.0	10	2.0	0.012	4.4	LOS A	0.0	1.0	0.48	0.34	0.48	20.8
West: Colbern Road														
5	L2	9	2.0	10	2.0	0.192	4.4	LOS A	0.9	22.2	0.19	0.08	0.19	18.7
2	T1	302	2.0	328	2.0	0.192	4.4	LOS A	0.9	22.2	0.19	0.08	0.19	20.9
12	R2	152	2.0	165	2.0	0.192	4.4	LOS A	0.9	22.2	0.19	0.08	0.19	20.4
Approach		463	2.0	503	2.0	0.192	4.4	LOS A	0.9	22.2	0.19	0.08	0.19	20.7
All Vehicles		1062	2.0	1154	2.0	0.208	4.4	LOS A	1.0	24.3	0.23	0.12	0.23	20.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

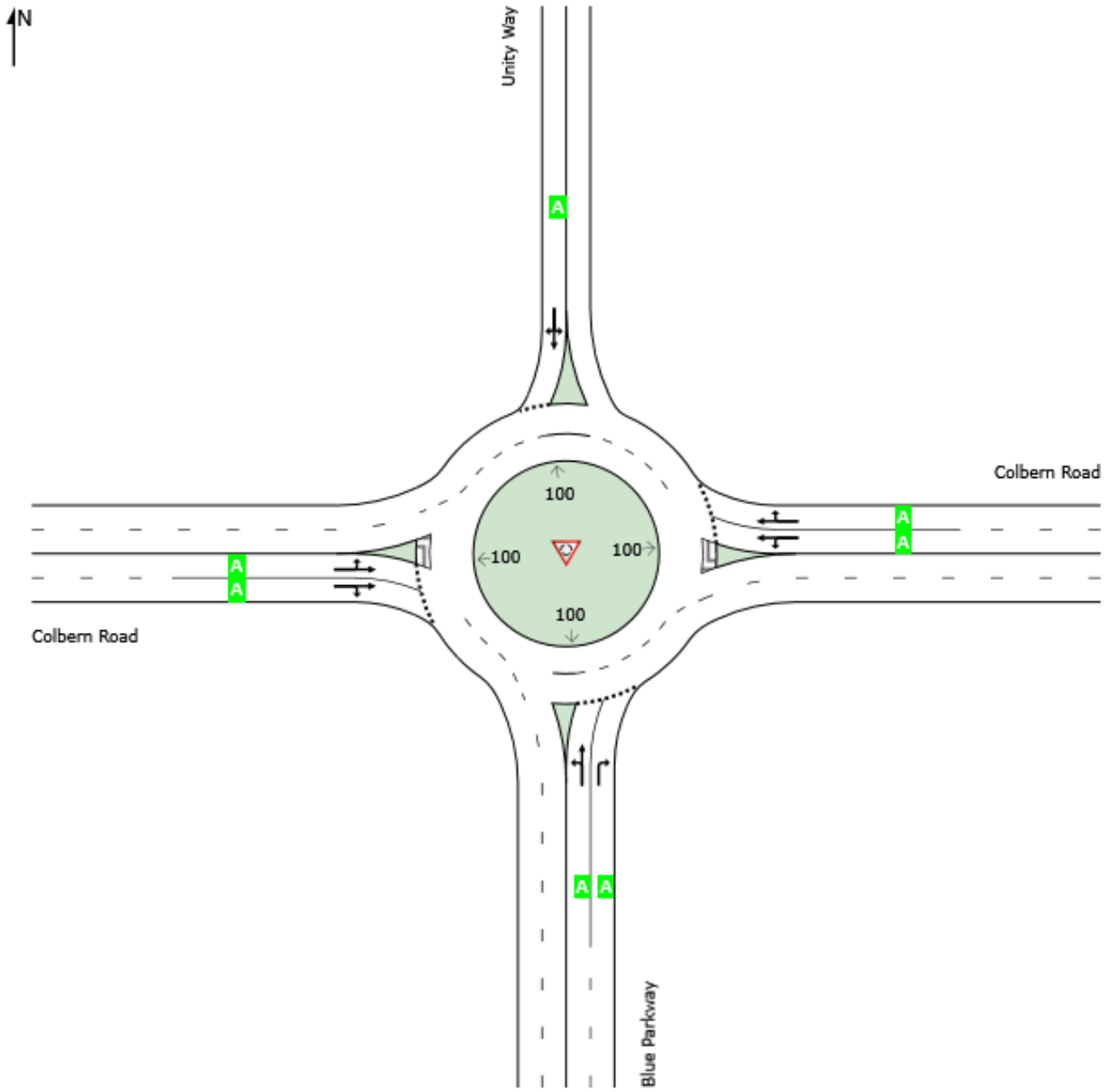
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	151	2.0	164	2.0	0.215	6.9	LOS A	0.8	20.6	0.56	0.56	0.56	20.4
8	T1	5	2.0	5	2.0	0.215	6.9	LOS A	0.8	20.6	0.56	0.56	0.56	17.9
18	R2	94	2.0	102	2.0	0.143	6.6	LOS A	0.5	13.3	0.56	0.55	0.56	20.4
Approach		250	2.0	272	2.0	0.215	6.8	LOS A	0.8	20.6	0.56	0.56	0.56	20.3
East: Colbern Road														
1	L2	35	2.0	38	2.0	0.187	4.7	LOS A	0.8	20.8	0.33	0.21	0.33	20.7
6	T1	364	2.0	396	2.0	0.187	4.7	LOS A	0.8	20.8	0.33	0.21	0.33	20.8
16	R2	6	2.0	7	2.0	0.187	4.7	LOS A	0.8	20.8	0.33	0.21	0.33	18.0
Approach		405	2.0	440	2.0	0.187	4.7	LOS A	0.8	20.8	0.33	0.21	0.33	20.7
North: Unity Way														
7	L2	41	2.0	45	2.0	0.094	5.3	LOS A	0.3	8.5	0.51	0.45	0.51	20.8
4	T1	19	2.0	21	2.0	0.094	5.3	LOS A	0.3	8.5	0.51	0.45	0.51	20.3
14	R2	12	2.0	13	2.0	0.094	5.3	LOS A	0.3	8.5	0.51	0.45	0.51	20.3
Approach		72	2.0	78	2.0	0.094	5.3	LOS A	0.3	8.5	0.51	0.45	0.51	20.6
West: Colbern Road														
5	L2	11	2.0	12	2.0	0.296	5.5	LOS A	1.5	38.1	0.28	0.15	0.28	18.6
2	T1	550	2.0	598	2.0	0.296	5.5	LOS A	1.5	38.1	0.28	0.15	0.28	20.6
12	R2	127	2.0	138	2.0	0.296	5.5	LOS A	1.5	38.1	0.28	0.15	0.28	20.1
Approach		688	2.0	748	2.0	0.296	5.5	LOS A	1.5	38.1	0.28	0.15	0.28	20.5
All Vehicles		1415	2.0	1538	2.0	0.296	5.5	LOS A	1.5	38.1	0.36	0.25	0.36	20.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	175	15	36	155	23	10	4	60	45	7	5
Future Vol, veh/h	3	175	15	36	155	23	10	4	60	45	7	5
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	190	16	39	168	25	11	4	65	49	8	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	193	0	0	206	0	0	370	475	103	362	471	97
Stage 1	-	-	-	-	-	-	204	204	-	259	259	-
Stage 2	-	-	-	-	-	-	166	271	-	103	212	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1378	-	-	1363	-	-	562	487	932	569	489	940
Stage 1	-	-	-	-	-	-	779	732	-	723	692	-
Stage 2	-	-	-	-	-	-	820	684	-	892	726	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1378	-	-	1363	-	-	538	470	932	512	472	940
Mov Cap-2 Maneuver	-	-	-	-	-	-	538	470	-	512	472	-
Stage 1	-	-	-	-	-	-	777	731	-	722	670	-
Stage 2	-	-	-	-	-	-	780	662	-	823	725	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.4	9.9	12.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	809	1378	-	-	1363	-	-	528
HCM Lane V/C Ratio	0.099	0.002	-	-	0.029	-	-	0.117
HCM Control Delay (s)	9.9	7.6	0	-	7.7	0.1	-	12.7
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.4

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	199	105	102	197	184	36
v/c Ratio	0.10	0.12	0.13	0.08	0.61	0.04
Control Delay	9.9	2.6	4.1	3.6	35.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	2.6	4.1	3.6	35.4	0.1
Queue Length 50th (ft)	22	0	13	13	74	0
Queue Length 95th (ft)	43	21	25	21	129	0
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	1903	905	902	2415	369	905
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	0.10	0.12	0.11	0.08	0.50	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	183	97	94	181	0	0	0	0	169	0	33
Future Volume (veh/h)	0	183	97	94	181	0	0	0	0	169	0	33
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	199	0	102	197	0				184	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	2086		878	2564	0				229	0	
Arrive On Green	0.00	0.59	0.00	0.12	1.00	0.00				0.13	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				1781	0	1585
Grp Volume(v), veh/h	0	199	0	102	197	0				184	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	1.7	0.0	1.5	0.0	0.0				7.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.7	0.0	1.5	0.0	0.0				7.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2086		878	2564	0				229	0	
V/C Ratio(X)	0.00	0.10		0.12	0.08	0.00				0.80	0.00	
Avail Cap(c_a), veh/h	0	2086		1097	2564	0				372	0	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	6.3	0.0	4.3	0.0	0.0				29.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.1	0.1	0.0				6.5	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
%ile BackOfQ(95%),veh/ln	0.0	0.9	0.0	0.6	0.0	0.0				5.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	6.4	0.0	4.4	0.1	0.0				36.2	0.0	0.0
LnGrp LOS	A	A		A	A	A				D	A	
Approach Vol, veh/h		199	A		299						184	A
Approach Delay, s/veh		6.4			1.5						36.2	
Approach LOS		A			A						D	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	55.6	9.4	46.2	14.4
Change Period (Y+Rc), s	* 5.1	* 5.1	* 5.1	5.4
Max Green Setting (Gmax), s	* 45	* 13	* 27	14.6
Max Q Clear Time (g_c+I1), s	2.0	3.5	3.7	9.0
Green Ext Time (p_c), s	2.4	0.1	2.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	78	304	245	280	54	124
v/c Ratio	0.09	0.10	0.10	0.24	0.28	0.11
Control Delay	2.5	2.2	6.4	1.8	31.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	2.2	6.4	1.8	31.7	2.1
Queue Length 50th (ft)	2	4	22	0	22	0
Queue Length 95th (ft)	m14	24	43	31	51	22
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	912	2958	2429	1174	369	1125
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	0.09	0.10	0.10	0.24	0.15	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	280	0	0	225	258	50	0	114	0	0	0
Future Volume (veh/h)	72	280	0	0	225	258	50	0	114	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	78	304	0	0	245	0	54	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	939	2845	0	0	2394		83	0				
Arrive On Green	0.11	1.00	0.00	0.00	0.67	0.00	0.05	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	78	304	0	0	245	0	54	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	0.9	0.0	0.0	0.0	1.7	0.0	2.1	0.0	0.0			
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.0	1.7	0.0	2.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	939	2845	0	0	2394		83	0				
V/C Ratio(X)	0.08	0.11	0.00	0.00	0.10		0.65	0.00				
Avail Cap(c_a), veh/h	1018	2845	0	0	2394		372	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.95	0.95	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	2.5	0.0	0.0	0.0	4.0	0.0	32.8	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	8.4	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			
%ile BackOfQ(95%),veh/ln	0.2	0.1	0.0	0.0	0.7	0.0	1.9	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.6	0.1	0.0	0.0	4.1	0.0	41.2	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		382			245	A		54	A			
Approach Delay, s/veh		0.6			4.1			41.2				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	8.9	52.4				61.3		8.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	7.0	* 33				* 45		14.6				
Max Q Clear Time (g_c+I1), s	2.9	3.7				2.0		4.1				
Green Ext Time (p_c), s	0.0	2.7				3.8		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	5.1
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	251	83	33	449	41	13
Future Vol, veh/h	251	83	33	449	41	13
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	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	273	90	36	488	45	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	363	0	634	182
Stage 1	-	-	-	-	318	-
Stage 2	-	-	-	-	316	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1192	-	411	829
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	712	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1192	-	394	829
Mov Cap-2 Maneuver	-	-	-	-	394	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	683	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	394	829	-	-	1192	-
HCM Lane V/C Ratio	0.113	0.017	-	-	0.03	-
HCM Control Delay (s)	15.3	9.4	-	-	8.1	0.1
HCM Lane LOS	C	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	48	143	97	612	312	77	68	332	313	67	408	86
v/c Ratio	0.10	0.46	0.28	0.75	0.26	0.12	0.18	0.45	0.28	0.19	0.41	0.14
Control Delay	13.7	44.2	2.0	24.7	13.1	0.5	28.8	45.7	3.6	18.5	29.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	44.2	2.0	24.7	13.1	0.5	28.8	45.7	3.6	18.5	29.0	0.5
Queue Length 50th (ft)	15	41	0	232	66	2	39	145	39	22	101	0
Queue Length 95th (ft)	32	71	0	327	18	0	80	204	2	51	152	0
Internal Link Dist (ft)		562			2353			407			251	
Turn Bay Length (ft)	200		200	200		200	160		200	290		200
Base Capacity (vph)	500	322	351	853	1218	654	393	740	1125	373	1005	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.44	0.28	0.72	0.26	0.12	0.17	0.45	0.28	0.18	0.41	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	132	89	563	287	71	63	305	288	62	375	79
Future Volume (veh/h)	44	132	89	563	287	71	63	305	288	62	375	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	143	97	612	312	77	68	332	0	67	408	86
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	478	246	110	802	1224	546	282	612		277	829	370
Arrive On Green	0.06	0.07	0.07	0.54	0.58	0.58	0.01	0.08	0.00	0.05	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	2494	3554	1585	1781	2619	1585	1781	3554	1585
Grp Volume(v), veh/h	48	143	97	612	312	77	68	332	0	67	408	86
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1247	1777	1585	1781	1309	1585	1781	1777	1585
Q Serve(g_s), s	0.0	3.5	4.0	17.3	3.9	1.3	2.6	11.0	0.0	2.5	8.9	2.6
Cycle Q Clear(g_c), s	0.0	3.5	4.0	17.3	3.9	1.3	2.6	11.0	0.0	2.5	8.9	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	478	246	110	802	1224	546	282	612		277	829	370
V/C Ratio(X)	0.10	0.58	0.88	0.76	0.25	0.14	0.24	0.54		0.24	0.49	0.23
Avail Cap(c_a), veh/h	541	324	144	859	1224	546	359	612		355	829	370
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.89	0.89	0.97	0.97	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	40.6	22.6	18.1	13.4	5.3	25.6	36.9	0.0	25.0	29.9	11.9
Incr Delay (d2), s/veh	0.1	2.2	35.6	3.4	0.4	0.5	0.4	3.3	0.0	0.4	2.1	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(95%),veh/ln	1.2	2.8	5.5	6.7	2.6	1.3	2.0	7.2	0.0	1.9	6.9	2.8
Unsig. Movement Delay, s/veh									41.30			
LnGrp Delay(d),s/veh	19.7	42.8	58.2	21.5	13.8	5.8	26.0	40.2	41.3	25.5	32.0	13.4
LnGrp LOS	B	D	E	C	B	A	C	D	D	C	C	B
Approach Vol, veh/h		288			1001			713	A		561	
Approach Delay, s/veh		44.1			17.9			39.3			28.3	
Approach LOS		D			B			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	27.0	34.8	12.0	9.1	27.0	10.8	36.0
Change Period (Y+Rc), s	5.0	* 6	* 5.8	* 5.8	5.0	* 6	5.8	* 5
Max Green Setting (Gmax), s	8.0	* 21	* 31	* 8.2	8.0	* 21	8.2	* 31
Max Q Clear Time (g_c+I1), s	4.6	10.9	19.3	6.0	4.5	13.0	2.0	5.9
Green Ext Time (p_c), s	0.0	1.9	1.8	0.2	0.0	1.2	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is included in calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	0	53	0	35	1	289	95	68	344	0
Future Vol, veh/h	5	0	0	53	0	35	1	289	95	68	344	0
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	0	58	0	38	1	314	103	74	374	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	909	941	374	838	838	314	374	0	0	417	0	0
Stage 1	522	522	-	316	316	-	-	-	-	-	-	-
Stage 2	387	419	-	522	522	-	-	-	-	-	-	-
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	256	263	672	286	302	726	1184	-	-	1142	-	-
Stage 1	538	531	-	695	655	-	-	-	-	-	-	-
Stage 2	637	590	-	538	531	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	246	672	272	282	726	1184	-	-	1142	-	-
Mov Cap-2 Maneuver	230	246	-	272	282	-	-	-	-	-	-	-
Stage 1	537	496	-	694	654	-	-	-	-	-	-	-
Stage 2	603	589	-	503	496	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21	17.2	0	1.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1184	-	-	230	272	726	1142	-	-
HCM Lane V/C Ratio	0.001	-	-	0.024	0.212	0.052	0.065	-	-
HCM Control Delay (s)	8	-	-	21	21.8	10.2	8.4	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.8	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	49	296	46	36	383
Future Vol, veh/h	46	49	296	46	36	383
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	-	-	225	225	-
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	50	53	322	50	39	416

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	816	161	0	0	372	0
Stage 1	322	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	330	856	-	-	1185	-
Stage 1	708	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	319	856	-	-	1185	-
Mov Cap-2 Maneuver	438	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	585	1185	-
HCM Lane V/C Ratio	-	-	0.177	0.033	-
HCM Control Delay (s)	-	-	12.5	8.1	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	60	72	213	184	51	97	152	74	17	252
v/c Ratio	0.02	0.19	0.18	0.41	0.25	0.07	0.25	0.23	0.11	0.03	0.59
Control Delay	13.6	28.4	1.1	17.0	17.8	0.2	14.3	16.6	0.8	12.2	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	28.4	1.1	17.0	17.8	0.2	14.3	16.6	0.8	12.2	29.1
Queue Length 50th (ft)	2	21	0	54	46	0	22	36	0	4	86
Queue Length 95th (ft)	12	60	2	120	131	0	55	104	5	15	175
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	593	902	841	635	1055	959	439	894	832	620	1022
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.07	0.09	0.34	0.17	0.05	0.22	0.17	0.09	0.03	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	55	66	196	169	47	89	140	68	16	199	33
Future Volume (veh/h)	9	55	66	196	169	47	89	140	68	16	199	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	60	72	213	184	51	97	152	74	17	216	36
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	413	346	293	560	562	476	328	449	381	370	297	50
Arrive On Green	0.01	0.19	0.19	0.13	0.30	0.30	0.07	0.24	0.24	0.02	0.19	0.19
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1563	260
Grp Volume(v), veh/h	10	60	72	213	184	51	97	152	74	17	0	252
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1823
Q Serve(g_s), s	0.2	1.5	2.1	5.0	4.1	1.3	2.3	3.6	2.0	0.4	0.0	7.0
Cycle Q Clear(g_c), s	0.2	1.5	2.1	5.0	4.1	1.3	2.3	3.6	2.0	0.4	0.0	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	413	346	293	560	562	476	328	449	381	370	0	347
V/C Ratio(X)	0.02	0.17	0.25	0.38	0.33	0.11	0.30	0.34	0.19	0.05	0.00	0.73
Avail Cap(c_a), veh/h	703	1021	865	810	1021	865	498	1004	851	795	0	979
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.0	18.5	18.8	14.5	14.7	13.7	16.1	17.0	16.4	15.0	0.0	20.6
Incr Delay (d2), s/veh	0.0	0.5	0.9	0.2	0.7	0.2	0.2	0.4	0.2	0.0	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(95%),veh/ln	0.1	1.1	1.3	3.2	2.9	0.7	1.4	2.4	1.1	0.2	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.0	19.0	19.7	14.7	15.4	13.9	16.3	17.4	16.6	15.0	0.0	23.5
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		142			448			323			269	
Approach Delay, s/veh		19.0			14.9			16.9			22.9	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	15.5	9.8	16.3	6.2	21.7	7.1	19.0
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	7.0	4.1	4.3	9.0	2.2	6.1	2.4	5.6
Green Ext Time (p_c), s	0.2	1.0	0.0	1.3	0.0	2.2	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	9	346	4	9	366	10	11	0	32	4	0	3
Future Vol, veh/h	9	346	4	9	366	10	11	0	32	4	0	3
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	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	376	4	10	398	11	12	0	35	4	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	380	0	0	823	827	378	840	824	404
Stage 1	-	-	-	-	-	-	398	398	-	424	424	-
Stage 2	-	-	-	-	-	-	425	429	-	416	400	-
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	1150	-	-	1178	-	-	292	307	669	285	308	647
Stage 1	-	-	-	-	-	-	628	603	-	608	587	-
Stage 2	-	-	-	-	-	-	607	584	-	614	602	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1150	-	-	1178	-	-	287	302	669	267	303	647
Mov Cap-2 Maneuver	-	-	-	-	-	-	287	302	-	267	303	-
Stage 1	-	-	-	-	-	-	622	598	-	603	582	-
Stage 2	-	-	-	-	-	-	599	579	-	577	597	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0.2	13	15.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	499	1178	-	-	1150	-	-	357
HCM Lane V/C Ratio	0.094	0.008	-	-	0.009	-	-	0.021
HCM Control Delay (s)	13	8.1	-	-	8.2	-	-	15.3
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	54	16	379	380	2
Future Vol, veh/h	6	54	16	379	380	2
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	7	59	17	412	413	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	860	414	415	0	-	0
Stage 1	414	-	-	-	-	-
Stage 2	446	-	-	-	-	-
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	326	638	1144	-	-	-
Stage 1	667	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	321	638	1144	-	-	-
Mov Cap-2 Maneuver	444	-	-	-	-	-
Stage 1	657	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1144	-	611	-	-
HCM Lane V/C Ratio	0.015	-	0.107	-	-
HCM Control Delay (s)	8.2	-	11.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	53	118	78	342	398	36
Future Vol, veh/h	53	118	78	342	398	36
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	150	-	-	250
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	58	128	85	372	433	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	975	433	472	0	-	0
Stage 1	433	-	-	-	-	-
Stage 2	542	-	-	-	-	-
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	279	623	1090	-	-	-
Stage 1	654	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	257	623	1090	-	-	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	583	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	1.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1090	-	388	623	-	-
HCM Lane V/C Ratio	0.078	-	0.148	0.206	-	-
HCM Control Delay (s)	8.6	-	15.9	12.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.5	0.8	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	265	392	37	0	70
Future Vol, veh/h	0	265	392	37	0	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	-	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	288	426	40	0	76

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	213
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	792
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	792
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	792
HCM Lane V/C Ratio	-	-	-	0.096
HCM Control Delay (s)	-	-	-	10
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.3

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	77	181	438	24	84	35
Future Vol, veh/h	77	181	438	24	84	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	250	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	84	197	476	26	91	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	502	0	-	0	743	238
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	267	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1059	-	-	-	351	763
Stage 1	-	-	-	-	591	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1059	-	-	-	323	763
Mov Cap-2 Maneuver	-	-	-	-	323	-
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	754	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1059	-	-	-	323	763
HCM Lane V/C Ratio	0.079	-	-	-	0.283	0.05
HCM Control Delay (s)	8.7	-	-	-	20.5	10
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.1	0.2

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	203	200	307	680	728	388
v/c Ratio	0.62	0.47	0.36	0.29	0.56	0.51
Control Delay	40.5	16.2	14.1	14.5	20.9	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	16.2	14.1	14.5	20.9	10.6
Queue Length 50th (ft)	111	40	82	148	125	45
Queue Length 95th (ft)	169	95	105	200	187	140
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	506	583	842	2357	1303	761
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	0.40	0.34	0.36	0.29	0.56	0.51

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	340	0	30	282	626	0	0	313	714
Future Volume (vph)	0	0	0	340	0	30	282	626	0	0	313	714
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.98		1.00	1.00			0.92	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1657		3433	3539			3119	1441
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1657		3433	3539			3119	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	370	0	33	307	680	0	0	340	776
RTOR Reduction (vph)	0	0	0	0	97	0	0	0	0	0	196	250
Lane Group Flow (vph)	0	0	0	203	103	0	307	680	0	0	532	138
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				17.7	17.7		22.1	59.9			31.9	31.9
Effective Green, g (s)				17.7	17.7		22.1	59.9			31.9	31.9
Actuated g/C Ratio				0.20	0.20		0.25	0.67			0.35	0.35
Clearance Time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Vehicle Extension (s)				4.0	4.0		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				330	325		842	2355			1105	510
v/s Ratio Prot				c0.12	0.06		c0.09	0.19			c0.17	
v/s Ratio Perm												0.10
v/c Ratio				0.62	0.32		0.36	0.29			0.48	0.27
Uniform Delay, d1				33.0	31.0		28.1	6.2			22.6	20.7
Progression Factor				1.00	1.00		0.45	2.04			1.38	2.86
Incremental Delay, d2				3.9	0.8		0.3	0.3			1.3	1.1
Delay (s)				36.9	31.7		13.1	13.0			32.4	60.4
Level of Service				D	C		B	B			C	E
Approach Delay (s)		0.0			34.3			13.0			42.1	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	241	242	520	504	197	55	654
v/c Ratio	0.54	0.40	0.78	0.24	0.26	0.56	0.36
Control Delay	26.5	22.3	26.1	6.6	1.4	51.1	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	22.3	26.1	6.6	1.4	51.1	14.5
Queue Length 50th (ft)	147	102	180	27	1	33	138
Queue Length 95th (ft)	227	151	278	42	0	m60	187
Internal Link Dist (ft)		662		1067			491
Turn Bay Length (ft)	515		515		200	100	
Base Capacity (vph)	542	735	777	2083	764	98	1815
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	0.44	0.33	0.67	0.24	0.26	0.56	0.36

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	444	0	478	0	0	0	0	464	181	51	602	0
Future Volume (vph)	444	0	478	0	0	0	0	464	181	51	602	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Lane Util. Factor	*0.70	0.95	1.00					0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1239	1681	1583					5085	1583	1770	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1239	1681	1583					5085	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	483	0	520	0	0	0	0	504	197	55	654	0
RTOR Reduction (vph)	0	0	96	0	0	0	0	0	119	0	0	0
Lane Group Flow (vph)	241	242	424	0	0	0	0	504	78	55	654	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	32.2	32.2	32.2					35.7	35.7	4.0	46.2	
Effective Green, g (s)	32.2	32.2	32.2					35.7	35.7	4.0	46.2	
Actuated g/C Ratio	0.36	0.36	0.36					0.40	0.40	0.04	0.51	
Clearance Time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0	4.0	3.5	4.0	
Lane Grp Cap (vph)	443	601	566					2017	627	78	1816	
v/s Ratio Prot	0.19	0.14						0.10		c0.03	c0.18	
v/s Ratio Perm			c0.27						0.05			
v/c Ratio	0.54	0.40	0.75					0.25	0.12	0.71	0.36	
Uniform Delay, d1	23.0	21.7	25.3					18.2	17.2	42.4	13.1	
Progression Factor	1.00	1.00	1.00					0.32	0.17	0.75	0.95	
Incremental Delay, d2	1.7	0.6	5.7					0.3	0.4	22.2	0.5	
Delay (s)	24.8	22.3	31.1					6.0	3.3	53.8	13.0	
Level of Service	C	C	C					A	A	D	B	
Approach Delay (s)		27.4			0.0			5.3			16.1	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	272	24	80	199	41	41	20	103	43	13	10
Future Vol, veh/h	6	272	24	80	199	41	41	20	103	43	13	10
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	296	26	87	216	45	45	22	112	47	14	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	261	0	0	322	0	0	612	758	161	586	749	131
Stage 1	-	-	-	-	-	-	323	323	-	413	413	-
Stage 2	-	-	-	-	-	-	289	435	-	173	336	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1300	-	-	1235	-	-	377	335	855	394	339	894
Stage 1	-	-	-	-	-	-	663	649	-	587	592	-
Stage 2	-	-	-	-	-	-	694	579	-	812	640	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1300	-	-	1235	-	-	335	305	855	302	309	894
Mov Cap-2 Maneuver	-	-	-	-	-	-	335	305	-	302	309	-
Stage 1	-	-	-	-	-	-	658	644	-	583	543	-
Stage 2	-	-	-	-	-	-	612	531	-	677	636	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.2	15.1	18.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	532	1300	-	-	1235	-	-	337
HCM Lane V/C Ratio	0.335	0.005	-	-	0.07	-	-	0.213
HCM Control Delay (s)	15.1	7.8	0	-	8.1	0.2	-	18.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.5	0	-	-	0.2	-	-	0.8

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	332	123	173	260	291	88
v/c Ratio	0.22	0.17	0.29	0.13	0.67	0.12
Control Delay	13.9	3.7	9.1	5.4	27.6	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	3.7	9.1	5.4	27.6	1.9
Queue Length 50th (ft)	42	0	12	8	94	0
Queue Length 95th (ft)	78	27	27	18	147	13
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	1481	741	609	2059	578	741
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	0.22	0.17	0.28	0.13	0.50	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	305	113	159	239	0	0	0	0	268	0	81
Future Volume (veh/h)	0	305	113	159	239	0	0	0	0	268	0	81
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	332	0	173	260	0				291	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1060		792	2230	0				352	0	
Arrive On Green	0.00	0.30	0.00	0.08	0.21	0.00				0.20	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				1781	0	1585
Grp Volume(v), veh/h	0	332	0	173	260	0				291	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	4.3	0.0	0.0	3.6	0.0				9.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.3	0.0	0.0	3.6	0.0				9.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1060		792	2230	0				352	0	
V/C Ratio(X)	0.00	0.31		0.22	0.12	0.00				0.83	0.00	
Avail Cap(c_a), veh/h	0	1060		792	2230	0				582	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.98	0.98	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	16.3	0.0	12.8	10.3	0.0				23.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.1	0.1	0.0				5.0	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
%ile BackOfQ(95%),veh/ln	0.0	3.0	0.0	2.8	1.9	0.0				7.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.1	0.0	13.0	10.4	0.0				28.1	0.0	0.0
LnGrp LOS	A	B		B	B	A				C	A	
Approach Vol, veh/h		332	A		433						291	A
Approach Delay, s/veh		17.1			11.4						28.1	
Approach LOS		B			B						C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		42.7			19.7	23.0		17.3				
Change Period (Y+Rc), s		* 5.1			* 5.1	* 5.1		5.4				
Max Green Setting (Gmax), s		* 30			* 6.9	* 18		19.6				
Max Q Clear Time (g_c+I1), s		5.6			2.0	6.3		11.4				
Green Ext Time (p_c), s		2.9			0.2	2.6		0.5				

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	91	532	322	272	111	98
v/c Ratio	0.12	0.20	0.16	0.26	0.45	0.10
Control Delay	3.1	2.4	8.8	2.3	29.6	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	2.4	8.8	2.3	29.6	1.4
Queue Length 50th (ft)	5	14	32	0	37	0
Queue Length 95th (ft)	m20	42	57	34	78	13
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	849	2626	2053	1032	283	975
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	0.11	0.20	0.16	0.26	0.39	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	489	0	0	296	250	102	0	90	0	0	0
Future Volume (veh/h)	84	489	0	0	296	250	102	0	90	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	91	532	0	0	322	0	111	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	820	2633	0	0	2106		144	0				
Arrive On Green	0.07	0.74	0.00	0.00	0.59	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	91	532	0	0	322	0	111	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	1.1	2.7	0.0	0.0	2.4	0.0	3.7	0.0	0.0			
Cycle Q Clear(g_c), s	1.1	2.7	0.0	0.0	2.4	0.0	3.7	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	820	2633	0	0	2106		144	0				
V/C Ratio(X)	0.11	0.20	0.00	0.00	0.15		0.77	0.00				
Avail Cap(c_a), veh/h	1001	2633	0	0	2106		285	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	3.8	2.4	0.0	0.0	5.5	0.0	27.0	0.0	0.0			
Incr Delay (d2), s/veh	0.1	0.2	0.0	0.0	0.2	0.0	8.5	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			
%ile BackOfQ(95%),veh/ln	0.5	0.8	0.0	0.0	1.3	0.0	3.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.8	2.5	0.0	0.0	5.6	0.0	35.5	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		623			322	A		111	A			
Approach Delay, s/veh		2.7			5.6			35.5				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	8.9	40.9				49.8		10.2				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	10.0	* 25				* 40		9.6				
Max Q Clear Time (g_c+I1), s	3.1	4.4				4.7		5.7				
Green Ext Time (p_c), s	0.1	3.4				7.4		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	7.0
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	612	58	20	328	75	38
Future Vol, veh/h	612	58	20	328	75	38
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	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	665	63	22	357	82	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	728	0	920	364
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	223	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	871	-	270	633
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	793	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	871	-	262	633
Mov Cap-2 Maneuver	-	-	-	-	262	-
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	768	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	20.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	262	633	-	-	871	-
HCM Lane V/C Ratio	0.311	0.065	-	-	0.025	-
HCM Control Delay (s)	24.8	11.1	-	-	9.2	0.1
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	1.3	0.2	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	111	420	84	535	210	134	102	495	615	109	447	74
v/c Ratio	0.21	0.68	0.21	0.87	0.18	0.21	0.27	0.69	0.65	0.41	0.42	0.12
Control Delay	16.2	44.3	2.1	50.1	19.9	2.7	11.8	26.1	6.3	22.9	30.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	16.2	44.3	2.1	50.1	19.9	2.7	11.8	26.1	6.4	22.9	30.6	0.4
Queue Length 50th (ft)	39	134	0	233	49	0	27	199	51	42	125	0
Queue Length 95th (ft)	71	174	8	#422	73	22	54	265	31	77	173	0
Internal Link Dist (ft)		562			2353			407			251	
Turn Bay Length (ft)	200		200	200		200	160		200	290		200
Base Capacity (vph)	589	821	476	614	1172	625	384	722	947	281	1062	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	12	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.51	0.18	0.87	0.18	0.21	0.27	0.69	0.66	0.39	0.42	0.12

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)	102	386	77	492	193	123	94	455	566	100	411	68
Future Volume (veh/h)	102	386	77	492	193	123	94	455	566	100	411	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	111	420	84	535	210	134	102	495	0	109	447	74
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	419	543	242	474	989	441	427	1007		357	1378	615
Arrive On Green	0.06	0.15	0.15	0.06	0.09	0.09	0.02	0.13	0.00	0.05	0.39	0.39
Sat Flow, veh/h	1781	3554	1585	2494	3554	1585	1781	2619	1585	1781	3554	1585
Grp Volume(v), veh/h	111	420	84	535	210	134	102	495	0	109	447	74
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1247	1777	1585	1781	1309	1585	1781	1777	1585
Q Serve(g_s), s	4.4	11.4	3.8	19.0	5.5	7.9	3.4	17.6	0.0	3.7	8.8	3.0
Cycle Q Clear(g_c), s	4.4	11.4	3.8	19.0	5.5	7.9	3.4	17.6	0.0	3.7	8.8	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	419	543	242	474	989	441	427	1007		357	1378	615
V/C Ratio(X)	0.26	0.77	0.35	1.13	0.21	0.30	0.24	0.49		0.31	0.32	0.12
Avail Cap(c_a), veh/h	521	824	368	474	1066	476	496	1007		421	1378	615
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.90	0.90	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	40.7	25.0	46.9	35.3	36.4	17.7	34.5	0.0	18.5	21.4	19.7
Incr Delay (d2), s/veh	0.3	2.5	0.8	81.5	0.1	0.4	0.3	1.5	0.0	0.5	0.6	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(95%),veh/ln	3.2	8.6	3.3	18.2	4.3	5.7	2.5	10.2	0.0	2.6	6.4	2.0
Unsig. Movement Delay, s/veh									9.50			
LnGrp Delay(d),s/veh	23.5	43.2	25.8	128.4	35.4	36.7	18.0	36.1	9.5	19.0	22.1	20.1
LnGrp LOS	C	D	C	F	D	D	B	D	A	B	C	C
Approach Vol, veh/h		615			879			1212	A		630	
Approach Delay, s/veh		37.3			92.2			21.1			21.3	
Approach LOS		D			F			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	44.8	24.0	21.1	10.4	44.5	12.3	32.8
Change Period (Y+Rc), s	5.0	* 6	* 5	5.8	5.0	* 6	* 5.8	5.0
Max Green Setting (Gmax), s	9.0	* 27	* 19	23.2	9.0	* 27	* 12	30.0
Max Q Clear Time (g_c+I1), s	5.4	10.8	21.0	13.4	5.7	19.6	6.4	9.9
Green Ext Time (p_c), s	0.1	2.6	0.0	1.9	0.1	1.8	0.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	42.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is included in calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	1	25	0	17	2	519	12	20	478	5
Future Vol, veh/h	2	0	1	25	0	17	2	519	12	20	478	5
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	27	0	18	2	564	13	22	520	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1151	1148	523	1135	1137	564	525	0	0	577	0	0
Stage 1	567	567	-	568	568	-	-	-	-	-	-	-
Stage 2	584	581	-	567	569	-	-	-	-	-	-	-
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	175	199	554	179	202	525	1042	-	-	996	-	-
Stage 1	508	507	-	508	506	-	-	-	-	-	-	-
Stage 2	498	500	-	508	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	166	194	554	175	197	525	1042	-	-	996	-	-
Mov Cap-2 Maneuver	166	194	-	175	197	-	-	-	-	-	-	-
Stage 1	507	496	-	507	505	-	-	-	-	-	-	-
Stage 2	480	499	-	496	495	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.8	22.3	0	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1042	-	-	217	175	525	996	-	-
HCM Lane V/C Ratio	0.002	-	-	0.015	0.155	0.035	0.022	-	-
HCM Control Delay (s)	8.5	-	-	21.8	29.3	12.1	8.7	-	-
HCM Lane LOS	A	-	-	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	56	504	40	65	468
Future Vol, veh/h	34	56	504	40	65	468
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	-	-	225	225	-
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	37	61	548	43	71	509

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1199	274	0	0	591	0
Stage 1	548	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	191	724	-	-	983	-
Stage 1	544	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	177	724	-	-	983	-
Mov Cap-2 Maneuver	313	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	481	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.3	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	484	983	-
HCM Lane V/C Ratio	-	-	0.202	0.072	-
HCM Control Delay (s)	-	-	14.3	8.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	178	159	175	85	59	107	284	230	42	350
v/c Ratio	0.07	0.45	0.35	0.36	0.13	0.09	0.32	0.48	0.35	0.11	0.70
Control Delay	15.5	32.8	7.7	18.3	23.1	0.3	17.3	26.0	5.3	14.8	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	32.8	7.7	18.3	23.1	0.3	17.3	26.0	5.3	14.8	34.9
Queue Length 50th (ft)	11	73	0	51	30	0	28	110	0	11	145
Queue Length 95th (ft)	34	159	50	112	75	0	71	224	52	34	286
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	602	799	770	596	935	866	379	792	805	547	917
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.22	0.21	0.29	0.09	0.07	0.28	0.36	0.29	0.08	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	164	146	161	78	54	98	261	212	39	311	11
Future Volume (veh/h)	37	164	146	161	78	54	98	261	212	39	311	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	178	159	175	85	59	107	284	230	42	338	12
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	459	332	282	413	458	388	320	505	428	325	433	15
Arrive On Green	0.04	0.18	0.18	0.11	0.24	0.24	0.07	0.27	0.27	0.04	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1795	64
Grp Volume(v), veh/h	40	178	159	175	85	59	107	284	230	42	0	350
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1859
Q Serve(g_s), s	0.9	5.0	5.3	4.5	2.1	1.7	2.5	7.5	7.1	1.0	0.0	10.1
Cycle Q Clear(g_c), s	0.9	5.0	5.3	4.5	2.1	1.7	2.5	7.5	7.1	1.0	0.0	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	459	332	282	413	458	388	320	505	428	325	0	449
V/C Ratio(X)	0.09	0.54	0.56	0.42	0.19	0.15	0.33	0.56	0.54	0.13	0.00	0.78
Avail Cap(c_a), veh/h	681	963	816	672	963	816	473	947	802	685	0	941
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.0	21.4	21.5	16.5	17.1	17.0	15.4	18.0	17.8	14.4	0.0	20.3
Incr Delay (d2), s/veh	0.0	2.8	3.8	0.3	0.4	0.4	0.2	1.0	1.0	0.1	0.0	3.0
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(95%),veh/ln	0.6	3.9	3.6	2.9	1.5	1.0	1.5	5.1	4.1	0.6	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.0	24.3	25.3	16.7	17.5	17.4	15.6	19.0	18.9	14.4	0.0	23.3
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		377			319			621			392	
Approach Delay, s/veh		23.7			17.1			18.4			22.3	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	15.7	10.1	19.8	7.9	19.5	8.4	21.5
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	6.5	7.3	4.5	12.1	2.9	4.1	3.0	9.5
Green Ext Time (p_c), s	0.1	2.9	0.0	1.7	0.0	1.2	0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	2	496	11	32	500	10	5	0	17	17	0	10
Future Vol, veh/h	2	496	11	32	500	10	5	0	17	17	0	10
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	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	539	12	35	543	11	5	0	18	18	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	554	0	0	551	0	0	1173	1173	545	1177	1174	549
Stage 1	-	-	-	-	-	-	549	549	-	619	619	-
Stage 2	-	-	-	-	-	-	624	624	-	558	555	-
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	1016	-	-	1019	-	-	169	192	538	168	192	535
Stage 1	-	-	-	-	-	-	520	516	-	476	480	-
Stage 2	-	-	-	-	-	-	473	478	-	514	513	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1016	-	-	1019	-	-	161	185	538	158	185	535
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	185	-	158	185	-
Stage 1	-	-	-	-	-	-	519	515	-	475	464	-
Stage 2	-	-	-	-	-	-	447	462	-	495	512	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.5	16	24.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	351	1019	-	-	1016	-	-	214
HCM Lane V/C Ratio	0.068	0.034	-	-	0.002	-	-	0.137
HCM Control Delay (s)	16	8.7	-	-	8.6	-	-	24.5
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	29	54	539	524	6
Future Vol, veh/h	3	29	54	539	524	6
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	3	32	59	586	570	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1278	574	577	0	-	0
Stage 1	574	-	-	-	-	-
Stage 2	704	-	-	-	-	-
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	183	518	996	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	172	518	996	-	-	-
Mov Cap-2 Maneuver	311	-	-	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	490	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	996	-	488	-	-
HCM Lane V/C Ratio	0.059	-	0.071	-	-
HCM Control Delay (s)	8.8	-	12.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	84	127	553	495	58
Future Vol, veh/h	40	84	127	553	495	58
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	150	-	-	250
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	43	91	138	601	538	63

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1415	538	601	0	-	0
Stage 1	538	-	-	-	-	-
Stage 2	877	-	-	-	-	-
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	151	543	976	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	407	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	130	543	976	-	-	-
Mov Cap-2 Maneuver	264	-	-	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	407	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	976	-	264	543	-	-
HCM Lane V/C Ratio	0.141	-	0.165	0.168	-	-
HCM Control Delay (s)	9.3	-	21.3	13	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.6	0.6	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	565	300	55	0	53
Future Vol, veh/h	0	565	300	55	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	150	-	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	614	326	60	0	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	163
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	853
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	853
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	853
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	9.5
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	117	504	315	38	61	27
Future Vol, veh/h	117	504	315	38	61	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	250	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	127	548	342	41	66	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	383	0	-	0	870	171
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	528	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1172	-	-	-	291	843
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	556	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1172	-	-	-	260	843
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	556	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	19.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1172	-	-	-	260	843
HCM Lane V/C Ratio	0.109	-	-	-	0.255	0.035
HCM Control Delay (s)	8.4	-	-	-	23.5	9.4
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	1	0.1

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	141	133	605	1155	721	344
v/c Ratio	0.59	0.41	0.57	0.44	0.55	0.46
Control Delay	50.0	14.7	47.1	2.0	15.9	8.4
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	50.0	14.7	47.1	2.1	15.9	8.4
Queue Length 50th (ft)	89	14	215	7	96	65
Queue Length 95th (ft)	149	67	270	43	m120	m90
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	304	380	1067	2598	1301	743
Starvation Cap Reductn	0	0	0	240	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.35	0.57	0.49	0.55	0.46

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	0	52	557	1063	0	0	346	634
Future Volume (vph)	0	0	0	200	0	52	557	1063	0	0	346	634
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.94		1.00	1.00			0.93	0.85
Flt Protected				0.95	0.97		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1610		3433	3539			3147	1441
Flt Permitted				0.95	0.97		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1610		3433	3539			3147	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	217	0	57	605	1155	0	0	376	689
RTOR Reduction (vph)	0	0	0	0	94	0	0	0	0	0	156	219
Lane Group Flow (vph)	0	0	0	141	39	0	605	1155	0	0	565	125
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				14.2	14.2		31.1	73.4			36.4	36.4
Effective Green, g (s)				14.2	14.2		31.1	73.4			36.4	36.4
Actuated g/C Ratio				0.14	0.14		0.31	0.73			0.36	0.36
Clearance Time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Vehicle Extension (s)				4.0	4.0		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				238	228		1067	2597			1145	524
v/s Ratio Prot				c0.08	0.02		c0.18	c0.33			0.18	
v/s Ratio Perm												0.09
v/c Ratio				0.59	0.17		0.57	0.44			0.49	0.24
Uniform Delay, d1				40.2	37.7		28.8	5.3			24.7	22.2
Progression Factor				1.00	1.00		1.55	0.28			0.87	2.29
Incremental Delay, d2				4.6	0.5		0.7	0.5			1.2	0.8
Delay (s)				44.8	38.2		45.3	1.9			22.5	51.6
Level of Service				D	D		D	A			C	D
Approach Delay (s)		0.0			41.6			16.8			31.9	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	392	392	537	977	450	41	552
v/c Ratio	0.78	0.58	0.70	0.50	0.51	0.29	0.33
Control Delay	37.2	26.1	19.2	12.6	3.2	51.6	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	26.1	19.2	12.6	3.2	51.6	19.6
Queue Length 50th (ft)	282	185	157	115	25	26	88
Queue Length 95th (ft)	452	278	277	185	m46	m45	141
Internal Link Dist (ft)		662		1067			491
Turn Bay Length (ft)	515		515		200	100	
Base Capacity (vph)	550	746	820	1959	886	159	1694
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	0.71	0.53	0.65	0.50	0.51	0.26	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	721	0	494	0	0	0	0	899	414	38	508	0
Future Volume (vph)	721	0	494	0	0	0	0	899	414	38	508	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Lane Util. Factor	*0.70	0.95	1.00					0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1239	1681	1583					5085	1583	1770	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1239	1681	1583					5085	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	784	0	537	0	0	0	0	977	450	41	552	0
RTOR Reduction (vph)	0	0	126	0	0	0	0	0	287	0	0	0
Lane Group Flow (vph)	392	392	411	0	0	0	0	977	163	41	552	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	40.5	40.5	40.5					36.2	36.2	5.2	47.9	
Effective Green, g (s)	40.5	40.5	40.5					36.2	36.2	5.2	47.9	
Actuated g/C Ratio	0.40	0.40	0.40					0.36	0.36	0.05	0.48	
Clearance Time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0	4.0	3.5	4.0	
Lane Grp Cap (vph)	501	680	641					1840	573	92	1695	
v/s Ratio Prot	c0.32	0.23						c0.19		0.02	c0.16	
v/s Ratio Perm			0.26						0.10			
v/c Ratio	0.78	0.58	0.64					0.53	0.28	0.45	0.33	
Uniform Delay, d1	25.9	23.1	23.9					25.2	22.7	46.0	16.1	
Progression Factor	1.00	1.00	1.00					0.46	0.60	1.09	1.11	
Incremental Delay, d2	8.2	1.4	2.5					0.7	0.8	3.5	0.4	
Delay (s)	34.2	24.5	26.4					12.3	14.5	53.4	18.4	
Level of Service	C	C	C					B	B	D	B	
Approach Delay (s)		28.1			0.0			13.0			20.8	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Simulation

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	5494	5523	5703	5420	5484	5522
Vehs Exited	5485	5542	5691	5390	5493	5522
Starting Vehs	153	176	163	151	157	156
Ending Vehs	162	157	175	181	148	161
Travel Distance (mi)	3178	3200	3302	3150	3204	3207
Travel Time (hr)	165.5	168.0	175.7	164.7	167.5	168.3
Total Delay (hr)	69.3	71.1	75.3	69.5	70.4	71.1
Total Stops	6657	6886	7056	6663	6604	6771
Fuel Used (gal)	132.8	133.8	139.1	131.5	134.1	134.3

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1216	1283	1321	1239	1240	1260
Vehs Exited	1230	1274	1338	1250	1255	1269
Starting Vehs	153	176	163	151	157	156
Ending Vehs	139	185	146	140	142	147
Travel Distance (mi)	714	735	764	729	725	734
Travel Time (hr)	35.9	38.3	39.9	37.6	37.1	37.7
Total Delay (hr)	14.3	15.9	16.5	15.4	15.3	15.5
Total Stops	1442	1568	1571	1529	1463	1515
Fuel Used (gal)	29.2	30.5	32.2	30.2	30.1	30.4

Interval #2 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1461	1436	1505	1433	1477	1461
Vehs Exited	1408	1440	1453	1409	1451	1433
Starting Vehs	139	185	146	140	142	147
Ending Vehs	192	181	198	164	168	177
Travel Distance (mi)	813	844	849	811	846	833
Travel Time (hr)	42.4	45.4	45.3	42.2	44.3	43.9
Total Delay (hr)	17.6	20.0	19.6	17.8	18.6	18.7
Total Stops	1732	1845	1825	1719	1764	1778
Fuel Used (gal)	34.3	35.1	36.1	33.8	35.6	35.0

Interval #3 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1507	1511	1528	1439	1468	1490
Vehs Exited	1497	1517	1530	1417	1440	1478
Starting Vehs	192	181	198	164	168	177
Ending Vehs	202	175	196	186	196	188
Travel Distance (mi)	879	871	889	839	848	865
Travel Time (hr)	47.4	45.8	48.9	45.5	45.5	46.6
Total Delay (hr)	20.9	19.5	21.9	19.9	19.7	20.4
Total Stops	1890	1873	2001	1862	1818	1889
Fuel Used (gal)	37.2	36.5	37.5	35.3	35.7	36.4

Interval #4 Information

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1310	1293	1349	1309	1299	1313
Vehs Exited	1350	1311	1370	1314	1347	1337
Starting Vehs	202	175	196	186	196	188
Ending Vehs	162	157	175	181	148	161
Travel Distance (mi)	771	751	800	772	784	776
Travel Time (hr)	39.8	38.6	41.5	39.5	40.6	40.0
Total Delay (hr)	16.5	15.7	17.4	16.4	16.8	16.5
Total Stops	1593	1600	1659	1553	1559	1594
Fuel Used (gal)	32.1	31.6	33.3	32.2	32.7	32.4

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	R	L	T	T	L
Maximum Queue (ft)	96	55	65	63	51	43	173
Average Queue (ft)	35	7	25	23	18	4	93
95th Queue (ft)	78	32	69	52	46	22	149
Link Distance (ft)	286	286			441	441	299
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	325			
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	67	34	22	82	65	71	98
Average Queue (ft)	13	6	1	17	28	57	37
95th Queue (ft)	43	26	11	53	73	65	77
Link Distance (ft)		441	441	483	483		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	2	
Queuing Penalty (veh)					0	3	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	T
Maximum Queue (ft)	65	147	113	105	210	221	223	130	48	185	355	311
Average Queue (ft)	24	76	31	40	114	117	51	62	21	68	186	61
95th Queue (ft)	56	132	78	74	184	192	139	105	47	173	301	203
Link Distance (ft)		908	908				2339	2339			389	389
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	200			200	200	200			200	160		
Storage Blk Time (%)					0	1	0			0	16	1
Queuing Penalty (veh)					0	1	0			0	10	3

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	129	115	185	239	186
Average Queue (ft)	10	34	59	132	28
95th Queue (ft)	78	76	136	212	94
Link Distance (ft)			370	370	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	290			200
Storage Blk Time (%)	0			2	0
Queuing Penalty (veh)	0			2	0

Intersection: 7: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	188	222	130	151	239	242	205	226	245
Average Queue (ft)	89	140	49	79	130	125	111	152	150
95th Queue (ft)	161	206	101	133	210	213	185	213	218
Link Distance (ft)		823		524	524	524	389	389	389
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	270		350						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 8: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	R	L	T	T
Maximum Queue (ft)	203	221	270	99	63	63	28	105	144	145
Average Queue (ft)	119	119	98	46	19	18	3	39	45	44
95th Queue (ft)	183	197	212	90	49	51	24	78	115	117
Link Distance (ft)		682			1054	1054			524	524
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	515		515	450			200	100		
Storage Blk Time (%)								0	1	
Queuing Penalty (veh)								1	1	

Intersection: 14: Douglas St & Drive 3

Movement	EB	EB	NB	B54	SB
Directions Served	L	R	L	T	T
Maximum Queue (ft)	94	92	71	101	4
Average Queue (ft)	31	33	22	4	0
95th Queue (ft)	66	65	54	74	3
Link Distance (ft)	306			370	555
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)		100	150		
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	0	0			

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	85	271
Average Queue (ft)	3	33
95th Queue (ft)	42	146
Link Distance (ft)	330	330
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	104	95	39	68	32	90	67	127	156	175	174	88
Average Queue (ft)	42	33	8	23	4	34	24	19	81	94	75	24
95th Queue (ft)	90	71	28	53	19	69	52	83	138	156	139	70
Link Distance (ft)	1012	1012	1012			981				604	604	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)								0	1	1	3	0
Queuing Penalty (veh)								0	2	1	2	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	128	152	149	169	117
Average Queue (ft)	60	86	66	80	41
95th Queue (ft)	113	133	124	133	74
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 7224: Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	39	80	92	62	214	174	66	48	62	40
Average Queue (ft)	10	14	28	11	94	52	23	14	27	13
95th Queue (ft)	31	48	70	43	182	133	57	42	58	38
Link Distance (ft)		2339	2339		1382	1382	660	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)					2					
Queuing Penalty (veh)					0					

Network Summary

Network wide Queuing Penalty: 28

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	7076	7223	7152	7173	7213	7168
Vehs Exited	7074	7202	7146	7145	7181	7147
Starting Vehs	215	222	218	206	221	211
Ending Vehs	217	243	224	234	253	231
Travel Distance (mi)	4174	4190	4205	4219	4227	4203
Travel Time (hr)	248.4	253.2	262.0	256.3	269.3	257.8
Total Delay (hr)	126.9	131.2	139.5	133.4	145.6	135.3
Total Stops	9811	9708	10134	9805	10554	10003
Fuel Used (gal)	185.6	188.7	189.6	188.9	192.1	189.0

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1615	1598	1689	1625	1650	1633
Vehs Exited	1610	1613	1689	1650	1665	1647
Starting Vehs	215	222	218	206	221	211
Ending Vehs	220	207	218	181	206	202
Travel Distance (mi)	957	922	995	966	994	967
Travel Time (hr)	53.0	49.5	56.4	53.0	55.6	53.5
Total Delay (hr)	25.1	22.5	27.5	24.8	26.6	25.3
Total Stops	2049	1858	2259	2057	2101	2067
Fuel Used (gal)	41.5	40.5	43.8	41.8	43.7	42.3

Interval #2 Information

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1940	1948	1843	1918	1980	1925
Vehs Exited	1862	1889	1800	1843	1867	1851
Starting Vehs	220	207	218	181	206	202
Ending Vehs	298	266	261	256	319	277
Travel Distance (mi)	1105	1107	1058	1080	1110	1092
Travel Time (hr)	68.3	66.4	66.1	61.5	69.2	66.3
Total Delay (hr)	36.3	34.4	35.4	30.1	36.7	34.6
Total Stops	2814	2547	2496	2366	2695	2584
Fuel Used (gal)	49.8	49.5	47.5	47.3	50.0	48.8

Interval #3 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1911	1955	1916	1934	1895	1924
Vehs Exited	1933	1935	1869	1882	1899	1905
Starting Vehs	298	266	261	256	319	277
Ending Vehs	276	286	308	308	315	294
Travel Distance (mi)	1122	1134	1109	1099	1112	1115
Travel Time (hr)	71.3	74.5	73.3	70.7	76.8	73.3
Total Delay (hr)	38.6	41.3	40.9	38.4	44.2	40.7
Total Stops	2861	2839	2909	2768	3040	2889
Fuel Used (gal)	50.8	52.1	50.8	50.3	51.6	51.1

Interval #4 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1610	1722	1704	1696	1688	1684
Vehs Exited	1669	1765	1788	1770	1750	1747
Starting Vehs	276	286	308	308	315	294
Ending Vehs	217	243	224	234	253	231
Travel Distance (mi)	990	1027	1044	1073	1011	1029
Travel Time (hr)	55.8	62.8	66.2	71.2	67.8	64.7
Total Delay (hr)	26.9	33.0	35.7	40.1	38.0	34.7
Total Stops	2087	2464	2470	2614	2718	2470
Fuel Used (gal)	43.6	46.6	47.4	49.4	46.7	46.8

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	R	L	T	T	L
Maximum Queue (ft)	131	55	67	119	85	90	202
Average Queue (ft)	60	14	7	61	42	33	108
95th Queue (ft)	109	43	38	107	75	71	182
Link Distance (ft)	286	286			441	441	299
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	325			
Storage Blk Time (%)		1	0				
Queuing Penalty (veh)		1	0				

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	72	88	54	104	69	65	122
Average Queue (ft)	22	35	11	39	9	18	63
95th Queue (ft)	55	74	41	85	39	61	109
Link Distance (ft)		441	441	483	483		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	0	
Queuing Penalty (veh)					1	0	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T	T
Maximum Queue (ft)	163	229	191	108	210	223	442	127	78	185	386	393
Average Queue (ft)	52	153	105	36	151	156	137	58	35	86	196	117
95th Queue (ft)	116	218	179	84	229	241	500	110	62	195	364	330
Link Distance (ft)		908	908				2339	2339			389	389
Upstream Blk Time (%)											2	1
Queuing Penalty (veh)											9	5
Storage Bay Dist (ft)	200			200	200	200			200	160		
Storage Blk Time (%)		2	0	0	8	10	0	0		0	22	2
Queuing Penalty (veh)		2	0	0	9	11	0	0		0	21	13

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	225	177	218	252	157
Average Queue (ft)	115	58	68	129	31
95th Queue (ft)	227	120	149	219	120
Link Distance (ft)			370	370	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	290			200
Storage Blk Time (%)	0		0	3	0
Queuing Penalty (veh)	1		0	2	0

Intersection: 7: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	156	203	272	351	189	279	180	227	227
Average Queue (ft)	66	119	181	205	61	99	104	138	146
95th Queue (ft)	142	190	257	293	147	205	159	202	211
Link Distance (ft)		823		524	524	524	389	389	389
Upstream Blk Time (%)				0					
Queuing Penalty (veh)				0					
Storage Bay Dist (ft)	270		350						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 8: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	R	L	T	T
Maximum Queue (ft)	300	331	167	418	550	362	32	124	203	168
Average Queue (ft)	154	192	61	251	178	110	1	41	113	98
95th Queue (ft)	245	286	134	445	487	302	14	99	178	151
Link Distance (ft)		682			1054	1054			524	524
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	515		515	450			200	100		
Storage Blk Time (%)				4	1	0		0	16	
Queuing Penalty (veh)				12	4	0		1	6	

Intersection: 14: Douglas St & Drive 3

Movement	EB	EB	NB	B54	SB
Directions Served	L	R	L	T	T
Maximum Queue (ft)	79	72	80	82	18
Average Queue (ft)	26	27	35	6	0
95th Queue (ft)	59	54	66	85	4
Link Distance (ft)	306			370	555
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)		100	150		
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	0	0			

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	322	350
Average Queue (ft)	83	186
95th Queue (ft)	282	407
Link Distance (ft)	330	330
Upstream Blk Time (%)	0	1
Queuing Penalty (veh)	1	8
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	292	284	52	142	110	163	206	29	175	545	574	140
Average Queue (ft)	151	142	17	50	24	74	95	4	59	288	297	60
95th Queue (ft)	288	285	45	104	70	138	179	18	165	535	545	162
Link Distance (ft)	1012	1012	1012			981				604	604	
Upstream Blk Time (%)										2	2	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)				0			1		0	31	43	0
Queuing Penalty (veh)				0			1		0	11	32	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	110	125	177	199	48
Average Queue (ft)	43	71	114	127	19
95th Queue (ft)	88	107	169	185	45
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 7224: Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	52	152	174	40	163	123	69	59	84	35
Average Queue (ft)	19	40	60	12	64	33	21	16	30	16
95th Queue (ft)	43	113	141	36	141	91	56	44	72	39
Link Distance (ft)		2339	2339		1382	1382	660	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)		0			1					
Queuing Penalty (veh)		0			0					

Network Summary

Network wide Queuing Penalty: 152

APPENDIX D

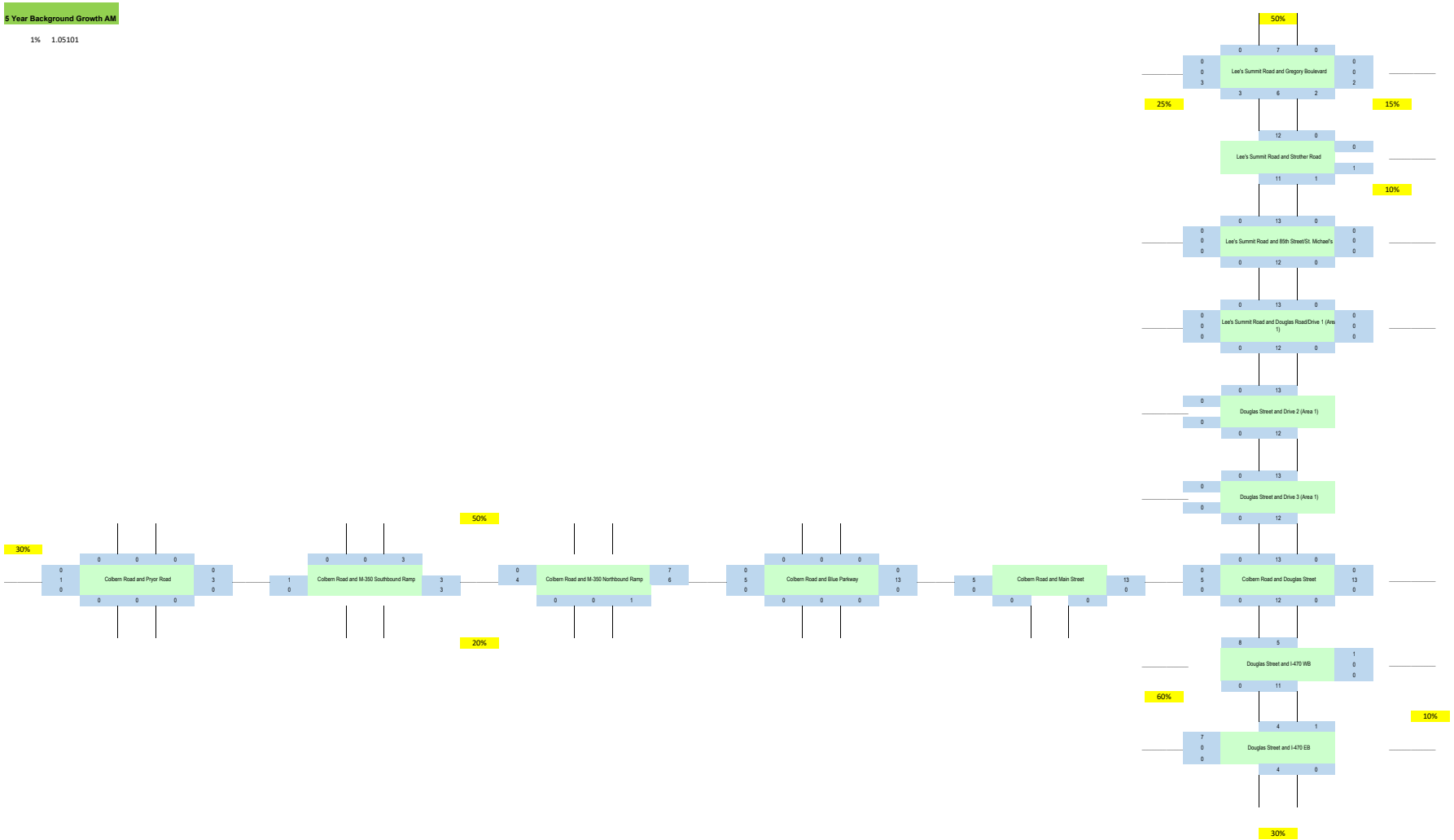
Build Year 2027 Plus Phases 1 and 2 Development Conditions

Growth

Roadway	*Count Year*	*Volume*	*Growth Rate*	*Time Period*
I-470 between M-350 and 291	2000	44496	3.1%	11 years count data (2000 to 2011)
	2005	54955	1.8%	8 years count data (2005 to 2013)
	2010	58863	3.5%	4 years count data (2010 to 2014)
	2011	63055	2.5%	4 years count data (2011 to 2015)
	2013	63370	4.0%	3 years count data (2013 to 2016)
	2014	67803	2.9%	16 years count data (2000 to 2016)
	2015	69837	Average	
	2016	71723	2.98%	
I-470 elbow at 291	2010	22178	-1.7%	3 years count data (2010 to 2013)
	2011	21735	-3.6%	3 years count data (2011 to 2014)
	2013	21109	-2.0%	2 years count data (2013 to 2015)
	2014	19569	2.0%	2 years count data (2014 to 2016)
	2015	20274	-1.4%	6 years count data (2010 to 2016)
	2016	20396	Average	
			-1.32%	
			Both Roadway Average	
			0.83%	

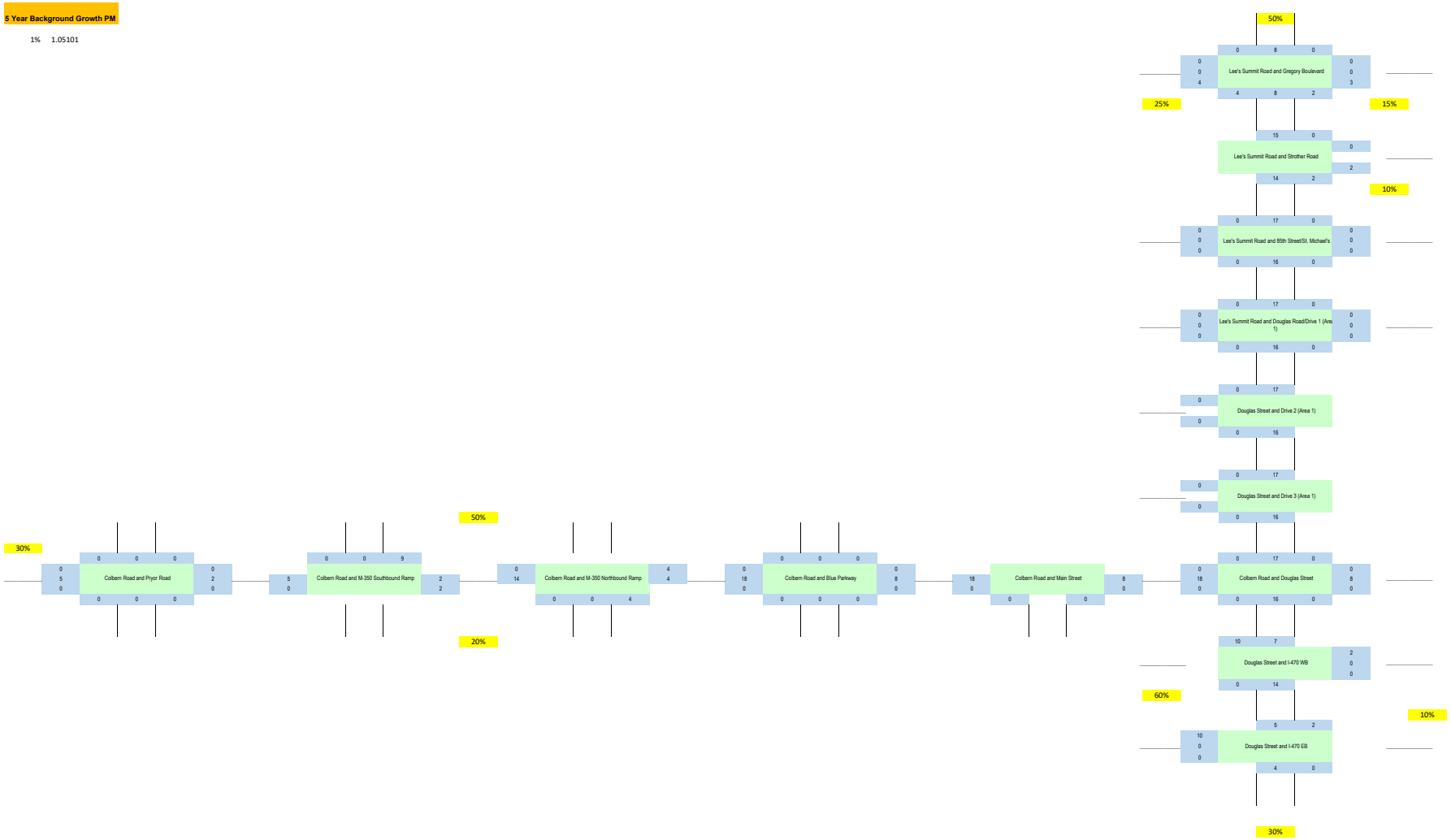
5 Year Background Growth AM

1% 1.05101



5 Year Background Growth PM

1% 1.05101



Trip Generation

Phase 2 (Areas 2 and 3)

Daily Trip Generation

ITE Code	Zone	Description	Land Use	Size		Trip Gen. Avg. Rate/Eq.	Daily Trips	Trip Distribution Enter	Trip Distribution Exit	Daily Trips Enter	Daily Trips Exit	Notes
850	2	Grocer (2A)	Supermarket	50,000	Sq. Ft.	Equation	4,709	50%	50%	2,355	2,354	
822	2	Retail	Strip Retail Plaza (<40k)	15,000	Sq. Ft.	Average Rate	817	50%	50%	409	408	
948	2	Car Wash	Automated Car Wash	1	Tunnels	*	780	50%	50%	390	390	
938	2	Coffee Shop	Coffee/Donut Shop with Drive-Thru (No Seating)	2	Lanes	Average Rate	358	50%	50%	179	179	
945	2	Convienience Store	Convience Store/Gas Station	5,700	Sq. Ft.	Average Rate	7,316	50%	50%	3,658	3,658	
932	2	Restaurant	High-Turnover (Sit-Down) Restaurant	7,000	Sq. Ft.	Average Rate	751	50%	50%	376	375	
934	2	Restaurant - Fast Food	Fast-Food Reastaurant with Drive-Thru	2,400	Sq. Ft.	Average Rate	1,122	50%	50%	561	561	
934	2	Restaurant - Fast Food	Fast-Food Reastaurant with Drive-Thru	2,400	Sq. Ft.	Average Rate	1,122	50%	50%	561	561	
932	3	Kitchen (Rest/Sport) (3A)	High-Turnover (Sit-Down) Restaurant	10,000	Sq. Ft.	Average Rate	1,072	50%	50%	536	536	
220	3	Residential (Riverwalk 1)	Multifamily Housing (Low-Rise)	36	Units	Equation	307	50%	50%	154	153	
822	3	Office/Retail (Riverwalk 1)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Average Rate	436	50%	50%	218	218	
932	3	Restaurant (Riverwalk 1)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	429	50%	50%	215	214	
220	3	Residential (Riverwalk 2)	Multifamily Housing (Low-Rise)	36	Units	Equation	307	50%	50%	154	153	
822	3	Office/Retail (Riverwalk 2)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Average Rate	436	50%	50%	218	218	
932	3	Restaurant (Riverwalk 2)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	429	50%	50%	215	214	
221	3	Residential (Riverwalk 3)	Multifamily Housing (Mid-Rise)	130	Units	Average Rate	591	50%	50%	296	295	
822	3	Office/Retail (Riverwalk 3)	Strip Retail Plaza (<40k)	14,000	Sq. Ft.	Average Rate	763	50%	50%	382	381	
932	3	Restaurant (Riverwalk 3)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	644	50%	50%	322	322	
221	3	Residential (Riverwalk 4)	Multifamily Housing (Mid-Rise)	130	Units	Average Rate	591	50%	50%	296	295	
822	3	Office/Retail (Riverwalk 4)	Strip Retail Plaza (<40k)	14,000	Sq. Ft.	Average Rate	763	50%	50%	382	381	
932	3	Restaurant (Riverwalk 4)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	644	50%	50%	322	322	
710	3	Office (Riverwalk)	General Office Building	20,000	Sq. Ft.	Equation	287	50%	50%	144	143	
435	3	Entertainment (3B)	Multipurpose Recreational Facility	50,000	Sq. Ft.	*	1,790	50%	50%	895	895	
720	3	Medical Office (3E)	Medical-Dental Office Building	36,000	Sq. Ft.	Equation	1,439	50%	50%	720	719	
932	3	Restaurant	High-Turnover (Sit-Down) Restaurant	7,500	Sq. Ft.	Average Rate	804	50%	50%	402	402	
932	3	Restaurant	High-Turnover (Sit-Down) Restaurant	7,500	Sq. Ft.	Average Rate	804	50%	50%	402	402	
Total							**29,511**			**14,762**	**14,749**	

*No daily rate provided, used 10x PM peak hour value.

AM Peak Hour Trip Generation

ITE Code	Zone	Description	Land Use	Size		Trip Gen. Avg. Rate/Eq.	AM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	AM Peak Hour Trips Enter	AM Peak Hour Trips Exit	AM Capture Trips Enter	AM Capture Trips Exit
850	2	Grocer (2A)	Supermarket	50,000	Sq. Ft.	Average Rate	143	59%	41%	84	59	81	57
822	2	Retail	Strip Retail Plaza (<40k)	15,000	Sq. Ft.	Average Rate	36	60%	40%	22	14	21	14
948	2	Car Wash	Automated Car Wash	1	Tunnels	N/A	0	50%	50%	0	0	0	0
938	2	Coffee Shop	Coffee/Donut Shop with Drive-Thru (No Seating)	2	Lanes	Equation	89	50%	50%	45	44	44	43
945	2	Convienience Store	Convience Store/Gas Station	5,700	Sq. Ft.	Average Rate	521	50%	50%	261	260	253	252
932	2	Restaurant	High-Turnover (Sit-Down) Restaurant	7,000	Sq. Ft.	Average Rate	67	55%	45%	37	30	36	29
934	2	Restaurant - Fast Food	Fast-Food Reastaurant with Drive-Thru	2,400	Sq. Ft.	Average Rate	108	51%	49%	55	53	53	51
934	2	Restaurant - Fast Food	Fast-Food Reastaurant with Drive-Thru	2,400	Sq. Ft.	Average Rate	108	51%	49%	55	53	53	51
932	3	Kitchen (Rest/Sport) (3A)	High-Turnover (Sit-Down) Restaurant	10,000	Sq. Ft.	N/A	0	55%	45%	0	0	0	0
220	3	Residential (Riverwalk 1)	Multifamily Housing (Low-Rise)	36	Units	Equation	35	24%	76%	8	27	8	26
822	3	Office/Retail (Riverwalk 1)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Average Rate	19	60%	40%	11	8	11	8
932	3	Restaurant (Riverwalk 1)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	39	55%	45%	21	18	20	17
220	3	Residential (Riverwalk 2)	Multifamily Housing (Low-Rise)	36	Units	Equation	35	24%	76%	8	27	8	26
822	3	Office/Retail (Riverwalk 2)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Average Rate	19	60%	40%	11	8	11	8
932	3	Restaurant (Riverwalk 2)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	39	55%	45%	21	18	20	17
221	3	Residential (Riverwalk 3)	Multifamily Housing (Mid-Rise)	130	Units	Equation	46	23%	77%	11	35	11	34
822	3	Office/Retail (Riverwalk 3)	Strip Retail Plaza (<40k)	14,000	Sq. Ft.	Equation	34	60%	40%	20	14	19	14
932	3	Restaurant (Riverwalk 3)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	58	55%	45%	32	26	31	25
221	3	Residential (Riverwalk 4)	Multifamily Housing (Mid-Rise)	130	Units	Equation	46	23%	77%	11	35	11	34
822	3	Office/Retail (Riverwalk 4)	Strip Retail Plaza (<40k)	14,000	Sq. Ft.	Equation	34	60%	40%	20	14	19	14
932	3	Restaurant (Riverwalk 4)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	58	55%	45%	32	26	31	25
710	3	Office (Riverwalk)	General Office Building	20,000	Sq. Ft.	Equation	42	88%	12%	37	5	36	5
435	3	Entertainment (3B)	Multipurpose Recreational Facility	50,000	Sq. Ft.	N/A	0	50%	50%	0	0	0	0
720	3	Medical Office (3E)	Medical-Dental Office Building	36,000	Sq. Ft.	Equation	97	79%	21%	77	20	75	19
932	3	Restaurant	High-Turnover (Sit-Down) Restaurant	7,500	Sq. Ft.	Average Rate	72	55%	45%	40	32	39	31
932	3	Restaurant	High-Turnover (Sit-Down) Restaurant	7,500	Sq. Ft.	Average Rate	72	55%	45%	40	32	39	31
Total							**1,817**			**959**	**858**	**930**	**831**

PM Peak Hour Trip Generation

ITE Code	Zone	Description	Land Use	Size		Trip Gen. Avg. Rate/Eq.	PM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	PM Peak Hour Trips Enter	PM Peak Hour Trips Exit	PM Capture Trips Enter	PM Capture Trips Exit
850	2	Grocer (2A)	Supermarket	50,000	Sq. Ft.	Equation	441	50%	50%	221	220	192	191
822	2	Retail	Strip Retail Plaza (<40k)	15,000	Sq. Ft.	Equation	104	50%	50%	52	52	45	45
948	2	Car Wash	Automated Car Wash	1	Tunnels	Equation	78	50%	50%	39	39	34	34
938	2	Coffee Shop	Coffee/Donut Shop with Drive-Thru (No Seating)	2	Lanes	Average Rate	31	50%	50%	16	15	14	13
945	2	Convienience Store	Convience Store/Gas Station	5,700	Sq. Ft.	Average Rate	451	50%	50%	226	225	197	196
932	2	Restaurant	High-Turnover (Sit-Down) Restaurant	7,000	Sq. Ft.	Average Rate	64	61%	39%	39	25	34	22
934	2	Restaurant - Fast Food	Fast-Food Reastaurant with Drive-Thru	2,400	Sq. Ft.	Average Rate	80	52%	48%	42	38	37	33
934	2	Restaurant - Fast Food	Fast-Food Reastaurant with Drive-Thru	2,400	Sq. Ft.	Average Rate	80	52%	48%	42	38	37	33
932	3	Kitchen (Rest/Sport) (3A)	High-Turnover (Sit-Down) Restaurant	10,000	Sq. Ft.	Average Rate	91	61%	39%	56	35	34	19
220	3	Residential (Riverwalk 1)	Multifamily Housing (Low-Rise)	36	Units	Equation	37	63%	37%	23	14	14	8
822	3	Office/Retail (Riverwalk 1)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Equation	67	50%	50%	34	33	20	18
932	3	Restaurant (Riverwalk 1)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	37	61%	39%	23	14	14	8
220	3	Residential (Riverwalk 2)	Multifamily Housing (Low-Rise)	36	Units	Equation	37	63%	37%	23	14	14	8
822	3	Office/Retail (Riverwalk 2)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Average Rate	67	50%	50%	34	33	20	18
932	3	Restaurant (Riverwalk 2)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	37	61%	39%	23	14	14	8
221	3	Residential (Riverwalk 3)	Multifamily Housing (Mid-Rise)	130	Units	Equation	52	61%	39%	32	20	19	11
822	3	Office/Retail (Riverwalk 3)	Strip Retail Plaza (<40k)	14,000	Sq. Ft.	Equation	99	50%	50%	50	49	30	27
932	3	Restaurant (Riverwalk 3)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	55	61%	39%	34	21	20	12
221	3	Residential (Riverwalk 4)	Multifamily Housing (Mid-Rise)	130	Units	Equation	52	61%	39%	32	20	19	11
822	3	Office/Retail (Riverwalk 4)	Strip Retail Plaza (<40k)	14,000	Sq. Ft.	Equation	99	50%	50%	50	49	30	27
932	3	Restaurant (Riverwalk 4)	High-Turnover (Sit-Down) Restaurant	6,000	Sq. Ft.	Average Rate	55	61%	39%	34	21	20	12
710	3	Office (Riverwalk)	General Office Building	20,000	Sq. Ft.	Equation	44	17%	83%	7	37	4	20
435	3	Entertainment (3B)	Multipurpose Recreational Facility	50,000	Sq. Ft.	Average Rate	179	55%	45%	98	81	59	45
720	3	Medical Office (3E)	Medical-Dental Office Building	36,000	Sq. Ft.	Equation	144	30%	70%	43	101	26	56
932	3	Restaurant	High-Turnover (Sit-Down) Restaurant	7,500	Sq. Ft.	Average Rate	68	61%	39%	41	27	25	15
932	3	Restaurant	High-Turnover (Sit-Down) Restaurant	7,500	Sq. Ft.	Average Rate	68	61%	39%	41	27	25	15
Total							**2,617**			**1,355**	**1,262**	**997**	**905**

Internal Capture Land Use Breakdown

			Land Use	AM Peak Enter	AM Peak Exit	PM Peak Enter	PM Peak Exit
		Zone 2	Office	-	-	-	-
			Retail	106	73	273	272
Internal Capture Rate			Restaurant	192	180	139	116
	AM	*PM*	Entertainment	-	-	-	-
Total	**3%**	**13%**	Residential	-	-	-	-
Entering	**3%**	**13%**	Hotel	-	-	-	-
Exiting	**3%**	**13%**	Other	261	260	265	264
Total				**559**	**513**	**677**	**652**
		Zone 3	Office	114	25	50	138
			Retail	62	44	168	164
Internal Capture Rate			Restaurant	186	152	252	159
	AM	*PM*	Entertainment	0	0	98	81
Total	**23%**	**42%**	Residential	38	124	110	68
Entering	**21%**	**40%**	Hotel	-	-	-	-
Exiting	**25%**	**45%**	Other	-	-	-	-
Total				**400**	**345**	**678**	**610**

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 2 (Phase 2)	**Date:**	2-Dec-22
Analysis Year:	2027	**Checked By:**	
Analysis Period:	**AM Peak Hour Period**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				179	106	73
Restaurant				372	192	180
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				521	261	260
Total				1072	559	513

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail			850			
Restaurant		850				
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		10	0	0	0
Restaurant	0	9		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,179	615	564
Internal Capture Percentage	3%	3%	3%
External Vehicle-Trips[3]	1,038	542	496
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	8%	13%
Restaurant	5%	5%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 2 (Phase 2)	**Date:**	2-Dec-22
Analysis Year:	2027	**Checked By:**	
Analysis Period:	**PM Peak Hour Period**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				545	273	272
Restaurant				255	139	116
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses[2]				529	265	264
Total				1329	677	652

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail			850			
Restaurant		850				
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		44	0	0	0
Restaurant	0	52		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,462	745	717
Internal Capture Percentage	13%	13%	13%
External Vehicle-Trips[3]	1,154	589	565
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	17%	15%
Restaurant	29%	41%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 3 (Phase 2)	**Date:**	2-Dec-22
Analysis Year:	2027	**Checked By:**	
Analysis Period:	**AM Peak Hour Period**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				139	114	25
Retail				106	62	44
Restaurant				338	186	152
Cinema/Entertainment				0	0	0
Residential				162	38	124
Hotel				0		
All Other Land Uses[2]				0		
Total				745	400	345

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		550	950	1150	550	
Retail	550		625	850	250	
Restaurant	950	625		1200	250	
Cinema/Entertainment	1150	850	1200		850	
Residential	550	250	250	850		
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	18	0	0	0
Retail	5		6	0	1	0
Restaurant	18	5		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	1	27	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	819	440	379
Internal Capture Percentage	23%	21%	25%
External Vehicle-Trips[3]	573	314	259
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	21%	93%
Retail	21%	25%
Restaurant	25%	15%
Cinema/Entertainment	N/A	N/A
Residential	7%	23%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 3 (Phase 2)	**Date:**	2-Dec-22
Analysis Year:	2027	**Checked By:**	
Analysis Period:	**PM Peak Hour Period**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				188	50	138
Retail				332	168	164
Restaurant				411	252	159
Cinema/Entertainment				179	98	81
Residential				178	110	68
Hotel				0		
All Other Land Uses[2]				0		
Total				1288	678	610

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		550	950	1150	550	
Retail	550		625	850	250	
Restaurant	950	625		1200	250	
Cinema/Entertainment	1150	850	1200		850	
Residential	550	250	250	850		
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		13	4	0	3	0
Retail	4		52	7	47	0
Restaurant	5	72		14	19	0
Cinema/Entertainment	2	7	8		5	0
Residential	3	18	16	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,417	746	671
Internal Capture Percentage	42%	40%	45%
External Vehicle-Trips[3]	745	406	339
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	25%	13%
Retail	59%	61%
Restaurant	29%	63%
Cinema/Entertainment	19%	25%
Residential	61%	49%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Turn Lane Warrants

16.1. Left-Turn Lane Standards

16.1.A. Left-turn lanes shall be provided on all approaches to intersections controlled by, or planned to be controlled by, traffic signals.

16.1.B. Left-turn lanes shall be provided on all arterial streets at the intersection with other arterial and collector streets. Left-turn lanes shall be provided on minor arterial streets at the intersection with any local street or driveway where the left-turn volume is at least 20 vehicles in any hour. On major arterial streets, left-turn lanes shall be at the intersection with all connectors (an exception may be granted for a singular, existing, residential lot).

16.1.C. Left-turn lanes shall be provided on collector streets at the intersection with a connector serving non-residential development where the left-turn volume is at least 30 vehicles in any hour and should be provided where the left-turn volume is less than 30 vehicles in any hour.

16.1.D. Left-turn lanes shall be provided on non-residential connectors intersecting with major arterial streets (where left-turn egress is permitted). Left-turn lanes shall be provided on non-residential connectors intersecting minor arterial streets (where left-turn egress is permitted) where the left-turn volume is at least 20 vehicles in any hour. Left-turn lanes should be provided on any connector at any location as recommended by a traffic study or where the left-turn lane provides design efficiencies desired by the owner/developer with exception of access associated with residential property.

16.1.E. Left-turn lanes shall be provided at all median openings on roadways with medians.

Left Turn Lane Warrants						
			Left Turn Volume			
Intersection	Movement	Street Classification	AM	PM	Other	Meets Warrant
Blue Parkway and Colbern Road (roundabout)	Southbound	Major Arterial	5	41	Arterial/Arterial	Roundabout
	Eastbound	Major Arterial	9	11	Arterial/Arterial	Roundabout
	Northbound	Major Arterial	63	151	Arterial/Arterial	Roundabout
	Westbound	Major Arterial	96	80	Arterial/Arterial	Roundabout
Main Street and Colbern Road	Westbound	Major Arterial	50	38	Arterial/Collector, Median	YES, 200' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	4	17	Arterial/Collector	YES, 200' Required
	Eastbound	Driveway	11	5	Driveway/Arterial	NO
Colbern Road and Drive 5	Westbound	Major Arterial	377	436	Arterial/Driveway, Median	YES, 200' Required
	Northbound	Driveway	216	252	Driveway/Arterial	YES, 150' Required
Douglas Street and Drive 2	Eastbound	Driveway	6	3	Driveway/Arterial	YES, 150' Required
Colbern Road and Drive 7	Northbound	Driveway	76	65	Driveway/Arterial	YES, 150' Required
	Westbound	Major Arterial	177	133	Arterial/Driveway, Median	YES, 200' Required
Colbern Road and Drive 6	Westbound	Major Arterial	51	79	Arterial/Driveway, Median	YES, 200' Required

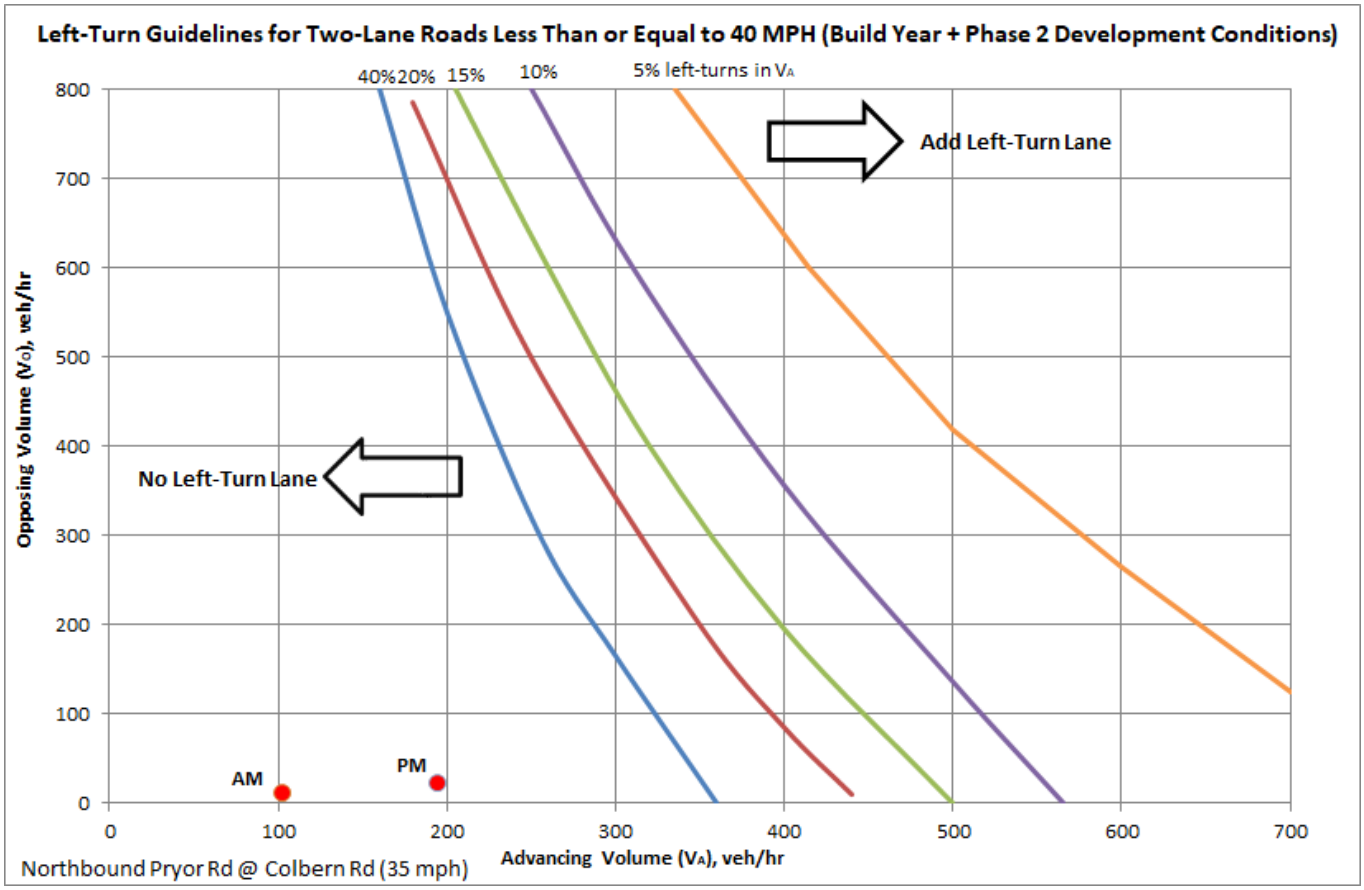
16.2. Right-Turn Lane Standards

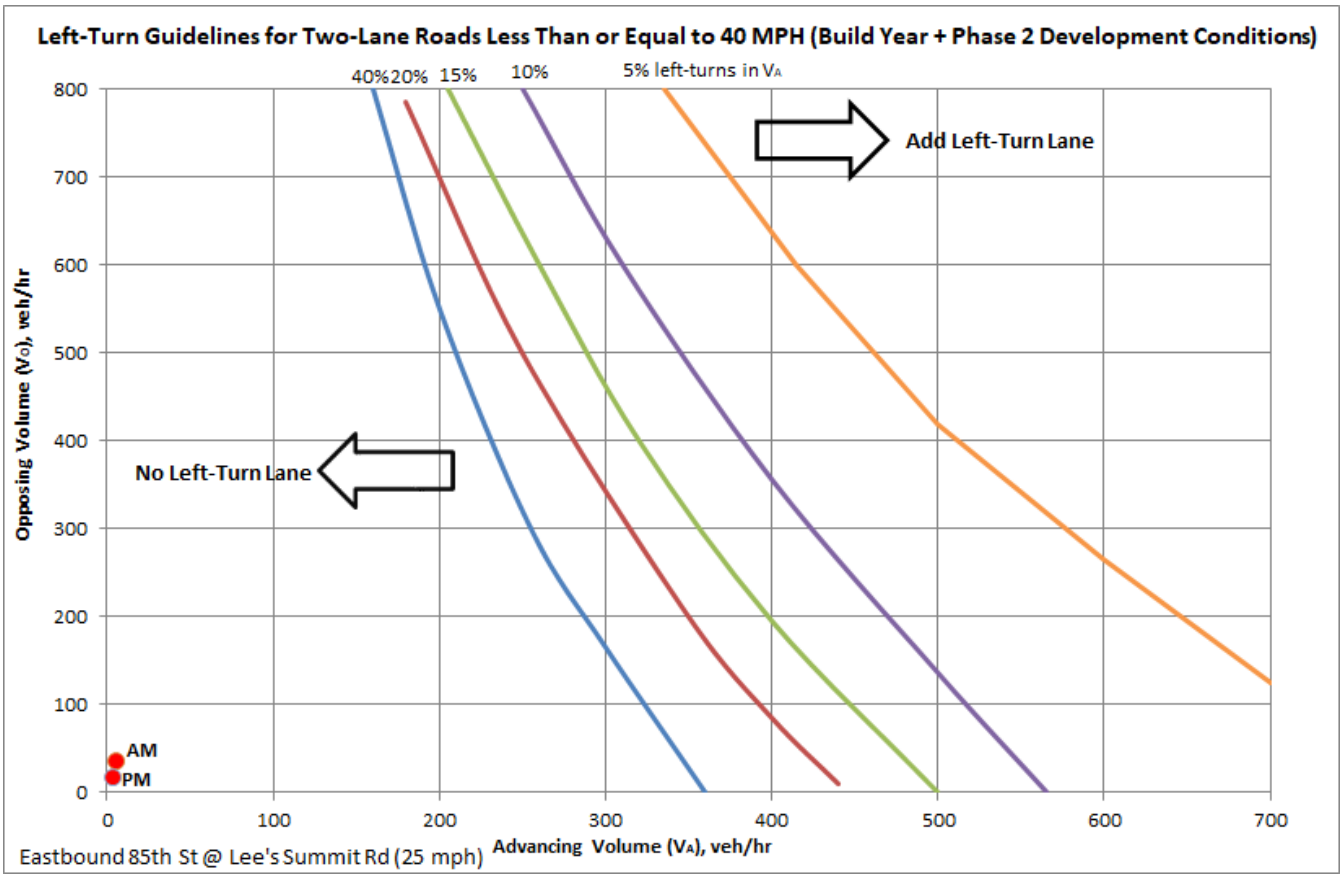
16.2.A. Required on arterial streets at each intersecting street or driveway where the right-turn volume on the major arterial street is or is projected to be at least 30 vehicles in any hour, or the right-turn volume on the minor arterial street is or is projected to be at least 60 vehicles in any hour. Minimum length should be 250 feet plus the taper on a major arterial at the intersection of another arterial street or 200 feet plus the taper on a minor arterial at the intersection with another arterial street or on a major arterial at the intersection of a collector and 150 feet plus the taper at other locations along arterial streets.

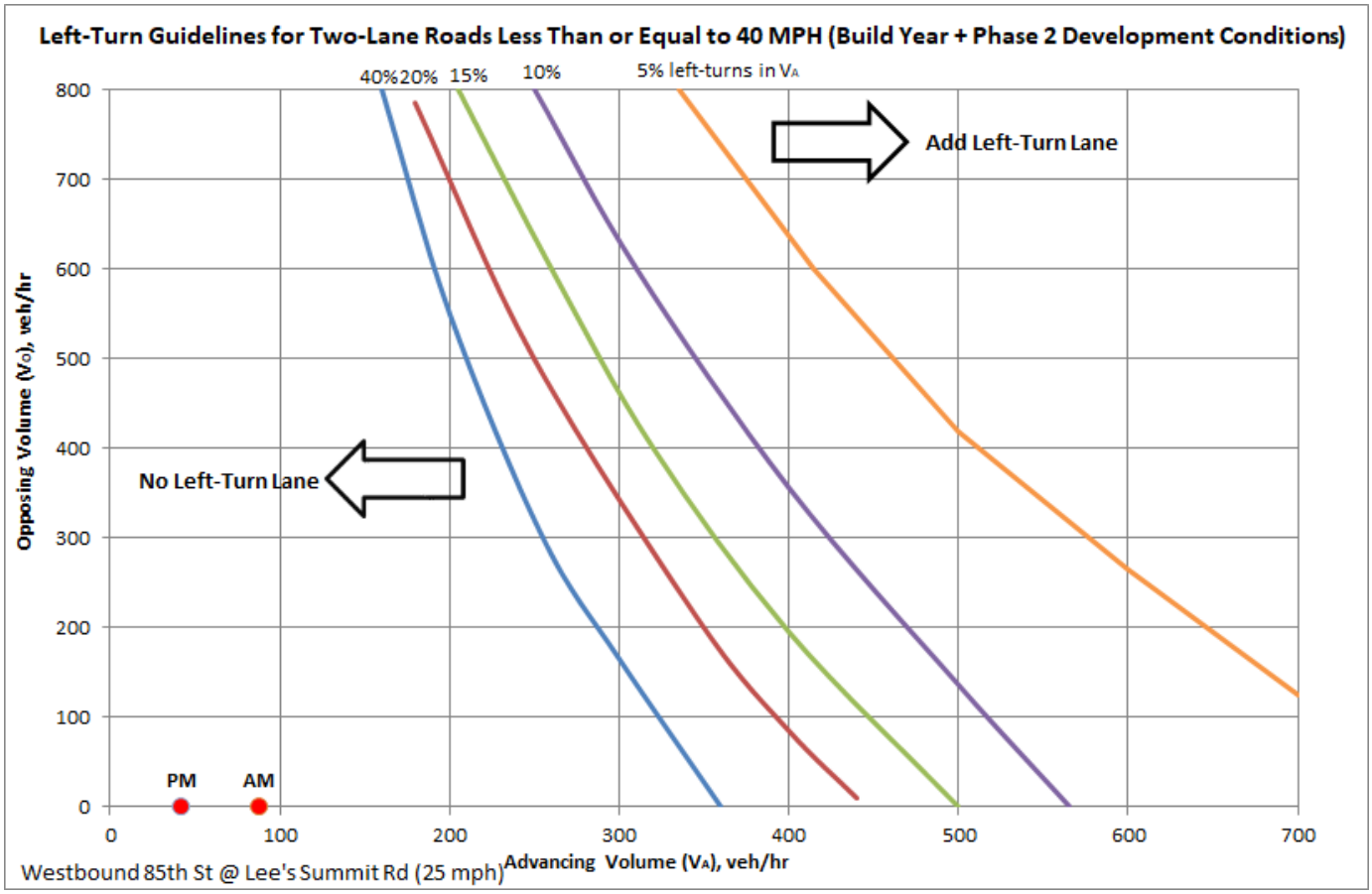
16.2.B. Required on collector streets in non-residential areas at the intersection with any street or driveway where the right-turn volume on the collector street is or is projected to be at least 100 vehicles in any hour. The minimum length should be 100 feet plus the taper.

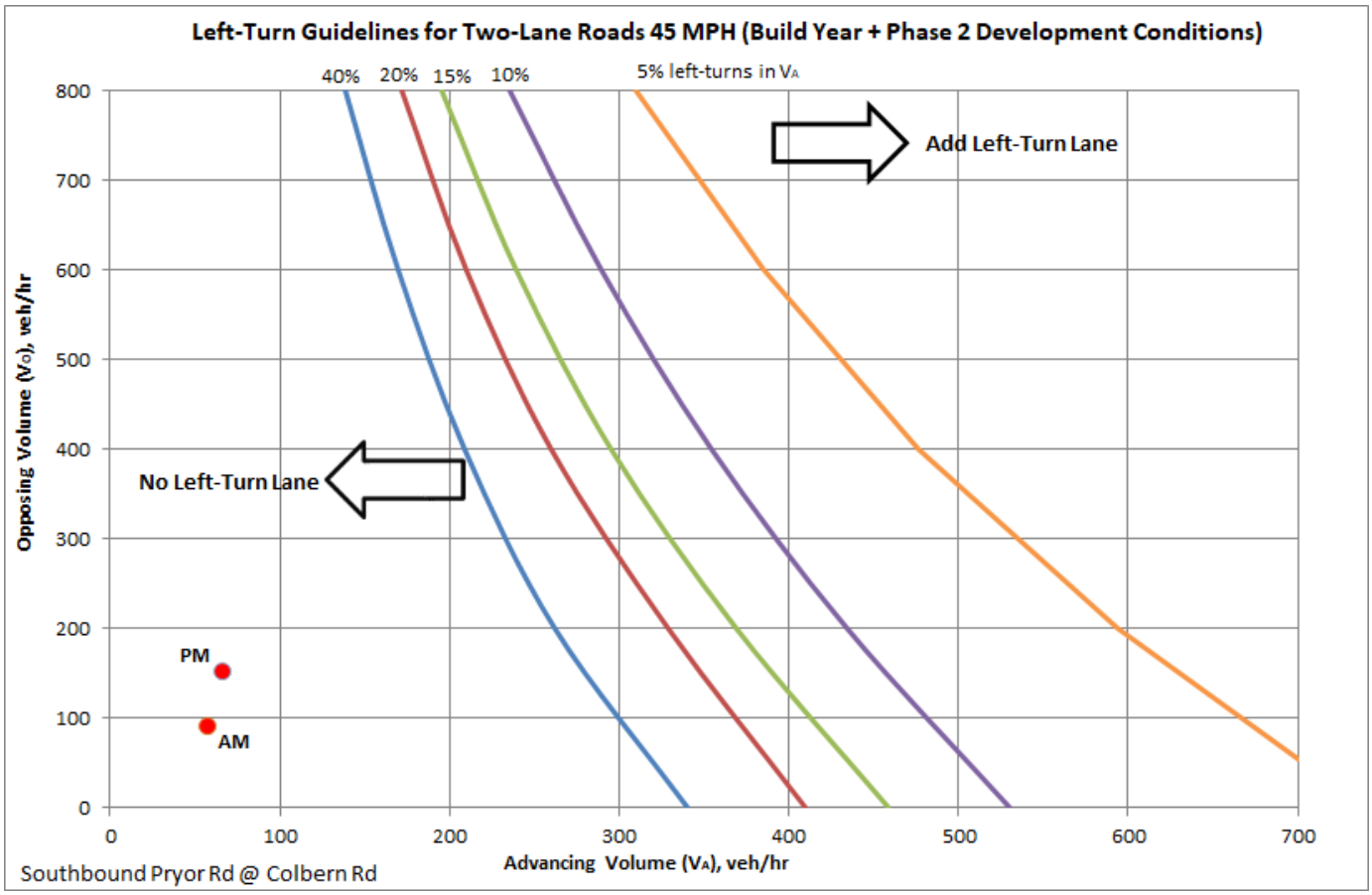
16.2.C. The length of the right-turn lane shall be increased as necessary to accommodate estimated queue length. The length of the right-turn lane at intersections controlled by traffic signals or roundabouts should be increased, if necessary, based on the longer of the queues in the turn lane or the adjacent through lane.

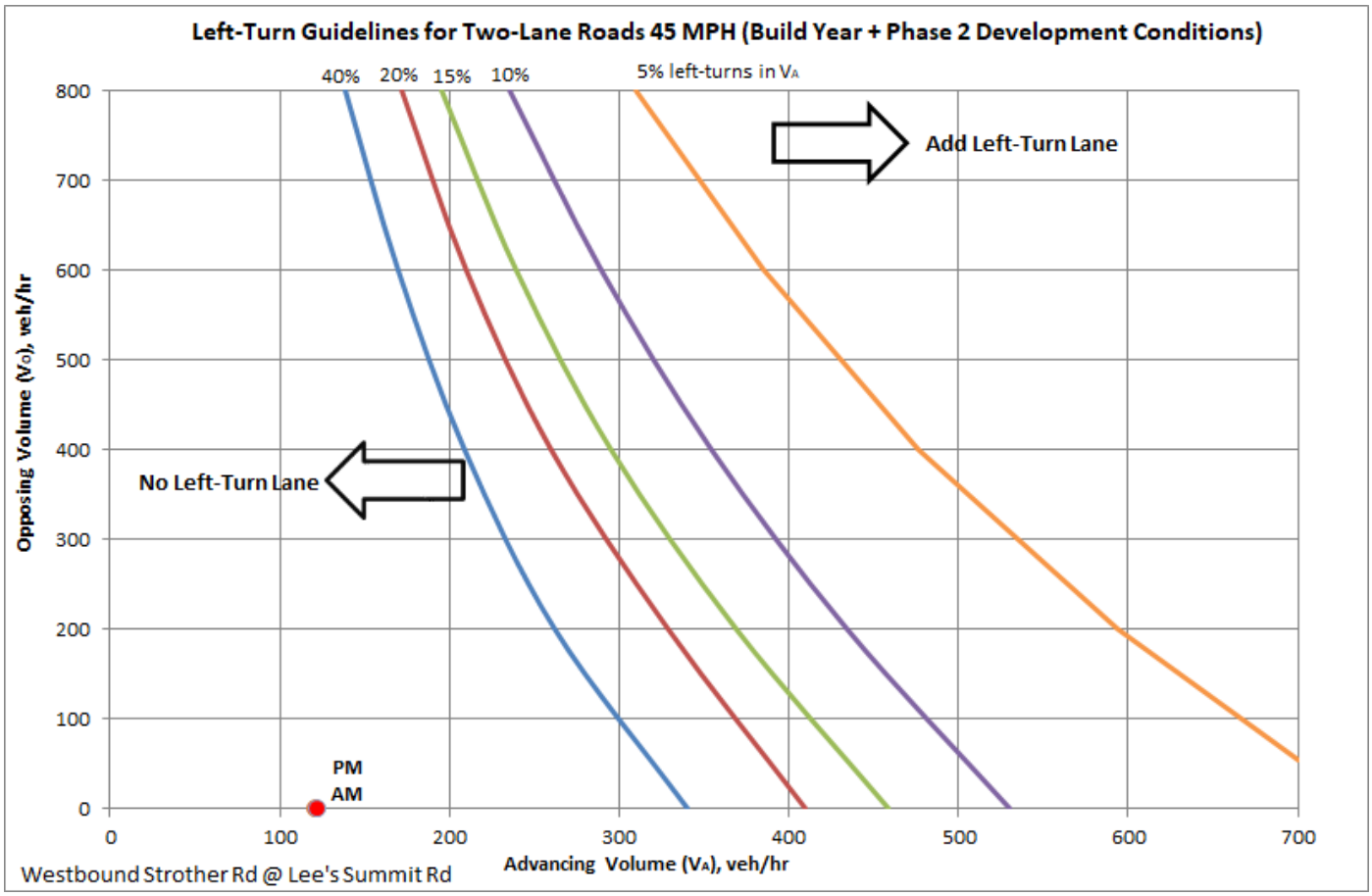
Right Turn Lane Warrants					
			Right Turn Volume		
Intersection	Movement	Street Classification	AM	PM	Meets Warrant
Blue Parkway and Colbern Road	Southbound	Major Arterial	3	12	NO
	Westbound	Major Arterial	19	6	NO
Main Street and Colbern Road	Eastbound	Major Arterial	83	58	YES, 250' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	3	10	NO
	Eastbound	Collector	32	17	NO
	Southbound	Major Arterial	4	11	NO
	Northbound	Major Arterial	10	10	NO
Colbern Road and Drive 5	Southbound	Driveway	35	27	NO
	Northbound	Driveway	183	229	YES, 100' Required
	Eastbound	Major Arterial	108	131	YES, 250' Required
Colbern Road and Drive 4	Northbound	Driveway	161	184	RIRO
	Eastbound	Major Arterial	95	104	YES, 250' Required
Douglas Street and Drive 2	Southbound	Major Arterial	2	6	NO
	Eastbound	Driveway	54	29	NO
Colbern Road and Drive 7	Northbound	Driveway	141	120	YES, 100' Required
	Eastbound	Major Arterial	95	71	YES, 250' Required
Colbern Road and Drive 6	Eastbound	Major Arterial	27	43	PM Only
	Northbound	Driveway	23	43	RIRO

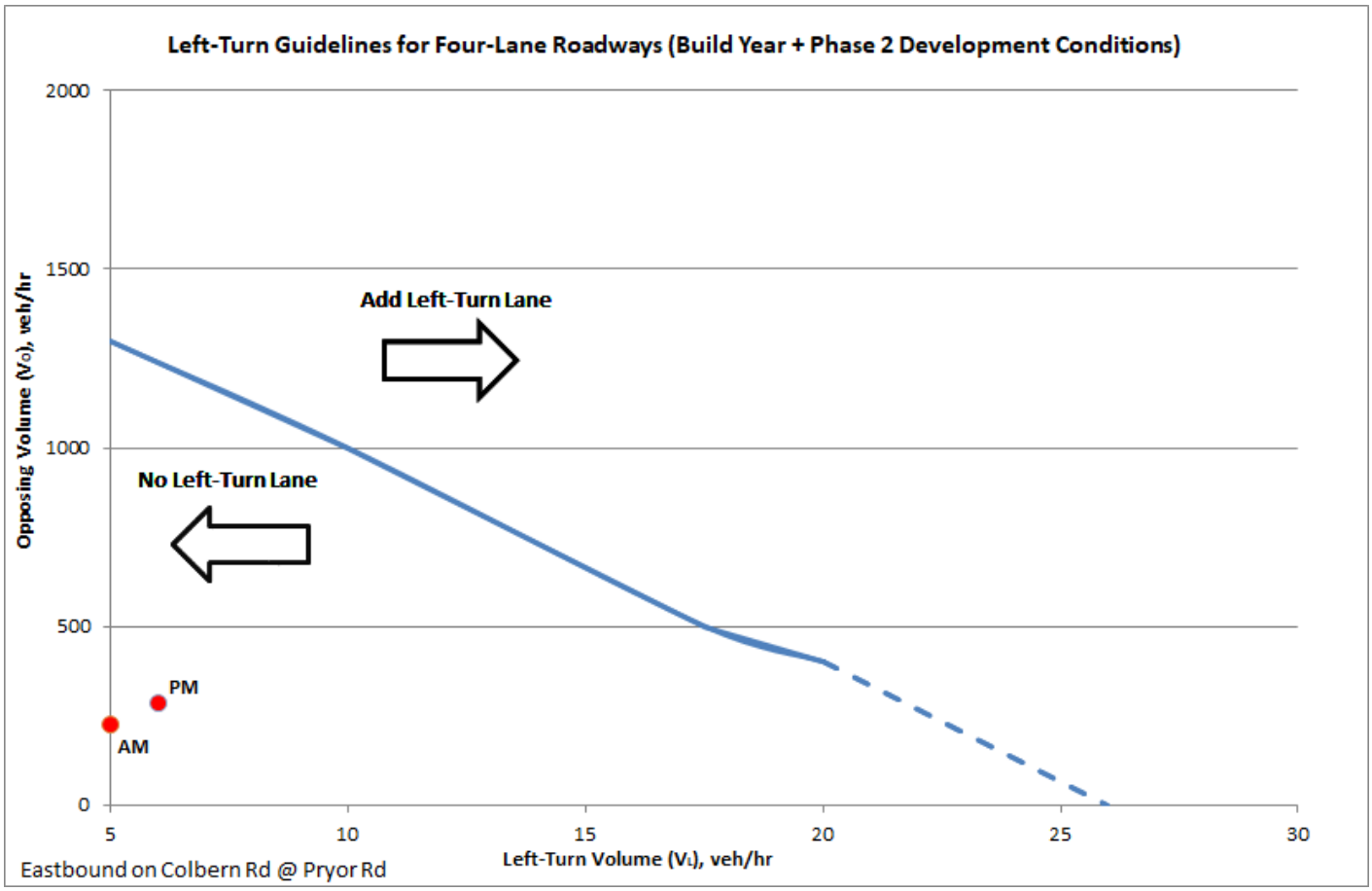

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Build Year + Phase 2 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Northbound Pryor Rd @ Colbern Rd (35 mph)

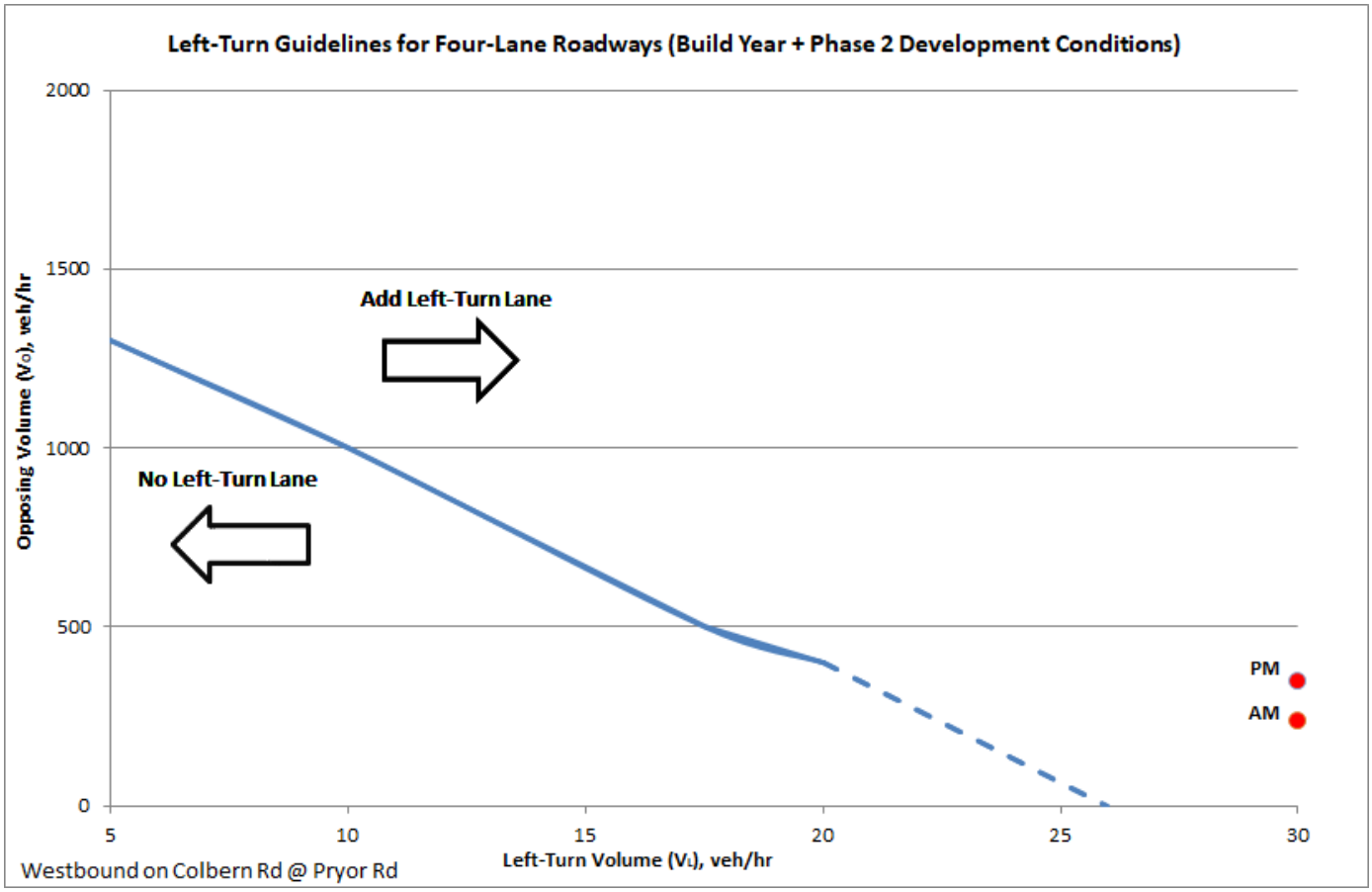

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Build Year + Phase 2 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Eastbound 85th St @ Lee's Summit Rd (25 mph)

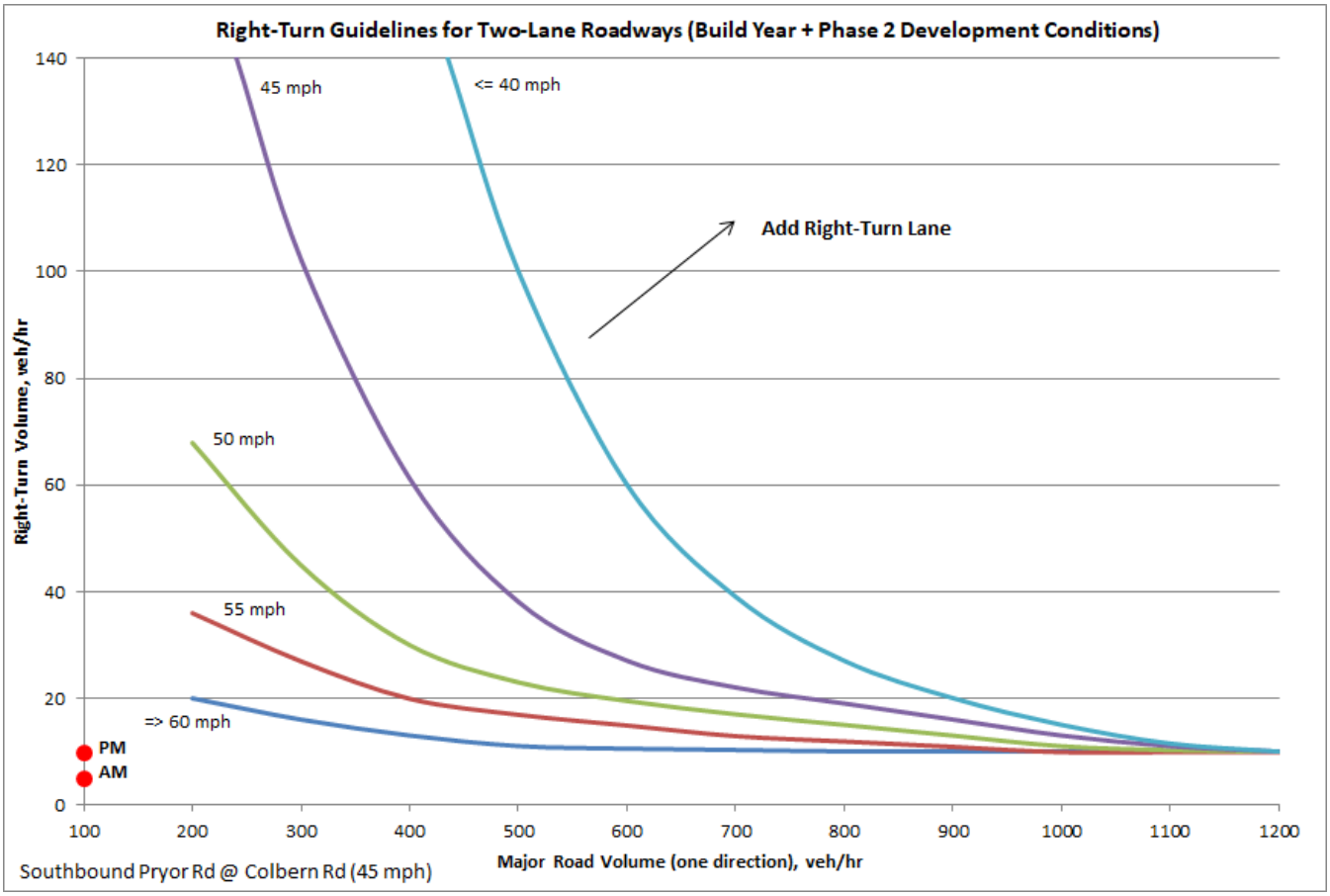

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Build Year + Phase 2 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound 85th St @ Lee's Summit Rd (25 mph)

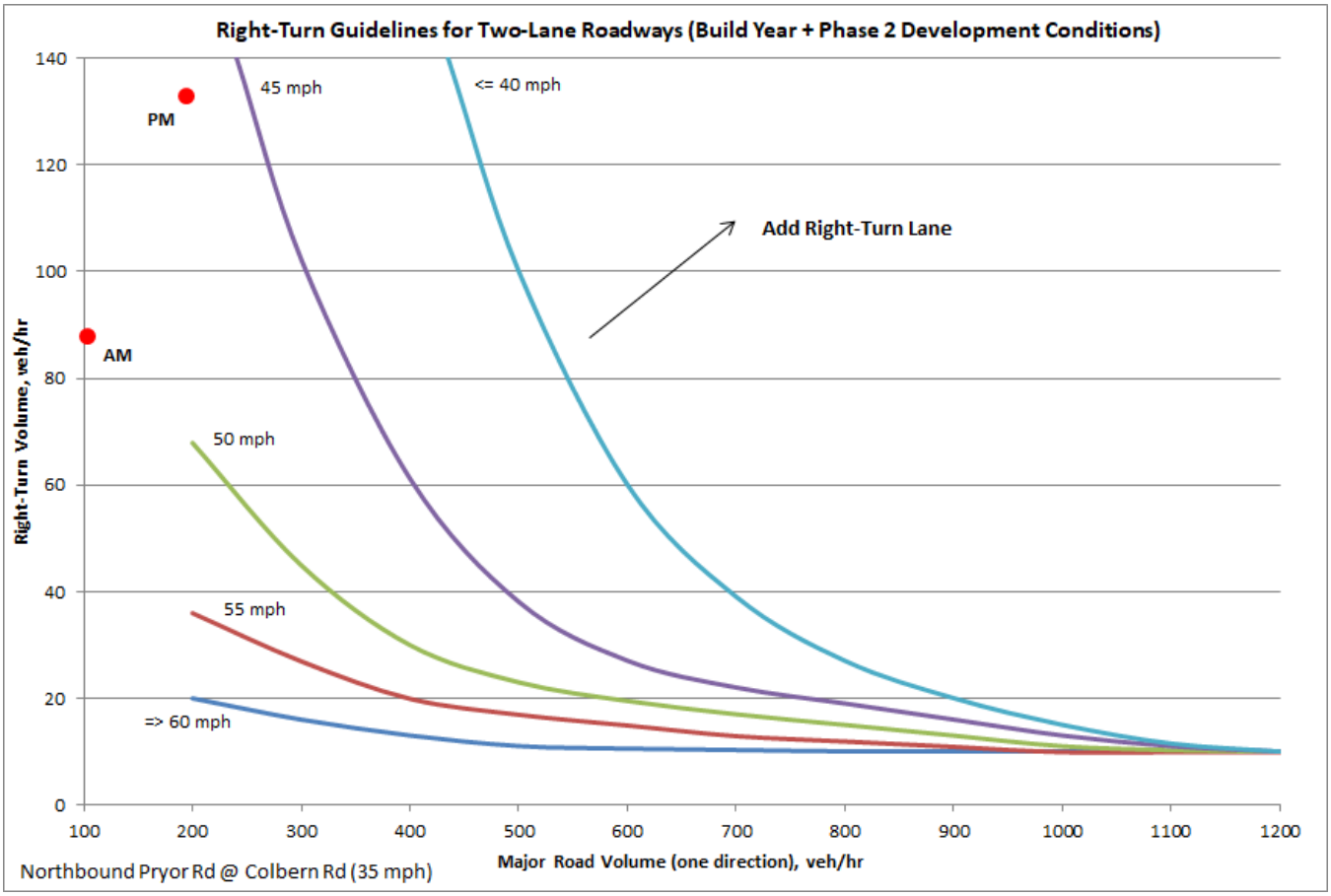

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Build Year + Phase 2 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Southbound Pryor Rd @ Colbern Rd

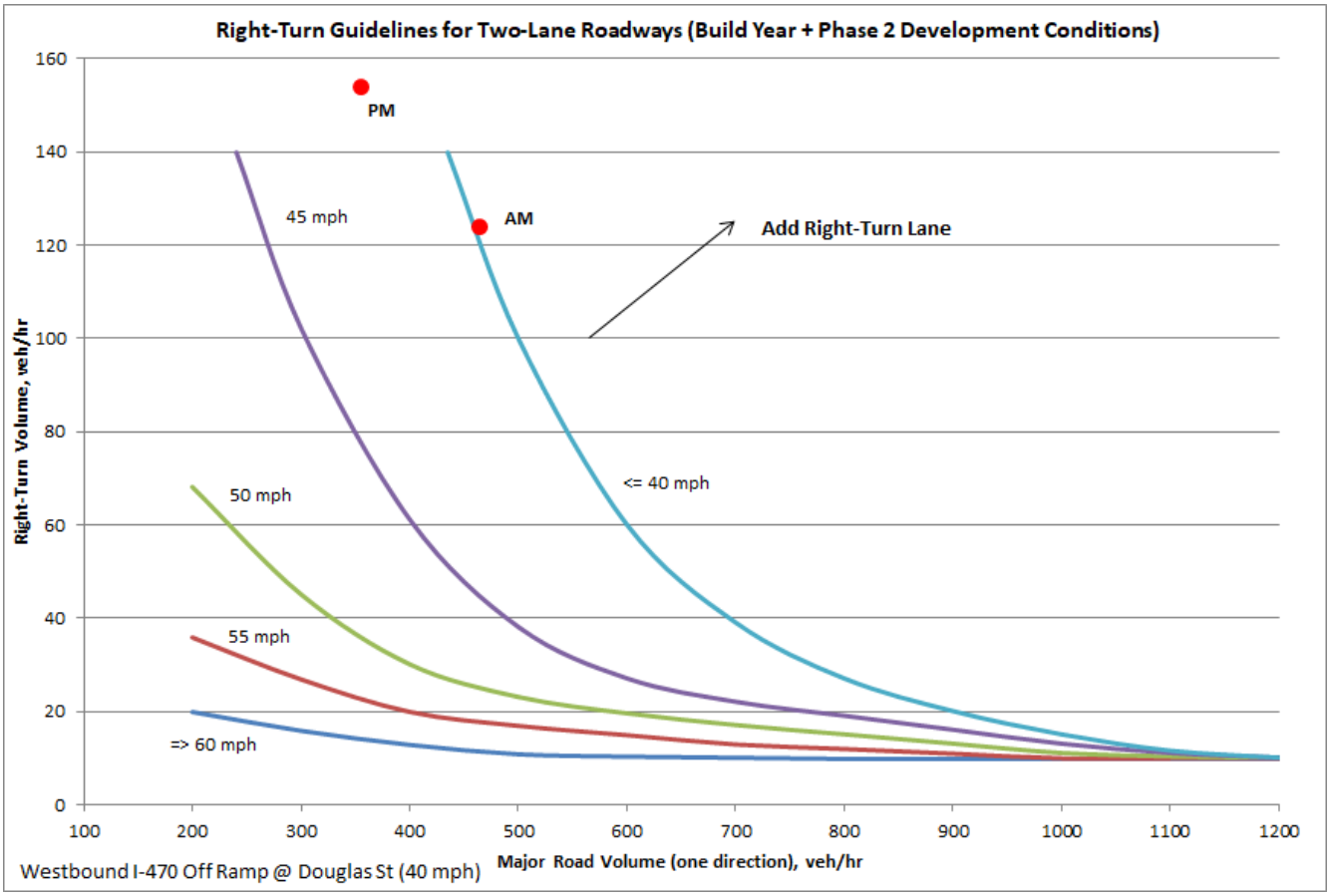

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Build Year + Phase 2 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound Strother Rd @ Lee's Summit Rd

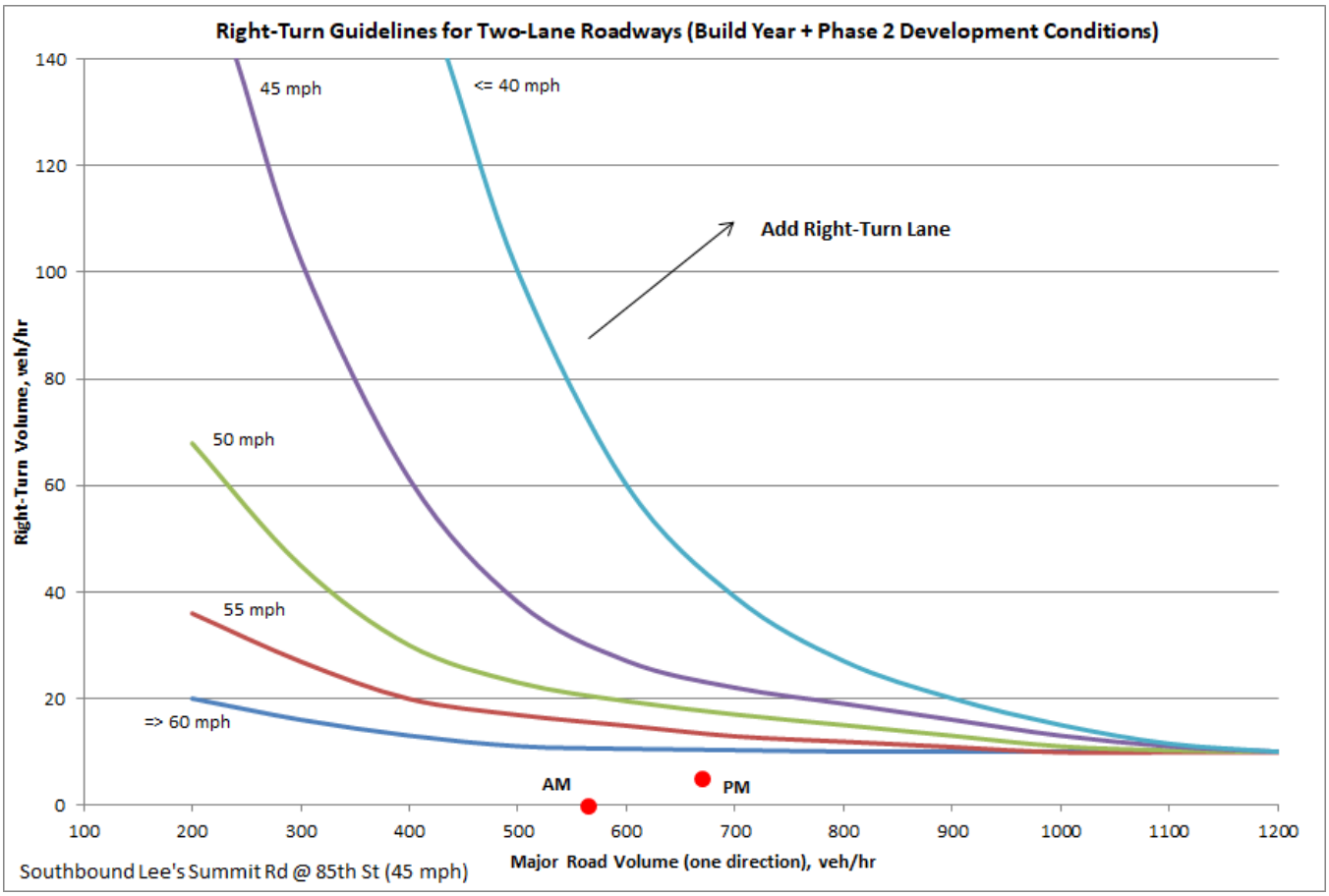

Left-Turn Guidelines for Four-Lane Roadways (Build Year + Phase 2 Development Conditions)
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Left-Turn Volume (VL), veh/hr
0
500
1000
1500
2000
5
10
15
20
25
30
Eastbound on Colbern Rd @ Pryor Rd

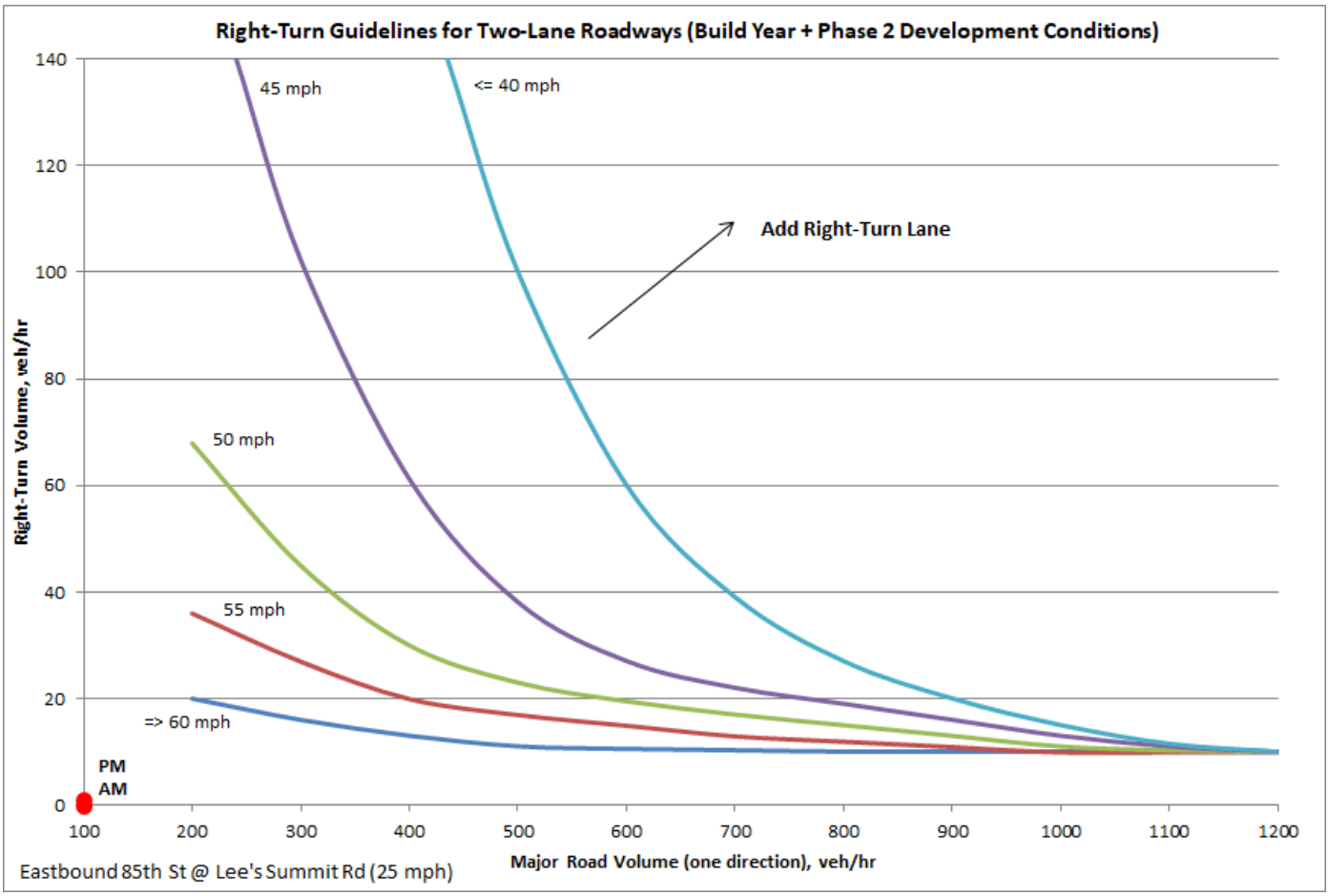

Left-Turn Guidelines for Four-Lane Roadways (Build Year + Phase 2 Development Conditions)
Opposing Volume (Vo), veh/hr
2000
1500
1000
500
0
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
5
10
15
20
25
30
Left-Turn Volume (VL), veh/hr
Westbound on Colbern Rd @ Pryor Rd

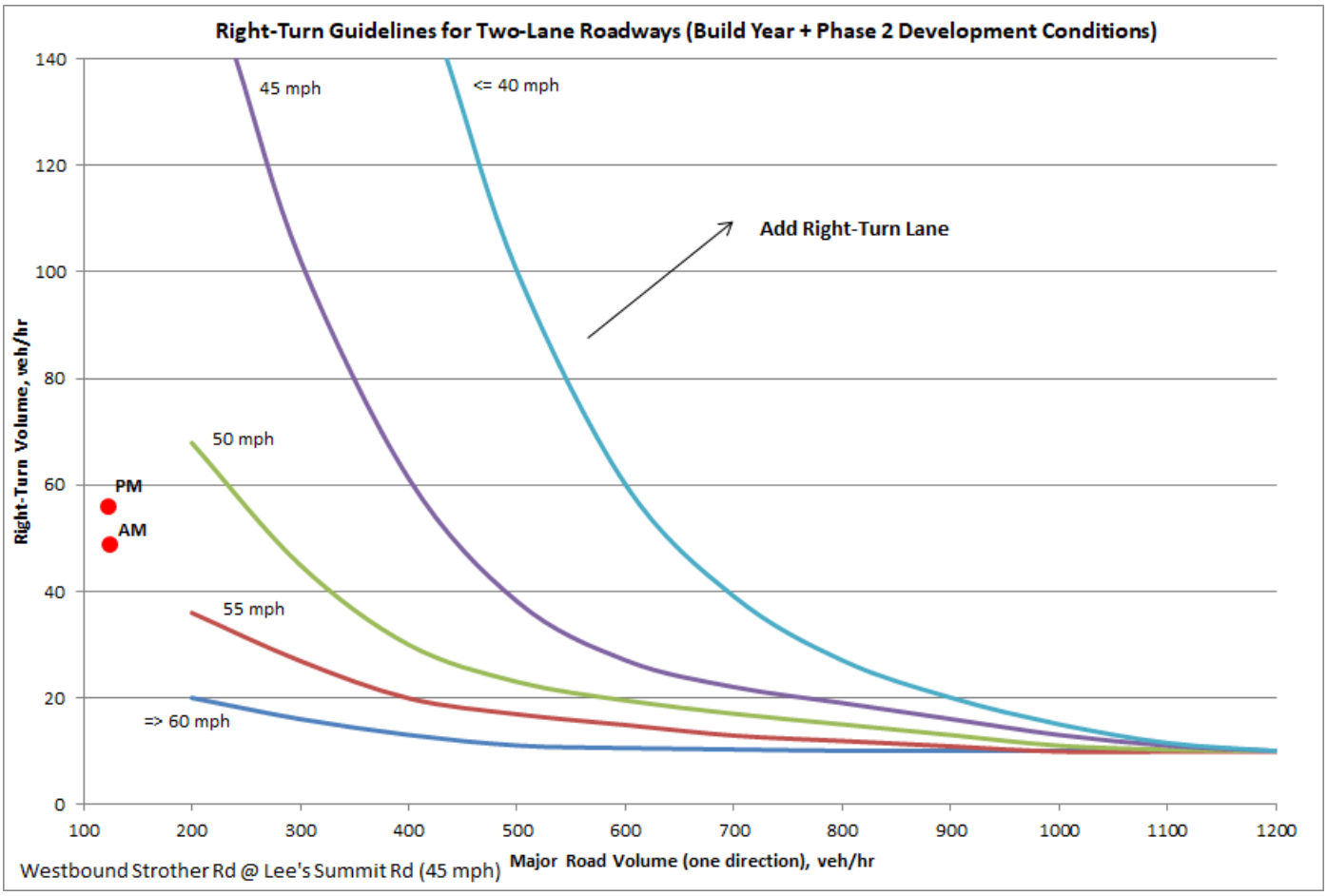

Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Southbound Pryor Rd @ Colbern Rd (45 mph)

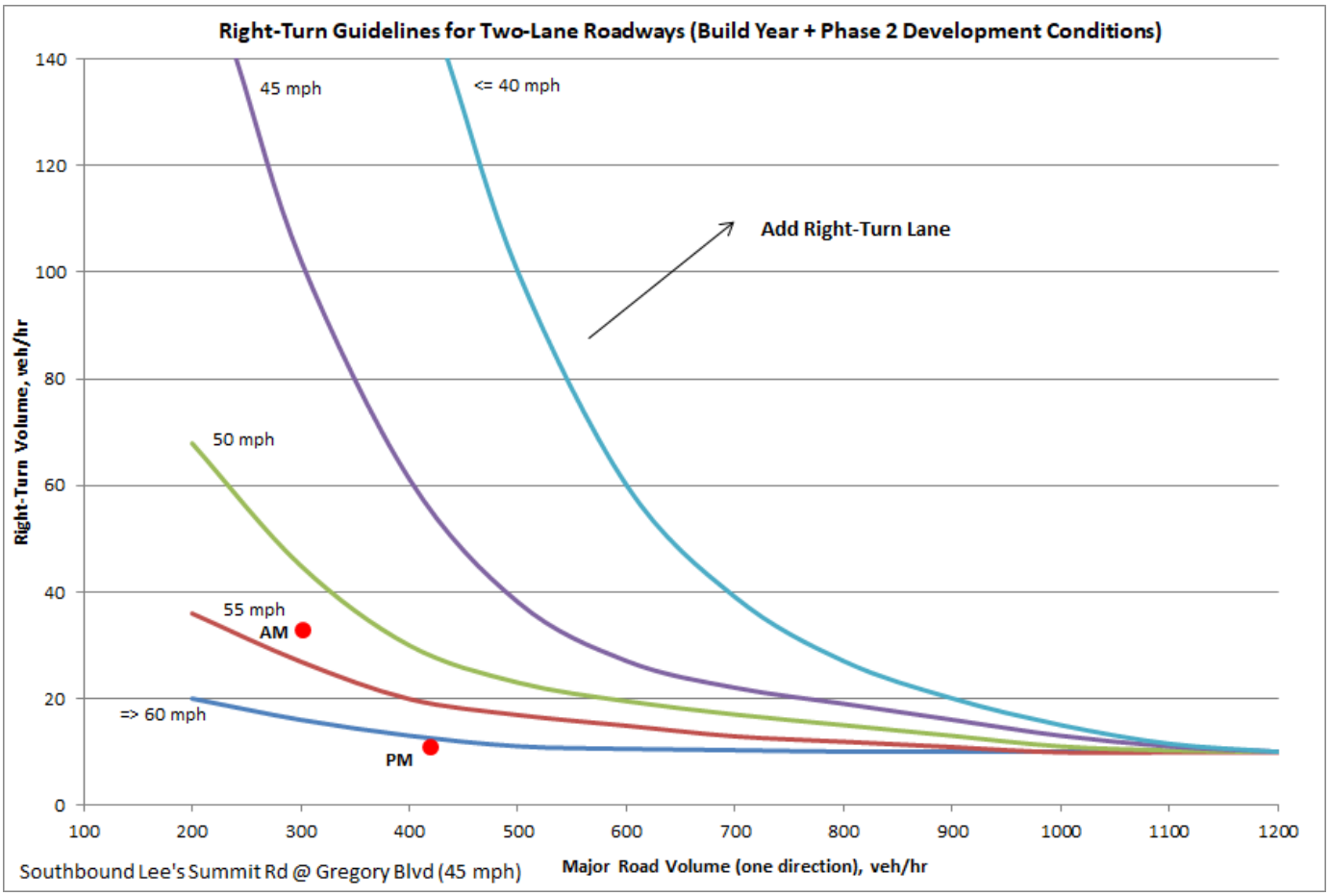

Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Northbound Pryor Rd @ Colbern Rd (35 mph)

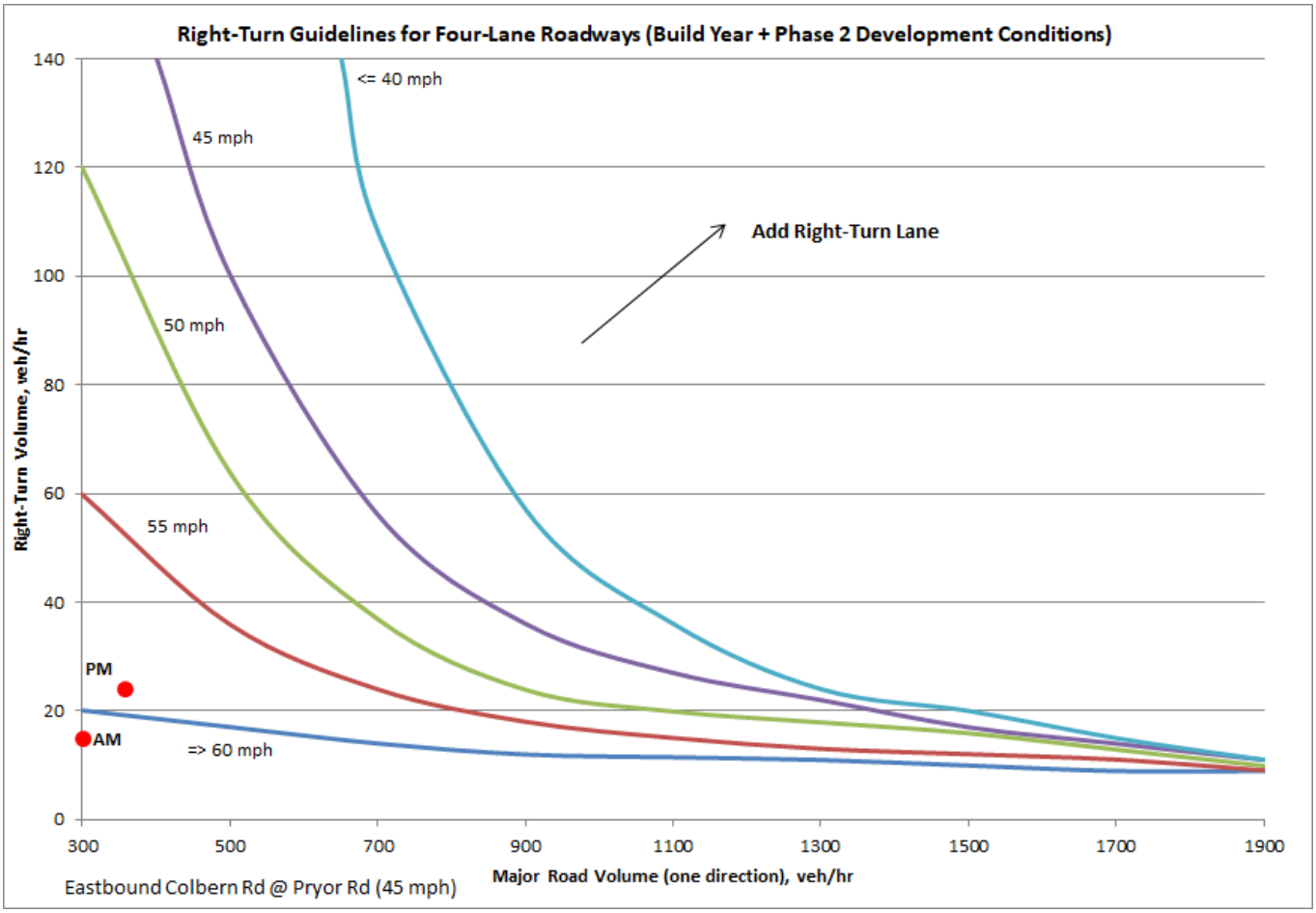

Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
PM
AM
45 mph
50 mph
55 mph
=> 60 mph
<= 40 mph
Add Right-Turn Lane
Westbound I-470 Off Ramp @ Douglas St (40 mph)

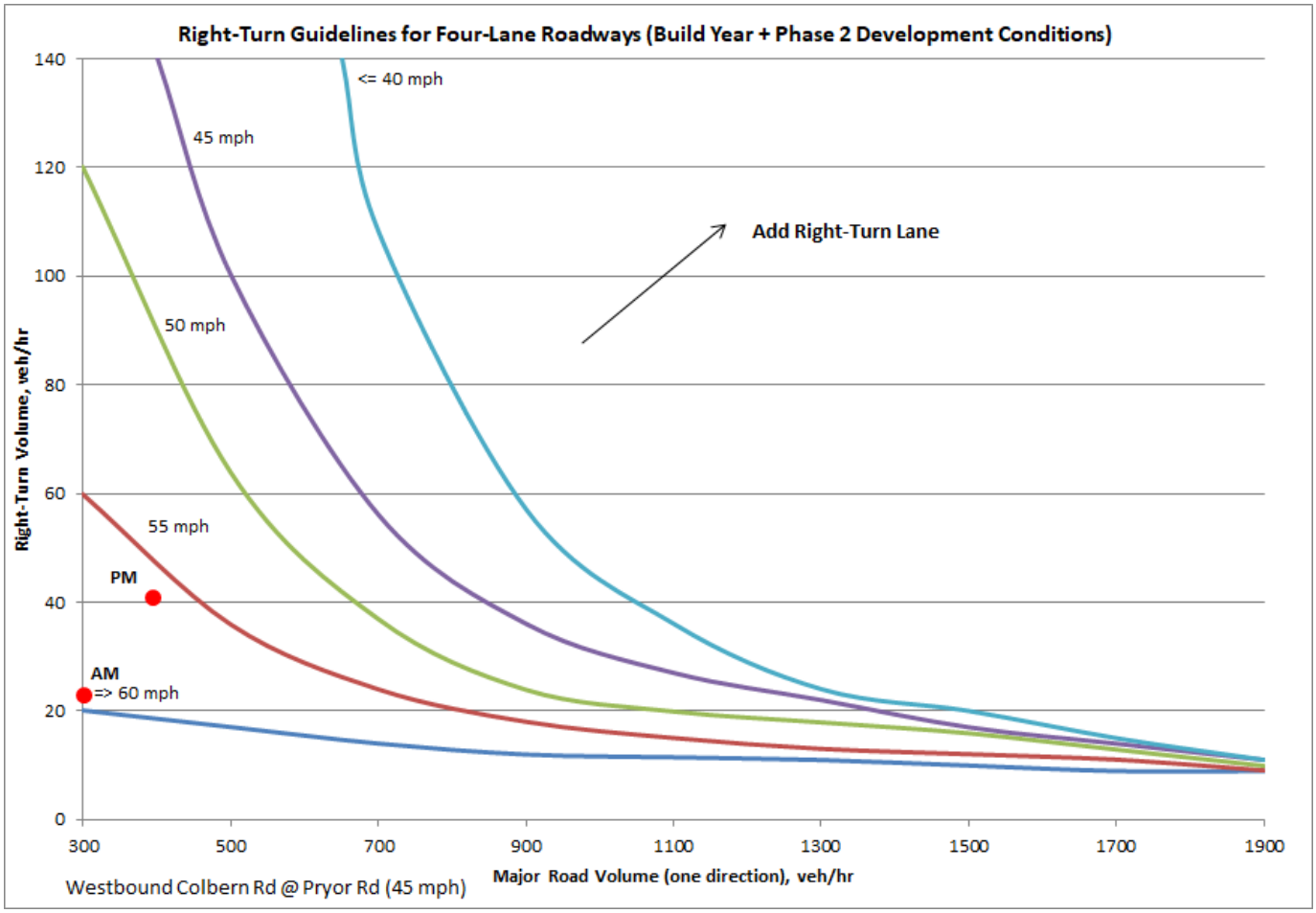

Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
AM
PM
Southbound Lee's Summit Rd @ 85th St (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
Eastbound 85th St @ Lee's Summit Rd (25 mph)


Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
Westbound Strother Rd @ Lee's Summit Rd (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
AM
=> 60 mph
PM
Southbound Lee's Summit Rd @ Gregory Blvd (45 mph)

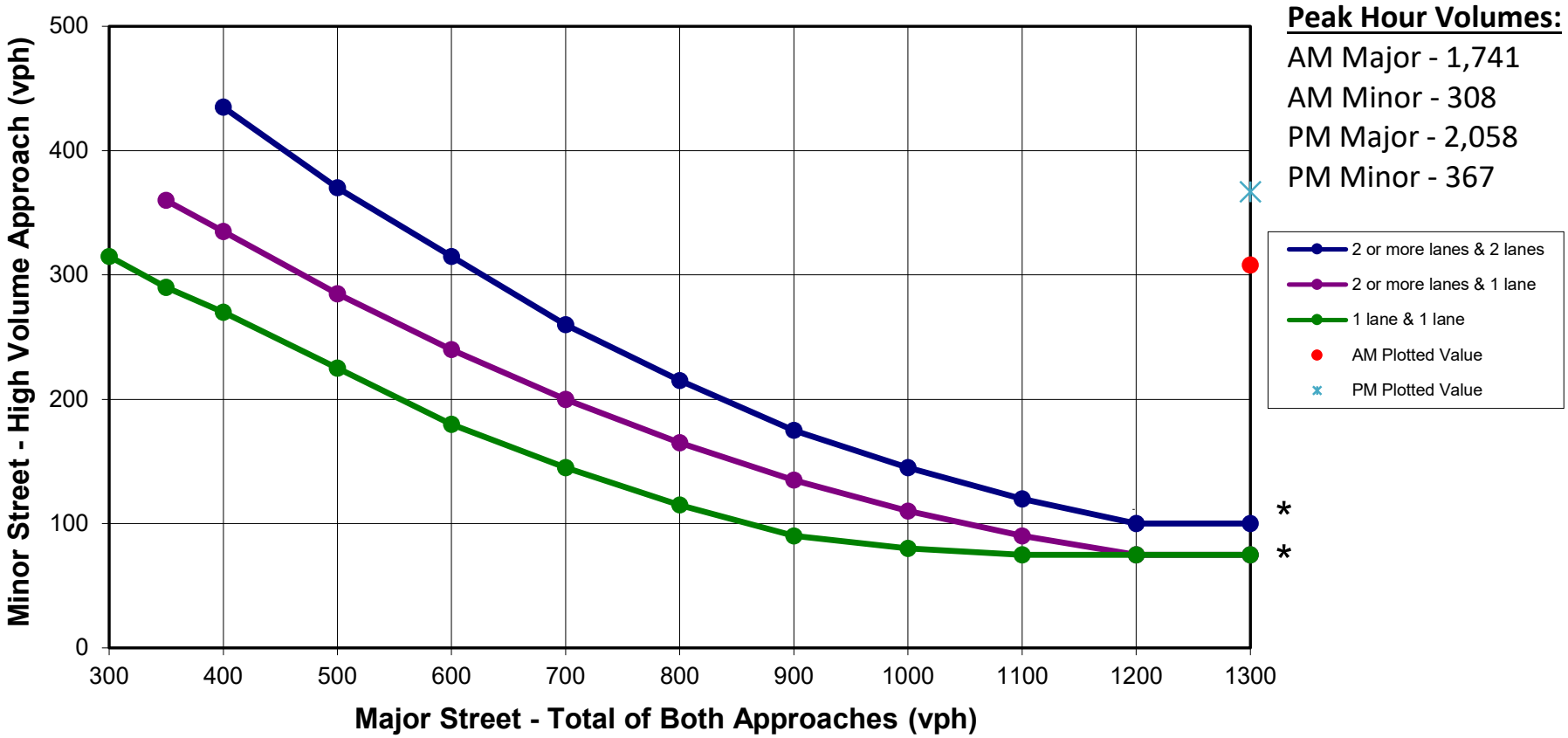

Right-Turn Guidelines for Four-Lane Roadways (Build Year + Phase 2 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
<= 40 mph
45 mph
Add Right-Turn Lane
50 mph
55 mph
PM
AM
=> 60 mph
Eastbound Colbern Rd @ Pryor Rd (45 mph)


Right-Turn Guidelines for Four-Lane Roadways (Build Year + Phase 2 Development Conditions)
<= 40 mph
45 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
0
20
40
60
80
100
120
140
300
500
700
900
1100
1300
1500
1700
1900
Westbound Colbern Rd @ Pryor Rd (45 mph)

Signal Warrants

Peak Hour Volume Warrant (Build Year + Phase 2)
Colbern Road & Drive 5

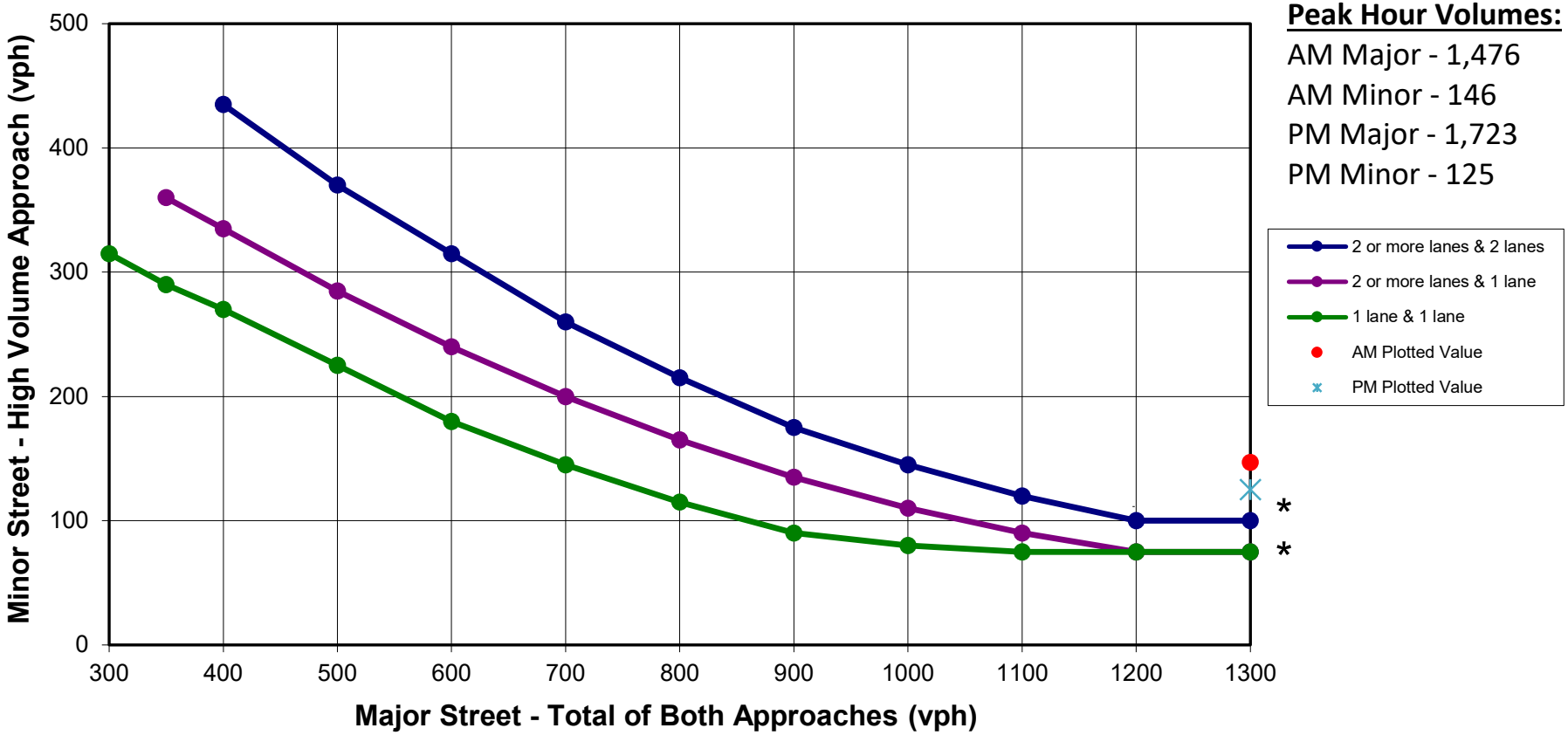
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Colbern Road & Drive 7

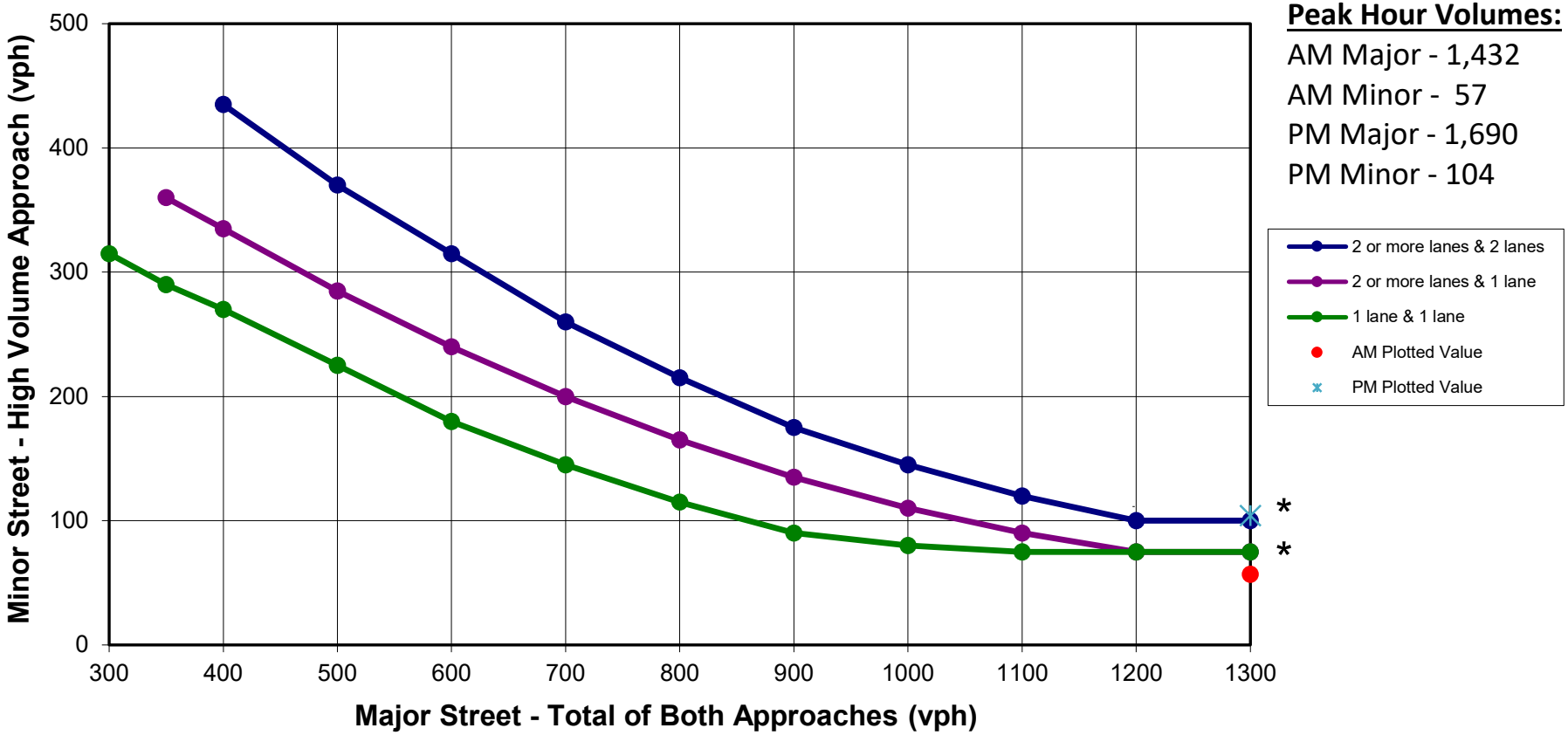
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Colbern Road & Main Street

(Community less than 10,000 population or above 40mph on major street)



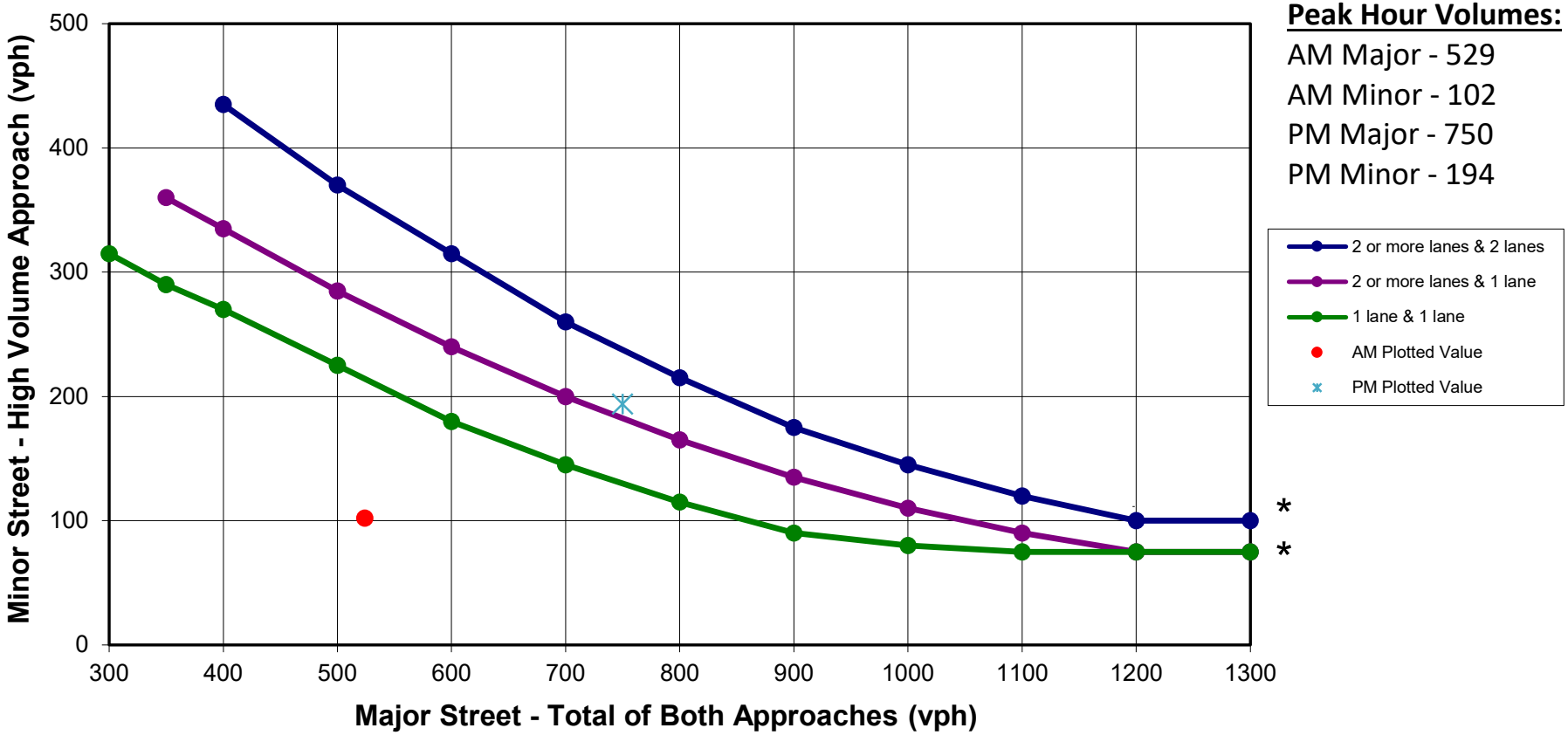
Peak Hour Volumes:

AM Major - 1,432
AM Minor - 57
PM Major - 1,690
PM Minor - 104

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Colbern Road & Pryor Road

(Community less than 10,000 population or above 40mph on major street)



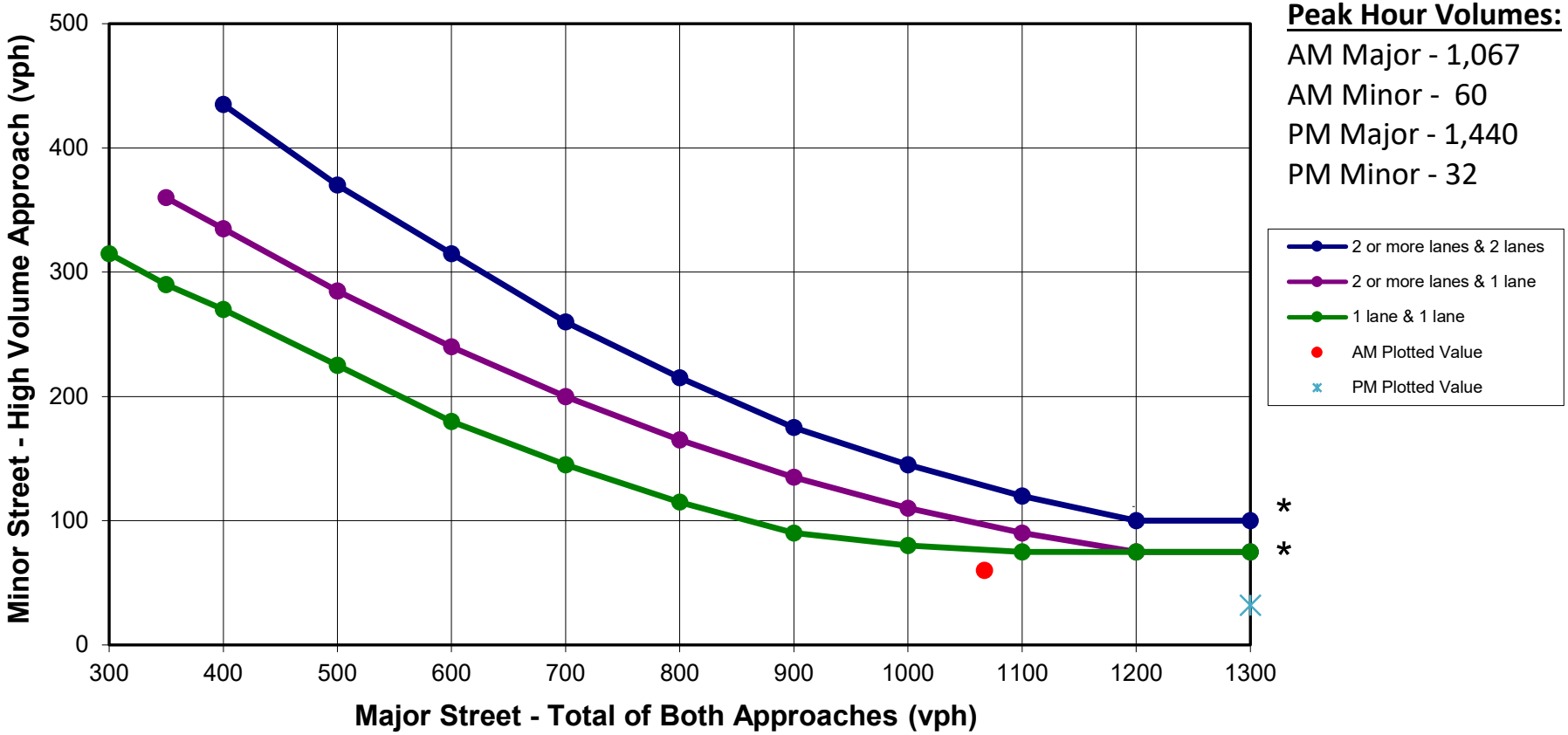
Peak Hour Volumes:

AM Major - 529
AM Minor - 102
PM Major - 750
PM Minor - 194

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Douglas Street & Drive 2

(Community less than 10,000 population or above 40mph on major street)



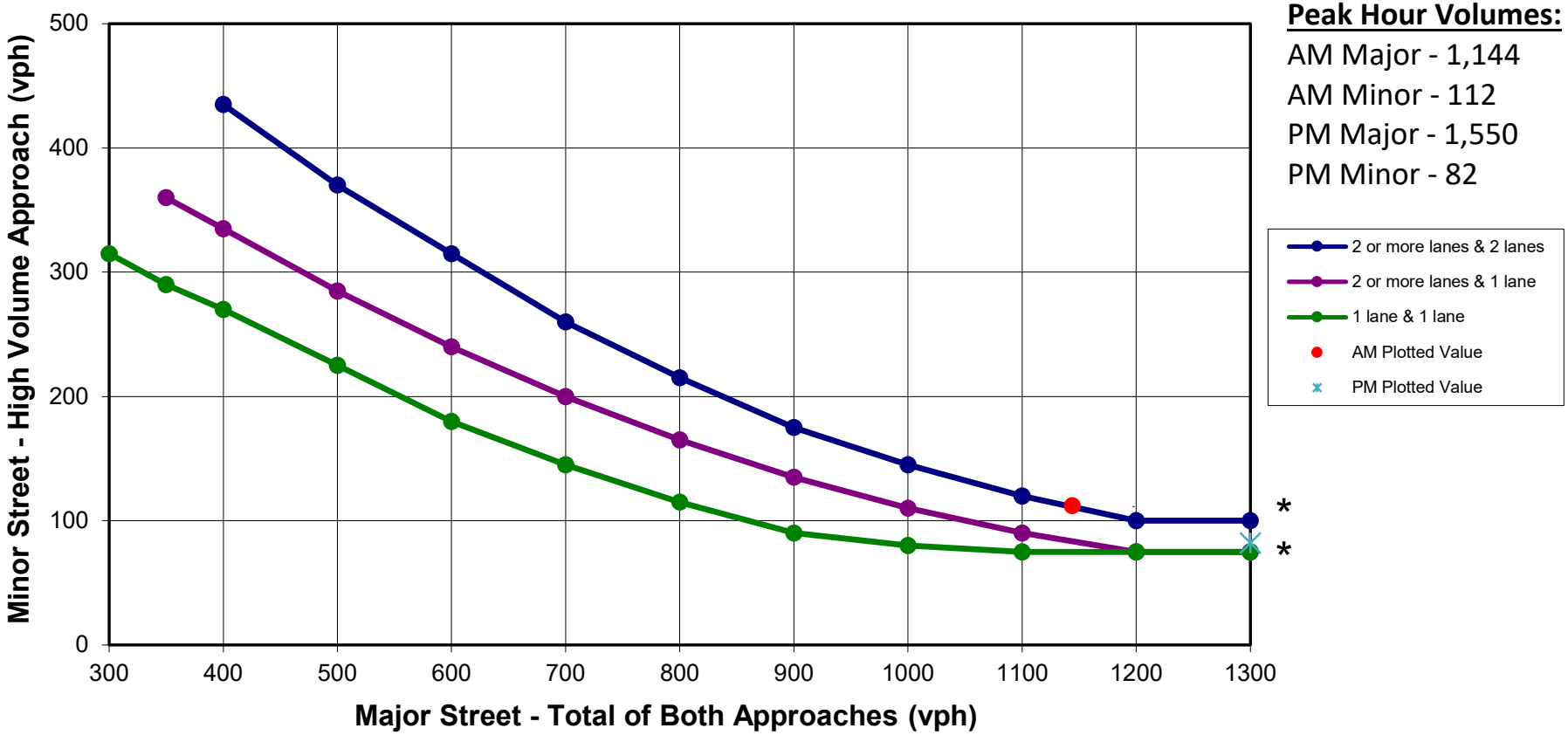
Peak Hour Volumes:

AM Major - 1,067
AM Minor - 60
PM Major - 1,440
PM Minor - 32

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Douglas Street & Drive 3

(Community less than 10,000 population or above 40mph on major street)



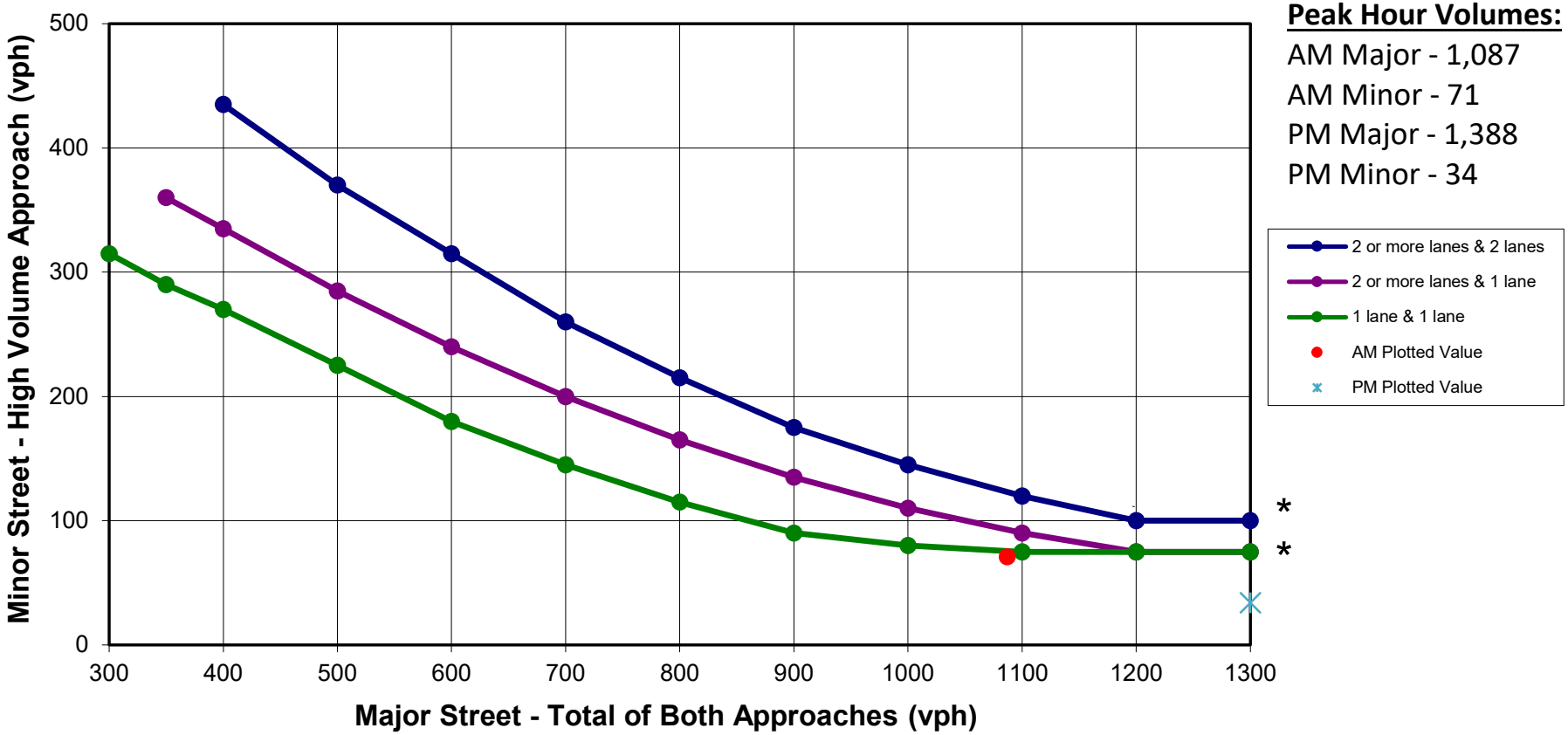
Peak Hour Volumes:

AM Major - 1,144
AM Minor - 112
PM Major - 1,550
PM Minor - 82

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Lee's Summit Road & 85th Street

(Community less than 10,000 population or above 40mph on major street)



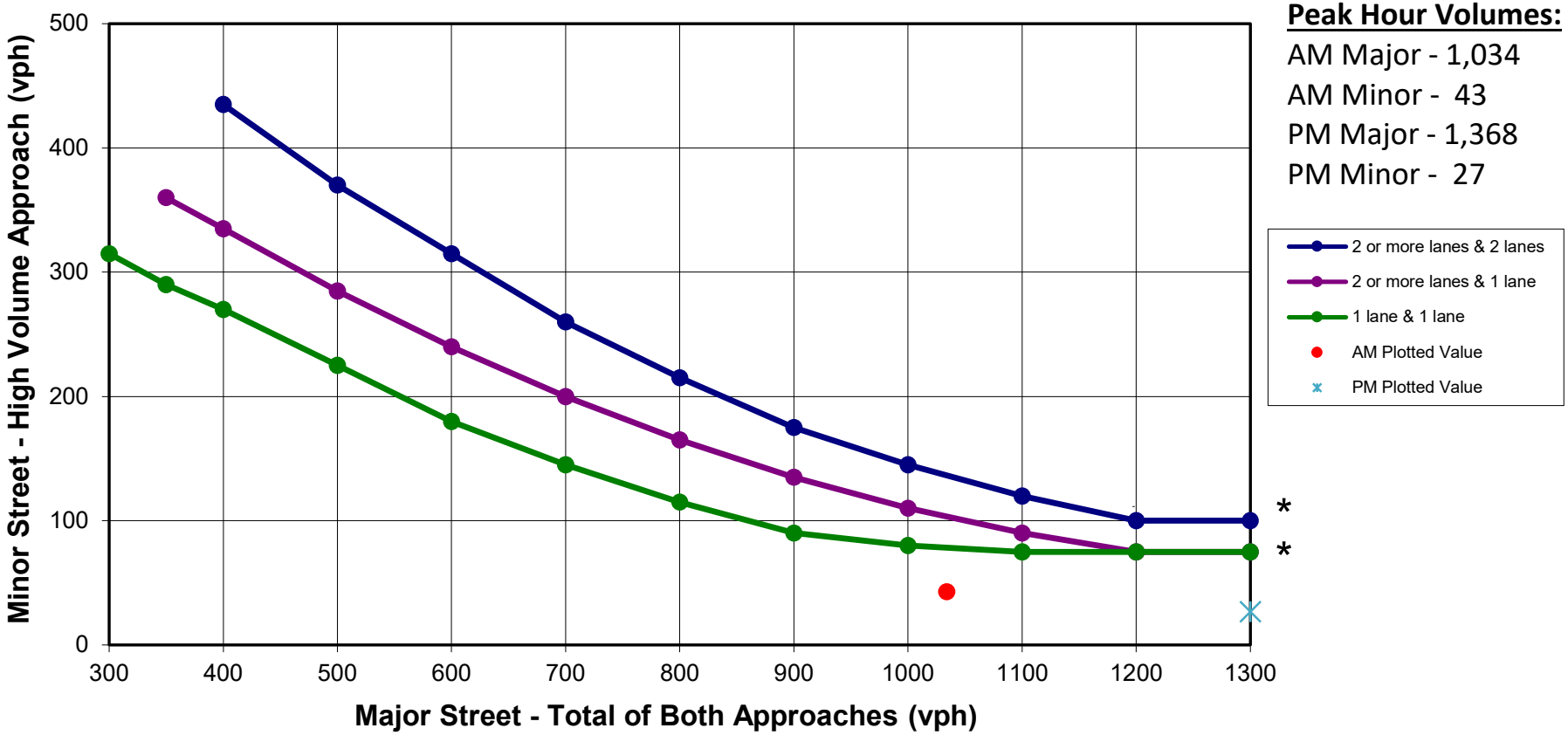
Peak Hour Volumes:

AM Major - 1,087
AM Minor - 71
PM Major - 1,388
PM Minor - 34

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Lee's Summit Road & Douglas Road/Drive 1

(Community less than 10,000 population or above 40mph on major street)



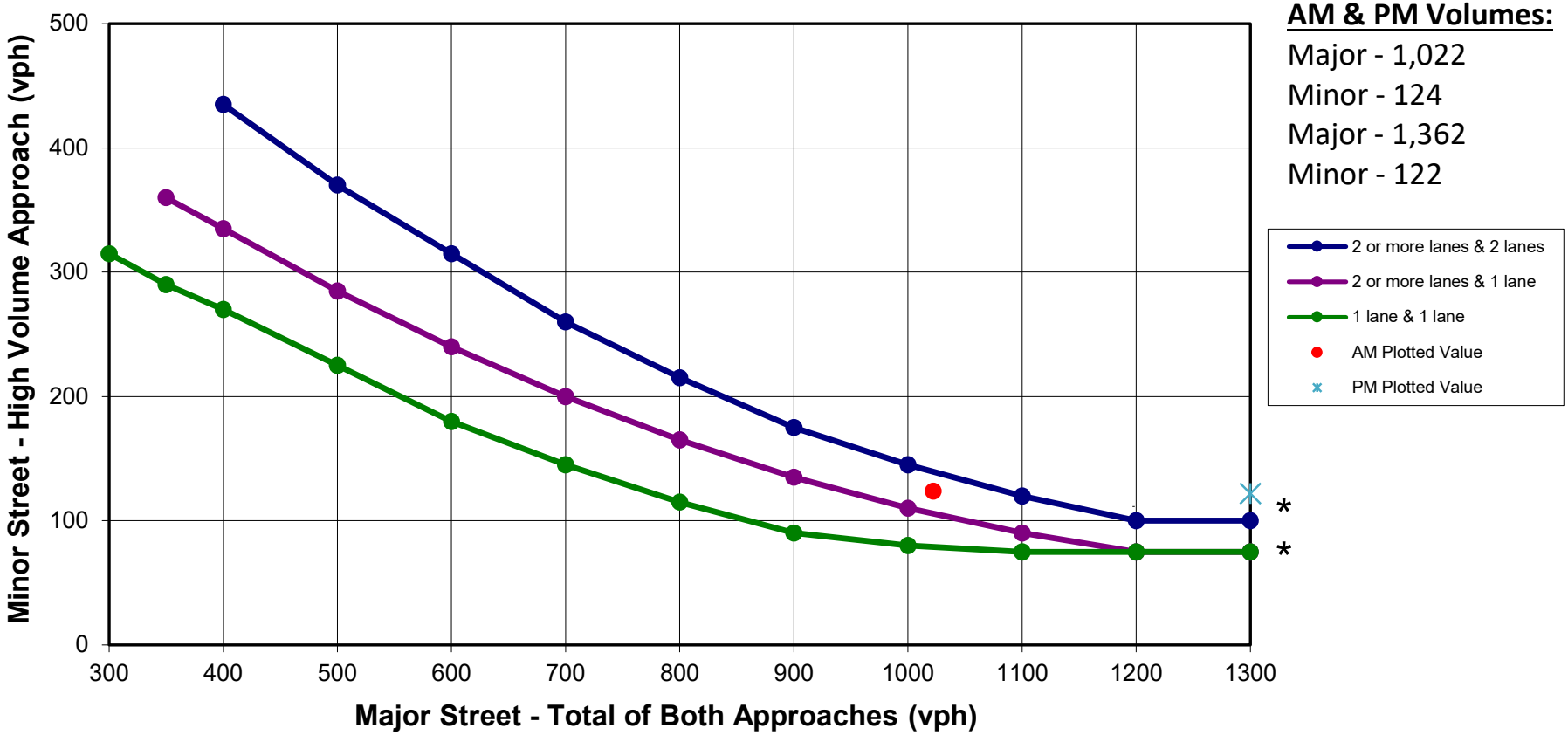
Peak Hour Volumes:

AM Major - 1,034
AM Minor - 43
PM Major - 1,368
PM Minor - 27

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 2)
Lee's Summit Road & Strother Road

(Community less than 10,000 population or above 40mph on major street)



AM & PM Volumes:

Major - 1,022
Minor - 124
Major - 1,362
Minor - 122

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Capacity Analysis

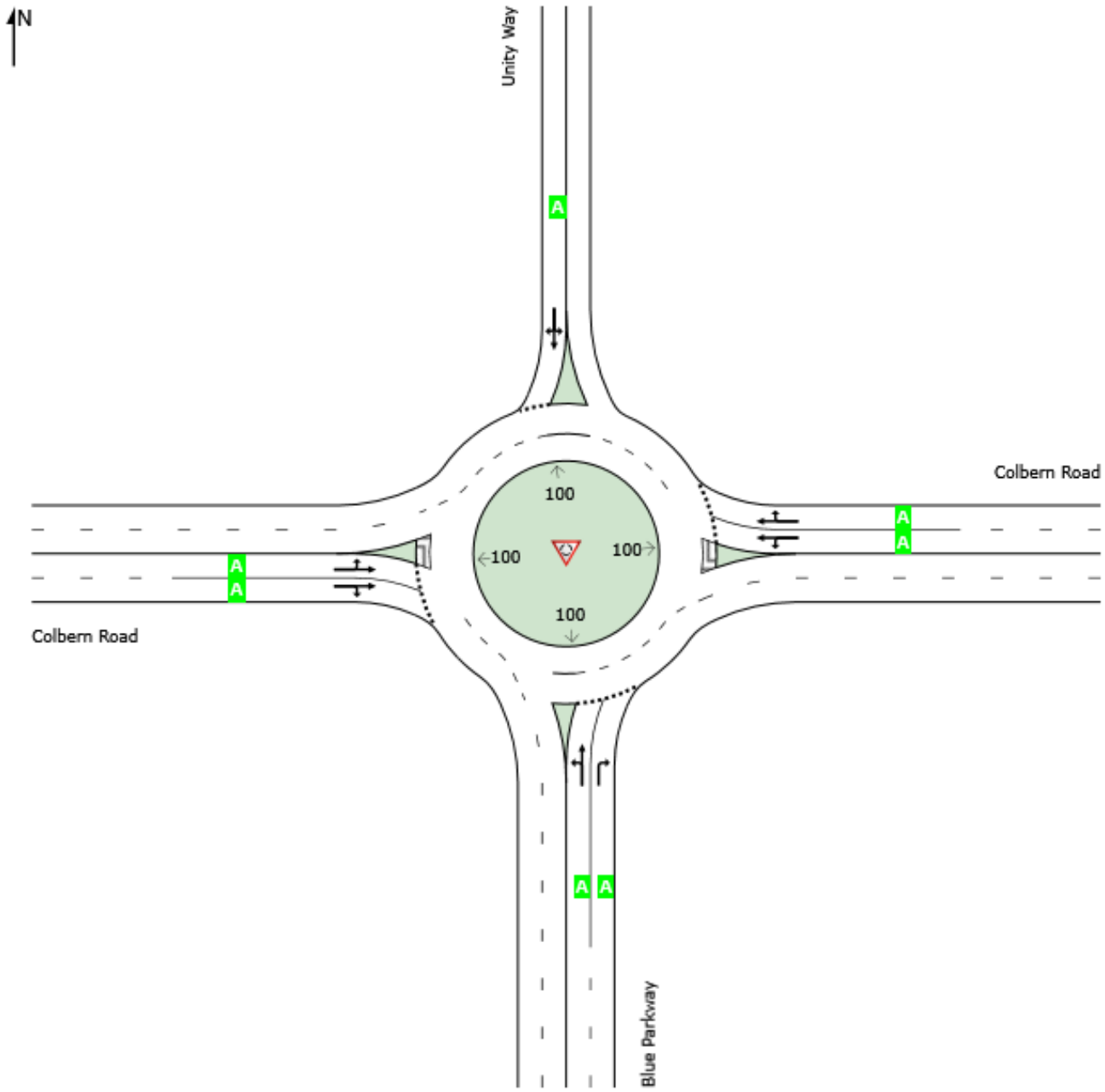
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	63	2.0	68	2.0	0.100	5.5	LOS A	0.4	9.0	0.52	0.48	0.52	20.7
8	T1	11	2.0	12	2.0	0.100	5.5	LOS A	0.4	9.0	0.52	0.48	0.52	18.1
18	R2	72	2.0	78	2.0	0.107	6.0	LOS A	0.4	9.8	0.54	0.51	0.54	20.5
Approach		146	2.0	159	2.0	0.107	5.8	LOS A	0.4	9.8	0.53	0.49	0.53	20.4
East: Colbern Road														
1	L2	96	2.0	104	2.0	0.330	5.8	LOS A	1.8	44.7	0.27	0.14	0.27	20.5
6	T1	663	2.0	721	2.0	0.330	5.8	LOS A	1.8	44.7	0.27	0.14	0.27	20.5
16	R2	19	2.0	21	2.0	0.330	5.8	LOS A	1.8	44.7	0.27	0.14	0.27	17.8
Approach		778	2.0	846	2.0	0.330	5.8	LOS A	1.8	44.7	0.27	0.14	0.27	20.5
North: Unity Way														
7	L2	5	2.0	5	2.0	0.015	5.8	LOS A	0.0	1.3	0.57	0.48	0.57	20.8
4	T1	1	2.0	1	2.0	0.015	5.8	LOS A	0.0	1.3	0.57	0.48	0.57	20.2
14	R2	3	2.0	3	2.0	0.015	5.8	LOS A	0.0	1.3	0.57	0.48	0.57	20.3
Approach		9	2.0	10	2.0	0.015	5.8	LOS A	0.0	1.3	0.57	0.48	0.57	20.5
West: Colbern Road														
5	L2	9	2.0	10	2.0	0.315	5.8	LOS A	1.6	41.4	0.30	0.16	0.30	18.5
2	T1	567	2.0	616	2.0	0.315	5.8	LOS A	1.6	41.4	0.30	0.16	0.30	20.6
12	R2	152	2.0	165	2.0	0.315	5.8	LOS A	1.6	41.4	0.30	0.16	0.30	20.1
Approach		728	2.0	791	2.0	0.315	5.8	LOS A	1.6	41.4	0.30	0.16	0.30	20.5
All Vehicles		1661	2.0	1805	2.0	0.330	5.8	LOS A	1.8	44.7	0.31	0.18	0.31	20.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

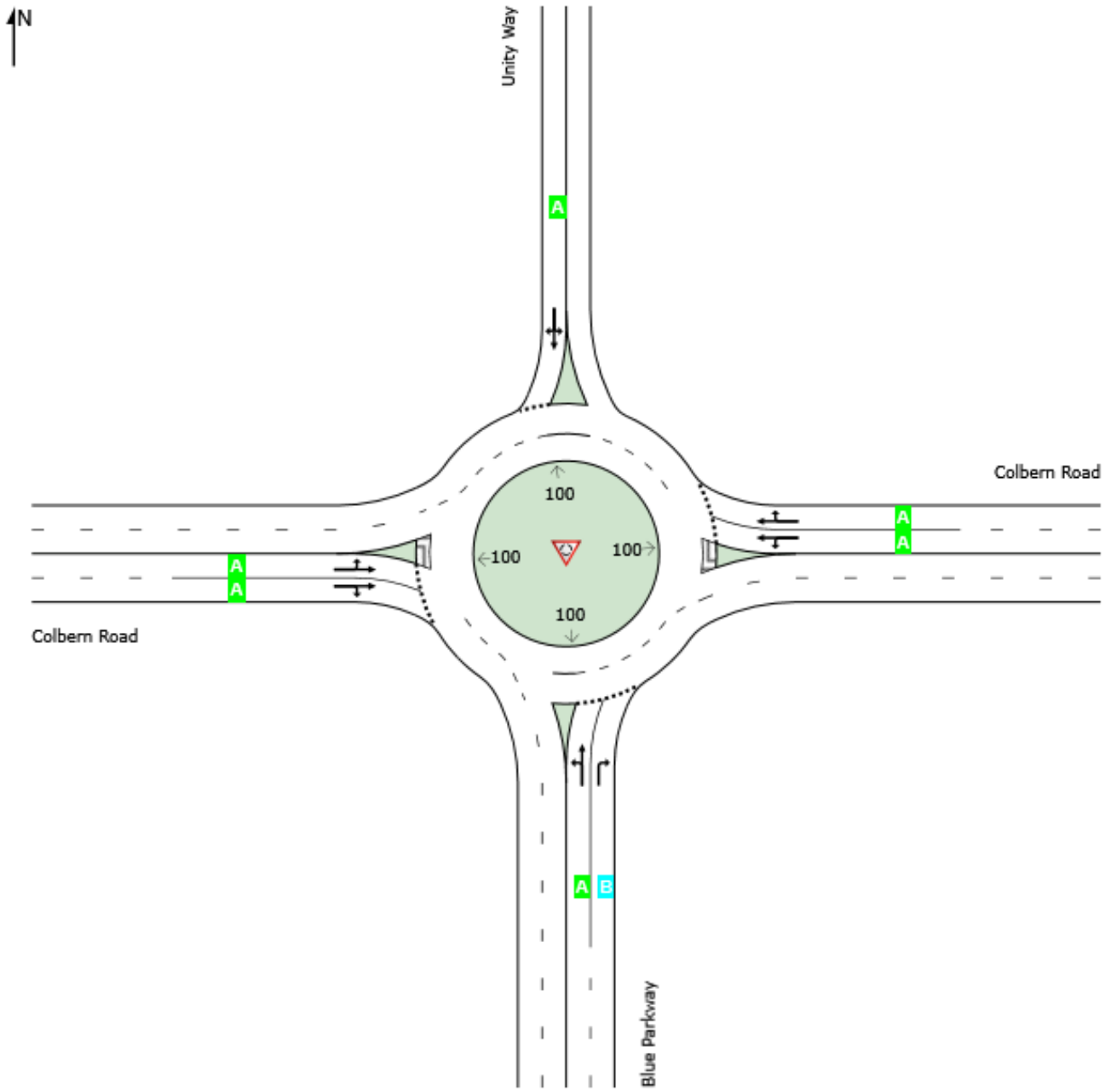
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	151	2.0	164	2.0	0.284	9.8	LOS A	1.1	27.0	0.66	0.68	0.70	19.9
8	T1	5	2.0	5	2.0	0.284	9.8	LOS A	1.1	27.0	0.66	0.68	0.70	17.5
18	R2	144	2.0	157	2.0	0.296	11.1	LOS B	1.1	28.9	0.68	0.73	0.75	19.6
Approach		300	2.0	326	2.0	0.296	10.4	LOS B	1.1	28.9	0.67	0.71	0.72	19.7
East: Colbern Road														
1	L2	80	2.0	87	2.0	0.329	6.2	LOS A	1.7	42.5	0.39	0.26	0.39	20.4
6	T1	626	2.0	680	2.0	0.329	6.2	LOS A	1.7	42.5	0.39	0.26	0.39	20.5
16	R2	6	2.0	7	2.0	0.329	6.2	LOS A	1.7	42.5	0.39	0.26	0.39	17.8
Approach		712	2.0	774	2.0	0.329	6.2	LOS A	1.7	42.5	0.39	0.26	0.39	20.4
North: Unity Way														
7	L2	41	2.0	45	2.0	0.126	7.3	LOS A	0.4	11.0	0.60	0.60	0.60	20.5
4	T1	19	2.0	21	2.0	0.126	7.3	LOS A	0.4	11.0	0.60	0.60	0.60	19.9
14	R2	12	2.0	13	2.0	0.126	7.3	LOS A	0.4	11.0	0.60	0.60	0.60	20.0
Approach		72	2.0	78	2.0	0.126	7.3	LOS A	0.4	11.0	0.60	0.60	0.60	20.2
West: Colbern Road														
5	L2	11	2.0	12	2.0	0.443	7.5	LOS A	2.6	67.1	0.41	0.26	0.41	18.3
2	T1	847	2.0	921	2.0	0.443	7.5	LOS A	2.6	67.1	0.41	0.26	0.41	20.3
12	R2	127	2.0	138	2.0	0.443	7.5	LOS A	2.6	67.1	0.41	0.26	0.41	19.7
Approach		985	2.0	1071	2.0	0.443	7.5	LOS A	2.6	67.1	0.41	0.26	0.41	20.2
All Vehicles		2069	2.0	2249	2.0	0.443	7.5	LOS A	2.6	67.1	0.44	0.34	0.45	20.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	259	246	307	947	985	460
v/c Ratio	0.72	0.58	0.65	0.41	0.62	0.50
Control Delay	47.3	25.0	16.9	3.7	12.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.1
Total Delay	47.3	25.0	16.9	3.7	12.9	6.1
Queue Length 50th (ft)	161	83	69	70	185	78
Queue Length 95th (ft)	240	160	130	106	334	112
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	438	490	527	2337	1601	914
Starvation Cap Reductn	0	0	0	0	150	51
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.50	0.58	0.41	0.68	0.53

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	340	0	124	282	871	0	0	483	846
Future Volume (vph)	0	0	0	340	0	124	282	871	0	0	483	846
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.92		1.00	1.00			0.93	0.85
Flt Protected				0.95	0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1588		3433	3539			3153	1441
Flt Permitted				0.95	0.98		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1588		3433	3539			3153	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	370	0	135	307	947	0	0	525	920
RTOR Reduction (vph)	0	0	0	0	81	0	0	0	0	0	142	247
Lane Group Flow (vph)	0	0	0	259	165	0	307	947	0	0	843	213
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				21.6	21.6		13.9	66.0			46.2	46.2
Effective Green, g (s)				21.6	21.6		13.9	66.0			46.2	46.2
Actuated g/C Ratio				0.22	0.22		0.14	0.66			0.46	0.46
Clearance Time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Vehicle Extension (s)				4.0	4.0		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				363	343		477	2335			1456	665
v/s Ratio Prot				c0.15	0.10		c0.09	0.27			c0.27	
v/s Ratio Perm												0.15
v/c Ratio				0.71	0.48		0.64	0.41			0.58	0.32
Uniform Delay, d1				36.3	34.3		40.7	7.9			19.8	17.0
Progression Factor				1.00	1.00		0.26	0.37			0.73	2.13
Incremental Delay, d2				7.0	1.5		2.9	0.5			1.3	0.9
Delay (s)				43.3	35.8		13.6	3.4			15.7	37.2
Level of Service				D	D		B	A			B	D
Approach Delay (s)		0.0			39.6			5.9			22.5	
Approach LOS		A			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	321	322	520	610	197	147	748
v/c Ratio	0.50	0.50	0.77	0.39	0.32	0.64	0.42
Control Delay	25.1	25.1	28.4	18.6	3.9	35.1	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	25.1	28.4	18.6	3.9	35.1	10.6
Queue Length 50th (ft)	153	153	218	54	0	90	119
Queue Length 95th (ft)	216	217	321	98	38	m152	163
Internal Link Dist (ft)		650		1067			491
Turn Bay Length (ft)	515		515		200	100	
Base Capacity (vph)	763	763	778	1551	619	265	1768
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	0.42	0.42	0.67	0.39	0.32	0.55	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	592	0	478	0	0	0	0	561	181	135	688	0
Future Volume (vph)	592	0	478	0	0	0	0	561	181	135	688	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Lane Util. Factor	*0.95	0.95	1.00					0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	1583					5085	1583	1770	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	1583					5085	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	643	0	520	0	0	0	0	610	197	147	748	0
RTOR Reduction (vph)	0	0	67	0	0	0	0	0	137	0	0	0
Lane Group Flow (vph)	321	322	453	0	0	0	0	610	60	147	748	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	38.4	38.4	38.4					30.5	30.5	13.0	50.0	
Effective Green, g (s)	38.4	38.4	38.4					30.5	30.5	13.0	50.0	
Actuated g/C Ratio	0.38	0.38	0.38					0.30	0.30	0.13	0.50	
Clearance Time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0	4.0	3.5	4.0	
Lane Grp Cap (vph)	645	645	607					1550	482	230	1769	
v/s Ratio Prot	0.19	0.19						0.12		c0.08	c0.21	
v/s Ratio Perm			c0.29						0.04			
v/c Ratio	0.50	0.50	0.75					0.39	0.12	0.64	0.42	
Uniform Delay, d1	23.5	23.5	26.6					27.4	25.1	41.3	15.9	
Progression Factor	1.00	1.00	1.00					0.60	0.53	0.60	0.57	
Incremental Delay, d2	0.8	0.8	5.3					0.7	0.5	4.8	0.6	
Delay (s)	24.3	24.3	31.9					17.2	13.9	29.4	9.7	
Level of Service	C	C	C					B	B	C	A	
Approach Delay (s)		27.7			0.0			16.3			12.9	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	222	15	61	200	23	10	4	88	45	7	5
Future Vol, veh/h	3	222	15	61	200	23	10	4	88	45	7	5
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	241	16	66	217	25	11	4	96	49	8	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	242	0	0	257	0	0	500	629	129	491	625	121
Stage 1	-	-	-	-	-	-	255	255	-	362	362	-
Stage 2	-	-	-	-	-	-	245	374	-	129	263	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1322	-	-	1305	-	-	454	398	897	461	400	908
Stage 1	-	-	-	-	-	-	727	695	-	629	624	-
Stage 2	-	-	-	-	-	-	737	616	-	861	689	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1322	-	-	1305	-	-	424	373	897	389	375	908
Mov Cap-2 Maneuver	-	-	-	-	-	-	424	373	-	389	375	-
Stage 1	-	-	-	-	-	-	725	693	-	627	587	-
Stage 2	-	-	-	-	-	-	680	580	-	762	687	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.8	10.5	15.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	770	1322	-	-	1305	-	-	408
HCM Lane V/C Ratio	0.144	0.002	-	-	0.051	-	-	0.152
HCM Control Delay (s)	10.5	7.7	0	-	7.9	0.1	-	15.4
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0.5

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	280	105	196	273	288	36
v/c Ratio	0.17	0.13	0.28	0.12	0.82	0.05
Control Delay	12.4	3.0	5.6	3.5	47.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	3.0	5.6	3.5	47.3	0.1
Queue Length 50th (ft)	36	0	20	14	118	0
Queue Length 95th (ft)	63	22	33	21	#233	0
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	1608	783	812	2314	369	783
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	0.17	0.13	0.24	0.12	0.78	0.05

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)	0	258	97	180	251	0	0	0	0	265	0	33
Future Volume (veh/h)	0	258	97	180	251	0	0	0	0	265	0	33
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	280	0	196	273	0				288	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1802		762	2357	0				333	0	
Arrive On Green	0.00	0.51	0.00	0.17	1.00	0.00				0.19	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				1781	0	1585
Grp Volume(v), veh/h	0	280	0	196	273	0				288	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	3.0	0.0	3.7	0.0	0.0				11.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.0	0.0	3.7	0.0	0.0				11.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1802		762	2357	0				333	0	
V/C Ratio(X)	0.00	0.16		0.26	0.12	0.00				0.87	0.00	
Avail Cap(c_a), veh/h	0	1802		942	2357	0				372	0	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.99	0.99	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.2	0.0	6.1	0.0	0.0				27.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.1	0.0				17.5	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
%ile BackOfQ(95%),veh/ln	0.0	1.7	0.0	1.6	0.1	0.0				9.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.4	0.0	6.3	0.1	0.0				45.1	0.0	0.0
LnGrp LOS	A	A		A	A	A				D	A	
Approach Vol, veh/h		280	A		469						288	A
Approach Delay, s/veh		9.4			2.7						45.1	
Approach LOS		A			A						D	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	51.5	10.9	40.6	18.5
Change Period (Y+Rc), s	* 5.1	* 5.1	* 5.1	5.4
Max Green Setting (Gmax), s	* 45	* 13	* 27	14.6
Max Q Clear Time (g_c+I1), s	2.0	5.7	5.0	13.0
Green Ext Time (p_c), s	3.4	0.3	2.9	0.1

Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	78	490	414	378	54	226
v/c Ratio	0.10	0.17	0.17	0.31	0.28	0.20
Control Delay	2.1	2.1	6.5	1.8	31.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	2.1	6.5	1.8	31.7	1.8
Queue Length 50th (ft)	2	6	40	0	22	0
Queue Length 95th (ft)	m10	m37	70	36	51	29
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	801	2958	2429	1205	369	1157
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	0.10	0.17	0.17	0.31	0.15	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	451	0	0	381	348	50	0	208	0	0	0
Future Volume (veh/h)	72	451	0	0	381	348	50	0	208	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	78	490	0	0	414	0	54	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	815	2845	0	0	2394		83	0				
Arrive On Green	0.11	1.00	0.00	0.00	0.67	0.00	0.05	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	78	490	0	0	414	0	54	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	0.9	0.0	0.0	0.0	3.0	0.0	2.1	0.0	0.0			
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.0	3.0	0.0	2.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	815	2845	0	0	2394		83	0				
V/C Ratio(X)	0.10	0.17	0.00	0.00	0.17		0.65	0.00				
Avail Cap(c_a), veh/h	894	2845	0	0	2394		372	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.86	0.86	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	2.6	0.0	0.0	0.0	4.2	0.0	32.8	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.2	0.0	8.4	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			
%ile BackOfQ(95%),veh/ln	0.2	0.1	0.0	0.0	1.3	0.0	1.9	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.6	0.1	0.0	0.0	4.4	0.0	41.2	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		568			414	A		54	A			
Approach Delay, s/veh		0.5			4.4			41.2				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	8.9	52.4				61.3		8.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	7.0	* 33				* 45		14.6				
Max Q Clear Time (g_c+I1), s	2.9	5.0				2.0		4.1				
Green Ext Time (p_c), s	0.0	4.9				6.6		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	4.1
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	562	83	50	737	41	32
Future Vol, veh/h	562	83	50	737	41	32
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	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	611	90	54	801	45	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	701	0	1165	351
Stage 1	-	-	-	-	656	-
Stage 2	-	-	-	-	509	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	892	-	187	645
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	569	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	892	-	167	645
Mov Cap-2 Maneuver	-	-	-	-	167	-
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	507	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	24
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	167	645	-	-	892	-
HCM Lane V/C Ratio	0.267	0.054	-	-	0.061	-
HCM Control Delay (s)	34.2	10.9	-	-	9.3	0.4
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	1	0.2	-	-	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	185	284	411	612	477	77	424	345	313	67	422	237
v/c Ratio	0.48	0.61	0.59	0.74	0.39	0.11	0.73	0.42	0.29	0.19	0.64	0.49
Control Delay	21.2	52.5	22.8	40.5	37.3	5.4	34.7	17.4	1.9	20.2	43.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	52.5	22.8	40.5	37.3	5.4	34.7	17.4	1.9	20.2	43.4	8.8
Queue Length 50th (ft)	55	98	129	224	98	0	140	92	0	25	129	0
Queue Length 95th (ft)	118	141	224	221	227	28	192	163	4	55	191	66
Internal Link Dist (ft)		562			2353			407			363	
Turn Bay Length (ft)	300		300	200		200	250		200	290		300
Base Capacity (vph)	433	608	701	832	1238	694	583	825	1089	347	656	486
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.47	0.59	0.74	0.39	0.11	0.73	0.42	0.29	0.19	0.64	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	261	378	563	439	71	390	317	288	62	388	218
Future Volume (veh/h)	170	261	378	563	439	71	390	317	288	62	388	218
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	185	284	411	612	477	77	424	345	0	67	422	237
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	364	492	461	722	1244	555	526	733		344	569	254
Arrive On Green	0.02	0.05	0.05	0.17	0.23	0.23	0.25	0.47	0.00	0.04	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	2850	3554	1585	3456	2619	1585	1781	3554	1585
Grp Volume(v), veh/h	185	284	411	612	477	77	424	345	0	67	422	237
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1425	1777	1585	1728	1309	1585	1781	1777	1585
Q Serve(g_s), s	0.0	7.8	10.4	20.8	11.3	2.6	11.5	9.0	0.0	2.6	11.3	14.8
Cycle Q Clear(g_c), s	0.0	7.8	10.4	20.8	11.3	2.6	11.5	9.0	0.0	2.6	11.3	14.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	364	492	461	722	1244	555	526	733		344	569	254
V/C Ratio(X)	0.51	0.58	0.89	0.85	0.38	0.14	0.81	0.47		0.19	0.74	0.93
Avail Cap(c_a), veh/h	456	611	514	798	1244	555	587	733		358	569	254
HCM Platoon Ratio	0.33	0.33	0.33	0.67	0.67	0.67	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	0.92	0.92	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	44.8	38.6	39.6	29.2	12.5	35.9	21.6	0.0	24.3	40.0	41.5
Incr Delay (d2), s/veh	1.1	1.1	16.5	7.2	0.8	0.5	6.8	2.0	0.0	0.3	8.5	41.9
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(95%),veh/ln	7.4	6.5	9.6	12.6	8.5	2.6	8.1	4.6	0.0	2.0	9.2	13.2
Unsig. Movement Delay, s/veh									8.10			
LnGrp Delay(d),s/veh	35.0	45.9	55.1	46.8	30.0	13.0	42.7	23.6	8.1	24.6	48.5	83.3
LnGrp LOS	D	D	E	D	C	B	D	C	A	C	D	F
Approach Vol, veh/h		880			1166			1082	A		726	
Approach Delay, s/veh		47.9			37.7			26.6			57.7	
Approach LOS		D			D			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.2	22.0	31.2	19.6	9.2	34.0	10.8	40.0
Change Period (Y+Rc), s	* 6	* 6	* 5.8	* 5.8	5.0	* 6	5.8	* 5
Max Green Setting (Gmax), s	* 17	* 16	* 28	* 17	5.0	* 28	10.2	* 35
Max Q Clear Time (g_c+I1), s	13.5	16.8	22.8	12.4	4.6	11.0	2.0	13.3
Green Ext Time (p_c), s	0.5	0.0	1.1	1.4	0.0	1.8	0.3	3.1

Intersection Summary	
HCM 6th Ctrl Delay	40.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is included in calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	0	53	0	35	1	427	95	68	496	0
Future Vol, veh/h	5	0	0	53	0	35	1	427	95	68	496	0
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	0	58	0	38	1	464	103	74	539	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1224	1256	539	1153	1153	464	539	0	0	567	0	0
Stage 1	687	687	-	466	466	-	-	-	-	-	-	-
Stage 2	537	569	-	687	687	-	-	-	-	-	-	-
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	156	171	542	174	197	598	1029	-	-	1005	-	-
Stage 1	437	447	-	577	562	-	-	-	-	-	-	-
Stage 2	528	506	-	437	447	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	138	158	542	164	182	598	1029	-	-	1005	-	-
Mov Cap-2 Maneuver	138	158	-	164	182	-	-	-	-	-	-	-
Stage 1	437	414	-	576	561	-	-	-	-	-	-	-
Stage 2	494	505	-	405	414	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.2	27.7	0	1.1
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1029	-	-	138	164	598	1005	-	-
HCM Lane V/C Ratio	0.001	-	-	0.039	0.351	0.064	0.074	-	-
HCM Control Delay (s)	8.5	-	-	32.2	38.4	11.4	8.9	-	-
HCM Lane LOS	A	-	-	D	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.5	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	75	49	408	72	36	506
Future Vol, veh/h	75	49	408	72	36	506
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	-	-	225	225	-
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	82	53	443	78	39	550

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1071	222	0	0	521	0
Stage 1	443	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	230	782	-	-	1043	-
Stage 1	615	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	221	782	-	-	1043	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	511	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	452	1043	-
HCM Lane V/C Ratio	-	-	0.298	0.038	-
HCM Control Delay (s)	-	-	16.3	8.6	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	60	96	265	184	51	118	204	122	17	310
v/c Ratio	0.02	0.20	0.25	0.50	0.25	0.07	0.32	0.29	0.18	0.03	0.67
Control Delay	15.0	31.1	3.9	19.9	19.3	0.2	15.2	17.1	3.6	12.1	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	31.1	3.9	19.9	19.3	0.2	15.2	17.1	3.6	12.1	31.5
Queue Length 50th (ft)	3	23	0	78	51	0	30	54	0	4	119
Queue Length 95th (ft)	13	63	17	162	139	0	64	135	28	15	217
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	580	843	795	603	986	905	407	862	807	610	958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.07	0.12	0.44	0.19	0.06	0.29	0.24	0.15	0.03	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	55	88	244	169	47	109	188	112	16	252	33
Future Volume (veh/h)	9	55	88	244	169	47	109	188	112	16	252	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	60	96	265	184	51	118	204	122	17	274	36
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	411	315	267	568	578	490	314	506	429	349	354	47
Arrive On Green	0.01	0.17	0.17	0.15	0.31	0.31	0.07	0.27	0.27	0.02	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1619	213
Grp Volume(v), veh/h	10	60	96	265	184	51	118	204	122	17	0	310
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1832
Q Serve(g_s), s	0.2	1.6	3.2	7.0	4.5	1.4	3.0	5.3	3.6	0.4	0.0	9.5
Cycle Q Clear(g_c), s	0.2	1.6	3.2	7.0	4.5	1.4	3.0	5.3	3.6	0.4	0.0	9.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	411	315	267	568	578	490	314	506	429	349	0	401
V/C Ratio(X)	0.02	0.19	0.36	0.47	0.32	0.10	0.38	0.40	0.28	0.05	0.00	0.77
Avail Cap(c_a), veh/h	673	928	787	729	928	787	455	913	773	732	0	894
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.9	21.2	21.9	16.1	15.7	14.7	16.8	17.7	17.1	15.3	0.0	21.8
Incr Delay (d2), s/veh	0.0	0.6	1.7	0.2	0.7	0.2	0.3	0.5	0.4	0.0	0.0	3.2
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(95%),veh/ln	0.1	1.3	2.1	4.6	3.2	0.8	1.9	3.6	2.1	0.3	0.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	21.9	23.6	16.3	16.4	14.9	17.1	18.3	17.5	15.3	0.0	25.1
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		166			500			444			327	
Approach Delay, s/veh		22.4			16.2			17.7			24.5	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	15.5	10.3	19.0	6.3	23.9	7.2	22.1
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	9.0	5.2	5.0	11.5	2.2	6.5	2.4	7.3
Green Ext Time (p_c), s	0.2	1.2	0.0	1.5	0.0	2.2	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	9	498	4	9	504	10	11	0	32	4	0	3
Future Vol, veh/h	9	498	4	9	504	10	11	0	32	4	0	3
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	200	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	541	4	10	548	11	12	0	35	4	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	559	0	0	545	0	0	1138	1142	543	1155	1139	554
Stage 1	-	-	-	-	-	-	563	563	-	574	574	-
Stage 2	-	-	-	-	-	-	575	579	-	581	565	-
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	1012	-	-	1024	-	-	179	200	540	174	201	532
Stage 1	-	-	-	-	-	-	511	509	-	504	503	-
Stage 2	-	-	-	-	-	-	503	501	-	499	508	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1012	-	-	1024	-	-	175	196	540	160	197	532
Mov Cap-2 Maneuver	-	-	-	-	-	-	175	196	-	160	197	-
Stage 1	-	-	-	-	-	-	506	504	-	499	498	-
Stage 2	-	-	-	-	-	-	495	496	-	462	503	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0.1	16.8	21.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	352	1024	-	-	1012	-	-	228
HCM Lane V/C Ratio	0.133	0.01	-	-	0.01	-	-	0.033
HCM Control Delay (s)	16.8	8.6	-	-	8.6	-	-	21.3
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	54	16	517	532	2
Future Vol, veh/h	6	54	16	517	532	2
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	7	59	17	562	578	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1175	579	580	0	-	0
Stage 1	579	-	-	-	-	-
Stage 2	596	-	-	-	-	-
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	212	515	994	-	-	-
Stage 1	560	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	208	515	994	-	-	-
Mov Cap-2 Maneuver	346	-	-	-	-	-
Stage 1	550	-	-	-	-	-
Stage 2	550	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	994	-	491	-	-
HCM Lane V/C Ratio	0.017	-	0.133	-	-
HCM Control Delay (s)	8.7	-	13.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	53	118	78	480	550	36
Future Vol, veh/h	53	118	78	480	550	36
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	150	-	-	250
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	58	128	85	522	598	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1290	598	637	0	-	0
Stage 1	598	-	-	-	-	-
Stage 2	692	-	-	-	-	-
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	180	502	947	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	497	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	164	502	947	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	500	-	-	-	-	-
Stage 2	497	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	1.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	947	-	302	502	-	-
HCM Lane V/C Ratio	0.09	-	0.191	0.255	-	-
HCM Control Delay (s)	9.2	-	19.7	14.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.7	1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	648	95	0	1010	37	0	0	161	0	0	70
Future Vol, veh/h	0	648	95	0	1010	37	0	0	161	0	0	70
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	-	-	150	-	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	704	103	0	1098	40	0	0	175	0	0	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	352	-	-	549
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	644	0	0	480
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	644	-	-	480
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.7	13.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	644	-	-	-	-	480
HCM Lane V/C Ratio	0.272	-	-	-	-	0.159
HCM Control Delay (s)	12.7	-	-	-	-	13.9
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	1.1	-	-	-	-	0.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	84	517	117	410	738	26	235	199	91	38
v/c Ratio	0.21	0.40	0.16	0.70	0.43	0.03	0.62	0.23	0.55	0.10
Control Delay	11.6	26.9	0.5	56.3	7.5	0.0	49.8	7.2	53.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	26.9	0.5	56.3	7.5	0.0	49.8	7.2	53.2	0.5
Queue Length 50th (ft)	22	130	0	123	49	0	74	38	56	0
Queue Length 95th (ft)	49	204	0	136	161	m0	113	59	102	0
Internal Link Dist (ft)		869			534					266
Turn Bay Length (ft)	300		300	300		250	150	150		
Base Capacity (vph)	397	1278	718	645	1697	844	411	885	282	499
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	0.21	0.40	0.16	0.64	0.43	0.03	0.57	0.22	0.32	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	476	108	377	679	24	216	0	183	84	0	35
Future Volume (veh/h)	77	476	108	377	679	24	216	0	183	84	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	517	117	410	738	26	235	0	199	91	0	38
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	542	1587	708	480	1921	857	307	438	592	193	0	136
Arrive On Green	0.05	0.45	0.45	0.28	1.00	1.00	0.09	0.00	0.23	0.09	0.00	0.09
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	3456	1870	1585	1418	0	1585
Grp Volume(v), veh/h	84	517	117	410	738	26	235	0	199	91	0	38
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1728	1870	1585	1418	0	1585
Q Serve(g_s), s	2.1	9.4	4.4	11.2	0.0	0.0	6.6	0.0	9.0	6.3	0.0	2.2
Cycle Q Clear(g_c), s	2.1	9.4	4.4	11.2	0.0	0.0	6.6	0.0	9.0	6.3	0.0	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	542	1587	708	480	1921	857	307	438	592	193	0	136
V/C Ratio(X)	0.16	0.33	0.17	0.85	0.38	0.03	0.77	0.00	0.34	0.47	0.00	0.28
Avail Cap(c_a), veh/h	568	1587	708	622	1921	857	415	711	823	356	0	317
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	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	0.00	1.00
Uniform Delay (d), s/veh	9.0	17.9	16.5	35.1	0.0	0.0	44.5	0.0	22.4	44.7	0.0	42.8
Incr Delay (d2), s/veh	0.1	0.5	0.5	8.9	0.6	0.1	5.8	0.0	0.3	1.8	0.0	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(95%),veh/ln	1.4	6.9	3.0	8.1	0.3	0.0	5.5	0.0	5.9	4.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.1	18.5	17.0	44.1	0.6	0.1	50.4	0.0	22.8	46.4	0.0	43.9
LnGrp LOS	A	B	B	D	A	A	D	A	C	D	A	D
Approach Vol, veh/h		718			1174			434			129	
Approach Delay, s/veh		17.1			15.8			37.7			45.7	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.4	19.9	50.7	14.9	14.6	10.5	60.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	38.0	18.0	26.0	12.0	20.0	6.0	38.0
Max Q Clear Time (g_c+I1), s	11.0	13.2	11.4	8.6	8.3	4.1	2.0
Green Ext Time (p_c), s	0.6	0.7	3.2	0.2	0.3	0.0	5.8

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	607	27	51	879	0	54
Future Vol, veh/h	607	27	51	879	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	660	29	55	955	0	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	689	0	-	330
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	901	-	0	666
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	901	-	-	666
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	666	-	-	901	-
HCM Lane V/C Ratio	0.088	-	-	0.062	-
HCM Control Delay (s)	10.9	-	-	9.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	493	95	177	702	76	141
Future Vol, veh/h	493	95	177	702	76	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	0	200
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	536	103	192	763	83	153

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	639	0	1302	268
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	766	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	941	-	152	730
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	419	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	941	-	121	730
Mov Cap-2 Maneuver	-	-	-	-	121	-
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	334	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	36.2
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	121	730	-	-	941	-
HCM Lane V/C Ratio	0.683	0.21	-	-	0.204	-
HCM Control Delay (s)	82.7	11.2	-	-	9.8	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	3.7	0.8	-	-	0.8	-

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	195	189	605	1442	981	449
v/c Ratio	0.70	0.56	0.80	0.57	0.67	0.51
Control Delay	53.3	24.2	14.8	2.5	10.1	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.1
Total Delay	53.3	24.2	14.8	2.6	10.2	1.8
Queue Length 50th (ft)	123	50	7	12	105	0
Queue Length 95th (ft)	200	123	79	73	m220	m0
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	321	374	827	2517	1471	877
Starvation Cap Reductn	0	0	0	90	63	48
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.51	0.73	0.59	0.70	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	0	154	557	1327	0	0	535	780
Future Volume (vph)	0	0	0	200	0	154	557	1327	0	0	535	780
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.87		1.00	1.00			0.94	0.85
Flt Protected				0.95	0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1526		3433	3539			3183	1441
Flt Permitted				0.95	0.99		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1526		3433	3539			3183	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	217	0	167	605	1442	0	0	582	848
RTOR Reduction (vph)	0	0	0	0	86	0	0	0	0	0	95	255
Lane Group Flow (vph)	0	0	0	195	103	0	605	1442	0	0	886	194
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				16.5	16.5		22.0	71.1			43.2	43.2
Effective Green, g (s)				16.5	16.5		22.0	71.1			43.2	43.2
Actuated g/C Ratio				0.16	0.16		0.22	0.71			0.43	0.43
Clearance Time (s)				5.9	5.9		5.9	6.5			6.5	6.5
Vehicle Extension (s)				4.0	4.0		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				277	251		755	2516			1375	622
v/s Ratio Prot				c0.12	0.07		c0.18	0.41			c0.28	
v/s Ratio Perm												0.13
v/c Ratio				0.70	0.41		0.80	0.57			0.64	0.31
Uniform Delay, d1				39.4	37.4		36.9	7.0			22.4	18.6
Progression Factor				1.00	1.00		0.21	0.25			0.43	0.10
Incremental Delay, d2				8.4	1.5		5.0	0.7			1.6	0.9
Delay (s)				47.9	38.9		12.8	2.4			11.2	2.7
Level of Service				D	D		B	A			B	A
Approach Delay (s)		0.0			43.4			5.5			8.5	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	479	479	537	1090	450	142	657
v/c Ratio	0.76	0.76	0.75	0.62	0.54	0.81	0.37
Control Delay	35.7	35.7	24.5	16.3	3.4	49.3	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	35.7	24.5	16.3	3.4	49.3	13.5
Queue Length 50th (ft)	267	267	189	147	19	84	151
Queue Length 95th (ft)	397	397	323	204	37	m#160	193
Internal Link Dist (ft)		650		1067			491
Turn Bay Length (ft)	515		515		200	100	
Base Capacity (vph)	662	662	737	1746	839	177	1798
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	0.72	0.72	0.73	0.62	0.54	0.80	0.37

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	881	0	494	0	0	0	0	1003	414	131	604	0
Future Volume (vph)	881	0	494	0	0	0	0	1003	414	131	604	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Lane Util. Factor	*0.95	0.95	1.00					0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1681	1583					5085	1583	1770	3539	
Flt Permitted	0.95	0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1681	1583					5085	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	958	0	537	0	0	0	0	1090	450	142	657	0
RTOR Reduction (vph)	0	0	117	0	0	0	0	0	296	0	0	0
Lane Group Flow (vph)	479	479	420	0	0	0	0	1090	154	142	657	0
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						6		5	2	
Permitted Phases			4						6			
Actuated Green, G (s)	37.6	37.6	37.6					34.3	34.3	10.0	50.8	
Effective Green, g (s)	37.6	37.6	37.6					34.3	34.3	10.0	50.8	
Actuated g/C Ratio	0.38	0.38	0.38					0.34	0.34	0.10	0.51	
Clearance Time (s)	5.6	5.6	5.6					6.5	6.5	6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0	4.0	3.5	4.0	
Lane Grp Cap (vph)	632	632	595					1744	542	177	1797	
v/s Ratio Prot	c0.28	0.28						c0.21		c0.08	0.19	
v/s Ratio Perm			0.27						0.10			
v/c Ratio	0.76	0.76	0.71					0.62	0.28	0.80	0.37	
Uniform Delay, d1	27.2	27.2	26.5					27.5	23.9	44.0	14.9	
Progression Factor	1.00	1.00	1.00					0.54	0.65	0.49	0.84	
Incremental Delay, d2	5.5	5.5	4.1					1.1	0.9	17.9	0.4	
Delay (s)	32.7	32.7	30.6					15.9	16.4	39.5	13.0	
Level of Service	C	C	C					B	B	D	B	
Approach Delay (s)		32.0			0.0			16.0			17.7	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	326	24	107	246	41	41	20	133	43	13	10
Future Vol, veh/h	6	326	24	107	246	41	41	20	133	43	13	10
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	354	26	116	267	45	45	22	145	47	14	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	312	0	0	380	0	0	754	925	190	724	916	156
Stage 1	-	-	-	-	-	-	381	381	-	522	522	-
Stage 2	-	-	-	-	-	-	373	544	-	202	394	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1245	-	-	1175	-	-	298	268	820	313	271	862
Stage 1	-	-	-	-	-	-	613	612	-	506	529	-
Stage 2	-	-	-	-	-	-	620	517	-	781	604	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1245	-	-	1175	-	-	254	234	820	217	237	862
Mov Cap-2 Maneuver	-	-	-	-	-	-	254	234	-	217	237	-
Stage 1	-	-	-	-	-	-	609	608	-	502	466	-
Stage 2	-	-	-	-	-	-	522	455	-	616	600	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.5	18.5	25.2
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	474	1245	-	-	1175	-	-	249
HCM Lane V/C Ratio	0.445	0.005	-	-	0.099	-	-	0.288
HCM Control Delay (s)	18.5	7.9	0	-	8.4	0.3	-	25.2
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	2.2	0	-	-	0.3	-	-	1.2

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	423	123	274	340	410	88
v/c Ratio	0.41	0.22	0.50	0.18	0.78	0.16
Control Delay	21.1	5.7	13.2	5.0	31.0	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	5.7	13.2	5.0	31.0	3.0
Queue Length 50th (ft)	71	0	63	38	144	0
Queue Length 95th (ft)	118	35	124	40	219	18
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	1037	553	553	1919	642	553
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	0.41	0.22	0.50	0.18	0.64	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	389	113	252	313	0	0	0	0	377	0	81
Future Volume (veh/h)	0	389	113	252	313	0	0	0	0	377	0	81
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	423	0	274	340	0				410	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	815		708	2044	0				469	0	
Arrive On Green	0.00	0.23	0.00	0.09	0.19	0.00				0.26	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				1781	0	1585
Grp Volume(v), veh/h	0	423	0	274	340	0				410	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	6.8	0.0	0.7	5.2	0.0				14.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.8	0.0	0.7	5.2	0.0				14.3	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	815		708	2044	0				469	0	
V/C Ratio(X)	0.00	0.52		0.39	0.17	0.00				0.87	0.00	
Avail Cap(c_a), veh/h	0	815		708	2044	0				647	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.97	0.97	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	21.9	0.0	19.9	13.3	0.0				22.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.4	0.0	0.3	0.2	0.0				9.7	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
%ile BackOfQ(95%),veh/ln	0.0	5.1	0.0	6.3	3.3	0.0				10.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.3	0.0	20.3	13.5	0.0				32.6	0.0	0.0
LnGrp LOS	A	C		C	B	A				C	A	
Approach Vol, veh/h		423	A		614						410	A
Approach Delay, s/veh		24.3			16.5						32.6	
Approach LOS		C			B						C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		42.5			22.5	20.0		22.5				
Change Period (Y+Rc), s		* 5.1			* 5.1	* 5.1		5.4				
Max Green Setting (Gmax), s		* 31			* 11	* 15		23.6				
Max Q Clear Time (g_c+I1), s		7.2			2.7	8.8		16.3				
Green Ext Time (p_c), s		3.9			0.5	2.1		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	91	741	503	375	111	211
v/c Ratio	0.14	0.28	0.24	0.34	0.44	0.21
Control Delay	5.8	4.8	9.5	2.4	30.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	4.8	9.5	2.4	30.0	2.5
Queue Length 50th (ft)	5	22	54	0	41	0
Queue Length 95th (ft)	m30	92	97	42	79	33
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	704	2639	2107	1094	370	1027
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	0.13	0.28	0.24	0.34	0.30	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	682	0	0	463	345	102	0	194	0	0	0
Future Volume (veh/h)	84	682	0	0	463	345	102	0	194	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	91	741	0	0	503	0	111	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	715	2680	0	0	2186		145	0				
Arrive On Green	0.04	0.51	0.00	0.00	0.62	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	91	741	0	0	503	0	111	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	1.1	7.8	0.0	0.0	4.1	0.0	4.0	0.0	0.0			
Cycle Q Clear(g_c), s	1.1	7.8	0.0	0.0	4.1	0.0	4.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	715	2680	0	0	2186		145	0				
V/C Ratio(X)	0.13	0.28	0.00	0.00	0.23		0.77	0.00				
Avail Cap(c_a), veh/h	824	2680	0	0	2186		373	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.78	0.78	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	3.8	5.9	0.0	0.0	5.6	0.0	29.3	0.0	0.0			
Incr Delay (d2), s/veh	0.1	0.2	0.0	0.0	0.2	0.0	8.2	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			
%ile BackOfQ(95%),veh/ln	0.5	3.2	0.0	0.0	2.2	0.0	3.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.9	6.1	0.0	0.0	5.9	0.0	37.5	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		832			503	A		111	A			
Approach Delay, s/veh		5.8			5.9			37.5				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	9.0	45.3				54.3		10.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	8.0	* 28				* 41		13.6				
Max Q Clear Time (g_c+I1), s	3.1	6.1				9.8		6.0				
Green Ext Time (p_c), s	0.1	5.8				10.5		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	5.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	959	58	38	635	75	58
Future Vol, veh/h	959	58	38	635	75	58
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	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	1042	63	41	690	82	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1105	0	1501	553
Stage 1	-	-	-	-	1074	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	628	-	113	477
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	628	-	101	477
Mov Cap-2 Maneuver	-	-	-	-	101	-
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	73.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	101	477	-	-	628	-
HCM Lane V/C Ratio	0.807	0.132	-	-	0.066	-
HCM Control Delay (s)	119	13.7	-	-	11.1	0.5
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	4.4	0.5	-	-	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	258	586	429	535	380	134	483	512	615	109	465	236
v/c Ratio	0.55	0.83	0.55	0.87	0.38	0.22	0.74	0.63	0.67	0.45	0.75	0.50
Control Delay	18.2	35.3	5.5	54.1	30.2	1.1	39.9	27.5	9.9	25.7	48.5	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	35.3	5.5	54.1	30.2	1.1	39.9	27.5	10.0	25.7	48.5	9.1
Queue Length 50th (ft)	130	191	26	206	101	0	166	233	212	43	152	0
Queue Length 95th (ft)	187	255	57	#313	145	3	223	288	173	79	#229	66
Internal Link Dist (ft)		562			2353			407			363	
Turn Bay Length (ft)	300		300	200		200	250		200	290		300
Base Capacity (vph)	500	750	786	628	1010	606	652	812	927	240	620	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	7	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.78	0.55	0.85	0.38	0.22	0.74	0.63	0.67	0.45	0.75	0.50

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)	237	539	395	492	350	123	444	471	566	100	428	217
Future Volume (veh/h)	237	539	395	492	350	123	444	471	566	100	428	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	258	586	429	535	380	134	483	512	0	109	465	236
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	463	703	642	590	1008	450	716	857		286	569	254
Arrive On Green	0.04	0.07	0.07	0.21	0.28	0.28	0.07	0.11	0.00	0.05	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	2850	3554	1585	3456	2619	1585	1781	3554	1585
Grp Volume(v), veh/h	258	586	429	535	380	134	483	512	0	109	465	236
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1425	1777	1585	1728	1309	1585	1781	1777	1585
Q Serve(g_s), s	9.9	16.3	5.0	18.3	8.6	6.6	13.7	18.6	0.0	4.1	12.6	10.5
Cycle Q Clear(g_c), s	9.9	16.3	5.0	18.3	8.6	6.6	13.7	18.6	0.0	4.1	12.6	10.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	463	703	642	590	1008	450	716	857		286	569	254
V/C Ratio(X)	0.56	0.83	0.67	0.91	0.38	0.30	0.67	0.60		0.38	0.82	0.93
Avail Cap(c_a), veh/h	520	753	664	627	1008	450	716	857		286	569	254
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.80	0.80	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	45.1	30.0	38.7	28.7	28.0	43.3	38.3	0.0	22.6	40.6	21.2
Incr Delay (d2), s/veh	1.0	7.6	2.5	16.2	0.2	0.4	2.0	2.5	0.0	0.8	12.4	41.1
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(95%),veh/ln	7.9	13.2	15.1	11.8	6.3	4.4	10.2	10.6	0.0	3.0	10.4	10.7
Unsig. Movement Delay, s/veh									18.80			
LnGrp Delay(d),s/veh	24.2	52.7	32.5	54.9	29.0	28.4	45.3	40.8	18.8	23.5	52.9	62.3
LnGrp LOS	C	D	C	D	C	C	D	D	B	C	D	E
Approach Vol, veh/h		1273			1049			1610	A		810	
Approach Delay, s/veh		40.1			42.1			33.7			51.7	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.7	22.0	25.7	25.6	10.0	38.7	17.9	33.4
Change Period (Y+Rc), s	* 6	* 6	* 5	5.8	5.0	* 6	* 5.8	5.0
Max Green Setting (Gmax), s	* 19	* 16	* 22	21.2	5.0	* 30	* 15	27.9
Max Q Clear Time (g_c+I1), s	15.7	14.6	20.3	18.3	6.1	20.6	11.9	10.6
Green Ext Time (p_c), s	0.6	0.5	0.4	1.5	0.0	2.2	0.2	2.4

Intersection Summary	
HCM 6th Ctrl Delay	40.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is included in calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	1	25	0	17	2	670	12	20	644	5
Future Vol, veh/h	2	0	1	25	0	17	2	670	12	20	644	5
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	27	0	18	2	728	13	22	700	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1495	1492	703	1479	1481	728	705	0	0	741	0	0
Stage 1	747	747	-	732	732	-	-	-	-	-	-	-
Stage 2	748	745	-	747	749	-	-	-	-	-	-	-
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	101	123	438	104	125	423	893	-	-	866	-	-
Stage 1	405	420	-	413	427	-	-	-	-	-	-	-
Stage 2	404	421	-	405	419	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	95	120	438	102	122	423	893	-	-	866	-	-
Mov Cap-2 Maneuver	95	120	-	102	122	-	-	-	-	-	-	-
Stage 1	404	410	-	412	426	-	-	-	-	-	-	-
Stage 2	385	420	-	394	409	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.6	36.9	0	0.3
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	893	-	-	129	102	423	866	-	-
HCM Lane V/C Ratio	0.002	-	-	0.025	0.266	0.044	0.025	-	-
HCM Control Delay (s)	9	-	-	33.6	52.6	13.9	9.3	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	66	56	626	69	65	602
Future Vol, veh/h	66	56	626	69	65	602
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	-	-	225	225	-
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	72	61	680	75	71	654

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1476	340	0	0	755	0
Stage 1	680	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	128	657	-	-	853	-
Stage 1	466	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	117	657	-	-	853	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	406	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.4	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	350	853	-
HCM Lane V/C Ratio	-	-	0.379	0.083	-
HCM Control Delay (s)	-	-	21.4	9.6	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.7	0.3	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	178	185	232	85	59	130	341	282	42	413
v/c Ratio	0.08	0.49	0.41	0.50	0.14	0.10	0.42	0.50	0.37	0.11	0.81
Control Delay	16.4	36.2	7.9	21.6	24.1	0.3	19.4	26.4	4.7	15.0	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	36.2	7.9	21.6	24.1	0.3	19.4	26.4	4.7	15.0	41.7
Queue Length 50th (ft)	12	84	0	80	34	0	38	147	0	12	196
Queue Length 95th (ft)	34	159	53	148	75	0	84	273	57	34	#355
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	568	696	707	528	815	773	342	716	782	524	800
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.26	0.44	0.10	0.08	0.38	0.48	0.36	0.08	0.52

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)	37	164	170	213	78	54	120	314	259	39	369	11
Future Volume (veh/h)	37	164	170	213	78	54	120	314	259	39	369	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	178	185	232	85	59	130	341	282	42	401	12
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	478	342	290	443	517	439	297	564	478	296	483	14
Arrive On Green	0.04	0.18	0.18	0.13	0.28	0.28	0.07	0.30	0.30	0.04	0.27	0.27
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1807	54
Grp Volume(v), veh/h	40	178	185	232	85	59	130	341	282	42	0	413
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1861
Q Serve(g_s), s	1.1	5.8	7.3	6.9	2.3	1.9	3.5	10.5	10.2	1.1	0.0	14.1
Cycle Q Clear(g_c), s	1.1	5.8	7.3	6.9	2.3	1.9	3.5	10.5	10.2	1.1	0.0	14.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	478	342	290	443	517	439	297	564	478	296	0	497
V/C Ratio(X)	0.08	0.52	0.64	0.52	0.16	0.13	0.44	0.60	0.59	0.14	0.00	0.83
Avail Cap(c_a), veh/h	660	821	695	590	821	695	402	807	684	595	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.1	24.8	25.4	18.4	18.4	18.3	17.4	20.0	19.9	15.8	0.0	23.2
Incr Delay (d2), s/veh	0.0	2.6	4.9	0.4	0.3	0.3	0.4	1.0	1.2	0.1	0.0	4.0
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(95%),veh/ln	0.7	4.7	5.1	4.7	1.7	1.2	2.2	7.4	6.1	0.7	0.0	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	27.4	30.3	18.8	18.7	18.6	17.8	21.1	21.1	15.8	0.0	27.2
LnGrp LOS	B	C	C	B	B	B	B	C	C	B	A	C
Approach Vol, veh/h		403			376			753			455	
Approach Delay, s/veh		27.6			18.7			20.5			26.2	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	17.8	11.0	24.0	8.1	24.1	8.7	26.3
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	8.9	9.3	5.5	16.1	3.1	4.3	3.1	12.5
Green Ext Time (p_c), s	0.2	3.0	0.0	1.9	0.0	1.2	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	2	662	11	32	651	10	5	0	17	17	0	10
Future Vol, veh/h	2	662	11	32	651	10	5	0	17	17	0	10
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	200	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	720	12	35	708	11	5	0	18	18	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	719	0	0	732	0	0	1519	1519	726	1523	1520	714
Stage 1	-	-	-	-	-	-	730	730	-	784	784	-
Stage 2	-	-	-	-	-	-	789	789	-	739	736	-
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	882	-	-	873	-	-	97	119	425	97	119	431
Stage 1	-	-	-	-	-	-	414	428	-	386	404	-
Stage 2	-	-	-	-	-	-	384	402	-	409	425	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	882	-	-	873	-	-	91	114	425	90	114	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	114	-	90	114	-
Stage 1	-	-	-	-	-	-	413	427	-	385	388	-
Stage 2	-	-	-	-	-	-	359	386	-	390	424	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.4	22.3	41.7
HCM LOS			C	E

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	232	873	-	-	882	-	-	127
HCM Lane V/C Ratio	0.103	0.04	-	-	0.002	-	-	0.231
HCM Control Delay (s)	22.3	9.3	-	-	9.1	-	-	41.7
HCM Lane LOS	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	29	54	690	690	6
Future Vol, veh/h	3	29	54	690	690	6
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	3	32	59	750	750	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1622	754	757	0	-	0
Stage 1	754	-	-	-	-	-
Stage 2	868	-	-	-	-	-
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	113	409	854	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	105	409	854	-	-	-
Mov Cap-2 Maneuver	240	-	-	-	-	-
Stage 1	433	-	-	-	-	-
Stage 2	411	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.3	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	854	-	384	-	-
HCM Lane V/C Ratio	0.069	-	0.091	-	-
HCM Control Delay (s)	9.5	-	15.3	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	84	127	704	661	58
Future Vol, veh/h	40	84	127	704	661	58
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	150	-	-	250
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	43	91	138	765	718	63

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1759	718	781	0	-	0
Stage 1	718	-	-	-	-	-
Stage 2	1041	-	-	-	-	-
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	93	429	837	-	-	-
Stage 1	483	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	78	429	837	-	-	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	403	-	-	-	-	-
Stage 2	340	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.4	1.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	837	-	204	429	-	-
HCM Lane V/C Ratio	0.165	-	0.213	0.213	-	-
HCM Control Delay (s)	10.1	-	27.4	15.6	-	-
HCM Lane LOS	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.6	-	0.8	0.8	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	987	104	0	956	55	0	0	184	0	0	53
Future Vol, veh/h	0	987	104	0	956	55	0	0	184	0	0	53
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	-	-	150	-	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1073	113	0	1039	60	0	0	200	0	0	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	537	-	-	520
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	488	0	0	501
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	488	-	-	501
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	17.4	13.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	488	-	-	-	-	501
HCM Lane V/C Ratio	0.41	-	-	-	-	0.115
HCM Control Delay (s)	17.4	-	-	-	-	13.1
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	2	-	-	-	-	0.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	127	871	142	474	582	41	274	249	66	29
v/c Ratio	0.26	0.64	0.18	0.69	0.31	0.04	0.66	0.39	0.23	0.08
Control Delay	9.8	28.0	0.5	38.8	9.5	0.1	50.2	9.3	32.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	28.0	0.5	38.8	9.5	0.1	50.2	9.3	32.3	0.4
Queue Length 50th (ft)	29	238	0	163	91	0	86	39	33	0
Queue Length 95th (ft)	52	306	0	218	120	m0	128	85	68	0
Internal Link Dist (ft)		869			534					266
Turn Bay Length (ft)	300		300	300		250	150	150		
Base Capacity (vph)	487	1360	790	686	1890	952	446	641	286	379
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	0.26	0.64	0.18	0.69	0.31	0.04	0.61	0.39	0.23	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	801	131	436	535	38	252	0	229	61	0	27
Future Volume (veh/h)	117	801	131	436	535	38	252	0	229	61	0	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	871	142	474	582	41	274	0	249	66	0	29
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	533	1315	586	828	1848	824	347	198	548	271	0	79
Arrive On Green	0.09	0.37	0.37	0.08	0.17	0.17	0.10	0.00	0.11	0.04	0.00	0.05
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	3456	1870	1585	1781	0	1585
Grp Volume(v), veh/h	127	871	142	474	582	41	274	0	249	66	0	29
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1728	1870	1585	1781	0	1585
Q Serve(g_s), s	0.0	20.5	4.0	13.2	14.3	1.4	7.7	0.0	1.9	3.3	0.0	1.8
Cycle Q Clear(g_c), s	0.0	20.5	4.0	13.2	14.3	1.4	7.7	0.0	1.9	3.3	0.0	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	533	1315	586	828	1848	824	347	198	548	271	0	79
V/C Ratio(X)	0.24	0.66	0.24	0.57	0.31	0.05	0.79	0.00	0.45	0.24	0.00	0.37
Avail Cap(c_a), veh/h	533	1315	586	828	1848	824	449	243	586	299	0	95
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	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	0.00	1.00
Uniform Delay (d), s/veh	16.9	26.3	9.2	41.1	25.8	9.0	43.9	0.0	11.6	37.5	0.0	46.0
Incr Delay (d2), s/veh	0.2	2.6	1.0	1.0	0.4	0.1	7.0	0.0	0.6	0.5	0.0	2.8
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(95%),veh/ln	3.1	13.3	4.0	10.2	11.1	1.3	6.5	0.0	4.6	2.6	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	28.9	10.2	42.1	26.3	9.1	51.0	0.0	12.2	37.9	0.0	48.8
LnGrp LOS	B	C	B	D	C	A	D	A	B	D	A	D
Approach Vol, veh/h		1140			1097			523			95	
Approach Delay, s/veh		25.3			32.5			32.5			41.2	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	16.6	30.0	43.0	16.0	11.0	15.0	58.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	13.0	20.0	37.0	13.0	6.0	5.0	52.0
Max Q Clear Time (g_c+I1), s	5.3	3.9	15.2	22.5	9.7	3.8	2.0	16.3
Green Ext Time (p_c), s	0.0	0.5	0.8	5.2	0.3	0.0	0.1	4.0

Intersection Summary	
HCM 6th Ctrl Delay	29.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	994	43	79	735	0	55
Future Vol, veh/h	994	43	79	735	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	1080	47	86	799	0	60

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1127	0	-	540
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	616	-	0	486
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	616	-	-	486
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	486	-	-	616	-
HCM Lane V/C Ratio	0.123	-	-	0.139	-
HCM Control Delay (s)	13.4	-	-	11.8	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	-

Intersection	
Int Delay, s/veh	8.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	917	71	133	602	65	120
Future Vol, veh/h	917	71	133	602	65	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	0	200
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	997	77	145	654	71	130

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1074	0	1614	499
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	617	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	645	-	95	517
Stage 1	-	-	-	-	318	-
Stage 2	-	-	-	-	501	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	645	-	74	517
Mov Cap-2 Maneuver	-	-	-	-	74	-
Stage 1	-	-	-	-	318	-
Stage 2	-	-	-	-	388	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	75.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	74	517	-	-	645	-
HCM Lane V/C Ratio	0.955	0.252	-	-	0.224	-
HCM Control Delay (s)	188.4	14.3	-	-	12.2	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	4.9	1	-	-	0.9	-

Simulation

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	8011	7748	7925	7735	7839	7853
Vehs Exited	8001	7756	7948	7770	7852	7866
Starting Vehs	236	223	267	262	251	244
Ending Vehs	246	215	244	227	238	232
Travel Distance (mi)	4488	4360	4394	4360	4395	4400
Travel Time (hr)	276.3	258.1	258.8	255.5	266.6	263.1
Total Delay (hr)	140.5	126.8	126.2	123.8	134.3	130.3
Total Stops	11532	10850	10727	10615	11220	10990
Fuel Used (gal)	206.7	198.3	200.0	198.2	202.4	201.1

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1836	1798	1776	1832	1767	1800
Vehs Exited	1839	1796	1814	1856	1792	1822
Starting Vehs	236	223	267	262	251	244
Ending Vehs	233	225	229	238	226	223
Travel Distance (mi)	1025	1015	996	1054	995	1017
Travel Time (hr)	59.7	58.7	57.2	59.2	58.4	58.6
Total Delay (hr)	28.7	28.1	27.1	27.5	28.3	27.9
Total Stops	2495	2426	2337	2434	2380	2410
Fuel Used (gal)	46.5	45.9	45.1	47.2	45.4	46.0

Interval #2 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2204	2031	2144	2008	2148	2106
Vehs Exited	2149	1949	2099	1954	2079	2043
Starting Vehs	233	225	229	238	226	223
Ending Vehs	288	307	274	292	295	286
Travel Distance (mi)	1191	1114	1172	1120	1161	1152
Travel Time (hr)	72.6	66.1	69.4	66.1	71.2	69.1
Total Delay (hr)	36.5	32.5	34.0	32.4	36.2	34.3
Total Stops	2976	2813	2857	2779	2984	2876
Fuel Used (gal)	54.3	50.7	53.3	50.6	53.5	52.5

Interval #3 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2175	2095	2131	2088	2093	2115
Vehs Exited	2126	2105	2130	2093	2101	2109
Starting Vehs	288	307	274	292	295	286
Ending Vehs	337	297	275	287	287	293
Travel Distance (mi)	1205	1186	1181	1159	1191	1184
Travel Time (hr)	79.7	72.9	71.5	70.9	73.7	73.7
Total Delay (hr)	43.2	37.3	35.9	35.8	38.1	38.0
Total Stops	3356	3103	3013	2974	3172	3127
Fuel Used (gal)	57.1	54.5	54.0	53.8	55.4	55.0

Interval #4 Information

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1796	1824	1874	1807	1831	1824
Vehs Exited	1887	1906	1905	1867	1880	1886
Starting Vehs	337	297	275	287	287	293
Ending Vehs	246	215	244	227	238	232
Travel Distance (mi)	1067	1044	1045	1027	1048	1046
Travel Time (hr)	64.3	60.5	60.6	59.3	63.3	61.6
Total Delay (hr)	32.1	29.0	29.2	28.1	31.7	30.0
Total Stops	2705	2508	2520	2428	2684	2566
Fuel Used (gal)	48.8	47.2	47.6	46.7	48.1	47.7

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	R	L	T	T	L
Maximum Queue (ft)	165	84	67	115	72	56	228
Average Queue (ft)	63	17	33	50	29	11	127
95th Queue (ft)	117	57	78	93	60	38	198
Link Distance (ft)	316	316			441	441	299
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			50	325			
Storage Blk Time (%)		0	1				
Queuing Penalty (veh)		0	1				

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	51	55	44	111	124	75	103
Average Queue (ft)	22	13	5	30	37	59	42
95th Queue (ft)	50	42	25	87	95	70	86
Link Distance (ft)		441	441	483	483		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	4	
Queuing Penalty (veh)					1	7	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	213	149	156	268	212	224	408	278	156	205	220	291
Average Queue (ft)	103	91	95	160	164	163	155	130	29	121	124	123
95th Queue (ft)	183	141	145	246	223	243	315	216	84	198	216	245
Link Distance (ft)		548	548				2333	2333				387
Upstream Blk Time (%)												0
Queuing Penalty (veh)												2
Storage Bay Dist (ft)	300			300	200	200			200	250	250	
Storage Blk Time (%)				0	3	5	1	1	0	0	0	1
Queuing Penalty (veh)				0	7	11	6	1	0	0	0	4

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	NB	SB	SB	SB	SB	B54
Directions Served	T	R	L	T	T	R	T
Maximum Queue (ft)	193	157	165	281	248	215	14
Average Queue (ft)	26	17	43	152	119	77	0
95th Queue (ft)	99	72	102	247	217	161	10
Link Distance (ft)	387			351	351		423
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				2	1		
Storage Bay Dist (ft)		200	290			300	
Storage Blk Time (%)	0	0		1	1		
Queuing Penalty (veh)	0	0		1	2		

Intersection: 7: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	257	330	199	181	208	126	224	304	299
Average Queue (ft)	125	196	88	73	85	42	122	185	147
95th Queue (ft)	231	288	167	158	171	96	200	284	267
Link Distance (ft)		823		524	524	524	387	387	387
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	270		350						
Storage Blk Time (%)	0	1							
Queuing Penalty (veh)	0	3							

Intersection: 8: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	R	L	T	T
Maximum Queue (ft)	305	233	290	198	185	137	10	124	307	237
Average Queue (ft)	192	124	116	94	74	35	0	85	105	84
95th Queue (ft)	284	204	238	171	153	92	8	142	231	172
Link Distance (ft)		649			1054	1054			524	524
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	515		515	450			200	100		
Storage Blk Time (%)								12	4	
Queuing Penalty (veh)								42	6	

Intersection: 14: Douglas St & Drive 3

Movement	EB	EB	NB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	85	97	66	4
Average Queue (ft)	34	39	28	0
95th Queue (ft)	70	79	57	3
Link Distance (ft)	307			
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		150	150	150
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 15: Drive 4 & Colbern Rd

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	117	91
Average Queue (ft)	44	30
95th Queue (ft)	84	63
Link Distance (ft)	182	287
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: Drive 5 & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	R
Maximum Queue (ft)	97	204	251	85	196	207	132	147	16	174	232	100
Average Queue (ft)	33	88	140	34	114	133	56	64	2	81	146	35
95th Queue (ft)	74	162	222	67	173	188	108	125	11	191	217	73
Link Distance (ft)		502	502				531	531			304	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			300	300	300			250	150		150
Storage Blk Time (%)										1	12	0
Queuing Penalty (veh)										1	14	0

Intersection: 16: Drive 5 & Colbern Rd

Movement	SB	SB
Directions Served	L	TR
Maximum Queue (ft)	137	49
Average Queue (ft)	57	14
95th Queue (ft)	111	36
Link Distance (ft)	282	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		150
Storage Blk Time (%)	1	
Queuing Penalty (veh)	0	

Intersection: 819: Bend

Movement	WB	WB
Directions Served	T	
Maximum Queue (ft)	358	352
Average Queue (ft)	185	94
95th Queue (ft)	420	314
Link Distance (ft)	318	318
Upstream Blk Time (%)	2	1
Queuing Penalty (veh)	13	3
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	96	84	39	63	28	91	54	123	174	280	239	138
Average Queue (ft)	44	31	7	25	4	39	24	21	87	135	102	26
95th Queue (ft)	86	67	27	51	19	78	48	87	157	239	193	85
Link Distance (ft)	1012	1012	1012			981				604	604	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)								0	1	6	5	0
Queuing Penalty (veh)								0	1	7	3	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	137	152	150	159	82
Average Queue (ft)	60	84	73	90	34
95th Queue (ft)	110	129	139	151	66
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	48	105	118	43	246	215	71	56	77	40
Average Queue (ft)	10	26	45	11	97	55	20	15	32	15
95th Queue (ft)	31	78	102	37	211	155	53	44	68	40
Link Distance (ft)		2333	2333		1382	1382	394	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)		0			3					
Queuing Penalty (veh)		0			1					

Network Summary

Network wide Queuing Penalty: 141

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	9658	9820	9747	9826	9842	9777
Vehs Exited	9536	9772	9575	9689	9817	9675
Starting Vehs	294	298	327	312	328	310
Ending Vehs	416	346	499	449	353	410
Travel Distance (mi)	5363	5512	5386	5470	5570	5460
Travel Time (hr)	467.6	414.1	429.6	419.5	404.0	427.0
Total Delay (hr)	309.4	251.6	270.8	258.0	239.6	265.9
Total Stops	15771	16169	16475	17058	16119	16320
Fuel Used (gal)	269.2	261.0	260.6	261.2	261.0	262.6

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2259	2339	2211	2220	2280	2259
Vehs Exited	2247	2330	2268	2232	2240	2260
Starting Vehs	294	298	327	312	328	310
Ending Vehs	306	307	270	300	368	310
Travel Distance (mi)	1257	1296	1270	1241	1300	1273
Travel Time (hr)	75.1	78.8	76.0	76.9	81.1	77.5
Total Delay (hr)	38.0	40.4	38.6	40.0	42.7	40.0
Total Stops	3099	3254	3033	3182	3280	3172
Fuel Used (gal)	55.6	57.5	56.4	55.9	57.5	56.6

Interval #2 Information

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2597	2613	2621	2566	2633	2605
Vehs Exited	2471	2469	2425	2462	2572	2478
Starting Vehs	306	307	270	300	368	310
Ending Vehs	432	451	466	404	429	435
Travel Distance (mi)	1398	1428	1394	1391	1460	1414
Travel Time (hr)	107.3	101.2	98.9	93.1	105.2	101.1
Total Delay (hr)	66.1	59.2	57.6	52.1	62.2	59.4
Total Stops	4158	4068	4065	3910	4401	4119
Fuel Used (gal)	66.7	66.3	64.2	63.4	68.2	65.8

Interval #3 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2488	2611	2613	2674	2618	2600
Vehs Exited	2429	2626	2609	2560	2602	2564
Starting Vehs	432	451	466	404	429	435
Ending Vehs	491	436	470	518	445	472
Travel Distance (mi)	1363	1476	1445	1463	1453	1440
Travel Time (hr)	136.8	131.7	124.7	120.5	114.3	125.6
Total Delay (hr)	96.5	88.2	82.2	77.4	71.3	83.1
Total Stops	4293	4894	4839	4921	4453	4677
Fuel Used (gal)	72.4	74.7	72.2	71.8	70.3	72.3

Interval #4 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2314	2257	2302	2366	2311	2307
Vehs Exited	2389	2347	2273	2435	2403	2367
Starting Vehs	491	436	470	518	445	472
Ending Vehs	416	346	499	449	353	410
Travel Distance (mi)	1346	1313	1276	1376	1357	1334
Travel Time (hr)	148.4	102.5	130.2	129.0	103.5	122.7
Total Delay (hr)	108.8	63.7	92.4	88.6	63.4	83.4
Total Stops	4221	3953	4538	5045	3985	4350
Fuel Used (gal)	74.5	62.4	67.9	70.1	65.0	68.0

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	211	161	74	209	120	75	274	62
Average Queue (ft)	110	46	18	102	47	30	155	2
95th Queue (ft)	188	122	64	169	94	72	247	46
Link Distance (ft)	316	316			441	441	299	299
Upstream Blk Time (%)							0	0
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)			50	325				
Storage Blk Time (%)		5	0					
Queuing Penalty (veh)		6	0					

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	72	119	110	154	98	67	121
Average Queue (ft)	31	57	39	64	16	35	59
95th Queue (ft)	63	104	95	124	54	79	100
Link Distance (ft)		441	441	483	483		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					1	1	
Queuing Penalty (veh)					2	2	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	232	303	305	305	212	224	575	285	78	248	275	409
Average Queue (ft)	98	151	154	153	164	161	185	92	35	143	205	274
95th Queue (ft)	186	262	268	267	230	251	524	209	63	233	336	465
Link Distance (ft)		548	548				2333	2333				387
Upstream Blk Time (%)												7
Queuing Penalty (veh)												52
Storage Bay Dist (ft)	300			300	200	200			200	250	250	
Storage Blk Time (%)	0	1	1	0	8	10	0	0		1	2	16
Queuing Penalty (veh)	0	2	4	0	14	18	1	0		3	5	72

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	NB	SB	SB	SB	SB	B54
Directions Served	T	R	L	T	T	R	T
Maximum Queue (ft)	423	225	279	335	311	195	62
Average Queue (ft)	209	136	74	182	139	62	2
95th Queue (ft)	478	280	176	300	269	153	45
Link Distance (ft)	387			351	351		423
Upstream Blk Time (%)	4			0	0		
Queuing Penalty (veh)	31			2	0		
Storage Bay Dist (ft)		200	290			300	
Storage Blk Time (%)	7	2	0	2	0	0	
Queuing Penalty (veh)	40	5	0	2	1	0	

Intersection: 7: Douglas St & 470 WB

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	L	T	T	T	TR	R
Maximum Queue (ft)	246	289	299	483	522	484	233	272	260
Average Queue (ft)	114	186	166	228	218	188	92	134	130
95th Queue (ft)	231	273	311	466	471	453	180	256	257
Link Distance (ft)		823		524	524	524	387	387	387
Upstream Blk Time (%)				1	2	1	0		
Queuing Penalty (veh)				6	11	8	0		
Storage Bay Dist (ft)	270		350						
Storage Blk Time (%)	0	1	1	1					
Queuing Penalty (veh)	0	1	2	4					

Intersection: 8: Douglas St & 470 EB

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	R	T	T	T	R	L	T	T
Maximum Queue (ft)	375	334	211	475	936	867	216	125	344	301
Average Queue (ft)	228	200	81	377	523	370	35	99	148	112
95th Queue (ft)	333	296	179	554	1090	972	148	150	293	236
Link Distance (ft)		649			1054	1054			524	524
Upstream Blk Time (%)					5	2				
Queuing Penalty (veh)					38	14				
Storage Bay Dist (ft)	515		515	450			200	100		
Storage Blk Time (%)				22	14	3	0	20	5	
Queuing Penalty (veh)				74	47	11	0	62	7	

Intersection: 14: Douglas St & Drive 3

Movement	EB	EB	NB	SB
Directions Served	L	R	L	T
Maximum Queue (ft)	105	82	90	9
Average Queue (ft)	36	31	40	1
95th Queue (ft)	84	59	75	6
Link Distance (ft)	307			530
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		150	150	
Storage Blk Time (%)	0			
Queuing Penalty (veh)	0			

Intersection: 15: Drive 4 & Colbern Rd

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	153	48
Average Queue (ft)	62	22
95th Queue (ft)	120	42
Link Distance (ft)	182	287
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: Drive 5 & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	120	332	372	226	163	174	145	156	36	174	264	41
Average Queue (ft)	49	166	203	47	88	106	61	72	6	104	165	1
95th Queue (ft)	95	265	334	140	140	157	115	131	22	209	248	30
Link Distance (ft)		502	502				531	531			304	304
Upstream Blk Time (%)			0								0	
Queuing Penalty (veh)			0								0	
Storage Bay Dist (ft)	300			300	300	300			250	150		
Storage Blk Time (%)		0	2	0						1	20	
Queuing Penalty (veh)		0	3	0						2	26	

Intersection: 16: Drive 5 & Colbern Rd

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	142	95	42
Average Queue (ft)	55	34	12
95th Queue (ft)	113	72	31
Link Distance (ft)		282	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150		150
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	365	364
Average Queue (ft)	193	297
95th Queue (ft)	443	436
Link Distance (ft)	318	318
Upstream Blk Time (%)	3	12
Queuing Penalty (veh)	22	84
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	333	326	68	130	97	424	239	32	174	624	621	140
Average Queue (ft)	191	177	19	53	24	109	130	4	53	380	371	58
95th Queue (ft)	382	371	51	103	66	295	248	19	160	694	684	159
Link Distance (ft)	1012	1012	1012			981				604	604	
Upstream Blk Time (%)										14	14	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)						0	9		0	47	40	0
Queuing Penalty (veh)						0	15		0	17	30	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	124	153	201	212	117
Average Queue (ft)	59	86	122	134	22
95th Queue (ft)	112	135	191	203	77
Link Distance (ft)			1054	1054	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				1	0

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	55	203	221	64	218	188	73	61	90	40
Average Queue (ft)	17	56	74	13	93	51	22	14	36	14
95th Queue (ft)	42	149	174	43	185	136	56	42	81	38
Link Distance (ft)		2333	2333		1382	1382	394	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)		1			2					
Queuing Penalty (veh)		0			0					

Network Summary

Network wide Queuing Penalty: 748

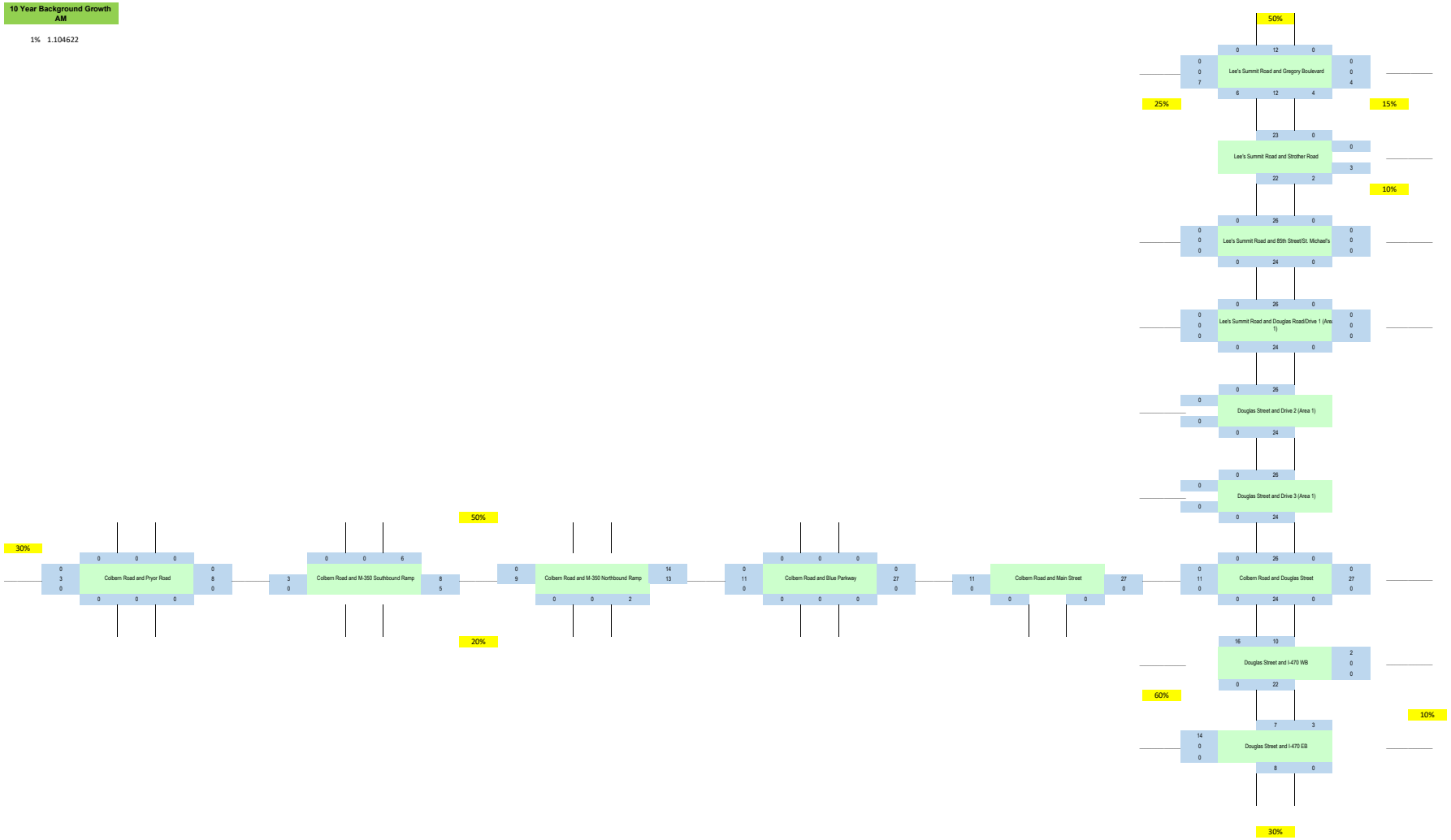
APPENDIX E

Build Year 2032 Plus Phases 1, 2, and 3 Development Conditions

Growth

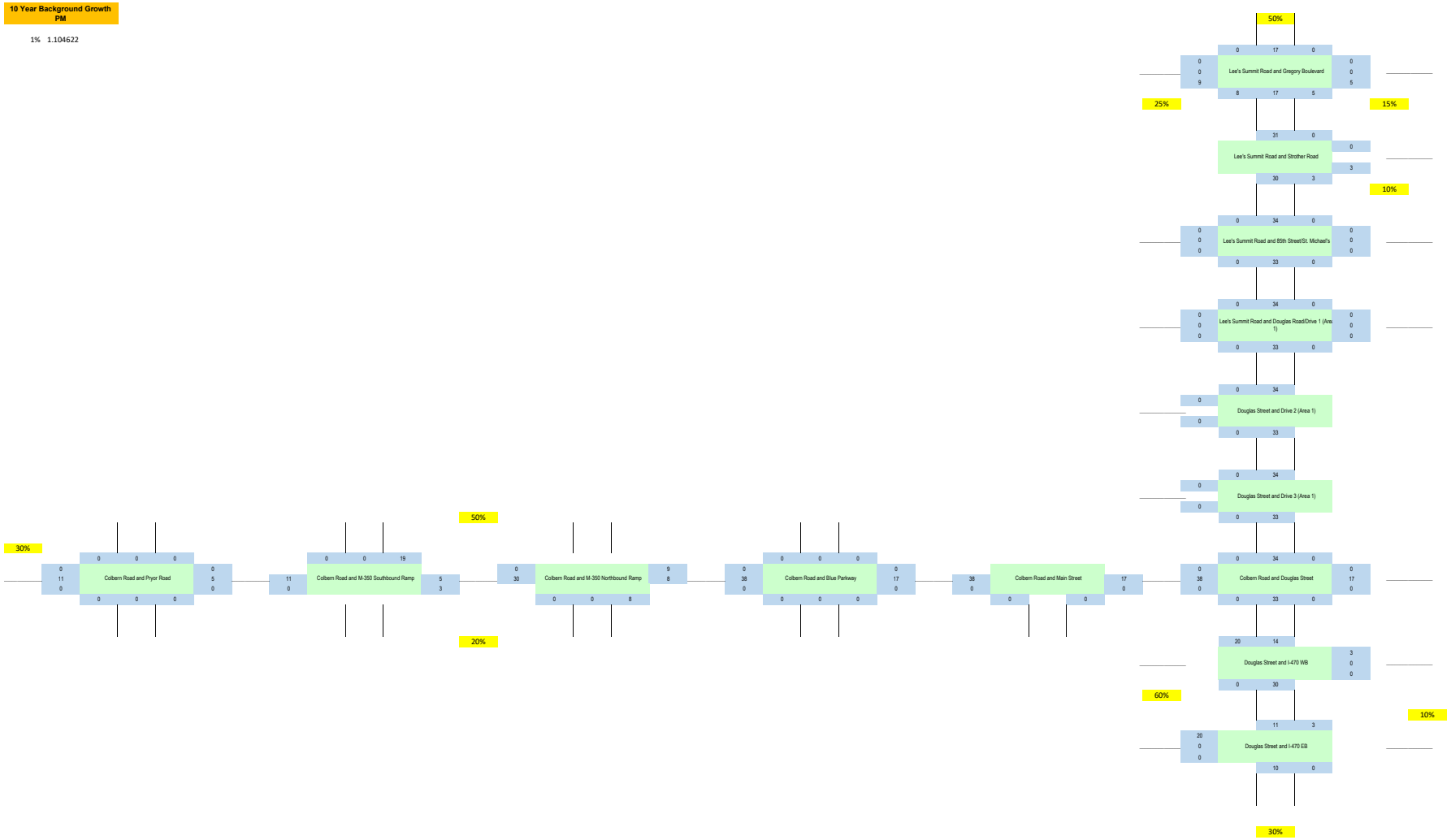
10 Year Background Growth AM

1% 1.104622



10 Year Background Growth PM

1% 1.104622



Trip Generation

Phase 3 (Areas 4 and 5)

Daily Trip Generation

ITE Code	Zone	Description	Land Use	Size		Trip Gen. Avg. Rate/Eq.	Daily Trips	Trip Distribution Enter	Trip Distribution Exit	Daily Trips Enter	Daily Trips Exit	Notes
220	4	Residential (4A)	Multifamily Housing (Low-Rise)	40	Units	Equation	332	50%	50%	166	166	
822	4	Office/Retail (4A)	Strip Retail Plaza (<40k)	15,000	Sq. Ft.	Average Rate	817	50%	50%	409	408	
220	4	Residential (4B)	Multifamily Housing (Low-Rise)	40	Units	Equation	332	50%	50%	166	166	
822	4	Office/Retail (4B)	Strip Retail Plaza (<40k)	15,000	Sq. Ft.	Average Rate	817	50%	50%	409	408	
720	4	Medical Office (4C)	Medical-Dental Office Building	45,000	Sq. Ft.	Average Rate	1,620	50%	50%	810	810	
720	4	Medical Office (4D)	Medical-Dental Office Building	45,000	Sq. Ft.	Average Rate	1,620	50%	50%	810	810	
221	4	Residential (4E-1)	Multifamily Housing (Mid-Rise)	120	Units	Average Rate	545	50%	50%	273	272	
712	4	Office/Retail (4E-1)	Strip Retail Plaza (<40k)	10,000	Sq. Ft.	Average Rate	545	50%	50%	273	272	
932	4	Restaurant (4E-1)	High-Turnover (Sit-Down) Restaurant	5,000	Sq. Ft.	Average Rate	536	50%	50%	268	268	
221	4	Residential (4E-2)	Multifamily Housing (Mid-Rise)	120	Units	Average Rate	545	50%	50%	273	272	
712	4	Office/Retail (4E-2)	Strip Retail Plaza (<40k)	10,000	Sq. Ft.	Average Rate	545	50%	50%	273	272	
932	4	Restaurant (4E-2)	High-Turnover (Sit-Down) Restaurant	5,000	Sq. Ft.	Average Rate	536	50%	50%	268	268	
221	4	Residential (4E-3)	Multifamily Housing (Mid-Rise)	100	Units	Average Rate	454	50%	50%	227	227	
712	4	Office/Retail (4E-3)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Average Rate	436	50%	50%	218	218	
932	4	Restaurant (4E-3)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	429	50%	50%	215	214	
221	4	Residential (4E-4)	Multifamily Housing (Mid-Rise)	100	Units	Average Rate	454	50%	50%	227	227	
712	4	Office/Retail (4E-4)	Strip Retail Plaza (<40k)	8,000	Sq. Ft.	Average Rate	436	50%	50%	218	218	
932	4	Restaurant (4E-4)	High-Turnover (Sit-Down) Restaurant	4,000	Sq. Ft.	Average Rate	429	50%	50%	215	214	
220	4	Lakeside Apartments 1-4	Multifamily Housing (Low-Rise)	240	Units	Equation	1,614	50%	50%	807	807	
221	4	Apartment Wrap 1-2	Multifamily Housing (Mid-Rise)	600	Units	Average Rate	2,724	50%	50%	1,362	1,362	
710	4	Commercial Office (4F)	General Office Building	20,000	Sq. Ft.	Equation	287	50%	50%	144	143	
710	4	Commercial Office (4G)	General Office Building	20,000	Sq. Ft.	Equation	287	50%	50%	144	143	
252	5	Senior Living Apartments	Senior Adult Housing - Multifamily	250	Units	Average Rate	810	50%	50%	405	405	
255	5	Senior Villas	Continuing Care Retirement Community	30	Units	Equation	261	50%	50%	131	130	
221	5	Apartment Units	Multifamily Housing (Mid-Rise)	240	Units	Average Rate	1,090	50%	50%	545	545	
210	5	Single Family Residential	Single-Family Detached Housing	120	Units	Equation	1,194	50%	50%	597	597	
Total							**18,501**			**9,853**	**9,842**	

AM Peak Hour Trip Generation

ITE Code	Zone	Description	Land Use	Size		Trip Gen. Avg. Rate/Eq.	AM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	AM Peak Hour Trips Enter	AM Peak Hour Trips Exit	AM Capture Trips Enter	AM Capture Trips Exit
220	4	Residential (4A)	Multifamily Housing (Low-Rise)	40	Units	Equation	36	24%	76%	9	27	7	22
822	4	Office/Retail (4A)	Strip Retail Plaza (<40k)	15000	Sq. Ft.	Average Rate	36	60%	40%	22	14	17	11
220	4	Residential (4B)	Multifamily Housing (Low-Rise)	40	Units	Equation	36	24%	76%	9	27	7	22
822	4	Office/Retail (4B)	Strip Retail Plaza (<40k)	15000	Sq. Ft.	Average Rate	36	60%	40%	22	14	17	11
720	4	Medical Office (4C)	Medical-Dental Office Building	45000	Sq. Ft.	Equation	118	79%	21%	93	25	73	20
720	4	Medical Office (4D)	Medical-Dental Office Building	45000	Sq. Ft.	Equation	118	79%	21%	93	25	73	20
221	4	Residential (4E-1)	Multifamily Housing (Mid-Rise)	120	Units	Equation	42	23%	77%	10	32	8	26
712	4	Office/Retail (4E-1)	Strip Retail Plaza (<40k)	10000	Sq. Ft.	Average Rate	24	60%	40%	14	10	11	8
932	4	Restaurant (4E-1)	High-Turnover (Sit-Down) Restaurant	5000	Sq. Ft.	Average Rate	48	55%	45%	26	22	20	18
221	4	Residential (4E-2)	Multifamily Housing (Mid-Rise)	120	Units	Equation	42	23%	77%	10	32	8	26
712	4	Office/Retail (4E-2)	Strip Retail Plaza (<40k)	10000	Sq. Ft.	Average Rate	24	60%	40%	14	10	11	8
932	4	Restaurant (4E-2)	High-Turnover (Sit-Down) Restaurant	5000	Sq. Ft.	Average Rate	48	55%	45%	26	22	20	18
221	4	Residential (4E-3)	Multifamily Housing (Mid-Rise)	100	Units	Equation	33	23%	77%	8	25	6	20
712	4	Office/Retail (4E-3)	Strip Retail Plaza (<40k)	8000	Sq. Ft.	Average Rate	19	60%	40%	11	8	9	6
932	4	Restaurant (4E-3)	High-Turnover (Sit-Down) Restaurant	4000	Sq. Ft.	Average Rate	39	55%	45%	21	18	16	14
221	4	Residential (4E-4)	Multifamily Housing (Mid-Rise)	100	Units	Equation	33	23%	77%	8	25	6	20
712	4	Office/Retail (4E-4)	Strip Retail Plaza (<40k)	8000	Sq. Ft.	Average Rate	19	60%	40%	11	8	9	6
932	4	Restaurant (4E-4)	High-Turnover (Sit-Down) Restaurant	4000	Sq. Ft.	Average Rate	39	55%	45%	21	18	16	14
220	4	Lakeside Apartments 1-4	Multifamily Housing (Low-Rise)	240	Units	Equation	98	24%	76%	24	74	19	59
221	4	Apartment Wrap 1-2	Multifamily Housing (Mid-Rise)	600	Units	Equation	253	23%	77%	58	195	45	156
710	4	Commercial Office (4F)	General Office Building	20000	Sq. Ft.	Equation	42	88%	12%	37	5	29	4
710	4	Commercial Office (4G)	General Office Building	20000	Sq. Ft.	Equation	42	88%	12%	37	5	29	4
252	5	Senior Living Apartments	Senior Adult Housing - Multifamily	250	Units	Average Rate	50	34%	66%	17	33	13	26
255	5	Senior Villas	Continuing Care Retirement Community	30	Units	Equation	26	65%	35%	17	9	17	9
221	5	Apartment Units	Multifamily Housing (Mid-Rise)	240	Units	Equation	94	23%	77%	22	72	17	58
210	5	Single Family Residential	Single-Family Detached Housing	120	Units	Equation	88	26%	74%	23	65	18	52
Total							**1,483**			**663**	**820**	**521**	**658**

PM Peak Hour Trip Generation

ITE Code	Zone	Description	Land Use	Size		Trip Gen. Avg. Rate/Eq.	PM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	PM Peak Hour Trips Enter	PM Peak Hour Trips Exit	PM Capture Trips Enter	PM Capture Trips Exit
220	4	Residential (4A)	Multifamily Housing (Low-Rise)	40	Units	Equation	38	63%	37%	24	14	19	11
822	4	Office/Retail (4A)	Strip Retail Plaza (<40k)	15000	Sq. Ft.	Equation	104	50%	50%	52	52	41	42
220	4	Residential (4B)	Multifamily Housing (Low-Rise)	40	Units	Equation	38	63%	37%	24	14	19	11
822	4	Office/Retail (4B)	Strip Retail Plaza (<40k)	15000	Sq. Ft.	Equation	104	50%	50%	52	52	41	42
720	4	Medical Office (4C)	Medical-Dental Office Building	45000	Sq. Ft.	Equation	180	30%	70%	54	126	43	101
720	4	Medical Office (4D)	Medical-Dental Office Building	45000	Sq. Ft.	Equation	180	30%	70%	54	126	43	101
221	4	Residential (4E-1)	Multifamily Housing (Mid-Rise)	120	Units	Equation	48	61%	39%	29	19	23	15
712	4	Office/Retail (4E-1)	Strip Retail Plaza (<40k)	10000	Sq. Ft.	Equation	78	50%	50%	39	39	31	31
932	4	Restaurant (4E-1)	High-Turnover (Sit-Down) Restaurant	5000	Sq. Ft.	Average Rate	46	61%	39%	28	18	22	14
221	4	Residential (4E-2)	Multifamily Housing (Mid-Rise)	120	Units	Equation	48	61%	39%	29	19	23	15
712	4	Office/Retail (4E-2)	Strip Retail Plaza (<40k)	10000	Sq. Ft.	Equation	78	50%	50%	39	39	31	31
932	4	Restaurant (4E-2)	High-Turnover (Sit-Down) Restaurant	5000	Sq. Ft.	Average Rate	46	61%	39%	28	18	22	14
221	4	Residential (4E-3)	Multifamily Housing (Mid-Rise)	100	Units	Equation	40	61%	39%	24	16	19	13
712	4	Office/Retail (4E-3)	Strip Retail Plaza (<40k)	8000	Sq. Ft.	Equation	67	50%	50%	34	33	27	26
932	4	Restaurant (4E-3)	High-Turnover (Sit-Down) Restaurant	4000	Sq. Ft.	Average Rate	37	61%	39%	23	14	18	11
221	4	Residential (4E-4)	Multifamily Housing (Mid-Rise)	100	Units	Equation	40	61%	39%	24	16	19	13
712	4	Office/Retail (4E-4)	Strip Retail Plaza (<40k)	8000	Sq. Ft.	Equation	67	50%	50%	34	33	27	26
932	4	Restaurant (4E-4)	High-Turnover (Sit-Down) Restaurant	4000	Sq. Ft.	Average Rate	37	61%	39%	23	14	18	11
220	4	Lakeside Apartments 1-4	Multifamily Housing (Low-Rise)	240	Units	Equation	124	63%	37%	78	46	62	37
221	4	Apartment Wrap 1-2	Multifamily Housing (Mid-Rise)	600	Units	Equation	235	61%	39%	143	92	113	74
710	4	Commercial Office (4F)	General Office Building	20000	Sq. Ft.	Equation	44	17%	83%	7	37	6	30
710	4	Commercial Office (4G)	General Office Building	20000	Sq. Ft.	Equation	44	17%	83%	7	37	6	30
252	5	Senior Living Apartments	Senior Adult Housing - Multifamily	250	Units	Average Rate	63	56%	44%	35	28	28	22
255	5	Senior Villas	Continuing Care Retirement Community	30	Units	Equation	60	39%	61%	23	37	23	37
221	5	Apartment Units	Multifamily Housing (Mid-Rise)	240	Units	Equation	94	61%	39%	57	37	45	30
210	5	Single Family Residential	Single-Family Detached Housing	120	Units	Equation	118	63%	37%	74	44	58	35
Total							**2,058**			**1,038**	**1,020**	**827**	**823**

Internal Capture Land Use Breakdown

Zone	Land Use	AM Peak Enter	AM Peak Exit	PM Peak Enter	PM Peak Exit
Zone 4	Office	260	60	122	326
	Retail	94	64	250	248
	Restaurant	94	80	102	64
	Entertainment	-	-	-	-
	Residential	136	437	375	236
	Hotel	-	-	-	-
	Other	-	-	-	-
Total		**584**	**641**	**849**	**874**
Zone 5	Office	-	-	-	-
	Retail	-	-	-	-
	Restaurant	-	-	-	-
	Entertainment	-	-	-	-
	Residential	79	179	189	146
	Hotel	-	-	-	-
	Other	-	-	-	-
Total		**79**	**179**	**189**	**146**

Internal Capture Rate

	AM	*PM*
Total	**21%**	**21%**
Entering	**22%**	**21%**
Exiting	**20%**	**20%**

	AM	*PM*
Total	**0%**	**0%**
Entering	**0%**	**0%**
Exiting	**0%**	**0%**

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 4 (Phase 3)	**Date:**	2-Dec-22
Analysis Year:	2032	**Checked By:**	
Analysis Period:	**AM Peak Hour Period**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				320	260	60
Retail				158	94	64
Restaurant				174	94	80
Cinema/Entertainment				0		
Residential				573	136	437
Hotel				0		
All Other Land Uses[2]				0		
Total				1225	584	641

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1275	775		1500	
Retail	1275		1200		1550	
Restaurant	775	1200			925	
Cinema/Entertainment						
Residential	1500	1550	925			
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		18	24	0	0	0
Retail	11		9	0	3	0
Restaurant	27	8		0	4	0
Cinema/Entertainment	0	0	0		0	0
Residential	9	5	21	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,347	642	705
Internal Capture Percentage	21%	22%	20%
External Vehicle-Trips[3]	972	457	515
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	16%	64%
Retail	30%	33%
Restaurant	52%	44%
Cinema/Entertainment	N/A	N/A
Residential	5%	7%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Aria (Discovery) TIS	**Organization:**	Olsson
Project Location:	Lee's Summit, MO	**Performed By:**	JSC
Scenario Description:	Zone 4 (Phase 3)	**Date:**	2-Dec-22
Analysis Year:	2032	**Checked By:**	
Analysis Period:	**PM Peak Hour Period**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				448	122	326
Retail				498	250	248
Restaurant				166	102	64
Cinema/Entertainment				0		
Residential				611	375	236
Hotel				0		
All Other Land Uses[2]				0		
Total				1723	849	874

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.10			1.10		
Retail	1.10			1.10		
Restaurant	1.10			1.10		
Cinema/Entertainment	1.10			1.10		
Residential	1.10			1.10		
Hotel	1.10			1.10		
All Other Land Uses[2]	1.10			1.10		

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1275	775		1500	
Retail	1275		1200		1550	
Restaurant	775	1200			925	
Cinema/Entertainment						
Residential	1500	1550	925			
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		15	2	0	6	0
Retail	5		32	0	54	0
Restaurant	2	29		0	12	0
Cinema/Entertainment	0	0	0		0	0
Residential	10	16	12	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,896	934	962
Internal Capture Percentage	21%	21%	20%
External Vehicle-Trips[3]	1,368	671	697
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	13%	6%
Retail	22%	33%
Restaurant	41%	61%
Cinema/Entertainment	N/A	N/A
Residential	17%	15%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Turn Lane Warrants

16.1. Left-Turn Lane Standards

16.1.A. Left-turn lanes shall be provided on all approaches to intersections controlled by, or planned to be controlled by, traffic signals.

16.1.B. Left-turn lanes shall be provided on all arterial streets at the intersection with other arterial and collector streets. Left-turn lanes shall be provided on minor arterial streets at the intersection with any local street or driveway where the left-turn volume is at least 20 vehicles in any hour. On major arterial streets, left-turn lanes shall be at the intersection with all connectors (an exception may be granted for a singular, existing, residential lot).

16.1.C. Left-turn lanes shall be provided on collector streets at the intersection with a connector serving non-residential development where the left-turn volume is at least 30 vehicles in any hour and should be provided where the left-turn volume is less than 30 vehicles in any hour.

16.1.D. Left-turn lanes shall be provided on non-residential connectors intersecting with major arterial streets (where left-turn egress is permitted). Left-turn lanes shall be provided on non-residential connectors intersecting minor arterial streets (where left-turn egress is permitted) where the left-turn volume is at least 20 vehicles in any hour. Left-turn lanes should be provided on any connector at any location as recommended by a traffic study or where the left-turn lane provides design efficiencies desired by the owner/developer with exception of access associated with residential property.

16.1.E. Left-turn lanes shall be provided at all median openings on roadways with medians.

Left Turn Lane Warrants						
			Left Turn Volume			
Intersection	Movement	Street Classification	AM	PM	Other	Meets Warrant
Blue Parkway and Colbern Road (roundabout)	Southbound	Major Arterial	5	41	Arterial/Arterial	Roundabout
	Eastbound	Major Arterial	9	11	Arterial/Arterial	Roundabout
	Northbound	Major Arterial	105	151	Arterial/Arterial	Roundabout
	Westbound	Major Arterial	129	121	Arterial/Arterial	Roundabout
Main Street and Colbern Road	Westbound	Major Arterial	112	128	Arterial/Collector, Median	YES, 200' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	4	17	Arterial/Collector	YES, 200' Required
	Eastbound	Driveway	11	5	Driveway/Arterial	NO
Douglas Street and Drive 2	Eastbound	Driveway	6	3	Driveway/Arterial	YES, 150' Required
Colbern Road and Drive 8	Westbound	Major Arterial	148	219	Arterial/Driveway	YES, 200' Required
Main Street and Drive 9	Southbound	Collector	90	133	Collector/Driveway	YES, 150' Required
	Westbound	Driveway	3	4	Driveway/Collector	NO
Main Street and Drive 10	Southbound	Collector	38	55	Collector/Driveway	YES, 150' Required
	Westbound	Driveway	7	10	Driveway/Collector	NO
Lee's Summit Road and Drive 11	Northbound	Major Arterial	28	65	Arterial/Driveway	YES, 200' Required
	Eastbound	Driveway	11	9	Driveway/Arterial	NO
Lee's Summit Road and Drive 12	Northbound	Major Arterial	28	65	Arterial/Driveway	YES, 200' Required
	Eastbound	Driveway	10	9	Driveway/Arterial	NO

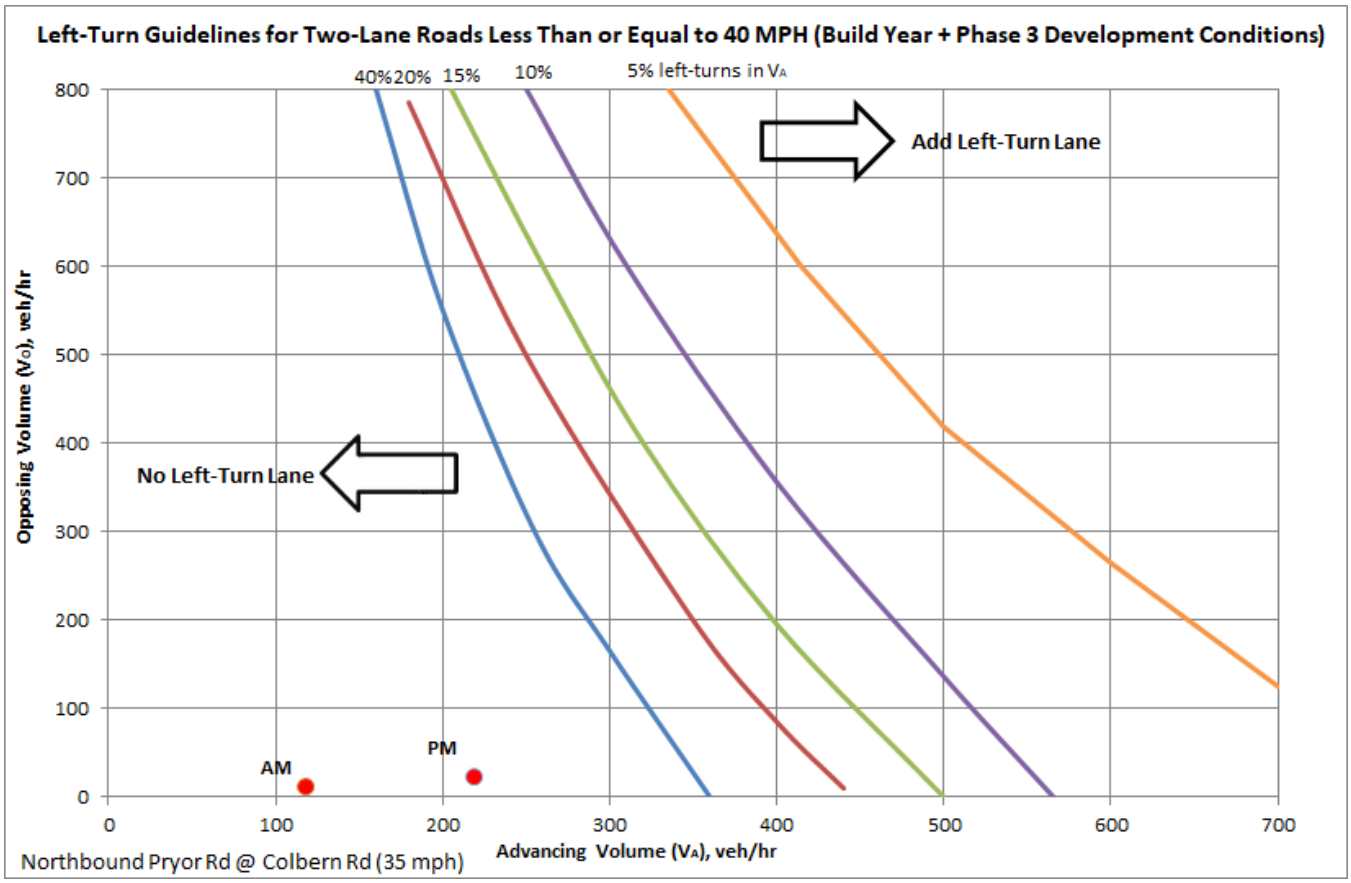
16.2. Right-Turn Lane Standards

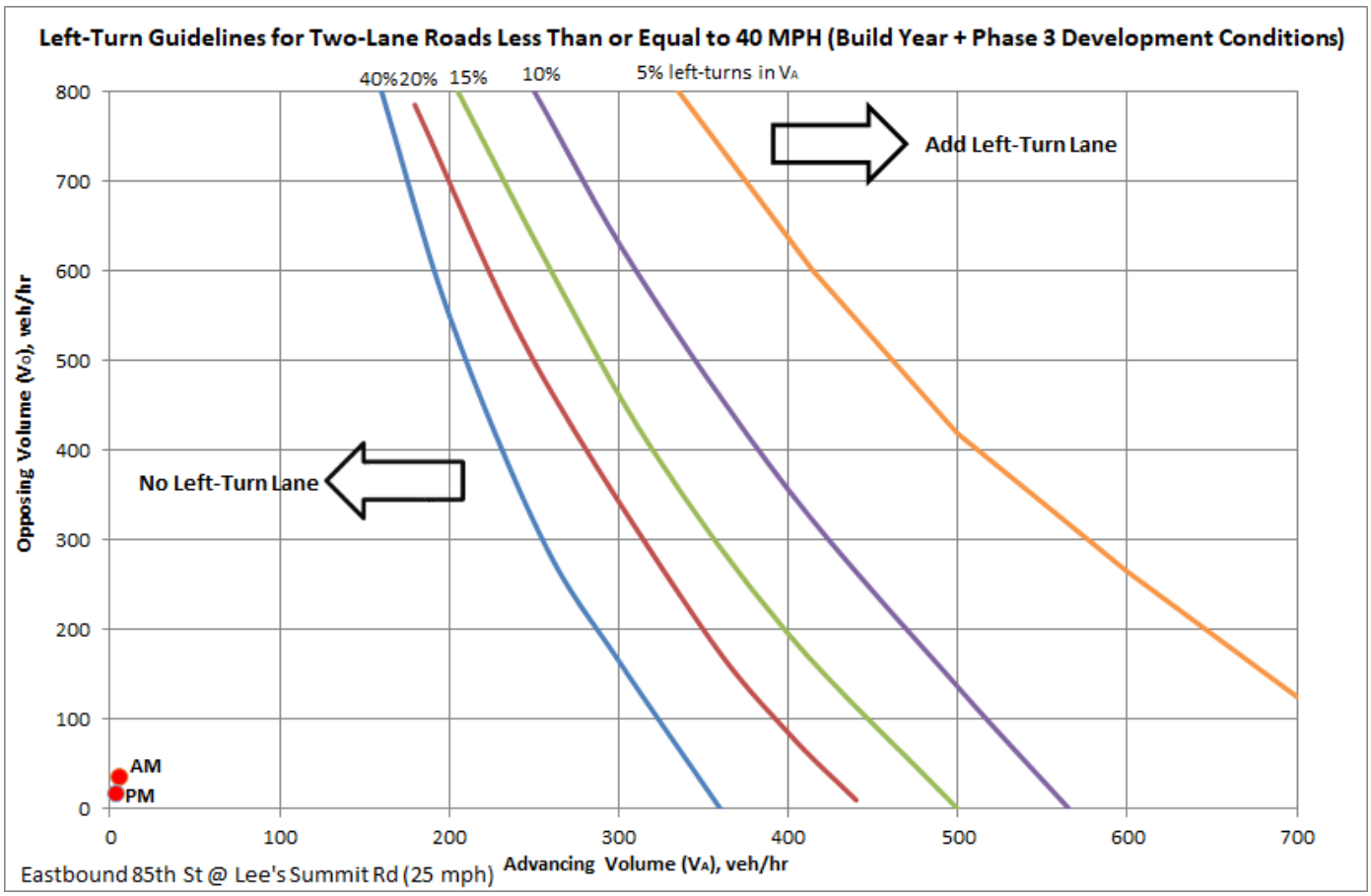
16.2.A. Required on arterial streets at each intersecting street or driveway where the right-turn volume on the major arterial street is or is projected to be at least 30 vehicles in any hour, or the right-turn volume on the minor arterial street is or is projected to be at least 60 vehicles in any hour. Minimum length should be 250 feet plus the taper on a major arterial at the intersection of another arterial street or 200 feet plus the taper on a minor arterial at the intersection with another arterial street or on a major arterial at the intersection of a collector and 150 feet plus the taper at other locations along arterial streets.

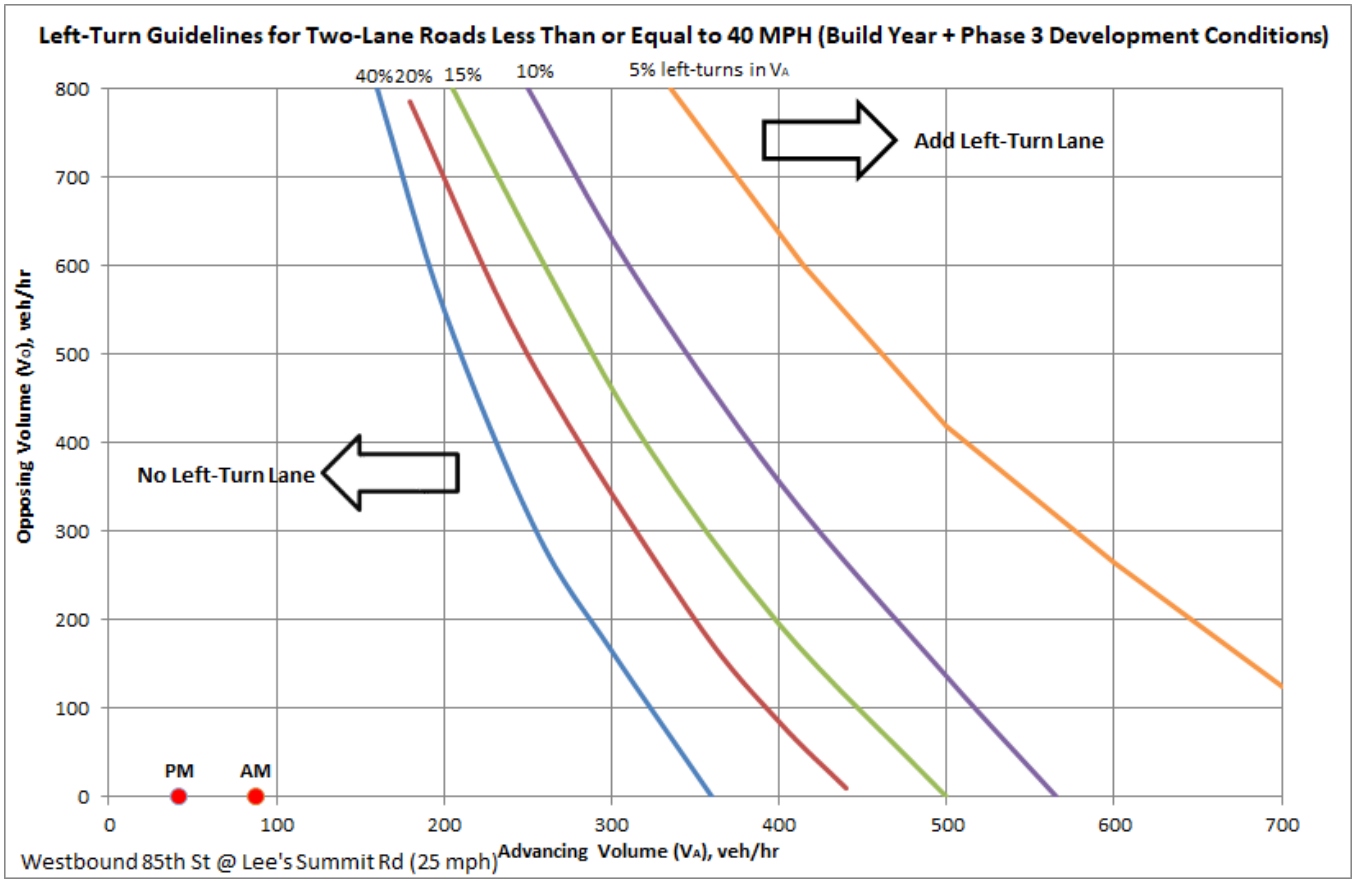
16.2.B. Required on collector streets in non-residential areas at the intersection with any street or driveway where the right-turn volume on the collector street is or is projected to be at least 100 vehicles in any hour. The minimum length should be 100 feet plus the taper.

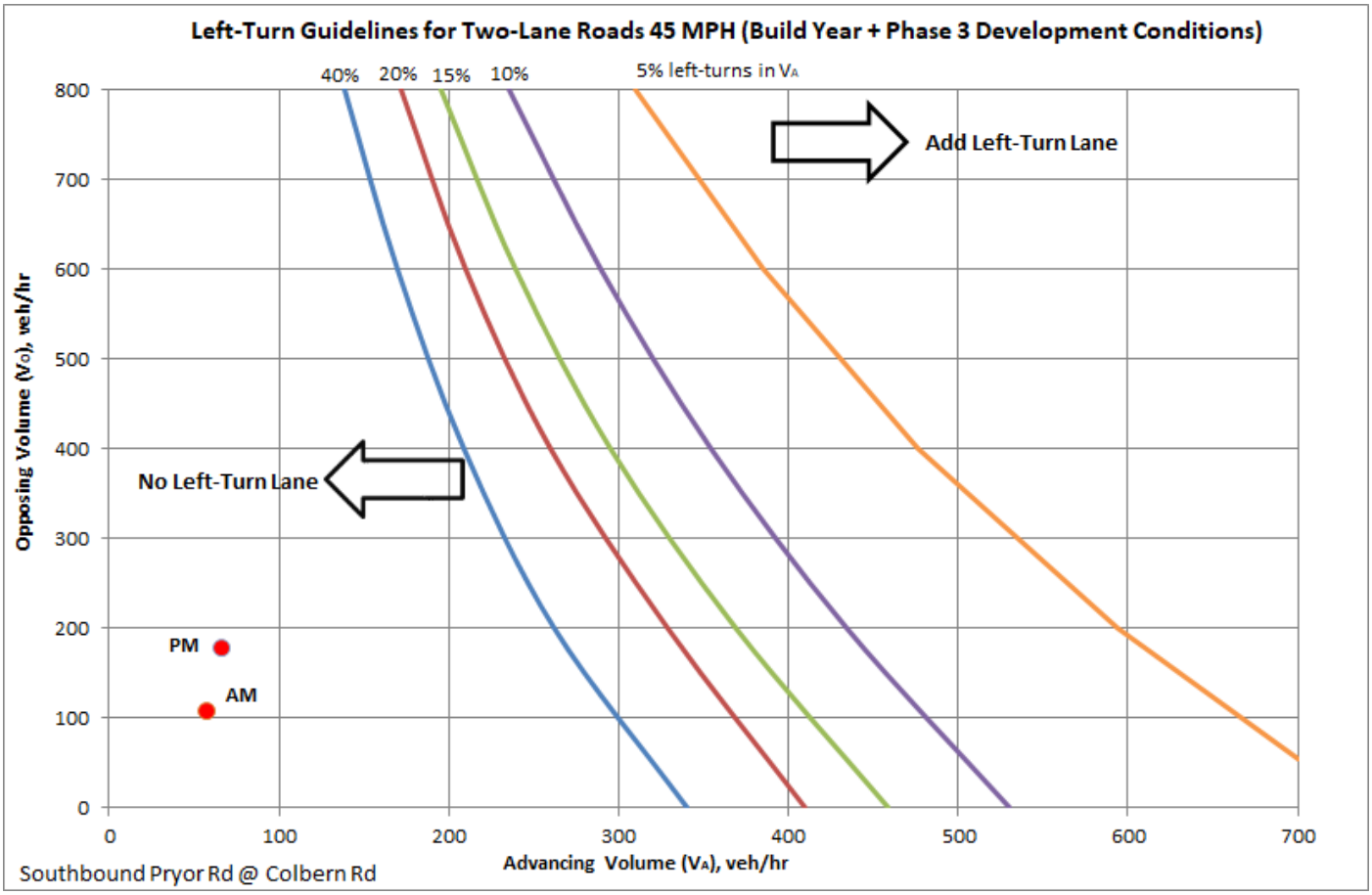
16.2.C. The length of the right-turn lane shall be increased as necessary to accommodate estimated queue length. The length of the right-turn lane at intersections controlled by traffic signals or roundabouts should be increased, if necessary, based on the longer of the queues in the turn lane or the adjacent through lane.

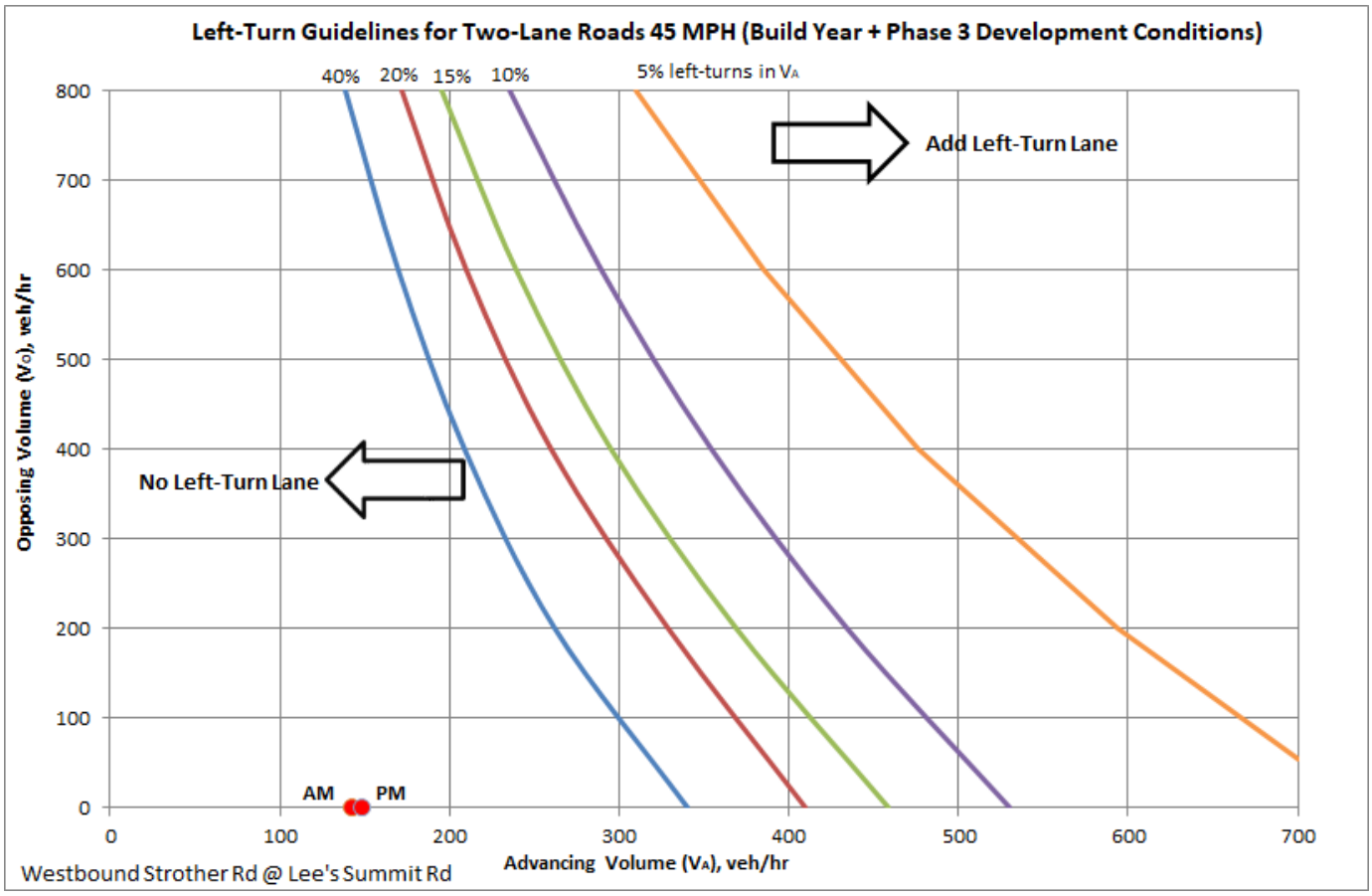
Right Turn Lane Warrants					
			Right Turn Volume		
Intersection	Movement	Street Classification	AM	PM	Meets Warrant
Blue Parkway and Colbern Road	Southbound	Major Arterial	3	12	NO
	Westbound	Major Arterial	19	6	NO
Main Street and Colbern Road	Eastbound	Major Arterial	152	158	YES, 250' Required
Douglas Road and Lee's Summit Road	Westbound	Collector	3	10	NO
	Eastbound	Collector	32	17	NO
	Southbound	Major Arterial	4	11	NO
	Northbound	Major Arterial	10	10	NO
Colbern Road and Drive 5	Southbound	Driveway	35	27	NO
	Northbound	Driveway	183	229	YES, 100' Required
Douglas Street and Drive 2	Southbound	Major Arterial	2	6	NO
	Eastbound	Driveway	54	29	NO
Colbern Road and Drive 8	Eastbound	Major Arterial	68	100	YES, 250' Required
	Northbound	Driveway	167	227	RIRO
Main Street and Drive 9	Northbound	Collector	3	4	NO
	Westbound	Driveway	135	183	YES, 100' Required
Main Street and Drive 10	Northbound	Collector	6	9	NO
	Westbound	Driveway	59	81	NO
Lee's Summit Road and Drive 11	Southbound	Major Arterial	5	12	NO
	Eastbound	Driveway	62	53	NO
Lee's Summit Road and Drive 12	Southbound	Major Arterial	4	12	NO
	Eastbound	Driveway	62	53	NO

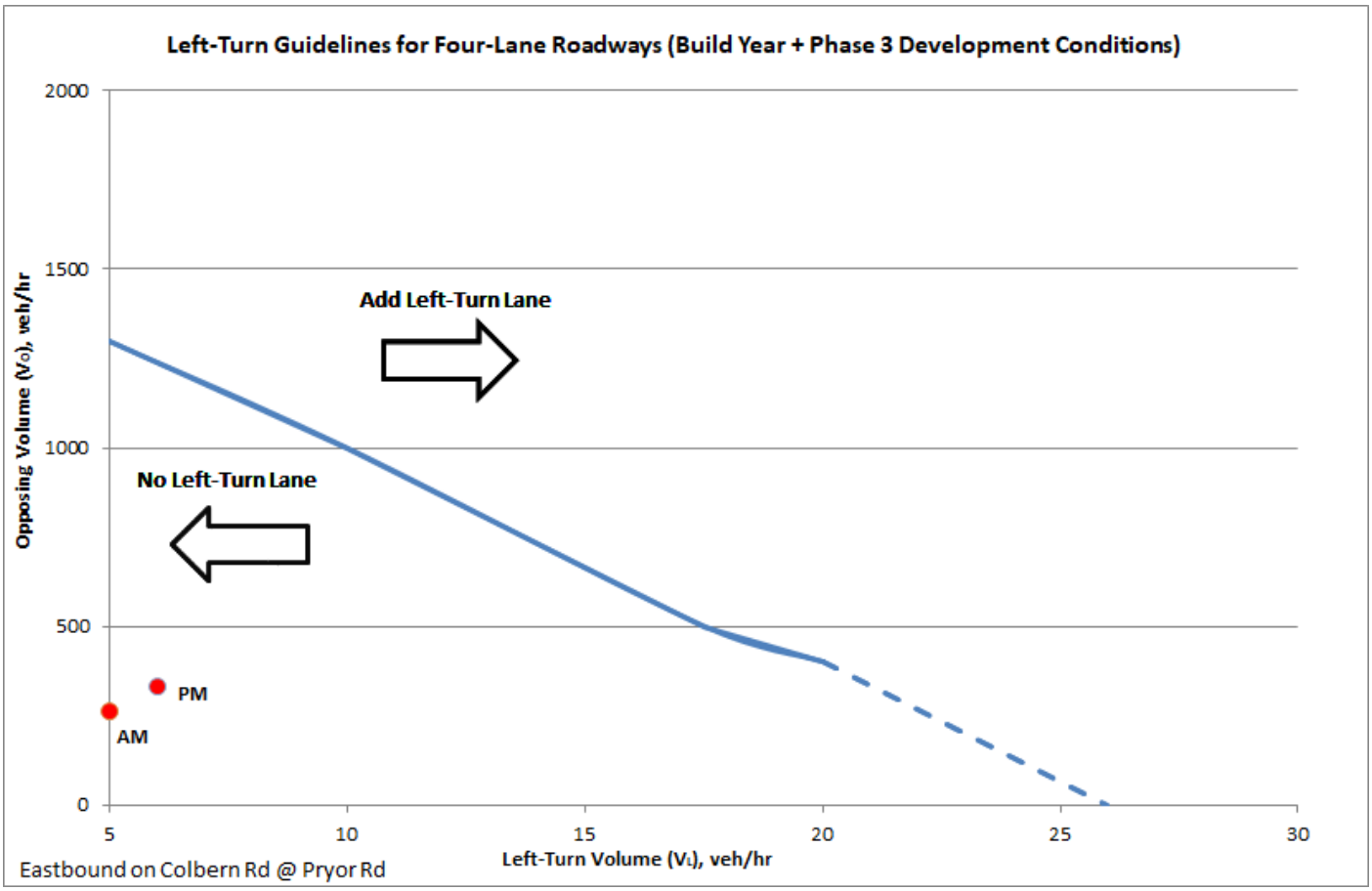

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Build Year + Phase 3 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Northbound Pryor Rd @ Colbern Rd (35 mph)

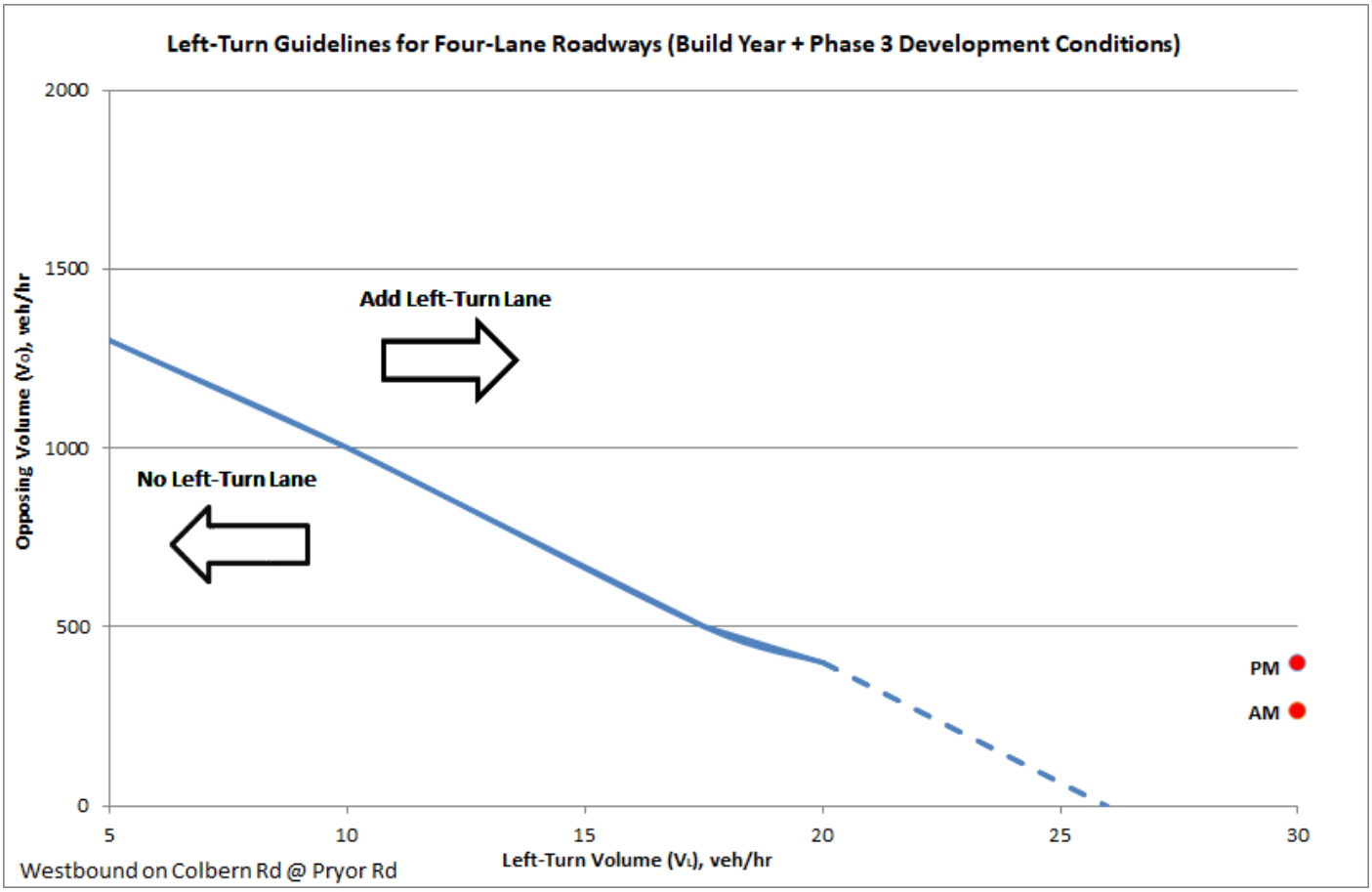

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Build Year + Phase 3 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Eastbound 85th St @ Lee's Summit Rd (25 mph)

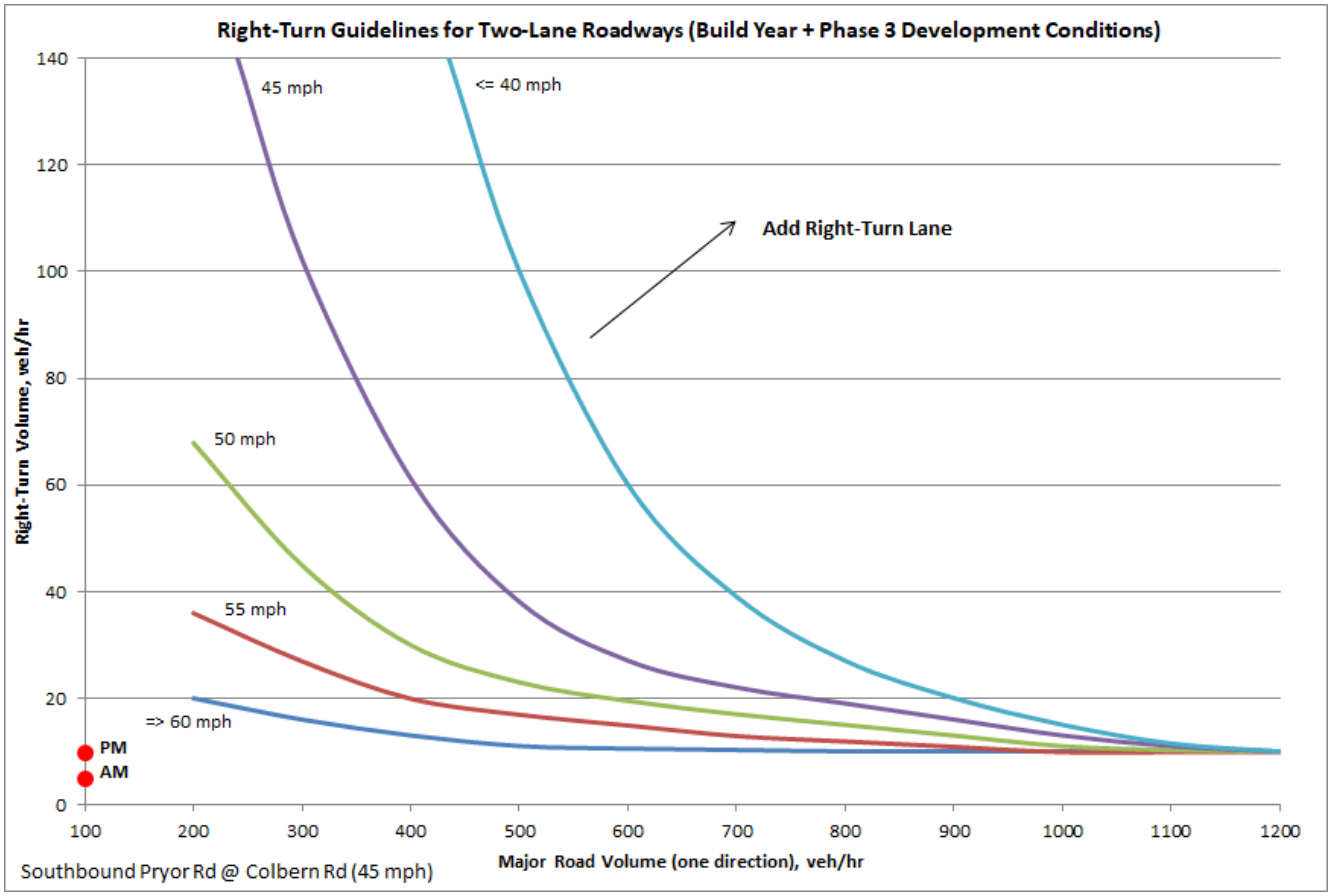

Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH (Build Year + Phase 3 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound 85th St @ Lee's Summit Rd (25 mph)

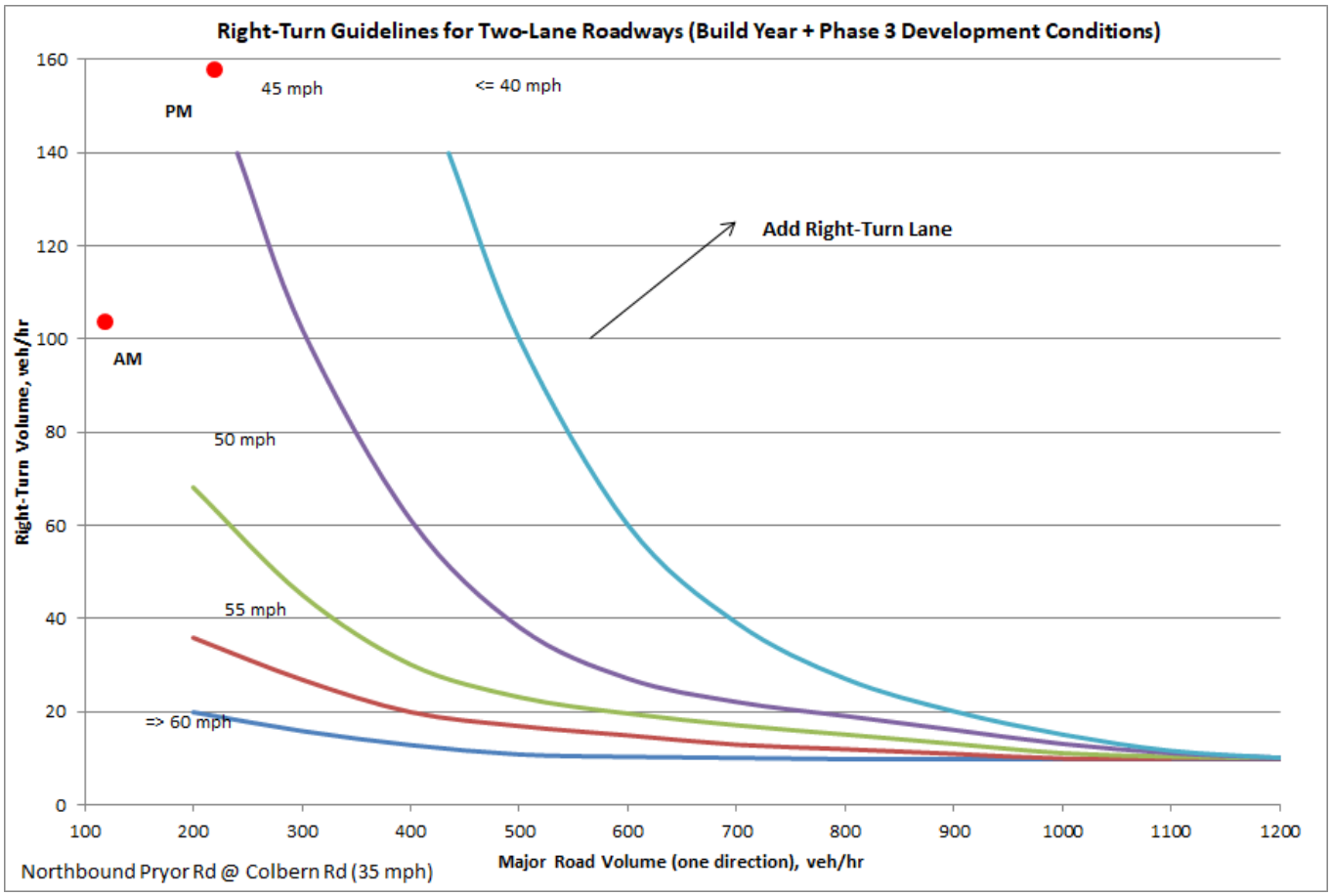

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Build Year + Phase 3 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Southbound Pryor Rd @ Colbern Rd

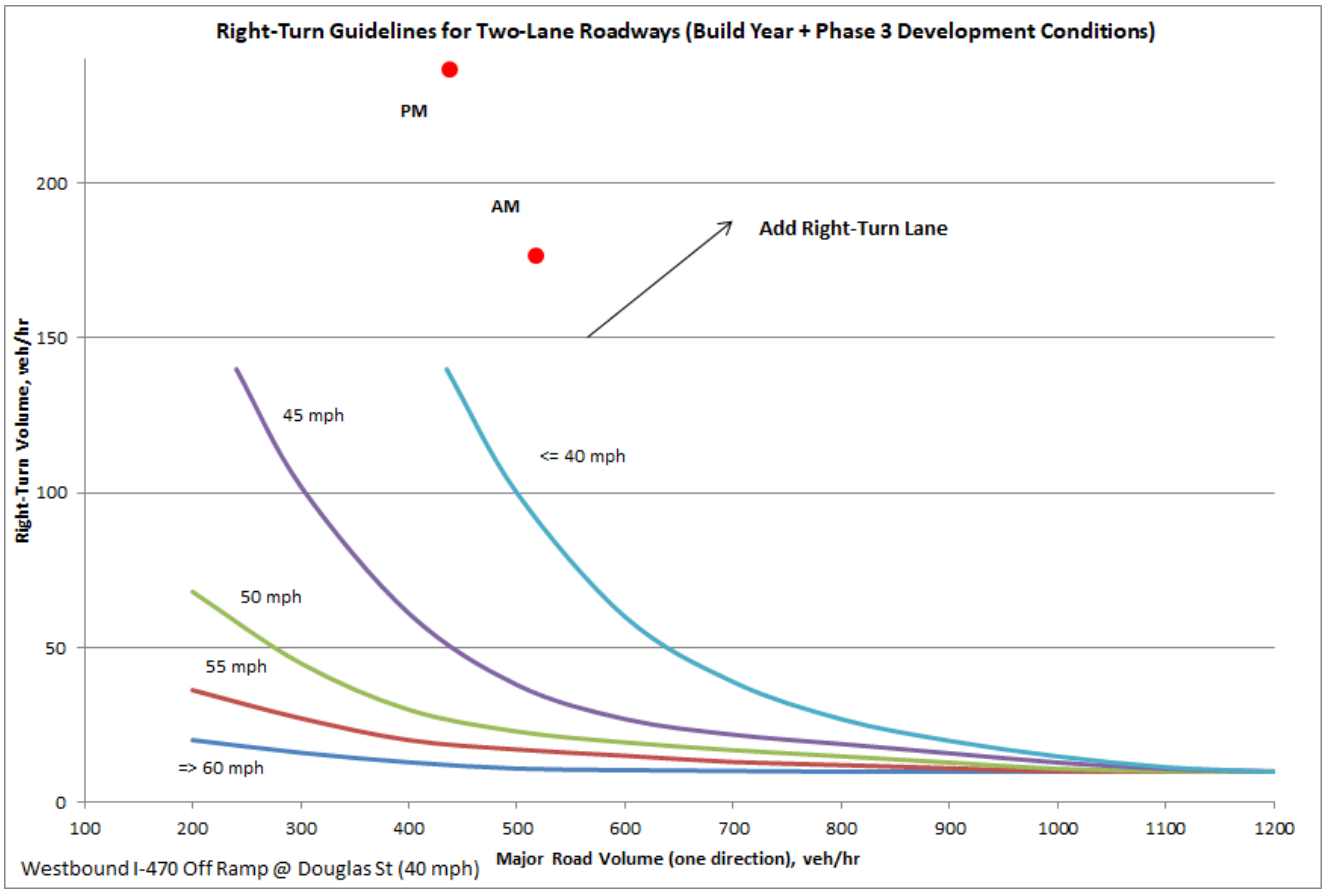

Left-Turn Guidelines for Two-Lane Roads 45 MPH (Build Year + Phase 3 Development Conditions)
40%
20%
15%
10%
5% left-turns in VA
Add Left-Turn Lane
No Left-Turn Lane
AM
PM
Opposing Volume (VO), veh/hr
Advancing Volume (VA), veh/hr
0
100
200
300
400
500
600
700
800
Westbound Strother Rd @ Lee's Summit Rd

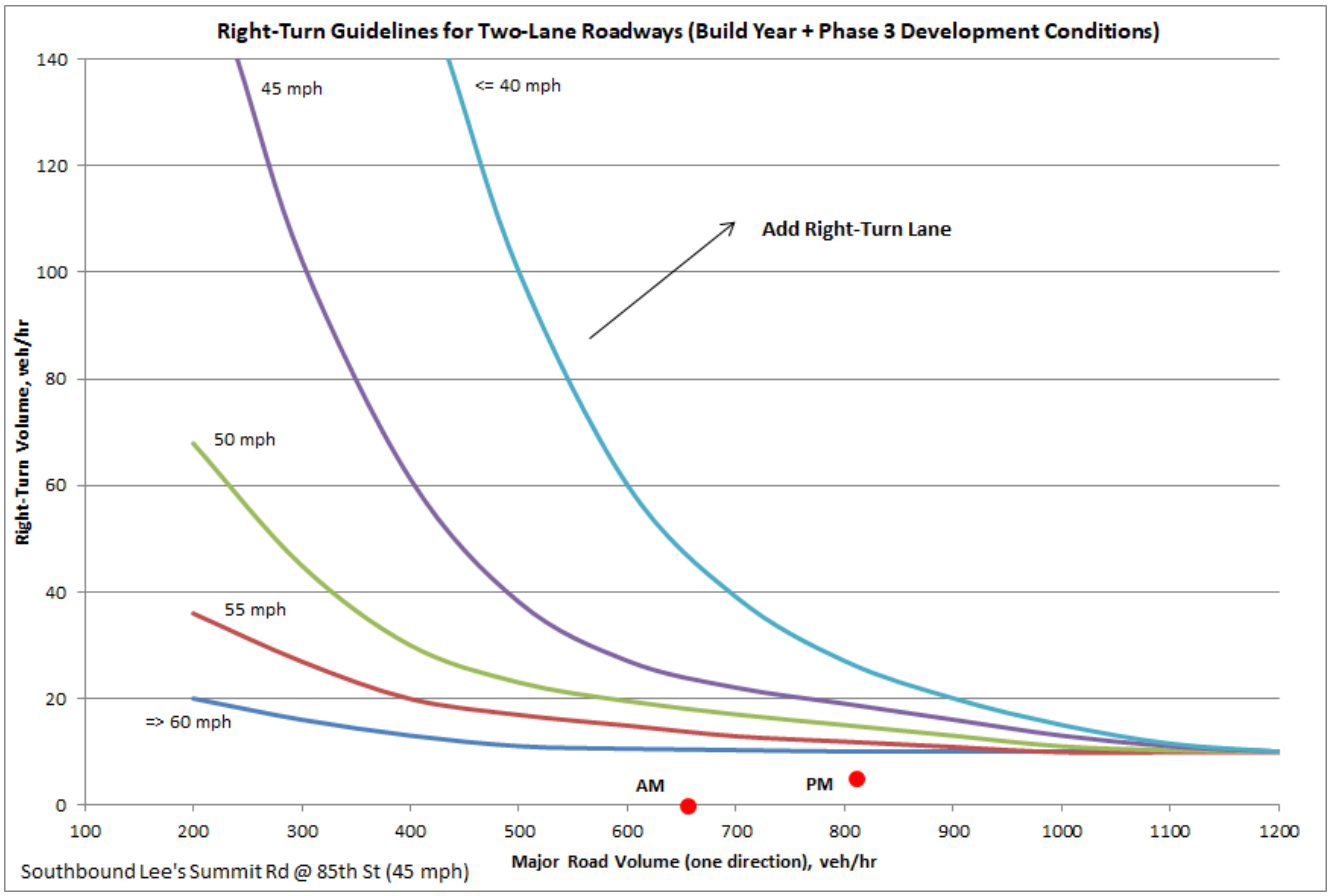

Left-Turn Guidelines for Four-Lane Roadways (Build Year + Phase 3 Development Conditions)
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
Opposing Volume (VO), veh/hr
Left-Turn Volume (VL), veh/hr
0
500
1000
1500
2000
5
10
15
20
25
30
Eastbound on Colbern Rd @ Pryor Rd

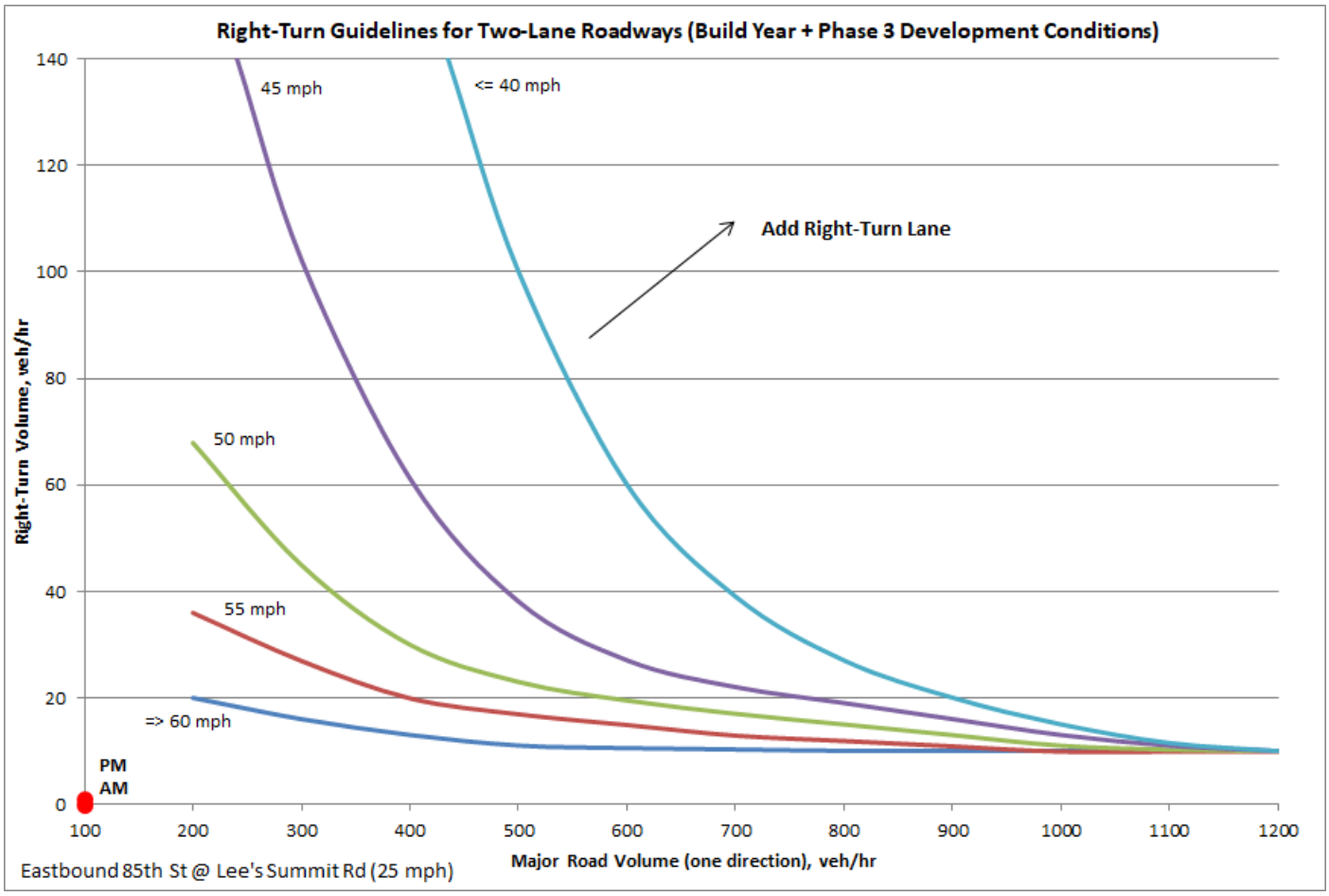

Left-Turn Guidelines for Four-Lane Roadways (Build Year + Phase 3 Development Conditions)
Opposing Volume (Vo), veh/hr
2000
1500
1000
500
0
Add Left-Turn Lane
No Left-Turn Lane
PM
AM
5
10
15
20
25
30
Left-Turn Volume (VL), veh/hr
Westbound on Colbern Rd @ Pryor Rd

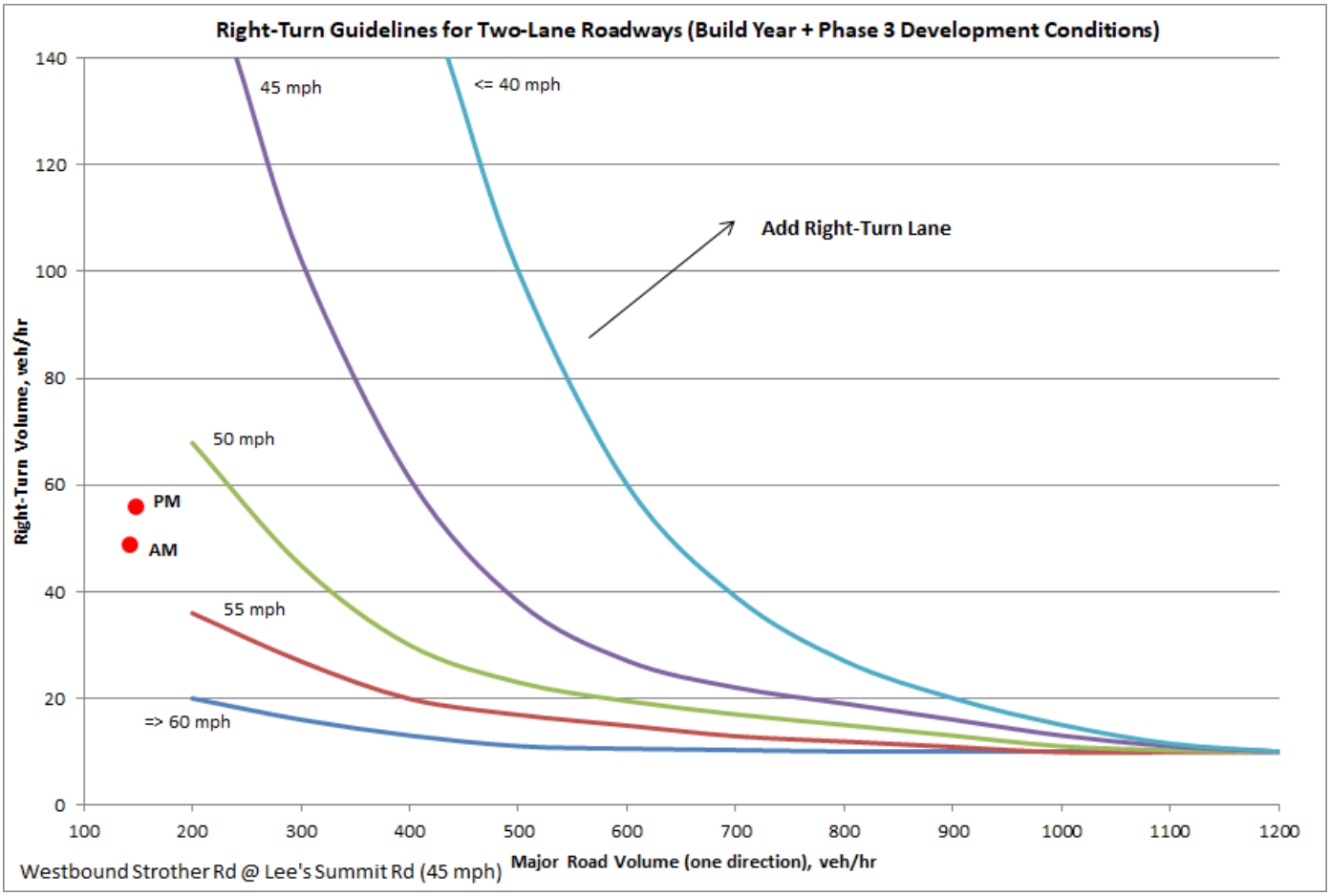

Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 3 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
PM
AM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Southbound Pryor Rd @ Colbern Rd (45 mph)

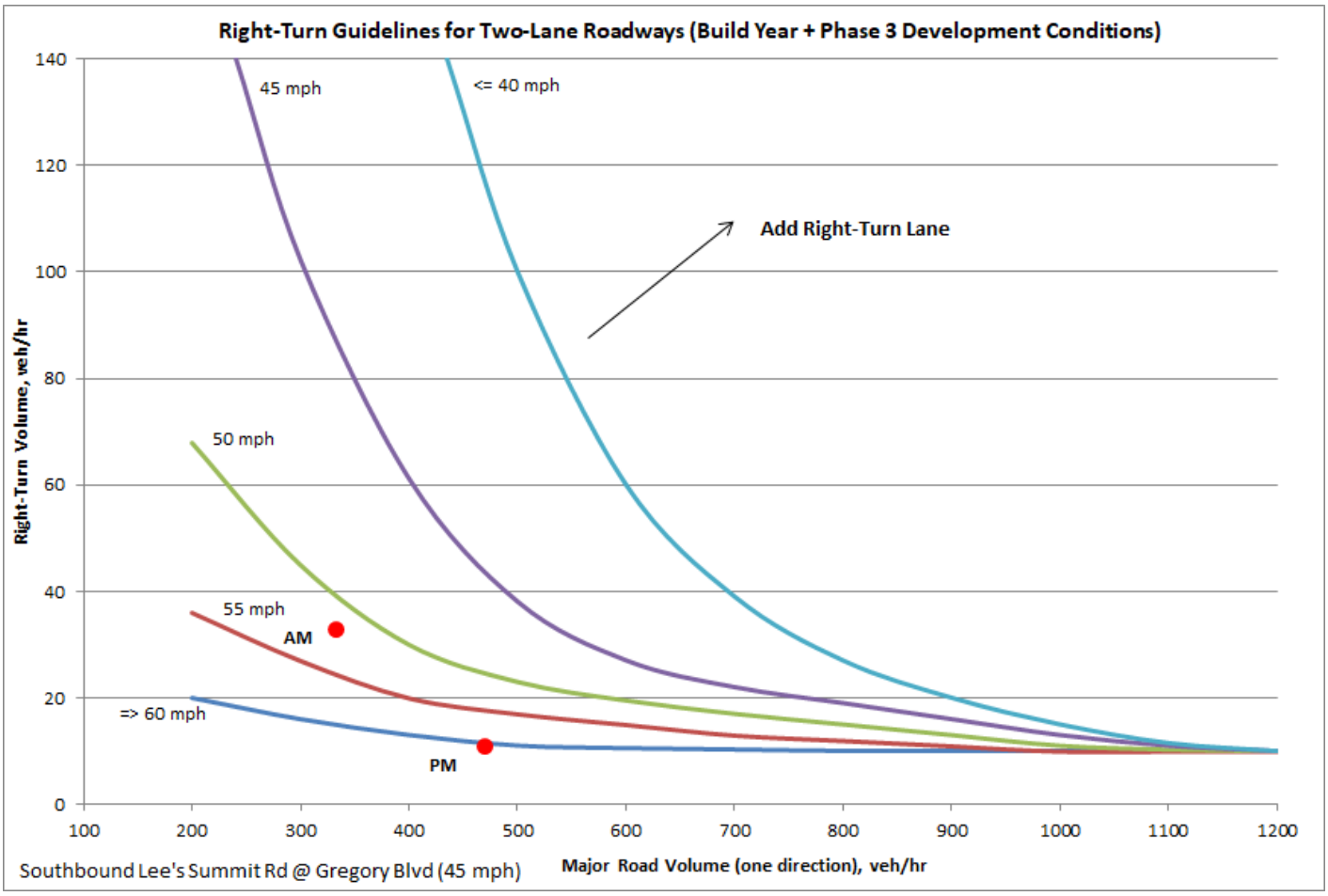

Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 3 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
PM
AM
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
0
20
40
60
80
100
120
140
160
100
200
300
400
500
600
700
800
900
1000
1100
1200
Northbound Pryor Rd @ Colbern Rd (35 mph)


Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 3 Development Conditions)
PM
AM
Add Right-Turn Lane
45 mph
<= 40 mph
50 mph
55 mph
=> 60 mph
Right-Turn Volume, veh/hr
0
50
100
150
200
100
200
300
400
500
600
700
800
900
1000
1100
1200
Major Road Volume (one direction), veh/hr
Westbound I-470 Off Ramp @ Douglas St (40 mph)


Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 3 Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
=> 60 mph
AM
PM
Right-Turn Volume, veh/hr
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Major Road Volume (one direction), veh/hr
Southbound Lee's Summit Rd @ 85th St (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 3 Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
=> 60 mph
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Eastbound 85th St @ Lee's Summit Rd (25 mph)

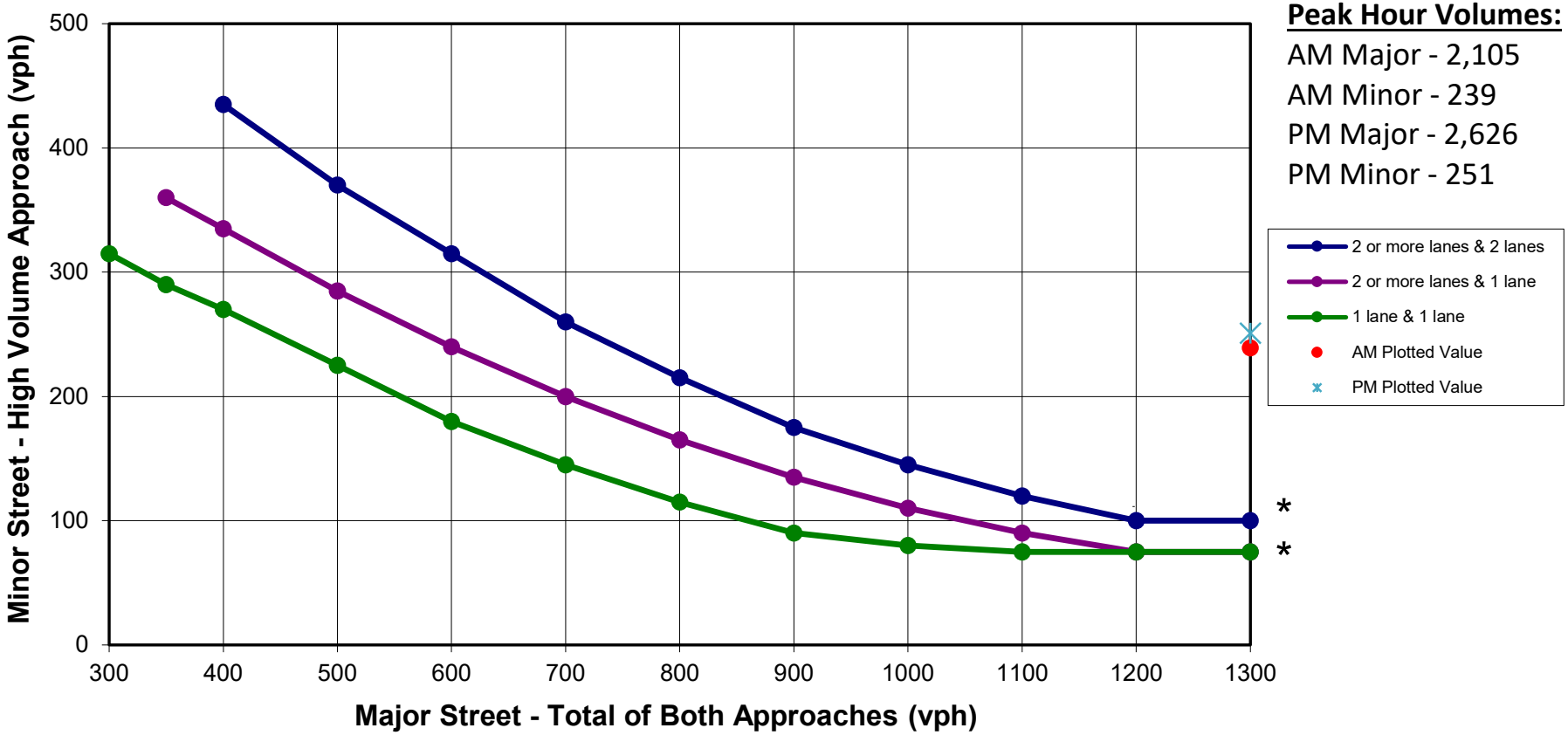

Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 3 Development Conditions)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
PM
AM
55 mph
=> 60 mph
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Westbound Strother Rd @ Lee's Summit Rd (45 mph)


Right-Turn Guidelines for Two-Lane Roadways (Build Year + Phase 3 Development Conditions)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
AM
=> 60 mph
PM
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
Southbound Lee's Summit Rd @ Gregory Blvd (45 mph)

Signal Warrants

Peak Hour Volume Warrant (Build Year + Phase 3)
Colbern Road & Drive 7

(Community less than 10,000 population or above 40mph on major street)



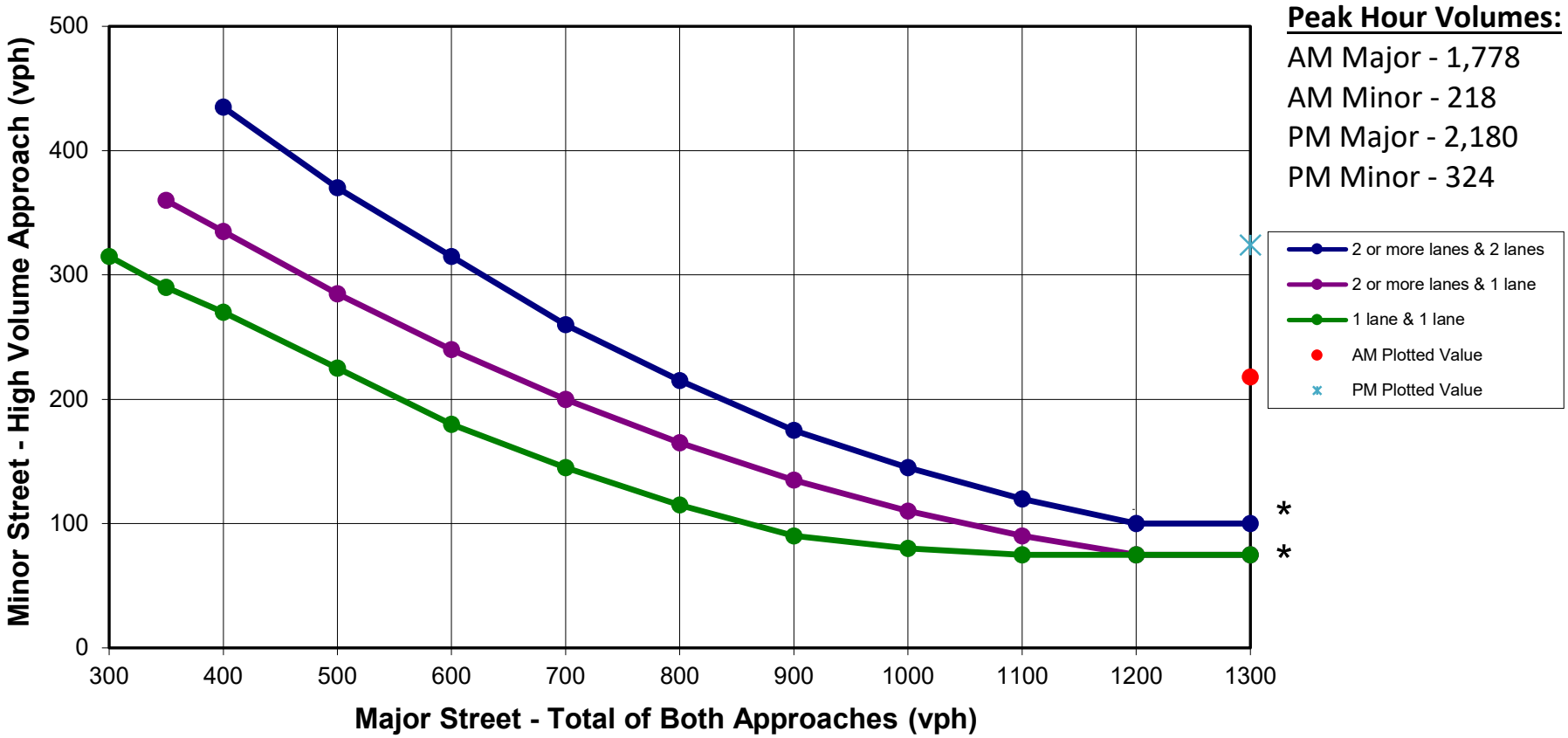
Peak Hour Volumes:

AM Major - 2,105
AM Minor - 239
PM Major - 2,626
PM Minor - 251

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Colbern Road & Main Street

(Community less than 10,000 population or above 40mph on major street)



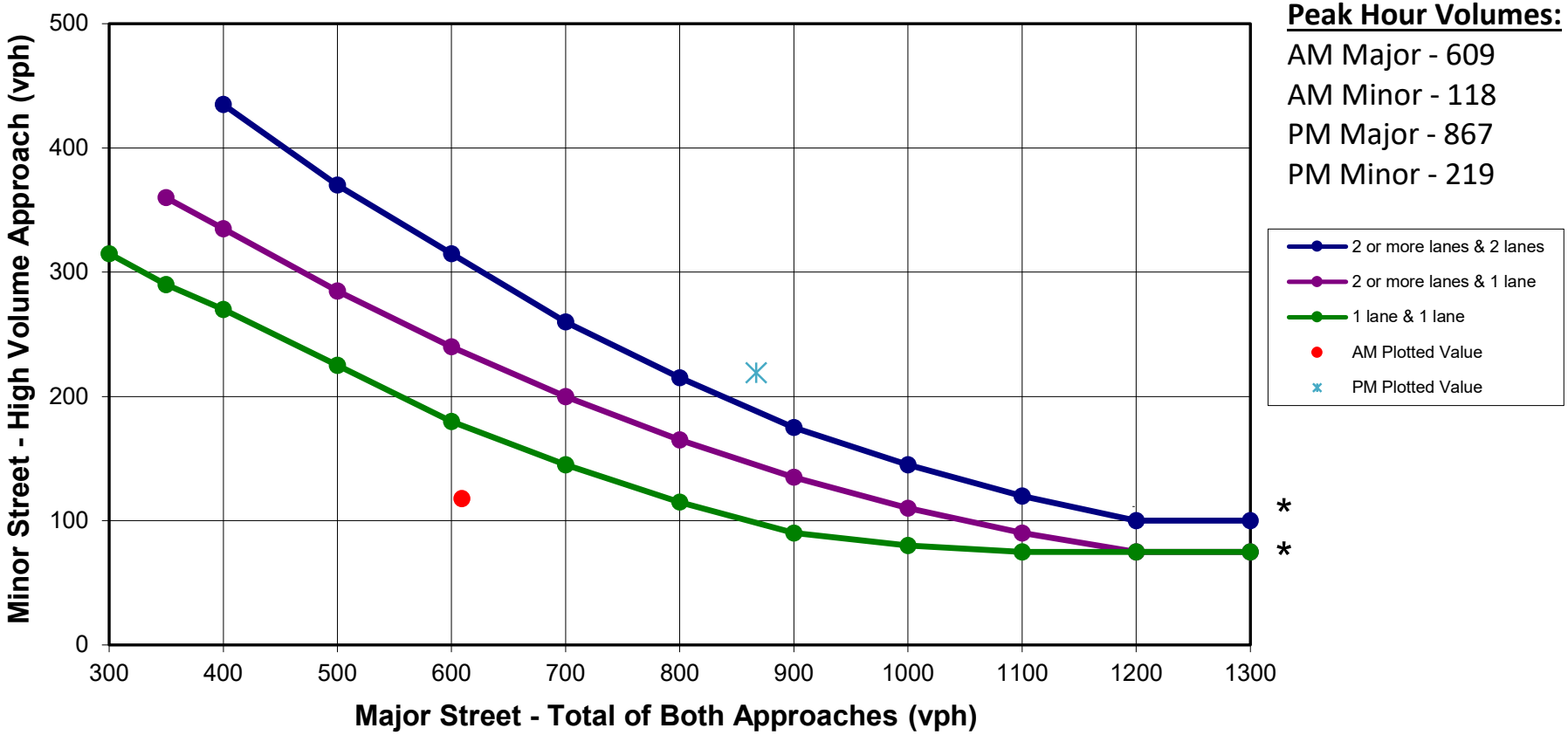
Peak Hour Volumes:

AM Major - 1,778
AM Minor - 218
PM Major - 2,180
PM Minor - 324

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Colbern Road & Pryor Road

(Community less than 10,000 population or above 40mph on major street)



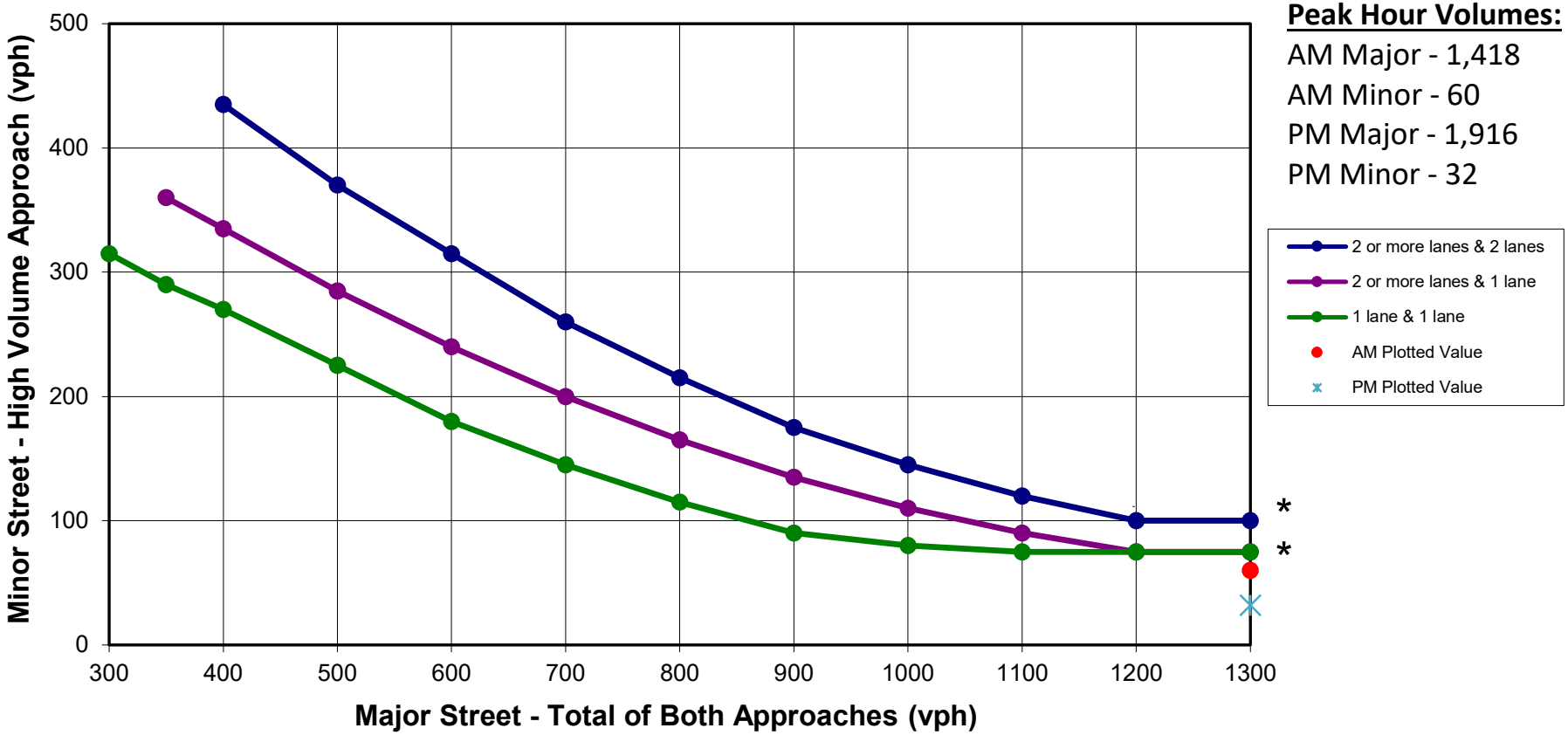
Peak Hour Volumes:

AM Major - 609
AM Minor - 118
PM Major - 867
PM Minor - 219

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Douglas Street & Drive 2

(Community less than 10,000 population or above 40mph on major street)



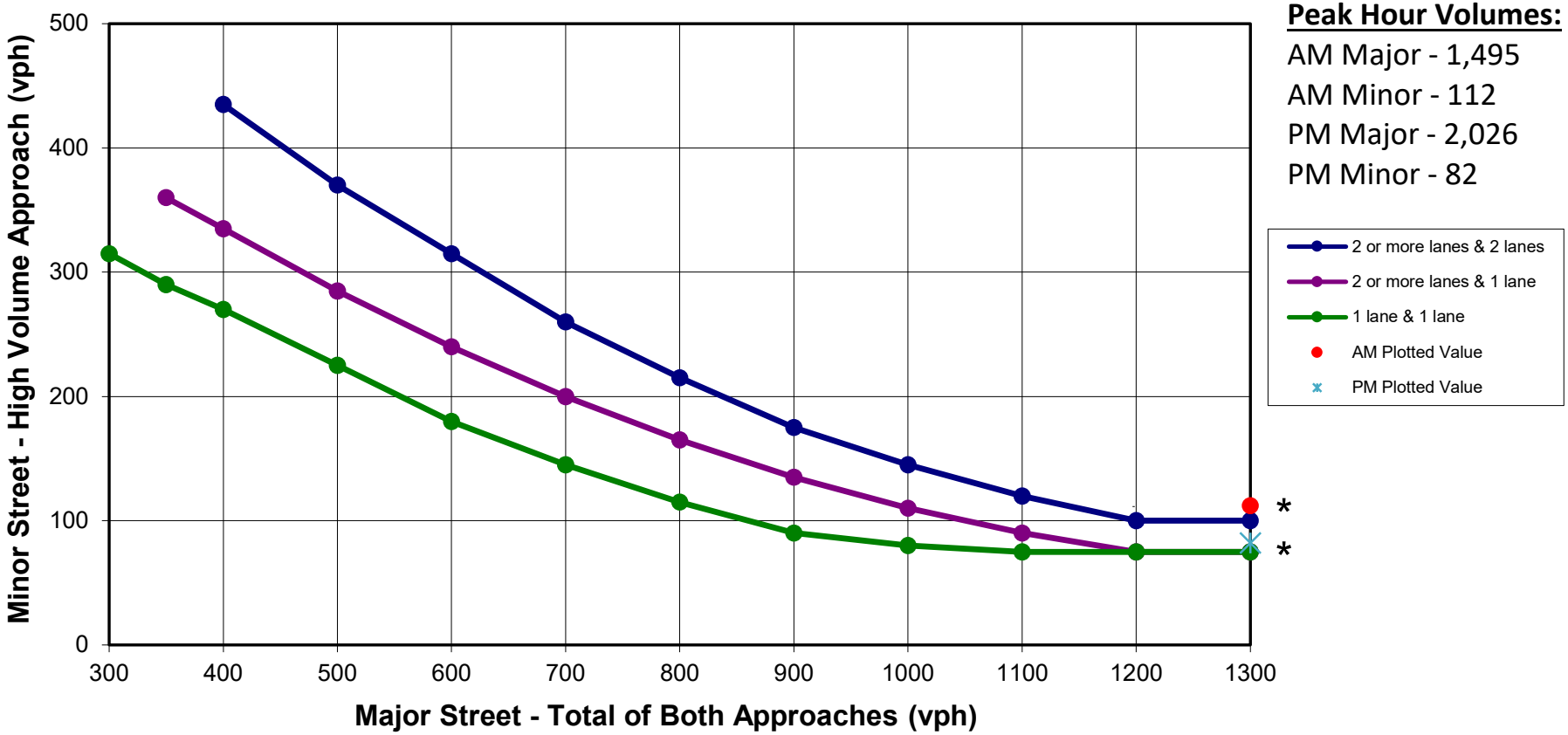
Peak Hour Volumes:

AM Major - 1,418
AM Minor - 60
PM Major - 1,916
PM Minor - 32

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Douglas Street & Drive 3

(Community less than 10,000 population or above 40mph on major street)



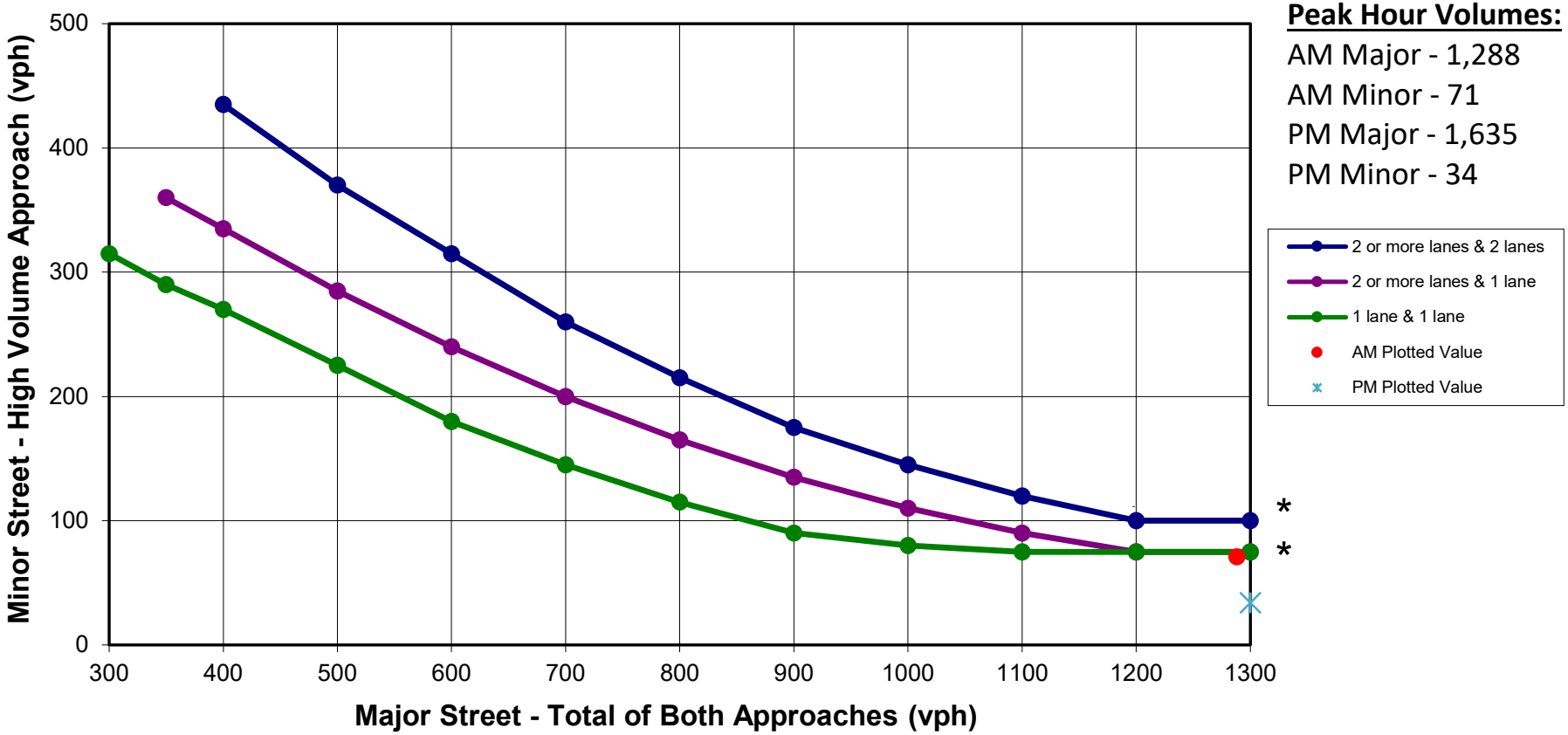
Peak Hour Volumes:

AM Major - 1,495
AM Minor - 112
PM Major - 2,026
PM Minor - 82

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Lee's Summit Road & 85th Street

(Community less than 10,000 population or above 40mph on major street)



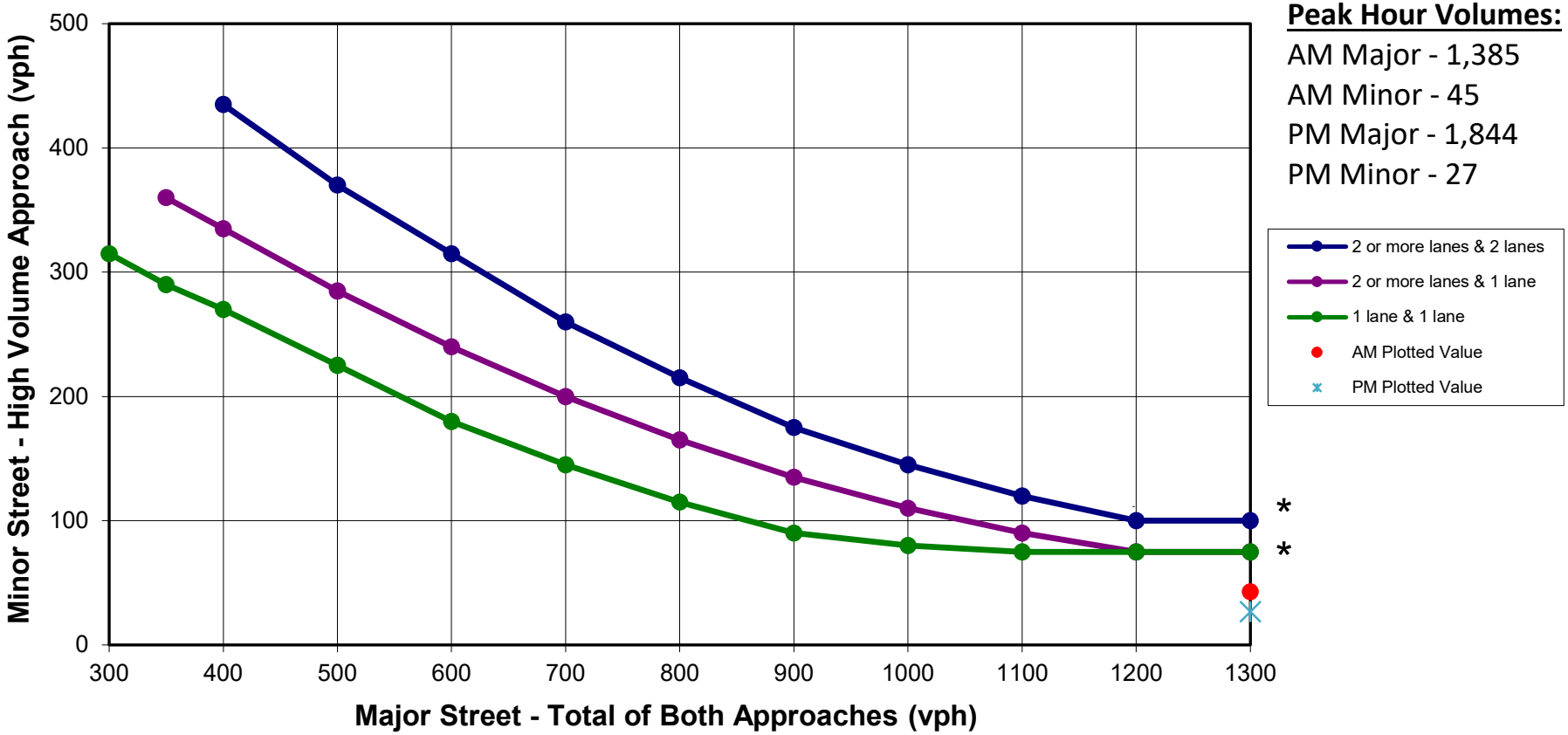
Peak Hour Volumes:

AM Major - 1,288
AM Minor - 71
PM Major - 1,635
PM Minor - 34

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Lee's Summit Road & Douglas Road/Drive 1

(Community less than 10,000 population or above 40mph on major street)



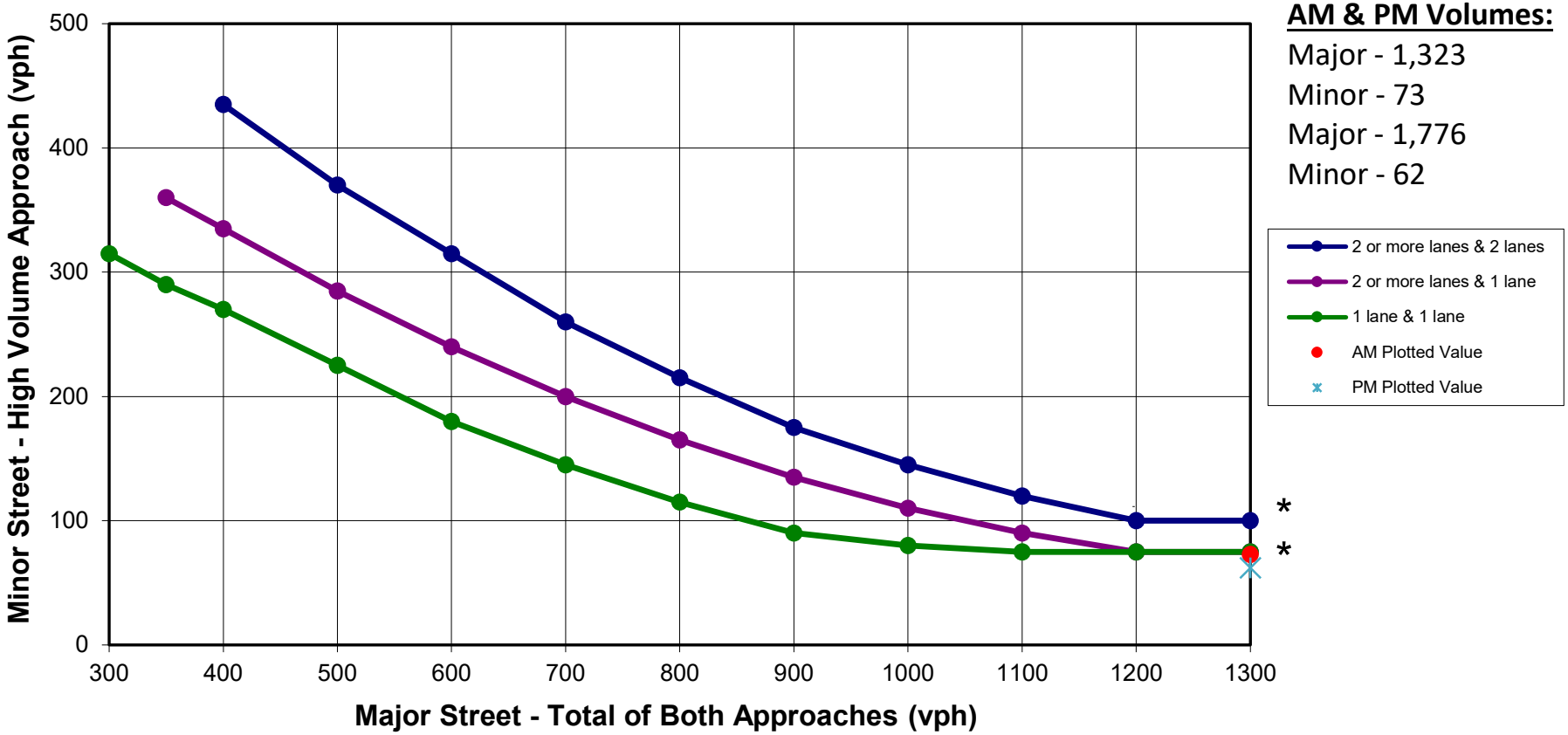
Peak Hour Volumes:

AM Major - 1,385
AM Minor - 45
PM Major - 1,844
PM Minor - 27

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Lee's Summit Road & Drive 11

(Community less than 10,000 population or above 40mph on major street)



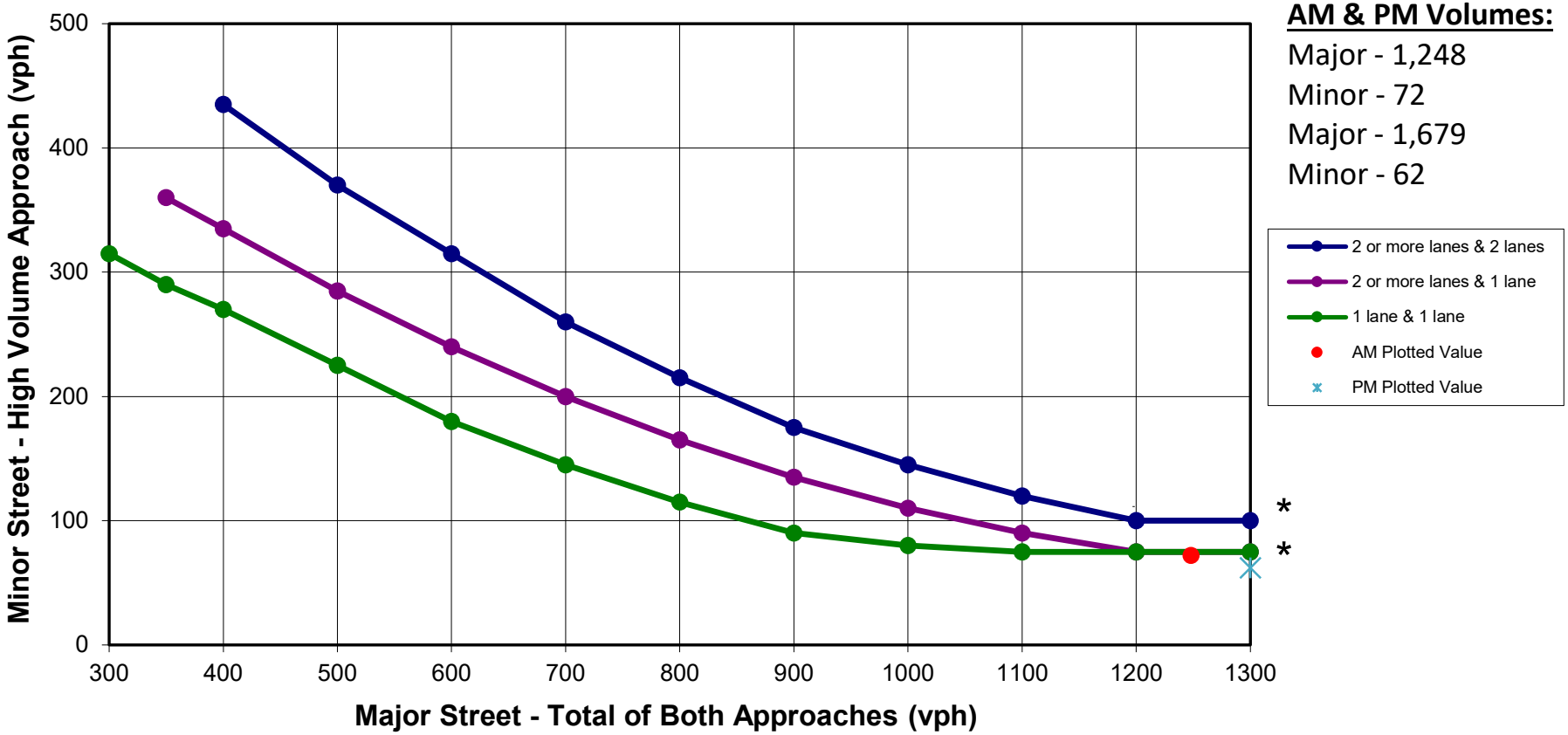
AM & PM Volumes:

Major - 1,323
Minor - 73
Major - 1,776
Minor - 62

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Lee's Summit Road & Drive 12

(Community less than 10,000 population or above 40mph on major street)



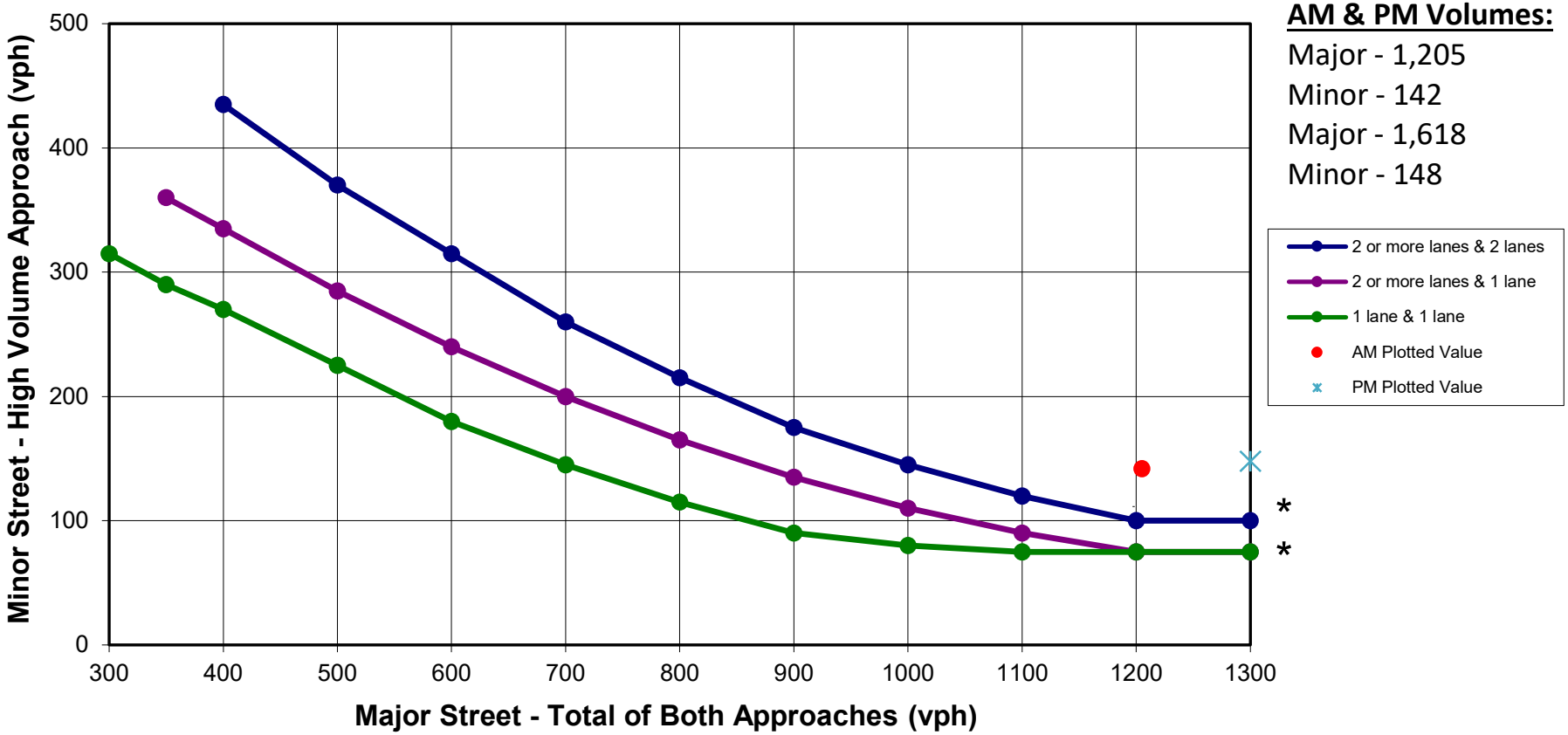
AM & PM Volumes:

Major - 1,248
Minor - 72
Major - 1,679
Minor - 62

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Lee's Summit Road & Strother Road

(Community less than 10,000 population or above 40mph on major street)



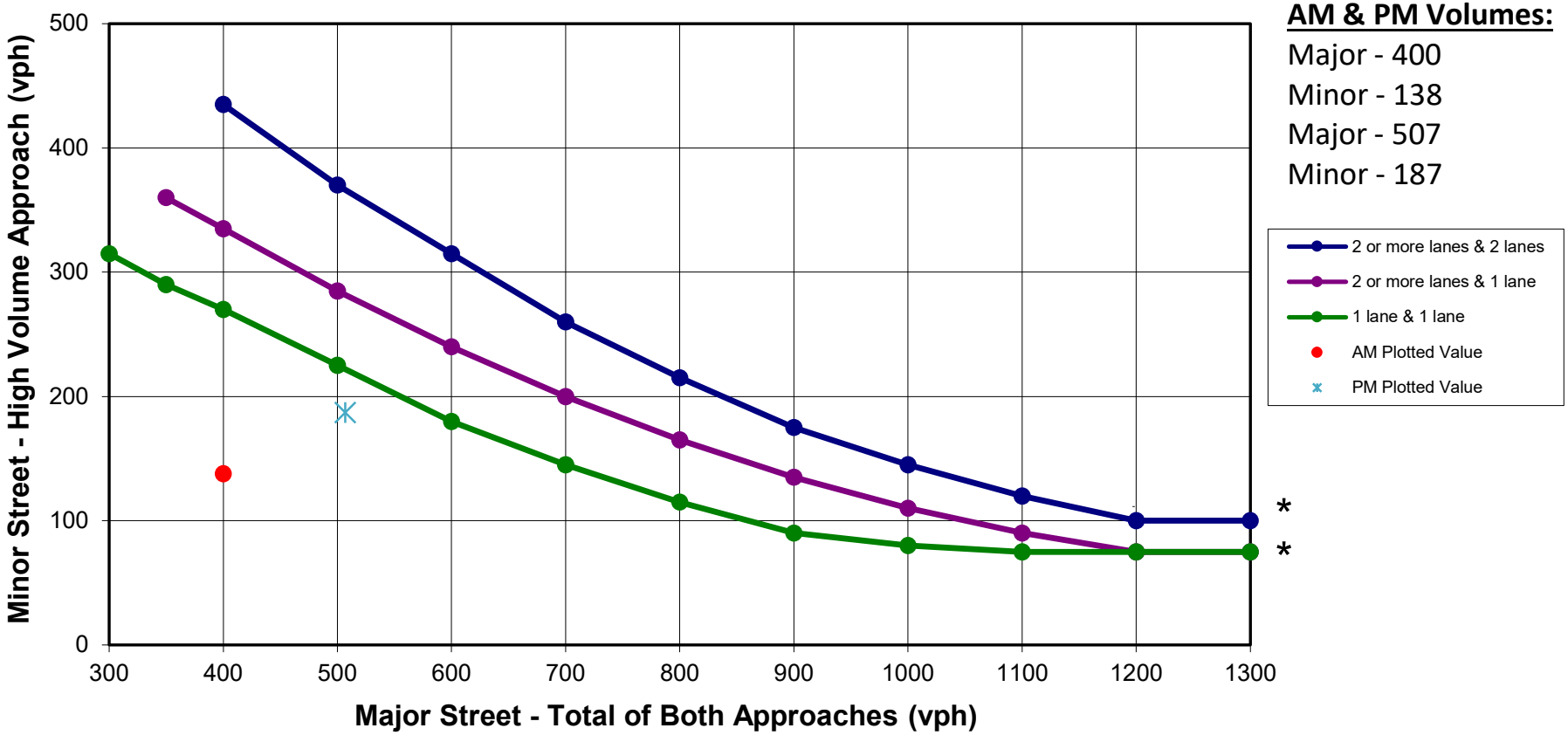
AM & PM Volumes:

Major - 1,205
Minor - 142
Major - 1,618
Minor - 148

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Main Street & Drive 9

(Community less than 10,000 population or above 40mph on major street)



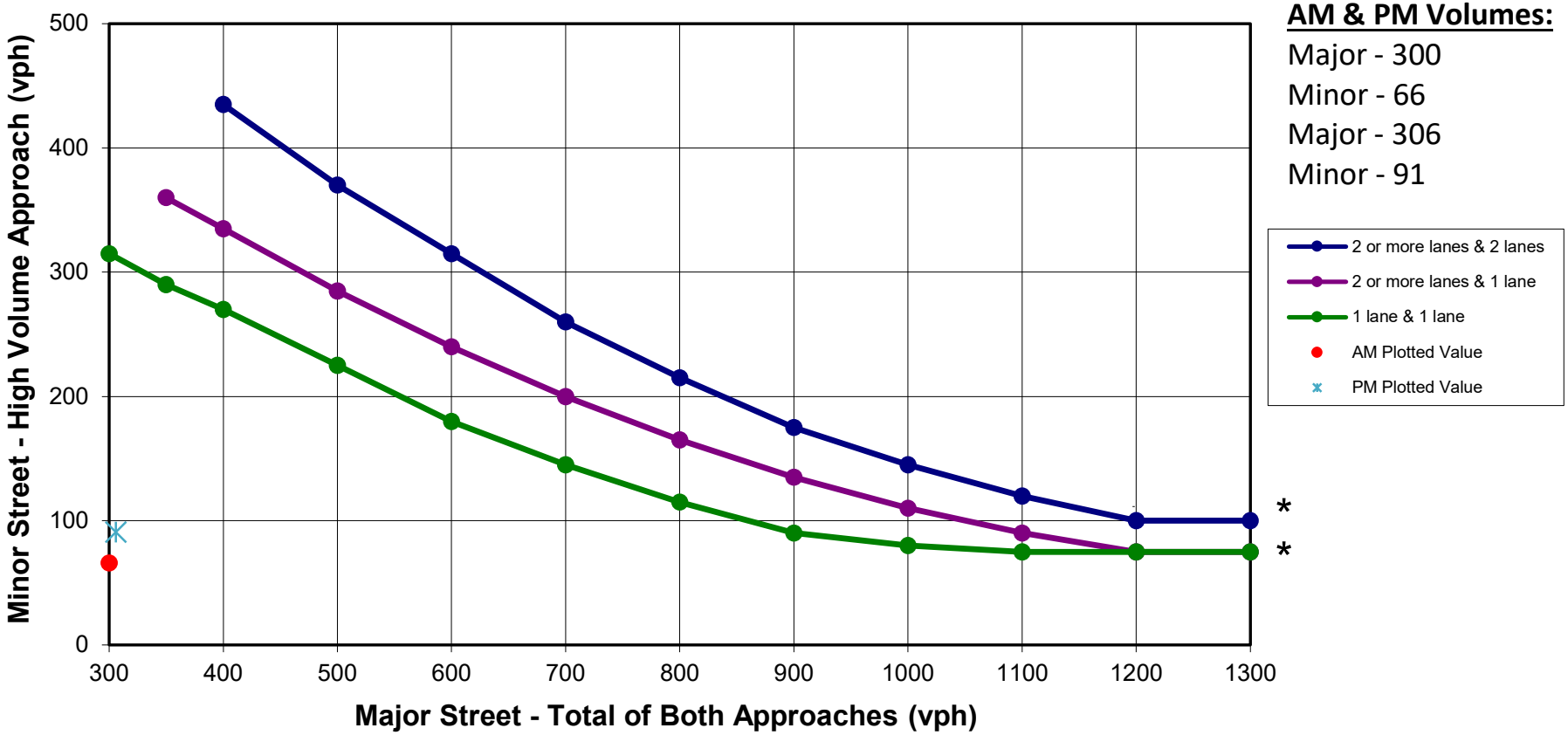
AM & PM Volumes:

Major - 400
Minor - 138
Major - 507
Minor - 187

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Build Year + Phase 3)
Main Street & Drive 10

(Community less than 10,000 population or above 40mph on major street)



AM & PM Volumes:

Major - 300
Minor - 66
Major - 306
Minor - 91

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Capacity Analysis

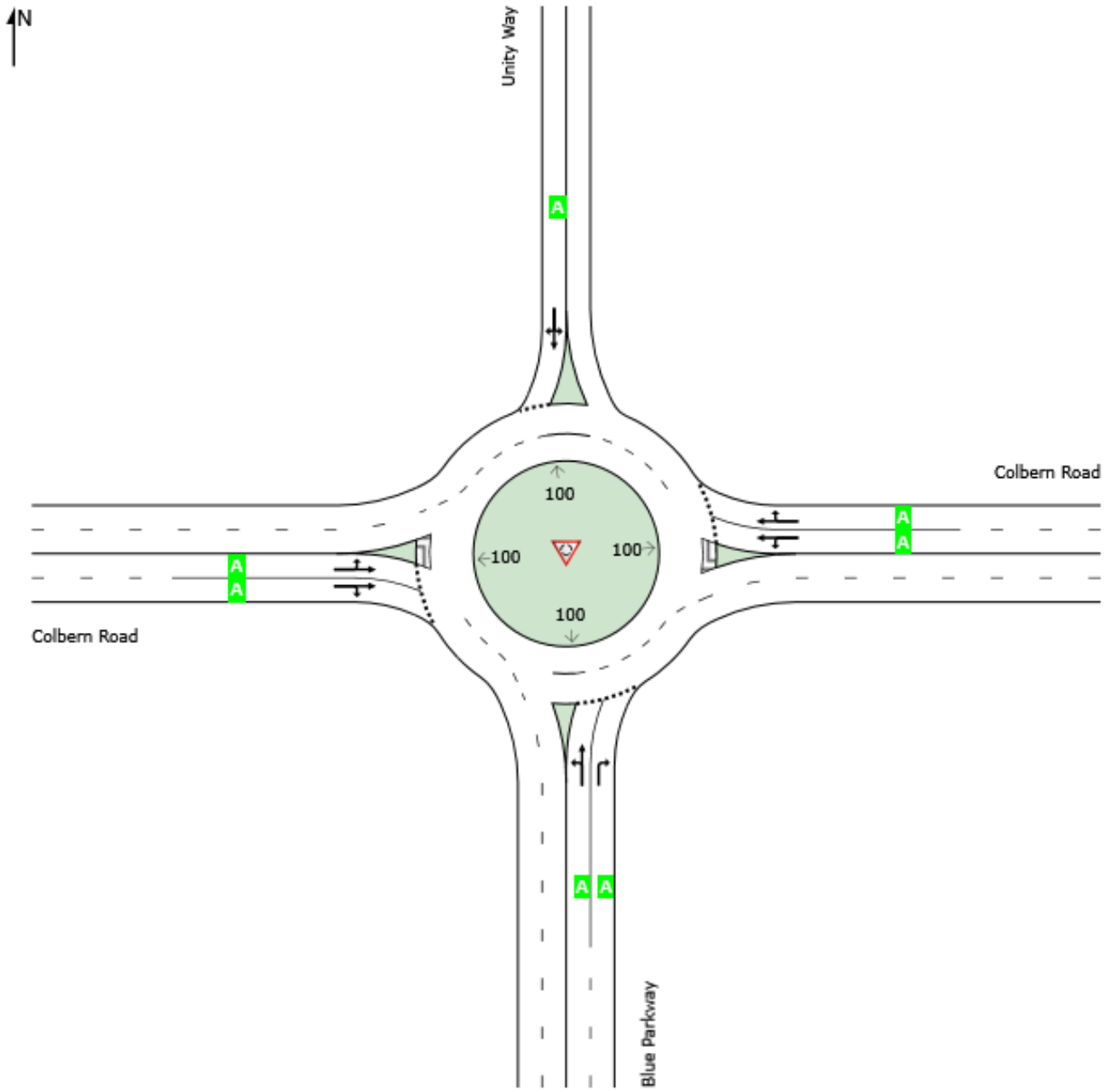
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	105	2.0	114	2.0	0.181	7.2	LOS A	0.7	16.5	0.59	0.59	0.59	20.4
8	T1	11	2.0	12	2.0	0.181	7.2	LOS A	0.7	16.5	0.59	0.59	0.59	17.8
18	R2	98	2.0	107	2.0	0.170	7.8	LOS A	0.6	15.6	0.61	0.61	0.61	20.1
Approach		214	2.0	233	2.0	0.181	7.5	LOS A	0.7	16.5	0.60	0.60	0.60	20.1
East: Colbern Road														
1	L2	129	2.0	140	2.0	0.447	7.5	LOS A	2.7	68.8	0.39	0.24	0.39	20.2
6	T1	861	2.0	936	2.0	0.447	7.5	LOS A	2.7	68.8	0.39	0.24	0.39	20.2
16	R2	19	2.0	21	2.0	0.447	7.5	LOS A	2.7	68.8	0.39	0.24	0.39	17.6
Approach		1009	2.0	1097	2.0	0.447	7.5	LOS A	2.7	68.8	0.39	0.24	0.39	20.2
North: Unity Way														
7	L2	5	2.0	5	2.0	0.020	7.5	LOS A	0.1	1.6	0.65	0.61	0.65	20.5
4	T1	1	2.0	1	2.0	0.020	7.5	LOS A	0.1	1.6	0.65	0.61	0.65	19.9
14	R2	3	2.0	3	2.0	0.020	7.5	LOS A	0.1	1.6	0.65	0.61	0.65	20.0
Approach		9	2.0	10	2.0	0.020	7.5	LOS A	0.1	1.6	0.65	0.61	0.65	20.2
West: Colbern Road														
5	L2	9	2.0	10	2.0	0.395	6.9	LOS A	2.2	56.3	0.38	0.23	0.38	18.4
2	T1	721	2.0	784	2.0	0.395	6.9	LOS A	2.2	56.3	0.38	0.23	0.38	20.4
12	R2	152	2.0	165	2.0	0.395	6.9	LOS A	2.2	56.3	0.38	0.23	0.38	19.9
Approach		882	2.0	959	2.0	0.395	6.9	LOS A	2.2	56.3	0.38	0.23	0.38	20.3
All Vehicles		2114	2.0	2298	2.0	0.447	7.2	LOS A	2.7	68.8	0.41	0.28	0.41	20.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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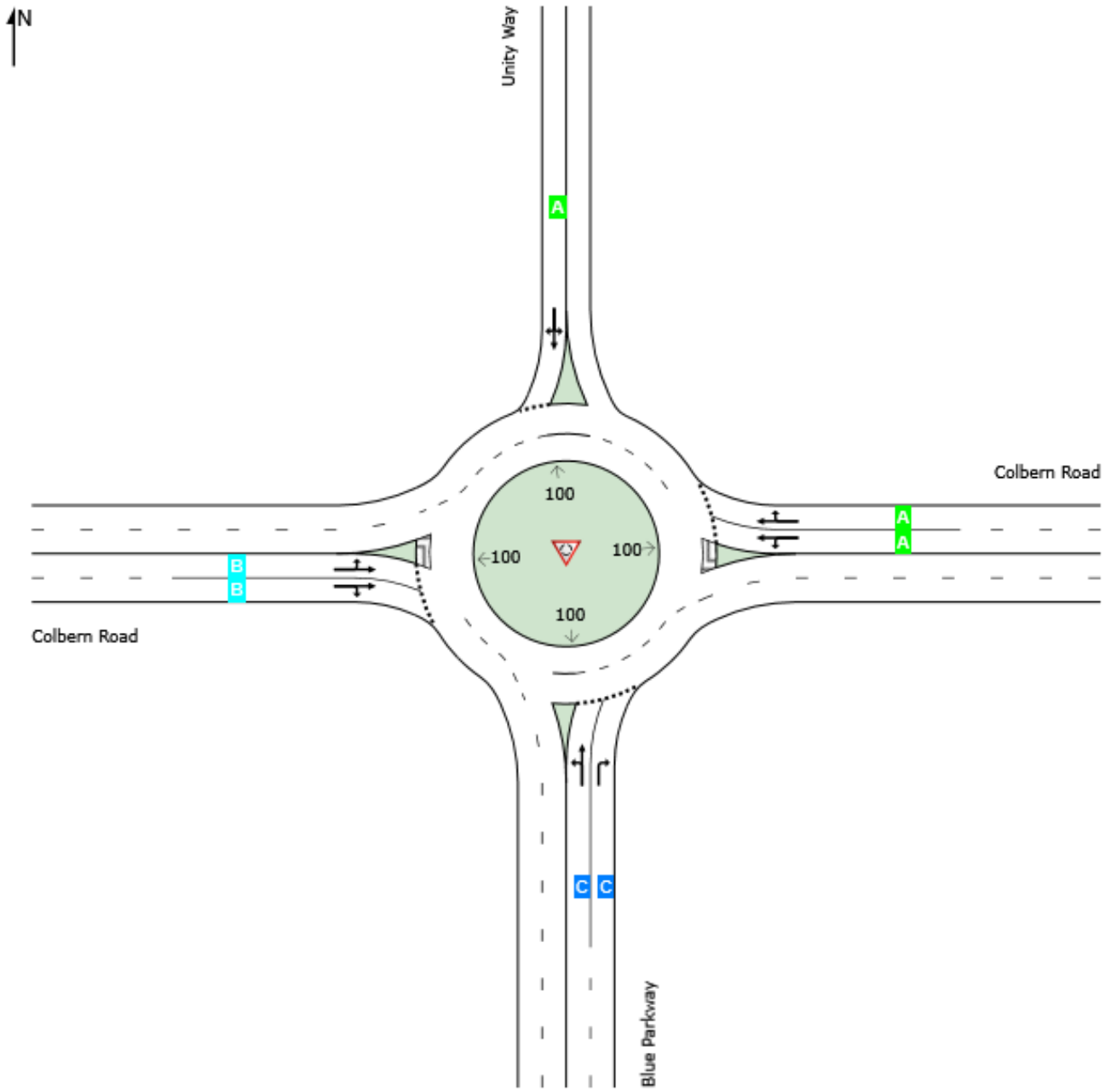
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	A	A	B	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	151	2.0	164	2.0	0.414	16.9	LOS C	1.7	44.1	0.79	0.98	1.11	18.8
8	T1	5	2.0	5	2.0	0.414	16.9	LOS C	1.7	44.1	0.79	0.98	1.11	16.6
18	R2	186	2.0	202	2.0	0.429	15.4	LOS C	1.9	47.2	0.77	0.98	1.11	18.8
Approach		342	2.0	372	2.0	0.429	16.1	LOS C	1.9	47.2	0.78	0.98	1.11	18.8
East: Colbern Road														
1	L2	121	2.0	132	2.0	0.458	7.9	LOS A	2.7	69.5	0.45	0.31	0.45	20.1
6	T1	865	2.0	940	2.0	0.458	7.9	LOS A	2.7	69.5	0.45	0.31	0.45	20.2
16	R2	6	2.0	7	2.0	0.458	7.9	LOS A	2.7	69.5	0.45	0.31	0.45	17.5
Approach		992	2.0	1078	2.0	0.458	7.9	LOS A	2.7	69.5	0.45	0.31	0.45	20.1
North: Unity Way														
7	L2	41	2.0	45	2.0	0.164	9.8	LOS A	0.5	13.8	0.70	0.70	0.70	20.0
4	T1	19	2.0	21	2.0	0.164	9.8	LOS A	0.5	13.8	0.70	0.70	0.70	19.5
14	R2	12	2.0	13	2.0	0.164	9.8	LOS A	0.5	13.8	0.70	0.70	0.70	19.6
Approach		72	2.0	78	2.0	0.164	9.8	LOS A	0.5	13.8	0.70	0.70	0.70	19.8
West: Colbern Road														
5	L2	11	2.0	12	2.0	0.579	10.2	LOS B	4.1	103.2	0.56	0.40	0.56	17.9
2	T1	1098	2.0	1193	2.0	0.579	10.2	LOS B	4.1	103.2	0.56	0.40	0.56	19.8
12	R2	127	2.0	138	2.0	0.579	10.2	LOS B	4.1	103.2	0.56	0.40	0.56	19.3
Approach		1236	2.0	1343	2.0	0.579	10.2	LOS B	4.1	103.2	0.56	0.40	0.56	19.7
All Vehicles		2642	2.0	2872	2.0	0.579	10.1	LOS B	4.1	103.2	0.55	0.45	0.59	19.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
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Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	250	15	80	238	23	10	4	104	45	7	5
Future Vol, veh/h	3	250	15	80	238	23	10	4	104	45	7	5
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	272	16	87	259	25	11	4	113	49	8	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	284	0	0	288	0	0	594	744	144	590	740	142
Stage 1	-	-	-	-	-	-	286	286	-	446	446	-
Stage 2	-	-	-	-	-	-	308	458	-	144	294	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1275	-	-	1271	-	-	389	341	877	391	343	880
Stage 1	-	-	-	-	-	-	697	674	-	561	572	-
Stage 2	-	-	-	-	-	-	677	565	-	844	668	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1275	-	-	1271	-	-	355	312	877	315	314	880
Mov Cap-2 Maneuver	-	-	-	-	-	-	355	312	-	315	314	-
Stage 1	-	-	-	-	-	-	695	672	-	559	525	-
Stage 2	-	-	-	-	-	-	609	519	-	728	666	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2	10.9	18.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	739	1275	-	-	1271	-	-	334
HCM Lane V/C Ratio	0.174	0.003	-	-	0.068	-	-	0.185
HCM Control Delay (s)	10.9	7.8	0	-	8	0.2	-	18.2
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	-	0.7

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	328	105	270	335	349	36
v/c Ratio	0.20	0.13	0.37	0.14	0.59	0.05
Control Delay	12.5	3.1	6.5	2.9	30.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	3.1	6.5	2.9	30.7	0.1
Queue Length 50th (ft)	41	0	24	15	71	0
Queue Length 95th (ft)	76	23	38	23	106	0
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325		200	200
Base Capacity (vph)	1648	799	803	2407	716	799
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	0.20	0.13	0.34	0.14	0.49	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	302	97	248	308	0	0	0	0	321	0	33
Future Volume (veh/h)	0	302	97	248	308	0	0	0	0	321	0	33
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	328	0	270	335	0				349	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1919		804	2543	0				465	0	
Arrive On Green	0.00	0.54	0.00	0.21	1.00	0.00				0.13	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				3456	0	1585
Grp Volume(v), veh/h	0	328	0	270	335	0				349	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1728	0	1585
Q Serve(g_s), s	0.0	3.3	0.0	4.8	0.0	0.0				6.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.3	0.0	4.8	0.0	0.0				6.8	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1919		804	2543	0				465	0	
V/C Ratio(X)	0.00	0.17		0.34	0.13	0.00				0.75	0.00	
Avail Cap(c_a), veh/h	0	1919		950	2543	0				721	0	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.98	0.98	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.2	0.0	4.8	0.0	0.0				29.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.1	0.0				2.5	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
%ile BackOfQ(50%),veh/ln	0.0	1.0	0.0	1.0	0.0	0.0				2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	8.3	0.0	5.0	0.1	0.0				31.6	0.0	0.0
LnGrp LOS	A	A		A	A	A				C	A	
Approach Vol, veh/h		328	A		605						349	A
Approach Delay, s/veh		8.3			2.3						31.6	
Approach LOS		A			A						C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.2			12.3	42.9		14.8				
Change Period (Y+Rc), s		* 5.1			* 5.1	* 5.1		5.4				
Max Green Setting (Gmax), s		* 45			* 13	* 27		14.6				
Max Q Clear Time (g_c+I1), s		2.0			6.8	5.3		8.8				
Green Ext Time (p_c), s		4.2			0.4	3.4		0.6				

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	78	599	550	458	54	285
v/c Ratio	0.11	0.20	0.23	0.37	0.28	0.24
Control Delay	2.9	3.1	6.8	2.0	31.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.9	3.1	6.8	2.0	31.7	1.8
Queue Length 50th (ft)	2	14	55	0	22	0
Queue Length 95th (ft)	m17	109	94	39	51	32
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	724	2958	2429	1230	369	1176
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	0.11	0.20	0.23	0.37	0.15	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	551	0	0	506	421	50	0	262	0	0	0
Future Volume (veh/h)	72	551	0	0	506	421	50	0	262	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	78	599	0	0	550	0	54	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	728	2845	0	0	2394		83	0				
Arrive On Green	0.11	1.00	0.00	0.00	0.67	0.00	0.05	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	78	599	0	0	550	0	54	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	0.9	0.0	0.0	0.0	4.2	0.0	2.1	0.0	0.0			
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.0	4.2	0.0	2.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	728	2845	0	0	2394		83	0				
V/C Ratio(X)	0.11	0.21	0.00	0.00	0.23		0.65	0.00				
Avail Cap(c_a), veh/h	807	2845	0	0	2394		372	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.92	0.92	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	2.7	0.0	0.0	0.0	4.4	0.0	32.8	0.0	0.0			
Incr Delay (d2), s/veh	0.1	0.2	0.0	0.0	0.2	0.0	8.4	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			
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.0	1.0	0.0	1.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.7	0.2	0.0	0.0	4.6	0.0	41.2	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		677			550	A		54	A			
Approach Delay, s/veh		0.4			4.6			41.2				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	8.9	52.4				61.3		8.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	7.0	* 33				* 45		14.6				
Max Q Clear Time (g_c+I1), s	2.9	6.2				2.0		4.1				
Green Ext Time (p_c), s	0.0	6.6				8.4		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	4.0
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	897	122	914	183	109
v/c Ratio	0.44	0.28	0.36	0.67	0.32
Control Delay	12.7	14.4	15.3	51.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	14.4	15.3	51.0	9.4
Queue Length 50th (ft)	148	52	206	111	0
Queue Length 95th (ft)	236	99	275	172	44
Internal Link Dist (ft)	1940		1212	552	
Turn Bay Length (ft)		200			150
Base Capacity (vph)	2034	507	2563	424	462
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.24	0.36	0.43	0.24

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	673	152	112	841	168	100
Future Volume (veh/h)	673	152	112	841	168	100
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	732	165	122	914	183	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1858	419	483	2677	226	201
Arrive On Green	0.64	0.64	0.02	0.25	0.13	0.13
Sat Flow, veh/h	2975	649	1781	3647	1781	1585
Grp Volume(v), veh/h	451	446	122	914	183	109
Grp Sat Flow(s),veh/h/ln	1777	1753	1781	1777	1781	1585
Q Serve(g_s), s	12.1	12.1	2.2	21.1	10.0	6.4
Cycle Q Clear(g_c), s	12.1	12.1	2.2	21.1	10.0	6.4
Prop In Lane		0.37	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1146	1131	483	2677	226	201
V/C Ratio(X)	0.39	0.39	0.25	0.34	0.81	0.54
Avail Cap(c_a), veh/h	1146	1131	611	2677	428	380
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.5	8.5	6.2	17.2	42.5	40.9
Incr Delay (d2), s/veh	1.0	1.0	0.3	0.3	6.8	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	4.1	0.7	10.0	4.7	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.5	9.5	6.4	17.6	49.3	43.2
LnGrp LOS	A	A	A	B	D	D
Approach Vol, veh/h	897			1036	292	
Approach Delay, s/veh	9.5			16.2	47.0	
Approach LOS	A			B	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		18.7	10.8	70.5		81.3
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		24.0	12.0	46.0		64.0
Max Q Clear Time (g_c+I1), s		12.0	4.2	14.1		23.1
Green Ext Time (p_c), s		0.7	0.2	5.9		7.0

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Queues
6: Douglas St & Colbern Rd

01/19/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	374	607	612	566	88	596	383	313	91	491	367
v/c Ratio	0.48	0.72	0.56	0.74	0.52	0.14	0.88	0.30	0.17	0.21	0.49	0.63
Control Delay	19.5	36.3	9.7	33.3	22.7	0.5	47.6	26.1	2.6	17.4	37.9	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	36.3	9.7	33.3	22.7	0.5	47.6	26.1	2.6	17.4	37.9	13.7
Queue Length 50th (ft)	46	101	61	188	155	1	206	104	1	33	103	48
Queue Length 95th (ft)	57	136	69	251	76	0	#285	177	23	63	139	102
Internal Link Dist (ft)		562			2353			694			850	
Turn Bay Length (ft)	300		300	500		200	375		200	290		500
Base Capacity (vph)	622	573	1088	823	1090	629	686	1261	1838	432	1002	587
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.65	0.56	0.74	0.52	0.14	0.87	0.30	0.17	0.21	0.49	0.63

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)	270	344	558	563	521	81	548	352	288	84	452	338
Future Volume (veh/h)	270	344	558	563	521	81	548	352	288	84	452	338
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	374	607	612	566	88	596	383	313	91	491	367
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	584	503	923	720	1095	488	655	1174	1503	363	970	380
Arrive On Green	0.02	0.05	0.05	0.21	0.31	0.31	0.32	0.55	0.55	0.05	0.19	0.19
Sat Flow, veh/h	3456	3554	2790	3456	3554	1585	3456	3554	2790	1781	5106	1585
Grp Volume(v), veh/h	293	374	607	612	566	88	596	383	313	91	491	367
Grp Sat Flow(s),veh/h/ln	1728	1777	1395	1728	1777	1585	1728	1777	1395	1781	1702	1585
Q Serve(g_s), s	0.0	10.4	6.5	17.0	13.1	2.9	16.6	5.9	0.9	3.3	8.6	13.0
Cycle Q Clear(g_c), s	0.0	10.4	6.5	17.0	13.1	2.9	16.6	5.9	0.9	3.3	8.6	13.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	584	503	923	720	1095	488	655	1174	1503	363	970	380
V/C Ratio(X)	0.50	0.74	0.66	0.85	0.52	0.18	0.91	0.33	0.21	0.25	0.51	0.96
Avail Cap(c_a), veh/h	702	576	981	795	1095	488	691	1174	1503	382	970	380
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	0.84	0.84	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	45.9	9.6	38.1	28.5	13.1	33.4	16.3	1.8	20.5	36.3	18.1
Incr Delay (d2), s/veh	0.7	4.5	1.5	7.4	1.6	0.7	13.7	0.6	0.3	0.4	1.9	38.1
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	5.1	3.1	7.6	5.5	1.5	6.9	2.2	0.4	1.3	3.6	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	50.4	11.1	45.5	30.1	13.9	47.1	17.0	2.1	20.8	38.2	56.1
LnGrp LOS	D	D	B	D	C	B	D	B	A	C	D	E
Approach Vol, veh/h		1274			1266			1292			949	
Approach Delay, s/veh		29.1			36.4			27.2			43.5	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.9	25.0	26.6	20.0	9.9	39.0	10.8	35.8
Change Period (Y+Rc), s	5.0	* 6	* 5.8	* 5.8	5.0	* 6	5.8	* 5
Max Green Setting (Gmax), s	20.0	* 19	* 23	* 16	6.0	* 33	8.4	* 31
Max Q Clear Time (g_c+I1), s	18.6	15.0	19.0	12.4	5.3	7.9	2.0	15.1
Green Ext Time (p_c), s	0.4	1.7	0.9	1.8	0.0	3.7	0.5	3.3

Intersection Summary	
HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	0	53	0	35	1	537	95	68	587	0
Future Vol, veh/h	5	0	0	53	0	35	1	537	95	68	587	0
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	0	58	0	38	1	584	103	74	638	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1443	1475	638	1372	1372	584	638	0	0	687	0	0
Stage 1	786	786	-	586	586	-	-	-	-	-	-	-
Stage 2	657	689	-	786	786	-	-	-	-	-	-	-
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	110	126	477	123	146	512	946	-	-	907	-	-
Stage 1	385	403	-	496	497	-	-	-	-	-	-	-
Stage 2	454	446	-	385	403	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	95	116	477	115	134	512	946	-	-	907	-	-
Mov Cap-2 Maneuver	95	116	-	115	134	-	-	-	-	-	-	-
Stage 1	385	370	-	496	497	-	-	-	-	-	-	-
Stage 2	420	446	-	354	370	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.2	43.7	0	1
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	946	-	-	95	115	512	907	-	-
HCM Lane V/C Ratio	0.001	-	-	0.057	0.501	0.074	0.081	-	-
HCM Control Delay (s)	8.8	-	-	45.2	64.3	12.6	9.3	-	-
HCM Lane LOS	A	-	-	E	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.3	0.2	0.3	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	93	49	498	92	36	579
Future Vol, veh/h	93	49	498	92	36	579
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	-	-	225	225	-
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	101	53	541	100	39	629

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1248	271	0	0	641	0
Stage 1	541	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	178	728	-	-	941	-
Stage 1	548	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	171	728	-	-	941	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	548	-	-	-	-	-
Stage 2	468	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	385	941	-
HCM Lane V/C Ratio	-	-	0.401	0.042	-
HCM Control Delay (s)	-	-	20.5	9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	60	111	296	184	51	136	247	160	17	344
v/c Ratio	0.02	0.22	0.31	0.59	0.27	0.08	0.38	0.32	0.21	0.03	0.73
Control Delay	16.1	32.9	5.8	23.3	20.4	0.2	15.8	17.1	3.9	11.8	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	32.9	5.8	23.3	20.4	0.2	15.8	17.1	3.9	11.8	34.4
Queue Length 50th (ft)	3	25	0	94	54	0	36	70	0	4	142
Queue Length 95th (ft)	13	65	28	190	144	0	71	161	39	15	241
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	536	762	733	551	892	832	398	813	781	603	868
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.15	0.54	0.21	0.06	0.34	0.30	0.20	0.03	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	55	102	272	169	47	125	227	147	16	283	33
Future Volume (veh/h)	9	55	102	272	169	47	125	227	147	16	283	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	60	111	296	184	51	136	247	160	17	308	36
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	407	293	248	568	583	494	316	551	467	332	385	45
Arrive On Green	0.01	0.16	0.16	0.17	0.31	0.31	0.08	0.29	0.29	0.02	0.23	0.23
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1644	192
Grp Volume(v), veh/h	10	60	111	296	184	51	136	247	160	17	0	344
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1836
Q Serve(g_s), s	0.2	1.8	4.1	8.6	4.8	1.5	3.6	6.8	5.1	0.4	0.0	11.3
Cycle Q Clear(g_c), s	0.2	1.8	4.1	8.6	4.8	1.5	3.6	6.8	5.1	0.4	0.0	11.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	407	293	248	568	583	494	316	551	467	332	0	430
V/C Ratio(X)	0.02	0.20	0.45	0.52	0.32	0.10	0.43	0.45	0.34	0.05	0.00	0.80
Avail Cap(c_a), veh/h	649	865	733	674	865	733	424	850	720	687	0	834
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	23.4	24.4	17.5	16.8	15.6	17.4	18.3	17.7	15.5	0.0	23.0
Incr Delay (d2), s/veh	0.0	0.7	2.7	0.3	0.7	0.2	0.3	0.6	0.4	0.0	0.0	3.5
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	0.8	1.5	3.2	2.0	0.5	1.3	2.6	1.6	0.2	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	24.2	27.1	17.8	17.4	15.8	17.7	18.9	18.1	15.5	0.0	26.5
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		181			531			543			361	
Approach Delay, s/veh		25.4			17.5			18.3			26.0	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.2	15.5	11.2	20.9	6.3	25.4	7.3	24.8
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	10.6	6.1	5.6	13.3	2.2	6.8	2.4	8.8
Green Ext Time (p_c), s	0.2	1.3	0.0	1.7	0.0	2.2	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	9	704	4	9	649	10	11	0	32	4	0	3
Future Vol, veh/h	9	704	4	9	649	10	11	0	32	4	0	3
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	200	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	765	4	10	705	11	12	0	35	4	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	716	0	0	769	0	0	1160	1523	385	1134	1520	358
Stage 1	-	-	-	-	-	-	787	787	-	731	731	-
Stage 2	-	-	-	-	-	-	373	736	-	403	789	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	880	-	-	841	-	-	151	117	613	157	118	638
Stage 1	-	-	-	-	-	-	351	401	-	379	425	-
Stage 2	-	-	-	-	-	-	620	423	-	595	400	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	880	-	-	841	-	-	148	114	613	146	115	638
Mov Cap-2 Maneuver	-	-	-	-	-	-	148	114	-	146	115	-
Stage 1	-	-	-	-	-	-	347	397	-	375	420	-
Stage 2	-	-	-	-	-	-	609	418	-	555	396	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.1	17.3	22.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	340	841	-	-	880	-	-	218
HCM Lane V/C Ratio	0.137	0.012	-	-	0.011	-	-	0.035
HCM Control Delay (s)	17.3	9.3	-	-	9.1	-	-	22.1
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	54	16	662	738	2
Future Vol, veh/h	6	54	16	662	738	2
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	7	59	17	720	802	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1197	402	804	0	-	0
Stage 1	803	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	179	598	816	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	175	598	816	-	-	-
Mov Cap-2 Maneuver	296	-	-	-	-	-
Stage 1	393	-	-	-	-	-
Stage 2	650	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	816	-	543	-	-
HCM Lane V/C Ratio	0.021	-	0.12	-	-
HCM Control Delay (s)	9.5	-	12.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	53	118	78	625	756	36
Future Vol, veh/h	53	118	78	625	756	36
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	150	200	-	-	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	58	128	85	679	822	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1332	411	861	0	-	0
Stage 1	822	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	146	590	776	-	-	-
Stage 1	392	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	130	590	776	-	-	-
Mov Cap-2 Maneuver	252	-	-	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	568	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.1	1.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	776	-	252	590	-	-
HCM Lane V/C Ratio	0.109	-	0.229	0.217	-	-
HCM Control Delay (s)	10.2	-	23.5	12.8	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.9	0.8	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1011	95	0	1370	37	0	0	161	0	0	70
Future Vol, veh/h	0	1011	95	0	1370	37	0	0	161	0	0	70
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	-	-	150	-	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1099	103	0	1489	40	0	0	175	0	0	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	550	-	-	745
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	479	0	0	357
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	479	-	-	357
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.8	17.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	479	-	-	-	-	357
HCM Lane V/C Ratio	0.365	-	-	-	-	0.213
HCM Control Delay (s)	16.8	-	-	-	-	17.8
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	1.7	-	-	-	-	0.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	84	912	117	410	1129	26	235	199	91	38
v/c Ratio	0.33	0.65	0.15	0.77	0.63	0.03	0.70	0.32	0.58	0.10
Control Delay	15.0	21.8	1.4	52.6	17.2	0.0	55.7	2.5	56.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	21.8	1.4	52.6	17.2	0.0	55.7	2.5	56.3	0.5
Queue Length 50th (ft)	16	120	0	137	217	0	75	0	56	0
Queue Length 95th (ft)	60	221	12	m178	m275	m0	#117	18	105	0
Internal Link Dist (ft)		869			534					266
Turn Bay Length (ft)	300		300	300		250	150	150		
Base Capacity (vph)	259	1400	764	558	1804	887	343	660	197	418
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	0.32	0.65	0.15	0.73	0.63	0.03	0.69	0.30	0.46	0.09

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	839	108	377	1039	24	216	0	183	84	0	35
Future Volume (veh/h)	77	839	108	377	1039	24	216	0	183	84	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	912	117	410	1129	26	235	0	199	91	0	38
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	278	1587	708	488	1929	860	302	434	368	192	0	134
Arrive On Green	0.09	0.89	0.89	0.05	0.18	0.18	0.09	0.00	0.23	0.08	0.00	0.08
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	3456	1870	1585	1418	0	1585
Grp Volume(v), veh/h	84	912	117	410	1129	26	235	0	199	91	0	38
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1728	1870	1585	1418	0	1585
Q Serve(g_s), s	2.0	5.6	0.9	11.8	29.1	1.4	6.7	0.0	11.0	6.3	0.0	2.2
Cycle Q Clear(g_c), s	2.0	5.6	0.9	11.8	29.1	1.4	6.7	0.0	11.0	6.3	0.0	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	278	1587	708	488	1929	860	302	434	368	192	0	134
V/C Ratio(X)	0.30	0.57	0.17	0.84	0.59	0.03	0.78	0.00	0.54	0.47	0.00	0.28
Avail Cap(c_a), veh/h	304	1587	708	553	1929	860	346	561	476	270	0	222
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	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	0.00	1.00
Uniform Delay (d), s/veh	13.3	3.3	3.0	46.5	30.7	19.3	44.7	0.0	33.7	44.8	0.0	42.9
Incr Delay (d2), s/veh	0.6	1.5	0.5	10.1	1.3	0.1	9.4	0.0	1.2	1.8	0.0	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	0.7	1.5	0.4	6.1	14.1	0.5	3.2	0.0	4.3	2.3	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	4.8	3.5	56.6	32.0	19.4	54.1	0.0	35.0	46.6	0.0	44.1
LnGrp LOS	B	A	A	E	C	B	D	A	C	D	A	D
Approach Vol, veh/h		1113			1565			434			129	
Approach Delay, s/veh		5.3			38.3			45.3			45.9	
Approach LOS		A			D			D			D	

Timer - Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		29.2	20.1	50.7	14.8	14.5	10.5	60.3
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s		30.0	16.0	36.0	10.0	14.0	6.0	46.0
Max Q Clear Time (g_c+I1), s		13.0	13.8	7.6	8.7	8.3	4.0	31.1
Green Ext Time (p_c), s		0.5	0.4	7.6	0.1	0.2	0.0	7.0

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	970	27	51	1239	0	54
Future Vol, veh/h	970	27	51	1239	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	1054	29	55	1347	0	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1083	0	-	527
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	640	-	0	496
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	640	-	-	496
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	496	-	-	640	-
HCM Lane V/C Ratio	0.118	-	-	0.087	-
HCM Control Delay (s)	13.2	-	-	11.2	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.3	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	822	120	288	1059	128	262
v/c Ratio	0.47	0.14	0.61	0.44	0.36	0.50
Control Delay	11.9	1.3	22.2	19.9	37.9	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	1.3	22.2	19.9	37.9	8.0
Queue Length 50th (ft)	87	0	149	296	71	0
Queue Length 95th (ft)	122	7	228	422	127	66
Internal Link Dist (ft)	919			966	331	
Turn Bay Length (ft)		150	200			200
Base Capacity (vph)	1746	840	606	2406	354	526
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	0.47	0.14	0.48	0.44	0.36	0.50

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	756	110	265	974	118	241
Future Volume (veh/h)	756	110	265	974	118	241
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	822	120	288	1059	128	262
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1862	830	592	2417	356	317
Arrive On Green	1.00	1.00	0.03	0.22	0.20	0.20
Sat Flow, veh/h	3647	1585	1781	3647	1781	1585
Grp Volume(v), veh/h	822	120	288	1059	128	262
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	0.0	0.0	7.0	25.6	6.2	15.8
Cycle Q Clear(g_c), s	0.0	0.0	7.0	25.6	6.2	15.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1862	830	592	2417	356	317
V/C Ratio(X)	0.44	0.14	0.49	0.44	0.36	0.83
Avail Cap(c_a), veh/h	1862	830	795	2417	356	317
HCM Platoon Ratio	2.00	2.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	9.1	22.4	34.5	38.3
Incr Delay (d2), s/veh	0.8	0.4	0.6	0.6	2.8	21.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	2.9	12.2	2.9	7.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.8	0.4	9.8	22.9	37.3	59.6
LnGrp LOS	A	A	A	C	D	E
Approach Vol, veh/h	942			1347	390	
Approach Delay, s/veh	0.7			20.1	52.3	
Approach LOS	A			C	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		26.0	15.6	58.4		74.0
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		20.0	21.0	41.0		68.0
Max Q Clear Time (g_c+I1), s		17.8	9.0	2.0		27.6
Green Ext Time (p_c), s		0.3	0.7	7.1		9.4

Intersection Summary	
HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	699	68	148	944	0	167
Future Vol, veh/h	699	68	148	944	0	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	760	74	161	1026	0	182

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	834	0	-	380
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	795	-	0	618
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	795	-	-	618
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	618	-	-	795	-
HCM Lane V/C Ratio	0.294	-	-	0.202	-
HCM Control Delay (s)	13.2	-	-	10.7	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	1.2	-	-	0.8	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	135	133	3	90	174
Future Vol, veh/h	3	135	133	3	90	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	-	-	-	-	-
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	147	145	3	98	189

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	532	147	0	0	148	0
Stage 1	147	-	-	-	-	-
Stage 2	385	-	-	-	-	-
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	508	900	-	-	1434	-
Stage 1	880	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	469	900	-	-	1434	-
Mov Cap-2 Maneuver	469	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	636	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	2.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	882	1434	-
HCM Lane V/C Ratio	-	-	0.17	0.068	-
HCM Control Delay (s)	-	-	9.9	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	59	77	6	38	139
Future Vol, veh/h	7	59	77	6	38	139
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	64	84	7	41	151

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	321	88	0	0	91	0
Stage 1	88	-	-	-	-	-
Stage 2	233	-	-	-	-	-
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	673	970	-	-	1504	-
Stage 1	935	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	653	970	-	-	1504	-
Mov Cap-2 Maneuver	653	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	782	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	923	1504	-
HCM Lane V/C Ratio	-	-	0.078	0.027	-
HCM Control Delay (s)	-	-	9.2	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	655	5	28	635	11	62
Future Vol, veh/h	655	5	28	635	11	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	712	5	30	690	12	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	717	0	1120	359
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	880	-	200	638
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	642	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	880	-	193	638
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	620	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	555	880	-	-	-
HCM Lane V/C Ratio	0.143	0.035	-	-	-
HCM Control Delay (s)	12.6	9.2	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	-

Intersection	
Int Delay, s/veh	1

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	598	4	28	618	10	62
Future Vol, veh/h	598	4	28	618	10	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	650	4	30	672	11	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	654	0	1048	652
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	396	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	931	-	237	467
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	931	-	229	467
Mov Cap-2 Maneuver	-	-	-	-	362	-
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	629	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	449	931	-	-	-
HCM Lane V/C Ratio	0.174	0.033	-	-	-
HCM Control Delay (s)	14.7	9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.6	0.1	-	-	-

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	374	24	132	290	41	41	20	158	43	13	10
Future Vol, veh/h	6	374	24	132	290	41	41	20	158	43	13	10
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	407	26	143	315	45	45	22	172	47	14	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	360	0	0	433	0	0	885	1080	217	853	1071	180
Stage 1	-	-	-	-	-	-	434	434	-	624	624	-
Stage 2	-	-	-	-	-	-	451	646	-	229	447	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1195	-	-	1123	-	-	239	217	787	253	219	832
Stage 1	-	-	-	-	-	-	570	579	-	440	476	-
Stage 2	-	-	-	-	-	-	557	465	-	753	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1195	-	-	1123	-	-	194	181	787	157	182	832
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	181	-	157	182	-
Stage 1	-	-	-	-	-	-	565	574	-	436	400	-
Stage 2	-	-	-	-	-	-	445	391	-	562	567	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.7	24.3	36.3
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	419	1195	-	-	1123	-	-	185
HCM Lane V/C Ratio	0.568	0.005	-	-	0.128	-	-	0.388
HCM Control Delay (s)	24.3	8	0	-	8.7	0.4	-	36.3
HCM Lane LOS	C	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	3.4	0	-	-	0.4	-	-	1.7

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	502	123	364	415	510	88
v/c Ratio	0.39	0.19	0.62	0.19	0.65	0.13
Control Delay	17.3	4.4	13.7	1.9	26.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	4.4	13.7	1.9	26.4	2.4
Queue Length 50th (ft)	75	0	56	1	94	0
Queue Length 95th (ft)	125	31	#132	8	127	16
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325		200	200
Base Capacity (vph)	1283	654	586	2165	1246	654
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	0.39	0.19	0.62	0.19	0.41	0.13

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)	0	462	113	335	382	0	0	0	0	469	0	81
Future Volume (veh/h)	0	462	113	335	382	0	0	0	0	469	0	81
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	502	0	364	415	0				510	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	815		802	2290	0				670	0	
Arrive On Green	0.00	0.23	0.00	0.11	0.21	0.00				0.19	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				3456	0	1585
Grp Volume(v), veh/h	0	502	0	364	415	0				510	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1728	0	1585
Q Serve(g_s), s	0.0	8.2	0.0	4.7	6.2	0.0				9.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.2	0.0	4.7	6.2	0.0				9.1	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	815		802	2290	0				670	0	
V/C Ratio(X)	0.00	0.62		0.45	0.18	0.00				0.76	0.00	
Avail Cap(c_a), veh/h	0	815		802	2290	0				1255	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.95	0.95	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	22.5	0.0	19.1	11.5	0.0				24.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.5	0.0	0.4	0.2	0.0				1.8	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
%ile BackOfQ(50%),veh/ln	0.0	3.5	0.0	4.7	2.1	0.0				3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	26.0	0.0	19.5	11.7	0.0				26.6	0.0	0.0
LnGrp LOS	A	C		B	B	A				C	A	
Approach Vol, veh/h		502	A		779						510	A
Approach Delay, s/veh		26.0			15.3						26.6	
Approach LOS		C			B						C	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	47.0	27.0	20.0	18.0
Change Period (Y+Rc), s	* 5.1	* 5.1	* 5.1	5.4
Max Green Setting (Gmax), s	* 31	* 11	* 15	23.6
Max Q Clear Time (g_c+I1), s	8.2	6.7	10.2	11.1
Green Ext Time (p_c), s	4.8	0.5	2.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	91	921	668	470	111	304
v/c Ratio	0.16	0.35	0.32	0.43	0.44	0.29
Control Delay	3.3	2.5	10.0	3.9	30.0	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.3	2.5	10.0	3.9	30.0	2.4
Queue Length 50th (ft)	4	21	76	16	41	0
Queue Length 95th (ft)	19	63	132	73	79	38
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	610	2639	2107	1099	370	1065
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	0.15	0.35	0.32	0.43	0.30	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	847	0	0	615	432	102	0	280	0	0	0
Future Volume (veh/h)	84	847	0	0	615	432	102	0	280	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	91	921	0	0	668	0	111	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	626	2680	0	0	2186		145	0				
Arrive On Green	0.04	0.51	0.00	0.00	0.62	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	91	921	0	0	668	0	111	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	1.1	10.1	0.0	0.0	5.8	0.0	4.0	0.0	0.0			
Cycle Q Clear(g_c), s	1.1	10.1	0.0	0.0	5.8	0.0	4.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	626	2680	0	0	2186		145	0				
V/C Ratio(X)	0.15	0.34	0.00	0.00	0.31		0.77	0.00				
Avail Cap(c_a), veh/h	734	2680	0	0	2186		373	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.84	0.84	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	3.9	6.4	0.0	0.0	5.9	0.0	29.3	0.0	0.0			
Incr Delay (d2), s/veh	0.1	0.3	0.0	0.0	0.4	0.0	8.2	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			
%ile BackOfQ(50%),veh/ln	0.3	2.7	0.0	0.0	1.7	0.0	1.9	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.0	6.7	0.0	0.0	6.3	0.0	37.5	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		1012			668	A		111	A			
Approach Delay, s/veh		6.5			6.3			37.5				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	9.0	45.3				54.3		10.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	8.0	* 28				* 41		13.6				
Max Q Clear Time (g_c+I1), s	3.1	7.8				12.1		6.0				
Green Ext Time (p_c), s	0.1	7.5				13.0		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1424	139	807	270	165
v/c Ratio	0.69	0.53	0.32	0.81	0.39
Control Delay	21.8	22.1	6.5	68.4	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	22.1	6.5	68.4	10.0
Queue Length 50th (ft)	410	35	102	219	6
Queue Length 95th (ft)	604	96	149	303	63
Internal Link Dist (ft)	1940		1212	552	
Turn Bay Length (ft)		200			150
Base Capacity (vph)	2064	324	2542	422	496
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.43	0.32	0.64	0.33

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1152	158	128	742	248	152
Future Volume (veh/h)	1152	158	128	742	248	152
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1252	172	139	807	270	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2030	277	288	2617	305	271
Arrive On Green	0.65	0.65	0.09	1.00	0.17	0.17
Sat Flow, veh/h	3234	429	1781	3647	1781	1585
Grp Volume(v), veh/h	706	718	139	807	270	165
Grp Sat Flow(s),veh/h/ln	1777	1793	1781	1777	1781	1585
Q Serve(g_s), s	30.3	30.7	3.6	0.0	19.2	12.5
Cycle Q Clear(g_c), s	30.3	30.7	3.6	0.0	19.2	12.5
Prop In Lane		0.24	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1148	1159	288	2617	305	271
V/C Ratio(X)	0.61	0.62	0.48	0.31	0.89	0.61
Avail Cap(c_a), veh/h	1148	1159	415	2617	425	378
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	13.6	11.8	0.0	52.6	49.8
Incr Delay (d2), s/veh	2.5	2.5	1.3	0.3	15.1	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	11.8	1.2	0.1	9.8	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.9	16.1	13.1	0.3	67.7	52.0
LnGrp LOS	B	B	B	A	E	D
Approach Vol, veh/h	1424			946	435	
Approach Delay, s/veh	16.0			2.2	61.8	
Approach LOS	B			A	E	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		28.3	11.7	90.0		101.7
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		31.0	15.0	66.0		87.0
Max Q Clear Time (g_c+I1), s		21.2	5.6	32.7		2.0
Green Ext Time (p_c), s		1.0	0.2	11.6		6.0

Intersection Summary	
HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

Queues
6: Douglas St & Colbern Rd

01/19/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	430	722	695	535	500	159	739	588	615	129	533	391
v/c Ratio	0.74	0.91	0.50	0.87	0.61	0.30	0.89	0.53	0.38	0.40	0.72	0.61
Control Delay	36.0	40.5	9.9	55.3	36.7	2.4	36.0	17.4	3.2	26.7	49.4	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	40.5	9.9	55.3	36.7	2.4	36.0	17.4	3.2	26.7	49.4	26.2
Queue Length 50th (ft)	115	229	117	181	158	0	131	94	47	51	128	172
Queue Length 95th (ft)	m167	#343	124	#269	218	10	#330	122	35	90	#170	270
Internal Link Dist (ft)		562			2353			694			850	
Turn Bay Length (ft)	300		300	500		200	375		200	290		500
Base Capacity (vph)	660	815	1414	621	826	527	850	1104	1606	321	745	671
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.89	0.49	0.86	0.61	0.30	0.87	0.53	0.38	0.40	0.72	0.58

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	396	664	639	492	460	146	680	541	566	119	490	360
Future Volume (veh/h)	396	664	639	492	460	146	680	541	566	119	490	360
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	430	722	695	535	500	159	739	588	615	129	533	391
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	517	809	1295	592	886	395	818	1083	1328	278	801	486
Arrive On Green	0.05	0.08	0.08	0.29	0.42	0.42	0.08	0.10	0.10	0.08	0.16	0.16
Sat Flow, veh/h	3456	3554	2790	3456	3554	1585	3456	3554	2790	1781	5106	1585
Grp Volume(v), veh/h	430	722	695	535	500	159	739	588	615	129	533	391
Grp Sat Flow(s),veh/h/ln	1728	1777	1395	1728	1777	1585	1728	1777	1395	1781	1702	1585
Q Serve(g_s), s	13.0	21.1	7.3	15.7	11.3	5.6	22.3	16.5	3.1	0.0	10.3	16.5
Cycle Q Clear(g_c), s	13.0	21.1	7.3	15.7	11.3	5.6	22.3	16.5	3.1	0.0	10.3	16.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	517	809	1295	592	886	395	818	1083	1328	278	801	486
V/C Ratio(X)	0.83	0.89	0.54	0.90	0.56	0.40	0.90	0.54	0.46	0.46	0.67	0.81
Avail Cap(c_a), veh/h	665	819	1303	625	886	395	856	1083	1328	278	801	486
HCM Platoon Ratio	0.33	0.33	0.33	1.67	1.67	1.67	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.68	0.68	0.68	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	47.3	8.1	36.7	26.3	14.3	47.2	40.3	26.0	40.4	41.7	33.5
Incr Delay (d2), s/veh	7.1	12.0	0.4	16.1	0.8	0.7	9.1	1.3	0.8	1.2	4.3	13.3
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	6.4	11.3	2.9	6.8	4.1	2.5	11.3	8.0	6.7	3.1	4.5	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.7	59.3	8.5	52.7	27.1	15.0	56.3	41.6	26.8	41.6	46.0	46.8
LnGrp LOS	E	E	A	D	C	B	E	D	C	D	D	D
Approach Vol, veh/h		1847			1194			1942			1053	
Approach Delay, s/veh		39.4			37.0			42.5			45.8	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.9	22.5	23.0	29.7	14.3	38.0	21.5	31.2
Change Period (Y+Rc), s	5.0	* 6	* 5	5.8	* 6	* 6	* 5.8	5.0
Max Green Setting (Gmax), s	26.0	* 14	* 19	24.2	* 8	* 32	* 20	23.0
Max Q Clear Time (g_c+I1), s	24.3	18.5	17.7	23.1	2.0	18.5	15.0	13.3
Green Ext Time (p_c), s	0.6	0.0	0.3	0.8	0.1	5.4	0.7	2.5

Intersection Summary	
HCM 6th Ctrl Delay	41.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	1	25	0	17	2	810	12	20	786	5
Future Vol, veh/h	2	0	1	25	0	17	2	810	12	20	786	5
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	27	0	18	2	880	13	22	854	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1801	1798	857	1785	1787	880	859	0	0	893	0	0
Stage 1	901	901	-	884	884	-	-	-	-	-	-	-
Stage 2	900	897	-	901	903	-	-	-	-	-	-	-
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	62	80	357	63	81	346	782	-	-	759	-	-
Stage 1	333	357	-	340	363	-	-	-	-	-	-	-
Stage 2	333	358	-	333	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	77	357	61	78	346	782	-	-	759	-	-
Mov Cap-2 Maneuver	57	77	-	61	78	-	-	-	-	-	-	-
Stage 1	332	347	-	339	362	-	-	-	-	-	-	-
Stage 2	314	357	-	322	346	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52.5	68.9	0	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	782	-	-	79	61	346	759	-	-
HCM Lane V/C Ratio	0.003	-	-	0.041	0.445	0.053	0.029	-	-
HCM Control Delay (s)	9.6	-	-	52.5	104.8	16	9.9	-	-
HCM Lane LOS	A	-	-	F	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.7	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	56	740	95	65	718
Future Vol, veh/h	92	56	740	95	65	718
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	-	-	225	225	-
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	100	61	804	103	71	780

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1726	402	0	0	907	0
Stage 1	804	-	-	-	-	-
Stage 2	922	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	~ 88	599	-	-	748	-
Stage 1	402	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 80	599	-	-	748	-
Mov Cap-2 Maneuver	207	-	-	-	-	-
Stage 1	402	-	-	-	-	-
Stage 2	349	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35	0	0.9
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	275	748	-
HCM Lane V/C Ratio	-	-	0.585	0.094	-
HCM Control Delay (s)	-	-	35	10.3	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	3.4	0.3	-

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	178	208	279	85	59	152	396	329	42	469
v/c Ratio	0.08	0.51	0.45	0.60	0.14	0.10	0.54	0.56	0.41	0.12	0.86
Control Delay	17.0	38.0	8.0	25.1	24.7	0.3	22.7	27.7	4.6	15.2	46.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	38.0	8.0	25.1	24.7	0.3	22.7	27.7	4.6	15.2	46.7
Queue Length 50th (ft)	14	95	0	114	37	0	49	188	0	13	249
Queue Length 95th (ft)	34	159	56	178	75	0	97	323	60	34	#451
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	561	654	690	503	765	735	305	709	806	490	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.27	0.30	0.55	0.11	0.08	0.50	0.56	0.41	0.09	0.62

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)	37	164	191	257	78	54	140	364	303	39	420	11
Future Volume (veh/h)	37	164	191	257	78	54	140	364	303	39	420	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	178	208	279	85	59	152	396	329	42	457	12
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	490	350	297	461	561	476	281	619	525	270	521	14
Arrive On Green	0.04	0.19	0.19	0.15	0.30	0.30	0.08	0.33	0.33	0.04	0.29	0.29
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1814	48
Grp Volume(v), veh/h	40	178	208	279	85	59	152	396	329	42	0	469
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1862
Q Serve(g_s), s	1.2	6.7	9.6	9.6	2.6	2.1	4.6	14.1	13.7	1.2	0.0	18.8
Cycle Q Clear(g_c), s	1.2	6.7	9.6	9.6	2.6	2.1	4.6	14.1	13.7	1.2	0.0	18.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	490	350	297	461	561	476	281	619	525	270	0	535
V/C Ratio(X)	0.08	0.51	0.70	0.61	0.15	0.12	0.54	0.64	0.63	0.16	0.00	0.88
Avail Cap(c_a), veh/h	640	704	597	523	704	597	340	692	587	520	0	689
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.7	28.6	29.8	20.8	20.1	19.9	19.7	22.2	22.1	17.3	0.0	26.6
Incr Delay (d2), s/veh	0.0	2.4	6.3	0.8	0.3	0.2	0.6	1.7	1.8	0.1	0.0	10.1
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	0.5	3.1	3.9	3.8	1.1	0.7	1.7	5.8	4.8	0.5	0.0	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	31.0	36.0	21.7	20.4	20.2	20.3	23.9	23.9	17.4	0.0	36.7
LnGrp LOS	B	C	D	C	C	C	C	C	C	B	A	D
Approach Vol, veh/h		426			423			877			511	
Approach Delay, s/veh		32.2			21.2			23.3			35.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	20.2	12.4	28.5	8.4	29.0	9.0	31.9
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	11.6	11.6	6.6	20.8	3.2	4.6	3.2	16.1
Green Ext Time (p_c), s	0.1	3.1	0.0	1.7	0.0	1.2	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	2	886	11	32	903	10	5	0	17	17	0	10
Future Vol, veh/h	2	886	11	32	903	10	5	0	17	17	0	10
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	200	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	963	12	35	982	11	5	0	18	18	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	993	0	0	975	0	0	1534	2036	488	1544	2037	497
Stage 1	-	-	-	-	-	-	973	973	-	1058	1058	-
Stage 2	-	-	-	-	-	-	561	1063	-	486	979	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	692	-	-	703	-	-	79	56	526	78	56	519
Stage 1	-	-	-	-	-	-	271	329	-	240	300	-
Stage 2	-	-	-	-	-	-	480	298	-	531	326	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	692	-	-	703	-	-	74	53	526	72	53	519
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	53	-	72	53	-
Stage 1	-	-	-	-	-	-	270	328	-	239	285	-
Stage 2	-	-	-	-	-	-	447	283	-	511	325	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.4	23.3	51.5
HCM LOS			C	F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	220	703	-	-	692	-	-	106
HCM Lane V/C Ratio	0.109	0.049	-	-	0.003	-	-	0.277
HCM Control Delay (s)	23.3	10.4	-	-	10.2	-	-	51.5
HCM Lane LOS	C	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	1

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	29	54	942	914	6
Future Vol, veh/h	3	29	54	942	914	6
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	3	32	59	1024	993	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1627	500	1000	0	-	0
Stage 1	997	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	93	516	688	-	-	-
Stage 1	318	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	85	516	688	-	-	-
Mov Cap-2 Maneuver	203	-	-	-	-	-
Stage 1	291	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	688	-	451	-	-
HCM Lane V/C Ratio	0.085	-	0.077	-	-
HCM Control Delay (s)	10.7	-	13.6	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	84	127	956	885	58
Future Vol, veh/h	40	84	127	956	885	58
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	150	200	-	-	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	43	91	138	1039	962	63

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1758	481	1025	0	-	0
Stage 1	962	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	76	531	673	-	-	-
Stage 1	331	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	60	531	673	-	-	-
Mov Cap-2 Maneuver	171	-	-	-	-	-
Stage 1	263	-	-	-	-	-
Stage 2	405	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.6	1.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	673	-	171	531	-	-
HCM Lane V/C Ratio	0.205	-	0.254	0.172	-	-
HCM Control Delay (s)	11.7	-	33.1	13.2	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.8	-	1	0.6	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1515	104	0	1445	55	0	0	184	0	0	53
Future Vol, veh/h	0	1515	104	0	1445	55	0	0	184	0	0	53
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	-	-	150	-	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1647	113	0	1571	60	0	0	200	0	0	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	824	-	-	786
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	316	0	0	335
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	316	-	-	335
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	34.1	18
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	316	-	-	-	-	335
HCM Lane V/C Ratio	0.633	-	-	-	-	0.172
HCM Control Delay (s)	34.1	-	-	-	-	18
HCM Lane LOS	D	-	-	-	-	C
HCM 95th %tile Q(veh)	4	-	-	-	-	0.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	127	1445	142	474	1113	41	274	249	66	29
v/c Ratio	0.36	0.78	0.16	0.81	0.50	0.04	0.77	0.60	0.35	0.08
Control Delay	6.9	24.4	2.2	52.6	6.1	0.1	58.4	13.6	46.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	24.4	2.2	52.6	6.1	0.1	58.4	13.6	46.4	0.4
Queue Length 50th (ft)	20	410	0	132	142	0	91	9	40	0
Queue Length 95th (ft)	35	508	25	m185	m154	m0	#144	84	84	0
Internal Link Dist (ft)		869			534					266
Turn Bay Length (ft)	300		300	300		250	150	150		
Base Capacity (vph)	349	1852	902	621	2248	1039	381	425	201	392
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	0.36	0.78	0.16	0.76	0.50	0.04	0.72	0.59	0.33	0.07

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1329	131	436	1024	38	252	0	229	61	0	27
Future Volume (veh/h)	117	1329	131	436	1024	38	252	0	229	61	0	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	1445	142	474	1113	41	274	0	249	66	0	29
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	352	1872	835	549	2272	1013	477	267	226	230	0	226
Arrive On Green	0.05	0.53	0.53	0.11	0.43	0.43	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	2679	1870	1585	1131	0	1585
Grp Volume(v), veh/h	127	1445	142	474	1113	41	274	0	249	66	0	29
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1339	1870	1585	1131	0	1585
Q Serve(g_s), s	2.5	34.1	4.9	14.2	23.8	1.6	10.4	0.0	15.0	5.6	0.0	1.7
Cycle Q Clear(g_c), s	2.5	34.1	4.9	14.2	23.8	1.6	12.1	0.0	15.0	5.6	0.0	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	1872	835	549	2272	1013	477	267	226	230	0	226
V/C Ratio(X)	0.36	0.77	0.17	0.86	0.49	0.04	0.57	0.00	1.10	0.29	0.00	0.13
Avail Cap(c_a), veh/h	371	1872	835	625	2272	1013	477	267	226	230	0	226
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	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	0.00	1.00
Uniform Delay (d), s/veh	9.2	19.8	12.9	45.8	17.6	11.3	44.6	0.0	45.0	41.0	0.0	39.3
Incr Delay (d2), s/veh	0.6	3.2	0.4	10.9	0.8	0.1	1.7	0.0	89.0	0.7	0.0	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	13.3	1.7	7.0	10.3	0.5	3.6	0.0	11.3	1.6	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.9	23.0	13.4	56.7	18.4	11.4	46.3	0.0	134.0	41.6	0.0	39.5
LnGrp LOS	A	C	B	E	B	B	D	A	F	D	A	D
Approach Vol, veh/h		1714			1628			523			95	
Approach Delay, s/veh		21.2			29.4			88.0			41.0	
Approach LOS		C			C			F			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	22.7	61.3		21.0	10.9	73.1				
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		15.0	19.0	53.0		15.0	6.0	66.0				
Max Q Clear Time (g_c+I1), s		17.0	16.2	36.1		7.6	4.5	25.8				
Green Ext Time (p_c), s		0.0	0.5	9.6		0.2	0.0	9.4				

Intersection Summary	
HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	1522	43	79	1224	0	55
Future Vol, veh/h	1522	43	79	1224	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	1654	47	86	1330	0	60

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1701	0	-	827
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	370	-	0	315
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	370	-	-	315
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	315	-	-	370	-
HCM Lane V/C Ratio	0.19	-	-	0.232	-
HCM Control Delay (s)	19.1	-	-	17.6	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	0.7	-	-	0.9	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1423	101	287	1043	134	278
v/c Ratio	0.75	0.12	0.76	0.40	0.47	0.57
Control Delay	15.3	5.3	41.2	6.4	55.6	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	5.3	41.2	6.4	55.6	10.4
Queue Length 50th (ft)	165	4	148	145	104	0
Queue Length 95th (ft)	263	m19	244	177	171	81
Internal Link Dist (ft)	919			966	331	
Turn Bay Length (ft)		150	200			200
Base Capacity (vph)	1902	874	454	2640	285	488
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	0.75	0.12	0.63	0.40	0.47	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1309	93	264	960	123	256
Future Volume (veh/h)	1309	93	264	960	123	256
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1423	101	287	1043	134	278
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2208	985	408	2652	288	256
Arrive On Green	1.00	1.00	0.08	0.75	0.16	0.16
Sat Flow, veh/h	3647	1585	1781	3647	1781	1585
Grp Volume(v), veh/h	1423	101	287	1043	134	278
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	0.0	0.0	7.5	13.7	8.9	21.0
Cycle Q Clear(g_c), s	0.0	0.0	7.5	13.7	8.9	21.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2208	985	408	2652	288	256
V/C Ratio(X)	0.64	0.10	0.70	0.39	0.47	1.09
Avail Cap(c_a), veh/h	2208	985	638	2652	288	256
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	7.0	5.9	49.4	54.5
Incr Delay (d2), s/veh	1.5	0.2	2.2	0.4	5.3	81.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	2.7	4.3	4.4	13.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.5	0.2	9.2	6.4	54.7	135.5
LnGrp LOS	A	A	A	A	D	F
Approach Vol, veh/h	1524			1330	412	
Approach Delay, s/veh	1.4			7.0	109.2	
Approach LOS	A			A	F	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		27.0	16.2	86.8		103.0
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		21.0	27.0	64.0		97.0
Max Q Clear Time (g_c+I1), s		23.0	9.5	2.0		15.7
Green Ext Time (p_c), s		0.0	0.7	15.4		8.7

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	1175	100	219	864	0	227
Future Vol, veh/h	1175	100	219	864	0	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	1277	109	238	939	0	247

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1386	0	-	639
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	490	-	0	419
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	490	-	-	419
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	25.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	419	-	-	490	-
HCM Lane V/C Ratio	0.589	-	-	0.486	-
HCM Control Delay (s)	25.2	-	-	19.1	-
HCM Lane LOS	D	-	-	C	-
HCM 95th %tile Q(veh)	3.7	-	-	2.6	-

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	183	217	4	133	153
Future Vol, veh/h	4	183	217	4	133	153
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	199	236	4	145	166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	694	238	0	0	240	0
Stage 1	238	-	-	-	-	-
Stage 2	456	-	-	-	-	-
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	801	-	-	1327	-
Stage 1	802	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	360	801	-	-	1327	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	561	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	3.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	781	1327	-
HCM Lane V/C Ratio	-	-	0.26	0.109	-
HCM Control Delay (s)	-	-	11.2	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1	0.4	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	81	140	9	55	102
Future Vol, veh/h	10	81	140	9	55	102
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	88	152	10	60	111

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	388	157	0	0	162	0
Stage 1	157	-	-	-	-	-
Stage 2	231	-	-	-	-	-
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	616	889	-	-	1417	-
Stage 1	871	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	588	889	-	-	1417	-
Mov Cap-2 Maneuver	588	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	771	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	2.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	842	1417	-
HCM Lane V/C Ratio	-	-	0.117	0.042	-
HCM Control Delay (s)	-	-	9.8	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	846	12	65	853	9	53
Future Vol, veh/h	846	12	65	853	9	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	920	13	71	927	10	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	933	0	1533	467
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	606	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	729	-	107	542
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	507	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	729	-	97	542
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	458	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.7	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	449	729	-	-	-
HCM Lane V/C Ratio	0.15	0.097	-	-	-
HCM Control Delay (s)	14.4	10.5	-	-	-
HCM Lane LOS	B	B	-	-	-
HCM 95th %tile Q(veh)	0.5	0.3	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	805	12	65	797	9	53
Future Vol, veh/h	805	12	65	797	9	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	875	13	71	866	10	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	888	0	1457	882
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	575	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	761	-	131	344
Stage 1	-	-	-	-	404	-
Stage 2	-	-	-	-	527	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	761	-	119	344
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	404	-
Stage 2	-	-	-	-	478	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.8	18.8
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	327	761	-	-	-
HCM Lane V/C Ratio	0.206	0.093	-	-	-
HCM Control Delay (s)	18.8	10.2	-	-	-
HCM Lane LOS	C	B	-	-	-
HCM 95th %tile Q(veh)	0.8	0.3	-	-	-

Queues
7: 470 EB & Douglas St & 470 WB

01/17/2023

Lane Group	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Group Flow (vph)	307	364	197	221	454	1035	735	520	370	192
v/c Ratio	0.53	0.25	0.25	0.67	0.29	0.58	0.69	1.18	0.50	0.45
Control Delay	41.9	23.4	12.1	42.5	22.5	6.4	39.5	124.7	36.7	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	23.4	12.1	42.5	22.5	6.4	39.5	124.7	36.7	11.2
Queue Length 50th (ft)	107	110	52	140	125	59	153	~280	107	15
Queue Length 95th (ft)	151	172	123	m200	176	142	187	#486	145	70
Internal Link Dist (ft)		1351			694					
Turn Bay Length (ft)	400		200	225		400		400		400
Base Capacity (vph)	583	1485	778	442	1542	1798	1247	442	858	518
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	0.53	0.25	0.25	0.50	0.29	0.58	0.59	1.18	0.43	0.37

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.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Configurations										
Traffic Volume (vph)	282	335	181	203	418	952	676	478	340	177
Future Volume (vph)	282	335	181	203	418	952	676	478	340	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.94	1.00	0.97	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	364	197	221	454	1035	735	520	370	192
RTOR Reduction (vph)	0	0	114	0	0	584	0	173	0	133
Lane Group Flow (vph)	307	364	83	221	454	451	735	347	370	59
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	Prot	Prot
Protected Phases	1	6		5	2		7	1	3	5
Permitted Phases			6			2				
Actuated Green, G (s)	17.0	42.0	42.0	18.6	43.6	43.6	21.4	17.0	21.4	18.6
Effective Green, g (s)	17.0	42.0	42.0	18.6	43.6	43.6	21.4	17.0	21.4	18.6
Actuated g/C Ratio	0.17	0.42	0.42	0.19	0.44	0.44	0.21	0.17	0.21	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	583	1486	664	329	1543	1215	1067	269	734	294
v/s Ratio Prot	0.09	0.10		c0.12	0.13		c0.15	c0.22	0.11	0.04
v/s Ratio Perm			0.05			c0.16				
v/c Ratio	0.53	0.24	0.12	0.67	0.29	0.37	0.69	1.29	0.50	0.20
Uniform Delay, d1	37.8	18.7	17.7	37.9	18.2	19.0	36.2	41.5	34.6	34.4
Progression Factor	1.02	1.12	3.10	0.92	1.16	3.91	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.4	0.3	4.7	0.4	0.7	2.0	154.8	0.7	0.5
Delay (s)	39.5	21.3	55.4	39.3	21.6	74.9	38.3	196.3	35.4	34.9
Level of Service	D	C	E	D	C	E	D	F	D	C
Approach Delay (s)		35.5			56.2					
Approach LOS		D			E					

Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues
7: 470 EB & Douglas St & 470 WB

01/17/2023

Lane Group	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Group Flow (vph)	605	582	450	234	535	993	1103	537	217	258
v/c Ratio	0.74	0.44	0.51	0.74	0.48	0.64	0.81	0.92	0.23	0.62
Control Delay	22.3	15.5	6.5	61.8	31.0	7.2	41.1	42.5	30.0	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	15.5	6.5	61.8	31.0	7.2	41.1	42.5	30.0	20.9
Queue Length 50th (ft)	180	127	60	158	138	65	240	191	57	55
Queue Length 95th (ft)	206	185	137	m199	m173	m89	292	#404	88	134
Internal Link Dist (ft)		1351			694					
Turn Bay Length (ft)	400		200	225		400		400		400
Base Capacity (vph)	820	1323	874	389	1113	1557	1430	583	984	476
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	0.74	0.44	0.51	0.60	0.48	0.64	0.77	0.92	0.22	0.54

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Configurations										
Traffic Volume (vph)	557	535	414	215	492	914	1015	494	200	237
Future Volume (vph)	557	535	414	215	492	914	1015	494	200	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5	6.5	5.9	5.9	5.9	5.9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.94	1.00	0.97	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	605	582	450	234	535	993	1103	537	217	258
RTOR Reduction (vph)	0	0	282	0	0	682	0	204	0	135
Lane Group Flow (vph)	605	582	168	234	535	311	1103	333	217	123
Turn Type	Prot	NA	Prot	Prot	NA	Prot	Prot	Prot	Prot	Prot
Protected Phases	1	6	6	5	2	2	7	1	3	5
Permitted Phases										
Actuated Green, G (s)	25.2	39.2	39.2	18.9	32.9	32.9	28.6	25.2	28.6	18.9
Effective Green, g (s)	25.2	39.2	39.2	18.9	32.9	32.9	28.6	25.2	28.6	18.9
Actuated g/C Ratio	0.24	0.37	0.37	0.18	0.31	0.31	0.27	0.24	0.27	0.18
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5	6.5	5.9	5.9	5.9	5.9
Vehicle Extension (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	823	1321	590	318	1108	873	1359	379	935	284
v/s Ratio Prot	0.18	c0.16	0.11	c0.13	0.15	0.11	c0.22	c0.21	0.06	0.08
v/s Ratio Perm										
v/c Ratio	0.74	0.44	0.28	0.74	0.48	0.36	0.81	0.88	0.23	0.43
Uniform Delay, d1	36.8	24.7	23.1	40.7	29.2	27.9	35.7	38.4	29.7	38.3
Progression Factor	0.49	0.57	1.84	1.27	1.00	2.92	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.7	0.8	6.6	1.1	0.8	3.9	20.2	0.2	1.2
Delay (s)	20.5	14.7	43.2	58.2	30.4	82.3	39.6	58.6	29.8	39.5
Level of Service	C	B	D	E	C	F	D	E	C	D
Approach Delay (s)		24.7			63.3					
Approach LOS		C			E					

Intersection Summary			
HCM 2000 Control Delay	44.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Simulation

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	9094	9085	9068	9026	9196	9093
Vehs Exited	9064	9063	9103	9068	9152	9088
Starting Vehs	276	282	298	291	241	277
Ending Vehs	306	304	263	249	285	275
Travel Distance (mi)	5557	5554	5464	5481	5619	5535
Travel Time (hr)	317.4	308.3	320.0	303.7	330.7	316.0
Total Delay (hr)	153.2	144.5	157.9	142.0	165.1	152.5
Total Stops	12179	12030	12329	11797	12306	12127
Fuel Used (gal)	250.6	248.2	249.5	245.3	255.4	249.8

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2008	2148	2089	2110	2199	2105
Vehs Exited	1992	2124	2132	2155	2156	2112
Starting Vehs	276	282	298	291	241	277
Ending Vehs	292	306	255	246	284	274
Travel Distance (mi)	1222	1306	1263	1292	1369	1291
Travel Time (hr)	64.1	70.1	67.4	69.0	75.2	69.2
Total Delay (hr)	28.1	31.6	29.9	31.0	35.1	31.2
Total Stops	2459	2781	2594	2645	2851	2669
Fuel Used (gal)	53.8	57.7	56.8	56.9	60.6	57.2

Interval #2 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2527	2381	2494	2492	2407	2460
Vehs Exited	2462	2341	2371	2366	2352	2380
Starting Vehs	292	306	255	246	284	274
Ending Vehs	357	346	378	372	339	356
Travel Distance (mi)	1514	1444	1464	1472	1426	1464
Travel Time (hr)	88.8	83.2	88.0	84.6	83.8	85.7
Total Delay (hr)	44.1	40.5	44.6	41.2	41.6	42.4
Total Stops	3431	3300	3485	3399	3179	3361
Fuel Used (gal)	69.0	64.9	67.3	66.6	64.6	66.5

Interval #3 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2485	2422	2407	2378	2446	2427
Vehs Exited	2471	2428	2418	2393	2413	2426
Starting Vehs	357	346	378	372	339	356
Ending Vehs	371	340	367	357	372	361
Travel Distance (mi)	1508	1474	1453	1442	1483	1472
Travel Time (hr)	89.5	83.4	92.1	82.3	91.1	87.6
Total Delay (hr)	45.1	39.8	49.0	39.7	47.4	44.2
Total Stops	3516	3202	3593	3199	3351	3369
Fuel Used (gal)	68.8	66.0	67.6	65.0	68.3	67.1

Interval #4 Information

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2074	2134	2078	2046	2144	2095
Vehs Exited	2139	2170	2182	2154	2231	2174
Starting Vehs	371	340	367	357	372	361
Ending Vehs	306	304	263	249	285	275
Travel Distance (mi)	1313	1329	1285	1274	1341	1308
Travel Time (hr)	74.9	71.7	72.6	67.8	80.6	73.5
Total Delay (hr)	36.0	32.6	34.4	30.1	41.0	34.8
Total Stops	2773	2747	2657	2554	2925	2727
Fuel Used (gal)	59.0	59.6	57.7	56.7	61.9	59.0

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	L	L
Maximum Queue (ft)	157	77	67	126	66	56	225	180
Average Queue (ft)	68	19	29	60	26	12	129	53
95th Queue (ft)	121	53	74	105	56	41	198	139
Link Distance (ft)	317	317			436	436	298	298
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	325				
Storage Blk Time (%)		1	1					
Queuing Penalty (veh)		1	1					

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	59	46	49	140	175	75	85	27
Average Queue (ft)	23	12	4	38	48	60	35	3
95th Queue (ft)	52	40	26	106	120	72	71	33
Link Distance (ft)		436	436	562	562		343	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	325					50		200
Storage Blk Time (%)					0	5		
Queuing Penalty (veh)					2	12		

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	R	R	L	L	T	T	R	L
Maximum Queue (ft)	135	171	195	192	149	154	307	340	216	195	42	345
Average Queue (ft)	67	88	109	121	72	81	178	196	102	93	11	242
95th Queue (ft)	116	142	168	179	118	124	287	302	174	161	31	434
Link Distance (ft)			539	539					2308	2308		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300	300			300	300	500	500			200	375
Storage Blk Time (%)										0		6
Queuing Penalty (veh)										0		17

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	T	T	R	R	L	T	T	T	R
Maximum Queue (ft)	464	362	324	67	64	99	158	226	243	244
Average Queue (ft)	279	113	94	24	27	40	80	93	131	102
95th Queue (ft)	574	292	262	56	56	78	137	182	211	186
Link Distance (ft)	643	643	643				840	840		
Upstream Blk Time (%)	1	0	0							
Queuing Penalty (veh)	4	0	0							
Storage Bay Dist (ft)				200	200	290			500	500
Storage Blk Time (%)	10									
Queuing Penalty (veh)	29									

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	NB	NB	NB	NB	SB	SB	SB	SB	NE	NE	NE	NE
Directions Served	L	L	T	T	L	T	T	>	L	L	L	>
Maximum Queue (ft)	167	176	165	179	192	153	140	117	269	213	209	186
Average Queue (ft)	87	103	65	87	114	69	76	3	149	118	116	18
95th Queue (ft)	145	158	133	154	178	125	133	39	235	187	185	132
Link Distance (ft)		1308	1308	1308		643	643		601	601	601	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400				225			400				400
Storage Blk Time (%)				0								
Queuing Penalty (veh)				0								

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	SW	SW
Directions Served	L	L
Maximum Queue (ft)	184	167
Average Queue (ft)	116	93
95th Queue (ft)	173	151
Link Distance (ft)	632	632
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Douglas St

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	T
Maximum Queue (ft)	78	93	72	4	13
Average Queue (ft)	30	38	32	0	0
95th Queue (ft)	62	70	61	5	6
Link Distance (ft)	320			510	510
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150	200		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: Drive 4 & Colbern Rd

Movement	EB	NB	SB
Directions Served	T	R	R
Maximum Queue (ft)	11	147	76
Average Queue (ft)	1	63	32
95th Queue (ft)	10	124	62
Link Distance (ft)	531	182	287
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: Drive 5 & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	R
Maximum Queue (ft)	85	426	449	325	212	253	297	316	81	171	241	151
Average Queue (ft)	37	169	247	75	106	127	131	154	7	85	150	56
95th Queue (ft)	72	322	412	240	174	202	230	254	47	197	224	118
Link Distance (ft)		669	669				531	531			303	
Upstream Blk Time (%)		0	0								0	
Queuing Penalty (veh)		0	0								0	
Storage Bay Dist (ft)	300			300	300	300			250	150		150
Storage Blk Time (%)		1	5	0		0	0	1		1	15	0
Queuing Penalty (veh)		1	6	0		0	0	0		1	16	0

Intersection: 16: Drive 5 & Colbern Rd

Movement	SB	SB
Directions Served	L	TR
Maximum Queue (ft)	134	52
Average Queue (ft)	59	15
95th Queue (ft)	113	37
Link Distance (ft)	282	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		150
Storage Blk Time (%)	1	
Queuing Penalty (veh)	0	

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	312	464
Average Queue (ft)	17	47
95th Queue (ft)	145	268
Link Distance (ft)	558	558
Upstream Blk Time (%)		0
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	63	130	37	70	39	105	84	122	174	246	245	140
Average Queue (ft)	16	61	6	24	6	48	36	24	68	110	134	44
95th Queue (ft)	46	115	23	53	27	89	65	70	127	191	220	131
Link Distance (ft)	1012	1012	1012			982				1267	1267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)								0	0	2	13	0
Queuing Penalty (veh)								0	0	3	9	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	140	152	186	184	82
Average Queue (ft)	62	88	100	111	45
95th Queue (ft)	111	133	166	170	76
Link Distance (ft)			1308	1308	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	56	80	99	64	240	218	69	56	93	48
Average Queue (ft)	13	12	15	11	91	53	21	16	34	13
95th Queue (ft)	38	41	48	43	195	146	55	46	76	39
Link Distance (ft)		2308	2308		1382	1382	383	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)					2					
Queuing Penalty (veh)					0					

Network Summary

Network wide Queuing Penalty: 108

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	11595	11429	11550	11367	11458	11477
Vehs Exited	11505	11355	11444	11316	11329	11390
Starting Vehs	434	382	376	377	376	383
Ending Vehs	524	456	482	428	505	477
Travel Distance (mi)	7053	7013	7077	6994	7039	7035
Travel Time (hr)	556.4	568.3	535.9	514.1	609.6	556.9
Total Delay (hr)	350.4	363.9	330.3	310.3	404.6	351.9
Total Stops	18158	18289	17919	17037	18642	18009
Fuel Used (gal)	344.4	346.8	342.1	333.4	356.6	344.7

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2659	2648	2728	2638	2707	2675
Vehs Exited	2678	2627	2698	2598	2673	2654
Starting Vehs	434	382	376	377	376	383
Ending Vehs	415	403	406	417	410	410
Travel Distance (mi)	1646	1647	1686	1630	1647	1651
Travel Time (hr)	104.7	101.7	106.2	103.1	107.7	104.7
Total Delay (hr)	56.6	53.8	57.2	55.6	59.7	56.6
Total Stops	3651	3739	3857	3670	3630	3710
Fuel Used (gal)	74.9	74.2	76.4	73.6	76.3	75.1

Interval #2 Information

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3111	3061	2986	2986	3106	3051
Vehs Exited	3009	2961	2922	2923	2935	2952
Starting Vehs	415	403	406	417	410	410
Ending Vehs	517	503	470	480	581	509
Travel Distance (mi)	1849	1835	1797	1798	1844	1825
Travel Time (hr)	132.8	132.5	121.0	125.2	140.7	130.5
Total Delay (hr)	79.0	79.2	68.6	72.7	86.8	77.3
Total Stops	4790	4716	4362	4346	4743	4597
Fuel Used (gal)	86.9	87.4	83.0	84.0	88.6	86.0

Interval #3 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3047	2992	3134	2981	2993	3032
Vehs Exited	2980	2938	2980	2948	2955	2957
Starting Vehs	517	503	470	480	581	509
Ending Vehs	584	557	624	513	619	575
Travel Distance (mi)	1827	1803	1845	1831	1853	1832
Travel Time (hr)	160.0	163.9	154.5	145.2	186.7	162.1
Total Delay (hr)	106.7	111.5	101.0	92.3	132.9	108.9
Total Stops	5223	5249	5063	4558	5652	5147
Fuel Used (gal)	93.3	92.7	92.9	90.1	99.6	93.7

Interval #4 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2778	2728	2702	2762	2652	2722
Vehs Exited	2838	2829	2844	2847	2766	2822
Starting Vehs	584	557	624	513	619	575
Ending Vehs	524	456	482	428	505	477
Travel Distance (mi)	1731	1728	1750	1736	1696	1728
Travel Time (hr)	158.9	170.1	154.2	140.5	174.5	159.7
Total Delay (hr)	108.2	119.5	103.5	89.7	125.1	109.2
Total Stops	4494	4585	4637	4463	4617	4561
Fuel Used (gal)	89.3	92.6	89.8	85.8	92.1	89.9

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	L	L
Maximum Queue (ft)	242	202	73	292	162	145	212	170
Average Queue (ft)	134	68	21	145	52	39	141	65
95th Queue (ft)	212	157	69	250	118	80	199	146
Link Distance (ft)	317	317			436	436	298	298
Upstream Blk Time (%)					0			
Queuing Penalty (veh)					0			
Storage Bay Dist (ft)			50	325				
Storage Blk Time (%)		7	0	1				
Queuing Penalty (veh)		9	1	2				

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	80	124	129	185	180	75	138
Average Queue (ft)	31	65	47	88	42	47	60
95th Queue (ft)	64	116	107	163	124	87	110
Link Distance (ft)		436	436	562	562		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					2	1	
Queuing Penalty (veh)					8	5	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	R	R	L	L	T	T	R	L
Maximum Queue (ft)	292	325	559	558	325	183	470	476	588	298	176	386
Average Queue (ft)	140	242	357	361	215	105	295	303	195	113	35	266
95th Queue (ft)	235	399	590	598	408	165	506	510	561	240	101	412
Link Distance (ft)			539	539					2308	2308		
Upstream Blk Time (%)			4	4								
Queuing Penalty (veh)			34	39								
Storage Bay Dist (ft)	300	300			300	300	500	500			200	375
Storage Blk Time (%)	0	0	19	17	0		3	6	0	0	0	4
Queuing Penalty (veh)	0	1	81	114	1		7	14	1	0	0	13

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	T	T	R	R	L	T	T	T	R
Maximum Queue (ft)	555	470	319	142	118	191	438	558	425	401
Average Queue (ft)	295	111	88	55	57	87	157	237	244	186
95th Queue (ft)	539	318	203	107	101	166	361	530	453	389
Link Distance (ft)	643	643	643				840	840		
Upstream Blk Time (%)	0	0	0					0		
Queuing Penalty (veh)	2	1	0					2		
Storage Bay Dist (ft)				200	200	290			500	500
Storage Blk Time (%)	6		0	0			0	3	2	0
Queuing Penalty (veh)	22		0	0			0	14	2	0

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	NE	NE
Directions Served	L	L	T	T	>	L	T	T	>	>	L	L
Maximum Queue (ft)	371	552	356	340	224	247	256	175	203	252	304	296
Average Queue (ft)	182	212	76	114	13	150	118	105	27	75	192	174
95th Queue (ft)	387	481	217	219	98	237	198	161	148	237	278	249
Link Distance (ft)		1308	1308	1308			643	643	643		601	601
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400				200	225				400		
Storage Blk Time (%)	1	4		1	0	2	0					
Queuing Penalty (veh)	3	12		3	0	6	0					

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	NE	NE	SW	SW	SW
Directions Served	L	>	L	L	>
Maximum Queue (ft)	318	245	155	183	219
Average Queue (ft)	201	16	81	47	14
95th Queue (ft)	291	125	133	121	113
Link Distance (ft)	601		632	632	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		400			400
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Intersection: 14: Douglas St

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	R
Maximum Queue (ft)	191	166	118	38	33
Average Queue (ft)	57	40	50	2	3
95th Queue (ft)	144	107	92	23	18
Link Distance (ft)	320			510	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150	200		150
Storage Blk Time (%)	4	0			
Queuing Penalty (veh)	3	0			

Intersection: 15: Drive 4 & Colbern Rd

Movement	EB	EB	EB	NB	SB
Directions Served	T	T	R	R	R
Maximum Queue (ft)	409	427	140	220	79
Average Queue (ft)	77	88	24	156	30
95th Queue (ft)	331	364	122	238	63
Link Distance (ft)	531	531		182	287
Upstream Blk Time (%)	0	0		42	
Queuing Penalty (veh)	0	1		0	
Storage Bay Dist (ft)			150		
Storage Blk Time (%)		6	0		
Queuing Penalty (veh)		6	0		

Intersection: 16: Drive 5 & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	324	662	666	325	237	246	117	110	24	174	283	185
Average Queue (ft)	98	338	376	125	141	157	53	50	3	105	169	7
95th Queue (ft)	260	634	661	349	211	225	104	99	15	212	258	64
Link Distance (ft)		669	669				531	531			303	303
Upstream Blk Time (%)		1	5								0	
Queuing Penalty (veh)		0	0								0	
Storage Bay Dist (ft)	300			300	300	300			250	150		
Storage Blk Time (%)		7	16	0						2	22	0
Queuing Penalty (veh)		9	22	0						2	29	0

Intersection: 16: Drive 5 & Colbern Rd

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	171	107	60
Average Queue (ft)	89	45	14
95th Queue (ft)	164	90	42
Link Distance (ft)		282	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150		150
Storage Blk Time (%)	2		
Queuing Penalty (veh)	0		

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	613	679
Average Queue (ft)	288	427
95th Queue (ft)	683	839
Link Distance (ft)	558	558
Upstream Blk Time (%)	5	31
Queuing Penalty (veh)	38	235
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	428	491	74	120	109	263	227	29	174	547	569	140
Average Queue (ft)	207	299	21	53	29	98	117	4	36	269	300	66
95th Queue (ft)	410	495	54	97	84	230	212	18	109	523	558	168
Link Distance (ft)	1012	1012	1012			982				1267	1267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)						0	5		0	25	39	0
Queuing Penalty (veh)						0	8		0	9	28	1

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	130	147	205	222	143
Average Queue (ft)	59	84	122	135	21
95th Queue (ft)	114	131	190	207	82
Link Distance (ft)			1308	1308	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				0	0

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	83	253	256	72	228	199	72	53	82	44
Average Queue (ft)	18	93	114	15	102	64	18	13	29	15
95th Queue (ft)	52	211	235	50	218	166	52	42	67	39
Link Distance (ft)		2308	2308		1382	1382	383	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)		3			3					
Queuing Penalty (veh)		1			1					

Network Summary

Network wide Queuing Penalty: 793

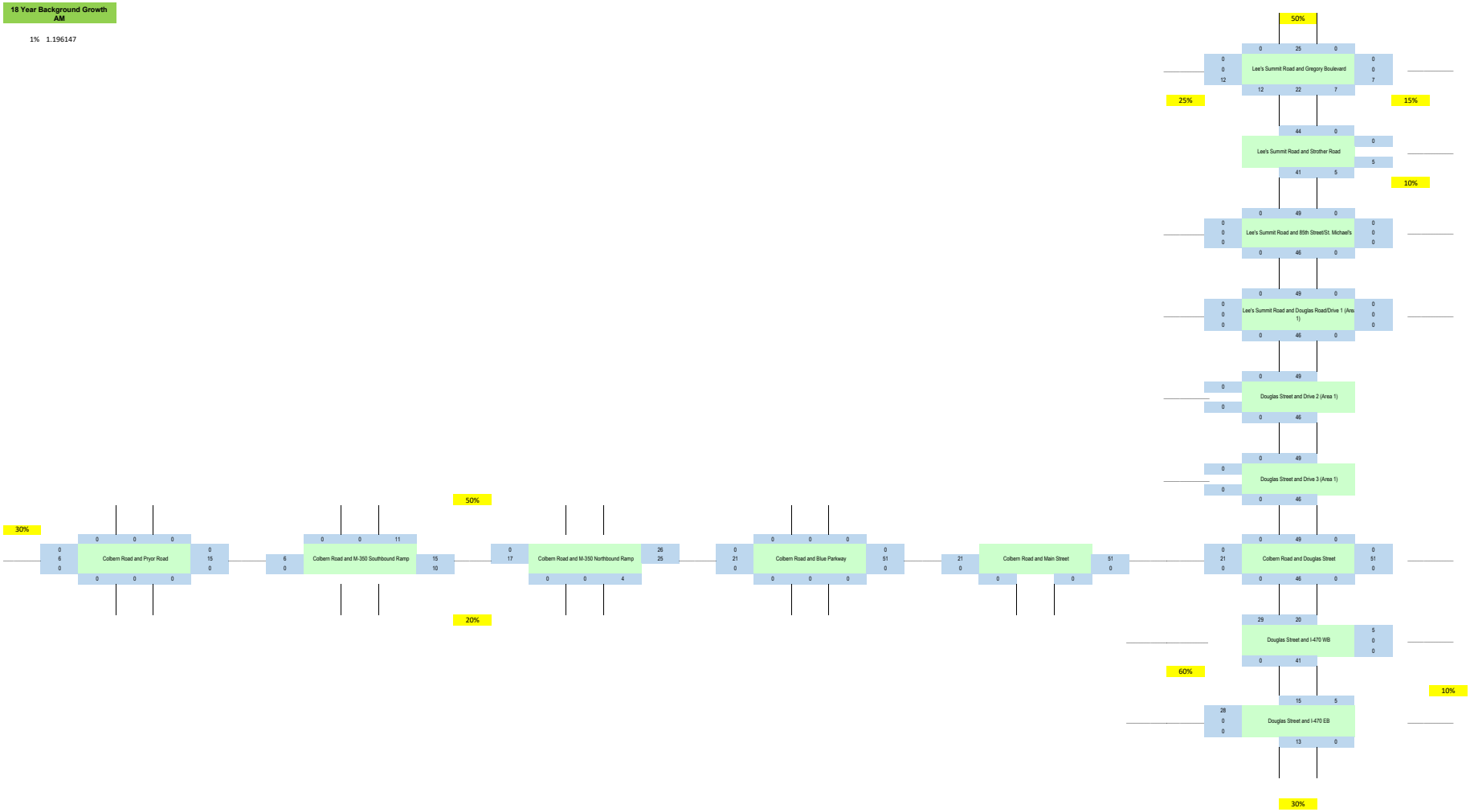
APPENDIX F

Future Year 2040 Plus Full Build Development Conditions

Growth

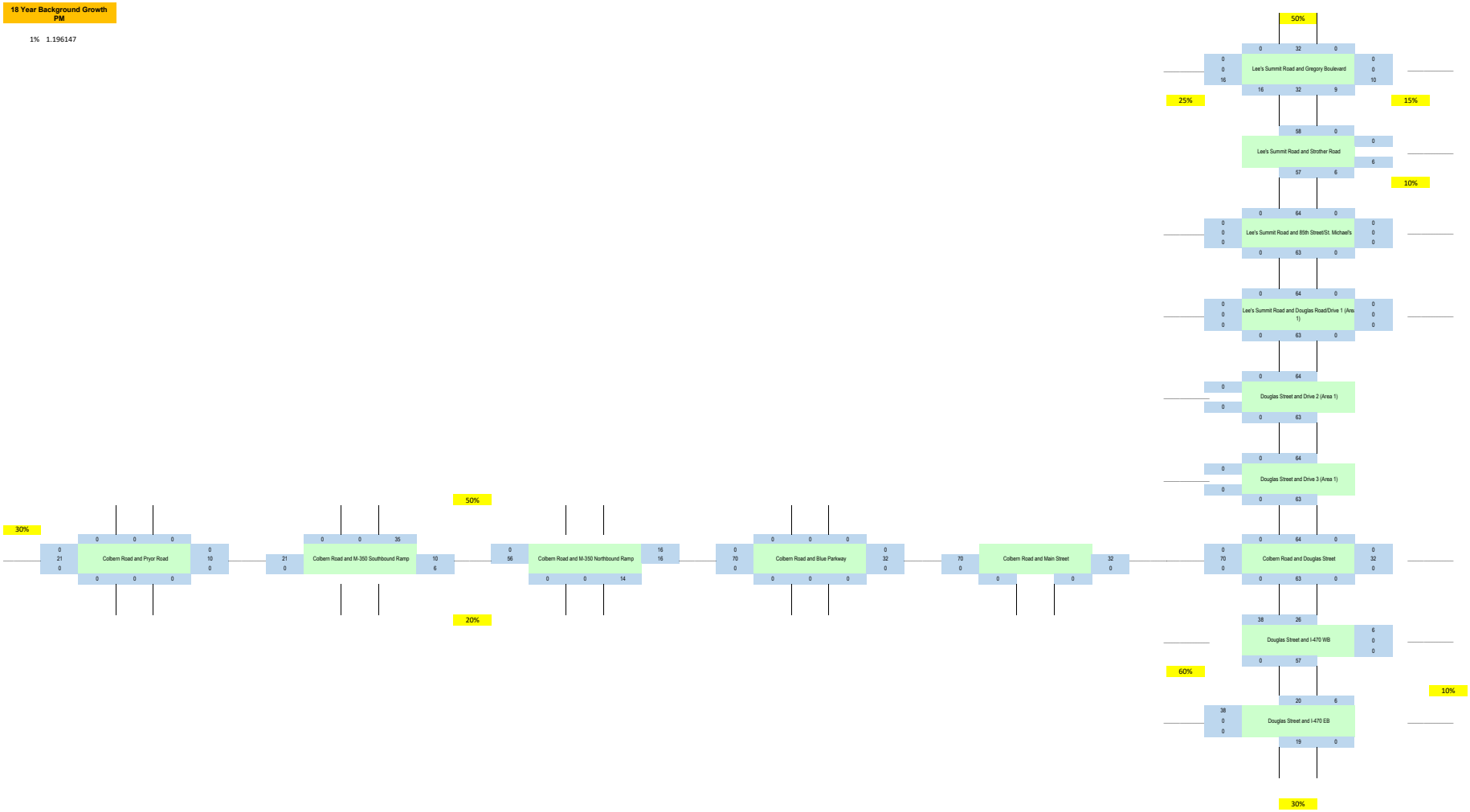
18 Year Background Growth AM

1% 1.196147



18 Year Background Growth PM

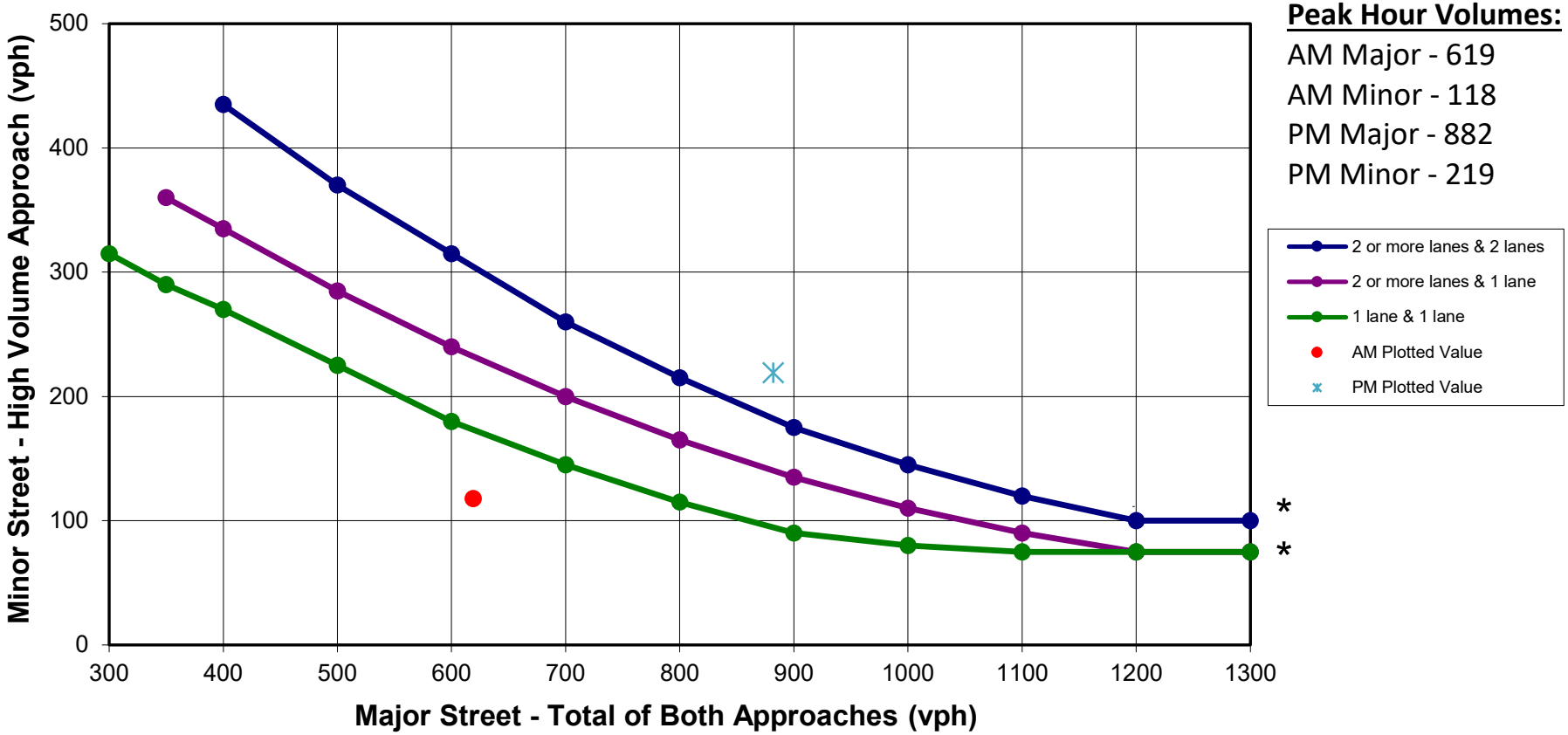
1% 1.196147



Signal Warrants

Peak Hour Volume Warrant (Future Year 2040)
Colbern Road & Pryor Road

(Community less than 10,000 population or above 40mph on major street)



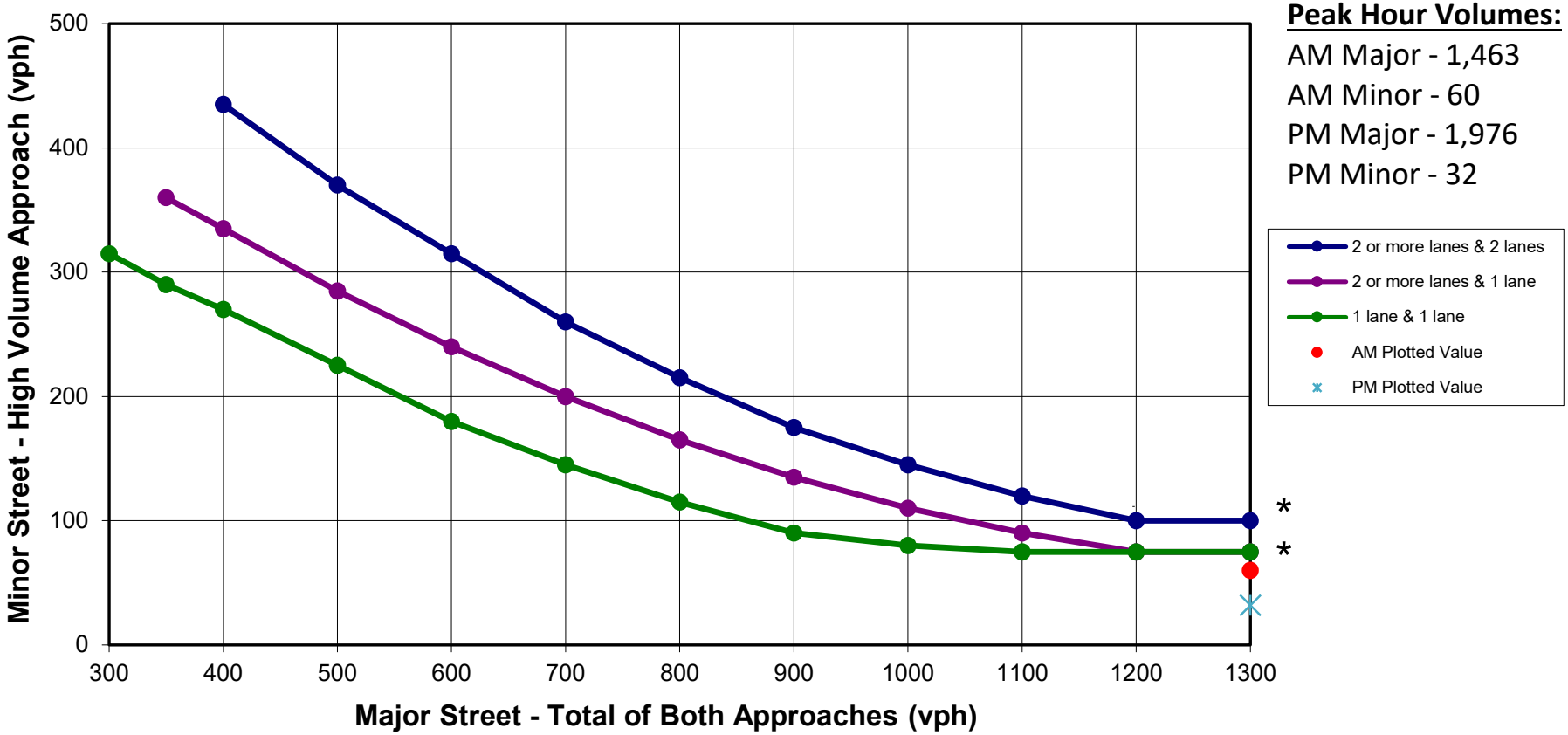
Peak Hour Volumes:

AM Major - 619
AM Minor - 118
PM Major - 882
PM Minor - 219

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Future Year 2040)
Douglas Street & Drive 2

(Community less than 10,000 population or above 40mph on major street)



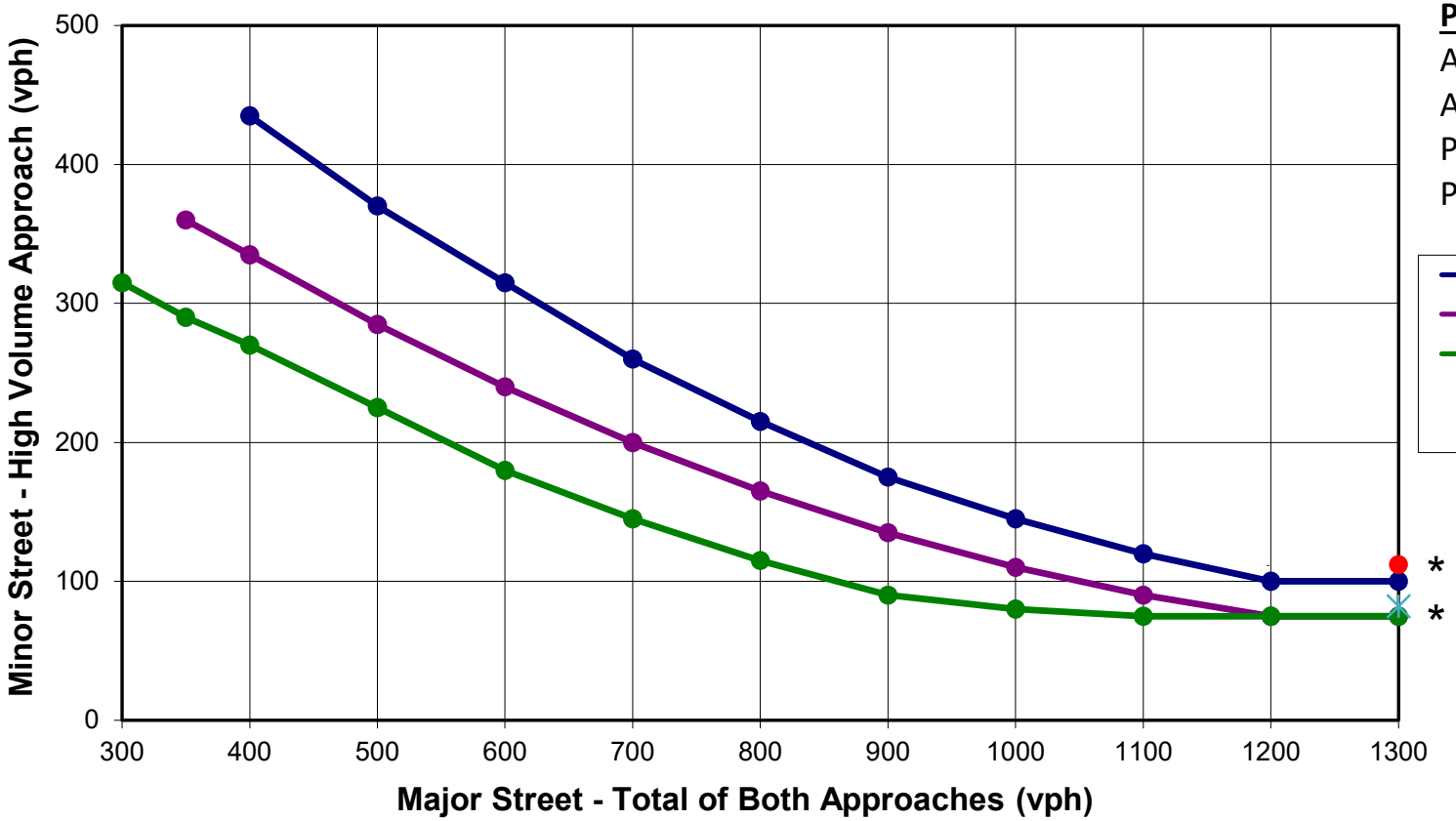
Peak Hour Volumes:

AM Major - 1,463
AM Minor - 60
PM Major - 1,976
PM Minor - 32

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Future Year 2040)
Douglas Street & Drive 3

(Community less than 10,000 population or above 40mph on major street)



Peak Hour Volumes:

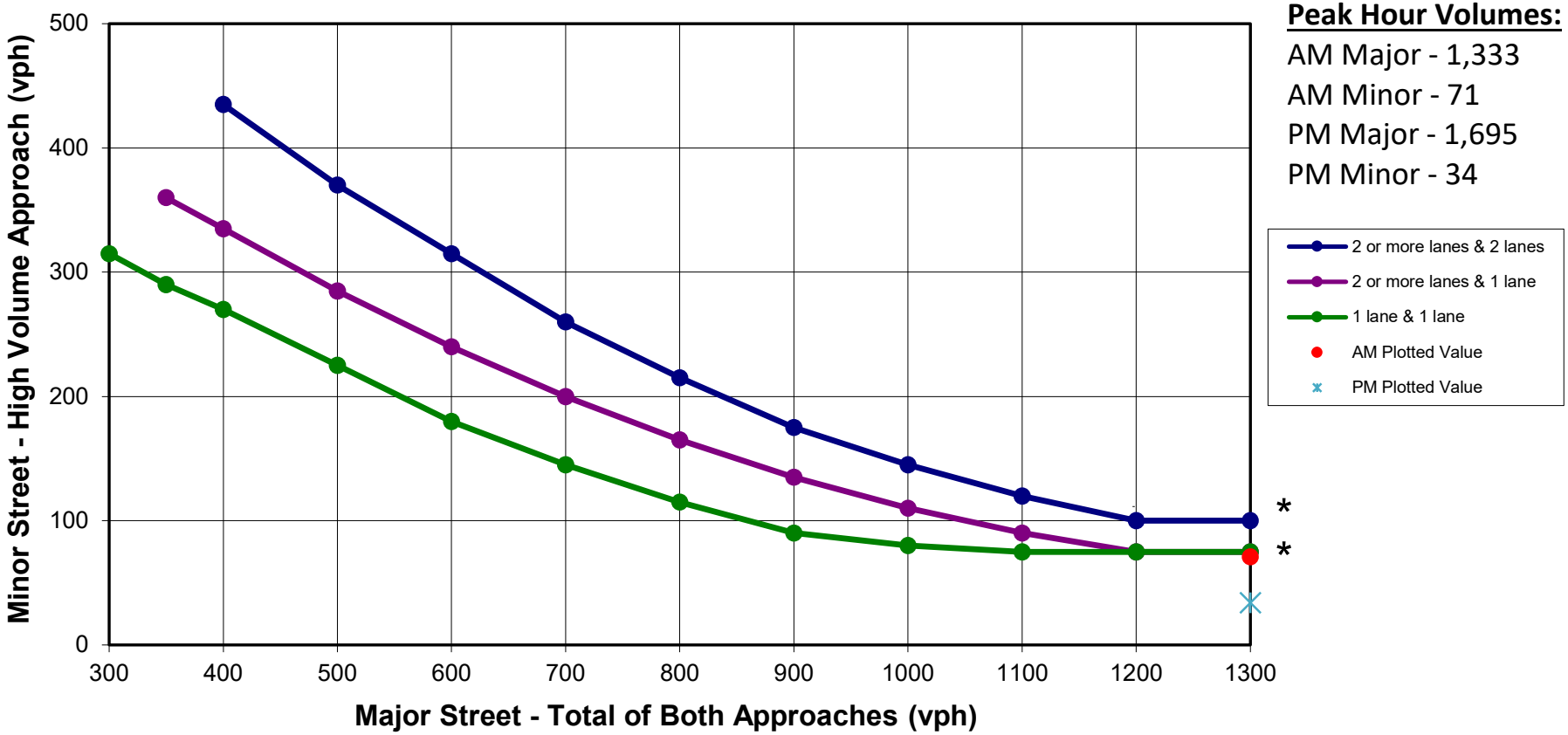
AM Major - 1,540
AM Minor - 112
PM Major - 2,086
PM Minor - 82

- 2 or more lanes & 2 lanes
- 2 or more lanes & 1 lane
- 1 lane & 1 lane
- AM Plotted Value
- PM Plotted Value

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Future Year 2040)
Lee's Summit Road & 85th Street

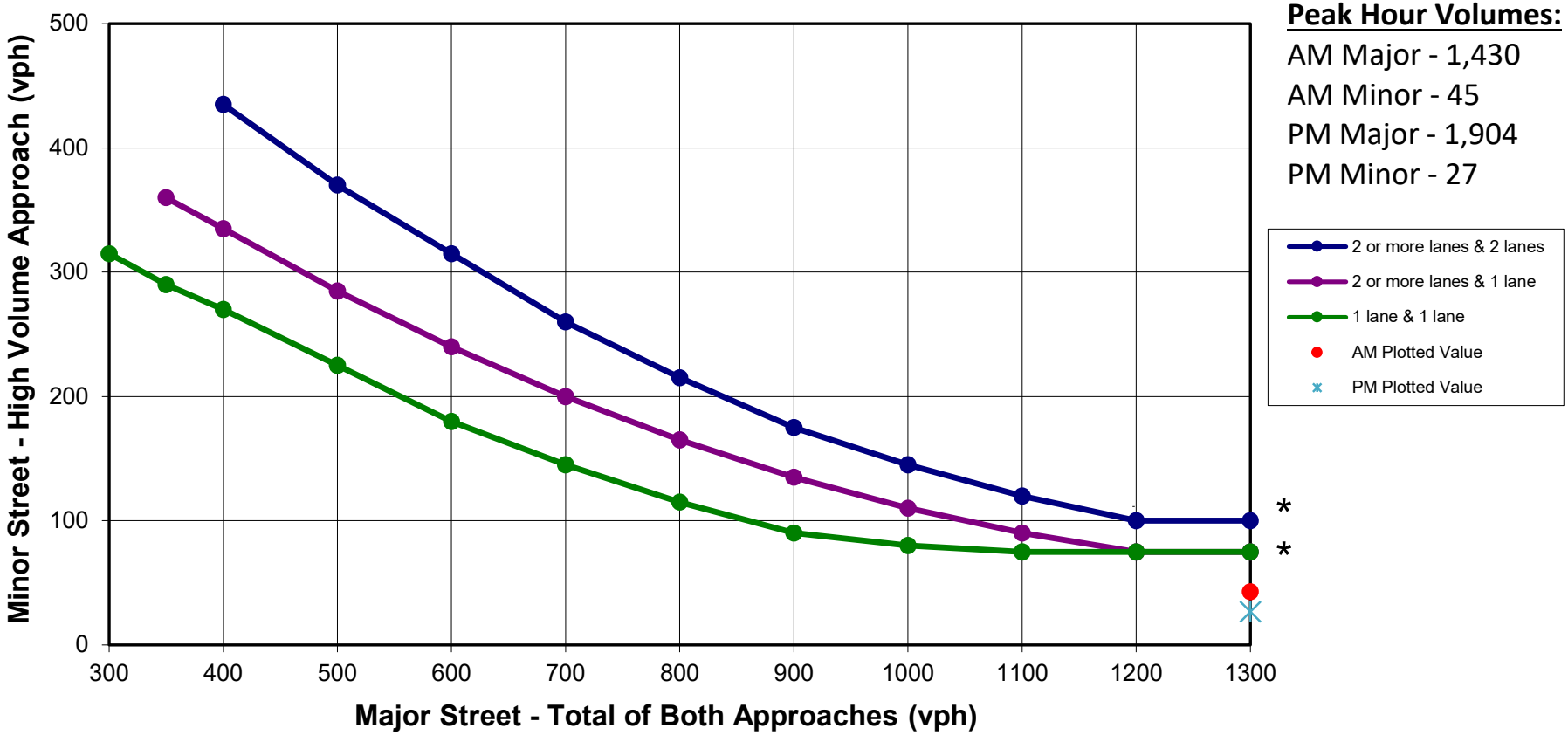
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Future Year 2040)
Lee's Summit Road & Douglas Road/Drive 1

(Community less than 10,000 population or above 40mph on major street)



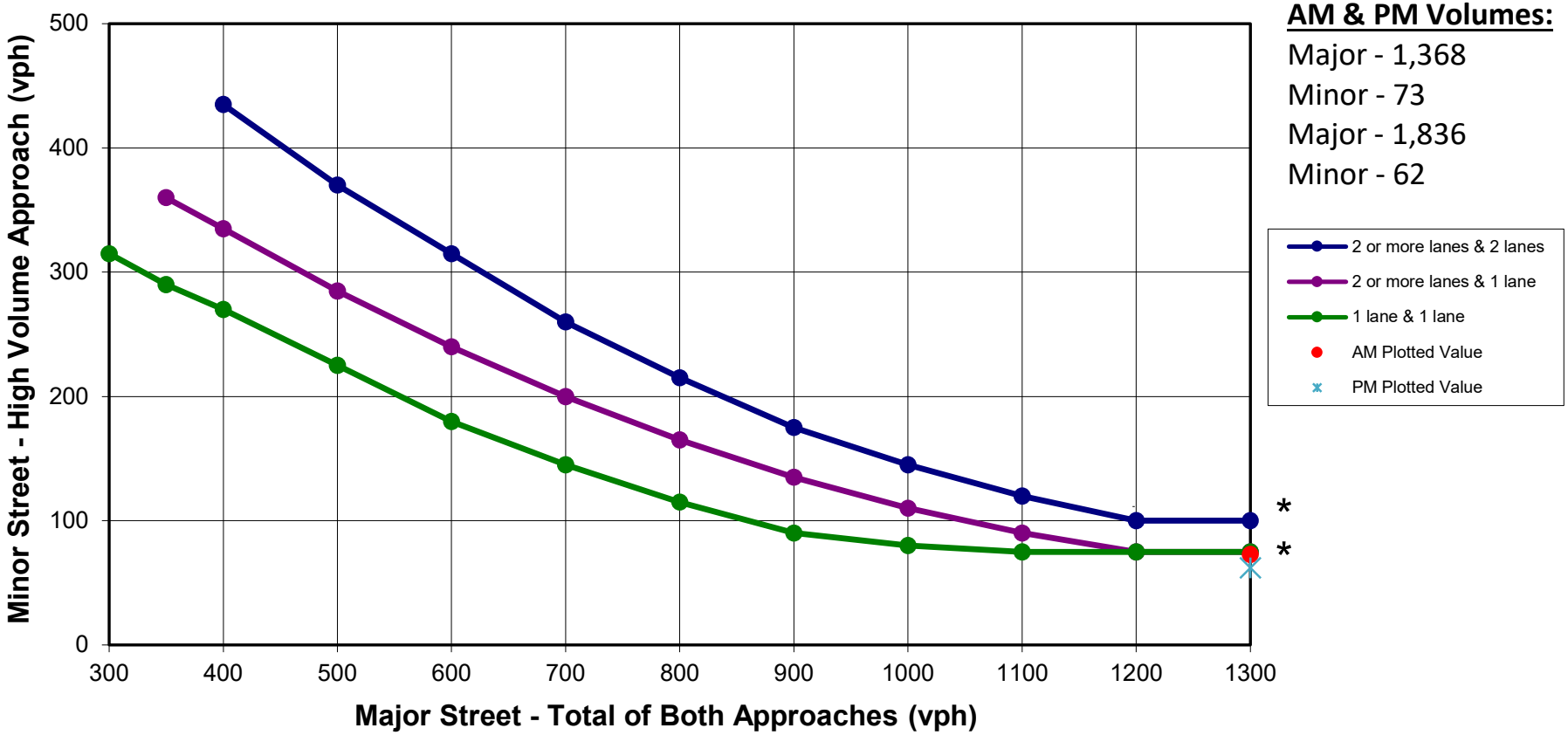
Peak Hour Volumes:

AM Major - 1,430
AM Minor - 45
PM Major - 1,904
PM Minor - 27

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Future Year 2040)
Lee's Summit Road & Drive 11

(Community less than 10,000 population or above 40mph on major street)



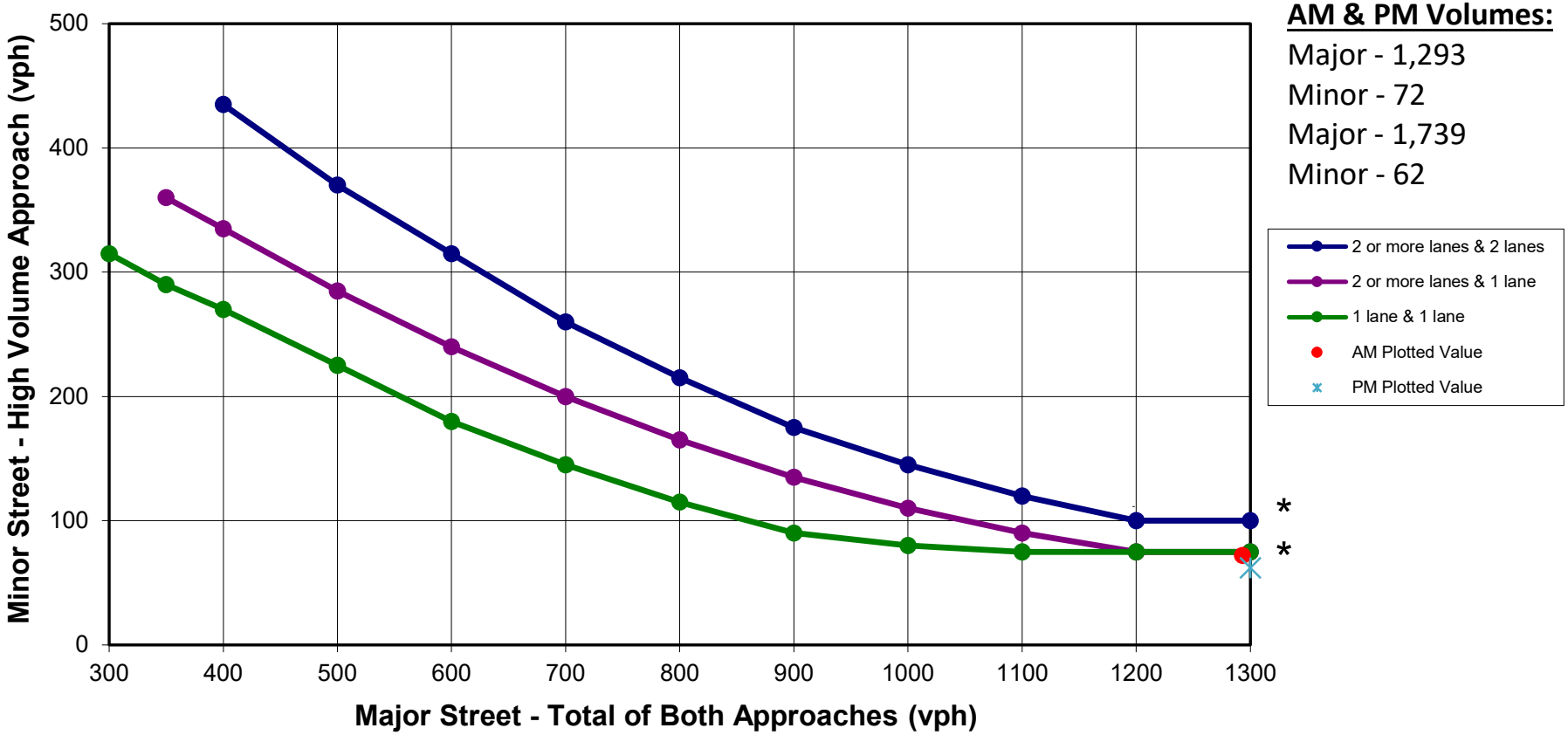
AM & PM Volumes:

Major - 1,368
Minor - 73
Major - 1,836
Minor - 62

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Future Year 2040)
Lee's Summit Road & Drive 12

(Community less than 10,000 population or above 40mph on major street)



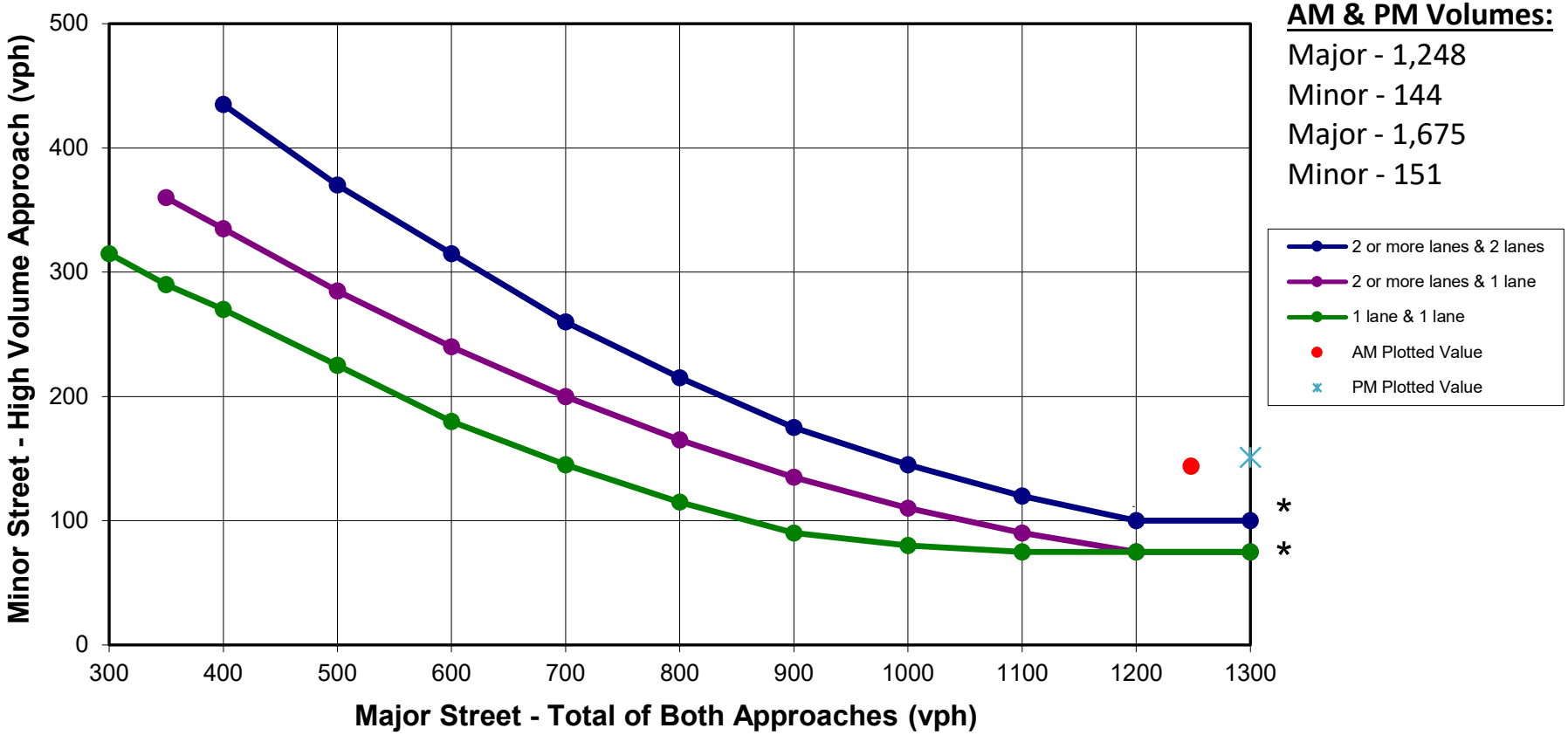
AM & PM Volumes:

Major - 1,293
Minor - 72
Major - 1,739
Minor - 62

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Peak Hour Volume Warrant (Future Year 2040)
Lee's Summit Road & Strother Road

(Community less than 10,000 population or above 40mph on major street)



AM & PM Volumes:

Major - 1,248
Minor - 144
Major - 1,675
Minor - 151

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Capacity Analysis

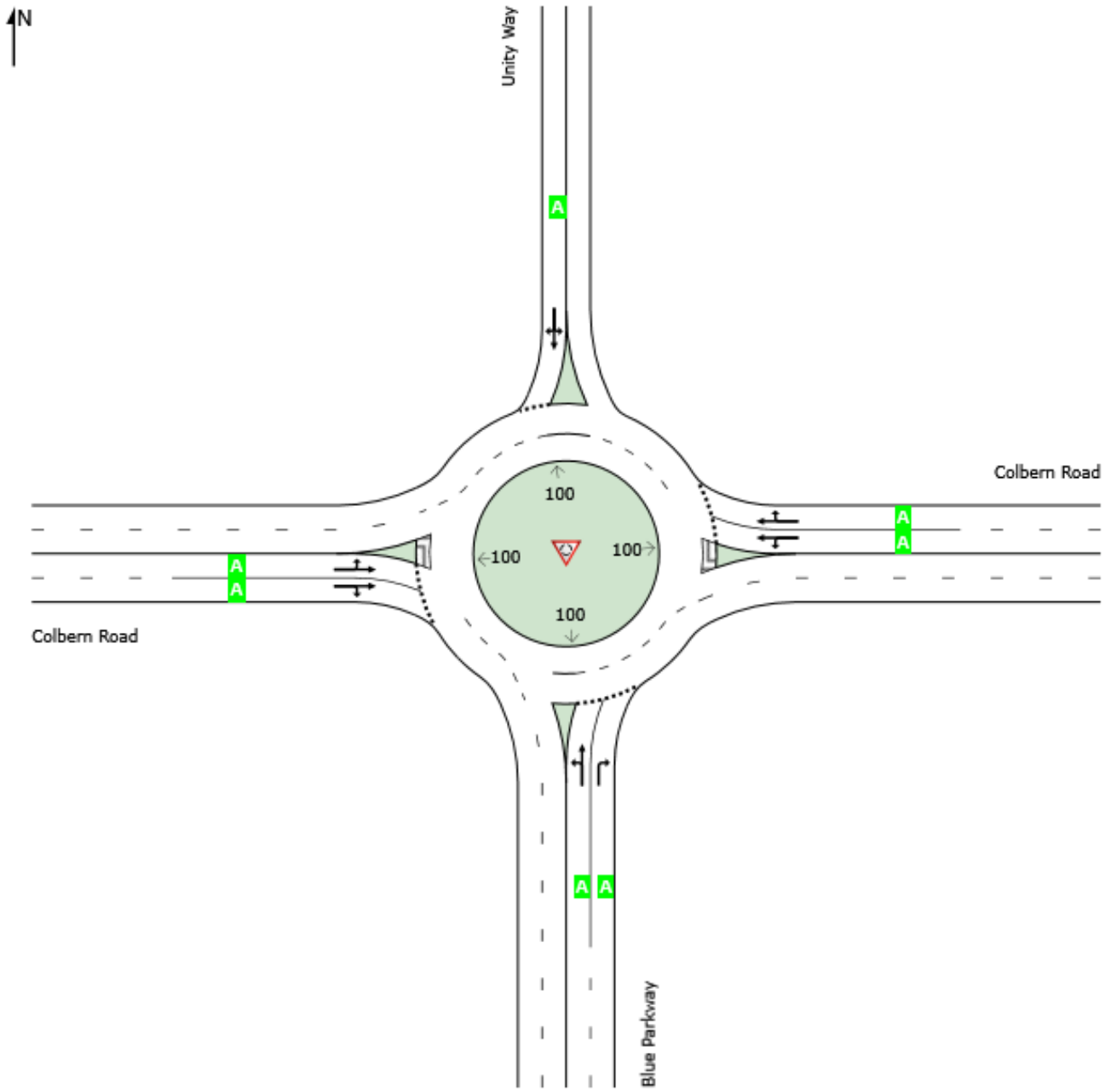
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

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Project: F:\2021\04501-05000\021-04643-A\40-Design\Reports\TFTC\2023 January Update\Sidra\FY+Full Build Blue Pkwy.sip9

MOVEMENT SUMMARY

Site: 101 [Colbern & Blue Pkwy AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	105	2.0	114	2.0	0.183	7.3	LOS A	0.7	16.7	0.59	0.59	0.59	20.4
8	T1	11	2.0	12	2.0	0.183	7.3	LOS A	0.7	16.7	0.59	0.59	0.59	17.8
18	R2	98	2.0	107	2.0	0.172	7.9	LOS A	0.6	15.8	0.61	0.61	0.61	20.1
Approach		214	2.0	233	2.0	0.183	7.6	LOS A	0.7	16.7	0.60	0.60	0.60	20.1
East: Colbern Road														
1	L2	129	2.0	140	2.0	0.457	7.7	LOS A	2.8	71.5	0.40	0.24	0.40	20.1
6	T1	885	2.0	962	2.0	0.457	7.7	LOS A	2.8	71.5	0.40	0.24	0.40	20.2
16	R2	19	2.0	21	2.0	0.457	7.7	LOS A	2.8	71.5	0.40	0.24	0.40	17.6
Approach		1033	2.0	1123	2.0	0.457	7.7	LOS A	2.8	71.5	0.40	0.24	0.40	20.1
North: Unity Way														
7	L2	5	2.0	5	2.0	0.020	7.7	LOS A	0.1	1.6	0.66	0.63	0.66	20.4
4	T1	1	2.0	1	2.0	0.020	7.7	LOS A	0.1	1.6	0.66	0.63	0.66	19.9
14	R2	3	2.0	3	2.0	0.020	7.7	LOS A	0.1	1.6	0.66	0.63	0.66	20.0
Approach		9	2.0	10	2.0	0.020	7.7	LOS A	0.1	1.6	0.66	0.63	0.66	20.2
West: Colbern Road														
5	L2	9	2.0	10	2.0	0.399	6.9	LOS A	2.3	57.2	0.38	0.24	0.38	18.3
2	T1	731	2.0	795	2.0	0.399	6.9	LOS A	2.3	57.2	0.38	0.24	0.38	20.4
12	R2	152	2.0	165	2.0	0.399	6.9	LOS A	2.3	57.2	0.38	0.24	0.38	19.9
Approach		892	2.0	970	2.0	0.399	6.9	LOS A	2.3	57.2	0.38	0.24	0.38	20.3
All Vehicles		2148	2.0	2335	2.0	0.457	7.3	LOS A	2.8	71.5	0.41	0.28	0.41	20.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

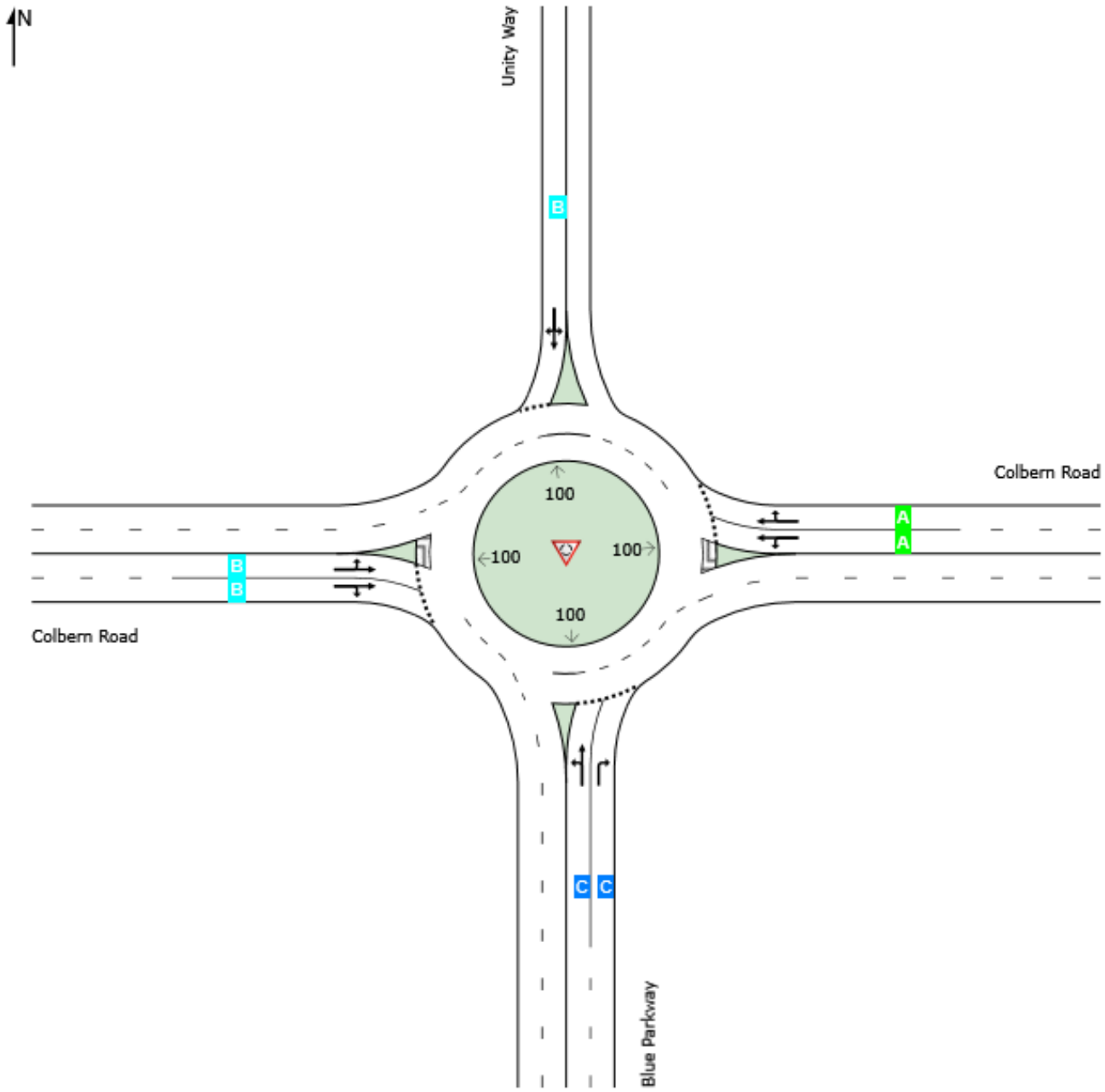
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	A	B	B	B



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Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
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Delay Model: HCM Delay Formula (Geometric Delay is not included).

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Site: 101 [Colbern & Blue Pkwy PM (Site Folder: General)]

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Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Blue Parkway														
3	L2	151	2.0	164	2.0	0.428	17.8	LOS C	1.8	45.7	0.80	1.01	1.15	18.6
8	T1	5	2.0	5	2.0	0.428	17.8	LOS C	1.8	45.7	0.80	1.01	1.15	16.5
18	R2	186	2.0	202	2.0	0.442	16.2	LOS C	1.9	48.8	0.78	1.00	1.14	18.7
Approach		342	2.0	372	2.0	0.442	16.9	LOS C	1.9	48.8	0.79	1.01	1.14	18.6
East: Colbern Road														
1	L2	121	2.0	132	2.0	0.465	8.0	LOS A	2.8	71.2	0.46	0.31	0.46	20.1
6	T1	880	2.0	957	2.0	0.465	8.0	LOS A	2.8	71.2	0.46	0.31	0.46	20.1
16	R2	6	2.0	7	2.0	0.465	8.0	LOS A	2.8	71.2	0.46	0.31	0.46	17.5
Approach		1007	2.0	1095	2.0	0.465	8.0	LOS A	2.8	71.2	0.46	0.31	0.46	20.1
North: Unity Way														
7	L2	41	2.0	45	2.0	0.166	10.0	LOS B	0.5	14.0	0.70	0.70	0.70	20.0
4	T1	19	2.0	21	2.0	0.166	10.0	LOS B	0.5	14.0	0.70	0.70	0.70	19.4
14	R2	12	2.0	13	2.0	0.166	10.0	LOS B	0.5	14.0	0.70	0.70	0.70	19.5
Approach		72	2.0	78	2.0	0.166	10.0	LOS B	0.5	14.0	0.70	0.70	0.70	19.8
West: Colbern Road														
5	L2	11	2.0	12	2.0	0.594	10.5	LOS B	4.3	108.4	0.57	0.41	0.57	17.8
2	T1	1130	2.0	1228	2.0	0.594	10.5	LOS B	4.3	108.4	0.57	0.41	0.57	19.7
12	R2	127	2.0	138	2.0	0.594	10.5	LOS B	4.3	108.4	0.57	0.41	0.57	19.2
Approach		1268	2.0	1378	2.0	0.594	10.5	LOS B	4.3	108.4	0.57	0.41	0.57	19.7
All Vehicles		2689	2.0	2923	2.0	0.594	10.4	LOS B	4.3	108.4	0.56	0.46	0.60	19.7

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Queues
7: 470 EB & Douglas St & 470 WB

01/17/2023

Lane Group	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Group Flow (vph)	307	370	197	223	463	1049	750	520	370	196
v/c Ratio	0.53	0.25	0.25	0.68	0.30	0.58	0.70	1.18	0.50	0.46
Control Delay	41.9	23.7	12.3	42.9	23.1	6.7	39.6	128.1	36.4	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	23.7	12.3	42.9	23.1	6.7	39.6	128.1	36.4	11.6
Queue Length 50th (ft)	106	112	52	141	129	58	157	~285	107	17
Queue Length 95th (ft)	151	174	123	m202	180	144	191	#490	145	73
Internal Link Dist (ft)		1351			694					
Turn Bay Length (ft)	400		200	225		400		400		400
Base Capacity (vph)	583	1475	775	442	1535	1802	1247	439	858	518
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	0.53	0.25	0.25	0.50	0.30	0.58	0.60	1.18	0.43	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.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Configurations										
Traffic Volume (vph)	282	340	181	205	426	965	690	478	340	180
Future Volume (vph)	282	340	181	205	426	965	690	478	340	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.94	1.00	0.97	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	370	197	223	463	1049	750	520	370	196
RTOR Reduction (vph)	0	0	115	0	0	594	0	170	0	133
Lane Group Flow (vph)	307	370	82	223	463	455	750	350	370	63
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	Prot	Prot
Protected Phases	1	6		5	2		7	1	3	5
Permitted Phases			6			2				
Actuated Green, G (s)	17.0	41.7	41.7	18.7	43.4	43.4	21.6	17.0	21.6	18.7
Effective Green, g (s)	17.0	41.7	41.7	18.7	43.4	43.4	21.6	17.0	21.6	18.7
Actuated g/C Ratio	0.17	0.42	0.42	0.19	0.43	0.43	0.22	0.17	0.22	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	583	1475	660	330	1535	1209	1077	269	741	296
v/s Ratio Prot	0.09	0.10		c0.13	0.13		c0.15	c0.22	0.11	0.04
v/s Ratio Perm			0.05			c0.16				
v/c Ratio	0.53	0.25	0.12	0.68	0.30	0.38	0.70	1.30	0.50	0.21
Uniform Delay, d1	37.8	19.0	17.9	37.8	18.4	19.1	36.2	41.5	34.4	34.4
Progression Factor	1.02	1.12	3.16	0.93	1.18	4.13	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.4	0.4	4.7	0.4	0.7	2.1	159.8	0.7	0.5
Delay (s)	39.5	21.6	56.9	39.8	22.2	79.7	38.3	201.3	35.2	34.9
Level of Service	D	C	E	D	C	E	D	F	D	C
Approach Delay (s)		35.9			59.2					
Approach LOS		D			E					

Intersection Summary			
HCM 2000 Control Delay	64.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	253	15	80	245	23	10	4	104	45	7	5
Future Vol, veh/h	3	253	15	80	245	23	10	4	104	45	7	5
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	275	16	87	266	25	11	4	113	49	8	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	291	0	0	291	0	0	600	754	146	599	750	146
Stage 1	-	-	-	-	-	-	289	289	-	453	453	-
Stage 2	-	-	-	-	-	-	311	465	-	146	297	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1268	-	-	1268	-	-	385	337	875	385	339	875
Stage 1	-	-	-	-	-	-	694	672	-	556	568	-
Stage 2	-	-	-	-	-	-	674	561	-	842	666	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1268	-	-	1268	-	-	351	308	875	310	310	875
Mov Cap-2 Maneuver	-	-	-	-	-	-	351	308	-	310	310	-
Stage 1	-	-	-	-	-	-	692	670	-	554	521	-
Stage 2	-	-	-	-	-	-	606	515	-	726	664	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2	10.9	18.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	736	1268	-	-	1268	-	-	329
HCM Lane V/C Ratio	0.174	0.003	-	-	0.069	-	-	0.188
HCM Control Delay (s)	10.9	7.8	0	-	8	0.2	-	18.5
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	-	0.7

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	332	105	275	342	354	36
v/c Ratio	0.20	0.13	0.38	0.14	0.59	0.05
Control Delay	12.6	3.2	6.7	2.9	30.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	3.2	6.7	2.9	30.7	0.1
Queue Length 50th (ft)	42	0	24	15	73	0
Queue Length 95th (ft)	77	23	38	23	107	0
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325		200	200
Base Capacity (vph)	1638	796	798	2403	716	796
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	0.20	0.13	0.34	0.14	0.49	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	305	97	253	315	0	0	0	0	326	0	33
Future Volume (veh/h)	0	305	97	253	315	0	0	0	0	326	0	33
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	332	0	275	342	0				354	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1907		801	2537	0				470	0	
Arrive On Green	0.00	0.54	0.00	0.21	1.00	0.00				0.14	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				3456	0	1585
Grp Volume(v), veh/h	0	332	0	275	342	0				354	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1728	0	1585
Q Serve(g_s), s	0.0	3.3	0.0	5.0	0.0	0.0				6.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.3	0.0	5.0	0.0	0.0				6.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1907		801	2537	0				470	0	
V/C Ratio(X)	0.00	0.17		0.34	0.13	0.00				0.75	0.00	
Avail Cap(c_a), veh/h	0	1907		944	2537	0				721	0	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.98	0.98	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.3	0.0	4.9	0.0	0.0				29.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.1	0.0				2.5	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
%ile BackOfQ(50%),veh/ln	0.0	1.0	0.0	1.0	0.0	0.0				2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	8.5	0.0	5.1	0.1	0.0				31.6	0.0	0.0
LnGrp LOS	A	A		A	A	A				C	A	
Approach Vol, veh/h		332	A		617						354	A
Approach Delay, s/veh		8.5			2.3						31.6	
Approach LOS		A			A						C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.1			12.4	42.7		14.9				
Change Period (Y+Rc), s		* 5.1			* 5.1	* 5.1		5.4				
Max Green Setting (Gmax), s		* 45			* 13	* 27		14.6				
Max Q Clear Time (g_c+I1), s		2.0			7.0	5.3		8.9				
Green Ext Time (p_c), s		4.3			0.4	3.4		0.6				

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	78	608	563	471	54	287
v/c Ratio	0.11	0.21	0.23	0.38	0.28	0.24
Control Delay	2.9	3.1	6.8	2.1	31.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.9	3.1	6.8	2.1	31.7	1.8
Queue Length 50th (ft)	2	15	57	2	22	0
Queue Length 95th (ft)	m17	111	96	42	51	32
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	717	2958	2429	1231	369	1176
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	0.11	0.21	0.23	0.38	0.15	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	559	0	0	518	433	50	0	264	0	0	0
Future Volume (veh/h)	72	559	0	0	518	433	50	0	264	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	78	608	0	0	563	0	54	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	721	2845	0	0	2394		83	0				
Arrive On Green	0.11	1.00	0.00	0.00	0.67	0.00	0.05	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	78	608	0	0	563	0	54	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	0.9	0.0	0.0	0.0	4.3	0.0	2.1	0.0	0.0			
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.0	4.3	0.0	2.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	721	2845	0	0	2394		83	0				
V/C Ratio(X)	0.11	0.21	0.00	0.00	0.24		0.65	0.00				
Avail Cap(c_a), veh/h	800	2845	0	0	2394		372	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.92	0.92	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	2.7	0.0	0.0	0.0	4.4	0.0	32.8	0.0	0.0			
Incr Delay (d2), s/veh	0.1	0.2	0.0	0.0	0.2	0.0	8.4	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			
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.0	1.0	0.0	1.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.7	0.2	0.0	0.0	4.7	0.0	41.2	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		686			563	A		54	A			
Approach Delay, s/veh		0.4			4.7			41.2				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	8.9	52.4				61.3		8.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	7.0	* 33				* 45		14.6				
Max Q Clear Time (g_c+I1), s	2.9	6.3				2.0		4.1				
Green Ext Time (p_c), s	0.0	6.8				8.5		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	4.0
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	907	122	940	183	109
v/c Ratio	0.45	0.29	0.37	0.67	0.32
Control Delay	12.8	14.3	15.5	51.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	14.3	15.5	51.0	9.4
Queue Length 50th (ft)	151	53	215	111	0
Queue Length 95th (ft)	240	100	284	172	44
Internal Link Dist (ft)	1940		1212	552	
Turn Bay Length (ft)		200			150
Base Capacity (vph)	2036	504	2563	424	462
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.24	0.37	0.43	0.24

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	683	152	112	865	168	100
Future Volume (veh/h)	683	152	112	865	168	100
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	742	165	122	940	183	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1863	414	479	2677	226	201
Arrive On Green	0.64	0.64	0.02	0.25	0.13	0.13
Sat Flow, veh/h	2983	642	1781	3647	1781	1585
Grp Volume(v), veh/h	456	451	122	940	183	109
Grp Sat Flow(s),veh/h/ln	1777	1755	1781	1777	1781	1585
Q Serve(g_s), s	12.3	12.3	2.2	21.8	10.0	6.4
Cycle Q Clear(g_c), s	12.3	12.3	2.2	21.8	10.0	6.4
Prop In Lane		0.37	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1146	1132	479	2677	226	201
V/C Ratio(X)	0.40	0.40	0.25	0.35	0.81	0.54
Avail Cap(c_a), veh/h	1146	1132	607	2677	428	380
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.5	8.5	6.2	17.5	42.5	40.9
Incr Delay (d2), s/veh	1.0	1.0	0.3	0.4	6.8	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	4.1	0.7	10.3	4.7	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.5	9.5	6.5	17.8	49.3	43.2
LnGrp LOS	A	A	A	B	D	D
Approach Vol, veh/h	907			1062	292	
Approach Delay, s/veh	9.5			16.5	47.0	
Approach LOS	A			B	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		18.7	10.8	70.5		81.3
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		24.0	12.0	46.0		64.0
Max Q Clear Time (g_c+I1), s		12.0	4.2	14.3		23.8
Green Ext Time (p_c), s		0.7	0.2	5.9		7.2

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	385	607	612	592	88	596	407	313	91	516	367
v/c Ratio	0.50	0.73	0.56	0.75	0.54	0.14	0.88	0.32	0.17	0.22	0.51	0.63
Control Delay	20.6	36.7	9.6	33.8	23.2	0.5	47.3	26.5	2.7	17.5	38.2	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	36.7	9.6	33.8	23.2	0.5	47.3	26.5	2.7	17.5	38.2	13.7
Queue Length 50th (ft)	46	104	61	188	164	1	206	113	0	33	109	48
Queue Length 95th (ft)	57	142	68	252	87	0	#285	187	23	63	146	102
Internal Link Dist (ft)		562			2353			694			850	
Turn Bay Length (ft)	300		300	500		200	375		200	290		500
Base Capacity (vph)	601	573	1092	818	1090	629	686	1261	1834	419	1002	587
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.67	0.56	0.75	0.54	0.14	0.87	0.32	0.17	0.22	0.51	0.63

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)	270	354	558	563	545	81	548	374	288	84	475	338
Future Volume (veh/h)	270	354	558	563	545	81	548	374	288	84	475	338
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	385	607	612	592	88	596	407	313	91	516	367
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	585	510	929	713	1095	488	655	1174	1497	355	970	380
Arrive On Green	0.02	0.05	0.05	0.27	0.41	0.41	0.32	0.55	0.55	0.05	0.19	0.19
Sat Flow, veh/h	3456	3554	2790	3456	3554	1585	3456	3554	2790	1781	5106	1585
Grp Volume(v), veh/h	293	385	607	612	592	88	596	407	313	91	516	367
Grp Sat Flow(s),veh/h/ln	1728	1777	1395	1728	1777	1585	1728	1777	1395	1781	1702	1585
Q Serve(g_s), s	0.0	10.7	6.5	16.8	12.6	2.5	16.6	6.4	0.9	3.3	9.1	13.0
Cycle Q Clear(g_c), s	0.0	10.7	6.5	16.8	12.6	2.5	16.6	6.4	0.9	3.3	9.1	13.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	585	510	929	713	1095	488	655	1174	1497	355	970	380
V/C Ratio(X)	0.50	0.75	0.65	0.86	0.54	0.18	0.91	0.35	0.21	0.26	0.53	0.96
Avail Cap(c_a), veh/h	702	576	981	795	1095	488	691	1174	1497	374	970	380
HCM Platoon Ratio	0.33	0.33	0.33	1.33	1.33	1.33	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	0.83	0.83	0.83	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	45.9	9.5	34.9	24.2	11.1	33.4	16.4	1.8	20.5	36.5	18.1
Incr Delay (d2), s/veh	0.7	5.0	1.5	7.9	1.7	0.7	13.6	0.7	0.3	0.4	2.1	38.1
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	3.4	5.3	3.1	6.9	4.9	1.3	6.9	2.4	0.4	1.3	3.8	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	50.9	11.0	42.8	25.9	11.9	46.9	17.1	2.1	20.9	38.6	56.1
LnGrp LOS	D	D	B	D	C	B	D	B	A	C	D	E
Approach Vol, veh/h		1285			1292			1316			974	
Approach Delay, s/veh		29.3			33.0			27.1			43.5	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.9	25.0	26.4	20.2	9.9	39.0	10.8	35.8
Change Period (Y+Rc), s	5.0	* 6	* 5.8	* 5.8	5.0	* 6	5.8	* 5
Max Green Setting (Gmax), s	20.0	* 19	* 23	* 16	6.0	* 33	8.4	* 31
Max Q Clear Time (g_c+I1), s	18.6	15.0	18.8	12.7	5.3	8.4	2.0	14.6
Green Ext Time (p_c), s	0.4	1.7	1.0	1.7	0.0	3.9	0.5	3.5

Intersection Summary	
HCM 6th Ctrl Delay	32.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	0	53	0	35	1	559	95	68	610	0
Future Vol, veh/h	5	0	0	53	0	35	1	559	95	68	610	0
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	0	58	0	38	1	608	103	74	663	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1492	1524	663	1421	1421	608	663	0	0	711	0	0
Stage 1	811	811	-	610	610	-	-	-	-	-	-	-
Stage 2	681	713	-	811	811	-	-	-	-	-	-	-
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	102	118	461	114	136	496	926	-	-	888	-	-
Stage 1	373	393	-	482	485	-	-	-	-	-	-	-
Stage 2	440	435	-	373	393	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	88	108	461	107	125	496	926	-	-	888	-	-
Mov Cap-2 Maneuver	88	108	-	107	125	-	-	-	-	-	-	-
Stage 1	373	360	-	482	485	-	-	-	-	-	-	-
Stage 2	406	435	-	342	360	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	48.6	48.7	0	0.9
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	926	-	-	88	107	496	888	-	-
HCM Lane V/C Ratio	0.001	-	-	0.062	0.538	0.077	0.083	-	-
HCM Control Delay (s)	8.9	-	-	48.6	72.4	12.9	9.4	-	-
HCM Lane LOS	A	-	-	E	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.5	0.2	0.3	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	95	49	517	95	36	600
Future Vol, veh/h	95	49	517	95	36	600
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	-	-	225	225	-
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	103	53	562	103	39	652

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1292	281	0	0	665	0
Stage 1	562	-	-	-	-	-
Stage 2	730	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	167	717	-	-	922	-
Stage 1	535	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	160	717	-	-	922	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	456	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	371	922	-
HCM Lane V/C Ratio	-	-	0.422	0.042	-
HCM Control Delay (s)	-	-	21.6	9.1	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	60	116	299	184	51	142	258	163	17	358
v/c Ratio	0.02	0.22	0.33	0.60	0.27	0.08	0.40	0.33	0.21	0.03	0.74
Control Delay	16.6	33.5	6.6	24.1	20.9	0.2	16.1	17.0	3.9	11.7	34.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	33.5	6.6	24.1	20.9	0.2	16.1	17.0	3.9	11.7	34.7
Queue Length 50th (ft)	3	25	0	98	55	0	38	74	0	4	151
Queue Length 95th (ft)	14	66	31	197	146	0	74	168	39	15	252
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	529	753	726	545	880	824	393	818	787	601	857
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.16	0.55	0.21	0.06	0.36	0.32	0.21	0.03	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	55	107	275	169	47	131	237	150	16	296	33
Future Volume (veh/h)	9	55	107	275	169	47	131	237	150	16	296	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	60	116	299	184	51	142	258	163	17	322	36
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	402	287	243	564	580	491	317	568	481	333	398	45
Arrive On Green	0.01	0.15	0.15	0.17	0.31	0.31	0.08	0.30	0.30	0.02	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1652	185
Grp Volume(v), veh/h	10	60	116	299	184	51	142	258	163	17	0	358
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1837
Q Serve(g_s), s	0.2	1.8	4.4	8.9	4.9	1.5	3.8	7.3	5.2	0.4	0.0	12.0
Cycle Q Clear(g_c), s	0.2	1.8	4.4	8.9	4.9	1.5	3.8	7.3	5.2	0.4	0.0	12.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	402	287	243	564	580	491	317	568	481	333	0	443
V/C Ratio(X)	0.02	0.21	0.48	0.53	0.32	0.10	0.45	0.45	0.34	0.05	0.00	0.81
Avail Cap(c_a), veh/h	639	847	718	659	847	718	415	833	706	679	0	818
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	24.1	25.2	18.0	17.2	16.0	17.4	18.3	17.6	15.4	0.0	23.3
Incr Delay (d2), s/veh	0.0	0.8	3.1	0.3	0.7	0.2	0.4	0.6	0.4	0.0	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	1.7	3.3	2.0	0.5	1.4	2.8	1.7	0.2	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.2	24.9	28.2	18.3	17.9	16.2	17.8	18.9	18.0	15.5	0.0	26.9
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		186			534			563			375	
Approach Delay, s/veh		26.5			17.9			18.4			26.4	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	15.5	11.4	21.7	6.3	25.7	7.3	25.8
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	10.9	6.4	5.8	14.0	2.2	6.9	2.4	9.3
Green Ext Time (p_c), s	0.2	1.3	0.0	1.7	0.0	2.2	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	9	727	4	9	671	10	11	0	32	4	0	3
Future Vol, veh/h	9	727	4	9	671	10	11	0	32	4	0	3
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	200	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	790	4	10	729	11	12	0	35	4	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	740	0	0	794	0	0	1197	1572	397	1170	1569	370
Stage 1	-	-	-	-	-	-	812	812	-	755	755	-
Stage 2	-	-	-	-	-	-	385	760	-	415	814	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	862	-	-	823	-	-	141	109	602	148	110	627
Stage 1	-	-	-	-	-	-	339	390	-	367	415	-
Stage 2	-	-	-	-	-	-	610	413	-	585	390	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	862	-	-	823	-	-	138	106	602	137	107	627
Mov Cap-2 Maneuver	-	-	-	-	-	-	138	106	-	137	107	-
Stage 1	-	-	-	-	-	-	335	385	-	363	410	-
Stage 2	-	-	-	-	-	-	599	408	-	545	385	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.1	18	23.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	324	823	-	-	862	-	-	206
HCM Lane V/C Ratio	0.144	0.012	-	-	0.011	-	-	0.037
HCM Control Delay (s)	18	9.4	-	-	9.2	-	-	23.1
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	54	16	684	761	2
Future Vol, veh/h	6	54	16	684	761	2
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	7	59	17	743	827	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1234	415	829	0	-	0
Stage 1	828	-	-	-	-	-
Stage 2	406	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	169	586	798	-	-	-
Stage 1	389	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	165	586	798	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	381	-	-	-	-	-
Stage 2	641	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	798	-	530	-	-
HCM Lane V/C Ratio	0.022	-	0.123	-	-
HCM Control Delay (s)	9.6	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	53	118	78	647	779	36
Future Vol, veh/h	53	118	78	647	779	36
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	150	200	-	-	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	58	128	85	703	847	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1369	424	886	0	-	0
Stage 1	847	-	-	-	-	-
Stage 2	522	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	138	579	760	-	-	-
Stage 1	381	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	123	579	760	-	-	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	338	-	-	-	-	-
Stage 2	560	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	1.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	760	-	244	579	-	-
HCM Lane V/C Ratio	0.112	-	0.236	0.222	-	-
HCM Control Delay (s)	10.3	-	24.3	13	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.9	0.8	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1021	95	0	1394	37	0	0	161	0	0	70
Future Vol, veh/h	0	1021	95	0	1394	37	0	0	161	0	0	70
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	-	-	150	-	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1110	103	0	1515	40	0	0	175	0	0	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	555	-	-	758
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	475	0	0	350
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	475	-	-	350
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.9	18.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	475	-	-	-	-	350
HCM Lane V/C Ratio	0.368	-	-	-	-	0.217
HCM Control Delay (s)	16.9	-	-	-	-	18.1
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	1.7	-	-	-	-	0.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	84	923	117	410	1155	26	235	199	91	38
v/c Ratio	0.34	0.66	0.15	0.77	0.64	0.03	0.70	0.32	0.58	0.10
Control Delay	15.8	22.0	1.4	52.1	17.8	0.0	55.7	2.5	56.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	22.0	1.4	52.1	17.8	0.0	55.7	2.5	56.3	0.5
Queue Length 50th (ft)	16	121	0	137	226	0	75	0	56	0
Queue Length 95th (ft)	63	225	12	m179	m311	m0	#117	18	105	0
Internal Link Dist (ft)		869			534					266
Turn Bay Length (ft)	300		300	300		250	150	150		
Base Capacity (vph)	251	1400	764	558	1804	887	343	659	197	418
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	0.33	0.66	0.15	0.73	0.64	0.03	0.69	0.30	0.46	0.09

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	849	108	377	1063	24	216	0	183	84	0	35
Future Volume (veh/h)	77	849	108	377	1063	24	216	0	183	84	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	923	117	410	1155	26	235	0	199	91	0	38
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	271	1587	708	488	1929	860	302	434	368	192	0	134
Arrive On Green	0.09	0.89	0.89	0.05	0.18	0.18	0.09	0.00	0.23	0.08	0.00	0.08
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	3456	1870	1585	1418	0	1585
Grp Volume(v), veh/h	84	923	117	410	1155	26	235	0	199	91	0	38
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1728	1870	1585	1418	0	1585
Q Serve(g_s), s	2.0	5.8	0.9	11.8	29.9	1.4	6.7	0.0	11.0	6.3	0.0	2.2
Cycle Q Clear(g_c), s	2.0	5.8	0.9	11.8	29.9	1.4	6.7	0.0	11.0	6.3	0.0	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	271	1587	708	488	1929	860	302	434	368	192	0	134
V/C Ratio(X)	0.31	0.58	0.17	0.84	0.60	0.03	0.78	0.00	0.54	0.47	0.00	0.28
Avail Cap(c_a), veh/h	298	1587	708	553	1929	860	346	561	476	270	0	222
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	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	0.00	1.00
Uniform Delay (d), s/veh	13.6	3.3	3.0	46.5	31.0	19.3	44.7	0.0	33.7	44.8	0.0	42.9
Incr Delay (d2), s/veh	0.6	1.6	0.5	10.1	1.4	0.1	9.4	0.0	1.2	1.8	0.0	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	0.7	1.5	0.4	6.1	14.5	0.5	3.2	0.0	4.3	2.3	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	4.8	3.5	56.6	32.4	19.4	54.1	0.0	35.0	46.6	0.0	44.1
LnGrp LOS	B	A	A	E	C	B	D	A	C	D	A	D
Approach Vol, veh/h		1124			1591			434			129	
Approach Delay, s/veh		5.4			38.4			45.3			45.9	
Approach LOS		A			D			D			D	

Timer - Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		29.2	20.1	50.7	14.8	14.5	10.5	60.3
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s		30.0	16.0	36.0	10.0	14.0	6.0	46.0
Max Q Clear Time (g_c+I1), s		13.0	13.8	7.8	8.7	8.3	4.0	31.9
Green Ext Time (p_c), s		0.5	0.4	7.7	0.1	0.2	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	980	27	51	1263	0	54
Future Vol, veh/h	980	27	51	1263	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	1065	29	55	1373	0	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1094	0	-	533
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	634	-	0	491
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	634	-	-	491
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	491	-	-	634	-
HCM Lane V/C Ratio	0.12	-	-	0.087	-
HCM Control Delay (s)	13.3	-	-	11.2	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.3	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	833	120	288	1085	128	262
v/c Ratio	0.48	0.14	0.61	0.45	0.36	0.50
Control Delay	11.9	1.4	22.2	20.2	37.9	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	1.4	22.2	20.2	37.9	8.0
Queue Length 50th (ft)	88	0	150	305	71	0
Queue Length 95th (ft)	123	7	230	445	127	66
Internal Link Dist (ft)	919			966	331	
Turn Bay Length (ft)		150	200			200
Base Capacity (vph)	1743	838	601	2406	354	526
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	0.48	0.14	0.48	0.45	0.36	0.50

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	766	110	265	998	118	241
Future Volume (veh/h)	766	110	265	998	118	241
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	833	120	288	1085	128	262
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1862	830	588	2417	356	317
Arrive On Green	1.00	1.00	0.03	0.22	0.20	0.20
Sat Flow, veh/h	3647	1585	1781	3647	1781	1585
Grp Volume(v), veh/h	833	120	288	1085	128	262
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	0.0	0.0	7.0	26.3	6.2	15.8
Cycle Q Clear(g_c), s	0.0	0.0	7.0	26.3	6.2	15.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1862	830	588	2417	356	317
V/C Ratio(X)	0.45	0.14	0.49	0.45	0.36	0.83
Avail Cap(c_a), veh/h	1862	830	791	2417	356	317
HCM Platoon Ratio	2.00	2.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	9.1	22.6	34.5	38.3
Incr Delay (d2), s/veh	0.8	0.4	0.6	0.6	2.8	21.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	2.9	12.6	2.9	7.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.8	0.4	9.8	23.2	37.3	59.6
LnGrp LOS	A	A	A	C	D	E
Approach Vol, veh/h	953			1373	390	
Approach Delay, s/veh	0.7			20.4	52.3	
Approach LOS	A			C	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		26.0	15.6	58.4		74.0
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		20.0	21.0	41.0		68.0
Max Q Clear Time (g_c+I1), s		17.8	9.0	2.0		28.3
Green Ext Time (p_c), s		0.3	0.7	7.2		9.7

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	709	68	148	968	0	167
Future Vol, veh/h	709	68	148	968	0	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	771	74	161	1052	0	182

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	845	0	-	386
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	787	-	0	612
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	787	-	-	612
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	13.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	612	-	-	787	-
HCM Lane V/C Ratio	0.297	-	-	0.204	-
HCM Control Delay (s)	13.3	-	-	10.7	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	1.2	-	-	0.8	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	135	133	3	90	174
Future Vol, veh/h	3	135	133	3	90	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	-	-	-	-	-
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	147	145	3	98	189

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	532	147	0	0	148	0
Stage 1	147	-	-	-	-	-
Stage 2	385	-	-	-	-	-
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	508	900	-	-	1434	-
Stage 1	880	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	469	900	-	-	1434	-
Mov Cap-2 Maneuver	469	-	-	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	636	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	2.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	882	1434	-
HCM Lane V/C Ratio	-	-	0.17	0.068	-
HCM Control Delay (s)	-	-	9.9	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	59	77	6	38	139
Future Vol, veh/h	7	59	77	6	38	139
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	64	84	7	41	151

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	321	88	0	0	91	0
Stage 1	88	-	-	-	-	-
Stage 2	233	-	-	-	-	-
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	673	970	-	-	1504	-
Stage 1	935	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	653	970	-	-	1504	-
Mov Cap-2 Maneuver	653	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	782	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	923	1504	-
HCM Lane V/C Ratio	-	-	0.078	0.027	-
HCM Control Delay (s)	-	-	9.2	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	678	5	28	657	11	62
Future Vol, veh/h	678	5	28	657	11	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	737	5	30	714	12	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	742	0	1157	371
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	417	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	861	-	190	626
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	633	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	861	-	183	626
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	611	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	543	861	-	-	-
HCM Lane V/C Ratio	0.146	0.035	-	-	-
HCM Control Delay (s)	12.8	9.3	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	-

Intersection	
Int Delay, s/veh	1

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	621	4	28	640	10	62
Future Vol, veh/h	621	4	28	640	10	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	675	4	30	696	11	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	679	0	1085	677
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	408	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	911	-	225	452
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	641	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	911	-	218	452
Mov Cap-2 Maneuver	-	-	-	-	352	-
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	620	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	435	911	-	-	-
HCM Lane V/C Ratio	0.18	0.033	-	-	-
HCM Control Delay (s)	15.1	9.1	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	0.6	0.1	-	-	-

Lane Group	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Group Flow (vph)	605	591	450	237	545	1013	1123	537	217	261
v/c Ratio	0.74	0.45	0.52	0.74	0.49	0.65	0.82	0.92	0.23	0.62
Control Delay	22.4	15.7	6.5	61.9	30.4	6.8	41.5	43.2	29.9	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	15.7	6.5	61.9	30.4	6.8	41.5	43.2	29.9	21.1
Queue Length 50th (ft)	180	131	59	160	138	62	246	193	57	56
Queue Length 95th (ft)	208	190	133	m196	m173	m83	298	#407	88	136
Internal Link Dist (ft)		1351			694					
Turn Bay Length (ft)	400		200	225		400		400		400
Base Capacity (vph)	820	1315	871	389	1108	1568	1430	581	984	476
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	0.74	0.45	0.52	0.61	0.49	0.65	0.79	0.92	0.22	0.55

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	NBL	NBT	NBR2	SBL	SBT	SBR2	NEL	NER2	SWL	SWR2
Lane Configurations										
Traffic Volume (vph)	557	544	414	218	501	932	1033	494	200	240
Future Volume (vph)	557	544	414	218	501	932	1033	494	200	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5	6.5	5.9	5.9	5.9	5.9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.94	1.00	0.97	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	2787	4990	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	605	591	450	237	545	1013	1123	537	217	261
RTOR Reduction (vph)	0	0	283	0	0	696	0	203	0	135
Lane Group Flow (vph)	605	591	167	237	545	317	1123	334	217	126
Turn Type	Prot	NA	Prot	Prot	NA	Prot	Prot	Prot	Prot	Prot
Protected Phases	1	6	6	5	2	2	7	1	3	5
Permitted Phases										
Actuated Green, G (s)	25.1	39.0	39.0	19.0	32.9	32.9	28.7	25.1	28.7	19.0
Effective Green, g (s)	25.1	39.0	39.0	19.0	32.9	32.9	28.7	25.1	28.7	19.0
Actuated g/C Ratio	0.24	0.37	0.37	0.18	0.31	0.31	0.27	0.24	0.27	0.18
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5	6.5	5.9	5.9	5.9	5.9
Vehicle Extension (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	820	1314	587	320	1108	873	1363	378	938	286
v/s Ratio Prot	0.18	c0.17	0.11	c0.13	0.15	0.11	c0.23	c0.21	0.06	0.08
v/s Ratio Perm										
v/c Ratio	0.74	0.45	0.28	0.74	0.49	0.36	0.82	0.88	0.23	0.44
Uniform Delay, d1	36.9	24.9	23.2	40.7	29.3	27.9	35.8	38.5	29.6	38.3
Progression Factor	0.49	0.57	1.83	1.27	0.98	2.74	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.8	0.8	6.7	1.1	0.8	4.3	21.2	0.2	1.3
Delay (s)	20.6	14.9	43.2	58.5	29.8	77.3	40.1	59.8	29.7	39.5
Level of Service	C	B	D	E	C	E	D	E	C	D
Approach Delay (s)		24.7			60.4					
Approach LOS		C			E					

Intersection Summary			
HCM 2000 Control Delay	43.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	384	24	132	295	41	41	20	158	43	13	10
Future Vol, veh/h	6	384	24	132	295	41	41	20	158	43	13	10
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	417	26	143	321	45	45	22	172	47	14	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	366	0	0	443	0	0	898	1096	222	864	1087	183
Stage 1	-	-	-	-	-	-	444	444	-	630	630	-
Stage 2	-	-	-	-	-	-	454	652	-	234	457	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1189	-	-	1113	-	-	234	212	782	248	215	828
Stage 1	-	-	-	-	-	-	563	574	-	436	473	-
Stage 2	-	-	-	-	-	-	555	462	-	748	566	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1189	-	-	1113	-	-	189	176	782	153	179	828
Mov Cap-2 Maneuver	-	-	-	-	-	-	189	176	-	153	179	-
Stage 1	-	-	-	-	-	-	558	569	-	433	396	-
Stage 2	-	-	-	-	-	-	443	387	-	557	561	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.7	25.1	37.7
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	411	1189	-	-	1113	-	-	180
HCM Lane V/C Ratio	0.579	0.005	-	-	0.129	-	-	0.399
HCM Control Delay (s)	25.1	8	0	-	8.7	0.4	-	37.7
HCM Lane LOS	D	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	3.5	0	-	-	0.4	-	-	1.8

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	513	123	367	421	527	88
v/c Ratio	0.41	0.19	0.64	0.20	0.65	0.14
Control Delay	17.8	4.6	15.3	2.2	25.9	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	4.6	15.3	2.2	25.9	2.5
Queue Length 50th (ft)	78	0	62	1	97	0
Queue Length 95th (ft)	131	32	#158	8	128	17
Internal Link Dist (ft)	256			413		
Turn Bay Length (ft)		50	325		200	200
Base Capacity (vph)	1258	644	573	2140	1246	644
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	0.41	0.19	0.64	0.20	0.42	0.14

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)	0	472	113	338	387	0	0	0	0	485	0	81
Future Volume (veh/h)	0	472	113	338	387	0	0	0	0	485	0	81
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	0	1870
Adj Flow Rate, veh/h	0	513	0	367	421	0				527	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	815		789	2272	0				689	0	
Arrive On Green	0.00	0.23	0.00	0.11	0.21	0.00				0.20	0.00	0.00
Sat Flow, veh/h	0	3647	1585	1781	3647	0				3456	0	1585
Grp Volume(v), veh/h	0	513	0	367	421	0				527	0	0
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1781	1777	0				1728	0	1585
Q Serve(g_s), s	0.0	8.5	0.0	5.0	6.3	0.0				9.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.5	0.0	5.0	6.3	0.0				9.4	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	815		789	2272	0				689	0	
V/C Ratio(X)	0.00	0.63		0.46	0.19	0.00				0.77	0.00	
Avail Cap(c_a), veh/h	0	815		789	2272	0				1255	0	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.95	0.95	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	22.6	0.0	19.4	11.7	0.0				24.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.7	0.0	0.4	0.2	0.0				1.8	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
%ile BackOfQ(50%),veh/ln	0.0	3.7	0.0	4.8	2.2	0.0				3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	26.2	0.0	19.9	11.9	0.0				26.4	0.0	0.0
LnGrp LOS	A	C		B	B	A				C	A	
Approach Vol, veh/h		513	A		788						527	A
Approach Delay, s/veh		26.2			15.6						26.4	
Approach LOS		C			B						C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		46.6			26.6	20.0		18.4				
Change Period (Y+Rc), s		* 5.1			* 5.1	* 5.1		5.4				
Max Green Setting (Gmax), s		* 31			* 11	* 15		23.6				
Max Q Clear Time (g_c+I1), s		8.3			7.0	10.5		11.4				
Green Ext Time (p_c), s		4.9			0.4	2.0		1.6				

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	91	949	677	477	111	311
v/c Ratio	0.16	0.36	0.32	0.43	0.44	0.29
Control Delay	3.7	2.8	10.0	4.0	30.0	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	2.8	10.0	4.0	30.0	2.4
Queue Length 50th (ft)	4	21	78	17	41	0
Queue Length 95th (ft)	23	76	134	76	79	39
Internal Link Dist (ft)		413	926			
Turn Bay Length (ft)	325			50		200
Base Capacity (vph)	606	2639	2107	1099	370	1068
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	0.15	0.36	0.32	0.43	0.30	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	873	0	0	623	439	102	0	286	0	0	0
Future Volume (veh/h)	84	873	0	0	623	439	102	0	286	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	91	949	0	0	677	0	111	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	621	2680	0	0	2186		145	0				
Arrive On Green	0.04	0.51	0.00	0.00	0.62	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1781	0	1585			
Grp Volume(v), veh/h	91	949	0	0	677	0	111	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1781	0	1585			
Q Serve(g_s), s	1.1	10.5	0.0	0.0	5.9	0.0	4.0	0.0	0.0			
Cycle Q Clear(g_c), s	1.1	10.5	0.0	0.0	5.9	0.0	4.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	621	2680	0	0	2186		145	0				
V/C Ratio(X)	0.15	0.35	0.00	0.00	0.31		0.77	0.00				
Avail Cap(c_a), veh/h	730	2680	0	0	2186		373	0				
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.83	0.83	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	4.0	6.5	0.0	0.0	5.9	0.0	29.3	0.0	0.0			
Incr Delay (d2), s/veh	0.1	0.3	0.0	0.0	0.4	0.0	8.2	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			
%ile BackOfQ(50%),veh/ln	0.3	2.8	0.0	0.0	1.7	0.0	1.9	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.0	6.8	0.0	0.0	6.3	0.0	37.5	0.0	0.0			
LnGrp LOS	A	A	A	A	A		D	A				
Approach Vol, veh/h		1040			677	A		111	A			
Approach Delay, s/veh		6.6			6.3			37.5				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	9.0	45.3				54.3		10.7				
Change Period (Y+Rc), s	5.0	* 5.3				* 5.3		5.4				
Max Green Setting (Gmax), s	8.0	* 28				* 41		13.6				
Max Q Clear Time (g_c+I1), s	3.1	7.9				12.5		6.0				
Green Ext Time (p_c), s	0.1	7.6				13.4		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1459	139	823	270	165
v/c Ratio	0.71	0.54	0.32	0.81	0.39
Control Delay	22.6	24.1	6.5	68.4	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	24.1	6.5	68.4	10.0
Queue Length 50th (ft)	433	40	104	219	6
Queue Length 95th (ft)	630	107	153	303	63
Internal Link Dist (ft)	1940		1212	552	
Turn Bay Length (ft)		200			150
Base Capacity (vph)	2055	314	2542	422	496
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.44	0.32	0.64	0.33

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1184	158	128	757	248	152
Future Volume (veh/h)	1184	158	128	757	248	152
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1287	172	139	823	270	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2038	271	279	2617	305	271
Arrive On Green	0.65	0.65	0.09	1.00	0.17	0.17
Sat Flow, veh/h	3246	419	1781	3647	1781	1585
Grp Volume(v), veh/h	722	737	139	823	270	165
Grp Sat Flow(s),veh/h/ln	1777	1795	1781	1777	1781	1585
Q Serve(g_s), s	31.5	32.0	3.6	0.0	19.2	12.5
Cycle Q Clear(g_c), s	31.5	32.0	3.6	0.0	19.2	12.5
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1148	1160	279	2617	305	271
V/C Ratio(X)	0.63	0.64	0.50	0.31	0.89	0.61
Avail Cap(c_a), veh/h	1148	1160	407	2617	425	378
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.7	13.8	12.4	0.0	52.6	49.8
Incr Delay (d2), s/veh	2.6	2.7	1.4	0.3	15.1	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	12.4	1.2	0.1	9.8	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.3	16.5	13.8	0.3	67.7	52.0
LnGrp LOS	B	B	B	A	E	D
Approach Vol, veh/h	1459			962	435	
Approach Delay, s/veh	16.4			2.3	61.8	
Approach LOS	B			A	E	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		28.3	11.7	90.0		101.7
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s		31.0	15.0	66.0		87.0
Max Q Clear Time (g_c+I1), s		21.2	5.6	34.0		2.0
Green Ext Time (p_c), s		1.0	0.2	11.9		6.2

Intersection Summary	
HCM 6th Ctrl Delay	18.5
HCM 6th LOS	B

Queues
6: Douglas St & Colbern Rd

01/19/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	430	757	695	535	516	159	739	621	615	129	565	391
v/c Ratio	0.74	0.94	0.49	0.87	0.62	0.30	0.89	0.57	0.38	0.42	0.78	0.62
Control Delay	36.1	44.2	9.8	55.4	36.9	2.4	35.7	18.0	3.3	28.1	52.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	44.2	9.8	55.4	36.9	2.4	35.7	18.0	3.3	28.1	52.0	26.4
Queue Length 50th (ft)	113	243	112	181	165	0	131	100	47	51	137	172
Queue Length 95th (ft)	m163	#370	119	#269	225	11	#331	130	37	90	#193	270
Internal Link Dist (ft)		562			2353			694			850	
Turn Bay Length (ft)	300		300	500		200	375		200	290		500
Base Capacity (vph)	660	815	1422	621	837	531	850	1094	1592	305	729	666
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.93	0.49	0.86	0.62	0.30	0.87	0.57	0.39	0.42	0.78	0.59

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	396	696	639	492	475	146	680	571	566	119	520	360
Future Volume (veh/h)	396	696	639	492	475	146	680	571	566	119	520	360
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	430	757	695	535	516	159	739	621	615	129	565	391
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	517	819	1303	592	896	400	818	1083	1328	267	786	481
Arrive On Green	0.05	0.08	0.08	0.29	0.42	0.42	0.08	0.10	0.10	0.08	0.15	0.15
Sat Flow, veh/h	3456	3554	2790	3456	3554	1585	3456	3554	2790	1781	5106	1585
Grp Volume(v), veh/h	430	757	695	535	516	159	739	621	615	129	565	391
Grp Sat Flow(s),veh/h/ln	1728	1777	1395	1728	1777	1585	1728	1777	1395	1781	1702	1585
Q Serve(g_s), s	13.0	22.2	7.2	15.7	11.7	5.5	22.3	17.5	3.1	0.0	11.1	16.2
Cycle Q Clear(g_c), s	13.0	22.2	7.2	15.7	11.7	5.5	22.3	17.5	3.1	0.0	11.1	16.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	517	819	1303	592	896	400	818	1083	1328	267	786	481
V/C Ratio(X)	0.83	0.92	0.53	0.90	0.58	0.40	0.90	0.57	0.46	0.48	0.72	0.81
Avail Cap(c_a), veh/h	665	819	1303	625	896	400	856	1083	1328	267	786	481
HCM Platoon Ratio	0.33	0.33	0.33	1.67	1.67	1.67	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.67	0.67	0.67	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	47.6	8.0	36.7	26.1	14.3	47.2	40.7	26.0	41.3	42.3	33.8
Incr Delay (d2), s/veh	7.1	16.1	0.4	16.1	0.9	0.6	9.0	1.5	0.8	1.4	5.6	13.9
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	6.4	12.3	2.9	6.8	4.2	2.5	11.3	8.5	6.7	3.1	4.9	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.7	63.7	8.5	52.7	27.0	14.9	56.2	42.2	26.8	42.6	47.8	47.8
LnGrp LOS	E	E	A	D	C	B	E	D	C	D	D	D
Approach Vol, veh/h		1882			1210			1975			1085	
Approach Delay, s/veh		41.4			36.8			42.6			47.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.9	22.2	23.0	30.0	14.0	38.0	21.5	31.5
Change Period (Y+Rc), s	5.0	* 6	* 5	5.8	* 6	* 6	* 5.8	5.0
Max Green Setting (Gmax), s	26.0	* 14	* 19	24.2	* 8	* 32	* 20	23.0
Max Q Clear Time (g_c+I1), s	24.3	18.2	17.7	24.2	2.0	19.5	15.0	13.7
Green Ext Time (p_c), s	0.6	0.0	0.3	0.0	0.1	5.3	0.7	2.5

Intersection Summary	
HCM 6th Ctrl Delay	41.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	1	25	0	17	2	840	12	20	816	5
Future Vol, veh/h	2	0	1	25	0	17	2	840	12	20	816	5
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	-	-	-	-	-	50	200	-	175	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	1	27	0	18	2	913	13	22	887	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1867	1864	890	1851	1853	913	892	0	0	926	0	0
Stage 1	934	934	-	917	917	-	-	-	-	-	-	-
Stage 2	933	930	-	934	936	-	-	-	-	-	-	-
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	55	73	342	57	74	331	760	-	-	738	-	-
Stage 1	319	345	-	326	351	-	-	-	-	-	-	-
Stage 2	319	346	-	319	344	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	51	71	342	55	72	331	760	-	-	738	-	-
Mov Cap-2 Maneuver	51	71	-	55	72	-	-	-	-	-	-	-
Stage 1	318	335	-	325	350	-	-	-	-	-	-	-
Stage 2	300	345	-	309	334	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	58.1	79.6	0	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	760	-	-	71	55	331	738	-	-
HCM Lane V/C Ratio	0.003	-	-	0.046	0.494	0.056	0.029	-	-
HCM Control Delay (s)	9.8	-	-	58.1	122.5	16.5	10	-	-
HCM Lane LOS	A	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.9	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	95	767	98	65	745
Future Vol, veh/h	92	95	767	98	65	745
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	-	-	225	225	-
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	100	103	834	107	71	810

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1786	417	0	0	941	0
Stage 1	834	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	~ 81	585	-	-	726	-
Stage 1	388	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 73	585	-	-	726	-
Mov Cap-2 Maneuver	198	-	-	-	-	-
Stage 1	388	-	-	-	-	-
Stage 2	337	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	39.5	0	0.8
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	298	726	-
HCM Lane V/C Ratio	-	-	0.682	0.097	-
HCM Control Delay (s)	-	-	39.5	10.5	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	4.6	0.3	-

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	178	215	285	85	59	161	412	334	42	485
v/c Ratio	0.08	0.51	0.46	0.62	0.14	0.10	0.59	0.58	0.41	0.12	0.88
Control Delay	17.1	38.3	8.1	25.8	24.8	0.3	24.6	28.1	4.6	15.2	48.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	38.3	8.1	25.8	24.8	0.3	24.6	28.1	4.6	15.2	48.7
Queue Length 50th (ft)	14	95	0	117	38	0	52	198	0	13	260
Queue Length 95th (ft)	34	159	57	182	75	0	102	338	61	34	#475
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	557	646	689	496	755	727	294	715	813	482	741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.28	0.31	0.57	0.11	0.08	0.55	0.58	0.41	0.09	0.65

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)	37	164	198	262	78	54	148	379	307	39	435	11
Future Volume (veh/h)	37	164	198	262	78	54	148	379	307	39	435	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	178	215	285	85	59	161	412	334	42	473	12
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	490	354	300	461	569	482	279	635	539	265	532	13
Arrive On Green	0.04	0.19	0.19	0.15	0.30	0.30	0.08	0.34	0.34	0.04	0.29	0.29
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1816	46
Grp Volume(v), veh/h	40	178	215	285	85	59	161	412	334	42	0	485
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1862
Q Serve(g_s), s	1.2	7.0	10.4	10.2	2.7	2.2	5.0	15.2	14.4	1.2	0.0	20.3
Cycle Q Clear(g_c), s	1.2	7.0	10.4	10.2	2.7	2.2	5.0	15.2	14.4	1.2	0.0	20.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	490	354	300	461	569	482	279	635	539	265	0	545
V/C Ratio(X)	0.08	0.50	0.72	0.62	0.15	0.12	0.58	0.65	0.62	0.16	0.00	0.89
Avail Cap(c_a), veh/h	633	677	573	508	677	573	325	665	564	504	0	662
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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	29.6	31.0	21.5	20.7	20.5	20.4	22.8	22.5	17.7	0.0	27.6
Incr Delay (d2), s/veh	0.0	2.4	6.7	1.2	0.3	0.2	0.7	2.1	1.9	0.1	0.0	12.4
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	0.5	3.2	4.2	4.2	1.2	0.8	1.9	6.4	5.1	0.5	0.0	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	32.0	37.7	22.7	20.9	20.8	21.1	24.9	24.5	17.8	0.0	39.9
LnGrp LOS	B	C	D	C	C	C	C	C	C	B	A	D
Approach Vol, veh/h		433			429			907			527	
Approach Delay, s/veh		33.5			22.1			24.1			38.2	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	20.9	12.9	29.9	8.5	30.3	9.1	33.7
Change Period (Y+Rc), s	5.5	5.5	6.0	6.0	5.5	5.5	6.0	6.0
Max Green Setting (Gmax), s	14.5	29.5	9.0	29.0	9.5	29.5	14.0	29.0
Max Q Clear Time (g_c+I1), s	12.2	12.4	7.0	22.3	3.2	4.7	3.2	17.2
Green Ext Time (p_c), s	0.1	3.1	0.0	1.6	0.0	1.2	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	2	916	11	32	933	10	5	0	17	17	0	10
Future Vol, veh/h	2	916	11	32	933	10	5	0	17	17	0	10
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	200	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	996	12	35	1014	11	5	0	18	18	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1025	0	0	1008	0	0	1583	2101	504	1592	2102	513
Stage 1	-	-	-	-	-	-	1006	1006	-	1090	1090	-
Stage 2	-	-	-	-	-	-	577	1095	-	502	1012	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	673	-	-	683	-	-	73	51	513	72	51	506
Stage 1	-	-	-	-	-	-	258	317	-	230	289	-
Stage 2	-	-	-	-	-	-	469	288	-	520	315	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	673	-	-	683	-	-	68	48	513	67	48	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	48	-	67	48	-
Stage 1	-	-	-	-	-	-	257	316	-	229	274	-
Stage 2	-	-	-	-	-	-	435	273	-	500	314	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.3	24.8	56
HCM LOS			C	F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	206	683	-	-	673	-	-	99
HCM Lane V/C Ratio	0.116	0.051	-	-	0.003	-	-	0.296
HCM Control Delay (s)	24.8	10.6	-	-	10.4	-	-	56
HCM Lane LOS	C	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	1.1

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	29	54	972	944	6
Future Vol, veh/h	3	29	54	972	944	6
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	3	32	59	1057	1026	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1677	517	1033	0	-	0
Stage 1	1030	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	86	503	668	-	-	-
Stage 1	305	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	78	503	668	-	-	-
Mov Cap-2 Maneuver	193	-	-	-	-	-
Stage 1	278	-	-	-	-	-
Stage 2	483	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	668	-	437	-	-
HCM Lane V/C Ratio	0.088	-	0.08	-	-
HCM Control Delay (s)	10.9	-	13.9	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	84	127	986	915	58
Future Vol, veh/h	40	84	127	986	915	58
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	150	200	-	-	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	43	91	138	1072	995	63

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1807	498	1058	0	-	0
Stage 1	995	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	70	518	654	-	-	-
Stage 1	318	-	-	-	-	-
Stage 2	397	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	55	518	654	-	-	-
Mov Cap-2 Maneuver	164	-	-	-	-	-
Stage 1	251	-	-	-	-	-
Stage 2	397	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.3	1.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	654	-	164	518	-	-
HCM Lane V/C Ratio	0.211	-	0.265	0.176	-	-
HCM Control Delay (s)	12	-	34.7	13.4	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.8	-	1	0.6	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1547	104	0	1460	55	0	0	184	0	0	53
Future Vol, veh/h	0	1547	104	0	1460	55	0	0	184	0	0	53
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	-	-	150	-	-	150	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1682	113	0	1587	60	0	0	200	0	0	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	841	-	-	794
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	308	0	0	331
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	308	-	-	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	36	18.2
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	308	-	-	-	-	331
HCM Lane V/C Ratio	0.649	-	-	-	-	0.174
HCM Control Delay (s)	36	-	-	-	-	18.2
HCM Lane LOS	E	-	-	-	-	C
HCM 95th %tile Q(veh)	4.2	-	-	-	-	0.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	127	1479	142	474	1129	41	274	249	66	29
v/c Ratio	0.37	0.80	0.16	0.81	0.50	0.04	0.77	0.60	0.35	0.08
Control Delay	7.1	25.1	2.2	52.7	6.2	0.1	58.4	13.8	46.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	25.1	2.2	52.7	6.2	0.1	58.4	13.8	46.4	0.4
Queue Length 50th (ft)	20	427	0	132	144	0	91	11	40	0
Queue Length 95th (ft)	35	528	25	m186	m155	m0	#144	86	84	0
Internal Link Dist (ft)		869			534					266
Turn Bay Length (ft)	300		300	300		250	150	150		
Base Capacity (vph)	343	1852	902	621	2248	1039	381	424	201	389
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	0.37	0.80	0.16	0.76	0.50	0.04	0.72	0.59	0.33	0.07

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1361	131	436	1039	38	252	0	229	61	0	27
Future Volume (veh/h)	117	1361	131	436	1039	38	252	0	229	61	0	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	1479	142	474	1129	41	274	0	249	66	0	29
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	347	1872	835	549	2272	1013	477	267	226	230	0	226
Arrive On Green	0.05	0.53	0.53	0.11	0.43	0.43	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	2679	1870	1585	1131	0	1585
Grp Volume(v), veh/h	127	1479	142	474	1129	41	274	0	249	66	0	29
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1339	1870	1585	1131	0	1585
Q Serve(g_s), s	2.5	35.4	4.9	14.2	24.2	1.6	10.4	0.0	15.0	5.6	0.0	1.7
Cycle Q Clear(g_c), s	2.5	35.4	4.9	14.2	24.2	1.6	12.1	0.0	15.0	5.6	0.0	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	347	1872	835	549	2272	1013	477	267	226	230	0	226
V/C Ratio(X)	0.37	0.79	0.17	0.86	0.50	0.04	0.57	0.00	1.10	0.29	0.00	0.13
Avail Cap(c_a), veh/h	366	1872	835	625	2272	1013	477	267	226	230	0	226
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	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	0.00	1.00
Uniform Delay (d), s/veh	9.4	20.1	12.9	45.8	17.8	11.3	44.6	0.0	45.0	41.0	0.0	39.3
Incr Delay (d2), s/veh	0.6	3.5	0.4	10.9	0.8	0.1	1.7	0.0	89.0	0.7	0.0	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	13.9	1.7	7.0	10.5	0.5	3.6	0.0	11.3	1.6	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	23.6	13.4	56.7	18.5	11.4	46.3	0.0	134.0	41.6	0.0	39.5
LnGrp LOS	B	C	B	E	B	B	D	A	F	D	A	D
Approach Vol, veh/h		1748			1644			523			95	
Approach Delay, s/veh		21.8			29.3			88.0			41.0	
Approach LOS		C			C			F			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	22.7	61.3		21.0	10.9	73.1				
Change Period (Y+Rc), s		6.0	6.0	6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		15.0	19.0	53.0		15.0	6.0	66.0				
Max Q Clear Time (g_c+I1), s		17.0	16.2	37.4		7.6	4.5	26.2				
Green Ext Time (p_c), s		0.0	0.5	9.3		0.2	0.0	9.6				

Intersection Summary	
HCM 6th Ctrl Delay	34.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑		↱
Traffic Vol, veh/h	1554	43	79	1239	0	55
Future Vol, veh/h	1554	43	79	1239	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	1689	47	86	1347	0	60

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1736	0	-	845
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	359	-	0	306
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	359	-	-	306
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	19.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	306	-	-	359	-
HCM Lane V/C Ratio	0.195	-	-	0.239	-
HCM Control Delay (s)	19.6	-	-	18.2	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	0.7	-	-	0.9	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1458	101	287	1060	134	278
v/c Ratio	0.77	0.12	0.77	0.40	0.47	0.57
Control Delay	16.0	5.6	44.5	6.5	55.6	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	5.6	44.5	6.5	55.6	10.4
Queue Length 50th (ft)	168	4	157	150	104	0
Queue Length 95th (ft)	278	m20	253	181	171	81
Internal Link Dist (ft)	919			966	331	
Turn Bay Length (ft)		150	200			200
Base Capacity (vph)	1894	870	444	2640	285	488
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	0.77	0.12	0.65	0.40	0.47	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1341	93	264	975	123	256
Future Volume (veh/h)	1341	93	264	975	123	256
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1458	101	287	1060	134	278
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2208	985	401	2652	288	256
Arrive On Green	1.00	1.00	0.08	0.75	0.16	0.16
Sat Flow, veh/h	3647	1585	1781	3647	1781	1585
Grp Volume(v), veh/h	1458	101	287	1060	134	278
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	0.0	0.0	7.5	14.0	8.9	21.0
Cycle Q Clear(g_c), s	0.0	0.0	7.5	14.0	8.9	21.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2208	985	401	2652	288	256
V/C Ratio(X)	0.66	0.10	0.72	0.40	0.47	1.09
Avail Cap(c_a), veh/h	2208	985	631	2652	288	256
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	7.0	6.0	49.4	54.5
Incr Delay (d2), s/veh	1.6	0.2	2.4	0.5	5.3	81.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	2.7	4.4	4.4	13.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.6	0.2	9.4	6.4	54.7	135.5
LnGrp LOS	A	A	A	A	D	F
Approach Vol, veh/h	1559			1347	412	
Approach Delay, s/veh	1.5			7.0	109.2	
Approach LOS	A			A	F	

Timer - Assigned Phs		2	3	4			8
Phs Duration (G+Y+Rc), s		27.0	16.2	86.8			103.0
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0
Max Green Setting (Gmax), s		21.0	27.0	64.0			97.0
Max Q Clear Time (g_c+I1), s		23.0	9.5	2.0			16.0
Green Ext Time (p_c), s		0.0	0.7	16.1			9.0

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1207	100	219	879	0	227
Future Vol, veh/h	1207	100	219	879	0	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	200	-	-	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	1312	109	238	955	0	247

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1421	0	-	656
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	475	-	0	408
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	475	-	-	408
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	26.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	408	-	-	475	-
HCM Lane V/C Ratio	0.605	-	-	0.501	-
HCM Control Delay (s)	26.4	-	-	20	-
HCM Lane LOS	D	-	-	C	-
HCM 95th %tile Q(veh)	3.9	-	-	2.8	-

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	183	217	4	133	153
Future Vol, veh/h	4	183	217	4	133	153
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	199	236	4	145	166

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	694	238	0	0	240	0
Stage 1	238	-	-	-	-	-
Stage 2	456	-	-	-	-	-
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	801	-	-	1327	-
Stage 1	802	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	360	801	-	-	1327	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	561	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	3.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	781	1327	-
HCM Lane V/C Ratio	-	-	0.26	0.109	-
HCM Control Delay (s)	-	-	11.2	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1	0.4	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	81	140	9	55	102
Future Vol, veh/h	10	81	140	9	55	102
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	88	152	10	60	111

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	388	157	0	0	162	0
Stage 1	157	-	-	-	-	-
Stage 2	231	-	-	-	-	-
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	616	889	-	-	1417	-
Stage 1	871	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	588	889	-	-	1417	-
Mov Cap-2 Maneuver	588	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	771	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	2.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	842	1417	-
HCM Lane V/C Ratio	-	-	0.117	0.042	-
HCM Control Delay (s)	-	-	9.8	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	876	12	65	883	9	53
Future Vol, veh/h	876	12	65	883	9	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	952	13	71	960	10	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	965	0	1581	483
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	622	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	709	-	100	530
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	709	-	90	530
Mov Cap-2 Maneuver	-	-	-	-	214	-
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	448	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.7	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	436	709	-	-	-
HCM Lane V/C Ratio	0.155	0.1	-	-	-
HCM Control Delay (s)	14.8	10.6	-	-	-
HCM Lane LOS	B	B	-	-	-
HCM 95th %tile Q(veh)	0.5	0.3	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	835	12	65	827	9	53
Future Vol, veh/h	835	12	65	827	9	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	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	908	13	71	899	10	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	921	0	1507	915
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	592	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	739	-	122	330
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	517	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	739	-	110	330
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	467	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.8	19.6
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	314	739	-	-	-
HCM Lane V/C Ratio	0.215	0.096	-	-	-
HCM Control Delay (s)	19.6	10.4	-	-	-
HCM Lane LOS	C	B	-	-	-
HCM 95th %tile Q(veh)	0.8	0.3	-	-	-

Simulation

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	9200	9226	9181	9125	9263	9199
Vehs Exited	9188	9230	9227	9105	9290	9208
Starting Vehs	294	291	304	290	289	287
Ending Vehs	306	287	258	310	262	284
Travel Distance (mi)	5668	5643	5611	5573	5664	5632
Travel Time (hr)	322.3	328.7	313.4	317.3	332.6	322.9
Total Delay (hr)	155.4	162.6	147.7	152.8	165.7	156.8
Total Stops	12559	12350	12075	12017	12714	12338
Fuel Used (gal)	253.9	255.4	251.8	251.3	258.1	254.1

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2019	2098	2170	2080	2175	2107
Vehs Exited	2056	2078	2186	2116	2126	2114
Starting Vehs	294	291	304	290	289	287
Ending Vehs	257	311	288	254	338	294
Travel Distance (mi)	1255	1259	1318	1276	1321	1286
Travel Time (hr)	67.1	68.0	72.9	68.2	69.1	69.1
Total Delay (hr)	30.2	30.9	34.1	30.5	30.3	31.2
Total Stops	2570	2584	2798	2626	2673	2649
Fuel Used (gal)	55.1	56.3	59.2	56.4	58.3	57.1

Interval #2 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2473	2485	2407	2379	2443	2436
Vehs Exited	2361	2433	2341	2310	2417	2375
Starting Vehs	257	311	288	254	338	294
Ending Vehs	369	363	354	323	364	351
Travel Distance (mi)	1481	1496	1443	1411	1492	1464
Travel Time (hr)	85.4	88.6	81.2	77.5	91.4	84.8
Total Delay (hr)	41.7	44.5	38.5	35.8	47.4	41.6
Total Stops	3312	3346	3134	3023	3483	3258
Fuel Used (gal)	66.7	67.7	64.7	63.0	68.8	66.2

Interval #3 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2497	2451	2461	2474	2436	2463
Vehs Exited	2506	2428	2448	2449	2440	2455
Starting Vehs	369	363	354	323	364	351
Ending Vehs	360	386	367	348	360	356
Travel Distance (mi)	1531	1517	1492	1521	1496	1511
Travel Time (hr)	88.5	92.6	84.2	92.6	90.0	89.6
Total Delay (hr)	43.5	47.8	40.2	47.6	46.1	45.0
Total Stops	3468	3499	3238	3447	3296	3389
Fuel Used (gal)	69.3	69.1	67.4	70.0	68.8	68.9

Interval #4 Information

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2211	2192	2143	2192	2209	2190
Vehs Exited	2265	2291	2252	2230	2307	2269
Starting Vehs	360	386	367	348	360	356
Ending Vehs	306	287	258	310	262	284
Travel Distance (mi)	1401	1372	1358	1365	1355	1370
Travel Time (hr)	81.3	79.5	75.1	78.9	82.2	79.4
Total Delay (hr)	40.0	39.4	34.8	38.8	41.9	39.0
Total Stops	3209	2921	2905	2921	3262	3038
Fuel Used (gal)	62.8	62.3	60.6	61.8	62.3	62.0

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	L	L
Maximum Queue (ft)	175	92	65	127	73	56	235	167
Average Queue (ft)	74	19	23	61	27	10	141	63
95th Queue (ft)	140	65	68	106	58	38	206	150
Link Distance (ft)	317	317			436	436	298	298
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50	325				
Storage Blk Time (%)		1	0					
Queuing Penalty (veh)		1	0					

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	R	L
Maximum Queue (ft)	66	59	28	137	189	76	86
Average Queue (ft)	29	14	3	40	52	62	35
95th Queue (ft)	59	45	17	101	139	75	72
Link Distance (ft)		436	436	562	562		343
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	325					50	
Storage Blk Time (%)					0	5	
Queuing Penalty (veh)					1	14	

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	R	R	L	L	T	T	R	L
Maximum Queue (ft)	157	193	210	204	173	166	380	374	267	187	38	375
Average Queue (ft)	68	92	119	130	72	85	208	228	104	98	8	218
95th Queue (ft)	126	151	190	196	124	136	360	376	202	163	26	393
Link Distance (ft)			539	539					2308	2308		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300	300			300	300	500	500			200	375
Storage Blk Time (%)										0		1
Queuing Penalty (veh)										0		4

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	T	T	R	R	L	T	T	T	R
Maximum Queue (ft)	477	332	262	91	64	110	177	219	242	199
Average Queue (ft)	237	112	93	28	26	43	84	104	142	112
95th Queue (ft)	470	283	235	67	54	84	144	189	221	185
Link Distance (ft)	643	643	643				840	840		
Upstream Blk Time (%)	1	0	0							
Queuing Penalty (veh)	2	1	1							
Storage Bay Dist (ft)				200	200	290			500	500
Storage Blk Time (%)	5		0	0						
Queuing Penalty (veh)	14		0	0						

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	NB	NB	NB	NB	SB	SB	SB	SB	NE	NE	NE	NE
Directions Served	L	L	T	T	L	T	T	>	L	L	L	>
Maximum Queue (ft)	168	169	171	166	224	147	149	110	244	222	216	200
Average Queue (ft)	90	101	74	86	114	70	75	3	147	128	124	18
95th Queue (ft)	145	153	140	152	186	127	127	42	223	200	193	134
Link Distance (ft)		1308	1308	1308		643	643		601	601	601	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400				225			400				400
Storage Blk Time (%)				0	0							
Queuing Penalty (veh)				0	1							

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	SW	SW
Directions Served	L	L
Maximum Queue (ft)	209	174
Average Queue (ft)	119	94
95th Queue (ft)	179	151
Link Distance (ft)	632	632
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Douglas St

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	T
Maximum Queue (ft)	74	105	70	4	13
Average Queue (ft)	32	38	30	0	1
95th Queue (ft)	63	76	57	5	7
Link Distance (ft)	320			510	510
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150	200		
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 15: Drive 4 & Colbern Rd

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	134	93
Average Queue (ft)	53	36
95th Queue (ft)	105	72
Link Distance (ft)	182	287
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: Drive 5 & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	R
Maximum Queue (ft)	138	349	434	186	184	201	252	252	75	174	256	152
Average Queue (ft)	38	175	240	55	106	124	137	157	6	101	162	53
95th Queue (ft)	91	305	393	176	166	181	218	238	45	208	238	113
Link Distance (ft)		669	669				531	531			303	
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	300			300	300	300			250	150		150
Storage Blk Time (%)		1	4	0			0	0		1	20	0
Queuing Penalty (veh)		0	5	0			0	0		1	22	0

Intersection: 16: Drive 5 & Colbern Rd

Movement	SB	SB
Directions Served	L	TR
Maximum Queue (ft)	116	55
Average Queue (ft)	54	15
95th Queue (ft)	101	39
Link Distance (ft)	282	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		150
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	260	433
Average Queue (ft)	11	36
95th Queue (ft)	111	227
Link Distance (ft)	558	558
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	112	148	38	83	31	113	75	119	147	198	263	140
Average Queue (ft)	20	70	7	27	7	42	36	26	65	103	137	30
95th Queue (ft)	60	132	25	56	27	80	62	75	118	173	223	95
Link Distance (ft)	1012	1012	1012			982				1267	1267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)									0	1	13	0
Queuing Penalty (veh)									0	1	9	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	138	147	200	210	126
Average Queue (ft)	69	90	102	115	45
95th Queue (ft)	123	139	173	181	85
Link Distance (ft)			1308	1308	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				1	0

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	48	111	118	68	231	199	61	52	94	36
Average Queue (ft)	10	19	23	13	103	62	23	14	31	14
95th Queue (ft)	30	69	77	46	211	158	56	42	70	39
Link Distance (ft)		2308	2308		1382	1382	383	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)		0			3					
Queuing Penalty (veh)		0			1					

Network Summary

Network wide Queuing Penalty: 80

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	11414	11509	11477	11356	11566	11465
Vehs Exited	11314	11413	11404	11215	11472	11364
Starting Vehs	383	417	433	366	397	393
Ending Vehs	483	513	506	507	491	498
Travel Distance (mi)	6998	7051	7059	6935	7116	7032
Travel Time (hr)	586.6	563.7	576.0	551.1	568.9	569.3
Total Delay (hr)	382.8	359.3	371.0	349.3	361.6	364.8
Total Stops	18377	18877	18380	17385	18287	18265
Fuel Used (gal)	350.6	346.4	348.0	340.6	348.7	346.9

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	4:45
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2619	2717	2697	2656	2712	2678
Vehs Exited	2621	2723	2713	2612	2692	2671
Starting Vehs	383	417	433	366	397	393
Ending Vehs	381	411	417	410	417	405
Travel Distance (mi)	1608	1700	1683	1612	1684	1657
Travel Time (hr)	99.2	105.9	103.8	102.8	104.9	103.3
Total Delay (hr)	52.2	56.5	55.0	55.6	55.7	55.0
Total Stops	3536	3651	3843	3543	3908	3696
Fuel Used (gal)	72.4	76.8	75.3	73.8	75.6	74.8

Interval #2 Information

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3100	3050	3028	3066	3086	3068
Vehs Exited	2931	2953	2910	2997	2943	2948
Starting Vehs	381	411	417	410	417	405
Ending Vehs	550	508	535	479	560	525
Travel Distance (mi)	1849	1815	1810	1861	1836	1834
Travel Time (hr)	139.7	130.9	136.2	130.4	130.1	133.4
Total Delay (hr)	85.8	78.2	83.6	76.3	76.6	80.1
Total Stops	4799	4712	4725	4412	4727	4676
Fuel Used (gal)	88.8	85.4	86.7	87.5	86.2	86.9

Interval #3 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	3025	3039	3036	2966	3083	3027
Vehs Exited	2963	2966	2971	2905	3043	2967
Starting Vehs	550	508	535	479	560	525
Ending Vehs	612	581	600	540	600	585
Travel Distance (mi)	1832	1834	1838	1793	1876	1835
Travel Time (hr)	176.8	161.8	164.6	153.9	169.4	165.3
Total Delay (hr)	123.7	108.7	111.3	102.0	114.8	112.1
Total Stops	5563	5468	5077	4730	5108	5189
Fuel Used (gal)	97.6	94.0	94.5	90.3	96.6	94.6

Interval #4 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2670	2703	2716	2668	2685	2686
Vehs Exited	2799	2771	2810	2701	2794	2773
Starting Vehs	612	581	600	540	600	585
Ending Vehs	483	513	506	507	491	498
Travel Distance (mi)	1710	1702	1729	1669	1721	1706
Travel Time (hr)	170.9	165.1	171.3	164.0	164.5	167.2
Total Delay (hr)	121.1	115.9	121.1	115.4	114.5	117.6
Total Stops	4479	5046	4735	4700	4544	4699
Fuel Used (gal)	91.7	90.2	91.6	88.9	90.3	90.5

Intersection: 2: M-350 SB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	L	L
Maximum Queue (ft)	240	183	74	334	261	165	258	193
Average Queue (ft)	148	78	28	168	58	44	147	68
95th Queue (ft)	224	171	80	300	155	110	222	150
Link Distance (ft)	317	317			436	436	298	298
Upstream Blk Time (%)					0		0	
Queuing Penalty (veh)					0		0	
Storage Bay Dist (ft)			50	325				
Storage Blk Time (%)		10	1	1				
Queuing Penalty (veh)		11	2	2				

Intersection: 3: M-350 NB Ramps & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	77	140	143	208	181	75	142	73
Average Queue (ft)	33	67	51	84	31	46	61	4
95th Queue (ft)	65	125	116	168	97	85	112	47
Link Distance (ft)		436	436	562	562		343	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	325					50		200
Storage Blk Time (%)					1	1	0	0
Queuing Penalty (veh)					5	5	0	0

Intersection: 6: Douglas St & Colbern Rd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	R	R	L	L	T	T	R	L
Maximum Queue (ft)	218	325	556	568	325	192	500	513	756	388	156	367
Average Queue (ft)	123	230	370	377	228	99	297	318	216	115	33	218
95th Queue (ft)	193	396	624	631	419	161	536	548	645	265	92	328
Link Distance (ft)			539	539					2308	2308		
Upstream Blk Time (%)			5	6								
Queuing Penalty (veh)			43	52								
Storage Bay Dist (ft)	300	300			300	300	500	500			200	375
Storage Blk Time (%)		0	23	24	1		4	7	1	1	0	0
Queuing Penalty (veh)		1	95	158	2		9	16	4	1	0	1

Intersection: 6: Douglas St & Colbern Rd

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	T	T	R	R	L	T	T	T	R
Maximum Queue (ft)	419	190	224	208	135	222	610	703	476	455
Average Queue (ft)	219	97	97	62	60	97	202	319	314	221
95th Queue (ft)	350	161	172	130	109	195	434	645	544	469
Link Distance (ft)	643	643	643				840	840		
Upstream Blk Time (%)	0						0	1		
Queuing Penalty (veh)	0						0	4		
Storage Bay Dist (ft)				200	200	290			500	500
Storage Blk Time (%)	0		0	0	0		3	4	4	1
Queuing Penalty (veh)	1		2	0	0		4	21	6	1

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	NE	NE
Directions Served	L	L	T	T	>	L	T	T	>	>	L	L
Maximum Queue (ft)	335	563	352	305	135	231	239	214	251	257	253	263
Average Queue (ft)	178	218	93	113	11	147	112	101	32	88	174	169
95th Queue (ft)	357	522	269	223	92	231	195	169	164	260	243	236
Link Distance (ft)		1308	1308	1308			643	643	643		601	601
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400				200	225				400		
Storage Blk Time (%)	1	6		1	0	2	0					
Queuing Penalty (veh)	3	16		3	0	5	0					

Intersection: 7: 470 EB & Douglas St & 470 WB

Movement	NE	NE	SW	SW	SW
Directions Served	L	>	L	L	>
Maximum Queue (ft)	342	266	145	119	214
Average Queue (ft)	220	27	81	43	13
95th Queue (ft)	315	173	136	103	98
Link Distance (ft)	601		632	632	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		400			400
Storage Blk Time (%)	0	0			
Queuing Penalty (veh)	1	0			

Intersection: 14: Douglas St

Movement	EB	EB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	121	129	122	29	63	14
Average Queue (ft)	43	39	53	1	5	1
95th Queue (ft)	101	90	97	21	61	10
Link Distance (ft)	320			510	510	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		150	200			150
Storage Blk Time (%)	1	0			0	
Queuing Penalty (veh)	0	0			0	

Intersection: 15: Drive 4 & Colbern Rd

Movement	EB	EB	EB	NB	SB
Directions Served	T	T	R	R	R
Maximum Queue (ft)	358	404	140	211	97
Average Queue (ft)	86	100	21	161	31
95th Queue (ft)	335	371	115	246	70
Link Distance (ft)	531	531		182	287
Upstream Blk Time (%)	0	1		51	
Queuing Penalty (veh)	2	5		0	
Storage Bay Dist (ft)			150		
Storage Blk Time (%)		7	0		
Queuing Penalty (veh)		8	0		

Intersection: 16: Drive 5 & Colbern Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	290	612	645	325	217	225	112	121	20	174	269	135
Average Queue (ft)	87	297	340	101	136	154	51	50	3	108	175	6
95th Queue (ft)	229	545	601	305	201	215	104	98	13	211	253	61
Link Distance (ft)		669	669				531	531			303	303
Upstream Blk Time (%)		1	2								0	
Queuing Penalty (veh)		0	0								0	
Storage Bay Dist (ft)	300			300	300	300			250	150		
Storage Blk Time (%)		7	13	0						1	20	0
Queuing Penalty (veh)		8	18	0						1	26	0

Intersection: 16: Drive 5 & Colbern Rd

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	166	132	77
Average Queue (ft)	83	48	18
95th Queue (ft)	152	110	67
Link Distance (ft)		282	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150		150
Storage Blk Time (%)	1	3	0
Queuing Penalty (veh)	0	1	0

Intersection: 819: Bend

Movement	WB	WB
Directions Served		T
Maximum Queue (ft)	656	677
Average Queue (ft)	358	470
95th Queue (ft)	741	892
Link Distance (ft)	558	558
Upstream Blk Time (%)	6	45
Queuing Penalty (veh)	46	346
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	LT	R	L	L	T	T	R
Maximum Queue (ft)	407	467	207	150	129	171	199	33	174	593	656	140
Average Queue (ft)	205	294	26	59	33	86	99	4	47	298	332	57
95th Queue (ft)	442	530	93	117	83	142	177	20	140	610	647	159
Link Distance (ft)	1012	1012	1012			982				1267	1267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				175	215		215	150	150			115
Storage Blk Time (%)				0			0			27	39	0
Queuing Penalty (veh)				0			1			10	29	0

Intersection: 7118: Douglas Street/Douglas St & Mulberry

Movement	SB	SB	SB	SB	SB
Directions Served	UL	L	T	T	R
Maximum Queue (ft)	119	135	211	218	39
Average Queue (ft)	54	81	118	129	17
95th Queue (ft)	105	123	184	197	42
Link Distance (ft)			1308	1308	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	400	400			200
Storage Blk Time (%)				1	
Queuing Penalty (veh)				0	

Intersection: 7224: Town Center Blvd & Colbern Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	LT	R
Maximum Queue (ft)	122	242	254	100	242	221	73	47	85	43
Average Queue (ft)	21	109	132	16	103	66	22	16	29	15
95th Queue (ft)	65	219	243	56	206	161	57	43	67	40
Link Distance (ft)		2308	2308		1382	1382	383	467	467	467
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150			150						
Storage Blk Time (%)		3			3					
Queuing Penalty (veh)		1			1					

Network Summary

Network wide Queuing Penalty: 976

STATE OF MISSOURI
SHANNON L
JEFFRIES
NUMBER
PE-2008000069
PROFESSIONAL ENGINEER

01.19.2023

DISCOVERY PARK

Lee’s Summit, Missouri

January 2023

Olsson Project No. A21-04643