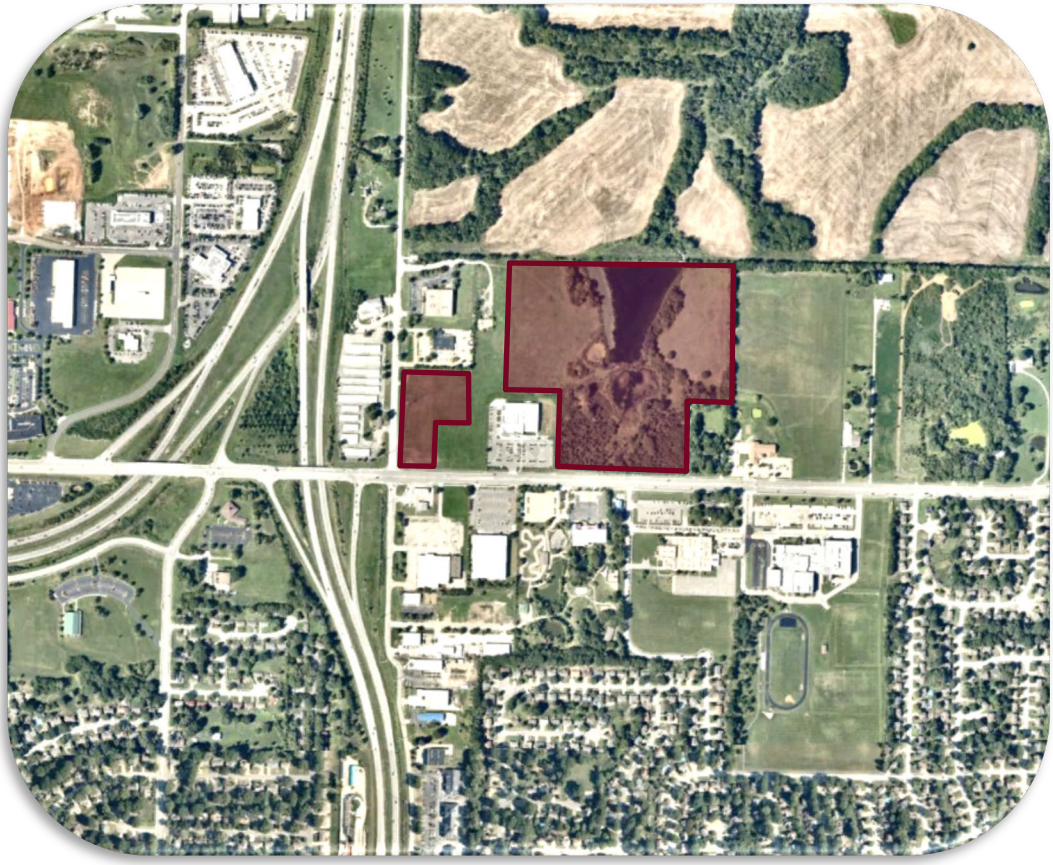
Traffic Impact Study

Colbern Road

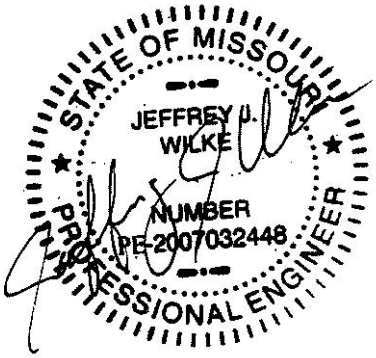


LEE'S SUMMIT, MISSOURI

APRIL 2023

Prepared By:

Kimley»Horn



04/21/2023

Contents

TABLES

EXHIBITS (SEE APPENDIX A)

1.0 INTRODUCTION

This report serves as the traffic analysis for the Colbern Road development, located near the northeast corner of the Colbern Road & Rice Road intersection in Lee's Summit, Missouri. The location of the development site is shown on **Exhibit 1** in **Appendix A**.

1.1 REPORT PURPOSE AND OBJECTIVES

The purpose of this study is to address traffic and transportation impacts of the proposed development on surrounding streets and intersections. This traffic impact study was prepared based on criteria set forth by the City of Lee's Summit *Access Management Code*. The following information is provided.

- A description and map of the existing and proposed street network to be affected by the proposed development. This information includes existing and proposed roadway characteristics and existing traffic volumes.
- Trip generation calculations based on the Institute of Traffic Engineers (ITE) *Trip Generation Manual,* 11th Edition, for the proposed development. In addition, projected trip distributions onto the street network are provided.
- Analysis of impacts of the traffic generated by the proposed development on the street network, including analysis of peak period levels of service (LOS), delay times, and queuing at study area intersections.
- Evaluation of compliance with access management guidelines.
- Discussion of potential improvements and traffic management measures identified to mitigate operational concerns.

In summary, the study is to determine the trip generation of the Colbern Road development, assign new development trips to the street network, analyze various scenarios to determine the impacts of proposed site traffic, and identify potential mitigation measures needed to achieve acceptable operations at the study intersections.

2.0 EXISTING CONDITIONS

2.1 STUDY AREA

The development site is in the northern portion of Lee's Summit, Missouri, and currently consists of 36 acres of undeveloped land. North of the proposed development site there are large parcels of undeveloped land currently used for agricultural purposes. The Mid-Continent Public Library is located along the north side of Colbern Road and is not included in the development site. To the south of the site across Colbern Road, there is a gas station, a church, and Underwood Elementary School. To the west of the site is a commercial business and a United States Postal Service (USPS) office building that are accessed from Rice Road. There is a fire station and a self-storage business located west of the site across Rice Road. East of the site there is undeveloped land and a church located along Colbern Road.

Through discussion with City staff, the following intersections were included within the study area for the traffic analysis. The list provides the existing intersection control for each of the study intersections.

- Colbern Road & MO-291 NB Ramp (Signalized)
- Colbern Road & Rice Road (Side Street Stop)
- Colbern Road & Lucky Road (Signalized)
- Colbern Road & Ball Drive (Signalized)
- Colbern Road & Todd George Parkway (Signalized)

2.2 STREET NETWORK

The existing street network within the study area includes Colbern Road, Rice Road, and Lucky Road, Ball Drive, and Todd George Parkway. The following provides a summary of the existing street network within the study area:

Colbern Road is an east-west roadway that runs south of the proposed development site. Through the study area, Colbern Road is a four-lane divided roadway with curbs and gutters. There are sections of raised medians and striped medians near the site. There is a shared-use path along the south side of the road and a sidewalk along the north side. According to the Lee's Summit Thoroughfare Master Plan, Colbern Road is classified as a Major Arterial. The posted speed limit is 40 miles per hour (mph).

Colbern Road provides access to the regional highway system with partial diamond interchanges at both Interstate 470 and MO-291. The other half of the partial diamond interchange with I-470 is accessed from Douglas Street, farther to the west of the site.

Rice Road runs north-south to the west of the proposed development. The two-lane roadway has a varying width near the site with segments of curb and gutter and paved shoulders of varying widths. To the north of Rice Drive, the roadway narrows to a constant width of 22 feet with turf shoulders adjacent to the roadway. There are no sidewalks along either side of Rice Road. The roadway is classified as an Industrial/Commercial Collector with a posted speed limit of 45 mph.

The intersection of Colbern Road and Rice Road is a full access intersection with stop-sign control for the Rice Road approaches and uninterrupted flow for Colbern Road. The intersection is located 200 feet east of the signalized intersection with the MO-291 northbound exit ramp.

Lucky Road is a north-south roadway that has not been constructed at the time of this study. Lucky Road is to have one through lane in each direction and is to be located along the west edge of the Mid-Continent Public Library, aligning with an existing driveway to a church that south of Colbern Road. Lucky Road is shown on the Thoroughfare Master Plan as an Industrial/Commercial collector that extends north of Colbern Road.

Ball Drive is a north-south roadway that currently runs extends south of Colbern Road. Through the study area, Ball Drive is a two-lane, undivided roadway with curbs and gutters. There is a sidewalk along the east side of Ball Drive. The street is classified as a residential collector to the south of Colbern Road. The Thoroughfare Master Plan indicates that the roadway is to extend north of Colbern Road in the future as an Industrial/Commercial collector. The posted speed limit is 25 mph.

Todd George Parkway is a north-south roadway located east of the proposed development site. North of the intersection at Colbern Road, Todd George Parkway is a two-lane undivided roadway with 6-foot paved shoulders and no sidewalks. South of the intersection at Colbern Road, Todd George Parkway is a four-lane, divided roadway with a raised median and curbs and gutters. There is a shared use path that runs along the west side of the roadway and a sidewalk along the east side. The roadway is classified as a Major Arterial. The posted speed limit along Todd George Parkway is 45 mph.

2.3 DATA COLLECTION

The Turning Movement Counts (TMCs) that were provided in the Heartland Market Traffic Impact Study were used for the following intersections in this study:

- Colbern Road & MO-291 NB Ramp
- Colbern Road & Rice Road
- Colbern Road & Todd George Parkway

The counts were collected at the three study intersections on Tuesday, August 9, 2022. The AM peak hour occurred between 7:15 AM and 8:15 AM, and the PM peak hour occurred between 4:30 PM and 5:30 PM. For the intersection at Colbern Road & Ball Drive, TMCs were collected for the AM and PM peak hours on Wednesday, April 19, 2023. The turning movement count data collected for the Colbern Road & Ball Drive intersection is included in **Appendix B**.

The Existing Conditions peak hour turning movement volumes are shown on **Exhibit 2**. The existing geometry with lane configurations and intersection control at the study intersections is shown on **Exhibit 3**.

3.0 APPROVED DEVELOPMENT

Several developments have been approved in recent years in the vicinity of the proposed development site but are not yet constructed and occupied. These developments are described in the following section.

3.1 HEARTLAND MARKET CONVENIENCE STORE/GAS STATION

The Heartland Market development is located at the northwest corner of the Colbern Road & Lucky Road intersection. The 1.7-acre development consists of a 5,400 square-foot convenience store/gas station with 16 fueling positions. Two public roadways will be constructed as part of the development. Lucky Road will be constructed north of Colbern Road adjacent to the west side of the Heartland Market site. Ikerd Road will be an east-west local roadway extending between Rice Road and Lucky Road along the north side of the Heartland market site.

A traffic impact study was prepared for the development in November 2022. The traffic study identified several improvements to the street network to mitigate the addition of site trips. A raised median is required on Colbern Road that will extend from Rice Road to an existing private driveway roughly 1,000 feet east of Rice Road. There will be a median break at the intersection of Colbern Road and proposed Lucky Road, providing a full-access, signalized intersection. The median will be configured to provide a 200-foot eastbound left-turn lane at Lucky Road, and a 135-foot westbound left-turn lane at Rice Road. At Colbern Road & Rice Road the median will eliminate the eastbound left-turn movement, as well as the northbound and southbound left-turn and through movements. At Colbern Road & Lucky Road, a westbound right-turn lane and southbound left-turn lane will be constructed. The intersection will also be signalized.

3.2 COLBERN ROAD SENIOR SITE

The proposed Colbern Road Senior Site development will be located along the east side of Lucky Road to the north of the planned Heartland Market development. Lucky Road will be extended to the north adjacent to the site as part of the development and stubbed for future extension to the north. The Colbern Road Senior Site consists of a 101,280 square-foot building with corridors branching in several directions. The building will contain several types of senior living residences for different levels of care, including 32 beds for memory care, 78 beds for assisted living, and 110 units for independent living.

The traffic impact study for this development was prepared by Kimley-Horn. The traffic impact study for the Colbern Road Senior Site did not require a capacity analysis as the total trip generation was less than 100 trips. For the purposes of this study, the trips from the development were assigned to the study intersections with a distribution similar to the proposed development as described in the next section this report.

3.3 APPROVED DEVELOPMENT TRIPS

Trips from the approved developments were added to the existing traffic volumes to develop Existing plus Approved conditions traffic volumes. The Existing plus Approved Conditions peak hour turning movement volumes are shown on **Exhibit 4**. The Existing plus Approved Conditions geometry with lane configurations and intersection control at the study intersections is shown on **Exhibit 5**. This includes the improvements identified in the Heartland Market Traffic Impact Study.

4.0 PROPOSED DEVELOPMENT

4.1 SITE DESCRIPTION

The proposed development includes several parcels located near the northeast corner of the Colbern Road & Rice Road intersection. The western portion of the site consists of two proposed office buildings. Lot 1 consists of an 8,500 square foot office building. It is bounded by Rice Road to the west, the approved Heartland Market convenience store/gas station development to the east, and Colbern Road to the south. There is an approved east-west public roadway, Ikerd Road, that separates Lot 1 and Lot 3. Lot 3 consists of a 25,000 square foot office building.

The eastern portion of the site consists of multifamily and medical office land uses. Lots 6, 7, and 8 are medical office buildings along the north side of Colbern Road. Lot 9 is located to the north and west of the medical office buildings and includes two 3-story multifamily buildings totaling 84 units. On Lot 5, there are 13 smaller multifamily buildings totaling 52 units to the north and east of the medical office buildings.

The site plan shows the extension of Ball Drive north of Colbern Road through the eastern portion of the proposed development site. The roadway will include curbs and gutters with sidewalks along each side of the street. The street will measure 40 feet between the backs of curbs, which is consistent with the City's standards for collector streets. Ball Drive will end at the property line and be stubbed for a future extension to the north.

The proposed site plan is included in **Appendix C** for reference.

4.2 SITE CIRCULATION

The eastern portion of the proposed development will be accessed from several access points along the proposed extension of Ball Drive. Rice Road, Lucky Road, and Ikerd Road will be used to access the two office buildings in the western portion of the proposed development.

4.3 TRIP GENERATION

Trip generation estimates were prepared using the *ITE Trip Generation Manual, 11th Edition*. **Table 1** shows the expected trips to be generated by the proposed development. The total trip generation is anticipated to be 2,576 daily trips, 210 trips during the AM peak hour (136 entering and 74 exiting), and 267 trips during the PM peak hour (100 entering and 167 exiting). **Appendix D** provides the *Trip Generation Manual* calculations used to determine the trip generation of the proposed site.

TABLE 1: TRIP GENERATION

Land Use Description	ITE LUC	Intensity / Units	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Multifamily – Low Rise Housing	220	136 Dwelling Units	947	16	49	65	50	29	79
General Office Building	710	25,000 SF	347	45	6	51	9	44	53
Small Office Building	712	8,500 SF	122	12	2	14	6	12	18
Medical Office Building	720	29,500 SF	1,160	63	17	80	35	82	117
Total Site Trips			**2,576**	**136**	**74**	**210**	**100**	**167**	**267**

4.4 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The estimated trips generated by the proposed development were assigned to the street network based on the trip distributions summarized in **Table 2**. This distribution is based on existing traffic patterns, the surrounding street network, and engineering judgement.

TABLE 2: TRIP DISTRIBUTION

Direction To/From	Percentage
East on Colbern Road	20%
West on Colbern Road	55%
South on MO-291	20%
South on Todd George Parkway	5%
Total	**100%**

The detailed distribution patterns through the study intersections are shown in **Exhibit 6**.

Exhibit 7 shows the total development trip assignment. The proposed development trip assignments were added to the Existing plus Approved Conditions traffic volumes. **Exhibit 8** illustrates the Existing plus Approved plus Development peak hour traffic volumes. The Existing plus Approved plus Development geometry with lane configurations and intersection control at the study intersections is shown on **Exhibit 9**.

5.0 FUTURE CONDITIONS

The traffic analysis focused on two analysis years: Existing (Year 2022) and Future (Year 2042).

5.1 FUTURE TRAFFIC FORECASTING

For the future year traffic forecasts, background traffic growth was added to the existing traffic volumes, then the approved development trips, proposed development site trips, and trips from future development to the north of the site were added to reflect conditions in year 2042.

5.2 BACKGROUND GROWTH

To estimate background traffic growth, the existing traffic volumes at the study intersections were assumed to increase at a rate of 1% per year for a 20-year planning horizon. This growth rate is consistent with future growth projections from the Mid-America Regional Council (MARC).

5.3 FUTURE DEVELOPMENT TRIPS

There are several large areas of undeveloped land adjacent to the north edge of the proposed development site. Future development in these areas will add traffic to the study network, specifically Lucky Road and Ball Drive. No developments have been planned for these areas, but future development is assumed to be warehousing type land uses, which is consistent with the future land use map from the Lee's Summit comprehensive plan. The *Trip Generation Manual* was used to calculate estimated trips generated by future warehousing land use Nearly 300 acres was assumed to be developed in this north area in the future, with a floor-area ratio of 0.15. The trips generated by the future land use were routed through Lucky Road, Ball Drive, and Todd George Parkway, and assigned to the street network in a manner similar to the proposed development.

6.0 ACCESS MANAGEMENT

The City of Lee's Summit *Access Management Code* (AMC) provides guidance for the design of driveways, access spacing, and the need for turn lanes at intersections. These items are discussed in the following paragraphs.

6.1 ACCESS SPACING

The AMC includes requirements for minimum spacing between street connections, depending on street classification. Along Industrial/Commercial roadways such as Lucky Road and Ball Drive, the minimum spacing is 300 feet, measured between centerlines. The traffic studies for Heartland Market and the Colbern Road Senior Site discuss proposed access spacings along Lucky Road, several of which do not meet the minimum spacing requirements. The distance between the centerline of Colbern Road and the first site driveway to the north of Colbern Road is 320 feet, which meets the minimum spacing requirement. The driveways for the multi-family units located along Ball Drive farther to the north are all spaced less than 300 feet apart which does not meet the minimum spacing guidelines.

The office building on Lot 1 in the southwestern corner of the site will be accessed from a a driveway that will be shared with the Heartland Market convenience store/gas station along Ikerd Road. The access points for the other office building on Lot 3 are not indicated in the site plan. It would be appropriate to provide access from Ikerd Road, aligning with the shared driveway for Lot 1 and the Heartland Market convenience store/gas station.

6.2 TURN LANE ANALYSIS

The *Access Management Code* also provides standards for left- and right-turn lanes based on traffic volumes and street classification. According to the *Access Management Code*, left-turn lanes are required on all arterial streets at the intersection with other arterial and collector streets. Therefore, an eastbound left-turn will be required at the intersection of Colbern Road & Ball Drive when the proposed extension is constructed. The AMC states the minimum length of a left-turn lane is 200 feet plus taper at the intersection of an arterial street with a collector street. However, there is not adequate space available to construct a left-turn lane with a storage length of 200 feet. This is due to the existing westbound left-turn lane used to access the property located at the southwest corner of the intersection of Colbern Road & Ball Drive. The eastbound left-turn lane is proposed to have a storage length of 120 feet plus taper to not impact existing westbound left-turn lane.

The AMC requires right-turn lanes on arterial streets at each intersecting street or driveway where the right-turn volume on the major arterial street is projected to be at least 30 vehicles in any hour. The westbound right-turn volumes at the Colbern Road & Ball Drive intersection are below the minimum thresholds for Existing plus Approved plus Development Conditions. However, this condition is satisfied for the Future Conditions scenario. According to the AMC, right-turn lanes are required to have a minimum storage length of 200 feet plus taper at the intersection of a major arterial street with a collector.

The AMC also requires left-turn lanes on all approaches to signalized intersections. Therefore, a southbound left-turn lane should be constructed on Ball Drive at the Colbern Road intersection.

7.0 INTERSECTION CAPACITY ANALYSIS

7.1 LEVEL OF SERVICE OVERVIEW

Intersection capacity analysis was performed at the study intersections for the following three scenarios:

- Existing Conditions (Year 2022)
- Existing plus Approved Conditions
- Existing plus Approved plus Development
- Future Conditions (Year 2042)

The capacity analysis was performed for the weekday AM and PM peak hours using Synchro or Sidra traffic modeling software to determine intersection delay and level of service (LOS). Calculations were performed based on the methodologies outlined in the *Highway Capacity Manual (HCM)*, 6th Edition, which is published by the Transportation Research Board. Signalized intersections were evaluated based on the 2000 Edition of the HCM because the 6th Edition will not evaluate the signal phasing.

LOS is a quantitative measure used by traffic engineers to describe the operations of an intersection. It ranges from A to F, with A being the best and F being the worst level of operation. LOS A conditions are characterized by minimal vehicle delay and free-flow conditions, while LOS F is characterized by long vehicle delay – usually when demand exceeds available roadway capacity. **Table 3** shows the definition of LOS for unsignalized and signalized intersections.

TABLE 3: LEVEL OF SERVICE

Level of Service	Average Control Delay (seconds/vehicle) at:	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

Levels of service are evaluated based on the movement groupings which are required to yield to other traffic. Typically, these are left turns off the major street and the side street approaches for two-way stop-controlled intersections. For signalized intersections each movement grouping is evaluated, and LOS is evaluated for the intersection as a whole.

The City of Lee's Summit has adopted LOS C as the minimum desirable LOS. However, LOS D and E may be considered acceptable for low to moderate traffic volumes, the availability of alternate routes, and the duration of activity resulting in lower LOS.

The volume-to-capacity (v/c) ratio is a secondary measure of intersection performance. The v/c ratio represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected. The v/c ratio is important in

understanding low-volume movements that, due to their nature, may experience relatively high delays yet operate will under capacity.

Traffic queues were also evaluated as part of the analyses. Long traffic queues which extend beyond the amount of storage available, either between intersections or within turn lanes, can have significant impacts on operations. The projected vehicular queues were analyzed to ensure the analyses are reflective of the physical constraints of the study intersections and to identify if additional storage is needed for turn lanes.

7.2 EXISTING (YEAR 2022) ANALYSIS

Capacity analysis was conducted for existing traffic conditions at the study intersections to determine baseline conditions for the existing analysis year and to calibrate the models. The analysis was performed for weekday AM and PM peak hours and is based on the lane configurations and traffic volumes shown in **Exhibits 2** and **3**. The Synchro reports are provided in **Appendix E**.

Table 4 provides a summary of the capacity analysis at the study intersections.

TABLE 4: EXISTING (YEAR 2022) PEAK HOUR CONDITIONS

Intersection	Control	Movement	Operational Analysis Results							
			AM Peak Hour				PM Peak Hour			
			Delay (sec/veh)	LOS	95% Queue	V/C Ratio	Delay (sec/veh)	LOS	95% Queue	V/C Ratio
Colbern Road & MO-291 NB Ramp	Traffic Signal	EB	2.4	A	54'	0.13	3.2	A	187'	0.40
		WB	0.4	A	158'	0.39	0.2	A	< 50'	0.23
		NBL	61.5	E	186'	0.84	62.1	E	174'	0.83
		Overall	**6.8**	**A**	--	--	**6.6**	**A**	--	--
Colbern Road & Rice Road	Side Street Stop	EBL	11.1	B	< 50'	0.05	9.0	A	< 50'	0.07
		WBL	8.3	A	< 50'	0.01	11.5	B	< 50'	0.02
		NB	29.6	D	< 50'	0.15	108.9	F	70'	0.63
		SB	17.3	C	< 50'	0.18	31.8	D	50'	0.43
Colbern Road & Ball Drive	Traffic Signal	EBT/R	0.2	A	56'	0.13	0.8	A	272'	0.41
		WBL	1.9	A	< 50'	0.05	1.1	A	< 50'	0.04
		WBT	2.2	A	90'	0.34	1.0	A	< 50'	0.18
		NB	65.1	E	124'	0.80	75.6	E	68'	0.78
		Overall	**6.0**	**A**	--	--	**2.8**	**A**	--	--
Colbern Road & Todd George Parkway	Traffic Signal	EBL	13.2	B	< 50'	0.05	13.9	B	< 50'	0.10
		EBT	13.4	B	91'	0.15	20.6	C	301'	0.49
		EBR	13.0	B	< 50'	0.08	18.6	B	< 50'	0.32
		WBL	10.9	B	< 50'	0.10	15.4	B	57'	0.24
		WBT/R	18.0	B	405'	0.53	18.4	B	208'	0.33
		NBL	39.6	D	225'	0.64	37.2	D	101'	0.44
		NBT	57.0	E	330'	0.88	58.3	E	288'	0.87
		NBR	38.8	D	< 50'	0.11	44.1	D	< 50'	0.35
		SBL	45.5	D	79'	0.47	43.3	D	183'	0.79
		SBT/R	49.5	D	63'	0.30	41.6	D	179'	0.54
		Overall	**28.5**	**C**	--	--	**29.8**	**C**	--	--

Based on the analysis, all intersections currently operate at an overall acceptable LOS. However, there are several left-turn movements that operate at a LOS E in the AM and PM peak hours. It is not uncommon for minor street movements to experience longer delays along coordinated signalized corridors. Additionally, the northbound approach at the Colbern Road & Rice Road intersection is shown to operate at LOS F in the PM peak hour.

7.3 EXISTING PLUS APPROVED ANALYSIS

Capacity analysis was conducted for Existing plus Approved Conditions at the study intersections to determine the impact of site generated traffic from the surrounding approved developments. The analysis was performed for weekday AM and PM peak hours and is based on the traffic volumes shown in **Exhibit 4**. The lane configurations and intersection controls are shown on **Exhibit 5**. The Synchro reports are provided in **Appendix E.**

Table 5 provides a summary of the capacity analysis at the study intersections.

TABLE 5: EXISTING PLUS APPROVED PEAK HOUR CONDITIONS

Intersection	Control	Movement	Operational Analysis Results							
			AM Peak Hour				PM Peak Hour			
			Delay (sec/veh)	LOS	95% Queue	V/C Ratio	Delay (sec/veh)	LOS	95% Queue	V/C Ratio
Colbern Road & MO-291 NB Ramp	Traffic Signal	EB	2.6	A	74'	0.18	3.5	A	220'	0.44
		WB	3.8	A	80'	0.46	8.4	A	< 50'	0.29
		NBL	61.7	E	186'	0.84	62.1	E	114'	0.83
		Overall	**8.2**	**A**	--	--	**9.2**	**A**	--	--
Colbern Road & Rice Road	Side Street Stop	WBL	9.0	A	< 50'	0.02	13.1	B	< 50'	0.05
		NB	10.4	B	< 50'	0.05	16.5	C	< 50'	0.15
		SB	16.8	C	< 50'	0.31	12.1	B	< 50'	0.22
Colbern Road & Lucky Road	Traffic Signal	EBL	2.0	A	78'	0.47	2.7	A	71'	0.40
		EBT/R	0.1	A	< 50'	0.11	0.4	A	128'	0.40
		WBL	0.0	A	< 50'	0.01	0.0	A	< 50'	0.01
		WBT	0.4	A	345'	0.39	0.2	A	113'	0.25
		WBR	0.1	A	< 50'	0.07	0.1	A	< 50'	0.06
		NBR	0.0	A	< 50'	0.01	0.0	A	< 50'	0.01
		SBL/R	58.9	E	86'	0.43	56.4	E	< 50'	0.59
		Overall	**2.4**	**A**	--	--	**3.7**	**A**	--	--
Colbern Road & Ball Drive	Traffic Signal	EBT/R	0.2	A	52'	0.15	0.9	A	61'	0.44
		WBL	1.9	A	< 50'	0.05	1.1	A	50'	0.04
		WBT	2.3	A	136'	0.36	1.1	A	51'	0.20
		NB	65.1	E	124'	0.80	75.2	E	69'	0.78
		Overall	**5.8**	**A**	--	--	**2.8**	**A**	--	--
Colbern Road & Todd George Parkway	Traffic Signal	EBL	13.8	B	< 50'	0.07	14.2	B	< 50'	0.13
		EBT	13.9	B	98'	0.22	21.1	C	398'	0.73
		EBR	13.4	B	< 50'	0.13	18.8	B	98'	0.48
		WBL	11.2	B	< 50'	0.13	16.1	B	57'	0.28
		WBT/R	17.8	B	404'	0.74	18.2	B	224'	0.48
		NBL	18.9	B	231'	0.54	21.3	C	110'	0.38
		NBT	26.9	C	326'	0.79	32.0	C	297'	0.79
		NBR	19.9	B	< 50'	0.10	26.0	C	< 50'	0.32
		SBL	23.7	C	78'	0.33	20.9	C	190'	0.65
		SBT/R	26.6	C	63'	0.28	24.6	C	185'	0.51
		Overall	**19.1**	**C**	--	--	**21.8**	**C**	--	--

The analysis results in **Table 5** indicate that the study intersections are projected to operate acceptably with the addition of trips from the approved developments in the surrounding area. As in the Existing Conditions scenario, several left-turn movements throughout the study network are projected to operate at LOS E during both peak hours. All queues of turning traffic are projected to be contained within their respective turn lanes.

7.4 EXISTING PLUS APPROVED PLUS DEVELOPMENT ANALYSIS

Several improvements are identified to mitigate traffic generated by the proposed development at the intersection of Colbern Road & Ball Drive. These improvements are listed below:

Colbern Road & Ball Drive

- Construct an eastbound left-turn lane with a storage length of 120 feet plus an appropriate taper
- Construct a southbound left-turn lane with a storage length of 150 feet plus an appropriate taper
- Modify the traffic signal to provide protected-permitted left-turn phasing for east/west traffic.

Capacity analysis was conducted for Existing plus Approved plus Development Conditions at the study intersections to determine the impact of site generated traffic from the proposed development. The analysis was performed for weekday AM and PM peak hours and is based on the lane configurations and traffic volumes shown in **Exhibits 8** and **9**. The Synchro reports are provided in **Appendix E.**

Table 6 provides a summary of the capacity analysis at the study intersections.

The analysis results in **Table 6** indicate that the addition of site generated trips from the proposed development is projected to impact the levels of service at the study intersections. All intersections are projected to operate at acceptable overall levels of service. As in the Existing plus Approved Conditions scenario, several minor street movements are projected to operate at LOS E during both peak hours. The eastbound left movement at the Colbern Road & Ball Drive intersection is projected to have a 95th percentile queue length of 173 feet during the AM peak hour, exceeding the available storage capacity. No additional storage capacity can be provided without impacting the existing turn lane for the private driveway located roughly 380 feet to the west of Ball Drive.

The southbound left-turn movement at Colbern Road & Lucky Road is projected to exceed the storage of the short left-turn lane during the PM peak hour. Increasing the storage length of this lane will impact the northbound left-turn lane proposed at the Lucky Road & Ikerd Road intersection as part of the Heartland Market development.

TABLE 6: EXISTING PLUS APPROVED PLUS DEVELOPMENT PEAK HOUR CONDITIONS

Intersection	Control	Movement	Operational Analysis Results							
			AM Peak Hour				PM Peak Hour			
			Delay (sec/veh)	LOS	95% Queue	V/C Ratio	Delay (sec/veh)	LOS	95% Queue	V/C Ratio
Colbern Road & MO-291 NB Ramp	Traffic Signal	EB	2.7	A	90'	0.21	3.5	A	226'	0.45
		WB	12.3	B	56'	0.48	9.0	A	51'	0.33
		NBL	61.2	E	185'	0.83	62.2	E	174'	0.83
		Overall	**13.3**	**B**	--	--	**9.3**	**A**	--	--
Colbern Road & Rice Road	Side Street Stop	WBL	0.2	A	< 50'	0.03	13.5	B	< 50'	0.05
		NBR	11.0	B	< 50'	0.06	17.0	C	< 50'	0.16
		SBR	17.9	C	< 50'	0.35	13.2	B	< 50'	0.27
Colbern Road & Lucky Road	Traffic Signal	EBL	4.5	A	139'	0.60	3.7	A	67'	0.49
		EBT/R	0.1	A	< 50'	0.13	0.4	A	128'	0.41
		WBL	0.0	A	< 50'	0.01	0.0	A	< 50'	0.01
		WBT	4.2	A	320'	0.41	5.8	A	196'	0.28
		WBR	3.0	A	< 50'	0.08	4.8	A	< 50'	0.06
		NB	0.0	A	92'	0.01	0.0	A	< 50'	0.01
		SBL	58.7	E	60'	0.44	56.2	E	158'	0.60
		Overall	**5.1**	**A**	--	--	**5.6**	**A**	--	--
Colbern Road & Ball Drive	Traffic Signal	EBL	3.0	A	173'	0.16	2.8	A	< 50'	0.08
		EBT/R	2.4	A	163'	0.14	4.7	A	484'	0.44
		WBL	1.2	A	< 50'	0.05	2.8	A	< 50'	0.05
		WBT/R	1.7	A	461'	0.34	1.9	A	153'	0.20
		NB	69.7	E	171'	0.35	61.7	E	< 50'	0.09
		SBL	66.7	E	< 50'	0.15	63.1	E	54'	0.23
		SBT/R	78.0	E	< 50'	0.65	75.5	E	< 50'	0.78
		Overall	**5.2**	**A**	--	--	**8.1**	**A**	--	--
Colbern Road & Todd George Parkway	Traffic Signal	EBL	14.1	B	< 50'	0.07	14.0	B	< 50'	0.13
		EBT	14.1	B	92'	0.24	20.9	C	401'	0.73
		EBR	13.6	B	< 50'	0.14	18.5	B	98'	0.48
		WBL	11.3	B	< 50'	0.13	15.9	B	56'	0.28
		WBT/R	19.2	B	372'	0.78	17.9	B	224'	0.47
		NBL	18.5	B	189'	0.55	21.5	C	113'	0.39
		NBT	26.1	C	261'	0.78	32.2	C	292'	0.79
		NBR	19.5	B	< 50'	0.10	26.2	C	< 50'	0.32
		SBL	23.5	C	63'	0.32	21.2	C	188'	0.64
		SBT/R	26.6	C	57'	0.29	25.0	C	184'	0.51
		Overall	**19.5**	**B**	--	--	**21.7**	**C**	--	--

7.5 FUTURE (YEAR 2042) ANALYSIS

With future traffic volumes, the turn lane analysis found that an additional turn lane will be warranted as indicated below:

Colbern Road & Ball Drive

- Construct an eastbound left-turn lane with a storage length of 120 feet plus an appropriate taper

Capacity analysis was conducted for future traffic conditions at the study intersections to determine the need for capacity improvements within the study network in the future. The analysis was performed for weekday AM and PM peak hours and is based on the lane configurations and traffic volumes shown in **Exhibits 10** and **11**. The Synchro and reports are provided in **Appendix E.**

Table 7 provides a summary of the capacity analysis at the study intersections.

Overall, the study intersections are projected to operate at acceptable levels of service in the future, but there are some individual movements that have lower levels of service and long queues.. The analysis results indicate that several left-turn movements are projected to continue operating at LOS E in both AM and PM peak hours with slight increases in delays.

Some operational and queuing issues are projected at Colbern Road & Lucky Road. The eastbound left movement is projected to have a 95th percentile queue that exceeds the storage length of the turn-lane. The volume-to capacity ratio indicates that the movement is projected to operate near capacity. This indicates that dual eastbound left-turn lanes are likely needed at Colbern Road & Lucky Road in the future with development of the land to the north of the proposed development site. Dual eastbound left-turn lanes would also require two northbound receiving lanes on Lucky Road. The southbound left-turn movement is projected to exceed the storage of the short left-turn lane during the PM peak hour similar to the previous scenario.

TABLE 7: FUTURE (YEAR 2042) PEAK HOUR CONDITIONS

Intersection	Control	Movement	Operational Analysis Results							
			AM Peak Hour				PM Peak Hour			
			Delay (sec/veh)	LOS	95% Queue	V/C Ratio	Delay (sec/veh)	LOS	95% Queue	V/C Ratio
Colbern Road & MO-291 NB Ramp	Traffic Signal	EB	4.0	A	178'	0.36	5.2	A	453'	0.58
		WB	6.2	A	60'	0.63	12.9	B	69'	0.49
		NBL	61.3	E	219'	0.87	60.8	E	194'	0.85
		Overall	**9.2**	**A**	--	--	**11.7**	**B**	--	--
Colbern Road & Rice Road	Side Street Stop	WBL	12.1	B	< 50'	0.05	17.4	B	< 50'	0.08
		NBR	13.9	B	< 50'	0.09	22.5	C	< 50'	0.23
		SBR	29.7	D	105'	0.64	25.4	D	115'	0.65
Colbern Road & Lucky Road	Traffic Signal	EBL	39.6	D	428'	0.96	6.7	A	266'	0.72
		EBT/R	0.2	A	< 50'	0.22	0.6	A	225'	0.51
		WBL	0.0	A	< 50'	0.01	0.0	A	< 50'	0.01
		WBT	12.2	C	725'	0.61	8.4	A	313'	0.37
		WBR	7.4	B	< 50'	0.12	6.4	A	< 50'	0.08
		NB	0.0	A	101'	0.01	0.0	A	< 50'	0.01
		SBL	61.5	E	67'	0.54	56.1	E	196'	0.63
		Overall	**15.2**	**B**	--	--	**6.7**	**A**	--	--
Colbern Road & Ball Drive	Traffic Signal	EBL	14.1	B	370'	0.60	3.5	A	< 50'	0.11
		EBT/R	3.4	A	124'	0.19	6.6	A	611'	0.56
		WBL	1.8	A	< 50'	0.08	4.5	A	< 50'	0.08
		WBT	2.4	A	302'	0.44	2.2	A	167'	0.25
		WBR	1.3	A	< 50'	0.04	1.7	A	< 50'	0.03
		NB	64.3	E	233'	0.27	59.8	E	60'	0.09
		SBL	63.7	E	56'	0.21	63.8	E	102'	0.43
		SBR	76.5	E	< 50'	0.77	73.6	E	< 50'	0.80
		Overall	**7.7**	**A**	--	--	**9.8**	**A**	--	--
Colbern Road & Todd George Parkway	Traffic Signal	EBL	25.9	C	< 50'	0.14	18.9	B	< 50'	0.19
		EBT	17.7	B	124'	0.24	32.0	C	536'	0.84
		EBR	16.8	B	< 50'	0.15	25.0	C	158'	0.57
		WBL	14.4	B	54'	0.16	25.2	C	73'	0.48
		WBT/R	38.1	C	621'	0.87	24.5	C	299'	0.56
		NBL	33.9	C	346'	0.73	28.2	C	139'	0.49
		NBT	57.2	D	458'	0.89	53.0	D	410'	0.88
		NBR	31.2	C	< 50'	0.12	35.1	D	< 50'	0.36
		SBL	40.8	D	116'	0.54	38.9	D	361'	0.87
		SBT/R	41.5	D	78'	0.30	32.1	D	237'	0.54
		Overall	**36.0**	**C**	--	--	**31.9**	**C**	--	--

8.0 CONCLUSIONS AND RECOMMENDATIONS

A traffic impact study for the Colbern Road development has been prepared by Kimley-Horn. The proposed site is generally located near the northeast corner of located near the northeast corner of the Colbern Road & Rice Road intersection in Lee's Summit, Missouri. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system. The following provides a summary of the analysis.

Intersection capacity analysis was performed at the study intersections for the following four scenarios:

- Existing Conditions (Year 2022)
- Existing plus Approved Conditions
- Existing plus Approved plus Development Conditions
- Future Conditions (Year 2042)

Based on the Existing Conditions analysis, all signalized study intersections currently operate at an overall acceptable LOS. The northbound approach to the Colbern Road & Rice Road intersection operates at LOS F during the PM peak hour.

The Existing plus Approved analysis results indicate that the study intersections are projected to operate acceptably with the addition of trips from the approved developments in the surrounding area and the associated improvements.

The proposed development is expected to generate 2,576 daily trips, with 210 trips in the AM peak hour and 267 trips in the PM peak hour. Several improvements are identified to mitigate traffic generated by the proposed development:

<u>Colbern Road & Ball Drive</u>

- Construct an eastbound left-turn lane with a storage length of 120 feet plus an appropriate taper
- Construct a southbound left-turn lane with a storage length of 150 feet plus an appropriate taper
- Modify the traffic signal to provide protected-permitted left-turn phasing for east/west traffic.

The site trips from the proposed development were added to the street network and all study intersections are projected to continue operating at acceptable LOS, with several individual movements operating at a LOS E. The eastbound left movement at the Colbern Road & Ball Drive intersection is projected to have a queue length that exceeds the available storage capacity. The capacity of the turn lane cannot be increased without impacting the existing left-turn lane for the private driveway to the west of the intersection.

The southbound left-turn movement at Colbern Road & Lucky Road is projected to exceed the storage of the short left-turn lane during the PM peak hour. Increasing the storage length of this lane will impact the northbound left-turn lane proposed at the Lucky Road & Ikerd Road intersection.

The future conditions scenario includes an annual 1% background growth rate applied over 20 years. It also includes traffic generated from future development of the large area of land located directly north of the proposed development site based on the future land use map from the Lee's Summit comprehensive plan.

With future traffic volumes, the turn lane analysis found that an additional turn lane will be warranted as indicated below:

Colbern Road & Ball Drive

- Construct an eastbound left-turn lane with a storage length of 120 feet plus an appropriate taper

All study intersections are projected to continue operating at acceptable LOS in the future, with several individual movements operating at a LOS E. The 95th percentile queue length for the eastbound left-turn movement at the Colbern Road & Lucky Road intersection is projected to well exceed the available storage. The movement is also projected to operate at capacity. This indicates that dual left-turn lanes may be needed for the eastbound left-turn movement in the future.

Queues for the southbound left-turn movement at Colbern Road & Lucky Road as well as the eastbound left-turn movement at Colbern Road & Ball Drive are projected to exceed the available storage lengths in the turn lanes as they did in the Existing plus Approved plus Development scenario.

APPENDIX

Appendix A: EXHIBITS

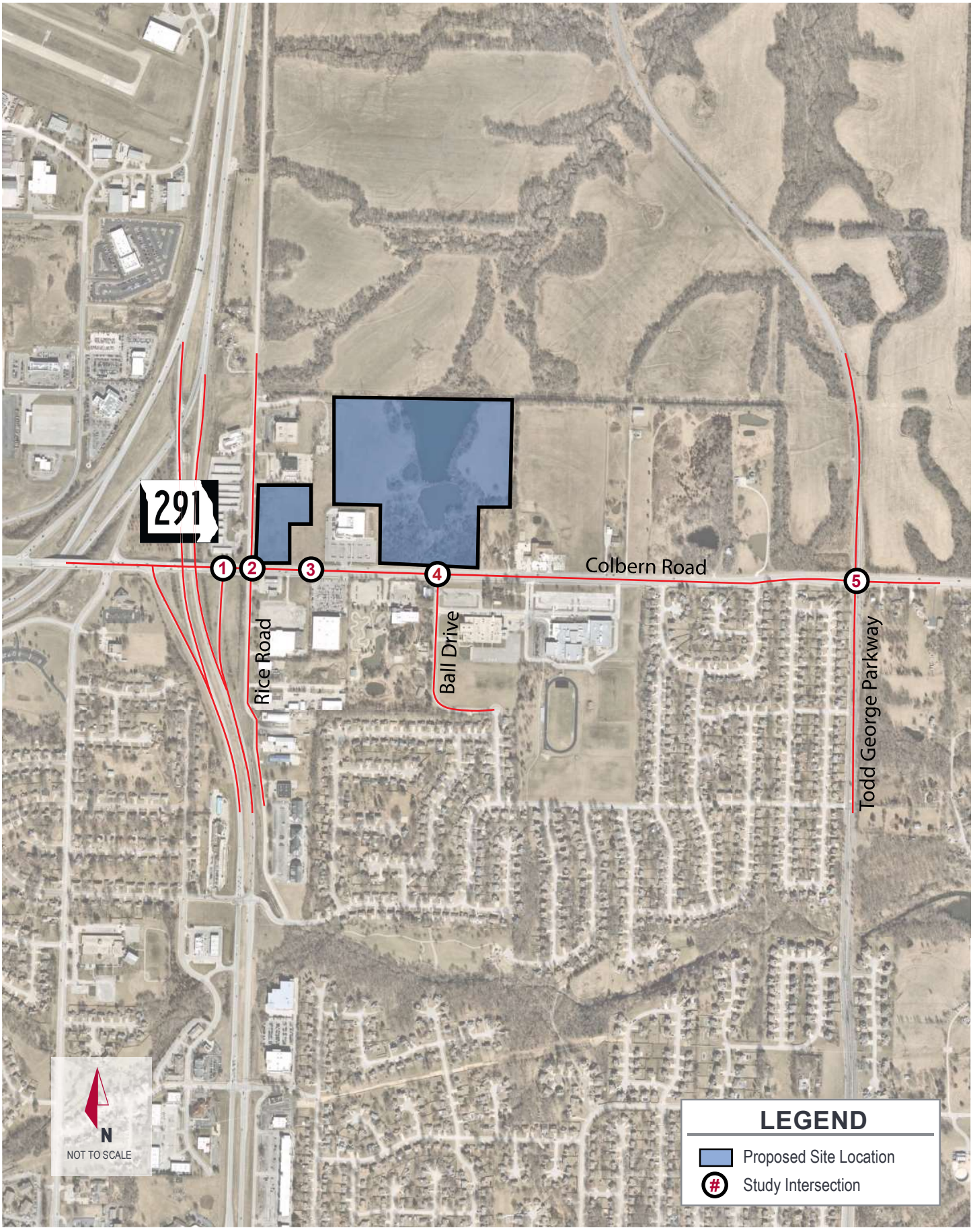
Appendix B: TURNING MOVEMENT COUNTS

Appendix C: SITE PLAN

Appendix D: ITE TRIP GENERATION MANUAL SHEETS

Appendix E: SYNCHRO REPORTS

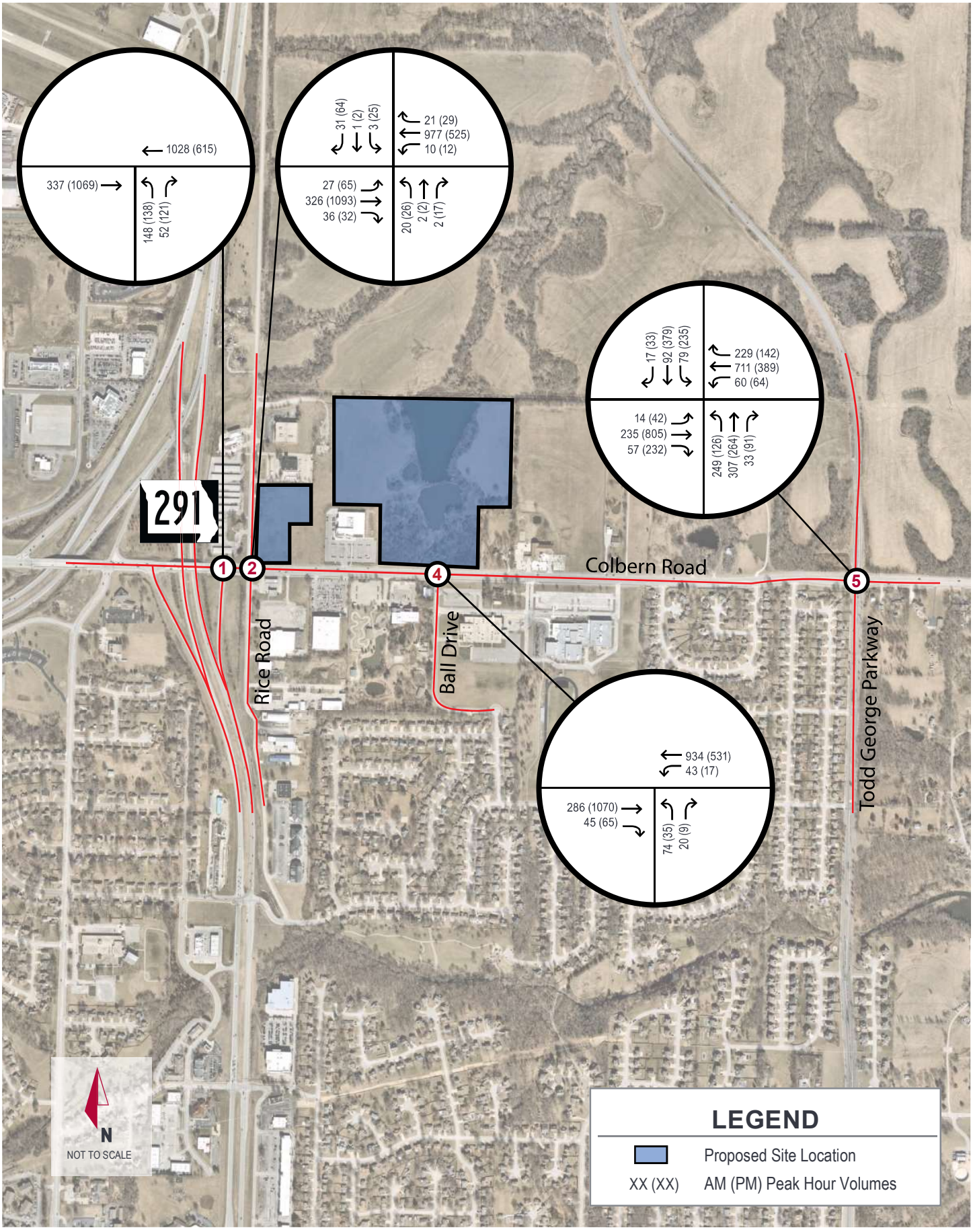
Appendix A: Exhibits



Kimley»Horn

EXHIBIT 1

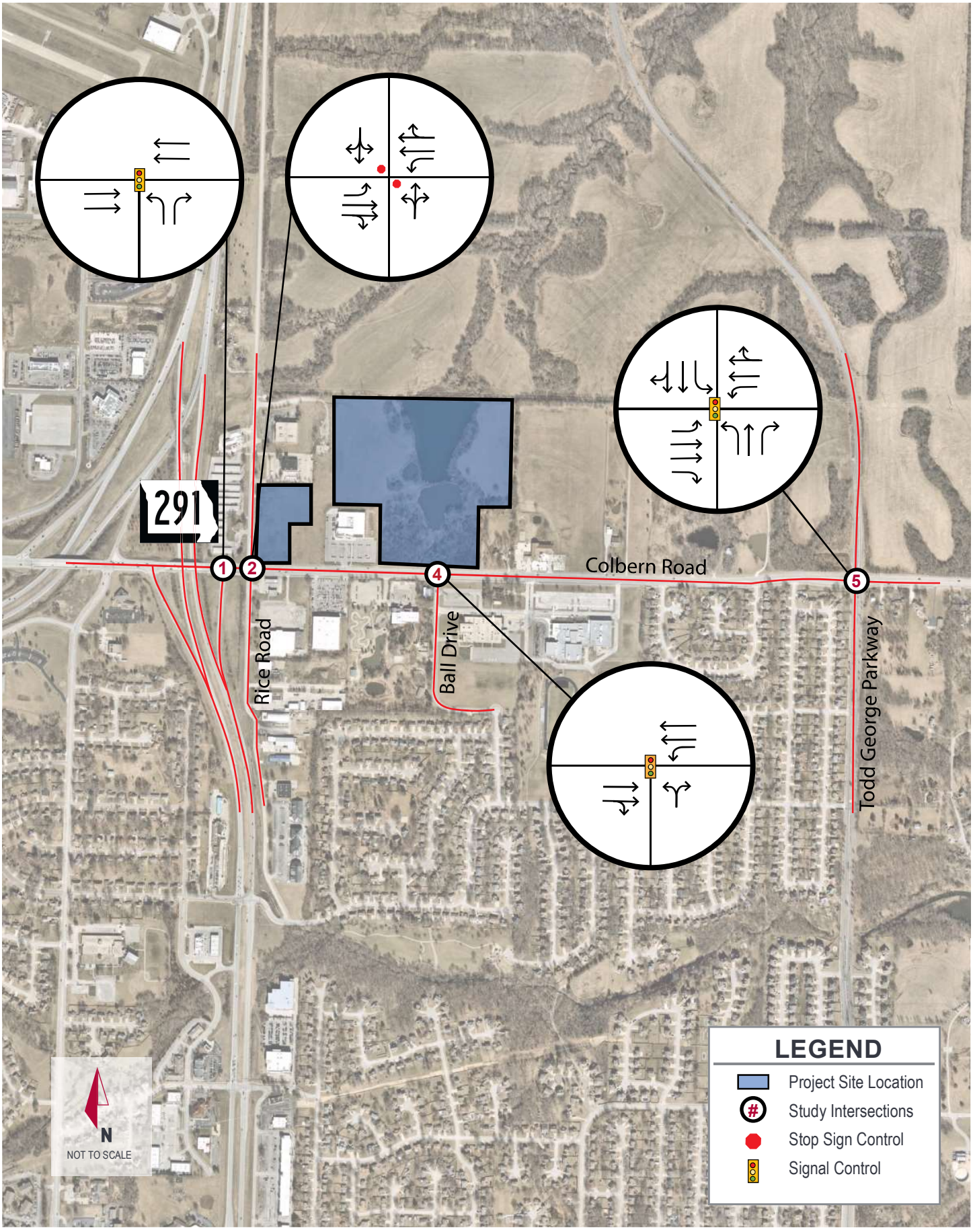
PROJECT SITE LOCATION AND STUDY AREA



Kimley»Horn

EXHIBIT 2

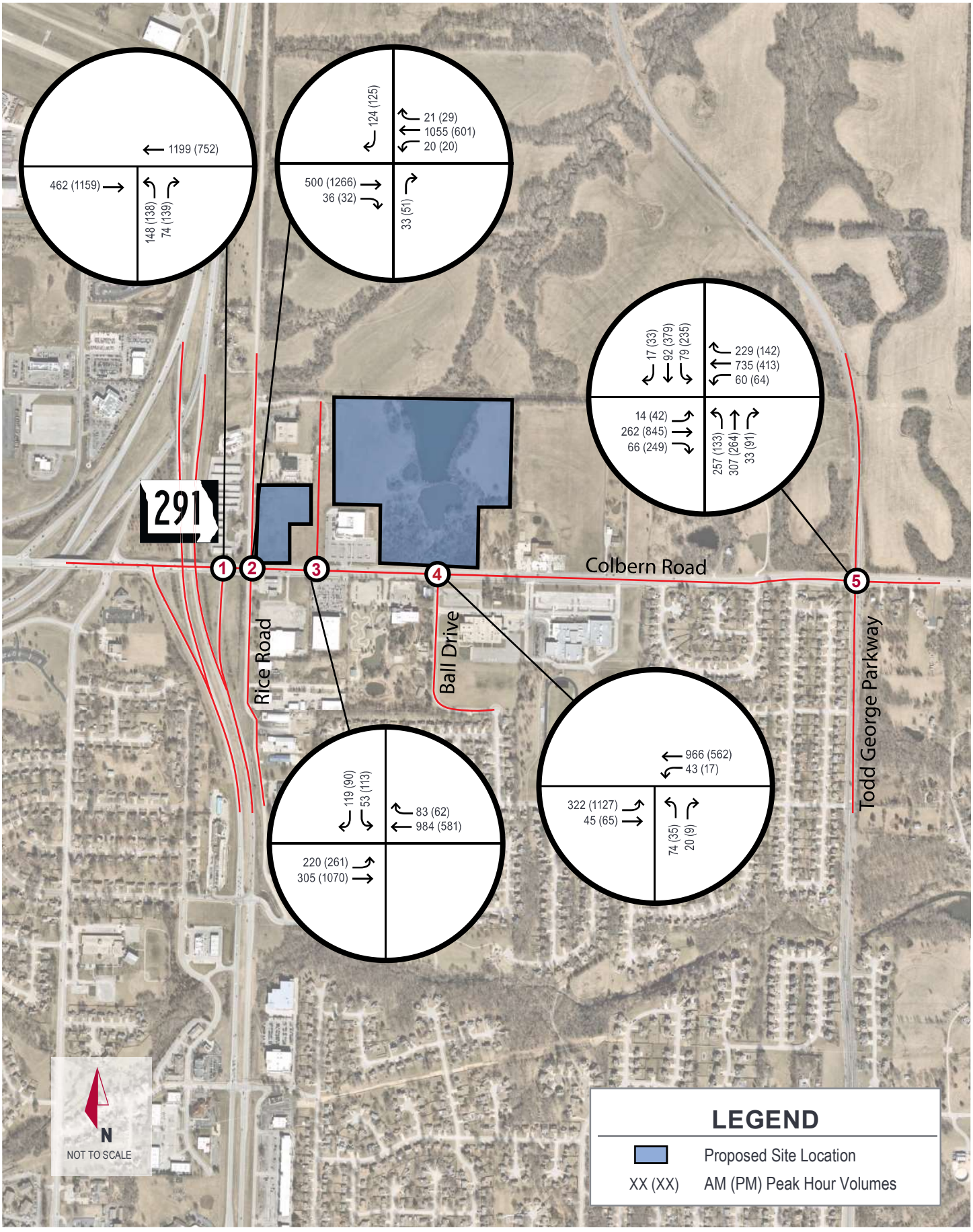
EXISTING YEAR (2022) PEAK HOUR TRAFFIC VOLUMES



Kimley»Horn

EXHIBIT 3

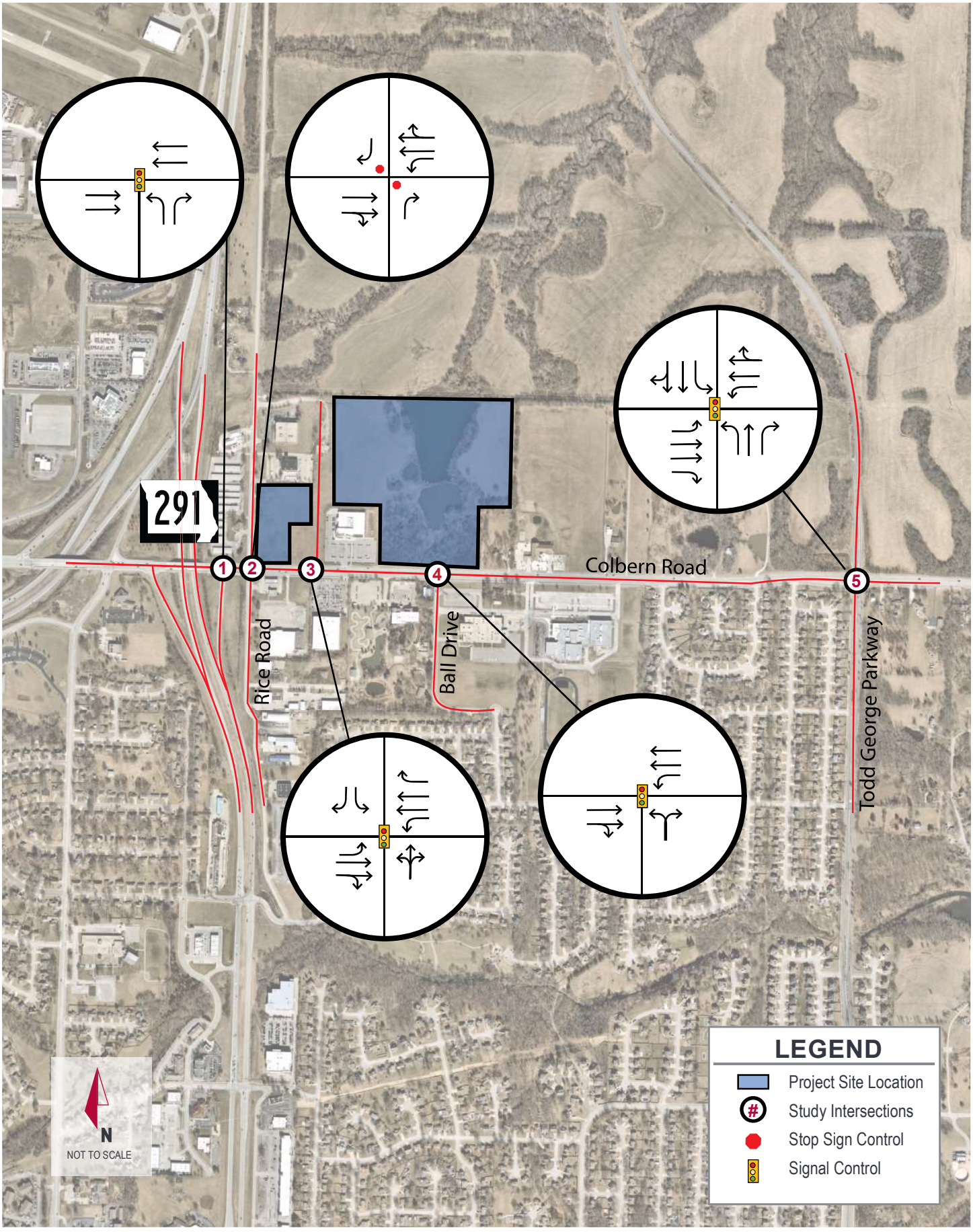
EXISTING GEOMETRY AND INTERSECTION CONTROL



Kimley»Horn

EXHIBIT 4

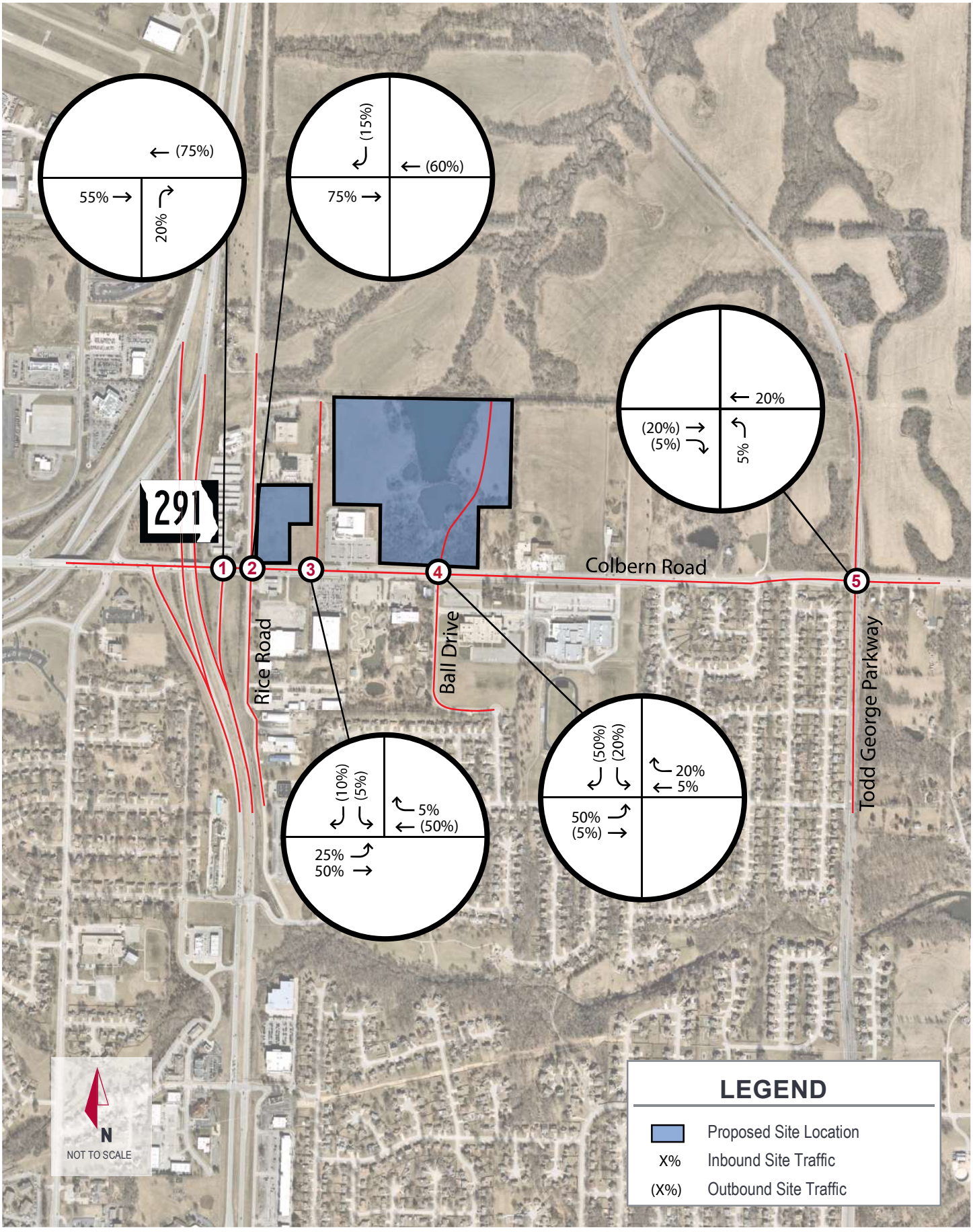
EXISTING PLUS APPROVED PEAK HOUR TRAFFIC VOLUMES



Kimley»Horn

EXHIBIT 5

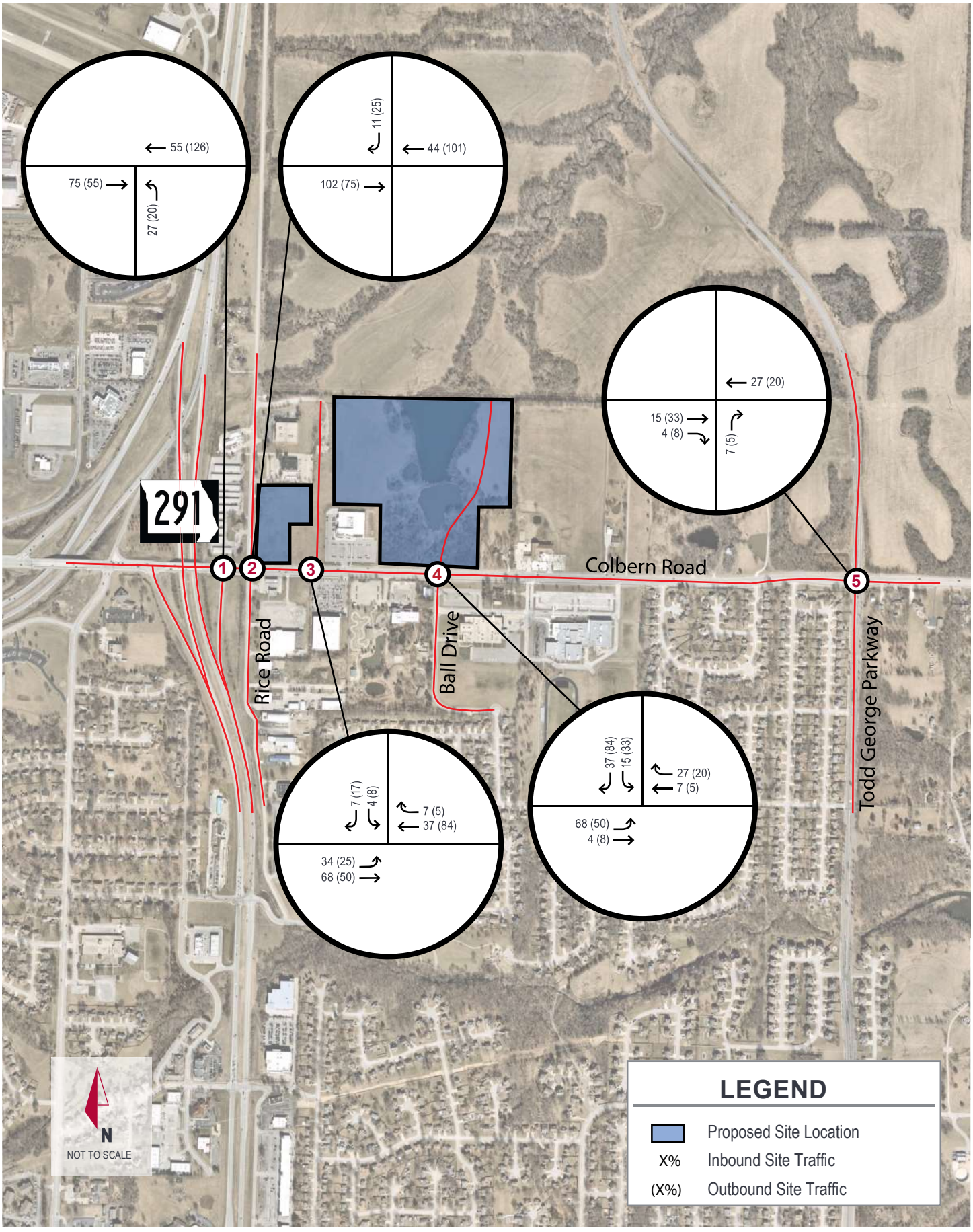
EXISTING PLUS APPROVED GEOMETRY AND INTERSECTION CONTROL



Kimley»Horn

EXHIBIT 6

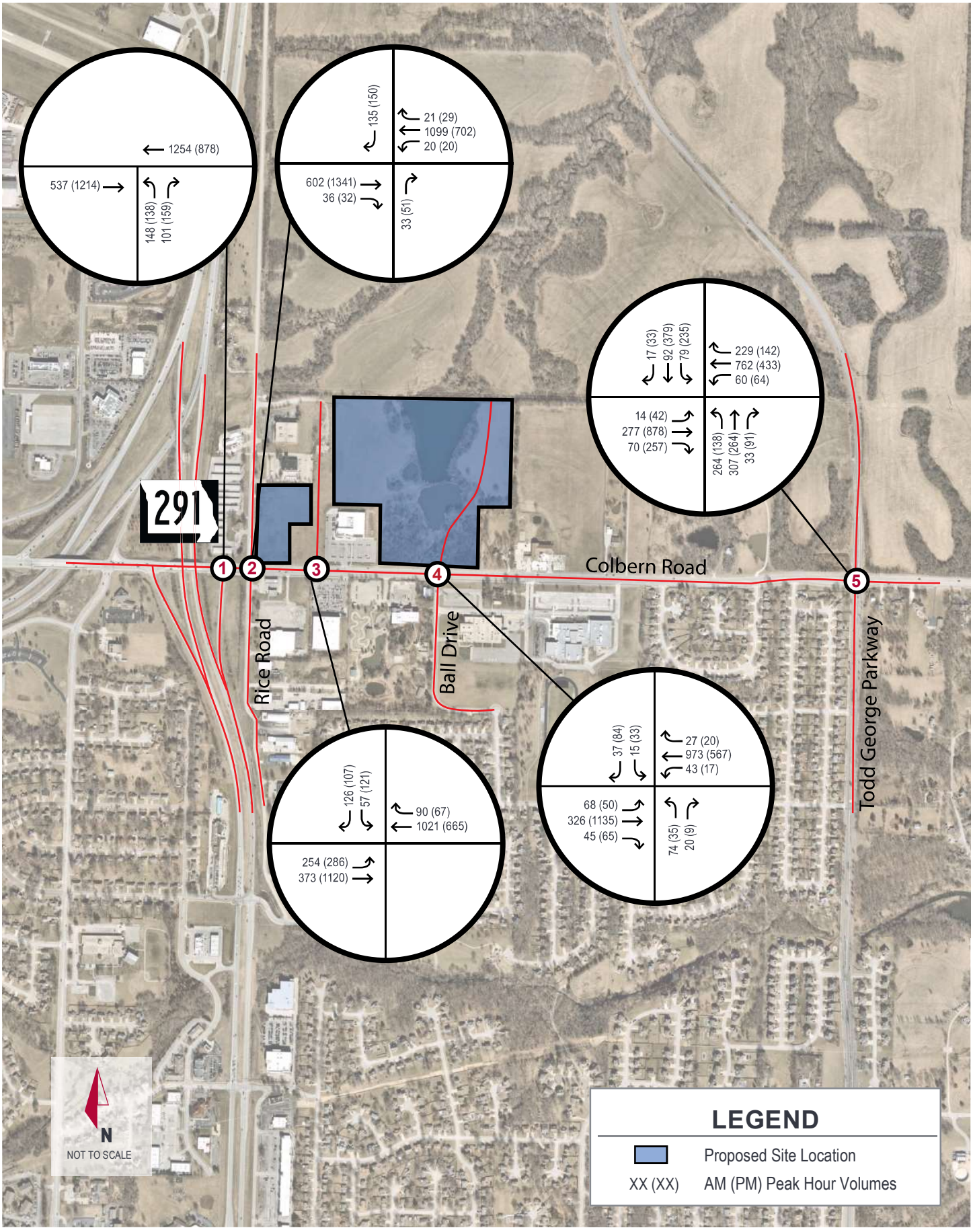
PROJECT TRIP DISTRIBUTION



Kimley»Horn

EXHIBIT 7

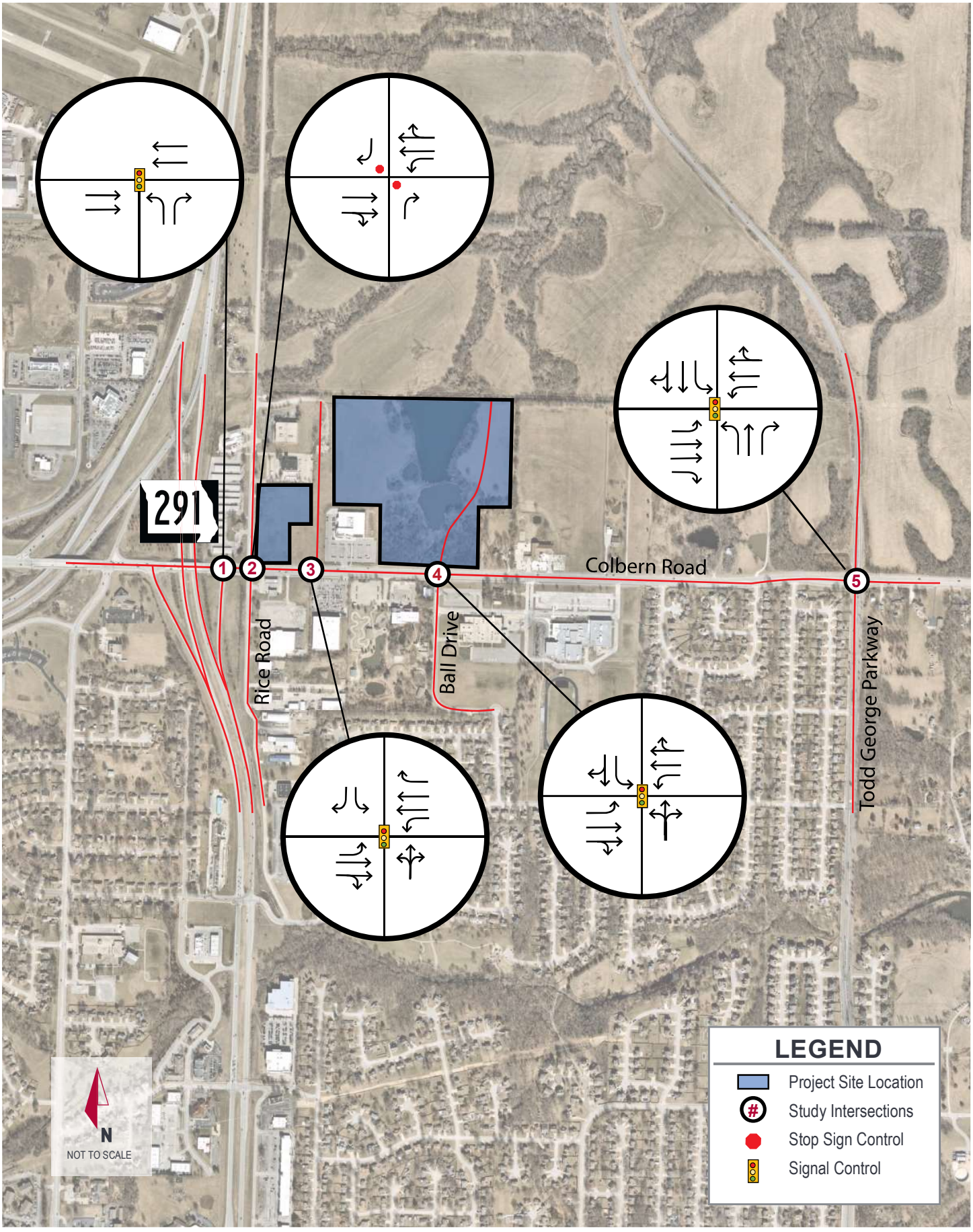
PROJECT TRAFFIC ASSIGNMENT



Kimley»Horn

EXHIBIT 8

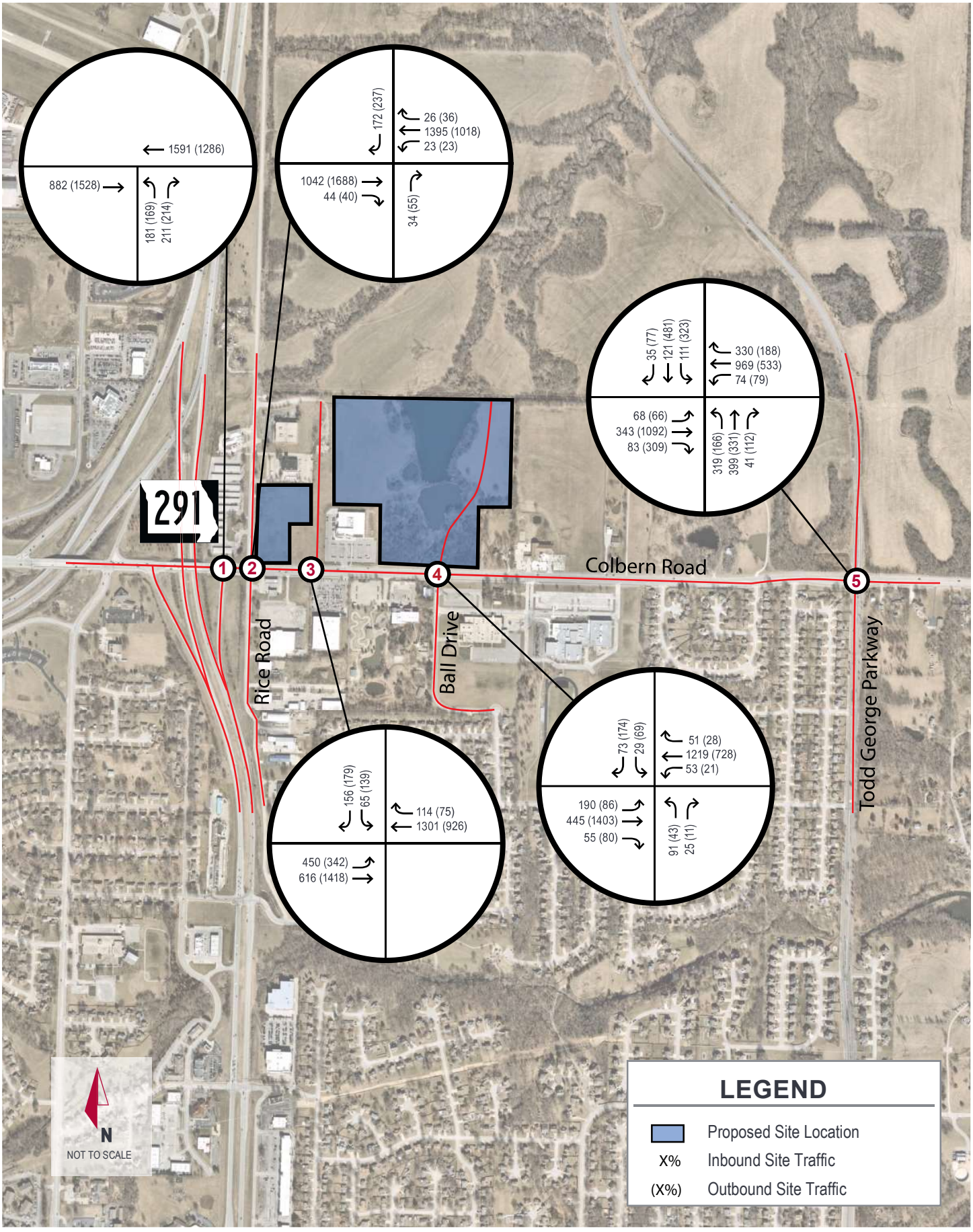
EXISTING PLUS APPROVED PLUS DEVELOPMENT PEAK HOUR TRAFFIC VOLUMES



Kimley»Horn

EXHIBIT 9

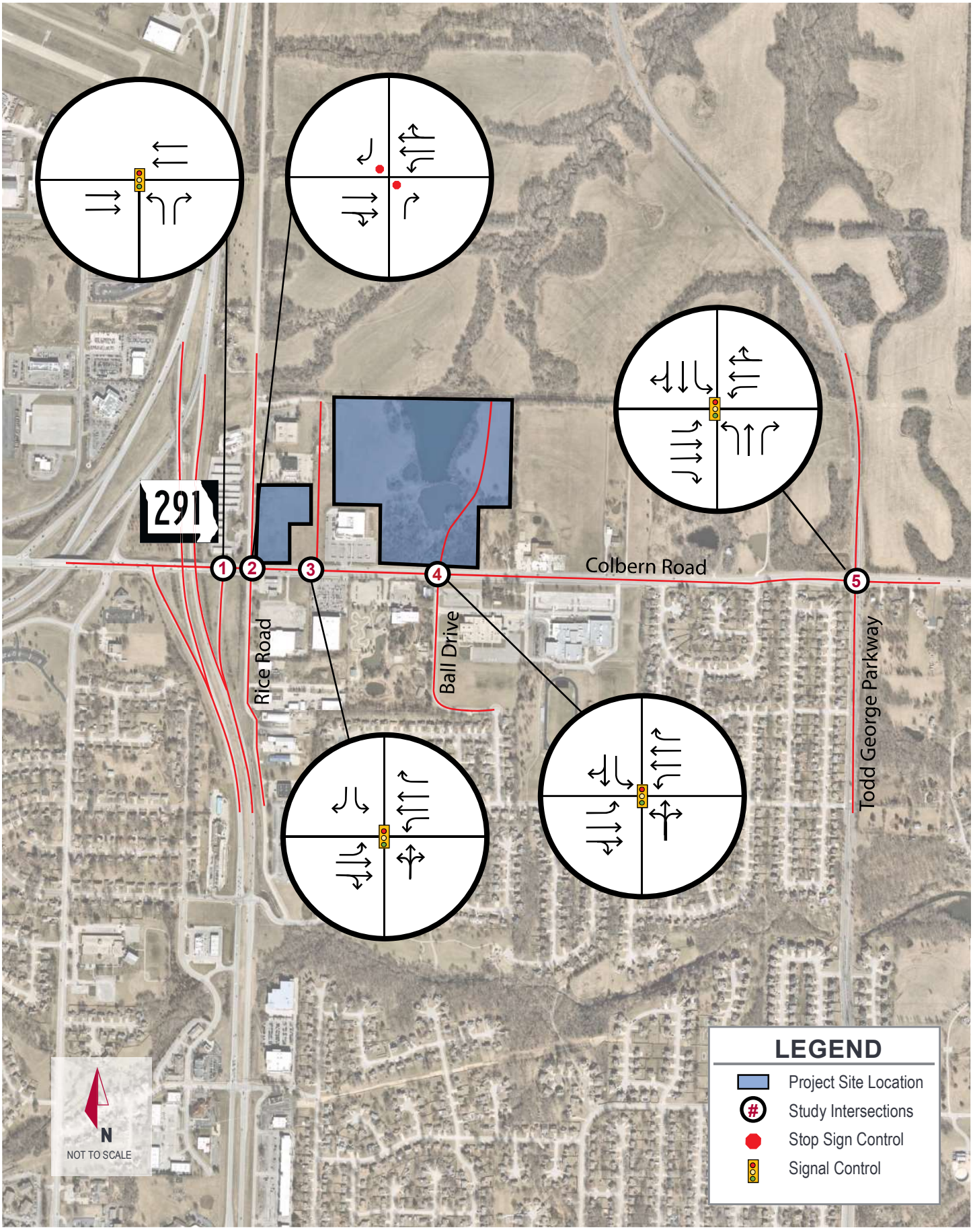
EXISTING PLUS APPROVED PLUS DEVELOPMENT GEOMETRY AND INTERSECTION CONTROL



Kimley»Horn

EXHIBIT 10

FUTURE YEAR (2042) PEAK HOUR TRAFFIC VOLUMES



Kimley»Horn

EXHIBIT 11

FUTURE GEOMETRY AND INTERSECTION CONTROL

Appendix B: Turning Movement Counts

Colbern Road & Ball Drive - Turning Movement Counts

Wed April 19, 2023

AM Peak (7:15AM -8:15AM) - Overall Peak Hour

All Classes

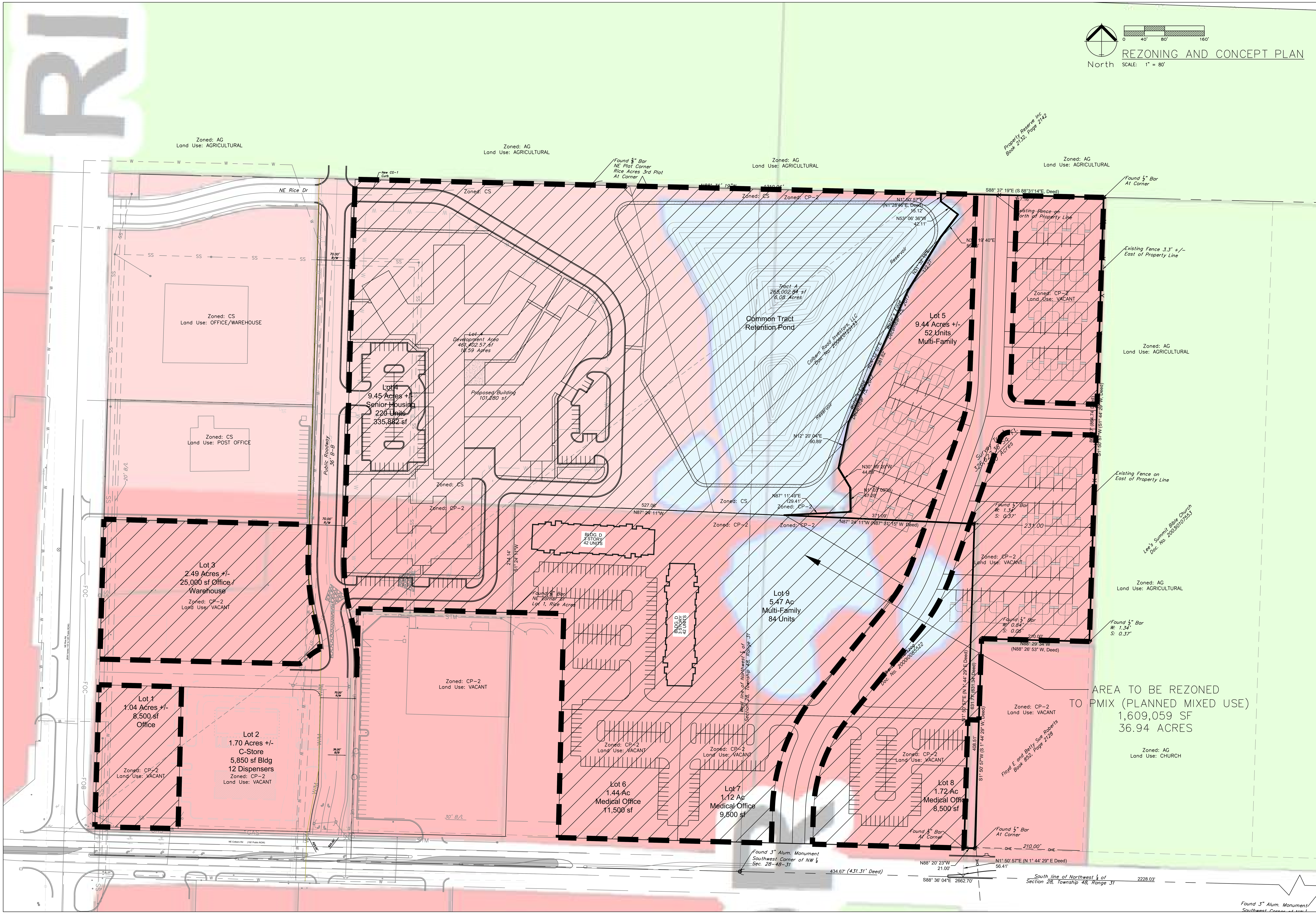
All Movements

Streets	Ball Drive										Colbern Road					Colbern Road					
Direction	Northbound					Southbound					Eastbound					Westbound					
Start Time	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Total All
7:15 AM	20	0	0	0	**20**	0	0	0	0	0	0	76	5	0	**81**	3	294	0	0	**297**	**398**
7:30 AM	18	0	0	0	**18**	0	0	0	0	0	0	81	6	0	**87**	4	254	0	0	**258**	**363**
7:45 AM	12	0	3	0	**15**	0	0	0	0	0	0	99	10	0	**109**	5	284	0	0	**289**	**413**
8:00 AM	24	0	17	0	**41**	0	0	0	0	0	0	115	24	0	**139**	31	248	0	0	**279**	**459**
Total	74	0	20	0	**94**	0	0	0	0	0	0	371	45	0	**416**	43	1080	0	0	**1123**	**2912**

Colbern Road & Ball Drive - Turning Movement Counts
Wed April 19, 2023
PM Peak (4:30PM -5:30PM) - Overall Peak Hour
All Classes
All Movements

Streets	Ball Drive										Colbern Road					Colbern Road					
Direction	Northbound					Southbound					Eastbound					Westbound					
Start Time	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Total All
4:30 PM	14	0	3	0	17	0	0	0	0	0	0	253	10	0	263	2	150	0	0	152	432
4:45 PM	8	0	2	0	10	0	0	0	0	0	0	272	10	0	282	1	128	0	0	129	421
5:00 PM	6	0	3	0	9	0	0	0	0	0	0	335	21	0	356	6	168	0	0	174	539
5:15 PM	7	0	1	0	8	0	0	0	0	0	0	321	24	0	345	8	151	0	0	159	512
Total	35	0	9	0	44	0	0	0	0	0	0	1181	65	0	1246	17	597	0	0	614	1904

Appendix C: Site Plan



ENGINEERING SOLUTIONS
ENGINEERING & SURVEYING
50 SE 30TH STREET
LEE'S SUMMIT, MO 64082
P:(816) 623-9888 F:(816)623-9849

Professional Registration
Missouri
Engineering 2005002186-D
Surveying 2005008319-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

Colbern Road Investments
Lee's Summit, Jackson County, Missouri

Project: COLBERN ROAD INVESTMENTS LSMO
Issue Date: March 7, 2023

Rezoning and Concept Plan
Construction Plans for:
Colbern Road Overall Site
Lee's Summit, Jackson County, Missouri

Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-14335

REVISIONS

C.101

Appendix D: ITE Trip Generation Manual Data

Land Use: 150
Warehousing

Description

A warehouse is primarily devoted to the storage of materials, but it may also include office and maintenance areas. High-cube transload and short-term storage warehouse (Land Use 154), high-cube fulfillment center warehouse (Land Use 155), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, and Texas.

Source Numbers

184, 331, 406, 411, 443, 579, 583, 596, 598, 611, 619, 642, 752, 869, 875, 876, 914, 940, 1050

Warehousing
(150)

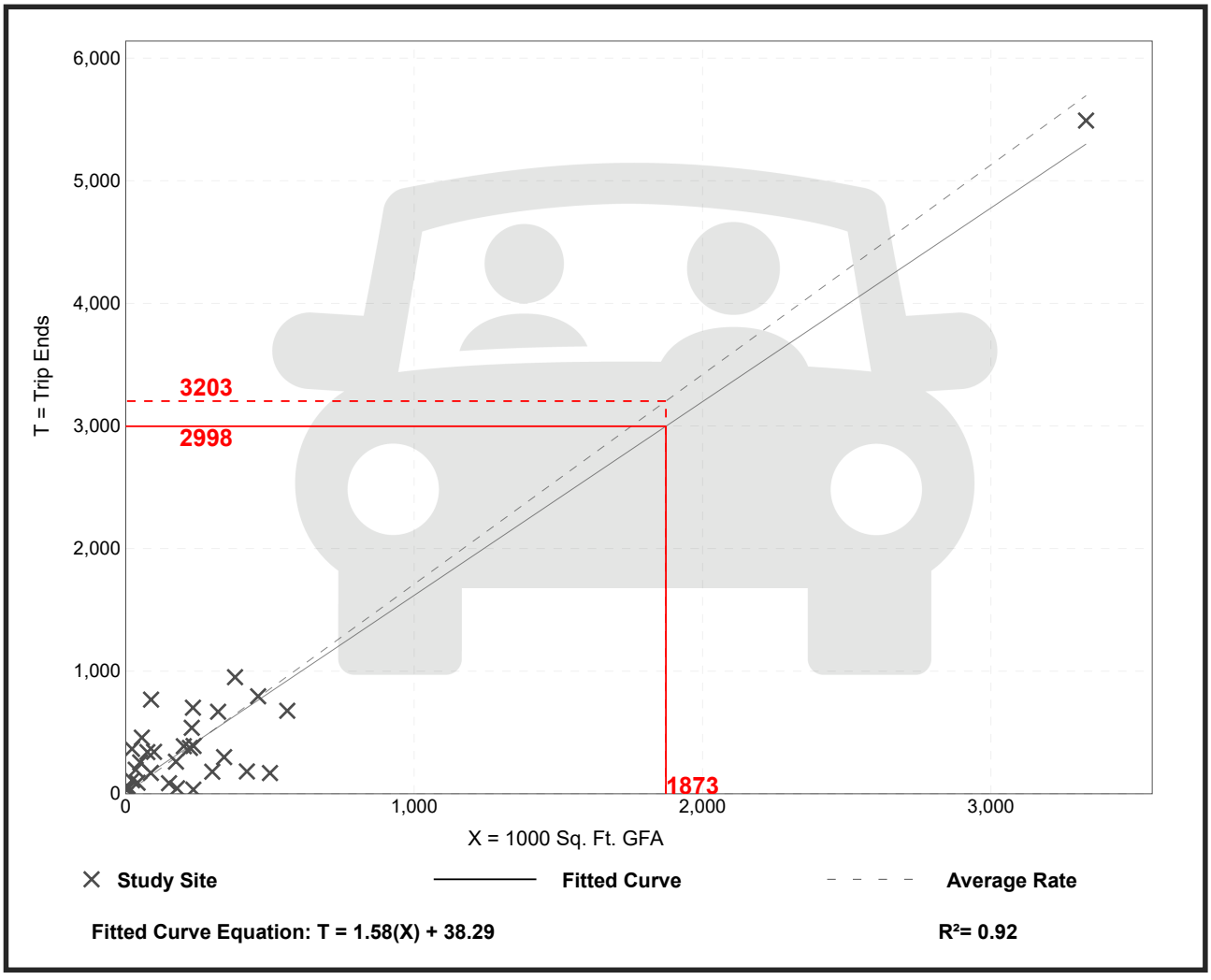
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 292
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.71	0.15 - 16.93	1.48

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

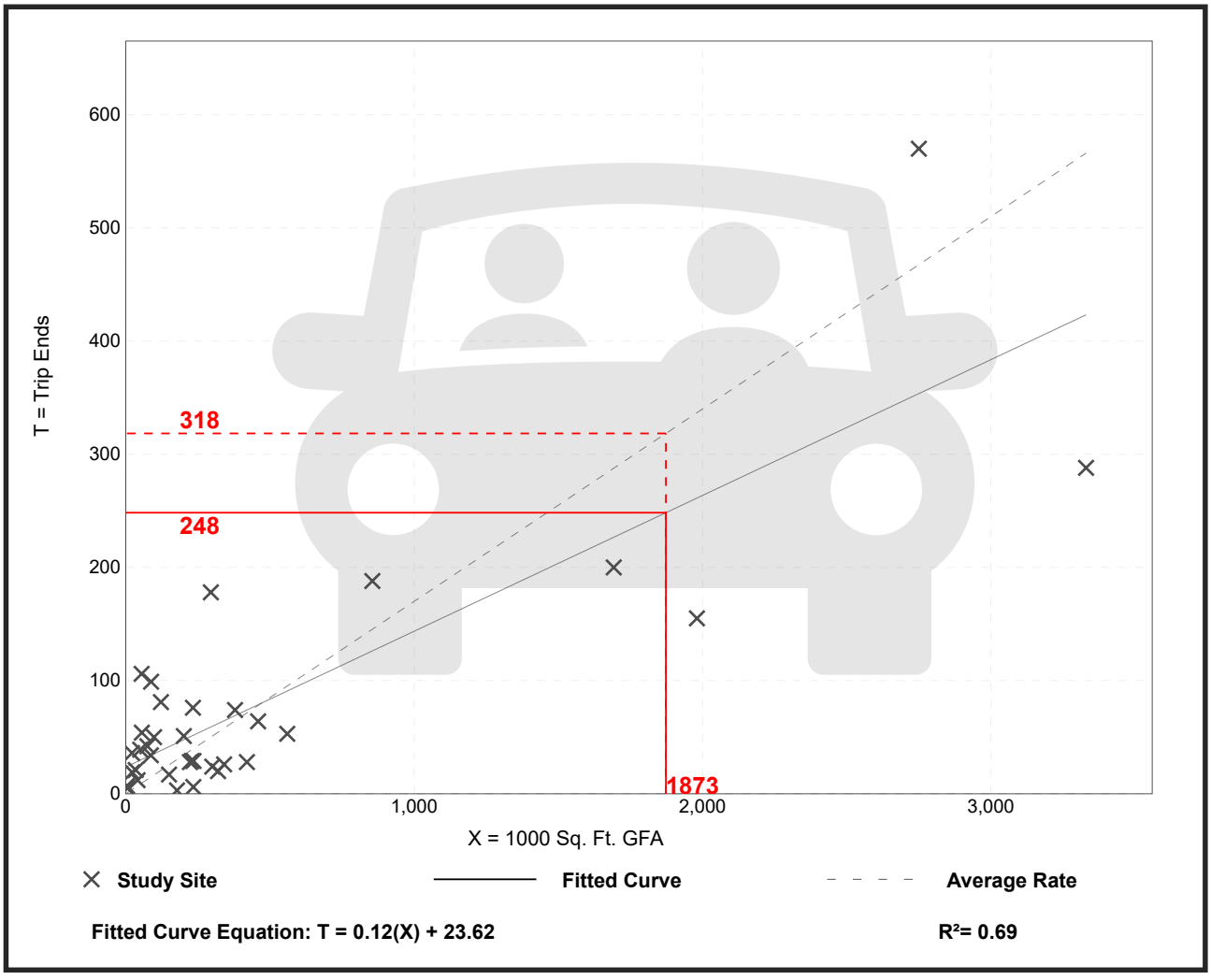
Warehousing
(150)

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: 36
Avg. 1000 Sq. Ft. GFA: 448
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.19

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

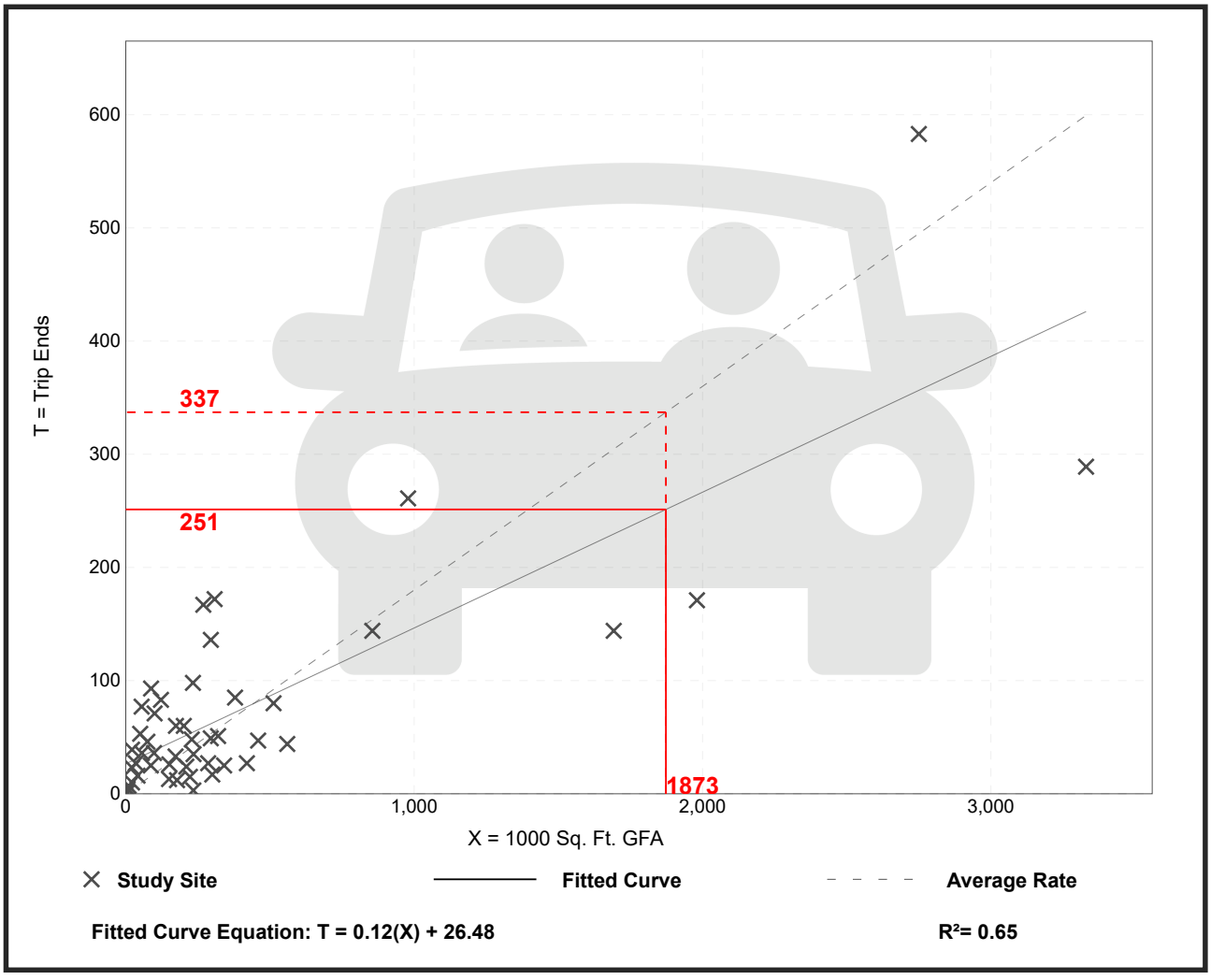
Warehousing
(150)

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: 49
Avg. 1000 Sq. Ft. GFA: 400
Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.18	0.01 - 1.80	0.18

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Land Use: 220
Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.

- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.

- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), affordable housing (Land Use 223), and off-campus student apartment (low-rise) (Land Use 225) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in British Columbia (CAN), California, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, and Washington.

Source Numbers

188, 204, 237, 300, 305, 306, 320, 321, 357, 390, 412, 525, 530, 579, 583, 638, 864, 866, 896, 901, 903, 904, 936, 939, 944, 946, 947, 948, 963, 964, 966, 967, 1012, 1013, 1014, 1036, 1047, 1056, 1071, 1076

Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

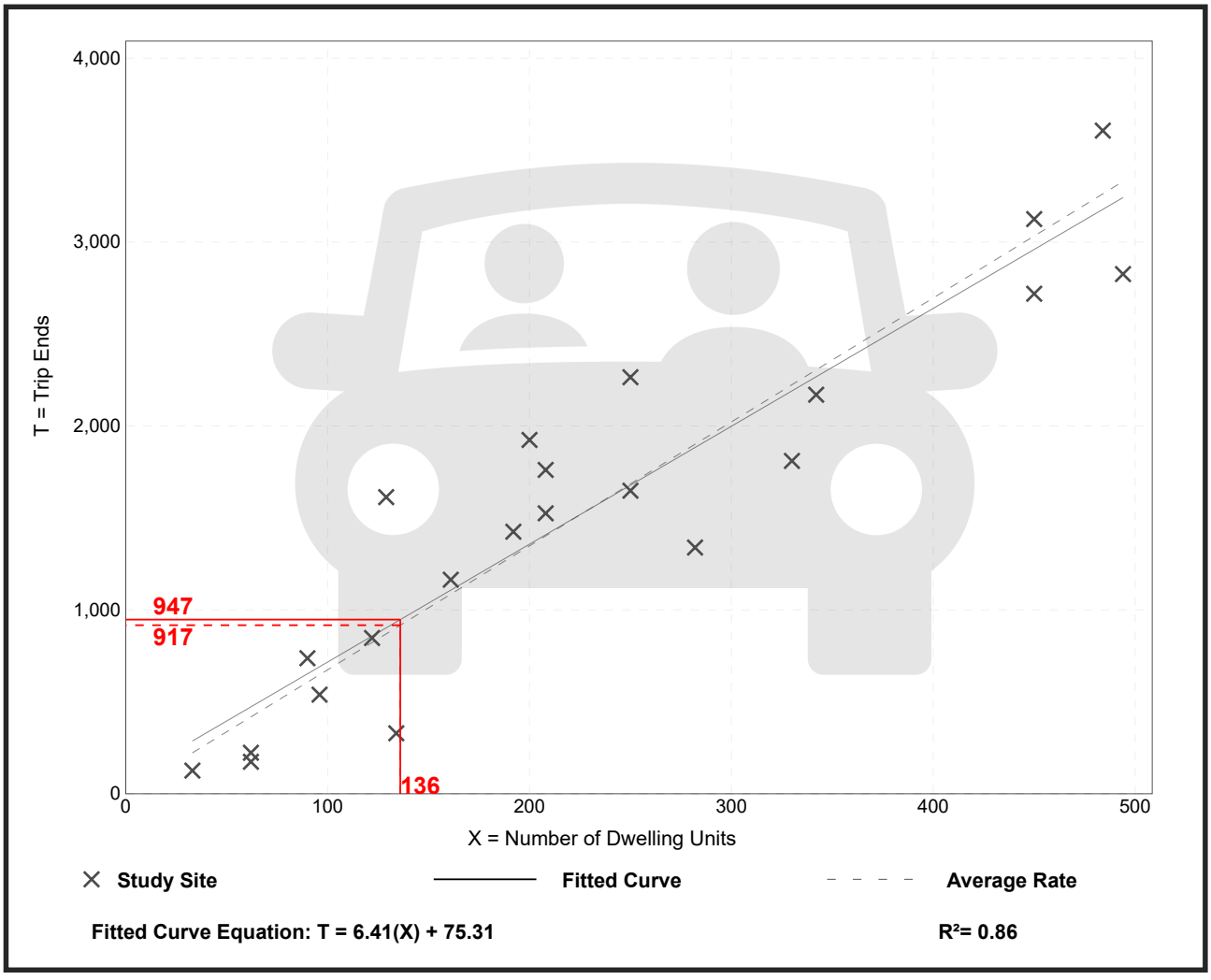
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 229
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

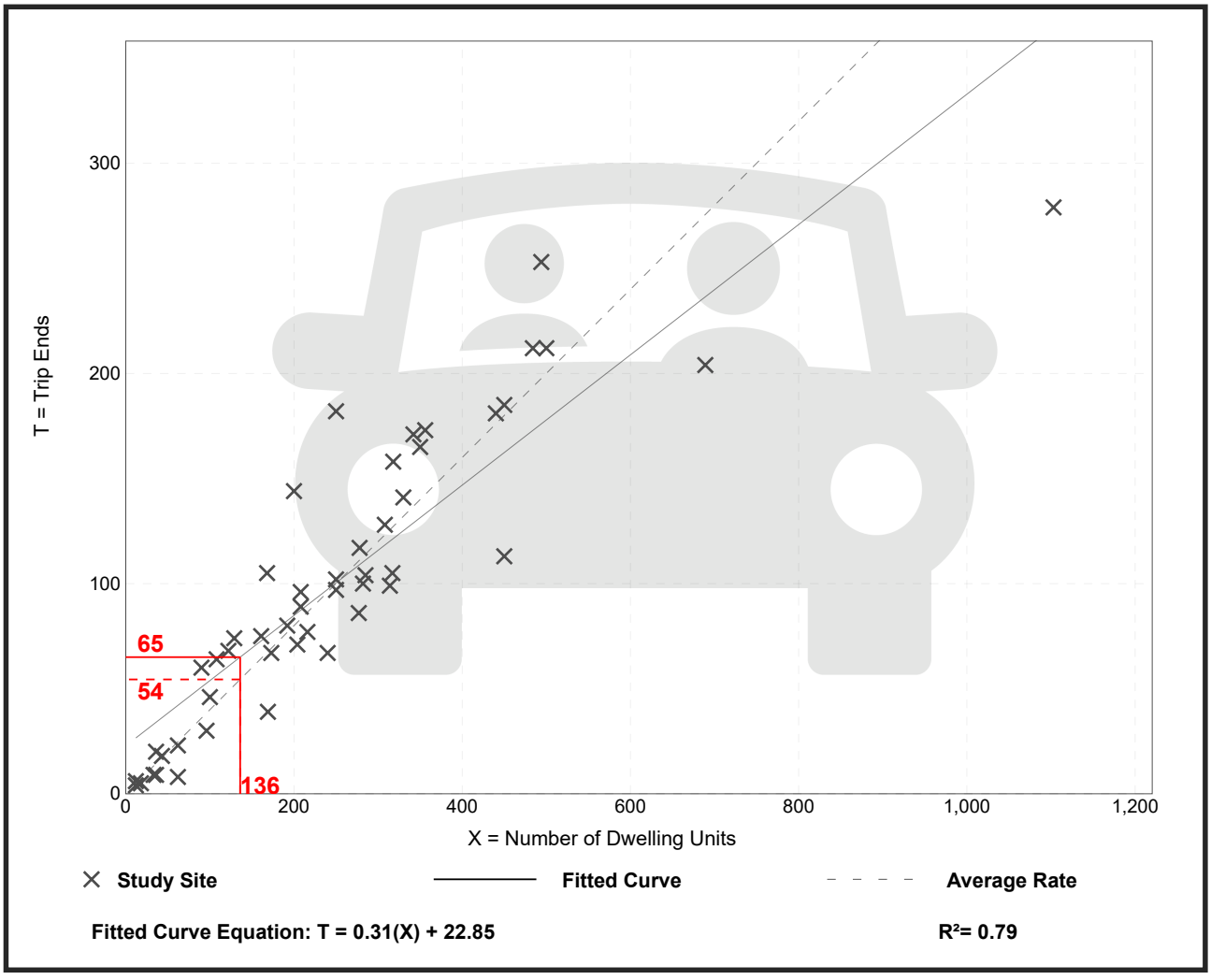
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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: 49
Avg. Num. of Dwelling Units: 249
Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

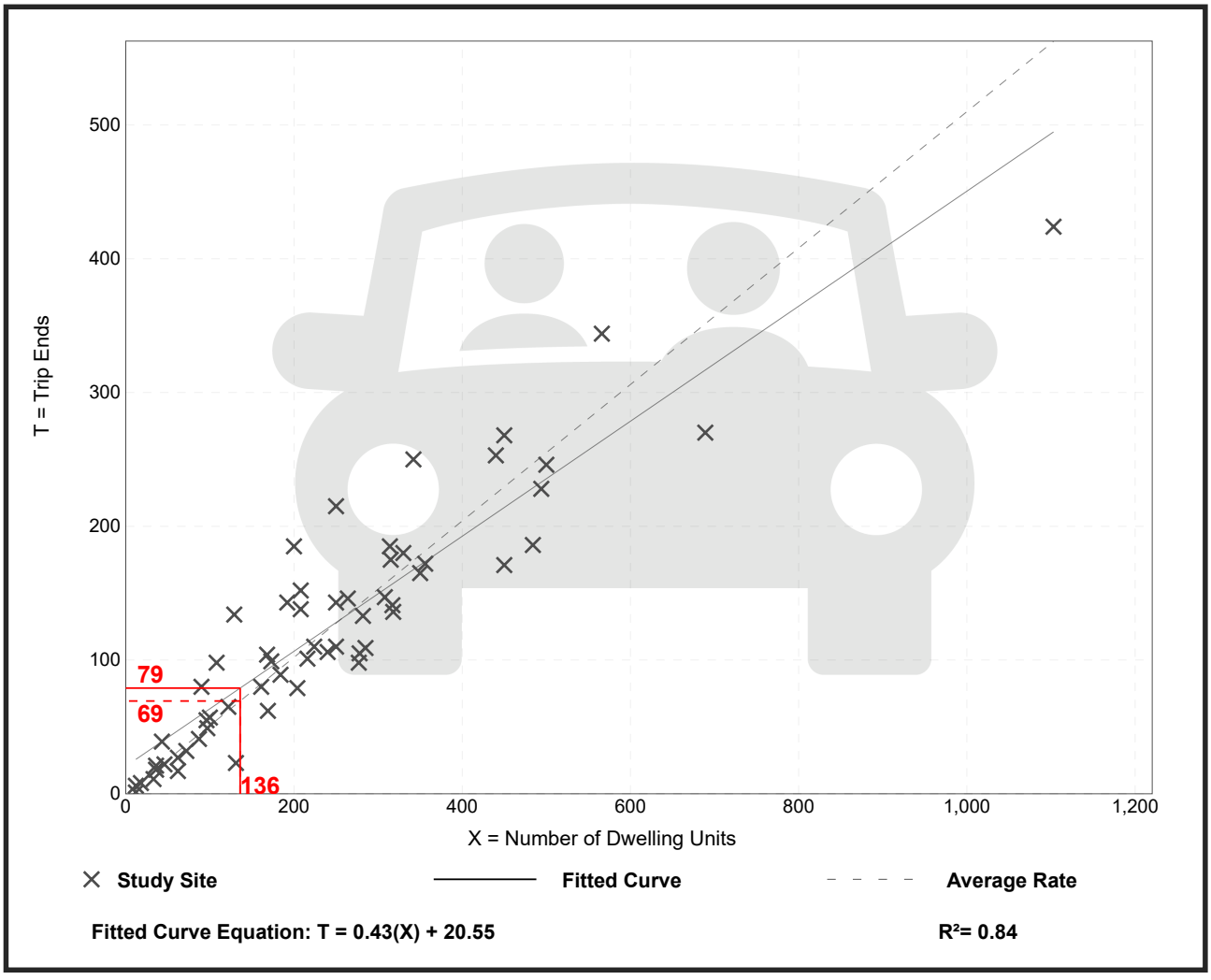
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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:	59
Avg. Num. of Dwelling Units:	241
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Land Use: 710
General Office Building

Description

A general office building is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building houses multiple tenants that can include, as examples, professional services, insurance companies, investment brokers, a banking institution, a restaurant, or other service retailers. A general office building with a gross floor area of 10,000 square feet or less is classified as a small office building (Land Use 712). Corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), medical-dental office building (Land Use 720), office park (Land Use 750), research and development center (Land Use 760), and business park (Land Use 770) are additional related uses.

Additional Data

If two or more general office buildings are in close physical proximity (within a close walk) and function as a unit (perhaps with a shared parking facility and common or complementary tenants), the total gross floor area or employment of the paired office buildings can be used for calculating the site trip generation. If the individual buildings are isolated or not functionally related to one another, trip generation should be calculated for each building separately.

For study sites with reported gross floor area and employees, an average employee density of 3.3 employees per 1,000 square feet GFA (or roughly 300 square feet per employee) has been consistent through the 1980s, 1990s, and 2000s. No sites counted in the 2010s reported both GFA and employees.

The average building occupancy varies considerably within the studies for which occupancy data were provided. The reported occupied gross floor area was 88 percent for general urban/suburban sites and 96 percent for the center city core and dense multi-use urban sites.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

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

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

The average numbers of person trips per vehicle trip at the 18 dense multi-use urban sites at which both person trip and vehicle trip data were collected are as follows:

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

The average numbers of person trips per vehicle trip at the 23 general urban/suburban sites at which both person trip and vehicle trip data were collected are as follows:

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

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, Colorado, Connecticut, Georgia, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, Ontario (CAN)Pennsylvania, Texas, Utah, Virginia, and Washington.

Source Numbers

161, 175, 183, 184, 185, 207, 212, 217, 247, 253, 257, 260, 262, 273, 279, 297, 298, 300, 301, 302, 303, 304, 321, 322, 323, 324, 327, 404, 407, 408, 419, 423, 562, 734, 850, 859, 862, 867, 869, 883, 884, 890, 891, 904, 940, 944, 946, 964, 965, 972, 1009, 1030, 1058, 1061

General Office Building
(710)

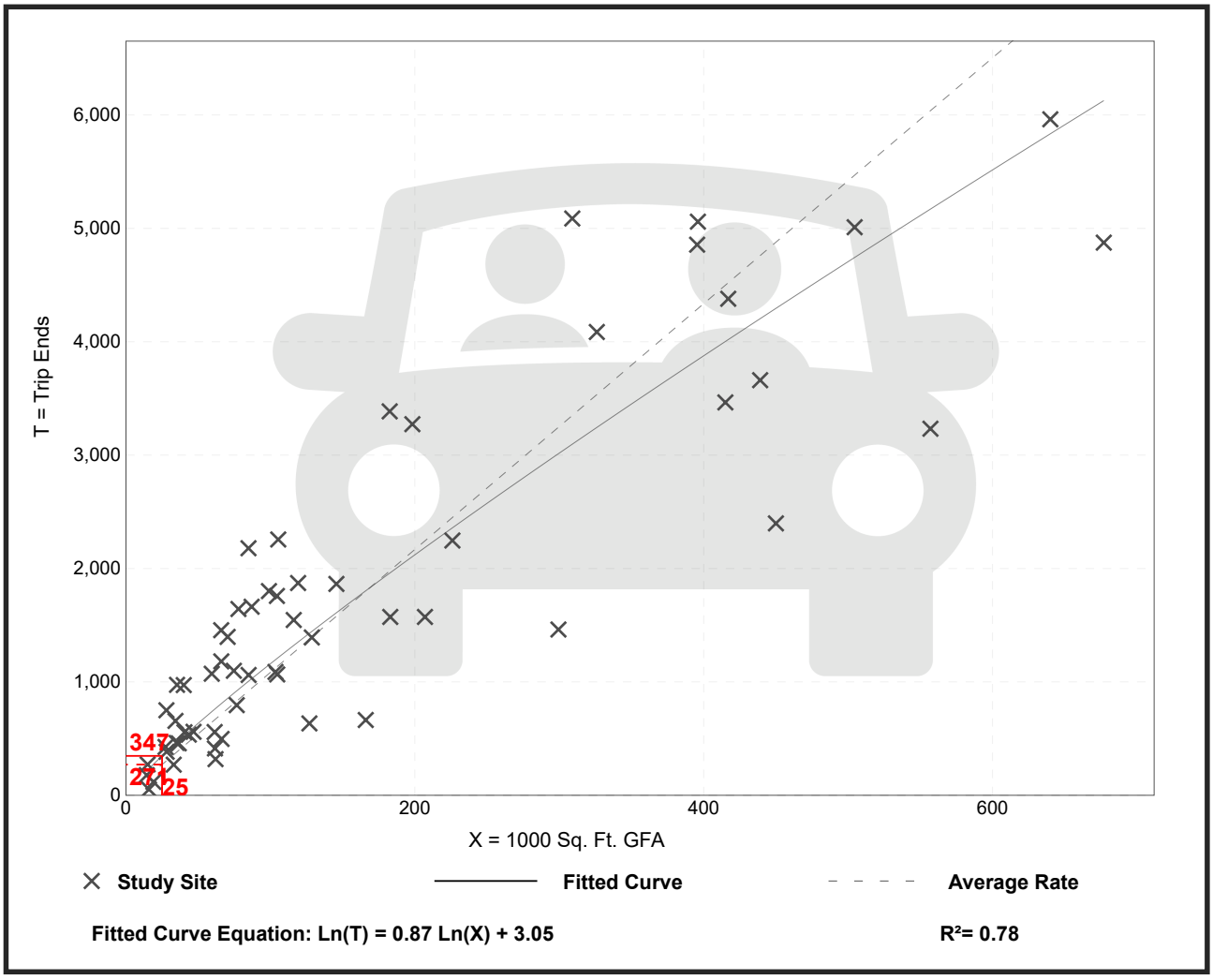
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 59
Avg. 1000 Sq. Ft. GFA: 163
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
10.84	3.27 - 27.56	4.76

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

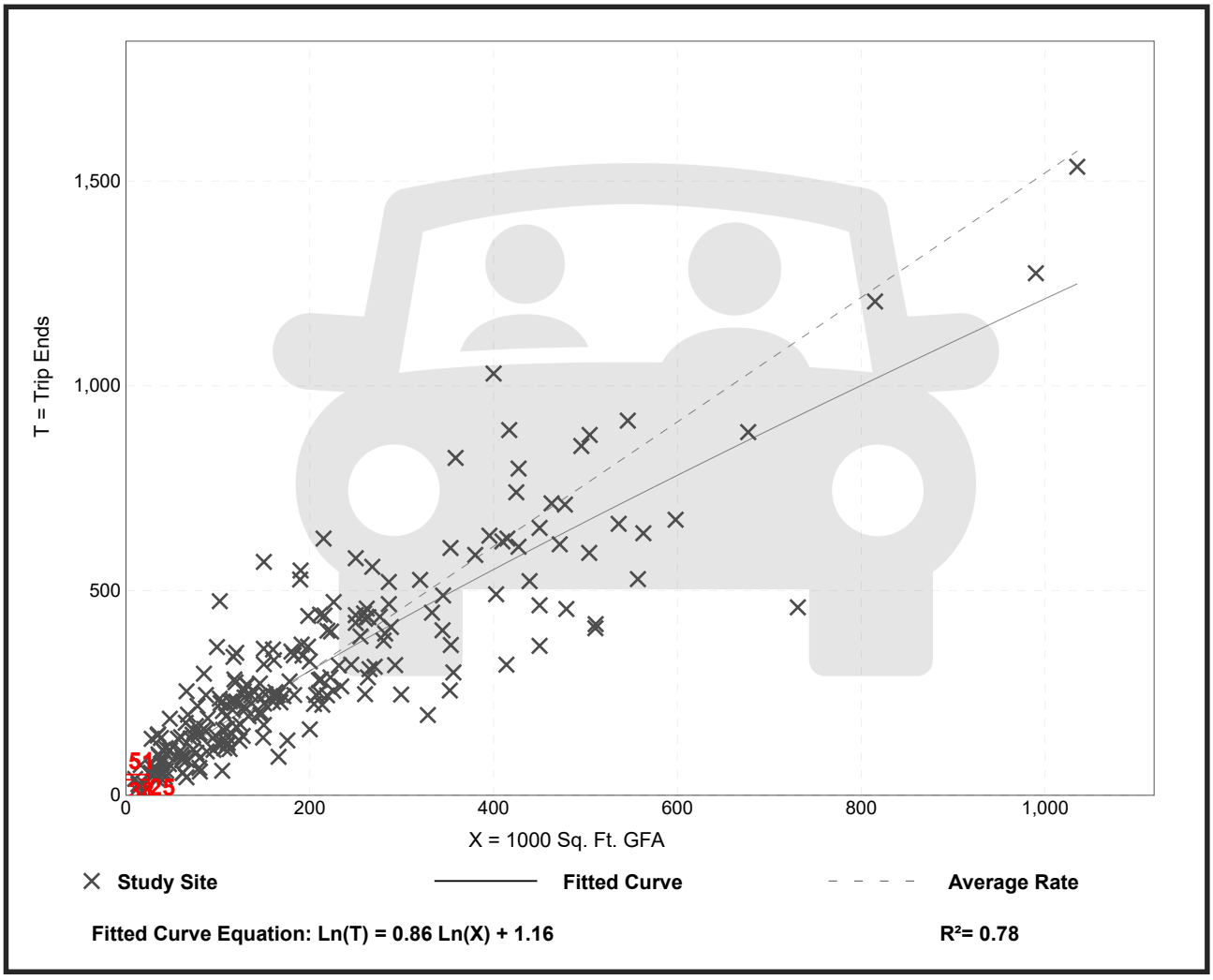
General Office Building
(710)

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: 221
Avg. 1000 Sq. Ft. GFA: 201
Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.52	0.32 - 4.93	0.58

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

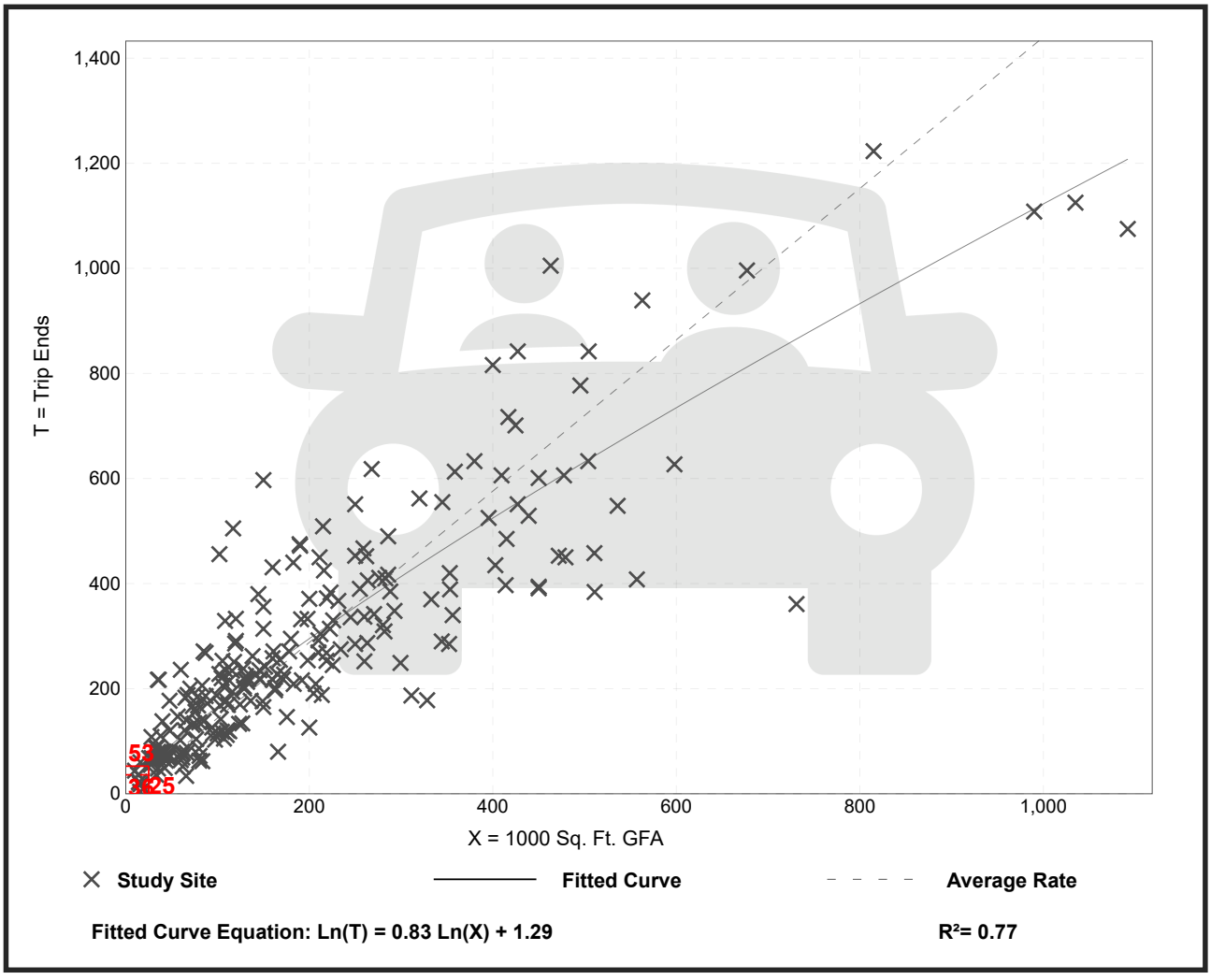
General Office Building
(710)

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: 232
Avg. 1000 Sq. Ft. GFA: 199
Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.44	0.26 - 6.20	0.60

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Land Use: 712
Small Office Building

Description

A small office building is the same as a general office building (Land Use 710) but with less than or equal to 10,000 square feet of gross floor area. The building typically houses a single tenant. It is a location where affairs of a business, commercial or industrial organization, or professional person or firm are conducted. General office building (Land Use 710) is a related use.

Additional Data

Attorney office, mortgage company, financial advisor, insurance agency, home health care provider, and real estate company are examples of tenants included in the small office building database. The diversity of employer types results in a wide range in employee density in the database. Densities range from a high of 1,300 to a low of 240 square feet per employee with an overall average of nearly 600 square feet per employee (a value much larger than the average observed in a general office building study sites).

In addition to the significant difference in employee density, small office buildings tend to be dominated by a single tenant (or very few) that are more service-oriented than a typical general office building. The result is more frequent and regular visitors and higher trip generation rates.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s and the 2010s in Alberta (CAN), California, Texas, and Wisconsin.

Source Numbers

418, 890, 891, 959, 976

Small Office Building
(712)

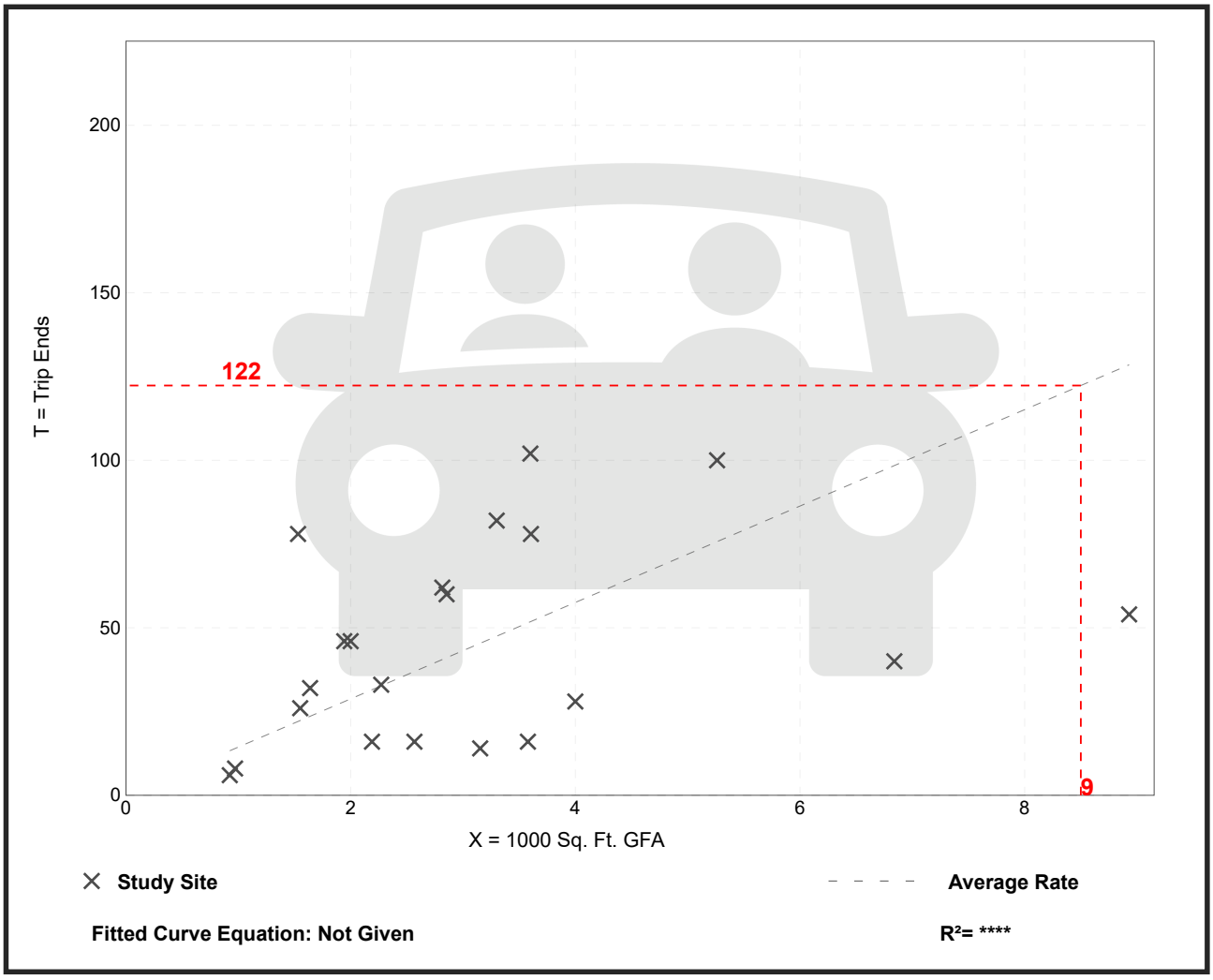
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
14.39	4.44 - 50.91	10.16

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

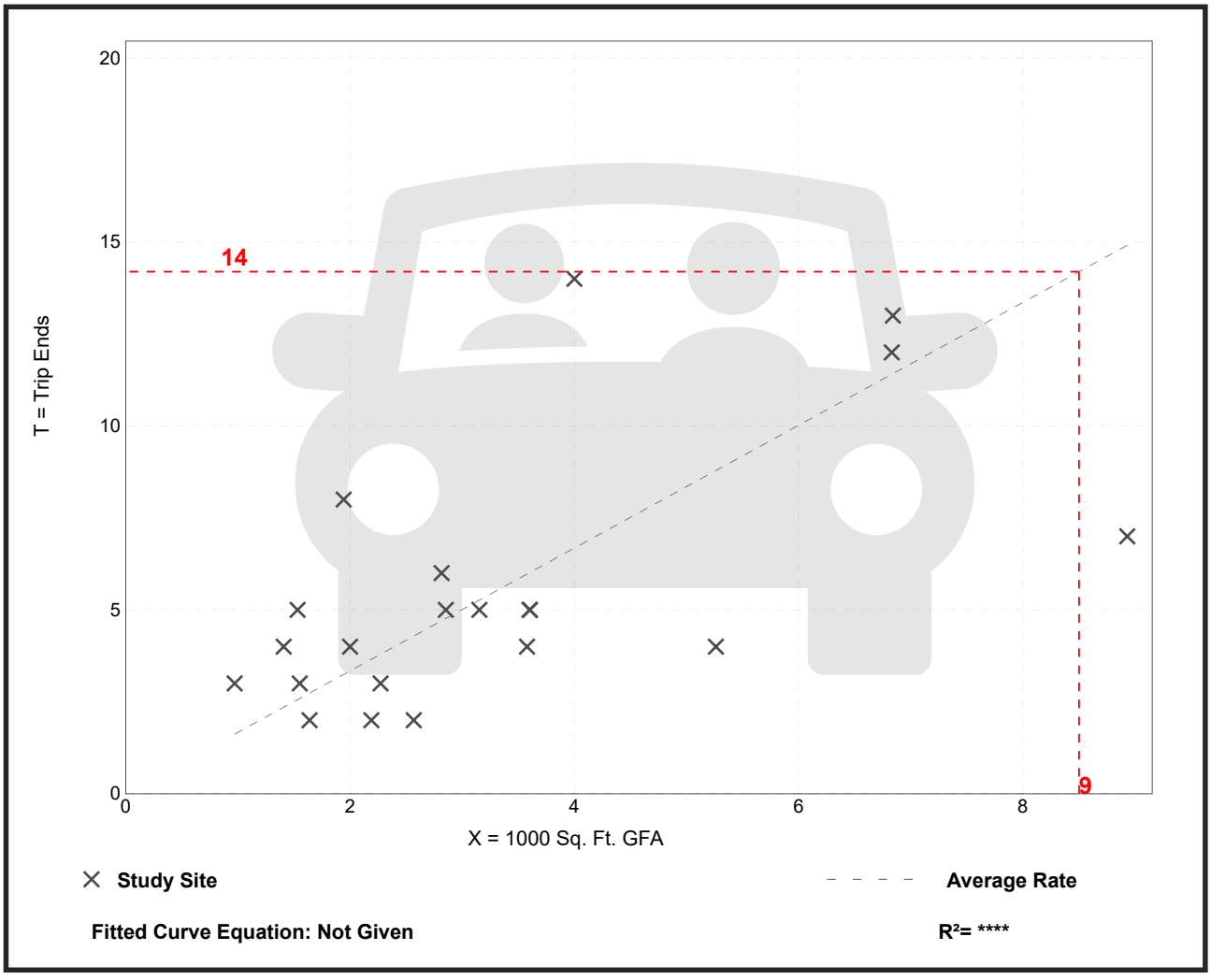
Small Office Building
(712)

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: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 82% entering, 18% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.67	0.76 - 4.12	0.88

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

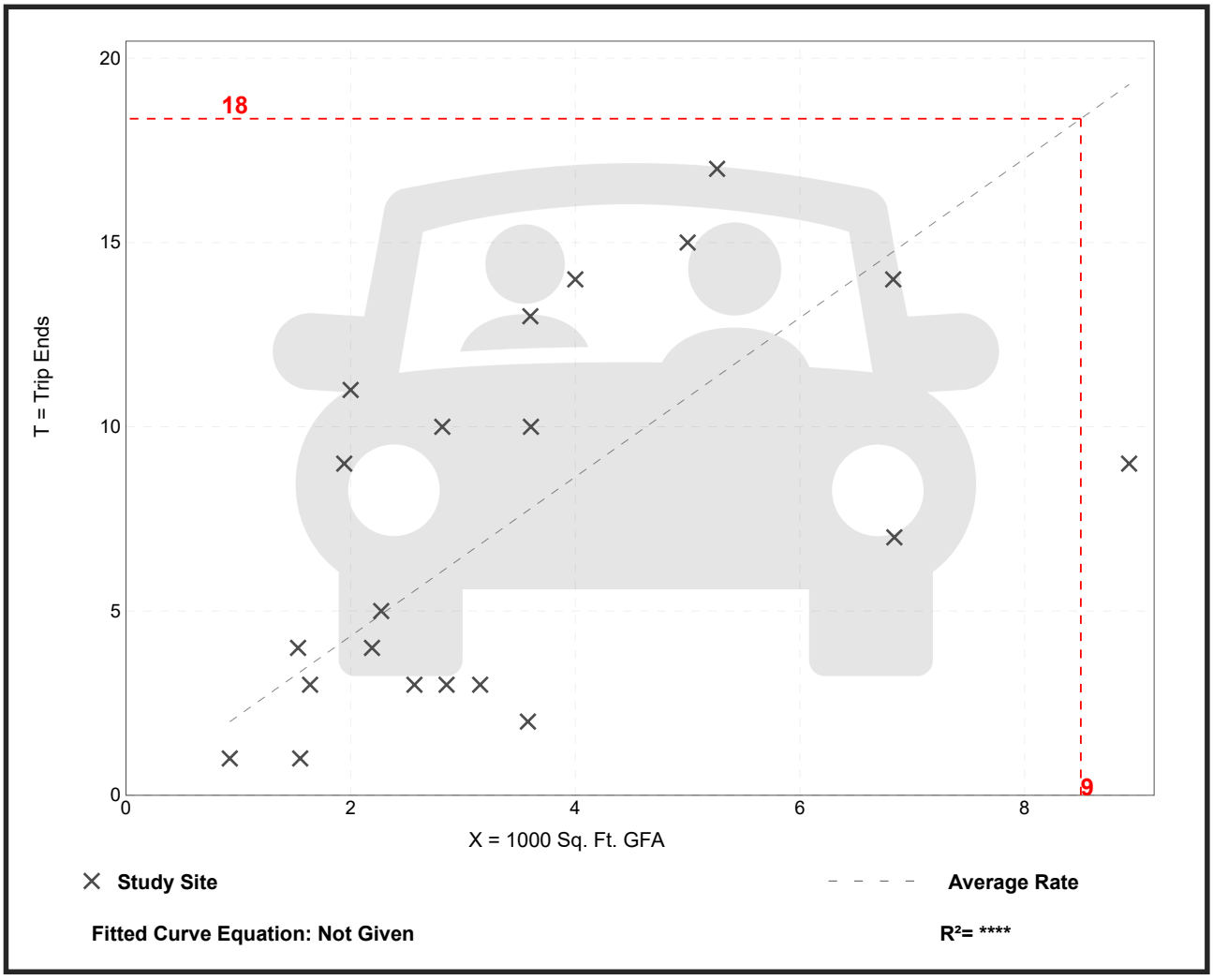
Small Office Building
(712)

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: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.16	0.56 - 5.50	1.26

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Land Use: 720
Medical-Dental Office Building

Description

A medical-dental office building is a facility that provides diagnoses and outpatient care on a routine basis but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility. General office building (Land Use 710) and clinic (Land Use 630) are related uses.

Land Use Subcategory

Analysis of medical-dental office building data found that trip generation rates are measurably different for sites located within or adjacent to a hospital campus and sites that are stand-alone. Data plots are presented for these two land use subcategories.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Connecticut, Kentucky, Maryland, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, South Dakota, Texas, Virginia, Washington, and Wisconsin.

Source Numbers

104, 109, 120, 157, 184, 209, 211, 253, 287, 294, 295, 304, 357, 384, 404, 407, 423, 444, 509, 601, 715, 867, 879, 901, 902, 908, 959, 972

Medical-Dental Office Building - Stand-Alone
(720)

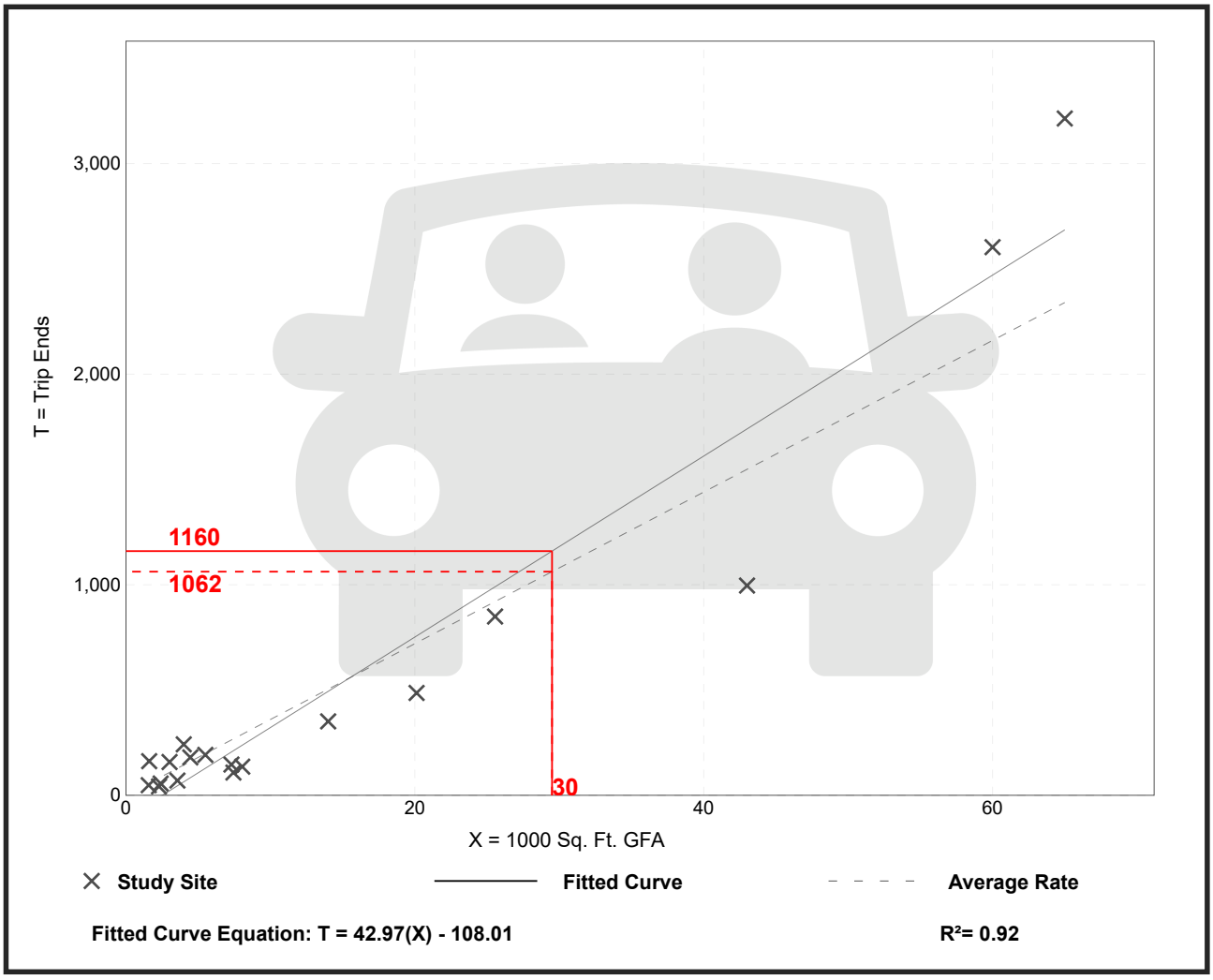
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 18
Avg. 1000 Sq. Ft. GFA: 15
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
36.00	14.52 - 100.75	13.38

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

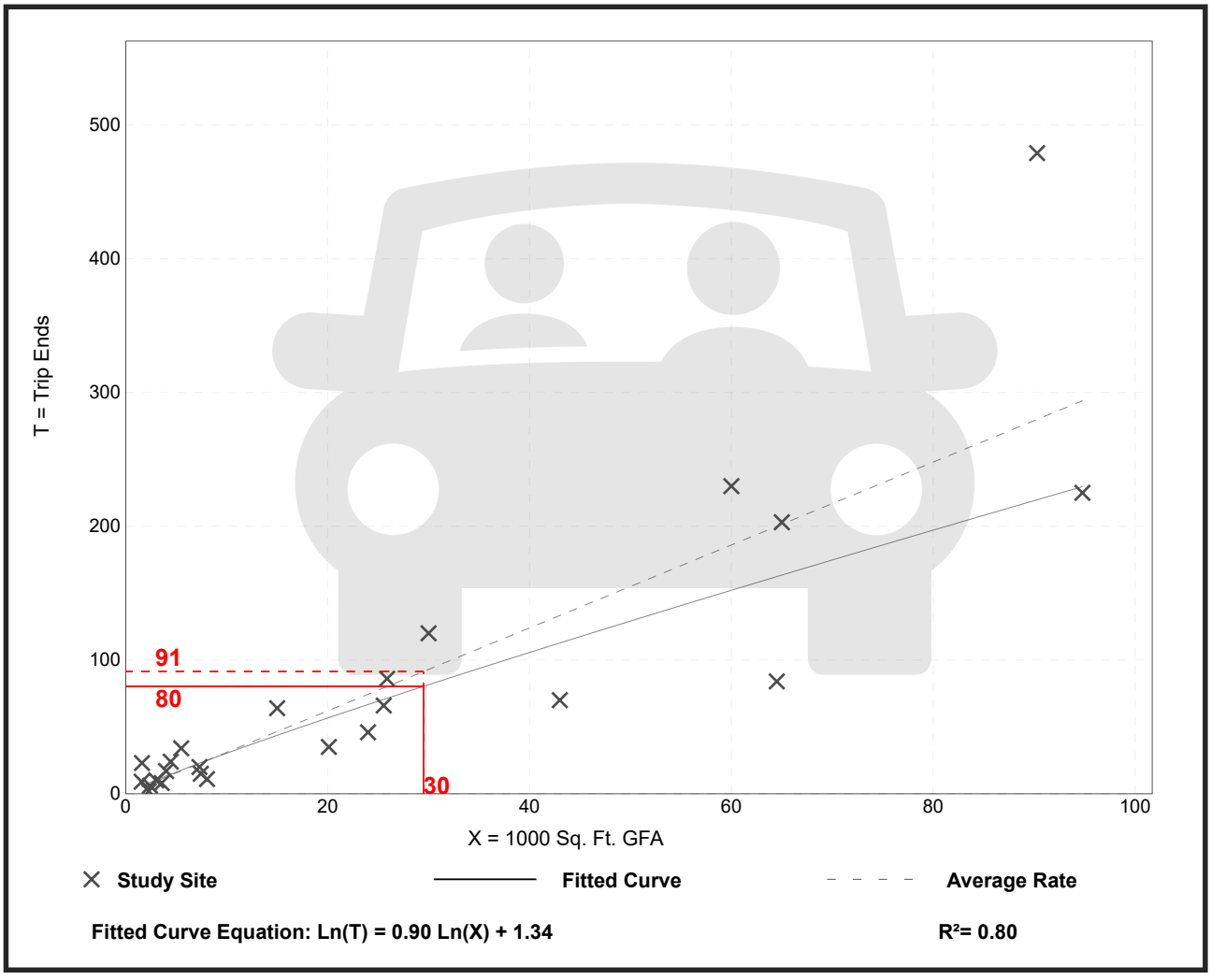
Medical-Dental Office Building - Stand-Alone
(720)

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: 24
Avg. 1000 Sq. Ft. GFA: 25
Directional Distribution: 79% entering, 21% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.10	0.87 - 14.30	1.49

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

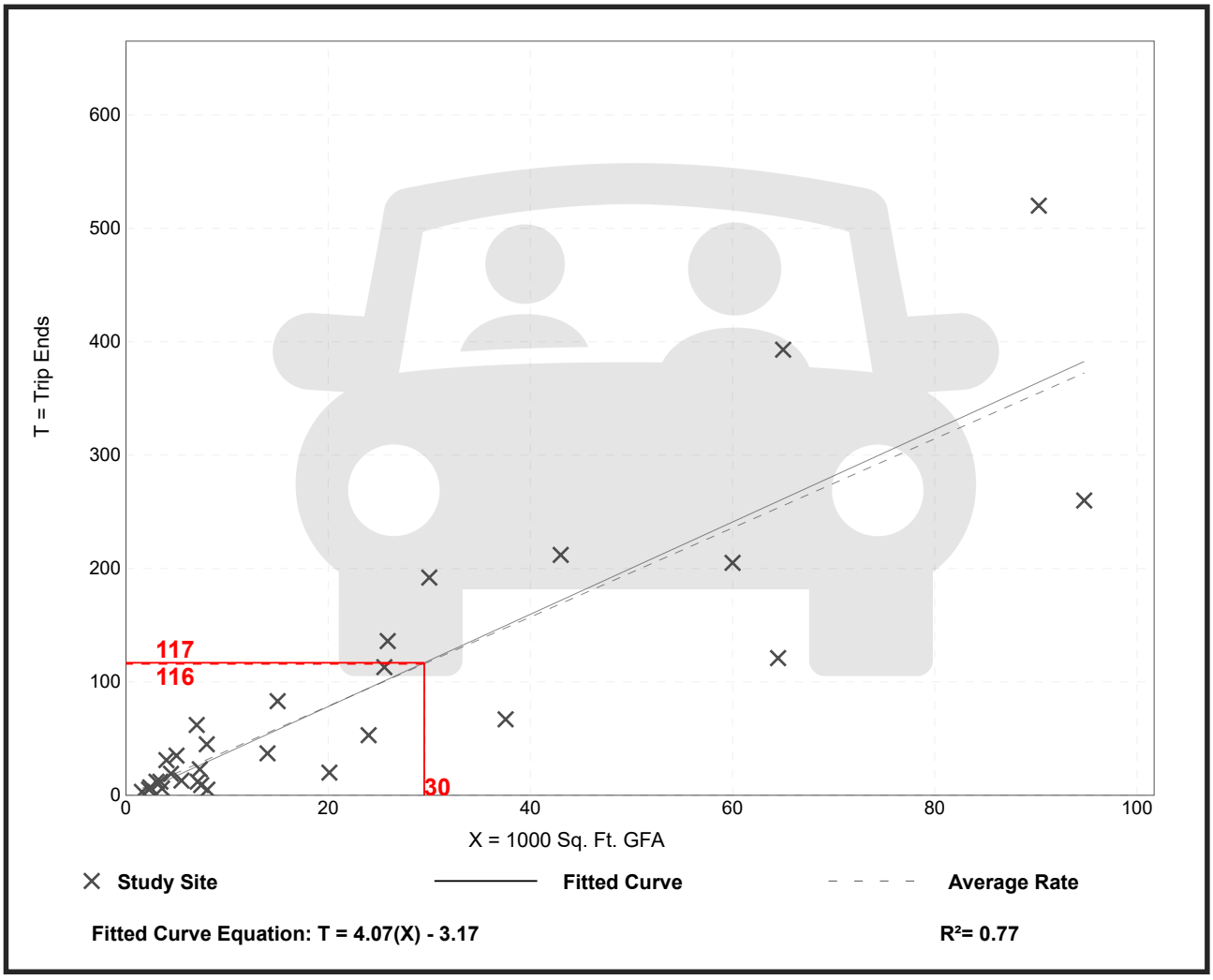
Medical-Dental Office Building - Stand-Alone
(720)

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: 30
Avg. 1000 Sq. Ft. GFA: 23
Directional Distribution: 30% entering, 70% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.93	0.62 - 8.86	1.86

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Appendix E: Synchro Reports

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	374	1142	164	58
v/c Ratio	0.14	0.41	0.68	0.22
Control Delay	3.6	2.8	62.8	12.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	2.8	62.8	12.6
Queue Length 50th (ft)	30	49	122	0
Queue Length 95th (ft)	54	158	186	37
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2655	2785	459	458
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.14	0.41	0.36	0.13

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	337	0	0	1028	148	52
Future Volume (veh/h)	337	0	0	1028	148	52
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	1796	0	0	1870	1856	1870
Adj Flow Rate, veh/h	374	0	0	1142	164	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	7	0	0	2	3	2
Cap, veh/h	2779	0	0	2894	195	
Arrive On Green	0.81	0.00	0.00	1.00	0.11	0.00
Sat Flow, veh/h	3593	0	0	3741	1767	1585
Grp Volume(v), veh/h	374	0	0	1142	164	0
Grp Sat Flow(s),veh/h/ln	1706	0	0	1777	1767	1585
Q Serve(g_s), s	2.7	0.0	0.0	0.0	10.9	0.0
Cycle Q Clear(g_c), s	2.7	0.0	0.0	0.0	10.9	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2779	0	0	2894	195	
V/C Ratio(X)	0.13	0.00	0.00	0.39	0.84	
Avail Cap(c_a), veh/h	2779	0	0	2894	464	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.3	0.0	0.0	0.0	52.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	9.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	0.0	0.0	0.3	9.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.4	0.0	0.0	0.4	61.5	0.0
LnGrp LOS	A	A	A	A	E	
Approach Vol, veh/h	374			1142	164	
Approach Delay, s/veh	2.4			0.4	61.5	
Approach LOS	A			A	E	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	17.8	102.2	102.2
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	79.5	79.5
Max Q Clear Time (g_c+I1), s	12.9	4.7	2.0
Green Ext Time (p_c), s	0.4	2.5	10.6

Intersection Summary	
HCM 6th Ctrl Delay	6.8
HCM 6th LOS	A

Notes

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

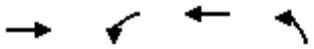
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	326	36	10	977	21	20	2	2	3	1	31
Future Vol, veh/h	27	326	36	10	977	21	20	2	2	3	1	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	55	-	-	375	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	6	8	10	2	2	2	2	2	2	2	3
Mvmt Flow	30	362	40	11	1086	23	22	2	2	3	1	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1109	0	0	402	0	0	1008	1573	201	1362	1582	555
Stage 1	-	-	-	-	-	-	442	442	-	1120	1120	-
Stage 2	-	-	-	-	-	-	566	1131	-	242	462	-
Critical Hdwy	4.14	-	-	4.3	-	-	7.54	6.54	6.94	7.54	6.54	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.3	-	-	3.52	4.02	3.32	3.52	4.02	3.33
Pot Cap-1 Maneuver	625	-	-	1098	-	-	195	109	806	107	108	473
Stage 1	-	-	-	-	-	-	564	575	-	220	280	-
Stage 2	-	-	-	-	-	-	476	277	-	740	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	625	-	-	1098	-	-	171	103	806	100	102	473
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	103	-	100	102	-
Stage 1	-	-	-	-	-	-	537	547	-	209	277	-
Stage 2	-	-	-	-	-	-	435	274	-	700	536	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	29.6	17.3
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	173	625	-	-	1098	-	-	332
HCM Lane V/C Ratio	0.154	0.048	-	-	0.01	-	-	0.117
HCM Control Delay (s)	29.6	11.1	-	-	8.3	-	-	17.3
HCM Lane LOS	D	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0	-	-	0.4



Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	368	48	1038	104
v/c Ratio	0.14	0.06	0.36	0.58
Control Delay	4.4	1.8	2.6	58.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.4	1.8	2.6	58.5
Queue Length 50th (ft)	35	2	21	71
Queue Length 95th (ft)	56	m11	90	124
Internal Link Dist (ft)	1336		2012	883
Turn Bay Length (ft)		265		
Base Capacity (vph)	2622	845	2923	377
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.14	0.06	0.36	0.28

Intersection Summary

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

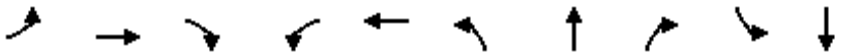
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	286	45	43	934	74	20
Future Volume (veh/h)	286	45	43	934	74	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	318	50	48	1038	82	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2399	373	909	3018	103	28
Arrive On Green	1.00	1.00	0.03	0.85	0.08	0.08
Sat Flow, veh/h	3175	480	1781	3647	1357	364
Grp Volume(v), veh/h	182	186	48	1038	105	0
Grp Sat Flow(s),veh/h/ln	1777	1784	1781	1777	1737	0
Q Serve(g_s), s	0.0	0.0	0.6	7.5	7.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.6	7.5	7.1	0.0
Prop In Lane		0.27	1.00		0.78	0.21
Lane Grp Cap(c), veh/h	1383	1389	909	3018	131	0
V/C Ratio(X)	0.13	0.13	0.05	0.34	0.80	0.00
Avail Cap(c_a), veh/h	1383	1389	991	3018	369	0
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	1.8	1.9	54.6	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.3	10.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	0.1	0.2	2.4	6.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.2	0.2	1.9	2.2	65.1	0.0
LnGrp LOS	A	A	A	A	E	A
Approach Vol, veh/h	368			1086	105	
Approach Delay, s/veh	0.2			2.2	65.1	
Approach LOS	A			A	E	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		13.6	8.5	97.9		106.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		25.5	9.5	71.5		85.5
Max Q Clear Time (g_c+I1), s		9.1	2.6	2.0		9.5
Green Ext Time (p_c), s		0.2	0.0	2.2		9.1

Intersection Summary	
HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

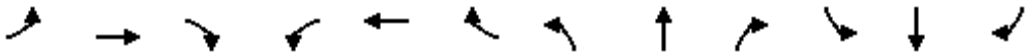
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	261	63	67	1044	277	341	37	88	121
v/c Ratio	0.06	0.15	0.08	0.10	0.55	0.61	0.81	0.09	0.43	0.24
Control Delay	10.9	14.7	1.0	12.9	20.1	36.2	58.7	0.4	33.9	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	14.7	1.0	12.9	20.1	36.2	58.7	0.4	33.9	39.4
Queue Length 50th (ft)	4	44	0	21	232	166	251	0	47	38
Queue Length 95th (ft)	9	91	0	48	405	225	330	0	79	63
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	271	1760	825	641	1902	465	566	543	205	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.15	0.08	0.10	0.55	0.60	0.60	0.07	0.43	0.17

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	235	57	60	711	229	249	307	33	79	92	17
Future Volume (veh/h)	14	235	57	60	711	229	249	307	33	79	92	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1767	1870	1870	1856	1870	1870	1856	1781	1870	1811
Adj Flow Rate, veh/h	16	261	63	67	790	254	277	341	37	88	102	19
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	9	2	2	3	2	2	3	8	2	6
Cap, veh/h	298	1900	820	666	1501	482	433	386	325	188	346	63
Arrive On Green	0.02	0.55	0.55	0.04	0.57	0.57	0.15	0.21	0.21	0.06	0.12	0.12
Sat Flow, veh/h	1781	3469	1497	1781	2644	850	1781	1870	1572	1697	3003	546
Grp Volume(v), veh/h	16	261	63	67	531	513	277	341	37	88	59	62
Grp Sat Flow(s),veh/h/ln	1781	1735	1497	1781	1777	1717	1781	1870	1572	1697	1777	1772
Q Serve(g_s), s	0.5	4.4	2.4	1.9	22.1	22.1	15.9	21.2	2.3	5.4	3.7	3.8
Cycle Q Clear(g_c), s	0.5	4.4	2.4	1.9	22.1	22.1	15.9	21.2	2.3	5.4	3.7	3.8
Prop In Lane	1.00		1.00	1.00		0.49	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	298	1900	820	666	1008	975	433	386	325	188	205	204
V/C Ratio(X)	0.05	0.14	0.08	0.10	0.53	0.53	0.64	0.88	0.11	0.47	0.29	0.30
Avail Cap(c_a), veh/h	349	1900	820	681	1008	975	455	569	478	194	363	362
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	1.00	1.00
Uniform Delay (d), s/veh	13.1	13.3	12.8	10.8	16.0	16.0	36.8	46.2	38.7	43.7	48.6	48.7
Incr Delay (d2), s/veh	0.1	0.2	0.2	0.1	2.0	2.0	2.8	10.8	0.2	1.8	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	3.0	1.5	1.3	13.8	13.5	11.3	16.1	1.6	4.2	2.9	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	13.4	13.0	10.9	18.0	18.0	39.6	57.0	38.8	45.5	49.4	49.5
LnGrp LOS	B	B	B	B	B	B	D	E	D	D	D	D
Approach Vol, veh/h		340			1111			655			209	
Approach Delay, s/veh		13.3			17.6			48.6			47.8	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	29.3	9.0	70.2	22.5	18.3	6.6	72.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	36.5	5.5	52.5	19.5	24.5	5.5	52.5
Max Q Clear Time (g_c+I1), s	7.4	23.2	3.9	6.4	17.9	5.8	2.5	24.1
Green Ext Time (p_c), s	0.0	1.6	0.0	1.9	0.1	0.5	0.0	7.4

Intersection Summary	
HCM 6th Ctrl Delay	28.5
HCM 6th LOS	C

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1162	668	150	132
v/c Ratio	0.41	0.24	0.66	0.44
Control Delay	4.6	2.5	62.8	16.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.6	2.5	62.8	16.7
Queue Length 50th (ft)	116	38	112	15
Queue Length 95th (ft)	187	56	174	71
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2816	2816	449	484
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.24	0.33	0.27

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1069	0	0	615	138	121
Future Volume (veh/h)	1069	0	0	615	138	121
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	0	0	1870	1870	1870
Adj Flow Rate, veh/h	1162	0	0	668	150	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	2926	0	0	2926	181	
Arrive On Green	0.82	0.00	0.00	1.00	0.10	0.00
Sat Flow, veh/h	3741	0	0	3741	1781	1585
Grp Volume(v), veh/h	1162	0	0	668	150	0
Grp Sat Flow(s),veh/h/ln	1777	0	0	1777	1781	1585
Q Serve(g_s), s	10.3	0.0	0.0	0.0	9.9	0.0
Cycle Q Clear(g_c), s	10.3	0.0	0.0	0.0	9.9	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2926	0	0	2926	181	
V/C Ratio(X)	0.40	0.00	0.00	0.23	0.83	
Avail Cap(c_a), veh/h	2926	0	0	2926	453	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.8	0.0	0.0	0.0	52.9	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.2	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.2	0.0	0.0	0.1	8.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	3.2	0.0	0.0	0.2	62.1	0.0
LnGrp LOS	A	A	A	A	E	
Approach Vol, veh/h	1162			668	150	
Approach Delay, s/veh	3.2			0.2	62.1	
Approach LOS	A			A	E	

Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		16.7		103.3		103.3
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		80.5		80.5
Max Q Clear Time (g_c+I1), s		11.9		12.3		2.0
Green Ext Time (p_c), s		0.4		10.9		5.0

Intersection Summary		
HCM 6th Ctrl Delay		6.6
HCM 6th LOS		A

Notes

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

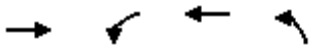
Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	1093	32	12	525	29	26	2	17	25	2	64
Future Vol, veh/h	65	1093	32	12	525	29	26	2	17	25	2	64
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	55	-	-	375	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	1188	35	13	571	32	28	2	18	27	2	70

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	603	0	0	1223	0	0	1661	1977	612	1350	1978	302
Stage 1	-	-	-	-	-	-	1348	1348	-	613	613	-
Stage 2	-	-	-	-	-	-	313	629	-	737	1365	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	971	-	-	566	-	-	64	61	436	109	61	694
Stage 1	-	-	-	-	-	-	159	218	-	446	481	-
Stage 2	-	-	-	-	-	-	672	474	-	376	214	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	971	-	-	566	-	-	52	55	436	94	55	694
Mov Cap-2 Maneuver	-	-	-	-	-	-	52	55	-	94	55	-
Stage 1	-	-	-	-	-	-	147	202	-	413	470	-
Stage 2	-	-	-	-	-	-	588	463	-	330	198	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	108.9	31.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	78	971	-	-	566	-	-	231
HCM Lane V/C Ratio	0.627	0.073	-	-	0.023	-	-	0.428
HCM Control Delay (s)	108.9	9	-	-	11.5	-	-	31.8
HCM Lane LOS	F	A	-	-	B	-	-	D
HCM 95th %tile Q(veh)	2.8	0.2	-	-	0.1	-	-	2



Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1234	18	577	48
v/c Ratio	0.42	0.05	0.19	0.38
Control Delay	2.7	0.8	0.6	53.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.7	0.8	0.6	53.1
Queue Length 50th (ft)	20	1	10	29
Queue Length 95th (ft)	272	m2	13	68
Internal Link Dist (ft)	1336		2012	883
Turn Bay Length (ft)		265		
Base Capacity (vph)	2968	409	3116	218
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.04	0.19	0.22

Intersection Summary

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

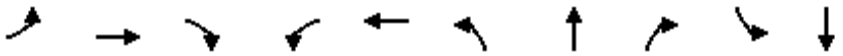
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1070	65	17	531	35	9
Future Volume (veh/h)	1070	65	17	531	35	9
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1163	71	18	577	38	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2832	173	469	3158	49	13
Arrive On Green	1.00	1.00	0.02	0.89	0.04	0.04
Sat Flow, veh/h	3496	208	1781	3647	1349	355
Grp Volume(v), veh/h	607	627	18	577	49	0
Grp Sat Flow(s),veh/h/ln	1777	1833	1781	1777	1739	0
Q Serve(g_s), s	0.0	0.0	0.2	2.6	3.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.2	2.6	3.4	0.0
Prop In Lane		0.11	1.00		0.78	0.20
Lane Grp Cap(c), veh/h	1479	1526	469	3158	63	0
V/C Ratio(X)	0.41	0.41	0.04	0.18	0.78	0.00
Avail Cap(c_a), veh/h	1479	1526	547	3158	210	0
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	1.1	0.9	57.3	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.0	0.1	18.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.6	0.0	0.3	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.8	0.8	1.1	1.0	75.6	0.0
LnGrp LOS	A	A	A	A	E	A
Approach Vol, veh/h	1234			595	49	
Approach Delay, s/veh	0.8			1.0	75.6	
Approach LOS	A			A	E	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		8.8	6.8	104.4		111.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		14.5	7.5	84.5		96.5
Max Q Clear Time (g_c+I1), s		5.4	2.2	2.0		4.6
Green Ext Time (p_c), s		0.0	0.0	10.7		4.1

Intersection Summary	
HCM 6th Ctrl Delay	2.8
HCM 6th LOS	A

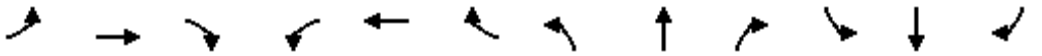
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	46	875	252	70	577	137	287	99	255	448
v/c Ratio	0.11	0.53	0.30	0.24	0.35	0.43	0.78	0.23	0.74	0.50
Control Delay	13.9	21.1	3.2	17.5	21.0	28.4	59.8	3.5	39.3	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	21.1	3.2	17.5	21.0	28.4	59.8	3.5	39.3	38.5
Queue Length 50th (ft)	13	263	12	25	139	70	213	0	140	154
Queue Length 95th (ft)	26	301	35	57	208	101	288	20	183	179
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	411	1650	846	292	1630	322	489	515	371	1214
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.53	0.30	0.24	0.35	0.43	0.59	0.19	0.69	0.37

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	805	232	64	389	142	126	264	91	235	379	33
Future Volume (veh/h)	42	805	232	64	389	142	126	264	91	235	379	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	875	252	70	423	154	137	287	99	255	412	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	461	1789	798	298	1301	469	313	332	281	322	764	66
Arrive On Green	0.03	0.50	0.50	0.04	0.51	0.51	0.08	0.18	0.18	0.13	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	2559	922	1781	1870	1585	1781	3308	288
Grp Volume(v), veh/h	46	875	252	70	292	285	137	287	99	255	220	228
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1704	1781	1870	1585	1781	1777	1819
Q Serve(g_s), s	1.5	19.5	11.3	2.3	11.6	11.8	7.4	17.9	6.6	13.5	13.1	13.2
Cycle Q Clear(g_c), s	1.5	19.5	11.3	2.3	11.6	11.8	7.4	17.9	6.6	13.5	13.1	13.2
Prop In Lane	1.00		1.00	1.00		0.54	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	461	1789	798	298	903	867	313	332	281	322	410	420
V/C Ratio(X)	0.10	0.49	0.32	0.24	0.32	0.33	0.44	0.87	0.35	0.79	0.54	0.54
Avail Cap(c_a), veh/h	484	1789	798	327	903	867	315	491	416	378	614	629
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	1.00	1.00
Uniform Delay (d), s/veh	13.8	19.6	17.6	15.0	17.4	17.4	36.3	48.0	43.3	33.9	40.5	40.6
Incr Delay (d2), s/veh	0.1	1.0	1.0	0.4	1.0	1.0	1.0	10.4	0.8	9.4	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	12.5	7.5	1.6	8.4	8.2	5.8	14.0	4.7	10.6	9.6	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	20.6	18.6	15.4	18.3	18.4	37.2	58.3	44.1	43.3	41.6	41.6
LnGrp LOS	B	C	B	B	B	B	D	E	D	D	D	D
Approach Vol, veh/h		1173			647			523			703	
Approach Delay, s/veh		19.9			18.0			50.1			42.3	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.3	25.8	9.0	64.9	13.8	32.2	8.4	65.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.5	31.5	6.5	44.5	9.5	41.5	5.5	45.5
Max Q Clear Time (g_c+I1), s	15.5	19.9	4.3	21.5	9.4	15.2	3.5	13.8
Green Ext Time (p_c), s	0.3	1.4	0.0	7.1	0.0	2.4	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	513	1332	164	82
v/c Ratio	0.19	0.48	0.68	0.28
Control Delay	3.7	2.8	63.1	11.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.7	2.8	63.1	11.6
Queue Length 50th (ft)	43	59	123	0
Queue Length 95th (ft)	74	80	186	44
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2657	2786	416	438
Starvation Cap Reductn	0	95	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.49	0.39	0.19

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	462	0	0	1199	148	74
Future Volume (veh/h)	462	0	0	1199	148	74
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	1796	0	0	1870	1856	1870
Adj Flow Rate, veh/h	513	0	0	1332	164	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	7	0	0	2	3	2
Cap, veh/h	2780	0	0	2895	195	
Arrive On Green	0.81	0.00	0.00	0.81	0.11	0.00
Sat Flow, veh/h	3593	0	0	3741	1767	1585
Grp Volume(v), veh/h	513	0	0	1332	164	0
Grp Sat Flow(s),veh/h/ln	1706	0	0	1777	1767	1585
Q Serve(g_s), s	3.9	0.0	0.0	13.3	10.9	0.0
Cycle Q Clear(g_c), s	3.9	0.0	0.0	13.3	10.9	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2780	0	0	2895	195	
V/C Ratio(X)	0.18	0.00	0.00	0.46	0.84	
Avail Cap(c_a), veh/h	2780	0	0	2895	420	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.4	0.0	0.0	3.3	52.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.0	0.0	5.8	9.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.6	0.0	0.0	3.8	61.7	0.0
LnGrp LOS	A	A	A	A	E	
Approach Vol, veh/h	513			1332	164	
Approach Delay, s/veh	2.6			3.8	61.7	
Approach LOS	A			A	E	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	17.7	102.3	102.3
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	82.5	82.5
Max Q Clear Time (g_c+I1), s	12.9	5.9	15.3
Green Ext Time (p_c), s	0.4	3.6	13.8

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Notes

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

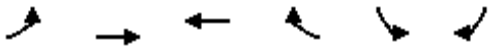
Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	500	36	20	1055	21	0	0	33	0	0	124
Future Vol, veh/h	0	500	36	20	1055	21	0	0	33	0	0	124
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	-	-	-	135	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	6	8	10	2	2	2	2	2	2	2	3
Mvmt Flow	0	556	40	22	1172	23	0	0	37	0	0	138

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	596	0	0	-	-	298	-	-	598
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.3	-	-	-	-	6.94	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.3	-	-	-	-	3.32	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	924	-	-	0	0	698	0	0	443
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	924	-	-	-	-	698	-	-	443
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

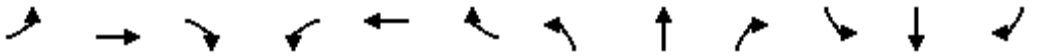
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	10.4	16.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	698	-	-	924	-	-	443
HCM Lane V/C Ratio	0.053	-	-	0.024	-	-	0.311
HCM Control Delay (s)	10.4	-	-	9	-	-	16.8
HCM Lane LOS	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-	-	1.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	244	339	1093	92	59	132
v/c Ratio	0.54	0.11	0.43	0.08	0.43	0.54
Control Delay	12.6	1.6	9.7	2.9	61.3	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	1.6	9.7	2.9	61.3	17.0
Queue Length 50th (ft)	22	16	192	3	44	0
Queue Length 95th (ft)	78	22	345	29	86	59
Internal Link Dist (ft)		423	832			
Turn Bay Length (ft)	200			150	125	
Base Capacity (vph)	573	2998	2535	1172	154	518
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	0.43	0.11	0.43	0.08	0.38	0.25

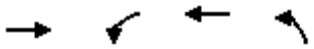
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	305	0	0	984	83	0	0	0	53	0	119
Future Volume (veh/h)	220	305	0	0	984	83	0	0	0	53	0	119
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	0	1870
Adj Flow Rate, veh/h	244	339	0	0	1093	92	0	0	0	59	0	132
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	0	2
Cap, veh/h	520	3135	0	893	2837	1265	0	2	0	136	0	0
Arrive On Green	0.09	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.04	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	0	-84166	0	1781	59	
Grp Volume(v), veh/h	244	339	0	0	1093	92	0	0	0	59	58.9	
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	0	1870	0	1781	E	
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9		
Cycle Q Clear(g_c), s	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9		
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	520	3135	0	893	2837	1265	0	2	0	136		
V/C Ratio(X)	0.47	0.11	0.00	0.00	0.39	0.07	0.00	0.00	0.00	0.43		
Avail Cap(c_a), veh/h	757	3135	0	966	2837	1265	0	281	0	201		
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.93	0.93	0.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.8		
Incr Delay (d2), s/veh	0.7	0.1	0.0	0.0	0.4	0.1	0.0	0.0	0.0	2.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	0.8	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.0	3.3		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.0	0.1	0.0	0.0	0.4	0.1	0.0	0.0	0.0	58.9		
LnGrp LOS	A	A	A	A	A	A	A	A	A	E		
Approach Vol, veh/h		583			1185			0				
Approach Delay, s/veh		0.9			0.3			0.0				
Approach LOS		A			A							

Timer - Assigned Phs	1	2	3	4			7	8				
Phs Duration (G+Y+Rc), s	9.6	0.0	0.0	110.4			10.1	100.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5			4.5	4.5				
Max Green Setting (Gmax), s	9.5	18.0	5.0	69.5			21.5	53.0				
Max Q Clear Time (g_c+I1), s	5.9	0.0	0.0	2.0			5.0	2.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	2.3			0.6	10.1				

Intersection Summary			
HCM 6th Ctrl Delay		2.4	
HCM 6th LOS		A	



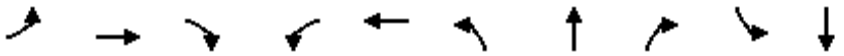
Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	408	48	1073	104
v/c Ratio	0.16	0.06	0.37	0.58
Control Delay	3.8	2.5	3.2	58.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.8	2.5	3.2	58.5
Queue Length 50th (ft)	33	5	83	71
Queue Length 95th (ft)	52	15	136	124
Internal Link Dist (ft)	832		2012	883
Turn Bay Length (ft)		265		
Base Capacity (vph)	2627	818	2923	377
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.16	0.06	0.37	0.28

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	322	45	43	966	74	20
Future Volume (veh/h)	322	45	43	966	74	20
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	358	50	48	1073	82	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2441	338	880	3018	103	28
Arrive On Green	1.00	1.00	0.03	0.85	0.08	0.08
Sat Flow, veh/h	3228	434	1781	3647	1357	364
Grp Volume(v), veh/h	202	206	48	1073	105	0
Grp Sat Flow(s),veh/h/ln	1777	1792	1781	1777	1737	0
Q Serve(g_s), s	0.0	0.0	0.6	7.8	7.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.6	7.8	7.1	0.0
Prop In Lane		0.24	1.00		0.78	0.21
Lane Grp Cap(c), veh/h	1383	1395	880	3018	131	0
V/C Ratio(X)	0.15	0.15	0.05	0.36	0.80	0.00
Avail Cap(c_a), veh/h	1383	1395	962	3018	369	0
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	1.8	2.0	54.6	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.3	10.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.2	0.2	2.6	6.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.2	0.2	1.9	2.3	65.1	0.0
LnGrp LOS	A	A	A	A	E	A
Approach Vol, veh/h	408			1121	105	
Approach Delay, s/veh	0.2			2.3	65.1	
Approach LOS	A			A	E	

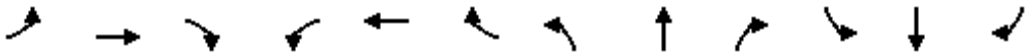
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		13.6	8.5	97.9		106.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		25.5	9.5	71.5		85.5
Max Q Clear Time (g_c+I1), s		9.1	2.6	2.0		9.8
Green Ext Time (p_c), s		0.2	0.0	2.4		9.6

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



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	291	73	67	1071	286	341	37	88	121
v/c Ratio	0.07	0.24	0.12	0.14	0.74	0.50	0.60	0.07	0.28	0.22
Control Delay	13.3	19.2	0.4	13.4	23.3	22.6	33.3	0.2	21.9	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	19.2	0.4	13.4	23.3	22.6	33.3	0.2	21.9	31.3
Queue Length 50th (ft)	4	52	0	17	188	80	133	0	22	21
Queue Length 95th (ft)	17	98	0	47	404	231	326	0	78	63
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	216	2475	1105	485	2463	621	914	818	325	1127
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.12	0.07	0.14	0.43	0.46	0.37	0.05	0.27	0.11

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	262	66	60	735	229	257	307	33	79	92	17
Future Volume (veh/h)	14	262	66	60	735	229	257	307	33	79	92	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1767	1870	1870	1856	1870	1870	1856	1781	1870	1811
Adj Flow Rate, veh/h	16	291	73	67	817	254	286	341	37	88	102	19
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	9	2	2	3	2	2	3	8	2	6
Cap, veh/h	226	1313	567	534	1103	343	527	432	363	271	374	68
Arrive On Green	0.02	0.38	0.38	0.05	0.41	0.41	0.17	0.23	0.23	0.06	0.12	0.12
Sat Flow, veh/h	1781	3469	1497	1781	2669	829	1781	1870	1572	1697	3003	546
Grp Volume(v), veh/h	16	291	73	67	544	527	286	341	37	88	59	62
Grp Sat Flow(s),veh/h/ln	1781	1735	1497	1781	1777	1721	1781	1870	1572	1697	1777	1772
Q Serve(g_s), s	0.4	3.7	2.1	1.4	16.9	16.9	8.5	11.2	1.2	2.9	2.0	2.1
Cycle Q Clear(g_c), s	0.4	3.7	2.1	1.4	16.9	16.9	8.5	11.2	1.2	2.9	2.0	2.1
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	226	1313	567	534	734	711	527	432	363	271	221	221
V/C Ratio(X)	0.07	0.22	0.13	0.13	0.74	0.74	0.54	0.79	0.10	0.33	0.27	0.28
Avail Cap(c_a), veh/h	341	2841	1226	588	1455	1410	760	1016	855	362	639	637
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	1.00	1.00
Uniform Delay (d), s/veh	13.6	13.8	13.3	11.0	16.2	16.2	18.0	23.6	19.8	23.0	25.9	25.9
Incr Delay (d2), s/veh	0.1	0.1	0.1	0.1	1.5	1.5	0.9	3.3	0.1	0.7	0.6	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(95%),veh/ln	0.2	2.3	1.1	0.9	10.1	9.8	5.5	8.3	0.7	2.0	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	13.9	13.4	11.2	17.7	17.8	18.9	26.9	19.9	23.7	26.5	26.6
LnGrp LOS	B	B	B	B	B	B	B	C	B	C	C	C
Approach Vol, veh/h		380			1138			664			209	
Approach Delay, s/veh		13.8			17.3			23.1			25.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	19.6	8.0	29.2	15.4	12.6	5.8	31.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	35.5	5.5	53.5	19.5	23.5	5.5	53.5
Max Q Clear Time (g_c+I1), s	4.9	13.2	3.4	5.7	10.5	4.1	2.4	18.9
Green Ext Time (p_c), s	0.0	1.9	0.0	2.1	0.5	0.5	0.0	8.1

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1288	836	153	154
v/c Ratio	0.46	0.30	0.66	0.54
Control Delay	5.0	1.7	62.9	27.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.0	1.7	62.9	27.4
Queue Length 50th (ft)	138	19	114	45
Queue Length 95th (ft)	220	45	177	107
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2811	2811	420	445
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.30	0.36	0.35

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1159	0	0	752	138	139
Future Volume (veh/h)	1159	0	0	752	138	139
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	0	0	1870	1870	1870
Adj Flow Rate, veh/h	1288	0	0	836	153	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	2920	0	0	2920	184	
Arrive On Green	0.82	0.00	0.00	0.55	0.10	0.00
Sat Flow, veh/h	3741	0	0	3741	1781	1585
Grp Volume(v), veh/h	1288	0	0	836	153	0
Grp Sat Flow(s),veh/h/ln	1777	0	0	1777	1781	1585
Q Serve(g_s), s	12.2	0.0	0.0	15.1	10.1	0.0
Cycle Q Clear(g_c), s	12.2	0.0	0.0	15.1	10.1	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2920	0	0	2920	184	
V/C Ratio(X)	0.44	0.00	0.00	0.29	0.83	
Avail Cap(c_a), veh/h	2920	0	0	2920	423	
HCM Platoon Ratio	1.00	1.00	1.00	0.67	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.0	0.0	0.0	8.2	52.8	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.1	0.0	0.0	10.6	8.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	3.5	0.0	0.0	8.4	62.1	0.0
LnGrp LOS	A	A	A	A	E	
Approach Vol, veh/h	1288			836	153	
Approach Delay, s/veh	3.5			8.4	62.1	
Approach LOS	A			A	E	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	16.9	103.1	103.1
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	82.5	82.5
Max Q Clear Time (g_c+I1), s	12.1	14.2	17.1
Green Ext Time (p_c), s	0.4	13.0	6.6

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Notes

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

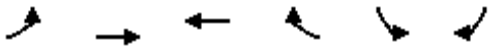
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1266	32	20	601	29	0	0	51	0	0	125
Future Vol, veh/h	0	1266	32	20	601	29	0	0	51	0	0	125
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	-	-	-	135	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1407	36	22	668	32	0	0	57	0	0	139

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1443	0	0	-	-	722	-	-	350
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	466	-	-	0	0	369	0	0	646
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	466	-	-	-	-	369	-	-	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

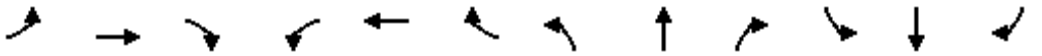
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	16.5	12.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	369	-	-	466	-	-	646
HCM Lane V/C Ratio	0.154	-	-	0.048	-	-	0.215
HCM Control Delay (s)	16.5	-	-	13.1	-	-	12.1
HCM Lane LOS	C	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-	-	0.8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	290	1189	646	69	126	100
v/c Ratio	0.45	0.41	0.27	0.06	0.62	0.37
Control Delay	5.3	3.5	7.2	0.1	63.3	12.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	5.3	3.5	7.2	0.1	63.3	12.8
Queue Length 50th (ft)	39	99	70	0	94	0
Queue Length 95th (ft)	71	128	113	0	152	49
Internal Link Dist (ft)		423	832			
Turn Bay Length (ft)	200			150	125	
Base Capacity (vph)	774	2866	2432	1130	274	606
Starvation Cap Reductn	0	316	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.47	0.27	0.06	0.46	0.17

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	1070	0	0	581	62	0	0	0	113	0	90
Future Volume (veh/h)	261	1070	0	0	581	62	0	0	0	113	0	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	0	1870
Adj Flow Rate, veh/h	290	1189	0	0	646	69	0	0	0	126	0	100
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	0	2
Cap, veh/h	716	2980	0	409	2620	1169	0	2	0	214	0	0
Arrive On Green	0.13	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.09	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	0	-84166	0	1781	126	
Grp Volume(v), veh/h	290	1189	0	0	646	69	0	0	0	126	56.4	
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	0	1870	0	1781	E	
Q Serve(g_s), s	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3		
Cycle Q Clear(g_c), s	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3		
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	716	2980	0	409	2620	1169	0	2	0	214		
V/C Ratio(X)	0.40	0.40	0.00	0.00	0.25	0.06	0.00	0.00	0.00	0.59		
Avail Cap(c_a), veh/h	966	2980	0	482	2620	1169	0	281	0	335		
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.99	0.99	0.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.8		
Incr Delay (d2), s/veh	0.4	0.4	0.0	0.0	0.2	0.1	0.0	0.0	0.0	2.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	1.7	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0	7.0		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.7	0.4	0.0	0.0	0.2	0.1	0.0	0.0	0.0	56.4		
LnGrp LOS	A	A	A	A	A	A	A	A	A	E		
Approach Vol, veh/h		1479			715			0				
Approach Delay, s/veh		0.8			0.2			0.0				
Approach LOS		A			A							

Timer - Assigned Phs	1	2	3	4			7	8				
Phs Duration (G+Y+Rc), s	14.9	0.0	0.0	105.1			12.2	93.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5			4.5	4.5				
Max Green Setting (Gmax), s	18.5	18.0	5.0	60.5			24.5	41.0				
Max Q Clear Time (g_c+I1), s	10.3	0.0	0.0	2.0			6.9	2.0				
Green Ext Time (p_c), s	0.2	0.0	0.0	11.2			0.8	4.9				

Intersection Summary			
HCM 6th Ctrl Delay		3.7	
HCM 6th LOS		A	

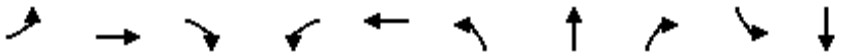
Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1324	19	624	49
v/c Ratio	0.45	0.05	0.20	0.38
Control Delay	3.1	1.8	1.6	53.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.1	1.8	1.6	53.1
Queue Length 50th (ft)	5	2	31	30
Queue Length 95th (ft)	61	5	51	69
Internal Link Dist (ft)	832		2012	883
Turn Bay Length (ft)		265		
Base Capacity (vph)	2970	377	3114	218
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.05	0.20	0.22

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1127	65	17	562	35	9
Future Volume (veh/h)	1127	65	17	562	35	9
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1252	72	19	624	39	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2838	163	439	3156	50	13
Arrive On Green	1.00	1.00	0.02	0.89	0.04	0.04
Sat Flow, veh/h	3509	196	1781	3647	1357	348
Grp Volume(v), veh/h	651	673	19	624	50	0
Grp Sat Flow(s),veh/h/ln	1777	1835	1781	1777	1740	0
Q Serve(g_s), s	0.0	0.0	0.2	2.9	3.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.2	2.9	3.4	0.0
Prop In Lane		0.11	1.00		0.78	0.20
Lane Grp Cap(c), veh/h	1477	1525	439	3156	64	0
V/C Ratio(X)	0.44	0.44	0.04	0.20	0.78	0.00
Avail Cap(c_a), veh/h	1477	1525	516	3156	210	0
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	1.1	0.9	57.3	0.0
Incr Delay (d2), s/veh	0.9	0.8	0.0	0.1	17.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.6	0.0	0.4	3.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.9	0.8	1.1	1.1	75.2	0.0
LnGrp LOS	A	A	A	A	E	A
Approach Vol, veh/h	1324			643	50	
Approach Delay, s/veh	0.8			1.1	75.2	
Approach LOS	A			A	E	

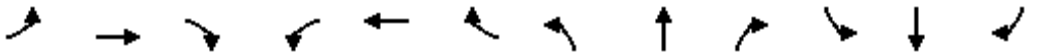
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		8.9	6.8	104.2		111.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		14.5	7.5	84.5		96.5
Max Q Clear Time (g_c+I1), s		5.4	2.2	2.0		4.9
Green Ext Time (p_c), s		0.0	0.0	12.2		4.6

Intersection Summary	
HCM 6th Ctrl Delay	2.8
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	939	277	71	617	148	293	101	261	458
v/c Ratio	0.14	0.73	0.39	0.32	0.44	0.39	0.70	0.22	0.63	0.46
Control Delay	16.8	30.6	8.6	19.6	21.4	22.2	45.9	3.7	26.0	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	30.6	8.6	19.6	21.4	22.2	45.9	3.7	26.0	29.1
Queue Length 50th (ft)	15	256	27	23	135	54	166	0	103	117
Queue Length 95th (ft)	42	398	98	57	224	110	297	22	190	185
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	330	1876	938	229	1882	399	668	655	512	1686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.50	0.30	0.31	0.33	0.37	0.44	0.15	0.51	0.27

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	845	249	64	413	142	133	264	91	235	379	33
Future Volume (veh/h)	42	845	249	64	413	142	133	264	91	235	379	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	47	939	277	71	459	158	148	293	101	261	421	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	364	1294	577	252	973	332	388	371	315	400	836	73
Arrive On Green	0.04	0.36	0.36	0.05	0.37	0.37	0.09	0.20	0.20	0.14	0.25	0.25
Sat Flow, veh/h	1781	3554	1585	1781	2600	888	1781	1870	1585	1781	3306	289
Grp Volume(v), veh/h	47	939	277	71	313	304	148	293	101	261	225	233
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1711	1781	1870	1585	1781	1777	1818
Q Serve(g_s), s	1.2	16.9	10.0	1.8	9.9	10.0	4.8	11.0	4.0	8.1	8.1	8.1
Cycle Q Clear(g_c), s	1.2	16.9	10.0	1.8	9.9	10.0	4.8	11.0	4.0	8.1	8.1	8.1
Prop In Lane	1.00		1.00	1.00		0.52	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	364	1294	577	252	665	640	388	371	315	400	449	460
V/C Ratio(X)	0.13	0.73	0.48	0.28	0.47	0.48	0.38	0.79	0.32	0.65	0.50	0.51
Avail Cap(c_a), veh/h	412	2161	964	316	1114	1073	459	769	652	624	980	1003
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	1.00	1.00
Uniform Delay (d), s/veh	14.1	20.4	18.2	15.5	17.6	17.7	20.7	28.2	25.4	19.1	23.7	23.7
Incr Delay (d2), s/veh	0.2	0.8	0.6	0.6	0.5	0.5	0.6	3.8	0.6	1.8	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	10.5	6.1	1.2	6.7	6.5	3.3	8.5	2.6	5.6	5.7	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	21.2	18.8	16.1	18.1	18.2	21.3	32.0	26.0	20.9	24.6	24.6
LnGrp LOS	B	C	B	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h		1263			688			542			719	
Approach Delay, s/veh		20.4			18.0			28.0			23.3	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.1	19.2	8.3	31.5	11.1	23.3	7.6	32.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.9	30.5	6.5	45.1	9.5	40.9	5.1	46.5
Max Q Clear Time (g_c+I1), s	10.1	13.0	3.8	18.9	6.8	10.1	3.2	12.0
Green Ext Time (p_c), s	0.5	1.7	0.0	8.1	0.1	2.5	0.0	3.9

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	597	1393	164	112
v/c Ratio	0.23	0.50	0.67	0.35
Control Delay	4.0	3.1	61.6	10.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.0	3.2	61.6	10.8
Queue Length 50th (ft)	52	80	122	0
Queue Length 95th (ft)	90	56	185	49
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2647	2776	751	743
Starvation Cap Reductn	0	43	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.51	0.22	0.15

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	537	0	0	1254	148	101
Future Volume (veh/h)	537	0	0	1254	148	101
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	1796	0	0	1870	1856	1870
Adj Flow Rate, veh/h	597	0	0	1393	164	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	7	0	0	2	3	2
Cap, veh/h	2777	0	0	2892	197	
Arrive On Green	0.81	0.00	0.00	0.55	0.11	0.00
Sat Flow, veh/h	3593	0	0	3741	1767	1585
Grp Volume(v), veh/h	597	0	0	1393	164	0
Grp Sat Flow(s),veh/h/ln	1706	0	0	1777	1767	1585
Q Serve(g_s), s	4.7	0.0	0.0	29.0	10.9	0.0
Cycle Q Clear(g_c), s	4.7	0.0	0.0	29.0	10.9	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2777	0	0	2892	197	
V/C Ratio(X)	0.21	0.00	0.00	0.48	0.83	
Avail Cap(c_a), veh/h	2777	0	0	2892	758	
HCM Platoon Ratio	1.00	1.00	1.00	0.67	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.5	0.0	0.0	11.7	52.2	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.6	8.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	0.0	0.0	18.3	9.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.7	0.0	0.0	12.3	61.2	0.0
LnGrp LOS	A	A	A	B	E	
Approach Vol, veh/h	597			1393	164	
Approach Delay, s/veh	2.7			12.3	61.2	
Approach LOS	A			B	E	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	17.8	102.2	102.2
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	51.5	59.5	59.5
Max Q Clear Time (g_c+I1), s	12.9	6.7	31.0
Green Ext Time (p_c), s	0.5	4.3	12.0

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Notes

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

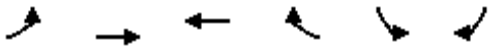
Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	602	36	20	1099	21	0	0	33	0	0	135
Future Vol, veh/h	0	602	36	20	1099	21	0	0	33	0	0	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	6	8	10	2	2	2	2	2	2	2	3
Mvmt Flow	0	669	40	22	1221	23	0	0	37	0	0	150

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	709	0	0	-	-	355	-	-	622
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.3	-	-	-	-	6.94	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.3	-	-	-	-	3.32	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	835	-	-	0	0	641	0	0	427
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	835	-	-	-	-	641	-	-	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	11	17.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	641	-	-	835	-	-	427
HCM Lane V/C Ratio	0.057	-	-	0.027	-	-	0.351
HCM Control Delay (s)	11	-	-	9.4	-	-	17.9
HCM Lane LOS	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-	-	1.6



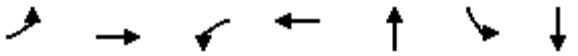
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	282	414	1134	100	63	140
v/c Ratio	0.62	0.14	0.46	0.09	0.44	0.55
Control Delay	18.8	1.6	10.1	0.8	61.6	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	1.6	10.1	0.8	61.6	16.7
Queue Length 50th (ft)	23	17	181	0	47	0
Queue Length 95th (ft)	139	35	320	11	92	60
Internal Link Dist (ft)		423	832			
Turn Bay Length (ft)	150			150	125	
Base Capacity (vph)	682	2991	2464	1143	331	681
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	0.14	0.46	0.09	0.19	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	254	373	0	0	1021	90	0	0	0	57	0	126
Future Volume (veh/h)	254	373	0	0	1021	90	0	0	0	57	0	126
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	0	1870
Adj Flow Rate, veh/h	282	414	0	0	1134	100	0	0	0	63	0	140
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	0	2
Cap, veh/h	467	3124	0	827	2797	1248	0	2	0	142	0	0
Arrive On Green	0.11	1.00	0.00	0.00	0.79	0.79	0.00	0.00	0.00	0.05	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	0	-84166	0	1781	63	
Grp Volume(v), veh/h	282	414	0	0	1134	100	0	0	0	63	58.7	
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	0	1870	0	1781	E	
Q Serve(g_s), s	3.7	0.0	0.0	0.0	12.0	1.7	0.0	0.0	0.0	4.2		
Cycle Q Clear(g_c), s	3.7	0.0	0.0	0.0	12.0	1.7	0.0	0.0	0.0	4.2		
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	467	3124	0	827	2797	1248	0	2	0	142		
V/C Ratio(X)	0.60	0.13	0.00	0.00	0.41	0.08	0.00	0.00	0.00	0.44		
Avail Cap(c_a), veh/h	853	3124	0	899	2797	1248	0	281	0	394		
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.51	0.51	0.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	3.3	0.0	0.0	0.0	4.0	2.9	0.0	0.0	0.0	56.5		
Incr Delay (d2), s/veh	1.3	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	2.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	1.1	0.1	0.0	0.0	5.3	0.8	0.0	0.0	0.0	3.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.5	0.1	0.0	0.0	4.2	3.0	0.0	0.0	0.0	58.7		
LnGrp LOS	A	A	A	A	A	A	A	A	A	E		
Approach Vol, veh/h		696			1234			0				
Approach Delay, s/veh		1.9			4.1			0.0				
Approach LOS		A			A							

Timer - Assigned Phs	1	2	3	4			7	8				
Phs Duration (G+Y+Rc), s	10.0	0.0	0.0	110.0			11.0	99.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5			4.5	4.5				
Max Green Setting (Gmax), s	22.5	18.0	5.0	56.5			32.5	29.0				
Max Q Clear Time (g_c+I1), s	6.2	0.0	0.0	2.0			5.7	14.0				
Green Ext Time (p_c), s	0.1	0.0	0.0	2.8			0.8	7.1				

Intersection Summary												
HCM 6th Ctrl Delay			5.1									
HCM 6th LOS			A									

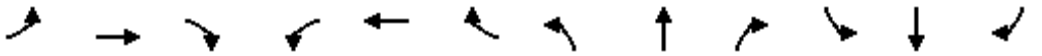


Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	76	412	48	1111	104	17	41
v/c Ratio	1.12	0.34	0.15	0.79	1.30	0.02	0.05
Control Delay	190.7	34.1	25.2	41.7	215.3	18.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	190.7	34.1	25.2	41.7	215.3	18.9	0.3
Queue Length 50th (ft)	~88	153	29	495	~46	7	0
Queue Length 95th (ft)	#173	163	46	461	#171	25	3
Internal Link Dist (ft)		832		2012	883		460
Turn Bay Length (ft)	150		265			150	
Base Capacity (vph)	93	1641	325	1893	80	700	889
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	0.82	0.25	0.15	0.59	1.30	0.02	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

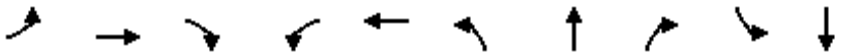
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	326	45	43	973	27	74	0	20	15	0	37
Future Volume (veh/h)	68	326	45	43	973	27	74	0	20	15	0	37
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	76	362	50	48	1081	30	82	0	22	17	0	41
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	474	2622	359	896	3167	88	0	0	63	111	0	63
Arrive On Green	0.84	0.84	0.84	0.03	0.90	0.90	0.00	0.00	0.04	0.04	0.00	0.04
Sat Flow, veh/h	507	3140	430	1781	3532	98	0	0	1585	1390	0	1585
Grp Volume(v), veh/h	76	204	208	48	544	567	0	0	22	17	0	41
Grp Sat Flow(s),veh/h/ln	507	1777	1793	1781	1777	1853	0	0	1585	1390	0	1585
Q Serve(g_s), s	4.1	3.0	3.1	0.5	6.5	6.5	0.0	0.0	1.9	0.0	0.0	3.6
Cycle Q Clear(g_c), s	4.1	3.0	3.1	0.5	6.5	6.5	0.0	0.0	1.9	1.3	0.0	3.6
Prop In Lane	1.00		0.24	1.00		0.05	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	474	1484	1498	896	1594	1662	0	0	63	111	0	63
V/C Ratio(X)	0.16	0.14	0.14	0.05	0.34	0.34	0.00	0.00	0.35	0.15	0.00	0.65
Avail Cap(c_a), veh/h	474	1484	1498	906	1594	1662	0	0	636	521	0	530
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)	0.99	0.99	0.99	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.3	2.2	2.2	1.2	1.1	1.1	0.0	0.0	66.4	66.1	0.0	67.2
Incr Delay (d2), s/veh	0.7	0.2	0.2	0.0	0.6	0.6	0.0	0.0	3.3	0.6	0.0	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	1.4	1.5	0.1	1.5	1.5	0.0	0.0	1.5	1.1	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.0	2.4	2.4	1.2	1.7	1.6	0.0	0.0	69.7	66.7	0.0	78.0
LnGrp LOS	A	A	A	A	A	A	A	A	E	E	A	E
Approach Vol, veh/h		488			1159			22			58	
Approach Delay, s/veh		2.5			1.6			69.7			74.7	
Approach LOS		A			A			E			E	

Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		10.1	8.7	123.1	0.0	10.1		131.9				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		57.0	5.0	67.0	5.0	47.5		76.5				
Max Q Clear Time (g_c+I1), s		3.9	2.5	6.1	0.0	5.6		8.5				
Green Ext Time (p_c), s		0.1	0.0	3.6	0.0	0.3		8.8				

Intersection Summary	
HCM 6th Ctrl Delay	5.2
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	308	78	67	1101	293	341	37	88	121
v/c Ratio	0.07	0.22	0.12	0.13	0.67	0.57	0.65	0.07	0.40	0.30
Control Delay	12.1	17.2	0.9	11.9	18.7	22.5	31.7	0.3	24.4	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	17.2	0.9	11.9	18.7	22.5	31.7	0.3	24.4	30.8
Queue Length 50th (ft)	3	50	0	15	176	95	140	0	25	23
Queue Length 95th (ft)	15	92	6	42	372	189	261	0	63	57
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	230	1667	788	523	1670	999	1374	1181	220	832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.18	0.10	0.13	0.66	0.29	0.25	0.03	0.40	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	277	70	60	762	229	264	307	33	79	92	17
Future Volume (veh/h)	14	277	70	60	762	229	264	307	33	79	92	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1767	1870	1870	1856	1870	1870	1856	1781	1870	1811
Adj Flow Rate, veh/h	16	308	78	67	847	254	293	341	37	88	102	19
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	9	2	2	3	2	2	3	8	2	6
Cap, veh/h	214	1286	555	517	1093	327	537	438	368	277	360	65
Arrive On Green	0.02	0.37	0.37	0.05	0.41	0.41	0.18	0.23	0.23	0.06	0.12	0.12
Sat Flow, veh/h	1781	3469	1497	1781	2695	807	1781	1870	1572	1697	3003	546
Grp Volume(v), veh/h	16	308	78	67	558	543	293	341	37	88	59	62
Grp Sat Flow(s),veh/h/ln	1781	1735	1497	1781	1777	1725	1781	1870	1572	1697	1777	1772
Q Serve(g_s), s	0.4	3.9	2.2	1.4	17.5	17.6	8.5	11.0	1.2	2.9	2.0	2.0
Cycle Q Clear(g_c), s	0.4	3.9	2.2	1.4	17.5	17.6	8.5	11.0	1.2	2.9	2.0	2.0
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	214	1286	555	517	721	700	537	438	368	277	213	212
V/C Ratio(X)	0.07	0.24	0.14	0.13	0.77	0.78	0.55	0.78	0.10	0.32	0.28	0.29
Avail Cap(c_a), veh/h	318	1967	849	559	1007	978	1400	1612	1355	304	497	495
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	1.00	1.00
Uniform Delay (d), s/veh	14.0	14.0	13.5	11.2	16.6	16.6	17.6	23.1	19.3	22.9	25.8	25.8
Incr Delay (d2), s/veh	0.1	0.1	0.1	0.1	2.5	2.6	0.9	3.0	0.1	0.7	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	2.4	1.2	0.9	10.6	10.4	5.6	8.1	0.7	1.9	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	14.1	13.6	11.3	19.1	19.2	18.5	26.1	19.5	23.5	26.5	26.6
LnGrp LOS	B	B	B	B	B	B	B	C	B	C	C	C
Approach Vol, veh/h		402			1168			671			209	
Approach Delay, s/veh		14.0			18.7			22.4			25.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	19.6	8.0	28.4	15.8	12.2	5.7	30.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	55.5	5.0	36.5	42.5	18.0	5.0	36.5
Max Q Clear Time (g_c+I1), s	4.9	13.0	3.4	5.9	10.5	4.0	2.4	19.6
Green Ext Time (p_c), s	0.0	2.1	0.0	2.2	0.8	0.4	0.0	6.5

Intersection Summary	
HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1320	954	150	173
v/c Ratio	0.47	0.34	0.66	0.62
Control Delay	5.0	1.9	63.0	34.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.0	1.9	63.0	34.4
Queue Length 50th (ft)	142	30	112	64
Queue Length 95th (ft)	226	51	174	133
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2817	2817	420	440
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.34	0.36	0.39

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1214	0	0	878	138	159
Future Volume (veh/h)	1214	0	0	878	138	159
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	0	0	1870	1870	1870
Adj Flow Rate, veh/h	1320	0	0	954	150	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	2926	0	0	2926	181	
Arrive On Green	0.82	0.00	0.00	0.55	0.10	0.00
Sat Flow, veh/h	3741	0	0	3741	1781	1585
Grp Volume(v), veh/h	1320	0	0	954	150	0
Grp Sat Flow(s),veh/h/ln	1777	0	0	1777	1781	1585
Q Serve(g_s), s	12.5	0.0	0.0	17.6	9.9	0.0
Cycle Q Clear(g_c), s	12.5	0.0	0.0	17.6	9.9	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2926	0	0	2926	181	
V/C Ratio(X)	0.45	0.00	0.00	0.33	0.83	
Avail Cap(c_a), veh/h	2926	0	0	2926	423	
HCM Platoon Ratio	1.00	1.00	1.00	0.67	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.0	0.0	0.0	8.7	52.9	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	7.5	4.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	3.5	0.0	0.0	9.0	62.2	0.0
LnGrp LOS	A	A	A	A	E	
Approach Vol, veh/h	1320			954	150	
Approach Delay, s/veh	3.5			9.0	62.2	
Approach LOS	A			A	E	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	16.7	103.3	103.3
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	82.5	82.5
Max Q Clear Time (g_c+I1), s	11.9	14.5	19.6
Green Ext Time (p_c), s	0.3	13.6	8.0

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Notes

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

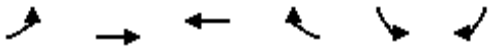
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1341	32	20	702	29	0	0	51	0	0	150
Future Vol, veh/h	0	1341	32	20	702	29	0	0	51	0	0	150
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1458	35	22	763	32	0	0	55	0	0	163

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1493	0	0	-	-	747	-	-	398
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	446	-	-	0	0	355	0	0	601
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	446	-	-	-	-	355	-	-	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	17	13.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	355	-	-	446	-	-	601
HCM Lane V/C Ratio	0.156	-	-	0.049	-	-	0.271
HCM Control Delay (s)	17	-	-	13.5	-	-	13.2
HCM Lane LOS	C	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-	-	1.1



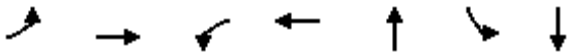
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	311	1217	723	73	132	116
v/c Ratio	0.51	0.43	0.30	0.07	0.63	0.40
Control Delay	6.7	3.5	9.7	0.1	63.2	12.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	6.7	3.5	9.7	0.1	63.2	12.3
Queue Length 50th (ft)	42	88	106	0	99	0
Queue Length 95th (ft)	67	128	196	0	158	52
Internal Link Dist (ft)		423	832			
Turn Bay Length (ft)	150			150	125	
Base Capacity (vph)	760	2854	2372	1106	264	605
Starvation Cap Reductn	0	300	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	0.48	0.30	0.07	0.50	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	1120	0	0	665	67	0	0	0	121	0	107
Future Volume (veh/h)	286	1120	0	0	665	67	0	0	0	121	0	107
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	0	1870
Adj Flow Rate, veh/h	311	1217	0	0	723	73	0	0	0	132	0	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	0	2
Cap, veh/h	634	2968	0	395	2587	1154	0	2	0	220	0	0
Arrive On Green	0.14	1.00	0.00	0.00	0.73	0.73	0.00	0.00	0.00	0.09	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	0	-84166	0	1781	132	
Grp Volume(v), veh/h	311	1217	0	0	723	73	0	0	0	132	56.2	
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	0	1870	0	1781	E	
Q Serve(g_s), s	5.5	0.0	0.0	0.0	8.3	1.6	0.0	0.0	0.0	8.7		
Cycle Q Clear(g_c), s	5.5	0.0	0.0	0.0	8.3	1.6	0.0	0.0	0.0	8.7		
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	634	2968	0	395	2587	1154	0	2	0	220		
V/C Ratio(X)	0.49	0.41	0.00	0.00	0.28	0.06	0.00	0.00	0.00	0.60		
Avail Cap(c_a), veh/h	917	2968	0	468	2587	1154	0	281	0	320		
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.98	0.98	0.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	3.1	0.0	0.0	0.0	5.6	4.7	0.0	0.0	0.0	53.6		
Incr Delay (d2), s/veh	0.6	0.4	0.0	0.0	0.3	0.1	0.0	0.0	0.0	2.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.1	0.2	0.0	0.0	2.7	0.5	0.0	0.0	0.0	4.1		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.7	0.4	0.0	0.0	5.8	4.8	0.0	0.0	0.0	56.2		
LnGrp LOS	A	A	A	A	A	A	A	A	A	E		
Approach Vol, veh/h		1528			796			0				
Approach Delay, s/veh		1.1			5.7			0.0				
Approach LOS		A			A							

Timer - Assigned Phs	1	2	3	4			7	8				
Phs Duration (G+Y+Rc), s	15.3	0.0	0.0	104.7			12.9	91.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5			4.5	4.5				
Max Green Setting (Gmax), s	17.5	18.0	5.0	61.5			27.5	39.0				
Max Q Clear Time (g_c+I1), s	10.7	0.0	0.0	2.0			7.5	10.3				
Green Ext Time (p_c), s	0.2	0.0	0.0	11.6			0.8	5.3				

Intersection Summary												
HCM 6th Ctrl Delay			5.6									
HCM 6th LOS			A									



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	54	1305	18	638	48	36	91
v/c Ratio	0.09	0.46	0.05	0.22	0.60	0.25	0.19
Control Delay	7.1	7.8	5.0	3.9	32.3	57.5	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	7.8	5.0	3.9	32.3	57.5	0.9
Queue Length 50th (ft)	5	92	2	34	0	33	0
Queue Length 95th (ft)	46	484	15	153	#29	54	0
Internal Link Dist (ft)		832		2012	883		460
Turn Bay Length (ft)	150		265			150	
Base Capacity (vph)	621	2855	340	2969	80	274	585
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	0.09	0.46	0.05	0.21	0.60	0.13	0.16

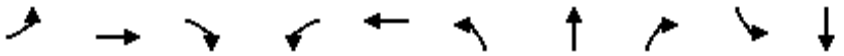
Intersection Summary

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)	50	1135	65	17	567	20	35	0	9	33	0	84
Future Volume (veh/h)	50	1135	65	17	567	20	35	0	9	33	0	84
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	54	1234	71	18	616	22	38	0	10	36	0	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	694	2779	160	381	3021	108	0	0	116	156	0	116
Arrive On Green	0.81	0.81	0.81	0.02	0.86	0.86	0.00	0.00	0.07	0.07	0.00	0.07
Sat Flow, veh/h	790	3416	196	1781	3500	125	0	0	1585	1405	0	1585
Grp Volume(v), veh/h	54	641	664	18	313	325	0	0	10	36	0	91
Grp Sat Flow(s),veh/h/ln	790	1777	1835	1781	1777	1848	0	0	1585	1405	0	1585
Q Serve(g_s), s	1.9	14.9	15.0	0.2	4.1	4.2	0.0	0.0	0.8	2.4	0.0	8.0
Cycle Q Clear(g_c), s	1.9	14.9	15.0	0.2	4.1	4.2	0.0	0.0	0.8	3.2	0.0	8.0
Prop In Lane	1.00		0.11	1.00		0.07	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	694	1446	1493	381	1534	1595	0	0	116	156	0	116
V/C Ratio(X)	0.08	0.44	0.44	0.05	0.20	0.20	0.00	0.00	0.09	0.23	0.00	0.78
Avail Cap(c_a), veh/h	694	1446	1493	431	1534	1595	0	0	380	295	0	273
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)	0.90	0.90	0.90	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.6	3.9	3.9	2.8	1.6	1.6	0.0	0.0	61.4	62.4	0.0	64.7
Incr Delay (d2), s/veh	0.2	0.9	0.9	0.1	0.3	0.3	0.0	0.0	0.3	0.7	0.0	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.4	4.5	0.1	0.9	0.9	0.0	0.0	0.4	1.3	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.8	4.7	4.7	2.8	1.9	1.9	0.0	0.0	61.7	63.1	0.0	75.5
LnGrp LOS	A	A	A	A	A	A	A	A	E	E	A	E
Approach Vol, veh/h		1359			656			10			127	
Approach Delay, s/veh		4.7			1.9			61.7			72.0	
Approach LOS		A			A			E			E	

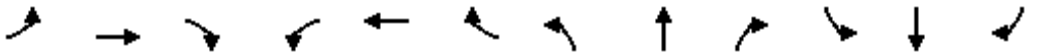
Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		14.9	7.0	120.0	0.0	14.9		127.1				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		34.0	6.5	88.5	5.0	24.5		99.5				
Max Q Clear Time (g_c+I1), s		2.8	2.2	17.0	0.0	10.0		6.2				
Green Ext Time (p_c), s		0.0	0.0	12.5	0.0	0.5		4.0				

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	46	954	279	70	625	150	287	99	255	448
v/c Ratio	0.14	0.73	0.39	0.31	0.44	0.39	0.70	0.22	0.62	0.46
Control Delay	16.4	30.1	8.5	19.1	21.1	22.5	45.7	3.5	26.3	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	30.1	8.5	19.1	21.1	22.5	45.7	3.5	26.3	29.7
Queue Length 50th (ft)	14	258	27	22	136	56	161	0	101	115
Queue Length 95th (ft)	40	401	98	56	224	113	292	20	188	184
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	332	1924	957	229	1928	404	670	656	497	1637
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.50	0.29	0.31	0.32	0.37	0.43	0.15	0.51	0.27

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	878	257	64	433	142	138	264	91	235	379	33
Future Volume (veh/h)	42	878	257	64	433	142	138	264	91	235	379	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	954	279	70	471	154	150	287	99	255	412	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	1315	587	252	1003	326	387	365	309	397	814	71
Arrive On Green	0.04	0.37	0.37	0.05	0.38	0.38	0.09	0.20	0.20	0.14	0.25	0.25
Sat Flow, veh/h	1781	3554	1585	1781	2637	856	1781	1870	1585	1781	3308	288
Grp Volume(v), veh/h	46	954	279	70	316	309	150	287	99	255	220	228
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1716	1781	1870	1585	1781	1777	1819
Q Serve(g_s), s	1.2	17.1	10.0	1.8	10.0	10.1	4.9	10.8	4.0	8.0	7.9	8.0
Cycle Q Clear(g_c), s	1.2	17.1	10.0	1.8	10.0	10.1	4.9	10.8	4.0	8.0	7.9	8.0
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	366	1315	587	252	676	653	387	365	309	397	437	447
V/C Ratio(X)	0.13	0.73	0.48	0.28	0.47	0.47	0.39	0.79	0.32	0.64	0.50	0.51
Avail Cap(c_a), veh/h	415	2209	985	316	1138	1099	463	769	652	600	949	971
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	1.00	1.00
Uniform Delay (d), s/veh	13.8	20.1	17.9	15.3	17.3	17.4	20.9	28.4	25.6	19.4	24.1	24.1
Incr Delay (d2), s/veh	0.2	0.8	0.6	0.6	0.5	0.5	0.6	3.8	0.6	1.7	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	6.4	3.4	0.7	3.7	3.6	1.9	4.8	1.4	3.1	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	20.9	18.5	15.9	17.8	17.9	21.5	32.2	26.2	21.2	25.0	25.0
LnGrp LOS	B	C	B	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h		1279			695			536			703	
Approach Delay, s/veh		20.1			17.7			28.1			23.6	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	19.0	8.3	32.0	11.2	22.7	7.6	32.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.9	30.5	6.5	46.1	9.8	39.6	5.1	47.5
Max Q Clear Time (g_c+I1), s	10.0	12.8	3.8	19.1	6.9	10.0	3.2	12.1
Green Ext Time (p_c), s	0.5	1.7	0.0	8.3	0.1	2.4	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	980	1768	201	234
v/c Ratio	0.38	0.65	0.73	0.59
Control Delay	5.5	4.6	62.7	18.7
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	5.5	4.7	62.7	18.7
Queue Length 50th (ft)	111	84	150	40
Queue Length 95th (ft)	178	67	219	115
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2587	2714	386	486
Starvation Cap Reductn	0	142	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.69	0.52	0.48

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	882	0	0	1591	181	211
Future Volume (veh/h)	882	0	0	1591	181	211
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	1796	0	0	1870	1856	1870
Adj Flow Rate, veh/h	980	0	0	1768	201	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	7	0	0	2	3	2
Cap, veh/h	2708	0	0	2820	232	
Arrive On Green	0.79	0.00	0.00	0.79	0.13	0.00
Sat Flow, veh/h	3593	0	0	3741	1767	1585
Grp Volume(v), veh/h	980	0	0	1768	201	0
Grp Sat Flow(s),veh/h/ln	1706	0	0	1777	1767	1585
Q Serve(g_s), s	10.0	0.0	0.0	24.5	13.4	0.0
Cycle Q Clear(g_c), s	10.0	0.0	0.0	24.5	13.4	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2708	0	0	2820	232	
V/C Ratio(X)	0.36	0.00	0.00	0.63	0.87	
Avail Cap(c_a), veh/h	2708	0	0	2820	390	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.6	0.0	0.0	5.1	51.1	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	1.1	10.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	0.0	0.0	10.9	10.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.0	0.0	0.0	6.2	61.3	0.0
LnGrp LOS	A	A	A	A	E	
Approach Vol, veh/h	980			1768	201	
Approach Delay, s/veh	4.0			6.2	61.3	
Approach LOS	A			A	E	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	20.3	99.7	99.7
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	26.5	84.5	84.5
Max Q Clear Time (g_c+I1), s	15.4	12.0	26.5
Green Ext Time (p_c), s	0.4	8.4	23.0

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Notes

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

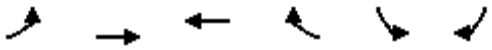
Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1042	44	23	1395	26	0	0	34	0	0	172
Future Vol, veh/h	0	1042	44	23	1395	26	0	0	34	0	0	172
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	6	8	10	2	2	2	2	2	2	2	3
Mvmt Flow	0	1158	49	26	1550	29	0	0	38	0	0	191

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1207	0	0	-	-	604	-	-	790
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.3	-	-	-	-	6.94	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.3	-	-	-	-	3.32	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	531	-	-	0	0	441	0	0	331
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	531	-	-	-	-	441	-	-	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	13.9	29.7
HCM LOS			B	D

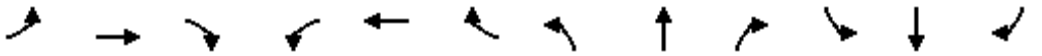
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	441	-	-	531	-	-	331
HCM Lane V/C Ratio	0.086	-	-	0.048	-	-	0.577
HCM Control Delay (s)	13.9	-	-	12.1	-	-	29.7
HCM Lane LOS	B	-	-	B	-	-	D
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-	-	3.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	500	684	1446	127	72	173
v/c Ratio	0.87	0.22	0.75	0.14	0.64	0.66
Control Delay	50.5	1.5	26.0	3.1	78.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	1.5	26.0	3.1	78.7	20.0
Queue Length 50th (ft)	285	25	419	0	57	0
Queue Length 95th (ft)	428	56	#725	32	101	67
Internal Link Dist (ft)		423	832			
Turn Bay Length (ft)	150			150	125	
Base Capacity (vph)	623	3047	1934	927	113	496
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	0.80	0.22	0.75	0.14	0.64	0.35

Intersection Summary

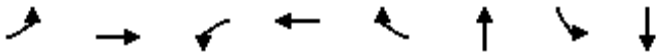
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	450	616	0	0	1301	114	0	0	0	65	0	156
Future Volume (veh/h)	450	616	0	0	1301	114	0	0	0	65	0	156
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	0	1870
Adj Flow Rate, veh/h	500	684	0	0	1446	127	0	0	0	72	0	173
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	0	2
Cap, veh/h	522	3139	0	566	2369	1057	0	2	0	134	0	0
Arrive On Green	0.36	1.00	0.00	0.00	0.67	0.67	0.00	0.00	0.00	0.04	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	0	-84166	0	1781	72	
Grp Volume(v), veh/h	500	684	0	0	1446	127	0	0	0	72	61.5	
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	0	1870	0	1781	E	
Q Serve(g_s), s	18.1	0.0	0.0	0.0	27.4	3.5	0.0	0.0	0.0	4.8		
Cycle Q Clear(g_c), s	18.1	0.0	0.0	0.0	27.4	3.5	0.0	0.0	0.0	4.8		
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	522	3139	0	566	2369	1057	0	2	0	134		
V/C Ratio(X)	0.96	0.22	0.00	0.00	0.61	0.12	0.00	0.00	0.00	0.54		
Avail Cap(c_a), veh/h	715	3139	0	639	2369	1057	0	281	0	134		
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.83	0.83	0.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	19.5	0.0	0.0	0.0	11.2	7.3	0.0	0.0	0.0	57.3		
Incr Delay (d2), s/veh	20.1	0.2	0.0	0.0	1.0	0.2	0.0	0.0	0.0	4.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	18.9	0.1	0.0	0.0	14.5	2.0	0.0	0.0	0.0	4.2		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.6	0.2	0.0	0.0	12.2	7.4	0.0	0.0	0.0	61.5		
LnGrp LOS	D	A	A	A	B	A	A	A	A	E		
Approach Vol, veh/h		1184			1573			0				
Approach Delay, s/veh		16.8			11.8			0.0				
Approach LOS		B			B							

Timer - Assigned Phs	1	2	3	4			7	8				
Phs Duration (G+Y+Rc), s	9.5	0.0	0.0	110.5			26.0	84.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5			4.5	4.5				
Max Green Setting (Gmax), s	5.0	18.0	5.0	74.0			34.5	44.5				
Max Q Clear Time (g_c+I1), s	6.8	0.0	0.0	2.0			20.1	29.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.1			1.4	9.1				

Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

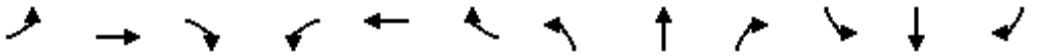


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	211	555	59	1354	57	129	32	81
v/c Ratio	1.01	0.24	0.10	0.54	0.05	1.61	0.11	0.19
Control Delay	92.1	9.9	5.8	10.4	1.3	341.3	47.7	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.1	9.9	5.8	10.4	1.3	341.3	47.7	8.1
Queue Length 50th (ft)	182	97	14	256	0	~94	25	0
Queue Length 95th (ft)	#370	124	26	302	12	#233	56	38
Internal Link Dist (ft)		832		2012		883		460
Turn Bay Length (ft)	150		265		200		150	
Base Capacity (vph)	211	2316	568	2595	1176	80	296	428
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.24	0.10	0.52	0.05	1.61	0.11	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

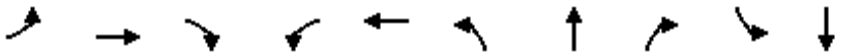
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	445	55	53	1219	51	91	0	25	29	0	73
Future Volume (veh/h)	190	445	55	53	1219	51	91	0	25	29	0	73
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	211	494	61	59	1354	57	101	0	28	32	0	81
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	352	2570	316	766	3093	1380	0	0	105	149	0	105
Arrive On Green	0.81	0.81	0.81	0.03	0.87	0.87	0.00	0.00	0.07	0.07	0.00	0.07
Sat Flow, veh/h	381	3185	392	1781	3554	1585	0	0	1585	1382	0	1585
Grp Volume(v), veh/h	211	275	280	59	1354	57	0	0	28	32	0	81
Grp Sat Flow(s),veh/h/ln	381	1777	1800	1781	1777	1585	0	0	1585	1382	0	1585
Q Serve(g_s), s	36.9	5.0	5.1	0.7	11.3	0.7	0.0	0.0	2.4	0.1	0.0	7.1
Cycle Q Clear(g_c), s	39.2	5.0	5.1	0.7	11.3	0.7	0.0	0.0	2.4	2.4	0.0	7.1
Prop In Lane	1.00		0.22	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	1434	1452	766	3093	1380	0	0	105	149	0	105
V/C Ratio(X)	0.60	0.19	0.19	0.08	0.44	0.04	0.00	0.00	0.27	0.21	0.00	0.77
Avail Cap(c_a), veh/h	352	1434	1452	778	3093	1380	0	0	324	247	0	218
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)	0.97	0.97	0.97	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	3.1	3.1	1.8	1.9	1.2	0.0	0.0	63.0	63.0	0.0	65.2
Incr Delay (d2), s/veh	7.1	0.3	0.3	0.0	0.5	0.1	0.0	0.0	1.3	0.7	0.0	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.5	2.7	2.8	0.3	3.9	0.2	0.0	0.0	1.8	2.0	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	3.4	3.4	1.8	2.4	1.3	0.0	0.0	64.3	63.7	0.0	76.5
LnGrp LOS	B	A	A	A	A	A	A	A	E	E	A	E
Approach Vol, veh/h		766			1470			28			113	
Approach Delay, s/veh		6.4			2.3			64.3			72.9	
Approach LOS		A			A			E			E	

Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		13.9	9.0	119.1	0.0	13.9		128.1				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		29.0	5.5	94.5	5.0	19.5		104.5				
Max Q Clear Time (g_c+I1), s		4.4	2.7	41.2	0.0	9.1		13.3				
Green Ext Time (p_c), s		0.1	0.0	9.2	0.0	0.3		14.9				

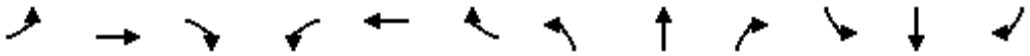
Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	381	92	82	1444	354	443	46	123	173
v/c Ratio	0.51	0.24	0.12	0.16	0.89	0.71	0.88	0.09	0.68	0.27
Control Delay	25.7	18.8	1.2	13.7	35.0	37.2	59.7	0.4	47.2	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	18.8	1.2	13.7	35.0	37.2	59.7	0.4	47.2	35.7
Queue Length 50th (ft)	27	91	0	29	509	211	327	0	63	51
Queue Length 95th (ft)	53	124	10	54	621	308	#505	1	#131	85
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	149	1799	840	505	1809	509	576	550	182	719
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.21	0.11	0.16	0.80	0.70	0.77	0.08	0.68	0.24

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)	68	343	83	74	969	330	319	399	41	111	121	35
Future Volume (veh/h)	68	343	83	74	969	330	319	399	41	111	121	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1767	1870	1870	1856	1870	1870	1856	1781	1870	1811
Adj Flow Rate, veh/h	76	381	92	82	1077	367	354	443	46	123	134	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	5	9	2	2	3	2	2	3	8	2	6
Cap, veh/h	169	1617	698	508	1219	410	506	486	409	208	435	123
Arrive On Green	0.04	0.47	0.47	0.04	0.47	0.47	0.17	0.26	0.26	0.07	0.16	0.16
Sat Flow, veh/h	1781	3469	1497	1781	2611	878	1781	1870	1572	1697	2738	771
Grp Volume(v), veh/h	76	381	92	82	728	716	354	443	46	123	85	88
Grp Sat Flow(s),veh/h/ln	1781	1735	1497	1781	1777	1712	1781	1870	1572	1697	1777	1732
Q Serve(g_s), s	2.4	7.3	3.9	2.6	40.8	42.2	17.8	25.3	2.5	6.6	4.7	4.9
Cycle Q Clear(g_c), s	2.4	7.3	3.9	2.6	40.8	42.2	17.8	25.3	2.5	6.6	4.7	4.9
Prop In Lane	1.00		1.00	1.00		0.51	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	169	1617	698	508	830	800	506	486	409	208	283	275
V/C Ratio(X)	0.45	0.24	0.13	0.16	0.88	0.90	0.70	0.91	0.11	0.59	0.30	0.32
Avail Cap(c_a), veh/h	179	1763	761	520	906	873	506	562	472	208	355	346
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	1.00	1.00
Uniform Delay (d), s/veh	24.1	17.6	16.7	14.2	26.5	26.9	29.6	39.6	31.1	36.5	40.9	41.0
Incr Delay (d2), s/veh	1.9	0.1	0.1	0.1	9.2	11.2	4.2	17.7	0.1	4.4	0.6	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(95%),veh/ln	1.8	5.0	2.3	1.8	25.1	25.5	12.4	19.5	1.7	5.2	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	17.7	16.8	14.4	35.7	38.1	33.9	57.2	31.2	40.8	41.5	41.7
LnGrp LOS	C	B	B	B	D	D	C	E	C	D	D	D
Approach Vol, veh/h		549			1526			843			296	
Approach Delay, s/veh		18.7			35.7			46.0			41.3	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	33.1	9.1	55.9	23.2	22.0	9.0	55.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.6	33.1	5.3	56.0	18.7	22.0	5.1	56.2
Max Q Clear Time (g_c+I1), s	8.6	27.3	4.6	9.3	19.8	6.9	4.4	44.2
Green Ext Time (p_c), s	0.0	1.3	0.0	2.9	0.0	0.7	0.0	7.2

Intersection Summary	
HCM 6th Ctrl Delay	36.0
HCM 6th LOS	D

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1661	1398	184	233
v/c Ratio	0.62	0.52	0.62	0.78
Control Delay	8.7	3.1	54.6	56.1
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	8.7	3.1	54.6	56.1
Queue Length 50th (ft)	265	59	134	145
Queue Length 95th (ft)	430	77	194	219
Internal Link Dist (ft)	1098	119	458	
Turn Bay Length (ft)				
Base Capacity (vph)	2678	2678	435	420
Starvation Cap Reductn	0	181	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.56	0.42	0.55

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1528	0	0	1286	169	214
Future Volume (veh/h)	1528	0	0	1286	169	214
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	0	0	1870	1870	1870
Adj Flow Rate, veh/h	1661	0	0	1398	184	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	0	2	2	2
Cap, veh/h	2856	0	0	2856	216	
Arrive On Green	0.80	0.00	0.00	0.54	0.12	0.00
Sat Flow, veh/h	3741	0	0	3741	1781	1585
Grp Volume(v), veh/h	1661	0	0	1398	184	0
Grp Sat Flow(s),veh/h/ln	1777	0	0	1777	1781	1585
Q Serve(g_s), s	20.7	0.0	0.0	29.6	12.1	0.0
Cycle Q Clear(g_c), s	20.7	0.0	0.0	29.6	12.1	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2856	0	0	2856	216	
V/C Ratio(X)	0.58	0.00	0.00	0.49	0.85	
Avail Cap(c_a), veh/h	2856	0	0	2856	438	
HCM Platoon Ratio	1.00	1.00	1.00	0.67	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.3	0.0	0.0	12.3	51.7	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.6	9.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	0.0	12.7	6.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.2	0.0	0.0	12.9	60.8	0.0
LnGrp LOS	A	A	A	B	E	
Approach Vol, veh/h	1661			1398	184	
Approach Delay, s/veh	5.2			12.9	60.8	
Approach LOS	A			B	E	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	19.1	100.9	100.9
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	29.5	81.5	81.5
Max Q Clear Time (g_c+I1), s	14.1	22.7	31.6
Green Ext Time (p_c), s	0.4	20.5	14.4

Intersection Summary	
HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B

Notes

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

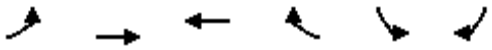
Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1688	40	23	962	36	0	0	55	0	0	291
Future Vol, veh/h	0	1688	40	23	962	36	0	0	55	0	0	291
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1835	43	25	1046	39	0	0	60	0	0	316

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1878	0	0	-	-	939	-	-	543
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	316	-	-	0	0	265	0	0	484
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	316	-	-	-	-	265	-	-	484
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	22.5	25.4
HCM LOS			C	D

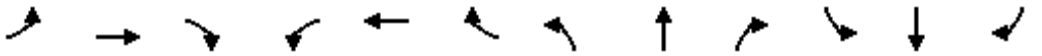
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	265	-	-	316	-	-	484
HCM Lane V/C Ratio	0.226	-	-	0.079	-	-	0.654
HCM Control Delay (s)	22.5	-	-	17.4	-	-	25.4
HCM Lane LOS	C	-	-	C	-	-	D
HCM 95th %tile Q(veh)	0.8	-	-	0.3	-	-	4.6



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	417	1496	889	82	151	253
v/c Ratio	0.66	0.53	0.45	0.09	0.71	0.61
Control Delay	19.0	4.4	18.5	0.6	68.5	12.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	19.0	4.5	18.5	0.6	68.5	12.7
Queue Length 50th (ft)	116	136	213	0	113	0
Queue Length 95th (ft)	266	225	313	5	#196	77
Internal Link Dist (ft)		423	832			
Turn Bay Length (ft)	150			150	125	
Base Capacity (vph)	701	2845	1961	937	236	674
Starvation Cap Reductn	0	347	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	0.59	0.60	0.45	0.09	0.64	0.38

Intersection Summary

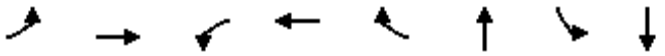
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	384	1376	0	0	818	75	0	0	0	139	0	233
Future Volume (veh/h)	384	1376	0	0	818	75	0	0	0	139	0	233
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	0	1870
Adj Flow Rate, veh/h	417	1496	0	0	889	82	0	0	0	151	0	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	0	2
Cap, veh/h	579	2931	0	302	2431	1084	0	2	0	239	0	0
Arrive On Green	0.21	1.00	0.00	0.00	0.68	0.68	0.00	0.00	0.00	0.10	0.00	0.00
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	0	-84166	0	1781	151	
Grp Volume(v), veh/h	417	1496	0	0	889	82	0	0	0	151	56.1	
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	0	1870	0	1781	E	
Q Serve(g_s), s	9.2	0.0	0.0	0.0	12.6	2.1	0.0	0.0	0.0	10.0		
Cycle Q Clear(g_c), s	9.2	0.0	0.0	0.0	12.6	2.1	0.0	0.0	0.0	10.0		
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	579	2931	0	302	2431	1084	0	2	0	239		
V/C Ratio(X)	0.72	0.51	0.00	0.00	0.37	0.08	0.00	0.00	0.00	0.63		
Avail Cap(c_a), veh/h	848	2931	0	375	2431	1084	0	281	0	290		
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.98	0.98	0.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	5.0	0.0	0.0	0.0	8.0	6.3	0.0	0.0	0.0	53.0		
Incr Delay (d2), s/veh	1.7	0.6	0.0	0.0	0.4	0.1	0.0	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		
%ile BackOfQ(50%),veh/ln	1.7	0.3	0.0	0.0	4.4	0.7	0.0	0.0	0.0	4.7		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.7	0.6	0.0	0.0	8.4	6.4	0.0	0.0	0.0	56.1		
LnGrp LOS	A	A	A	A	A	A	A	A	A	E		
Approach Vol, veh/h		1913			971			0				
Approach Delay, s/veh		2.0			8.2			0.0				
Approach LOS		A			A							

Timer - Assigned Phs	1	2	3	4			7	8				
Phs Duration (G+Y+Rc), s	16.5	0.0	0.0	103.5			16.9	86.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5			4.5	4.5				
Max Green Setting (Gmax), s	15.5	18.0	5.0	63.5			30.5	38.0				
Max Q Clear Time (g_c+I1), s	12.0	0.0	0.0	2.0			11.2	14.6				
Green Ext Time (p_c), s	0.1	0.0	0.0	16.9			1.2	6.5				

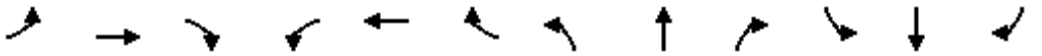
Intersection Summary												
HCM 6th Ctrl Delay			6.7									
HCM 6th LOS			A									



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	63	1597	23	752	37	59	75	111
v/c Ratio	0.12	0.59	0.10	0.26	0.03	0.74	0.46	0.27
Control Delay	7.4	10.0	5.1	4.1	1.3	51.3	64.8	1.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	10.2	5.1	4.1	1.3	51.3	64.8	1.6
Queue Length 50th (ft)	13	282	3	56	0	0	68	0
Queue Length 95th (ft)	48	611	16	167	9	#60	102	0
Internal Link Dist (ft)		832		2012		883		460
Turn Bay Length (ft)	150		265		200		150	
Base Capacity (vph)	529	2729	238	2901	1306	80	277	521
Starvation Cap Reductn	0	456	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.70	0.10	0.26	0.03	0.74	0.27	0.21

Intersection Summary

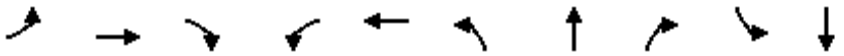
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	1389	80	21	692	34	43	0	11	69	0	102
Future Volume (veh/h)	58	1389	80	21	692	34	43	0	11	69	0	102
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	63	1510	87	23	752	37	47	0	12	75	0	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	598	2720	156	290	3017	1346	0	0	139	176	0	139
Arrive On Green	0.80	0.80	0.80	0.02	0.85	0.85	0.00	0.00	0.09	0.09	0.00	0.09
Sat Flow, veh/h	687	3416	196	1781	3554	1585	0	0	1585	1402	0	1585
Grp Volume(v), veh/h	63	783	814	23	752	37	0	0	12	75	0	111
Grp Sat Flow(s),veh/h/ln	687	1777	1835	1781	1777	1585	0	0	1585	1402	0	1585
Q Serve(g_s), s	2.9	22.8	23.1	0.3	5.8	0.5	0.0	0.0	1.0	6.1	0.0	9.8
Cycle Q Clear(g_c), s	2.9	22.8	23.1	0.3	5.8	0.5	0.0	0.0	1.0	7.0	0.0	9.8
Prop In Lane	1.00		0.11	1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	598	1415	1461	290	3017	1346	0	0	139	176	0	139
V/C Ratio(X)	0.11	0.55	0.56	0.08	0.25	0.03	0.00	0.00	0.09	0.43	0.00	0.80
Avail Cap(c_a), veh/h	598	1415	1461	322	3017	1346	0	0	402	315	0	296
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)	0.82	0.82	0.82	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	3.2	5.3	5.3	4.4	2.1	1.7	0.0	0.0	59.6	62.2	0.0	63.6
Incr Delay (d2), s/veh	0.3	1.3	1.3	0.1	0.2	0.0	0.0	0.0	0.3	1.6	0.0	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	7.1	7.4	0.1	1.3	0.1	0.0	0.0	0.4	2.7	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.5	6.5	6.6	4.5	2.2	1.7	0.0	0.0	59.8	63.8	0.0	73.6
LnGrp LOS	A	A	A	A	A	A	A	A	E	E	A	E
Approach Vol, veh/h		1660			812			12			186	
Approach Delay, s/veh		6.4			2.3			59.8			69.7	
Approach LOS		A			A			E			E	

Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		16.9	7.5	117.6	0.0	16.9		125.1				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		36.0	5.5	87.5	5.0	26.5		97.5				
Max Q Clear Time (g_c+I1), s		3.0	2.3	25.1	0.0	11.8		7.8				
Green Ext Time (p_c), s		0.0	0.0	18.8	0.0	0.7		5.9				

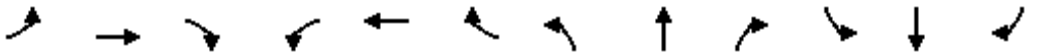
Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	57	1187	355	86	783	189	351	122	351	548
v/c Ratio	0.23	0.85	0.47	0.55	0.57	0.52	0.84	0.27	0.86	0.52
Control Delay	19.5	38.4	12.3	32.1	27.2	26.1	61.5	6.5	48.3	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	38.4	12.3	32.1	27.2	26.1	61.5	6.5	48.3	34.4
Queue Length 50th (ft)	24	440	72	36	234	88	260	0	197	180
Queue Length 95th (ft)	48	536	158	#73	299	139	#410	40	#361	237
Internal Link Dist (ft)		352			2011		1524			1062
Turn Bay Length (ft)	130		170	150		200		220	265	
Base Capacity (vph)	253	1529	807	155	1497	393	475	505	441	1195
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.78	0.44	0.55	0.52	0.48	0.74	0.24	0.80	0.46

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)	52	1092	327	79	533	188	174	323	112	323	463	41
Future Volume (veh/h)	52	1092	327	79	533	188	174	323	112	323	463	41
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	57	1187	355	86	579	204	189	351	122	351	503	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	1408	628	180	1035	364	383	400	339	404	934	83
Arrive On Green	0.04	0.40	0.40	0.04	0.40	0.40	0.10	0.21	0.21	0.17	0.28	0.28
Sat Flow, veh/h	1781	3554	1585	1781	2578	906	1781	1870	1585	1781	3300	294
Grp Volume(v), veh/h	57	1187	355	86	399	384	189	351	122	351	270	278
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1707	1781	1870	1585	1781	1777	1817
Q Serve(g_s), s	1.9	31.2	17.9	2.9	17.8	17.9	8.4	18.7	6.7	15.1	13.2	13.3
Cycle Q Clear(g_c), s	1.9	31.2	17.9	2.9	17.8	17.9	8.4	18.7	6.7	15.1	13.2	13.3
Prop In Lane	1.00		1.00	1.00		0.53	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	297	1408	628	180	713	685	383	400	339	404	503	514
V/C Ratio(X)	0.19	0.84	0.57	0.48	0.56	0.56	0.49	0.88	0.36	0.87	0.54	0.54
Avail Cap(c_a), veh/h	322	1606	716	197	803	772	434	500	424	489	632	647
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	1.00	1.00
Uniform Delay (d), s/veh	18.5	28.2	24.2	23.2	23.8	23.8	27.2	39.2	34.5	25.4	31.2	31.2
Incr Delay (d2), s/veh	0.3	3.9	0.8	1.9	0.7	0.7	1.0	13.8	0.6	13.5	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	13.2	6.5	1.2	7.2	7.0	3.5	9.7	2.6	7.4	5.5	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.9	32.0	25.0	25.2	24.4	24.5	28.2	53.0	35.1	38.9	32.1	32.1
LnGrp LOS	B	C	C	C	C	C	C	D	D	D	C	C
Approach Vol, veh/h		1599			869			662			899	
Approach Delay, s/veh		30.0			24.5			42.6			34.8	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.1	26.5	9.1	45.3	15.0	33.6	8.5	45.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	22.5	27.5	5.5	46.5	13.4	36.6	5.5	46.5
Max Q Clear Time (g_c+I1), s	17.1	20.7	4.9	33.2	10.4	15.3	3.9	19.9
Green Ext Time (p_c), s	0.5	1.3	0.0	7.6	0.1	2.9	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	31.9
HCM 6th LOS	C