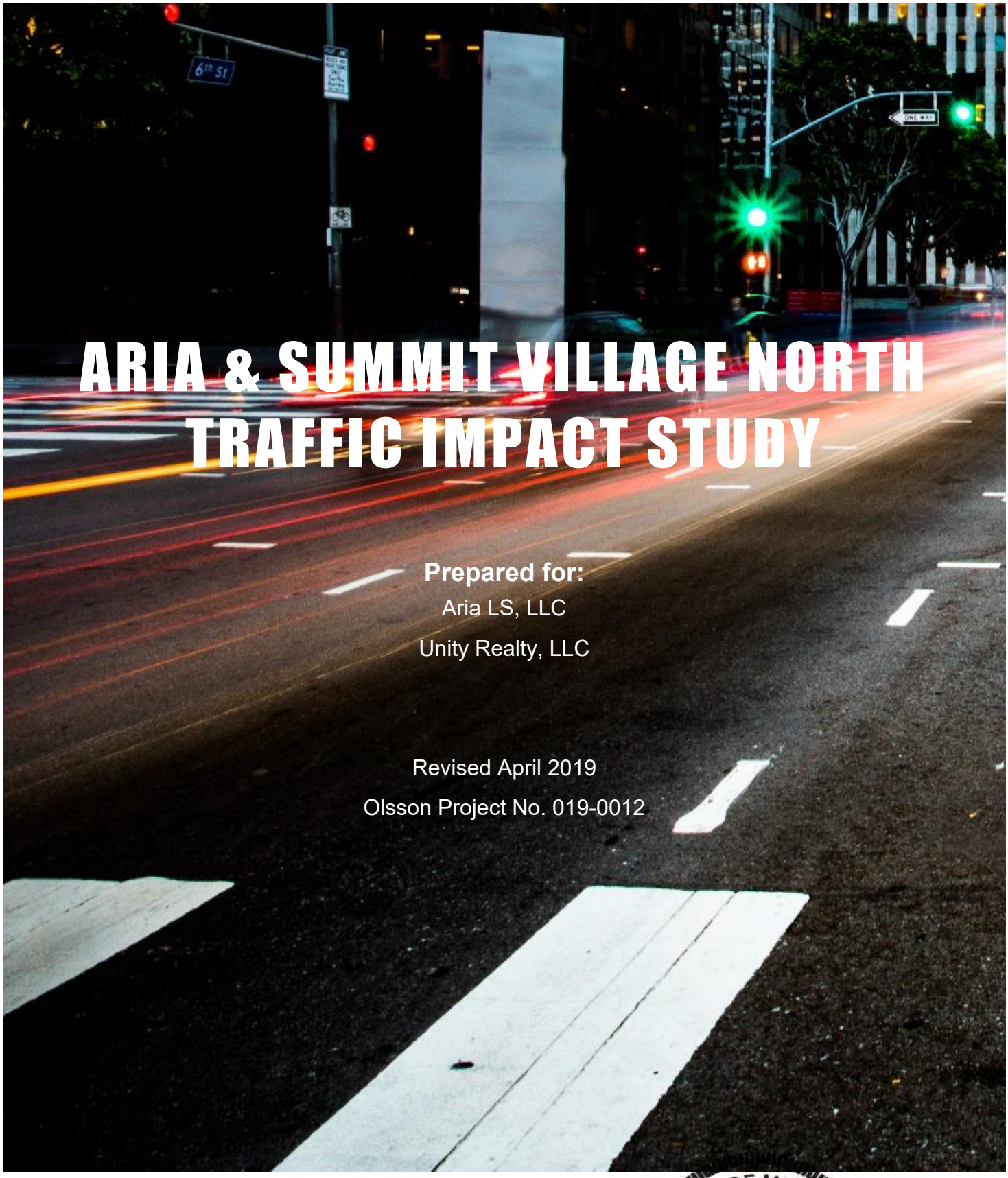

ARIA & SUMMIT VILLAGE NORTH TRAFFIC IMPACT STUDY

Prepared for:

Aria LS, LLC

Unity Realty, LLC

Revised April 2019

Olsson Project No. 019-0012

olsson

STATE OF MISSOURI
SHANNON L. JEFFRIES
NUMBER PE-2008000069
PROFESSIONAL ENGINEER
04.24.2019

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Appendix A: Data Collection

Appendix B: Existing Conditions Analysis

Appendix C: Existing plus Phase 1 Development Conditions Analysis

Appendix D: Existing plus Full Build Development Conditions Analysis

1. INTRODUCTION AND OBJECTIVE

This report studies traffic impacts regarding the proposed construction of a multi-use development located in the northwest quadrant of the intersection of Colbern Road and Douglas Street in Lee's Summit, Missouri. This report will review the impacts of the proposed Aria and Summit Village North developments 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, 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 (referenced as Douglas Road for the purposes of this report)
- Douglas Street and Colbern Road
- Douglas Street and I-470 Westbound Ramps
- Douglas Street and I-470 Eastbound 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 Conditions
- Existing plus Phase 1 Development Conditions
- Existing plus Full Build Development Conditions

The development is proposed to be constructed in two phases. The first phase is multi-family residential land use. The second phase will consist of senior living facilities, a hotel, gasoline station, retail and restaurant land uses. Full build analysis will consider both phase 1 and phase 2 development.

Staff from the City of Lee's Summit, Missouri, City of Kansas City, Missouri, and Missouri Department of Transportation were contacted regarding the scope of work.

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

FIGURE 1

Vicinity Map

Aria & Summit Village North
Lee's Summit, MO

Source: Google Maps

LEGEND

- Site Location
- Phase 1 Development
- Phase 2 Development

2. DATA COLLECTION

The data collection effort included acquiring peak-hour vehicular turning movement counts and intersection signal timings, as well as a documentation of current roadway geometrics. Traffic counts were collected on Tuesday, January 8th, 2019 at the study intersections listed above with the exception of the intersections of Douglas Street with Colbern Road, I-470 Westbound Ramps and I-470 Eastbound Ramps. These intersections were counted as part of the Douglas Street corridor signal retiming project that was recently completed. Traffic counts at the I-470 interchange were collected on Wednesday, October 19th, 2016, and counts at the Douglas Street and Colbern Road intersection were collected on Tuesday, September 12th, 2017. 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.

Based on the collected data, the AM and PM peak hour periods for the study intersections were determined to be from 7:00-8:00 AM and 4:30-5:30 PM, respectively. The existing peak hour volumes are illustrated in **Figure 2**.

Existing signal timing information for the intersection of Lee's Summit Road and Gregory Boulevard was provided by the City of Kansas City, Missouri. The existing signal timings along Douglas Street, including the intersections of Douglas Street with Colbern Road and Douglas Street with the I-470 interchange are currently under evaluation as part of the Mid America Regional Council's (MARC) Operation Green Light (OGL) project. The signal timings that are proposed for this corridor were used for analysis purposes. Proposed timings were used to more accurately replicate the base conditions after the OGL signal timing information is implemented.

Traffic count data collected for this study can be found in **Appendix A**.

FIGURE 2

Existing
Peak Hour Volumes

Aria & Summit Village North
Lee's Summit, MO

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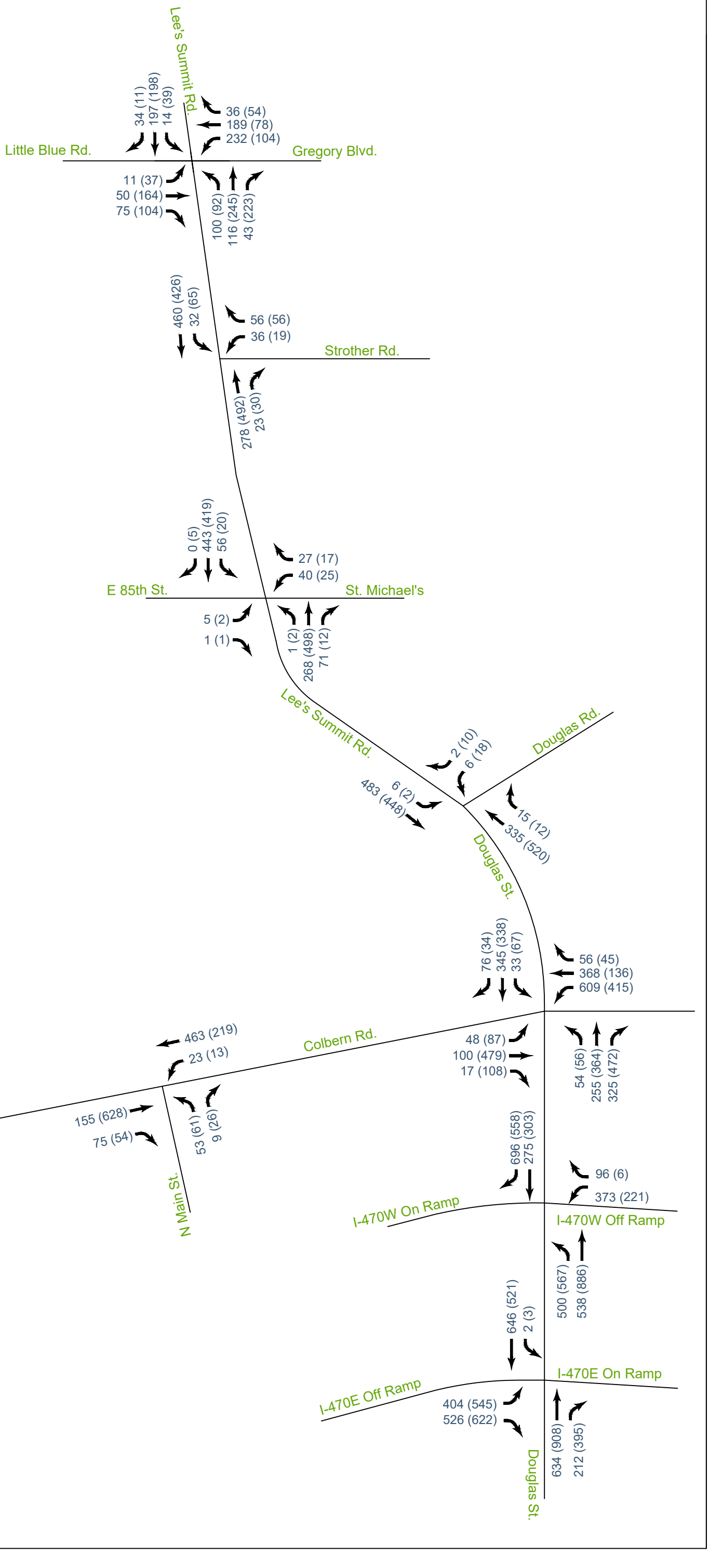

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AM (PM) Peak Hour Volume

3. EXISTING CONDITIONS

Existing traffic conditions were evaluated to identify any existing deficiencies and to provide a baseline for comparative purposes.

3.1. Network Characteristics

Thirteen 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, and Blue Parkway/Unity Way. 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 leg of this intersection is referred to as Douglas Road.

I-470 is a roadway maintained by MoDOT. The functional classification for I-470 was acquired using MoDOT's *Functional Classification Map.*

85th Street is maintained by KCMO. The functional classification for 85th Street was acquired using the Kansas City *Major Street Plan.*

Strother Road, Douglas Street (with the exception of the interchange, which is maintained by MoDOT), Douglas Road, Main Street, and Blue Parkway are maintained by the City of Lee's Summit. The functional classification for these roadways was acquired from the City of Lee's Summit *Existing Functional Classification Map*.

Maintenance of portions of Gregory Boulevard, Lee's Summit Road, and Colbern Road is split between KCMO and Lee's Summit. Gregory Boulevard west of Lee's Summit Road is maintained by KCMO. 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 KCMO. The south portion is maintained by Lee's Summit.

*C*urrent network characteristics were determined and are summarized in **Table 1.**

Table 1. 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	Lee's Summit - Minor Arterial	East of Lee's Summit Road – Lee's Summit	2-Lane	Undivided	35 mph east of Lee's Summit Rd
Little Blue Road	KCMO – Local Link	West of Lee's Summit Road – KCMO	2-Lane	Undivided	40 mph west of Lee's Summit Rd
Strother Road	Minor Arterial	Lee's Summit	2-Lane	Undivided	45 mph
85th Street	Local Link	KCMO	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 Street and 85th Street; North – KCMO; South – Lee's Summit	4-Lane north of Strother Road, 3-Lane south of Strother Road	Divided north of Strother Road, undivided south of Strother Road	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	Major Arterial	Lee's Summit	2-Lane west of Douglas Street, 4-Lane east of Douglas Street**	Undivided	45 mph
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*

**Speed limit not posted, assumed 25 mph for analysis purposes.*

***The City of Lee's Summit is currently in the planning and design phase for improvements to Colbern Road. Colbern Road is expected to be improved to a four-lane roadway west of Douglas Street.*

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 Colbern Road to north of Strother Road. North of Strother Road, the roadway section transitions to 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 2**, 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 2. 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 Phase 2
Strother Road	11-foot lanes plus 6-foot shoulders	Interim	0.9 mi north of Phase 2
Lee's Summit Road	11-foot lanes plus 13-foot TWLTL plus 6-foot shoulders	Interim	Borders phase 1 and phase 2
Douglas Road	11-foot lanes plus 4-foot shoulders	Interim*	Near phase 1; Across Lee's Summit Road
Douglas Street	11-foot lanes plus 13-foot TWLTL plus 6-foot shoulders	Interim	Borders phase 1 and phase 2
Colbern Road	11-foot lanes west of Douglas Street	Interim without shoulder west of Douglas Street	Borders phase 2 west of Douglas Street
Main Street	11-foot lanes	Unimproved	0.81 mi west of Phase 2
Blue Parkway	11-foot lanes	Street	1.2 mi west of Phase 2

**Categorized as "unimproved" in the City's TMP but was recently constructed to interim standards at the intersection of Lee's Summit Road.*

Table 3 illustrates control type for each study intersection as well as basic intersection characteristics.

Table 3. Existing Study Intersection Summary.

Intersection	Maintaining Jurisdiction	Traffic Control Method	Dedicated Left-Turn Lanes	Dedicated Right-Turn Lanes
Lee's Summit Road at Gregory Road	KCMO	Signalized	All directions	Eastbound, westbound, northbound
Lee's Summit Road at Strother Road	KCMO	Unsignalized	Southbound	Northbound
Lee's Summit Road at 85th Street/St. Michael's High School Drive	KCMO	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	Northbound
Douglas Street at I-470 Westbound Ramp	MoDOT	Signalized	Dual northbound, westbound	Southbound
Douglas Street at I-470 Eastbound Ramp	MoDOT	Signalized	Southbound, 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

3.2. Existing Site Characteristics

The majority of the proposed development site is currently vacant; two private residential homes are located toward the north side of the development area. The property is bordered by vacant property to the west and south, large lot single family residential to the north, and the Lee's Summit Municipal Airport to the east.

3.3. Existing 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: Based on the Lee's Summit 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.

Based on the Lee's Summit AMC, left-turn lanes shall be provided on all arterial streets at the intersection with another arterial or collector street. Left-turn lanes shall also 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 except at the intersection of Colbern Road at Main Street, where no left-turn lanes are provided.

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 and eastbound left-turn lanes at the intersection do not meet the recommended minimum length.

Based on the MoDOT EPG left-turn lane warrant, no additional left-turn lanes are currently warranted at intersections under KCMO or MoDOT jurisdiction.

Right-turn Lanes: Based on the Lee's Summit AMC, right-turn lanes shall be provided on arterial streets with a right-turn movement of 30 vehicles in any hour at each intersecting street or driveway. Based on this criteria, additional right-turn lanes are required for the eastbound approach at Colbern Road and Main Street as well as eastbound, westbound and southbound approaches at Colbern Road and Douglas Street.

Based on MoDOT EPG right-turn lane warrants, no additional right-turn lanes are currently warranted at intersections under KCMO or MoDOT jurisdiction.

Existing locations that do not meet left and right-turn lane standards include:

- Left-turn lanes in northbound and westbound directions at Colbern Road and Main Street
- Northbound and eastbound left-turn lane length at Colbern Road and Douglas Street
- Eastbound right-turn lane at Colbern Road and Main Street
- Eastbound, westbound and southbound right-turn lanes at Colbern Road and Douglas Street

Capacity analysis was reviewed for existing conditions in **Section 3.4** to determine if additional turn lanes and/or storage length is recommended based on existing operations. Turn lane warrant analysis sheets can be found 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 Four-Hour Vehicular Volume Warrant (Warrant 2) and the Peak Hour Signal Warrant (Warrant 3) were evaluated for the following existing unsignalized study intersections:

- 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
- Lee's Summit Road and Main Street

Based on existing traffic volumes, the intersection of Colbern Road and Main Street and the intersection of Lee's Summit Road and Strother Road are on the threshold of meeting the warrant for signalization for the PM peak hour period. Due to the warrant being limited to the PM peak hour, a signal is not recommended at this time. The remaining unsignalized study intersections do not currently warrant signalization. Signal warrant analysis sheets can be found in **Appendix B**.

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

FIGURE 3

Existing
Lane Configuration and
Traffic Control

Aria & Summit Village North
Lee's Summit, MO

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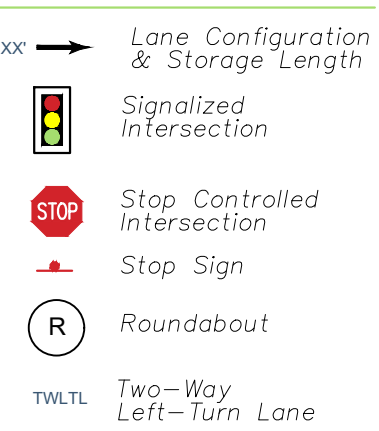

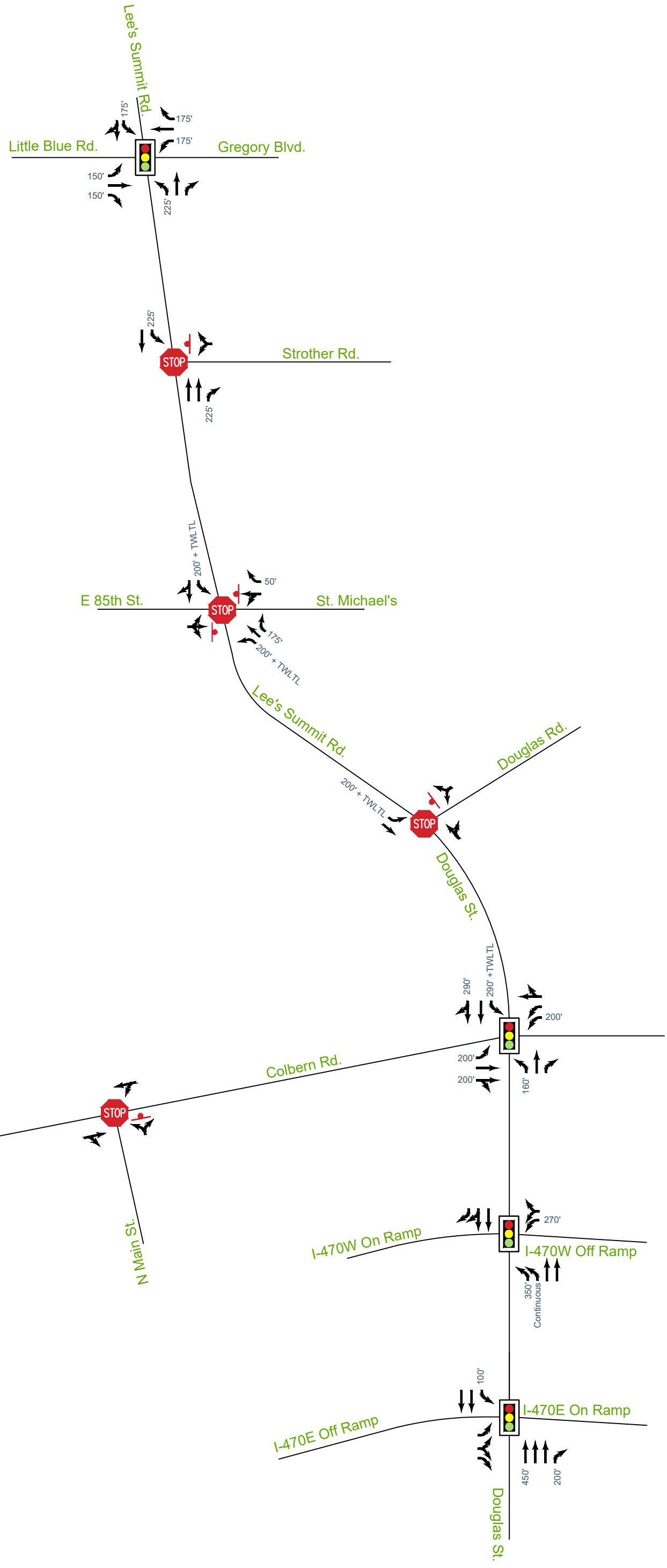

3.4. Existing Capacity Analysis

Capacity analysis was performed for the existing study intersections utilizing the existing lane configurations and traffic control. Adjacent signalized intersections were included in analysis in order to treat Douglas Street as a coordinated system. Analysis was conducted using Synchro Version 10 and aaSIDRA Version 7.0 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 at I-470 Westbound and Douglas Street at I-470 Eastbound. 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 not delay and LOS F representing very high delay. **Table 4** 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 4. 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 typically considers peak hour LOS E on urban roadways and peak hour LOS D on rural roadways as being considered acceptable based on future year traffic projections.

The existing signalized study intersections are operating at an overall LOS C or better with individual movements operating at a LOS D or better with acceptable queues during the AM and PM peak hour periods with the following exceptions:

- Douglas Street and Colbern Road
    - The intersection operates at a LOS D overall during the PM peak hour, which is not desirable based on Lee's Summit policy. Providing turn lanes at the intersection of Colbern Road and Douglas Street as recommended in the City of Lee's Summit AMC when the planned improvement project to Colbern Road is conducted would be expected to provide operational benefit.
    - The eastbound through/right-turn movement operates at a LOS E during the PM peak hour, which is considered acceptable based on Lee's Summit policy.
        - The 95th-percentile queue of 265 feet extends beyond the adjacent left-turn bay.
    - The westbound left-turn movement operates at a LOS E during the PM peak hour, which is considered acceptable based on Lee's Summit policy.
        - The 95th-percentile queue of 192 feet is contained within the 200-foot storage bay.
    - The northbound through movement queue of 380 feet extends beyond the adjacent left-turn bay during the PM peak hour.
- Douglas Street and I-470 Eastbound Ramps
    - The southbound left-turn movement operates at a LOS E during the PM peak hour, which is considered acceptable based on MoDOT's "Practical Design" policy.
        - The 95th-percentile queue is less than one vehicle.

A City project is planned along Colbern Road west of Douglas Street (currently in the early design phase), which is anticipated to improve the road section to two through lanes and provide right and left-turn lanes where necessary. Improvements associated with the project would be expected to improve intersection operations at Douglas Street and Colbern Road to an acceptable level including improved operations to the eastbound through, westbound left-turn, and northbound through movements, which are currently operating as stated above. The overall intersection would be expected to operate at a LOS C with all movements operating at a LOS D or better if turn lanes are provided as recommended in the AMC. When planning intersection

improvements, consideration should be given to increasing the provided turn lane storage to accommodate existing and anticipated queue lengths.

Unsignalized capacity analysis was conducted for the unsignalized study intersections. Based on capacity analysis, all movements at unsignalized intersections are operating at a LOS D or better during both peak hour periods with acceptable queues with the exception of the westbound through/left-turn movement at Lee's Summit Road and St. Michael's High School Drive. This movement operates at a LOS E during the PM peak hour with a 95th-percentile queue of less than two vehicles. A LOS E could be considered below KCMO guidelines; however, these operations are believed to be acceptable as stated below.

Referencing Section 20.7 of the HCM 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 suggests that performance measures in addition to delay, such as volume-to-capacity (v/c) ratios for individual movements and queue lengths, should also be considered when evaluating the overall performance at two-way stop-controlled intersections. At the unsignalized minor street approach listed above, the v/c ratios and 95th-percentile queues are expected to be acceptable during the peak hour periods.

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 conditions capacity analysis summary is illustrated in **Figure 4**. Detailed results may be found in **Appendix B**.

FIGURE 4

Existing
Level of Service

Aria & Summit Village North
Lee's Summit, MO

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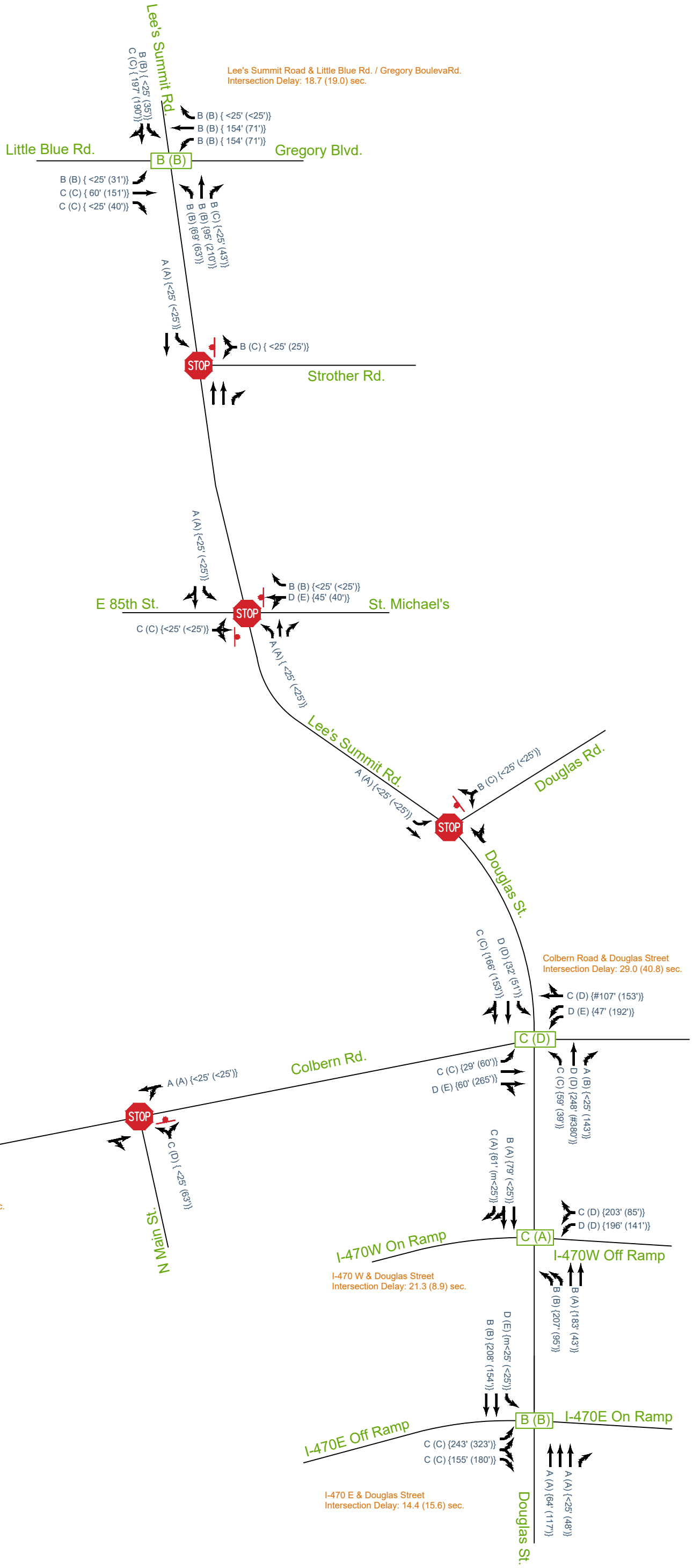

LEGEND

AM (PM) {AM (PM)}	*Movement LOS & {95th-percentile Queue}*
→	*Lane Geometry*
STOP	*Stop Controlled Intersection*
	Stop Sign
AM (PM)	*Signalized Intersection LOS*
AM (PM)	*Roundabout Intersection LOS*
m	*95th Percentile Queue is Metered by Upstream Signal*
#	*95th Percentile Queue Exceeds Capacity*

4. 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 the proposed development. Phase 1 will consist of a 480-unit multi-family residential development. The latest available site plan at the time of this report is illustrated in **Figure 5**, with phase 1 of the development highlighted.

4.1. Phase 1 Development Trip Generation and Distribution

To determine the impact of potential site traffic on the roadway network, expected trips associated with the current and proposed site were generated for the study network. The Institute of Transportation Engineers (ITE) provides methods for estimating traffic volumes of common land uses in the Trip Generation Manual (10th Edition).

The land use that most resembles phase 1 development is Land Use Code 221 (Multi-family Housing, Mid-Rise). **Table 5** shows the expected trip generation characteristics for the proposed use. A full summary of the trip generation can be found in **Appendix C.**

Table 5. Phase 1 Development Trip Generation.

Land Use	Size	Daily	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	Enter	Exit	Total	Enter	Exit
Multi-Family Housing	480 Units	2,615	160	42	118	200	122	78

Trips generated by the proposed development were distributed through the study network based on the anticipated land use, characteristics of the surrounding area and existing traffic gravity. The expected trip distribution and site trips are shown in **Figure 6.** The resulting existing plus phase 1 development volumes are illustrated in **Figure 7**.

FIGURE 5

Site Plan

Aria & Summit Village North
Lee's Summit, MO

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LEGEND

- Phase 1 Development
- Phase 2 Development

FIGURE 6

Proposed Development
Trip Distribution (Phase 1)

Aria & Summit Village North
Lee's Summit, MO

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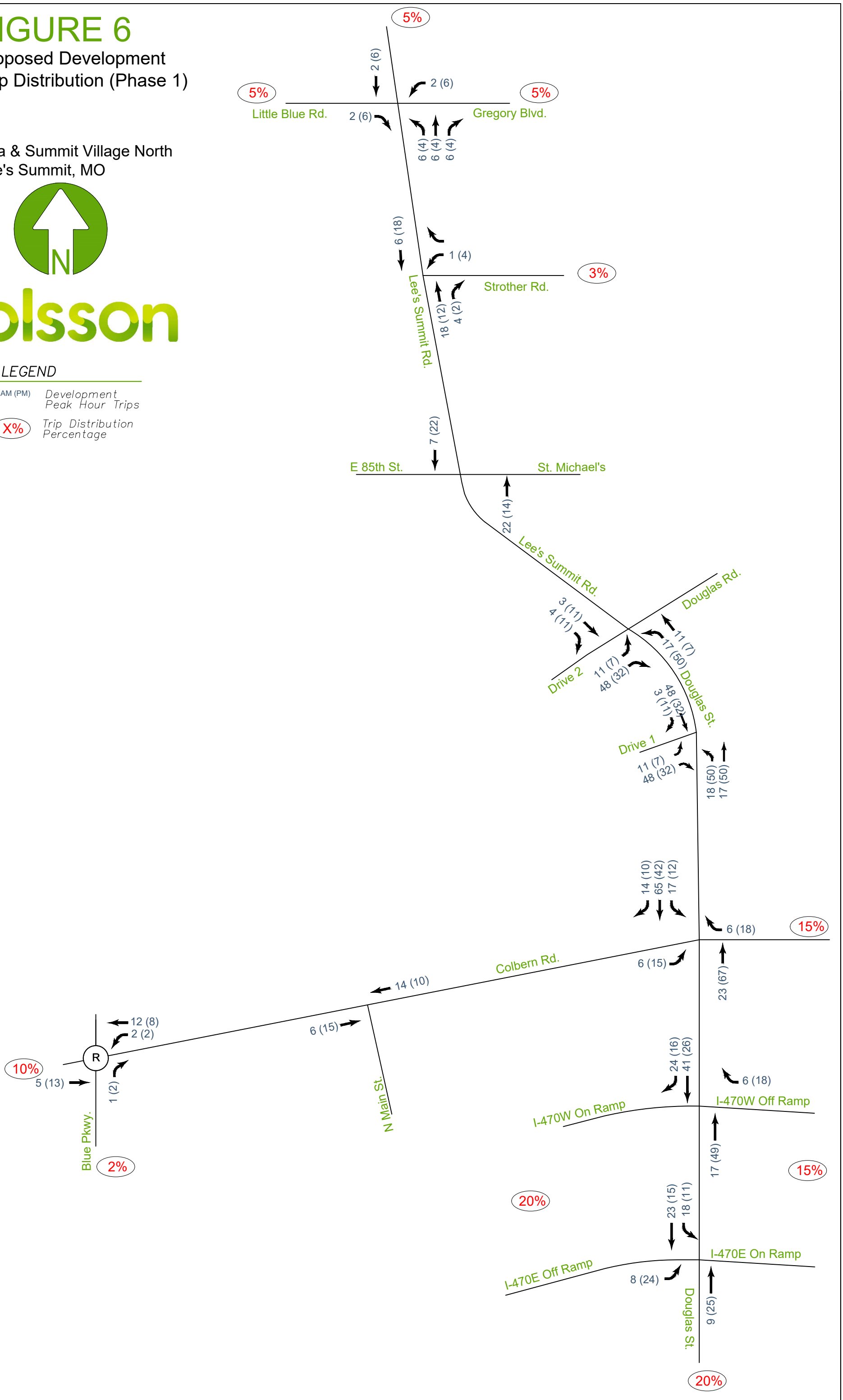

FIGURE 7

Existing plus Phase 1 Development
Peak Hour Volumes

Aria & Summit Village North
Lee's Summit, MO

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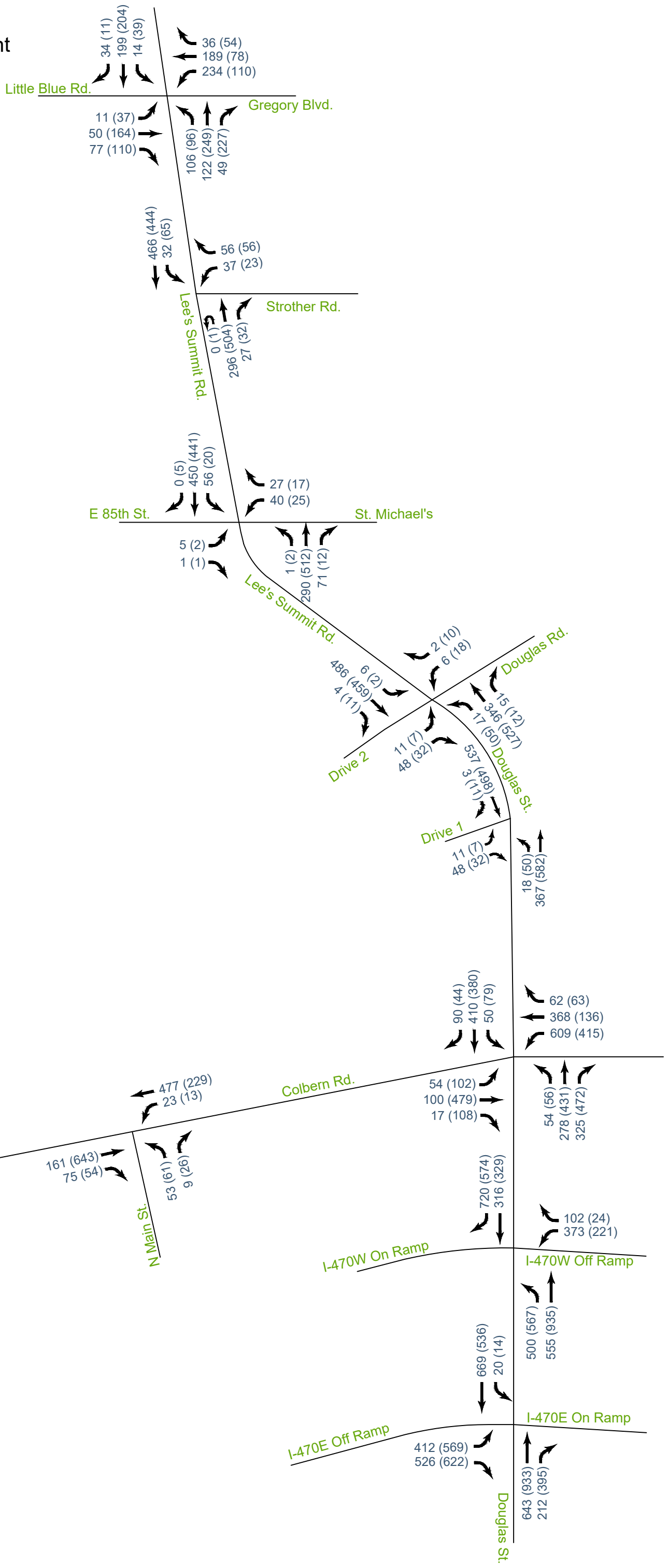
LEGEND

AM (PM) Peak Hour Volume



4.2. Phase 1 Site Characteristics

Access to Phase 1 development is proposed via two drives, located along Douglas Street/Lee's Summit Road, as illustrated on the site plan (**Figure 5**).

Proposed Access Spacing

Drive 1 is proposed along Douglas Street, approximately 1,750 feet north of Colbern Road. The drive is proposed to align with an existing access point located along the east side of Douglas Street. Drive 2 is proposed along Lee's Summit Road, aligning at the existing intersection with Douglas Road. Drive 2 is located approximately 750 feet north of Drive 1.

The Lee's Summit AMC was referenced to evaluate the proposed location of Drives 1 and 2. Referencing Section 15.1, 'Connection Spacing Standards' of the AMC, connection spacing must be outside the intersection functional area of adjacent intersections and accommodate the warranted or required turn lanes. Minimum recommended connection spacing is 660 feet along a major arterial roadway.

Two existing drives are located south of the proposed Drive 1 location along the east side of Douglas Street. The first adjacent drive is located approximately 375 feet south of the proposed Drive 1 location, and the second drive is located approximately 815 feet south of Drive 1. Both existing drive locations are gated and support limited usage. Per conversations with City staff, these drives are exempt from City intersection/driveway spacing criteria due to restricted access; thus, their proximity to Drive 1 is expected to be acceptable.

Drive 1 is located approximately 750 feet south of Douglas Road / Drive 2, which meets minimum spacing standards. Drive 1 also exceeds minimum spacing standards from the adjacent intersection of Douglas Street with Colbern Road. While the proposed spacing meets City standards, Drive 1 and Drive 2 should be located so that sight distance is not limited by the roadway geometrics, signage or vegetation. Sight distance for turning movements at these locations should be verified.

A private drive for the City-owned lift station and holding pond is located approximately 620 feet north of the proposed Drive 2 location, along the south/west side of Lee's Summit Road. The access is gated and services low volumes of traffic. Per conversations with City staff, the drive is exempt from City intersection/driveway spacing criteria due to its restricted access, thus the proximity to Drive 2 is acceptable. Drive 2 is located approximately 750 feet north of Drive 1, which meets minimum spacing standards. Drive 2 is located approximately 820 feet south of an existing residential driveway, which also meets minimum spacing standards.

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 throat length for each phase 1 access point is provided in **Table 6.** Each access is proposed with one entering and two exiting lanes of traffic.

Table 6. Phase 1 Access Characteristics

Proposed Access	Public Roadway Intersected	Access Type	Proposed Throat Length	Proposed Width	Median Divided
Drive 1	Douglas Street	Full Access	335 feet	40 feet	Partial
Drive 2	Lee's Summit Road	Full Access	100 feet	36 feet	No

Drive 1: Lee's Summit driveway width criteria is based on projected peak hour and daily traffic volumes. Trip generation completed in **Section 4.1** of this report projects that Drive 1 will service 100 vehicles during the highest peak hour period. Drive 1 has a proposed driveway width of 40 feet. Referencing *Table 18-1* of the AMC, driveways servicing less than 150 vehicles per hour (vph) during the peak hour period should have a driveway width between 28 feet and 42 feet for two-way access. The proposed width of Drive 1 meets City standards.

Throat length standards for a proposed access is based on projected peak hour volumes, per the City of Lee's Summit AMC. Drive 1 has a proposed driveway throat length of 335 feet. Referencing *Table 18-2* of the AMC, driveways servicing between 50 to 100 vph during the peak hour period should have a minimum throat length of 100 feet adjacent to an arterial roadway. Drive 1 meets the minimum driveway throat length standards.

Drive 2: The same criteria as discussed above for Drive 1 were referenced for Drive 2 characteristics. Drive 2 is expected to service 100 vehicles during the highest peak hour period. Drive 2 has a proposed driveway width of 36 feet, which meets City standards (28 to 42 feet) for a low volume driveway.

Drive 2 has a proposed driveway throat length of 100 feet, which meets the minimum driveway throat length standards (100 feet) for a driveway of this type.

Capacity analysis will be reviewed to determine if adequate throat length is provided to accommodate expected vehicular queuing.

4.3. Existing plus Phase 1 Development Warrant Analysis

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

Left-turn Lanes: Based on the Lee's Summit AMC, a dedicated northbound left-turn lane with a minimum length of 200 feet shall be provided at Drive 1 and Drive 2. Due to the presence of the existing two-way left-turn lane along Lee's Summit Road/Douglas Street, this turn lane is already provided. It is recommended to re-stripe the two-way left-turn lane to provide a dedicated northbound left-turn lane with 200 feet of storage at Drive 1 and Drive 2.

Right-turn Lanes: The right-turn volumes into Drive 1 and Drive 2 are not expected to warrant additional southbound right-turn lanes at these locations.

Turn lane warrant analysis sheets can be found in **Appendix C.**

Signal Warrants: The peak hour signal warrant (Warrant 3) was evaluated for the following study intersections considering existing plus phase 1 development conditions:

- Colbern Road and Main Street
- 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/Drive 2
- Douglas Street and Drive 1

After phase 1 development, the intersection of Colbern Road and Main Street and the intersection of Lee's Summit Road and Strother Road are expected to continue to be on the threshold of meeting the warrant for the PM peak hour period. Meeting the warrant is expected to be limited to the PM peak hour and therefore a signal is not recommended; operations of the intersections will be reviewed to determine if alternative control is needed. The remaining unsignalized study intersections are not expected to warrant signalization. Signal warrant analysis sheets for existing plus phase 1 development conditions can be found in **Appendix C**.

Existing plus phase 1 development lane configurations and traffic control for the study network are illustrated in **Figure 8**.

FIGURE 8

Existing plus Phase 1 Development
Lane Configuration and Traffic Control

Aria & Summit Village North
Lee's Summit, MO

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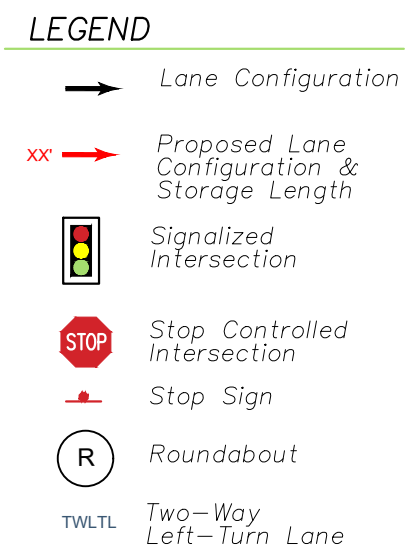

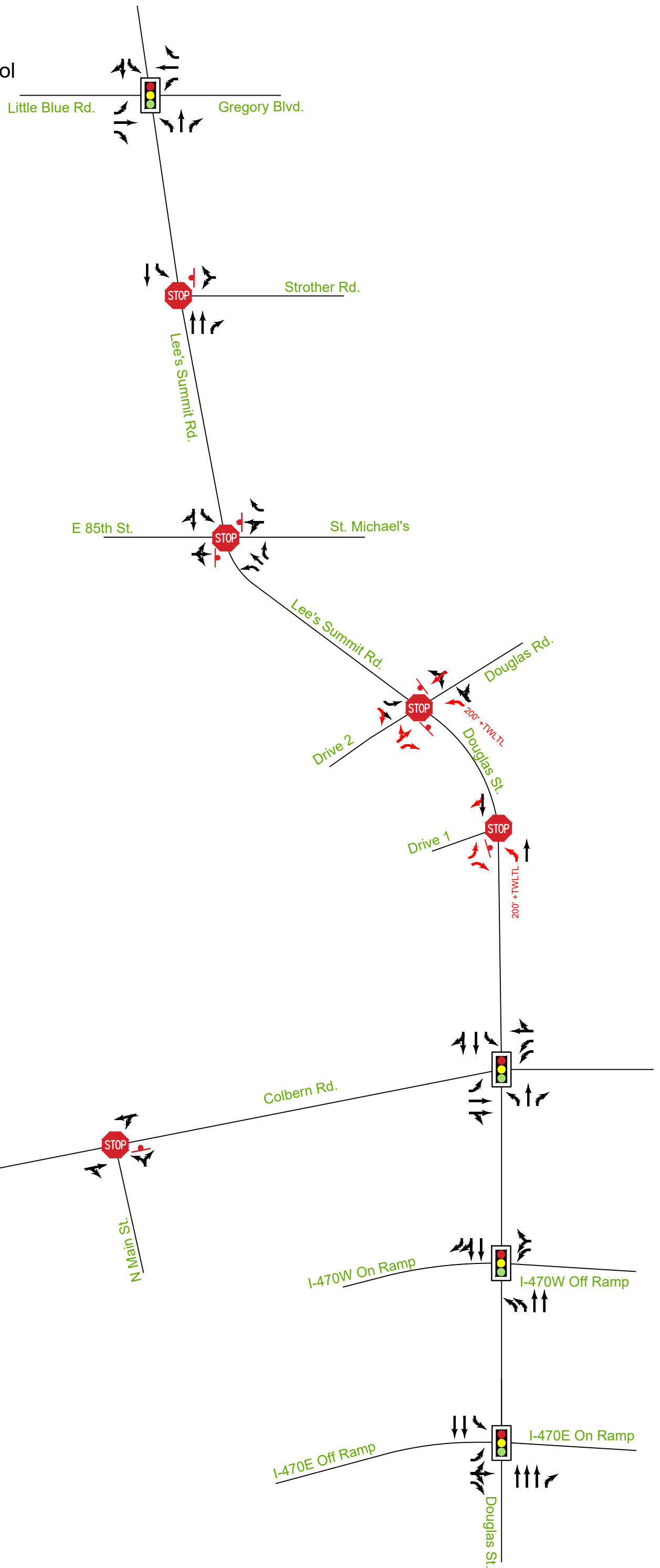

4.4. Existing plus Phase 1 Development Capacity Analysis

Capacity analysis was performed for existing plus phase 1 development conditions using the methodologies described in **Section 3.3**. 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 except at Douglas Street and Colbern Road, which is expected to operate at a LOS D in the PM peak hour. This is below desirable conditions described in the City of Lee's Summit LOS Policy but is nominally above the LOS C upper limit threshold, with similar delay as existing conditions, and is believed to be acceptable. The individual movements that are expected to have a decline in operations (to LOS E or worse) or significantly higher queues compared to existing conditions are listed below:

- Douglas Street and Colbern Road
    - The northbound through movement is expected to operate with a 95th-percentile queue length of 424 feet during the PM peak hour period, which is a slight increase (less than two vehicles) from existing conditions. If this queue, which has a 5% probability of being exceeded, were to occur, it would slightly extend into the upstream intersection at Douglas Street and the I-470 Westbound Ramps. Based on field observation at this intersection (prior to OGL signal timing implementation), the existing northbound queue was observed at times to extend into the upstream signal. When this occurred, drivers waited at the upstream stop bar and did not block the westbound off-ramp. It could be reasonably expected that this behavior will continue if this occurs under phase 1 development conditions. This is not expected to significantly impact northbound operations on the overpass bridge.
- Douglas Street and I-470 Eastbound Ramps
    - The southbound left-turn movement is expected to operate at a LOS E during the AM peak hour period, which is considered acceptable based on Lee's Summit policy.
        - The 95th-percentile queue of 33 feet would be contained within the 100-foot turn bay.

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 movements that are expected to experience a decline in operations (LOS E or worse) or significantly higher queues compared to existing conditions are listed below:

- Lee's Summit Road and Douglas Road/Drive 2
    - The westbound movement is expected to operate at a LOS E during the PM peak hour period, which is considered acceptable based on Lee's Summit policy.
        - The 95th-percentile queue is expected to be less than one vehicle.
    - The eastbound through/left-turn movement is expected to operate at a LOS E during the PM peak hour period, which is considered acceptable based on Lee's Summit policy.
        - The 95th-percentile queue is expected to be one vehicle or less.
- Lee's Summit Road and 85th Street / St. Michael's High School Drive
    - The westbound through/left-turn movement is expected to operate at a LOS E during the AM peak hour period, which could be considered below KCMO guidelines; however, these operations are believed to be acceptable as stated below.
        - The 95th-percentile queue is expected to be less than two vehicles.

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.

Phase 1 development is proposed along the frontage of Douglas Street/Lee's Summit Road, which is currently classified as an interim roadway. Based on the City's Unimproved Road Policy, development may be permitted on roadways improved to the interim standard until the roadway reaches its allowable capacity. A three-lane roadway can typically serve approximately 13,500 vehicles per day and still maintain a theoretical LOS C, which is acceptable according to this policy. Based on the existing daily traffic counts as referenced from *Exhibit 9 – Existing Traffic counts* provided in the City of Lee's Summit *Thoroughfare Master Plan (TMP) 2015-2040*, Douglas Street/Lee's Summit Road serves approximately 7,641 vehicles per day.

Approximately 2,615 daily trips are expected with the phase 1 development. This would result in 10,256 daily vehicles along Douglas Street/Lee's Summit Road, which is considered acceptable. The interim road condition of Douglas Street/Lee's Summit Road is acceptable after phase 1 development.

The existing plus phase 1 development capacity analysis summary is illustrated in **Figure 9**. Detailed results may be found in **Appendix C.**

FIGURE 9

Existing plus Phase 1 Development
Level of Service

Aria & Summit Village North
Lee's Summit, MO

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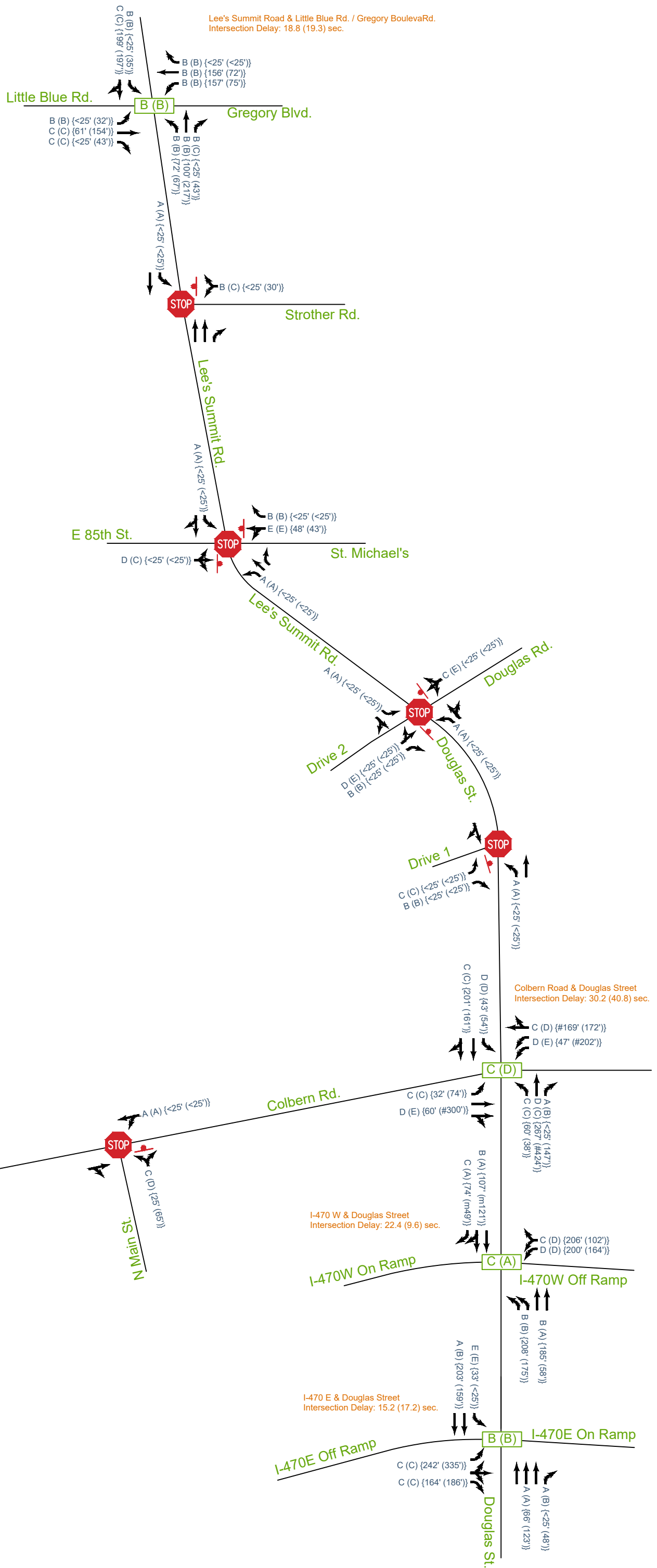
AM (PM) {AM (PM)}	Movement LOS & {95th-percentile Queue}
→	Lane Geometry
STOP	Stop Controlled Intersection
STOP	Stop Sign
AM (PM)	Signalized Intersection LOS
AM (PM)	Roundabout Intersection LOS
m	95th Percentile Queue is Metered by Upstream Signal
#	95th Percentile Queue Exceeds Capacity



5. EXISTING PLUS FULL BUILD DEVELOPMENT CONDITIONS

Traffic operations with phase 1 and phase 2 of the proposed development in place, representing full build conditions, were evaluated to identify any potential geometric improvements that could be attributed to the additional traffic associated with the proposed development. Phase 2 will consist of a 4,000 square foot convenience market/gas station, 53,600 square feet of retail/restaurant space, a 200-unit attached senior living residential facility, a 150-room hotel, and a 400-unit retirement community with continued care. The latest available site plan at the time of this report is illustrated in **Figure 5**, with phase 2 of the development highlighted. The 400-unit retirement community with continued care is located north of phase 1 development. The remaining portion of phase 2 is located south of phase 1.

The expected timeline of the phase 2 development is unknown at the time of submittal of this report. However, the development is expected to have a similar timeline as the Colbern Road roadway improvements that are planned for by the City. Colbern Road, which is a major arterial, is expected to be widened to a four-lane roadway with turn lanes. City standards require dedicated left-turn lanes on major arterials at all connections and right-turn lanes where there are at least 30 right-turning vehicles per hour. These improvements were assumed to be implemented along Colbern Road at Douglas Street and at Main Street. The roundabout at Blue Parkway is assumed to operate with two east-west through lanes. These improvements are assumed to be completed prior to phase 2 development.

5.1. Phase 2 Development Trip Generation and Distribution

Trip generation was conducted for phase 2 development as discussed in **Section 4.1.** The land uses that most resemble phase 2 development is Land Use (LU) Code 252 (Senior Housing - Attached), LU 255 (Continuing Care Retirement Community), LU 310 (Hotel), LU 820 (Shopping Center), LU 932 (High-Turnover Sit-Down Restaurant) and LU 960 (Super Convenience Market/Gas Station). At the time of this report, the square footage split of the 53,600 square feet of retail/restaurant space (seven total buildings) and the exact number of fueling positions for the 4,800 square foot convenience market/gas station were not known. Therefore, an assumed split of 25,000 square feet of retail and 28,600 square feet of high-turnover (sit-down) restaurant was utilized. The convenience market/gas station was assumed to contain 16 fueling positions. These assumptions are believed to provide a conservative analysis of the expected site. **Table 7** shows the expected trip generation characteristics for these proposed uses considered phase 2 development. **Table 8** provides a summary of trip generation for full build conditions considering phase 1 and phase 2 development.

A full summary of the phase 2 trip generation can be found in **Appendix D.**

Table 7. Phase 2 Development Trip Generation.

Land Use	Size	Daily	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	Enter	Exit	Total	Enter	Exit
Senior Housing – Attached	200 Units	779	40	14	26	51	28	23
Continuing Care Retirement Community	400 Units	1,520	72	47	25	77	30	47
Hotel	150 Rooms	1,267	70	41	29	87	44	43
Shopping Center	25,000 SF	2,343	165	102	63	195	94	101
High-Turnover (Sit-Down) Restaurant	28,600 SF	3,209	285	157	128	280	174	106
Super Convenience Market/Gas Station	16 Fueling Positions	3,689	450	225	225	368	184	184
TOTAL		**12,807**	**1,082**	**586**	**496**	**1,058**	**554**	**504**

Table 8. Full Build Development Trip Generation.

Development Phase	Daily	AM Peak Hour Trips			PM Peak Hour Trips		
		Total	Enter	Exit	Total	Enter	Exit
Phase 1	2,615	160	42	118	200	122	78
Phase 2	12,807	1,082	588	496	1,058	554	504
TOTAL	**15,422**	**1,242**	**630**	**614**	**1,258**	**676**	**582**

Trips generated by the proposed development were distributed through the study network based on the anticipated land use, characteristics of the surrounding area and existing traffic gravity. The same trip distribution for primary trips was used as discussed in **Section 4.1.**

The use of pass-by characteristics for the proposed convenience market/gas station was considered based on information provided in the ITE Trip Generation Handbook (10th Edition). Pass-by trips are made by traffic already on the roadway and passing the site, versus making a direct trip to the development (primary trips). According to the ITE Trip Generation Handbook, pass-by information for the Super Convenience Market/Gas Station land use is not published in the ITE manual. Thus, the pass-by characteristics during the AM and PM peak hour periods for a land use similar to the proposed site (Convenience Market with Gasoline Pumps) was utilized.

Pass-by trips for this land use varies from 48% to 87%. To be conservative, 40% pass-by trips during the AM and PM peak hour was used for this study. Trip generation data considering pass-by trips for the proposed convenience market/gas station are illustrated in **Table 9.**

Table 9. Super Convenience Market/Gas Station Trip Generation – Pass-by.

Land Use	Pass-by Percentage	AM Peak Hour Trips				PM Peak Hour Trips			
		Primary		Pass-by		Primary		Pass-by	
		Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Super Convenience Market/Gas Station	40%	135	135	90	90	110	110	74	74

The expected trip distribution of the phase 2 development, considering primary and pass-by trips, are shown in **Figure 10.** The resulting existing plus full build development volumes are illustrated in **Figure 11**.

FIGURE 10

Proposed Development
Trip Distribution (Phase 2)

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AM (PM) *Development Peak Hour Trips*

[AM (PM)] *Pass-By Peak Hour Trips*

X% *Trip Distribution Percentage*

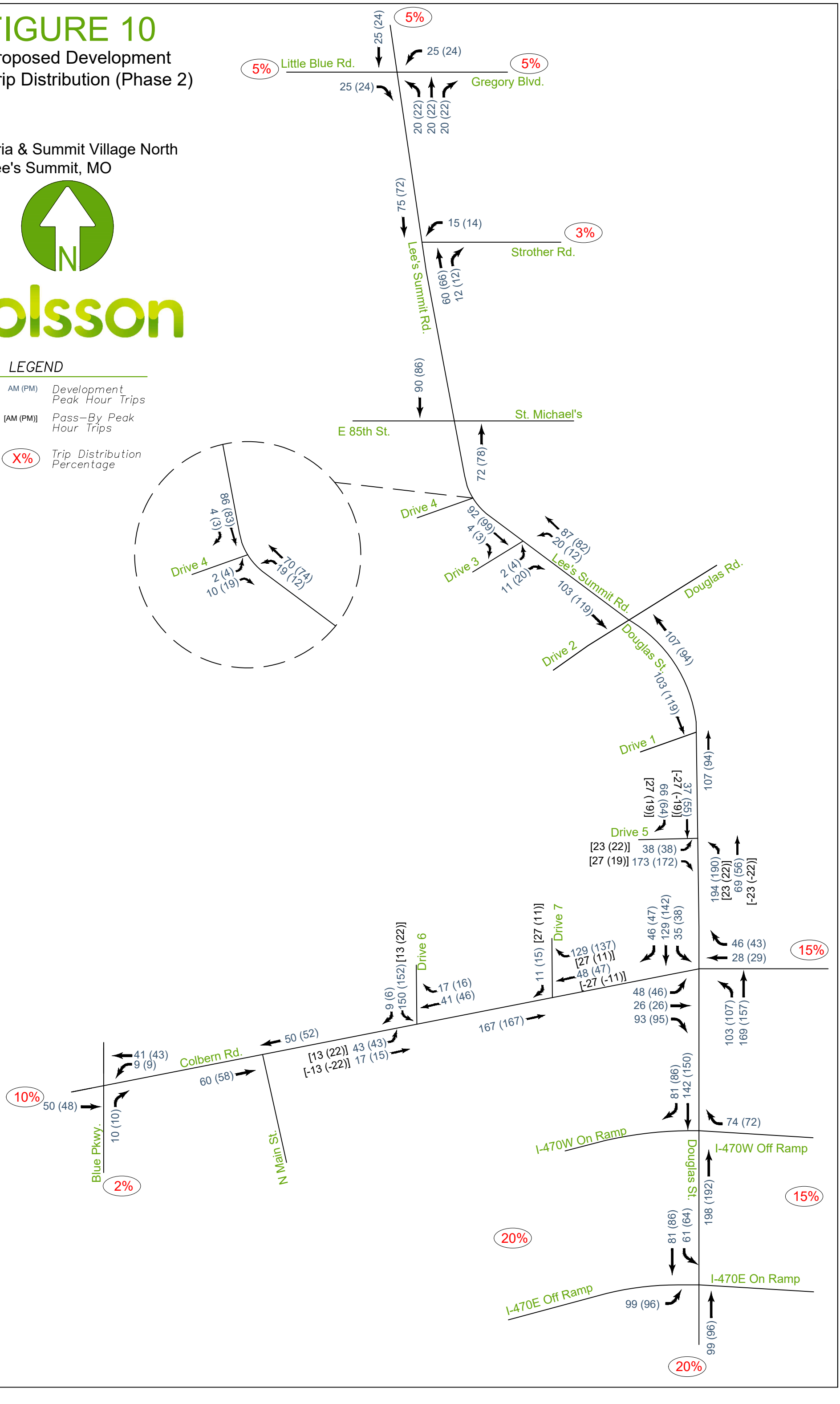

FIGURE 11

Existing plus Full Build
Peak Hour Volumes

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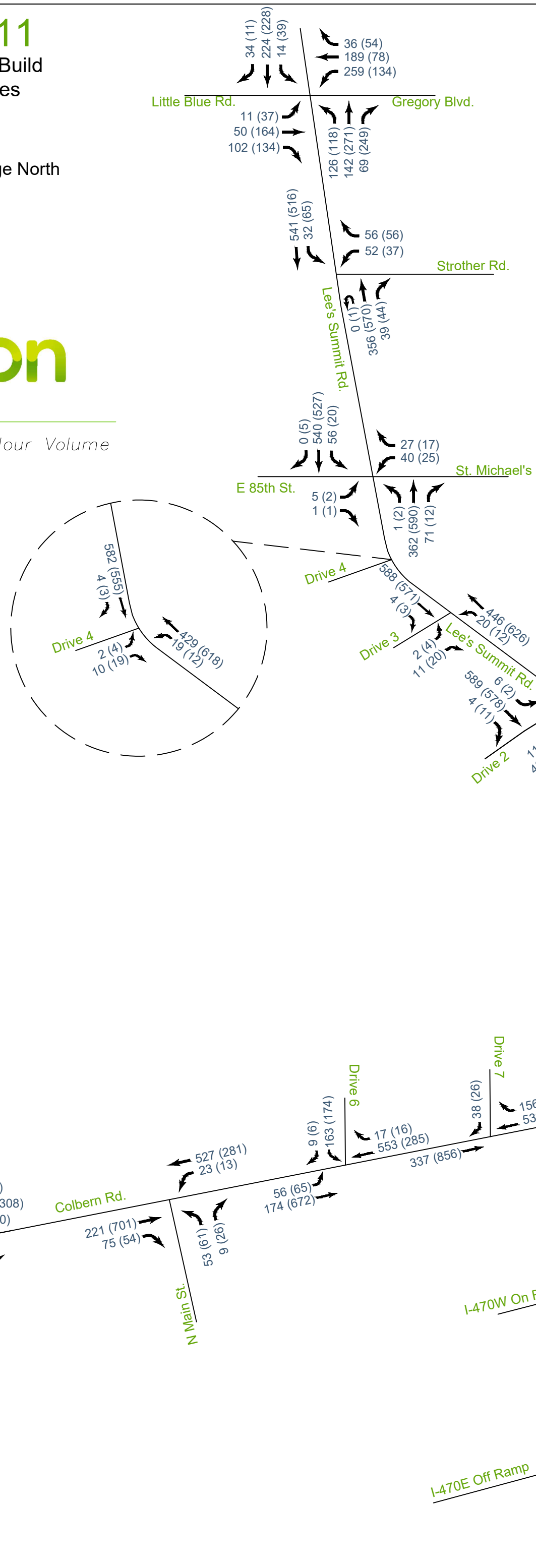

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AM (PM) Peak Hour Volume

5.2. Phase 2 Site Characteristics

Access to phase 2 development is proposed via three additional drives (Drive 3, Drive 4 and Drive 5) along Douglas Street/Lee's Summit Road and two additional drives (Drive 6 and Drive 7) along Colbern Road.

Proposed Access Spacing – Drive 3 and Drive 4

Drives 3 and 4 are located in the northern portion of the development and are proposed to provide full access to the continuing care retirement community. Drive 3 is proposed along the west side of Lee's Summit Road approximately 1,625 feet north of Douglas Road/Drive 2. Drive 4 is proposed along the west side of Lee's Summit Road approximately 680 feet north of Drive 3. The Lee's Summit AMC was referenced to evaluate the proposed location of Drives 3 and 4 using the same criteria referenced in **Section 4.2** of this report.

Two existing drives are in the vicinity of the proposed Drive 3 location – one approximately 90 feet to the north and another approximately 630 feet to the south. Another existing drive is approximately 310 feet north of the proposed Drive 4 location. These existing drives provide access to a total of five large lot, residential homes located on the east side of Lee's Summit Road and are expected to have limited usage throughout the day; thus, their proximity to Drive 3 and Drive 4 is expected to be acceptable. The proposed spacing between Drive 3 and Drive 4 (approximately 680 feet) meets the City's minimum spacing standards of 660 feet.

Proposed Access Spacing – Drive 5, Drive 6, and Drive 7

Drives 5 and 6 are located in the southern portion of the development and are proposed to provide full access to the hotel, attached senior living facility, restaurant/retail areas, and convenience market/gas station. Drive 7 is located in the southeast corner of the development along Colbern Road and is proposed to provide controlled, right-in/right-out access (RIRO) with physical barrier.

Drive 5 is proposed along the west side of Douglas Street and aligns with an existing, gated driveway approximately 940 feet north of Colbern Road. Drive 6 and Drive 7 are proposed along the north side of Colbern Road – approximately 1,285 feet and 385 feet west of Douglas Street, respectively. The Lee's Summit AMC was referenced to evaluate the proposed location of Drives 5, 6, and 7 using the same criteria referenced in **Section 4.2** of this report.

One existing drive is located approximately 450 feet north of the proposed Drive 5 location. Another existing drive is located approximately 535 feet west of the proposed Drive 6 location. These existing drive locations are gated and support limited usage. Per conversations with City staff, these drives are exempt from City intersection/driveway spacing criteria due to restricted access, thus the proximity to Drive 5 is acceptable.

The proposed spacing from Drive 5 to the signalized intersection of Douglas Street and Colbern Road is 940 feet. As discussed in **Section 5.3** and **Section 5.4** of this report, a traffic signal is recommended at Drive 5. The City's AMC requires minimum traffic signal spacing of one-eighth mile (660 feet) with a desirable spacing of one-quarter mile (1,320 feet). The proposed location of Drive 5 exceeds the minimum required full access spacing and minimum required traffic signal spacing (660 feet). The proposed spacing between Drive 5 and Drive 1 (located approximately 820 feet to the north) exceeds the minimum required full access spacing (660 feet).

One existing drive is located approximately 535 feet west of the proposed Drive 6 location. This existing drive appears to support limited usage; thus, their proximity to the proposed drives are expected to be acceptable.

The proposed spacing from Drive 7 to the signalized intersection of Douglas Street and Colbern Road is 385 feet (measured center-to-center). Drive 7 is proposed as a right-in/right-out intersection. It is recommended to provide a physical barrier along Colbern Road between Drive 7 and Douglas Street to facilitate this limited access; this drive location should be coordinated with the City so that the barrier can be constructed with the City's planned improvements along Colbern Road.

Per the City's AMC, limited access intersections should be outside the functional area of the adjacent intersection and accommodate any warranted or required turn lanes. The downstream functional area of the intersection of Colbern Road and Douglas Street is 360 feet. Drive 7 is located approximately 340 feet (measured back-of-curb at the west side of Douglas Street to back-of-curb at the east side of Drive 7), which is slightly below the recommended downstream spacing by 20 feet. Adequate spacing is provided to accommodate the recommended westbound right-turn lane for Drive 7.

The proposed spacing between Drive 6 and Drive 7 along Colbern Road is 900 feet. The proposed location of Drive 6 exceeds the minimum required full access spacing (660 feet).

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 throat length for each phase 2 access point is provided in **Table 10.** The proposed driveway characteristics were reviewed using the same criteria described in **Section 4.2** of this report.

Table 10. Phase 2 Access Characteristics

Proposed Access	Public Roadway Intersected	Access Type	Proposed Throat Length	Proposed Width	Median Divided
Drive 3	Lee's Summit Road	Full Access	165 feet	68 feet*	Yes
Drive 4	Lee's Summit Road	Full Access	115 feet	44 feet	No
Drive 5	Douglas Street	Full Access	225 feet	36 feet	Partial
Drive 6	Colbern Road	Full Access	400 feet	75 feet*	Yes
Drive 7	Colbern Road	RIRO	125 feet	30 feet	Partial

**Driveway width includes proposed median*

Drive 3: Drive 3 is expected to service 39 vehicles during the highest peak hour period. Drive 3 has a proposed driveway width of 68 feet, which includes an 18-foot median (measured from back-of-curb). Excluding the median, Drive 3 has a proposed driveway width of 46 feet that is to be utilized for one entering and two exiting lanes. According to Table 18-1 of the City's AMC, the maximum width for a low volume roadway such as Drive 3 is 42 feet when striped for three lanes. It is recommended to construct Drive 3 with a maximum driveway width of 42 feet (plus proposed median, if desired) with one 14-foot entering lane and two 12-foot exiting lanes to meet the City's driveway width standards.

Throat length standards for a proposed access is based on projected peak hour volumes, per the City of Lee's Summit AMC. Drive 3 has a proposed driveway throat length of 165 feet. Referencing *Table 18-2* of the AMC, driveways servicing between 10 to 50 vph during the peak hour period should have a minimum throat length of 75 feet adjacent to an arterial roadway. Drive 3 meets the minimum driveway throat length standards.

Drive 4: Drive 4 is expected to service 38 vehicles during the highest peak hour period. Drive 4 is proposed with one entering and two exiting lanes with a driveway width of 44 feet, which is more than the City's maximum driveway width standard (42 feet) for a low volume driveway. It is recommended to construct Drive 4 with a maximum driveway width of 42 feet with one 14-foot entering lane and two 12-foot exiting lanes to meet City standards.

Drive 4 has a proposed driveway throat length of 115 feet, which meets the City's minimum driveway throat length standard (75 feet) for a driveway of this type.

Drive 5: Drive 5 is expected to service 539 vehicles during the highest peak hour period. Drive 5 has a proposed driveway width of 36 feet to be utilized for one entering and two exiting lanes. The minimum width stated in the City's AMC for a high-volume driveway is 42 feet, and the maximum width is to be determined by the traffic study. If required by the City, Drive 5 should be

constructed with a minimum width of 42 feet to meet City standards. However, the proposed width of 36 feet is expected to adequately accommodate the recommended driveway configuration of one entering and two exiting lanes at this location.

Referencing *Table 18-2* of the AMC, driveways servicing 400 vph or more during the peak hour period should have a minimum throat length of 150 feet (or more as calculated by the traffic study) adjacent to an arterial roadway. Drive 5 has a proposed driveway throat length of 225 feet, which meets the City's minimum driveway throat length standard. Based on the capacity analysis (discussed in **Section 5.4**), the proposed throat length is expected to be adequate and accommodate expected vehicular queuing.

Drive 6: Drive 6 is expected to service 261 vehicles during the highest peak hour period. Drive 6 has a proposed driveway width of 75 feet, which includes a 15-foot median (measured from back-of-curb). Excluding the median, Drive 3 has a proposed driveway width of 56 feet that is to be utilized for two entering and two exiting lanes. The proposed driveway width of 56 feet meets the City's driveway width standards for a medium volume roadway (42-56 feet).

Referencing *Table 18-2* of the AMC, driveways servicing between 100 to 400 vph during the peak hour period should have a minimum throat length of 125 feet (or more as calculated by the traffic study) adjacent to an arterial roadway. Drive 6 has a proposed driveway throat length of 400 feet, which meets the City's minimum driveway throat length standard. Based on the capacity analysis (discussed in **Section 5.4**), the proposed throat length is expected to be adequate to accommodate expected vehicular queuing.

Drive 7: Drive 7 is expected to service 194 vehicles during the highest peak hour period. Drive 7 is proposed with one entering lane and one exiting lane with a driveway width of 30 feet. The City's driveway width standards for a medium volume roadway refer to a typical driveway with three or four lanes. However, Drive 7 is a two-lane access due to its RIRO access. According to Table 18-1 of the City's AMC, the minimum width for a two-lane driveway is 28 feet. The proposed driveway width of 30 feet meets minimum City standards for a two-lane driveway.

Drive 7 has a proposed driveway throat length of 125 feet, which meets the City's minimum driveway throat length standard (125 feet or more) for a driveway of this type. Based on the capacity analysis (discussed in **Section 5.4**), the longest queues expected at Drive 7 would be contained within the proposed throat length.

5.3. Existing plus Full Build Development Warrant Analysis

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

Left-turn Lanes: Based on the Lee's Summit AMC, a dedicated northbound left-turn lane with a minimum length of 200 feet shall be provided at Drive 5. Due to the presence of the existing two-way left-turn lane along Douglas Street, this turn lane is already provided. It is recommended to re-stripe the two-way left-turn lane to provide a dedicated northbound left-turn lane with 200 feet of storage at Drive 5. Per the City's AMC, a dedicated eastbound left-turn lane with a minimum length of 200 feet shall also be provided at Drive 6. It is recommended to provide an eastbound left-turn lane with 200 feet of storage at Drive 6.

Right-turn Lanes: Based on the Lee's Summit AMC, a dedicated right-turn lane with a minimum length of 150 feet shall be provided along major arterials at connections with a minimum of 30 right-turning vehicles in any given hour. Based on the expected trips at Drive 5 and Drive 7, it is recommended to install a dedicated right-turn lane at both locations.

As stated in **Section 3.3** of this report, a southbound right-turn lane is currently warranted at the intersection of Colbern Road and Douglas Street under existing conditions. If it is not installed with the planned City roadway widening along Colbern Road, a southbound right-turn lane with 200 feet of storage is recommended at this time.

No additional right-turn lanes are expected to be warranted at the remaining study intersections. Turn lane warrant analysis sheets can be found in **Appendix D.**

Signal Warrants: The peak hour signal warrant (Warrant 3) was evaluated for the following study intersections considering existing plus full build conditions:

- 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 Drive 3
- Lee's Summit Road and Drive 4
- Douglas Street and Drive 5
- Colbern Road and Drive 6

After full build development, the intersection of Lee's Summit Road and Strother Road is expected to be on the threshold for meeting the warrant for signalization during the AM peak hour and be warranted during the PM peak hour period. Because this warrant is expected to be limited to the PM peak hour period, a signal is not recommended at this location for full build conditions. As discussed in **Section 5.4** of this report, operations of the intersection are expected to be acceptable under stop control.

The intersection of Douglas Street and Drive 5 is expected to be warranted for signalization during both the AM and PM peak hour periods. For this reason and considering the expected operations, a signal is recommended at the intersection of Douglas Street and Drive 5. Signal interconnect should be provided between the intersection of Colbern Road with Douglas Street and Douglas Street with Drive 5.

The intersection of Colbern Road and Drive 6 is expected to be warranted for signalization during the PM peak hour period only. As stated in **Section 5.4** of this report, this intersection is expected to operate acceptably under stop control. A signal is not recommended at the intersection of Colbern Road and Drive 6 at this time. The remaining unsignalized study intersections are not expected to warrant signalization. The intersection of Colbern Road and Main Street met the PM peak hour warrant for signalization in previous scenarios; with the improvement of Colbern Road to a four-lane roadway this warrant is no longer met. Signal warrant analysis sheets for existing plus full build development conditions can be found in **Appendix D**.

Existing plus full build development lane configurations and traffic control for the study network are illustrated in **Figure 12**.

FIGURE 12

Existing plus Full Build
Lane Configuration and Traffic Control

Aria & Summit Village North
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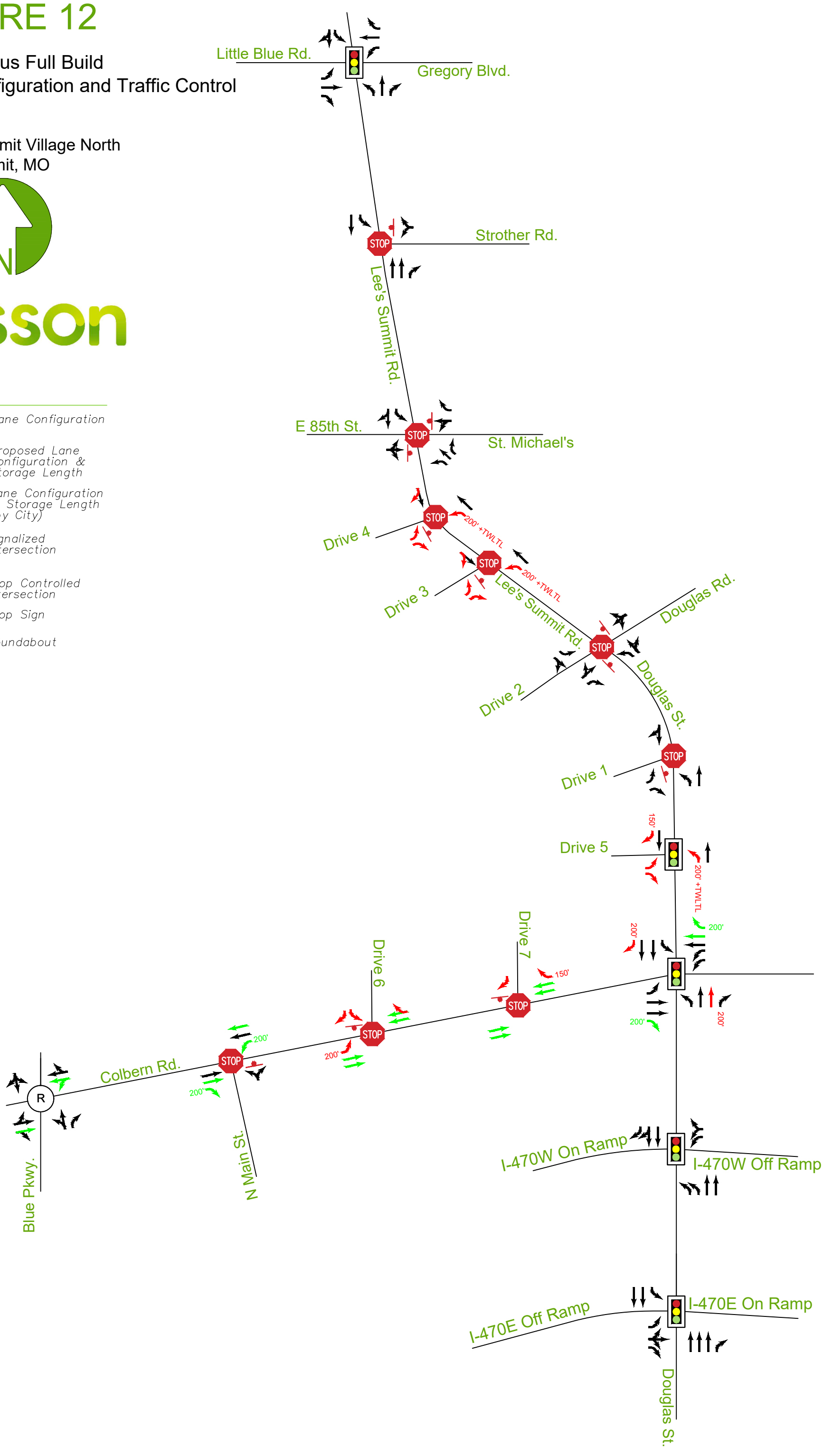
- *Lane Configuration*
- xx' *Proposed Lane Configuration & Storage Length*
- xx' *Lane Configuration & Storage Length (by City)*
- *Signalized Intersection*
- STOP *Stop Controlled Intersection*
- *Stop Sign*
- R *Roundabout*



5.4. Existing plus Full Build Development Capacity Analysis

Capacity analysis was performed for existing plus full build development conditions using the methodologies described in **Section 3.3**.

After full build development, an additional northbound through lane is recommended at the intersection of Douglas Street and Colbern Road to improve intersection operations. It is recommended to merge the two northbound through lanes to meet the existing one northbound through lane at an acceptable distance between Colbern Road and Drive 5.

Considering the roadway improvements planned along Colbern Road by the City, as well as the improvements that are recommended for full build development conditions, all signalized study intersections are expected to operate at a LOS C or better overall, which is an acceptable level of service according to City and MoDOT LOS Policies. The individual signalized movements are expected to have a LOS E or better with acceptable queues, which is an acceptable level of service according to City and MoDOT LOS Policies.

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 movements that are expected to experience a decline in operations (LOS E or worse) or significantly higher queues compared to existing plus phase 1 conditions are listed below:

- Lee's Summit Road and Douglas Road/Drive 2
    - The westbound movement is expected to operate at a LOS F during the PM peak hour period, which is considered acceptable under certain scenarios based on Lee's Summit policy. Considering the expected queues, these operations are believed to be acceptable. Additional reasoning from the HCM is provided below.
        - The 95th-percentile queue is expected to be less than two vehicles.
    - The eastbound through/left-turn movement is expected to operate at a LOS E and LOS F during the AM and PM peak hour periods, respectively, which is considered acceptable under certain scenarios based on Lee's Summit policy. Considering the expected queues, these operations are believed to be acceptable. Additional reasoning from the HCM is provided below.
        - The 95th-percentile queue is expected to be one vehicle.
- Lee's Summit Road and 85th Street / St. Michaels High School Drive
    - The westbound through/left-turn movement is expected to operate at a LOS F during both peak hour periods, which could be considered below KCMO design standard; however, these operations are believed to be acceptable considering the expected queues. Additional reasoning from the HCM is provided below.
        - The 95th-percentile queue is expected to be less than three vehicles.

- Lee's Summit Road and Strother Road
    - The westbound movement is expected to operate at a LOS E during the PM peak hour period.
        - The 95th-percentile queue is expected to be less than three vehicles.
- Colbern Road and Drive 6
    - The southbound left-turn movement is expected to operate at a LOS E and LOS F during the AM and PM peak hour periods, respectively.
        - The longest 95th-percentile queue is expected to be 148 feet during the PM peak hour period, which would be contained within the provided throat length.

Referencing Section 20.7 of the HCM 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 suggests that performance measures in addition to delay, such as volume-to-capacity (v/c) ratios for individual movements and queue lengths, should also be considered when evaluating the overall performance at two-way stop-controlled intersections. 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.

Phase 2 development is proposed along the frontage of Douglas Street/Lee's Summit Road, currently classified as an interim roadway, and along Colbern Road, which is considered an unimproved roadway. Based on the City's Unimproved Road Policy, development will not be allowed on unimproved roads and may be permitted on roadways improved to the interim standard until the roadway reaches its allowable capacity.

The planned City project for Colbern Road, which is assumed to occur before phase 2 development, would improve Colbern Road to a four-lane roadway with turn lanes, which is above the standards for either unimproved or interim condition.

With no planned improvements, Douglas Street/Lee's Summit Road is expected to remain a three-lane roadway. **Table 11** below shows a summary of the study roadways, expected daily volumes after phase 2 development, and expected theoretical level of service. Calculations to determine the approximate daily traffic is provided in **Appendix D**.

Douglas Street is expected to be slightly over the threshold (430 vehicles based on traffic projections) for a theoretical LOS C based on anticipated traffic volumes. Based on a review of expected operations at intersections along the corridor, operations of the roadway section are expected to be acceptable. The interim road condition of Douglas Street/Lee's Summit Road

and the future condition of Colbern Road is believed to be acceptable after phase 2 development.

Table 11. Phase 2 Roadway Conditions Related to the Unimproved Roadway Policy

Public Roadway	Approx. Location	Expected Daily Traffic	Theoretical LOS
Lee's Summit Road	Drive 3	12,360 vpd	C
Douglas Street	Drive 1	13,930 vpd	D
Colbern Road	Drive 6	12,180 vpd	B

The existing plus full build development capacity analysis summary is illustrated in **Figure 9**. Detailed results may be found in **Appendix D.**

Consideration for Adjacent Future Development

The site plan indicates future development along the west side of the Aria and Summit Village North development. As future development occurs along the corridor, consideration should be given to providing shared access at Drive 6 with adjacent development. If signalization is warranted with future development, Drive 6 would provide shared access between two developments and meets spacing requirements for signalization.

FIGURE 13

Existing plus Full Build Level of Service

Aria & Summit Village North
Lee's Summit, MO

olsson

LEGEND

AM (PM) {AM (PM)} — Movement LOS & {95th-percentile Queue}

Lane Geometry

STOP — Stop Controlled Intersection

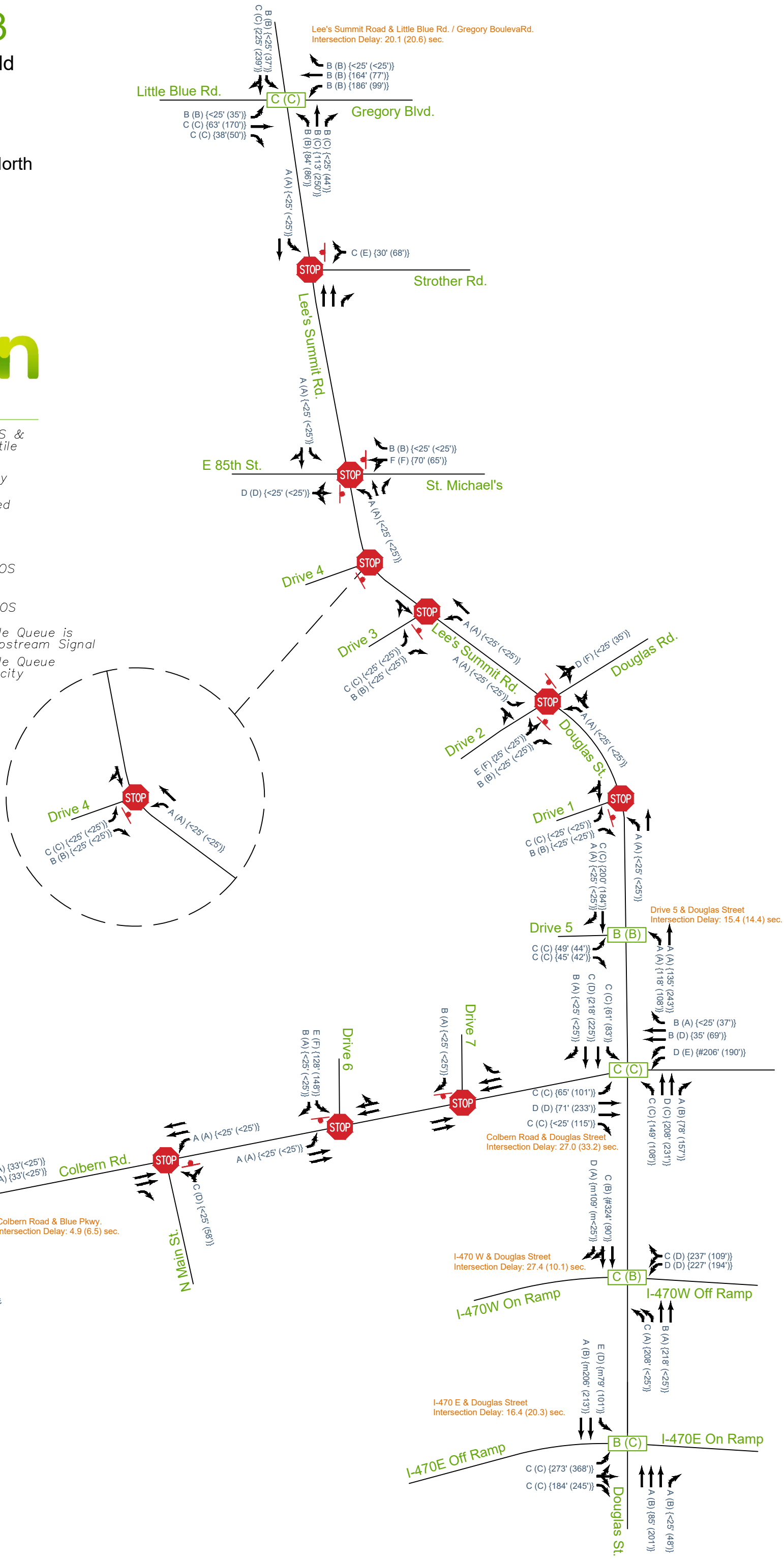
Stop Sign

AM (PM) — Signalized Intersection LOS

AM (PM) — Roundabout Intersection LOS

m — 95th Percentile Queue is Metered by Upstream Signal

— 95th Percentile Queue Exceeds Capacity



6. CONCLUSIONS

This report summarizes analysis conducted for the proposed Aria and Summit Village North development projects, located in the northwest quadrant of the intersection of Colbern Road and Douglas Street in Lee's Summit, Missouri.

6.1. Summary

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

1. Based on a review of the existing roadway network, there are multiple locations that currently do not comply with the Lee's Summit AMC. Locations that do not meet left/right-turn lane standards include:
    - Left-turn lanes in northbound and westbound directions at Colbern Road and Main Street
    - Northbound, eastbound and westbound left-turn lane length at Colbern Road and Douglas Street
    - Eastbound right-turn lane at Colbern Road and Main Street
    - Eastbound, westbound and southbound right-turn lanes at Colbern Road and Douglas Street

    Based on a review of existing operations, improvements to the network at these locations to meet the Lee's Summit AMC are not recommended.

2. Colbern Road is planned to be widened to a four-lane roadway with turn lanes provided where necessary. This is a planned City project that is expected to occur approximately at the same time as the full build development. It is assumed that the planned roadway widening will be constructed to City standards set forth in the AMC including left and right-turn lanes provided in the east-west direction along Colbern Road at Douglas Street and at Main Street. 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.
3. The intersections of Colbern Road and Main Street, Colbern Road and Drive 6, and Lee's Summit Road and Strother Road 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. Therefore, a traffic signal is not recommended at these locations.
4. Based on the capacity analysis results at the intersection of Colbern Road and Douglas Street, the 95th-percentile queue associated with the northbound through movement is

expected to extend into the upstream signal at the I-470 Westbound Ramps during the PM peak hour period after phase 1 development. This is an increase of less than two vehicles compared to the queue under existing conditions. Based on field observation at this intersection (prior to OGL signal timing implementation), the existing northbound queue was observed at times to extend into the upstream signal. When this occurred, drivers waited at the upstream stop bar and did not block the westbound off-ramp. It could be reasonably expected that this behavior will continue if this occurs under phase 1 development conditions. This is not expected to significantly impact northbound operations on the overpass bridge. An additional northbound through lane at the intersection is recommended with phase 2 development.

5. The site plan indicates future development along the north side of Colbern Road, west of the Aria and Summit Village North developments. As future development occurs along the corridor, consideration should be given to providing shared access at Drive 6 with adjacent development. If signalization is warranted with future development, Drive 6 would provide shared access between two developments and meets spacing requirements for signalization.

6.2. Recommendations

Based on review and analysis of the proposed redevelopment site, the following action items are recommended:

Existing plus Phase 1 Development Conditions

Lee's Summit Road/Douglas Street:

1. Verify adequate sight distance is provided for turning movements at Drive 1 and Drive 2.
2. Re-stripe the existing two-way left-turn lane along Lee's Summit Road/Douglas Street to provide a dedicated northbound left-turn lane with 200 feet of storage at the following locations:
    a. Drive 1
    b. Drive 2

Existing plus Full Build Development Conditions

Lee's Summit Road/Douglas Street

1. Construct Drive 3 and Drive 4 with a maximum driveway width of 42 feet with one 14-foot entering lane and two 12-foot exiting lanes to meet City driveway standards. If desired, a proposed median should be constructed to satisfy these lane geometrics.
2. Install a traffic signal at Drive 5 and provide two exiting lanes and one entering lane. If required by the City, Drive 5 should be constructed with a minimum width of 42 feet to

meet City standards. However, the proposed width of 36 feet is expected to adequately accommodate the recommended driveway configuration. Provide signal interconnect between the intersections of Colbern Road with Douglas Street and Douglas Street with Drive 5.

3. Re-stripe the existing two-way left-turn lane along Lee's Summit Road/Douglas Street to provide a dedicated northbound left-turn lane with 200 feet of storage at the following locations:
    a. Drive 3
    b. Drive 4
    c. Drive 5
4. Install a southbound right-turn lane with minimum of 150 feet plus taper at Drive 5.
5. A southbound right-turn lane is warranted at Colbern Road and Douglas Street according to the Lee's Summit AMC. If this improvement is not provided with the proposed City improvements along Colbern Road, install a dedicated southbound right-turn lane with a minimum of 200 feet of storage plus taper at the intersection of Colbern Road and Douglas Street. Consideration should be given to increasing the provided turn lane storage to 250 feet to accommodate queue lengths associated with the southbound through movement.
6. Install an additional northbound through lane at the intersection of Colbern Road and Douglas Street and merge to one northbound lane at an acceptable distance downstream between Colbern Road and Drive 5. This results in a left-turn, two through, and a right-turn lane for the northbound approach at this intersection.

Colbern Road:

7. Construct Drive 7 with a minimum width of 28 feet, including one exiting lane and one entering lane, to meet City standards.
8. Provide a physical barrier along Colbern Road between Drive 7 and Douglas Street to facilitate right-in/right-out access. This drive location should be coordinated with the City so that the barrier can be constructed with the City's planned improvements along Colbern Road.
9. Install an eastbound left-turn lane with minimum of 200 feet of storage at Drive 6.
10. Install a westbound right-turn lane with minimum of 150 feet plus taper at Drive 7.

APPENDIX A

Data Collection

Traffic Counts

Study Name	Douglas & EB Ramp 2016
Start Date	Wednesday, October 19, 2016 6:00 AM
End Date	Thursday, October 20, 2016 6:00 AM
Site Code	

Road Volumes

TMV	ove	Southbound				Southbound Total	Westbound				Westbound Total	Northbound				Northbound Total	Eastbound				Eastbound Total	Grand Total
Interval		R	T	L	U		R	T	L	U		R	T	L	U		R	T	L	U		
10/19/2016 6:00		0	50	0	0	50	0	0	0	0	0	15	77	0	0	92	48	0	27	0	75	217
10/19/2016 6:15		0	92	0	0	92	0	0	0	0	0	13	97	0	0	110	63	0	35	0	98	300
10/19/2016 6:30		0	128	0	0	128	0	0	0	0	0	18	142	0	0	160	83	0	58	0	141	429
10/19/2016 6:45		0	145	2	0	147	0	0	0	0	0	22	165	0	0	187	108	0	87	0	195	529
10/19/2016 7:00		0	121	0	0	121	0	0	0	0	0	52	190	0	0	242	82	0	73	0	155	518
10/19/2016 7:15		0	147	0	0	147	0	0	0	0	0	77	184	0	0	261	99	0	81	0	180	588
10/19/2016 7:30		0	150	1	0	151	0	0	0	0	0	59	174	0	0	233	124	0	98	0	222	606
10/19/2016 7:45		0	201	1	0	202	0	0	0	0	0	39	136	0	0	175	158	0	98	0	256	633
10/19/2016 8:00		0	148	0	0	148	0	0	0	0	0	37	140	0	0	177	145	1	80	0	226	551
10/19/2016 8:15		0	156	0	0	156	0	0	0	0	0	44	143	0	0	187	139	0	76	0	215	558
10/19/2016 8:30		0	127	0	0	127	0	0	0	0	0	50	137	0	0	187	106	0	69	0	175	489
10/19/2016 8:45		0	144	0	0	144	0	0	0	0	0	42	112	0	0	154	140	0	82	0	222	520
10/19/2016 9:00		0	105	1	0	106	0	0	0	0	0	46	101	0	0	147	91	1	44	0	136	389
10/19/2016 9:15		0	126	3	0	129	0	0	0	0	0	43	113	0	0	156	111	0	81	0	192	477
10/19/2016 9:30		0	118	1	0	119	0	0	0	0	0	58	117	0	0	175	102	0	60	0	162	456
10/19/2016 9:45		0	129	2	0	131	0	0	0	0	0	41	100	0	0	141	96	0	59	0	155	427
10/19/2016 10:00		0	117	2	0	119	0	0	0	0	0	75	125	0	0	200	84	0	71	0	155	474
10/19/2016 10:15		0	94	5	0	99	0	0	0	0	0	58	99	0	0	157	79	0	57	0	136	392
10/19/2016 10:30		0	122	2	0	124	0	0	0	0	0	59	126	0	0	185	88	0	54	0	142	451
10/19/2016 10:45		0	110	0	0	110	0	0	0	0	0	76	131	0	0	207	104	0	65	0	169	486
10/19/2016 11:00		0	108	3	0	111	0	0	0	0	0	65	138	0	0	203	98	0	74	0	172	486
10/19/2016 11:15		0	108	0	0	108	0	0	0	0	0	55	142	0	0	197	108	0	79	0	187	492
10/19/2016 11:30		0	131	2	0	133	0	0	0	0	0	89	117	0	0	206	97	0	81	0	178	517
10/19/2016 11:45		0	120	3	0	123	0	0	0	0	0	81	125	0	0	206	120	0	73	0	193	522
10/19/2016 12:00		0	102	2	0	104	0	0	0	0	0	80	181	0	0	261	108	1	77	0	186	551
10/19/2016 12:15		0	125	0	0	125	0	0	0	0	0	82	185	0	0	267	107	0	73	0	180	572
10/19/2016 12:30		0	115	4	0	119	0	0	0	0	0	67	173	0	0	240	122	0	74	0	196	555
10/19/2016 12:45		0	119	1	0	120	0	0	0	0	0	76	157	0	0	233	127	0	106	0	233	586
10/19/2016 13:00		0	113	1	0	114	0	0	0	0	0	75	149	0	0	224	109	1	68	0	178	516
10/19/2016 13:15		0	122	5	0	127	0	0	0	0	0	55	154	0	0	209	120	0	90	0	210	546
10/19/2016 13:30		0	164	0	0	164	0	0	0	0	0	67	146	0	0	213	127	0	78	0	205	582
10/19/2016 13:45		0	87	1	0	88	0	0	0	0	0	82	137	0	0	219	115	0	70	0	185	492
10/19/2016 14:00		0	117	1	0	118	0	0	0	0	0	66	134	0	0	200	94	0	90	0	184	502
10/19/2016 14:15		0	166	4	0	170	0	0	0	0	0	67	146	0	0	213	126	0	88	0	214	597
10/19/2016 14:30		0	128	0	0	128	0	0	0	0	0	93	142	0	0	235	133	0	91	0	224	587
10/19/2016 14:45		0	128	1	0	129	0	0	0	0	0	84	135	0	0	219	122	0	95	0	217	565
10/19/2016 15:00		0	121	1	0	122	0	0	0	0	0	89	175	0	0	264	110	0	84	0	194	580
10/19/2016 15:15		0	128	4	0	132	0	0	0	0	0	87	148	0	0	235	137	0	109	0	246	613
10/19/2016 15:30		0	125	3	0	128	0	0	0	0	0	125	171	0	0	296	149	0	131	0	280	704
10/19/2016 15:45		0	128	1	0	129	0	0	0	0	0	94	168	0	0	262	143	0	115	1	259	650
10/19/2016 16:00		0	128	0	0	128	0	0	0	0	0	111	209	0	0	320	160	0	113	0	273	721
10/19/2016 16:15		0	121	0	0	121	0	0	0	0	0	77	177	0	0	254	130	0	145	0	275	650
10/19/2016 16:30		0	128	0	0	128	0	0	0	0	0	88	228	0	0	316	167	0	137	0	304	748
10/19/2016 16:45		0	150	0	0	150	0	0	0	0	0	102	212	0	0	314	146	0	124	0	270	734
10/19/2016 17:00		0	130	1	0	131	0	0	0	0	0	118	248	0	0	366	152	0	140	0	292	789

Study Name	Douglas & EB Ramp 2016
Start Date	Wednesday, October 19, 2016 6:00 AM
End Date	Thursday, October 20, 2016 6:00 AM
Site Code	

Road Volumes

TMV	ove	Southbound				Southbound Total	Westbound				Westbound Total	Northbound				Northbound Total	Eastbound				Eastbound Total	Grand Total
Interval		R	T	L	U		R	T	L	U		R	T	L	U		R	T	L	U		
10/19/2016 17:15		0	113	2	0	115	0	0	0	0	0	87	220	0	0	307	157	0	144	0	301	723
10/19/2016 17:30		0	102	1	0	103	0	0	0	0	0	69	166	0	0	235	156	0	139	0	295	633
10/19/2016 17:45		0	115	5	0	120	0	0	0	0	0	56	155	0	0	211	140	0	135	0	275	606
10/19/2016 18:00		0	101	4	0	105	0	0	0	0	0	87	155	0	0	242	134	0	116	0	250	597
10/19/2016 18:15		0	116	0	0	116	0	0	0	0	0	55	152	0	0	207	147	0	104	0	251	574
10/19/2016 18:30		0	105	2	0	107	0	0	0	0	0	55	138	0	0	193	121	0	91	0	212	512
10/19/2016 18:45		0	88	1	0	89	0	0	0	0	0	57	114	0	0	171	105	0	78	0	183	443
10/19/2016 19:00		0	68	1	0	69	0	0	0	0	0	61	125	0	0	186	94	0	68	0	162	417
10/19/2016 19:15		0	60	0	0	60	0	0	0	0	0	65	140	0	0	205	80	0	72	0	152	417
10/19/2016 19:30		0	34	0	0	34	0	0	0	0	0	52	111	0	0	163	52	0	66	0	118	315
10/19/2016 19:45		0	45	1	0	46	0	0	0	0	0	47	113	0	0	160	70	0	55	0	125	331
10/19/2016 20:00		0	44	2	0	46	0	0	0	0	0	71	168	0	0	239	45	0	59	0	104	389
10/19/2016 20:15		0	26	0	0	26	1	0	0	0	1	50	85	0	0	135	49	0	50	0	99	261
10/19/2016 20:30		0	31	0	0	31	0	0	0	0	0	29	73	0	0	102	48	0	41	0	89	222
10/19/2016 20:45		0	34	3	0	37	0	0	0	0	0	37	56	0	0	93	56	0	49	0	105	235
10/19/2016 21:00		0	22	0	0	22	0	0	0	0	0	42	64	0	0	106	48	0	32	0	80	208
10/19/2016 21:15		0	23	0	0	23	0	0	0	0	0	24	41	0	0	65	43	0	35	0	78	166
10/19/2016 21:30		0	19	0	0	19	0	0	0	0	0	20	42	0	0	62	32	0	23	0	55	136
10/19/2016 21:45		0	24	0	0	24	0	0	0	0	0	11	35	0	0	46	42	0	37	0	79	149
10/19/2016 22:00		0	12	0	0	12	0	0	0	0	0	19	32	0	0	51	31	0	22	0	53	116
10/19/2016 22:15		0	18	0	0	18	0	0	0	0	0	14	24	0	0	38	35	0	16	0	51	107
10/19/2016 22:30		0	16	0	0	16	0	0	0	0	0	12	23	0	0	35	27	0	20	0	47	98
10/19/2016 22:45		0	15	0	0	15	0	0	0	0	0	7	32	0	0	39	22	0	19	0	41	95
10/19/2016 23:00		0	2	0	0	2	0	0	0	0	0	20	35	0	0	55	12	0	5	0	17	74
10/19/2016 23:15		0	8	1	0	9	0	0	0	0	0	13	20	0	0	33	10	0	10	0	20	62
10/19/2016 23:30		0	6	0	0	6	0	0	0	0	0	12	22	0	0	34	12	0	11	0	23	63
10/19/2016 23:45		0	3	0	0	3	0	0	0	0	0	4	13	0	0	17	8	0	12	0	20	40
10/20/2016		0	8	0	0	8	0	0	0	0	0	16	10	0	0	26	10	0	8	0	18	52
10/20/2016 0:15		0	4	0	0	4	0	0	0	0	0	3	10	0	0	13	7	0	9	0	16	33
10/20/2016 0:30		0	5	0	0	5	0	0	0	0	0	1	9	0	0	10	5	0	5	0	10	25
10/20/2016 0:45		0	2	0	0	2	0	0	0	0	0	1	5	0	0	6	7	0	2	0	9	17
10/20/2016 1:00		0	5	0	0	5	0	0	0	0	0	2	6	0	0	8	6	0	5	0	11	24
10/20/2016 1:15		0	5	0	0	5	0	0	0	0	0	4	6	0	0	10	4	0	6	0	10	25
10/20/2016 1:30		0	4	0	0	4	0	0	0	0	0	3	7	0	0	10	3	0	3	0	6	20
10/20/2016 1:45		0	1	0	0	1	0	0	0	0	0	2	6	0	0	8	1	0	2	0	3	12
10/20/2016 2:00		0	1	0	0	1	0	0	0	0	0	3	7	0	0	10	3	0	4	0	7	18
10/20/2016 2:15		0	3	0	0	3	0	0	0	0	0	1	3	0	0	4	5	0	7	0	12	19
10/20/2016 2:30		0	3	0	0	3	0	0	0	0	0	1	6	0	0	7	2	0	4	0	6	16
10/20/2016 2:45		0	1	0	0	1	0	0	0	0	0	1	6	0	0	7	2	0	4	0	6	14
10/20/2016 3:00		0	2	0	0	2	0	0	0	0	0	3	5	0	0	8	3	0	1	0	4	14
10/20/2016 3:15		0	3	0	0	3	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	5
10/20/2016 3:30		0	3	0	0	3	0	0	0	0	0	2	4	0	0	6	3	0	3	0	6	15
10/20/2016 3:45		0	2	0	0	2	0	0	0	0	0	2	3	0	0	5	4	0	2	0	6	13
10/20/2016 4:00		0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	4	0	5	0	9	24
10/20/2016 4:15		0	7	0	0	7	0	0	0	0	0	1	7	0	0	8	3	0	3	0	6	21
10/20/2016 4:30		0	6	0	0	6	0	0	0	0	0	2	9	0	0	11	5	0	2	0	7	24
10/20/2016 4:45		0	7	0	0	7	0	0	0	0	0	4	14	0	0	18	5	0	9	0	14	39
10/20/2016 5:00		0	7	0	0	7	0	0	0	0	0	6	17	0	0	23	14	0	7	0	21	51
10/20/2016 5:15		0	23	1	0	24	0	0	0	0	0	5	21	0	0	26	10	0	13	0	23	73
10/20/2016 5:30		0	56	0	0	56	0	0	0	0	0	5	40	0	0	45	23	0	14	0	37	138
10/20/2016 5:45		0	45	0	0	45	0	0	0	0	0	12	39	0	0	51	30	0	30	0	60	156
Grand Total		0	7101	82	0	7183	1	0	0	0	1	4156	9310	0	0	13466	7112	4	5417	1	12534	33184

Study Name	Douglas & WB Ramp 2016
Start Date	Wednesday, October 19, 2016 6:00 AM
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Site Code	

Road Volumes

TMV	ve																			
	Southbound				Southbound Total	Westbound				Westbound Total	Northbound				Northbound Total	Eastbound				Eastbound Total	Grand Total
Interval	R	T	L	U		R	T	L	U		R	T	L	U		R	T	L	U		
10/19/2016 6:00	93	10	0	0	103	1	0	38	0	39	0	29	61	0	90	0	0	0	0	0	232
10/19/2016 6:15	135	26	0	0	161	0	0	58	0	58	0	47	82	0	129	0	0	0	0	0	348
10/19/2016 6:30	149	36	0	0	185	0	0	83	0	83	0	82	151	0	233	0	0	0	0	0	501
10/19/2016 6:45	174	55	0	0	229	0	0	90	0	90	0	109	154	0	263	0	0	0	0	0	582
10/19/2016 7:00	201	45	0	0	246	2	0	80	0	82	0	115	144	0	259	0	0	0	0	0	587
10/19/2016 7:15	156	75	0	0	231	2	0	78	0	80	0	126	148	0	274	0	0	0	0	0	585
10/19/2016 7:30	173	63	0	0	236	1	0	83	0	84	0	151	116	0	267	0	0	0	0	0	587
10/19/2016 7:45	132	87	0	0	219	1	0	132	0	133	0	146	92	0	238	0	0	0	0	0	590
10/19/2016 8:00	106	51	0	0	157	3	0	89	0	92	0	119	54	0	173	0	0	0	0	0	422
10/19/2016 8:15	127	45	0	0	172	1	0	103	0	104	0	102	119	0	221	0	0	0	0	0	497
10/19/2016 8:30	114	51	0	0	165	2	0	66	0	68	0	100	103	0	203	0	0	0	0	0	436
10/19/2016 8:45	105	58	0	0	163	2	0	83	0	85	0	120	83	0	203	0	0	0	0	0	451
10/19/2016 9:00	98	50	0	0	148	0	0	46	0	46	0	83	64	0	147	0	0	0	0	0	341
10/19/2016 9:15	93	57	0	0	150	0	0	72	0	72	0	95	75	0	170	0	0	0	0	0	392
10/19/2016 9:30	98	42	0	0	140	2	1	67	0	70	0	107	86	0	193	0	0	0	0	0	403
10/19/2016 9:45	88	64	0	0	152	2	0	72	0	74	0	93	65	0	158	0	0	0	0	0	384
10/19/2016 10:00	75	49	0	0	124	2	0	81	0	83	0	105	74	0	179	0	0	0	0	0	386
10/19/2016 10:15	96	39	0	0	135	1	0	51	0	52	0	91	75	0	166	0	0	0	0	0	353
10/19/2016 10:30	84	76	0	0	160	0	0	60	0	60	0	94	82	0	176	0	0	0	0	0	396
10/19/2016 10:45	80	50	0	0	130	0	0	53	0	53	0	90	95	0	185	0	0	0	0	0	368
10/19/2016 11:00	77	58	0	0	135	0	0	59	0	59	0	112	82	0	194	0	0	0	0	0	388
10/19/2016 11:15	80	63	0	0	143	1	0	50	0	51	0	134	102	0	236	0	0	0	0	0	430
10/19/2016 11:30	77	58	0	0	135	0	1	70	0	71	0	126	78	0	204	0	0	0	0	0	410
10/19/2016 11:45	75	76	0	0	151	0	0	56	0	56	0	117	72	0	189	0	0	0	0	0	396
10/19/2016 12:00	82	62	0	0	144	0	1	40	0	41	0	145	97	0	242	0	0	0	0	0	427
10/19/2016 12:15	108	72	0	0	180	1	0	59	0	60	0	141	111	0	252	0	0	0	0	0	492
10/19/2016 12:30	84	60	0	0	144	0	0	45	0	45	0	151	112	0	263	1	0	0	0	1	453
10/19/2016 12:45	72	60	0	0	132	2	0	69	0	71	0	160	92	0	252	0	0	0	0	0	455
10/19/2016 13:00	88	66	0	0	154	2	0	49	0	51	0	121	94	0	215	0	0	0	0	0	420
10/19/2016 13:15	58	57	0	0	115	0	0	59	0	59	0	156	82	0	238	0	0	0	0	0	412
10/19/2016 13:30	69	66	0	0	135	0	0	82	0	82	0	134	90	0	224	0	0	0	0	0	441
10/19/2016 13:45	78	48	0	0	126	1	0	47	0	48	0	110	88	0	198	0	0	0	0	0	372
10/19/2016 14:00	81	63	0	0	144	1	0	52	0	53	0	132	96	0	228	0	0	0	0	0	425
10/19/2016 14:15	121	108	0	0	229	2	0	61	0	63	0	131	103	0	234	0	0	0	0	0	526
10/19/2016 14:30	111	58	0	0	169	2	0	80	0	82	0	143	90	0	233	0	0	0	0	0	484
10/19/2016 14:45	100	55	0	0	155	1	0	71	0	72	0	138	80	0	218	0	0	0	0	0	445
10/19/2016 15:00	94	77	0	0	171	0	0	61	0	61	0	137	121	0	258	0	0	0	0	0	490
10/19/2016 15:15	98	64	0	0	162	2	1	68	0	71	0	157	94	0	251	0	0	0	0	0	484
10/19/2016 15:30	114	72	0	0	186	1	0	52	0	53	0	172	113	0	285	0	0	0	0	0	524
10/19/2016 15:45	94	74	0	0	168	1	0	64	0	65	0	177	113	0	290	0	0	0	0	0	523
10/19/2016 16:00	115	61	0	0	176	0	0	59	0	59	0	163	132	0	295	0	0	0	0	0	530
10/19/2016 16:15	120	61	0	0	181	0	0	58	0	58	0	210	126	0	336	0	0	0	0	0	575
10/19/2016 16:30	104	65	0	0	169	2	0	60	0	62	0	211	122	0	333	0	0	0	0	0	564
10/19/2016 16:45	105	93	0	0	198	4	0	61	0	65	0	213	141	0	354	0	0	0	0	0	617
10/19/2016 17:00	126	70	0	0	196	0	0	52	0	52	0	224	146	0	370	0	0	0	0	0	618

Study Name	Douglas & WB Ramp 2016
Start Date	Wednesday, October 19, 2016 6:00 AM
End Date	Thursday, October 20, 2016 6:00 AM
Site Code	

Road Volumes

TMV	ve																				
	Southbound				Southbound Total	Westbound				Westbound Total	Northbound				Northbound Total	Eastbound				Eastbound Total	Grand Total
Interval	R	T	L	U		R	T	L	U		R	T	L	U		R	T	L	U		
10/19/2016 17:15	122	78	0	0	200	0	0	48	0	48	0	228	158	0	386	0	0	0	0	0	634
10/19/2016 17:30	98	57	0	0	155	0	0	46	0	46	0	193	121	0	314	0	0	0	0	0	515
10/19/2016 17:45	94	62	0	0	156	0	0	59	0	59	0	192	108	0	300	0	0	0	0	0	515
10/19/2016 18:00	112	63	0	0	175	1	0	45	0	46	0	170	112	0	282	0	0	0	0	0	503
10/19/2016 18:15	76	67	0	0	143	0	0	46	0	46	0	139	104	0	243	0	0	0	0	0	432
10/19/2016 18:30	58	51	0	0	109	2	0	50	0	52	0	147	80	0	227	0	0	0	0	0	388
10/19/2016 18:45	59	46	0	0	105	1	1	49	0	51	0	112	86	0	198	0	0	0	0	0	354
10/19/2016 19:00	73	41	0	0	114	2	1	31	0	34	0	107	90	0	197	0	0	0	0	0	345
10/19/2016 19:15	44	40	0	0	84	0	0	26	0	26	0	117	88	0	205	0	0	0	0	0	315
10/19/2016 19:30	47	18	0	0	65	0	0	16	0	16	0	106	77	0	183	0	0	0	0	0	264
10/19/2016 19:45	53	18	0	0	71	1	0	29	0	30	0	84	75	0	159	0	0	0	0	0	260
10/19/2016 20:00	54	21	0	0	75	0	0	22	0	22	0	115	101	0	216	0	0	0	0	0	313
10/19/2016 20:15	38	12	0	0	50	0	0	20	0	20	0	74	81	0	155	0	0	0	0	0	225
10/19/2016 20:30	41	17	0	0	58	1	0	15	0	16	0	68	47	0	115	0	0	0	1	1	190
10/19/2016 20:45	41	28	0	0	69	0	0	11	0	11	0	59	32	0	91	0	0	0	0	0	171
10/19/2016 21:00	22	14	0	0	36	0	1	12	0	13	0	71	42	0	113	0	0	0	0	0	162
10/19/2016 21:15	21	7	0	0	28	0	0	12	0	12	0	47	36	0	83	0	0	0	0	0	123
10/19/2016 21:30	25	11	0	0	36	1	0	9	0	10	0	37	30	0	67	0	0	0	0	0	113
10/19/2016 21:45	15	14	0	0	29	2	0	7	0	9	0	44	26	0	70	0	0	0	0	0	108
10/19/2016 22:00	20	6	0	0	26	0	0	9	0	9	0	34	23	0	57	0	0	0	0	0	92
10/19/2016 22:15	12	4	0	0	16	1	0	14	0	15	0	23	18	0	41	0	0	0	0	0	72
10/19/2016 22:30	14	10	0	0	24	0	0	8	0	8	0	26	13	0	39	0	0	0	0	0	71
10/19/2016 22:45	11	6	0	0	17	0	0	10	0	10	0	28	23	0	51	0	0	0	0	0	78
10/19/2016 23:00	8	1	0	0	9	0	0	2	0	2	0	19	27	0	46	0	0	0	0	0	57
10/19/2016 23:15	15	6	0	0	21	0	0	2	0	2	0	15	12	0	27	0	0	0	0	0	50
10/19/2016 23:30	5	6	0	0	11	0	0	1	0	1	0	12	22	0	34	0	0	0	0	0	46
10/19/2016 23:45	3	2	0	0	5	0	0	1	0	1	0	19	9	0	28	0	0	0	0	0	34
10/20/2016	5	3	0	0	8	0	0	2	0	2	0	14	4	0	18	0	0	0	0	0	28
10/20/2016 0:15	10	5	0	0	15	0	0	0	0	0	0	12	9	0	21	0	0	0	0	0	36
10/20/2016 0:30	11	5	0	0	16	0	0	1	0	1	0	5	10	0	15	0	0	0	0	0	32
10/20/2016 0:45	7	1	0	0	8	0	0	1	0	1	0	2	5	0	7	0	0	0	0	0	16
10/20/2016 1:00	3	1	0	0	4	0	0	1	0	1	0	5	5	0	10	0	0	0	0	0	15
10/20/2016 1:15	5	3	0	0	8	0	0	5	0	5	0	5	4	0	9	0	0	0	0	0	22
10/20/2016 1:30	3	1	0	0	4	0	0	3	0	3	0	9	4	0	13	0	0	0	0	0	20
10/20/2016 1:45	4	1	0	0	5	0	0	0	0	0	0	4	4	0	8	0	0	0	0	0	13
10/20/2016 2:00	3	0	0	0	3	0	0	2	0	2	0	4	7	0	11	0	0	0	0	0	16
10/20/2016 2:15	5	1	0	0	6	0	0	2	0	2	0	7	2	0	9	0	0	0	0	0	17
10/20/2016 2:30	0	2	0	0	2	0	0	1	0	1	0	4	6	0	10	0	0	0	0	0	13
10/20/2016 2:45	4	2	0	0	6	0	0	1	0	1	0	7	5	0	12	0	0	0	0	0	19
10/20/2016 3:00	4	0	0	0	4	0	0	2	0	2	0	4	6	0	10	0	0	0	0	0	16
10/20/2016 3:15	2	1	0	0	3	0	0	2	0	2	0	1	1	0	2	0	0	0	0	0	7
10/20/2016 3:30	9	2	0	0	11	0	0	0	0	0	0	3	3	0	6	0	0	0	0	0	17
10/20/2016 3:45	2	0	0	0	2	0	0	3	0	3	0	3	2	0	5	0	0	0	0	0	10
10/20/2016 4:00	3	2	0	0	5	0	0	3	0	3	0	8	6	0	14	0	0	0	0	0	22
10/20/2016 4:15	12	4	0	0	16	0	0	3	0	3	0	4	5	0	9	0	0	0	0	0	28
10/20/2016 4:30	15	0	0	0	15	0	0	5	0	5	0	2	11	0	13	0	0	0	0	0	33
10/20/2016 4:45	15	1	0	0	16	0	0	5	0	5	0	8	11	0	19	0	0	0	0	0	40
10/20/2016 5:00	21	1	0	0	22	0	0	7	0	7	0	8	14	0	22	0	0	0	0	0	51
10/20/2016 5:15	29	8	0	0	37	0	0	11	0	11	0	13	15	0	28	0	0	0	0	0	76
10/20/2016 5:30	47	12	0	0	59	0	0	39	0	39	0	19	38	0	57	0	0	0	0	0	155
10/20/2016 5:45	72	10	0	0	82	0	0	39	0	39	0	41	31	0	72	0	0	0	0	0	193
Grand Total	6180	3468	0	0	9648	57	7	3707	0	3771	0	8297	6349	0	14646	1	0	0	1	2	28067

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

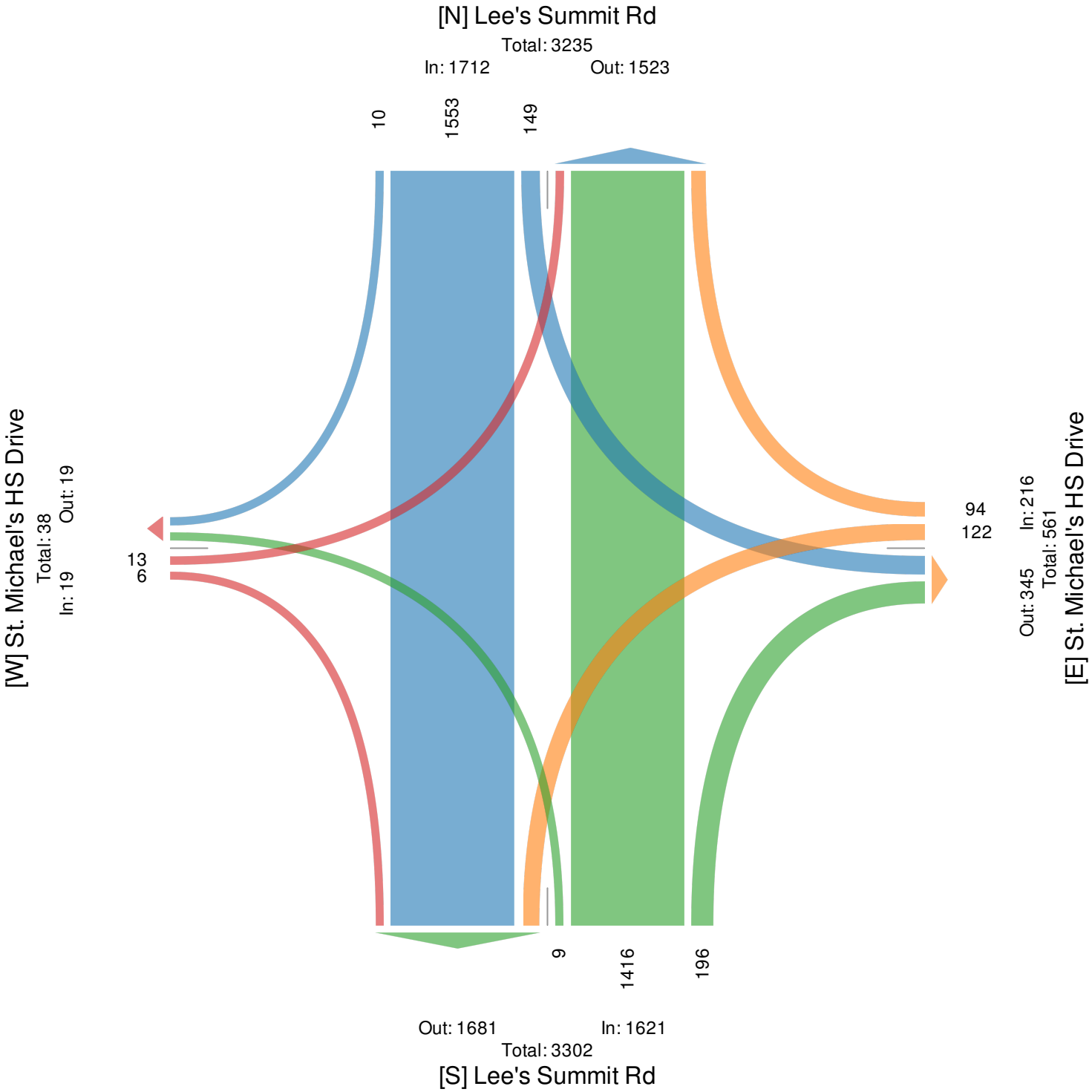
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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 7:00AM	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

GEWALT HAMILTON ASSOCIATES, INC.
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

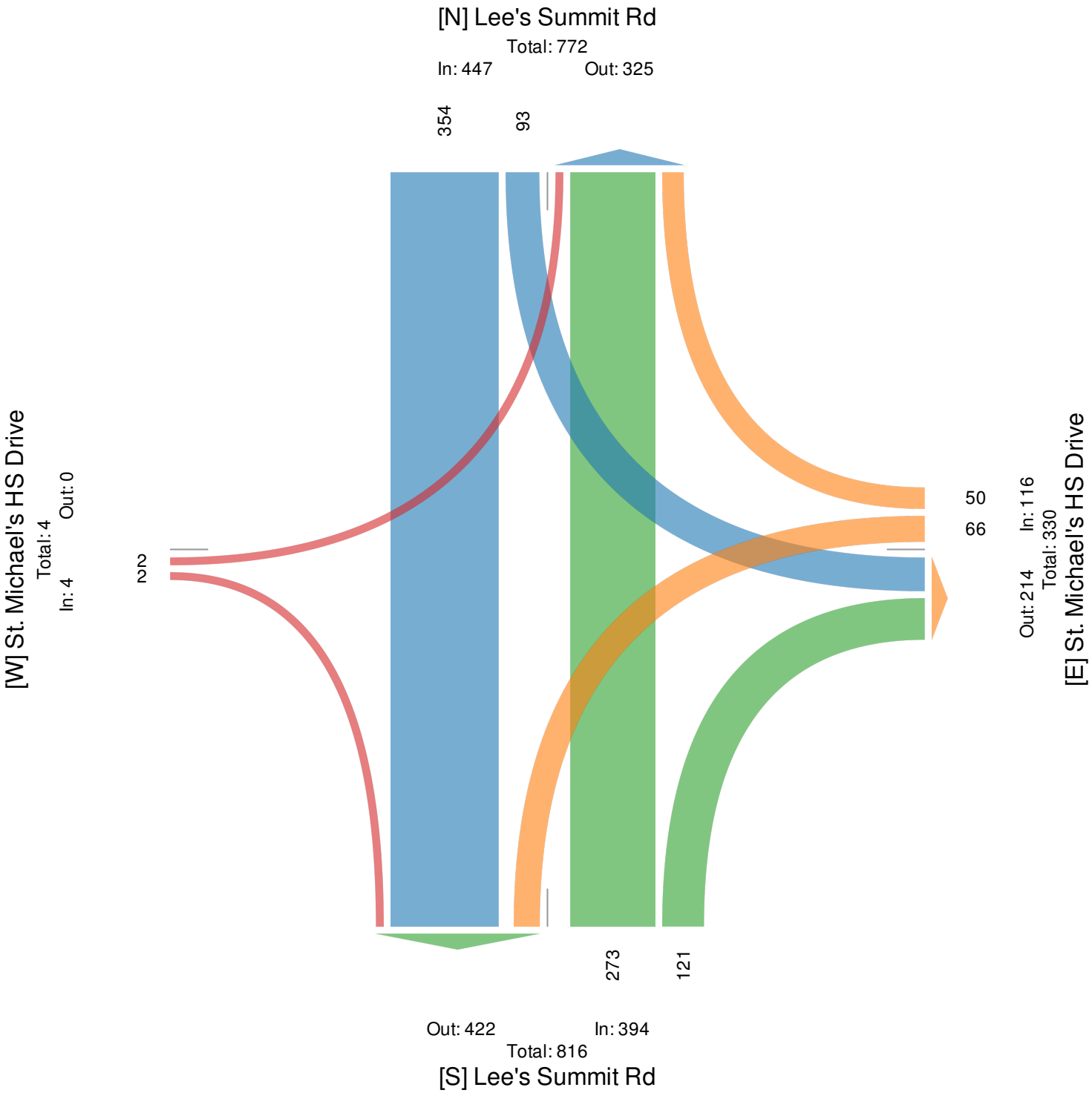
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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

GEWALT HAMILTON ASSOCIATES, INC.
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

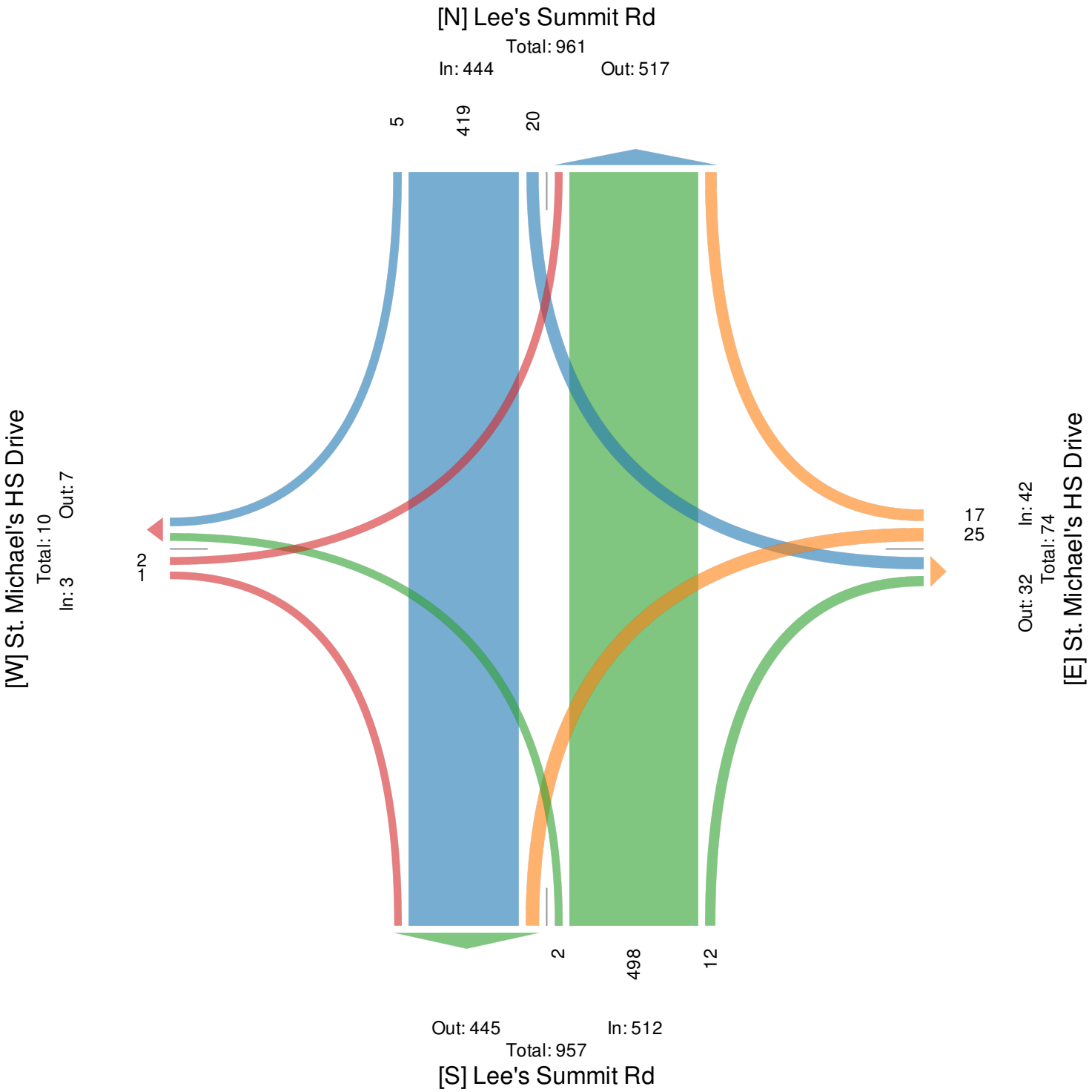
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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

GEWALT HAMILTON ASSOCIATES, INC.
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

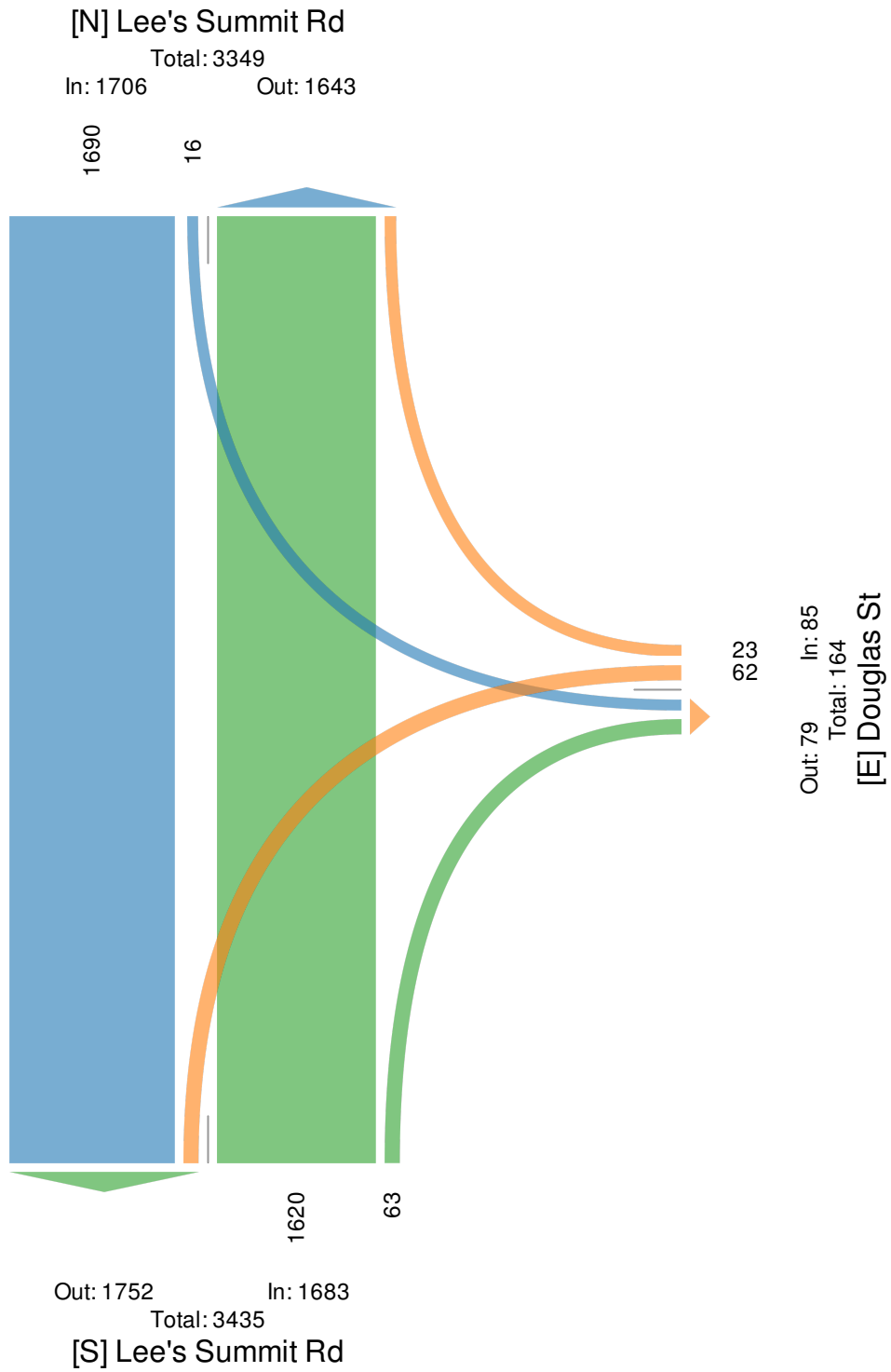
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas St				Lee's Summit Rd				Lee's Summit Rd				
Direction	Westbound				Northbound				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

GEWALT HAMILTON ASSOCIATES, INC.
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

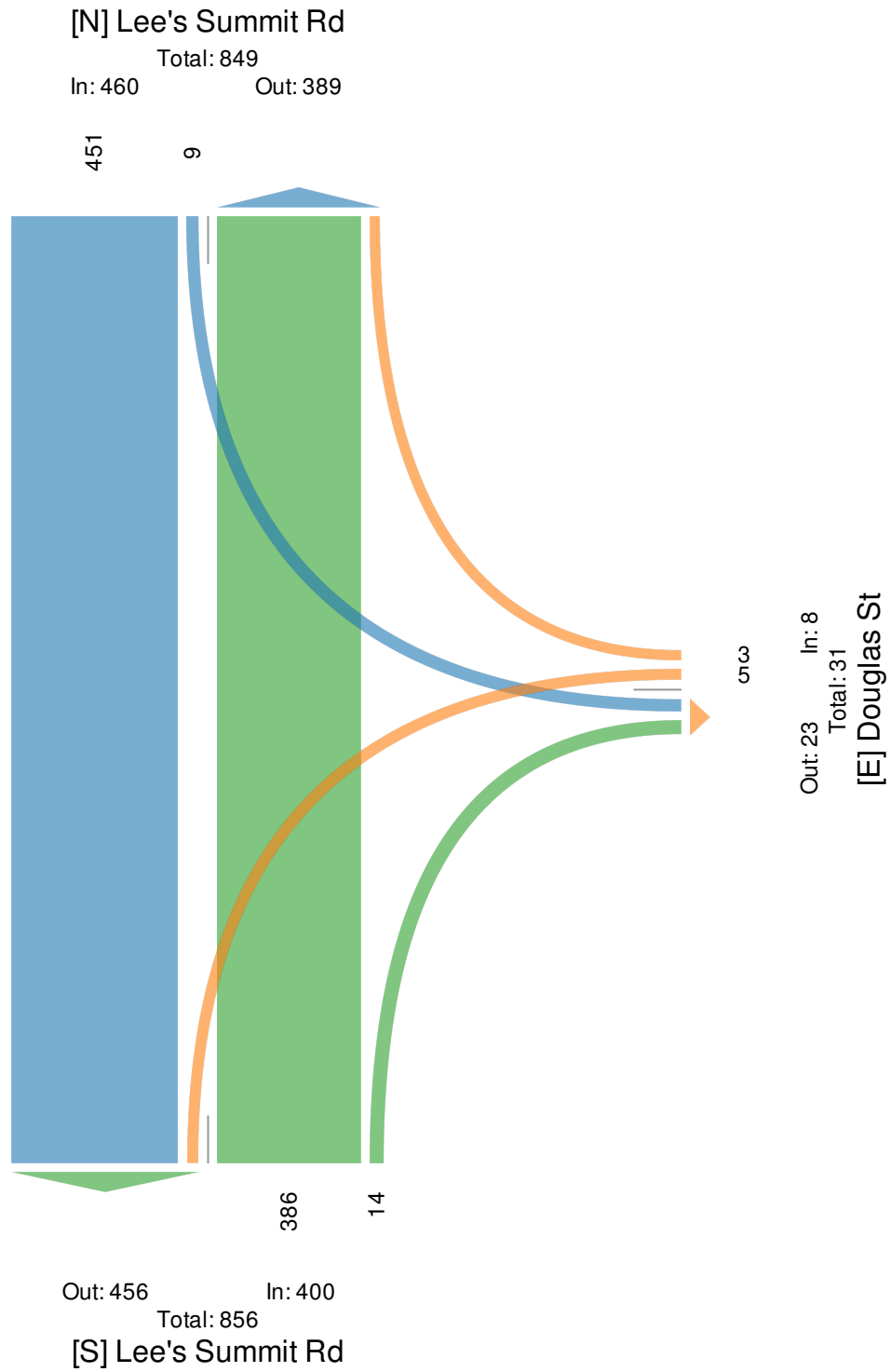
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Douglas St				Lee's Summit Rd				Lee's Summit Rd				
Direction	Westbound				Northbound				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

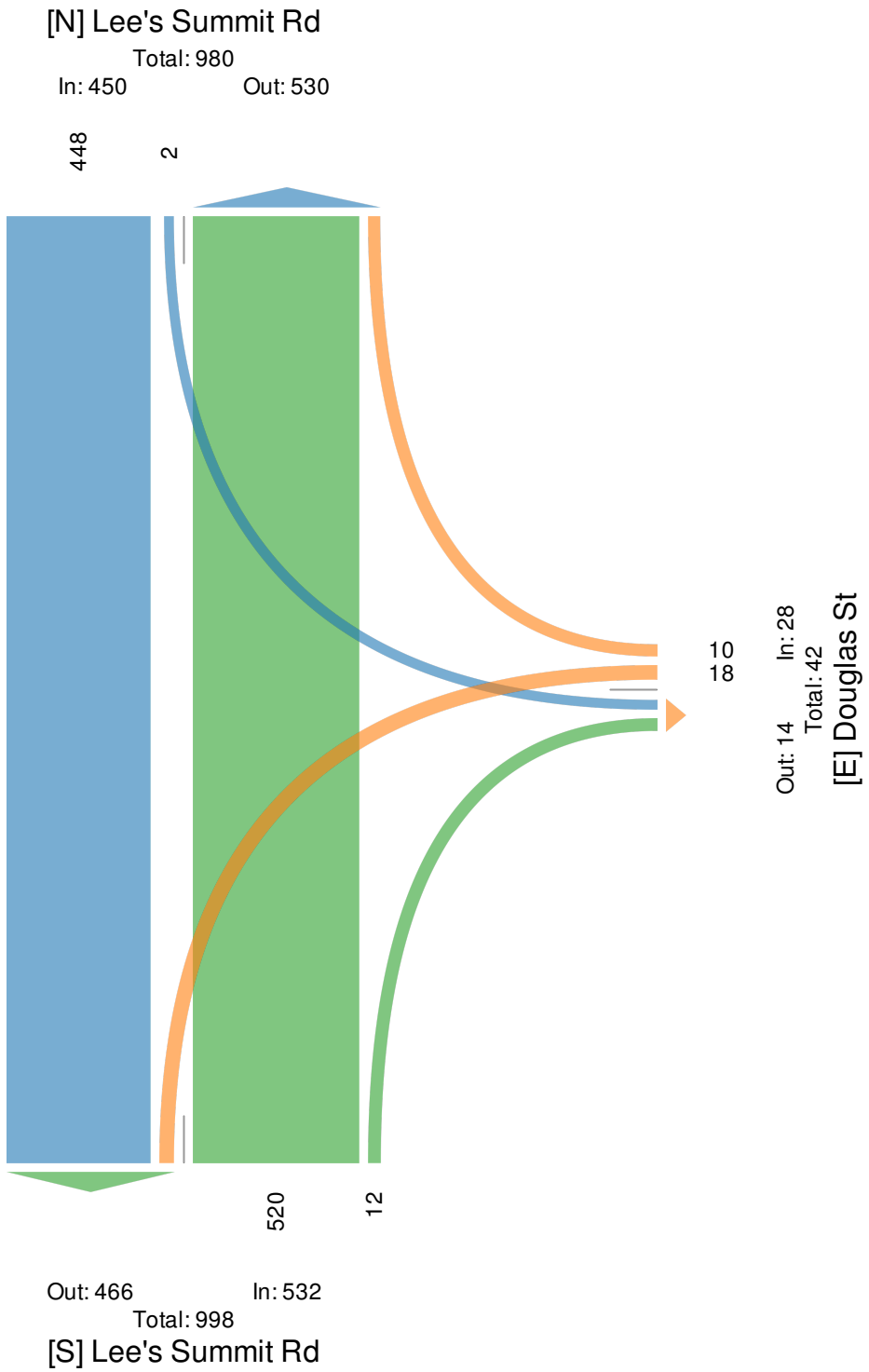
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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

GEWALT HAMILTON ASSOCIATES, INC.
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

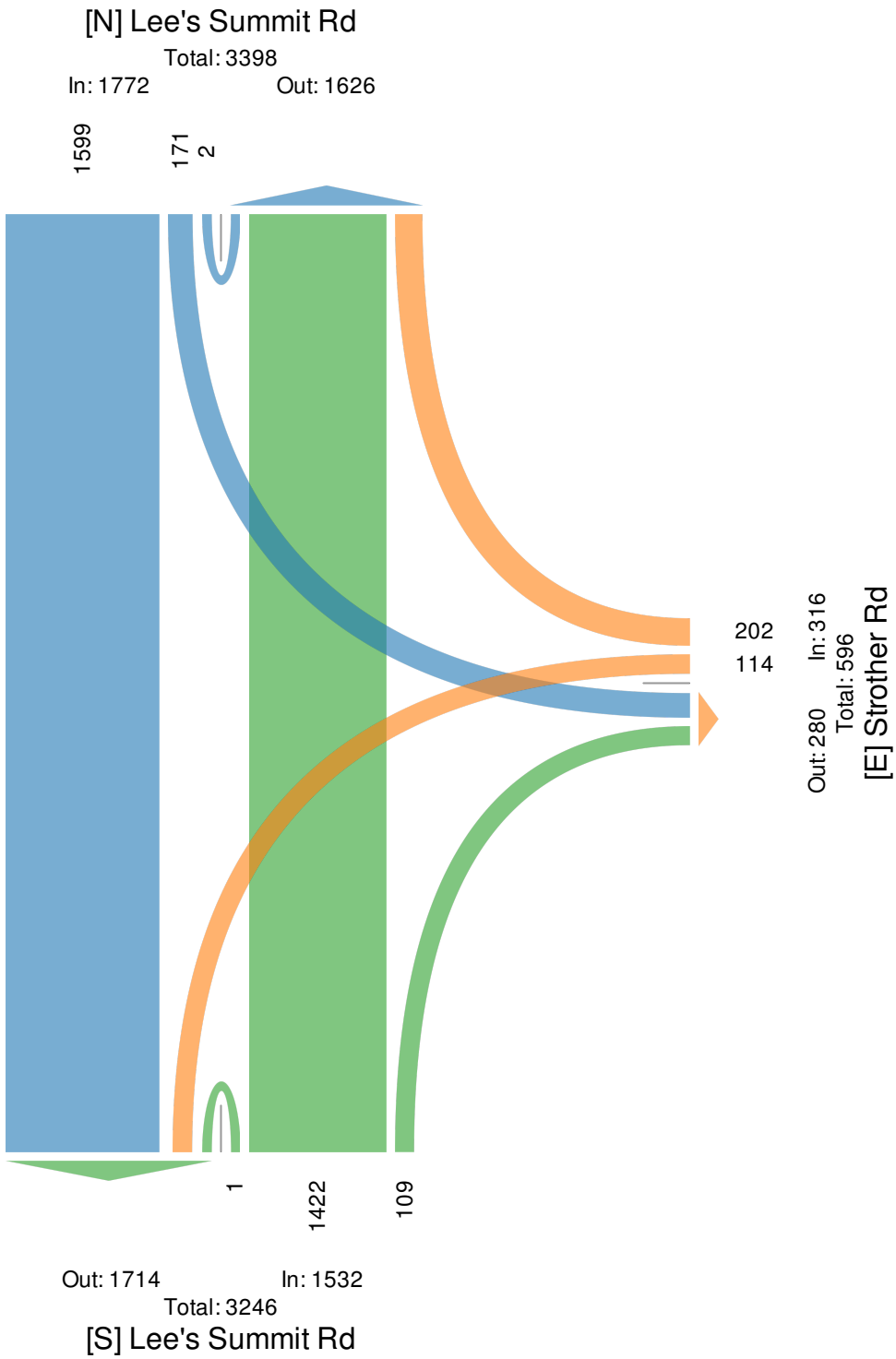
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Strother Rd				Lee's Summit Rd				Lee's Summit Rd				
Direction	Westbound				Northbound				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

GEWALT HAMILTON ASSOCIATES, INC.
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

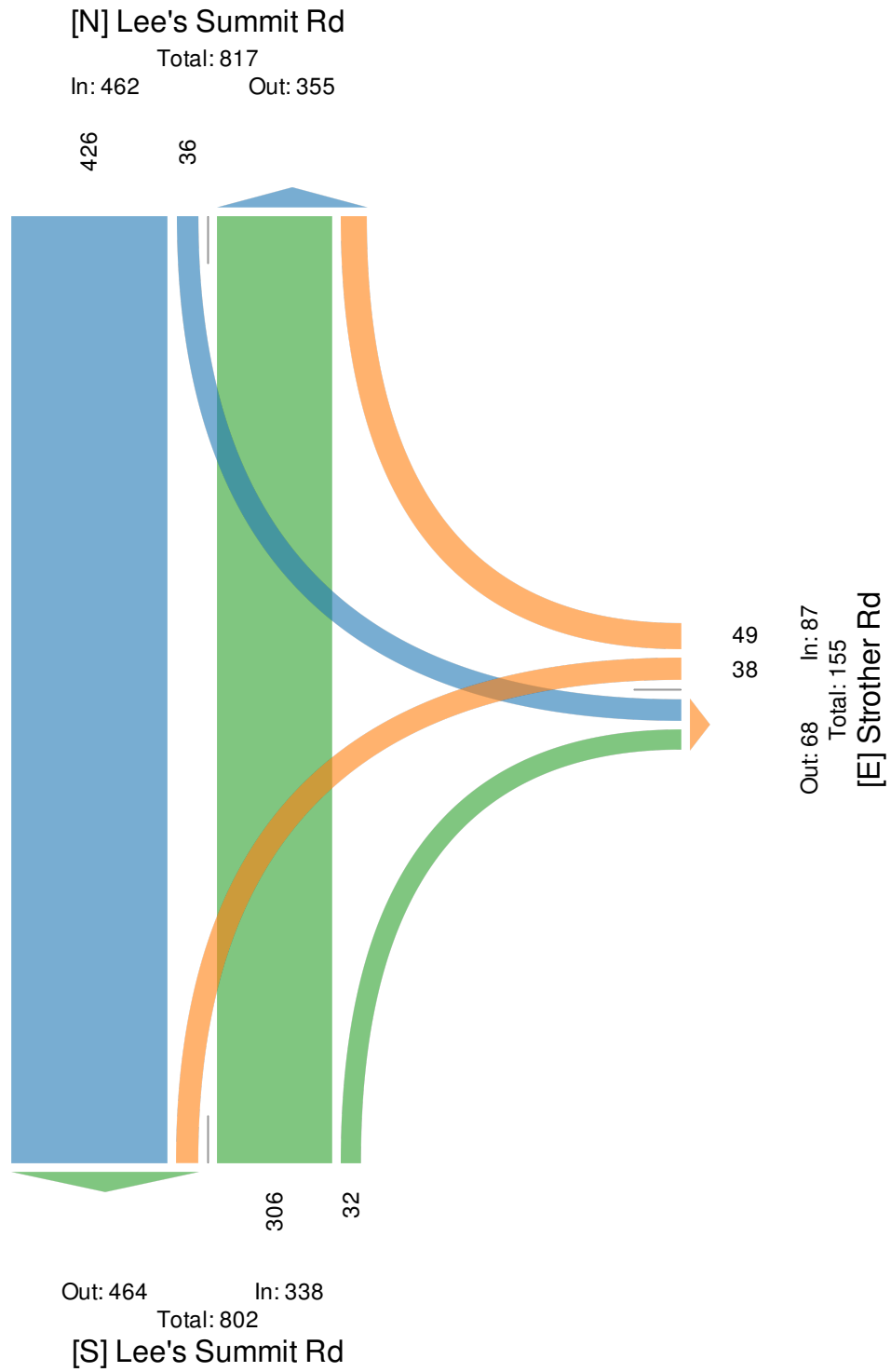
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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

GEWALT HAMILTON ASSOCIATES, INC.
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

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

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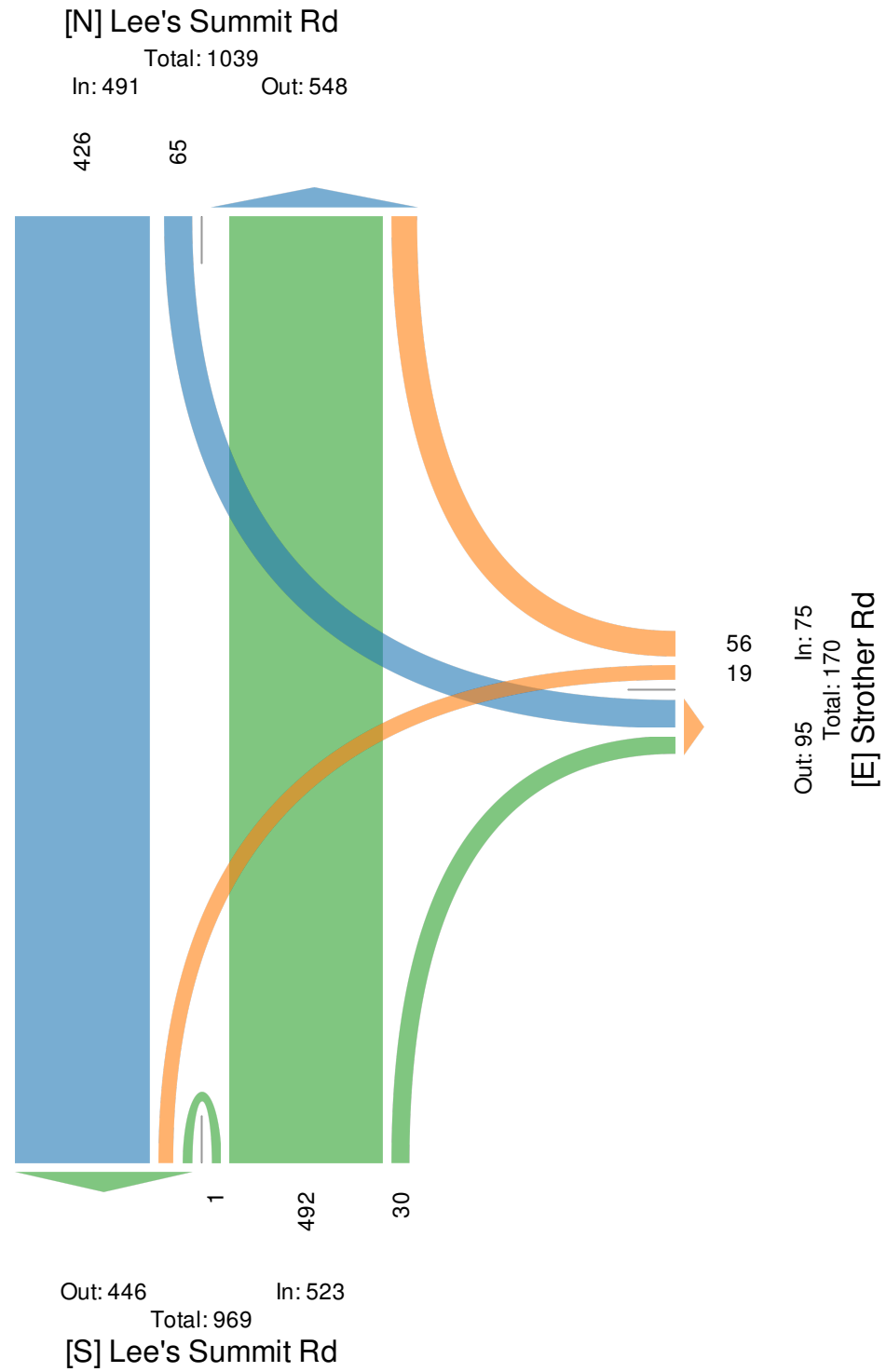
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



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

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**
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

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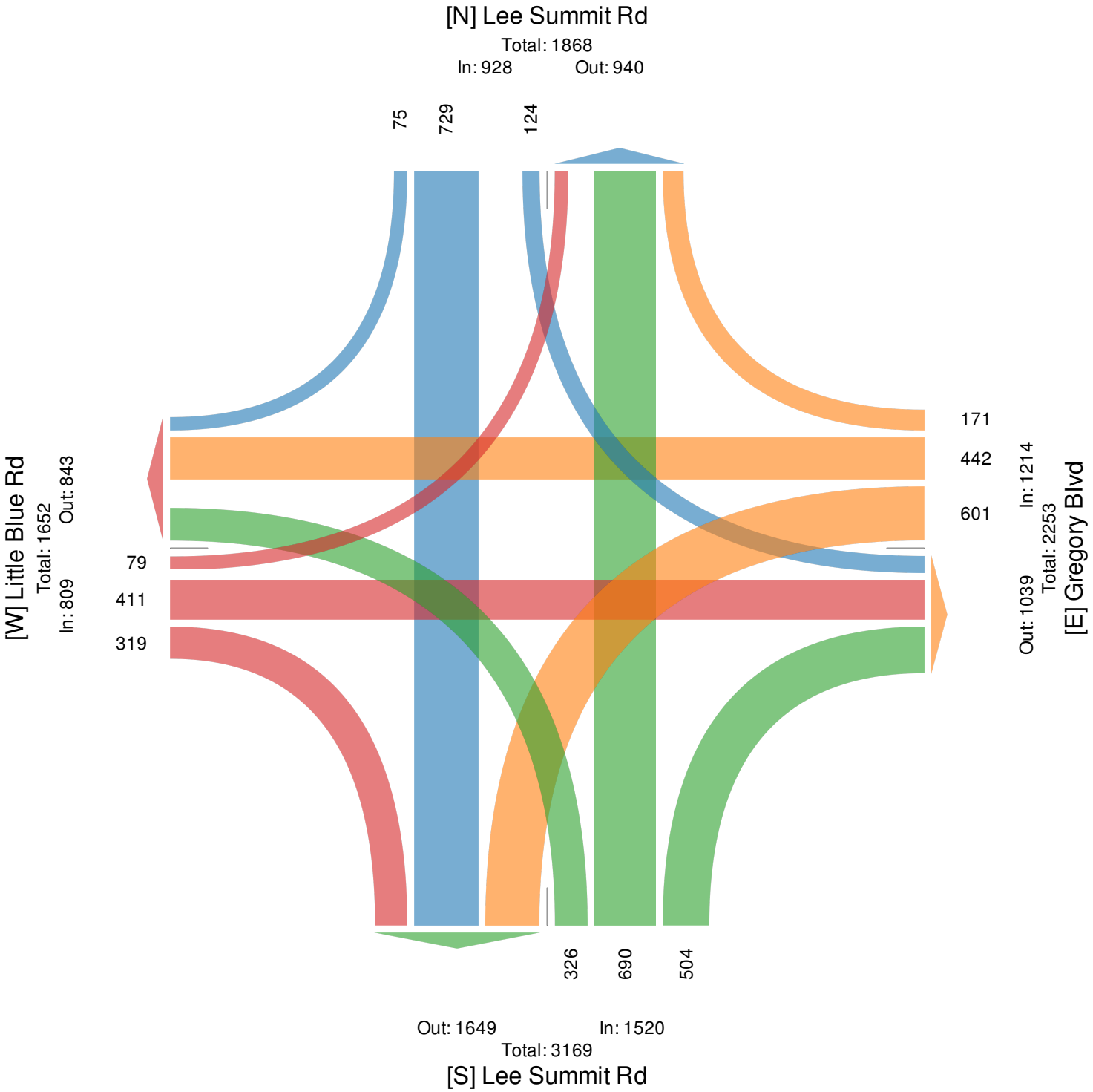
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



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

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

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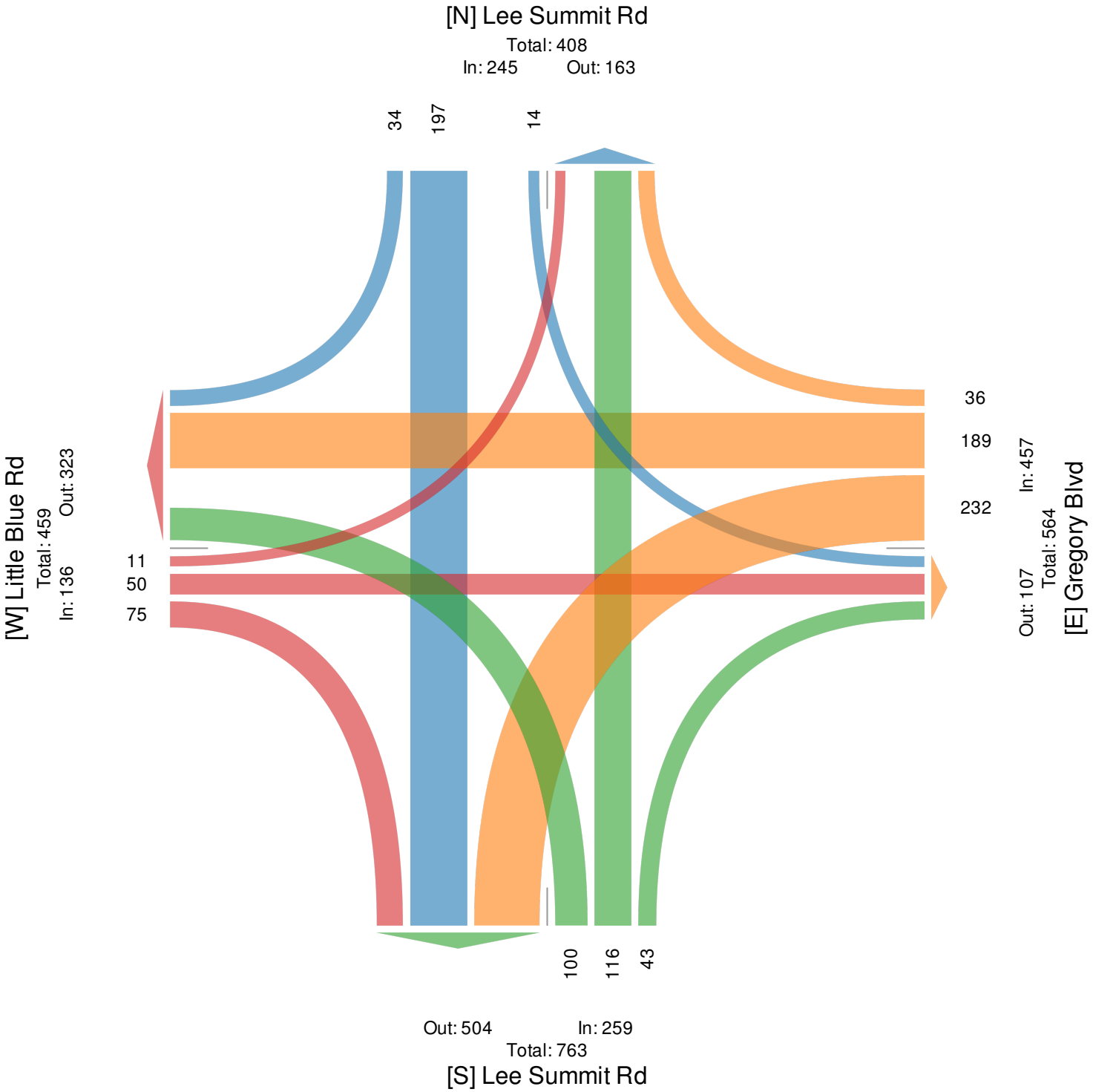

Lee's Summit Rd & NW Gregory Blvd - TMC
Tue Jan 8, 2019
PM Peak (4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 610107, Location: 38.97627, -94.390019

GEWALT HAMILTON ASSOCIATES, INC.
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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

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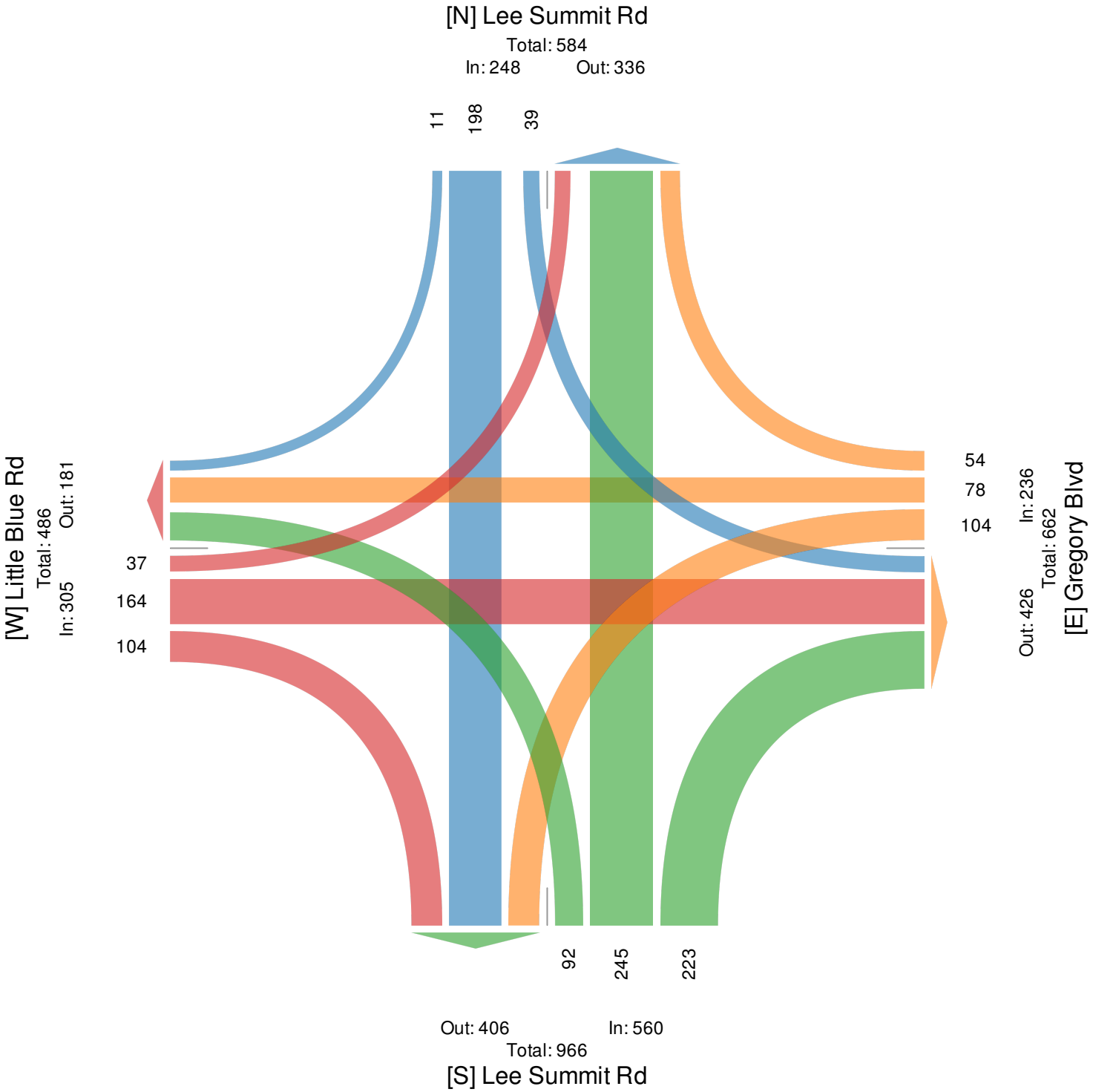


Study Name	Douglas & Colbern 2017
Start Date	Tuesday, September 12, 2017 6:00 AM
End Date	Tuesday, September 12, 2017 7:00 PM
Site Code	

Road Volumes

TMV	Movement	Southbound				Southbound Total	Westbound				Westbound Total	Northbound				Northbound Total	Eastbound				Eastbound Total	Grand Total
Interval		R	T	L	U		R	T	L	U		R	T	L	U		R	T	L	U		
9/12/2017 6:00		4	26	2	0	32	2	25	94	0	121	21	27	2	0	50	0	4	2	0	6	209
9/12/2017 6:15		5	32	5	0	42	5	50	112	0	167	26	47	8	0	81	2	5	3	0	10	300
9/12/2017 6:30		6	43	6	0	55	7	63	135	0	205	35	52	3	0	90	0	7	3	0	10	360
9/12/2017 6:45		14	64	8	0	86	4	90	145	0	239	77	58	16	0	151	5	15	6	0	26	502
9/12/2017 7:00		17	97	8	0	122	8	113	158	0	279	70	49	11	0	130	5	16	5	0	26	557
9/12/2017 7:15		20	89	10	0	119	12	108	159	0	279	66	67	25	0	158	4	28	9	0	41	597
9/12/2017 7:30		25	69	10	0	104	21	110	163	0	294	89	81	17	0	187	3	28	23	0	54	639
9/12/2017 7:45		22	85	5	0	112	15	77	129	0	221	100	87	7	0	194	5	28	11	0	44	571
9/12/2017 8:00		18	66	5	0	89	9	59	111	0	179	76	68	9	0	153	8	26	13	0	47	468
9/12/2017 8:15		19	71	10	0	100	15	51	118	0	184	69	75	15	0	159	3	26	17	0	46	489
9/12/2017 8:30		17	72	10	0	99	17	56	141	0	214	59	57	13	0	129	4	16	9	0	29	471
9/12/2017 8:45		12	64	9	0	85	6	46	102	0	154	65	51	10	0	126	11	23	9	0	43	408
9/12/2017 9:00		5	59	6	0	70	11	30	100	0	141	57	44	11	0	112	4	24	2	0	30	353
9/12/2017 9:15		2	56	10	0	68	8	17	96	0	121	56	32	6	0	94	13	20	6	0	39	322
9/12/2017 9:30		7	60	4	0	71	5	30	100	0	135	48	34	3	0	85	7	15	4	0	26	317
9/12/2017 9:45		4	65	7	0	76	12	18	72	0	102	69	49	8	0	126	5	23	3	0	31	335
9/12/2017 10:00		3	51	4	0	58	6	23	75	0	104	47	42	8	0	97	8	25	0	0	33	292
9/12/2017 10:15		3	45	2	0	50	5	18	75	0	98	43	51	5	1	100	6	29	6	0	41	289
9/12/2017 10:30		6	42	5	0	53	5	19	75	0	99	47	44	9	0	100	1	11	5	0	17	269
9/12/2017 10:45		4	64	8	0	76	7	14	93	0	114	48	53	8	0	109	6	18	2	0	26	325
9/12/2017 11:00		1	62	9	0	72	6	20	92	0	118	57	43	7	0	107	7	28	6	0	41	338
9/12/2017 11:15		4	52	8	0	64	9	20	92	0	121	66	47	11	1	125	12	18	2	0	32	342
9/12/2017 11:30		5	57	8	0	70	8	21	107	0	136	65	40	10	0	115	10	18	4	0	32	353
9/12/2017 11:45		5	63	6	0	74	5	11	94	0	110	86	55	5	0	146	11	19	7	0	37	367
9/12/2017 12:00		3	56	9	0	68	4	16	108	0	128	83	46	7	0	136	8	26	3	0	37	369
9/12/2017 12:15		8	49	9	0	66	8	22	85	0	115	64	52	15	0	131	11	24	6	0	41	353
9/12/2017 12:30		1	51	6	0	58	5	15	85	0	105	91	61	8	0	160	12	30	3	0	45	368
9/12/2017 12:45		10	61	13	0	84	11	21	111	0	143	101	54	6	0	161	8	26	10	0	44	432
9/12/2017 13:00		6	49	11	0	66	10	17	76	0	103	53	43	7	0	103	14	21	4	0	39	311
9/12/2017 13:15		3	48	6	0	57	11	26	79	0	116	77	46	8	0	131	9	26	3	0	38	342
9/12/2017 13:30		3	44	6	0	53	10	27	75	0	112	70	58	9	0	137	4	22	4	0	30	332
9/12/2017 13:45		3	66	10	0	79	12	21	88	0	121	79	59	7	0	145	5	21	4	0	30	375
9/12/2017 14:00		6	57	6	0	69	12	23	67	0	102	68	60	6	0	134	10	34	7	0	51	356
9/12/2017 14:15		8	82	10	0	100	11	23	85	0	119	83	73	9	0	165	11	24	8	0	43	427
9/12/2017 14:30		10	86	9	0	105	10	21	124	0	155	80	77	14	0	171	13	33	8	0	54	485
9/12/2017 14:45		7	74	11	0	92	11	28	98	0	137	88	72	10	0	170	14	31	10	0	55	454
9/12/2017 15:00		7	77	9	0	93	15	24	96	0	135	91	88	9	0	188	13	41	11	0	65	481
9/12/2017 15:15		11	103	22	0	136	10	31	90	0	131	91	59	4	0	154	19	46	16	0	81	502
9/12/2017 15:30		21	114	18	0	153	8	32	96	0	136	84	72	22	0	178	12	55	24	0	91	558
9/12/2017 15:45		15	98	33	0	146	12	32	94	0	138	73	56	11	0	140	18	51	19	0	88	512
9/12/2017 16:00		6	64	17	0	87	17	38	119	0	174	84	57	14	0	155	17	103	33	0	153	569
9/12/2017 16:15		6	86	13	0	105	10	28	107	0	145	99	60	15	0	174	34	99	25	0	158	582
9/12/2017 16:30		8	81	16	0	105	13	43	117	0	173	111	95	11	0	217	17	111	30	0	158	653
9/12/2017 16:45		6	90	22	0	118	10	38	106	0	154	100	89	13	0	202	28	122	29	0	179	653
9/12/2017 17:00		5	74	9	0	88	17	44	133	0	194	121	101	20	0	242	19	119	24	0	162	686
9/12/2017 17:15		10	75	18	0	103	12	34	95	0	141	115	86	11	0	212	33	134	33	0	200	656
9/12/2017 17:30		10	103	14	0	127	7	31	91	0	129	119	72	12	0	203	31	142	26	0	199	658
9/12/2017 17:45		9	75	26	0	110	9	27	96	0	132	117	93	13	0	223	39	145	15	0	199	664
9/12/2017 18:00		5	73	10	0	88	11	29	120	0	160	93	67	6	0	166	33	106	20	0	159	573
9/12/2017 18:15		4	84	7	0	95	11	32	98	0	141	89	78	5	0	172	16	77	14	0	107	515
9/12/2017 18:30		5	54	9	0	68	8	22	71	0	101	75	63	6	0	144	10	63	6	0	79	392
9/12/2017 18:45		2	40	5	0	47	4	22	45	0	71	90	71	7	0	168	7	35	13	0	55	341
Grand Total		426	3468	519	0	4413	497	1856	5293	0	7646	3931	3161	512	2	7606	605	2237	565	0	3407	23072

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

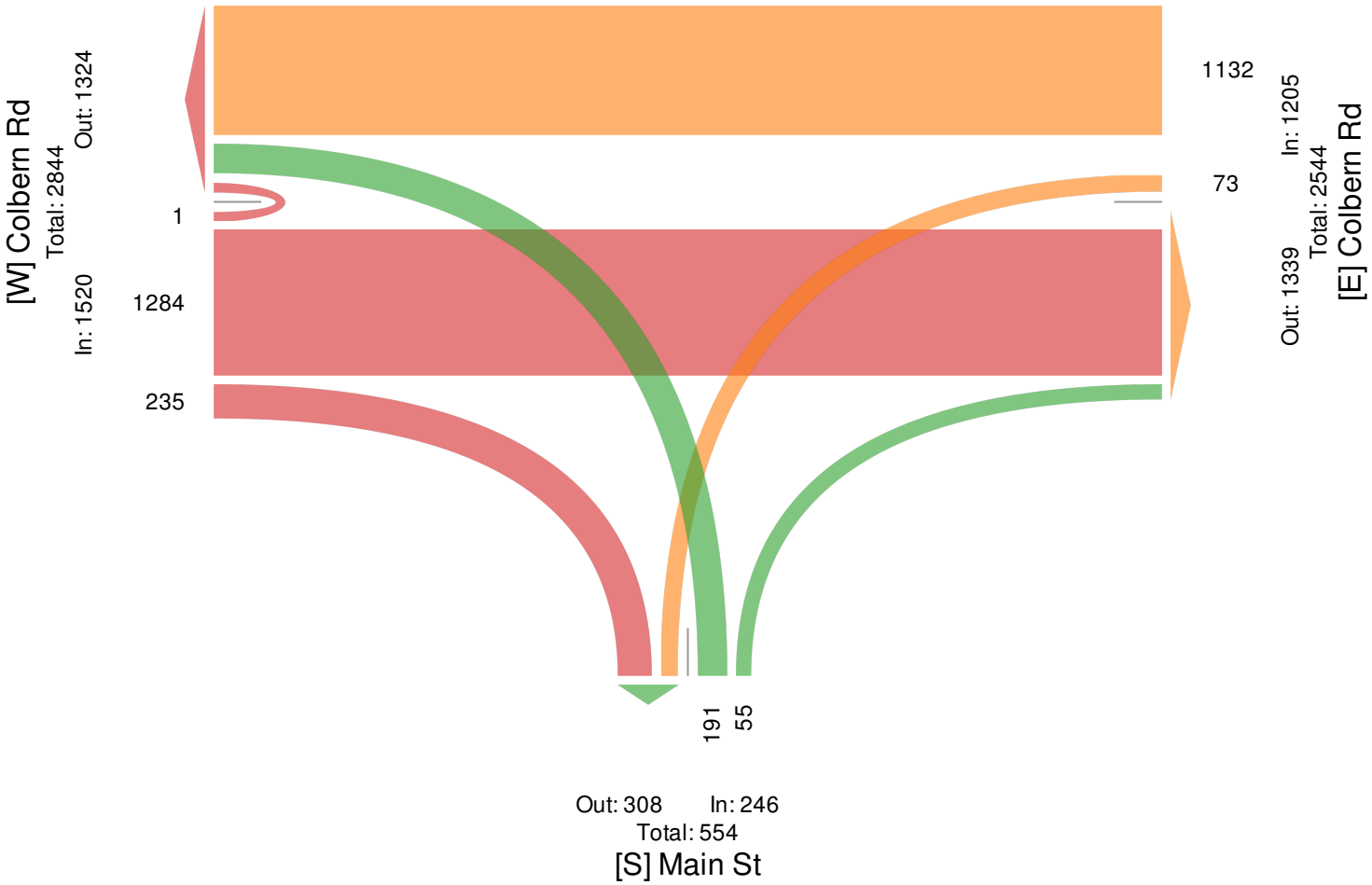
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern Rd				Colbern Rd				Main St				
Direction	Eastbound				Westbound				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

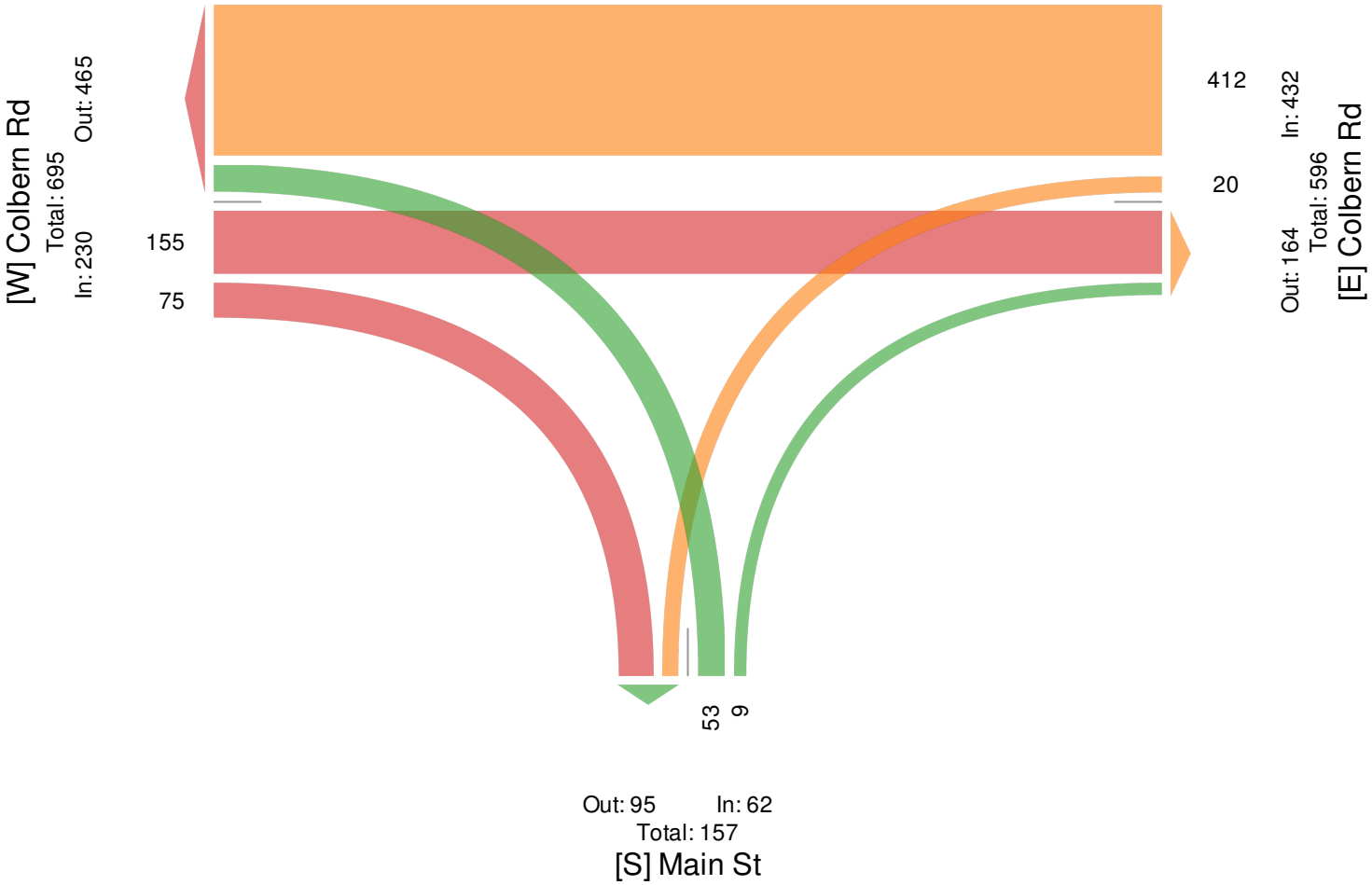
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern Rd				Colbern Rd				Main St				
Direction	Eastbound				Westbound				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

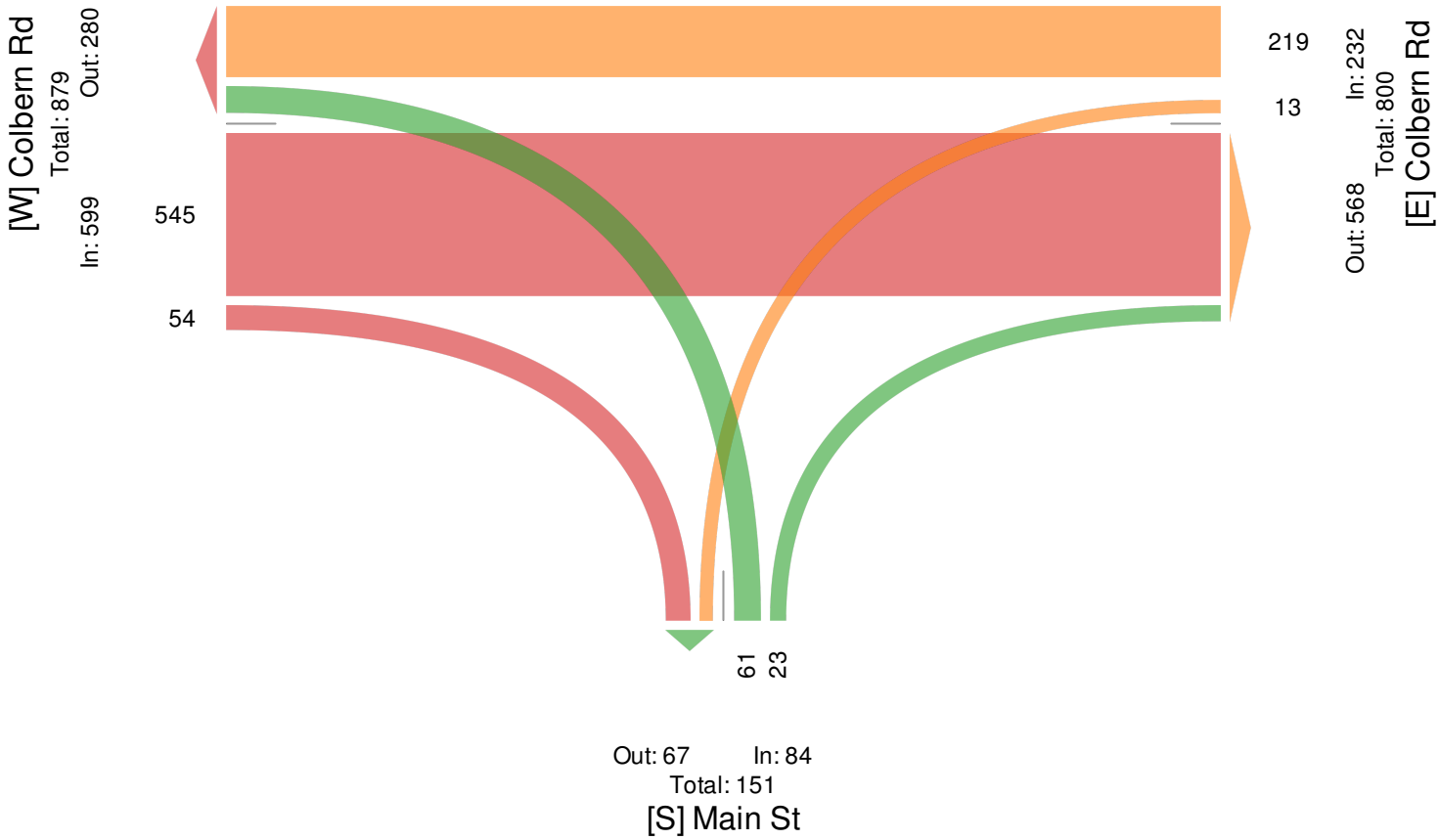
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern Rd				Colbern Rd				Main St				
Direction	Eastbound				Westbound				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

GEWALT HAMILTON ASSOCIATES, INC.
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

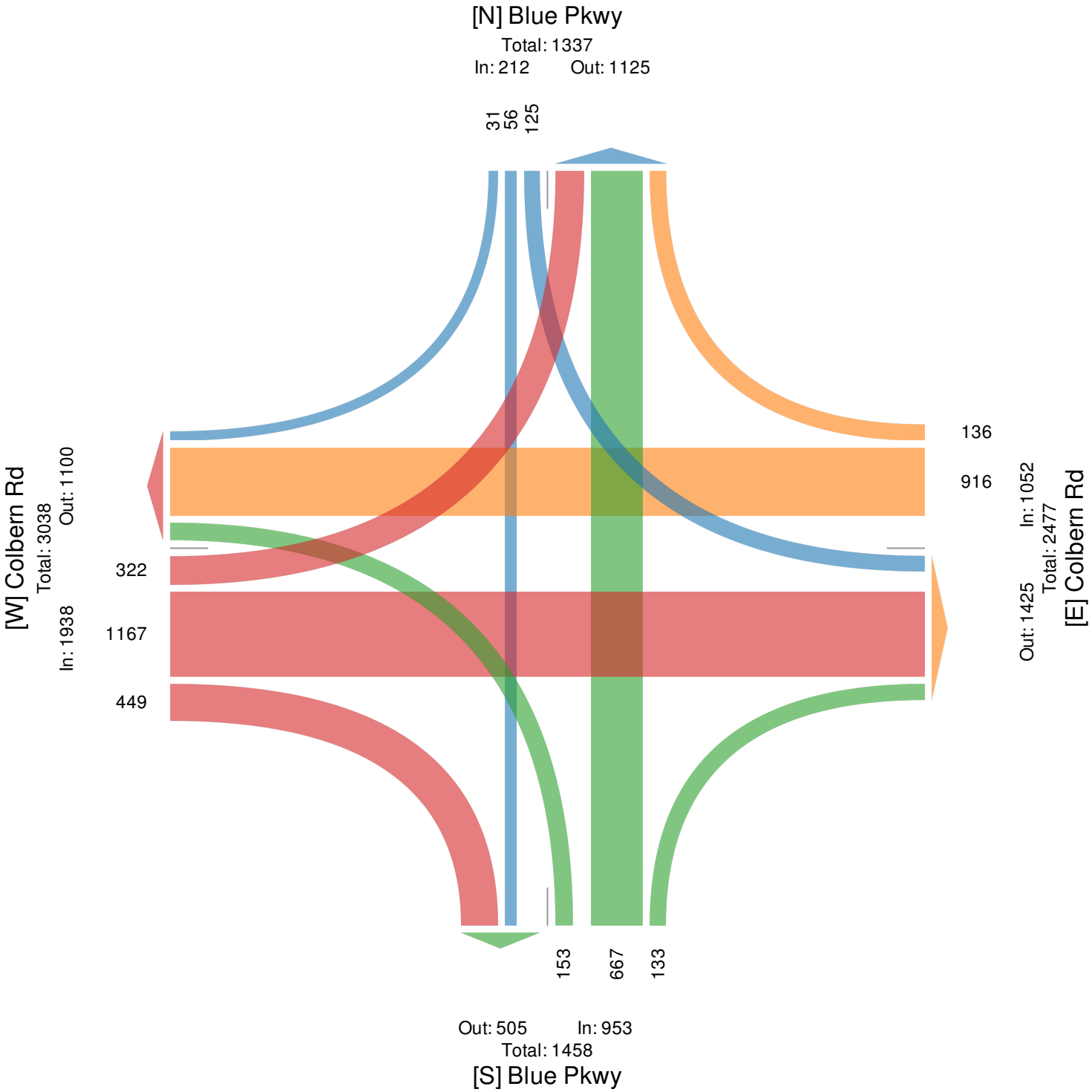
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern Rd					Colbern Rd					Blue Pkwy					Blue Pkwy					
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	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

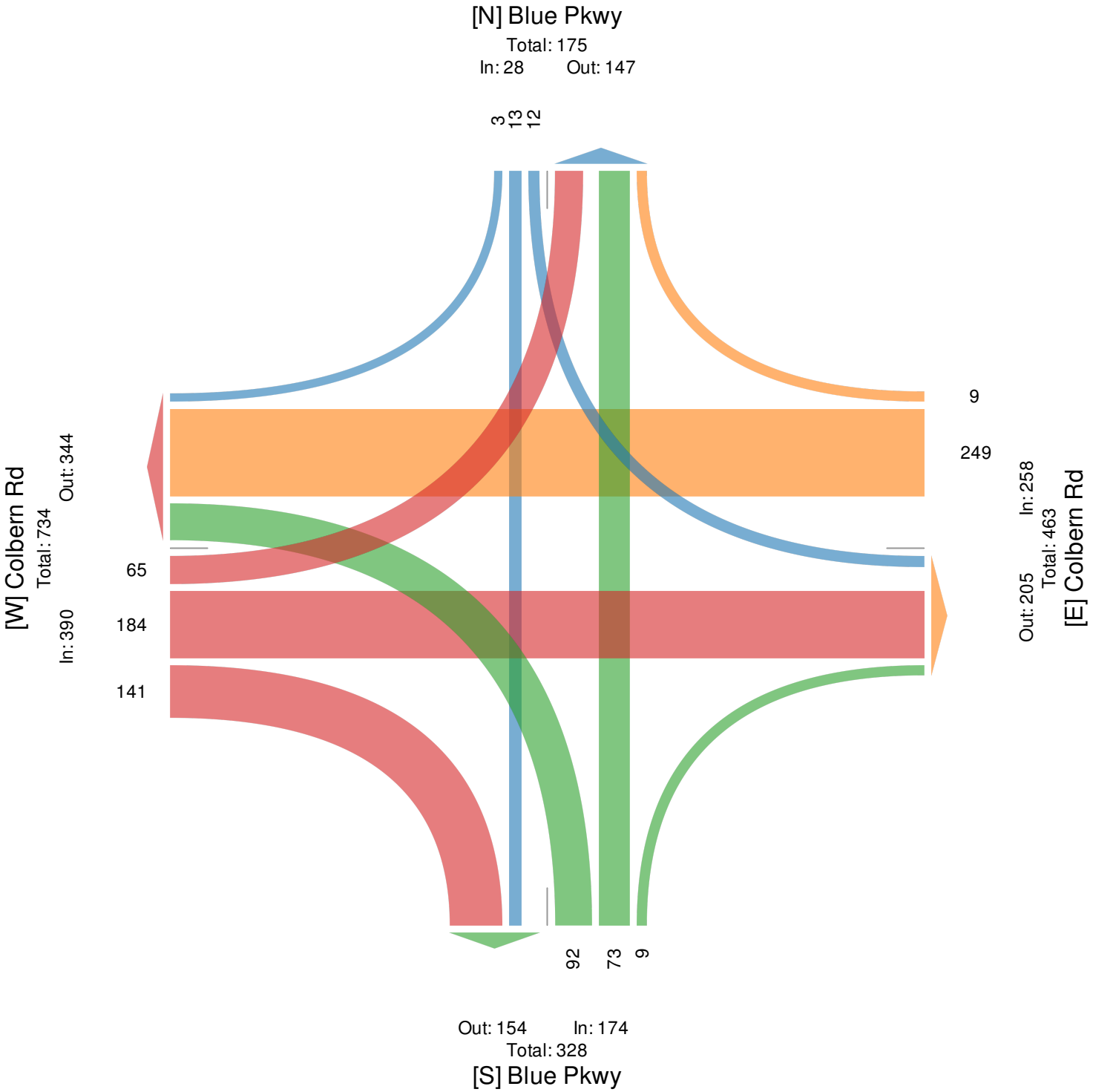
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

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

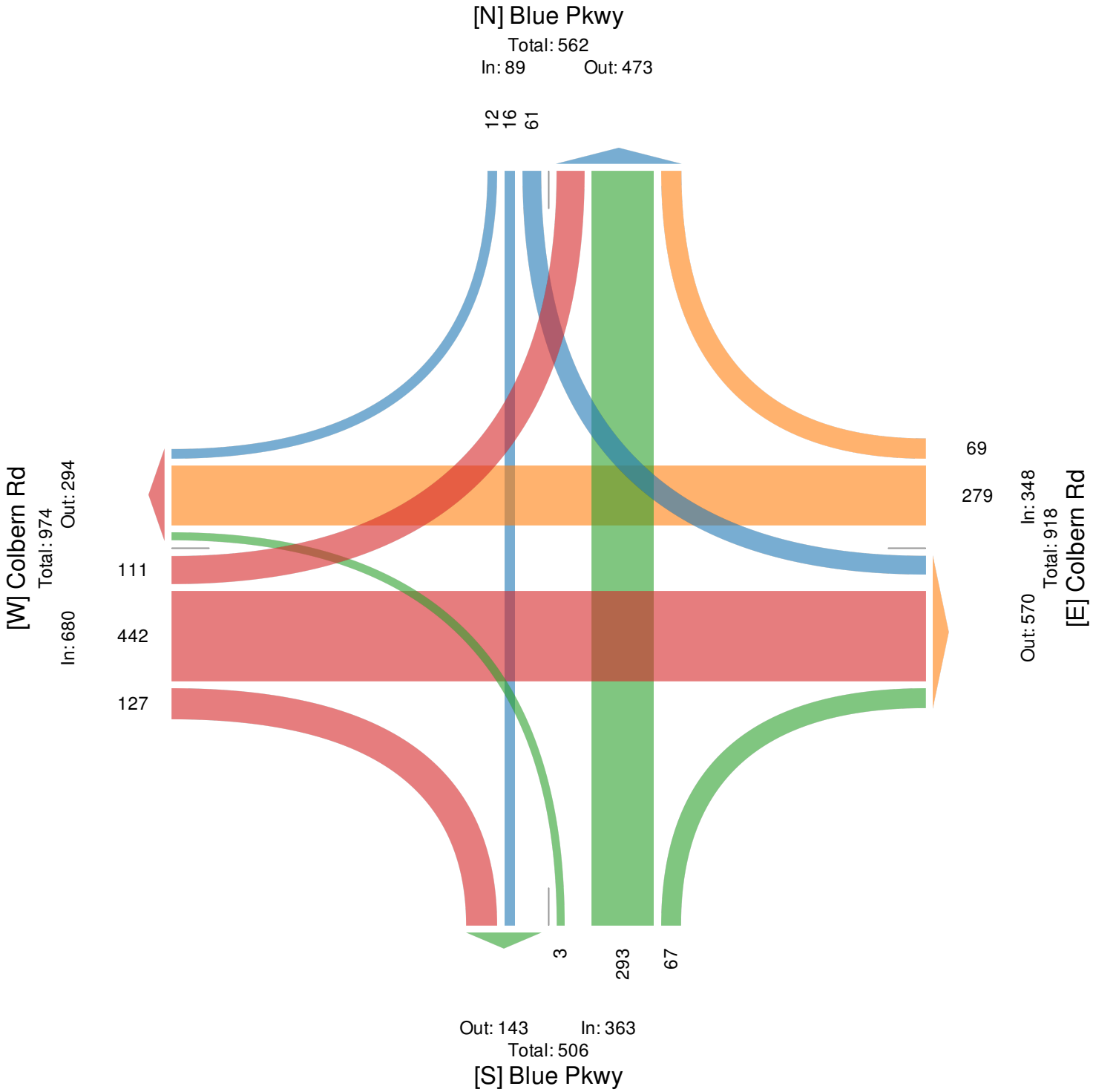
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern Rd					Colbern Rd					Blue Pkwy					Blue Pkwy					
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	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

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



Signal Timings

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 18.3.4					

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)1

Pattern	1	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)2

Pattern	2	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)3

Pattern	3	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)4

Pattern	4	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)5

Pattern	5	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)6

Pattern	6	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)7

Pattern	7	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)8

Pattern	8	**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						

Action Plan (MM-5-2)9

Pattern	9	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)11

Pattern	11	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)12

Pattern	12	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Action Plan (MM-5-2)13

Pattern	13	**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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

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
LP 16 - 30	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
LP 46 - 60	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
LP 76 - 90	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					

Coordination Parameter Data - 1 ()

Coordination Data	
Use Split Pattern	1
Cycle Time	100
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	15	35	15	35	15	35	15	35
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases	2, 6							

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 2 ()

Coordination Data	
Use Split Pattern	2
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 3 ()

Coordination Data	
Use Split Pattern	3
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 4 ()

Coordination Data	
Use Split Pattern	4
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 5 ()

Coordination Data	
Use Split Pattern	5
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 6 ()

Coordination Data	
Use Split Pattern	6
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 7 ()

Coordination Data	
Use Split Pattern	7
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 8 ()

Coordination Data	
Use Split Pattern	8
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 9 ()

Coordination Data	
Use Split Pattern	9
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 11 ()

Coordination Data	
Use Split Pattern	11
Cycle Time	0
Offset Val	0
Actuated Crd Phase	Yes
Actuated Walk	No
Phase Reservice	No
Max Select	MAXINH

Split Sum	0
STD (COS)	
Dwell Add Time	0
Timing Plan	1
Sequence Num	1
Action Plan	0
Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 12 ()

Coordination Data		Split Sum	0
Use Split Pattern	12		
Cycle Time	0	STD (COS)	
Offset Val	0	Dwell Add Time	0
Actuated Crd Phase	Yes	Timing Plan	1
Actuated Walk	No	Sequence Num	1
Phase Reservice	No	Action Plan	0
Max Select	MAXINH	Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

Coordination Parameter Data - 13 ()

Coordination Data		Split Sum	0
Use Split Pattern	13		
Cycle Time	0	STD (COS)	
Offset Val	0	Dwell Add Time	0
Actuated Crd Phase	Yes	Timing Plan	1
Actuated Walk	No	Sequence Num	1
Phase Reservice	No	Action Plan	0
Max Select	MAXINH	Force Off	FIXED

Phase Number	1	2	3	4	5	6	7	8
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0

Phase Number	9	10	11	12	13	14	15	16
Split	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0
Prefercence 2	0	0	0	0	0	0	0	0
Coord Phases								

	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	0	0	0	0
Split Demand	0	0	Xartery Pattern	0

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	NONE	**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

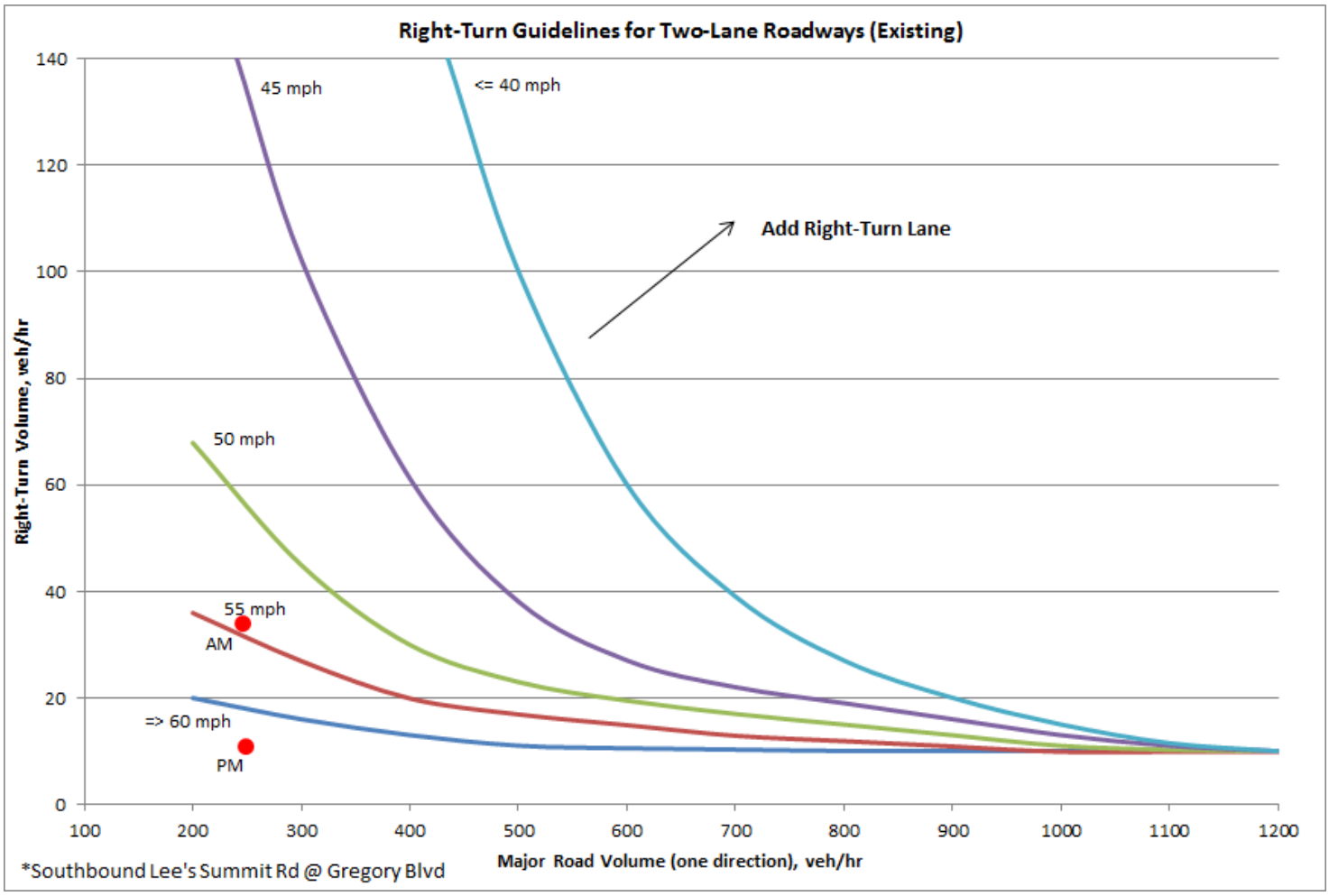
LOAD SWITCH ASSIGN (MMU CHANNEL)

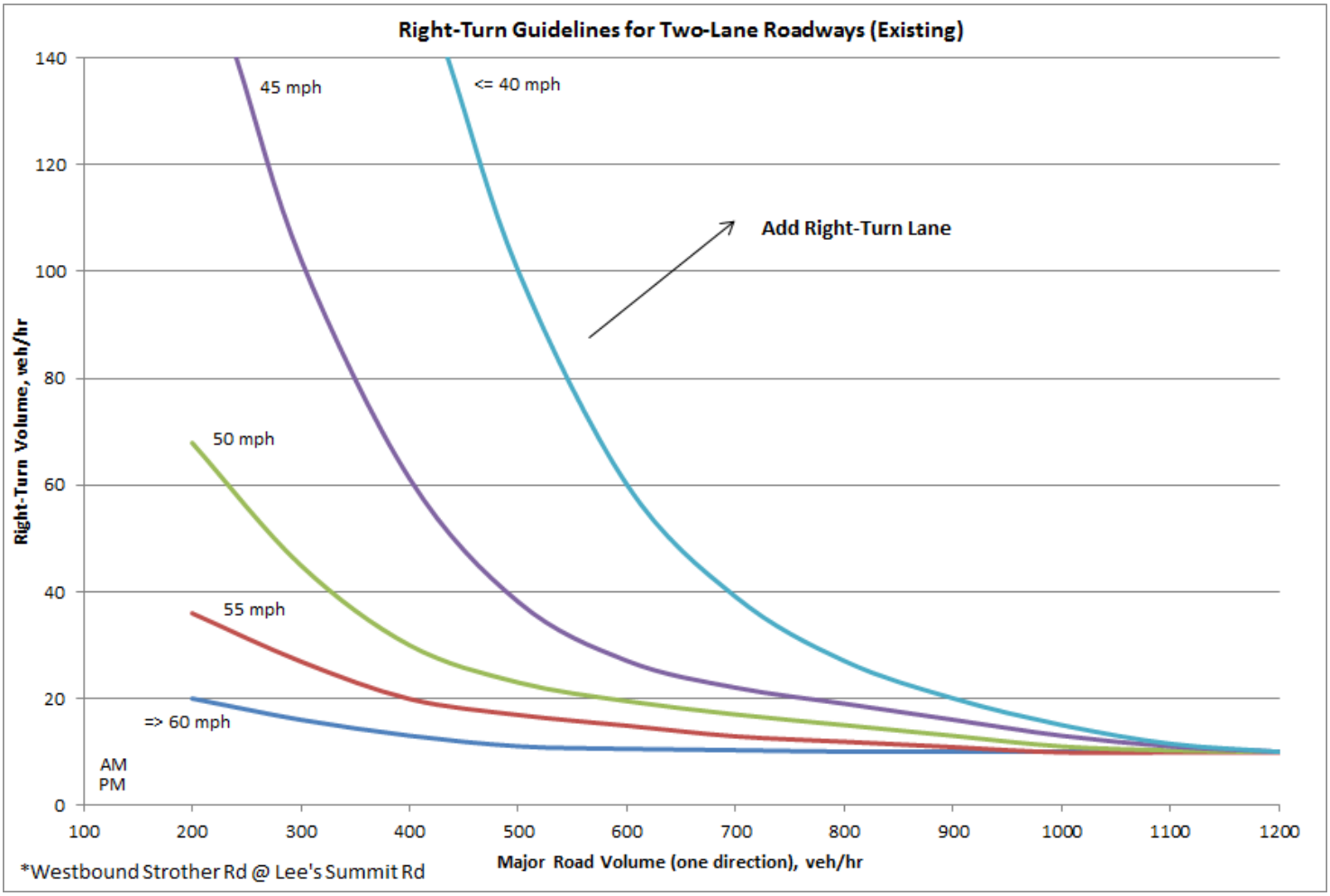
LD Switch	Phase/Ovlp	Type	Dimming	Power	Auto	Together
1	1	Vehicle	NONE	Auto	Red	NONE
2	2	Vehicle	NONE	Auto	Red	NONE
3	3	Vehicle	NONE	Auto	Red	NONE
4	4	Vehicle	NONE	Auto	Red	TOGETHER
5	5	Vehicle	DAHLC	Auto	Red	NONE
6	6	Vehicle	DAHLC	Auto	Red	NONE
7	7	Vehicle	DAHLC	Auto	Red	NONE
8	8	Vehicle	DAHLC	Auto	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

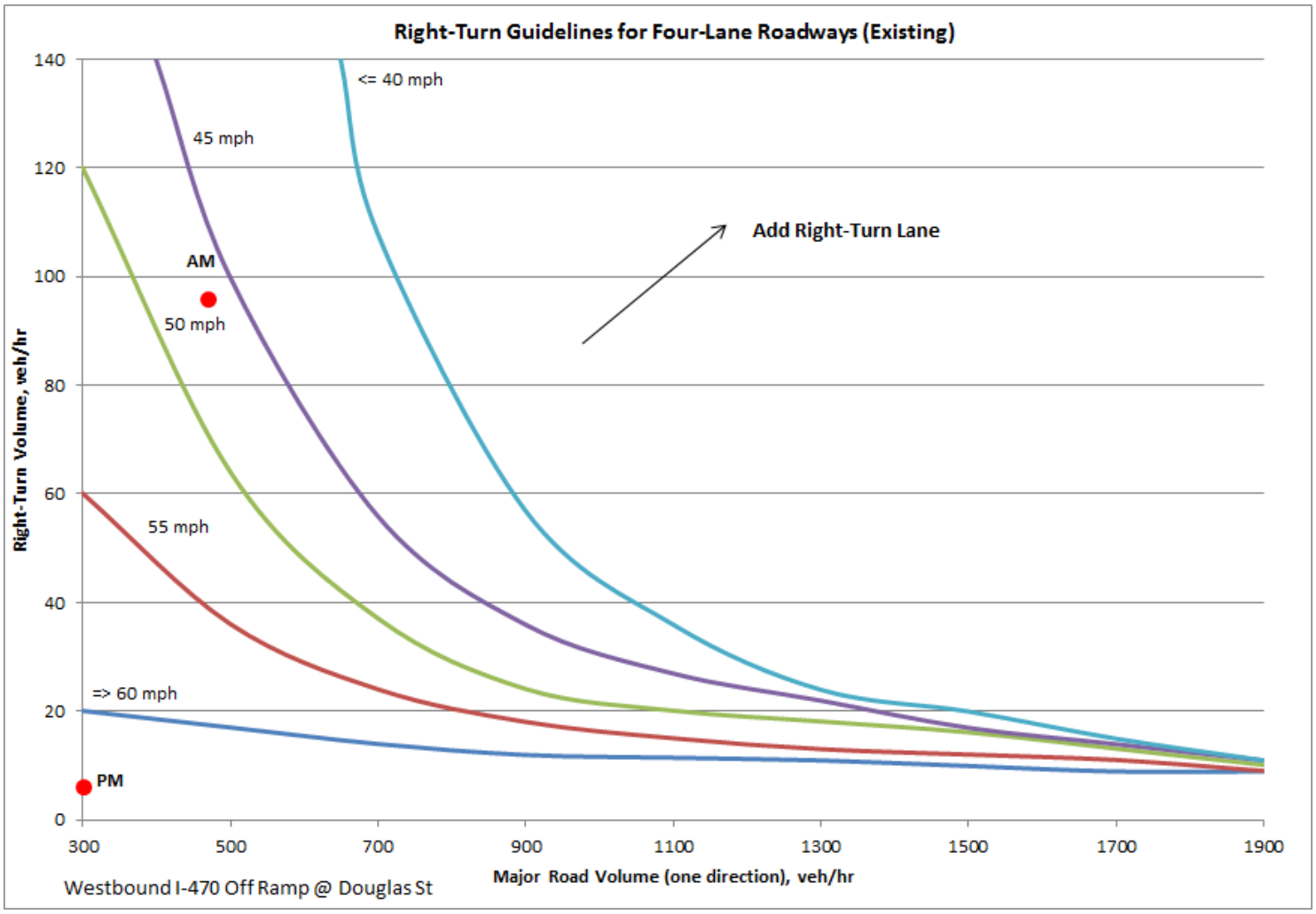
APPENDIX B

Existing Conditions Analysis

Turn Lane Warrants


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


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


Right-Turn Guidelines for Four-Lane Roadways (Existing)
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
<= 40 mph
45 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
AM
PM
140
120
100
80
60
40
20
0
300
500
700
900
1100
1300
1500
1700
1900
Westbound I-470 Off Ramp @ Douglas St

Signal Warrants

Major Street : Lee's Summit Rd
Minor Street : 85th St / St. Michaels HS Drive
City : Kansas City, MO
County : Jackson

Time Count Began : 7:00 am
Date : January 8, 2019
Day of Week of Count: Tuesday

Is the intersection in a community with a population less than 10,000 or are speeds greater than 40 mph? yes

	Major Street	Minor Street
Adjustment factor for day of week and month of year of count	1	1
Number of Lanes	1	1

Time Beginning	Major Street Approach Volumes NORTH	SOUTH	Total	≅	Minor Street Approach Volumes EAST	WEST	*
12:00 m	0	0	0		0	0	0
1:00	0	0	0		0	0	0
2:00	0	0	0		0	0	0
3:00 am	0	0	0		0	0	0
4:00	0	0	0		0	0	0
5:00	0	0	0		0	0	0
6:00 am	0	0	0		0	0	0
7:00	340	499	839		6	67	67
8:00	307	383	690		5	74	74
9:00 am	0	0	0		0	0	0
10:00	0	0	0		0	0	0
11:00	0	0	0		0	0	0
12:00 n	0	0	0		0	0	0
1:00	0	0	0		0	0	0
2:00	0	0	0		0	0	0
3:00 pm	0	0	0		0	0	0
4:00	464	440	904		4	43	43
5:00	510	390	900		4	32	32
6:00 pm	0	0	0		0	0	0
7:00	0	0	0		0	0	0
8:00	0	0	0		0	0	0
9:00 pm	0	0	0		0	0	0
10:00	0	0	0		0	0	0
11:00	0	0	0		0	0	0
24HR Total	1621	1712			19	216	

Note: ≅ Total of both approaches.
* The HIGHEST approach only.

NOTE: Minimum hourly volumes reduced for population <10,000 or speed >40 mph (70% Factor)

NOTE: No adjust ment made

Warrant #1 - Condition A

Percent of Warrant Volumes Met Major	Minor
0	0
0	0
0	0
0	0
0	0
0	0
0	0
240	64
197	70
0	0
0	0
0	0
0	0
0	0
0	0
0	0
258	41
257	30
0	0
0	0
0	0
0	0
0	0
0	0
0	0
Warranting Volumes 350	105
Hours Met	0
Warrant Met	No

Warrant #1 - Condition B

Percent of Warrant Volumes Met Major	Minor
0	0
0	0
0	0
0	0
0	0
0	0
0	0
160	126
131	140
0	0
0	0
0	0
0	0
0	0
0	0
0	0
172	81
171	60
0	0
0	0
0	0
0	0
0	0
0	0
0	0
Warranting Volumes 525	53
Hours Met	2
Warrant Met	No

Warrant #1 - Combination of Conditions A & B

For this warrant vehicle volume requirements for conditions A and B are reduced to
56% Factor

NOTE: Conditions A and B **SHALL BOTH** meet a minimum of 8 hours. However, the 8 hours satisfying condition A **NEED NOT** be the same as the 8 hours satisfying condition B.

Condition	A	B
Hours Met	0	3
Warrant Met	No	

Warrant #2

Warrant Volume	Percent of Warrant
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
60	112
80	93
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
60	72
60	53
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
Warranting Volumes From MUTCD Fig. 4C-2	
Hours Met	1
Warrant Met	No

Warrant #3

Warrant Volume	Percent of Warrant
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
110	61
150	49
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
90	48
90	36
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
Warranting Volumes From MUTCD Fig. 4C-4	
Hours Met	0
Warrant Met	No

***** Major Street volume is so low that no Minor Street warrant exists

Major Street : Lee's Summit Rd
Minor Street : Strother Rd
City : Kansas City, MO
County : Jackson

Time Count Began : 7:00 am
Date : January 8, 2019
Day of Week of Count: Tuesday

Is the intersection in a community with a population less than 10,000 or are speeds greater than 40 mph? yes

	Major Street	Minor Street
Adjustment factor for day of week and month of year of count	1	1
Number of Lanes	2	1

Time Beginning	Major Street Approach Volumes NORTH	SOUTH	Total ≅	Minor Street Approach Volumes EAST	WEST	*
12:00 m	0	0	0	0	0	0
1:00	0	0	0	0	0	0
2:00	0	0	0	0	0	0
3:00 am	0	0	0	0	0	0
4:00	0	0	0	0	0	0
5:00	0	0	0	0	0	0
6:00 am	0	0	0	0	0	0
7:00	301	492	793	0	92	92
8:00	259	373	632	0	57	57
9:00 am	0	0	0	0	0	0
10:00	0	0	0	0	0	0
11:00	0	0	0	0	0	0
12:00 n	0	0	0	0	0	0
1:00	0	0	0	0	0	0
2:00	0	0	0	0	0	0
3:00 pm	0	0	0	0	0	0
4:00	463	469	932	0	101	101
5:00	509	438	947	0	66	66
6:00 pm	0	0	0	0	0	0
7:00	0	0	0	0	0	0
8:00	0	0	0	0	0	0
9:00 pm	0	0	0	0	0	0
10:00	0	0	0	0	0	0
11:00	0	0	0	0	0	0
24HR Total	1532	1772		0	316	

Note: ≅ Total of both approaches.
* The HIGHEST approach only.

NOTE: Minimum hourly volumes reduced for population <10,000 or speed >40 mph (70% Factor)

NOTE: No adjust ment made

Warrant #1 - Condition A

Percent of Warrant Volumes Met Major	Minor
0	0
0	0
0	0
0	0
0	0
0	0
0	0
189	88
150	54
0	0
0	0
0	0
0	0
0	0
0	0
0	0
222	96
225	63
0	0
0	0
0	0
0	0
0	0
0	0

Warranting Volumes: 420 / 105

Hours Met: 0
Warrant Met: No

Warrant #1 - Condition B

Percent of Warrant Volumes Met Major	Minor
0	0
0	0
0	0
0	0
0	0
0	0
0	0
126	174
100	108
0	0
0	0
0	0
0	0
0	0
0	0
0	0
148	191
150	125
0	0
0	0
0	0
0	0
0	0
0	0

Warranting Volumes: 630 / 53

Hours Met: 4
Warrant Met: No

Warrant #1 - Combination of Conditions A & B

For this warrant vehicle volume requirements for conditions A and B are reduced to **56% Factor**

NOTE: Conditions A and B **SHALL BOTH** meet a minimum of 8 hours. However, the 8 hours satisfying condition A **NEED NOT** be the same as the 8 hours satisfying condition B.

Condition	A	B
Hours Met	2	4
Warrant Met	No	

Warrant #2

Warrant Volume	Percent of Warrant
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
80	115
120	48
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
60	168
60	110
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****

Warranting Volumes From MUTCD Fig. 4C-2

Hours Met: 3
Warrant Met: No

***** Major Street volume is so low that no Minor Street warrant exists

Warrant #3

Warrant Volume	Percent of Warrant
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
170	54
230	25
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
130	78
130	51
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****

Warranting Volumes From MUTCD Fig. 4C-4

Hours Met: 0
Warrant Met: No

Major Street : Main St
Minor Street : Colbern Rd
City : Lee's Summit, MO
County : Jackson

Time Count Began : 7:00 am
Date : January 8, 2019
Day of Week of Count: Tuesday

Is the intersection in a community with a population less than 10,000 or are speeds greater than 40 mph? yes

	Major Street	Minor Street
Adjustment factor for day of week and month of year of count	1	1
Number of Lanes	1	1

Time Beginning	Major Street Approach Volumes EAST	WEST	Total	≅	Minor Street Approach Volumes NORTH	SOUTH	*
12:00 m	0	0	0		0	0	0
1:00	0	0	0		0	0	0
2:00	0	0	0		0	0	0
3:00 am	0	0	0		0	0	0
4:00	0	0	0		0	0	0
5:00	0	0	0		0	0	0
6:00 am	0	0	0		0	0	0
7:00	230	432	662		62	0	62
8:00	220	328	548		36	0	36
9:00 am	0	0	0		0	0	0
10:00	0	0	0		0	0	0
11:00	0	0	0		0	0	0
12:00 n	0	0	0		0	0	0
1:00	0	0	0		0	0	0
2:00	0	0	0		0	0	0
3:00 pm	0	0	0		0	0	0
4:00	523	247	770		74	0	74
5:00	547	198	745		74	0	74
6:00 pm	0	0	0		0	0	0
7:00	0	0	0		0	0	0
8:00	0	0	0		0	0	0
9:00 pm	0	0	0		0	0	0
10:00	0	0	0		0	0	0
11:00	0	0	0		0	0	0
24HR Total	1520	1205			246	0	

Note: ≅ Total of both approaches.
* The HIGHEST approach only.

NOTE: Minimum hourly volumes reduced for population <10,000 or speed >40 mph (70% Factor)

NOTE: No adjust ment made

Warrant #1 - Condition A

Percent of Warrant Volumes Met Major	Minor
0	0
0	0
0	0
0	0
0	0
0	0
0	0
189	59
157	34
0	0
0	0
0	0
0	0
0	0
0	0
0	0
220	70
213	70
0	0
0	0
0	0
0	0
0	0
0	0

Warranting Volumes: 350 / 105

Hours Met: 0
Warrant Met: No

Warrant #1 - Condition B

Percent of Warrant Volumes Met Major	Minor
0	0
0	0
0	0
0	0
0	0
0	0
0	0
126	117
104	68
0	0
0	0
0	0
0	0
0	0
0	0
0	0
147	140
142	140
0	0
0	0
0	0
0	0
0	0
0	0

Warranting Volumes: 525 / 53

Hours Met: 3
Warrant Met: No

Warrant #1 - Combination of Conditions A & B

For this warrant vehicle volume requirements for conditions A and B are reduced to **56% Factor**

NOTE: Conditions A and B **SHALL BOTH** meet a minimum of 8 hours. However, the 8 hours satisfying condition A **NEED NOT** be the same as the 8 hours satisfying condition B.

Condition	A	B
Hours Met	0	3
Warrant Met	No	

Warrant #2

Warrant Volume	Percent of Warrant
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
80	78
110	33
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
60	123
70	106
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****

Warranting Volumes From MUTCD Fig. 4C-2

Hours Met: 2
Warrant Met: No

Warrant #3

Warrant Volume	Percent of Warrant
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
160	39
200	18
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****
120	62
130	57
0	*****
0	*****
0	*****
0	*****
0	*****
0	*****

Warranting Volumes From MUTCD Fig. 4C-4

Hours Met: 0
Warrant Met: No

***** Major Street volume is so low that no Minor Street warrant exists

Major Street : Lee's Summit Rd
Minor Street : Douglas Rd
City : Lee's Summit, MO
County : Jackson

Time Count Began : 7:00 am
Date : January 8, 2019
Day of Week of Count: Tuesday

Is the intersection in a community with a population less than 10,000 or are speeds greater than 40 mph? yes

	Major Street	Minor Street
Adjustment factor for day of week and month of year of count	1	1
Number of Lanes	1	1

Time Beginning	Major Street Approach Volumes NORTH	SOUTH	Total	≅	Minor Street Approach Volumes EAST	WEST	*
12:00 m	0	0	0		0	0	0
1:00	0	0	0		0	0	0
2:00	0	0	0		0	0	0
3:00 am	0	0	0		0	0	0
4:00	0	0	0		0	0	0
5:00	0	0	0		0	0	0
6:00 am	0	0	0		0	0	0
7:00	350	489	839		0	8	8
8:00	327	379	706		0	18	18
9:00 am	0	0	0		0	0	0
10:00	0	0	0		0	0	0
11:00	0	0	0		0	0	0
12:00 n	0	0	0		0	0	0
1:00	0	0	0		0	0	0
2:00	0	0	0		0	0	0
3:00 pm	0	0	0		0	0	0
4:00	494	442	936		0	38	38
5:00	512	396	908		0	21	21
6:00 pm	0	0	0		0	0	0
7:00	0	0	0		0	0	0
8:00	0	0	0		0	0	0
9:00 pm	0	0	0		0	0	0
10:00	0	0	0		0	0	0
11:00	0	0	0		0	0	0
24HR Total	1683	1706			0	85	

Note: ≅ Total of both approaches.
* The HIGHEST approach only.

NOTE: Minimum hourly volumes reduced for population <10,000 or speed >40 mph (70% Factor)

NOTE: No adjust ment made

Warrant #1 - Condition A		Warrant #1 - Condition B		Warrant #1 - Combination of Conditions A & B		Warrant #2		Warrant #3	
Percent of Warrant Volumes Met		Percent of Warrant Volumes Met				Warrant Volume	Percent of Warrant	Warrant Volume	Percent of Warrant
Major	Minor	Major	Minor						
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	0	0			0	*****	0	*****
0	0	0	0			0	*****	0	*****
240	8	160	15			60	13	110	7
202	17	134	34			80	23	140	13
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	0	0			0	*****	0	*****
0	0	0	0			0	*****	0	*****
267	36	178	72			60	63	90	42
259	20	173	40			60	35	90	23
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	0	0			0	*****	0	*****
Warranting Volumes 350	105	Warranting Volumes 525	53			Warranting Volumes From MUTCD Fig. 4C-2		Warranting Volumes From MUTCD Fig. 4C-4	
Hours Met	0	Hours Met	0	Condition	A B	Hours Met	0	Hours Met	0
Warrant Met	No	Warrant Met	No	Hours Met	0 0	Warrant Met	No	Warrant Met	No
				Warrant Met	No				

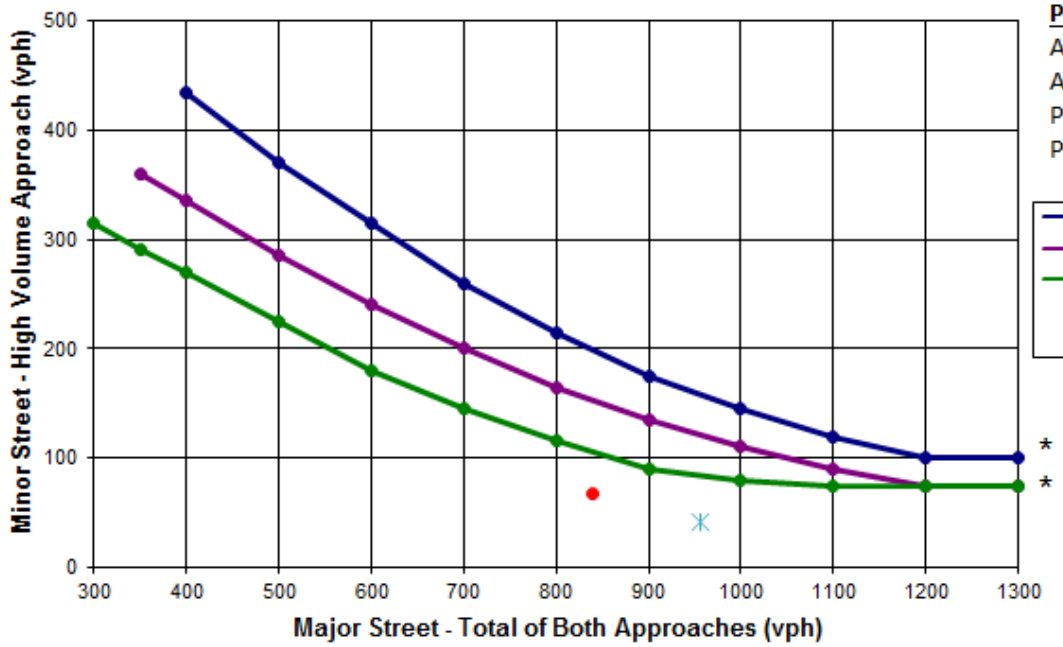
For this warrant vehicle volume requirements for conditions A and B are reduced to **56% Factor**

NOTE: Conditions A and B **SHALL BOTH** meet a minimum of 8 hours. However, the 8 hours satisfying condition A **NEED NOT** be the same as the 8 hours satisfying condition B.

***** Major Street volume is so low that no Minor Street warrant exists

Peak Hour Volume Warrant
Lee's Summit Road & 85th Street

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



Peak Hour Volumes:

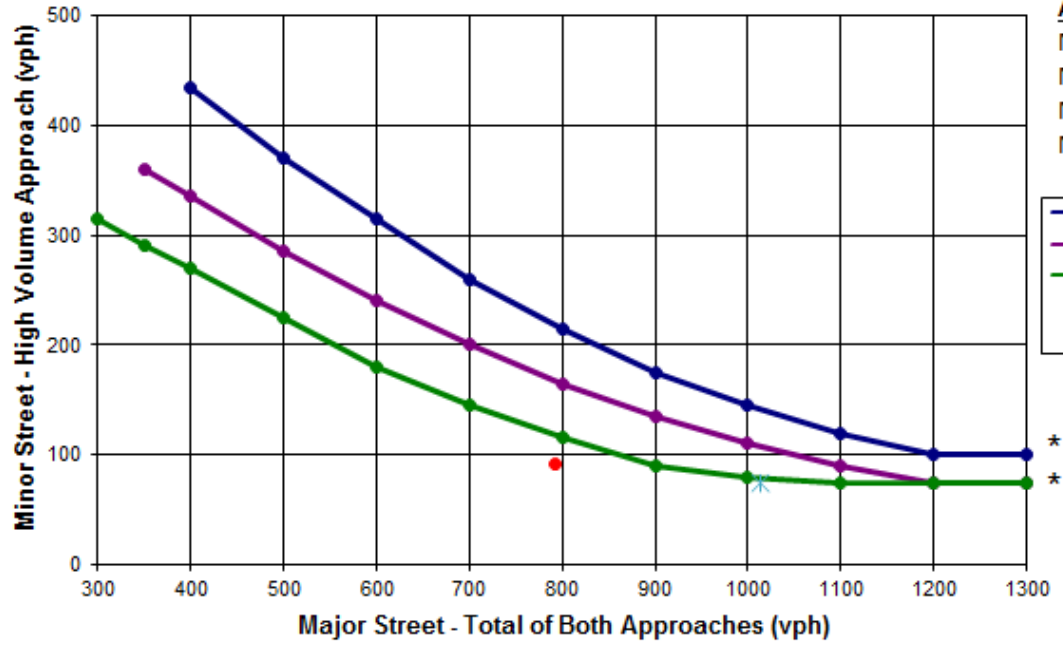
AM Major - 839
AM Minor - 67
PM Major - 956
PM Minor - 45

- 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 and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant
Lee's Summit Road & Strother Road

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



AM & PM Volumes:

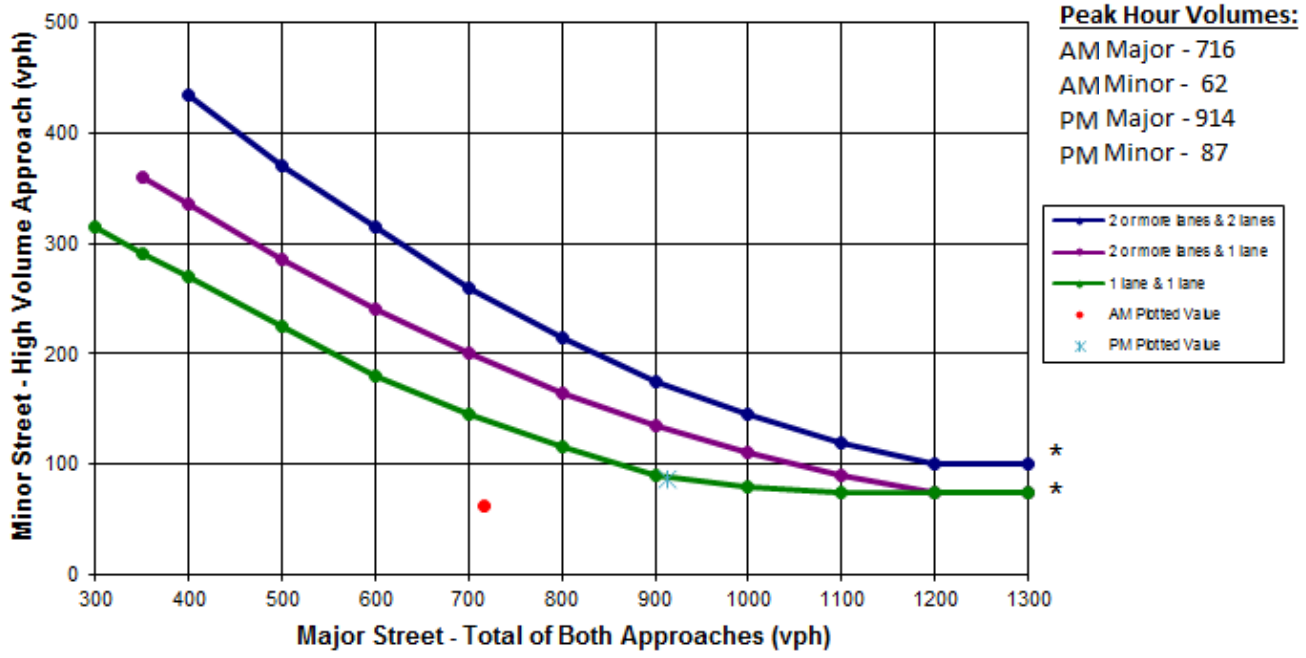
Major - 793
Minor - 92
Major - 1014
Minor - 75

- 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 and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant
Colbern Road & Main Street

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



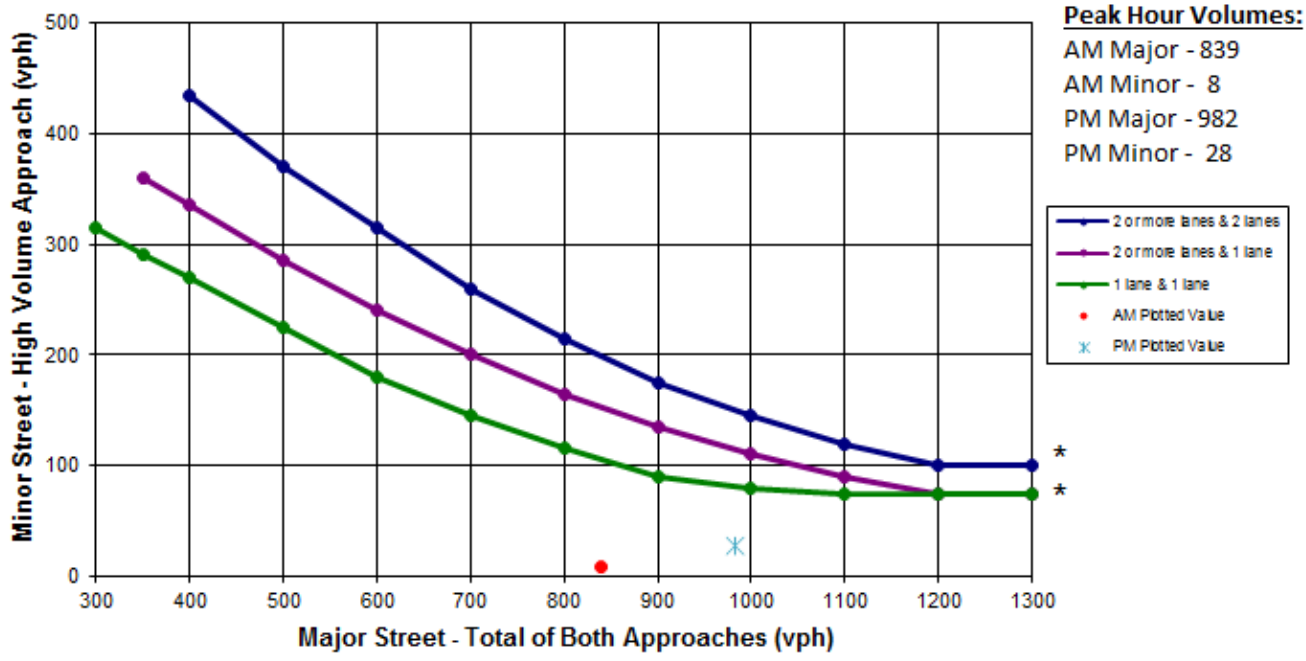
Peak Hour Volumes:

AM Major - 716
AM Minor - 62
PM Major - 914
PM Minor - 87

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant
Lee's Summit Road & Douglas Road

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



Peak Hour Volumes:

AM Major - 839
AM Minor - 8
PM Major - 982
PM Minor - 28

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Capacity Analysis

Intersection	
Int Delay, s/veh	0.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	6	483	335	15	6	2
Future Vol, veh/h	6	483	335	15	6	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	38	94	80	75	75	25
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	514	419	20	8	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	439	0	-	0	975	429
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	546	-
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	1121	-	-	-	279	626
Stage 1	-	-	-	-	657	-
Stage 2	-	-	-	-	580	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1121	-	-	-	275	626
Mov Cap-2 Maneuver	-	-	-	-	400	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	580	-

Approach	SE	NW	SW
HCM Control Delay, s	0.2	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1121	-	488
HCM Lane V/C Ratio	-	-	0.014	-	0.033
HCM Control Delay (s)	-	-	8.3	-	12.6
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	1	40	0	27	1	268	71	56	443	0
Future Vol, veh/h	5	0	1	40	0	27	1	268	71	56	443	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	42	100	25	50	100	45	25	84	55	61	89	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	4	80	0	60	4	319	129	92	498	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1104	1138	498	1011	1009	319	498	0	0	448	0	0
Stage 1	682	682	-	327	327	-	-	-	-	-	-	-
Stage 2	422	456	-	684	682	-	-	-	-	-	-	-
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	188	201	572	218	240	722	1066	-	-	1112	-	-
Stage 1	440	450	-	686	648	-	-	-	-	-	-	-
Stage 2	609	568	-	439	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	184	572	202	219	722	1066	-	-	1112	-	-
Mov Cap-2 Maneuver	161	184	-	202	219	-	-	-	-	-	-	-
Stage 1	438	413	-	683	645	-	-	-	-	-	-	-
Stage 2	556	566	-	400	413	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.9	23.9	0.1	1.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1066	-	-	197	202	722	1112	-	-
HCM Lane V/C Ratio	0.004	-	-	0.081	0.396	0.083	0.083	-	-
HCM Control Delay (s)	8.4	-	-	24.9	34	10.4	8.5	-	-
HCM Lane LOS	A	-	-	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1.8	0.3	0.3	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	36	56	278	23	32	460
Future Vol, veh/h	36	56	278	23	32	460
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	82	74	78	58	67	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	76	356	40	48	489

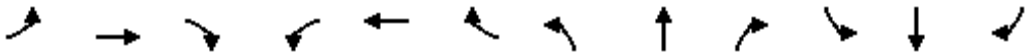
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	941	178	0	0	396	0
Stage 1	356	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	277	835	-	-	1161	-
Stage 1	681	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	266	835	-	-	1161	-
Mov Cap-2 Maneuver	379	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	556	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	579	1161	-
HCM Lane V/C Ratio	-	-	0.207	0.041	-
HCM Control Delay (s)	-	-	12.8	8.2	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	64	91	261	212	48	112	143	52	20	269
v/c Ratio	0.03	0.21	0.25	0.47	0.28	0.07	0.30	0.23	0.09	0.04	0.62
Control Delay	14.1	31.9	5.9	18.3	18.4	0.2	16.2	20.2	0.3	13.6	31.9
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	14.1	31.9	5.9	18.3	18.4	0.2	16.2	20.2	0.3	13.6	31.9
Queue Length 50th (ft)	4	24	0	73	57	0	28	36	0	5	99
Queue Length 95th (ft)	13	60	19	154	154	0	69	95	0	15	197
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	641	1000	905	699	1143	1017	555	1000	903	693	1120
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	0.10	0.37	0.19	0.05	0.20	0.14	0.06	0.03	0.24

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	50	75	232	189	36	100	116	43	14	197	34
Future Volume (veh/h)	11	50	75	232	189	36	100	116	43	14	197	34
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	16	64	91	261	212	48	112	143	52	20	229	40
Peak Hour Factor	0.69	0.78	0.82	0.89	0.89	0.75	0.89	0.81	0.83	0.70	0.86	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	406	326	276	577	576	488	322	464	393	388	309	54
Arrive On Green	0.02	0.17	0.17	0.15	0.31	0.31	0.07	0.25	0.25	0.02	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1551	271
Grp Volume(v), veh/h	16	64	91	261	212	48	112	143	52	20	0	269
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1822
Q Serve(g_s), s	0.3	1.7	2.9	6.6	5.1	1.2	2.8	3.6	1.5	0.5	0.0	8.0
Cycle Q Clear(g_c), s	0.3	1.7	2.9	6.6	5.1	1.2	2.8	3.6	1.5	0.5	0.0	8.0
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	406	326	276	577	576	488	322	464	393	388	0	363
V/C Ratio(X)	0.04	0.20	0.33	0.45	0.37	0.10	0.35	0.31	0.13	0.05	0.00	0.74
Avail Cap(c_a), veh/h	837	1142	967	926	1142	967	658	1142	967	967	0	1112
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	13.3	20.2	20.7	15.2	15.5	14.2	16.8	17.6	16.8	15.5	0.0	21.6
Incr Delay (d2), s/veh	0.0	0.6	1.5	0.2	0.8	0.2	0.2	0.4	0.2	0.0	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(50%),veh/ln	0.1	0.7	1.0	2.3	2.0	0.4	1.0	1.4	0.5	0.2	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.3	20.9	22.2	15.4	16.3	14.4	17.1	17.9	16.9	15.5	0.0	24.6
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		171			521			307			289	
Approach Delay, s/veh		20.9			15.7			17.5			24.0	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	15.5	10.2	17.4	6.6	23.1	7.4	20.2
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	20.0	35.0	15.0	35.0	15.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	8.6	4.9	4.8	10.0	2.3	7.1	2.5	5.6
Green Ext Time (p_c), s	0.3	1.3	0.1	1.5	0.0	2.7	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	155	75	23	463	53	9
Future Vol, veh/h	155	75	23	463	53	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	85	71	90	70	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	199	88	32	514	76	12

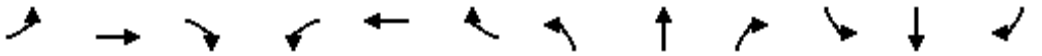
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	287	0	821	243
Stage 1	-	-	-	-	243	-
Stage 2	-	-	-	-	578	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1275	-	344	796
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	561	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1275	-	332	796
Mov Cap-2 Maneuver	-	-	-	-	332	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	361	-	-	1275	-
HCM Lane V/C Ratio	0.243	-	-	0.025	-
HCM Control Delay (s)	18.1	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	336	317	595	604	778	424
v/c Ratio	0.77	0.66	0.68	0.27	0.64	0.57
Control Delay	43.0	27.8	20.8	16.8	9.3	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	27.8	20.8	16.8	9.3	5.8
Queue Length 50th (ft)	182	121	162	143	63	37
Queue Length 95th (ft)	196	203	207	183	79	61
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	522	560	877	2230	1218	748
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	0.64	0.57	0.68	0.27	0.64	0.57

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	373	0	96	500	538	0	0	275	696
Future Volume (vph)	0	0	0	373	0	96	500	538	0	0	275	696
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.94		1.00	1.00			0.92	0.85
Flt Protected				0.95	0.97		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1614		3433	3539			3112	1441
Flt Permitted				0.95	0.97		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1614		3433	3539			3112	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.71	1.00	0.75	0.84	0.89	1.00	1.00	0.78	0.82
Adj. Flow (vph)	0	0	0	525	0	128	595	604	0	0	353	849
RTOR Reduction (vph)	0	0	0	0	63	0	0	0	0	0	225	289
Lane Group Flow (vph)	0	0	0	336	254	0	595	604	0	0	553	135
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				23.3	23.3		23.0	56.7			28.7	28.7
Effective Green, g (s)				23.3	23.3		23.0	56.7			28.7	28.7
Actuated g/C Ratio				0.26	0.26		0.26	0.63			0.32	0.32
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				435	417		877	2229			992	459
v/s Ratio Prot				c0.20	0.16		c0.17	0.17			c0.18	
v/s Ratio Perm												0.09
v/c Ratio				0.77	0.61		0.68	0.27			0.56	0.29
Uniform Delay, d1				30.9	29.3		30.2	7.4			25.4	23.0
Progression Factor				1.00	1.00		0.55	2.02			0.46	1.05
Incremental Delay, d2				8.3	2.5		2.2	0.3			1.8	1.3
Delay (s)				39.2	31.9		18.8	15.3			13.5	25.5
Level of Service				D	C		B	B			B	C
Approach Delay (s)		0.0			35.6			17.0			17.7	
Approach LOS		A			D			B			B	

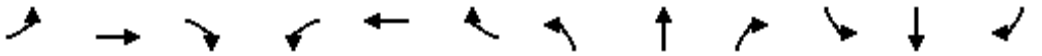
Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	92	132	655	493	90	311	401	40	482
v/c Ratio	0.35	0.32	0.85	0.78	0.26	0.52	0.34	0.12	0.51
Control Delay	22.9	34.9	28.9	24.9	26.3	37.5	2.3	19.1	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	34.9	28.9	24.9	26.3	37.5	2.3	19.1	29.4
Queue Length 50th (ft)	27	32	238	242	46	185	11	14	120
Queue Length 95th (ft)	29	60	47	#107	59	248	10	32	166
Internal Link Dist (ft)		2564		2353		407			2439
Turn Bay Length (ft)	200		200		160			290	
Base Capacity (vph)	275	416	853	633	350	593	1223	347	953
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.32	0.77	0.78	0.26	0.52	0.33	0.12	0.51

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)	48	100	17	609	368	56	54	255	325	33	345	76
Future Volume (veh/h)	48	100	17	609	368	56	54	255	325	33	345	76
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	92	112	20	655	409	84	90	311	401	40	392	90
Peak Hour Factor	0.52	0.89	0.85	0.93	0.90	0.67	0.60	0.82	0.81	0.83	0.88	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	299	350	61	709	519	107	304	499	873	221	747	170
Arrive On Green	0.06	0.12	0.12	0.47	0.58	0.58	0.02	0.09	0.09	0.04	0.26	0.26
Sat Flow, veh/h	1781	3024	528	2494	1506	309	1781	1870	1585	1781	2876	654
Grp Volume(v), veh/h	92	65	67	655	0	493	90	311	401	40	241	241
Grp Sat Flow(s),veh/h/ln	1781	1777	1775	1247	0	1815	1781	1870	1585	1781	1777	1753
Q Serve(g_s), s	0.0	3.0	3.1	22.1	0.0	19.0	3.3	14.4	5.6	0.0	10.4	10.6
Cycle Q Clear(g_c), s	0.0	3.0	3.1	22.1	0.0	19.0	3.3	14.4	5.6	0.0	10.4	10.6
Prop In Lane	1.00		0.30	1.00		0.17	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	299	206	205	709	0	625	304	499	873	221	462	455
V/C Ratio(X)	0.31	0.32	0.33	0.92	0.00	0.79	0.30	0.62	0.46	0.18	0.52	0.53
Avail Cap(c_a), veh/h	363	206	205	859	0	625	368	499	873	257	462	455
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	0.00	0.89	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	36.5	36.6	22.7	0.0	16.6	23.9	36.7	3.3	35.1	28.5	28.6
Incr Delay (d2), s/veh	0.6	0.9	0.9	12.6	0.0	8.8	0.5	5.6	1.7	0.4	4.2	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.3	1.3	5.5	0.0	6.5	1.4	7.9	3.2	0.8	4.7	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	37.4	37.5	35.3	0.0	25.3	24.5	42.3	5.0	35.5	32.7	33.0
LnGrp LOS	C	D	D	D	A	C	C	D	A	D	C	C
Approach Vol, veh/h		224			1148			802			522	
Approach Delay, s/veh		35.8			31.0			21.6			33.0	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	29.4	30.6	16.2	9.2	30.0	10.8	36.0
Change Period (Y+Rc), s	5.0	* 6	5.0	* 5.8	* 6	* 6	5.8	* 5
Max Green Setting (Gmax), s	8.0	* 21	31.0	* 8.2	* 5	* 24	8.2	* 31
Max Q Clear Time (g_c+I1), s	5.3	12.6	24.1	5.1	2.0	16.4	2.0	21.0
Green Ext Time (p_c), s	0.0	1.7	1.5	0.1	0.0	2.0	0.1	2.0

Intersection Summary	
HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

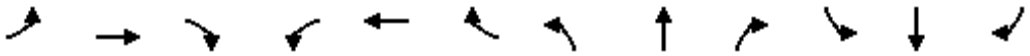
Notes

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	377	356	349	737	307	4	808
v/c Ratio	0.68	0.65	0.62	0.27	0.31	0.04	0.41
Control Delay	31.7	22.7	21.8	4.3	1.2	41.5	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	22.7	21.8	4.3	1.2	41.5	11.4
Queue Length 50th (ft)	192	135	124	14	0	2	164
Queue Length 95th (ft)	243	14	155	64	0	m4	208
Internal Link Dist (ft)		541		1067			491
Turn Bay Length (ft)					200	100	
Base Capacity (vph)	747	711	722	2737	993	98	1983
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	0.50	0.50	0.48	0.27	0.31	0.04	0.41

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)	404	1	526	0	0	0	0	634	212	2	646	0
Future Volume (vph)	404	1	526	0	0	0	0	634	212	2	646	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	1.00	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1478	1504					5085	1583	1770	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1478	1504					5085	1583	1770	3539	
Peak-hour factor, PHF	0.91	0.25	0.83	1.00	1.00	1.00	1.00	0.86	0.69	0.50	0.80	1.00
Adj. Flow (vph)	444	4	634	0	0	0	0	737	307	4	808	0
RTOR Reduction (vph)	0	66	66	0	0	0	0	0	156	0	0	0
Lane Group Flow (vph)	377	290	283	0	0	0	0	737	151	4	808	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)	29.6	29.6	29.6					44.4	44.4	1.0	50.4	
Effective Green, g (s)	29.6	29.6	29.6					44.4	44.4	1.0	50.4	
Actuated g/C Ratio	0.33	0.33	0.33					0.49	0.49	0.01	0.56	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	552	486	494					2508	780	19	1981	
v/s Ratio Prot	c0.22	0.20						0.14		0.00	c0.23	
v/s Ratio Perm			0.19						0.10			
v/c Ratio	0.68	0.60	0.57					0.29	0.19	0.21	0.41	
Uniform Delay, d1	26.1	25.2	25.0					13.5	12.8	44.1	11.3	
Progression Factor	1.00	1.00	1.00					0.30	0.16	1.02	0.84	
Incremental Delay, d2	3.5	2.0	1.6					0.3	0.5	4.3	0.5	
Delay (s)	29.6	27.2	26.6					4.4	2.6	49.1	10.0	
Level of Service	C	C	C					A	A	D	A	
Approach Delay (s)		27.8			0.0			3.9			10.2	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

LANE LEVEL OF SERVICE

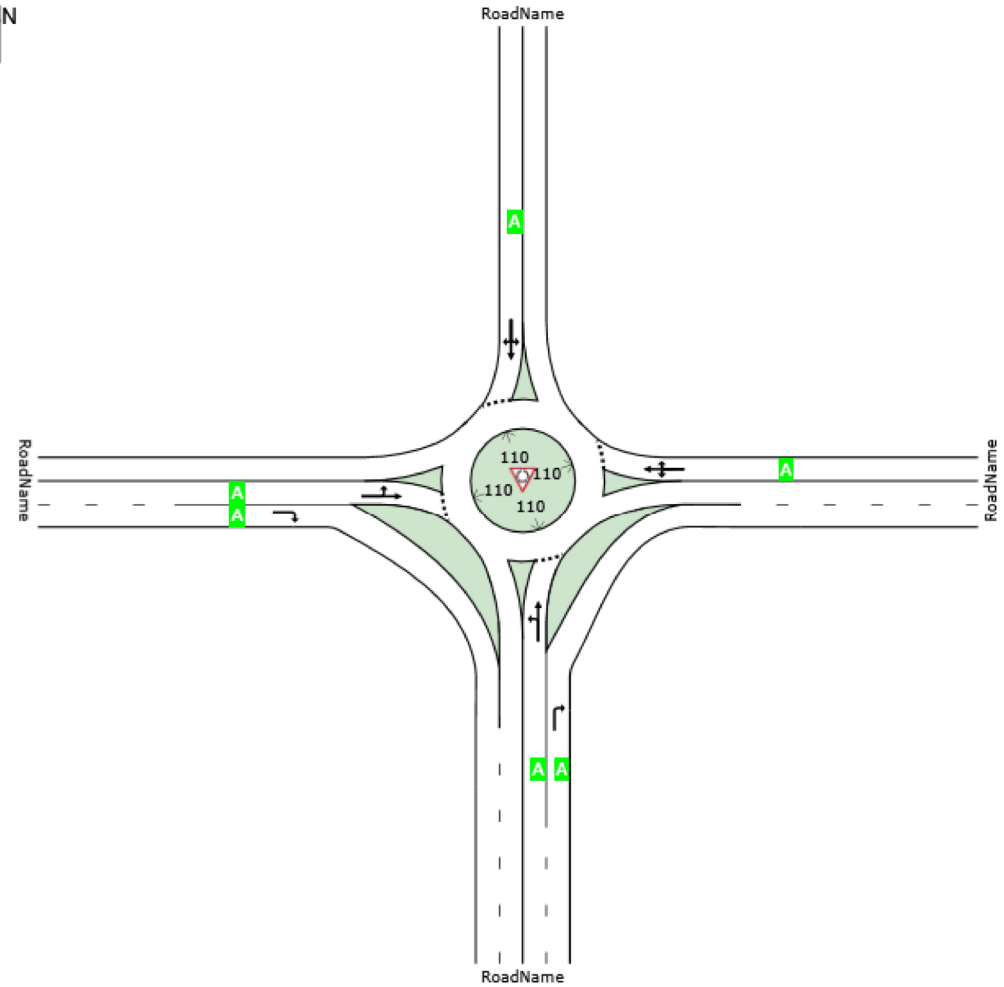
Lane Level of Service

Site: 101 [Colbern Rd & Blue Pkwy (Ex AM)]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
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).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

Site: 101 [Colbern Rd & Blue Pkwy (Ex AM)]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: RoadName													
Lane 1[d]	104	2.0	1093	0.095	100	4.1	LOS A	0.4	9.5	Full	1600	0.0	0.0
Lane 2	20	2.0	1642	0.012	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	124	2.0		0.095		3.4	LOS A	0.4	9.5				
East: RoadName													
Lane 1[d]	591	2.0	1200	0.493	100	8.3	LOS A	3.5	88.5	Full	1600	0.0	0.0
Approach	591	2.0		0.493		8.3	LOS A	3.5	88.5				
North: RoadName													
Lane 1[d]	16	2.0	690	0.023	100	5.5	LOS A	0.1	2.2	Full	1600	0.0	0.0
Approach	16	2.0		0.023		5.5	LOS A	0.1	2.2				
West: RoadName													
Lane 1[d]	252	2.0	1311	0.192	100	4.4	LOS A	0.9	22.3	Full	1600	0.0	0.0
Lane 2	217	2.0	1642	0.132	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	469	2.0		0.192		2.4	LOS A	0.9	22.3				
Intersection	1200	2.0		0.493		5.5	LOS A	3.5	88.5				

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.
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).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Intersection	
Int Delay, s/veh	0.5

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	2	448	520	12	18	10
Future Vol, veh/h	2	448	520	12	18	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	50	93	83	60	75	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	482	627	20	24	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	647	0	-	0	1127	637
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	490	-
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	939	-	-	-	226	477
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	939	-	-	-	225	477
Mov Cap-2 Maneuver	-	-	-	-	360	-
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	616	-

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	939	-	392
HCM Lane V/C Ratio	-	-	0.004	-	0.092
HCM Control Delay (s)	-	-	8.8	-	15.1
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0	-	0.3

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	2	0	1	25	0	17	2	498	12	20	419	5
Future Vol, veh/h	2	0	1	25	0	17	2	498	12	20	419	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	50	100	25	39	100	71	50	84	75	63	90	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	4	64	0	24	4	593	16	32	466	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1155	1151	470	1137	1139	593	474	0	0	609	0	0
Stage 1	534	534	-	601	601	-	-	-	-	-	-	-
Stage 2	621	617	-	536	538	-	-	-	-	-	-	-
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	174	198	594	179	201	506	1088	-	-	970	-	-
Stage 1	530	524	-	487	489	-	-	-	-	-	-	-
Stage 2	475	481	-	529	522	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	191	594	173	194	506	1088	-	-	970	-	-
Mov Cap-2 Maneuver	161	191	-	173	194	-	-	-	-	-	-	-
Stage 1	528	507	-	485	487	-	-	-	-	-	-	-
Stage 2	451	479	-	508	505	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	30.8	0.1	0.6
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1088	-	-	253	173	506	970	-	-
HCM Lane V/C Ratio	0.004	-	-	0.032	0.371	0.047	0.033	-	-
HCM Control Delay (s)	8.3	-	-	19.7	37.6	12.5	8.8	-	-
HCM Lane LOS	A	-	-	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.6	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	19	56	1	492	30	65	426
Future Vol, veh/h	19	56	1	492	30	65	426
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	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	68	93	25	83	83	90	91
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	28	60	4	593	36	72	468

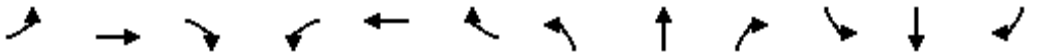
Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1213	297	-	0	0	629	0
Stage 1	601	-	-	-	-	-	-
Stage 2	612	-	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	2.219	-
Pot Cap-1 Maneuver	187	700	-	-	-	951	-
Stage 1	511	-	-	-	-	-	-
Stage 2	540	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	173	700	-	-	-	951	-
Mov Cap-2 Maneuver	173	-	-	-	-	-	-
Stage 1	472	-	-	-	-	-	-
Stage 2	540	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.4		1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	356	951	-
HCM Lane V/C Ratio	-	-	0.248	0.076	-
HCM Control Delay (s)	-	-	18.4	9.1	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	193	116	141	104	68	124	272	265	44	249
v/c Ratio	0.09	0.47	0.26	0.31	0.17	0.11	0.31	0.45	0.38	0.11	0.61
Control Delay	14.4	30.3	7.2	16.4	22.2	1.4	16.9	25.5	5.2	14.8	33.4
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	14.4	30.3	7.2	16.4	22.2	1.4	16.9	25.5	5.2	14.8	33.4
Queue Length 50th (ft)	12	72	0	36	35	0	32	102	0	11	95
Queue Length 95th (ft)	31	151	40	71	71	0	63	210	43	35	190
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	644	941	858	653	1075	964	562	941	930	628	1065
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	0.21	0.14	0.22	0.10	0.07	0.22	0.29	0.28	0.07	0.23

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	164	104	104	78	54	92	245	223	39	198	11
Future Volume (veh/h)	37	164	104	104	78	54	92	245	223	39	198	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	48	193	116	141	104	68	124	272	265	44	233	16
Peak Hour Factor	0.77	0.85	0.90	0.74	0.75	0.79	0.74	0.90	0.84	0.89	0.85	0.69
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	450	357	302	401	435	368	366	441	374	309	348	24
Arrive On Green	0.05	0.19	0.19	0.09	0.23	0.23	0.08	0.24	0.24	0.05	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1730	119
Grp Volume(v), veh/h	48	193	116	141	104	68	124	272	265	44	0	249
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1849
Q Serve(g_s), s	1.0	4.9	3.3	3.2	2.4	1.8	2.8	6.8	8.0	1.0	0.0	6.5
Cycle Q Clear(g_c), s	1.0	4.9	3.3	3.2	2.4	1.8	2.8	6.8	8.0	1.0	0.0	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	450	357	302	401	435	368	366	441	374	309	0	372
V/C Ratio(X)	0.11	0.54	0.38	0.35	0.24	0.18	0.34	0.62	0.71	0.14	0.00	0.67
Avail Cap(c_a), veh/h	874	1249	1058	921	1249	1058	734	1249	1058	909	0	1234
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	14.0	19.1	18.5	15.0	16.4	16.1	15.0	17.9	18.4	14.4	0.0	19.3
Incr Delay (d2), s/veh	0.0	2.7	1.7	0.2	0.6	0.5	0.2	1.4	2.5	0.1	0.0	2.1
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	0.4	2.1	1.2	1.1	1.0	0.6	0.9	2.6	2.7	0.3	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	21.9	20.2	15.2	17.0	16.6	15.2	19.3	20.9	14.4	0.0	21.4
LnGrp LOS	B	C	C	B	B	B	B	B	C	B	A	C
Approach Vol, veh/h		357			313			661			293	
Approach Delay, s/veh		20.3			16.1			19.2			20.4	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	15.5	10.2	16.5	8.0	17.7	8.4	18.4
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	20.0	35.0	15.0	35.0	15.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	5.2	6.9	4.8	8.5	3.0	4.4	3.0	10.0
Green Ext Time (p_c), s	0.1	3.0	0.1	1.3	0.0	1.6	0.0	2.3

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

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	628	54	13	219	61	26
Future Vol, veh/h	628	54	13	219	61	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	68	54	83	66	52
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	675	79	24	264	92	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	754	0	1027	715
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	312	-
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	-	-	856	-	260	431
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	856	-	251	431
Mov Cap-2 Maneuver	-	-	-	-	251	-
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	742	-

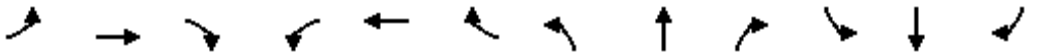
Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	28.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	294	-	-	856	-
HCM Lane V/C Ratio	0.484	-	-	0.028	-
HCM Control Delay (s)	28.2	-	-	9.3	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	2.5	-	-	0.1	-

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	131	128	630	923	677	306
v/c Ratio	0.60	0.45	0.73	0.34	0.42	0.37
Control Delay	51.7	22.6	16.8	2.7	2.0	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	22.6	16.8	2.7	2.0	1.1
Queue Length 50th (ft)	84	31	106	51	10	0
Queue Length 95th (ft)	141	85	95	43	12	m1
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	319	377	1098	2722	1603	838
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	0.34	0.57	0.34	0.42	0.37

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	221	0	6	567	886	0	0	303	558
Future Volume (vph)	0	0	0	221	0	6	567	886	0	0	303	558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.98		1.00	1.00			0.93	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1664		3433	3539			3160	1441
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1664		3433	3539			3160	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.91	1.00	0.38	0.90	0.96	1.00	1.00	0.82	0.91
Adj. Flow (vph)	0	0	0	243	0	16	630	923	0	0	370	613
RTOR Reduction (vph)	0	0	0	0	66	0	0	0	0	0	120	162
Lane Group Flow (vph)	0	0	0	131	62	0	630	923	0	0	557	144
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				13.1	13.1		25.0	76.9			46.9	46.9
Effective Green, g (s)				13.1	13.1		25.0	76.9			46.9	46.9
Actuated g/C Ratio				0.13	0.13		0.25	0.77			0.47	0.47
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				220	217		858	2721			1482	675
v/s Ratio Prot				c0.08	0.04		c0.18	0.26			c0.18	
v/s Ratio Perm												0.10
v/c Ratio				0.60	0.29		0.73	0.34			0.38	0.21
Uniform Delay, d1				41.0	39.2		34.4	3.6			17.1	15.7
Progression Factor				1.00	1.00		0.34	0.60			0.11	0.06
Incremental Delay, d2				4.3	0.7		3.3	0.3			0.6	0.5
Delay (s)				45.2	40.0		15.0	2.5			2.4	1.5
Level of Service				D	D		B	A			A	A
Approach Delay (s)		0.0			42.6			7.6			2.1	
Approach LOS		A			D			A			A	

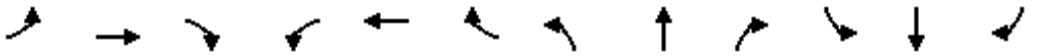
Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	118	653	532	245	80	418	482	105	468
v/c Ratio	0.26	0.82	0.82	0.42	0.22	0.70	0.49	0.37	0.41
Control Delay	16.4	44.3	45.3	21.1	18.2	29.5	5.9	27.5	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	16.4	44.3	45.3	21.1	18.2	29.5	6.1	27.5	29.1
Queue Length 50th (ft)	38	195	164	103	24	249	83	43	129
Queue Length 95th (ft)	60	265	192	153	39	#380	143	51	153
Internal Link Dist (ft)		2564		2353		407			2439
Turn Bay Length (ft)	200		200		160			290	
Base Capacity (vph)	509	840	672	599	411	600	987	326	1132
Starvation Cap Reductn	0	0	0	0	0	0	88	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.78	0.79	0.41	0.19	0.70	0.54	0.32	0.41

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)	87	479	108	415	136	45	56	364	472	67	338	34
Future Volume (veh/h)	87	479	108	415	136	45	56	364	472	67	338	34
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	118	515	138	532	177	68	80	418	482	105	428	40
Peak Hour Factor	0.74	0.93	0.78	0.78	0.77	0.66	0.70	0.87	0.98	0.64	0.79	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	409	588	157	611	417	160	440	505	708	338	887	83
Arrive On Green	0.06	0.21	0.21	0.06	0.11	0.11	0.21	0.45	0.45	0.12	0.27	0.27
Sat Flow, veh/h	1781	2774	740	3456	1287	494	1781	1870	1585	1781	3286	306
Grp Volume(v), veh/h	118	329	324	532	0	245	80	418	482	105	231	237
Grp Sat Flow(s),veh/h/ln	1781	1777	1737	1728	0	1781	1781	1870	1585	1781	1777	1815
Q Serve(g_s), s	4.3	17.9	18.1	15.3	0.0	12.9	0.0	19.6	0.0	0.0	10.9	11.0
Cycle Q Clear(g_c), s	4.3	17.9	18.1	15.3	0.0	12.9	0.0	19.6	0.0	0.0	10.9	11.0
Prop In Lane	1.00		0.43	1.00		0.28	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	409	377	368	611	0	577	440	505	708	338	480	490
V/C Ratio(X)	0.29	0.87	0.88	0.87	0.00	0.42	0.18	0.83	0.68	0.31	0.48	0.48
Avail Cap(c_a), veh/h	511	412	403	657	0	577	440	505	708	338	480	490
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.00	0.99	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	38.1	38.2	46.0	0.0	35.9	25.2	25.4	14.9	36.8	30.6	30.7
Incr Delay (d2), s/veh	0.4	17.3	18.5	11.6	0.0	0.5	0.2	13.8	5.0	0.5	3.4	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	9.2	9.2	8.0	0.0	6.1	1.3	8.4	6.5	2.2	4.9	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	55.4	56.7	57.5	0.0	36.4	25.4	39.2	19.9	37.3	34.0	34.1
LnGrp LOS	C	E	E	E	A	D	C	D	B	D	C	C
Approach Vol, veh/h		771			777			980			573	
Approach Delay, s/veh		50.7			50.9			28.6			34.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	33.0	22.7	27.0	17.3	33.0	12.3	37.4
Change Period (Y+Rc), s	* 5	6.0	* 5	5.8	* 5	6.0	* 5.8	5.0
Max Green Setting (Gmax), s	* 9	27.0	* 19	23.2	* 9	27.0	* 12	30.0
Max Q Clear Time (g_c+I1), s	2.0	13.0	17.3	20.1	2.0	21.6	6.3	14.9
Green Ext Time (p_c), s	0.1	0.3	0.4	1.1	0.1	2.1	0.1	1.1

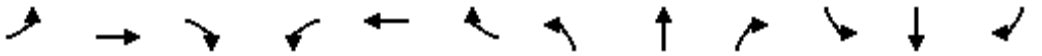
Intersection Summary	
HCM 6th Ctrl Delay	40.8
HCM 6th LOS	D

Notes

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	430	412	401	987	470	8	599
v/c Ratio	0.72	0.68	0.60	0.37	0.45	0.08	0.31
Control Delay	34.6	24.1	15.2	4.7	1.7	47.0	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	24.1	15.2	4.7	1.7	47.0	12.5
Queue Length 50th (ft)	241	169	98	30	0	5	103
Queue Length 95th (ft)	323	257	180	117	48	8	154
Internal Link Dist (ft)		541		1067			491
Turn Bay Length (ft)					200	100	
Base Capacity (vph)	722	713	764	2675	1055	98	1932
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	0.60	0.58	0.52	0.37	0.45	0.08	0.31

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	545	0	622	0	0	0	0	908	395	3	521	0
Future Volume (vph)	545	0	622	0	0	0	0	908	395	3	521	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	1.00	0.95	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1503	1504					5085	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1503	1504					5085	1583	1770	3539	
Peak-hour factor, PHF	0.95	1.00	0.93	1.00	1.00	1.00	1.00	0.92	0.84	0.38	0.87	1.00
Adj. Flow (vph)	574	0	669	0	0	0	0	987	470	8	599	0
RTOR Reduction (vph)	0	76	133	0	0	0	0	0	242	0	0	0
Lane Group Flow (vph)	430	336	268	0	0	0	0	987	228	8	599	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)	35.4	35.4	35.4					48.6	48.6	1.0	54.6	
Effective Green, g (s)	35.4	35.4	35.4					48.6	48.6	1.0	54.6	
Actuated g/C Ratio	0.35	0.35	0.35					0.49	0.49	0.01	0.55	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	595	532	532					2471	769	17	1932	
v/s Ratio Prot	c0.26	0.22						c0.19		0.00	c0.17	
v/s Ratio Perm			0.18						0.14			
v/c Ratio	0.72	0.63	0.50					0.40	0.30	0.47	0.31	
Uniform Delay, d1	28.0	26.9	25.4					16.4	15.4	49.2	12.4	
Progression Factor	1.00	1.00	1.00					0.28	0.38	1.00	0.88	
Incremental Delay, d2	4.3	2.4	0.8					0.3	0.7	17.9	0.4	
Delay (s)	32.4	29.3	26.1					4.9	6.5	67.4	11.3	
Level of Service	C	C	C					A	A	E	B	
Approach Delay (s)		29.3			0.0			5.4			12.1	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

LANE LEVEL OF SERVICE

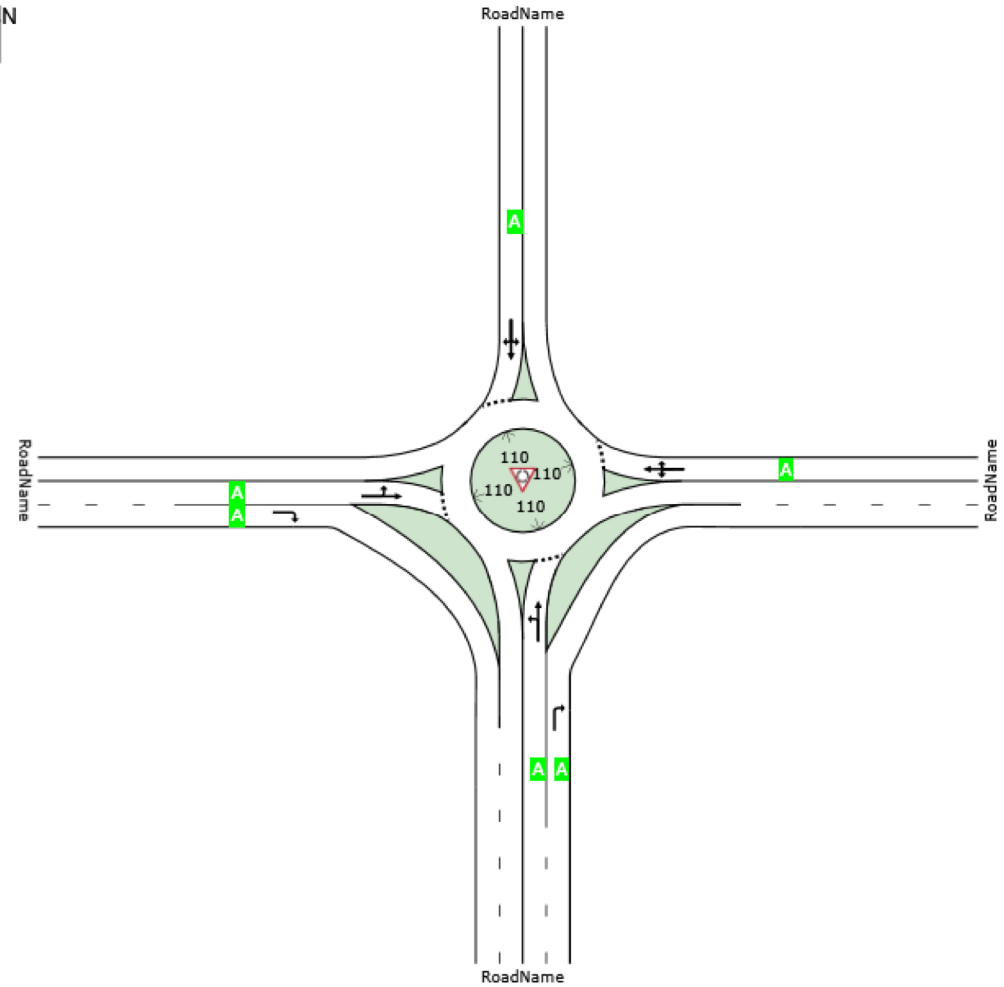
Lane Level of Service

Site: 101 [Colbern Rd & Blue Pkwy (Ex PM)]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
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).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

Site: 101 [Colbern Rd & Blue Pkwy (Ex PM)]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: RoadName													
Lane 1[d]	244	2.0	728	0.336	100	9.1	LOS A	1.4	36.6	Full	1600	0.0	0.0
Lane 2	112	2.0	1642	0.068	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	356	2.0		0.336		6.2	LOS A	1.4	36.6				
East: RoadName													
Lane 1[d]	331	2.0	1024	0.324	100	6.8	LOS A	1.7	42.7	Full	1600	0.0	0.0
Approach	331	2.0		0.324		6.8	LOS A	1.7	42.7				
North: RoadName													
Lane 1[d]	131	2.0	762	0.172	100	6.6	LOS A	0.7	18.2	Full	1600	0.0	0.0
Approach	131	2.0		0.172		6.6	LOS A	0.7	18.2				
West: RoadName													
Lane 1[d]	620	2.0	1233	0.503	100	8.3	LOS A	3.3	84.4	Full	1600	0.0	0.0
Lane 2	165	2.0	1642	0.100	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	785	2.0		0.503		6.6	LOS A	3.3	84.4				
Intersection	1603	2.0		0.503		6.6	LOS A	3.3	84.4				

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.
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).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

APPENDIX C

Existing plus Phase 1 Development Conditions Analysis

Trip Generation

Land Use: 221
Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (Land Use 225), and mid-rise residential with 1st-floor commercial (Land Use 231) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the mid-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.46 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 95.7 percent of the total dwelling units were occupied.

Time-of-day distribution data for this land use are presented in Appendix A. For the eight general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 4:45 and 5:45 p.m., respectively.

For the four dense multi-use urban sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:15 and 5:15 p.m., respectively. For the three center city core sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 6:45 and 7:45 a.m. and 5:00 and 6:00 p.m., respectively.

For the six sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.46 residents per occupied dwelling unit.

For the five sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 95.7 percent of the units were occupied.

The average numbers of person trips per vehicle trip at the five center city core sites at which both person trip and vehicle trip data were collected were as follows:

- 1.84 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.94 during Weekday, AM Peak Hour of Generator
- 2.07 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.59 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 32 dense multi-use urban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.90 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.90 during Weekday, AM Peak Hour of Generator
- 2.00 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.08 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 13 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.56 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.88 during Weekday, AM Peak Hour of Generator
- 1.70 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.07 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Delaware, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, Ontario, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Virginia, and Wisconsin.

Source Numbers

168, 188, 204, 305, 306, 321, 357, 390, 436, 525, 530, 579, 638, 818, 857, 866, 901, 904, 910, 912, 918, 934, 936, 939, 944, 947, 948, 949, 959, 963, 964, 966, 967, 969, 970

Multifamily Housing (Mid-Rise)
(221)

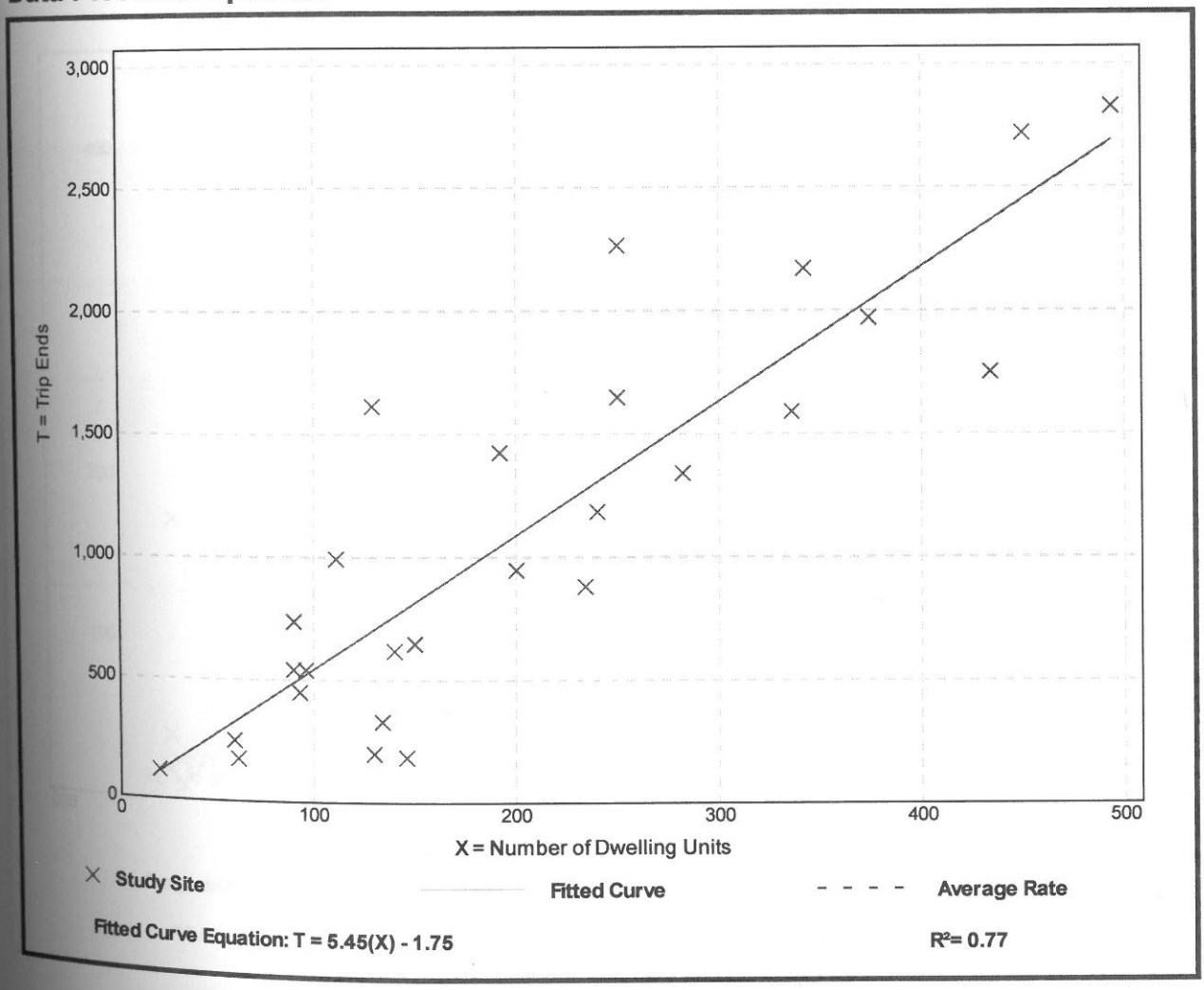
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 27
Avg. Num. of Dwelling Units: 205
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
5.44	1.27 - 12.50	2.03

Data Plot and Equation



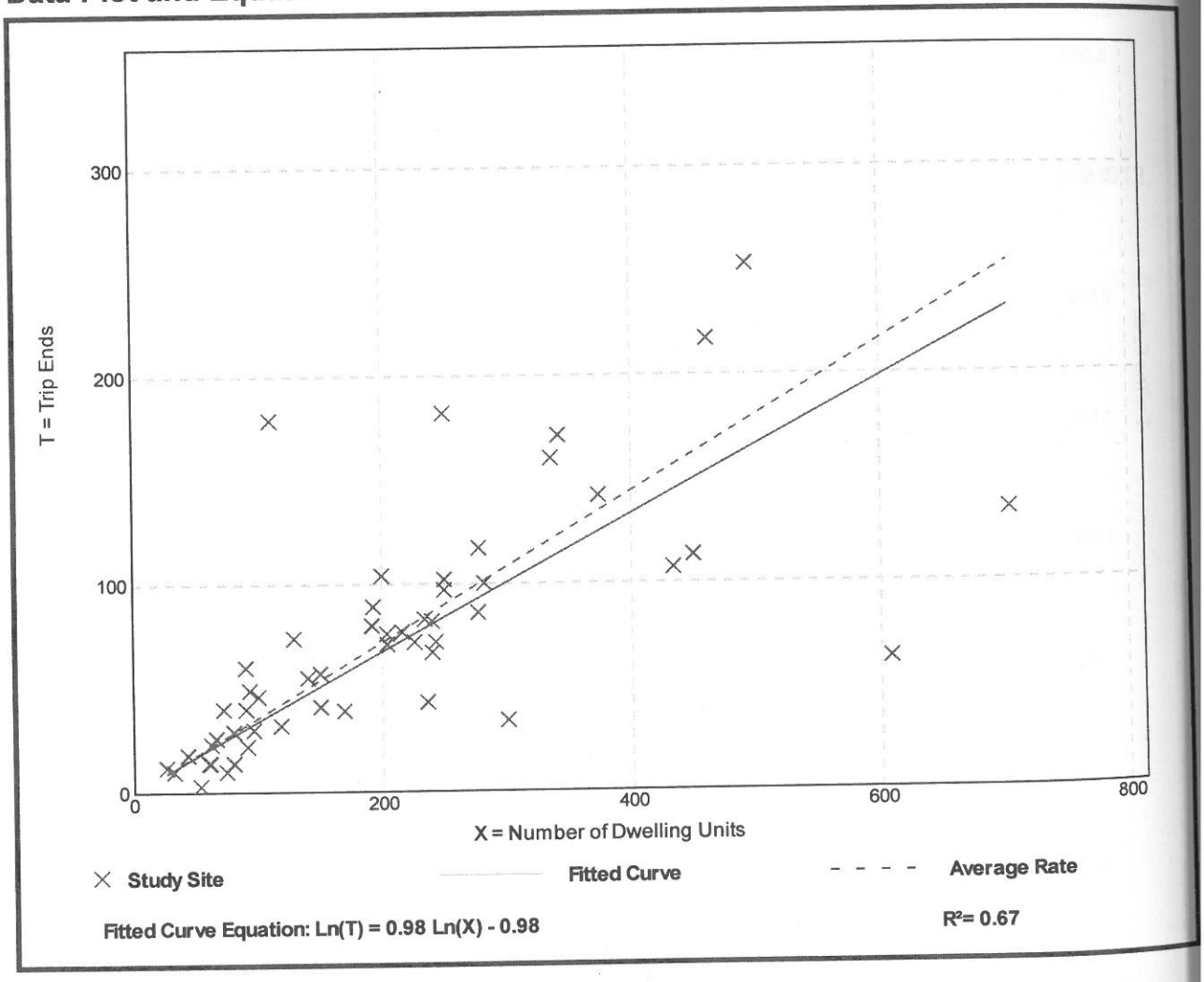
Multifamily Housing (Mid-Rise)
(221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 53
Avg. Num. of Dwelling Units: 207
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.06 - 1.61	0.19

Data Plot and Equation



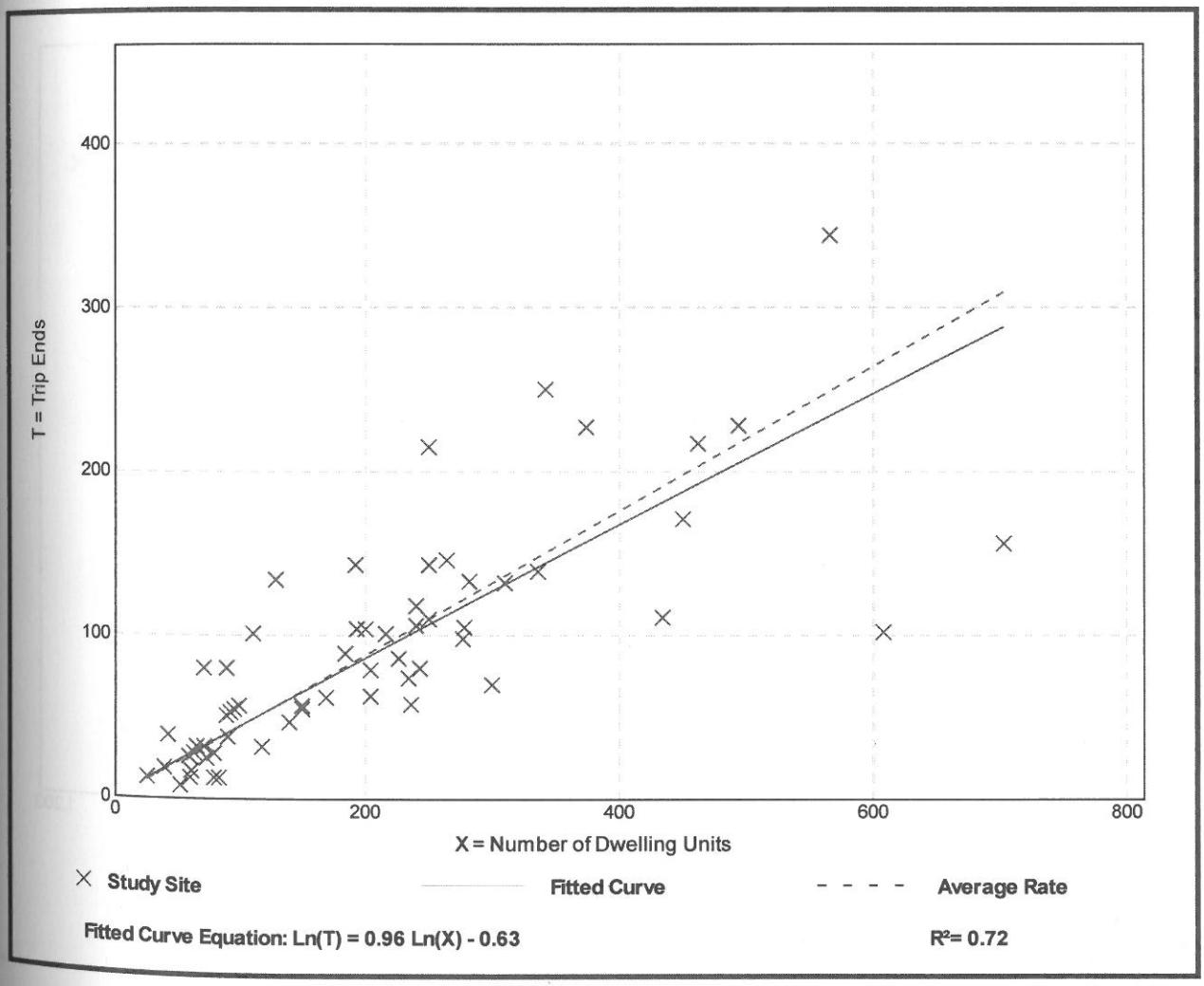
Multifamily Housing (Mid-Rise)
(221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 60
Avg. Num. of Dwelling Units: 208
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 1.11	0.19

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) - 0.63

R^2= 0.72

Daily Trip Generation

ITE Code	Land Use	Size		Trip Gen. Avg. Rate/Eq.	Daily Trips	Trip Distribution Enter	Trip Distribution Exit	Daily Trips Enter	Daily Trips Exit
221	Multi-Family Housing (Mid-Rise)	480	Dwelling Units	Equation	2,615	50%	50%	1,308	1,307
Total					**2,615**			**1,308**	**1,307**

AM Peak Hour Trip Generation

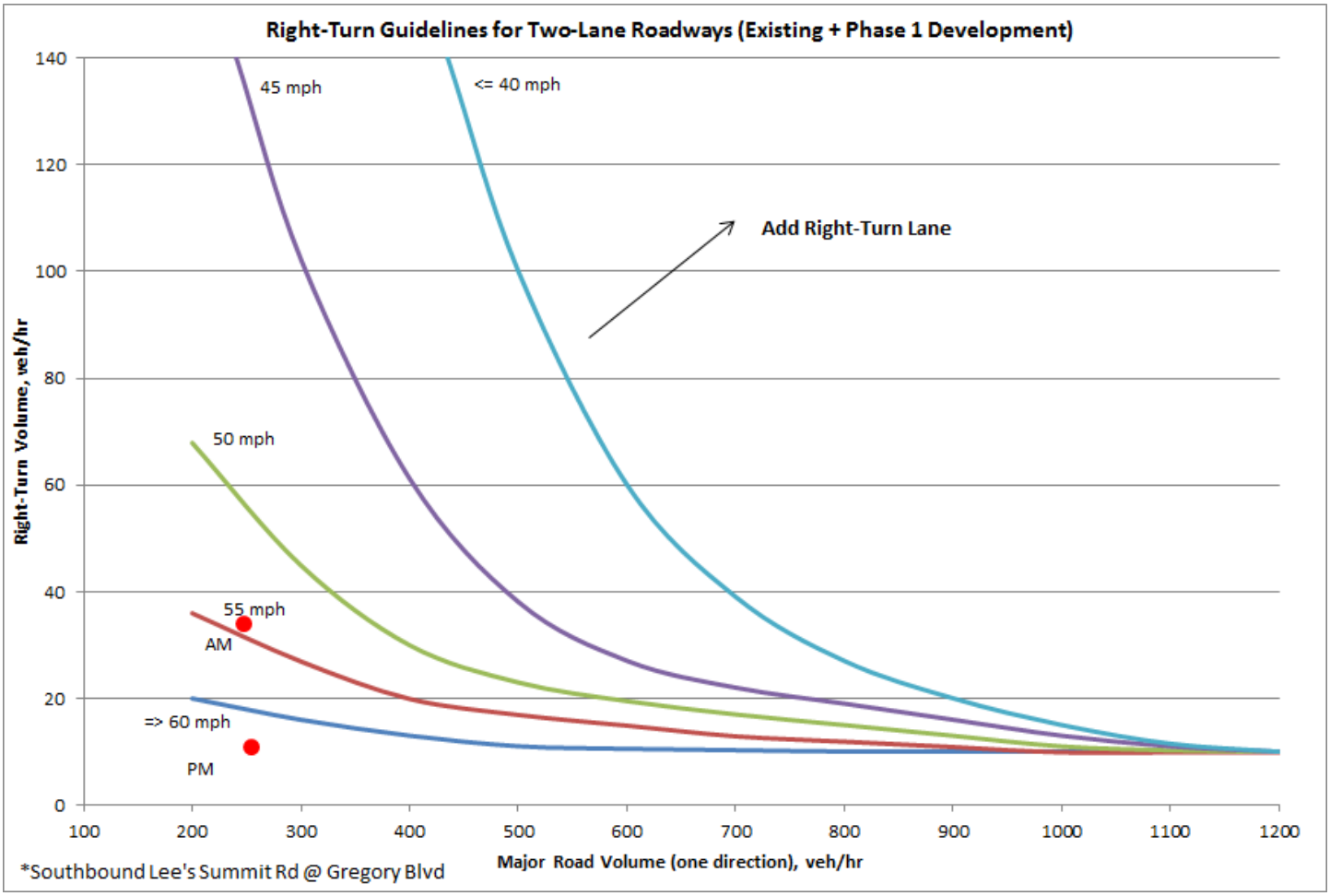
ITE Code/Page	Land Use	Size		Trip Gen. Avg. Rate/Eq.	AM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	AM Peak Hour Trips Enter	AM Peak Hour Trips Exit
221	Multi-Family Housing (Mid-Rise)	480	Dwelling Units	Equation	160	26%	74%	42	118
Total					**160**			**42**	**118**

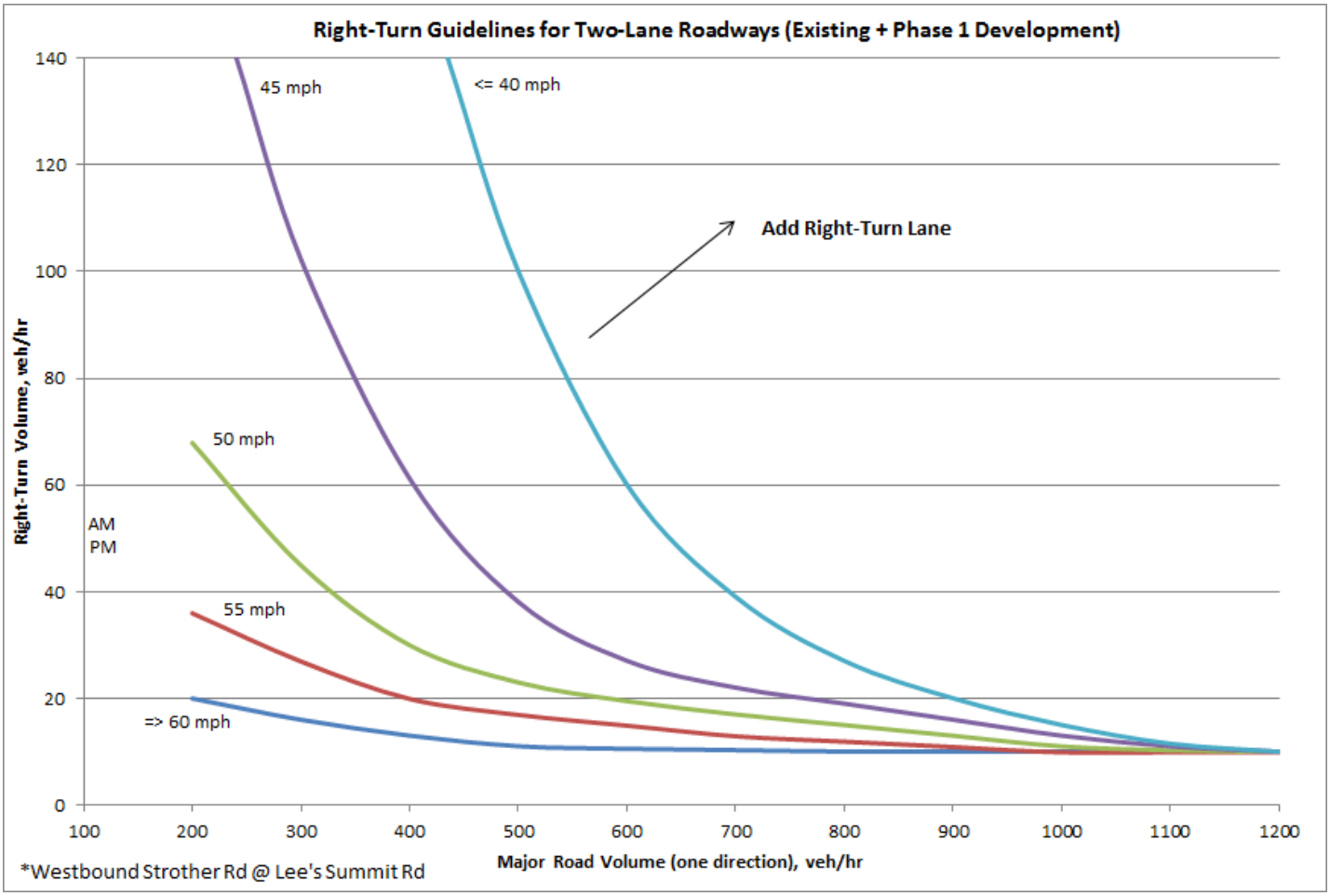
PM Peak Hour Trip Generation

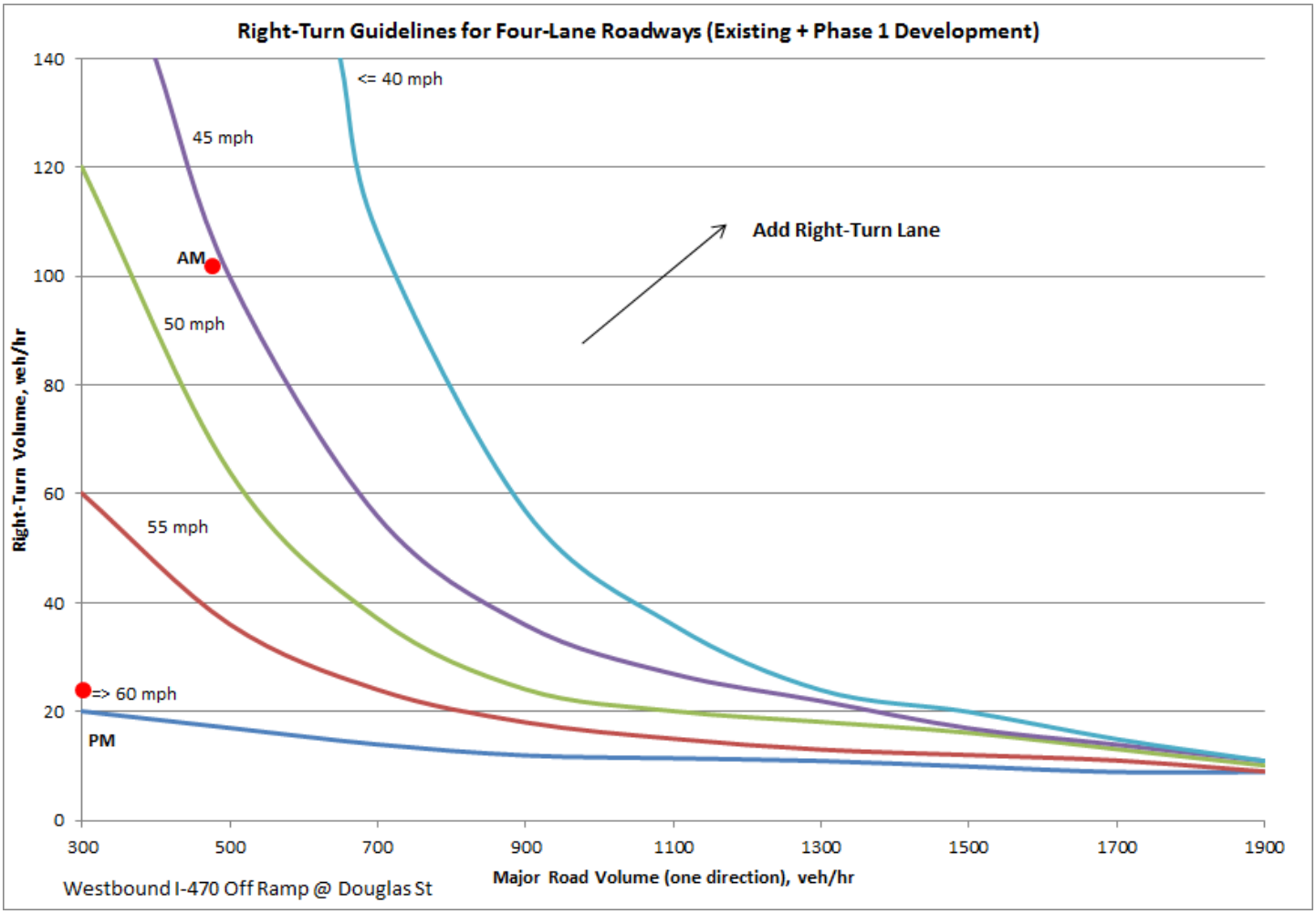
ITE Code/Page	Land Use	Size		Trip Gen. Avg. Rate/Eq.	PM Peak Hour Trips	Trip Distribution Enter	Trip Distribution Exit	PM Peak Hour Trips Enter	PM Peak Hour Trips Exit
221	Multi-Family Housing (Mid-Rise)	480	Dwelling Units	Equation	200	61%	39%	122	78
Total					**200**			**122**	**78**

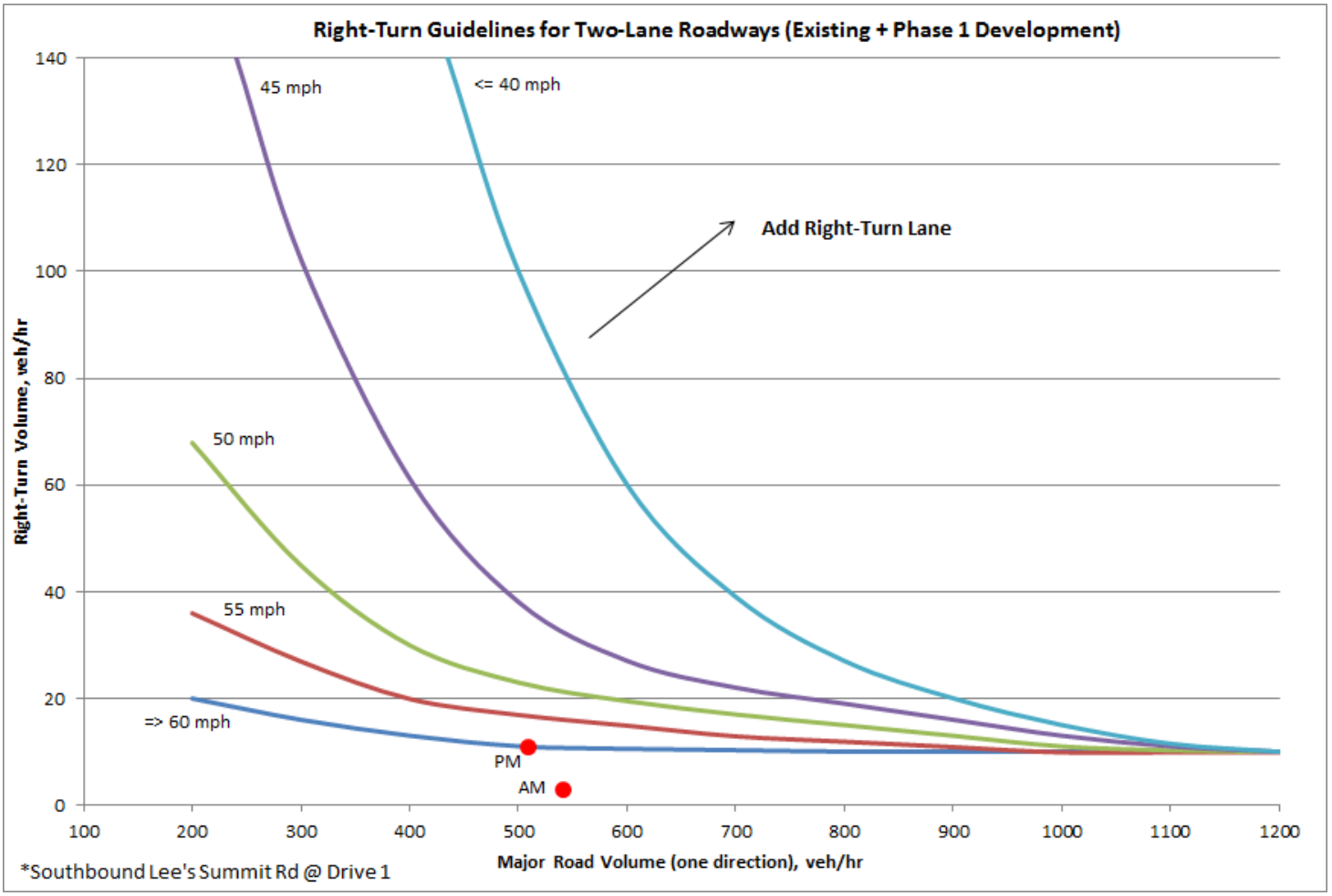
Trip Distribution	
Roadway To/From	**Percentage**
Lee's Summit Road (north)	5%
Little Blue (west)	5%
Gregory (east)	5%
Strother Road (east)	3%
Colbern Road (west)	10%
Colbern Road (east)	15%
Blue Parkway (South)	2%
I-470 (west)	20%
I-470 (east)	15%
Douglas Street (south)	20%
Total	**100%**

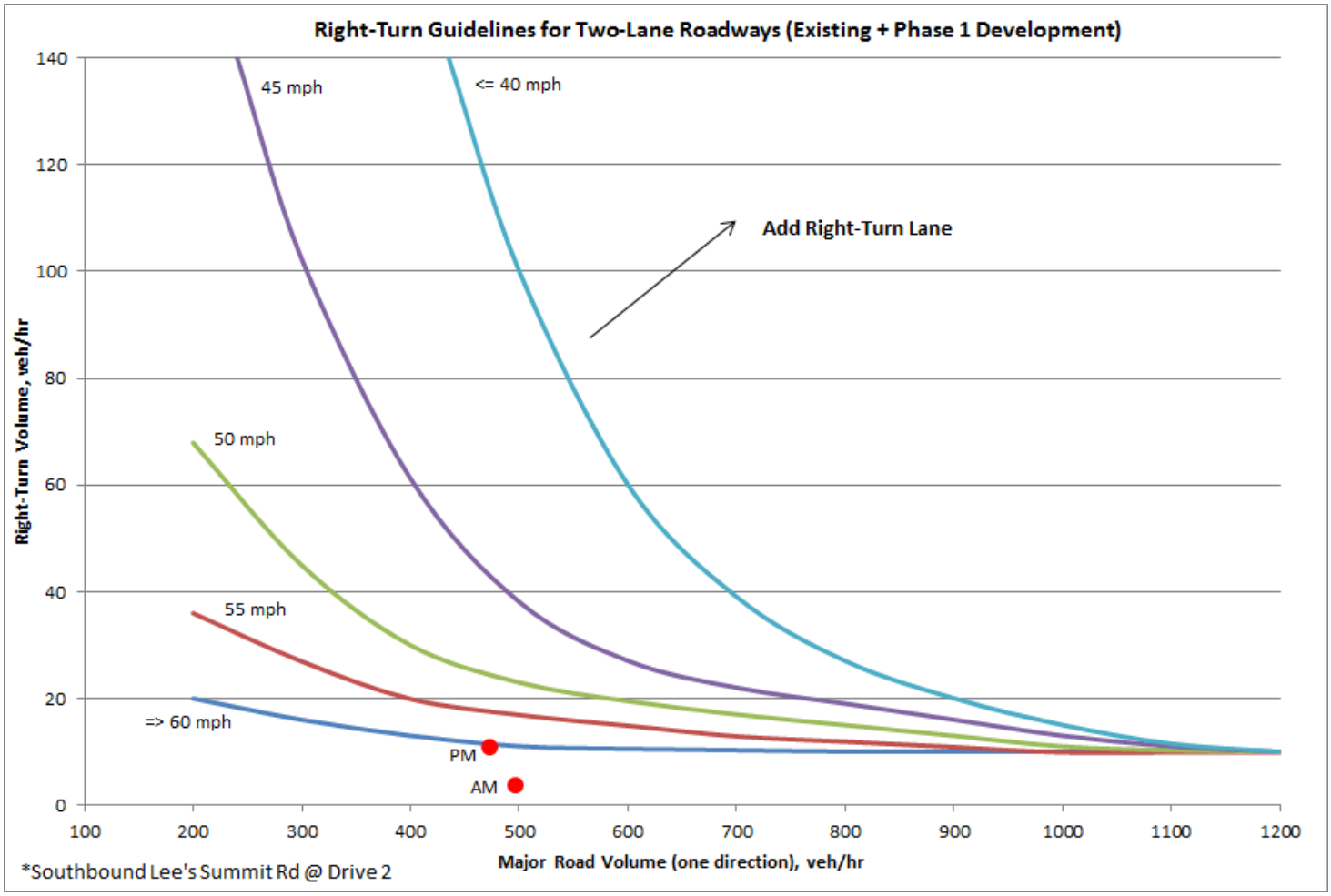
Turn Lane Warrants


Right-Turn Guidelines for Two-Lane Roadways (Existing + Phase 1 Development)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
AM
=> 60 mph
PM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
*Southbound Lee's Summit Rd @ Gregory Blvd


Right-Turn Guidelines for Two-Lane Roadways (Existing + Phase 1 Development)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
AM
PM
55 mph
=> 60 mph
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
*Westbound Strother Rd @ Lee's Summit Rd


Right-Turn Guidelines for Four-Lane Roadways (Existing + Phase 1 Development)
<= 40 mph
45 mph
50 mph
55 mph
=> 60 mph
AM
PM
Add Right-Turn Lane
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
Westbound I-470 Off Ramp @ Douglas St
0
20
40
60
80
100
120
140
300
500
700
900
1100
1300
1500
1700
1900

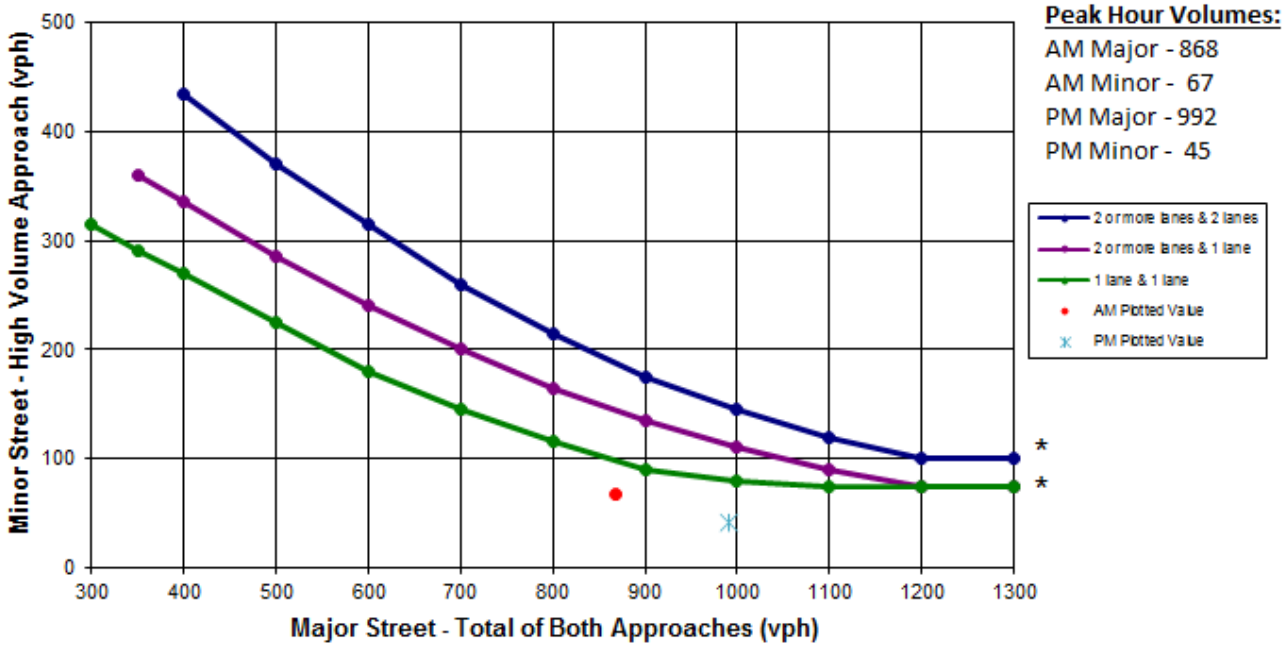

Right-Turn Guidelines for Two-Lane Roadways (Existing + Phase 1 Development)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
=> 60 mph
PM
AM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
0
20
40
60
80
100
120
140
100
200
300
400
500
600
700
800
900
1000
1100
1200
*Southbound Lee's Summit Rd @ Drive 1


Right-Turn Guidelines for Two-Lane Roadways (Existing + Phase 1 Development)
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
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 @ Drive 2

Signal Warrants

Peak Hour Volume Warrant (Existing + Phase 1 Development)
Lee's Summit Road & 85th Street

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



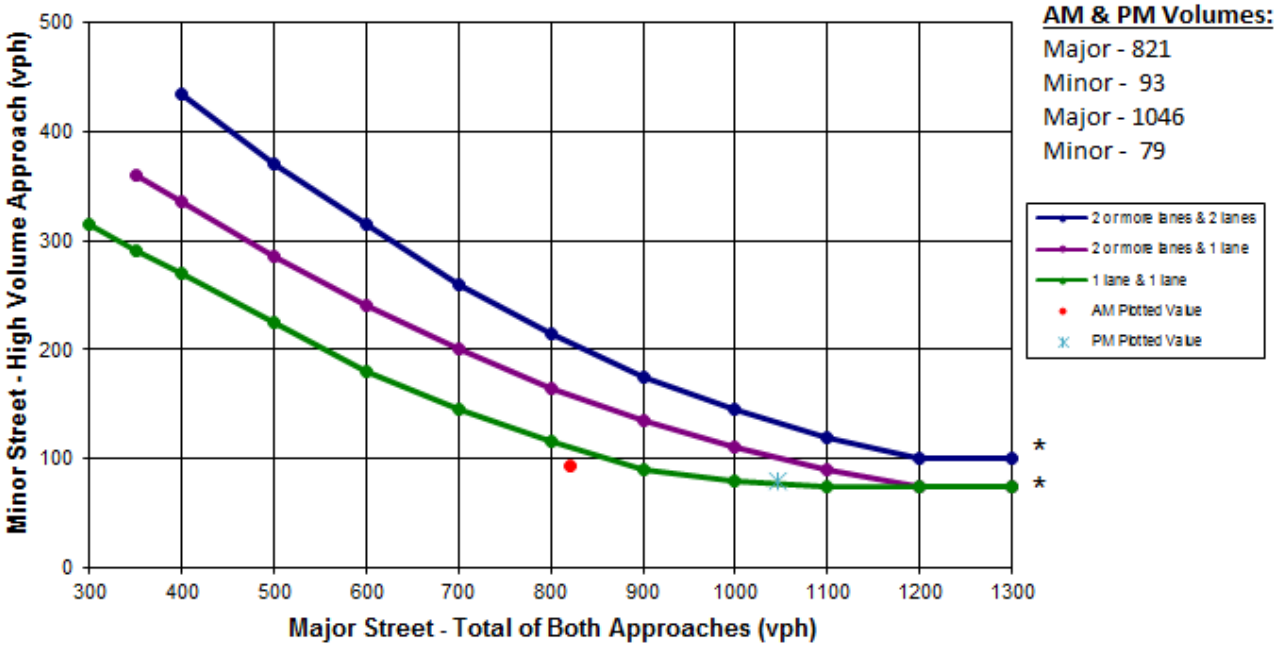
Peak Hour Volumes:

AM Major - 868
AM Minor - 67
PM Major - 992
PM Minor - 45

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Phase 1 Development)
Lee's Summit Road & Strother Road

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



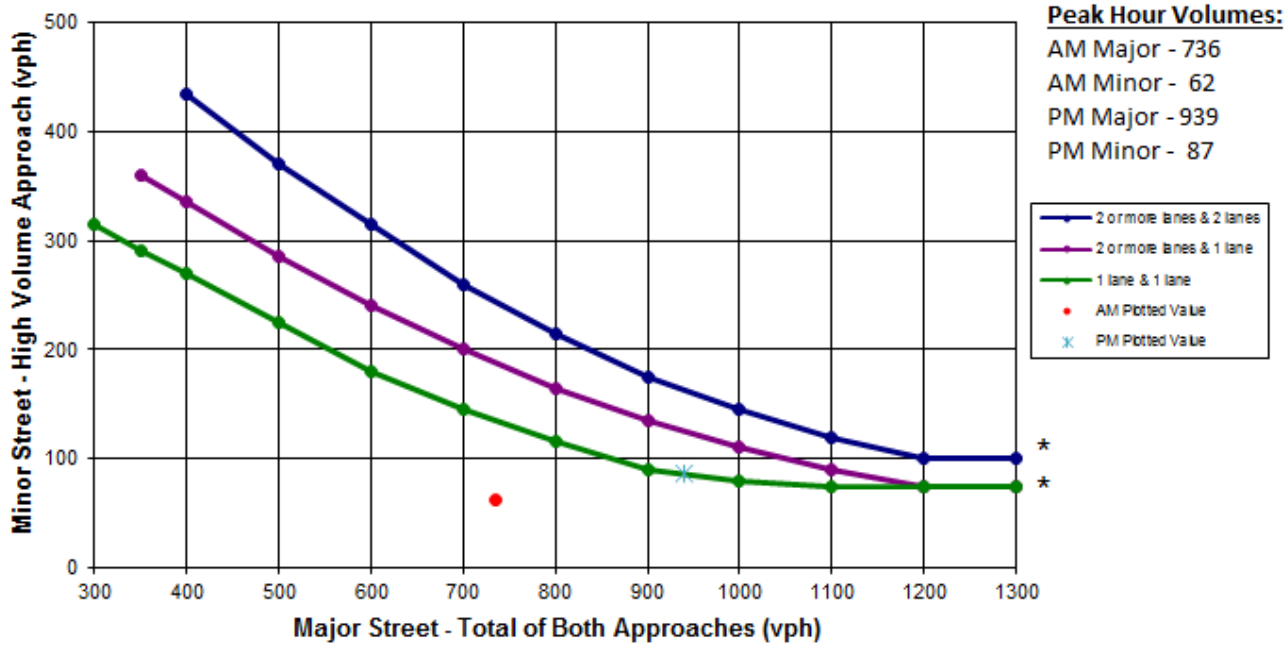
AM & PM Volumes:

Major - 821
Minor - 93
Major - 1046
Minor - 79

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Phase 1 Development)
Colbern Road & Main Street

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



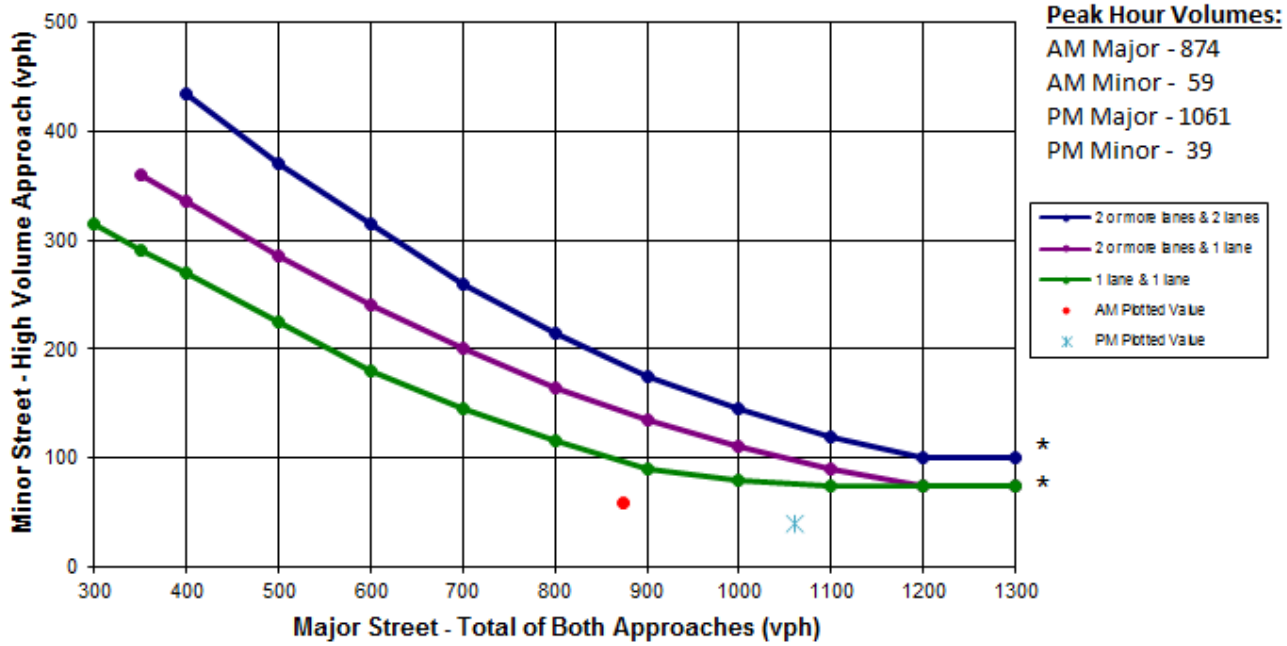
Peak Hour Volumes:

AM Major - 736
AM Minor - 62
PM Major - 939
PM Minor - 87

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Phase 1 Development)
Lee's Summit Road & Douglas Road/Drive 2

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



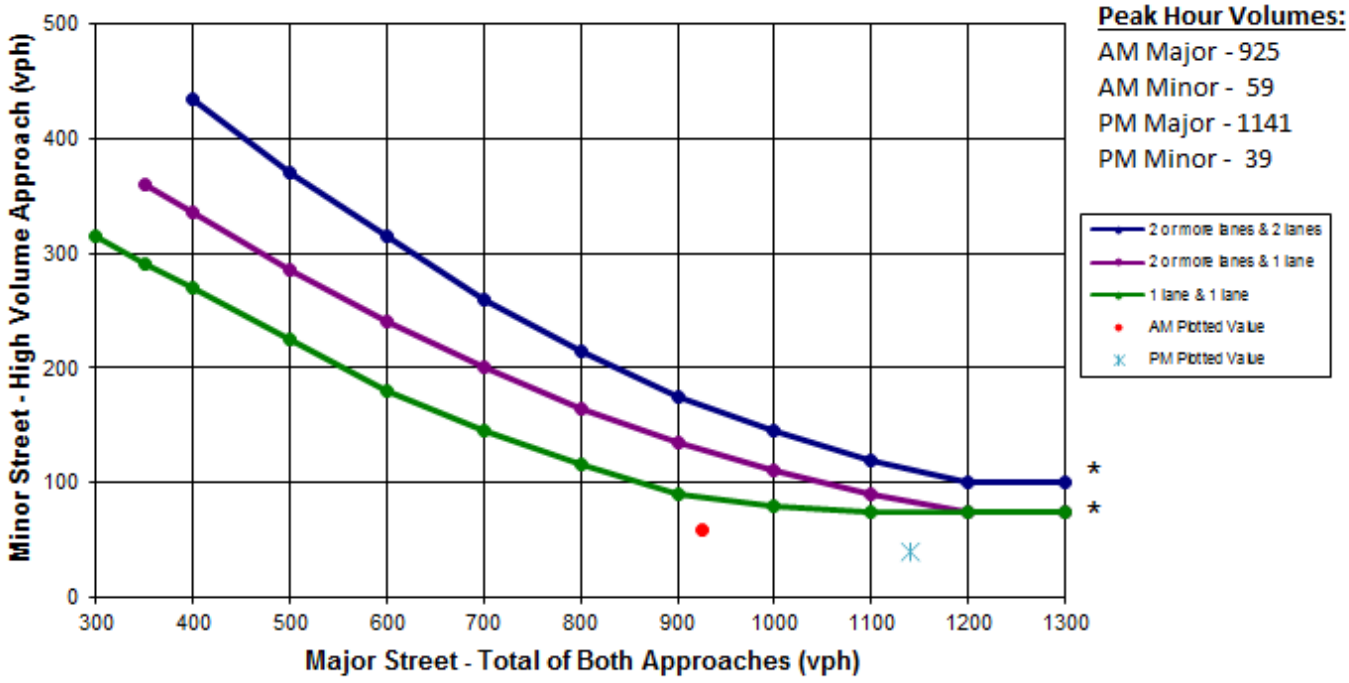
Peak Hour Volumes:

AM Major - 874
AM Minor - 59
PM Major - 1061
PM Minor - 39

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Phase 1 Development)
Lee's Summit Road & Drive 1

(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 and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Capacity Analysis

Intersection	
Int Delay, s/veh	2.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	6	486	4	17	346	15	11	0	48	6	0	2
Future Vol, veh/h	6	486	4	17	346	15	11	0	48	6	0	2
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	-	-	200	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	94	30	40	80	75	35	92	78	75	92	25
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	517	13	43	433	20	31	0	62	8	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	453	0	0	530	0	0	1089	1095	524	1116	1091	443
Stage 1	-	-	-	-	-	-	556	556	-	529	529	-
Stage 2	-	-	-	-	-	-	533	539	-	587	562	-
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	1108	-	-	1037	-	-	193	214	553	185	215	615
Stage 1	-	-	-	-	-	-	515	513	-	533	527	-
Stage 2	-	-	-	-	-	-	531	522	-	496	510	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1108	-	-	1037	-	-	182	202	553	157	203	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	202	-	157	203	-
Stage 1	-	-	-	-	-	-	508	506	-	526	505	-
Stage 2	-	-	-	-	-	-	502	501	-	434	503	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0.7	17.9	20.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	182	553	1037	-	-	1108	-	-	250
HCM Lane V/C Ratio	0.173	0.111	0.041	-	-	0.014	-	-	0.064
HCM Control Delay (s)	28.9	12.3	8.6	-	-	8.3	-	-	20.4
HCM Lane LOS	D	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.6	0.4	0.1	-	-	0	-	-	0.2

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	5	0	1	40	0	27	1	290	71	56	450	0
Future Vol, veh/h	5	0	1	40	0	27	1	290	71	56	450	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	42	100	25	50	100	45	25	84	55	61	89	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	4	80	0	60	4	345	129	92	506	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1138	1172	506	1045	1043	345	506	0	0	474	0	0
Stage 1	690	690	-	353	353	-	-	-	-	-	-	-
Stage 2	448	482	-	692	690	-	-	-	-	-	-	-
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	179	192	566	207	229	698	1059	-	-	1088	-	-
Stage 1	435	446	-	664	631	-	-	-	-	-	-	-
Stage 2	590	553	-	434	446	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	153	175	566	192	209	698	1059	-	-	1088	-	-
Mov Cap-2 Maneuver	153	175	-	192	209	-	-	-	-	-	-	-
Stage 1	433	408	-	661	628	-	-	-	-	-	-	-
Stage 2	537	551	-	394	408	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26	25.4	0.1	1.3
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1059	-	-	187	192	698	1088	-	-
HCM Lane V/C Ratio	0.004	-	-	0.085	0.417	0.086	0.084	-	-
HCM Control Delay (s)	8.4	-	-	26	36.5	10.6	8.6	-	-
HCM Lane LOS	A	-	-	D	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1.9	0.3	0.3	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	56	296	27	32	466
Future Vol, veh/h	37	56	296	27	32	466
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	82	74	78	58	67	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	76	379	47	48	496

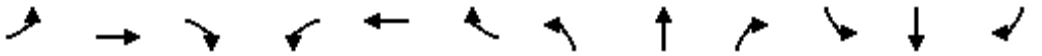
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	971	190	0	0	426	0
Stage 1	379	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	265	820	-	-	1132	-
Stage 1	663	-	-	-	-	-
Stage 2	552	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	254	820	-	-	1132	-
Mov Cap-2 Maneuver	370	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	552	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	564	1132	-
HCM Lane V/C Ratio	-	-	0.214	0.042	-
HCM Control Delay (s)	-	-	13.1	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	64	94	263	212	48	119	151	59	20	271
v/c Ratio	0.03	0.22	0.27	0.50	0.29	0.07	0.31	0.22	0.09	0.04	0.65
Control Delay	14.4	32.4	6.6	19.1	18.8	0.2	16.2	19.8	0.7	13.6	33.3
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	14.4	32.4	6.6	19.1	18.8	0.2	16.2	19.8	0.7	13.6	33.3
Queue Length 50th (ft)	4	24	0	75	58	0	30	39	0	5	101
Queue Length 95th (ft)	13	61	20	157	156	0	72	100	0	15	199
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	603	936	855	660	1070	960	551	936	852	669	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	0.03	0.07	0.11	0.40	0.20	0.05	0.22	0.16	0.07	0.03	0.26

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	50	77	234	189	36	106	122	49	14	199	34
Future Volume (veh/h)	11	50	77	234	189	36	106	122	49	14	199	34
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	16	64	94	263	212	48	119	151	59	20	231	40
Peak Hour Factor	0.69	0.78	0.82	0.89	0.89	0.75	0.89	0.81	0.83	0.70	0.86	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	405	324	274	575	575	487	325	470	398	384	310	54
Arrive On Green	0.02	0.17	0.17	0.15	0.31	0.31	0.08	0.25	0.25	0.02	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1553	269
Grp Volume(v), veh/h	16	64	94	263	212	48	119	151	59	20	0	271
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1822
Q Serve(g_s), s	0.4	1.7	3.0	6.7	5.1	1.2	3.0	3.8	1.7	0.5	0.0	8.1
Cycle Q Clear(g_c), s	0.4	1.7	3.0	6.7	5.1	1.2	3.0	3.8	1.7	0.5	0.0	8.1
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	405	324	274	575	575	487	325	470	398	384	0	364
V/C Ratio(X)	0.04	0.20	0.34	0.46	0.37	0.10	0.37	0.32	0.15	0.05	0.00	0.74
Avail Cap(c_a), veh/h	832	1133	960	918	1133	960	654	1133	960	958	0	1104
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	13.4	20.5	21.0	15.4	15.6	14.3	16.9	17.6	16.8	15.5	0.0	21.7
Incr Delay (d2), s/veh	0.0	0.6	1.6	0.2	0.8	0.2	0.3	0.4	0.2	0.0	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(50%),veh/ln	0.1	0.7	1.1	2.4	2.0	0.4	1.0	1.4	0.5	0.2	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	21.1	22.6	15.6	16.5	14.5	17.2	18.0	17.0	15.5	0.0	24.8
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		174			523			329			291	
Approach Delay, s/veh		21.2			15.8			17.5			24.1	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	15.5	10.3	17.5	6.6	23.3	7.4	20.5
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	20.0	35.0	15.0	35.0	15.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	8.7	5.0	5.0	10.1	2.4	7.1	2.5	5.8
Green Ext Time (p_c), s	0.3	1.3	0.1	1.5	0.0	2.7	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	161	75	23	477	53	9
Future Vol, veh/h	161	75	23	477	53	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	85	71	90	70	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	206	88	32	530	76	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	294	0	844	250
Stage 1	-	-	-	-	250	-
Stage 2	-	-	-	-	594	-
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	-	-	1268	-	334	789
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	552	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1268	-	322	789
Mov Cap-2 Maneuver	-	-	-	-	322	-
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	552	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	18.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	350	-	-	1268	-
HCM Lane V/C Ratio	0.251	-	-	0.026	-
HCM Control Delay (s)	18.7	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	48	18	367	537	3
Future Vol, veh/h	11	48	18	367	537	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	35	78	40	80	94	30
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	62	45	459	571	10

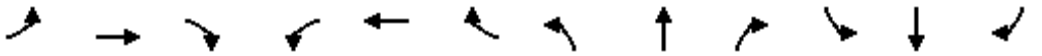
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1125	576	581	0	-	0
Stage 1	576	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	227	517	993	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	217	517	993	-	-	-
Mov Cap-2 Maneuver	343	-	-	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	579	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	993	-	343	517	-	-
HCM Lane V/C Ratio	0.045	-	0.092	0.119	-	-
HCM Control Delay (s)	8.8	-	16.6	12.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0.4	-	-

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	341	320	595	624	844	439
v/c Ratio	0.78	0.66	0.68	0.28	0.71	0.58
Control Delay	43.0	27.8	21.7	16.9	12.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.8
Total Delay	43.0	27.8	21.7	16.9	12.0	7.1
Queue Length 50th (ft)	185	122	176	145	85	50
Queue Length 95th (ft)	200	206	208	185	107	74
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	522	559	877	2220	1191	756
Starvation Cap Reductn	0	0	0	0	0	111
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.68	0.28	0.71	0.68

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	373	0	102	500	555	0	0	316	720
Future Volume (vph)	0	0	0	373	0	102	500	555	0	0	316	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.94		1.00	1.00			0.92	0.85
Flt Protected				0.95	0.97		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1610		3433	3539			3126	1441
Flt Permitted				0.95	0.97		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1610		3433	3539			3126	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.71	1.00	0.75	0.84	0.89	1.00	1.00	0.78	0.82
Adj. Flow (vph)	0	0	0	525	0	136	595	624	0	0	405	878
RTOR Reduction (vph)	0	0	0	0	63	0	0	0	0	0	202	300
Lane Group Flow (vph)	0	0	0	341	257	0	595	624	0	0	642	139
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				23.5	23.5		23.0	56.5			28.5	28.5
Effective Green, g (s)				23.5	23.5		23.0	56.5			28.5	28.5
Actuated g/C Ratio				0.26	0.26		0.26	0.63			0.32	0.32
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				438	420		877	2221			989	456
v/s Ratio Prot				c0.20	0.16		c0.17	0.18			c0.21	
v/s Ratio Perm												0.10
v/c Ratio				0.78	0.61		0.68	0.28			0.65	0.30
Uniform Delay, d1				30.8	29.2		30.2	7.6			26.4	23.3
Progression Factor				1.00	1.00		0.57	1.99			0.49	1.22
Incremental Delay, d2				8.5	2.6		2.2	0.3			2.6	1.4
Delay (s)				39.3	31.9		19.6	15.4			15.5	29.8
Level of Service				D	C		B	B			B	C
Approach Delay (s)		0.0			35.7			17.4			20.4	
Approach LOS		A			D			B			C	

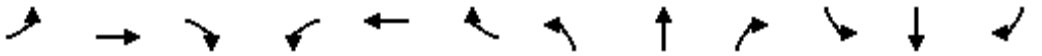
Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	104	132	655	502	90	339	401	60	573
v/c Ratio	0.39	0.32	0.85	0.79	0.30	0.62	0.35	0.20	0.60
Control Delay	24.2	34.9	28.9	25.9	26.9	41.0	2.4	20.8	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	34.9	28.9	25.9	26.9	41.0	2.4	20.8	31.4
Queue Length 50th (ft)	31	32	238	248	46	206	9	21	149
Queue Length 95th (ft)	32	60	47	#169	60	267	5	43	201
Internal Link Dist (ft)		2564		2353		407			1615
Turn Bay Length (ft)	200		200		160			290	
Base Capacity (vph)	278	416	853	632	309	551	1174	305	953
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.32	0.77	0.79	0.29	0.62	0.34	0.20	0.60

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)	54	100	17	609	368	62	54	278	325	50	410	90
Future Volume (veh/h)	54	100	17	609	368	62	54	278	325	50	410	90
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	104	112	20	655	409	93	90	339	401	60	466	107
Peak Hour Factor	0.52	0.89	0.85	0.93	0.90	0.67	0.60	0.82	0.81	0.83	0.88	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	291	350	61	709	508	115	279	499	873	222	771	176
Arrive On Green	0.06	0.12	0.12	0.47	0.58	0.58	0.02	0.09	0.09	0.04	0.27	0.27
Sat Flow, veh/h	1781	3024	528	2494	1475	335	1781	1870	1585	1781	2874	655
Grp Volume(v), veh/h	104	65	67	655	0	502	90	339	401	60	287	286
Grp Sat Flow(s),veh/h/ln	1781	1777	1775	1247	0	1810	1781	1870	1585	1781	1777	1752
Q Serve(g_s), s	0.0	3.0	3.1	22.1	0.0	19.8	3.3	15.8	5.6	0.0	12.7	12.8
Cycle Q Clear(g_c), s	0.0	3.0	3.1	22.1	0.0	19.8	3.3	15.8	5.6	0.0	12.7	12.8
Prop In Lane	1.00		0.30	1.00		0.19	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	291	206	205	709	0	623	279	499	873	222	477	470
V/C Ratio(X)	0.36	0.32	0.33	0.92	0.00	0.81	0.32	0.68	0.46	0.27	0.60	0.61
Avail Cap(c_a), veh/h	354	206	205	859	0	623	344	499	873	244	477	470
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	0.00	0.89	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	36.5	36.6	22.7	0.0	16.7	23.7	37.3	3.4	36.8	28.7	28.8
Incr Delay (d2), s/veh	0.7	0.9	0.9	12.6	0.0	9.6	0.6	7.1	1.7	0.6	5.5	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.3	1.3	5.5	0.0	6.7	1.4	8.8	3.1	1.2	5.8	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	37.4	37.5	35.3	0.0	26.3	24.4	44.4	5.1	37.5	34.3	34.6
LnGrp LOS	C	D	D	D	A	C	C	D	A	D	C	C
Approach Vol, veh/h		236			1157			830			633	
Approach Delay, s/veh		36.3			31.4			23.2			34.7	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	30.1	30.6	16.2	9.9	30.0	10.8	36.0
Change Period (Y+Rc), s	5.0	* 6	5.0	* 5.8	* 6	* 6	5.8	* 5
Max Green Setting (Gmax), s	8.0	* 21	31.0	* 8.2	* 5	* 24	8.2	* 31
Max Q Clear Time (g_c+I1), s	5.3	14.8	24.1	5.1	2.0	17.8	2.0	21.8
Green Ext Time (p_c), s	0.0	1.7	1.5	0.1	0.0	1.9	0.1	2.0

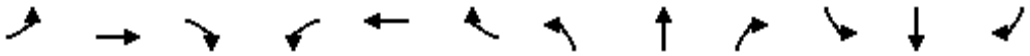
Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Notes

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	376	360	355	748	307	40	836
v/c Ratio	0.68	0.65	0.64	0.30	0.33	0.41	0.42
Control Delay	31.1	23.5	22.8	6.1	1.3	50.0	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	23.5	22.8	6.1	1.3	50.0	10.8
Queue Length 50th (ft)	189	140	130	27	1	25	162
Queue Length 95th (ft)	242	17	164	66	0	32	201
Internal Link Dist (ft)		541		1067			491
Turn Bay Length (ft)					200	100	
Base Capacity (vph)	747	708	718	2495	933	98	1972
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	0.50	0.51	0.49	0.30	0.33	0.41	0.42

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	412	1	526	0	0	0	0	643	212	20	669	0
Future Volume (vph)	412	1	526	0	0	0	0	643	212	20	669	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	1.00	0.95	
Frt	1.00	0.88	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1482	1504					5085	1583	1770	3539	
Flt Permitted	0.95	0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1482	1504					5085	1583	1770	3539	
Peak-hour factor, PHF	0.91	0.25	0.83	1.00	1.00	1.00	1.00	0.86	0.69	0.50	0.80	1.00
Adj. Flow (vph)	453	4	634	0	0	0	0	748	307	40	836	0
RTOR Reduction (vph)	0	60	60	0	0	0	0	0	163	0	0	0
Lane Group Flow (vph)	376	300	295	0	0	0	0	748	144	40	836	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)	29.8	29.8	29.8					42.2	42.2	3.0	50.2	
Effective Green, g (s)	29.8	29.8	29.8					42.2	42.2	3.0	50.2	
Actuated g/C Ratio	0.33	0.33	0.33					0.47	0.47	0.03	0.56	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	556	490	497					2384	742	59	1973	
v/s Ratio Prot	c0.22	0.20						0.15		0.02	c0.24	
v/s Ratio Perm			0.20						0.09			
v/c Ratio	0.68	0.61	0.59					0.31	0.19	0.68	0.42	
Uniform Delay, d1	25.9	25.2	25.1					14.9	14.0	43.0	11.5	
Progression Factor	1.00	1.00	1.00					0.36	0.16	0.98	0.78	
Incremental Delay, d2	3.3	2.3	1.9					0.3	0.6	20.6	0.5	
Delay (s)	29.2	27.5	27.0					5.6	2.8	62.7	9.5	
Level of Service	C	C	C					A	A	E	A	
Approach Delay (s)		27.9			0.0			4.8			11.9	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	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)	15.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

LANE LEVEL OF SERVICE

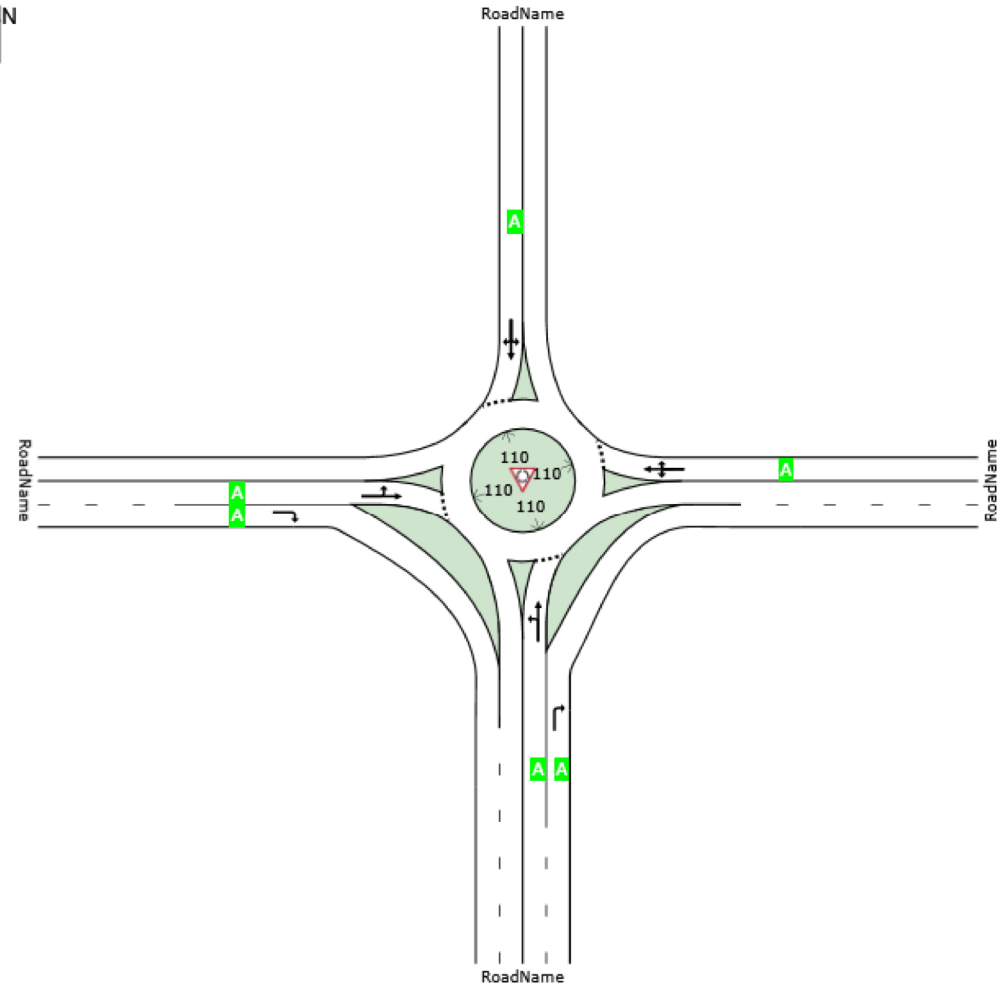
Lane Level of Service

Site: 101 [Colbern Rd & Blue Pkwy (Ex + Ph1 AM)]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
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).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

Site: 101 [Colbern Rd & Blue Pkwy (Ex + Ph1 AM)]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: RoadName													
Lane 1[d]	104	2.0	1088	0.095	100	4.1	LOS A	0.4	9.6	Full	1600	0.0	0.0
Lane 2	22	2.0	1642	0.014	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	126	2.0		0.095		3.4	LOS A	0.4	9.6				
East: RoadName													
Lane 1[d]	604	2.0	1200	0.504	100	8.5	LOS A	3.6	92.0	Full	1600	0.0	0.0
Approach	604	2.0		0.504		8.5	LOS A	3.6	92.0				
North: RoadName													
Lane 1[d]	16	2.0	680	0.023	100	5.5	LOS A	0.1	2.2	Full	1600	0.0	0.0
Approach	16	2.0		0.023		5.5	LOS A	0.1	2.2				
West: RoadName													
Lane 1[d]	258	2.0	1311	0.197	100	4.4	LOS A	0.9	22.9	Full	1600	0.0	0.0
Lane 2	217	2.0	1642	0.132	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	475	2.0		0.197		2.4	LOS A	0.9	22.9				
Intersection	1221	2.0		0.504		5.6	LOS A	3.6	92.0				

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).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Intersection	
Int Delay, s/veh	2.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	2	459	11	50	527	12	7	0	32	18	0	10
Future Vol, veh/h	2	459	11	50	527	12	7	0	32	18	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	-	-	200	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	93	35	78	83	60	35	92	55	75	92	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	494	31	64	635	20	20	0	58	24	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	655	0	0	525	0	0	1297	1301	510	1320	1306	645
Stage 1	-	-	-	-	-	-	518	518	-	773	773	-
Stage 2	-	-	-	-	-	-	779	783	-	547	533	-
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	932	-	-	1042	-	-	139	161	563	134	160	472
Stage 1	-	-	-	-	-	-	541	533	-	392	409	-
Stage 2	-	-	-	-	-	-	389	404	-	521	525	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	932	-	-	1042	-	-	129	151	563	114	150	472
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	151	-	114	150	-
Stage 1	-	-	-	-	-	-	539	531	-	390	384	-
Stage 2	-	-	-	-	-	-	356	379	-	465	523	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.8	18.7	35.6
HCM LOS			C	E

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	129	563	1042	-	-	932	-	-	153
HCM Lane V/C Ratio	0.155	0.103	0.062	-	-	0.004	-	-	0.236
HCM Control Delay (s)	38	12.1	8.7	-	-	8.9	-	-	35.6
HCM Lane LOS	E	B	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.5	0.3	0.2	-	-	0	-	-	0.9

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	2	0	1	25	0	17	2	512	12	20	441	5
Future Vol, veh/h	2	0	1	25	0	17	2	512	12	20	441	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	50	100	25	39	100	71	50	84	75	63	90	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	4	64	0	24	4	610	16	32	490	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1196	1192	494	1178	1180	610	498	0	0	626	0	0
Stage 1	558	558	-	618	618	-	-	-	-	-	-	-
Stage 2	638	634	-	560	562	-	-	-	-	-	-	-
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	163	187	575	168	190	494	1066	-	-	956	-	-
Stage 1	514	512	-	477	481	-	-	-	-	-	-	-
Stage 2	465	473	-	513	510	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	151	180	575	162	183	494	1066	-	-	956	-	-
Mov Cap-2 Maneuver	151	180	-	162	183	-	-	-	-	-	-	-
Stage 1	512	495	-	475	479	-	-	-	-	-	-	-
Stage 2	441	471	-	492	493	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.6	33.4	0.1	0.5
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1066	-	-	239	162	494	956	-	-
HCM Lane V/C Ratio	0.004	-	-	0.033	0.396	0.048	0.033	-	-
HCM Control Delay (s)	8.4	-	-	20.6	41.1	12.7	8.9	-	-
HCM Lane LOS	A	-	-	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.7	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	23	56	1	504	32	65	444
Future Vol, veh/h	23	56	1	504	32	65	444
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	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	68	93	25	83	83	90	91
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	34	60	4	607	39	72	488

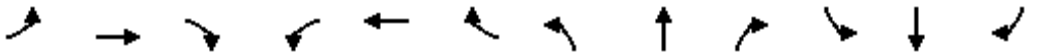
Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1247	304	-	0	0	646	0
Stage 1	615	-	-	-	-	-	-
Stage 2	632	-	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	2.219	-
Pot Cap-1 Maneuver	178	693	-	-	-	937	-
Stage 1	503	-	-	-	-	-	-
Stage 2	529	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	164	693	-	-	-	937	-
Mov Cap-2 Maneuver	164	-	-	-	-	-	-
Stage 1	464	-	-	-	-	-	-
Stage 2	529	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.8		1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	321	937	-
HCM Lane V/C Ratio	-	-	0.293	0.077	-
HCM Control Delay (s)	-	-	20.8	9.2	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	193	122	149	104	68	130	277	270	44	256
v/c Ratio	0.09	0.48	0.28	0.33	0.17	0.11	0.33	0.46	0.39	0.11	0.62
Control Delay	14.6	31.0	7.6	16.8	22.4	1.4	17.2	25.7	5.2	14.9	34.1
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	14.6	31.0	7.6	16.8	22.4	1.4	17.2	25.7	5.2	14.9	34.1
Queue Length 50th (ft)	12	73	0	39	35	0	34	105	0	11	99
Queue Length 95th (ft)	32	154	43	75	72	0	67	217	43	35	197
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	643	928	850	650	1061	953	555	928	924	625	1053
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	0.21	0.14	0.23	0.10	0.07	0.23	0.30	0.29	0.07	0.24

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	164	110	110	78	54	96	249	227	39	204	11
Future Volume (veh/h)	37	164	110	110	78	54	96	249	227	39	204	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	48	193	122	149	104	68	130	277	270	44	240	16
Peak Hour Factor	0.77	0.85	0.90	0.74	0.75	0.79	0.74	0.90	0.84	0.89	0.85	0.69
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	451	353	299	405	440	373	364	446	378	307	350	23
Arrive On Green	0.05	0.19	0.19	0.09	0.24	0.24	0.08	0.24	0.24	0.04	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1734	116
Grp Volume(v), veh/h	48	193	122	149	104	68	130	277	270	44	0	256
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1850
Q Serve(g_s), s	1.1	5.0	3.6	3.5	2.4	1.8	3.0	7.0	8.3	1.0	0.0	6.8
Cycle Q Clear(g_c), s	1.1	5.0	3.6	3.5	2.4	1.8	3.0	7.0	8.3	1.0	0.0	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	451	353	299	405	440	373	364	446	378	307	0	373
V/C Ratio(X)	0.11	0.55	0.41	0.37	0.24	0.18	0.36	0.62	0.71	0.14	0.00	0.69
Avail Cap(c_a), veh/h	870	1234	1046	909	1234	1046	722	1234	1046	899	0	1220
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	14.1	19.5	18.9	15.2	16.4	16.2	15.2	18.0	18.5	14.4	0.0	19.6
Incr Delay (d2), s/veh	0.0	2.8	1.9	0.2	0.6	0.5	0.2	1.4	2.5	0.1	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.1	1.3	1.2	1.0	0.6	1.0	2.7	2.7	0.3	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	22.3	20.8	15.4	17.0	16.7	15.4	19.5	21.0	14.5	0.0	21.9
LnGrp LOS	B	C	C	B	B	B	B	B	C	B	A	C
Approach Vol, veh/h		363			321			677			300	
Approach Delay, s/veh		20.7			16.2			19.3			20.8	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	15.5	10.3	16.7	8.0	18.0	8.4	18.7
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	20.0	35.0	15.0	35.0	15.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	5.5	7.0	5.0	8.8	3.1	4.4	3.0	10.3
Green Ext Time (p_c), s	0.2	3.0	0.1	1.4	0.0	1.6	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	643	54	13	229	61	26
Future Vol, veh/h	643	54	13	229	61	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	68	54	83	66	52
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	691	79	24	276	92	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	770	0	1055	731
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	324	-
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	-	-	844	-	250	422
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	733	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	844	-	242	422
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	733	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	29.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	285	-	-	844	-
HCM Lane V/C Ratio	0.5	-	-	0.029	-
HCM Control Delay (s)	29.6	-	-	9.4	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	2.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	32	50	582	498	11
Future Vol, veh/h	7	32	50	582	498	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	35	55	78	83	93	35
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	58	64	701	535	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1380	551	566	0	-	0
Stage 1	551	-	-	-	-	-
Stage 2	829	-	-	-	-	-
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	159	534	1006	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	149	534	1006	-	-	-
Mov Cap-2 Maneuver	263	-	-	-	-	-
Stage 1	540	-	-	-	-	-
Stage 2	429	-	-	-	-	-

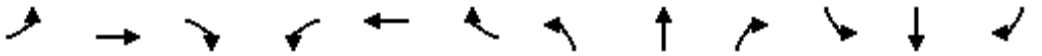
Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1006	-	263	534	-	-
HCM Lane V/C Ratio	0.064	-	0.076	0.109	-	-
HCM Control Delay (s)	8.8	-	19.8	12.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	0.4	-	-

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	158	148	630	974	710	322
v/c Ratio	0.66	0.50	0.73	0.36	0.46	0.39
Control Delay	52.9	25.2	14.9	2.3	3.3	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	25.2	14.9	2.3	3.3	1.9
Queue Length 50th (ft)	101	44	91	8	11	0
Queue Length 95th (ft)	164	102	175	58	m121	m49
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	319	367	1098	2676	1559	832
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	44	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.40	0.57	0.37	0.46	0.39

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	221	0	24	567	935	0	0	329	574
Future Volume (vph)	0	0	0	221	0	24	567	935	0	0	329	574
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	5.0
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			3169	1441
Flt Permitted				0.95	0.97		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1610		3433	3539			3169	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.91	1.00	0.38	0.90	0.96	1.00	1.00	0.82	0.91
Adj. Flow (vph)	0	0	0	243	0	63	630	974	0	0	401	631
RTOR Reduction (vph)	0	0	0	0	65	0	0	0	0	0	113	175
Lane Group Flow (vph)	0	0	0	158	83	0	630	974	0	0	597	147
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				14.4	14.4		25.0	75.6			45.6	45.6
Effective Green, g (s)				14.4	14.4		25.0	75.6			45.6	45.6
Actuated g/C Ratio				0.14	0.14		0.25	0.76			0.46	0.46
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				242	231		858	2675			1445	657
v/s Ratio Prot				c0.09	0.05		c0.18	0.28			c0.19	
v/s Ratio Perm												0.10
v/c Ratio				0.65	0.36		0.73	0.36			0.41	0.22
Uniform Delay, d1				40.4	38.6		34.4	4.1			18.2	16.5
Progression Factor				1.00	1.00		0.29	0.45			0.18	0.33
Incremental Delay, d2				6.2	1.0		3.2	0.3			0.6	0.6
Delay (s)				46.6	39.6		13.2	2.2			3.9	6.0
Level of Service				D	D		B	A			A	A
Approach Delay (s)		0.0			43.2			6.5			4.6	
Approach LOS		A			D			A			A	

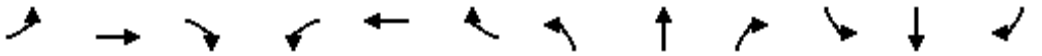
Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	138	653	532	272	80	495	482	123	533
v/c Ratio	0.35	0.86	0.90	0.51	0.22	0.80	0.50	0.53	0.43
Control Delay	20.0	48.9	56.6	25.2	15.5	32.8	5.9	35.0	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0
Total Delay	20.0	48.9	56.6	25.2	15.5	33.0	6.0	35.0	26.6
Queue Length 50th (ft)	51	197	174	127	24	243	86	46	138
Queue Length 95th (ft)	74	#300	#202	172	38	#424	147	54	161
Internal Link Dist (ft)		2564		2353		407			1615
Turn Bay Length (ft)	200		200		160			290	
Base Capacity (vph)	414	776	590	536	384	615	941	258	1233
Starvation Cap Reductn	0	0	0	0	0	6	72	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.84	0.90	0.51	0.21	0.81	0.55	0.48	0.43

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	479	108	415	136	63	56	431	472	79	380	44
Future Volume (veh/h)	102	479	108	415	136	63	56	431	472	79	380	44
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	138	515	138	532	177	95	80	495	482	123	481	52
Peak Hour Factor	0.74	0.93	0.78	0.78	0.77	0.66	0.70	0.87	0.98	0.64	0.79	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	572	152	587	347	186	400	599	777	282	1036	112
Arrive On Green	0.07	0.21	0.21	0.06	0.10	0.10	0.14	0.53	0.53	0.09	0.32	0.32
Sat Flow, veh/h	1781	2774	740	3456	1145	615	1781	1870	1585	1781	3236	349
Grp Volume(v), veh/h	138	329	324	532	0	272	80	495	482	123	263	270
Grp Sat Flow(s),veh/h/ln	1781	1777	1737	1728	0	1760	1781	1870	1585	1781	1777	1808
Q Serve(g_s), s	5.2	18.0	18.2	15.3	0.0	14.7	0.0	22.1	0.0	0.0	11.8	11.9
Cycle Q Clear(g_c), s	5.2	18.0	18.2	15.3	0.0	14.7	0.0	22.1	0.0	0.0	11.8	11.9
Prop In Lane	1.00		0.43	1.00		0.35	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	375	366	358	587	0	533	400	599	777	282	569	578
V/C Ratio(X)	0.37	0.90	0.91	0.91	0.00	0.51	0.20	0.83	0.62	0.44	0.46	0.47
Avail Cap(c_a), veh/h	427	377	368	587	0	533	400	599	777	282	569	578
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.00	0.99	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	38.7	38.7	46.4	0.0	38.0	26.1	21.0	11.2	39.5	27.1	27.2
Incr Delay (d2), s/veh	0.6	23.1	24.7	17.5	0.0	0.8	0.2	11.7	3.5	1.1	2.7	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	9.8	9.8	8.4	0.0	7.0	1.4	8.5	5.2	2.8	5.2	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	61.8	63.5	63.9	0.0	38.8	26.3	32.7	14.7	40.5	29.8	29.9
LnGrp LOS	C	E	E	E	A	D	C	C	B	D	C	C
Approach Vol, veh/h		791			804			1057			656	
Approach Delay, s/veh		55.7			55.4			24.0			31.9	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	38.0	22.0	26.4	13.6	38.0	13.1	35.3
Change Period (Y+Rc), s	* 5	6.0	* 5	5.8	* 5	6.0	* 5.8	5.0
Max Green Setting (Gmax), s	* 8	32.0	* 17	21.2	* 8	32.0	* 10	28.0
Max Q Clear Time (g_c+I1), s	2.0	13.9	17.3	20.2	2.0	24.1	7.2	16.7
Green Ext Time (p_c), s	0.1	0.4	0.0	0.4	0.1	3.0	0.1	1.1

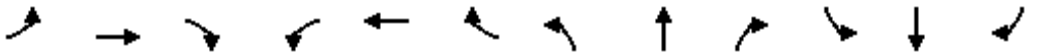
Intersection Summary	
HCM 6th Ctrl Delay	40.8
HCM 6th LOS	D

Notes

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	443	424	401	1014	470	37	616
v/c Ratio	0.73	0.69	0.60	0.42	0.47	0.35	0.32
Control Delay	34.6	25.2	15.7	6.9	2.5	52.1	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	25.2	15.7	6.9	2.5	52.1	13.3
Queue Length 50th (ft)	247	181	103	93	31	23	131
Queue Length 95th (ft)	335	275	186	123	48	24	165
Internal Link Dist (ft)		541		1067			491
Turn Bay Length (ft)					200	100	
Base Capacity (vph)	722	709	758	2408	996	105	1908
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	0.60	0.53	0.42	0.47	0.35	0.32

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	569	0	622	0	0	0	0	933	395	14	536	0
Future Volume (vph)	569	0	622	0	0	0	0	933	395	14	536	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	1.00	0.95	
Frt	1.00	0.91	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1507	1504					5085	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1507	1504					5085	1583	1770	3539	
Peak-hour factor, PHF	0.95	1.00	0.93	1.00	1.00	1.00	1.00	0.92	0.84	0.38	0.87	1.00
Adj. Flow (vph)	599	0	669	0	0	0	0	1014	470	37	616	0
RTOR Reduction (vph)	0	70	125	0	0	0	0	0	257	0	0	0
Lane Group Flow (vph)	443	354	276	0	0	0	0	1014	213	37	616	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)	36.1	36.1	36.1					45.3	45.3	3.6	53.9	
Effective Green, g (s)	36.1	36.1	36.1					45.3	45.3	3.6	53.9	
Actuated g/C Ratio	0.36	0.36	0.36					0.45	0.45	0.04	0.54	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	606	544	542					2303	717	63	1907	
v/s Ratio Prot	c0.26	0.24						c0.20		c0.02	0.17	
v/s Ratio Perm			0.18						0.13			
v/c Ratio	0.73	0.65	0.51					0.44	0.30	0.59	0.32	
Uniform Delay, d1	27.7	26.7	25.0					18.7	17.3	47.5	12.9	
Progression Factor	1.00	1.00	1.00					0.33	0.59	0.95	0.91	
Incremental Delay, d2	4.5	2.8	0.8					0.4	0.7	12.1	0.4	
Delay (s)	32.3	29.5	25.8					6.6	10.9	57.4	12.1	
Level of Service	C	C	C					A	B	E	B	
Approach Delay (s)		29.3			0.0			8.0			14.7	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

LANE LEVEL OF SERVICE

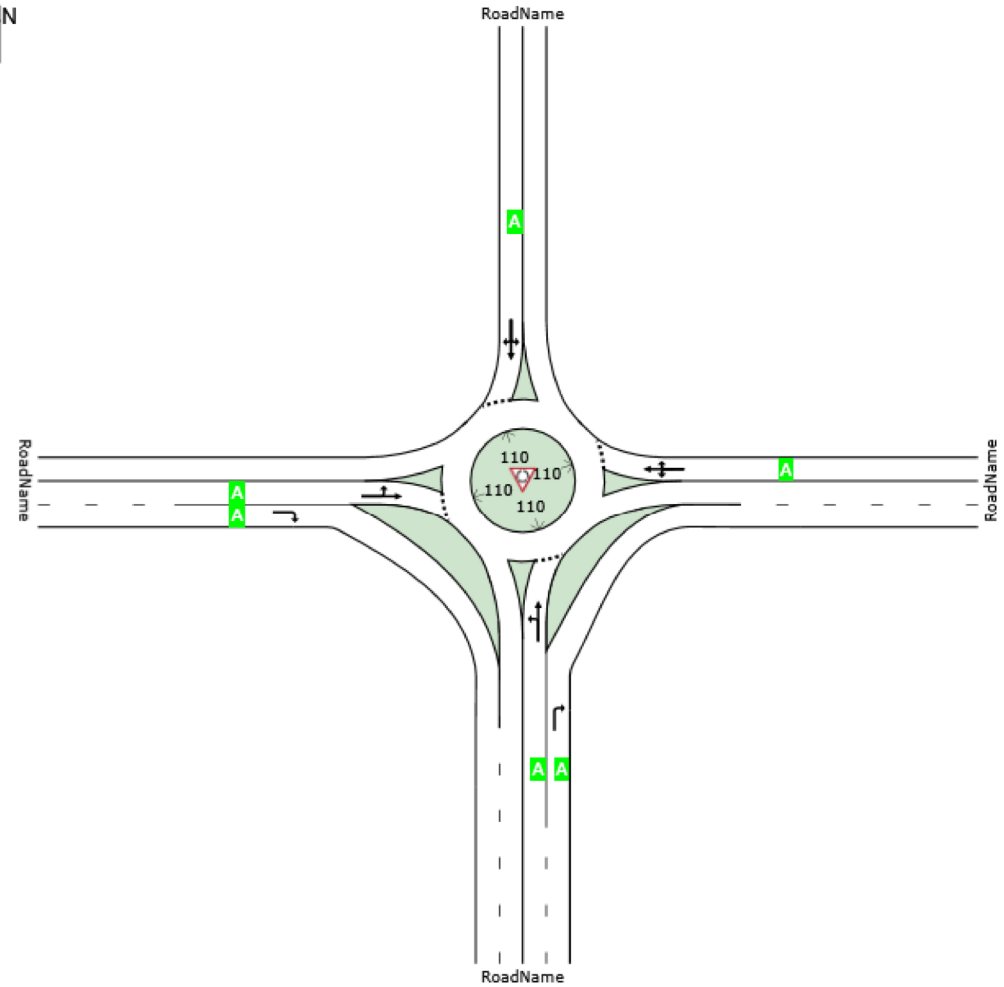
Lane Level of Service

Site: 101 [Colbern Rd & Blue Pkwy (Ex + Ph1 PM)]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
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).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

Site: 101 [Colbern Rd & Blue Pkwy (Ex + Ph1 PM)]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: RoadName													
Lane 1[d]	244	2.0	719	0.340	100	9.3	LOS A	1.5	37.3	Full	1600	0.0	0.0
Lane 2	114	2.0	1642	0.070	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	359	2.0		0.340		6.3	LOS A	1.5	37.3				
East: RoadName													
Lane 1[d]	341	2.0	1024	0.333	100	6.9	LOS A	1.7	44.3	Full	1600	0.0	0.0
Approach	341	2.0		0.333		6.9	LOS A	1.7	44.3				
North: RoadName													
Lane 1[d]	131	2.0	755	0.173	100	6.6	LOS A	0.7	18.3	Full	1600	0.0	0.0
Approach	131	2.0		0.173		6.6	LOS A	0.7	18.3				
West: RoadName													
Lane 1[d]	633	2.0	1233	0.514	100	8.5	LOS A	3.5	87.8	Full	1600	0.0	0.0
Lane 2	165	2.0	1642	0.100	100	0.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	798	2.0		0.514		6.8	LOS A	3.5	87.8				
Intersection	1629	2.0		0.514		6.7	LOS A	3.5	87.8				

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).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Theoretical Roadway Capacity

The expected daily phase 1 development trips were added to the existing daily volumes illustrated in the City's TMP to determine the estimated AADT of Lee's Summit Road / Douglas Street after phase 1 development.

The estimated AADT was used to determine the theoretical level of service after phase 1 development to determine if the roadway status is acceptable based on the City's Unimproved Roadway Policy.

According to the City's Thoroughfare Master Plan 2015-2040, Lee's Summit Road/Douglas Street currently services approximately 7,641 vehicles per day.

Approximately 2,615 daily trips are expected with the phase 1 development.

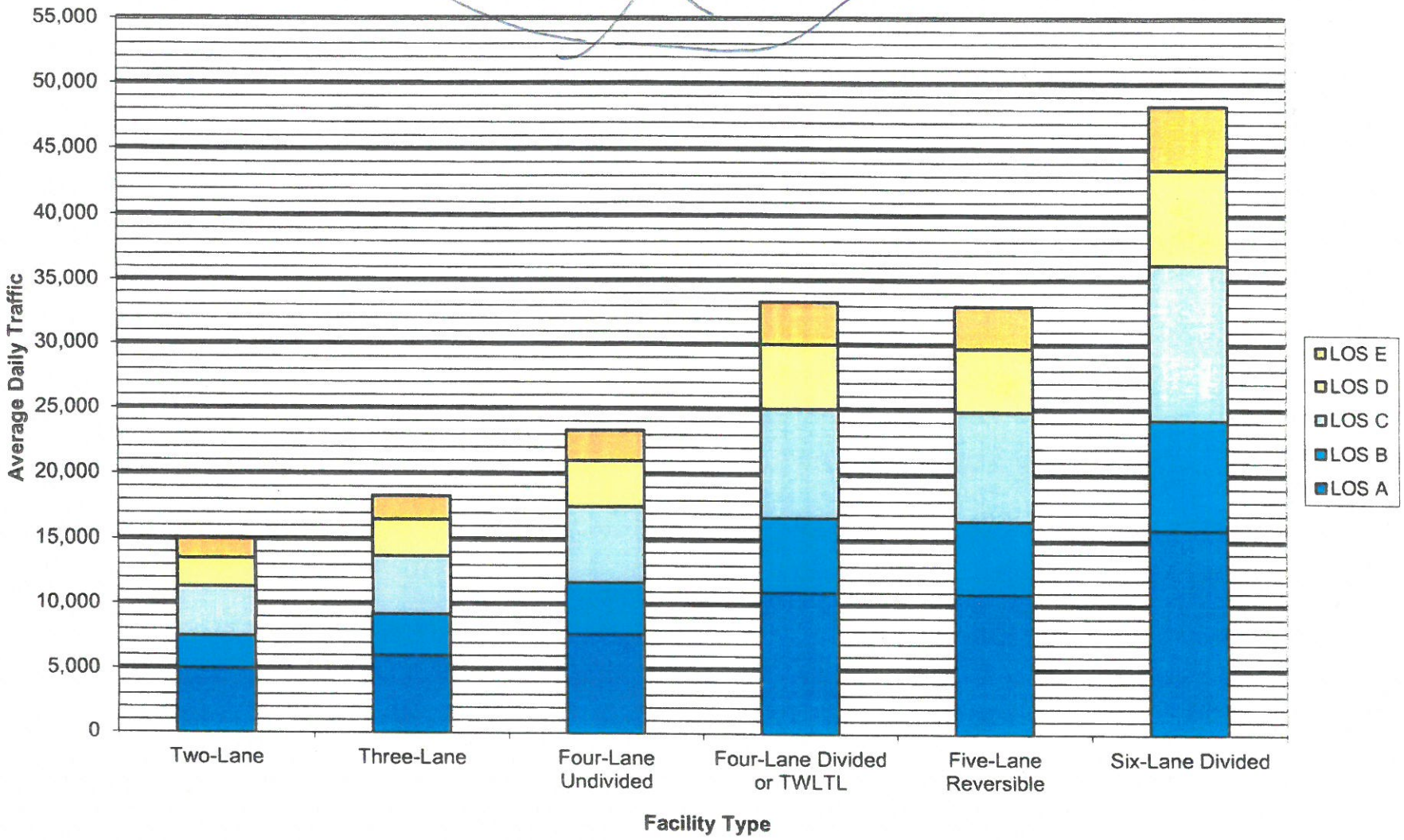
This would result in 10,256 daily vehicles along Douglas Street/ Lee's Summit Road.

Daily total traffic = 7,641 vpd + 2,615 vpd = 10,256 vpd

12,360 vpd results in a theoretical LOS of C along Lee's Summit Road.

Source: City's Thoroughfare Master Plan 2015-2040

https://cityofls.net/Portals/0/Files/Planning/Comp%20Plan/TFMP%202015%20to%202040.pdf?ver=2018-05-01-160101-007



Notes:
Capacities based on signalization set to high priority with high turns

Source: Calculations from NCHRP 365 Chapter 10

APPENDIX D

Existing plus Full Build Development Conditions Analysis

Trip Generation

Land Use: 252
Senior Adult Housing—Attached

Description

Senior adult housing consists of attached independent living developments, including retirement communities, age-restricted housing, and active adult communities. These developments may include limited social or recreational services. However, they generally lack centralized dining and onsite medical facilities. Residents in these communities live independently, are typically active (requiring little to no medical supervision) and may or may not be retired. Senior adult housing—detached (Land Use 251), congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related uses.

Additional Data

Time-of-day distribution data for this land use are presented in Appendix A. For the one general urban/suburban site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 12:00 and 1:00 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, and the 2000s in Alberta (CAN), California, Illinois, New Hampshire, New Jersey, New York, and Pennsylvania.

Source Numbers

272, 501, 576, 602, 703, 734, 741, 902, 970

Senior Adult Housing - Attached
(252)

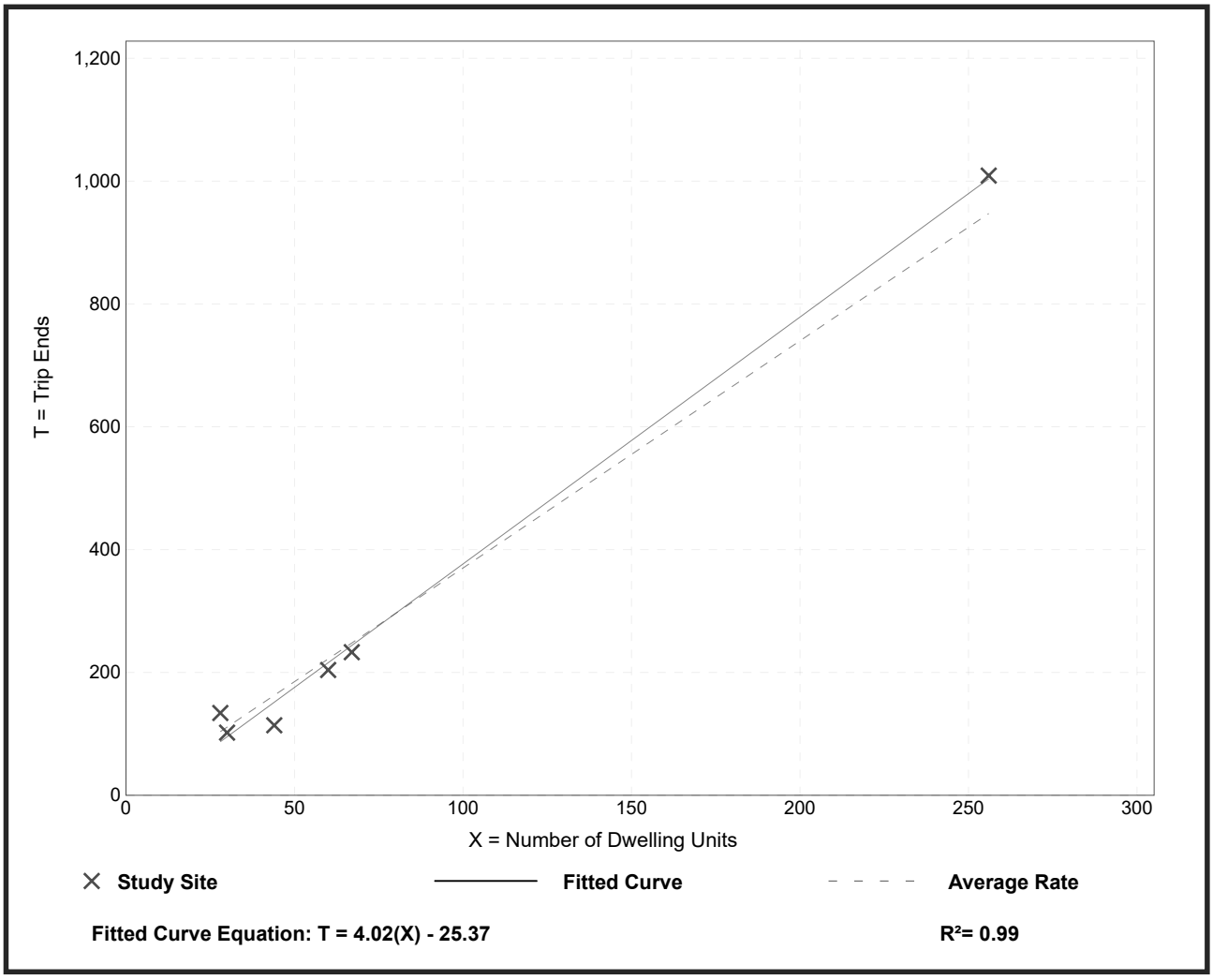
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Dwelling Units: 81
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.70	2.59 - 4.79	0.53

Data Plot and Equation



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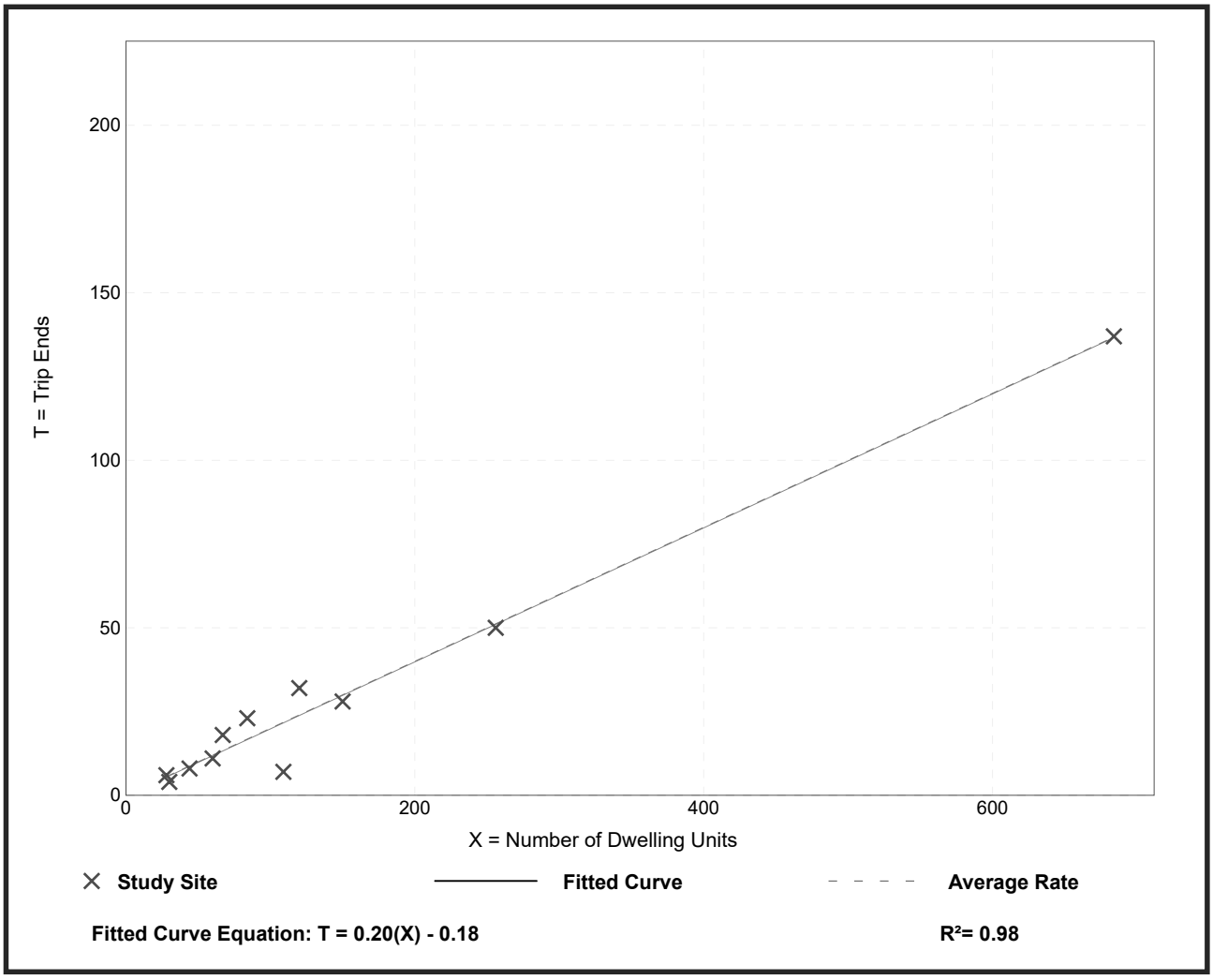
Senior Adult Housing - Attached
(252)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	11
Avg. Num. of Dwelling Units:	148
Directional Distribution:	35% entering, 65% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.20	0.06 - 0.27	0.05

Data Plot and Equation



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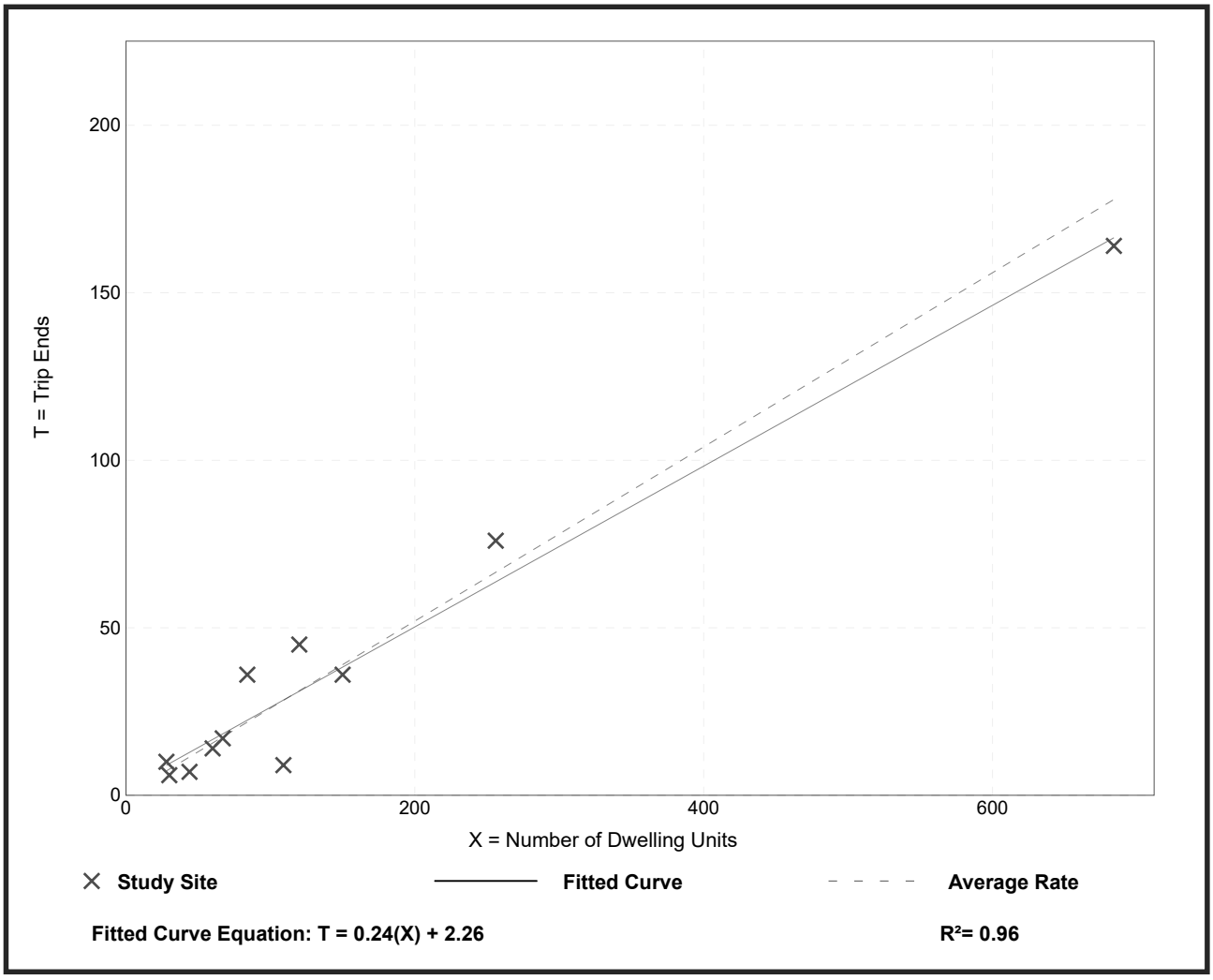
Senior Adult Housing - Attached
(252)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 11
Avg. Num. of Dwelling Units: 148
Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.26	0.08 - 0.43	0.08

Data Plot and Equation



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Land Use: 255
Continuing Care Retirement Community

Description

A continuing care retirement community (CCRC) is a land use that provides multiple elements of senior adult living. CCRCs combine aspects of independent living with increased care, as lifestyle needs change with time. Housing options may include various combinations of senior adult (detached), senior adult (attached), congregate care, assisted living, and skilled nursing care—aimed at allowing the residents to live in one community as their medical needs change. The communities may also contain special services such as medical, dining, recreational, and some limited, supporting retail facilities. CCRCs are usually self-contained villages. Senior adult housing—detached (Land Use 251), senior adult housing—attached (Land Use 252), congregate care facility (Land Use 253), assisted living (Land Use 254), and nursing home (Land Use 620) are related uses.

Additional Data

Caution should be used when applying these data. CCRCs are relatively new and unique land uses. These developments consist of various housing components (dwelling units, rooms, and beds[1]) that often exist in varying proportions. Therefore, the use of a single housing component does not fully describe the trip generation characteristics of these communities. Based upon the limited data submitted for this land use, it was determined that a comprehensive independent variable, units, was the most appropriate descriptor of the characteristics. This variable is defined as an aggregate of all living accommodations common to these communities. The independent variable, occupied units, provides data on the number of units that were occupied at the study sites at the time of the survey.

To illustrate the varying proportions of housing options that exist, the following table is provided for nine of the CCRCs included in this land use as an example. Users are strongly cautioned to exercise proper professional judgment in applying these data.

Living Accommodations at CCRCs		
Occupied Dwelling Units/Rooms[2]	Occupied Beds	Total Occupied Units
215	46	261
220	151	371
620	100	720
312	166	478
210	37	247
323	120[3]	443
233	121[3]	354
209	33	242
234	94	328

The sites were surveyed in the 1980s, the 1990s, and the 2000s in Connecticut, Illinois, Maryland, Massachusetts, Pennsylvania, and Virginia.

A complete study of CCRCs requires future analysis of their various components. Therefore, it is important to collect as much information as possible. At the very least, the total number of dwelling units, rooms, and beds should be obtained; if possible, the number of corresponding occupied units should be recorded as well.

Source Numbers

244, 253, 388, 501, 576, 713, 715

[1] Dwelling units, rooms, and beds are the independent variables typically used to represent independent housing (detached/attached/congregate care), assisted living facilities, and nursing homes, respectively. Occupied dwelling units/rooms may be private or shared accommodations.

[2] Total number of combined dwelling units and rooms available within a community.

[3] For analysis purposes, an assumption was made that the total number of beds equaled the total number of occupied beds.

Continuing Care Retirement Community
(255)

Vehicle Trip Ends vs: **Units**
On a: **Weekday**

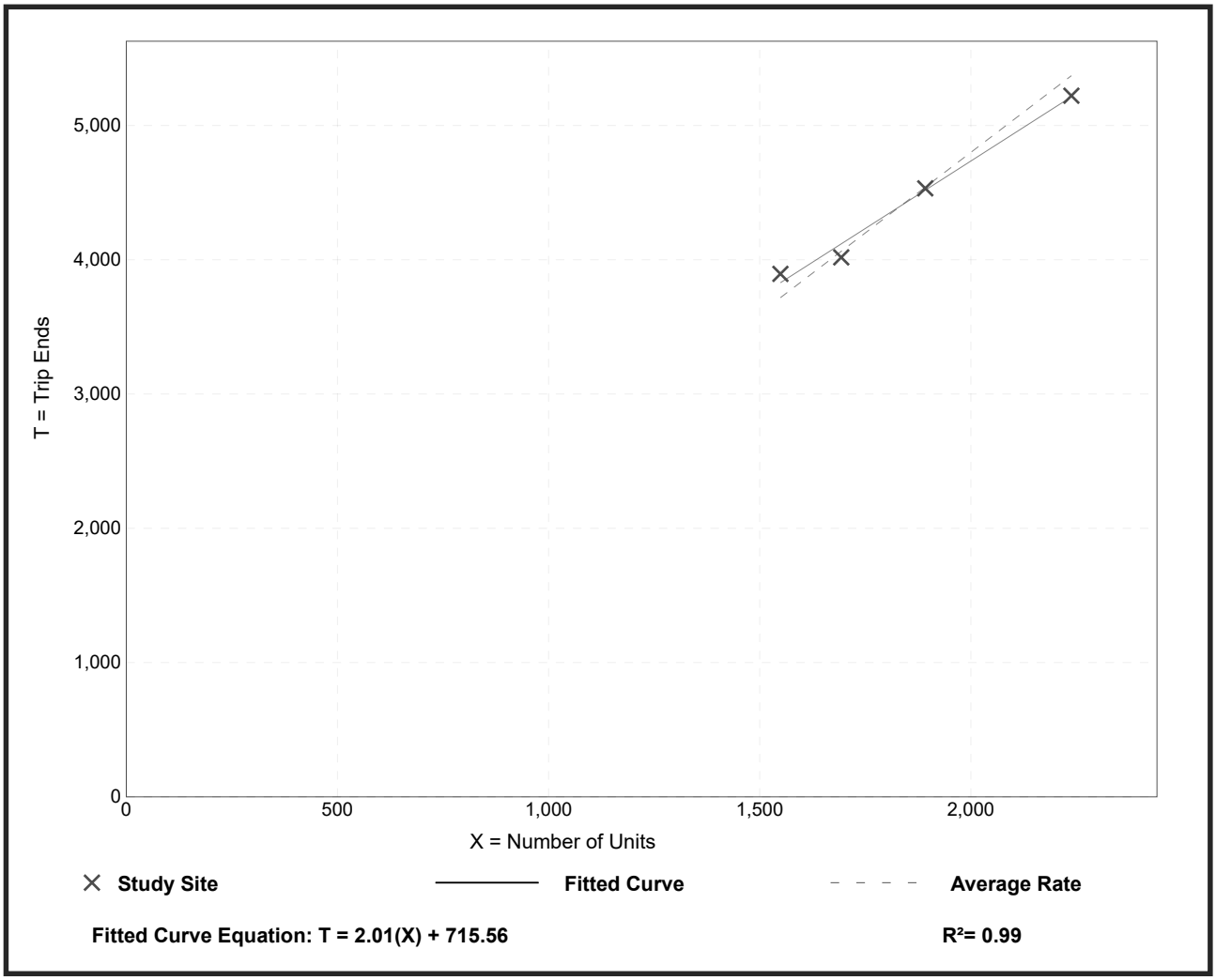
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. Num. of Units: 1843
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Unit

Average Rate	Range of Rates	Standard Deviation
2.40	2.33 - 2.51	0.08

Data Plot and Equation

Caution – Small Sample Size



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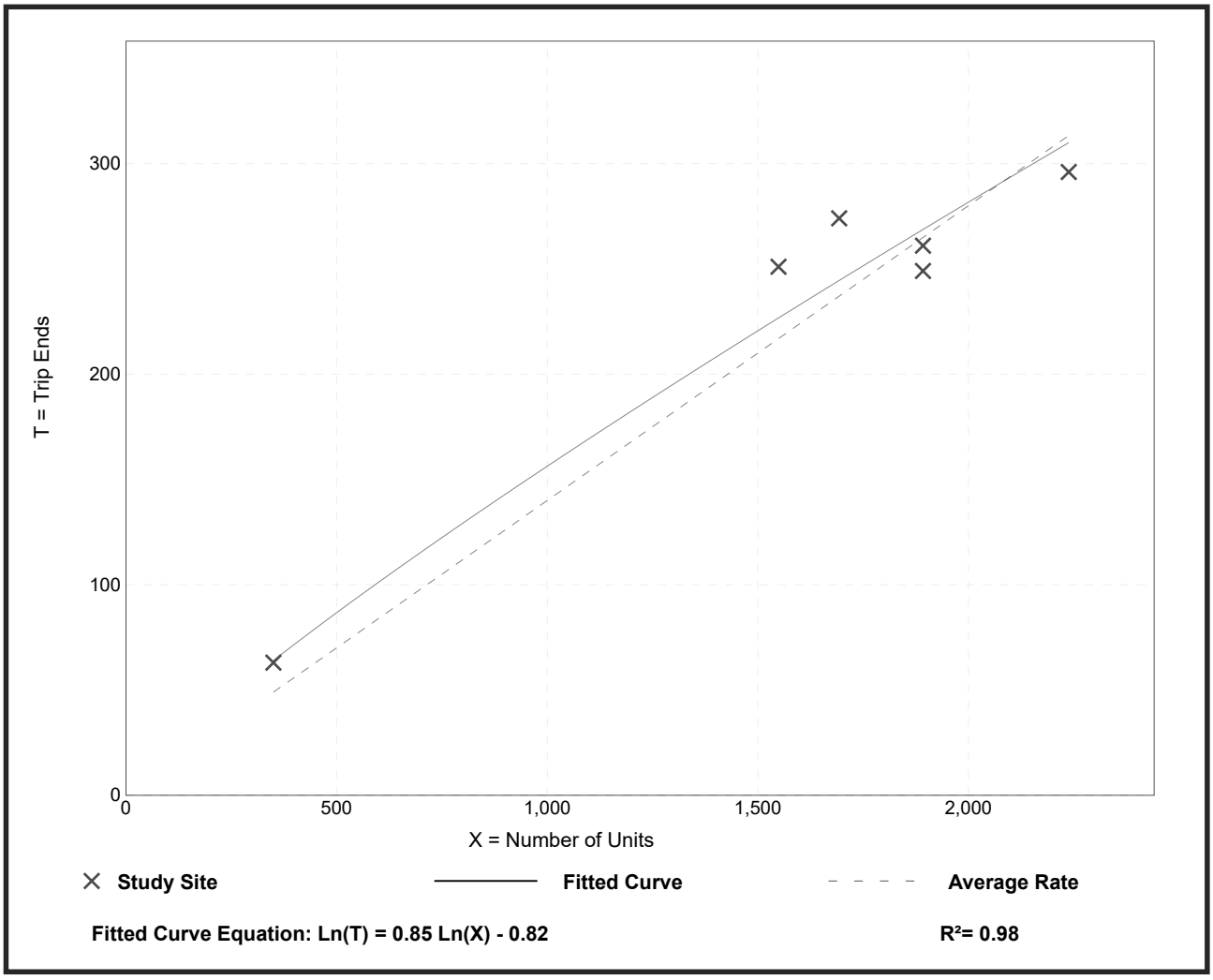
Continuing Care Retirement Community
(255)

Vehicle Trip Ends vs: **Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Units: 1602
Directional Distribution: 65% entering, 35% exiting

Vehicle Trip Generation per Unit

Average Rate	Range of Rates	Standard Deviation
0.14	0.13 - 0.18	0.02

Data Plot and Equation



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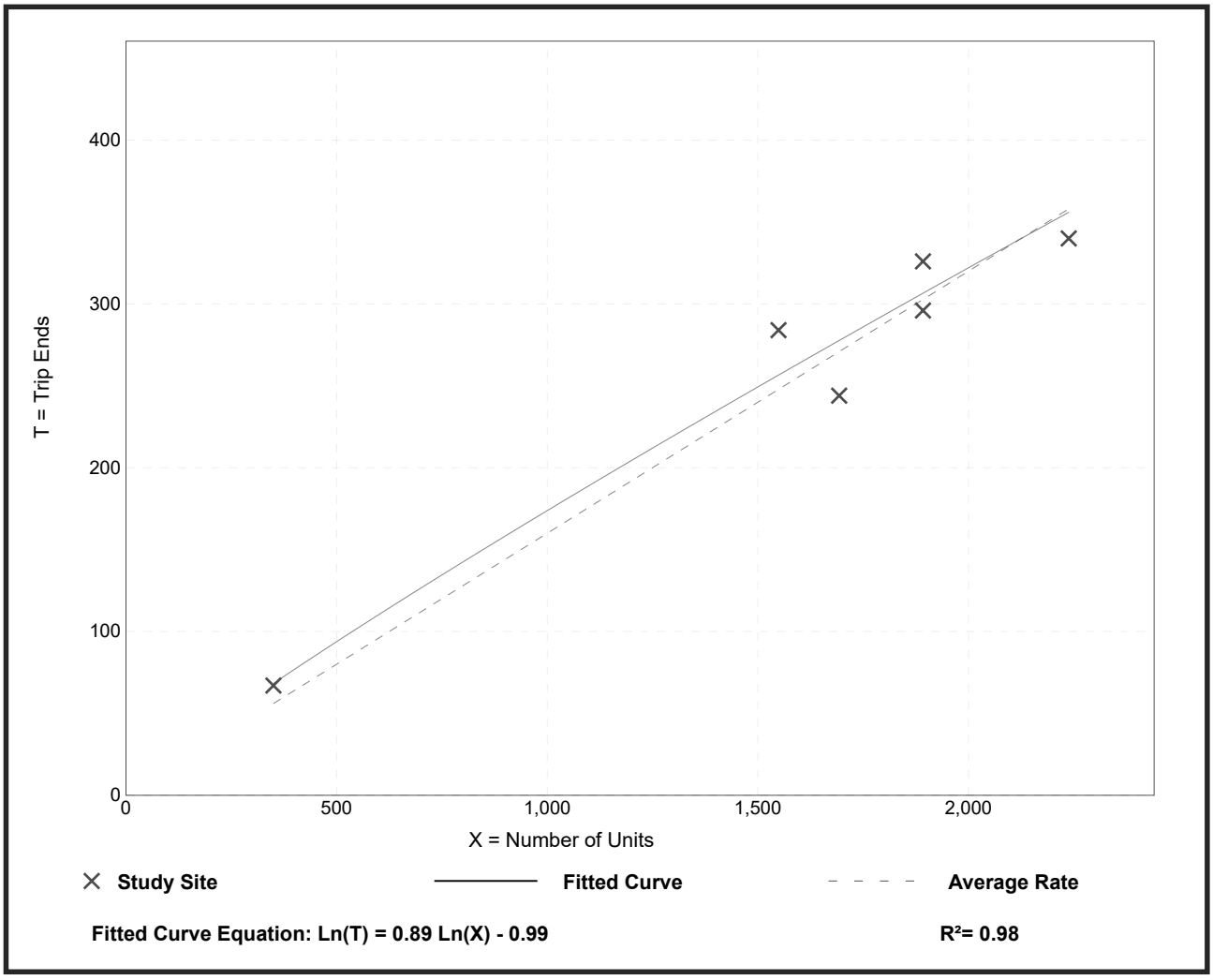
Continuing Care Retirement Community
(255)

Vehicle Trip Ends vs: **Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Units: 1602
Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per Unit

Average Rate	Range of Rates	Standard Deviation
0.16	0.14 - 0.19	0.02

Data Plot and Equation



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Land Use: 310
Hotel

Description

A hotel is a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops. All suites hotel (Land Use 311), business hotel (Land Use 312), motel (Land Use 320), and resort hotel (Land Use 330) are related uses.

Additional Data

Studies of hotel employment density indicate that, on the average, a hotel will employ 0.9 employees per room.[1]

Twenty-five studies provided information on occupancy rates at the time the studies were conducted. The average occupancy rate for these studies was approximately 82 percent.

Some properties contained in this land use provide guest transportation services such as airport shuttles, limousine service, or golf course shuttle service, which may have an impact on the overall trip generation rates.

Time-of-day distribution data for this land use are presented in Appendix A. For the one center city core site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 8:30 and 9:30 a.m. and 3:15 and 4:15 p.m., respectively. On Saturday and Sunday, the peak hours were between 5:00 and 6:00 p.m. and 10:15 and 11:15 a.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, District of Columbia, Florida, Georgia, Indiana, Minnesota, New York, Pennsylvania, South Dakota, Texas, Vermont, Virginia, and Washington.

For all lodging uses, it is important to collect data on occupied rooms as well as total rooms in order to accurately predict trip generation characteristics for the site.

Trip generation at a hotel may be related to the presence of supporting facilities such as convention facilities, restaurants, meeting/banquet space, and retail facilities. Future data submissions should specify the presence of these amenities. Reporting the level of activity at the supporting facilities such as full, empty, partially active, number of people attending a meeting/banquet during observation may also be useful in further analysis of this land use.

Source Numbers

170, 260, 262, 277, 280, 301, 306, 357, 422, 507, 577, 728, 867, 872, 925, 951

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[1] Buttke, Carl H. Unpublished studies of building employment densities, Portland, Oregon.

Hotel
(310)

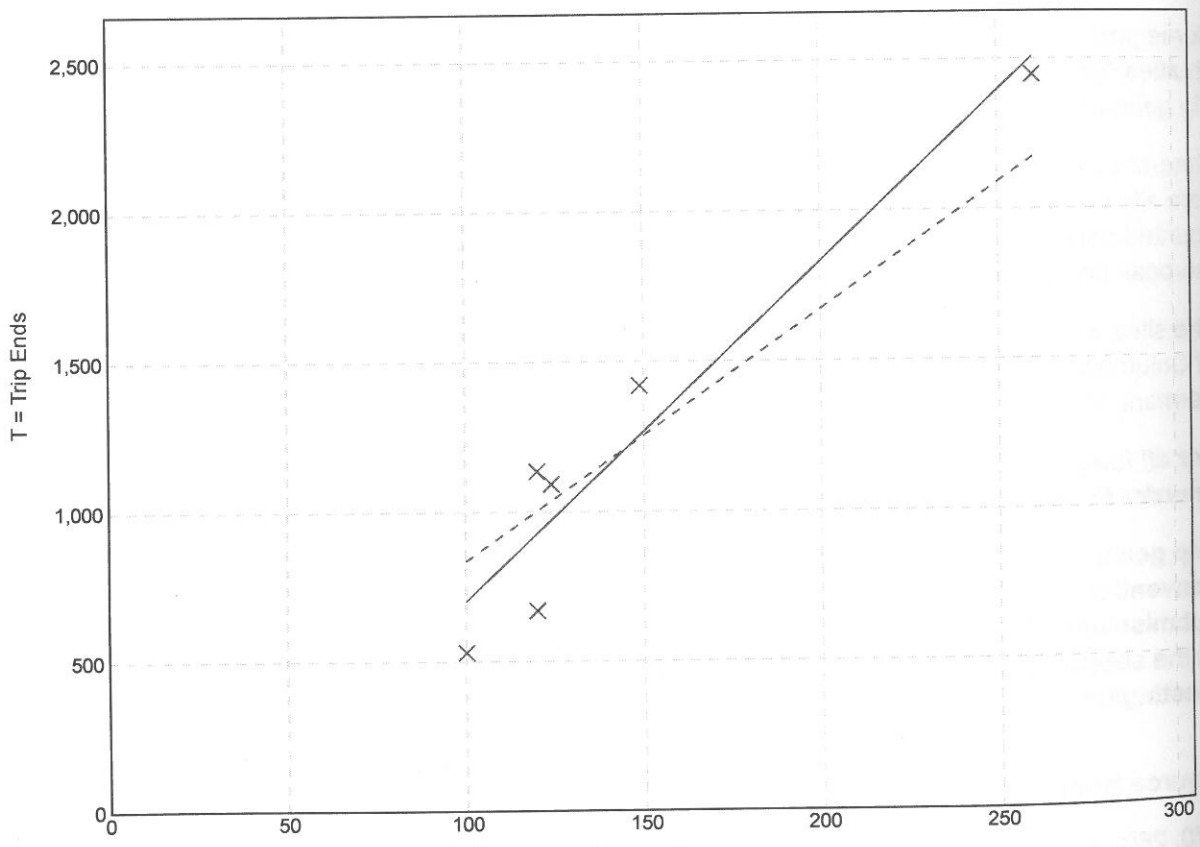
Vehicle Trip Ends vs: **Rooms**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Rooms: 146
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Room

Average Rate	Range of Rates	Standard Deviation
8.36	5.31 - 9.53	1.86

Data Plot and Equation



Fitted Curve Equation: T = 11.29(X) - 426.97

R^2= 0.92

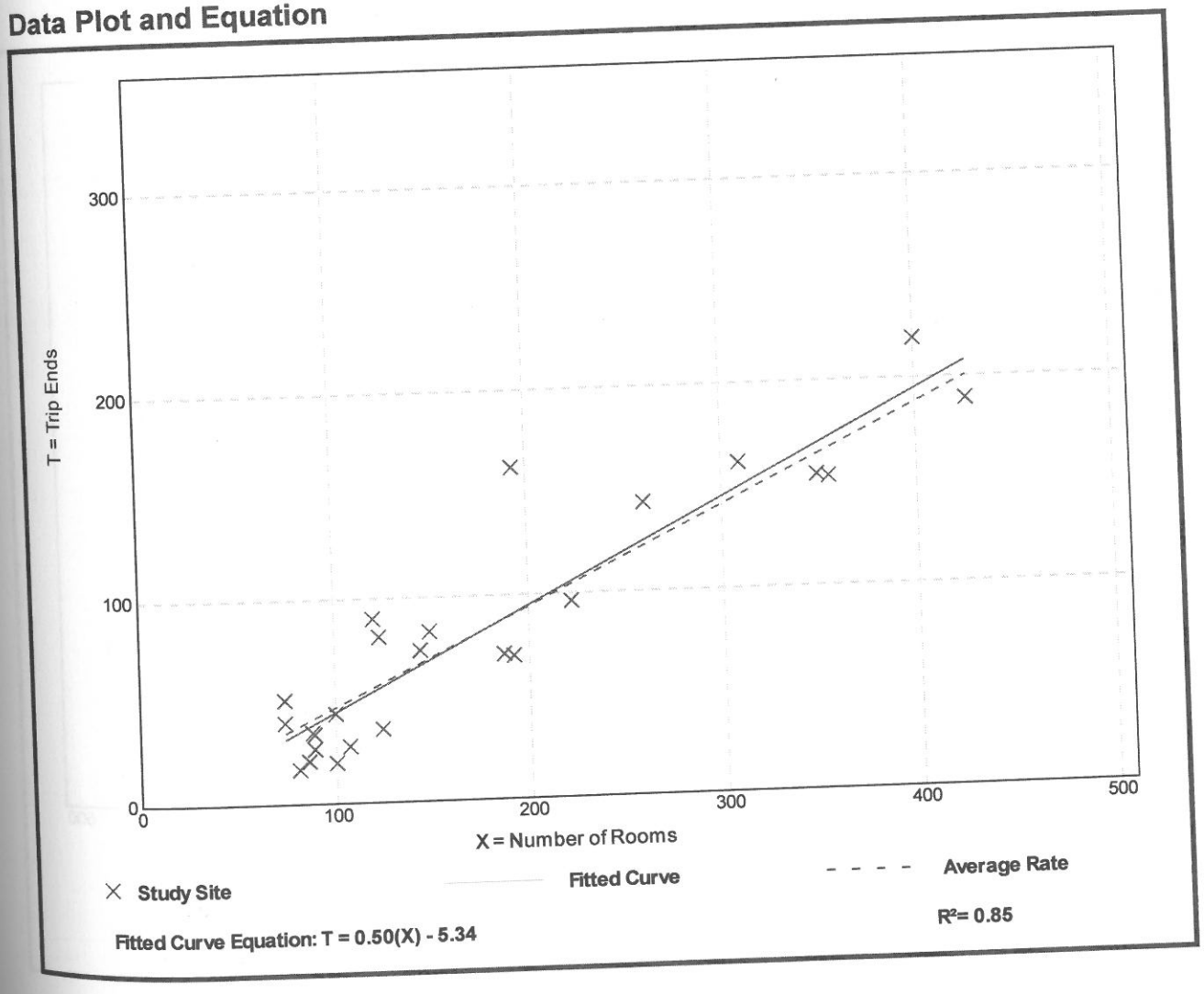
Hotel
(310)

Vehicle Trip Ends vs: **Rooms**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 25
Avg. Num. of Rooms: 178
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Room

Average Rate	Range of Rates	Standard Deviation
0.47	0.20 - 0.84	0.14

Data Plot and Equation



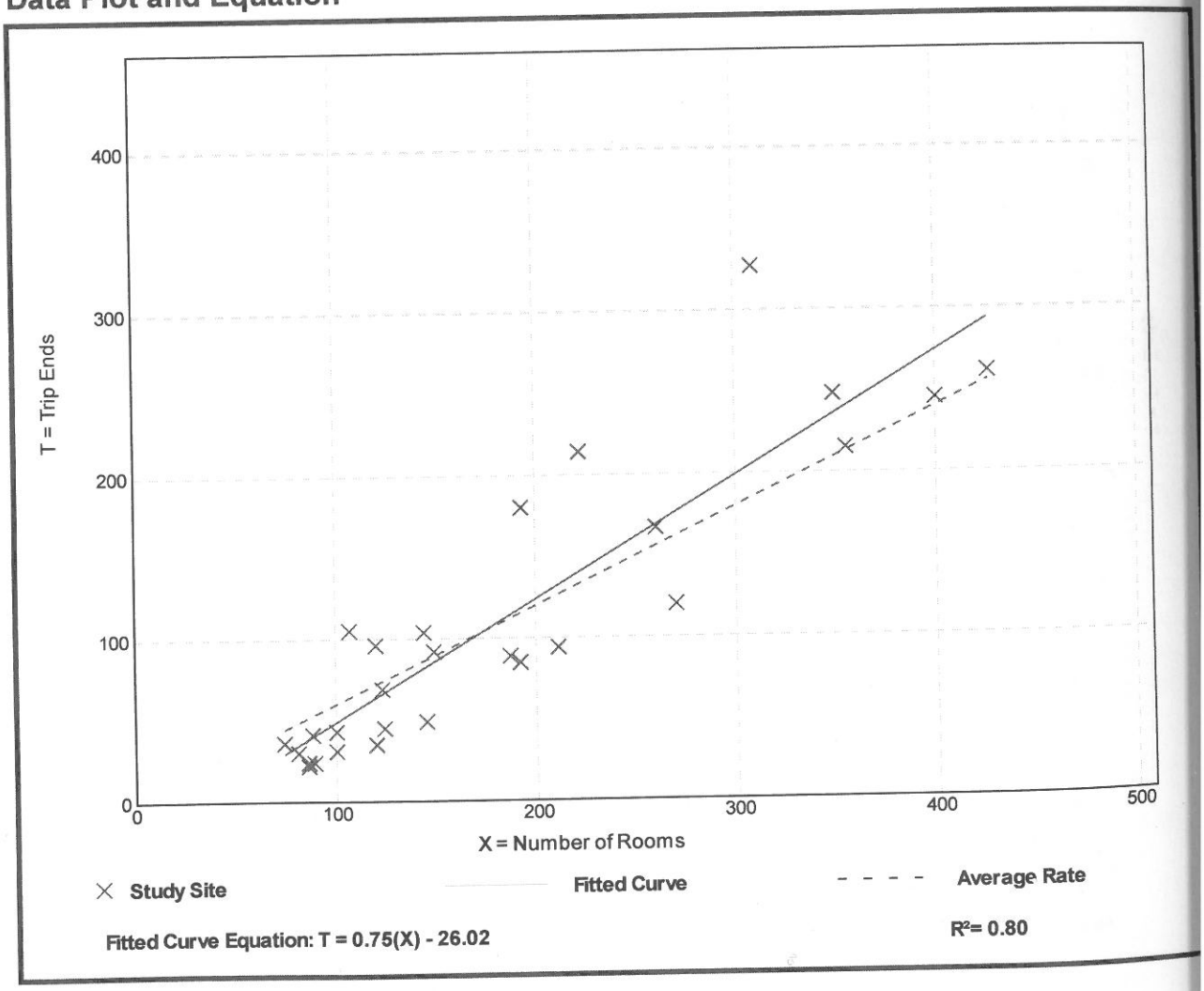
Hotel
(310)

Vehicle Trip Ends vs: **Rooms**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 28
Avg. Num. of Rooms: 183
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Room

Average Rate	Range of Rates	Standard Deviation
0.60	0.26 - 1.06	0.22

Data Plot and Equation



Land Use: 820
Shopping Center

Description

A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. A shopping center also provides on-site parking facilities sufficient to serve its own parking demands. Factory outlet center (Land Use 823) is a related use.

Additional Data

Shopping centers, including neighborhood centers, community centers, regional centers, and super regional centers, were surveyed for this land use. Some of these centers contained non-merchandising facilities, such as office buildings, movie theaters, restaurants, post offices, banks, health clubs, and recreational facilities (for example, ice skating rinks or indoor miniature golf courses).

Many shopping centers, in addition to the integrated unit of shops in one building or enclosed around a mall, include outparcels (peripheral buildings or pads located on the perimeter of the center adjacent to the streets and major access points). These buildings are typically drive-in banks, retail stores, restaurants, or small offices. Although the data herein do not indicate which of the centers studied included peripheral buildings, it can be assumed that some of the data show their effect.

The vehicle trips generated at a shopping center are based upon the total GLA of the center. In cases of smaller centers without an enclosed mall or peripheral buildings, the GLA could be the same as the gross floor area of the building.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 12:15 and 1:15 p.m., respectively.

The average numbers of person trips per vehicle trip at the 27 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.31 during Weekday, AM Peak Hour of Generator
- 1.43 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 1.46 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

Source Numbers

105, 110, 154, 156, 159, 186, 190, 198, 199, 202, 204, 211, 213, 239, 251, 259, 260, 269, 294, 295, 299, 300, 301, 304, 305, 307, 308, 309, 310, 311, 314, 315, 316, 317, 319, 358, 365, 376, 385, 390, 400, 404, 414, 420, 423, 428, 437, 440, 442, 444, 446, 507, 562, 580, 598, 629, 658, 702, 715, 728, 868, 870, 871, 880, 899, 908, 912, 915, 926, 936, 944, 946, 960, 961, 962, 973, 974, 978

Shopping Center
(820)

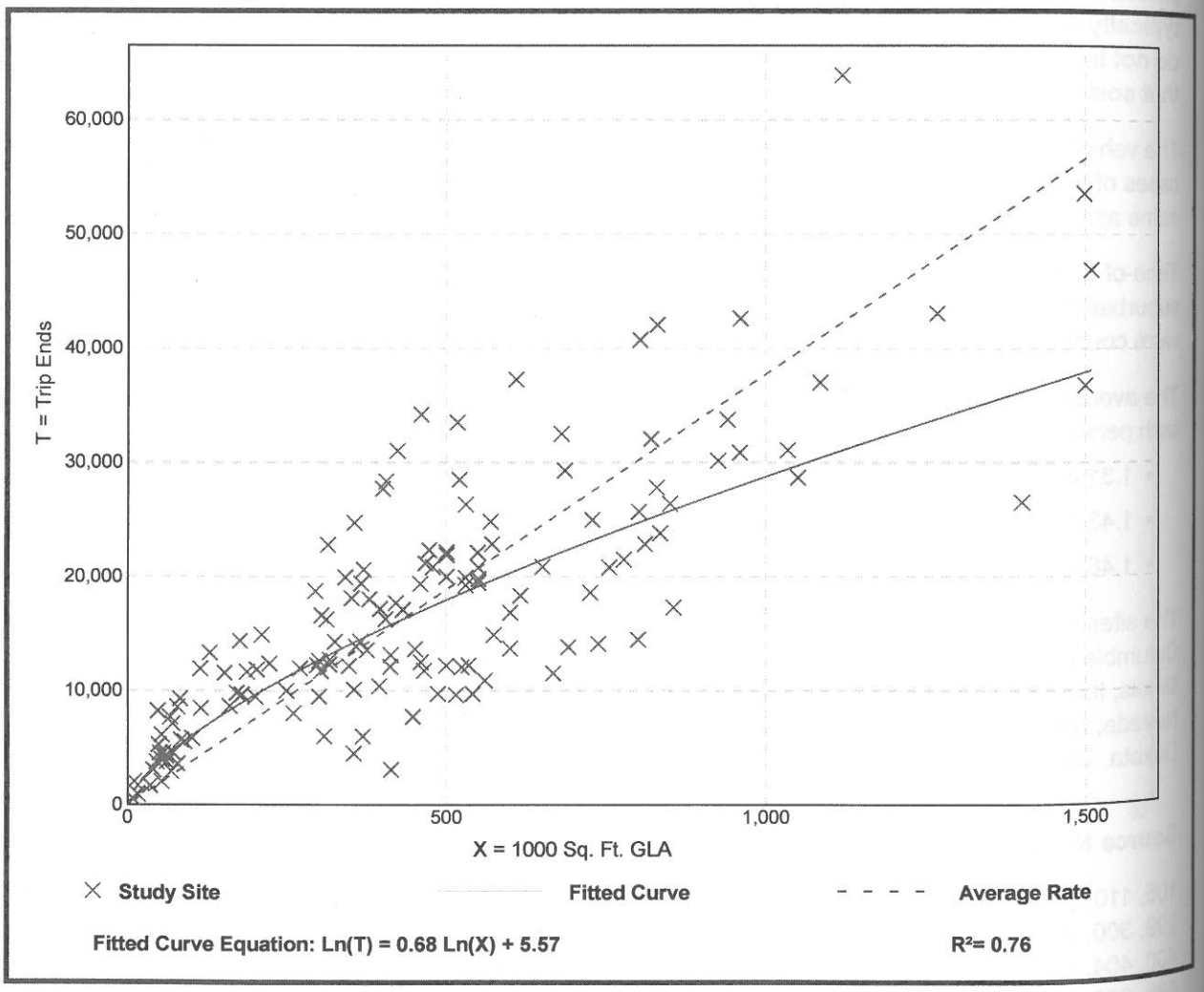
Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 147
1000 Sq. Ft. GLA: 453
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
37.75	7.42 - 207.98	16.41

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.68 Ln(X) + 5.57

R^2= 0.76

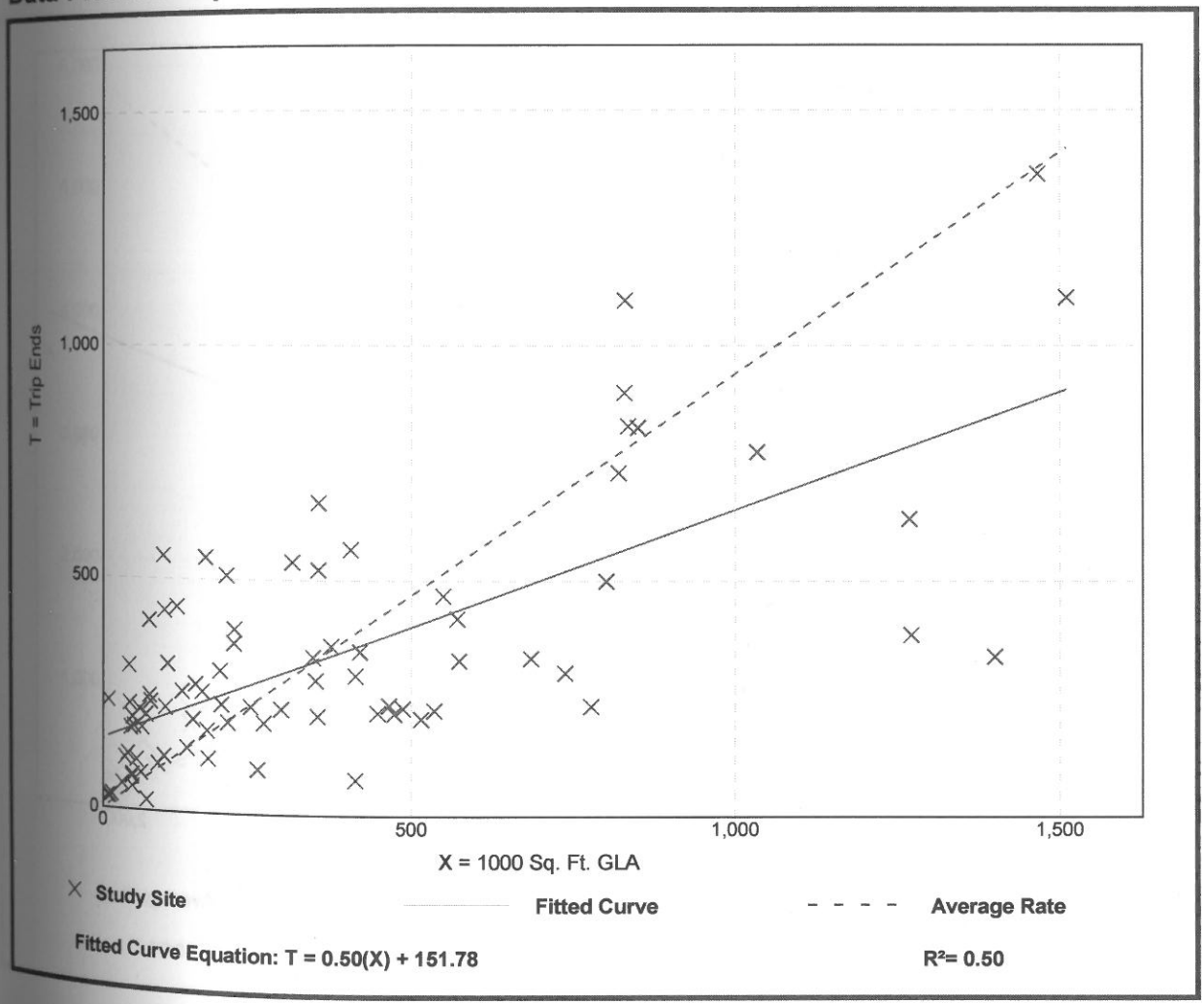
Shopping Center
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 84
1000 Sq. Ft. GLA: 351
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
0.94	0.18 - 23.74	0.87

Data Plot and Equation



Fitted Curve Equation: T = 0.50(X) + 151.78

R^2= 0.50

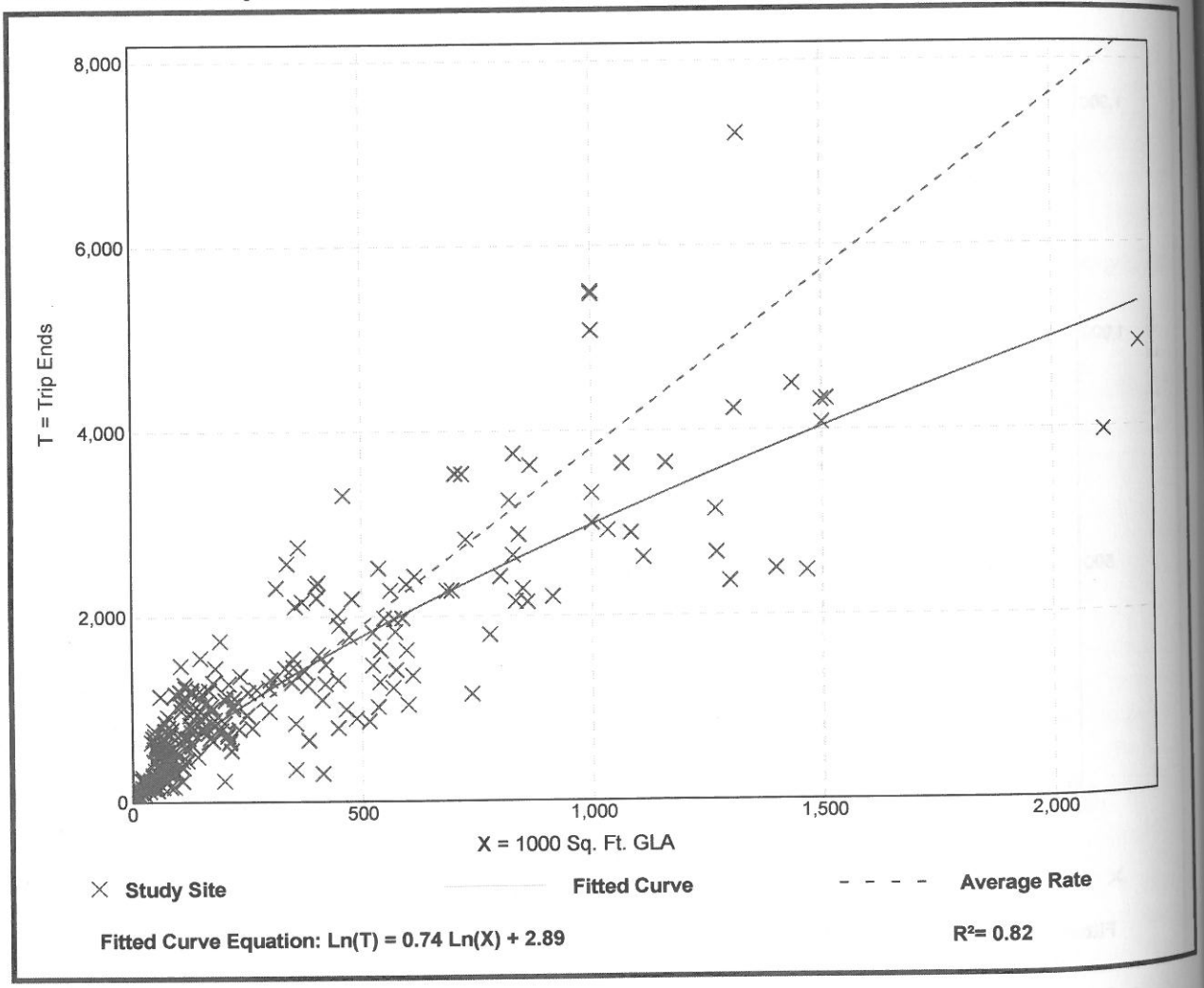
Shopping Center
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 261
1000 Sq. Ft. GLA: 327
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.81	0.74 - 18.69	2.04

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.74 Ln(X) + 2.89

R^2= 0.82

Land Use: 932
High-Turnover (Sit-Down) Restaurant

Description

This land use consists of sit-down, full-service eating establishments with typical duration of stay of approximately one hour. This type of restaurant is usually moderately priced and frequently belongs to a restaurant chain. Generally, these restaurants serve lunch and dinner; they may also be open for breakfast and are sometimes open 24 hours a day. These restaurants typically do not take reservations. Patrons commonly wait to be seated, are served by a waiter/waitress, order from menus and pay for their meal after they eat. Some facilities contained within this land use may also contain a bar area for serving food and alcoholic drinks. Fast casual restaurant (Land Use 930), quality restaurant (Land Use 931), fast-food restaurant without drive-through window (Land Use 933), fast-food restaurant with drive-through window (Land Use 934), and fast-food restaurant with drive-through window and no indoor seating (Land Use 935) are related uses.

Additional Data

Users should exercise caution when applying statistics during the AM peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the AM peak hour of the adjacent street traffic were removed from the database.

The outdoor seating area is not included in the overall gross floor area. Therefore, the number of seats may be a more reliable independent variable on which to establish trip generation rates for facilities having significant outdoor seating.

Time-of-day distribution data for this land use for a weekday, Saturday, and Sunday are presented in Appendix A. For the 38 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 12:00 and 1:00 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Florida, Georgia, Indiana, Kentucky, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Texas, Vermont, and Wisconsin.

Source Numbers

126, 269, 275, 280, 300, 301, 305, 338, 340, 341, 358, 384, 424, 432, 437, 438, 444, 507, 555, 577, 589, 617, 618, 728, 868, 884, 885, 903, 927, 944, 961, 962, 977

High-Turnover (Sit-Down) Restaurant
(932)

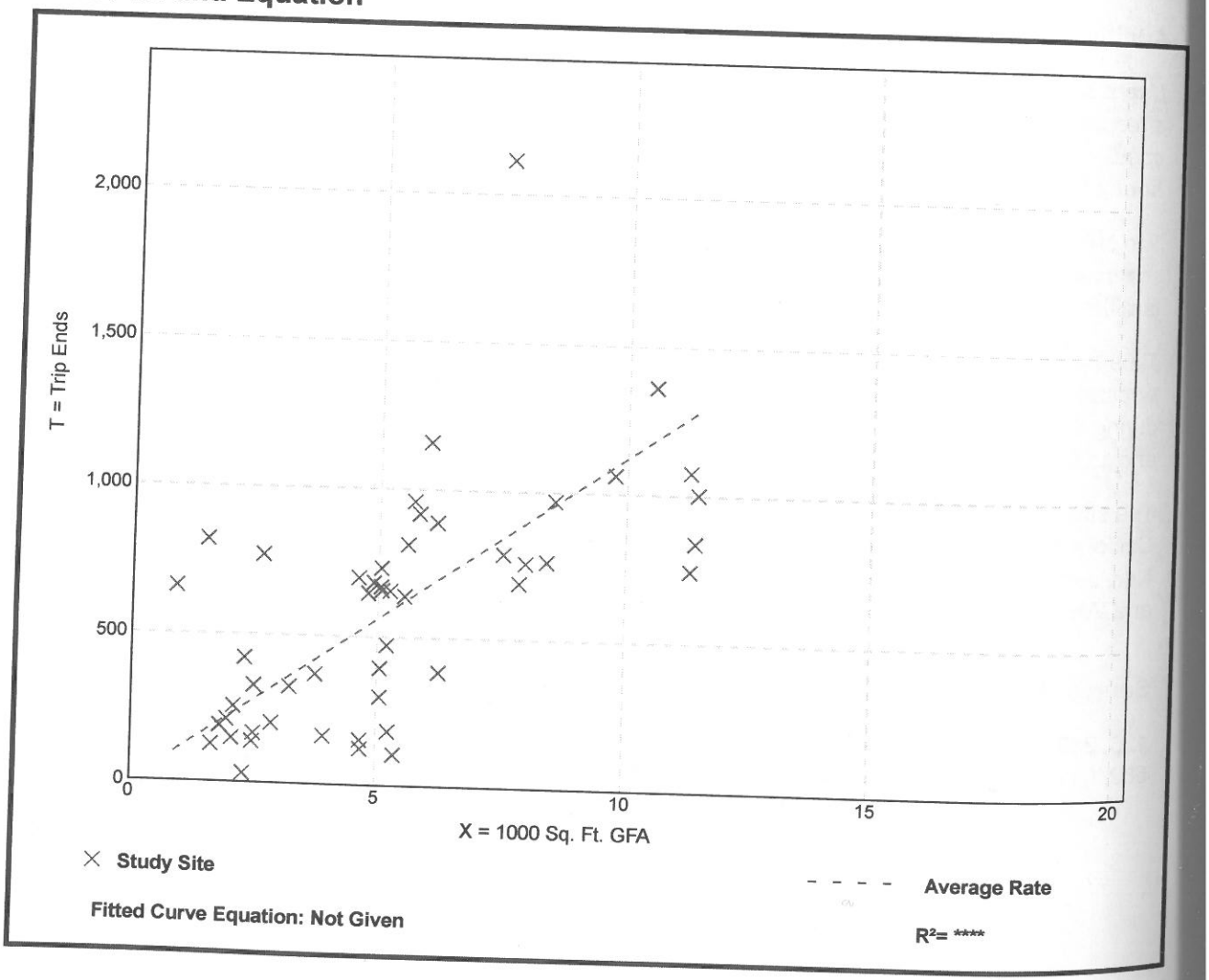
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 50
1000 Sq. Ft. GFA: 5
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
112.18	13.04 - 742.41	72.51

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

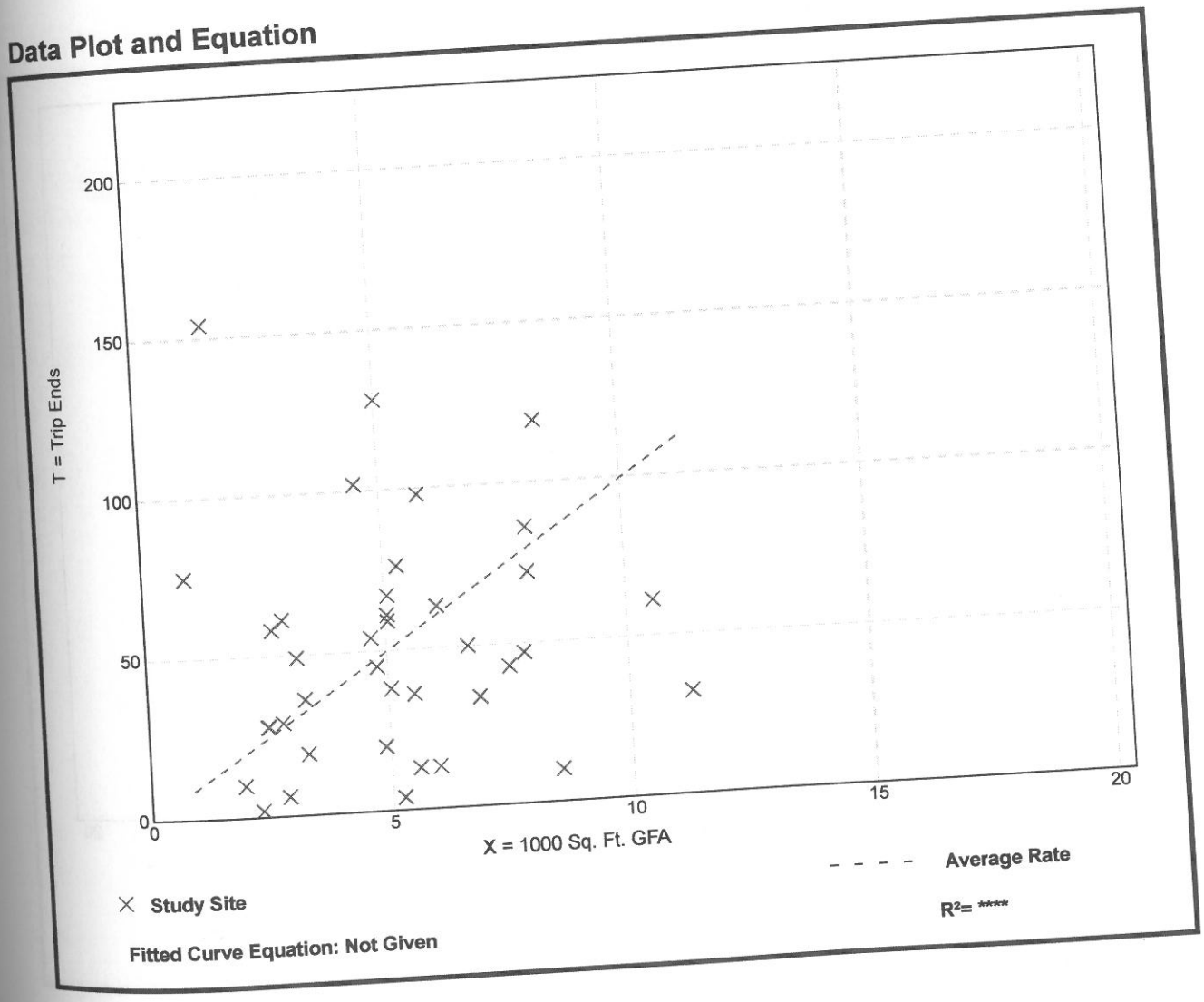
High-Turnover (Sit-Down) Restaurant
(932)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 39
1000 Sq. Ft. GFA: 5
Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.94	0.76 - 102.39	11.33

Data Plot and Equation



Fitted Curve Equation: Not Given

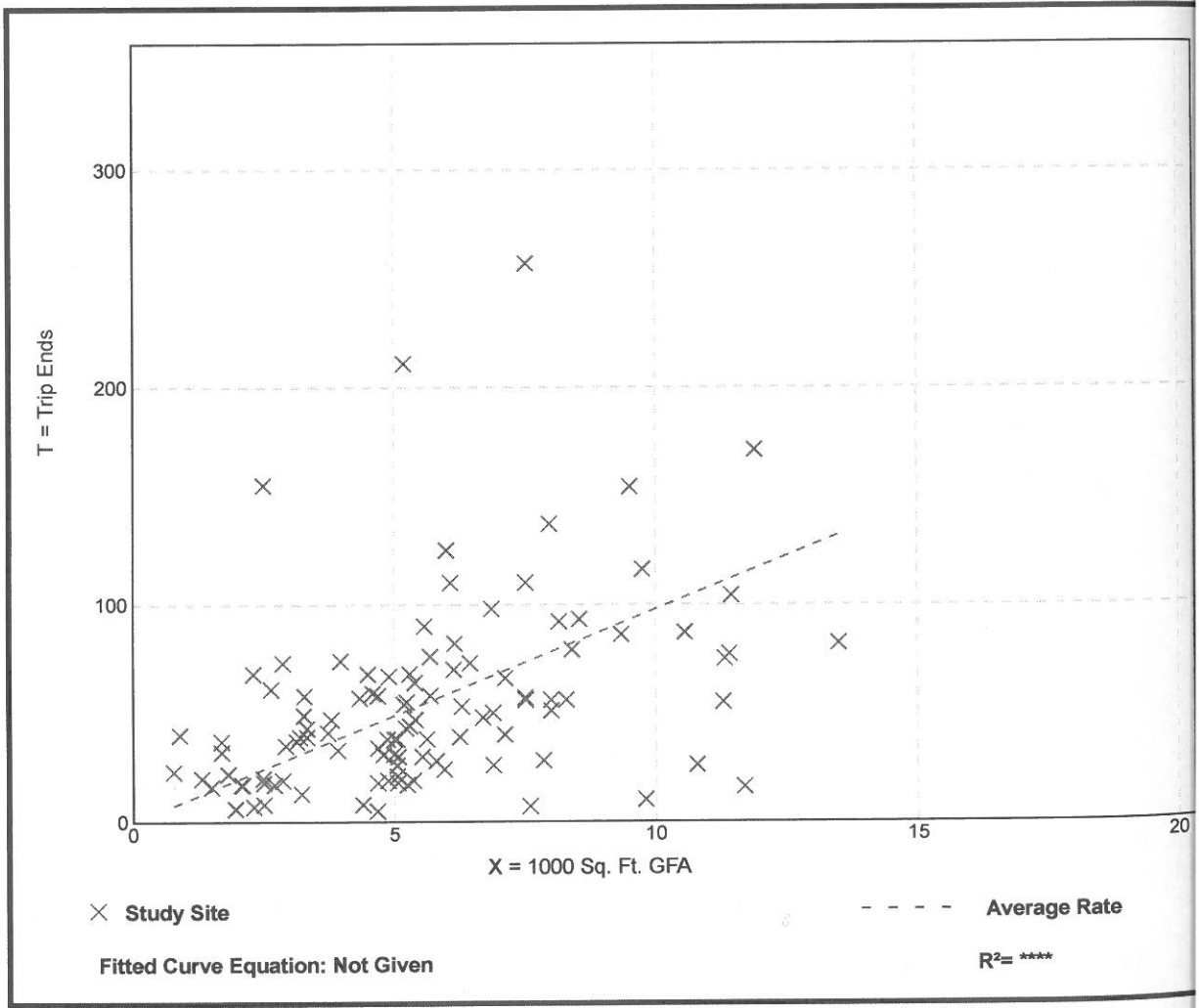
High-Turnover (Sit-Down) Restaurant
(932)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 107
1000 Sq. Ft. GFA: 6
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.77	0.92 - 62.00	7.37

Data Plot and Equation



Land Use: 960
Super Convenience Market/Gas Station

Description

This land use includes gasoline/service stations with convenience markets where there is significant business related to the sale of convenience items and the fueling of motor vehicles. Some commonly sold convenience items include newspapers, freshly brewed coffee, daily-made donuts, bakery items, hot and cold beverages, breakfast items, dairy items, fresh fruits, soups, light meals, ready-to-go and freshly made sandwiches and wraps, and ready-to-go salads. Stores typically also had automated teller machines (ATMs), and public restrooms. The sites included in this land use category have the following two specific characteristics:

- The gross floor area of the convenience market is at least 3,000 gross square feet
- The number of vehicle fueling positions is at least 10

Convenience market with gasoline pumps (Land Use 853) and gasoline/service station with convenience market (Land Use 945) are related uses.

Additional Data

To reflect changing characteristics of the convenience market component of this land use, only data from the past two decades have been included in this land use.

The independent variable, vehicle fueling positions, is defined as the maximum number of vehicles that can be fueled simultaneously. Gasoline/service stations in this land use include “pay-at-the-pump” and traditional fueling stations.

A multi-variable regression analysis based on both the convenience market gross floor area (GFA) and the number of vehicle fueling positions (VFP) produced a series of fitted curve equations. The equations are in the form of:

Vehicle Trips = [(VFP Factor) x (Number of VFP)] + [(GFA Factor) x (GFA)] + (Constant)

The values for the VFP factor, GFA factor, and constant are presented in the following table for each time period for which a fitted curve equation could produce an R^2 value of at least 0.50.

Time Period	VFP Factor	GFA Factor	Constant	R^2
Weekday, AM Peak Hour of Generator	10.3	105	-290	0.62
Weekday, PM Peak Hour of Generator	6.91	76.0	-133	0.68
Weekday, AM Peak Hour of Adjacent Street	16.1	135	-483	0.66
Weekday, PM Peak Hour of Adjacent Street	11.5	82.9	-226	0.51

The sites were surveyed in the late 1990’s, 2000s and the 2010s in Florida, Iowa, Maryland, Minnesota, New Hampshire, New Jersey, Pennsylvania, Texas, Utah, and Wisconsin.

Source Numbers

617, 813, 844, 850, 864, 865, 867, 869, 882, 888, 904, 938, 954, 960, 962

Super Convenience Market/Gas Station
(960)

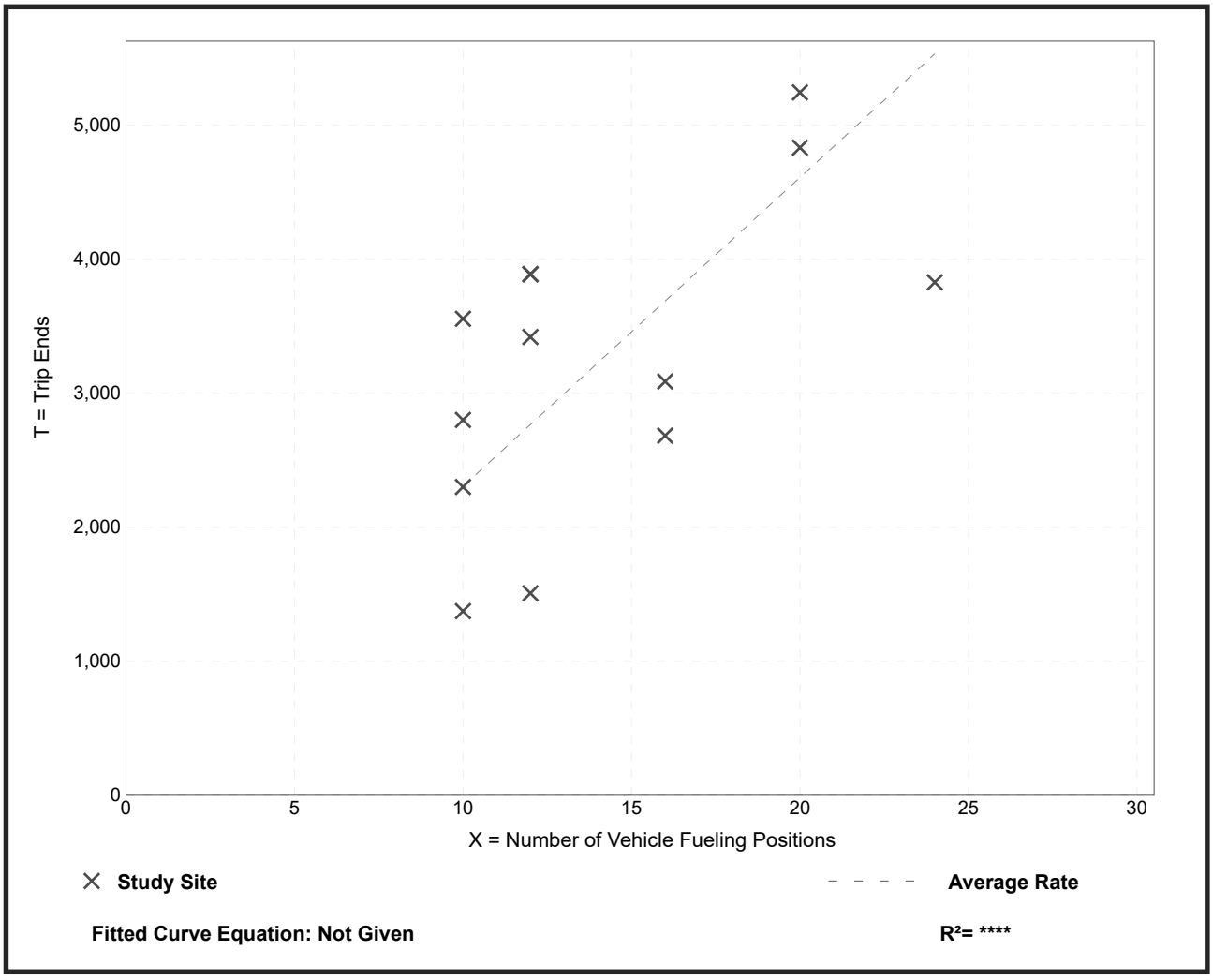
Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 13
Avg. Num. of Vehicle Fueling Positions: 14
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
230.52	125.67 - 355.60	71.75

Data Plot and Equation



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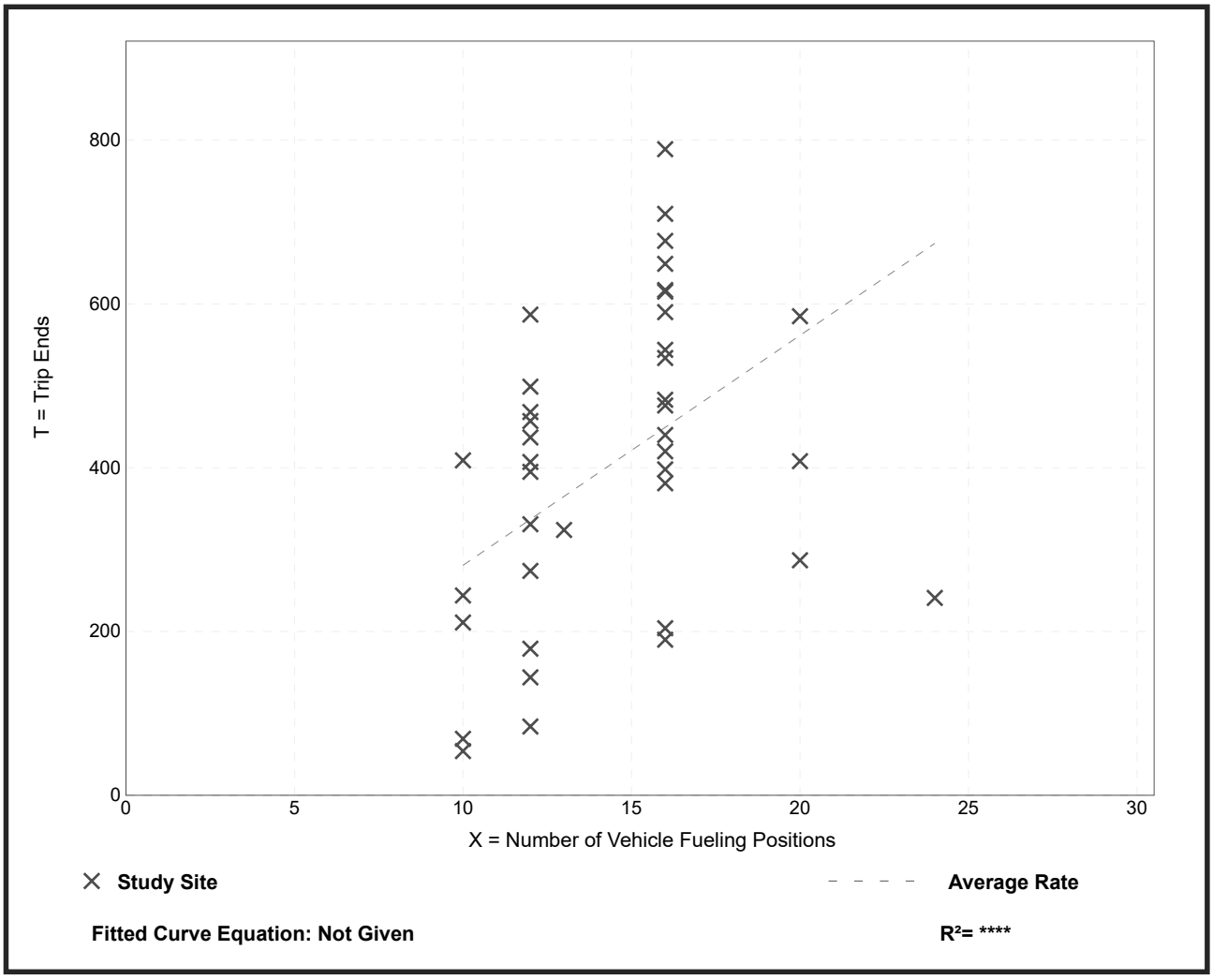
Super Convenience Market/Gas Station
(960)

Vehicle Trip Ends vs: **Vehicle Fueling Positions**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 39
Avg. Num. of Vehicle Fueling Positions: 14
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
28.08	5.40 - 49.31	11.98

Data Plot and Equation



Trip Generation Manual, 10th Edition ● Institute of Transportation Engineers

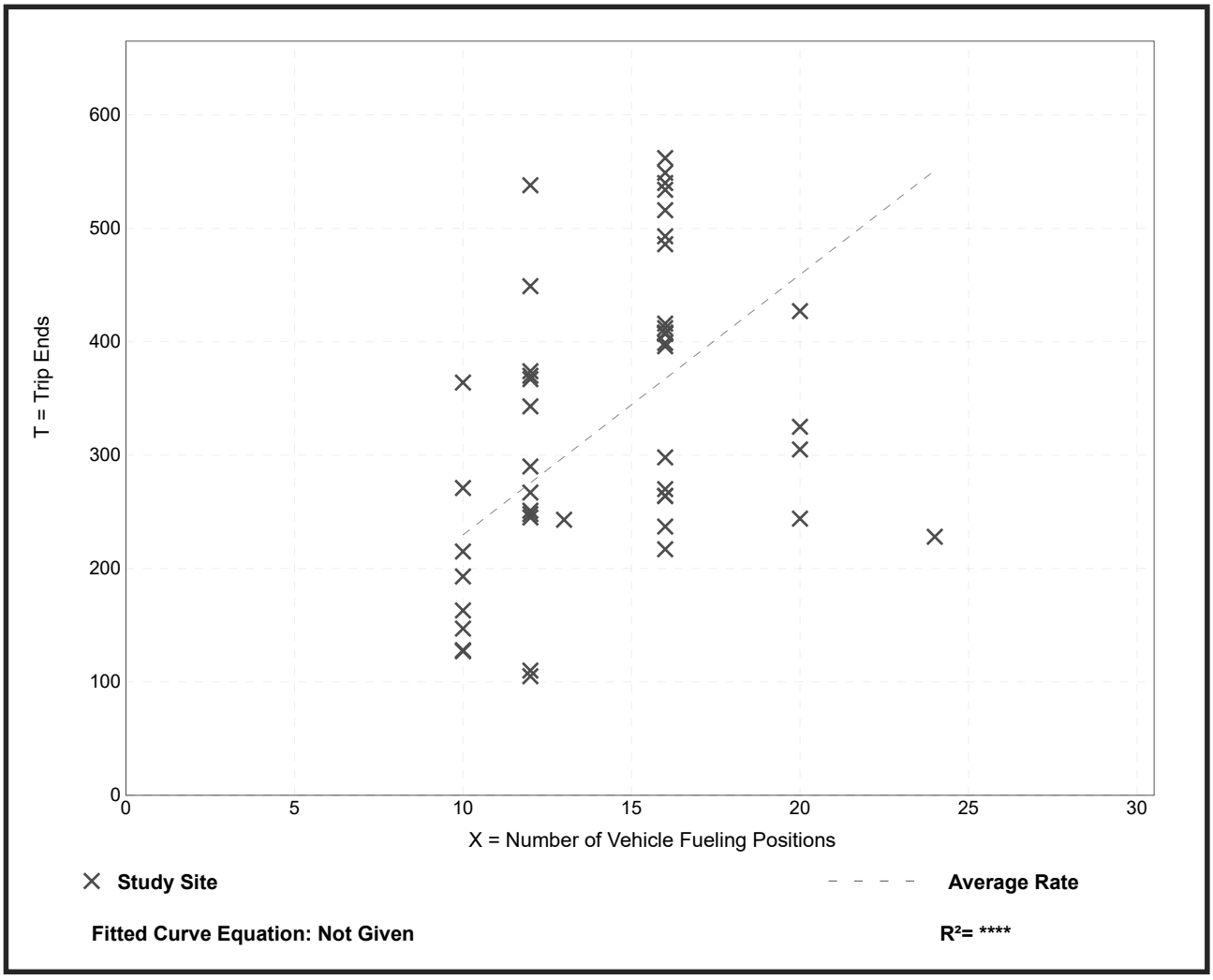
Super Convenience Market/Gas Station
(960)

Vehicle Trip Ends vs: **Vehicle Fueling Positions**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 48
Avg. Num. of Vehicle Fueling Positions: 14
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
22.96	8.75 - 44.83	8.34

Data Plot and Equation



Trip Generation Manual, 10th Edition ● Institute of Transportation Engineers

Daily Trip Generation

ITE Code	Land Use	Size		Trip Gen. Avg. Rate/Eq.	Daily Trips	Pass-by Percent	Trip Distribution Enter	Trip Distribution Exit	Daily Trips Enter	Daily Trips Exit	Daily Pass-by Trips Enter	Daily Pass-by Trips Exit
252	Senior Housing - Attached	200	Units	Equation	779	0%	50%	50%	390	389	0	0
255	Continuining Care Retirement Community	400	Units	Equation	1,520	0%	50%	50%	760	760	0	0
310	Hotel	150	Rooms	Equation	1,267	0%	50%	50%	634	633	0	0
820	Shopping Center	25,000	SF	Equation	2,343	0%	50%	50%	1,172	1,171	0	0
932	High-Turnover (Sit-Down) Restaurant	28,600	SF	Average Rate	3,209	0%	50%	50%	1,605	1,604	0	0
960	Super Convenience Market/Gas Station	16	Fueling Positions	Average Rate	3,689	40%	50%	50%	1,107	1,107	738	737
Total					**12,807**				**5,668**	**5,664**	**738**	**737**

AM Peak Hour Trip Generation

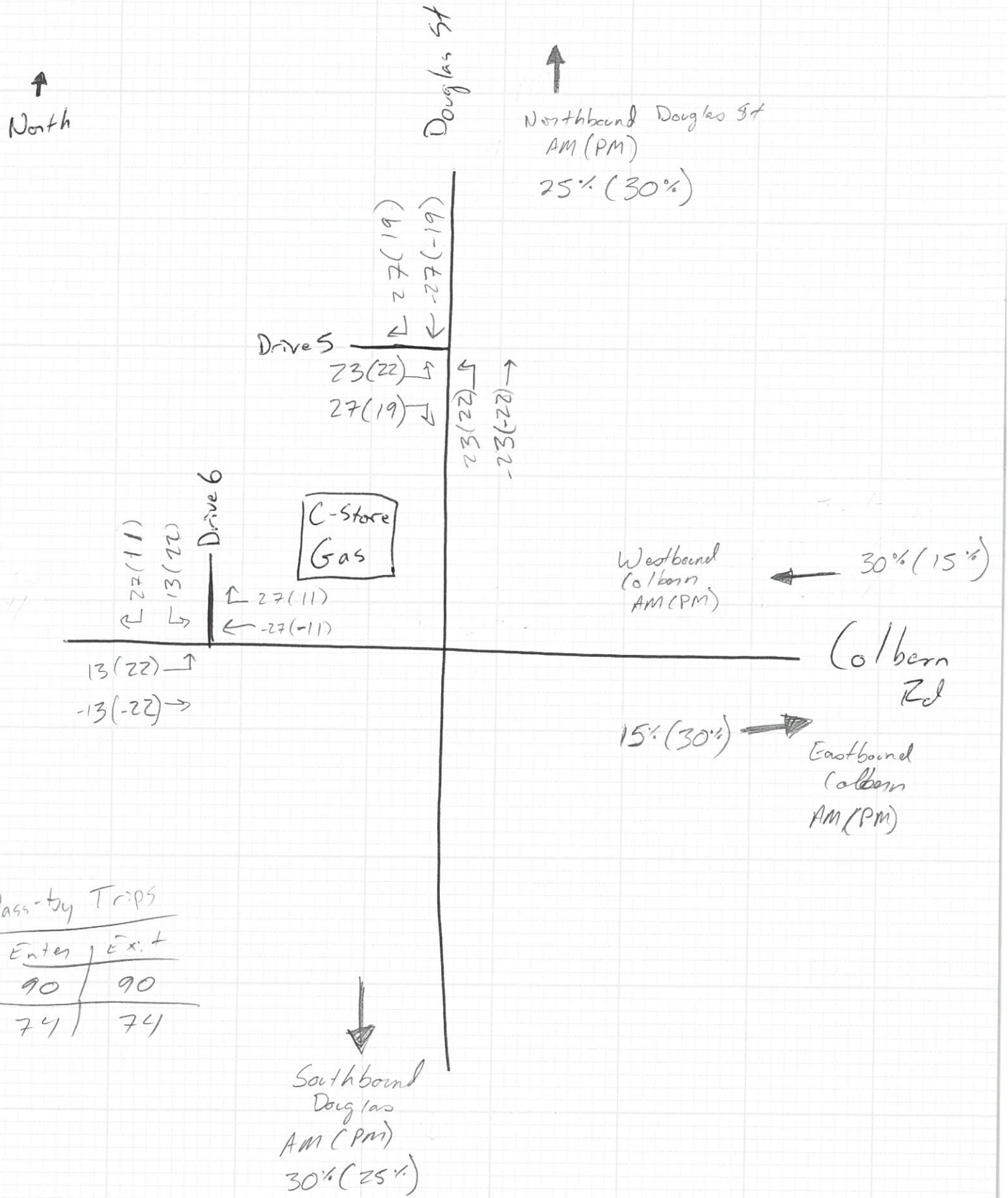
ITE Code/Page	Land Use	Size		Trip Gen. Avg. Rate/Eq.	AM Peak Hour Trips	Pass-by Percent	Trip Distribution Enter	Trip Distribution Exit	AM Primary Peak Hour Trips Enter	AM Primary Peak Hour Trips Exit	AM Pass-by Trips Enter	AM Pass-by Trips Exit
252	Senior Housing - Attached	200	Units	Equation	40	0%	35%	65%	14	26	0	0
255	Continuining Care Retirement Community	400	Units	Equation	72	0%	65%	35%	47	25	0	0
310	Hotel	150	Rooms	Equation	70	0%	59%	41%	41	29	0	0
820	Shopping Center	25,000	SF	Equation	165	0%	62%	38%	102	63	0	0
932	High-Turnover (Sit-Down) Restaurant	28,600	SF	Average Rate	285	0%	55%	45%	157	128	0	0
960	Super Convenience Market/Gas Station	16	Fueling Positions	Equation	450	40%	50%	50%	135	135	90	90
Total					**1,082**				**496**	**406**	**90**	**90**

PM Peak Hour Trip Generation

ITE Code/Page	Land Use	Size		Trip Gen. Avg. Rate/Eq.	PM Peak Hour Trips	Pass-by Percent	Trip Distribution Enter	Trip Distribution Exit	PM Primary Peak Hour Trips Enter	PM Primary Peak Hour Trips Exit	PM Pass-by Trips Enter	PM Pass-by Trips Exit
252	Senior Housing - Attached	200	Units	Equation	51	0%	55%	45%	28	23	0	0
255	Continuining Care Retirement Community	400	Units	Equation	77	0%	39%	61%	30	47	0	0
310	Hotel	150	Rooms	Equation	87	0%	51%	49%	44	43	0	0
820	Shopping Center	25,000	SF	Equation	195	0%	48%	52%	94	101	0	0
932	High-Turnover (Sit-Down) Restaurant	28,600	SF	Average Rate	280	0%	62%	38%	174	106	0	0
960	Super Convenience Market/Gas Station	16	Fueling Positions	Average Rate	368	40%	50%	50%	110	110	74	74
Total					**1,058**				**480**	**430**	**74**	**74**

Trip Distribution

Roadway To/From	Percentage
Lee's Summit Road (north)	5%
Little Blue (west)	5%
Gregory (east)	5%
Strother Road (east)	3%
Colbern Road (west)	10%
Colbern Road (east)	15%
Blue Parkway (South)	2%
I-470 (west)	20%
I-470 (east)	15%
Douglas Street (south)	20%
Total	**100%**



Pass-by Trips

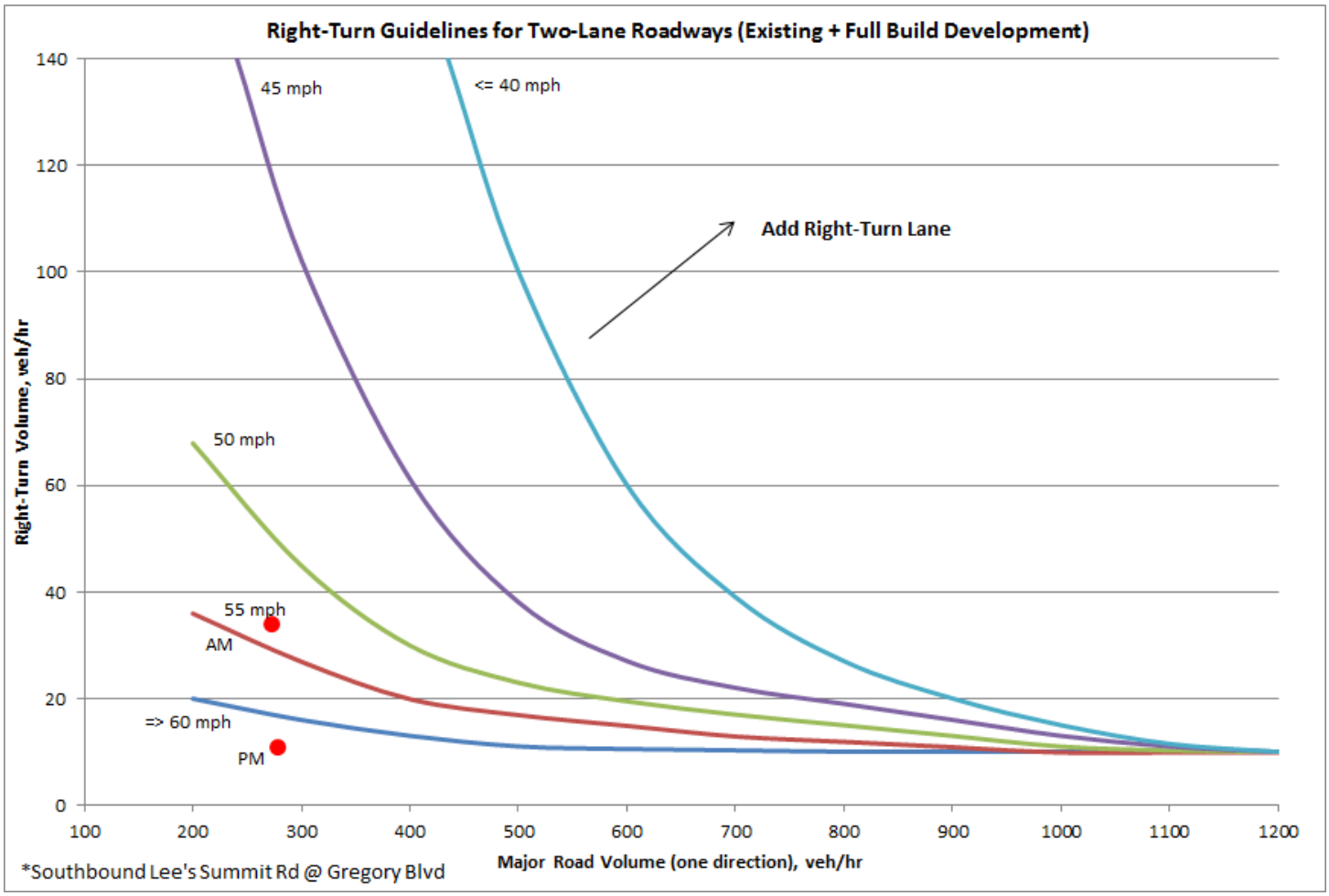
	Enter	Exit
AM	90	90
PM	74	74

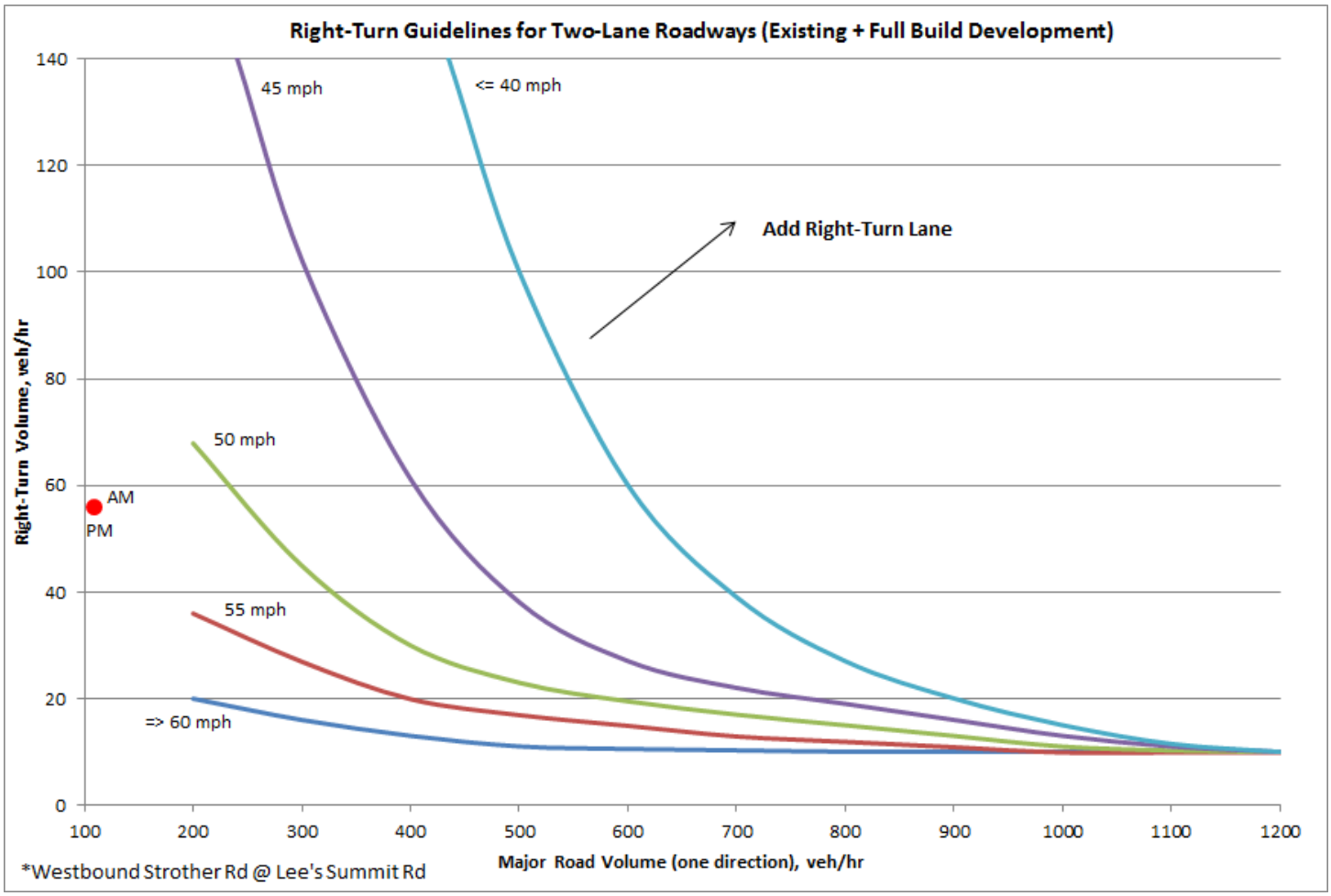
OLSSON ASSOCIATES

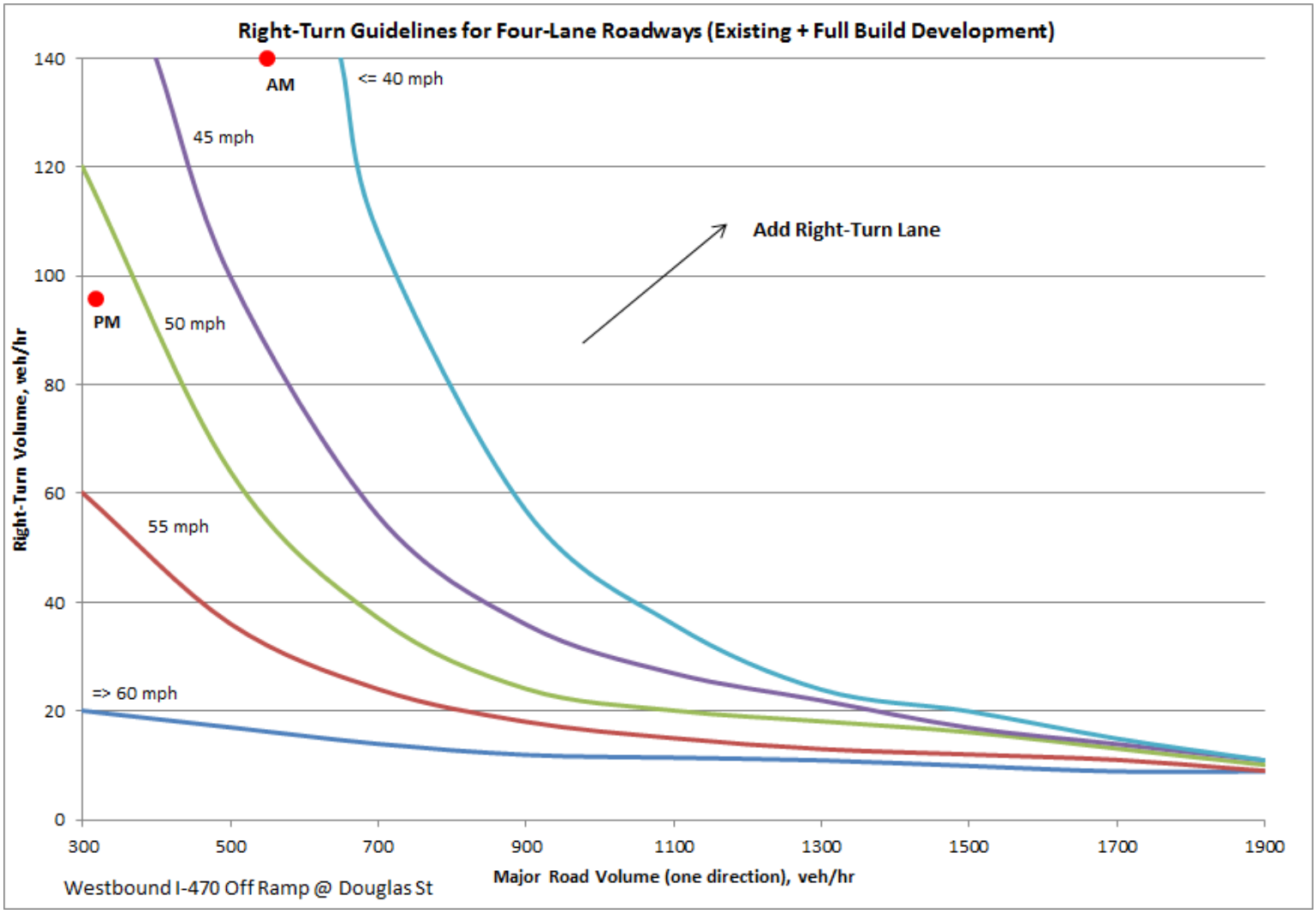
PROJECT: Aria

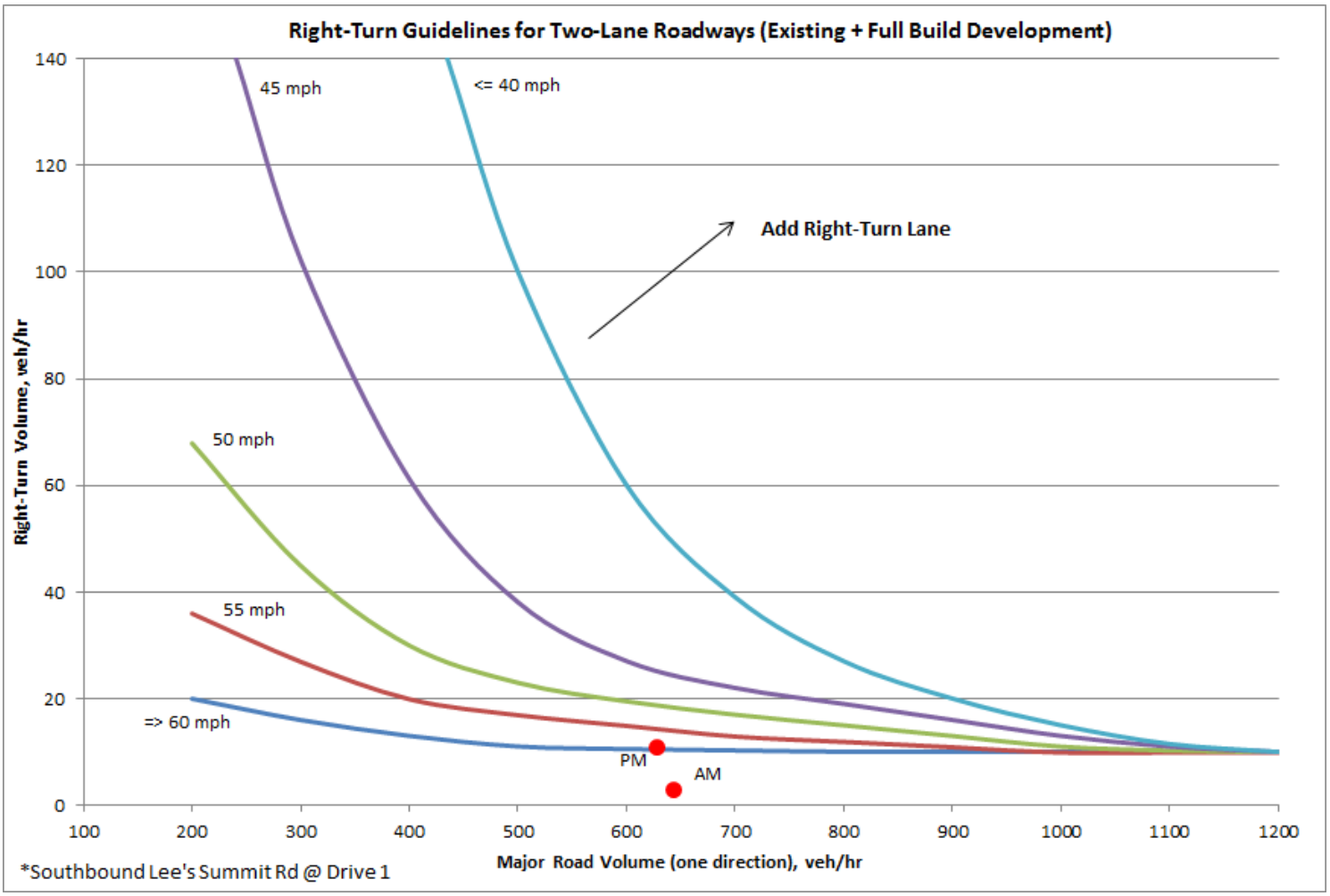
project no.: 019-0012
drawn by: JAB
date: 2-1-19
page 1 of 1

Turn Lane Warrants

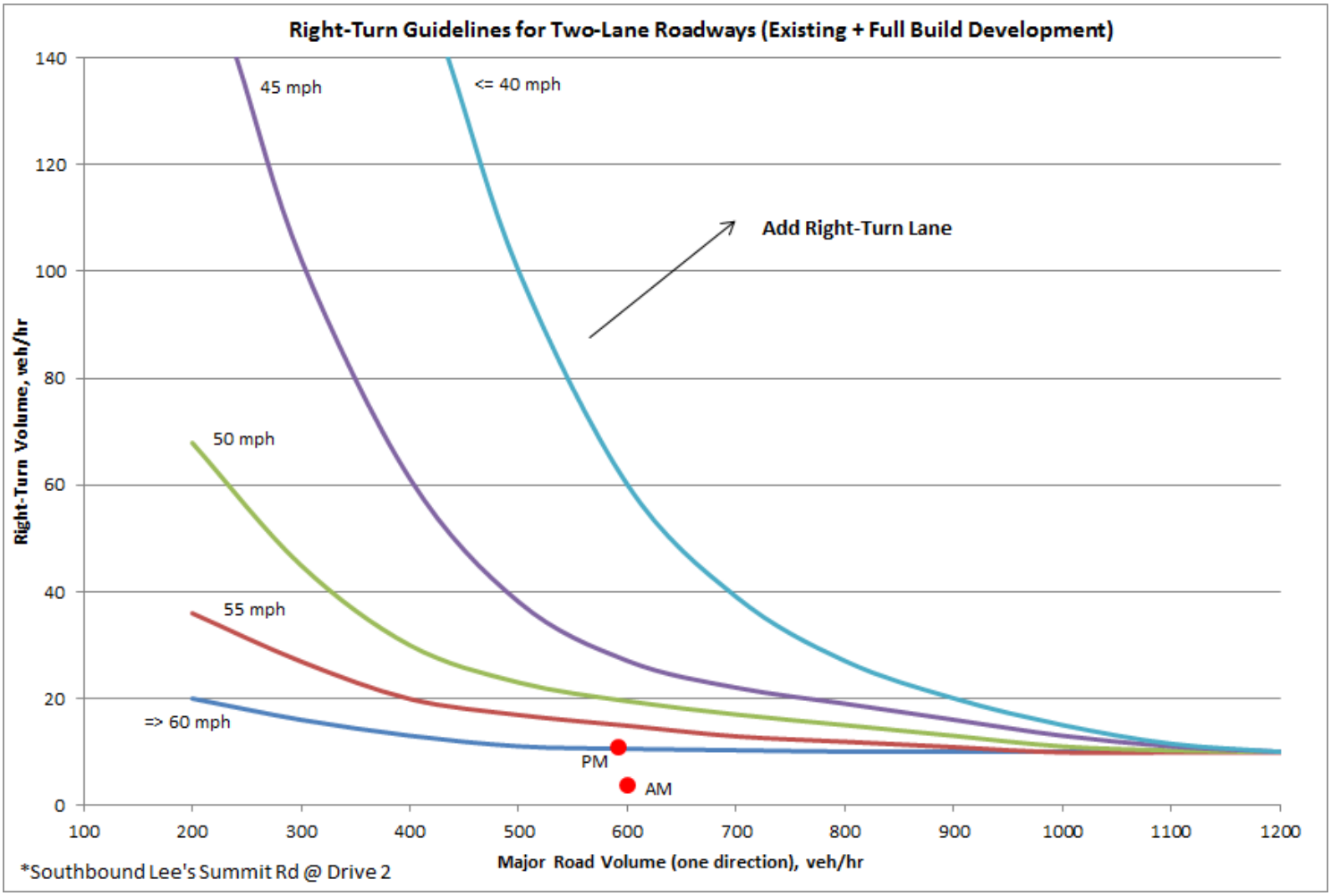

Right-Turn Guidelines for Two-Lane Roadways (Existing + Full Build Development)
45 mph
<= 40 mph
Add Right-Turn Lane
50 mph
55 mph
AM
=> 60 mph
PM
Right-Turn Volume, veh/hr
Major Road Volume (one direction), veh/hr
*Southbound Lee's Summit Rd @ Gregory Blvd


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


Right-Turn Guidelines for Four-Lane Roadways (Existing + Full Build Development)
140
120
100
80
60
40
20
0
Right-Turn Volume, veh/hr
AM
PM
<= 40 mph
45 mph
50 mph
55 mph
=> 60 mph
Add Right-Turn Lane
300
500
700
900
1100
1300
1500
1700
1900
Major Road Volume (one direction), veh/hr
Westbound I-470 Off Ramp @ Douglas St



*Southbound Lee's Summit Rd @ Drive 1

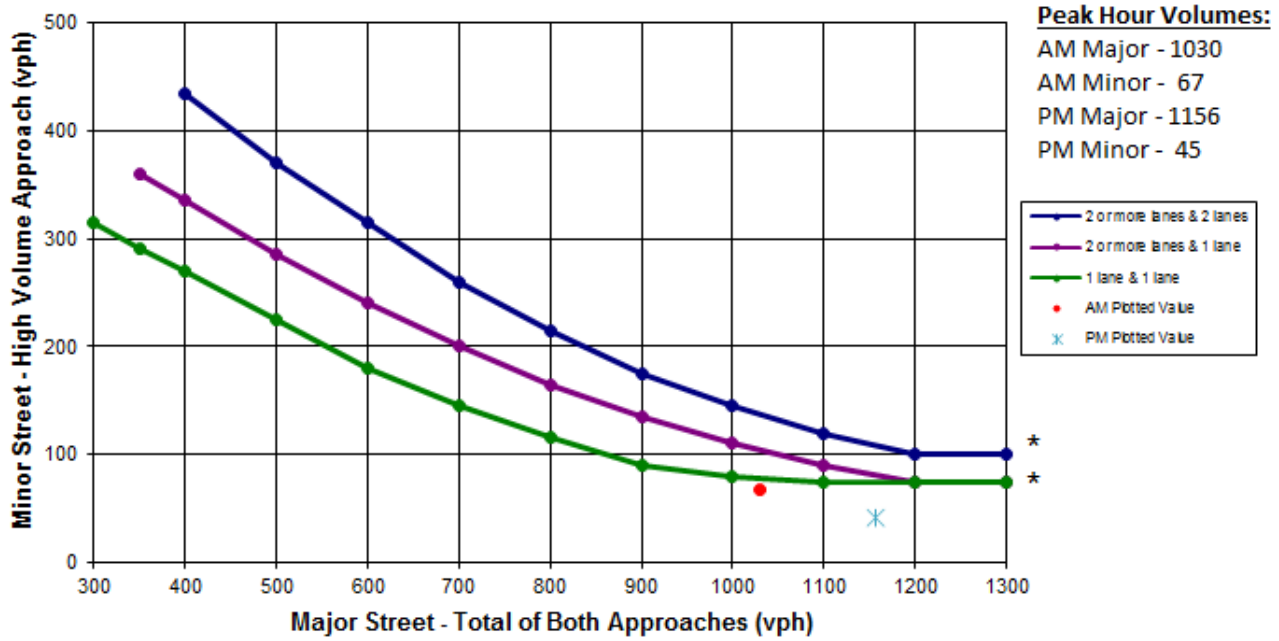


*Southbound Lee's Summit Rd @ Drive 2

Signal Warrants

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

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



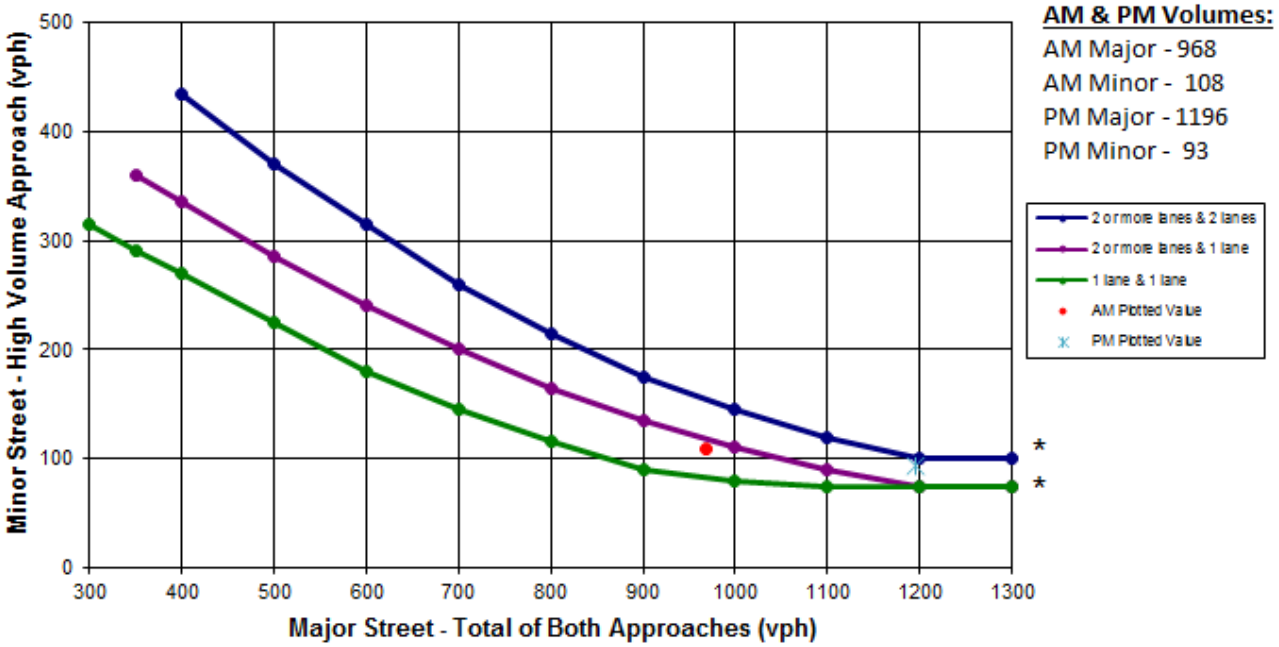
Peak Hour Volumes:

AM Major - 1030
AM Minor - 67
PM Major - 1156
PM Minor - 45

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Lee's Summit Road & Strother Road

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



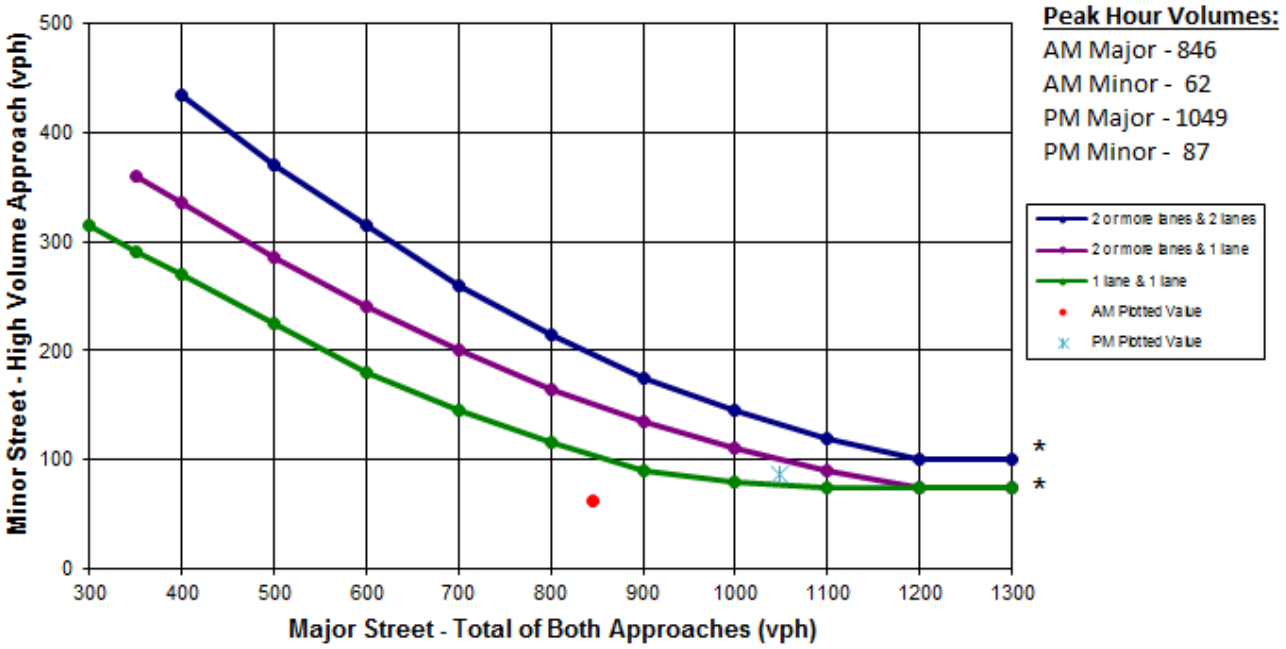
AM & PM Volumes:

AM Major - 968
AM Minor - 108
PM Major - 1196
PM Minor - 93

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Colbern Road & Main Street

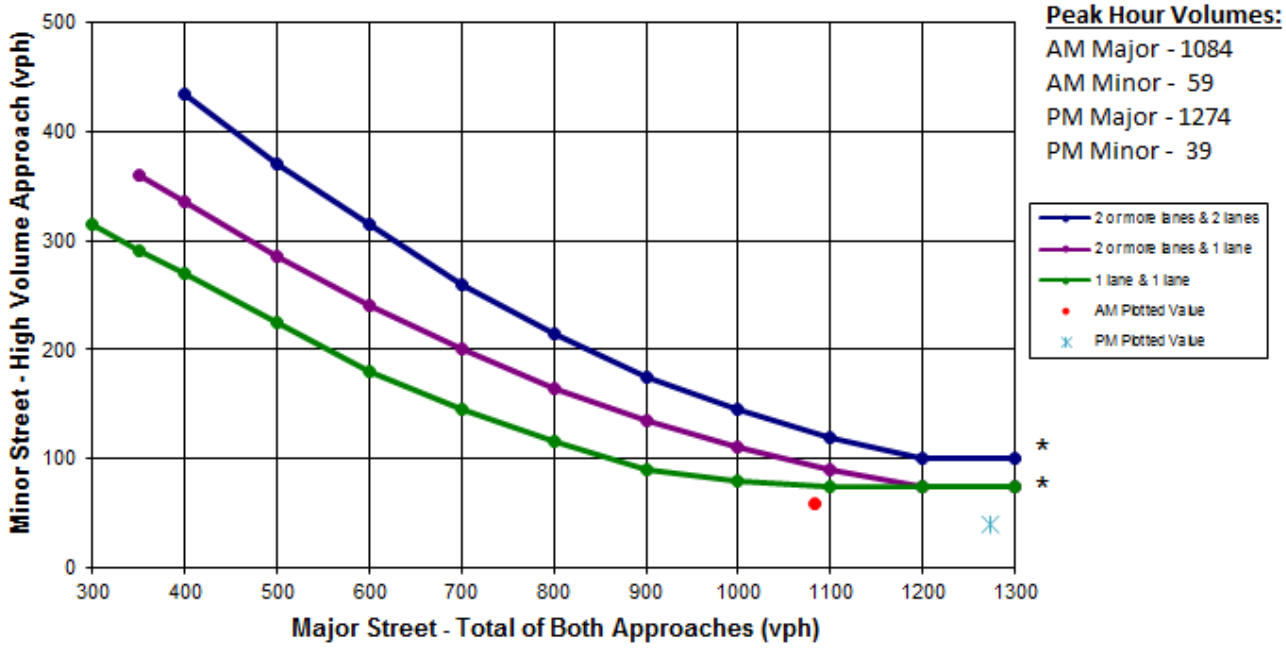
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Lee's Summit Road & Douglas Road/Drive 2

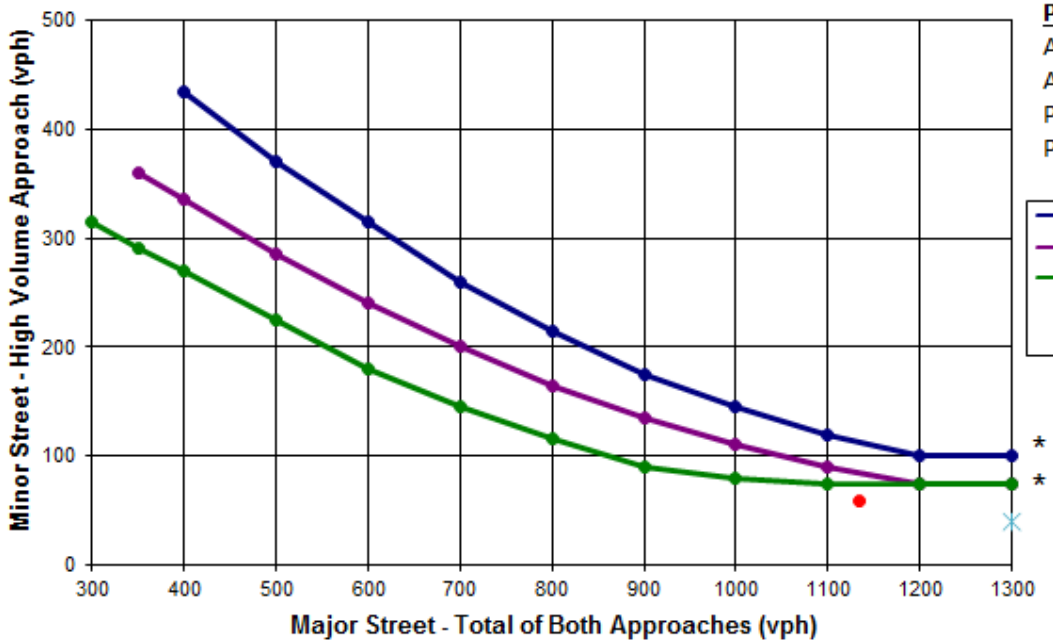
(Community less than 10,000 population or above 40mph on major street)



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Lee's Summit Road & Drive 1

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



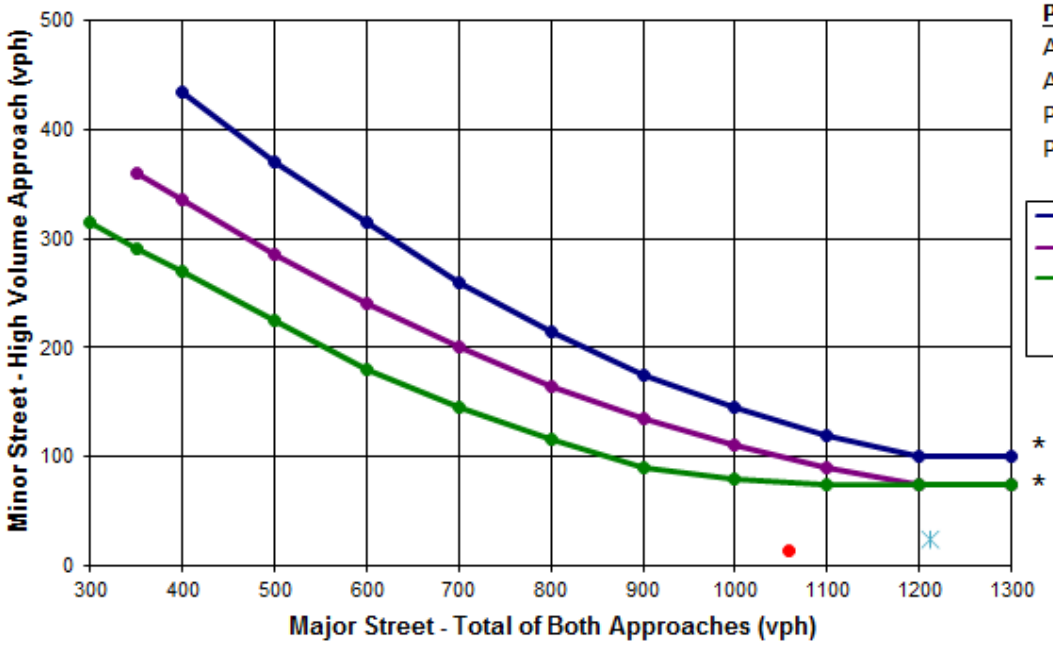
Peak Hour Volumes:

AM Major - 1135
AM Minor - 59
PM Major - 1300
PM Minor - 39

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Lee's Summit Road & Drive 3

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



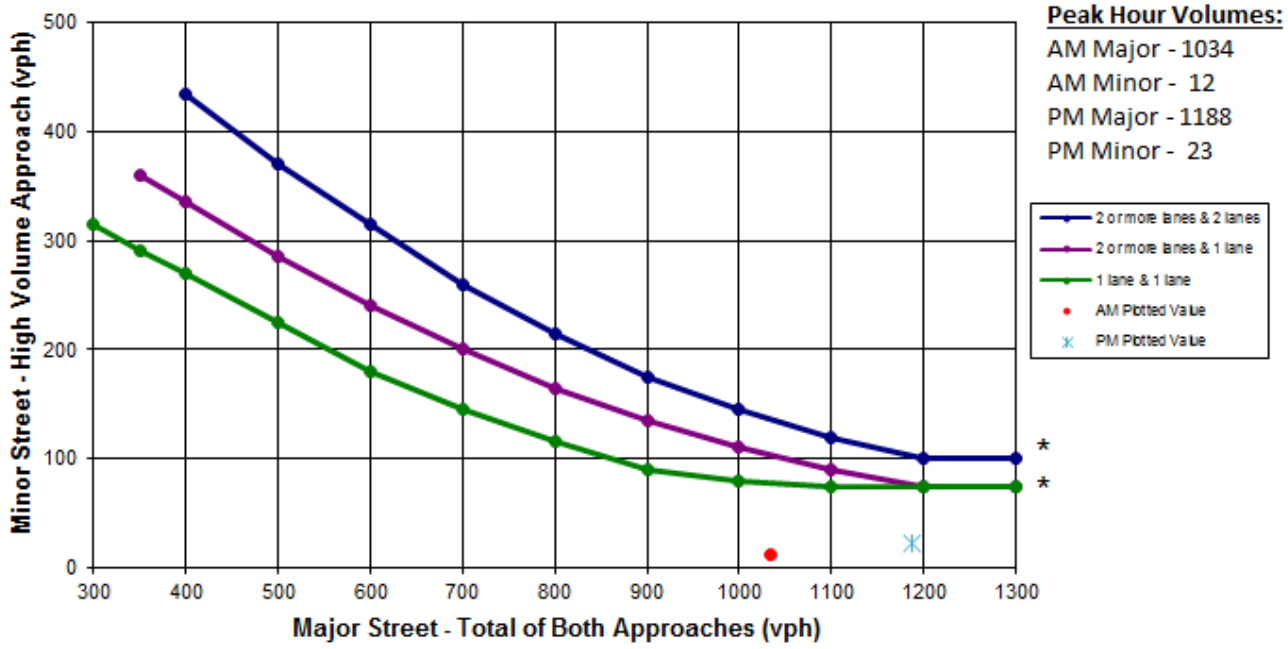
Peak Hour Volumes:

AM Major - 1058
AM Minor - 13
PM Major - 1212
PM Minor - 24

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Lee's Summit Road & Drive 4

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



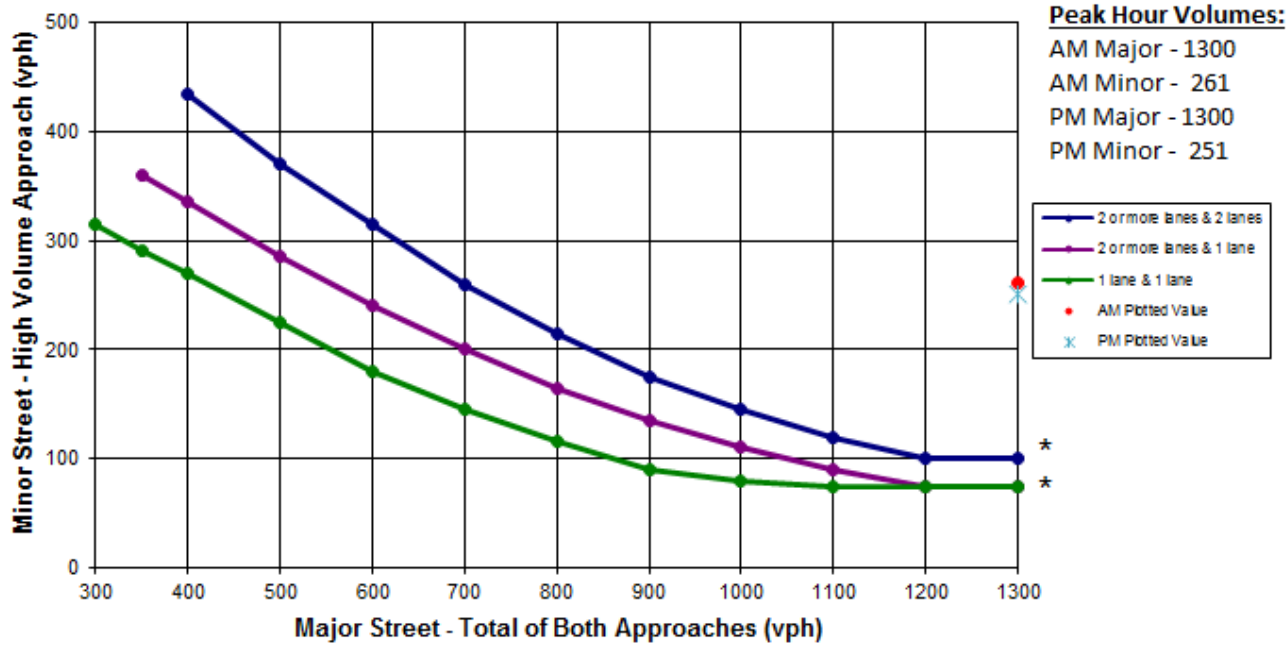
Peak Hour Volumes:

AM Major - 1034
AM Minor - 12
PM Major - 1188
PM Minor - 23

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Lee's Summit Road & Drive 5

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



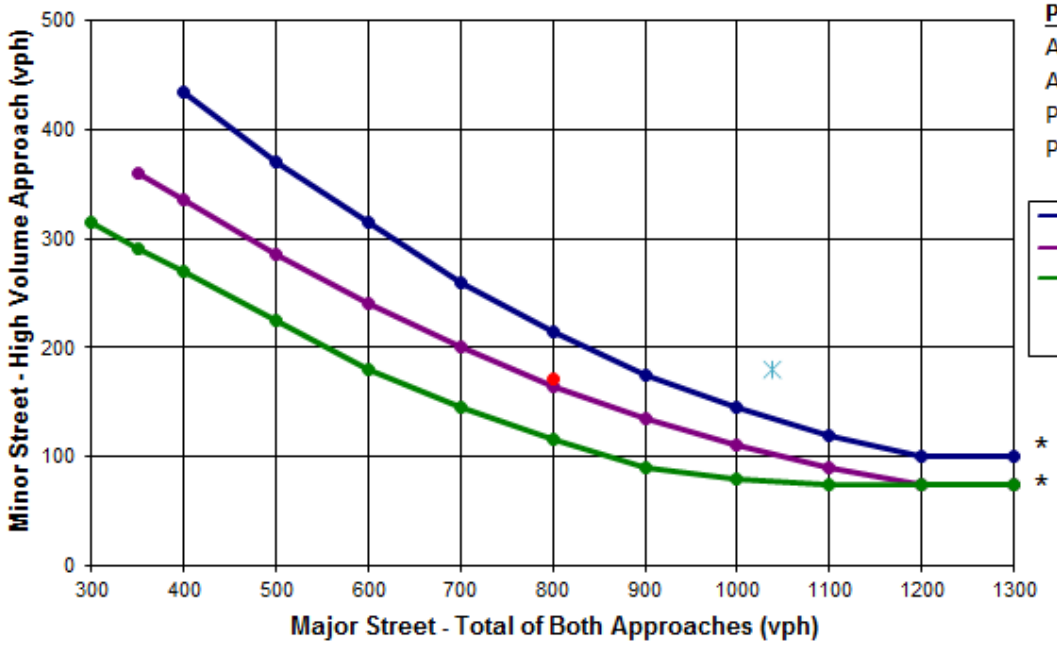
Peak Hour Volumes:

AM Major - 1300
AM Minor - 261
PM Major - 1300
PM Minor - 251

*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Peak Hour Volume Warrant (Existing + Full Build Development)
Colbern Road & Drive 6

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



Peak Hour Volumes:

AM Major - 800
AM Minor - 172
PM Major - 1038
PM Minor - 180

- 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 and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

Capacity Analysis

Intersection	
Int Delay, s/veh	2.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	6	589	4	17	453	15	11	0	48	6	0	2
Future Vol, veh/h	6	589	4	17	453	15	11	0	48	6	0	2
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	-	-	200	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	94	30	40	80	75	35	92	78	75	92	25
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	627	13	43	566	20	31	0	62	8	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	586	0	0	640	0	0	1332	1338	634	1359	1334	576
Stage 1	-	-	-	-	-	-	666	666	-	662	662	-
Stage 2	-	-	-	-	-	-	666	672	-	697	672	-
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	989	-	-	944	-	-	131	153	479	126	154	517
Stage 1	-	-	-	-	-	-	449	457	-	451	459	-
Stage 2	-	-	-	-	-	-	449	454	-	431	454	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	989	-	-	944	-	-	123	144	479	105	145	517
Mov Cap-2 Maneuver	-	-	-	-	-	-	123	144	-	105	145	-
Stage 1	-	-	-	-	-	-	442	450	-	444	438	-
Stage 2	-	-	-	-	-	-	422	433	-	370	447	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0.6	23.9	27.6
HCM LOS			C	D

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	123	479	944	-	-	989	-	-	175
HCM Lane V/C Ratio	0.256	0.128	0.045	-	-	0.016	-	-	0.091
HCM Control Delay (s)	44	13.6	9	-	-	8.7	-	-	27.6
HCM Lane LOS	E	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1	0.4	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	1	40	0	27	1	362	71	56	540	0
Future Vol, veh/h	5	0	1	40	0	27	1	362	71	56	540	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	42	100	25	50	100	45	25	84	55	61	89	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	4	80	0	60	4	431	129	92	607	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1325	1359	607	1232	1230	431	607	0	0	560	0	0
Stage 1	791	791	-	439	439	-	-	-	-	-	-	-
Stage 2	534	568	-	793	791	-	-	-	-	-	-	-
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	133	149	496	154	178	624	971	-	-	1011	-	-
Stage 1	383	401	-	597	578	-	-	-	-	-	-	-
Stage 2	530	506	-	382	401	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	135	496	142	161	624	971	-	-	1011	-	-
Mov Cap-2 Maneuver	111	135	-	142	161	-	-	-	-	-	-	-
Stage 1	381	365	-	595	576	-	-	-	-	-	-	-
Stage 2	477	504	-	344	365	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.5	38.5	0.1	1.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	971	-	-	138	142	624	1011	-	-
HCM Lane V/C Ratio	0.004	-	-	0.115	0.563	0.096	0.091	-	-
HCM Control Delay (s)	8.7	-	-	34.5	58.9	11.4	8.9	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	2.8	0.3	0.3	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	56	356	39	32	541
Future Vol, veh/h	52	56	356	39	32	541
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	82	74	78	58	67	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	76	456	67	48	576

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1128	228	0	0	523	0
Stage 1	456	-	-	-	-	-
Stage 2	672	-	-	-	-	-
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	212	775	-	-	1042	-
Stage 1	606	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	202	775	-	-	1042	-
Mov Cap-2 Maneuver	323	-	-	-	-	-
Stage 1	578	-	-	-	-	-
Stage 2	506	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	473	1042	-
HCM Lane V/C Ratio	-	-	0.294	0.046	-
HCM Control Delay (s)	-	-	15.8	8.6	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

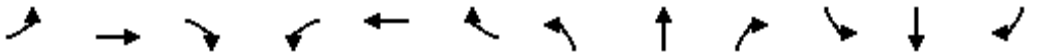
Intersection	
Intersection Delay, s/veh	5.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	531	667	148	16
Demand Flow Rate, veh/h	541	680	151	16
Vehicles Circulating, veh/h	83	118	328	738
Vehicles Exiting, veh/h	671	361	296	60
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.7	5.4	4.4	5.0
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Right	Left
Designated Moves	LT	TR	LT	TR	LT	R	LTR
Assumed Moves	LT	TR	LT	TR	LT	R	LTR
RT Channelized							
Lane Util	0.470	0.530	0.471	0.529	0.702	0.298	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328
Entry Flow, veh/h	254	287	320	360	106	45	16
Cap Entry Lane, veh/h	1251	1323	1211	1285	998	1075	758
Entry HV Adj Factor	0.982	0.981	0.979	0.982	0.978	0.978	0.995
Flow Entry, veh/h	250	281	313	353	104	44	16
Cap Entry, veh/h	1229	1298	1186	1261	976	1051	755
V/C Ratio	0.203	0.217	0.264	0.280	0.106	0.042	0.021
Control Delay, s/veh	4.7	4.6	5.4	5.4	4.7	3.8	5.0
LOS	A	A	A	A	A	A	A
95th %tile Queue, veh	1	1	1	1	0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	64	124	291	212	48	142	175	83	20	300
v/c Ratio	0.03	0.23	0.36	0.55	0.29	0.07	0.38	0.25	0.12	0.04	0.68
Control Delay	15.5	34.6	10.6	21.2	20.0	0.2	17.2	19.9	2.5	13.6	35.3
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	15.5	34.6	10.6	21.2	20.0	0.2	17.2	19.9	2.5	13.6	35.3
Queue Length 50th (ft)	4	26	0	90	62	0	38	48	0	5	121
Queue Length 95th (ft)	14	63	38	186	164	0	84	113	12	15	225
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	590	890	820	644	1017	918	529	890	816	672	999
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	0.03	0.07	0.15	0.45	0.21	0.05	0.27	0.20	0.10	0.03	0.30

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	50	102	259	189	36	126	142	69	14	224	34
Future Volume (veh/h)	11	50	102	259	189	36	126	142	69	14	224	34
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	16	64	124	291	212	48	142	175	83	20	260	40
Peak Hour Factor	0.69	0.78	0.82	0.89	0.89	0.75	0.89	0.81	0.83	0.70	0.86	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	398	302	256	572	579	490	334	517	438	384	338	52
Arrive On Green	0.02	0.16	0.16	0.17	0.31	0.31	0.09	0.28	0.28	0.02	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1583	244
Grp Volume(v), veh/h	16	64	124	291	212	48	142	175	83	20	0	300
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1827
Q Serve(g_s), s	0.4	1.8	4.4	8.1	5.5	1.3	3.8	4.6	2.5	0.5	0.0	9.6
Cycle Q Clear(g_c), s	0.4	1.8	4.4	8.1	5.5	1.3	3.8	4.6	2.5	0.5	0.0	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	398	302	256	572	579	490	334	517	438	384	0	390
V/C Ratio(X)	0.04	0.21	0.48	0.51	0.37	0.10	0.43	0.34	0.19	0.05	0.00	0.77
Avail Cap(c_a), veh/h	795	1057	896	849	1057	896	611	1057	896	918	0	1033
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	22.5	23.6	16.7	16.7	15.2	17.3	17.9	17.1	15.5	0.0	22.9
Incr Delay (d2), s/veh	0.0	0.7	3.0	0.3	0.8	0.2	0.3	0.4	0.2	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(50%),veh/ln	0.1	0.8	1.7	3.0	2.2	0.4	1.3	1.8	0.8	0.2	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	23.3	26.6	17.0	17.5	15.4	17.7	18.3	17.3	15.5	0.0	26.2
LnGrp LOS	B	C	C	B	B	B	B	B	B	B	A	C
Approach Vol, veh/h		204			551			400			320	
Approach Delay, s/veh		24.6			17.0			17.9			25.5	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.9	15.5	11.4	19.2	6.7	24.7	7.5	23.1
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	20.0	35.0	15.0	35.0	15.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	10.1	6.4	5.8	11.6	2.4	7.5	2.5	6.6
Green Ext Time (p_c), s	0.3	1.5	0.1	1.6	0.0	2.7	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	221	75	23	527	53	9
Future Vol, veh/h	221	75	23	527	53	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	85	71	90	70	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	283	88	32	586	76	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	371	0	640	142
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	357	-
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	-	-	1184	-	408	880
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	679	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1184	-	397	880
Mov Cap-2 Maneuver	-	-	-	-	397	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	679	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	429	-	-	1184	-
HCM Lane V/C Ratio	0.204	-	-	0.027	-
HCM Control Delay (s)	15.5	-	-	8.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	48	18	474	640	3
Future Vol, veh/h	11	48	18	474	640	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	35	78	40	80	94	30
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	62	45	593	681	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1369	686	691	0	-	0
Stage 1	686	-	-	-	-	-
Stage 2	683	-	-	-	-	-
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	162	447	904	-	-	-
Stage 1	500	-	-	-	-	-
Stage 2	502	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	154	447	904	-	-	-
Mov Cap-2 Maneuver	283	-	-	-	-	-
Stage 1	475	-	-	-	-	-
Stage 2	502	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	904	-	283	447	-	-
HCM Lane V/C Ratio	0.05	-	0.111	0.138	-	-
HCM Control Delay (s)	9.2	-	19.3	14.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	0.5	-	-

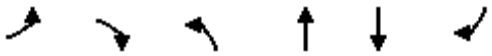
Intersection	
Int Delay, s/veh	0.6

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	588	4	20	446	2	11
Future Vol, veh/h	588	4	20	446	2	11
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	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	30	40	84	25	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	661	13	50	531	8	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	674	0	1299	668
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	631	-
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	-	-	917	-	178	458
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	530	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	917	-	168	458
Mov Cap-2 Maneuver	-	-	-	-	296	-
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	530	-

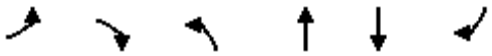
Approach	SE	NW	NE
HCM Control Delay, s	0	0.8	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	296	458	917	-	-	-
HCM Lane V/C Ratio	0.027	0.026	0.055	-	-	-
HCM Control Delay (s)	17.5	13.1	9.2	-	-	-
HCM Lane LOS	C	B	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0.1	0.2	-	-	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	78	230	249	530	628	112
v/c Ratio	0.28	0.52	0.61	0.47	0.55	0.07
Control Delay	23.7	8.6	14.6	7.4	8.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	8.6	14.6	7.4	8.5	0.1
Queue Length 50th (ft)	22	0	38	72	92	0
Queue Length 95th (ft)	49	45	118	135	200	0
Internal Link Dist (ft)	311			289	680	
Turn Bay Length (ft)			200			150
Base Capacity (vph)	694	760	502	1388	1388	1583
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	0.30	0.50	0.38	0.45	0.07

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	200	217	435	578	93
Future Volume (veh/h)	61	200	217	435	578	93
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	78	230	249	530	628	112
Peak Hour Factor	0.78	0.87	0.87	0.82	0.92	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	318	283	394	1202	734	905
Arrive On Green	0.18	0.18	0.16	0.64	0.39	0.39
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	78	230	249	530	628	112
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	2.5	9.4	8.1	9.5	20.6	2.2
Cycle Q Clear(g_c), s	2.5	9.4	8.1	9.5	20.6	2.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	318	283	0	1202	734	905
V/C Ratio(X)	0.25	0.81	0.00	0.44	0.86	0.12
Avail Cap(c_a), veh/h	530	472	0	1202	1058	1180
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	23.7	26.5	0.0	6.0	18.7	6.6
Incr Delay (d2), s/veh	0.4	5.6	0.0	0.3	4.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.8	0.0	2.4	8.4	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.1	32.1	0.0	6.2	23.6	6.7
LnGrp LOS	C	C	A	A	C	A
Approach Vol, veh/h	308			779	740	
Approach Delay, s/veh	30.0			4.2	21.0	
Approach LOS	C			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.2		18.0	16.8	32.3
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		38.0		20.0	38.0	38.0
Max Q Clear Time (g_c+I1), s		11.5		11.4	10.1	22.6
Green Ext Time (p_c), s		3.2		0.7	0.7	3.7

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	10	19	429	582	4
Future Vol, veh/h	2	10	19	429	582	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	35	40	84	89	30
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	29	48	511	654	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1268	661	667	0	-	0
Stage 1	661	-	-	-	-	-
Stage 2	607	-	-	-	-	-
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	186	462	923	-	-	-
Stage 1	514	-	-	-	-	-
Stage 2	544	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	176	462	923	-	-	-
Mov Cap-2 Maneuver	305	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	544	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	923	-	305	462	-	-
HCM Lane V/C Ratio	0.051	-	0.026	0.062	-	-
HCM Control Delay (s)	9.1	-	17.1	13.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	174	553	17	163	9
Future Vol, veh/h	56	174	553	17	163	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	85	90	40	85	35
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	205	614	43	192	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	657	0	-	0	883	329
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	247	-
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	926	-	-	-	285	667
Stage 1	-	-	-	-	489	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	926	-	-	-	263	667
Mov Cap-2 Maneuver	-	-	-	-	263	-
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	771	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	43.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	926	-	-	-	263	667
HCM Lane V/C Ratio	0.078	-	-	-	0.729	0.039
HCM Control Delay (s)	9.2	-	-	-	48.3	10.6
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0.3	-	-	-	5.1	0.1

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	337	532	156	0	38
Future Vol, veh/h	0	337	532	156	0	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	-	-	-	150	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	85	90	87	92	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	396	591	179	0	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	296
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	700
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	700
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

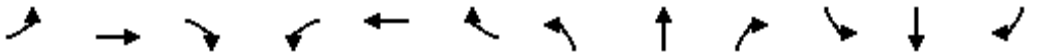
Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	700
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	10.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	383	354	595	818	987	460
v/c Ratio	0.83	0.71	0.68	0.38	0.88	0.61
Control Delay	46.1	29.9	22.3	17.2	22.6	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.6
Total Delay	46.1	29.9	22.3	17.2	22.6	9.1
Queue Length 50th (ft)	206	137	178	189	136	80
Queue Length 95th (ft)	227	237	208	218	#324	m109
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	522	550	877	2169	1119	756
Starvation Cap Reductn	0	0	0	0	0	85
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.64	0.68	0.38	0.88	0.69

Intersection Summary

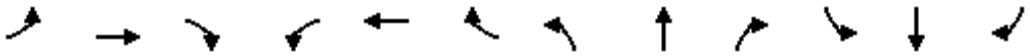
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	373	0	176	500	753	0	0	458	801
Future Volume (vph)	0	0	0	373	0	176	500	753	0	0	458	801
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.91		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	1579		3433	3539			3153	1441
Flt Permitted				0.95	0.98		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1579		3433	3539			3153	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.71	1.00	0.83	0.84	0.92	1.00	1.00	0.87	0.87
Adj. Flow (vph)	0	0	0	525	0	212	595	818	0	0	526	921
RTOR Reduction (vph)	0	0	0	0	63	0	0	0	0	0	167	321
Lane Group Flow (vph)	0	0	0	383	291	0	595	818	0	0	820	139
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				24.8	24.8		23.0	55.2			27.2	27.2
Effective Green, g (s)				24.8	24.8		23.0	55.2			27.2	27.2
Actuated g/C Ratio				0.28	0.28		0.26	0.61			0.30	0.30
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				463	435		877	2170			952	435
v/s Ratio Prot				c0.23	0.18		c0.17	0.23			c0.26	
v/s Ratio Perm												0.10
v/c Ratio				0.83	0.67		0.68	0.38			0.86	0.32
Uniform Delay, d1				30.6	29.0		30.2	8.8			29.6	24.3
Progression Factor				1.00	1.00		0.60	1.78			0.54	1.92
Incremental Delay, d2				11.5	3.9		2.2	0.4			7.6	1.4
Delay (s)				42.1	32.8		20.2	16.0			23.8	47.9
Level of Service				D	C		C	B			C	D
Approach Delay (s)		0.0			37.7			17.8			31.4	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

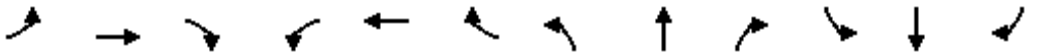
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	142	129	655	440	138	201	514	401	102	614	161
v/c Ratio	0.34	0.41	0.24	0.87	0.39	0.18	0.65	0.48	0.37	0.32	0.67	0.25
Control Delay	19.3	43.0	3.2	33.4	16.3	1.4	34.6	32.8	3.7	21.5	34.2	3.0
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	19.3	43.0	3.2	33.4	16.3	1.4	34.6	32.8	3.7	21.5	34.2	3.0
Queue Length 50th (ft)	42	41	0	242	101	9	104	161	23	35	165	0
Queue Length 95th (ft)	65	71	18	#206	35	7	149	208	78	61	218	21
Internal Link Dist (ft)		304			2353			407			486	
Turn Bay Length (ft)	200		200	200		200	160		250	290		290
Base Capacity (vph)	391	346	540	798	1140	780	311	1067	1097	316	917	646
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	0.34	0.41	0.24	0.82	0.39	0.18	0.65	0.48	0.37	0.32	0.67	0.25

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	126	110	609	396	108	157	447	325	85	540	135
Future Volume (veh/h)	102	126	110	609	396	108	157	447	325	85	540	135
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	131	142	129	655	440	138	201	514	401	102	614	161
Peak Hour Factor	0.78	0.89	0.85	0.93	0.90	0.78	0.78	0.87	0.81	0.83	0.88	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	388	339	310	704	1145	592	333	1066	923	271	932	504
Arrive On Green	0.06	0.10	0.10	0.47	0.54	0.54	0.03	0.10	0.10	0.05	0.26	0.26
Sat Flow, veh/h	1781	3554	1585	2494	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	131	142	129	655	440	138	201	514	401	102	614	161
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1247	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	0.0	3.4	6.4	22.3	6.5	0.0	7.2	12.3	5.1	0.0	13.9	1.6
Cycle Q Clear(g_c), s	0.0	3.4	6.4	22.3	6.5	0.0	7.2	12.3	5.1	0.0	13.9	1.6
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	388	339	310	704	1145	592	333	1066	923	271	932	504
V/C Ratio(X)	0.34	0.42	0.42	0.93	0.38	0.23	0.60	0.48	0.43	0.38	0.66	0.32
Avail Cap(c_a), veh/h	432	339	310	804	1145	592	333	1066	923	279	932	504
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	0.93	0.93	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	38.4	31.7	23.0	15.6	12.8	23.8	33.9	3.2	33.3	29.6	8.4
Incr Delay (d2), s/veh	0.5	0.8	0.9	14.7	0.9	0.8	2.8	1.5	1.4	0.9	3.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.4	2.4	5.7	2.3	1.3	3.3	6.0	2.5	2.0	6.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	39.2	32.6	37.6	16.5	13.6	26.6	35.4	4.6	34.2	33.2	10.0
LnGrp LOS	C	D	C	D	B	B	C	D	A	C	C	B
Approach Vol, veh/h		402			1233			1116			877	
Approach Delay, s/veh		32.8			27.4			22.7			29.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	29.6	30.4	14.4	10.6	33.0	10.8	34.0
Change Period (Y+Rc), s	5.0	* 6	5.0	* 5.8	* 6	* 6	5.8	* 5
Max Green Setting (Gmax), s	9.0	* 23	29.0	* 7.2	* 5	* 27	7.2	* 29
Max Q Clear Time (g_c+I1), s	9.2	15.9	24.3	8.4	2.0	14.3	2.0	8.5
Green Ext Time (p_c), s	0.0	2.5	1.2	0.0	0.1	3.9	0.1	3.0

Intersection Summary	
HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

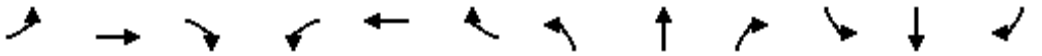
Notes

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	416	397	380	824	307	101	882
v/c Ratio	0.70	0.68	0.65	0.39	0.37	0.66	0.47
Control Delay	30.7	24.9	22.9	9.1	1.7	49.9	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	24.9	22.9	9.1	1.7	49.9	10.1
Queue Length 50th (ft)	205	164	142	62	1	62	153
Queue Length 95th (ft)	273	26	184	85	0	m79	m206
Internal Link Dist (ft)		541		1067			491
Turn Bay Length (ft)					200	100	
Base Capacity (vph)	747	712	715	2131	841	157	1892
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	0.56	0.56	0.53	0.39	0.37	0.64	0.47

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)	511	1	526	0	0	0	0	742	212	81	750	0
Future Volume (vph)	511	1	526	0	0	0	0	742	212	81	750	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	1.00	0.95	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1506	1504					5085	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1506	1504					5085	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.25	0.83	1.00	1.00	1.00	1.00	0.90	0.69	0.80	0.85	1.00
Adj. Flow (vph)	555	4	634	0	0	0	0	824	307	101	882	0
RTOR Reduction (vph)	0	50	55	0	0	0	0	0	182	0	0	0
Lane Group Flow (vph)	416	347	325	0	0	0	0	824	125	101	882	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)	31.9	31.9	31.9					36.7	36.7	6.4	48.1	
Effective Green, g (s)	31.9	31.9	31.9					36.7	36.7	6.4	48.1	
Actuated g/C Ratio	0.35	0.35	0.35					0.41	0.41	0.07	0.53	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	595	533	533					2073	645	125	1891	
v/s Ratio Prot	c0.25	0.23						0.16		c0.06	c0.25	
v/s Ratio Perm			0.22						0.08			
v/c Ratio	0.70	0.65	0.61					0.40	0.19	0.81	0.47	
Uniform Delay, d1	24.9	24.4	23.9					18.8	17.1	41.2	13.0	
Progression Factor	1.00	1.00	1.00					0.41	0.17	0.90	0.66	
Incremental Delay, d2	3.6	2.9	2.0					0.5	0.6	19.5	0.5	
Delay (s)	28.5	27.2	25.9					8.3	3.5	56.7	9.0	
Level of Service	C	C	C					A	A	E	A	
Approach Delay (s)		27.3			0.0			7.0			13.9	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

LANE LEVEL OF SERVICE

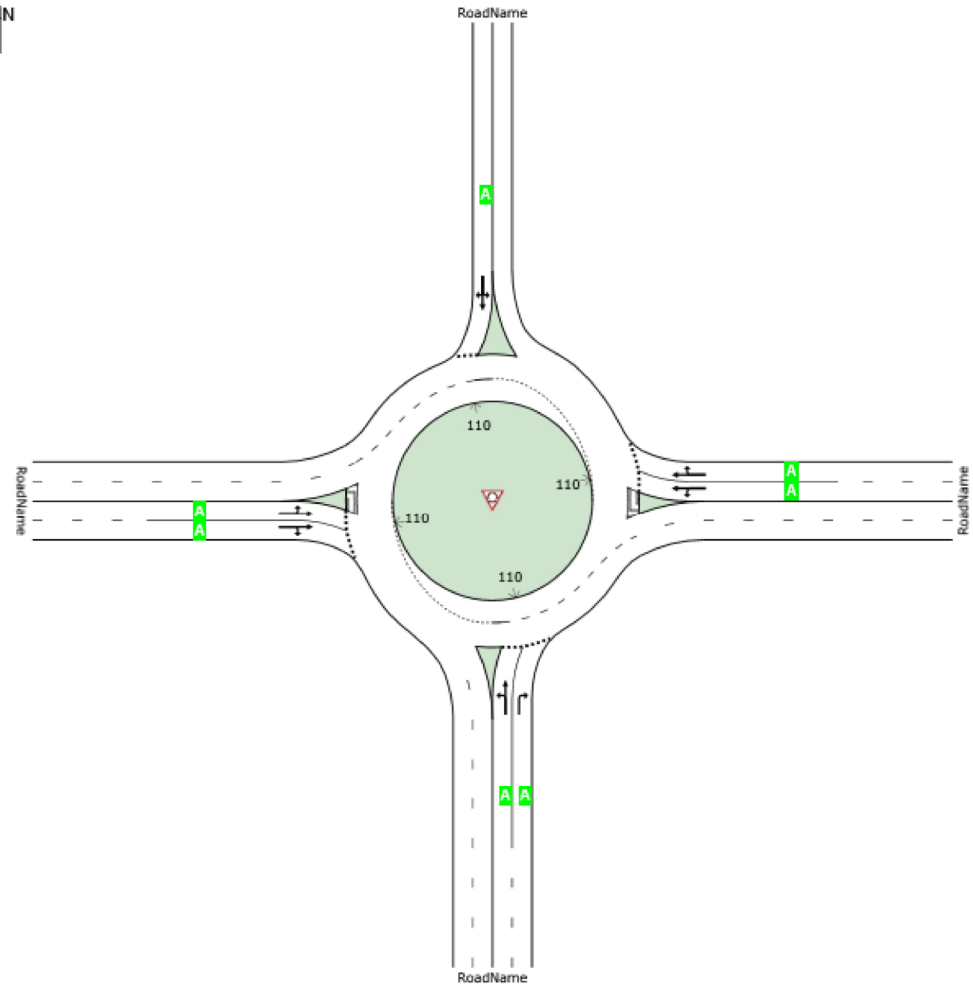
Lane Level of Service

Site: 101 [Colbern Rd & Blue Pkwy (Ex + FB AM)]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
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).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

Site: 101 [Colbern Rd & Blue Pkwy (Ex + FB AM)]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: RoadName													
Lane 1[d]	104	2.0	1053	0.098	100	4.3	LOS A	0.4	9.3	Full	1600	0.0	0.0
Lane 2	44	2.0	978	0.045	100	4.1	LOS A	0.2	4.2	Full	1600	0.0	0.0
Approach	148	2.0		0.098		4.2	LOS A	0.4	9.3				
East: RoadName													
Lane 1	333	2.0	1251	0.267	100	5.3	LOS A	1.3	33.0	Full	1600	0.0	0.0
Lane 2[d]	333	2.0	1251	0.267	100	5.3	LOS A	1.3	33.0	Full	1600	0.0	0.0
Approach	667	2.0		0.267		5.3	LOS A	1.3	33.0				
North: RoadName													
Lane 1[d]	16	2.0	743	0.021	100	5.1	LOS A	0.1	1.8	Full	1600	0.0	0.0
Approach	16	2.0		0.021		5.1	LOS A	0.1	1.8				
West: RoadName													
Lane 1	266	2.0	1290	0.206	100	4.5	LOS A	0.9	24.1	Full	1600	0.0	0.0
Lane 2[d]	266	2.0	1290	0.206	100	4.5	LOS A	0.9	24.1	Full	1600	0.0	0.0
Approach	531	2.0		0.206		4.5	LOS A	0.9	24.1				
Intersection	1362	2.0		0.267		4.9	LOS A	1.3	33.0				

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).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Intersection	
Int Delay, s/veh	2.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	2	578	11	50	621	12	7	0	32	18	0	10
Future Vol, veh/h	2	578	11	50	621	12	7	0	32	18	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	-	-	200	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	93	35	78	83	60	35	92	55	75	92	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	622	31	64	748	20	20	0	58	24	0	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	768	0	0	653	0	0	1538	1542	638	1561	1547	758
Stage 1	-	-	-	-	-	-	646	646	-	886	886	-
Stage 2	-	-	-	-	-	-	892	896	-	675	661	-
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	846	-	-	934	-	-	94	115	477	91	114	407
Stage 1	-	-	-	-	-	-	460	467	-	339	363	-
Stage 2	-	-	-	-	-	-	337	359	-	444	460	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	846	-	-	934	-	-	86	106	477	75	106	407
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	106	-	75	106	-
Stage 1	-	-	-	-	-	-	458	465	-	337	338	-
Stage 2	-	-	-	-	-	-	305	334	-	388	458	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.7	25.2	57.7
HCM LOS			D	F

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	86	477	934	-	-	846	-	-	103
HCM Lane V/C Ratio	0.233	0.122	0.069	-	-	0.005	-	-	0.35
HCM Control Delay (s)	59.1	13.6	9.1	-	-	9.3	-	-	57.7
HCM Lane LOS	F	B	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.8	0.4	0.2	-	-	0	-	-	1.4

Intersection	
Int Delay, s/veh	3.5

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	590	12	20	527	5
Future Vol, veh/h	2	0	1	25	0	17	2	590	12	20	527	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	50	100	25	39	100	71	50	84	75	63	90	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	4	64	0	24	4	702	16	32	586	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1384	1380	590	1366	1368	702	594	0	0	718	0	0
Stage 1	654	654	-	710	710	-	-	-	-	-	-	-
Stage 2	730	726	-	656	658	-	-	-	-	-	-	-
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	121	144	508	124	147	438	982	-	-	883	-	-
Stage 1	456	463	-	424	437	-	-	-	-	-	-	-
Stage 2	414	430	-	454	461	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	138	508	119	141	438	982	-	-	883	-	-
Mov Cap-2 Maneuver	111	138	-	119	141	-	-	-	-	-	-	-
Stage 1	454	446	-	422	435	-	-	-	-	-	-	-
Stage 2	390	428	-	434	444	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.7	51.8	0	0.5
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	982	-	-	182	119	438	883	-	-
HCM Lane V/C Ratio	0.004	-	-	0.044	0.539	0.055	0.036	-	-
HCM Control Delay (s)	8.7	-	-	25.7	66	13.7	9.2	-	-
HCM Lane LOS	A	-	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	2.6	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	37	56	1	570	44	65	516
Future Vol, veh/h	37	56	1	570	44	65	516
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	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	68	93	25	83	83	90	91
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	54	60	4	687	53	72	567

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1406	344	-	0	0	740	0
Stage 1	695	-	-	-	-	-	-
Stage 2	711	-	-	-	-	-	-
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	141	653	-	-	-	864	-
Stage 1	457	-	-	-	-	-	-
Stage 2	486	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	129	653	-	-	-	864	-
Mov Cap-2 Maneuver	129	-	-	-	-	-	-
Stage 1	419	-	-	-	-	-	-
Stage 2	486	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	37.1		1.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	223	864	-
HCM Lane V/C Ratio	-	-	0.514	0.084	-
HCM Control Delay (s)	-	-	37.1	9.5	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	2.7	0.3	-

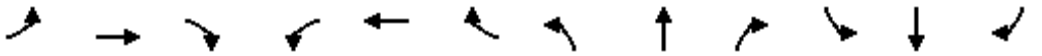
Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	850	404	373	131
Demand Flow Rate, veh/h	866	412	381	134
Vehicles Circulating, veh/h	149	273	779	637
Vehicles Exiting, veh/h	622	887	236	48
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.5	5.1	9.5	6.1
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Right	Left
Designated Moves	LT	TR	LT	TR	LT	R	LTR
Assumed Moves	LT	TR	LT	TR	LT	R	LTR
RT Channelized							
Lane Util	0.470	0.530	0.471	0.529	0.654	0.346	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328
Entry Flow, veh/h	407	459	194	218	249	132	134
Cap Entry Lane, veh/h	1177	1251	1050	1126	659	732	826
Entry HV Adj Factor	0.981	0.981	0.979	0.982	0.979	0.977	0.981
Flow Entry, veh/h	399	450	190	214	244	129	131
Cap Entry, veh/h	1155	1228	1028	1106	645	716	810
V/C Ratio	0.346	0.367	0.185	0.194	0.378	0.180	0.162
Control Delay, s/veh	6.5	6.5	5.2	5.0	10.8	7.0	6.1
LOS	A	A	A	A	B	A	A
95th %tile Queue, veh	2	2	1	1	2	1	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	193	149	181	104	68	159	301	296	44	284
v/c Ratio	0.09	0.49	0.33	0.39	0.17	0.11	0.41	0.47	0.40	0.11	0.66
Control Delay	15.8	34.0	7.8	18.8	23.7	1.1	18.9	26.4	5.0	15.6	37.1
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	15.8	34.0	7.8	18.8	23.7	1.1	18.9	26.4	5.0	15.6	37.1
Queue Length 50th (ft)	13	80	0	53	38	0	45	121	0	12	119
Queue Length 95th (ft)	35	170	50	99	77	0	86	250	44	37	239
Internal Link Dist (ft)		423			416			1597			611
Turn Bay Length (ft)	150		150	175		175	225			175	
Base Capacity (vph)	636	869	818	630	994	900	525	869	896	610	987
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	0.08	0.22	0.18	0.29	0.10	0.08	0.30	0.35	0.33	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	134	134	78	54	118	271	249	39	228	11
Future Volume (veh/h)	37	164	134	134	78	54	118	271	249	39	228	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	48	193	149	181	104	68	159	301	296	44	268	16
Peak Hour Factor	0.77	0.85	0.90	0.74	0.75	0.79	0.74	0.90	0.84	0.89	0.85	0.69
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	458	346	293	419	467	396	366	484	410	299	359	21
Arrive On Green	0.05	0.19	0.19	0.11	0.25	0.25	0.10	0.26	0.26	0.04	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1747	104
Grp Volume(v), veh/h	48	193	149	181	104	68	159	301	296	44	0	284
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1852
Q Serve(g_s), s	1.1	5.4	4.8	4.6	2.5	1.9	3.9	8.2	9.8	1.0	0.0	8.3
Cycle Q Clear(g_c), s	1.1	5.4	4.8	4.6	2.5	1.9	3.9	8.2	9.8	1.0	0.0	8.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	458	346	293	419	467	396	366	484	410	299	0	381
V/C Ratio(X)	0.10	0.56	0.51	0.43	0.22	0.17	0.43	0.62	0.72	0.15	0.00	0.75
Avail Cap(c_a), veh/h	841	1142	967	842	1142	967	659	1142	967	842	0	1130
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	14.6	21.2	21.0	16.1	17.1	16.9	16.0	18.8	19.4	14.9	0.0	21.4
Incr Delay (d2), s/veh	0.0	3.0	2.9	0.3	0.5	0.4	0.3	1.3	2.4	0.1	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.4	1.8	1.6	1.0	0.6	1.3	3.1	3.3	0.4	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.7	24.2	23.9	16.4	17.6	17.3	16.3	20.1	21.8	15.0	0.0	24.3
LnGrp LOS	B	C	C	B	B	B	B	C	C	B	A	C
Approach Vol, veh/h		390			353			756			328	
Approach Delay, s/veh		22.9			16.9			20.0			23.1	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	16.1	11.6	17.8	8.2	19.8	8.5	20.8
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	20.0	35.0	15.0	35.0	15.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	6.6	7.4	5.9	10.3	3.1	4.5	3.0	11.8
Green Ext Time (p_c), s	0.2	3.2	0.1	1.5	0.0	1.6	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	701	54	13	281	61	26
Future Vol, veh/h	701	54	13	281	61	26
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	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	68	54	83	66	52
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	754	79	24	339	92	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	833	0	972	377
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	218	-
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	-	-	796	-	250	621
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	797	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	796	-	243	621
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	797	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	26.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	309	-	-	796	-
HCM Lane V/C Ratio	0.461	-	-	0.03	-
HCM Control Delay (s)	26.2	-	-	9.7	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	2.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	32	50	676	617	11
Future Vol, veh/h	7	32	50	676	617	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	35	55	78	83	93	35
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	58	64	814	663	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1621	679	694	0	-	0
Stage 1	679	-	-	-	-	-
Stage 2	942	-	-	-	-	-
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	452	901	-	-	-
Stage 1	504	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	105	452	901	-	-	-
Mov Cap-2 Maneuver	217	-	-	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	379	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	901	-	217	452	-	-
HCM Lane V/C Ratio	0.071	-	0.092	0.129	-	-
HCM Control Delay (s)	9.3	-	23.3	14.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	0.4	-	-

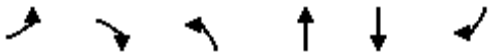
Intersection	
Int Delay, s/veh	0.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	571	3	12	626	4	20
Future Vol, veh/h	571	3	12	626	4	20
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	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	30	35	83	30	40
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	614	10	34	754	13	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	624	0	1441	619
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	822	-
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	-	-	957	-	146	489
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	432	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	957	-	141	489
Mov Cap-2 Maneuver	-	-	-	-	268	-
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	432	-

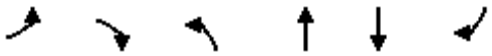
Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	SET	SER
Capacity (veh/h)	268	489	957	-	-	-
HCM Lane V/C Ratio	0.05	0.102	0.036	-	-	-
HCM Control Delay (s)	19.1	13.2	8.9	-	-	-
HCM Lane LOS	C	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.3	0.1	-	-	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	77	220	244	781	595	104
v/c Ratio	0.27	0.50	0.57	0.70	0.54	0.07
Control Delay	21.6	8.1	13.4	11.7	8.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	8.1	13.4	11.7	8.5	0.1
Queue Length 50th (ft)	21	0	35	127	82	0
Queue Length 95th (ft)	44	42	108	243	184	0
Internal Link Dist (ft)	189			289	680	
Turn Bay Length (ft)			200			150
Base Capacity (vph)	719	773	477	1248	1248	1583
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	0.28	0.51	0.63	0.48	0.07

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	191	212	648	553	83
Future Volume (veh/h)	60	191	212	648	553	83
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	77	220	244	781	595	104
Peak Hour Factor	0.78	0.87	0.87	0.83	0.93	0.80
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	312	278	398	1180	702	873
Arrive On Green	0.18	0.18	0.16	0.63	0.38	0.38
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	77	220	244	781	595	104
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	2.3	8.2	7.1	16.4	18.0	2.0
Cycle Q Clear(g_c), s	2.3	8.2	7.1	16.4	18.0	2.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	312	278	0	1180	702	873
V/C Ratio(X)	0.25	0.79	0.00	0.66	0.85	0.12
Avail Cap(c_a), veh/h	576	512	0	1180	997	1123
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	22.0	24.4	0.0	7.2	17.7	6.7
Incr Delay (d2), s/veh	0.4	5.0	0.0	1.4	4.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.3	0.0	4.2	7.2	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.4	29.5	0.0	8.6	22.6	6.7
LnGrp LOS	C	C	A	A	C	A
Approach Vol, veh/h	297			1025	699	
Approach Delay, s/veh	27.6			6.6	20.2	
Approach LOS	C			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		45.0		16.9	15.8	29.2
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		33.0		20.0	33.0	33.0
Max Q Clear Time (g_c+I1), s		18.4		10.2	9.1	20.0
Green Ext Time (p_c), s		4.4		0.7	0.6	3.2

Intersection Summary	
HCM 6th Ctrl Delay	14.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	19	12	618	555	3
Future Vol, veh/h	4	19	12	618	555	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	30	40	35	83	93	30
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	48	34	745	597	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1415	602	607	0	-	0
Stage 1	602	-	-	-	-	-
Stage 2	813	-	-	-	-	-
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	500	971	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	146	500	971	-	-	-
Mov Cap-2 Maneuver	273	-	-	-	-	-
Stage 1	528	-	-	-	-	-
Stage 2	436	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	971	-	273	500	-	-
HCM Lane V/C Ratio	0.035	-	0.049	0.095	-	-
HCM Control Delay (s)	8.8	-	18.9	13	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	0.3	-	-

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	672	285	16	174	6
Future Vol, veh/h	65	672	285	16	174	6
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	93	83	40	85	35
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	723	343	40	205	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	383	0	-	0	891	192
Stage 1	-	-	-	-	363	-
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	-	-	-	282	817
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	556	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1172	-	-	-	262	817
Mov Cap-2 Maneuver	-	-	-	-	262	-
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	556	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	51.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1172	-	-	-	262	817
HCM Lane V/C Ratio	0.071	-	-	-	0.781	0.021
HCM Control Delay (s)	8.3	-	-	-	54.7	9.5
HCM Lane LOS	A	-	-	-	F	A
HCM 95th %tile Q(veh)	0.2	-	-	-	5.9	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	856	272	148	0	26
Future Vol, veh/h	0	856	272	148	0	26
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	90	87	92	65
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	930	302	170	0	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	151
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	868
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	868
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

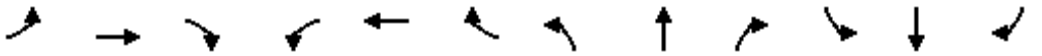
Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	868
HCM Lane V/C Ratio	-	-	-	0.046
HCM Control Delay (s)	-	-	-	9.3
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	190	173	630	1174	874	394
v/c Ratio	0.72	0.52	0.73	0.45	0.59	0.46
Control Delay	55.2	22.3	11.0	1.8	10.1	1.9
Queue Delay	0.0	0.0	0.0	0.1	0.1	0.1
Total Delay	55.2	22.3	11.0	1.9	10.2	2.0
Queue Length 50th (ft)	121	43	8	13	45	1
Queue Length 95th (ft)	194	109	0	21	90	m1
Internal Link Dist (ft)		795		491	407	
Turn Bay Length (ft)	270		350			
Base Capacity (vph)	319	378	1098	2628	1480	857
Starvation Cap Reductn	0	0	0	413	51	57
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.46	0.57	0.53	0.61	0.49

Intersection Summary

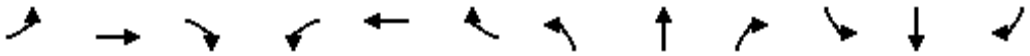
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	221	0	96	567	1127	0	0	479	660
Future Volume (vph)	0	0	0	221	0	96	567	1127	0	0	479	660
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor				0.95	0.95		0.97	0.95			0.91	0.91
Frt				1.00	0.90		1.00	1.00			0.94	0.85
Flt Protected				0.95	0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1562		3433	3539			3202	1441
Flt Permitted				0.95	0.98		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1562		3433	3539			3202	1441
Peak-hour factor, PHF	1.00	1.00	1.00	0.91	1.00	0.80	0.90	0.96	1.00	1.00	0.87	0.92
Adj. Flow (vph)	0	0	0	243	0	120	630	1174	0	0	551	717
RTOR Reduction (vph)	0	0	0	0	85	0	0	0	0	0	62	219
Lane Group Flow (vph)	0	0	0	190	88	0	630	1174	0	0	812	175
Turn Type				Split	NA		Prot	NA			NA	Perm
Protected Phases				8	8		1	6			2	
Permitted Phases												2
Actuated Green, G (s)				15.7	15.7		25.0	74.3			44.3	44.3
Effective Green, g (s)				15.7	15.7		25.0	74.3			44.3	44.3
Actuated g/C Ratio				0.16	0.16		0.25	0.74			0.44	0.44
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				263	245		858	2629			1418	638
v/s Ratio Prot				c0.11	0.06		c0.18	0.33			c0.25	
v/s Ratio Perm												0.12
v/c Ratio				0.72	0.36		0.73	0.45			0.57	0.27
Uniform Delay, d1				40.1	37.7		34.4	4.9			20.8	17.7
Progression Factor				1.00	1.00		0.19	0.25			0.44	0.19
Incremental Delay, d2				9.4	0.9		3.0	0.4			1.3	0.8
Delay (s)				49.5	38.6		9.4	1.7			10.5	4.2
Level of Service				D	D		A	A			B	A
Approach Delay (s)		0.0			44.3			4.4			8.5	
Approach LOS		A			D			A			A	

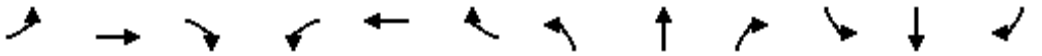
Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	185	543	260	532	206	136	196	653	482	150	599	108
v/c Ratio	0.38	0.81	0.42	0.81	0.20	0.20	0.55	0.60	0.50	0.46	0.57	0.15
Control Delay	20.4	49.2	17.9	45.2	21.9	3.5	30.9	24.7	6.1	28.9	33.0	1.5
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	20.4	49.2	17.9	45.2	21.9	3.5	30.9	24.7	6.3	28.9	33.0	1.5
Queue Length 50th (ft)	70	173	78	167	50	4	70	175	104	57	176	0
Queue Length 95th (ft)	101	233	115	190	69	37	108	231	157	83	225	10
Internal Link Dist (ft)		304			2353			407			486	
Turn Bay Length (ft)	200		200	200		200	160		250	290		290
Base Capacity (vph)	489	714	606	686	1093	697	366	1091	945	336	1056	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	72	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	0.38	0.76	0.43	0.78	0.19	0.20	0.54	0.60	0.55	0.45	0.57	0.15

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	505	203	415	165	106	163	588	472	117	521	92
Future Volume (veh/h)	148	505	203	415	165	106	163	588	472	117	521	92
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	543	260	532	206	136	196	653	482	150	599	108
Peak Hour Factor	0.80	0.93	0.78	0.78	0.80	0.78	0.83	0.90	0.98	0.78	0.87	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	459	646	529	617	950	648	433	995	727	393	959	575
Arrive On Green	0.09	0.18	0.18	0.06	0.09	0.09	0.25	0.47	0.47	0.14	0.27	0.27
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	185	543	260	532	206	136	196	653	482	150	599	108
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.4	14.8	0.0	15.3	5.4	1.7	0.0	14.1	0.0	0.0	14.8	2.3
Cycle Q Clear(g_c), s	7.4	14.8	0.0	15.3	5.4	1.7	0.0	14.1	0.0	0.0	14.8	2.3
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	459	646	529	617	950	648	433	995	727	393	959	575
V/C Ratio(X)	0.40	0.84	0.49	0.86	0.22	0.21	0.45	0.66	0.66	0.38	0.62	0.19
Avail Cap(c_a), veh/h	459	718	561	691	1098	715	433	995	727	393	959	575
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.67	1.67	1.67	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	0.90	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	39.5	26.6	45.8	35.9	9.6	28.8	22.9	14.0	33.6	32.0	7.6
Incr Delay (d2), s/veh	0.6	8.2	0.7	10.0	0.1	0.2	0.7	3.0	4.3	0.6	3.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	6.9	4.8	7.9	2.3	1.1	3.6	5.1	6.1	3.1	6.4	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	47.7	27.3	55.8	36.0	9.8	29.5	26.0	18.3	34.2	35.1	8.3
LnGrp LOS	C	D	C	E	D	A	C	C	B	C	D	A
Approach Vol, veh/h		988			874			1331			857	
Approach Delay, s/veh		37.8			44.0			23.7			31.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	33.0	22.8	24.0	19.2	34.0	15.1	31.7
Change Period (Y+Rc), s	* 5	6.0	* 5	5.8	* 5	6.0	* 5.8	5.0
Max Green Setting (Gmax), s	* 11	27.0	* 20	20.2	* 10	28.0	* 9.3	30.9
Max Q Clear Time (g_c+I1), s	2.0	16.8	17.3	16.8	2.0	16.1	9.4	7.4
Green Ext Time (p_c), s	0.3	0.5	0.6	1.4	0.2	4.7	0.0	1.6

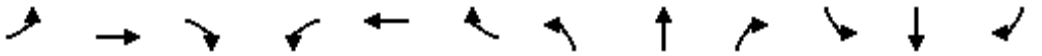
Intersection Summary	
HCM 6th Ctrl Delay	33.2
HCM 6th LOS	C

Notes

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	476	458	435	1118	470	98	699
v/c Ratio	0.76	0.74	0.66	0.54	0.51	0.59	0.38
Control Delay	34.9	29.3	20.5	11.2	3.8	50.2	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	29.3	20.5	11.2	3.8	50.2	14.1
Queue Length 50th (ft)	260	217	145	144	31	54	159
Queue Length 95th (ft)	368	332	245	201	48	101	213
Internal Link Dist (ft)		541		1067			491
Turn Bay Length (ft)					200	100	
Base Capacity (vph)	722	699	734	2059	920	180	1857
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	0.66	0.66	0.59	0.54	0.51	0.54	0.38

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	665	0	622	0	0	0	0	1029	395	78	622	0
Future Volume (vph)	665	0	622	0	0	0	0	1029	395	78	622	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	1.00	0.95	
Frt	1.00	0.92	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1528	1504					5085	1583	1770	3539	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1528	1504					5085	1583	1770	3539	
Peak-hour factor, PHF	0.95	1.00	0.93	1.00	1.00	1.00	1.00	0.92	0.84	0.80	0.89	1.00
Adj. Flow (vph)	700	0	669	0	0	0	0	1118	470	98	699	0
RTOR Reduction (vph)	0	48	96	0	0	0	0	0	284	0	0	0
Lane Group Flow (vph)	476	411	339	0	0	0	0	1118	186	98	699	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)	37.5	37.5	37.5					39.5	39.5	8.0	52.5	
Effective Green, g (s)	37.5	37.5	37.5					39.5	39.5	8.0	52.5	
Actuated g/C Ratio	0.38	0.38	0.38					0.40	0.40	0.08	0.52	
Clearance Time (s)	5.0	5.0	5.0					5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	630	573	564					2008	625	141	1857	
v/s Ratio Prot	c0.28	0.27						c0.22		c0.06	0.20	
v/s Ratio Perm			0.23						0.12			
v/c Ratio	0.76	0.72	0.60					0.56	0.30	0.70	0.38	
Uniform Delay, d1	27.3	26.7	25.2					23.5	20.7	44.8	14.1	
Progression Factor	1.00	1.00	1.00					0.41	0.89	0.87	0.89	
Incremental Delay, d2	5.1	4.3	1.8					0.8	0.9	11.5	0.5	
Delay (s)	32.4	31.0	27.0					10.5	19.3	50.4	13.0	
Level of Service	C	C	C					B	B	D	B	
Approach Delay (s)		30.2			0.0			13.1			17.6	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.3	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)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

LANE LEVEL OF SERVICE

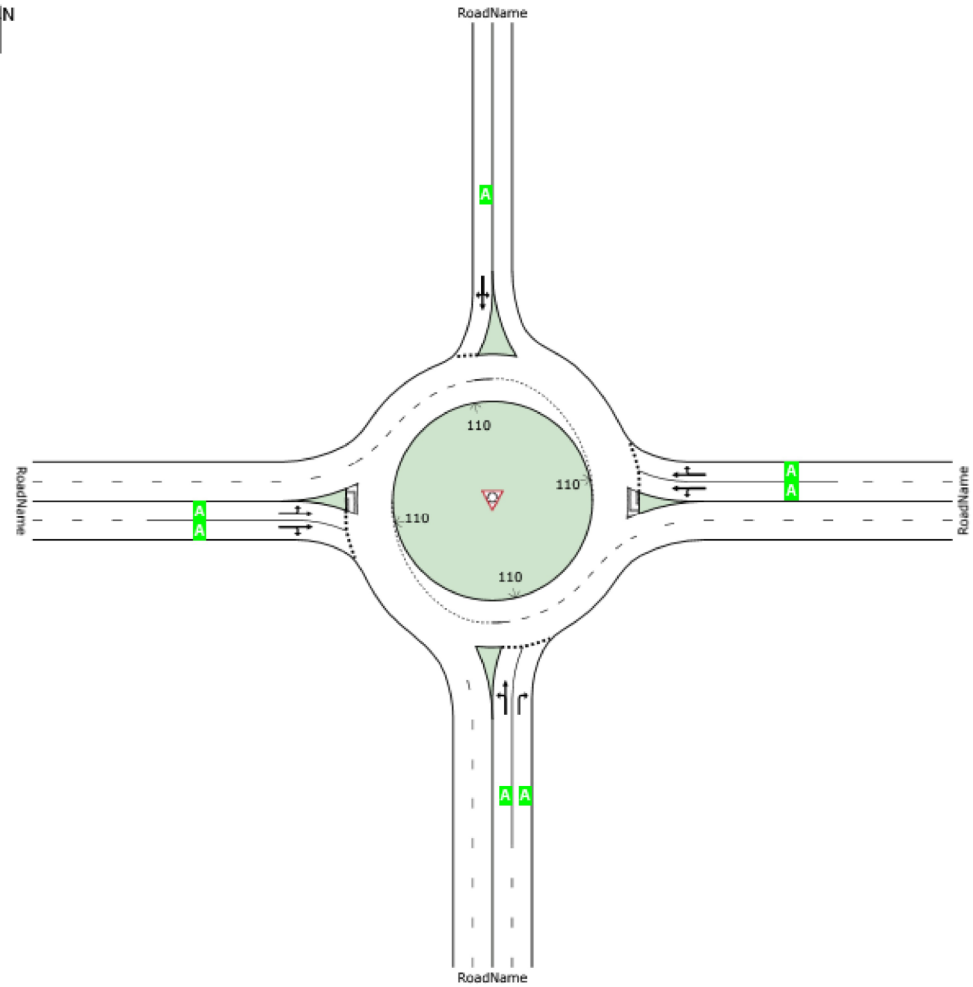
Lane Level of Service

Site: 101 [Colbern Rd & Blue Pkwy (Ex + FB PM)]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
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).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

LANE SUMMARY

Site: 101 [Colbern Rd & Blue Pkwy (Ex + FB PM)]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: RoadName													
Lane 1[d]	244	2.0	718	0.340	100	9.3	LOS A	1.4	35.6	Full	1600	0.0	0.0
Lane 2	129	2.0	647	0.200	100	7.9	LOS A	0.7	18.7	Full	1600	0.0	0.0
Approach	373	2.0		0.340		8.8	LOS A	1.4	35.6				
East: RoadName													
Lane 1	202	2.0	1085	0.186	100	5.0	LOS A	0.8	20.2	Full	1600	0.0	0.0
Lane 2[d]	202	2.0	1085	0.186	100	5.0	LOS A	0.8	20.2	Full	1600	0.0	0.0
Approach	404	2.0		0.186		5.0	LOS A	0.8	20.2				
North: RoadName													
Lane 1[d]	131	2.0	810	0.162	100	6.1	LOS A	0.6	15.1	Full	1600	0.0	0.0
Approach	131	2.0		0.162		6.1	LOS A	0.6	15.1				
West: RoadName													
Lane 1	425	2.0	1217	0.349	100	6.3	LOS A	1.9	47.0	Full	1600	0.0	0.0
Lane 2[d]	425	2.0	1217	0.349	100	6.3	LOS A	1.9	47.0	Full	1600	0.0	0.0
Approach	849	2.0		0.349		6.3	LOS A	1.9	47.0				
Intersection	1758	2.0		0.349		6.5	LOS A	1.9	47.0				

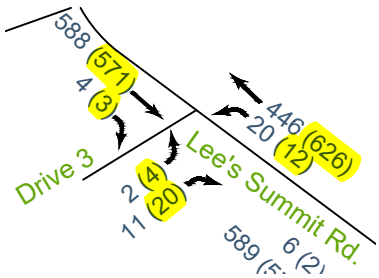
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective 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).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Theoretical Roadway LOS

Rather than adding the expected daily phase 2 development trips to the existing daily volumes illustrated in the City's TMP, daily traffic on the public roadway system was approximated by taking the expected PM peak hour volumes and multiplying by 10. This was done because the phase 2 development contains multiple driveways. Thus, the theoretical level of service was computed at a few different locations to determine if the roadway status is acceptable based on the City's Unimproved Roadway Policy.

Along Lee's Summit Road at Drive 3, the expected daily traffic is as follows:

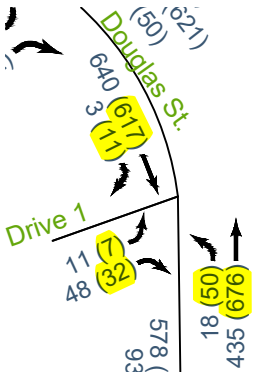


PM peak hour total traffic = (571 + 3 + 626 + 12 + 4 + 20) = 1,236 vph

Daily total traffic = 1,236 x 10 = 12,360 vpd

12,360 vpd results in a theoretical LOS of C along Lee's Summit Road at Drive 3

Along Douglas Street at Drive 1, the expected daily traffic is as follows:

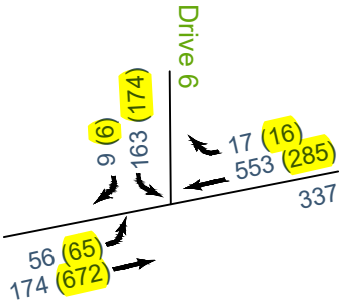


PM peak hour total traffic = (617 + 11 + 7 + 32 + 50 + 676) = 1,393 vph

Daily total traffic = 1,393 x 10 = 13,930 vpd

13,930 vpd results in a theoretical LOS of D along Douglas Street at Drive 1

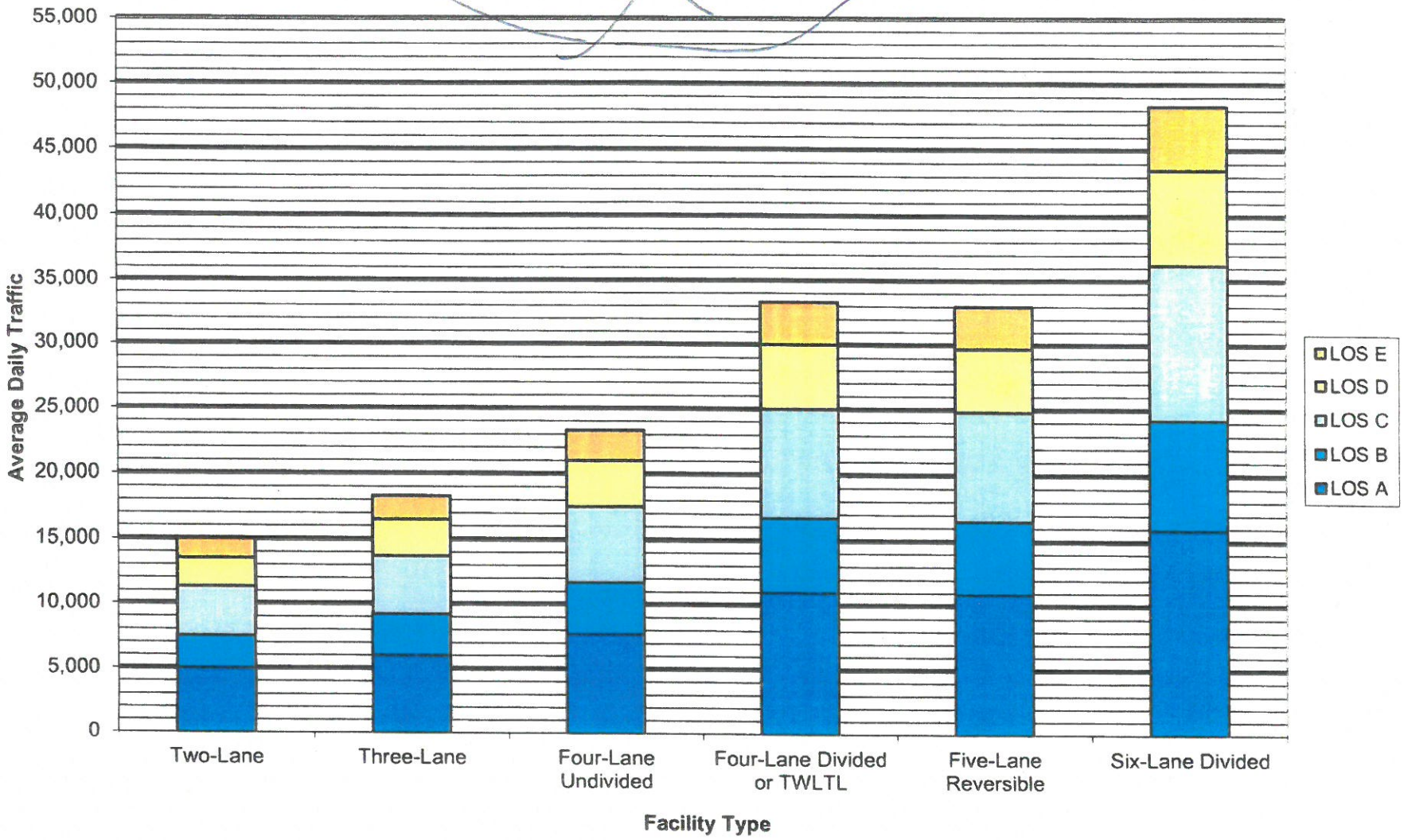
Along Colbern Road at Drive 6, the expected daily traffic is as follows:



PM peak hour total traffic = (65 + 672 + 16 + 285 + 6 + 174) = 1,218 vph

Daily total traffic = 1,218 x 10 = 12,180 vpd

12,180 vpd results in a theoretical LOS of B along Colbern Road at Drive 6.



Notes:
Capacities based on signalization set to high priority with high turns

Source: Calculations from NCHRP 365 Chapter 10


STATE OF MISSOURI
SHANNON
L
JEFFRIES
NUMBER
PE-2008000069
PROFESSIONAL ENGINEER
04.24.2019

ARIA & SUMMIT VILLAGE NORTH

Lee’s Summit, Missouri

Revised April 2019

Olsson Project No. 019-0012