Range Point Neighbourhood Transportation Impact Assessment Final Report

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Revision History

Rev.	Issue Date	Description
0	November 24, 2022	Range Point Neighbourhood Transportation Impact Assessment Study – Draft Report
1	January 17, 2023	Range Point Neighbourhood Transportation Impact Assessment Study – Final Report

1.0 Introduction

Morrison Hershfield Limited was retained by Yukon Government (YG) to perform a Transportation Impact Assessment (TIA) study for the proposed development in the YG's Lot 262-6 and Kwanlin Dün First Nation's (KDFN) Settlement Land parcel C-15B located in the Range Point Neighbourhood of Whitehorse, Yukon.

1.1 Study Scope & Methodology

The transportation impact assessment study was developed following the guidelines and standards from best practices. The main purpose of the transportation impact assessment study is to determine what the impacts may be from the proposed development and to determine what measures may be required to mitigate adverse impacts (if any) and to allow the roadway network to provide a satisfactory Level of Service (LOS). The following three scenarios are evaluated in the study. The existing and background scenarios present the operation conditions and associated recommendations without the proposed development, and the total traffic conditions summarize the recommendations mainly due to the proposed development.

- 2022 Existing Condition
- Scenario 1 - 2032 Horizon Year
    - 2032 Background Condition
    - 2032 Total Traffic Conditions with Minimum Number of Units (249 units)[1]
    - 2032 Total Traffic Conditions with Maximum Number of Units (516 units)[2]
- Scenario 2 - 2042 Horizon Year
    - 2042 Background Condition
    - 2042 Total Traffic Conditions with Minimum Number of Units (249 units)
    - 2042 Total Traffic Conditions with Maximum Number of Units (516 units)

Traffic analyses were conducted using the methods and procedures of the Highway Capacity Manual (HCM) and Trafficware's Synchro 10 software suite for intersections. Typical measures of effectiveness are delay, volume-to-capacity ratio (v/c ratio) and LOS.

The v/c ratio is a ratio of the factored volume to the calculated capacity. It is generally accepted that movements experiencing v/c ratios higher than 0.90 are indicative of improvements needed.

The LOS is determined as a function of the average delay per vehicle. The criteria upon which LOS is determined differs for signalized intersections versus unsignalized intersections. **Table 1** shows the relationships between LOS and average delay per vehicle for signalized and unsignalized intersections. Movements experiencing LOS of E or F will require improvements.

TABLE 1. LEVEL OF SERVICE CRITERIA OF SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

Level of Service (LOS)	Average Delay for UNSIGNALIZED Intersection Movements	Average Delay for SIGNALIZED Intersection Movements
A	0 – 10 sec. per vehicle	0 – 10 sec. per vehicle
B	> 10 – 15 sec. per vehicle	> 10 – 20 sec. per vehicle
C	> 15 – 25 sec. per vehicle	> 20 – 35 sec. per vehicle
D	> 25 – 35 sec. per vehicle	> 35 – 55 sec. per vehicle
E	> 35 – 50 sec. per vehicle	> 55 – 80 sec. per vehicle
F	> 50 sec. per vehicle	> 80 sec. per vehicle

[1] Lowest end of housing unit projections

[2] Highest end of housing unit projections

In addition to delay, LOS and v/c ratio measures, queues for critical movements (if any) are also evaluated to ensure that the 95th percentile queue does not exceed the existing storage length or impact upstream intersections.

1.2 Study Area Description

The Government of Yukon (YG) Land Development Branch and Kwanlin Dün First Nation (KDFN) Department of Heritage, Lands and Resources (HLR) are jointly developing YG's Lot 262-6 and KDFN's Settlement Land parcel C-15B in the Range Point neighbourhood of Whitehorse (**Figure 1**). The planning area consists of two surveyed land parcels and an unsurveyed "triangle" of Crown land situated between them. The area is situated on the west side of Range Road North and bordered by McIntyre Creek to the north, Mountain View Drive to the west, and Northland Mobile Home Park to the south. The area is generally flat to gently sloping, however, the western and northern portion of the site consist of a glaciolacustrine escarpment situated about 35 metres above McIntyre Creek with grades of up to 30%. Range Road is a north-south two-lane collector road running across the Range Point neighbourhood and will serve as the main access to/from the proposed site. Mountain View Drive is a north-south two-lane arterial road running across the west side of the site, with no existing direct access to the proposed site due to topography constraints.

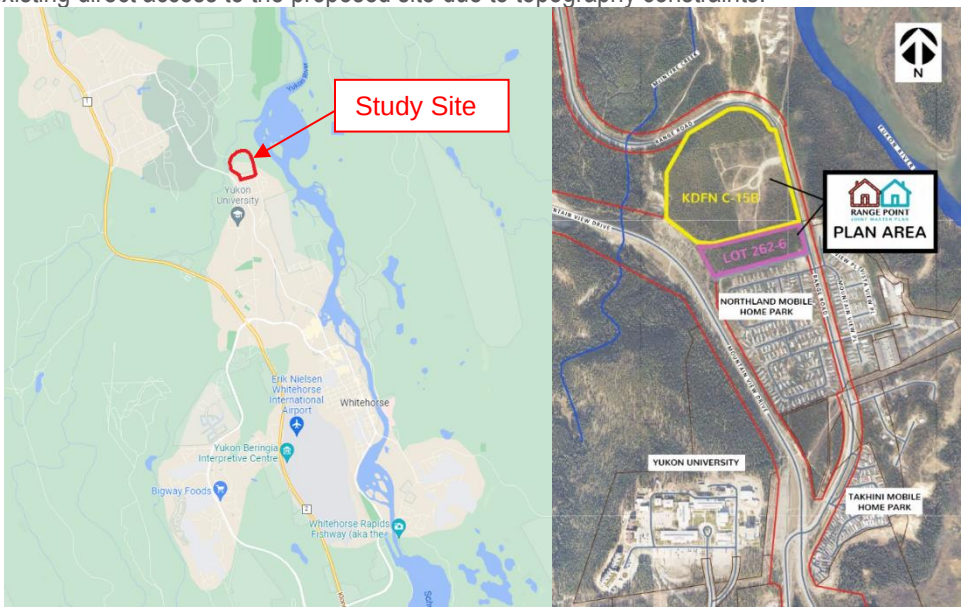


FIGURE 1. LOCATION OF THE PROPOSED DEVELOPMENT SITE

1.3 Existing Road Network Description

Range Road is a northbound-southbound two-lane undivided collector, with an unpaved multi-use pathway running parallel along the roadway.

Mountain View Drive is a northbound-southbound two-lane undivided arterial road that provides major connection between downtown and the communities on the north side of the city, including Whistle Bend and Porter Creek neighbourhoods.

Mountain View Drive and Range Road intersects to the south of the study site. This signalized intersection will serve as the main access point from the proposed Range Point neighbourhood to the rest of the city.

Range Road also connects with Whistle Bend Way with a stop controlled T intersection to the north of the study site. Whistle Bend Way is a northbound-southbound two-lane divided collector road providing the key connection between the Whistle Bend neighbourhood and Mountain View Drive.

Based on the "Whistle Bend Traffic Impact Analysis Update R1 Report" dated March 27, 2012, it is expected that Mountain View Drive will carry all the north-south traffic between Whitehorse downtown and the Whistle Bend and Porter Creek neighbourhoods as the communities build up.

Table 2 below summarizes the information of the above-mentioned roadways surrounding the study site.

TABLE 2. ROADWAYS SURROUNDING THE PROPOSED DEVELOPMENT SITE

#	Name	Classification	Configuration	Speed Limit
1	Range Road	Collector	Two-lane undivided	50 kph
2	Mountain View Drive	Arterial	Two-lane undivided	70 kph
3	Whistle Bend Way – Range Road	Arterial	Two-lane divided	50 kph

The typical intersections of interest of this TIA include:

1 Site Access 1 (North) / Range Road (Unsignalized)
2 Site Access 2 (South) / Range Road (Unsignalized)
3 Mountain View Drive / Range Road (Signalized)
4 Range Road / Whistle Bend Way (Unsignalized)

The following figure (**Figure 2**) illustrates the layout of the road network and above mentioned intersections surrounding the study site.

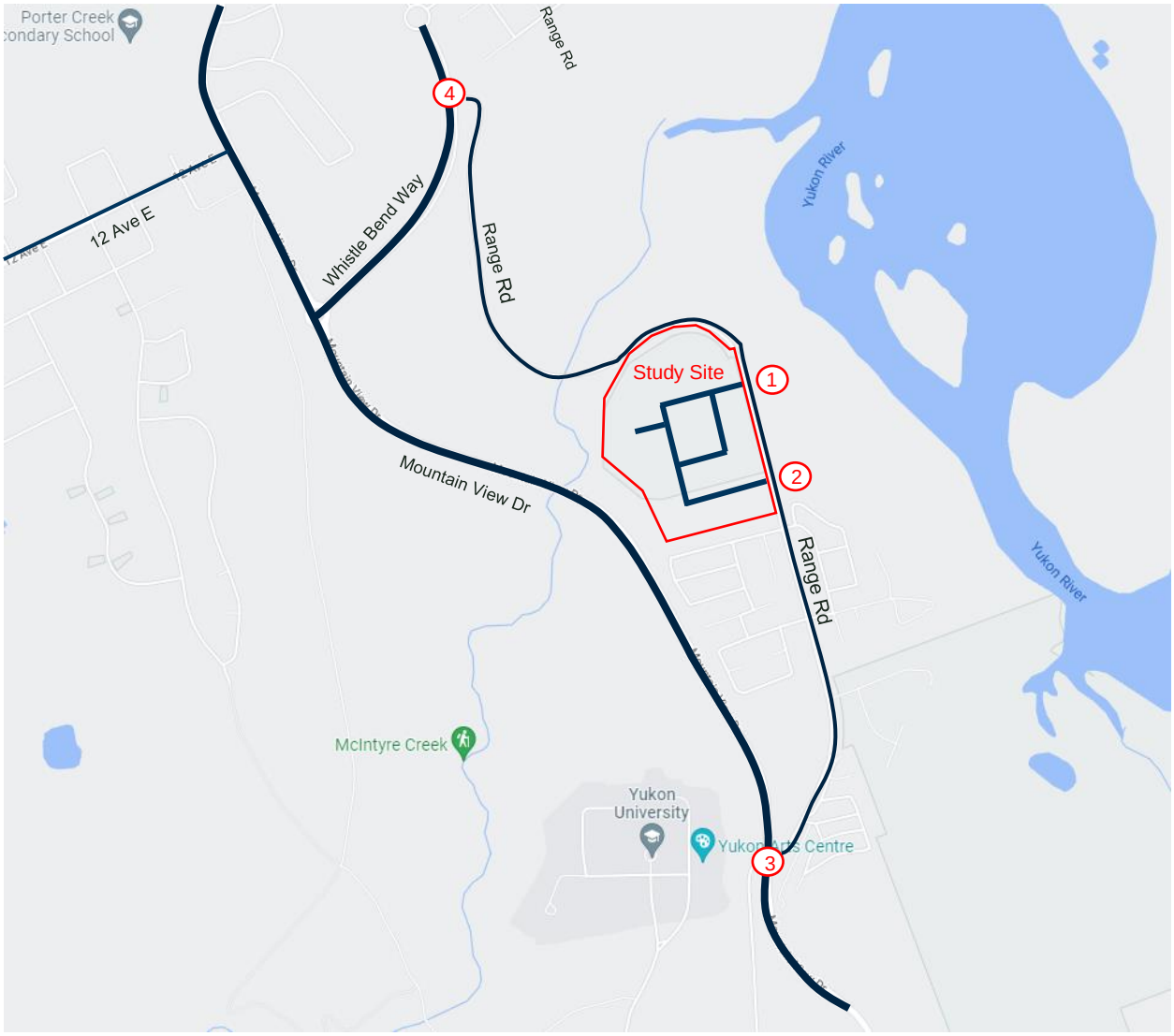


FIGURE 2. ROAD NETWORK SURROUNDING THE PROPOSED SITE

2.0 2022 Existing Condition

2.1 Traffic Volumes and Lane Configurations

The turning movement counts of Mountain View Drive / Range Road (2019) was obtained from the City of Whitehorse for the traffic analysis (**Appendix A**). The provided traffic volume was adjusted to the current year (2022) volume conditions with an annual growth rate of 2.0%.

The 2.0% growth rate was calculated by comparing the overall traffic volumes during the morning and afternoon peak hours over several years. Characteristically, traffic growth is proportional to the population growth. Both territory and Whitehorse population increase similarly based on historical population trends. By comparing the overall traffic volumes of several main intersections within the city, volumes grew by 2% in average between the period from 2015 to 2019. In comparing the population growth for the same period, the Yukon territory grew from 38,594 residents in 2016 to 41,436 in 2019, with a growth rate of approximately 2%.

Additionally, “Whistle Bend Traffic Impact Analysis Update R1 Report” (dated March 27, 2012) and “Whistle Bend Update Phase 8-16 Traffic Impact Assessment Updated” (dated March 2022) provided the traffic volume projections to/from Whistle Bend neighbourhood when it is fully built out (**Figure 3**). According to the 2022 First Quarter Population Report by Yukon Bureau of Statistics dated July 2022 (**Appendix B**), the existing population of Whistle Bend neighbourhood is 2,503, while it is expected that its population will grow to 8,127 when all phases of the neighbourhood is fully built out and occupied. Based on the above information, the through traffic volumes along Whistle Bend Way under 2022 existing condition were estimated by reducing the full build out volumes proportionally using the existing population (2,503) and full build out population (8,127) of Whistle Bend neighbourhood.

Range Road is expected to serve the local Range Road community under existing condition and in the future. Therefore, nominal existing background traffic volumes of 10 vehicles per hour during both a.m. and p.m. peak hours were assigned to the segment of Range Road to the north of the proposed development.

In sum, the 2022 existing a.m. and p.m. peak hour traffic volumes of the studied intersections are illustrated in the following **Figure 4**. The existing lane configurations are illustrated in **Figure 5**.

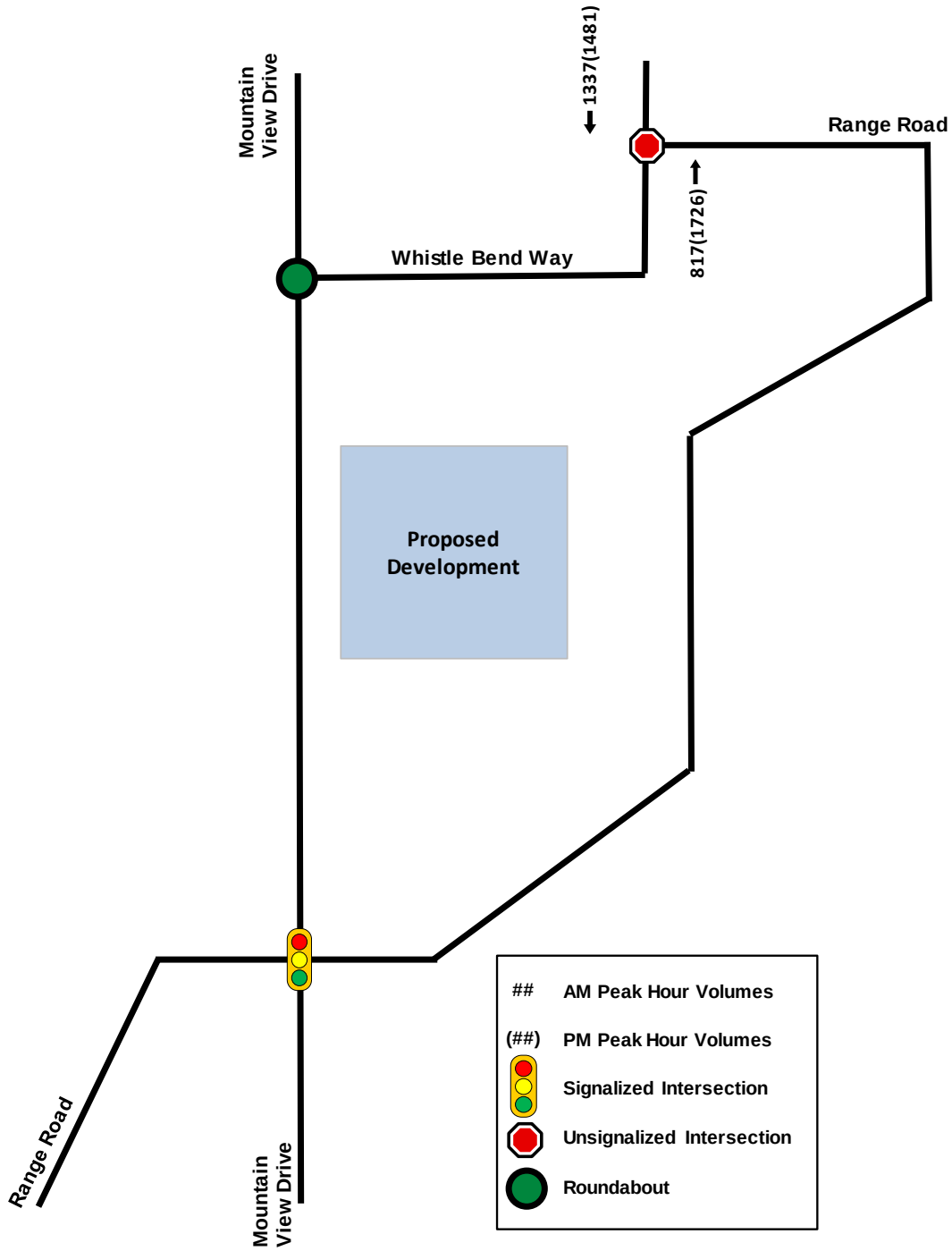


FIGURE 3. PEAK HOUR TRAFFIC VOLUMES TO/FROM WHISTLE BEND – FULL BUILD OUT

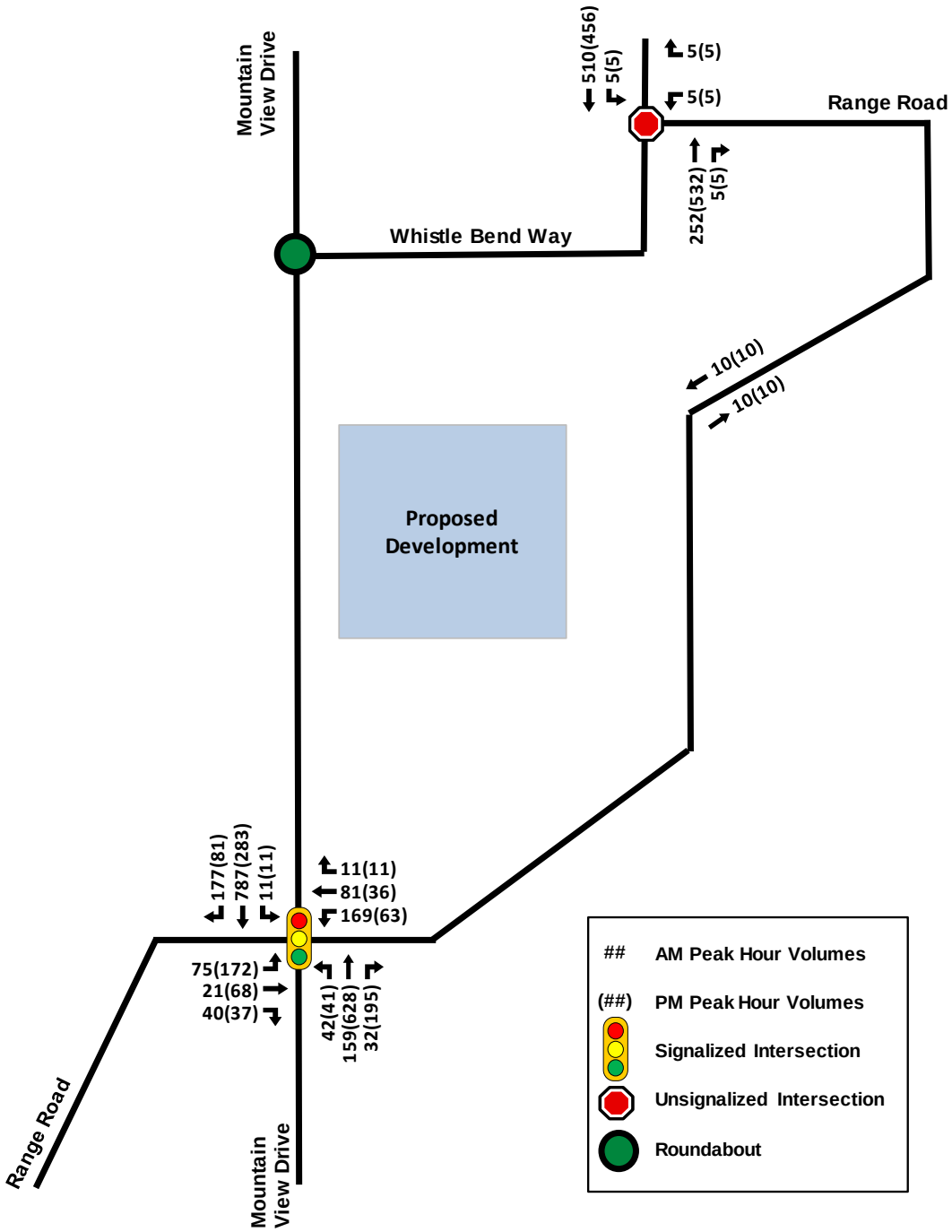


FIGURE 4. 2022 EXISTING TRAFFIC VOLUMES – WEEKDAY AM PEAK (PM PEAK)

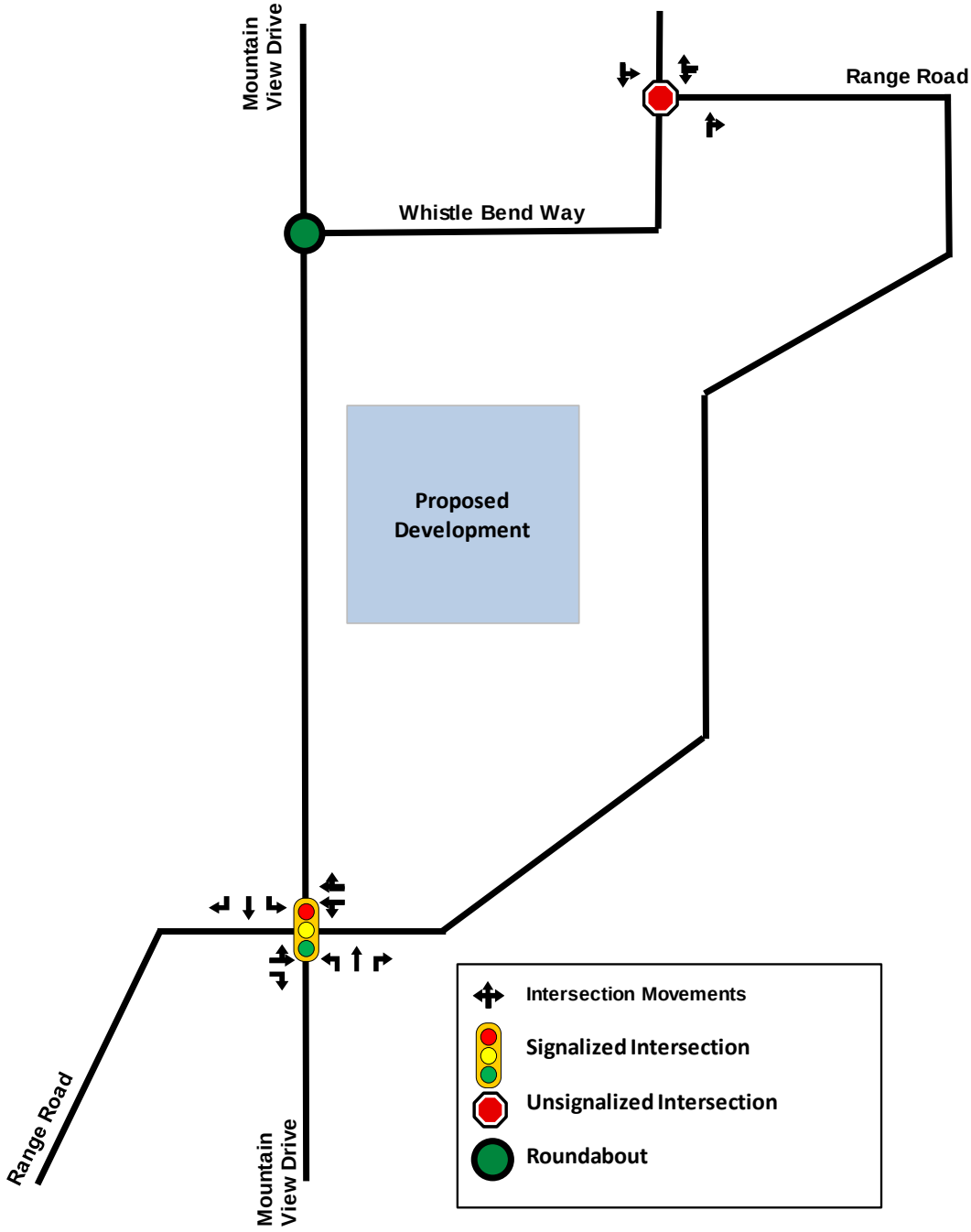


FIGURE 5. 2022 EXISTING LANE CONFIGURATIONS

2.2 Capacity Analysis

Synchro/SimTraffic software version 10 was used to conduct the capacity analysis for the study intersections under 2022 existing conditions. The intersections are performing satisfactorily with acceptable LOS and v/c ratios. **Table 3** summarizes the capacity analysis results of the weekday a.m. peak and p.m. peak hours. Detailed Synchro reports are included in **Appendix C**.

TABLE 3. 2022 EXISTING CONDITION INTERSECTION PERFORMANCE (WEEKDAY AM AND PM PEAKS)

Intersections		AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Drive (NB/SB) & Range Road (EB/WB)	Intersection Overall	B	18.2	0.89	-	B	11.6	0.63	-
4. Whistle Bend Way (NB/SB) & Range Rd (WB)	Intersection Overall	A	0.2	0.16	-	A	0.2	0.34	-

2.3 Site Visit

A site visit to the study site was conducted in the afternoon peak of Monday, October 3rd, 2022. Select site visit photos are shown in **Figure 6**.

The following were observed during the site visits:

- No major traffic issue was observed along Range Road to the east of Mountain View Drive.
- No sidewalk, crosswalk, or on-street parking is available along the Range Road North corridor. Minimal roadside facilities were observed (e.g., signage).
- There is an unpaved multi-use pathway available to the east of Range Road North. A few pedestrians and cyclists were observed using the multi-use pathway during the site visit.
- Speeding was observed along the curvature of Range Road to the north of the study site.

Range Road & Existing Access To the Land Parcel

Range Road

Range Rd & Mountain View Drive Intersection

Range Rd & Whistle Bend Way – Range Road Intersection

FIGURE 6. SITE VISIT PHOTOS

3.0 Proposed Development

3.1 Proposed Development

According to the site plan provided by Groundswell Planning (**Appendix D**), the proposed development mainly comprises of a variety type of residential developments, including single detached home, duplex/triplex, cottage cluster housing, medium density multiple unit buildings and high density multiple unit buildings.

Groundswell Planning then provided updated minimum and maximum residential housing unit counts on October 13, 2022, to replace the housing unit counts show in the site plan (**Appendix D**). Those updated housing unit counts are used for the purpose of this TIA study. As shown in **Table 4**, the updated total minimum and maximum housing unit counts are 249 units and 516 units, respectively.

TABLE 4. PROPOSED MINIMUM AND MAXIMUN HOUSING UNIT COUNTS

A) HOUSING UNIT COUNTS	CONCEPT D			
	KDFN		Lot 262-2	
	Min	Max	Min	Max
Comprehensive Residential Single Family 2 (RCS2)				
Single detached lots	14	14	10	10
Duplex lots			12	12
Triplex lots	15	15	12	12
Comprehensive Residential Multiple Family (RCM)	128	256		
Comprehensive Residential Multiple Family 2 (RCM2)				
Cottage Cluster Homes (RCM3)	24	87	13	47
Comprehensive Neighbourhood Commercial (CNC)				
Residential Multiple Housing (RM)	21	**63**		
	202	435	47	81
	Total Minimum (KDFN/YG)	**249**	Total Maximum (KDFN/YG)	**516**
		Median Estimate (KDFN/YG)	**382.5**	

3.2 Trip Generation (Weekday AM and PM Peak Hours)

The ITE Trip Generation Manual 10th Edition is used to estimate the trips generated from the proposed development. Based on the nature of this development, the ITE Land Use code Single-Family Detached Housing (Land use: 210), Single-Family Attached Housing (Land use: 215), and Multifamily Housing Low-Rise (Land use: 220) are considered comparable to this development. For conservative reasons, Multifamily Housing Low-Rise (Land Use: 220) is used for all multifamily development types due to its higher average trip generation rates compared to other multifamily land use categories (i.e., Multifamily Housing Mid-Rise and Multifamily Housing High-Rise). The following tables (**Table 5** and **Table 6**) summarize the estimated trip generation resulting from minimum and maximum housing unit counts of the development. Trip generation details and the ITE Trip Generation sheets of the above mentioned land uses are included in **Appendix E**.

TABLE 5. DEVELOPMENT TRIP GENERATION – MINIMUM HOUSING UNIT COUNTS

Minimum Housing Unit Counts				Total Generated Trips			Total Distribution of Generated Trips			
ITE comparable Land Use	ITE units	On a	Expected ITE Units (Dewelling Units)	Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out
Single-Family Detached Housing (210)	Dwelling Units	weekday	24	271	20	26	5	15	16	10
Single-Family Attached Housing (215)	Dwelling Units	weekday	39	247	15	19	5	10	11	8
Single-Family Attached Housing (215)	Dwelling Units	weekday	37	231	14	18	4	10	10	8
Multifamily Housing (Low-Rise) (220)	Dwelling Units	weekday	149	1030	69	85	17	52	54	31
			249	**1780**	**118**	**148**	**31**	**87**	**91**	**57**

TABLE 6. DEVELOPMENT TRIP GENERATION – MAXIMUM HOUSING UNIT COUNTS

Maximum Housing Unit Counts				Total Generated Trips			Total Distribution of Generated Trips			
ITE comparable Land Use	ITE units	On a	Expected ITE Units (Dewelling Units)	Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out
Single-Family Detached Housing (210)	Dwelling Units	weekday	24	271	20	26	5	15	16	10
Single-Family Attached Housing (215)	Dwelling Units	weekday	39	247	15	19	5	10	11	8
Single-Family Attached Housing (215)	Dwelling Units	weekday	134	971	64	76	20	44	43	33
Multifamily Housing (Low-Rise) (220)	Dwelling Units	weekday	319	2120	122	158	29	93	100	58
			516	**3609**	**221**	**279**	**59**	**162**	**170**	**109**

3.3 Trip Distribution

Trip distribution is used to determine the directional percentages for vehicles entering and leaving the proposed site. Considering the nature of the proposed development and the surrounding road network and given that there is no meaningful existing traffic information available along Range Road adjacent to the new development site, it is assumed that the site-generated trips for both 2032 and 2042 horizon years will travel northbound/southbound along Range Road based on the city's population split to the north and south of the development (**Table 7**). Information of the city's 2022 existing population was summarized based on the 2022 First Quarter Population Report by Yukon Bureau of Statistics dated July 2022 (**Appendix B**). The site generated traffic volumes with minimum housing units and maximum housing units are illustrated in the following **Figure 7** and **Figure 8**, respectively.

TABLE 7. SITE-GENERATED TRIPS NORTHBOUND/SOUTHBOUND DIRECTIONALY SPLIT ALONG RANGE ROAD

Direction	Directional Split	Population Split
Northbound	27%	8,284 (To the north of the site, including Porter Creek and Whistle Bend)
Southbound	73%	22,333 (To the south of the site)
Total	100%	30,617

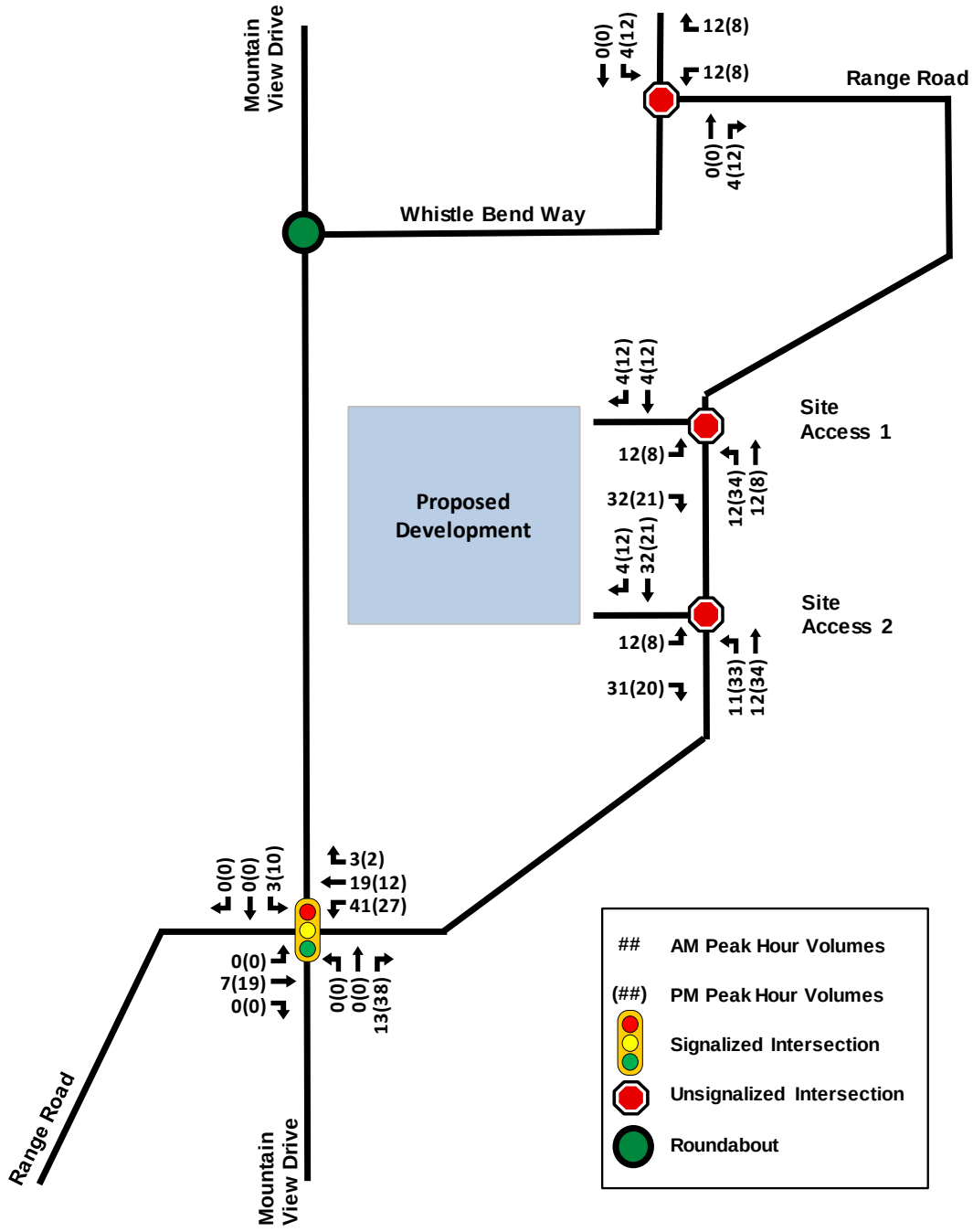


FIGURE 7. DEVELOPMENT VEHICULAR TRIPS (MINIMUM) – WEEKDAY AM PEAK (PM PEAK)

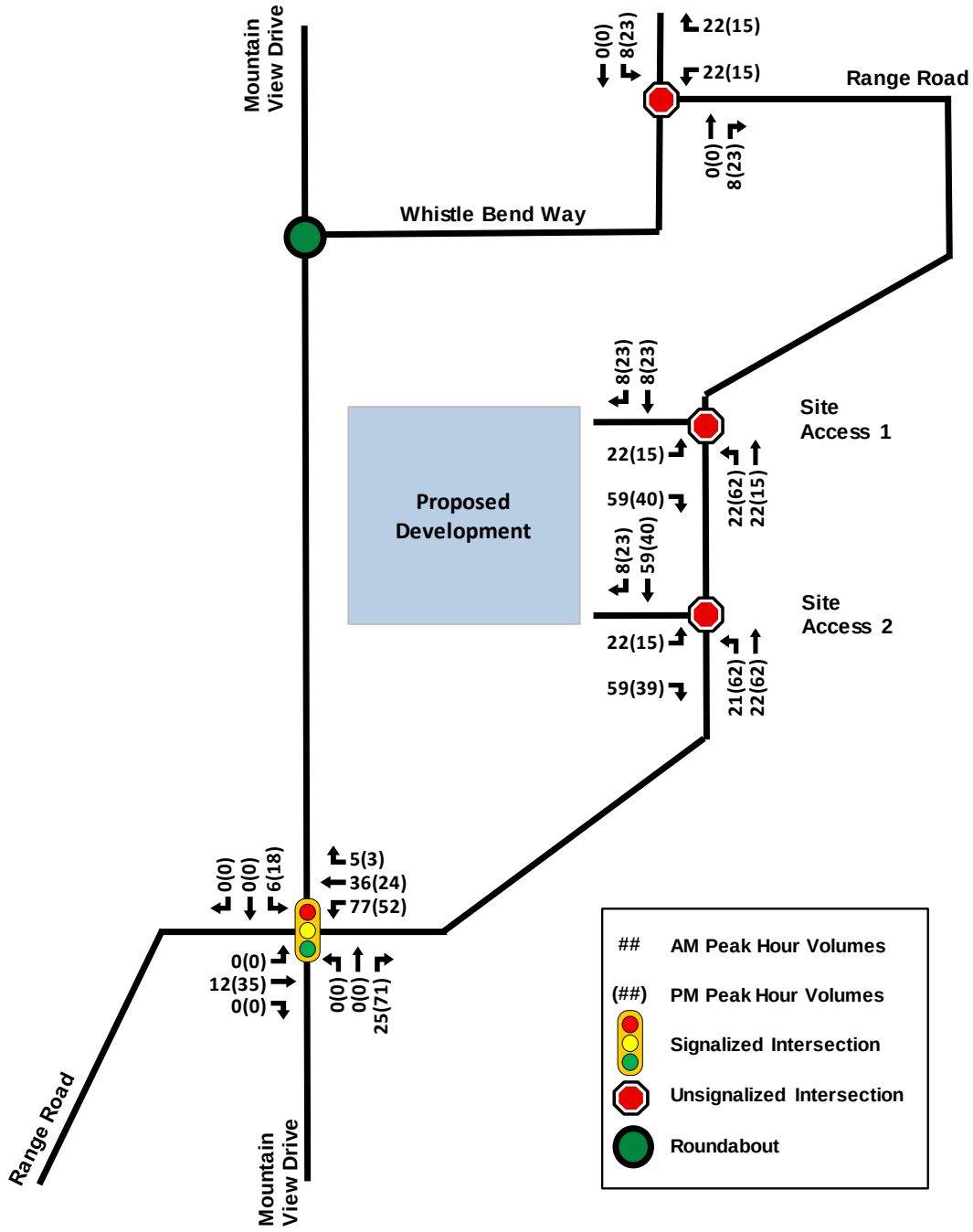


FIGURE 8. DEVELOPMENT VEHICULAR TRIPS (MAXIMUM) – WEEKDAY AM PEAK (PM PEAK)

4.0 Scenario 1 - 2032 Weekday Peak Hours - Background Traffic Condition

4.1 2032 Weekday Peak Hours - Background Condition Traffic Volumes

Background traffic volumes reflect growth in traffic over time that is not related to the proposed development. Background traffic volumes for each horizon year are forecasted using a 2.0% annual growth rate from 2022 existing traffic levels. Additionally, as the Whistle Bend neighbourhood is expected to grow much faster than the rest of the city, and the population is expected to grow from the existing level (2,503 people) to full build-out level (8,127 people) within approximately 20 years, a higher average annual growth rate of 6% is used to project the traffic volumes from/to the Whistle Bend neighbourhood. **Figure 9** illustrates estimated background traffic volumes for the 2032 horizon years.

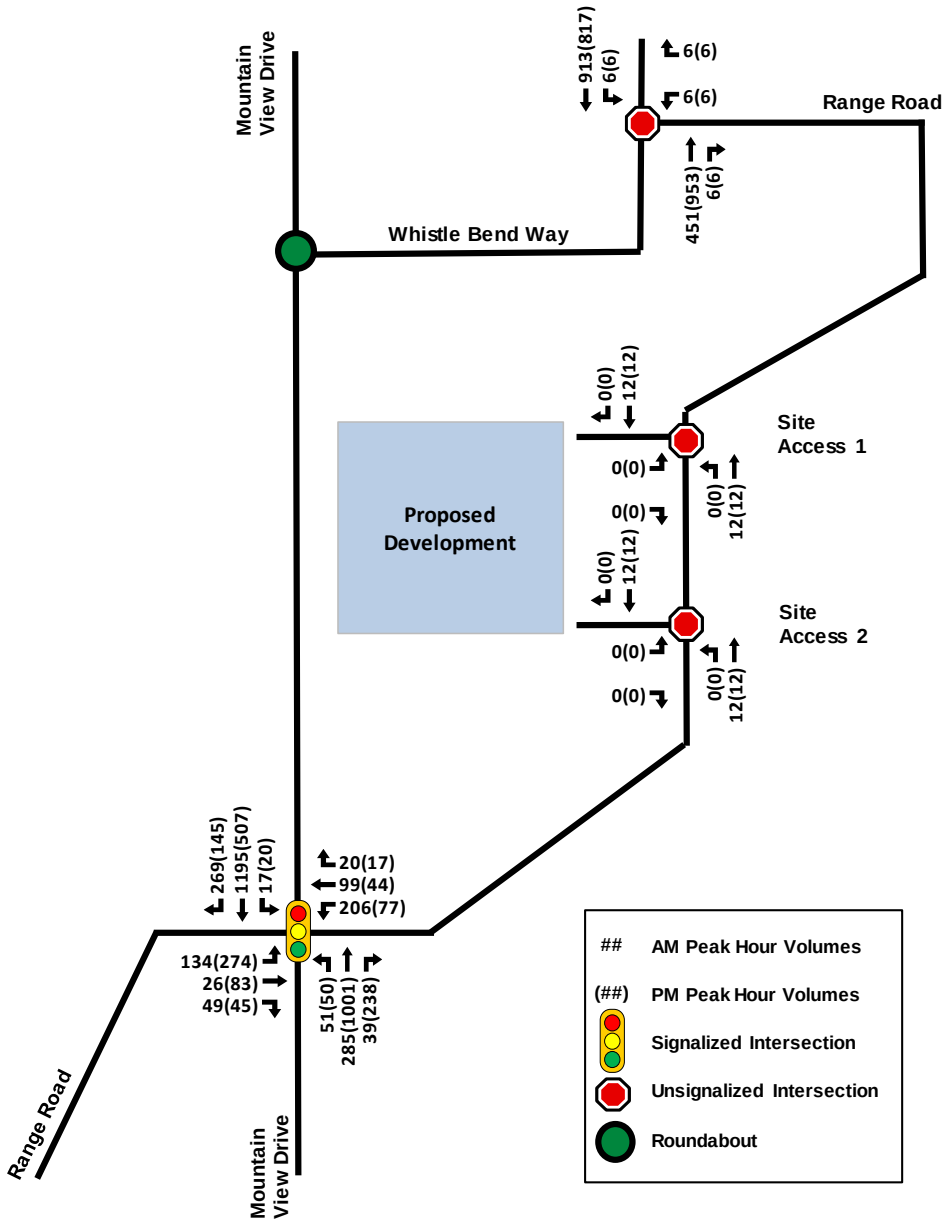


FIGURE 9. 2032 BACKGROUND TRAFFIC VOLUMES – WEEKDAY AM PEAK (PM PEAK)

4.2 2032 Weekday Peak Hours - Background Condition Capacity Analysis

Background traffic conditions indicate the performance of existing road networks in the future years, assuming the proposed development is not in place. The background traffic capacity analysis was conducted for both a.m. and p.m. peak hours on a typical weekday. Summaries of intersection capacity analysis of 2032 Horizon are included in **Table 8**. Detailed Synchro results of 2032 background traffic capacity analyses are included in **Appendix F**.

As shown in the capacity analysis results, the southbound through movement and the northbound through movement along Mountain View Drive at the intersection of Mountain View Drive / Range Road are expected to operate with LOS F with high delays and v/c ratios during a.m. and p.m. peak hours, respectively. Therefore, roadway configuration and signal timing improvements are recommended accordingly assuming no major transit or active transportation solutions are put in place (see **Section 4.3** below).

TABLE 8. 2032 BACKGROUND INTERSECTION PERFORMANCE (WEEKDAY AM AND PM PEAK HOURS)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movements	NBT	B	10.4	0.29	46.2	F	109.9	1.17	287.4
		SBT	F	133.6	1.23	358.1	B	17.9	0.59	93.2
	Intersection Overall		E	75.6	1.23	-	E	57.6	1.17	-
4. Whistle Bend Way (NB/SB) & Range Road (WB)	Intersection Overall		A	0.3	0.29	-	A	0.4	0.61	-

4.3 2032 Weekday Peak Hours - Background Condition Recommended Improvements

Due to the operating conditions of Mountain View Dr / Range Road intersection described in the above section, the following improvements are recommended (**Table 9**). Please note, the recommended improvements are based on the traffic volume projections and assumptions from the "Whistle Bend Traffic Impact Analysis Update R1 Report" dated March 27, 2012, and are intended to address issues stemming from the growth of the background traffic. Some of the recommended improvements are based on the above mentioned report (e.g., Mountain View Drive widening), and some of the improvements provide additional details to improve intersection operations (e.g., signal timing/phasing improvements). It is worth to note that the recommended improvements could be potentially altered if major changes to traffic patterns from Whistle Bend neighbourhood are expected in the future (e.g., due to Whistle Bend development plan updates or major transit / active transportation improvements along the Mountain View Drive corridor). The updated lane configurations are illustrated in **Figure 10**.

TABLE 9. 2032 BACKGROUND CONDITION RECOMMENDED IMPROVEMENTS

Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• Widen Mountain View Drive to a 4-lane arterial road, with two travel lanes each direction. (Based on the Whistle Bend Traffic Impact Analysis Update R1 Report, the Mountain View Drive is recommended to be widened between Whistle Bend Way and 2nd Ave)
	Signal Timing / Phasing	• Update the signal timing plan parameters • Increase cycle lengths to 80 seconds for a.m. peak and p.m. peak • Update Flash Don't Walk (FDW) times to 31 seconds for north-south crosswalks and 20 seconds for east-west crosswalks, based on 1.0 m/s pedestrian walking speed.

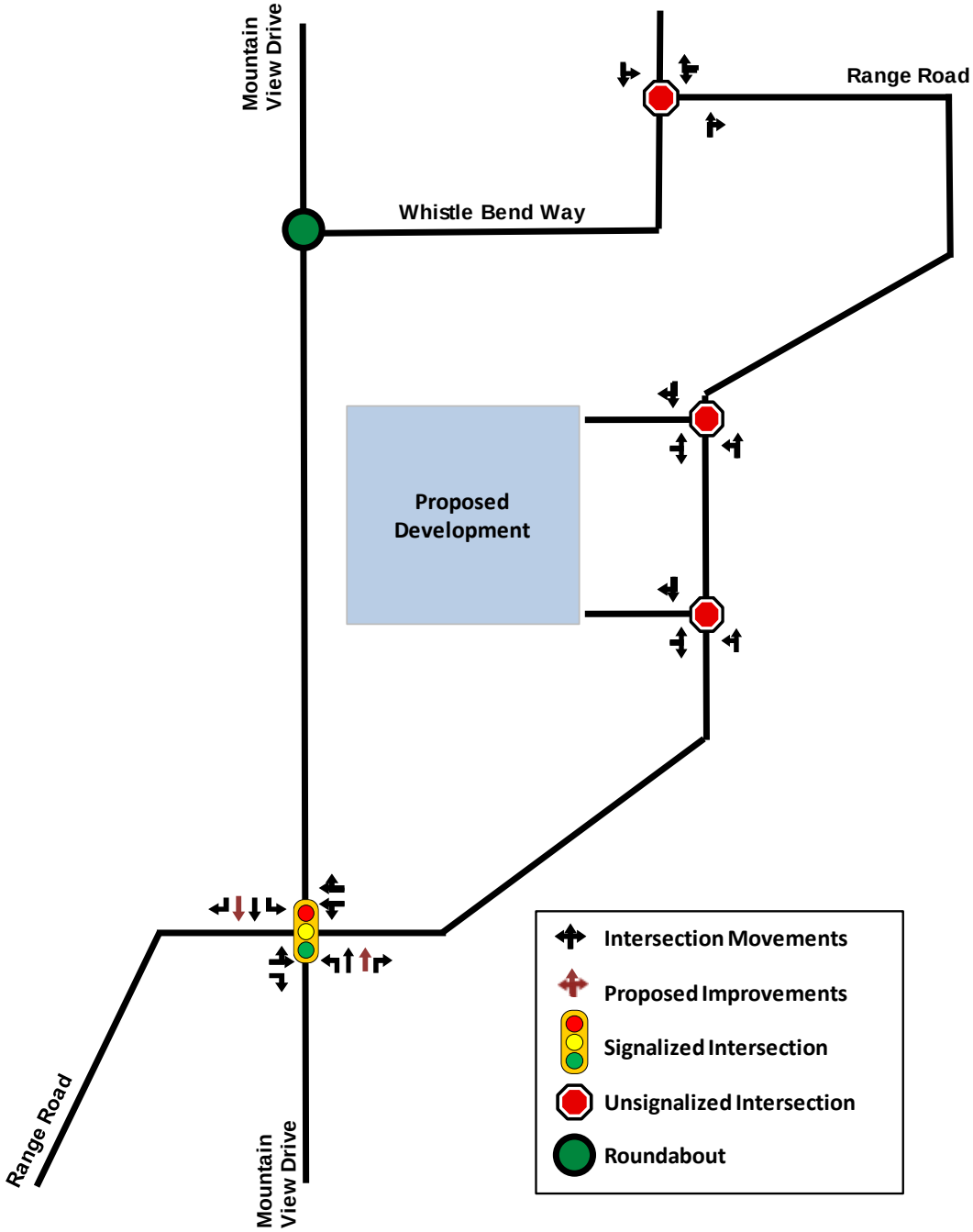


FIGURE 10. 2032 BACKGROUND PROPOSED LANE CONFIGURATION IMPROVEMENTS

With the above recommended improvements, all movements of the intersection of Mountain View Drive / Range Road will be operating with acceptable LOS, delay, and v/c ratios, and the update capacity analysis results are summarized in **Table 10** below. Synchro reports can be found in **Appendix F**.

TABLE 10. IMPROVED 2032 BACKGROUND INTERSECTION PERFORMANCE (WEEKDAY AM AND PM PEAK HOURS)

Intersections		AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Intersection Overall	B	14.9	0.70	-	B	18.3	0.90	-

5.0 Scenario 1 - 2032 Weekday Peak Hours – Total Traffic Condition

5.1 2032 Weekday Peak Hours - Total Traffic Condition Traffic Volumes and Lane Configurations

The 2032 horizon year total traffic volumes include the development traffic volumes (**Figure 7** and **Figure 8**) in addition to the 2032 background traffic volumes (**Figure 9**) and are illustrated in the following **Figure 11** and **Figure 12**.

5.2 2032 Weekday Peak Hours - Total Traffic Condition Capacity Analysis

The 2032 horizon year total traffic capacity analyses are evaluated for both AM and PM peak hours of a typical weekday. Summaries of intersection capacity analysis are included in **Table 11** and **Table 12**. The eastbound left turn and through movement at Mountain View Drive & Range Road intersection is expected to approach or exceed capacity during the PM peak hour under both scenarios with minimum housing units and maximum housing units. Recommended improvements are summarized in **Table 13**. Additionally, the westbound left and right turn movement at the Whistle Bend Way & Range Road intersection is expected to perform with long average delay during the PM peak hour for both minimum and maximum housing unit scenarios. However, as the volumes and the v/c ratios of the westbound movement are relatively low, no improvement is recommended but the movement should be closely monitored for its performance. All other intersections and movements are expected to operate with acceptable v/c ratio and Level of Service. Detailed Synchro results of the 2032 total traffic capacity analyses are included in **Appendix G**.

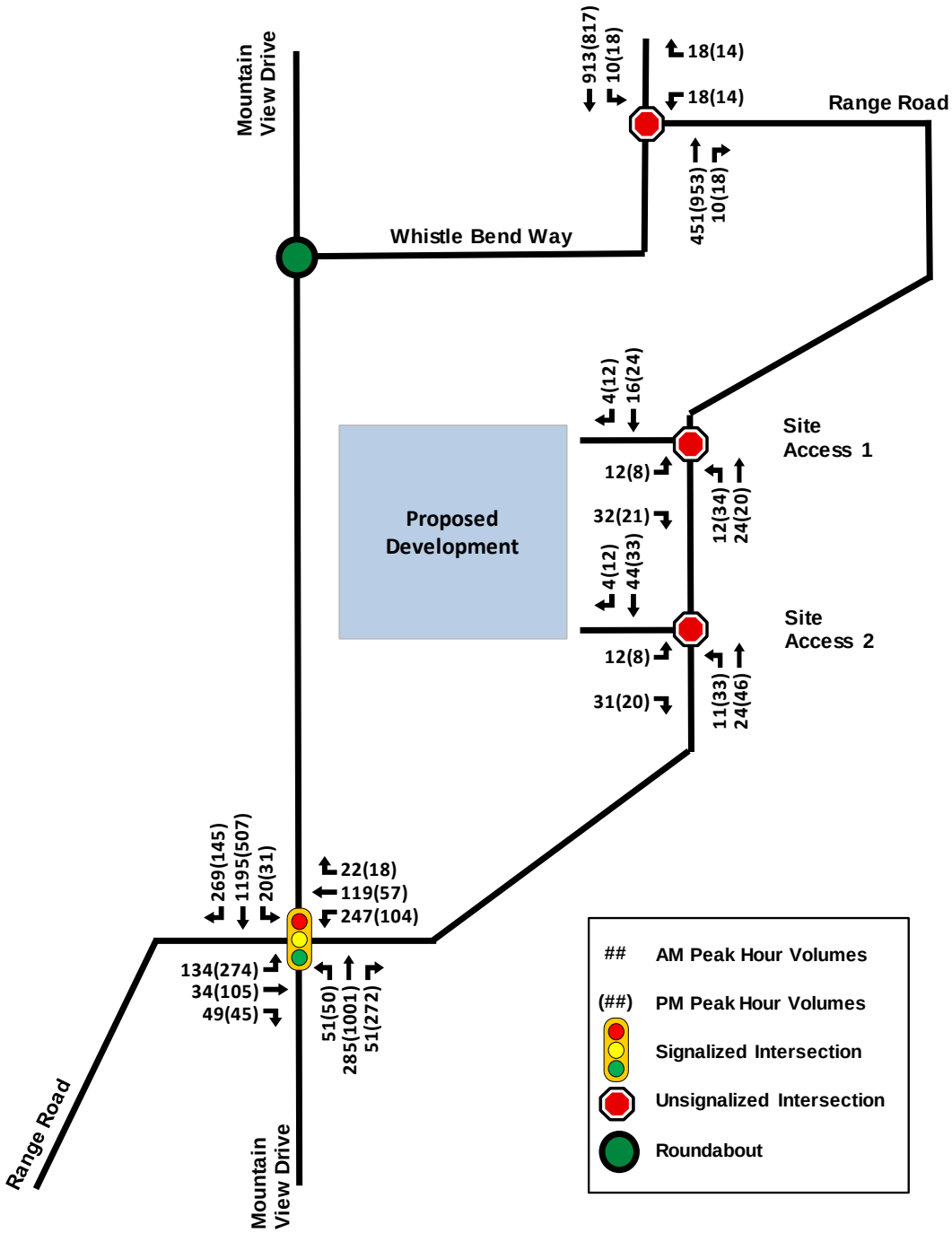


FIGURE 11. 2032 TOTAL TRAFFIC VOLUMES – BACKGROUND + DEVELOPMENT (MINIMUM) – WEEKDAY AM PEAK (PM PEAK)

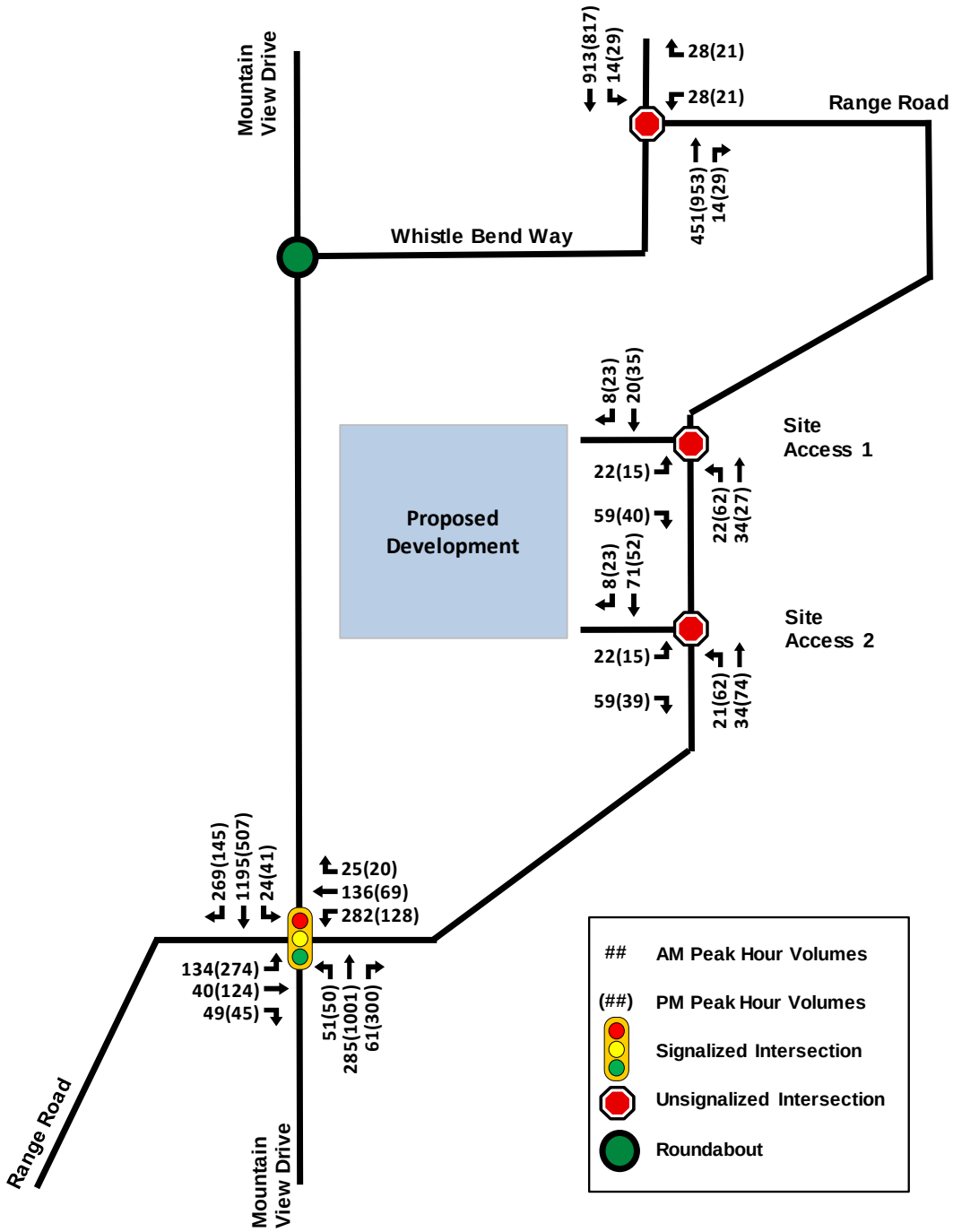


FIGURE 12. 2032 TOTAL TRAFFIC VOLUMES – BACKGROUND + DEVELOPMENT (MAXIMUM) – WEEKDAY AM PEAK (PM PEAK)

TABLE 11. 2032 TOTAL TRAFFIC CONDITION INTERSECTIONS PERFORMANCE MINIMUM HOUSING UNITS (WEEKDAY AM PEAK AND PM PEAK HOUR)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
1. Range Rd (NB/SB) & Site Access 1 (EB)	Intersection Overall		A	4.8	0.05	-	A	4.3	0.03	-
2. Range Rd (NB/SB) & Site Access 2 (EB)	Intersection Overall		A	3.7	0.05	-	A	3.3	0.03	-
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movement	EBLT	D	44.4	0.76	45.7	E	60.9	0.95	119.2
	Intersection Overall		B	16.4	0.76	-	B	20.1	0.95	-
4. Whistle Bend Way (NB/SB) & Range Rd (WB)	Critical Movement	WBLR	D	25.7	0.19	5.4	F	51.3	0.28	8.4
	Intersection Overall		A	0.9	0.29	-	A	1.2	0.62	-

TABLE 12. 2032 TOTAL TRAFFIC CONDITION INTERSECTIONS PERFORMANCE MAXIMUM HOUSING UNITS (WEEKDAY AM PEAK AND PM PEAK HOUR)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
1. Range Rd (NB/SB) & Site Access 1 (EB)	Intersection Overall		A	5.4	0.09	-	A	4.8	0.06	-
2. Range Rd (NB/SB) & Site Access 2 (EB)	Intersection Overall		A	4.2	0.09	-	A	3.7	0.07	-
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movement	EBLT	D	51.1	0.81	55.3	E	78.9	1.02	130.3
	Intersection Overall		B	17.9	0.81	-	C	23.1	1.02	-
4. Whistle Bend Way (NB/SB) & Range Rd (WB)	Critical Movement	WBLR	D	28.8	0.29	9.0	F	67.0	0.45	15.5
	Intersection Overall		A	1.4	0.30	-	A	2.2	0.63	-

5.3 2032 Weekday Peak Hours - Total Traffic Condition Recommended Improvements

Due to the operating condition of Mountain View Dr & Range Road intersection described in the above section, the following improvements to Mountain View Drive & Range Road intersection are recommended (**Table 13**) for both scenarios with minimum and maximum housing units. The recommended improvements are intended to address issues stemming from the proposed Range Point development. As mentioned earlier, since the volumes and the v/c ratios of the westbound movement of Whistle Bend Way & Range Road are relatively low, no improvement is recommended to this intersection but the westbound movement should be closely monitored for its performance. The updated lane configurations are illustrated in **Figure 13.**

TABLE 13. 2032 TOTAL TRAFFIC CONDITION RECOMMENDED IMPROVEMENTS FOR BOTH SCENARIOS WITH MINIMUM AND MAXIMUM HOUSING UNITS

Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• Change westbound lane configuration to 1 left turn lane + 1 shared through and right turn lane (Mainly because of the additional pressure to the westbound left turn movement due to the proposed development) • Provide 90 m westbound left turn storage length
	Signal Timing / Phasing	• None

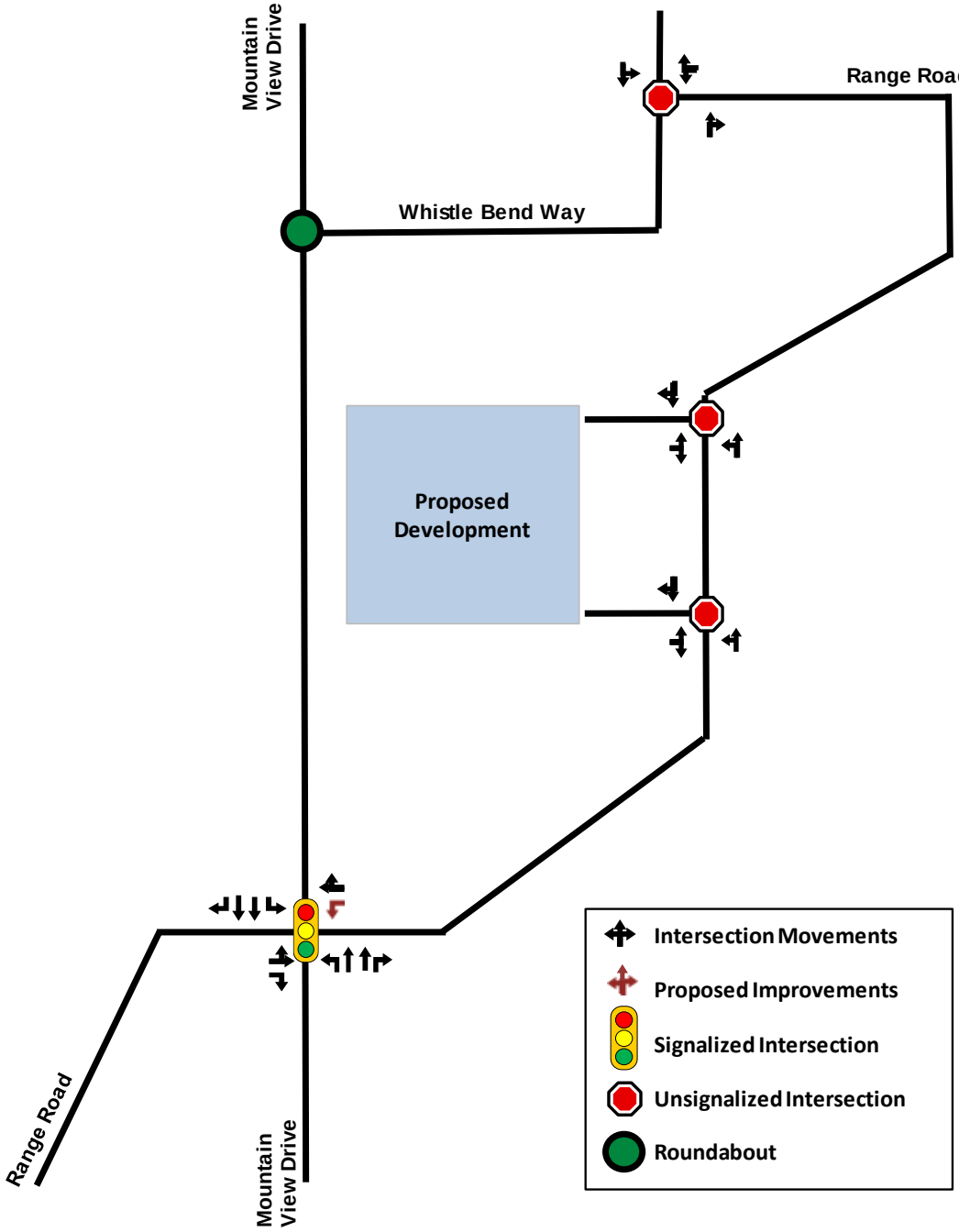


FIGURE 13. 2032 TOTAL TRAFFIC CONDITIONS PROPOSED LANE CONFIGURATION IMPROVEMENTS

With the above recommended improvements, all movements of the intersection of Mountain View Drive & Range Road will be operation with acceptable LOS, delay, and v/c ratios, and the update capacity analysis results are summarized in **Table 14** and **Table 15** below. Synchro reports can be found in **Appendix G**.

TABLE 14. IMPROVED 2032 TOTAL INTERSECTION PERFORMANCE WITH MINIMUM HOUSING UNITS (WEEKDAY AM AND PM PEAK HOURS)

Intersections		AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Intersection Overall	B	16.9	0.80	-	B	18.5	0.89	-

TABLE 15. IMPROVED 2032 TOTAL INTERSECTION PERFORMANCE WITH MAXIMUM HOUSING UNITS (WEEKDAY AM AND PM PEAK HOURS)

Intersections		AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Intersection Overall	B	18.5	0.85	-	B	19.7	0.90	-

6.0 Scenario 2 - 2042 Weekday Peak Hours - Background Traffic Condition

6.1 2042 Weekday Peak Hours - Background Condition Traffic Volumes

Similar to Scenario 1, background traffic volumes reflect growth in traffic over time that is not related to the proposed development. Background traffic volumes for 2042 horizon year are also forecasted using a 2.0% annual growth rate from 2022 existing traffic levels. Additionally, an average annual growth rate of 6% is used to project the traffic volumes from/to the Whistle Bend neighbourhood. **Figure 14** illustrates estimated background traffic volumes for the 2042 horizon years.

6.2 2042 Weekday Peak Hours - Background Condition Capacity Analysis

2042 background traffic conditions indicate the performance of 2032 improved background road networks (including all recommended improvements for both 2032 Background Traffic Condition and 2032 Total Traffic Condition) in the 2042 horizon year, assuming the proposed development is not in place. The background traffic capacity analysis was conducted for both a.m. and p.m. peak hours on a typical weekday. Summaries of intersection capacity analysis of 2042 Horizon are included in **Table 16**. Detailed Synchro results of 2042 background traffic capacity analyses are included in **Appendix H**.

As shown in the capacity analysis results, the southbound through movement and the northbound through movement along Mountain View Drive at the intersection with Range Road are expected to operate with high delays and v/c ratios during a.m. and p.m. peak hours, respectively. The eastbound left-through movement will also operate with LOS F during both peak hours due to the high eastbound left turning volumes.

The westbound left and right turn movement at the Whistle Bend Way & Range Road intersection will operate with LOS F during both peak hours due to the high northbound and southbound through movements along Whistle Bend Way.

Roadway configuration and signal timing improvements are recommended accordingly assuming no major transit or active transportation solutions are put in place (see **Section 6.3** below).

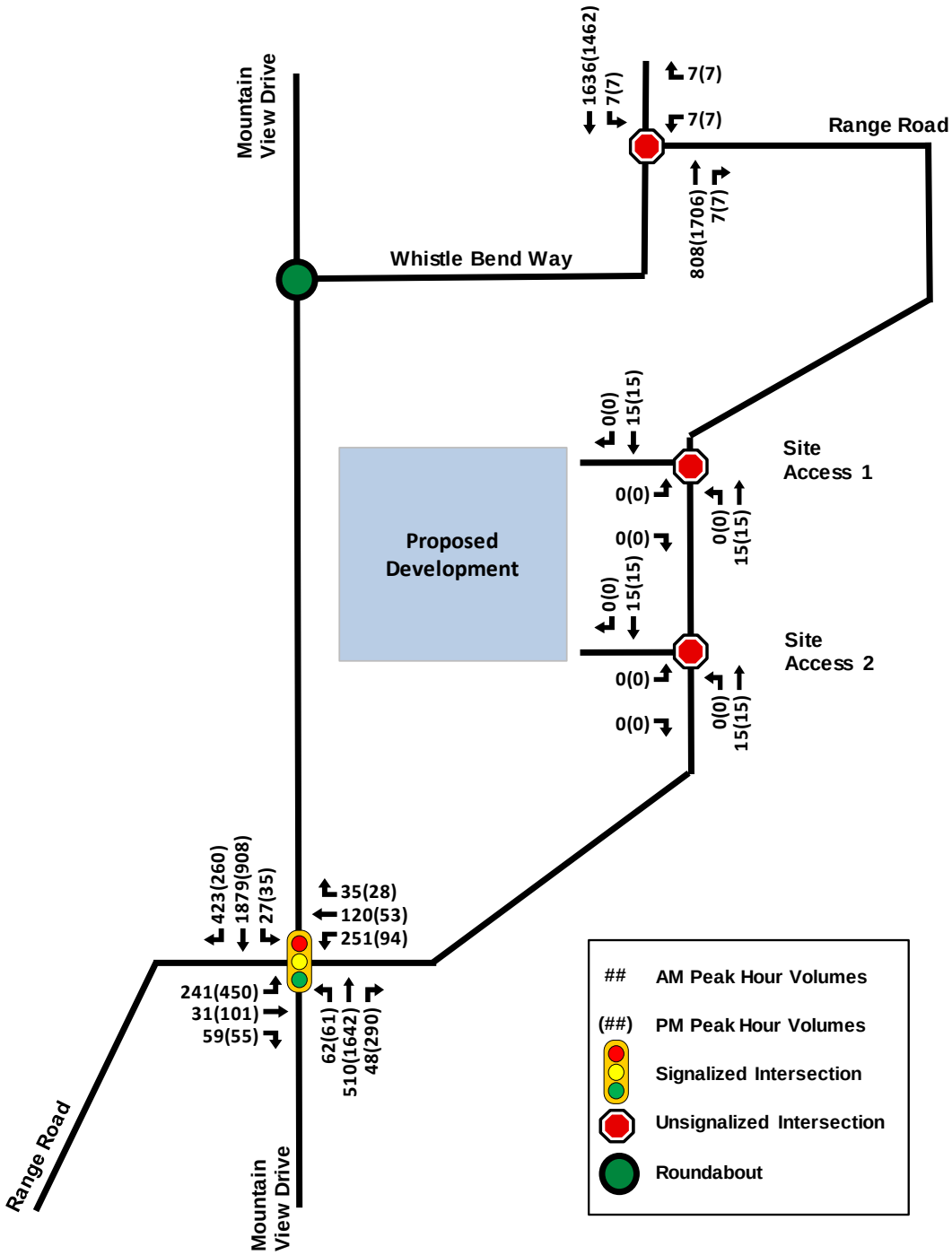


FIGURE 14. 2042 BACKGROUND TRAFFIC VOLUMES – WEEKDAY AM PEAK (PM PEAK)

TABLE 16. 2042 BACKGROUND INTERSECTION PERFORMANCE (WEEKDAY AM AND PM PEAK HOURS)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movements	NBL	E	57.4	0.69	31.8	B	18.6	0.33	16.6
		NBT	B	12.5	0.31	38.0	D	51.5	1.03	206.0
		SBT	F	91.6	1.14	252.4	B	16.3	0.57	74.5
		EBLT	C	37.8	0.76	77.5	F	177.7	1.30	186.5
		WBL	E	63.2	0.92	84.9	F	154.1	1.10	49.0
	Intersection Overall		E	58.0	1.14	-	D	54.7	1.30	-
4. Whistle Bend Way (NB/SB) & Range Road (WB)	Critical Movements	WBLR	F	123.2	0.35	9.8	F	190.2	0.48	12.8
	Intersection Overall		A	0.8	0.52	-	A	1.0	0.73	-

6.3 2042 Weekday Peak Hours - Background Condition Recommended Improvements

Due to the operating condition of Mountain View Dr & Range Road intersection and Whistle Bend Way & Range Road intersection described in the above section, the following improvements are recommended (**Table 17**). Please note, the recommended improvements are based on the traffic volume assumptions from "Whistle Bend Traffic Impact Analysis Update R1 Report" dated March 27, 2012. They are intended to address issues stemming from the growth of the background traffic. As mentioned earlier, the recommended improvements could be potentially altered if major changes to traffic patterns from Whistle Bend neighbourhood are expected in the future (e.g., due to Whistle Bend development plan updates or major transit / active transportation improvements along the Mountain View Drive corridor). The updated lane configurations are illustrated in **Figure 15**.

TABLE 17. 2042 BACKGROUND CONDITION RECOMMENDED IMPROVEMENTS

Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• Update eastbound lane configurations to 1 dedicated eastbound left turn lane + 1 shared eastbound through and right turn lane • Provide 120 m eastbound left turn storage length
	Signal Timing / Phasing	• Increase cycle lengths to 110 seconds for both a.m. peak and p.m. peak • Update eastbound left turn movement and westbound left turn movement to protected + permissive phase. • Optimize signal timing plans
Whistle Bend Way & Range Road	Intersection Configurations	• Widen Whistle Bend Way to a 4-lane arterial road (from Casca Blvd to Mountain View Drive) • Restrict Range Road westbound left turn movement

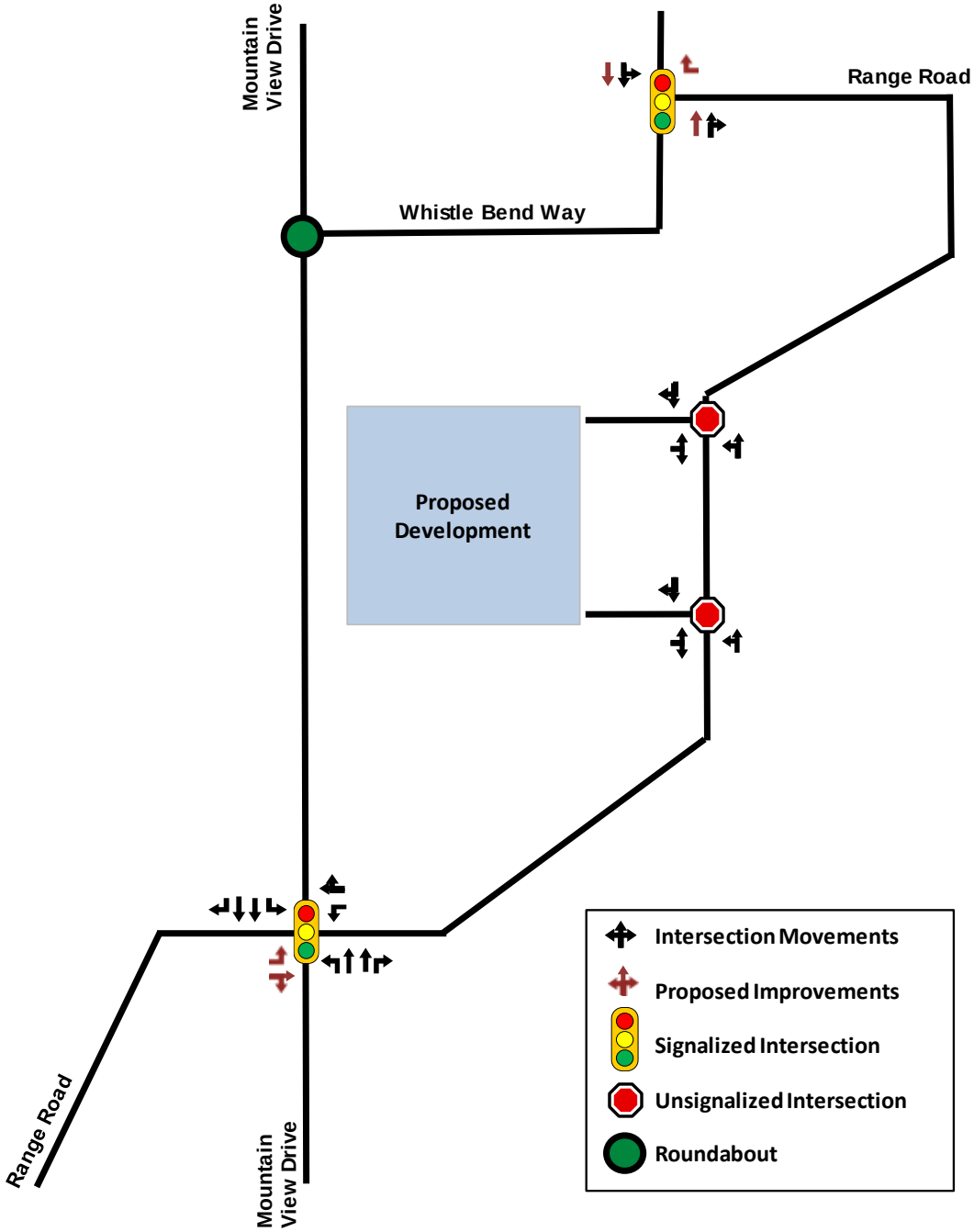


FIGURE 15. 2042 BACKGROUND CONDITIONS PROPOSED LANE CONFIGURATION IMPROVEMENTS

With the above recommended improvements, most of the movements of both intersections of Mountain View Drive & Range Road and Whistle Bend Way & Range Road will be operation with acceptable LOS, delay, and v/c ratios, except the northbound left turn movement during the a.m. peak hour and the northbound through movement during the p.m. peak hour at the Mountain View Drive & Range Road intersection. However, no additional geometric improvement is recommended to further improve the operation of this movement for the following reason:

- The northbound left turn movement will be experiencing high average delay during the a.m. peak hour, with relatively low volumes. The high average delay is mainly due to the long cycle length as well as the high northbound and southbound through movement along Mountain View Drive. It may not be cost effective to further lower the average delay of this movement without compromising LOS of other movements.
- The northbound through movement is expected to operate with v/c ratio slightly over the industry recognized threshold of 0.90 during the a.m. peak hour. As the delay is relatively low with a delay LOS of C, it is expected that the operation of the movement can be considered acceptable and no further improvement measures are required.
- Additionally, the high delay of the northbound left turn movement and the high v/c ratio of the northbound through movement are largely due to the high traffic volume projections to/from the Whistle Bend neighbourhood from previous TIA reports. If traffic patterns are changed due to Whistle Bend development plan updates or major transit / active transportation improvements along the Mountain View Drive corridor, the vehicular trips to/from Whistle Bend neighbourhood will be reduced, and it is expected that the failing movements can be substantially improved.

The update capacity analysis results are summarized in **Table 18** below. Synchro reports can be found in **Appendix H**.

TABLE 18. IMPROVED 2042 BACKGROUND INTERSECTION PERFORMANCE (WEEKDAY AM AND PM PEAK HOURS)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movement	NBL	F	97.4	0.87	29.6	C	20.6	0.29	22.9
		NBT	A	9.6	0.25	44.1	C	28.7	0.91	283.5
	Intersection Overall		C	25.1	0.90	-	C	24.6	0.91	-
4. Whistle Bend Way (NB/SB) & Range Rd (WB)	Intersection Overall		A	0.1	0.70	-	A	0.2	0.73	-

7.0 Scenario 2 - 2042 Weekday Peak Hours – Total Traffic Condition

7.1 2042 Weekday Peak Hours - Total Traffic Condition Traffic Volumes and Lane Configurations

The 2042 horizon year total traffic volumes are equal to the development traffic volumes (**Figure 7** and **Figure 8**) plus the 2042 background traffic volumes (**Figure 14**) and are illustrated in the following **Figure 16** and **Figure 17**. It is assumed that the westbound left turn volumes at the Whistle Bend Way & Range Road intersection will have to detour through the right turn movement.

7.2 2042 Weekday Peak Hours - Total Traffic Condition Capacity Analysis

On a typical weekday, the 2042 horizon year total traffic capacity analyses were evaluated for both a.m. and p.m. peak hours on a typical weekday. Summaries of intersection capacity analysis are included in **Table 19** and **Table 20**. There are a number of movements expected to experience high delays or v/c ratios at the Mountain View Drive & Range Road intersection during both a.m. and p.m. peak hours under both minimum and maximum housing unit scenarios. Proposed improvements and analysis results with improvements are summarized in **Table 21**. All other intersections and movements are expected to operate with acceptable v/c ratio and Level of Service. Detailed Synchro results of the 2042 total traffic capacity analyses are included in **Appendix I**.

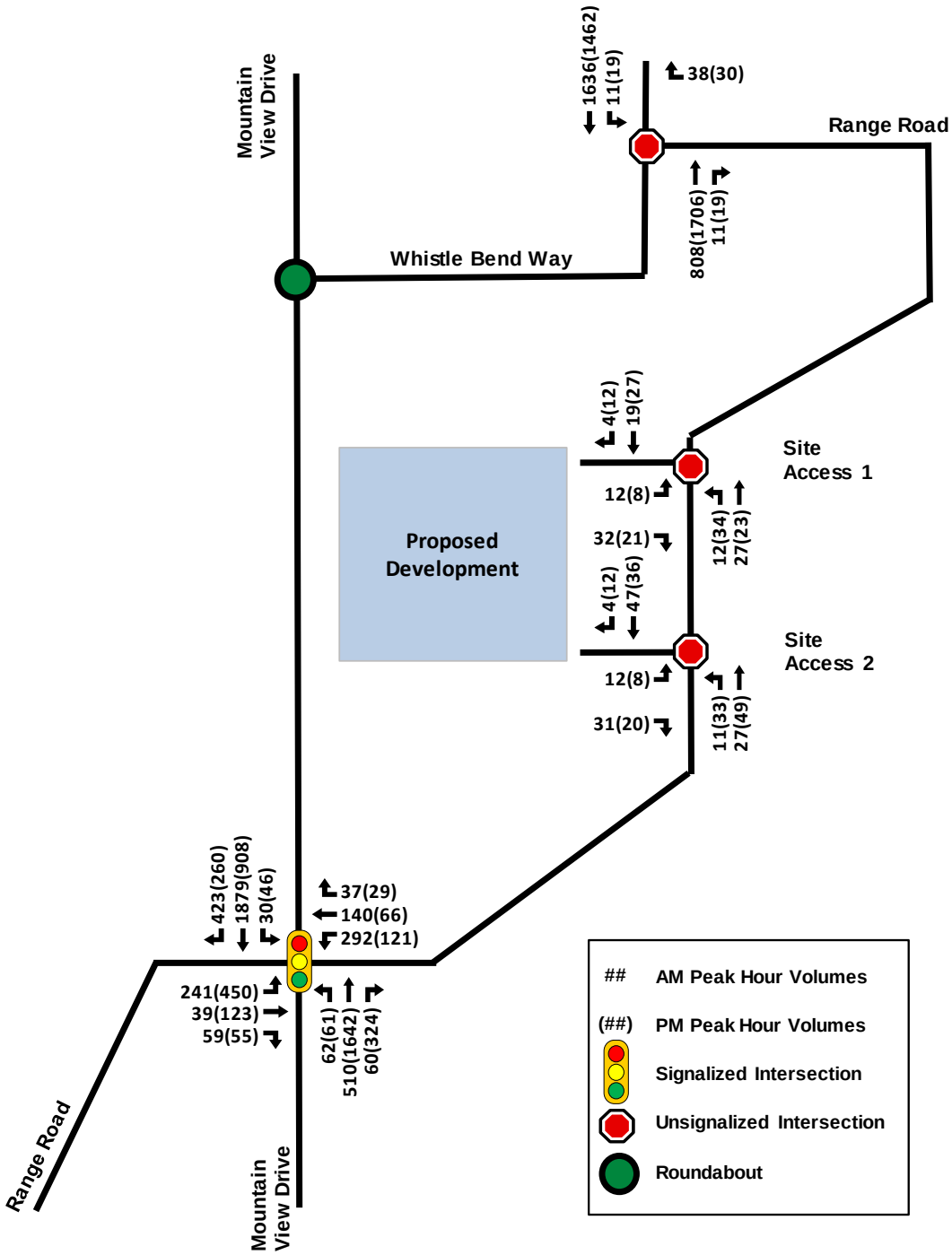


FIGURE 16. 2042 TOTAL TRAFFIC VOLUMES - BACKGROUND + DEVELOPMENT (MINIMUM) – WEEKDAY AM PEAK (PM PEAK)

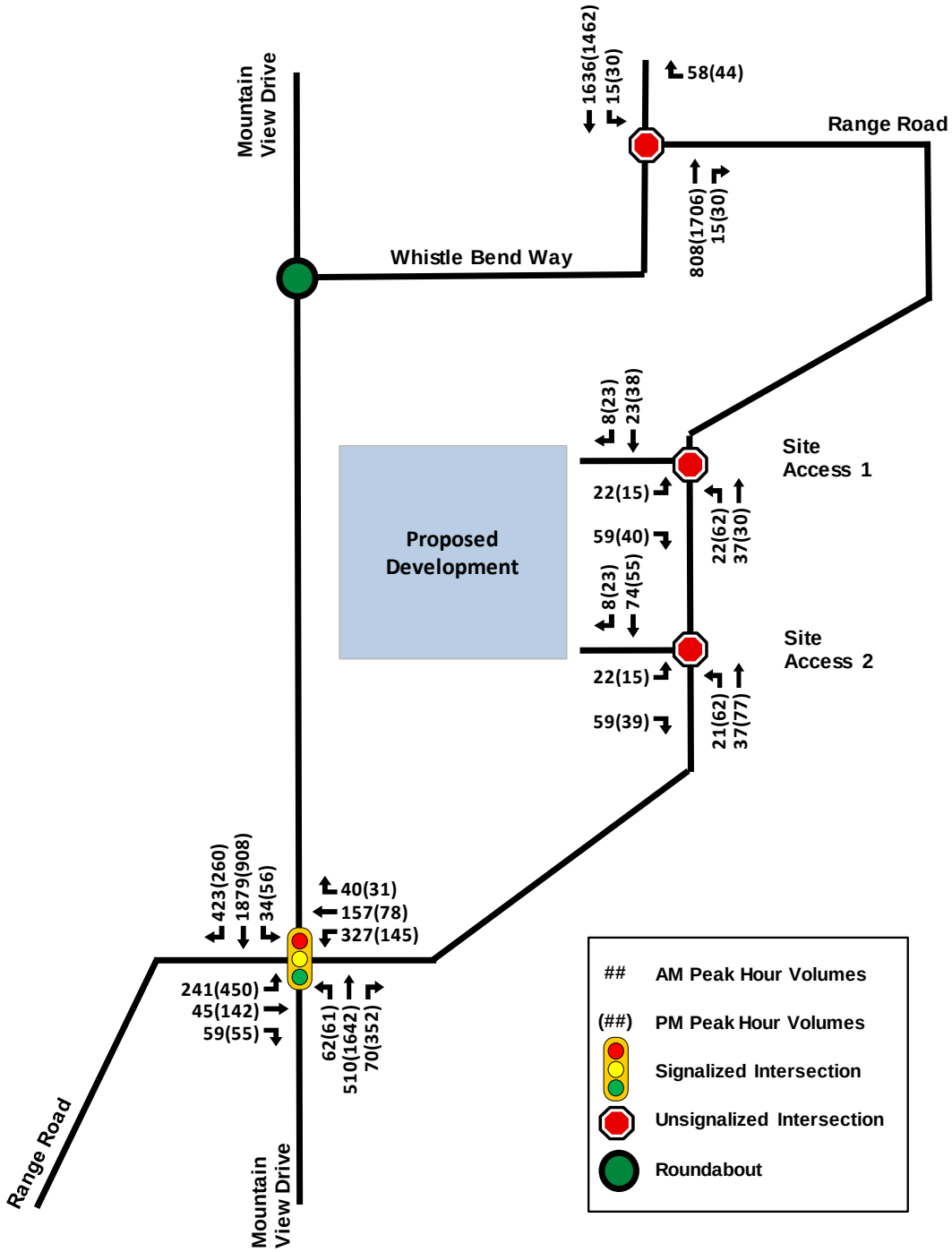


FIGURE 17. 2042 TOTAL TRAFFIC VOLUMES – BACKGROUND + DEVELOPMENT (MAXIMUM) – WEEKDAY AM PEAK (PM PEAK)

TABLE 19. 2042 TOTAL TRAFFIC CONDITION INTERSECTIONS PERFORMANCE MINIMUM HOUSING UNITS (WEEKDAY AM PEAK AND PM PEAK HOUR)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
1. Range Rd (NB/SB) & Site Access 1 (EB)	Intersection Overall		A	4.5	0.05	-	A	4.1	0.03	-
2. Range Rd (NB/SB) & Site Access 2 (EB)	Intersection Overall		A	3.5	0.05	-	A	3.2	0.03	-
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movement	NBL	F	100.4	0.88	29.6	C	21.5	0.31	23.1
		NBT	A	10.0	0.25	44.1	C	31.4	0.93	283.5
		SBL	A	10.0	0.06	8.3	E	58.2	0.62	33.2
	Intersection Overall		C	26.2	0.90	-	C	25.9	0.93	-
4. Whistle Bend Way (NB/SB) & Range Rd (WB)	Intersection Overall		A	0.3	0.70	-	A	0.5	0.73	-

TABLE 20. 2042 TOTAL TRAFFIC CONDITION INTERSECTIONS PERFORMANCE MAXIMUM HOUSING UNITS (WEEKDAY AM PEAK AND PM PEAK HOUR)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
1. Range Rd (NB/SB) & Site Access 1 (EB)	Intersection Overall		A	5.2	0.09	-	A	4.7	0.06	-
2. Range Rd (NB/SB) & Site Access 2 (EB)	Intersection Overall		A	4.1	0.10	-	A	3.7	0.07	-
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movement	NBL	F	100.8	0.88	27.7	C	22.4	0.32	23.3
		NBT	A	9.9	0.25	40.2	D	35.9	0.95	283.5
		SBL	A	10.0	0.06	8.3	F	84.1	0.78	41.2
		SBT	C	24.1	0.91	278.5	B	18.9	0.55	110.9
		EBL	E	63.4	0.89	79.4	D	37.6	0.84	109.8
		WBL	E	71.1	0.95	108.2	C	23.3	0.40	34.1
	Intersection Overall		C	27.4	0.91	-	C	28.3	0.95	-
4. Whistle Bend Way (NB/SB) & Range Rd (WB)	Intersection Overall		A	0.4	0.70	-	A	0.9	0.73	-

7.3 2042 Weekday Peak Hours - Total Traffic Condition Recommended Improvements

Due to the operating condition of Mountain View Dr & Range Road intersection described in the above section, improvement options were investigated for both minimum and maximum housing unit scenarios. Other than minor signal timing adjustments, no additional geometric improvement is recommended for the following reasons:

- Similar to the 2042 weekday background traffic condition, the northbound left turn movement and the southbound left turn movement will be experiencing delay LOS E or F during the a.m. and p.m. peak hours for both scenarios. However, the high average delay is mainly due to the long cycle length as well as the high northbound and southbound through movement along Mountain View Drive. It may not be cost effective to further lower the average delay of the movements without compromising LOS of other movements.
- The northbound through movement and the southbound through movement are expected to operate with v/c ratios slightly over the industry recognized threshold of 0.90 during p.m. and a.m. peak hours for the

maximum housing unit scenario. As the delay for both movements are relatively low with a delay LOS C, it is expected that the operations of the two movements can be considered acceptable and no further improvement measures are required other than minor signal timing plan adjustments.

- Additionally, the high delay of the northbound and southbound left turn movements and the high v/c ratio of the northbound and southbound through movements are largely due to the high traffic volume projections to/from the Whistle Bend neighbourhood from previous TIA reports. If traffic patterns are changed due to Whistle Bend development plan updates or major transit / active transportation improvements along the Mountain View Drive corridor, the vehicular trips to/from Whistle Bend neighbourhood will be reduced, and it is expected that the failing movements can be substantially improved.

With the improvements presented in **Table 21**, all other movements of the intersection of Mountain View Drive & Range Road will be operating with acceptable LOS, delay, and v/c ratios. The update capacity analysis results are summarized in **Table 22** and **Table 23** below. Synchro reports can be found in **Appendix I**.

TABLE 21. 2042 TOTAL TRAFFIC CONDITION RECOMMENDED IMPROVEMENTS FOR BOTH SCENARIOS WITH MINIMUM AND MAXIMUM HOUSING UNITS

Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• None
	Signal Timing / Phasing	• Minor adjustments to signal timing plans

TABLE 22. IMPROVED 2042 TOTAL INTERSECTION PERFORMANCE WITH MINIMUM HOUSING UNITS IMPROVED (WEEKDAY AM AND PM PEAK HOURS)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movement	NBL	F	100.4	0.88	29.6	C	19.8	0.29	22.0
		SBL	A	10.0	0.06	8.3	E	58.1	0.62	33.1
	Intersection Overall		C	26.2	0.90	-	C	25.2	0.90	-

TABLE 23. IMPROVED 2042 TOTAL INTERSECTION PERFORMANCE WITH MAXIMUM HOUSING UNITS IMPROVED (WEEKDAY AM AND PM PEAK HOURS)

Intersections			AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	Max v/c	95th Queue (m)	LOS	Delay (s)	Max v/c	95th Queue (m)
3. Mountain View Dr (NB/SB) & Range Rd (EB/WB)	Critical Movement	NBL	F	101.6	0.88	27.7	C	20.8	0.30	22.1
		NBT	B	10.9	0.26	42.3	C	31.3	0.92	275.4
		SBL	B	10.6	0.08	8.8	F	83.8	0.78	41.0
		SBT	C	28.5	0.94	286.6	B	17.8	0.53	106.8
	Intersection Overall		C	28.5	0.94	-	C	27.2	0.92	-

8.0 Other Considerations

8.1 Transportation Demand Management measures

Transportation Demand Management (TDM) provides a set of initiatives which are geared at improving the efficiency of the transportation network, encouraging alternatives to single-occupant vehicle travel and facilitating behavioural change. The associated policies, programs, services and products will influence why, when, how and where people travel. In 2014, the

City of Whitehorse developed its own Transportation Demand Management Plan to identify policies, programs and services to reduce single occupancy vehicle (SOV) reliance and the negative impacts associated with automobile use, and facilitate increasing walking, cycling and transit demand.

Although city-wide TDM policies and programs need to be designed and achieved at city level, individual development sites also share an important responsibility to make the TDM system come true. In addition, TDM measures implemented for the proposed site will be able to reduce the off-street parking demand, which is discussed in more details in **Section 8.5**.

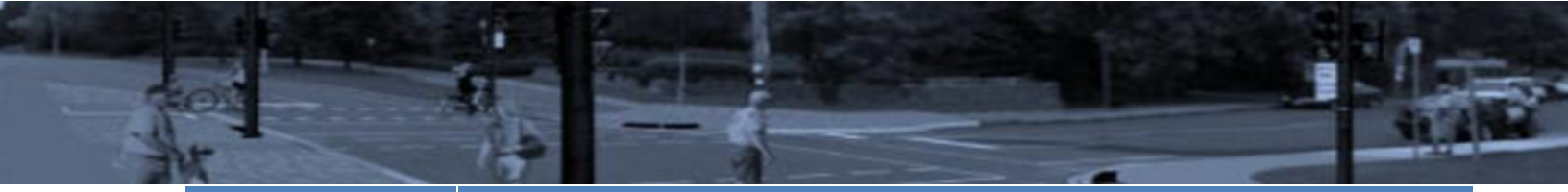
TDM measures help shape the economic and social factors behind personal travel decisions. One of the main purposes of TDM policies and programs is to influence the demand for travel in private vehicles and shift them to other modes. There are two main categories of TDM initiatives:

- Education, promotion, and outreach that change personal attitudes and awareness.
- Travel incentives and disincentives that make a travel option more attractive (i.e., easier, faster, less expensive or more attractive).

The following table (**Table 24**) summarizes the potential TDM measures for the proposed site.

TABLE 24. APPLICABLE TDM MEASURES FOR THE PROPOSED SITE

TDM Measures	Background and Potential Influence
Additional Class 1 Bicycle Parking	Provide additional Class 1 bicycle parking spaces (e.g., secured indoor bicycle parking facility). Providing sufficient Class 1 bicycle spaces will encourage residents and visitors to travel in bicycle mode.
Improved Access to Class 1 Bicycle Parking	Provide improved access to Class 1 bicycle parking. More secured, comprehensive and comfortable end of trip bicycle facilities will provide more confidence for residents to use cycling modes.
Enhanced Class 2 Bicycle Parking	Provide enhanced visitor Class 2 bicycle parking, including well-lit, secure, indoor facilities, and excellent access design. Providing more secured, comprehensive and comfortable end of trip bicycle facilities will encourage visitors to use cycling modes.
Bicycle Maintenance Facilities	Provide on-site bicycle maintenance facilities in a designated, secured area. Bicycle maintenance facilities will encourage ownership of bicycles, and consequently encourage the use of cycling mode
Parking Supply	Do not provide excessive off-street private vehicular parking in an amount greater than the minimum number of spaces required for the site. Limit the parking supply will discourage the use of private vehicles. It is also worth to note that the effectiveness of this TDM measure is dependent on availability and convenience of other travel options for the residents.
Car share Membership	The proposed site could provide a car share membership program to residents. Providing car sharing program subsidies may encourage the use of car share vehicles and reduce demand of using private vehicles and automobile parking.
Car Share Vehicles and Spaces	Provide dedicated publicly accessible car share vehicle(s) and space(s) on-site



TDM Measures	Background and Potential Influence
Shuttle Bus Service	Provide free local shuttle bus services between the subject site and city transit hubs / commercial centres / recreational centres for residents and visitors.
Transit pass subsidies	Provide this incentive will increase the level of transit mode share and effectively encourage residents and visitors to shift from other modes to transit mode.
Transportation Marketing Services	Provide individualized, tailored marketing and communication campaigns, including incentives to encourage the use of sustainable transportation modes.
Real-Time Information	Provide real-time sustainable transportation information (e.g., public transit real-time information) on displays in prominent locations on the project site.

8.2 Complete Streets

Historically in Whitehorse, transportation systems have been designed for drivers with the primary focus on accommodating automobile travel mode. When other modes of transportation, such as walking, cycling, and transit are considered, there are competing demands for limited roadway space. The Complete Streets concept attempts to address the challenges and promote a change from the vehicle-focus roadway design philosophy to accommodating all travel modes. The purpose of complete street is to encourage a holistic approach to street design that will develop a network of streets that is safe, attractive, comfortable, and welcoming to all road users in all seasons, while considering operational and maintenance challenges.

It is recommended to adopt the Complete Streets design philosophy and follow the Complete Streets design principles[3] below when designing the internal roadway network for the proposed site, including:

- Design to accommodate all users. The on-site streets should be well-designed to provide appropriate space to accommodate all principal street users, including pedestrians, cyclists, and automobiles. This could include sufficient space to accommodate a multi-use pathway, sidewalk, parking, and vehicular travel lanes.
- Design for safety with lower speed limit. The design speed should respect and complement the desired role and function of the street. The speed of vehicles impacts all users of the street and the liveability of the surrounding area. Given the expected level of active transportation activities on-site, the top priority should be given to meet the overall safety and comfort of pedestrians and cyclists. Therefore, it is recommended to reduce the speed limit to 30km/h for the internal streets and design lane widths to encourage a 30 km/hr operating speed.
- Design for desired vehicular operating speeds. The goal for Complete Streets is to establish a design speed equivalent to desired operating speed that creates a safer and more comfortable environment for drivers, pedestrians, and cyclists. Use slow-speed design features to enhance the walking/cycling environment, such as small curb radii, narrower sections, trees, on-street parking, curb extensions, and street furniture. Additional traffic calming measures can also be introduced to achieve the desired operating speed.
- Design to accommodate design vehicles and/or control vehicles. The design vehicle is a frequent user of a given street and dictates the minimum required turning radius. The design vehicle influences several geometric design features including lane width, corner radii, median nose design, and other intersection design details. A control vehicle is an infrequent large user. In Complete Street, designing for a larger vehicle than necessary is undesirable, due to the potential negative

[3] City of Calgary 2014 Complete Street Guide

impacts on pedestrian crossing distances and speed of turning vehicles. Alternatively, designing for a vehicle that is too small can result in operational problems if larger vehicles frequently use the roadway. It is recommended to identify the design vehicle and the control vehicle for the proposed site before applying design criteria for the internal streets. At the time of writing this report, it is expected that the design vehicle for the proposed site is SU-9 (for delivery, recycling and waste collection, etc.), while the control vehicle for the proposed site is firetrucks.

- Design with appropriate travel lane width. Travel lane width should be determined based on the context and desired speed for the site. Lane widths would ideally be sufficiently narrow to create some level of discomfort to a driver going too fast. Narrow lanes and the presence of on-street parking can aid in speed reduction.
- Design to accommodate on-street parking. On-street parking is important to provide a buffer for pedestrians and to help calm traffic speeds.
- Design with turn lanes only if appropriate. Turn lanes tend to allow higher speeds to occur through intersections. Therefore, the need for vehicle turn lanes should be balanced with the need to manage vehicle speeds, both of which impact other elements within the right-of-way such as sidewalk and green infrastructure width. Pedestrian and cyclist comfort and safety when interacting with turn lanes is also a major consideration.
- Design with appropriate and well-utilized right-of-way width. The selection of right-of-way width is a critical decision because the competing requirements of the cross-section elements must be considered. For Complete Streets, right-of-way width should be set to complement multi-modal (vehicular, bicycles, pedestrians) facility function.

8.3 Existing Active Transportation Demand and Active Transportation Improvements

The existing active transportation demand was reviewed using Strava data. It is worth to note that Strava data has its limitations and sometimes can only partially represent the site conditions. **Figure 18** illustrates the active transportation desired lines around the proposed site based on Strava data. The data shows that majority of the active transportation demand around the proposed site are along Range Road and the adjacent multi-use pathways. The map also shows there is active transportation demand along off-road trails including the escarpment trail bordering the Range Point development. and the trails to the north and west of the proposed site. It is recommended that the proposed active transportation improvements around the site should fully consider and address the desired active transportation routes. Those improvements could include but not limited to MUP, sidewalks, crosswalks, trails, etc.

FIGURE 18. EXISTING ACTIVE TRANSPORTATION DEMAND

Figure 19 shows the proposed trail system (internal non-motorized multi-use pathway) included in the development concept. It is expected that the natural surface trails (3m ROW), the paved trails (6m ROW), and the sidewalk system proposed by the concept drawing can fully address the existing active transportation demand (**Figure 18**) within the proposed site. Proper winter maintenance should be conducted to keep the on-site trails and sidewalk system fully functional during winter.

Pedestrian/cyclist crossing safety was listed as the second priority for potential capital improvements during the Transportation Master Planning process and is identified as one of the key areas needs to be enhanced. Proper pedestrian crossing treatments should be implemented at the six internal pedestrian crossings as well as the three pedestrian crossings along Range Road (**Figure 19**). It is recommended to follow the 2018 Pedestrian Crossing Control Guide 3rd Edition by Transportation Association of Canada for pedestrian crossing treatment selections and designs. Certain traffic calming measures (e.g., speed humps, raised pedestrian crossings) are also recommended to slow down vehicular traffic speed along this segment of Range Road. In addition to the pedestrian crossing treatment, advance warning signals are also recommended for the pedestrian/cyclist crossing along the curvature of Range Road to the north of the study site due to the existing active transportation demand and limited sight distances for the southbound direction. A slower speed limit should be considered as speeding on the curvature was observed during the site visit.

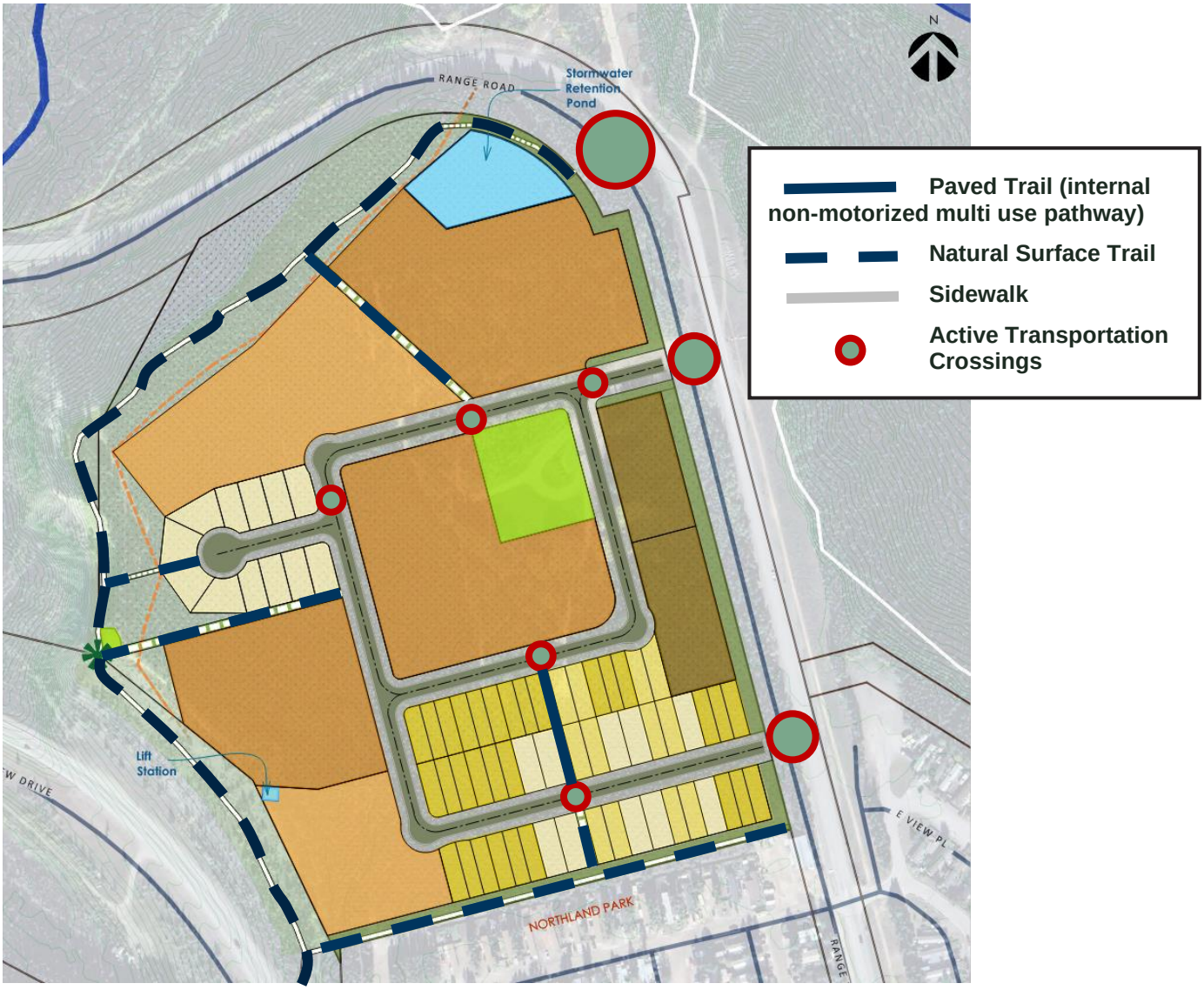


FIGURE 19. PROPOSED ACTIVE TRANSPORTATION ROUTES

We also recommend providing high quality and sufficient end-of-trip bicycle facilities to meet the bicycle parking needs at each proposed development. Those end-of-trip bicycle facilities could include Class 1 bicycle parking locker and Class 2 bicycle parking rack. Class 1 Bicycle Parking means facilities that provide restricted access and weather protection for long-term bicycle parking, including secure rooms within buildings and bicycle lockers; while Class 2 Bicycle Parking means freestanding racks or stands designed to secure bicycles for short-term bicycle parking. **Figure 20** shows examples of Class 1 bicycle parking locker and Class 2 bicycle parking rack. For the required number of bicycle parking facilities, please refer to the City of Whitehorse Zoning Bylaw 2012-20 Section 7.3.

FIGURE 20. EXAMPLES BICYCLE LOCKER (CLASS 1) AND BICYCLE RACK (CLASS 2)

In addition to the above site-related active transportation improvements, the following improvements surrounding the site should also be considered to complete the active transportation network and enhance active transportation connections to other parts of the city.

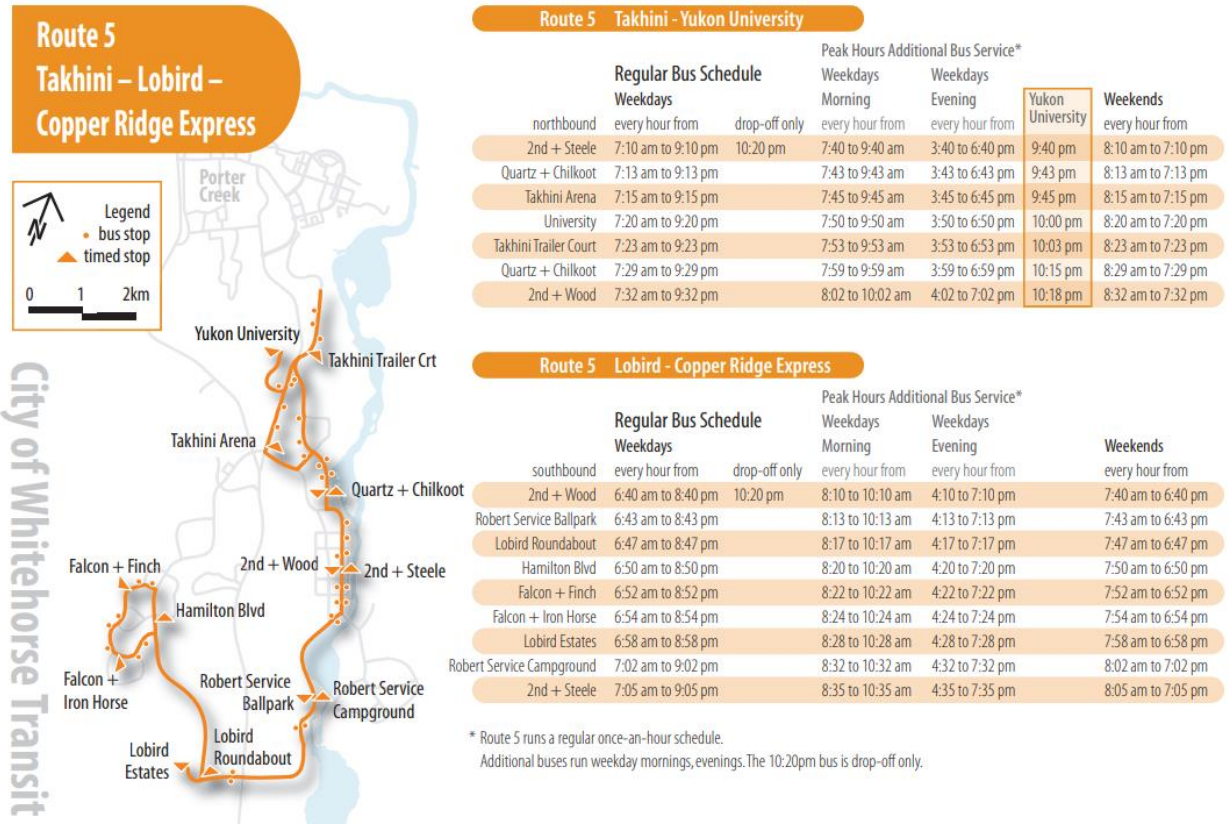
- Complete/enhance the multi-use pathway system along Range Road to both north side and south side of the city.
- Enhance the trail connection to better connect to areas of the city to the north and south.
- As the proposed development is immediately adjacent to the existing community to the south (Northland Mobile Home Park), coordination may be required for proper winter maintenance to keep the entire trail system functional in the Range Point area.

8.4 Transit Route Connections

Public transportation provides people with mobility and access to employment, community resources, medical care, and recreational opportunities. As Whitehorse grows, public transit service provides increasing benefits to the community including economic benefits, health benefits, environmental benefits, road congestion reduction, social connection benefits, as well as safety and equity.

Based on the existing Whitehorse transit route map, Bus Route #5, Takhini – Yukon University, is currently servicing the proposed site on both weekdays and weekends with service frequencies of every half-an-hour during morning and evening weekday peaks and every hour during weekday off peaks and weekends (**Figure 21**). Based on the minimum and maximum housing units proposed, the increase of population in Range Point neighbourhood could range from approximately 600 to 1,300 people. In order to accommodate such growth of the neighbourhood and encourage residents to utilize transit services over single occupancy vehicles, the following improvements are proposed when the subject site is substantially occupied. It is understood that many of them will require city's buy-in for implementation.

- Increase service frequency on Route 5 and consider additional service improvements. As the neighbourhood grows, increase service frequency from existing level to 3-4 buses per hour during weekday morning and evening peak hours.
- Improve punctuality of the bus services or provide real-time bus information through a transit app to minimize wait times of transit users.
- Install proper transit stops along Range Road. Add heated shelters and seating at bus stops with high utilizations.
- Ensure the optimum functioning of active transportation corridors between the subject site and Mountain View Drive to optimize the potential for residents to access additional transit services.



Route 5 Takhini - Yukon University

	Regular Bus Schedule Weekdays		Peak Hours Additional Bus Service* Weekdays Morning	Weekdays Evening	Yukon University	Weekends
northbound	every hour from	drop-off only	every hour from	every hour from		every hour from
2nd + Steele	7:10 am to 9:10 pm	10:20 pm	7:40 to 9:40 am	3:40 to 6:40 pm	9:40 pm	8:10 am to 7:10 pm
Quartz + Chilkoot	7:13 am to 9:13 pm		7:43 to 9:43 am	3:43 to 6:43 pm	9:43 pm	8:13 am to 7:13 pm
Takhini Arena	7:15 am to 9:15 pm		7:45 to 9:45 am	3:45 to 6:45 pm	9:45 pm	8:15 am to 7:15 pm
University	7:20 am to 9:20 pm		7:50 to 9:50 am	3:50 to 6:50 pm	10:00 pm	8:20 am to 7:20 pm
Takhini Trailer Court	7:23 am to 9:23 pm		7:53 to 9:53 am	3:53 to 6:53 pm	10:03 pm	8:23 am to 7:23 pm
Quartz + Chilkoot	7:29 am to 9:29 pm		7:59 to 9:59 am	3:59 to 6:59 pm	10:15 pm	8:29 am to 7:29 pm
2nd + Wood	7:32 am to 9:32 pm		8:02 to 10:02 am	4:02 to 7:02 pm	10:18 pm	8:32 am to 7:32 pm

Route 5 Lobird - Copper Ridge Express

	Regular Bus Schedule Weekdays		Peak Hours Additional Bus Service* Weekdays Morning	Weekdays Evening	Weekends
southbound	every hour from	drop-off only	every hour from	every hour from	every hour from
2nd + Wood	6:40 am to 8:40 pm	10:20 pm	8:10 to 10:10 am	4:10 to 7:10 pm	7:40 am to 6:40 pm
Robert Service Ballpark	6:43 am to 8:43 pm		8:13 to 10:13 am	4:13 to 7:13 pm	7:43 am to 6:43 pm
Lobird Roundabout	6:47 am to 8:47 pm		8:17 to 10:17 am	4:17 to 7:17 pm	7:47 am to 6:47 pm
Hamilton Blvd	6:50 am to 8:50 pm		8:20 to 10:20 am	4:20 to 7:20 pm	7:50 am to 6:50 pm
Falcon + Finch	6:52 am to 8:52 pm		8:22 to 10:22 am	4:22 to 7:22 pm	7:52 am to 6:52 pm
Falcon + Iron Horse	6:54 am to 8:54 pm		8:24 to 10:24 am	4:24 to 7:24 pm	7:54 am to 6:54 pm
Lobird Estates	6:58 am to 8:58 pm		8:28 to 10:28 am	4:28 to 7:28 pm	7:58 am to 6:58 pm
Robert Service Campground	7:02 am to 9:02 pm		8:32 to 10:32 am	4:32 to 7:32 pm	8:02 am to 7:02 pm
2nd + Steele	7:05 am to 9:05 pm		8:35 to 10:35 am	4:35 to 7:35 pm	8:05 am to 7:05 pm

* Route 5 runs a regular once-an-hour schedule.
Additional buses run weekday mornings, evenings. The 10:20pm bus is drop-off only.

FIGURE 21. WHITEHORSE TRANSIT ROUTE 5

8.5 Parking Provisions / Requirements

During a project meeting of this TIA, both Yukon Government and KDFN project managers expressed concerns about spillover to Range Road and/or adjacent properties once the proposed development is built out, as there is an established medium-density development nearby experiencing considerable parking spillover.

It is our understanding that the proposed development as well as the above mentioned neighbouring development (which is already experiencing parking spillover after fully occupied), are following the City of Whitehorse Zoning Bylaw 2012-20 for parking provisions. *"Section 7.3 Off-Street Parking and Bicycle Parking"* of the City of Whitehorse Zoning Bylaw 2012-20 outlines the parking requirement guidelines for residential land uses (**Table 25**). In general, the requirement includes 1 parking space per dwelling unit for single family housing developments and 1 parking space per dwelling unit plus 1 guest parking space per 7 dwelling units for multi-family housing developments. **Table 26** summarizes parking requirements examples of other Canadian cities on the west coast. The parking requirements of the Whitehorse Zoning Bylaw is relatively lower than parking requirements for similar land uses of other Canadian west coast cities, many of which are located in Metro Vancouver region with substantially higher transit and active transportation mode shares.

Based on the above, the study team has the following overall conclusions and recommendations for parking provisions of the subject development:

- The City of Whitehorse Zoning Bylaw 2012-20 outlines the minimum, but not the maximum parking provision requirements for developments.
- For single-family, duplex, triplex, and similar ground-oriented housing types, minimum 1 off-street parking space per dwelling unit is generally considered acceptable, given that ground-oriented single-family types housing usually has additional on-street parking spaces available at frontage.

- For multi-family housing types, such as townhouses and apartments, minimum 1 off-street parking space per dwelling unit + 1 space for visitor parking per 7 dwelling units (as per the Whitehorse Zoning Bylaw), is considered low and not sufficient for the purpose of the subject development if there is no comprehensive transportation demand management plan implemented. The minimum requirement may be sufficient for studio or 1 bedroom apartments but will not meet the parking needs for two or more bedroom apartments and townhouses, especially for more automobile oriented neighbourhoods.
- Based on the above, we recommend providing additional parking spaces for multi-family housing built on the proposed site. The following minimum parking provision can be considered:
    - 1 minimum parking space per bachelor or one-bedroom unit
    - 1.5 minimum parking spaces per two-bedroom unit
    - 2 minimum parking spaces per three- or more bedroom apartment unit and townhouse
    - In addition to the above, provide 1 visitor parking space per 7 dwelling unit.
- Under the circumstances that the above parking requirements cannot be met, it is recommended to prepare and implement a comprehensive transportation demand management plan to reduce reliance on automobile travel mode (**Section 8.1**). It is worth to note that limiting the off-street parking provision is a TDM measure commonly used to reduce the automobile travel mode. Therefore, this section is by no means recommending excessive off-street parking spaces greater than the guidance above.

TABLE 25. CITY OF WHITEHORSE ZONING BYLAW 2012-20 RESIDENTIAL PARKING REQUIREMENTS

Table 7.3.6 a) Residential Parking Requirements

Development	Parking Spaces		Loading Spaces		Class 2 Bicycle Parking
	Spaces	Per	Spaces	Per	Number
Single detached, duplexes, triplexes & townhouses	1	Dwelling unit	N/A	N/A	N/A
Housing, Apartment*	1	Dwelling unit	1	Up to 930m² GFA	1 per building
	1 guest	7 dwelling units	1	Over 930m² GFA	
Housing, Multiple (excluding apartments)*	1	Dwelling unit	N/A	N/A	1 per building
	1 guest	7 dwelling units	N/A	N/A	
Living and Garden Suites	1	unit	N/A	N/A	N/A
Temporary Shelter Services, B&B Lodging and Supportive Housing	1	2 sleeping units	N/A	N/A	N/A
Housing for Senior Citizens, regardless of housing type	1	2 dwelling units	N/A	N/A	1
Residential Care Homes	1	Facility	N/A	N/A	1
	0.25	Each staff on shift within any given 24-hour period			

TABLE 26. PARKING REQUIREMENTS EXAMPLES OF OTHER CANADIAN CITIES ON THE WEST COAST

Cities	Single-Family or Similar & Required Parking Space		Multi-Family or Similar & Required Parking Space	
Burnaby	Single Family, two family and row-house	1 per dwelling unit	Townhouses and Apartments	1.5-1.75 per dwelling unit + 0.2-0.25 per unit for visitors
Vancouver	One-Family, Two-Family dwelling	1 per dwelling unit	Multi-family residential	0.5 (for unit less than 50 m^2 GFA) – 2.2 space per unit + 0.075-0.15 per unit for visitors
Coquitlam	One-Family, Duplex, multiplex	2 per dwelling unit	Townhouses and Apartments	1 (studio and one-bed unit), 1.5 (two or more bed unit), and 2 (townhouse) per dwelling unit + 0.2 per unit for visitors
Richmond	Single Detached & Two-Unit Housing	2 per dwelling unit	Townhouses & Apartments	1.5-2.0 per dwelling unit + 0.2 per unit for visitors
Surrey	Single Family, Duplex, and Ground-Oriented Multiplex	2-3 per dwelling unit	Multiple Unit Residential (Non-Ground-Oriented)	1.3 (studio and one bed) - 1.5 (two or more beds) per dwelling unit + 0.2 per unit for visitors
Kelowna	Single Detached and Two Dwelling Housing	2 per dwelling unit	Multiple Dwelling Housing	1 (bachelor unit), 1.25 (one-bed unit), 1.5 (two-bed unit), and 2 (three-or more bed unit) per dwelling unit + 0.14 per unit for visitors

Note: the above parking requirements are general and for regular land uses in suburban areas similar to Range Point neighbourhood, but not for special zoning districts (e.g., town centres, LRT or BRT stations, etc.)

8.6 Road Safety Considerations

The traditional approach to road safety engineering uses collision data to identify high collision locations and apply mitigation measures to reduce the number and severity of collisions in the future. However, collision prevention and a proactive approach to road safety becomes increasingly important, especially for new developments and neighbourhoods. The goal of collision prevention is to adopt proactive approaches during the planning and design process. For the purpose of this study, the following road safety considerations are recommended.

Adopt Complete Streets

Compared to conventionally designed streets, Complete Streets have fewer collisions and high reductions in injuries and fatalities (**Section 8.2**).

Separate Road Users in Physical Space

As mentioned earlier, through adopting the Complete Street concept, the on-site roadways will provide appropriate space to accommodate all principal street users, including pedestrians, cyclists, and automobiles. This could include sufficient space to accommodate a multi-use pathway, sidewalk, parking, and vehicular travel lanes. By physically separating pedestrians and cyclists from vehicular traffic, the possibility that pedestrians or cyclists will be involved in a collision is substantially reduced.

Introduce a Lower Speed Limit (30km/h)

The design speed should respect and complement the desired role and function of the street. Safety benefits can be achieved through reducing speeds of motorists, which provide greater driver awareness, wider fields of vision, shorter stopping distances, and les kinetic energy during a collision. **Figure 22** shows the pedestrian injury percentage in relation to impact speed. At 30km/h or less, chances are very high that a pedestrian or cyclist will survive and/or not be severely injured in a collision with an automobile. Therefore, it is recommended to introduce a 30km/h speed limit to the internal streets of the development.

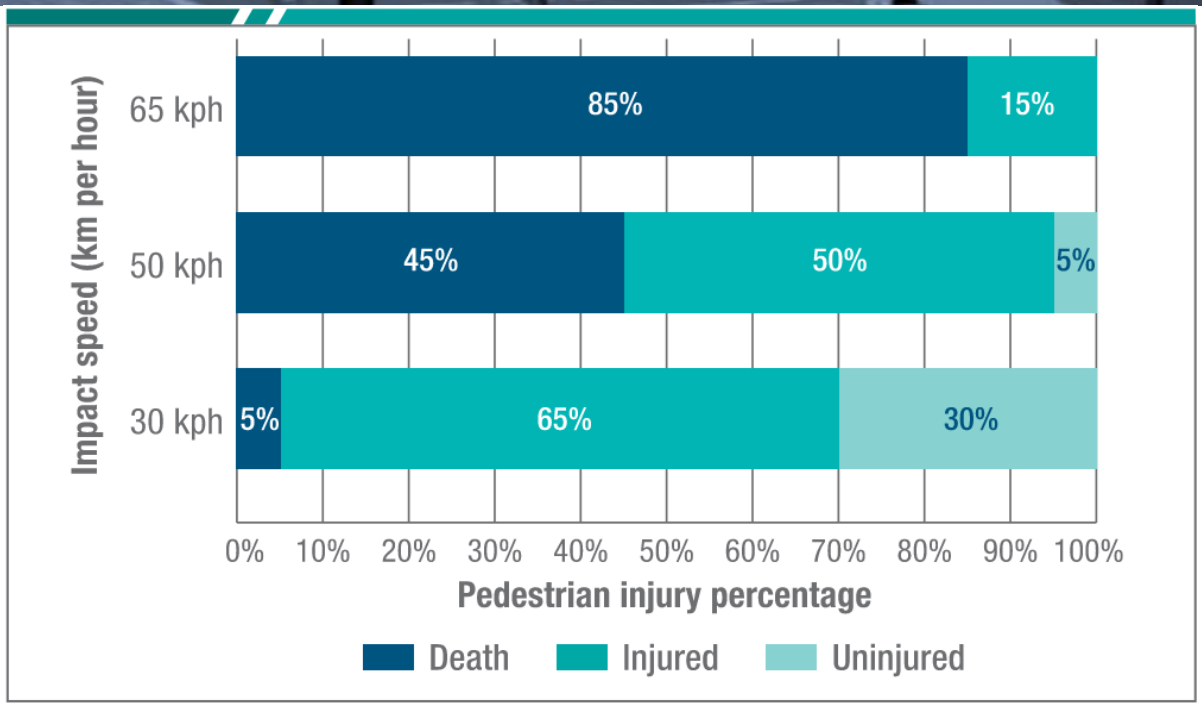


FIGURE 22. PEDESTRIAN INJURY PERCENTAGE[4]

Apply Traffic Calming Measures

A more organized street environment and design that cater to pedestrians and cyclists contribute to superior safety. Introduce traffic calming measures, such as speed humps, raised crosswalks, raised intersections, traffic circles, curb extensions, curb radius reductions, on-street parking, and all-way stop control, will be able to not only slower travelling speed of automobiles, but also considerably improve road safety and reduce severity of collisions.

Advance Warning Signals

As mentioned earlier, advance warning signals are recommended for the pedestrian/cyclist crossing along the curvature of Range Road to the north of the study site due to the existing active transportation demand and limited sight distances for both directions. A slower speed limit should be considered as speeding on the curvature was observed during the site visit.

8.7 Planned Road Network Improvement Projects

There are several planned road network improvement projects in the area, and coordination with the proposed improvements discussed in this report is recommended. The list of projects includes:

- Range Road North Reconstruction: the entire roadway will be reconstructed within the next 5 years.
- Range Road (Mountainview Drive to Two Mile Hill): potential addition of a bidirectional cycling facility on the west side of Range Road to conform to the proposed MUP on the west side of Range Road north.

9.0 Conclusions & Recommendations

The conclusions and recommendations are summarized as follows:

9.1 2022 Weekday Existing Condition

- The intersections of Mountain View Drive & Range Road and Whistle Bend Way & Range Road are operating with acceptable LOS and v/c ratios under 2022 existing condition.

[4] Source: Killing Speed and Saving Lives, UK Department of Transportation

9.2 Scenario 1 - 2032 Weekday Conditions

- The following improvements are recommended for the 2032 Background Traffic condition and are intended to address issues stemming from the growth of the background traffic.

Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• Widen Mountain View Drive to a 4-lane arterial road, with two travel lanes each direction. (Based on the Whistle Bend Traffic Impact Analysis Update R1 Report, the Mountain View Drive is recommended to be widened between Whistle Bend Way and 2nd Ave)
	Signal Timing / Phasing	• Update the signal timing plan parameters • Increase cycle lengths to 80 seconds for a.m. peak and p.m. peak • Update Flash Don't Walk (FDW) times to 31 seconds for north-south crosswalks and 20 seconds for east-west crosswalks, based on 1.0 m/s pedestrian walking speed.

- The following improvements are recommended to address traffic issues due to the additional trips generated from the proposed site for the 2032 Total Traffic condition for both minimum and maximum housing unit scenarios.

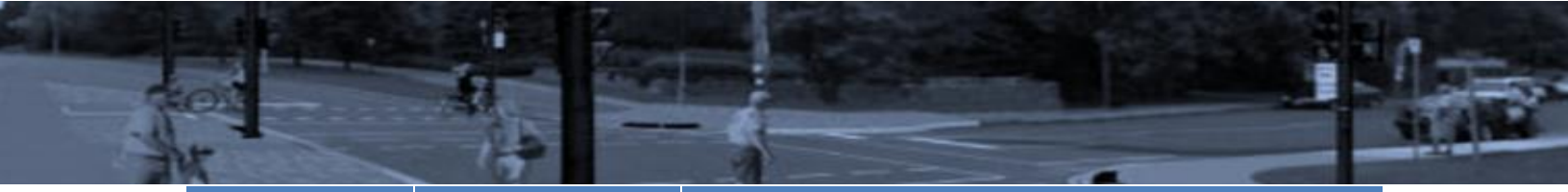
Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• Change westbound lane configuration to 1 left turn lane + 1 shared through and right turn lane (Mainly because of the additional pressure to the westbound left turn movement due to the proposed development) • Provide 90 m westbound left turn storage length
	Signal Timing / Phasing	• None

9.3 Scenario 2 - 2042 Weekday Conditions

- The following improvements are recommended for the 2042 Background Traffic conditions and are intended to address issues stemming from the growth of the background traffic.

Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• Update eastbound lane configurations to 1 dedicated eastbound left turn lane + 1 shared eastbound through and right turn lane • Provide 120 m eastbound left turn storage length
	Signal Timing / Phasing	• Increase cycle lengths to 110 seconds for both a.m. peak and p.m. peak • Update eastbound left turn movement and westbound left turn movement to protected + permissive phase. • Optimize signal timing plans
Whistle Bend Way & Range Road	Intersection Configurations	• Widen Whistle Bend Way to a 4-lane arterial road (from Casca Blvd to Mountain View Drive) • Restrict Range Road westbound left turn movement

- The following improvements are recommended to address traffic issues due to the additional trips generated from the proposed site for the 2042 Total Traffic conditions for both minimum and maximum housing unit scenarios.



Intersection	Improvement Types	Recommended Improvements
Mountain View Drive & Range Road	Intersection Configurations	• None
	Signal Timing / Phasing	• Minor adjustments to signal timing plans

9.4 Other Considerations

- Transportation Demand Management (TDM) measures. Section 8.1 provided a list of potential TDM measures for the proposed site, including additional Class 1 bicycle parking, improve access to Class 1 bicycle parking, enhanced Class 2 bicycle parking, bicycle maintenance facilities, parking supply management, car share membership, car share vehicles and spaces, shuttle bus service, transit pass subsidies, transportation marketing services, and real-time information provision.
- Complete Streets. It is recommended to adopt the Complete Street design philosophy for the internal roadway network design. The design principles include design to accommodate all road users, design for safety with lower speed limit, design for desired vehicular operating speeds, design to accommodate design vehicles and/or control vehicles, design with appropriate travel lane width, design to accommodate on-street parking, design with turn lanes only if appropriate, and design with appropriate and well-utilized right-of-way width.
- Active Transportation Improvements. The Strava data shows that the majority of the active transportation demand around the proposed site are along Range Road and adjacent multi-use pathways. The data also shows there is active transportation demand along off-road trails including the Range Point Trail and the trails to the north and west of the proposed site. It is expected that the active transportation network proposed within the site plan can fully address the active transportation demand within the proposed site. It is also recommended that proper winter maintenance should be conducted to keep the on-site trails and sidewalk system fully functional during winter.

  Additionally, proper pedestrian crossing treatments (2018 Pedestrian Crossing Control Guide 3rd Edition By TAC) are recommended to be implemented at both internal pedestrian crossing locations and the three crossing locations along Range Road. In addition to the pedestrian crossing treatment, advance warning flashing signals are also recommended for the north pedestrian/cyclist crossing along the curvature on Range Road due to the existing active transportation demand and limited sight distances for the southbound direction. A slower speed limit should be considered as speeding on the curvature was observed during the site visit.

  To further encourage residents to use alternative transportation modes, it is suggested to provide high quality and sufficient end-of-trip bicycle facilities to meeting bicycle parking needs at each development.

  Additionally, the following improvements surrounding the site should also be considered to enhance active transportation connections to other parts of the city, including: complete/enhance the multi-use pathway system along Range Road, enhance the trail connection to the neighbourhood to the south, and coordinate winter maintenance.
- Transit Route Connections. **Section 8.4** proposed a listed of improvements to enhance transit service to the study site, including increase transit service frequency, improve punctuality of bus services or provide real-time bus information, install proper transit stops along Range Road with heated shelters and seating, and explore the possibility of providing active transportation access to Mountain View Drive for additional bus services.

- Parking Provisions / Requirements. It is our understanding that the parking requirements of the Whitehorse Zoning Bylaw is relatively lower than parking requirements for similar land uses of other Canadian west coast cities, and following the minimum Whitehorse parking requirements may not be able to provide sufficient parking spaces for all residents of the study site. For multi-family housing types of the proposed site, the following minimum parking provision can be considered.
    - 1 minimum parking space per bachelor or one-bedroom unit
    - 1.5 minimum parking spaces per two-bedroom unit
    - 2 minimum parking spaces per three- or more bedroom apartment unit and townhouse
    - In addition to the above, provide 1 visitor parking space per 7 dwelling unit.

  Under the circumstances that the above parking requirements cannot be met, it is recommended to prepare and implement a comprehensive transportation demand management plan to reduce reliance on automobile travel mode
- Road Safety Considerations. Proposed measures to further enhance road safety (**Section 8.6**) include adopt Complete Streets, separate road users in physical space, introduce a lower speed limit (30km/h), apply traffic calming measures, and install advance warning signals at the pedestrian/cyclist crossing along the curvature of Range Road to the north of the study site.

Should you have any questions or comments concerning the contents of this report, please do not hesitate to contact the undersigned.

Sincerely,
MORRISON HERSHFIELD LTD.

Stanley J. Li, M.Sc., P.Eng., PTOE

Principal, Senior Transportation Engineer

Tel: 867 456 4747

Email: sli@morrisonhershfield.com

APPENDIX A – EXISTING TRAFFIC VOLUMES

INTERSECTION TURNING MOVEMENT COUNTS (TMC)

Mountain View Dr & Range R 2019-05-23

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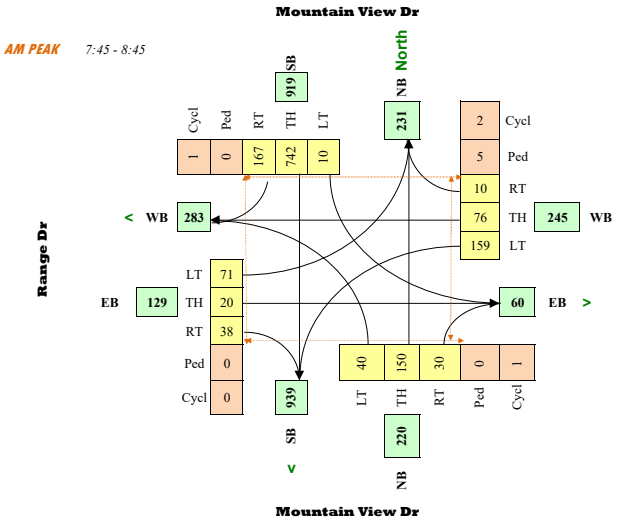
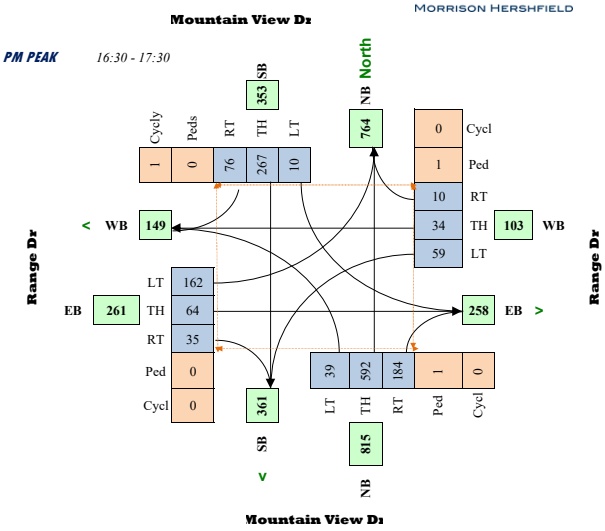
MORRISON HERSHFIELD





A.M. Peak Hour 7:45 - 8:45

	Range Dr					Range Dr					Mountain View Dr					Mountain View Dr				
	EB	EB	EB	crossing leg		WB	WB	WB	crossing leg		NB	NB	NB	crossing leg		SB	SB	SB	crossing leg	
Time	Left	Thru	Right	ped	cycle	Left	Thru	Right	ped	cycle	Left	Thru	Right	ped	cycle	Left	Thru	Right	ped	cycle
7:45 - 8:00	-	8	15	0	1	47	26	-	0	0	10	-	9	0	0	2	225	57	1	1
8:00 - 8:15	-	5	5	0	0	43	17	-	0	1	5	-	6	0	0	6	205	29	2	1
8:15 - 8:30	-	3	13	0	0	49	18	-	0	0	13	-	5	0	0	1	184	50	2	0
8:30 - 8:45	-	4	5	0	0	20	15	-	0	0	12	-	10	0	0	1	128	31	0	0
7:45 - 8:45	**-**	**20**	**38**	**0**	**1**	**159**	**76**	**-**	**0**	**1**	**40**	**-**	**30**	**0**	**0**	**10**	**742**	**167**	**5**	**2**

MAX
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P.M. Peak Hour 16:30 - 17:30

	Range Dr					Range Dr					Mountain View Dr					Mountain View Dr				
	EB	EB	EB	crossing leg		WB	WB	WB	crossing leg		NB	NB	NB	crossing leg		SB	SB	SB	crossing leg	
Time	Left	Thru	Right	ped	cycle	Left	Thru	Right	ped	cycle	Left	Thru	Right	ped	cycle	Left	Thru	Right	ped	cycle
16:30 - 16:45	-	14	12	0	1	17	6	-	0	0	13	-	40	0	0	3	77	25	1	0
16:45 - 17:00	-	16	9	0	0	16	9	-	0	0	10	-	44	0	0	1	59	18	0	0
17:00 - 17:15	-	18	6	0	0	14	9	-	1	0	10	-	61	0	0	2	61	16	0	0
17:15 - 17:30	-	16	8	0	0	12	10	-	0	0	6	-	39	0	0	4	70	17	0	0
16:30 - 17:30	**-**	**64**	**35**	**0**	**1**	**59**	**34**	**-**	**1**	**0**	**39**	**-**	**184**	**0**	**0**	**10**	**267**	**76**	**1**	**0**

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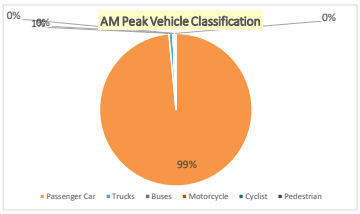
PM Peak Hour Factor: 0.895

Vehicle Classification

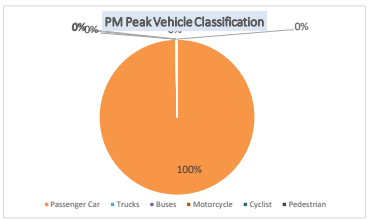
	TOTAL	%
Passenger Car	1513	99%
Trucks	13	1%
Buses	0	0%
Motorcycle	0	0%
Cyclist	4	0%
Pedestrian	5	0%
	1535	100%



Total Ped	5
Children	5
% of children walking	100%

Vehicle Classification

	TOTAL	%
Passenger Car	1532	100%
Trucks	0	0%
Buses	0	0%
Motorcycle	0	0%
Cyclist	1	0%
Pedestrian	2	0%
	1535	100%



Total Ped	2
Children	0
% of children walking	0%

APPENDIX B – YBS 2022 FIRST QUARTER POPULATION RERPORT

Yukon Bureau of Statistics

Population Report
First Quarter, 2022

Highlights:

- The estimated population of Yukon on March 31, 2022 was 43,744; an increase of 743, or 1.7%, compared to the figure for March 31, 2021 (43,001).
- Comparing March 31, 2022 to March 31, 2012, Yukon's population increased by 7,856, or 21.9%. The population of the Whitehorse area increased by 6,850, or 24.8%; Dawson City increased by 373, or 19.1%; and Watson Lake increased by 21, or 1.4%.

Notes on methodological changes:

Official population counts prior to June 2010 were based on information in Yukon Health Care Insurance Plan (YHCIP) files and a semi-annual health care update survey that estimated the number of plan members who were no longer Yukon residents. In 2010, the estimation model was revised and the population counts for June 2010 through December 2014 were derived by tracking changes in YHCIP files and other administrative data files. In 2015, the model was further revised to make the approach more comprehensive and to improve accuracy based on information in all available and applicable administrative data files of the Yukon government. In addition, the total population count of April 2011 was calibrated to a census-based estimate adjusted for net undercoverage.

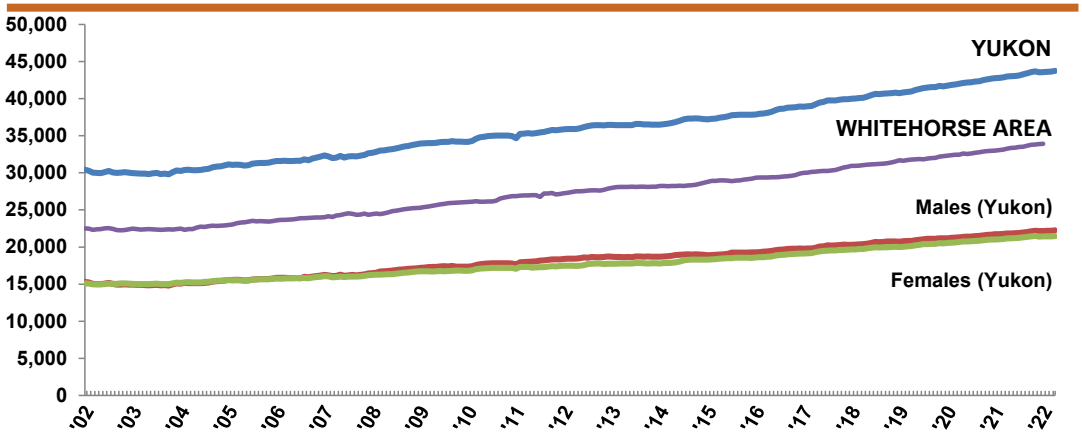
In 2020, the model was updated by prioritizing residential addresses over mailing addresses in the assignment of communities. This update allowed for separate reporting of population estimates for Johnson's Crossing and Mendenhall, and changes in the organization of Whitehorse subdivisions. The changes have been applied to all population estimates from June 2019 onwards.

Changes in community and subdivision populations from one time period to another are not only due to natural population change and migrations, but may also be due to the reassignment of residential addresses as additional administrative data became available.

All monthly estimates are as of the last day of the month. The June estimates represent annual figures.

Due to the change in methodology in 2015, figures presented in this publication for the period from April 2011 onwards are not strictly comparable to figures prior to that period.

Monthly Population, March 31, 2001 to March 31, 2022



- From 2004 through 2014, Yukon's population increased almost steadily in most quarters of every year except in 2013. Positive growth rates—often very high—have been recorded in each quarter, from 2015 onwards. The March 31, 2022 population at 43,744 is the new record-high[1] for Yukon.
- On March 31, 2022, Yukon's population (43,744), increased by 169 people, or 0.4%, from the figure for December 31, 2021 (43,575), and increased by 743 people, or 1.7%, from March 31, 2021 (43,001).

[1] Accurate population counts during the Gold Rush are not available. However, the population figure in the first Census for Yukon (1901) was 27,219.

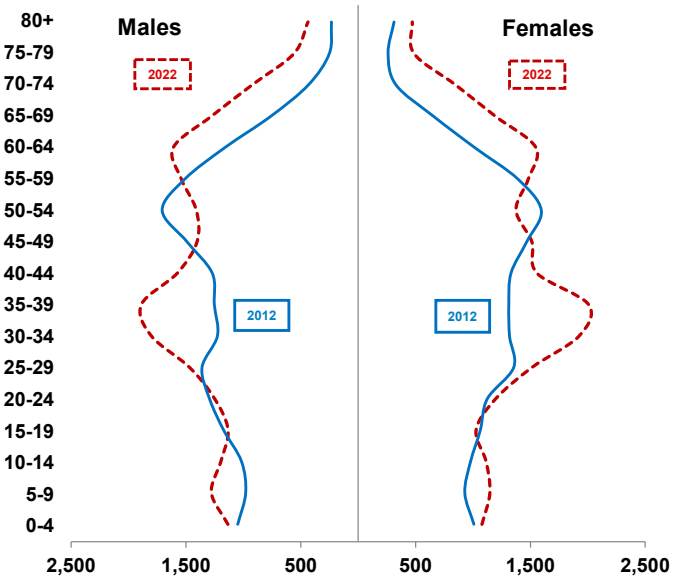
Monthly Population, Yukon, January 31, 2012 to March 31, 2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan	35,895	36,420	36,552	37,269	37,943	38,958	40,006	40,844	41,838	42,783	43,619
Feb	35,910	36,432	36,622	37,309	38,004	39,012	40,077	40,907	41,905	42,870	43,642
Mar	35,888	36,407	36,707	37,422	38,088	39,231	40,119	40,962	42,007	43,001	43,744
Apr	36,001	36,438	36,851	37,490	38,207	39,472	40,289	41,154	42,103	43,022	
May	36,158	36,414	36,997	37,583	38,440	39,567	40,457	41,279	42,162	43,056	
Jun[1]	**36,283**	**36,571**	**37,190**	**37,745**	**38,594**	**39,737**	**40,643**	**41,427**	**42,198**	**43,118**	
Jul	36,383	36,570	37,294	37,800	38,643	39,740	40,594	41,493	42,284	43,280	
Aug	36,427	36,512	37,293	37,834	38,761	39,761	40,670	41,551	42,339	43,416	
Sep	36,431	36,505	37,340	37,820	38,797	39,847	40,710	41,540	42,496	43,568	
Oct	36,375	36,492	37,311	37,832	38,843	39,928	40,746	41,699	42,602	43,668	
Nov	36,467	36,488	37,252	37,817	38,926	39,922	40,788	41,657	42,680	43,549	
Dec	36,445	36,473	37,210	37,868	38,900	39,968	40,717	41,730	42,744	43,575	

[1] June figures are referred to as 'annual'

- During the first quarter of 2022, Yukon's population increased by 169 people from 43,575 on December 31, 2021 to 43,744 on March 31, 2022.
- Comparing the months of January through March of 2021 to their respective months of 2020, population increased: 2.0% in January; 1.8% in February; and 1.7% in March.

Population by Age Group and Sex, Yukon, March 31, 2012 and March 31, 2022

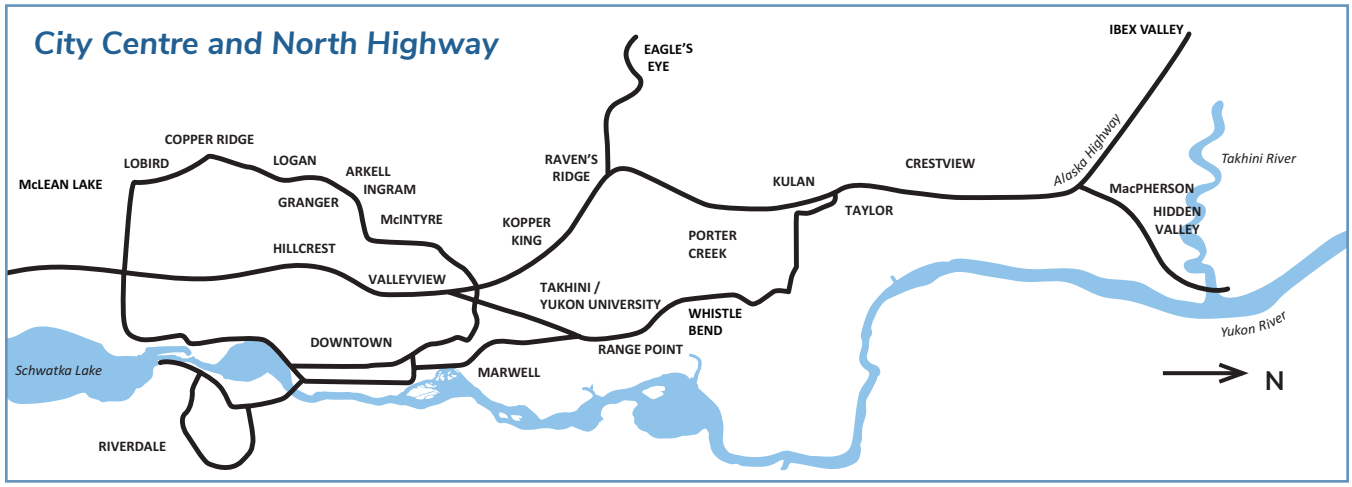


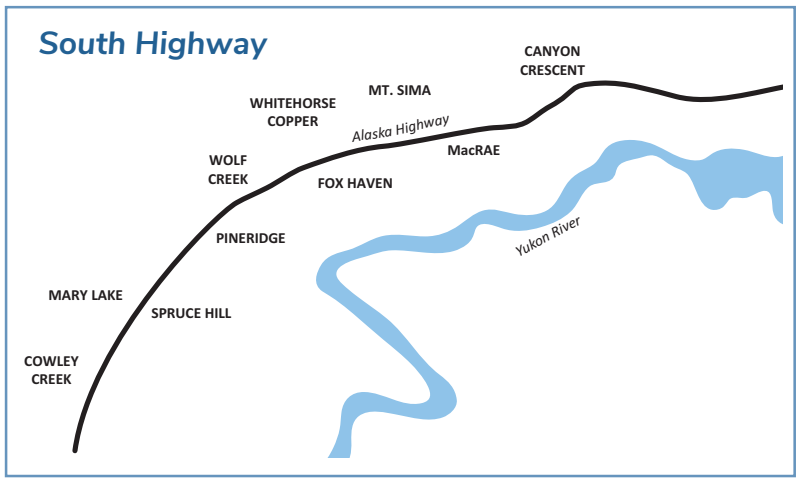
	Mar '22			Change from Mar '12 to Mar '22		
Age Groups	**Both Sexes**	**Males**	**Females**	**Both Sexes**	**Males**	**Females**
0-4	2,231	1,153	1,078	7.2%	7.5%	6.9%
5-9	2,417	1,270	1,147	25.5%	27.4%	23.5%
10-14	2,390	1,276	1,114	19.9%	25.8%	13.8%
15-19	2,147	1,120	1,027	-2.1%	-0.9%	-3.5%
20-24	2,463	1,265	1,198	1.1%	-3.5%	6.5%
25-29	2,971	1,456	1,515	8.9%	6.1%	11.8%
30-34	3,757	1,832	1,925	42.4%	38.8%	46.1%
35-39	3,971	1,964	2,007	55.6%	58.4%	53.0%
40-44	3,226	1,669	1,557	23.6%	30.5%	17.0%
45-49	2,928	1,415	1,513	0.1%	-2.9%	3.1%
50-54	2,821	1,446	1,375	-15.5%	-17.1%	-13.8%
55-59	2,980	1,498	1,482	2.4%	-1.4%	6.6%
60-64	3,158	1,610	1,548	42.9%	34.7%	52.5%
65-69	2,471	1,277	1,194	66.2%	53.5%	82.3%
70-74	1,775	928	847	123.6%	99.6%	157.4%
75-79	1,097	612	485	115.1%	145.8%	85.8%
80+	941	470	471	69.5%	94.2%	50.5%
All Ages	**43,744**	**22,261**	**21,483**	**21.9%**	**20.7%**	**23.1%**

Comparing March 31, 2022 to March 31, 2012, growth occurred as follows (15-year age groupings):

- 0 to 14 years = increased 1,038 people, (17.3%);
- 15 to 29 years = increased 224 people, (3.0%);
- 30 to 44 years = increased 3,154 people, (40.4%);
- 45 to 59 years = decreased 446 people, (-4.9%);
- 60 to 74 years = increased 2,913 people, (64.9%); and
- 75 years and over = increased 973 people, (91.4%).

Population by Subdivision in Whitehorse Area





Note:

Subdivisions are assigned based on boundaries provided by the City of Whitehorse. Areas outside of the City of Whitehorse boundaries are assigned using Statistics Canada's Census Subdivision (CSD) boundaries within the Census Agglomeration of Whitehorse.

Changes in subdivision (City and CSD subdivision) populations from one time period to another are not only due to natural population change and migrations, but may also be due to the reassignment of residential addresses as additional administrative data become available.

Subdivision	Mar '21	Dec '21	Mar '22
Arkell/Ingram	1,113	1,110	1,112
Copper Ridge	3,338	3,333	3,329
Cowley Creek	259	262	253
Crestview	1,018	1,026	1,041
Downtown	3,024	3,028	3,071
Granger	1,327	1,329	1,328
Hidden Valley/MacPherson	454	444	439
Hillcrest	723	720	719
Kopper King	216	203	203
Lobird	218	222	218
Logan	613	612	621
MacRae/Whse Copper/McLean Lake/ Mt. Sima/Canyon Cres.	642	633	653
Marwell	137	138	140
Mary Lake/Spruce Hill	474	471	470
McIntyre	506	494	503
Pineridge/Fox Haven	379	377	381
Porter Creek/Kulan/Taylor	4,692	4,741	4,740

Subdivision	Mar '21	Dec '21	Mar '22
Range Point	1,230	1,228	1,230
Raven's Ridge/Eagle's Eye	163	152	155
Riverdale	5,199	5,321	5,310
Takhini/Yukon University	1,456	1,491	1,466
Valleyview	159	159	155
Whistle Bend	2,046	2,357	2,503
Wolf Creek	424	430	437
Not in Defined Neighbourhood Within City Limits	143	141	140
Whitehorse-Municipal Boundaries	**29,953**	**30,422**	**30,617**
Ibex Valley[1]	486	508	520
Marsh Lake[2]	735	721	719
Mount Lorne[3]	463	462	459
Outside City Limits-North[4]	1,550	1,558	1,552
Outside City Limits-South[5]	567	580	581
Not applicable[6]	17	17	19
Whitehorse Area Total	**33,771**	**34,268**	**34,467**

[1] Previously included in Outside City Limits-West. Includes KM 1441 to KM 1485 Alaska Highway.
[2] Includes Alaska Highway KM 1355 to KM 1393 (Lewes River Bridge).
[3] Previously included in Outside City Limits-South. Includes KM 137 to KM 154 South Klondike Highway, including Annie Lake Road.
[4] Outside City Limits-North includes Takhini River Bridge north to KM 247 North Klondike Highway, including Takhini Hotsprings Road.
[5] Outside City Limits-South includes Golden Horn, Carcross Cut-off, south to Lewes River Bridge, as well as KM 114 to KM 137 South Klondike Highway.
[6] 'Not applicable' includes Kusawa Lake Road, and past KM 247 North Klondike Highway to Braeburn.

Population by Community[1] and Age Group, March 31, 2022

	Age Group																	All
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+	Ages
Beaver Creek	4	3	4	1	5	11	15	5	13	4	8	8	10	5	6	2	3	107
Burwash Landing	4	3	5	3	3	4	10	5	10	4	8	9	11	9	2	2	3	95
Carcross	17	25	24	19	23	28	30	36	23	32	40	41	34	38	29	20	13	472
Carmacks	33	43	37	35	38	34	36	36	46	37	30	43	53	40	24	12	7	584
Dawson City	104	105	107	101	105	136	244	244	178	152	159	169	189	149	90	53	36	2,321
Destruction Bay	0	2	3	2	2	1	4	3	8	3	7	5	10	2	4	0	3	59
Faro	18	30	31	20	18	23	21	36	35	19	20	34	59	50	28	20	10	472
Haines Junction	57	47	57	59	32	50	65	67	70	74	65	72	102	72	57	29	25	1,000
Johnson's Crossing	1	1	4	4	1	1	1	3	3	1	7	5	7	6	4	1	7	57
Mayo	19	25	18	16	20	27	35	40	33	28	23	36	46	37	28	12	14	457
Mendenhall	7	5	6	9	4	6	3	6	17	18	9	9	14	11	11	3	0	138
Old Crow	19	12	12	13	11	21	20	34	12	13	13	18	12	13	17	4	5	249
Pelly Crossing	18	21	29	20	23	27	32	33	23	21	32	33	25	21	8	13	6	385
Ross River	22	24	19	26	27	31	24	26	27	25	45	33	28	17	16	10	6	406
Tagish	8	10	9	10	10	18	11	12	20	17	28	46	54	55	28	26	18	380
Teslin	21	28	22	27	21	31	34	30	32	35	41	35	38	37	26	17	11	486
Watson Lake	70	78	86	72	76	94	119	100	73	92	115	141	136	91	60	60	49	1,512
Whitehorse Area[2]	1,809	1,955	1,916	1,710	2,043	2,428	3,049	3,248	2,598	2,349	2,167	2,229	2,312	1,803	1,325	805	721	34,467
Other[3]	0	0	1	0	1	0	4	7	5	4	4	14	18	15	12	8	4	97
Yukon	2,231	2,417	2,390	2,147	2,463	2,971	3,757	3,971	3,226	2,928	2,821	2,980	3,158	2,471	1,775	1,097	941	43,744

[1] Community-level estimates include populations within the municipalities and surrounding area up to halfway to the next municipal boundary along the relevant highway or road, with the exceptions of: Braeburn, Champagne, Swift River and City of Whitehorse.
[2] Whitehorse Area includes City of Whitehorse and surrounding areas as defined on page 3.
[3] Other includes Braeburn, Champagne, Swift River, Keno and Stewart Crossing.

Note: *The following tables are sourced from Statistics Canada (SC). SC derives their estimates using a model and revises them after twelve months. The SC estimates are finalized during postcensal revisions every five years. SC estimates will not align with YBS estimates in the preceding tables which are based on administrative data.*

International Migration To and From Yukon, January 1, 2022 to March 31, 2022(p)

	Immigrants	Emigrants	Returning Emigrants	Net Temporary Emigrants	Net Non-permanent Residents	Net International Migration
Jan 1 to Mar 31 '22	169	8	3	4	-102	58

Source: Statistics Canada. Table 17-10-0040-01 (accessed: 2022-07-15)

Origin and Destination of Interprovincial Migrants, January 1, 2022 to March 31, 2022(p)

Origin	Destination												
	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC	YT	NWT	NU
NFLD	n/a	35	251	49	119	521	0	50	539	113	0	30	7
PEI	7	n/a	262	97	59	194	0	0	85	15	0	0	28
NS	284	138	n/a	567	222	1,257	75	124	449	322	0	41	19
NB	138	119	730	n/a	469	784	35	19	446	153	4	0	0
QC	27	17	158	306	n/a	3,373	179	79	728	860	5	5	48
ON	1,042	968	2,839	3,137	3,918	n/a	1,064	1,061	7,615	4,770	122	130	257
MB	36	17	66	138	109	1,175	n/a	463	1,889	1,041	8	0	50
SK	29	4	123	51	75	1,048	329	n/a	2,795	1,142	52	13	18
AB	502	137	912	418	548	4,038	574	1,863	n/a	7,286	96	186	69
BC	122	49	500	237	872	2,748	468	632	7,033	n/a	125	29	43
YT	0	0	4	0	10	6	0	7	65	124	n/a	12	0
NWT	26	0	43	0	29	49	28	23	308	73	19	n/a	19
NU	6	0	29	10	34	164	11	0	28	10	5	26	n/a

	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC	YT	NWT	NU
In	2,219	1,484	5,917	5,010	6,464	15,357	2,763	4,321	21,980	15,909	436	472	558
Out	1,714	747	3,498	2,897	5,785	26,923	4,992	5,679	16,629	12,858	228	617	323
Net	505	737	2,419	2,113	679	-11,566	-2,229	-1,358	5,351	3,051	208	-145	235

Source: Statistics Canada. Table 17-10-0045-01 (accessed: 2022-07-15)

July 2022
Next Release: October 2022

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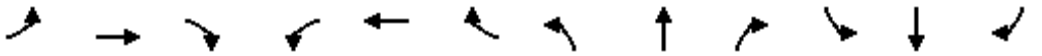
APPENDIX C – SYNCHRO REPORTS – 2022 EXISTING CONDITION

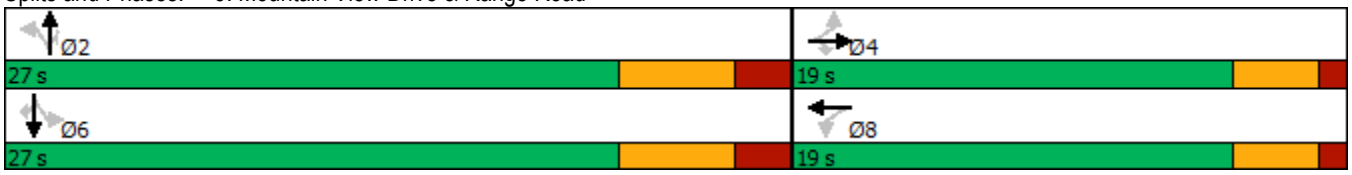


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	21	40	169	81	11	42	159	32	11	787	177
Future Volume (vph)	75	21	40	169	81	11	42	159	32	11	787	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994				0.850			0.850
Flt Protected		0.962			0.969		0.950			0.950		
Satd. Flow (prot)	0	1812	1601	0	3447	0	1789	1883	1601	1789	1883	1601
Flt Permitted		0.628			0.750		0.171			0.648		
Satd. Flow (perm)	0	1183	1601	0	2668	0	322	1883	1601	1220	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			71		10				35			192
Link Speed (k/h)		50			40			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			62.0			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	82	23	43	184	88	12	46	173	35	12	855	192
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	105	43	0	284	0	46	173	35	12	855	192
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		38.0	38.0	38.0	38.0	38.0	38.0
Total Split (s)	19.0	19.0	19.0	19.0	19.0		27.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	41.3%		58.7%	58.7%	58.7%	58.7%	58.7%	58.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.0	4.0		4.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	None	None	None	None	None
Act Effct Green (s)		12.2	12.2		12.2		23.4	23.4	23.4	23.4	23.4	23.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.27	0.27		0.27		0.51	0.51	0.51	0.51	0.51	0.51
v/c Ratio		0.33	0.09		0.40		0.28	0.18	0.04	0.02	0.89	0.21
Control Delay		16.9	2.5		15.0		14.1	7.9	3.6	7.6	26.7	2.4
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		16.9	2.5		15.0		14.1	7.9	3.6	7.6	26.7	2.4
LOS		B	A		B		B	A	A	A	C	A
Approach Delay		12.7			15.0			8.4			22.1	
Approach LOS		B			B			A			C	
Queue Length 50th (m)		6.4	0.0		8.9		1.7	6.1	0.0	0.4	49.9	0.0
Queue Length 95th (m)		20.0	3.2		21.4		11.5	23.0	4.0	3.3	#178.6	9.2
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		437	636		991		163	957	830	619	957	907
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.24	0.07		0.29		0.28	0.18	0.04	0.02	0.89	0.21

Intersection Summary			
Area Type:	Other		
Cycle Length: 46			
Actuated Cycle Length: 46			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 69.1%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	252	5	5	510
Future Vol, veh/h	5	5	252	5	5	510
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	274	5	5	554

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	841	277	0	0	279	0
Stage 1	277	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	335	762	-	-	1284	-
Stage 1	770	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	333	762	-	-	1284	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.1
HCM LOS	B		

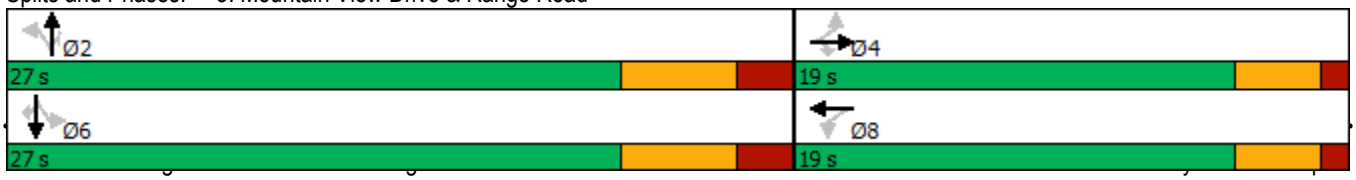
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	463	1284	-
HCM Lane V/C Ratio	-	-	0.023	0.004	-
HCM Control Delay (s)	-	-	13	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	68	37	63	36	11	41	628	195	11	283	81
Future Volume (vph)	172	68	37	63	36	11	41	628	195	11	283	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.985				0.850			0.850
Flt Protected		0.965			0.972		0.950			0.950		
Satd. Flow (prot)	0	1818	1601	0	3426	0	1789	1883	1601	1789	1883	1601
Flt Permitted		0.710			0.736		0.573			0.276		
Satd. Flow (perm)	0	1337	1601	0	2594	0	1079	1883	1601	520	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			71		12				212			88
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	187	74	40	68	39	12	45	683	212	12	308	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	261	40	0	119	0	45	683	212	12	308	88
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0		38.0	38.0	38.0	38.0	38.0	38.0
Total Split (s)	19.0	19.0	19.0	19.0	19.0		27.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	41.3%		58.7%	58.7%	58.7%	58.7%	58.7%	58.7%

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	15.0	15.0	15.0	15.0	15.0		21.0	21.0	21.0	21.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.0	4.0		4.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Gap (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None		None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0		25.0	25.0	25.0	25.0	25.0	25.0
Pedestrian Calls (#/hr)	0	0	0	1	1		1	1	1	1	1	1
Act Effct Green (s)		15.2	15.2		15.1		24.9	24.9	24.9	24.9	24.9	24.9
Actuated g/C Ratio		0.35	0.35		0.35		0.57	0.57	0.57	0.57	0.57	0.57
v/c Ratio		0.56	0.07		0.13		0.07	0.63	0.21	0.04	0.29	0.09
Control Delay		19.4	1.9		11.6		8.7	14.5	2.3	8.9	9.4	2.8
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		19.4	1.9		11.6		8.7	14.5	2.3	8.9	9.4	2.8
LOS		B	A		B		A	B	A	A	A	A
Approach Delay		17.0			11.6			11.5			8.0	
Approach LOS		B			B			B			A	
Queue Length 50th (m)		18.1	0.0		3.2		2.0	44.6	0.0	0.5	15.3	0.0
Queue Length 95th (m)		47.3	2.7		9.8		8.1	110.9	9.7	3.5	40.1	6.4
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		586	742		1144		627	1095	1020	302	1095	968
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.45	0.05		0.10		0.07	0.62	0.21	0.04	0.28	0.09

Intersection Summary			
Area Type:	Other		
Cycle Length: 46			
Actuated Cycle Length: 43.6			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 62.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	0.2

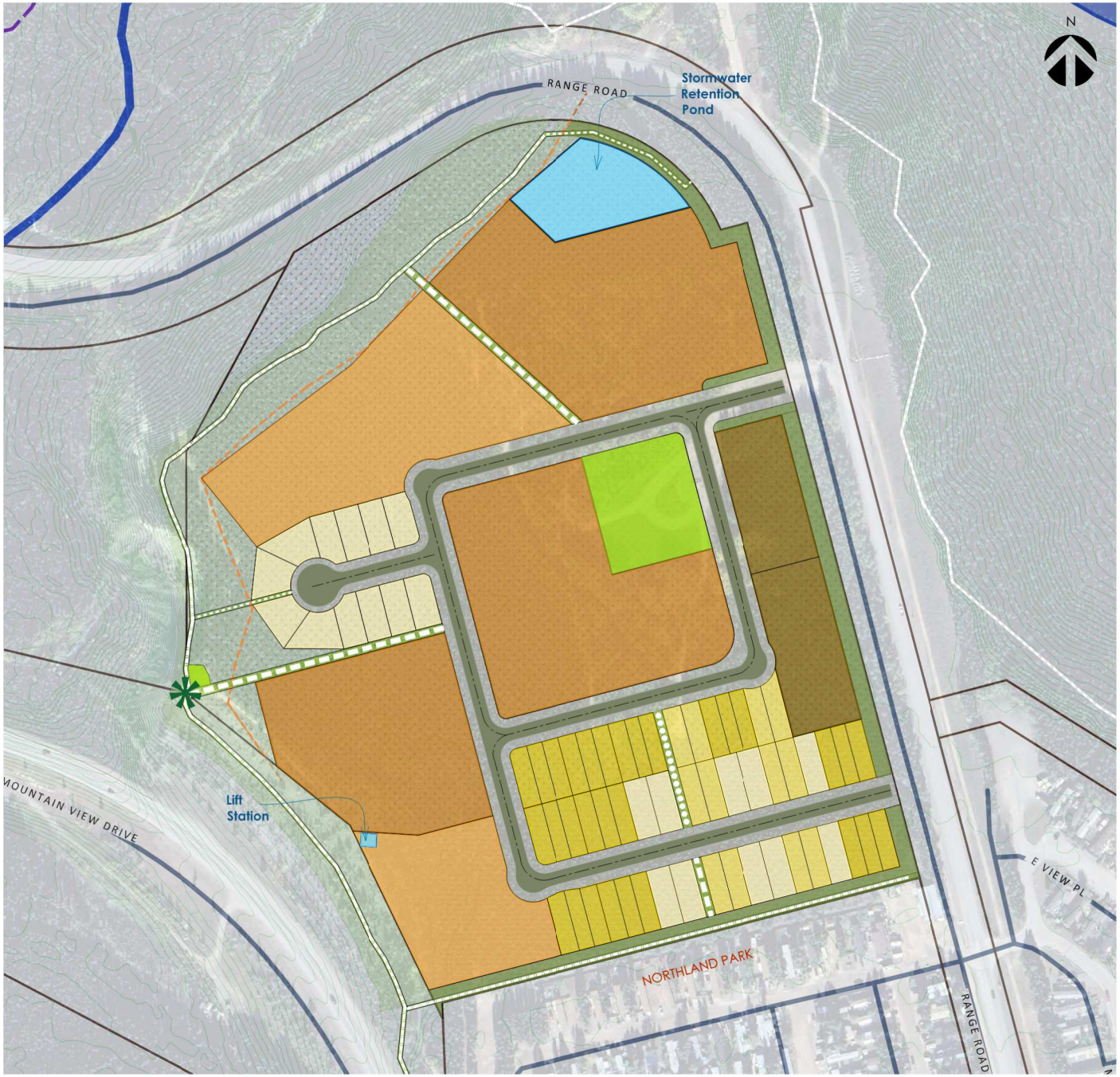
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	532	5	5	456
Future Vol, veh/h	5	5	532	5	5	456
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	578	5	5	496

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1087	581	0	0	583	0
Stage 1	581	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	239	514	-	-	991	-
Stage 1	559	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	237	514	-	-	991	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	602	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	324	991	-
HCM Lane V/C Ratio	-	-	0.034	0.005	-
HCM Control Delay (s)	-	-	16.5	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

APPENDIX D – SITE PLAN CONCEPT



NEIGHBOURHOOD PLAN
Fall 2022

RANGE POINT
JOINT MASTER PLAN

LEGEND

Housing/Development Type
- Single detached home
- Duplex
- Triplex
- Cottage cluster housing
- Multiple unit building - medium density
- Multiple unit buildings - medium to high density

Parks and Trails Features
- Treed buffer/gateway landscaping
- Perimeter greenspace
- Neighbourhood park and trail corridor
- Natural surface trail
- Paved trail
- Pocket park

Other
- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Road ROW
- Road w/centreline
- Geotechnical setback
- Utility

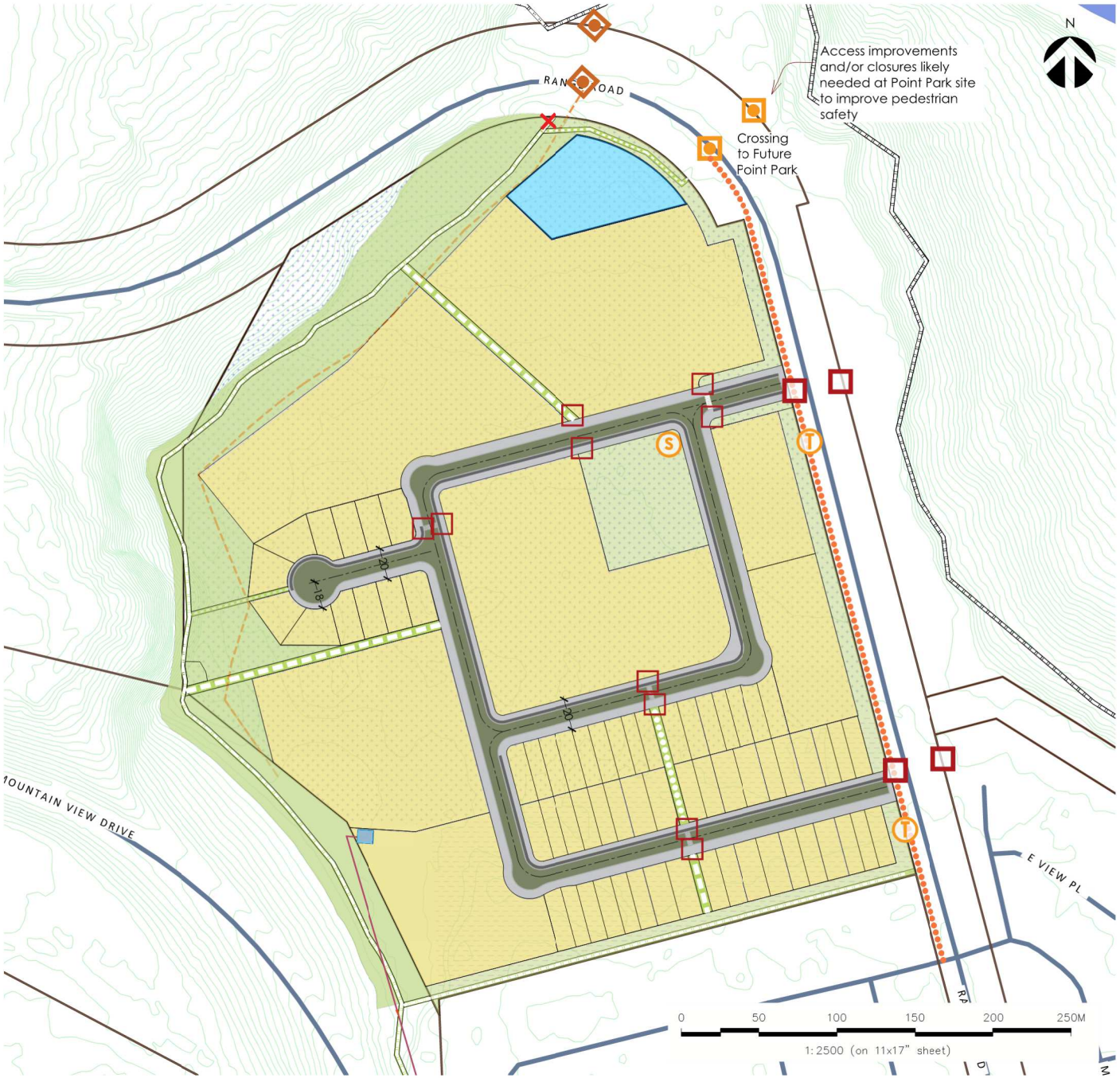
0 50 100 150 200 250M

1:2500 (on 11x17" sheet)

Clients: Yukon

Lead Consultant: GROUNDSWELL

Drafting: LEES & ASSOCIATES



TRANSPORTATION PLAN
Fall 2022

RANGE POINT
JOINT MASTER PLAN

LEGEND

Road Network
- Road ROW
- Road w/centreline (9m)

Active Transportation Network
- Sidewalk with rolled curb (1.5m)
- Range Road multi-use paved pathway (2m)
- Paved trail
- Existing natural surface trail
- Natural surface trail (1.5m with 3m ROW)
- Natural surface trail (3m with 6m ROW)
- (S) Public bike rack

Safety Features
- Signalized crosswalk
- Marked crosswalk
- Marked crosswalk and/or pedestrian enhancements (curb extensions, no landscaping zones, etc.)
- Advanced warning signal or sign
- Access closure

Transit
- (T) Potential transit stop

Other
- Housing
- Utility
- Parks, trails and greenspace
- Settlement Land parcel C-15B (KDFN)
- Lot 262-6 (YG)
- Existing or proposed lot boundary
- Geotechnical setback

Clients: Yukon
Lead Consultant: GROUNDSWELL
Drafting: LEES & ASSOCIATES

APPENDIX E – TRIP GENERATION DETAILS AND ITE TRIP GENERATION SHEETS

Minimum Housing Unit Counts			ITE Vehicle Trip Generation Rates (peak hours are for peak hour of adjacent street traffic unless highlighted)									Total Generated Trips			Total Distribution of Generated Trips			
ITE comparable Land Use	ITE units	On a	Daily	AM	PM	AM In	AM Out	PM In	PM Out	Expected ITE Units (Dewelling Units)	Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out
Single-Family Detached Housing (210)	Dwelling Units	weekday	Ln(T) = 0.92 Ln(X) + 2.68	Ln(T) = 0.91 Ln(X) + 0.12	Ln(T) = 0.94 Ln(X) + 0.27	26%	74%	63%	37%	24	271	20	26	5	15	16	10
Single-Family Attached Housing (215)	Dwelling Units	weekday	T = 7.62(X) - 50.48	T = 0.52(X) - 5.70	T = 0.60(X) - 3.93	31%	69%	57%	43%	39	247	15	19	5	10	11	8
Single-Family Attached Housing (215)	Dwelling Units	weekday	T = 7.62(X) - 50.48	T = 0.52(X) - 5.70	T = 0.60(X) - 3.93	31%	69%	57%	43%	37	231	14	18	4	10	10	8
Multifamily Housing (Low-Rise) (220)	Dwelling Units	weekday	T = 6.41(X) + 75.31	T = 0.31(X) + 22.85	T = 0.43(X) + 20.55	24%	76%	63%	37%	149	1030	69	85	17	52	54	31
									Total	**249**	**1780**	**118**	**148**	**31**	**87**	**91**	**57**

Maximum Housing Unit Counts			ITE Vehicle Trip Generation Rates (peak hours are for peak hour of adjacent street traffic unless highlighted)									Total Generated Trips			Total Distribution of Generated Trips			
ITE comparable Land Use	ITE units	On a	Daily	AM	PM	AM In	AM Out	PM In	PM Out	Expected ITE Units (Dewelling Units)	Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out
Single-Family Detached Housing (210)	Dwelling Units	weekday	Ln(T) = 0.92 Ln(X) + 2.68	Ln(T) = 0.91 Ln(X) + 0.12	Ln(T) = 0.94 Ln(X) + 0.27	26%	74%	63%	37%	24	271	20	26	5	15	16	10
Single-Family Attached Housing (215)	Dwelling Units	weekday	T = 7.62(X) - 50.48	T = 0.52(X) - 5.70	T = 0.60(X) - 3.93	31%	69%	57%	43%	39	247	15	19	5	10	11	8
Single-Family Attached Housing (215)	Dwelling Units	weekday	T = 7.62(X) - 50.48	T = 0.52(X) - 5.70	T = 0.60(X) - 3.93	31%	69%	57%	43%	134	971	64	76	20	44	43	33
Multifamily Housing (Low-Rise) (220)	Dwelling Units	weekday	T = 6.41(X) + 75.31	T = 0.31(X) + 22.85	T = 0.43(X) + 20.55	24%	76%	63%	37%	319	2120	122	158	29	93	100	58
									Total	**516**	**3609**	**221**	**279**	**59**	**162**	**170**	**109**

Land Use: 210
Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

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/).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077,1078, 1079

Single-Family Detached Housing
(210)

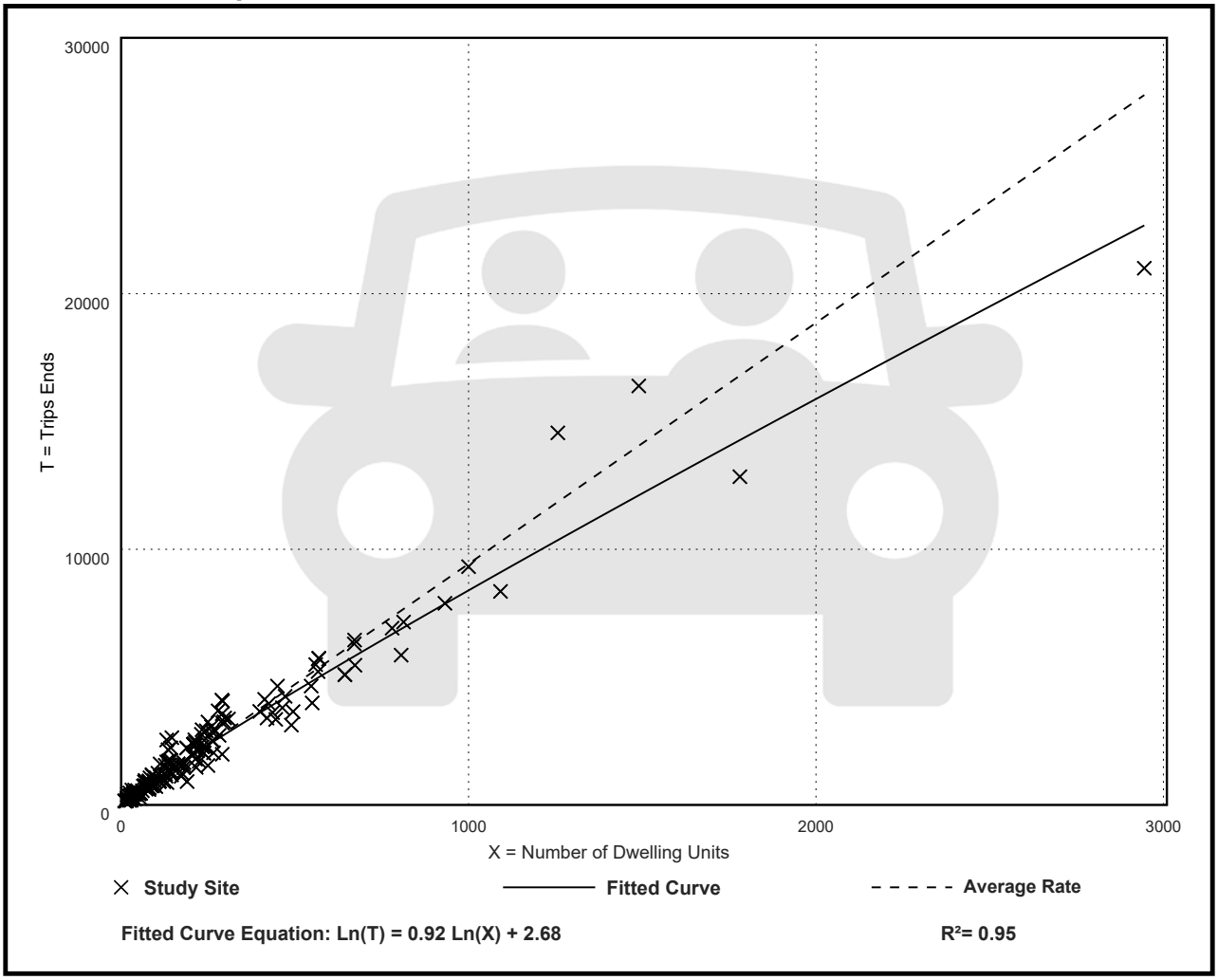
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.68

R^2= 0.95

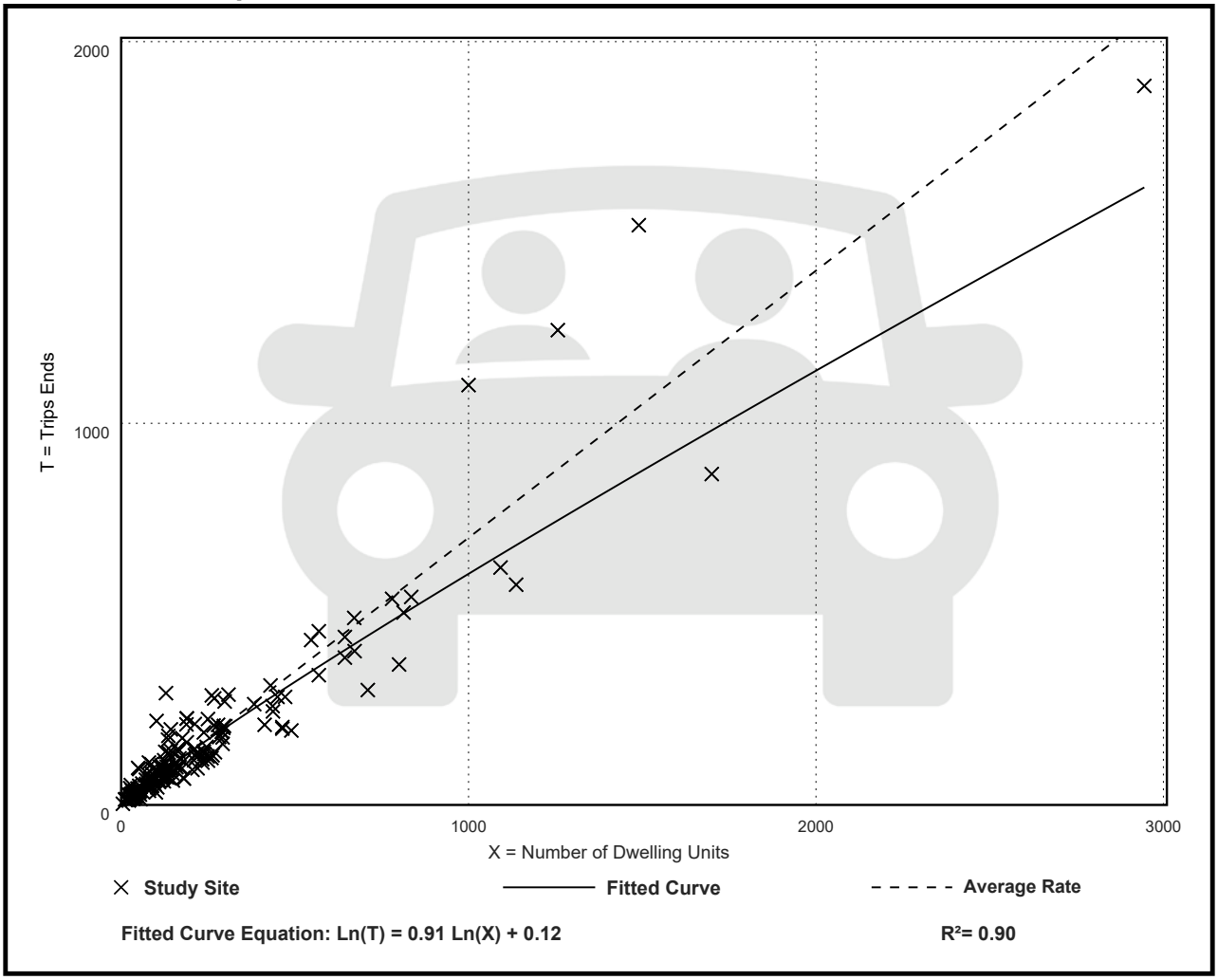
Single-Family Detached Housing
(210)

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: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



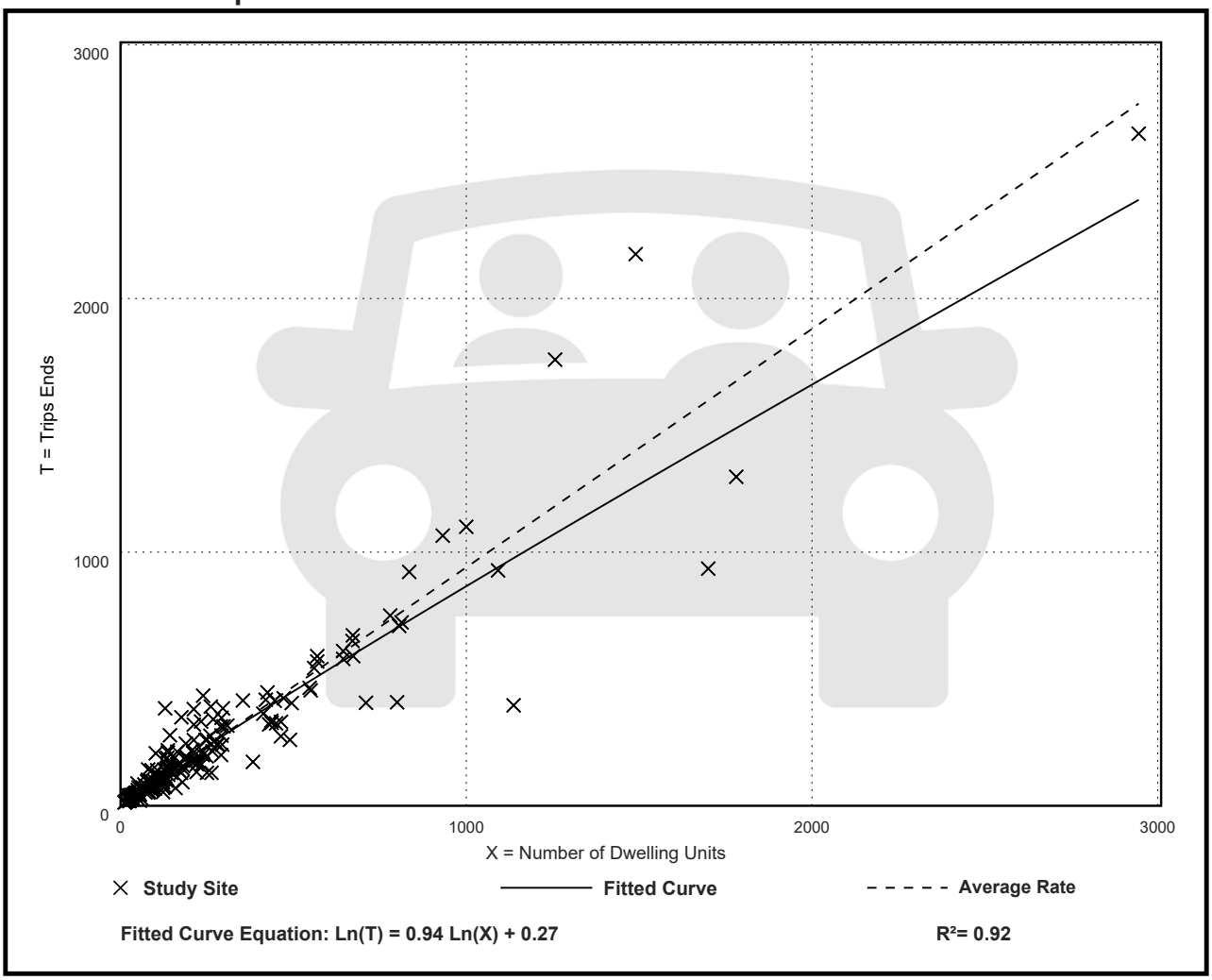
Single-Family Detached Housing
(210)

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: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing
(210)

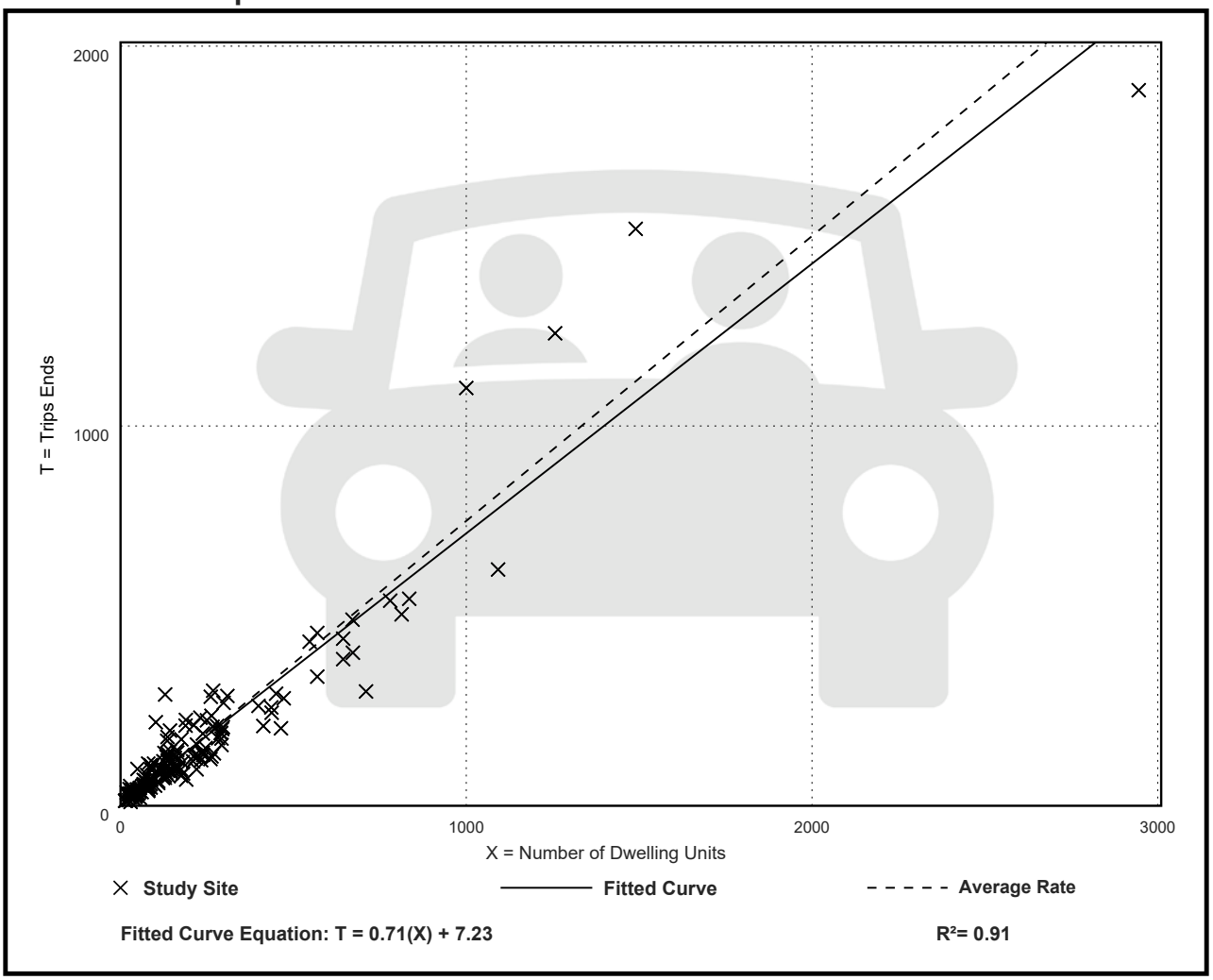
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 169
Avg. Num. of Dwelling Units: 217
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.75	0.34 - 2.27	0.25

Data Plot and Equation



Fitted Curve Equation: T = 0.71(X) + 7.23

R^2= 0.91

Single-Family Detached Housing
(210)

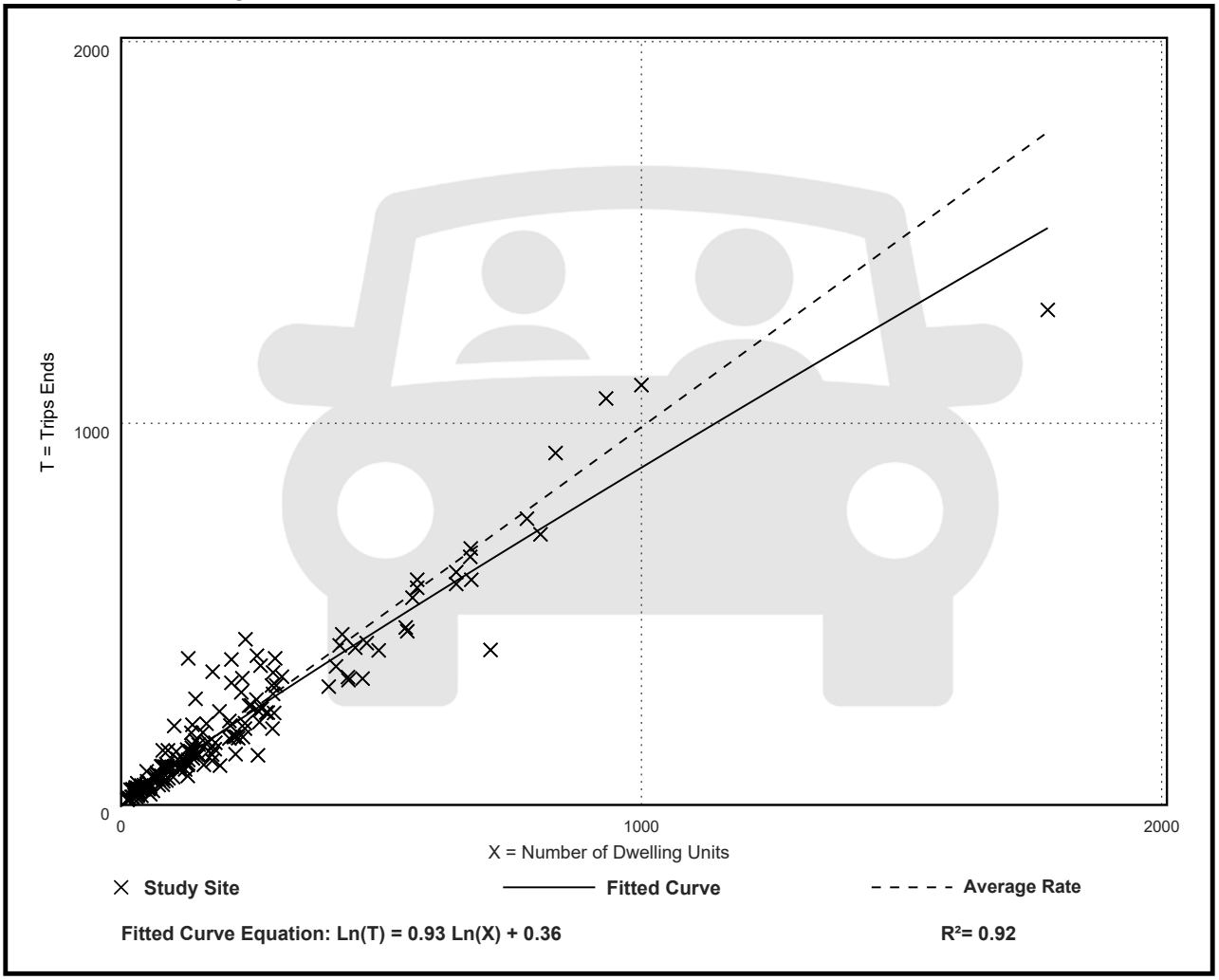
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 178
Avg. Num. of Dwelling Units: 203
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.49 - 2.98	0.28

Data Plot and Equation



Single-Family Detached Housing
(210)

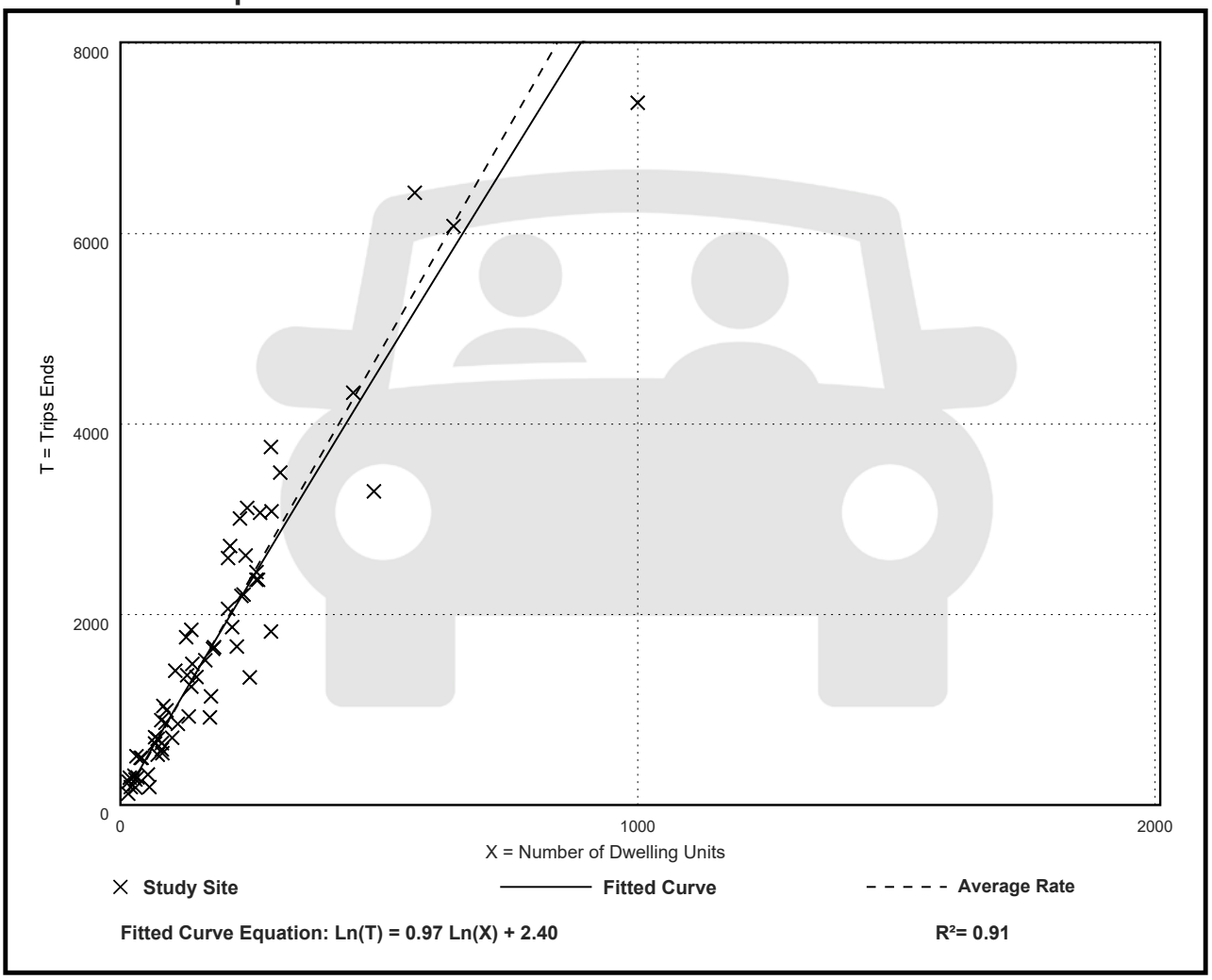
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 63
Avg. Num. of Dwelling Units: 179
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.48	3.36 - 16.52	2.26

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.97 Ln(X) + 2.40

R^2= 0.91

Single-Family Detached Housing
(210)

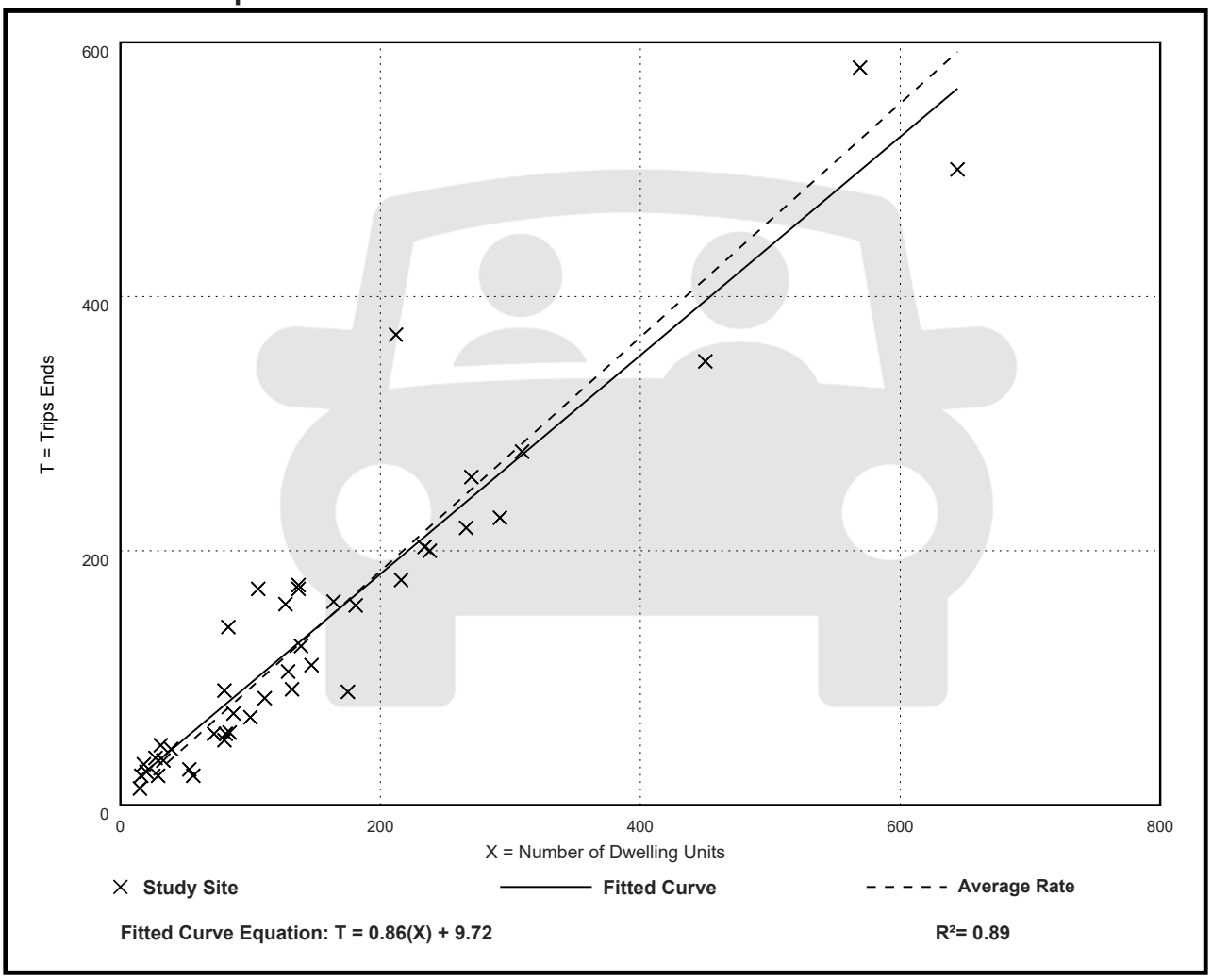
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 42
Avg. Num. of Dwelling Units: 152
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.92	0.41 - 1.78	0.27

Data Plot and Equation



Fitted Curve Equation: T = 0.86(X) + 9.72

R^2= 0.89

Single-Family Detached Housing
(210)

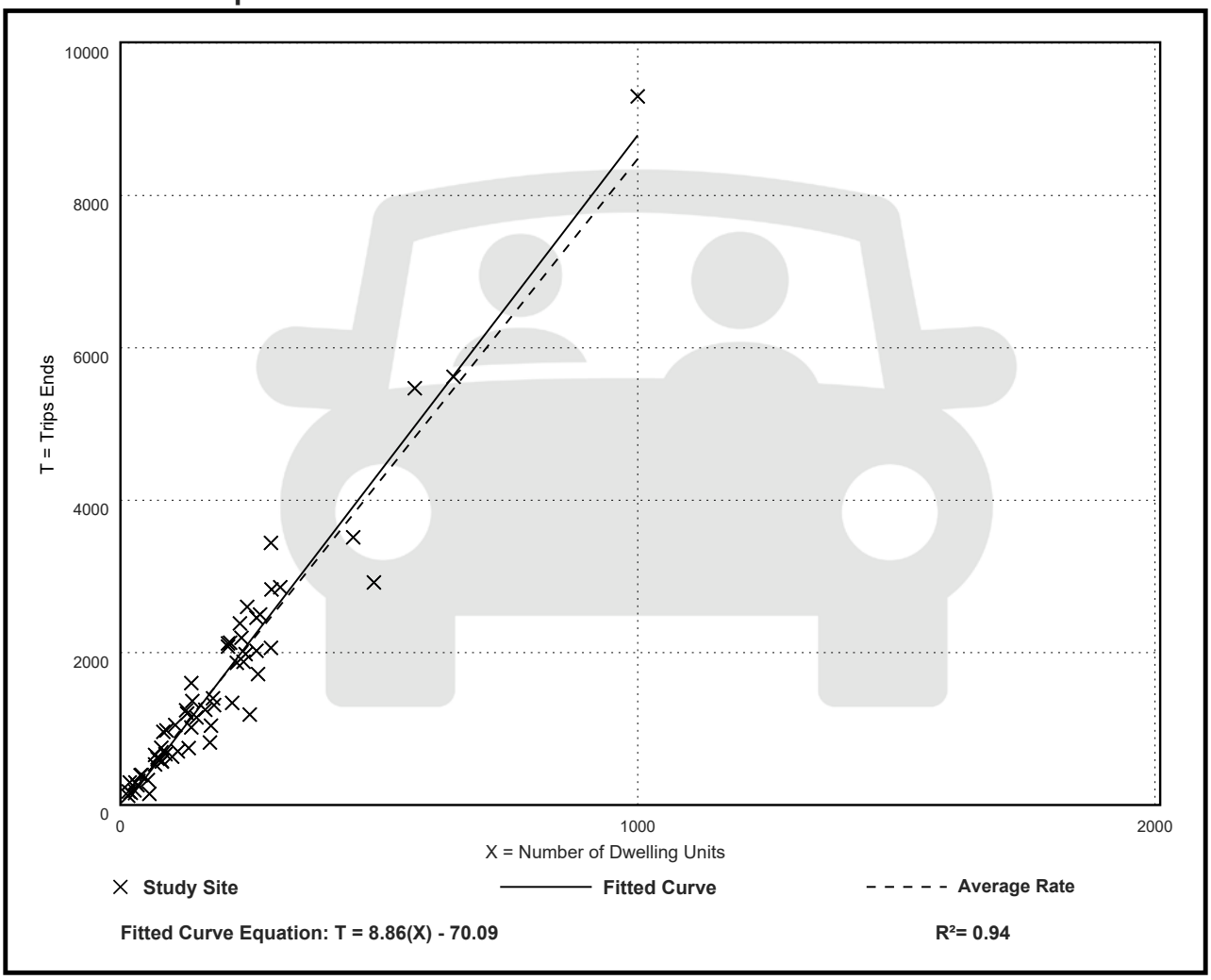
Vehicle Trip Ends vs: Dwelling Units
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 60
Avg. Num. of Dwelling Units: 186
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
8.48	2.61 - 16.44	1.74

Data Plot and Equation



Single-Family Detached Housing
(210)

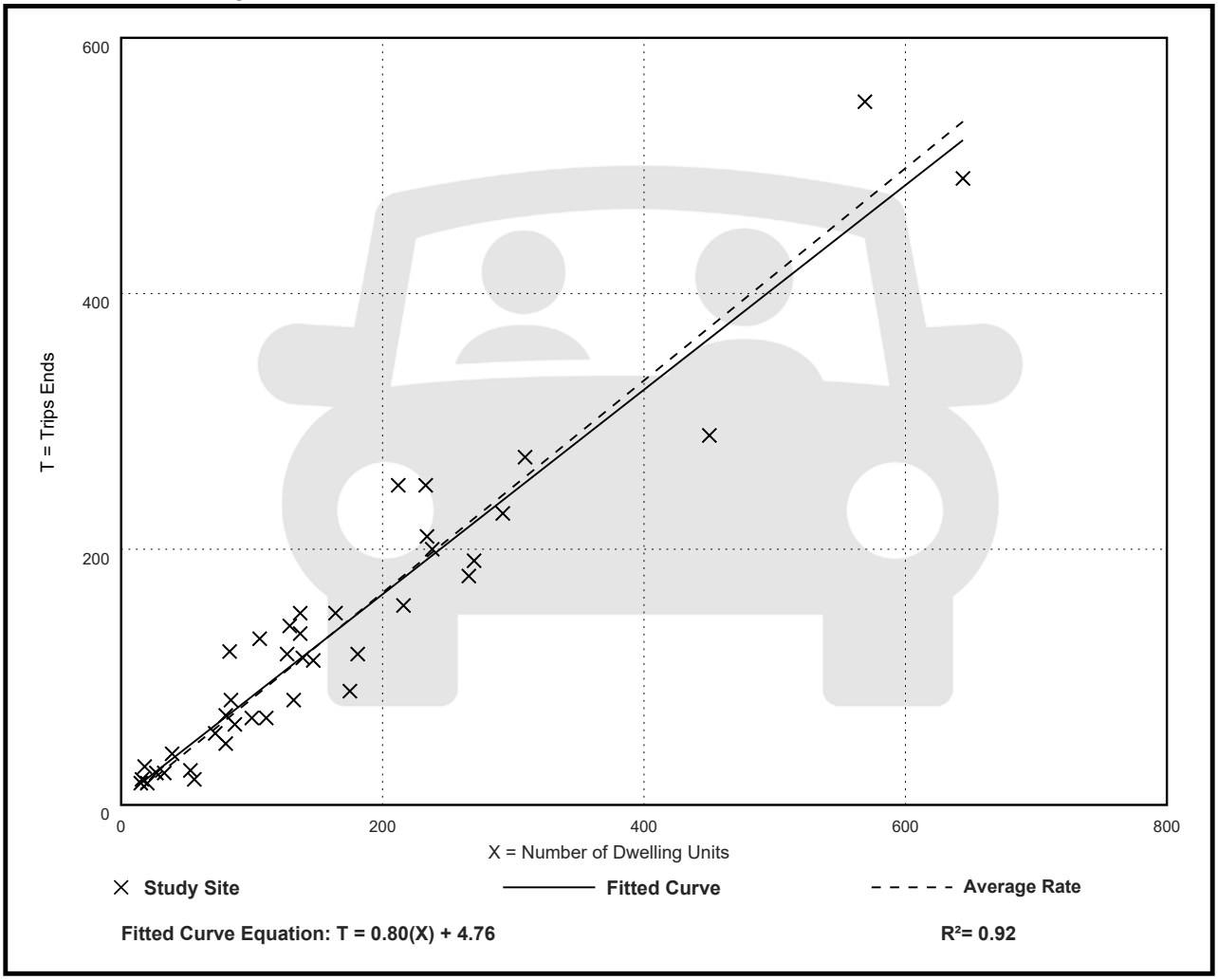
Vehicle Trip Ends vs: Dwelling Units
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 40
Avg. Num. of Dwelling Units: 162
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.83	0.36 - 1.67	0.19

Data Plot and Equation



Fitted Curve Equation: T = 0.80(X) + 4.76

R^2= 0.92

Single-Family Detached Housing
(210)

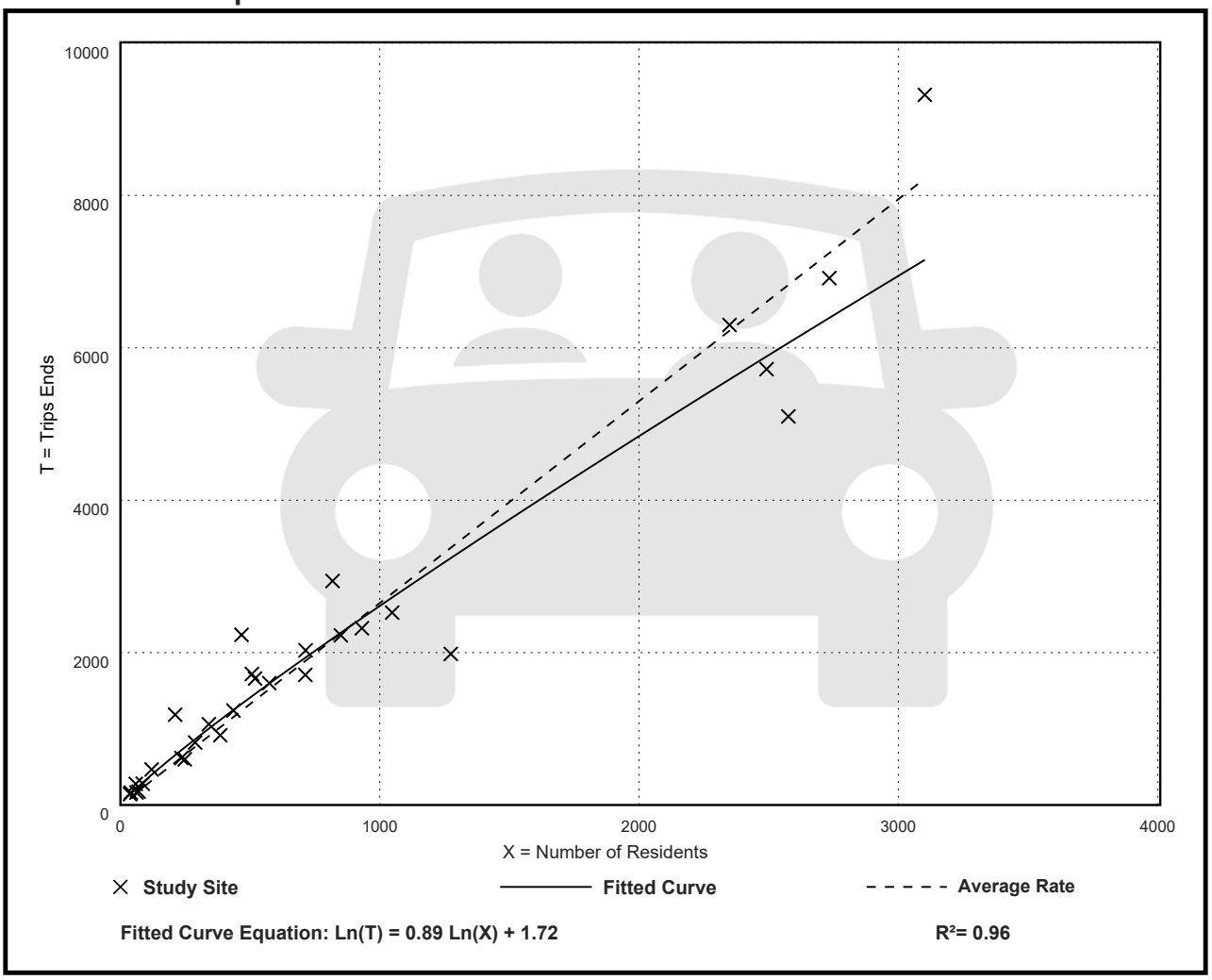
Vehicle Trip Ends vs: Residents
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 30
Avg. Num. of Residents: 810
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
2.65	1.56 - 5.62	0.64

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.89 Ln(X) + 1.72

R^2= 0.96

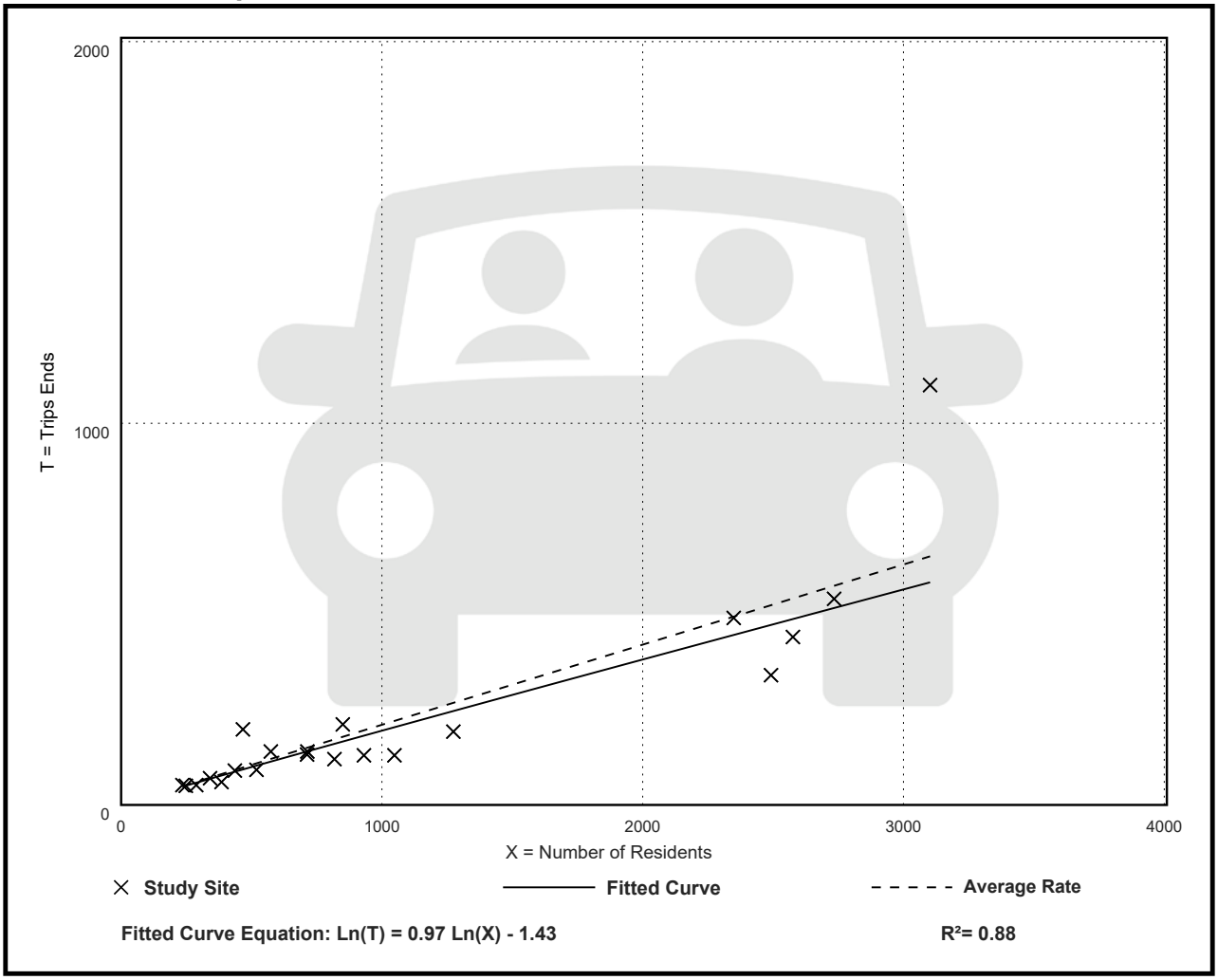
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Residents**
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. Num. of Residents: 1100
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.21	0.12 - 0.42	0.08

Data Plot and Equation



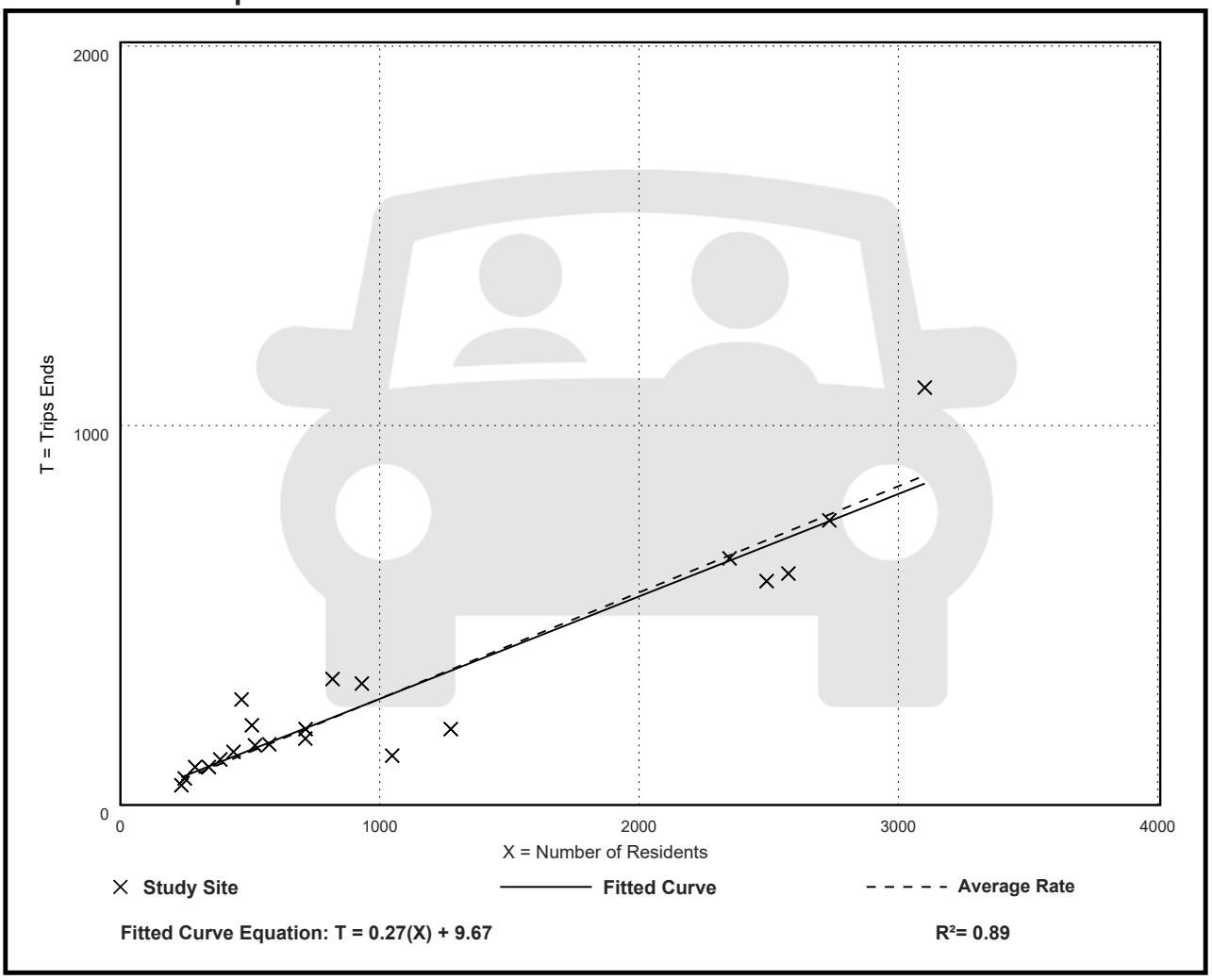
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: Residents
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. Num. of Residents: 1083
Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.28	0.12 - 0.60	0.08

Data Plot and Equation



Single-Family Detached Housing
(210)

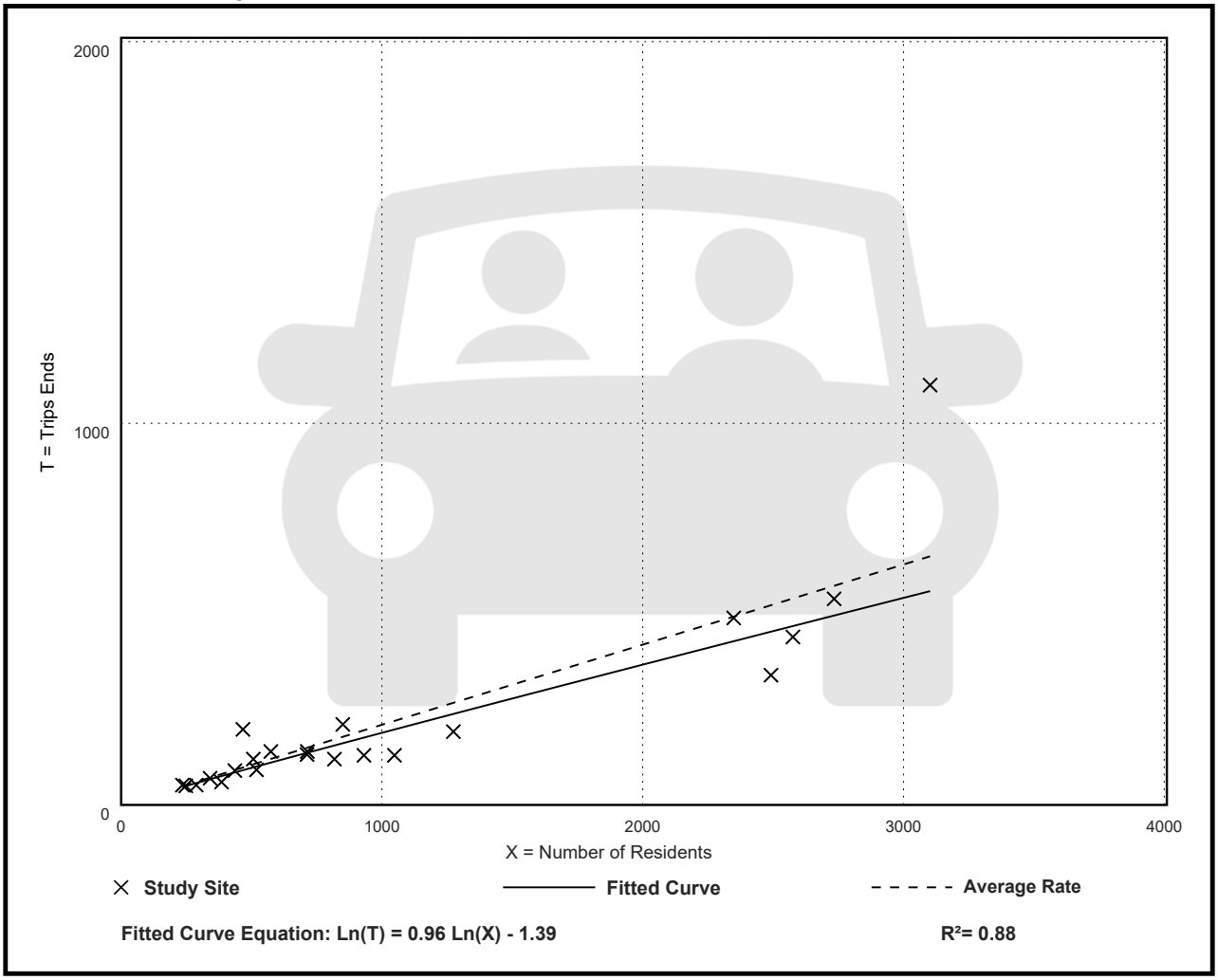
Vehicle Trip Ends vs: Residents
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Residents: 1073
Directional Distribution: 30% entering, 70% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.21	0.12 - 0.42	0.08

Data Plot and Equation



Single-Family Detached Housing
(210)

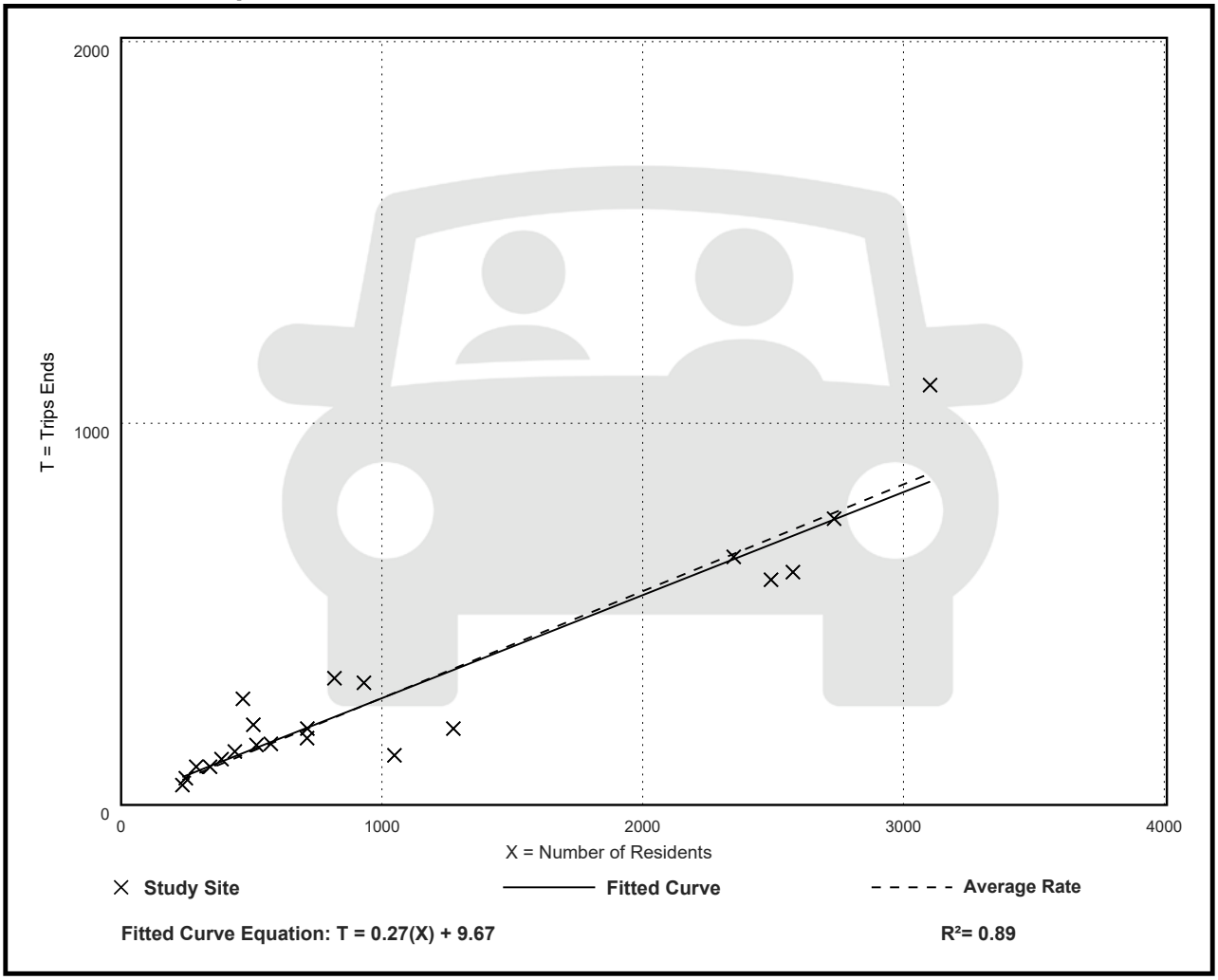
Vehicle Trip Ends vs: Residents
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 21
Avg. Num. of Residents: 1083
Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.28	0.12 - 0.60	0.08

Data Plot and Equation



Single-Family Detached Housing
(210)

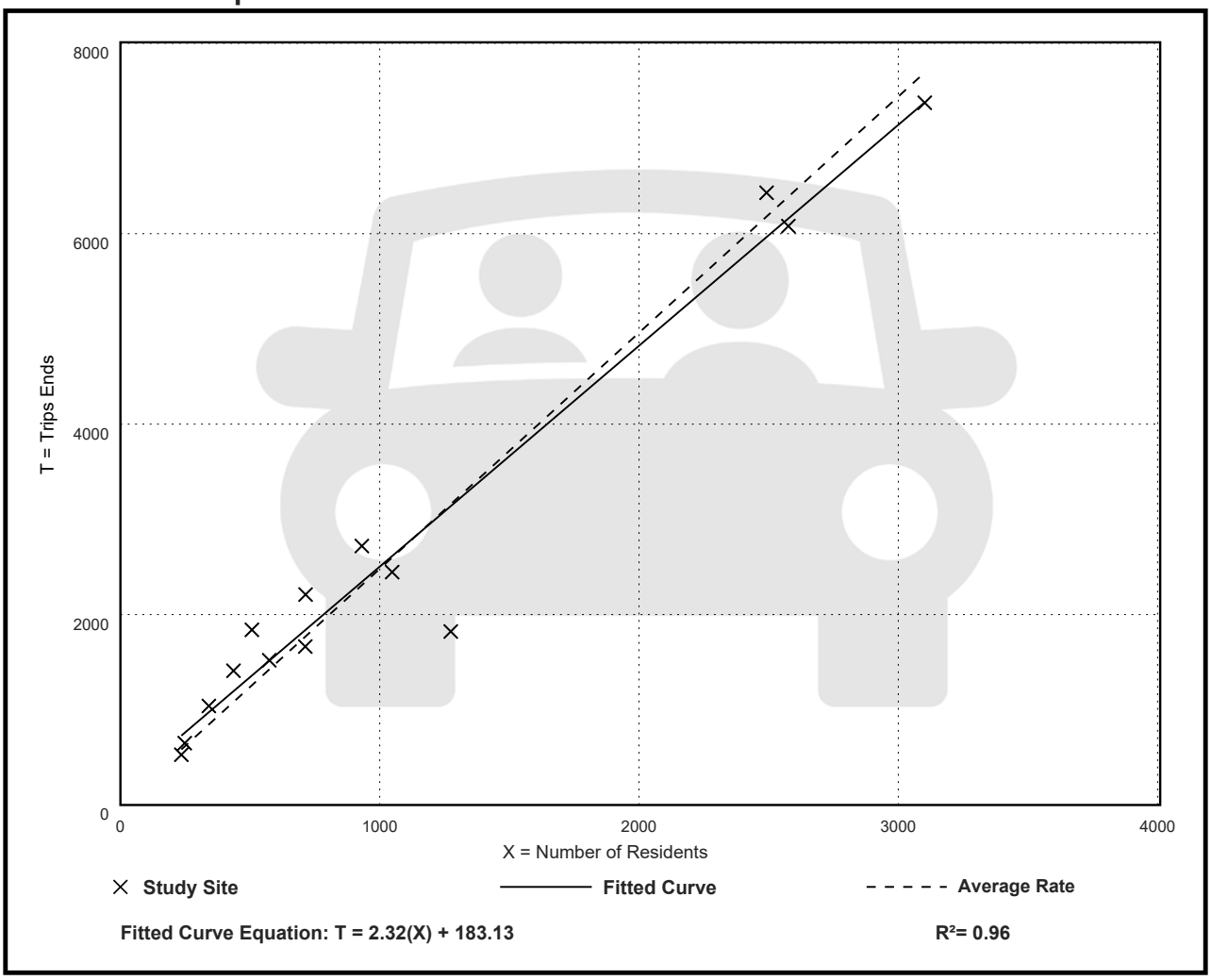
Vehicle Trip Ends vs: Residents
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. Num. of Residents: 1085
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
2.48	1.43 - 3.63	0.46

Data Plot and Equation



Fitted Curve Equation: T = 2.32(X) + 183.13

R^2= 0.96

Single-Family Detached Housing
(210)

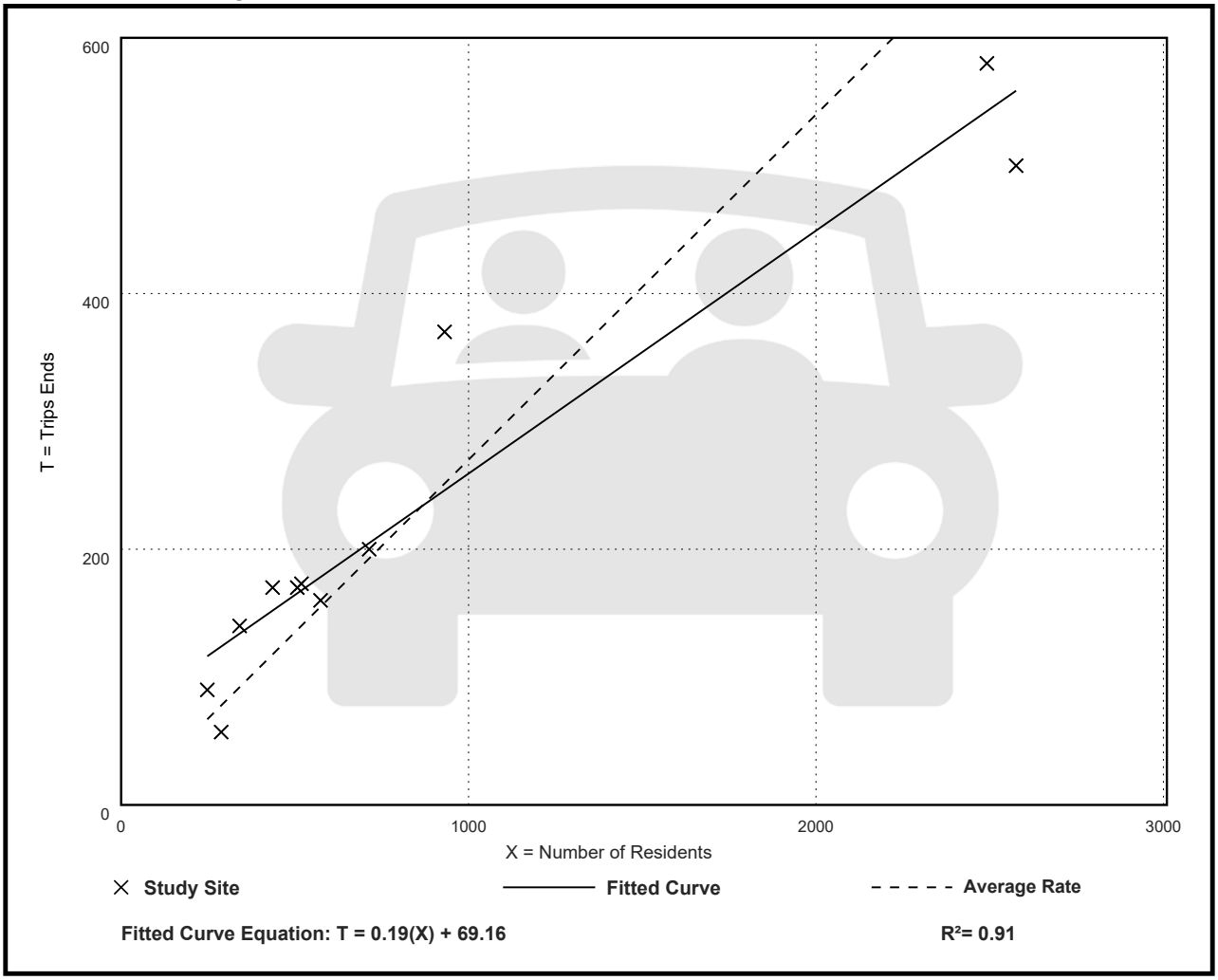
Vehicle Trip Ends vs: Residents
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 11
Avg. Num. of Residents: 875
Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.27	0.19 - 0.41	0.08

Data Plot and Equation



Single-Family Detached Housing
(210)

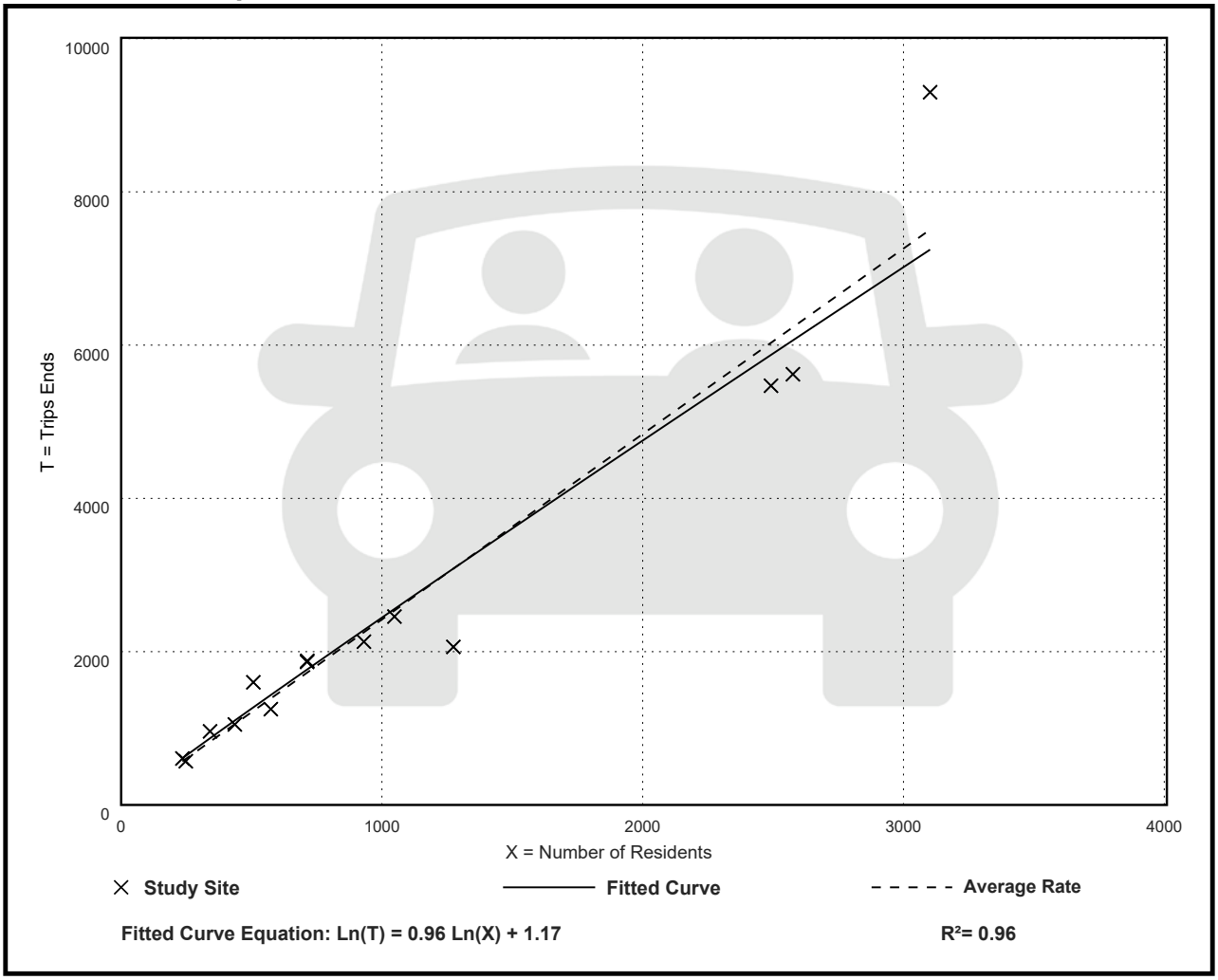
Vehicle Trip Ends vs: Residents
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. Num. of Residents: 1085
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
2.42	1.62 - 3.16	0.43

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 1.17

R^2= 0.96

Single-Family Detached Housing
(210)

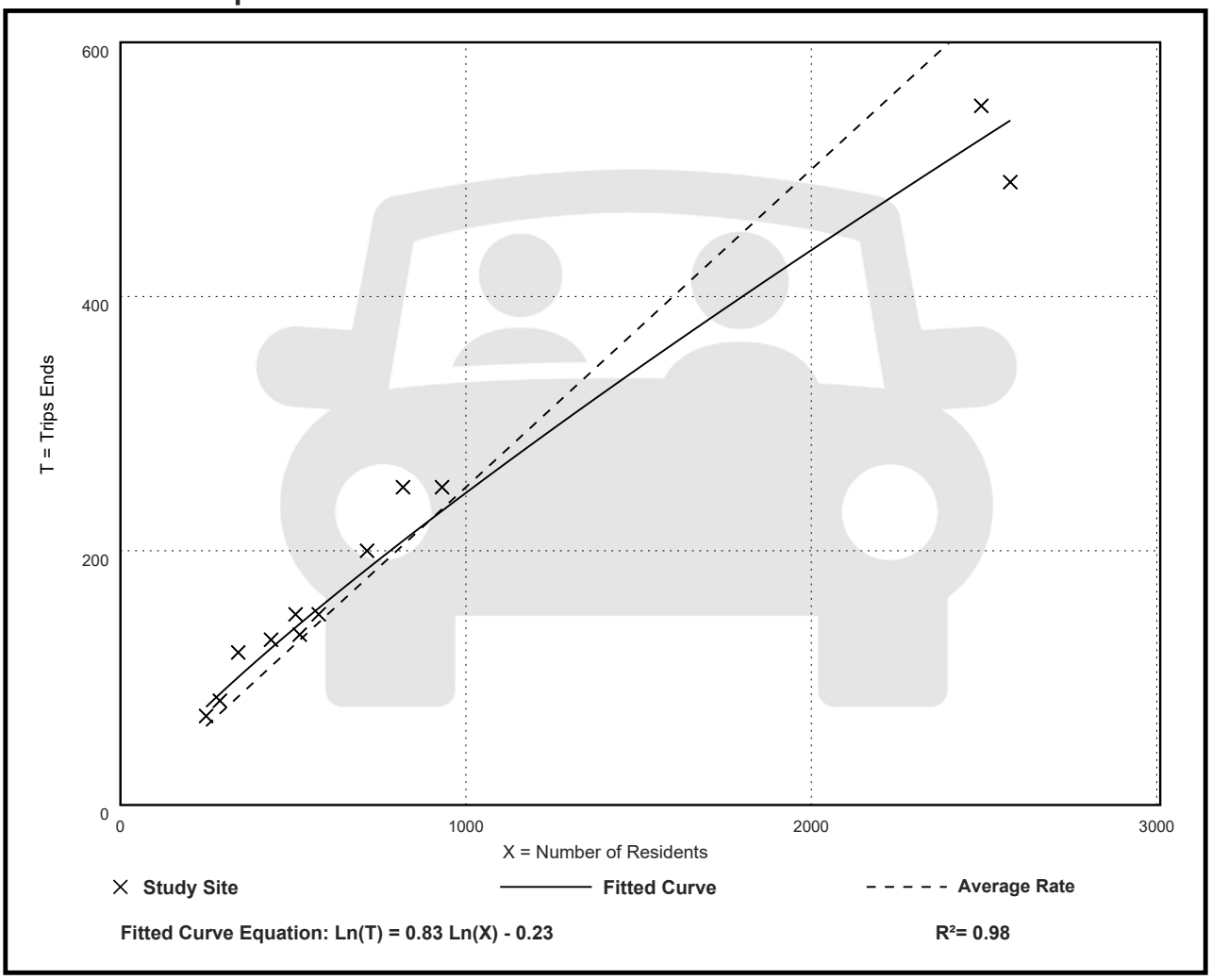
Vehicle Trip Ends vs: Residents
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 12
Avg. Num. of Residents: 870
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.25	0.19 - 0.35	0.05

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.83 Ln(X) - 0.23

R^2= 0.98

Land Use: 215
Single-Family Attached Housing

Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Additional Data

The database for this land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

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 British Columbia (CAN), California, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, Virginia, and Wisconsin.

Source Numbers

168, 204, 211, 237, 305, 306, 319, 321, 357, 390, 418, 525, 571, 583, 638, 735, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077

Single-Family Attached Housing
(215)

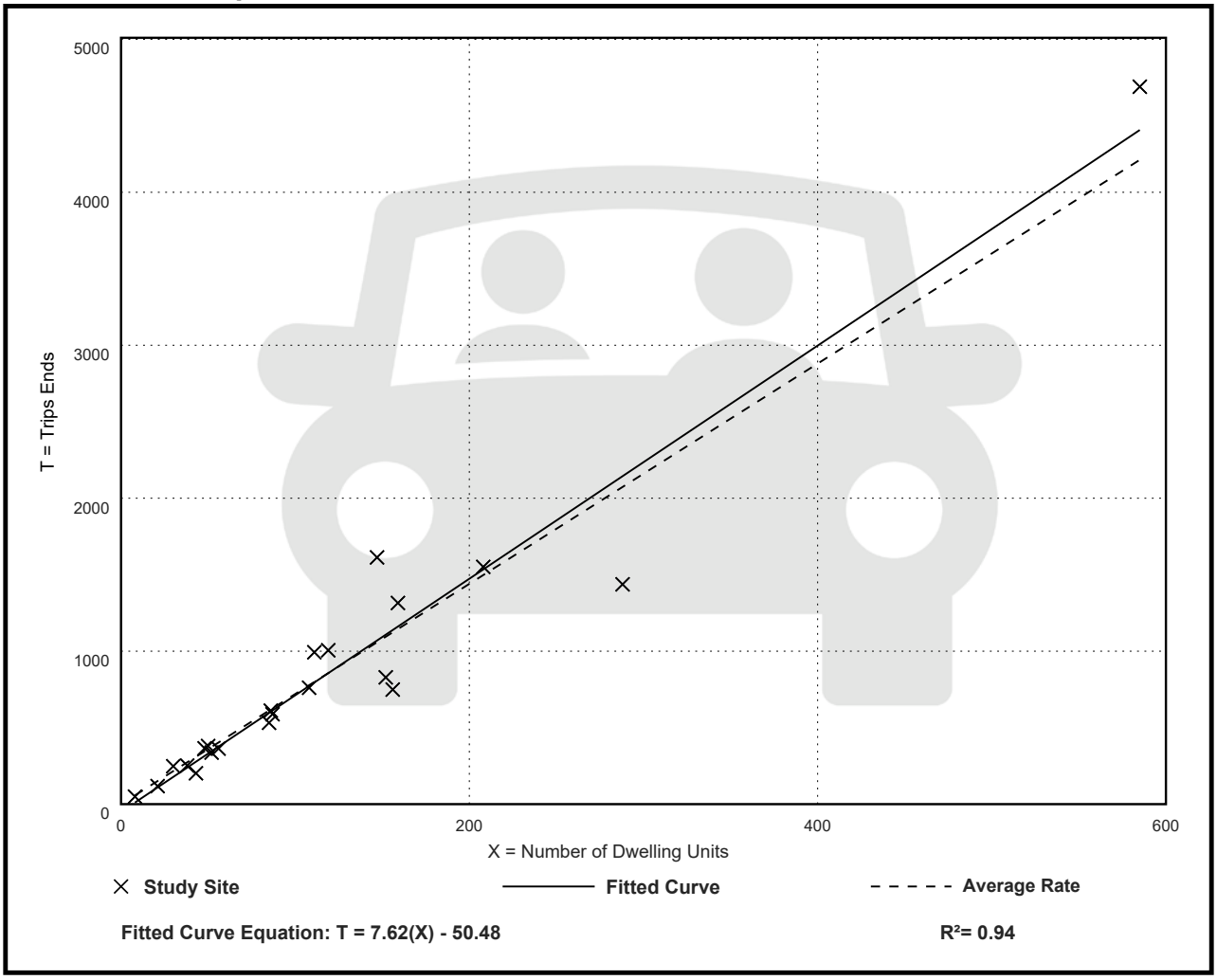
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



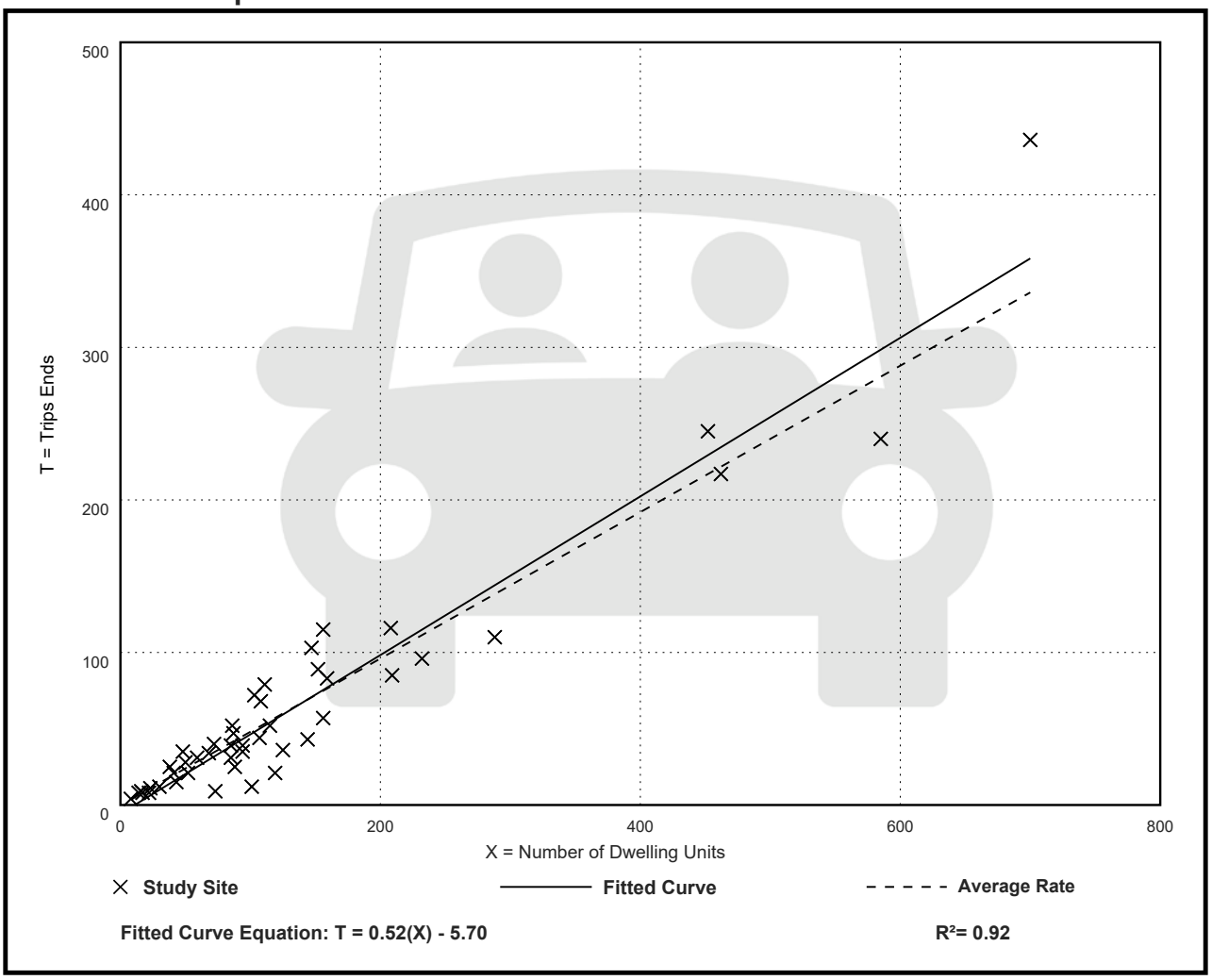
Single-Family Attached Housing
(215)

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: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



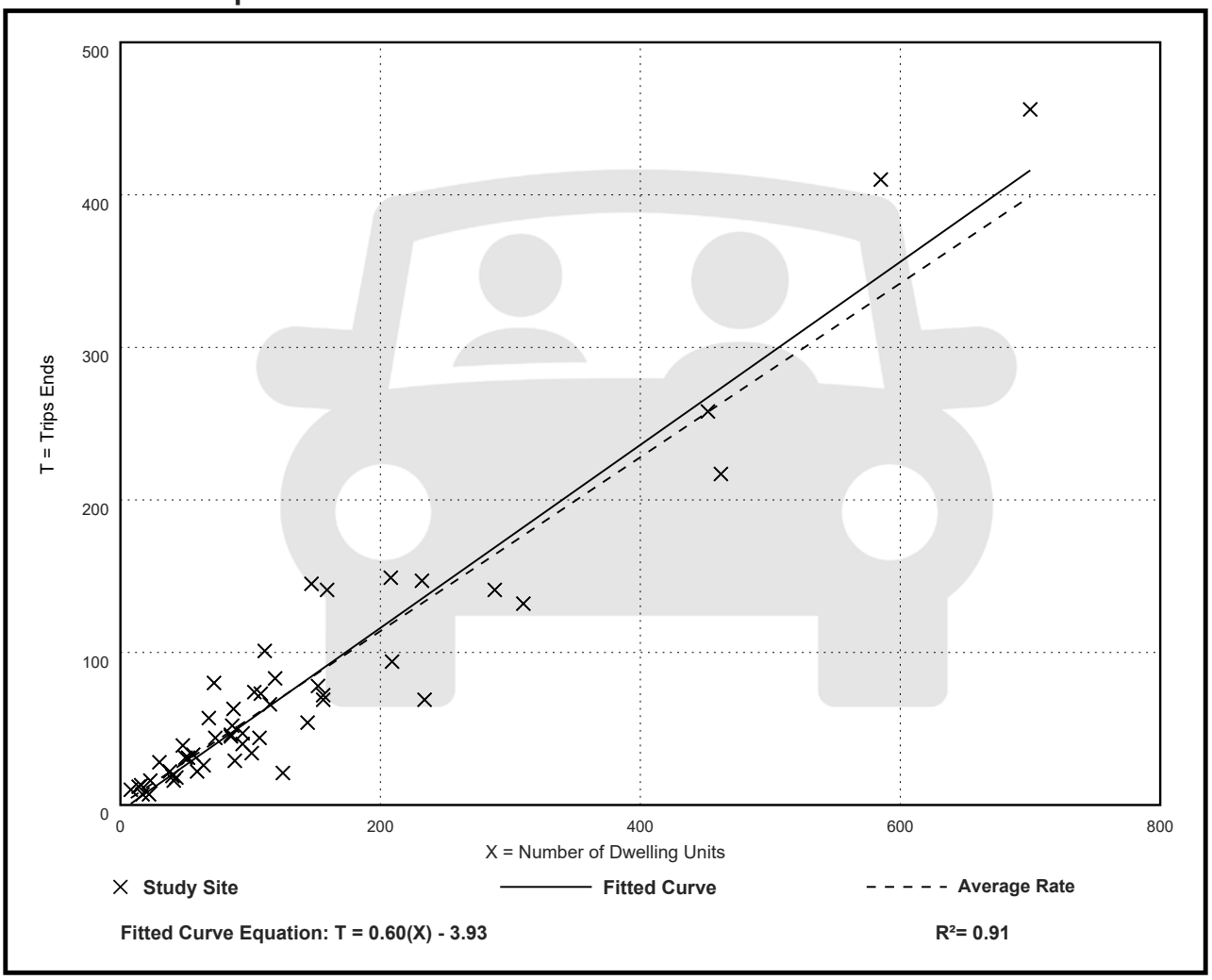
Single-Family Attached Housing
(215)

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: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Single-Family Attached Housing
(215)

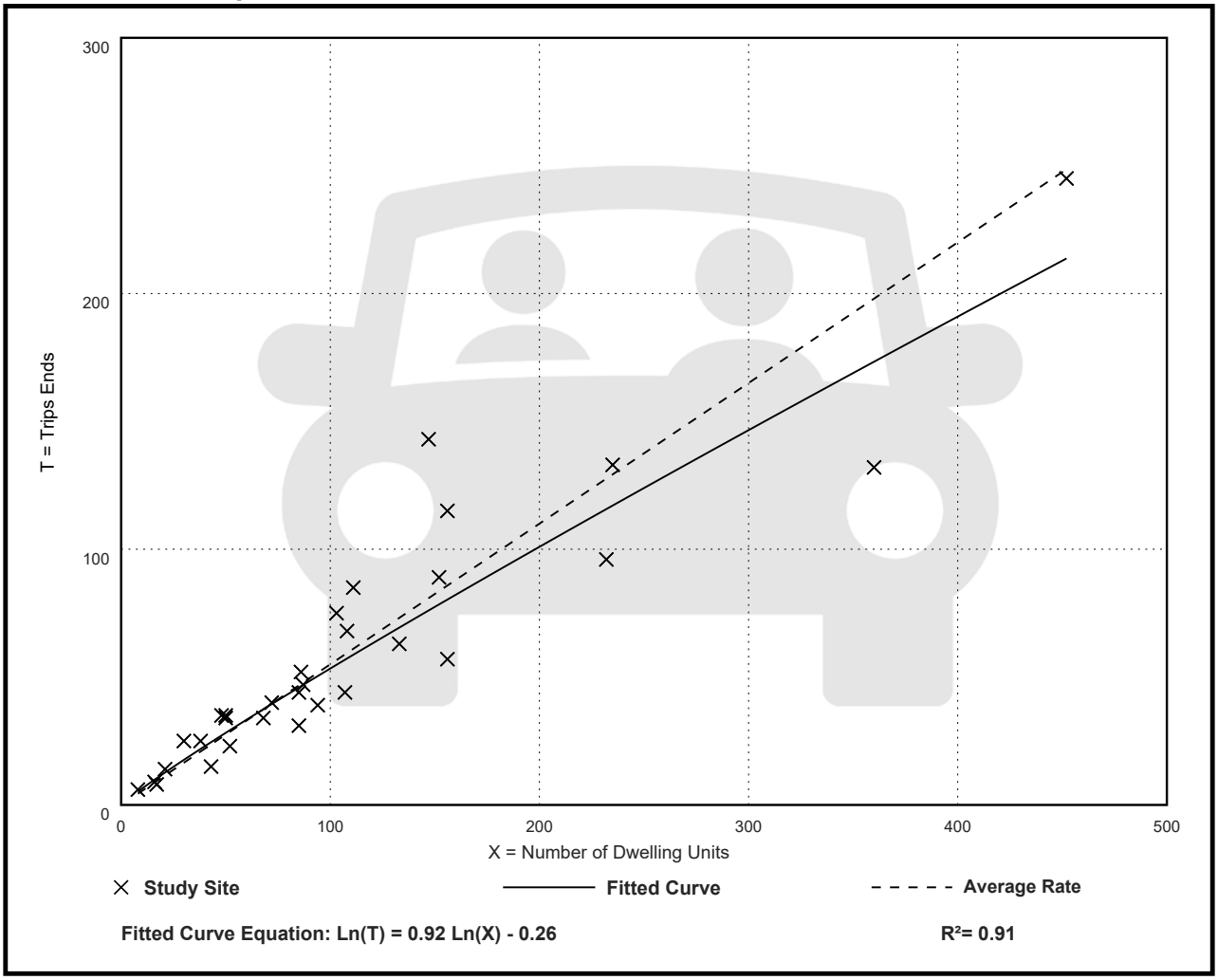
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 31
Avg. Num. of Dwelling Units: 110
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.55	0.35 - 0.97	0.16

Data Plot and Equation



Single-Family Attached Housing
(215)

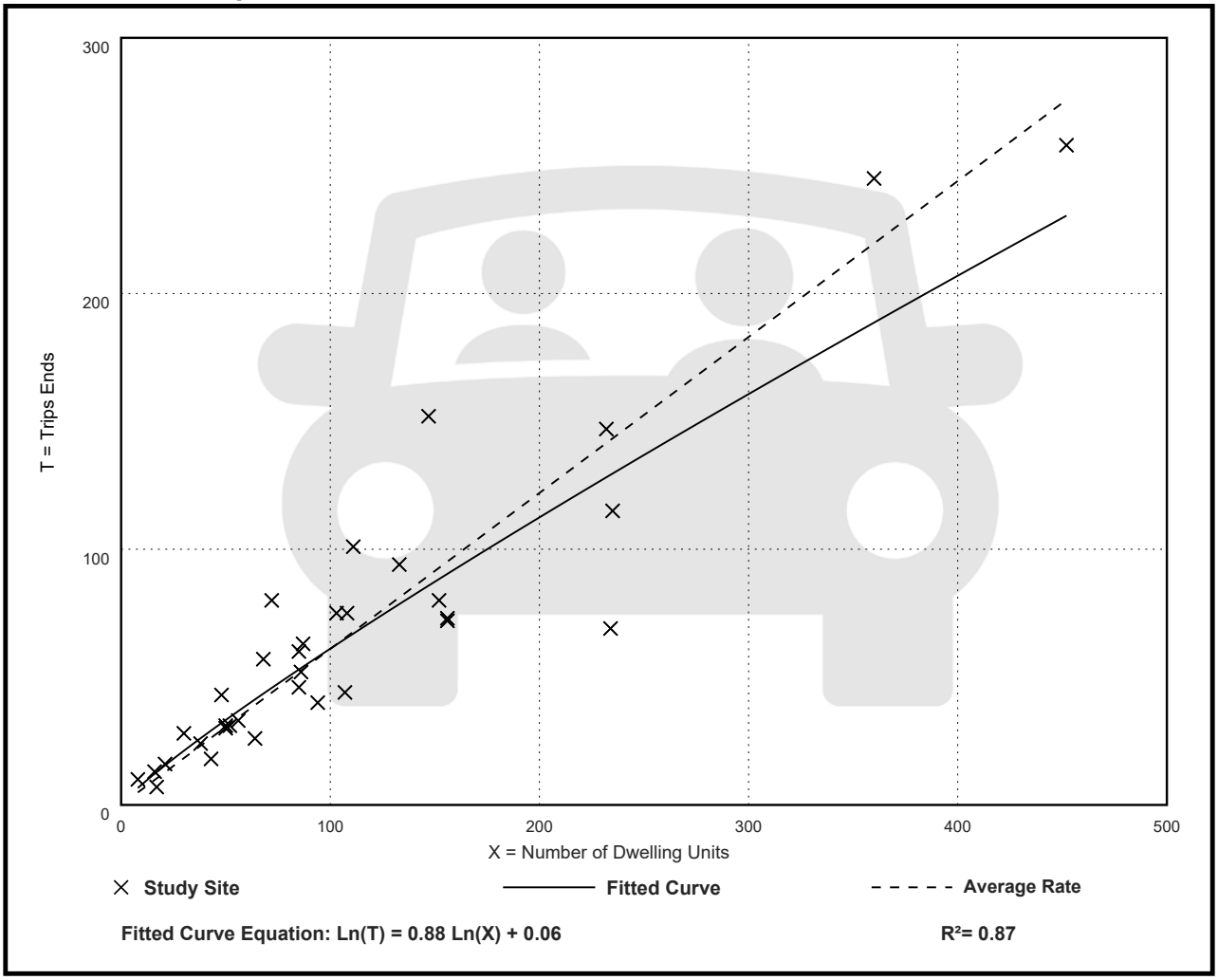
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 34
Avg. Num. of Dwelling Units: 110
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.61	0.29 - 1.25	0.18

Data Plot and Equation



Single-Family Attached Housing
(215)

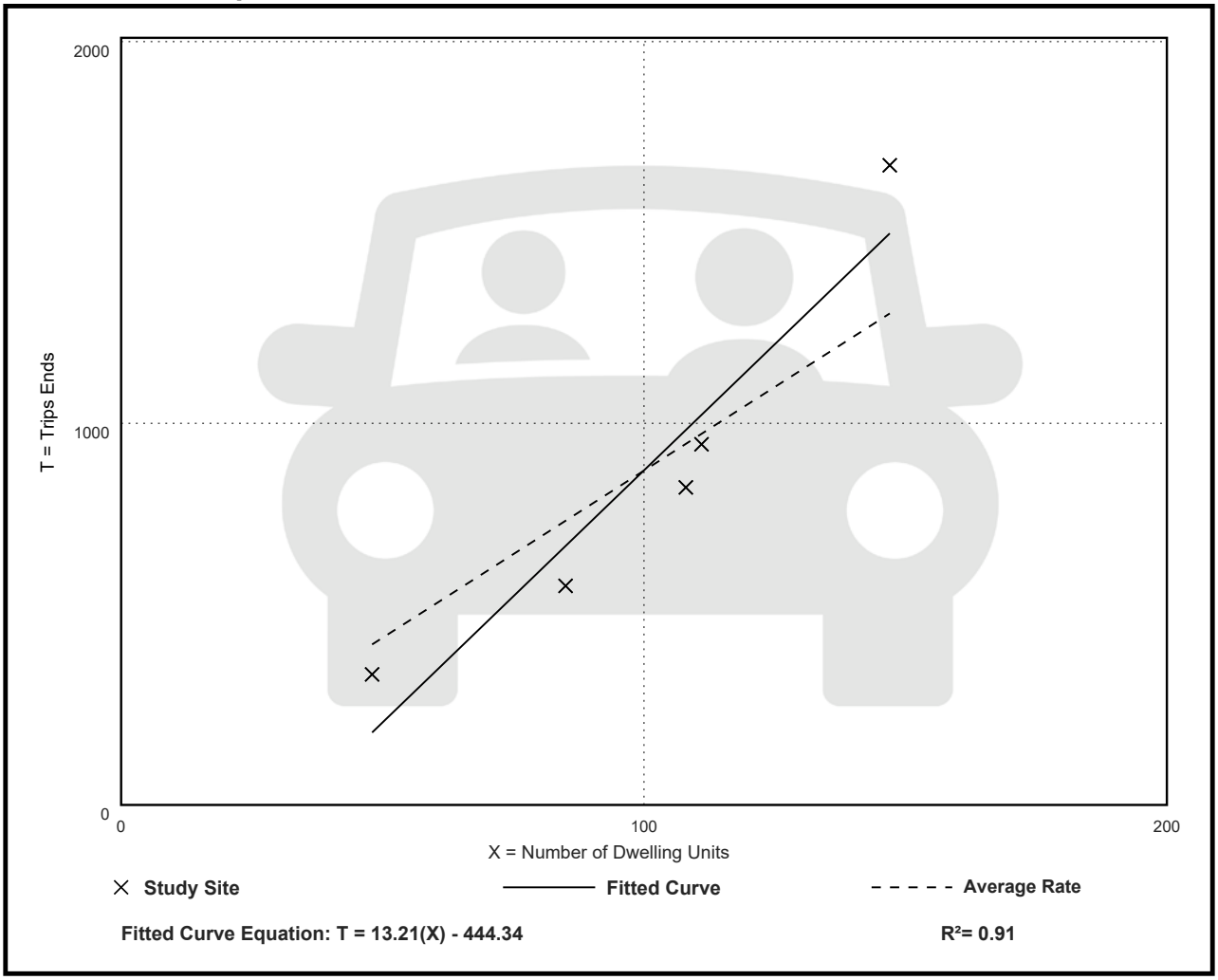
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 100
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
8.76	6.75 - 11.40	2.02

Data Plot and Equation



Fitted Curve Equation: T = 13.21(X) - 444.34

R^2= 0.91

Single-Family Attached Housing
(215)

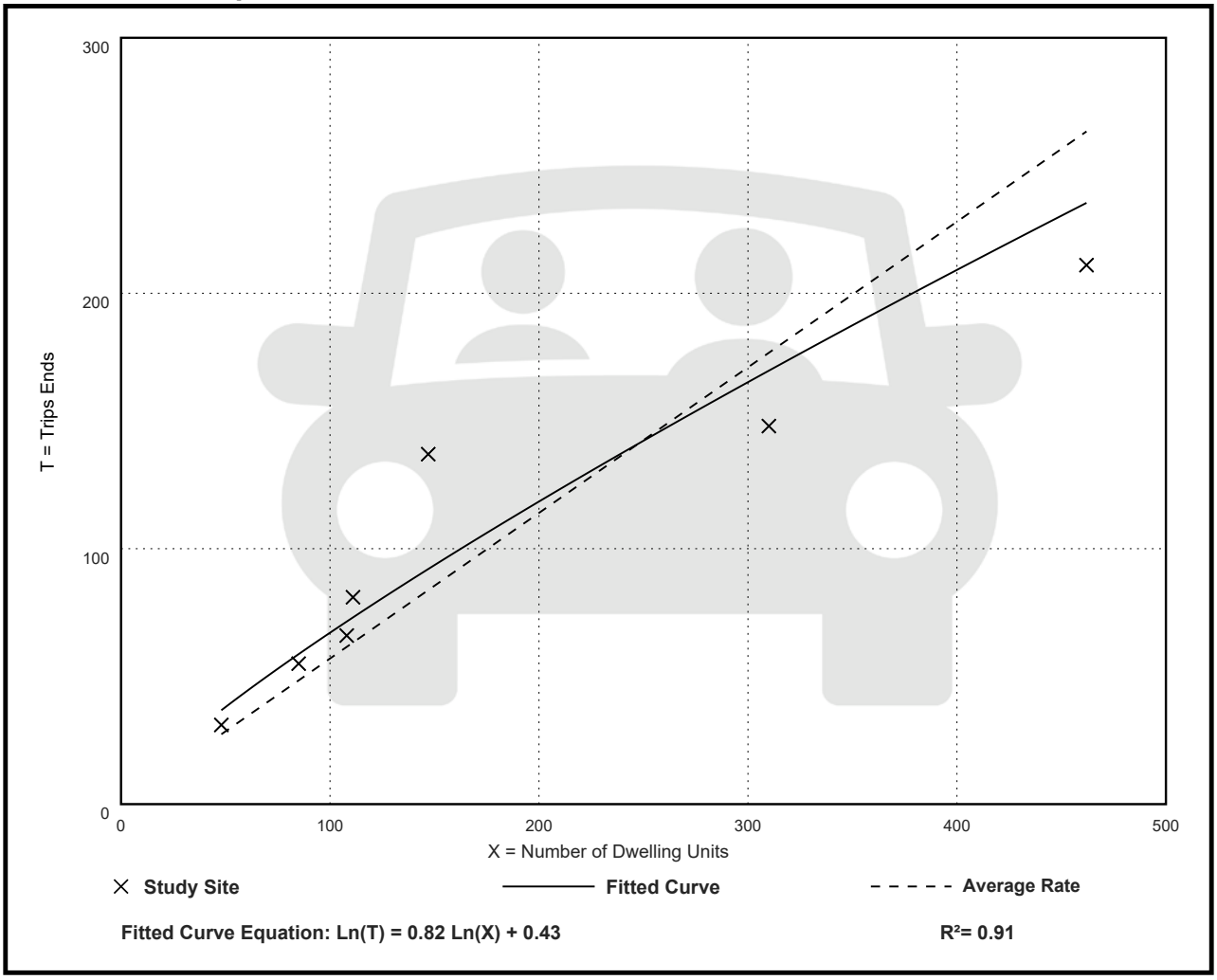
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Dwelling Units: 182
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.46 - 0.93	0.17

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.82 Ln(X) + 0.43

R^2= 0.91

Single-Family Attached Housing
(215)

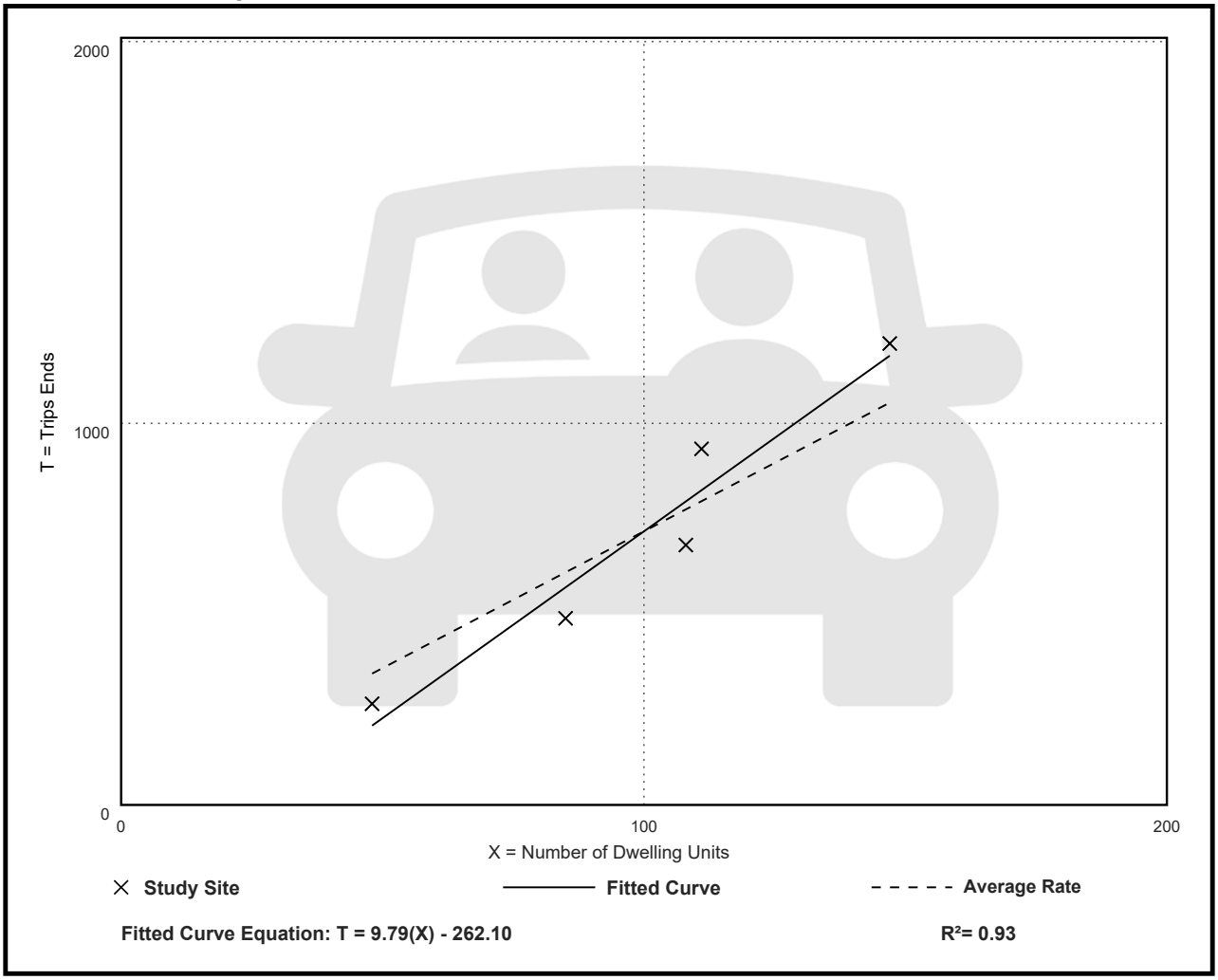
Vehicle Trip Ends vs: Dwelling Units
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 100
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.17	5.52 - 8.41	1.34

Data Plot and Equation



Fitted Curve Equation: T = 9.79(X) - 262.10

R^2= 0.93

Single-Family Attached Housing
(215)

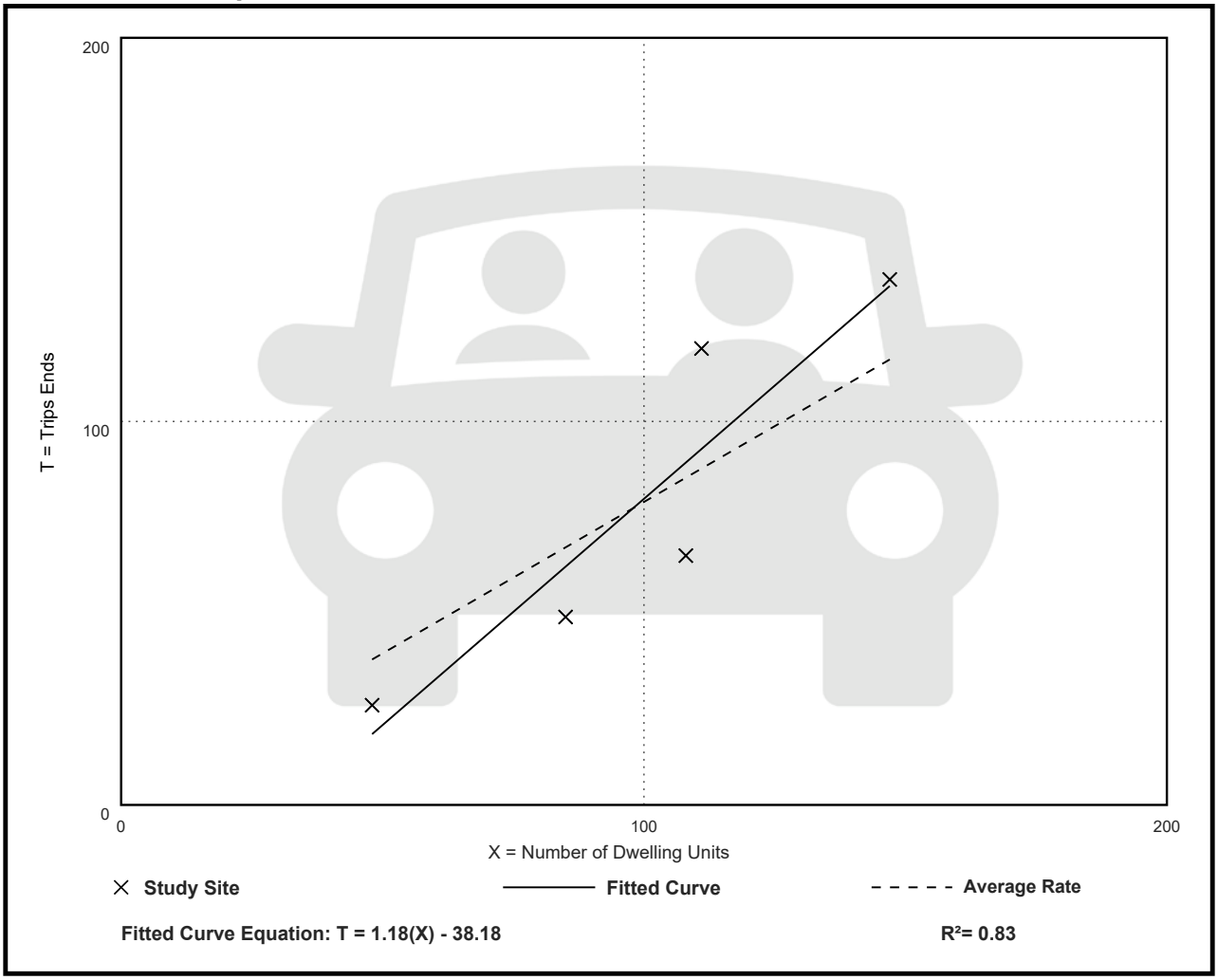
Vehicle Trip Ends vs: Dwelling Units
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 100
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.79	0.54 - 1.07	0.24

Data Plot and Equation



Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: Residents
On a: Weekday

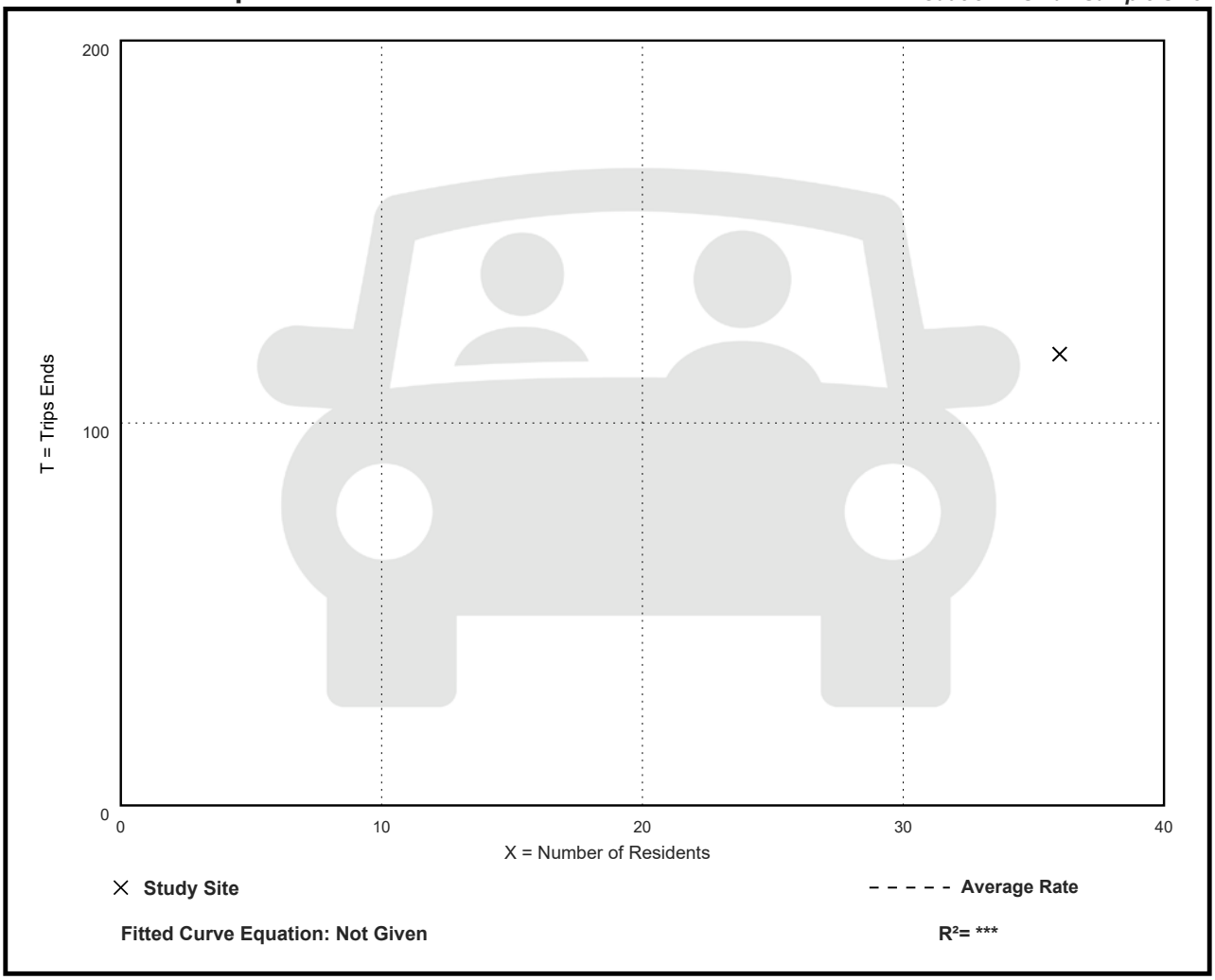
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 36
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
3.28	3.28 - 3.28	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: Residents
On a: Weekday,
AM Peak Hour of Generator

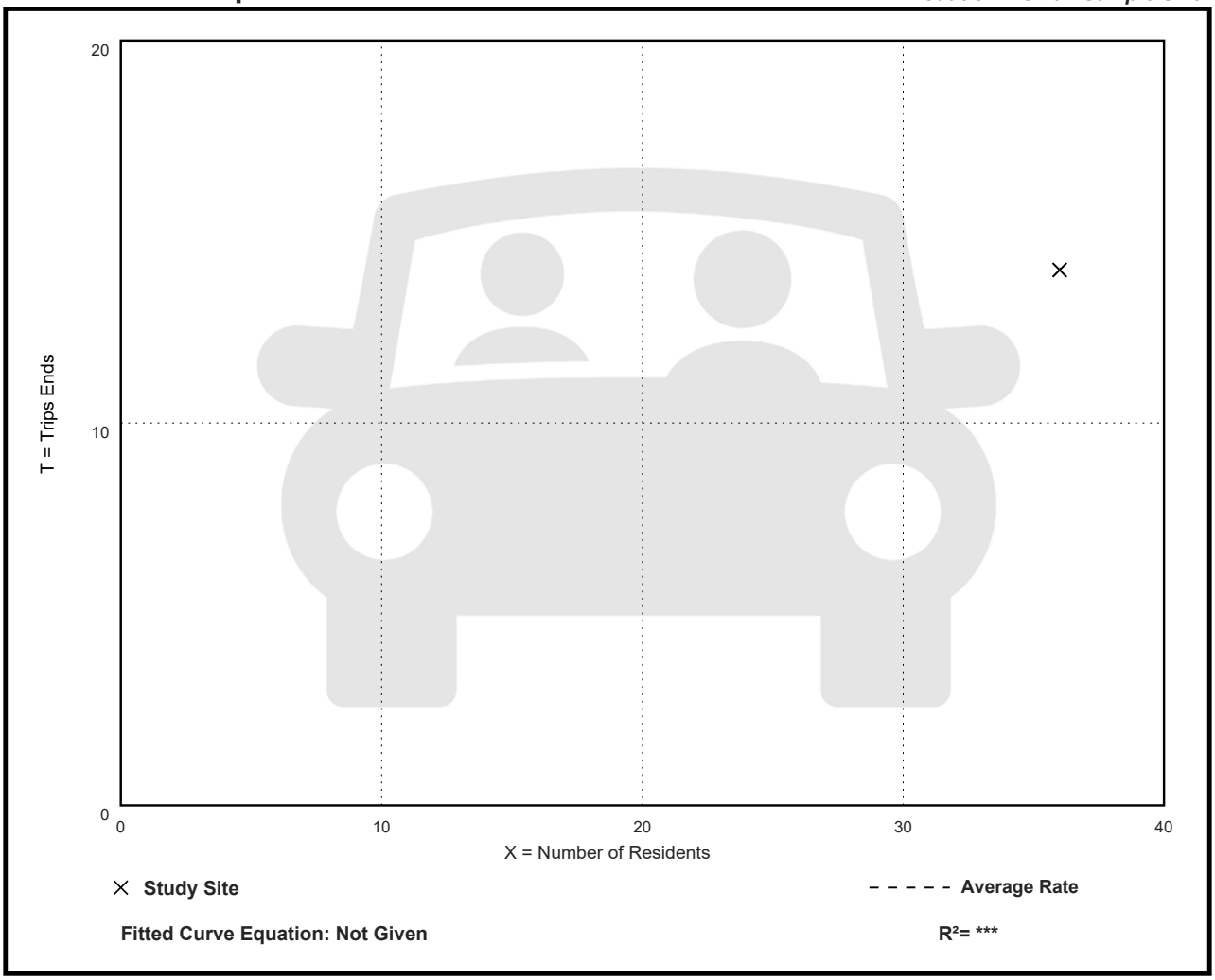
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 36
Directional Distribution: Not Available

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.39	0.39 - 0.39	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: Residents
On a: Weekday,
PM Peak Hour of Generator

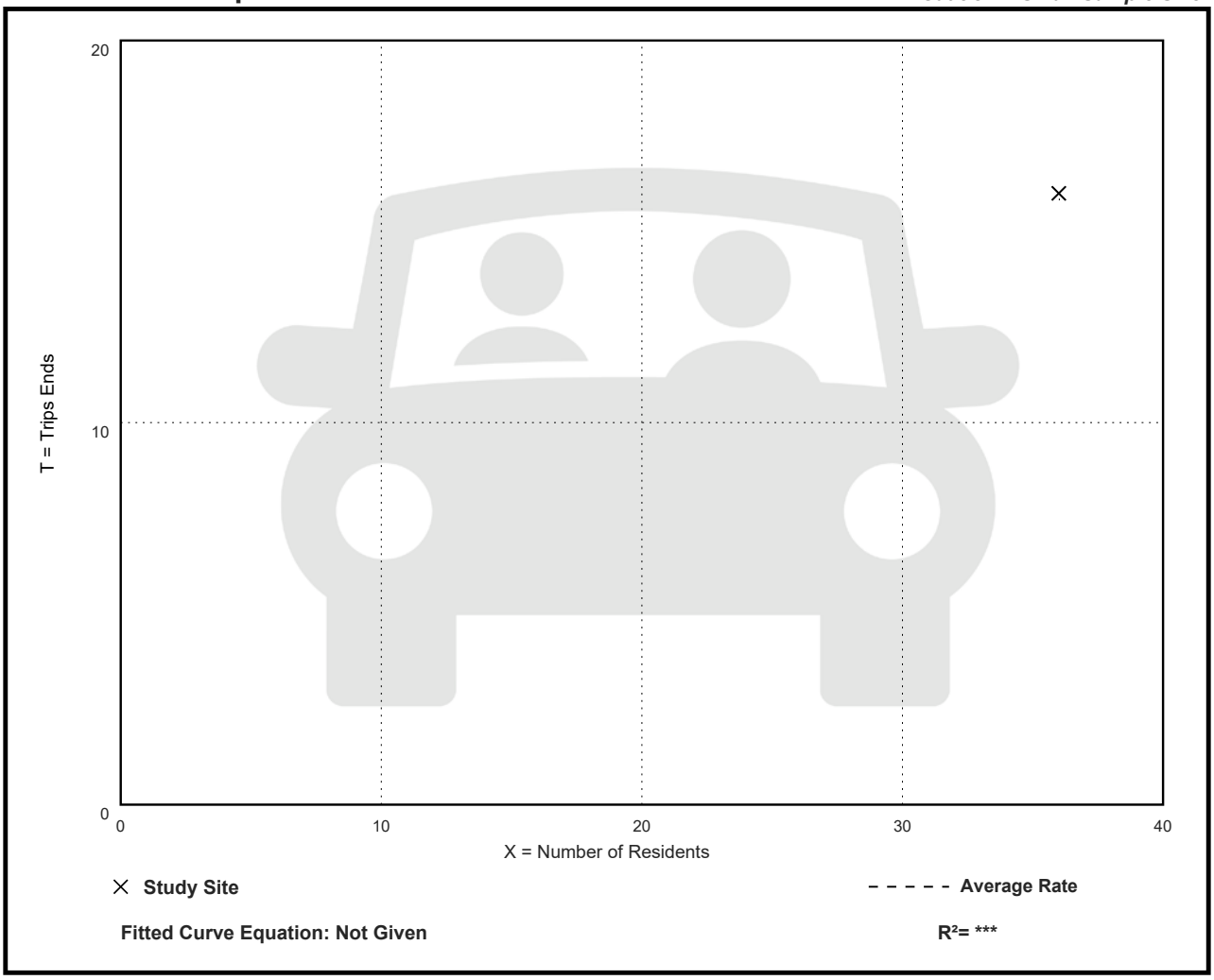
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 36
Directional Distribution: Not Available

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.44	0.44 - 0.44	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

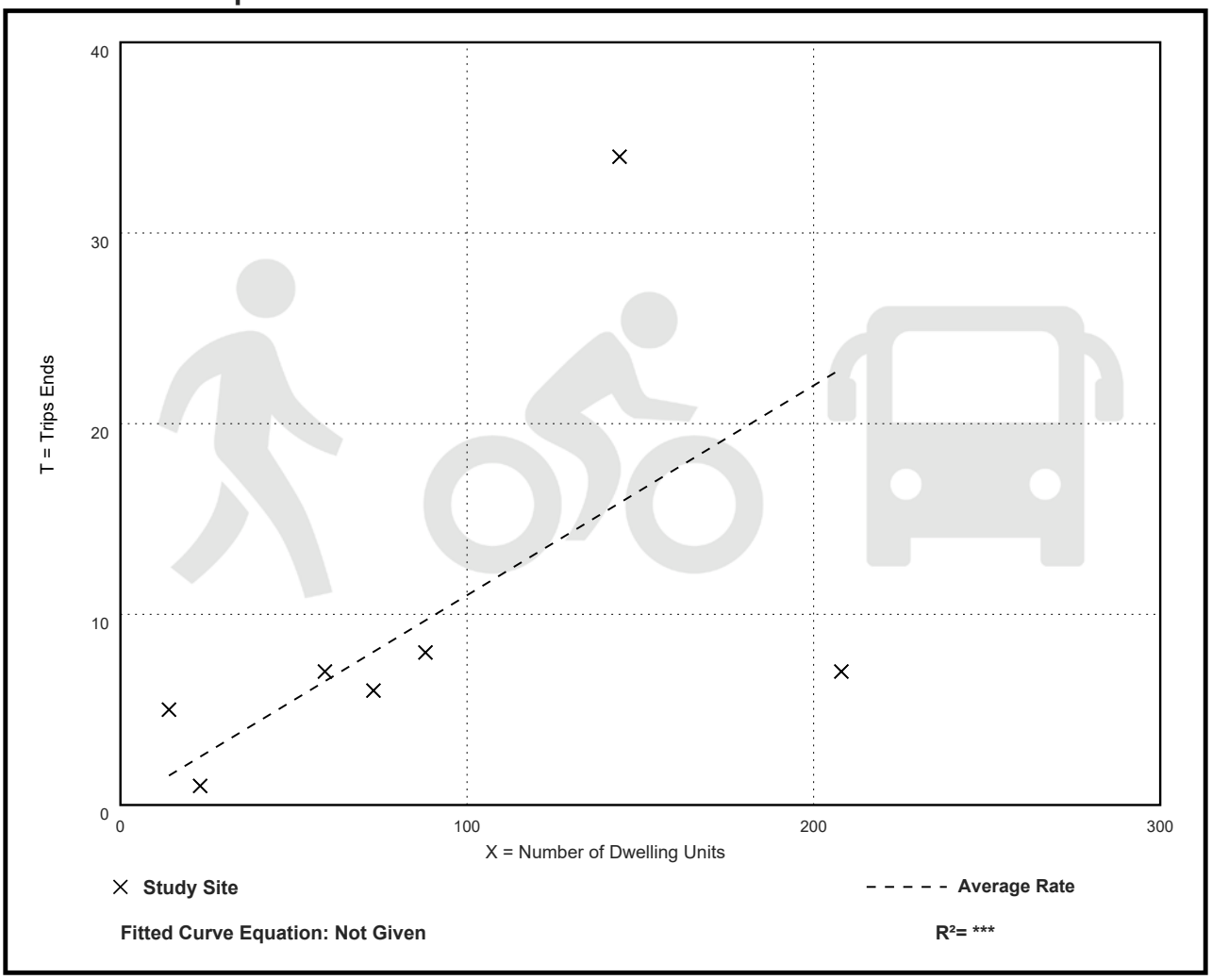
Single-Family Attached Housing
(215)

Walk+Bike+Transit 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: 7
Avg. Num. of Dwelling Units: 87
Directional Distribution: 75% entering, 25% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.11	0.03 - 0.36	0.09

Data Plot and Equation



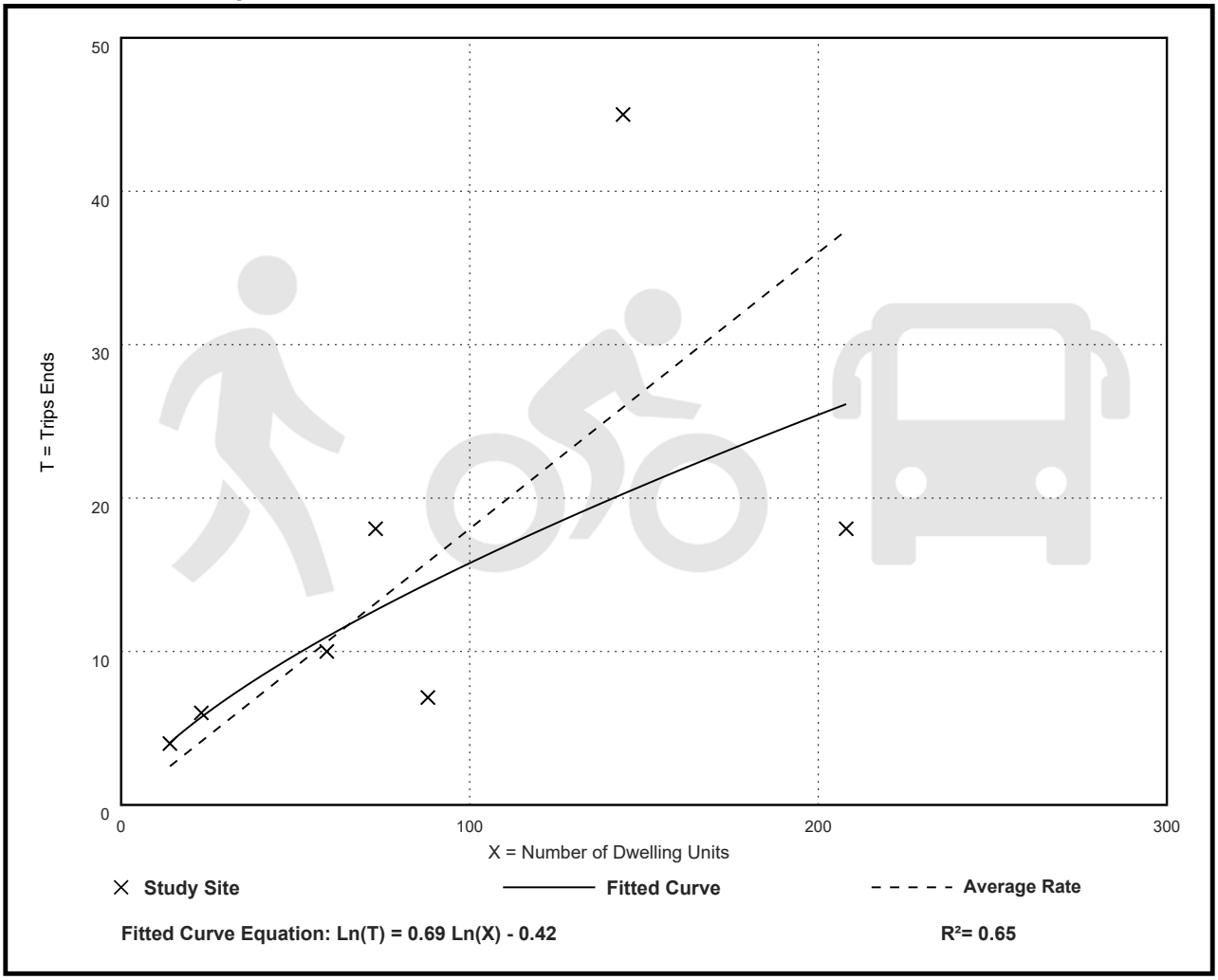
Single-Family Attached Housing
(215)

Walk+Bike+Transit 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: 7
Avg. Num. of Dwelling Units: 87
Directional Distribution: 38% entering, 62% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.18	0.08 - 0.31	0.11

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.69 Ln(X) - 0.42

R^2= 0.65

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)

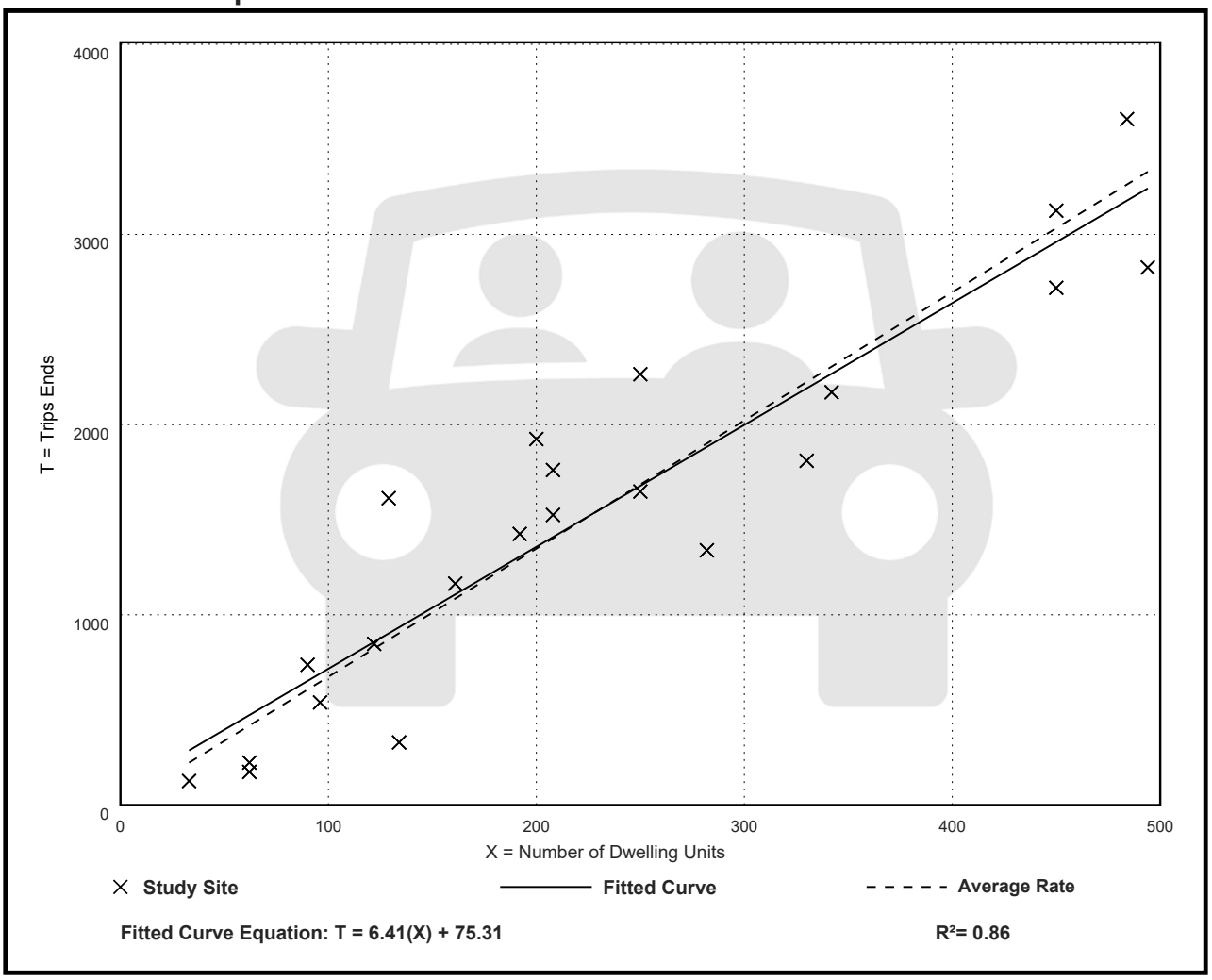
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



Fitted Curve Equation: T = 6.41(X) + 75.31

R^2= 0.86

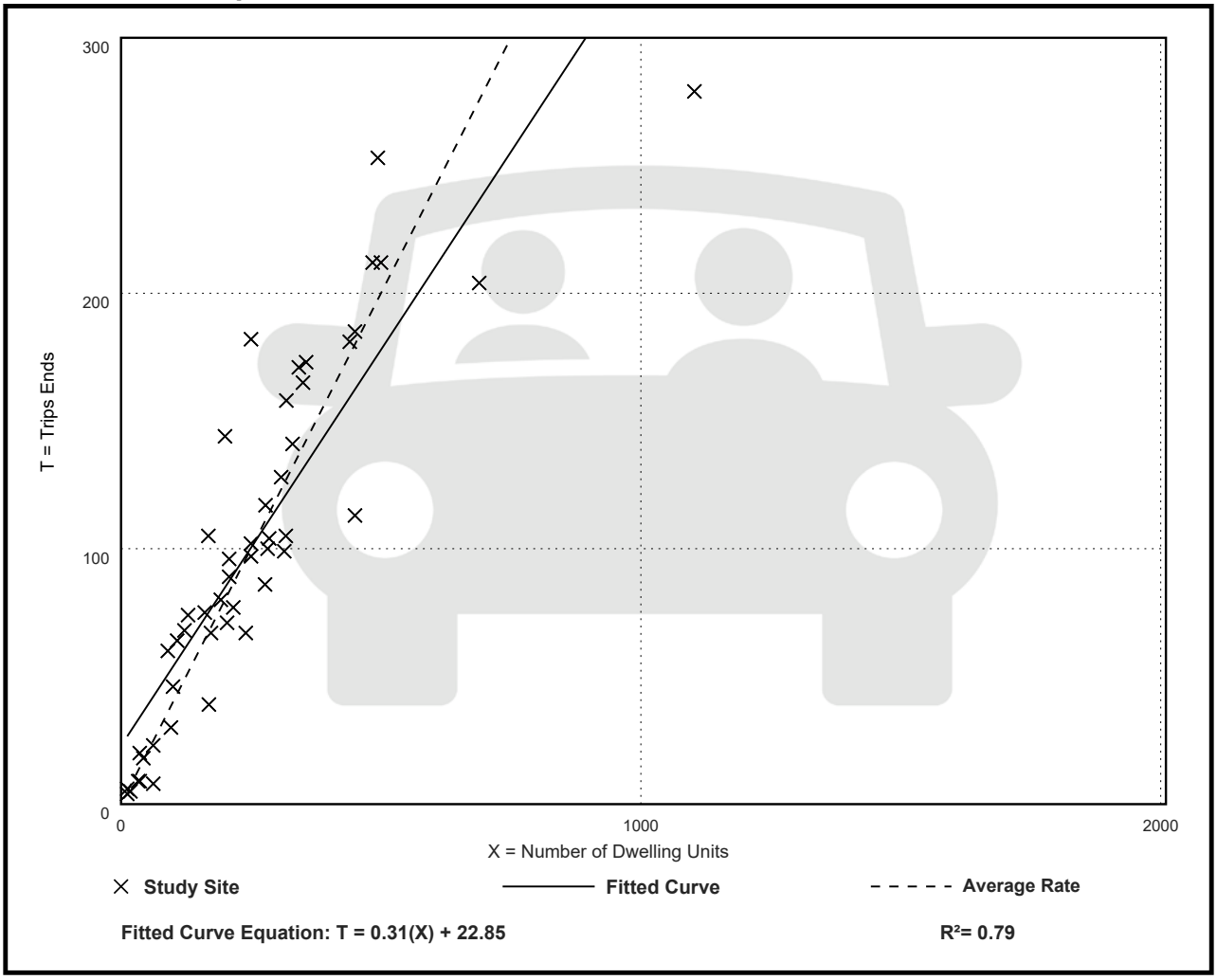
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



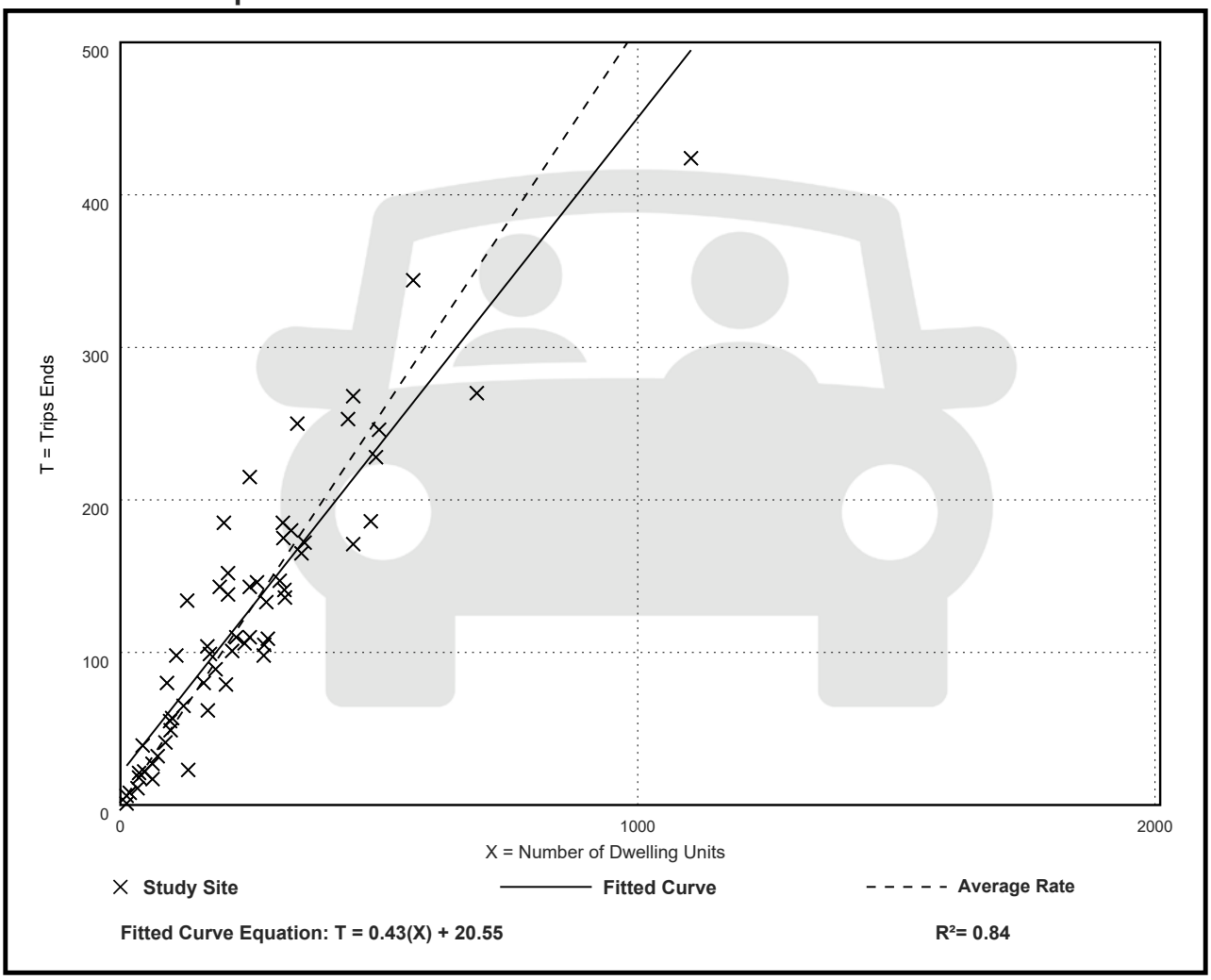
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



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

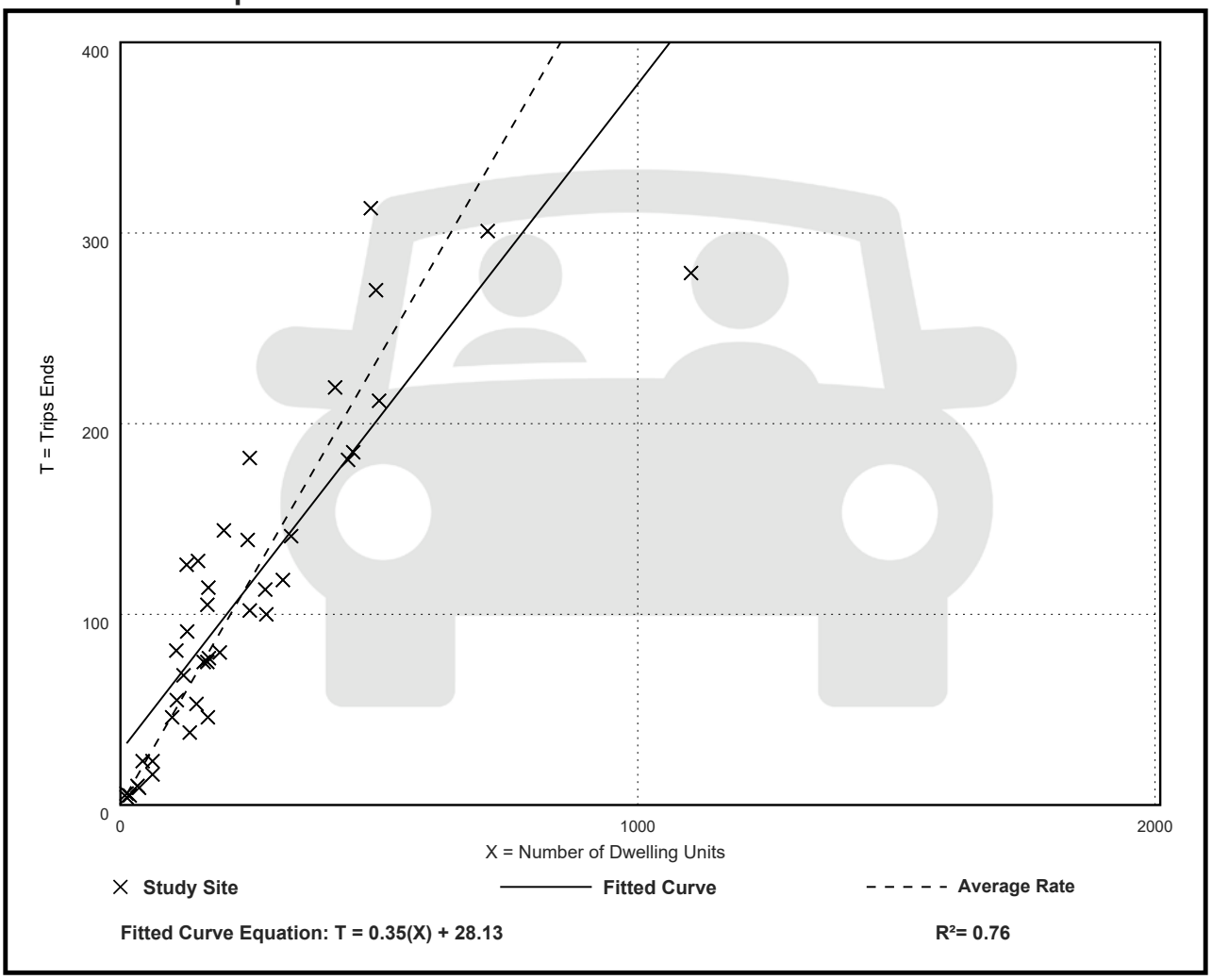
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 40
Avg. Num. of Dwelling Units: 234
Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.47	0.25 - 0.98	0.16

Data Plot and Equation



Fitted Curve Equation: T = 0.35(X) + 28.13

R^2= 0.76

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

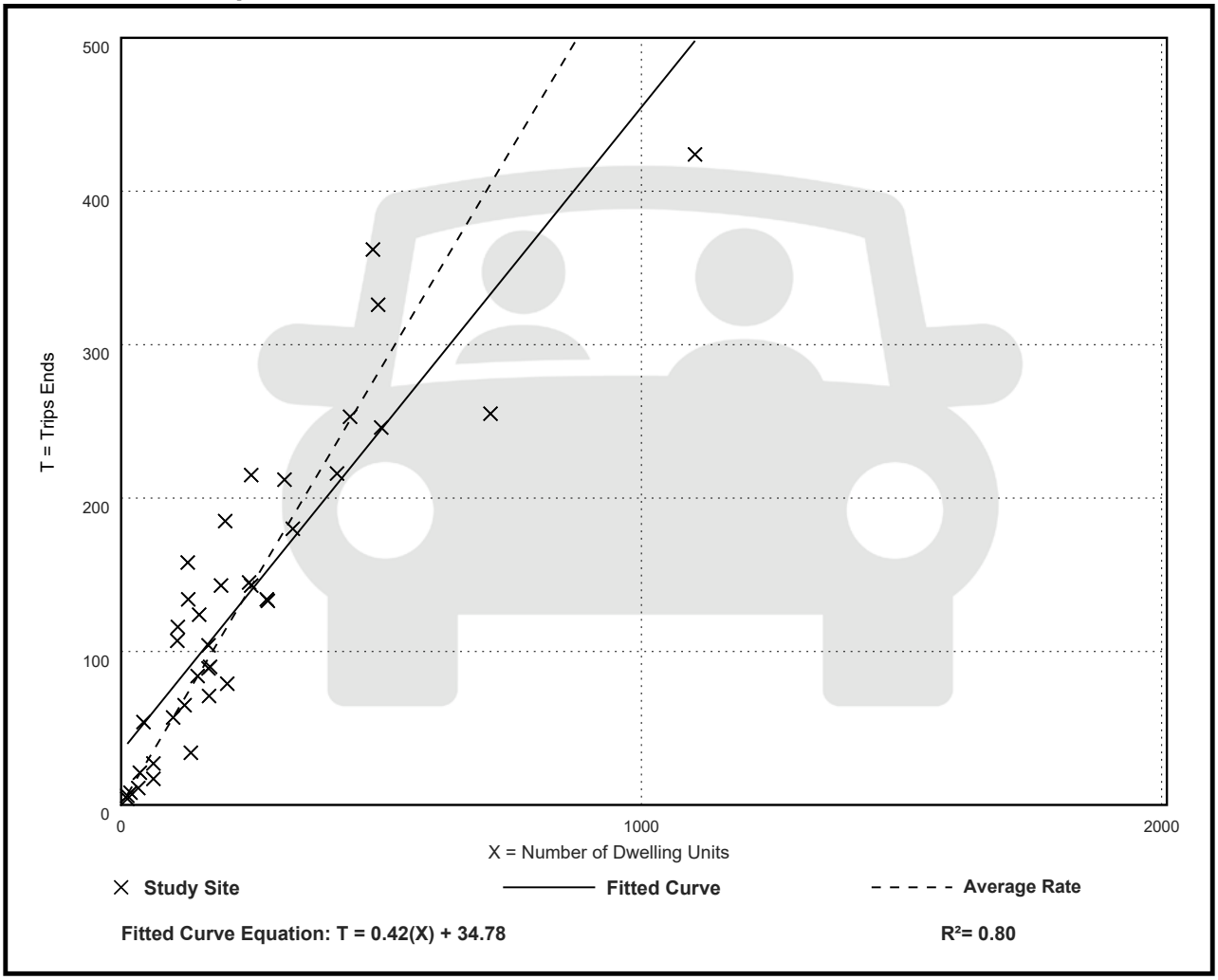
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 38
Avg. Num. of Dwelling Units: 231
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.25 - 1.26	0.20

Data Plot and Equation



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

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

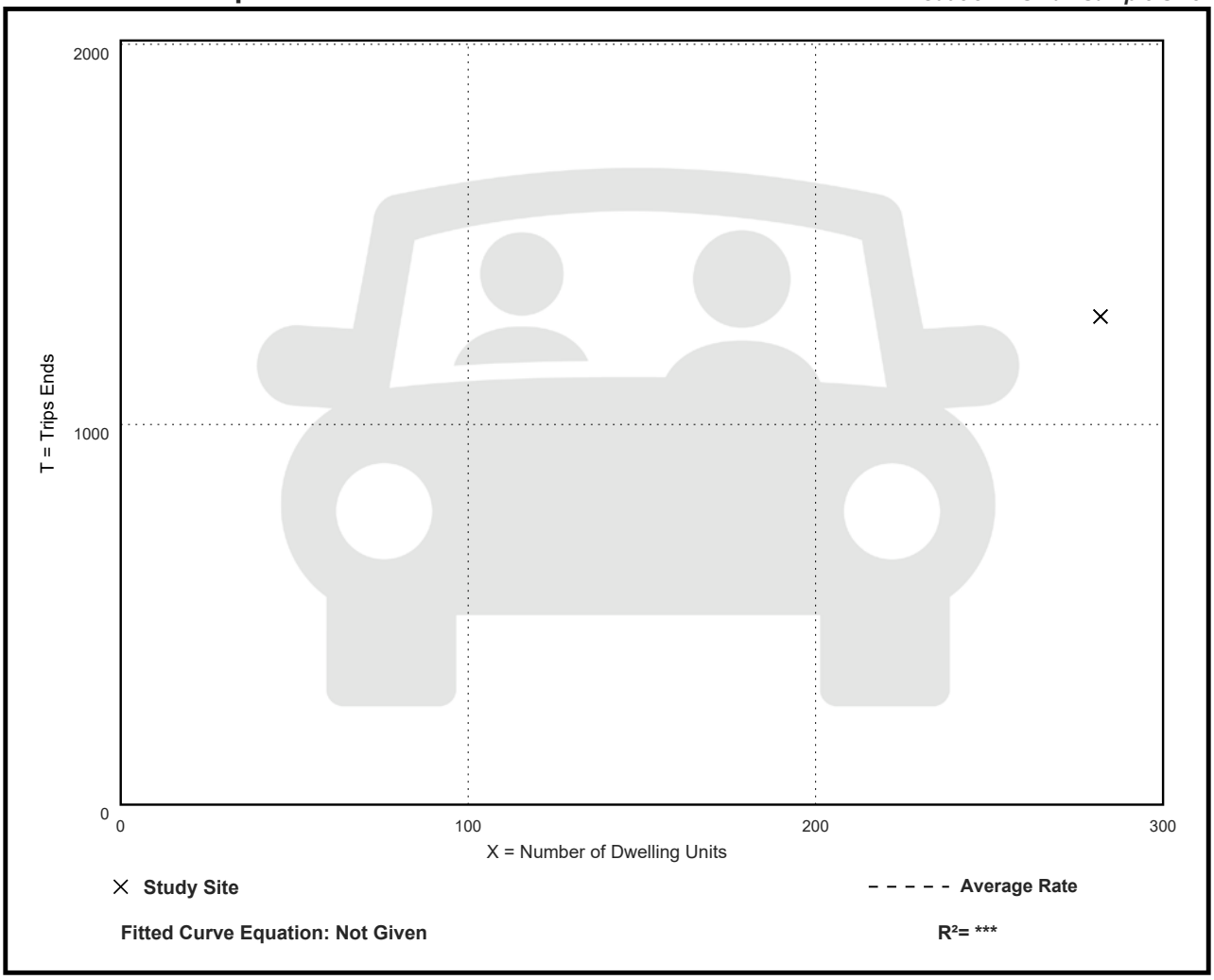
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.55	4.55 - 4.55	***

Data Plot and Equation

Caution – Small Sample Size



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

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

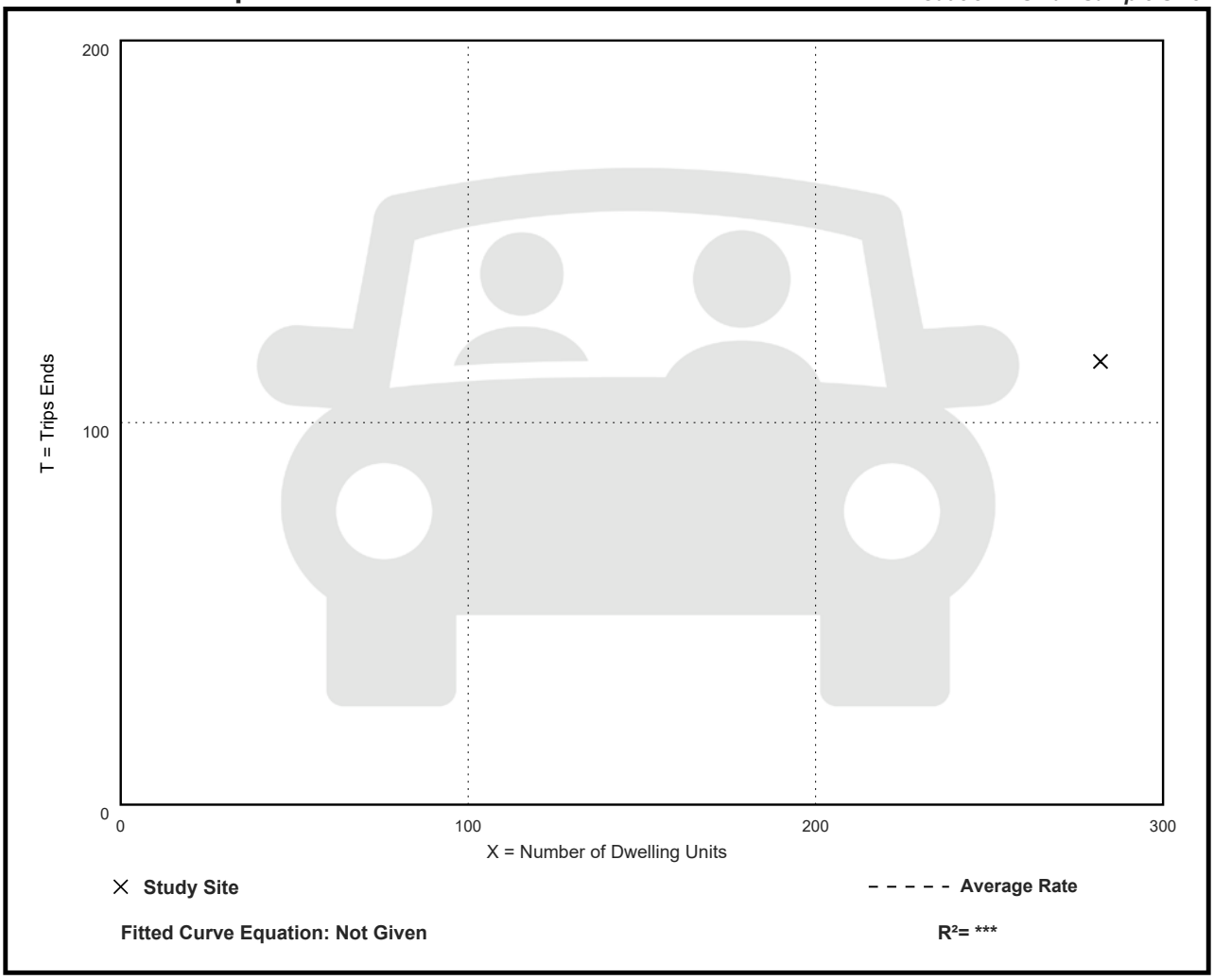
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.41	0.41 - 0.41	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

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

Vehicle Trip Ends vs: Dwelling Units
On a: Sunday

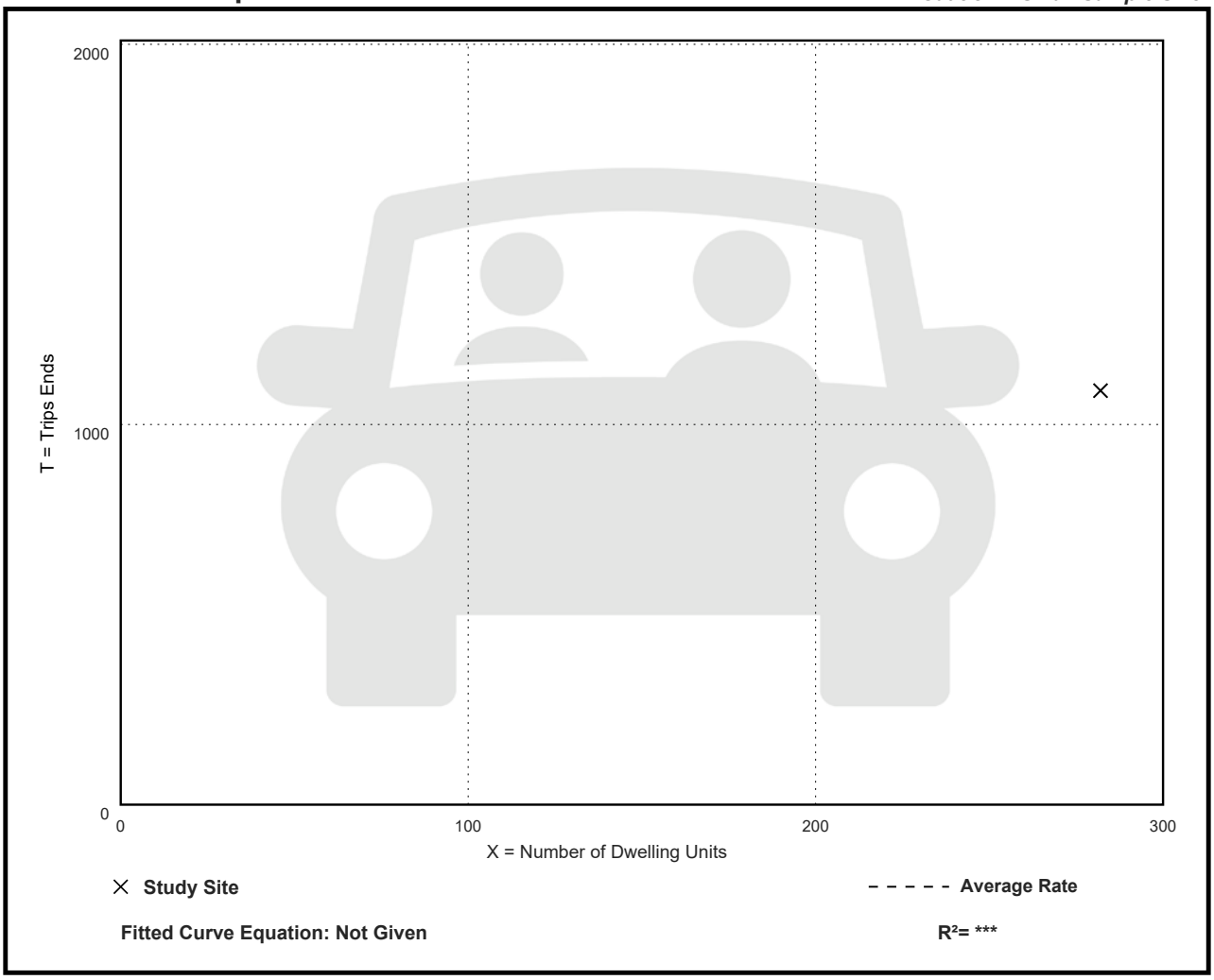
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.86	3.86 - 3.86	***

Data Plot and Equation

Caution – Small Sample Size



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

Vehicle Trip Ends vs: Dwelling Units
On a: Sunday, Peak Hour of Generator

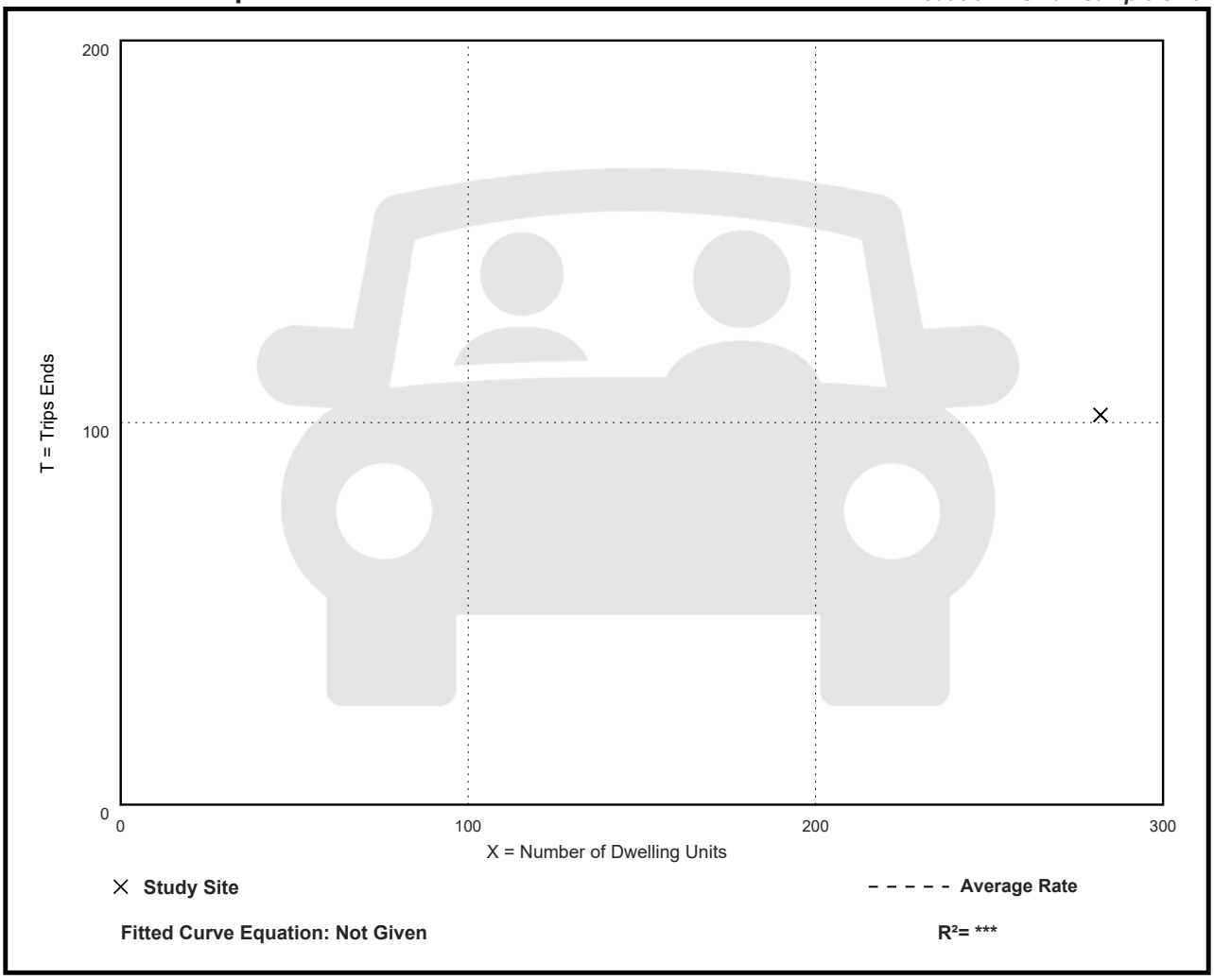
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.36 - 0.36	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

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

Vehicle Trip Ends vs: Residents
On a: Weekday

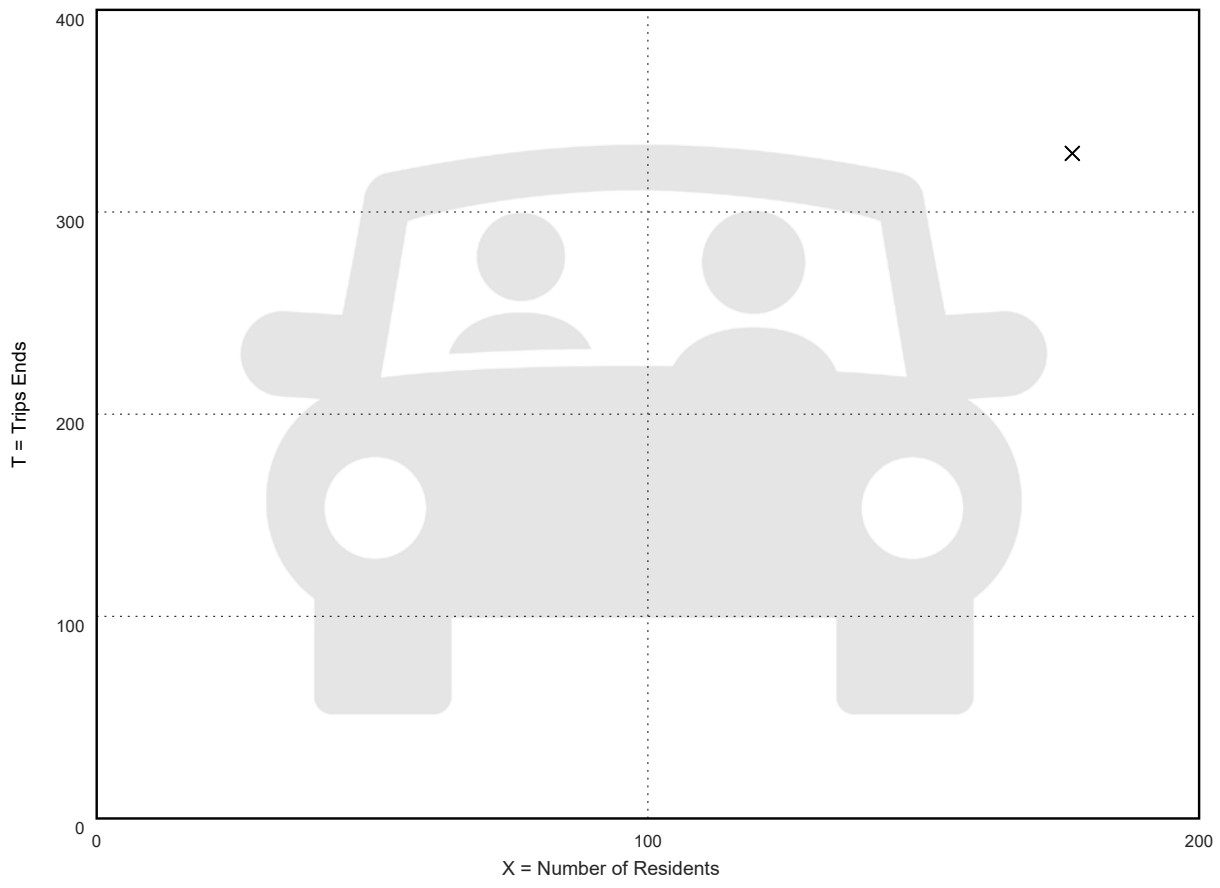
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 177
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
1.86	1.86 - 1.86	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

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

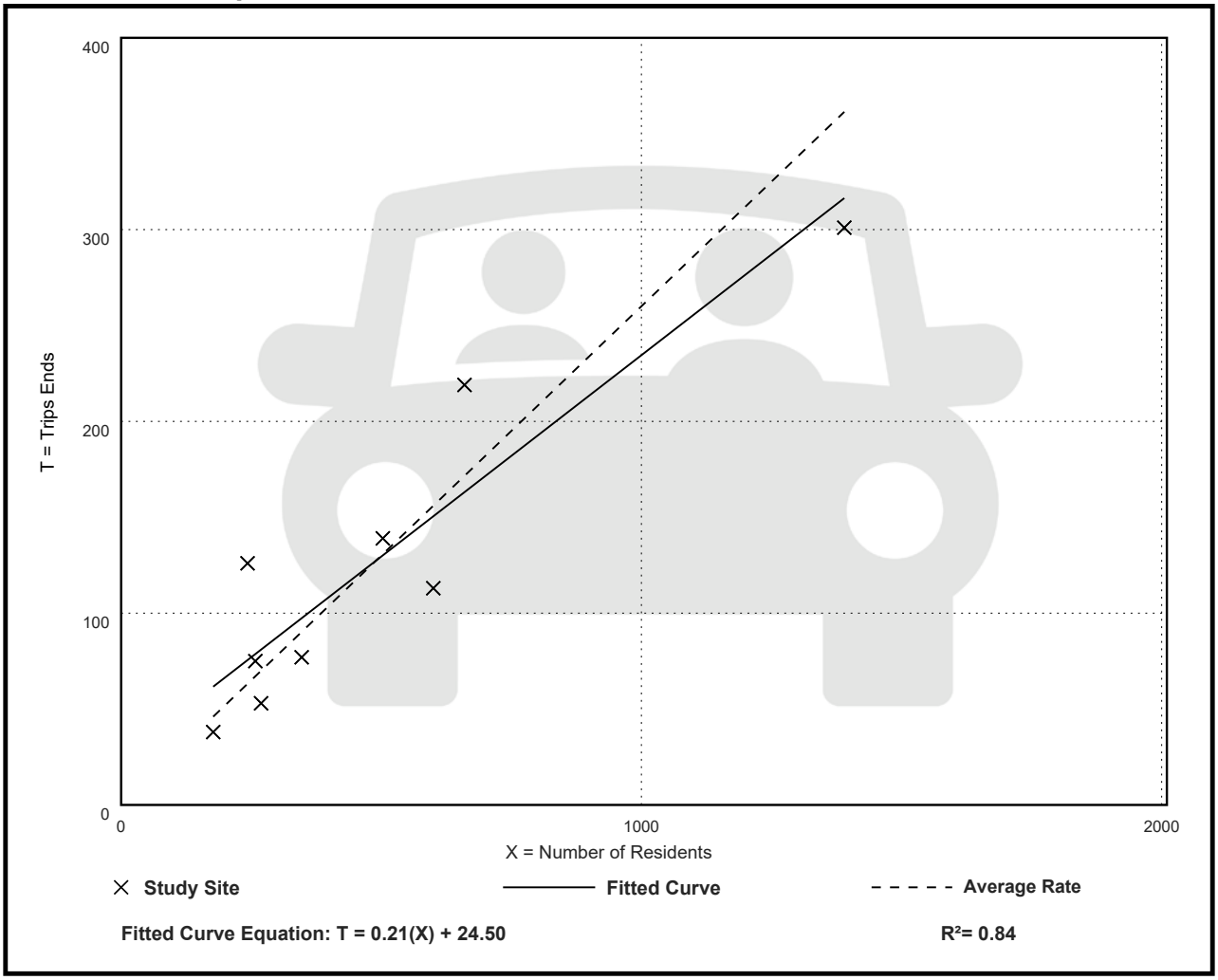
Vehicle Trip Ends vs: Residents
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. Num. of Residents: 494
Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.26	0.19 - 0.52	0.08

Data Plot and Equation



Fitted Curve Equation: T = 0.21(X) + 24.50

R^2= 0.84

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

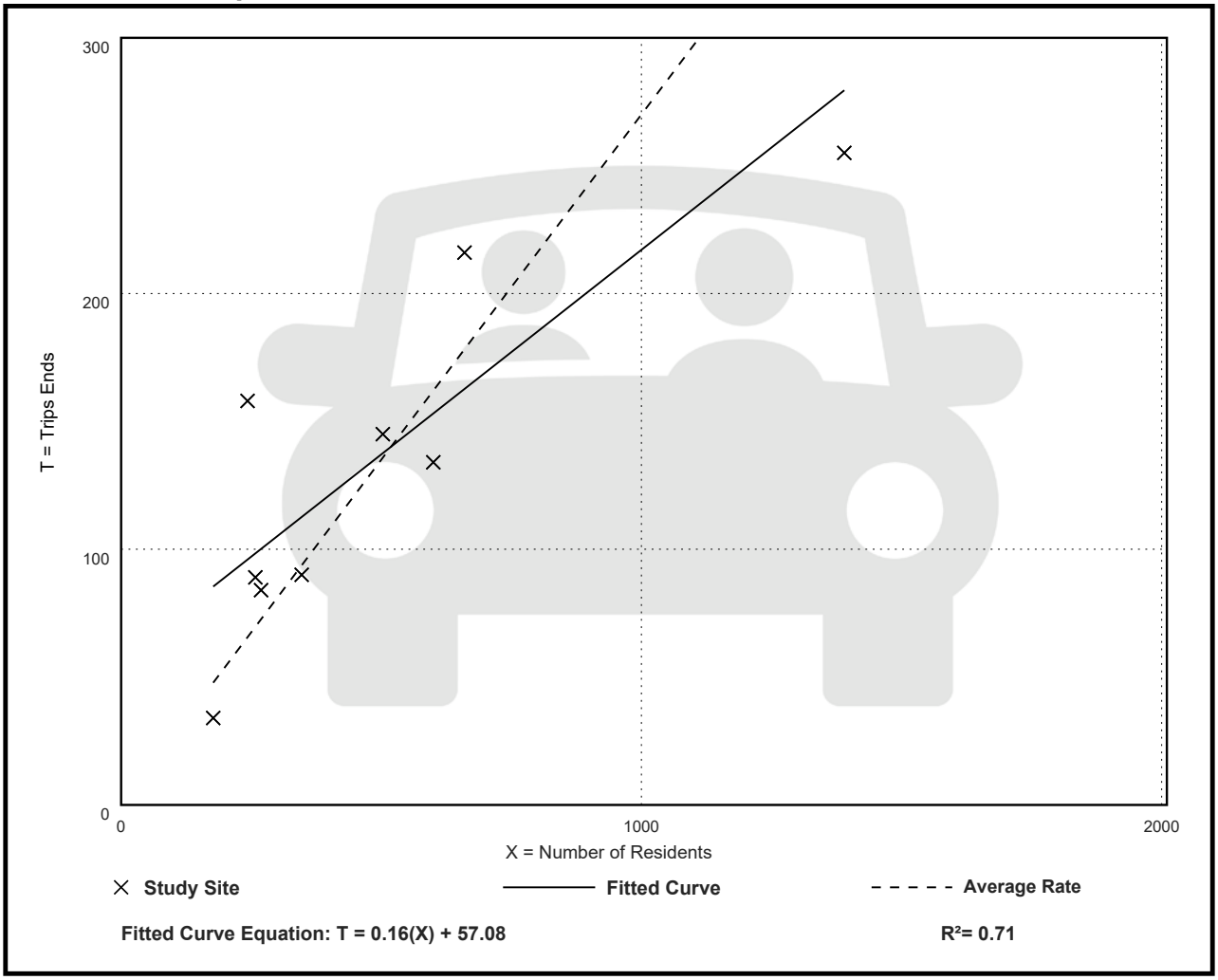
Vehicle Trip Ends vs: Residents
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. Num. of Residents: 494
Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.27	0.18 - 0.65	0.11

Data Plot and Equation



Fitted Curve Equation: T = 0.16(X) + 57.08

R^2= 0.71

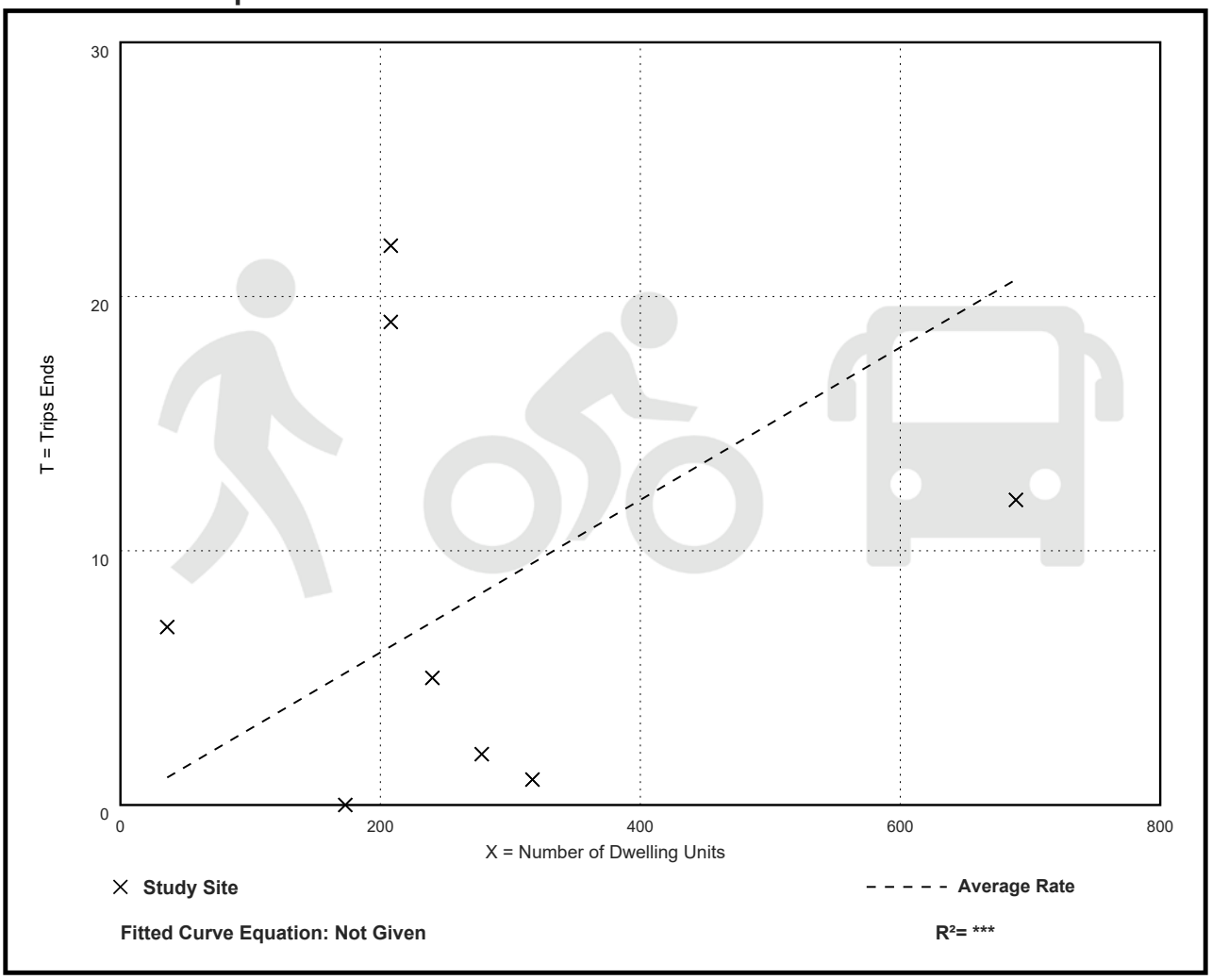
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Walk+Bike+Transit 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: 8
Avg. Num. of Dwelling Units: 269
Directional Distribution: 43% entering, 57% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.19	0.04

Data Plot and Equation



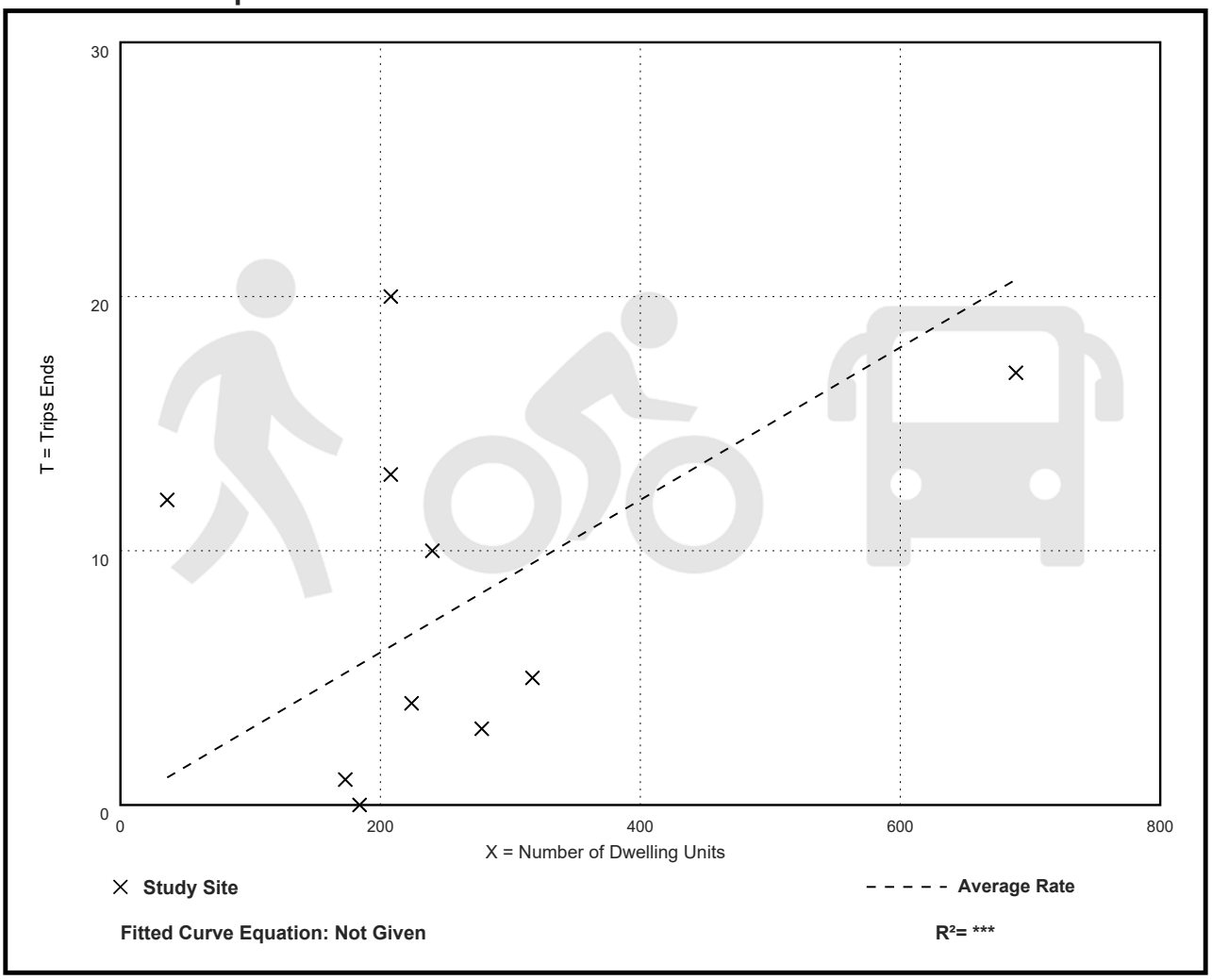
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Walk+Bike+Transit 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: 10
Avg. Num. of Dwelling Units: 256
Directional Distribution: 50% entering, 50% exiting

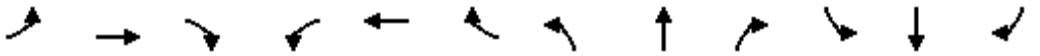
Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.33	0.05

Data Plot and Equation



APPENDIX F – SYNCHRO REPORTS – 2032 WEEKDAY BACKGROUND TRAFFIC CONDITION



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	26	49	206	99	20	51	285	39	17	1195	269
Future Volume (vph)	134	26	49	206	99	20	51	285	39	17	1195	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.991				0.850			0.850
Flt Protected		0.960			0.969		0.950			0.950		
Satd. Flow (prot)	0	1808	1601	0	3436	0	1789	1883	1601	1789	1883	1601
Flt Permitted		0.538			0.718		0.102			0.572		
Satd. Flow (perm)	0	1013	1601	0	2546	0	192	1883	1601	1077	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		9				45			204
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	146	28	53	224	108	22	55	310	42	18	1299	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	53	0	354	0	55	310	42	18	1299	292
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		17.2	17.2		17.2		39.1	39.1	39.1	39.1	39.1	39.1

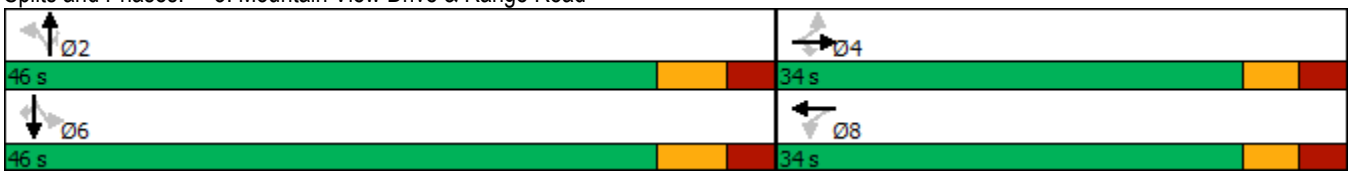
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.25	0.25		0.25		0.56	0.56	0.56	0.56	0.56	0.56
v/c Ratio		0.70	0.12		0.56		0.51	0.29	0.05	0.03	1.23	0.30
Control Delay		39.1	6.0		25.4		35.3	10.4	3.4	9.4	133.6	4.3
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.1	6.0		25.4		35.3	10.4	3.4	9.4	133.6	4.3
LOS		D	A		C		D	B	A	A	F	A
Approach Delay		31.4			25.4			13.0			108.7	
Approach LOS		C			C			B			F	
Queue Length 50th (m)		21.6	0.0		21.6		4.2	20.0	0.0	1.0	~223.1	5.0
Queue Length 95th (m)		41.4	6.9		33.5		#25.5	46.2	4.6	4.8	#358.1	20.6
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		404	673		1022		107	1053	915	602	1053	985
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.43	0.08		0.35		0.51	0.29	0.05	0.03	1.23	0.30

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 69.9			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 75.6		Intersection LOS: E	
Intersection Capacity Utilization 96.6%		ICU Level of Service F	
Analysis Period (min) 15			

~ 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.

Splits and Phases: 3: Mountain View Drive & Range Road



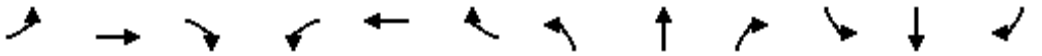
Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	451	6	6	913
Future Vol, veh/h	6	6	451	6	6	913
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	490	7	7	992

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1500	494	0	0	497	0
Stage 1	494	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	134	575	-	-	1067	-
Stage 1	613	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	132	575	-	-	1067	-
Mov Cap-2 Maneuver	132	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	348	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	215	1067	-
HCM Lane V/C Ratio	-	-	0.061	0.006	-
HCM Control Delay (s)	-	-	22.8	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	83	45	77	44	17	50	1001	238	20	507	145
Future Volume (vph)	274	83	45	77	44	17	50	1001	238	20	507	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.982				0.850			0.850
Flt Protected		0.963			0.973		0.950			0.950		
Satd. Flow (prot)	0	1814	1601	0	3419	0	1789	1883	1601	1789	1883	1601
Flt Permitted		0.675			0.588		0.337			0.103		
Satd. Flow (perm)	0	1271	1601	0	2066	0	635	1883	1601	194	1883	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		18				164			158
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	90	49	84	48	18	54	1088	259	22	551	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	388	49	0	150	0	54	1088	259	22	551	158
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		26.1	26.1		26.1		38.9	38.9	38.9	38.9	38.9	38.9

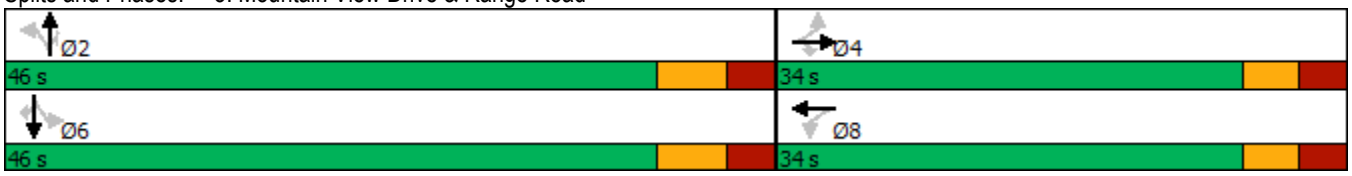
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.33	0.33		0.33		0.50	0.50	0.50	0.50	0.50	0.50
v/c Ratio		0.92	0.09		0.21		0.17	1.17	0.30	0.23	0.59	0.18
Control Delay		54.5	5.0		17.2		13.5	109.9	5.7	19.6	17.9	2.6
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		54.5	5.0		17.2		13.5	109.9	5.7	19.6	17.9	2.6
LOS		D	A		B		B	F	A	B	B	A
Approach Delay		49.0			17.2			87.0			14.6	
Approach LOS		D			B			F			B	
Queue Length 50th (m)		57.5	0.0		7.6		4.6	~213.4	7.9	2.0	60.9	0.0
Queue Length 95th (m)		#109.8	6.0		14.6		11.8	#287.4	21.0	8.0	93.2	9.2
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		449	602		742		314	932	874	96	932	872
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.86	0.08		0.20		0.17	1.17	0.30	0.23	0.59	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 78.5			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay: 57.6		Intersection LOS: E	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

~ 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.

Splits and Phases: 3: Mountain View Drive & Range Road



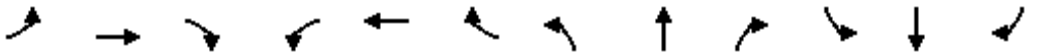
Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	953	6	6	817
Future Vol, veh/h	6	6	953	6	6	817
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	1036	7	7	888

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1942	1040	0	0	1043	0
Stage 1	1040	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	72	280	-	-	667	-
Stage 1	341	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	70	280	-	-	667	-
Mov Cap-2 Maneuver	70	-	-	-	-	-
Stage 1	341	-	-	-	-	-
Stage 2	388	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.3	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	112	667	-
HCM Lane V/C Ratio	-	-	0.116	0.01	-
HCM Control Delay (s)	-	-	41.3	10.5	0
HCM Lane LOS	-	-	E	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

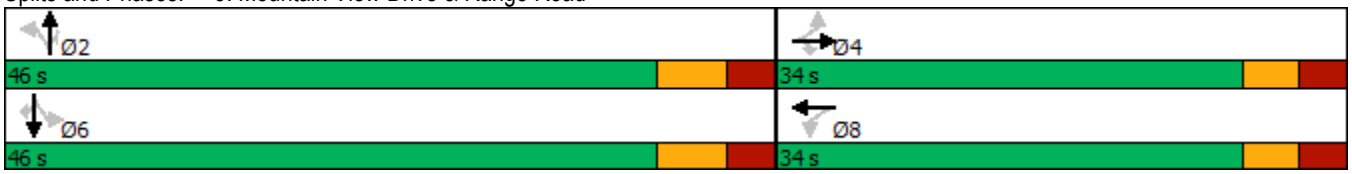


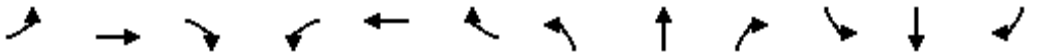
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	26	49	206	99	20	51	285	39	17	1195	269
Future Volume (vph)	134	26	49	206	99	20	51	285	39	17	1195	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.991				0.850			0.850
Flt Protected		0.960			0.969		0.950			0.950		
Satd. Flow (prot)	0	1808	1601	0	3436	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.538			0.718		0.149			0.563		
Satd. Flow (perm)	0	1013	1601	0	2546	0	281	3579	1601	1060	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		9				45			292
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	146	28	53	224	108	22	55	310	42	18	1299	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	53	0	354	0	55	310	42	18	1299	292
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		17.2	17.2		17.2		39.1	39.1	39.1	39.1	39.1	39.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.25	0.25		0.25		0.56	0.56	0.56	0.56	0.56	0.56
v/c Ratio		0.70	0.12		0.56		0.35	0.15	0.05	0.03	0.65	0.29
Control Delay		39.1	6.0		25.4		19.1	8.8	3.4	9.4	13.7	2.3
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.1	6.0		25.4		19.1	8.8	3.4	9.4	13.7	2.3
LOS		D	A		C		B	A	A	A	B	A
Approach Delay		31.4			25.4			9.6			11.6	
Approach LOS		C			C			A			B	
Queue Length 50th (m)		21.6	0.0		21.6		3.7	9.6	0.0	1.0	57.9	0.0
Queue Length 95th (m)		41.4	6.9		33.5		16.9	21.1	4.6	4.8	108.0	11.9
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		404	673		1022		157	2002	915	592	2002	1024
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.43	0.08		0.35		0.35	0.15	0.05	0.03	0.65	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 69.9			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Mountain View Drive & Range Road



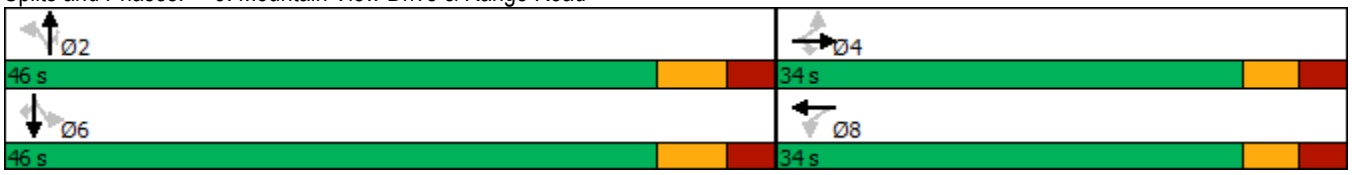


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	83	45	77	44	17	50	1001	238	20	507	145
Future Volume (vph)	274	83	45	77	44	17	50	1001	238	20	507	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.982				0.850			0.850
Flt Protected		0.963			0.973		0.950			0.950		
Satd. Flow (prot)	0	1814	1601	0	3419	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.675			0.583		0.442			0.187		
Satd. Flow (perm)	0	1271	1601	0	2049	0	832	3579	1601	352	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		18				259			158
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	90	49	84	48	18	54	1088	259	22	551	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	388	49	0	150	0	54	1088	259	22	551	158
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-0.6	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.7	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		26.5	25.9		25.9		38.9	38.9	38.9	38.9	38.9	38.9

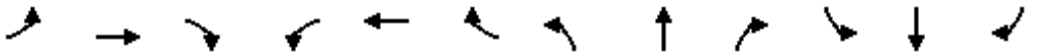
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.34	0.33		0.33		0.50	0.50	0.50	0.50	0.50	0.50
v/c Ratio		0.90	0.09		0.22		0.13	0.61	0.28	0.13	0.31	0.18
Control Delay		51.4	5.0		17.2		12.5	16.5	2.5	13.7	12.7	2.6
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		51.4	5.0		17.2		12.5	16.5	2.5	13.7	12.7	2.6
LOS		D	A		B		B	B	A	B	B	A
Approach Delay		46.2			17.2			13.8			10.6	
Approach LOS		D			B			B			B	
Queue Length 50th (m)		56.8	0.0		7.6		4.5	64.3	0.0	1.9	26.7	0.0
Queue Length 95th (m)		#108.2	6.0		14.6		11.2	84.8	11.5	6.5	37.7	9.2
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		460	604		737		412	1776	924	174	1776	874
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.84	0.08		0.20		0.13	0.61	0.28	0.13	0.31	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 78.3			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 18.3		Intersection LOS: B	
Intersection Capacity Utilization 78.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



APPENDIX G – SYNCHRO REPORTS – 2032 WEEKDAY TOTAL TRAFFIC CONDITION

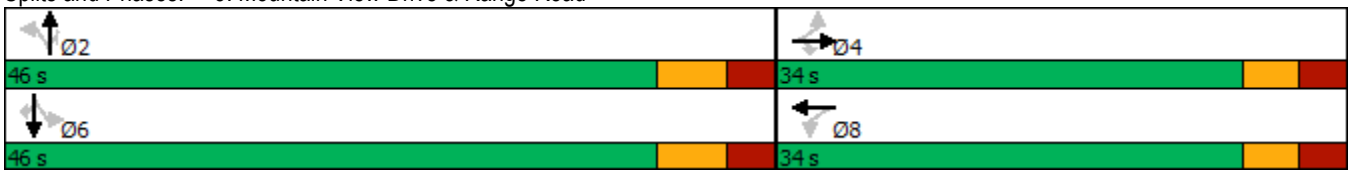


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	34	49	247	119	22	51	285	51	20	1195	269
Future Volume (vph)	134	34	49	247	119	22	51	285	51	20	1195	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.991				0.850			0.850
Flt Protected		0.962			0.969		0.950			0.950		
Satd. Flow (prot)	0	1812	1601	0	3436	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.487			0.713		0.144			0.563		
Satd. Flow (perm)	0	917	1601	0	2529	0	271	3579	1601	1060	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		8				55			292
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	146	37	53	268	129	24	55	310	55	22	1299	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	183	53	0	421	0	55	310	55	22	1299	292
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		18.8	18.8		18.8		39.1	39.1	39.1	39.1	39.1	39.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.26	0.26		0.26		0.55	0.55	0.55	0.55	0.55	0.55
v/c Ratio		0.76	0.11		0.63		0.37	0.16	0.06	0.04	0.66	0.29
Control Delay		44.4	5.8		26.7		21.2	9.4	3.5	9.9	14.8	2.4
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.4	5.8		26.7		21.2	9.4	3.5	9.9	14.8	2.4
LOS		D	A		C		C	A	A	A	B	A
Approach Delay		35.7			26.7			10.2			12.5	
Approach LOS		D			C			B			B	
Queue Length 50th (m)		23.5	0.0		26.7		4.1	10.4	0.0	1.3	62.8	0.0
Queue Length 95th (m)		45.7	6.8		40.3		17.7	21.3	5.6	5.6	109.7	12.1
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		358	659		991		147	1956	900	579	1956	1007
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.51	0.08		0.42		0.37	0.16	0.06	0.04	0.66	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 71.5			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 81.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	32	12	24	16	4
Future Vol, veh/h	12	32	12	24	16	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	35	13	26	17	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	71	19	21	0	-	0
Stage 1	19	-	-	-	-	-
Stage 2	52	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	933	1059	1595	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	926	1059	1595	-	-	-
Mov Cap-2 Maneuver	926	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	2.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1595	-	1019	-	-
HCM Lane V/C Ratio	0.008	-	0.047	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	31	11	24	44	4
Future Vol, veh/h	12	31	11	24	44	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	34	12	26	48	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	100	50	52	0	-	0
Stage 1	50	-	-	-	-	-
Stage 2	50	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	899	1018	1554	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	972	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	892	1018	1554	-	-	-
Mov Cap-2 Maneuver	892	-	-	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	972	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1554	-	979	-	-
HCM Lane V/C Ratio	0.008	-	0.048	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	18	451	10	10	913
Future Vol, veh/h	18	18	451	10	10	913
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	20	490	11	11	992

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1510	496	0	0	501	0
Stage 1	496	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	133	574	-	-	1063	-
Stage 1	612	-	-	-	-	-
Stage 2	350	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	130	574	-	-	1063	-
Mov Cap-2 Maneuver	130	-	-	-	-	-
Stage 1	612	-	-	-	-	-
Stage 2	342	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.8	0	0.1
HCM LOS	D		

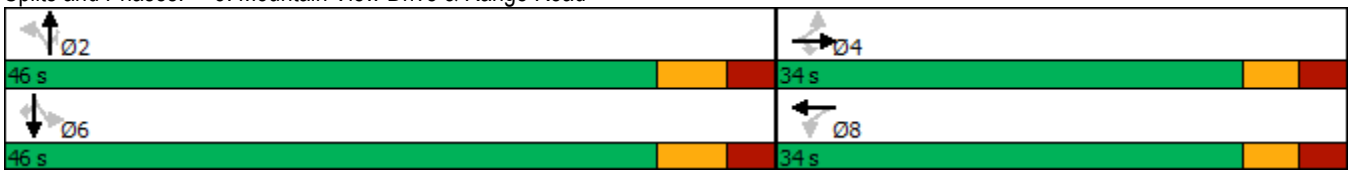
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	212	1063	-
HCM Lane V/C Ratio	-	-	0.185	0.01	-
HCM Control Delay (s)	-	-	25.8	8.4	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	105	45	104	57	18	50	1001	272	31	507	145
Future Volume (vph)	274	105	45	104	57	18	50	1001	272	31	507	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.985				0.850			0.850
Flt Protected		0.965			0.972		0.950			0.950		
Satd. Flow (prot)	0	1818	1601	0	3426	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.661			0.562		0.439			0.183		
Satd. Flow (perm)	0	1245	1601	0	1981	0	827	3579	1601	345	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		17				296			158
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	114	49	113	62	20	54	1088	296	34	551	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	412	49	0	195	0	54	1088	296	34	551	158
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-0.5	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.8	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		27.7	27.2		27.2		38.8	38.8	38.8	38.8	38.8	38.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.35	0.34		0.34		0.49	0.49	0.49	0.49	0.49	0.49
v/c Ratio		0.95	0.08		0.28		0.13	0.62	0.32	0.20	0.32	0.18
Control Delay		60.9	5.0		18.6		12.5	17.0	2.6	15.7	13.0	2.6
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		60.9	5.0		18.6		12.5	17.0	2.6	15.7	13.0	2.6
LOS		E	A		B		B	B	A	B	B	A
Approach Delay		55.0			18.6			13.9			10.9	
Approach LOS		D			B			B			B	
Queue Length 50th (m)		62.8	0.0		10.6		4.5	64.3	0.0	3.0	26.7	0.0
Queue Length 95th (m)		#119.2	6.0		19.0		11.2	84.8	12.1	9.3	37.7	9.2
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		441	595		702		404	1747	933	168	1747	862
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.93	0.08		0.28		0.13	0.62	0.32	0.20	0.32	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 79.5			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 20.1		Intersection LOS: C	
Intersection Capacity Utilization 79.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	21	34	20	24	12
Future Vol, veh/h	8	21	34	20	24	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	23	37	22	26	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	129	33	39	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	96	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	865	1041	1571	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	928	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	844	1041	1571	-	-	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	965	-	-	-	-	-
Stage 2	928	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	4.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1571	-	978	-	-
HCM Lane V/C Ratio	0.024	-	0.032	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	20	33	46	33	12
Future Vol, veh/h	8	20	33	46	33	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	22	36	50	36	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	165	43	49	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	826	1027	1558	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	806	1027	1558	-	-	-
Mov Cap-2 Maneuver	806	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	3.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1558	-	952	-	-
HCM Lane V/C Ratio	0.023	-	0.032	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

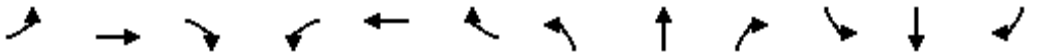
Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	14	953	18	18	817
Future Vol, veh/h	14	14	953	18	18	817
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	15	1036	20	20	888

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1974	1046	0	0	1056	0
Stage 1	1046	-	-	-	-	-
Stage 2	928	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	68	277	-	-	659	-
Stage 1	338	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	64	277	-	-	659	-
Mov Cap-2 Maneuver	64	-	-	-	-	-
Stage 1	338	-	-	-	-	-
Stage 2	362	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	53.3	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	104	659	-
HCM Lane V/C Ratio	-	-	0.293	0.03	-
HCM Control Delay (s)	-	-	53.3	10.6	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	40	49	282	136	25	51	285	61	24	1195	269
Future Volume (vph)	134	40	49	282	136	25	51	285	61	24	1195	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.992				0.850			0.850
Flt Protected		0.963			0.969		0.950			0.950		
Satd. Flow (prot)	0	1814	1601	0	3440	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.440			0.709		0.138			0.563		
Satd. Flow (perm)	0	829	1601	0	2517	0	260	3579	1601	1060	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		8				66			292
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	146	43	53	307	148	27	55	310	66	26	1299	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	189	53	0	482	0	55	310	66	26	1299	292
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		20.6	20.6		20.6		39.1	39.1	39.1	39.1	39.1	39.1

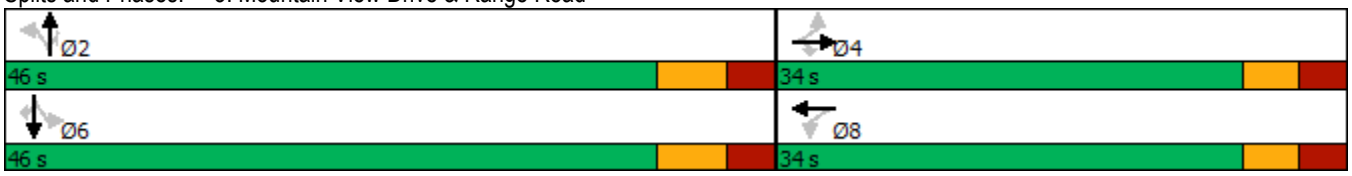
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.28	0.28		0.28		0.53	0.53	0.53	0.53	0.53	0.53
v/c Ratio		0.81	0.11		0.89dl		0.40	0.16	0.07	0.05	0.68	0.30
Control Delay		51.1	5.7		27.7		23.6	10.1	3.4	10.6	16.0	2.4
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		51.1	5.7		27.7		23.6	10.1	3.4	10.6	16.0	2.4
LOS		D	A		C		C	B	A	B	B	A
Approach Delay		41.2			27.7			10.8			13.4	
Approach LOS		D			C			B			B	
Queue Length 50th (m)		25.2	0.0		31.6		4.5	11.4	0.0	1.7	68.7	0.0
Queue Length 95th (m)		#55.3	6.8		47.0		18.3	21.3	6.1	6.2	109.7	12.1
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		315	644		962		138	1907	884	564	1907	989
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		0.60	0.08		0.50		0.40	0.16	0.07	0.05	0.68	0.30

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 73.3			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 17.9		Intersection LOS: B	
Intersection Capacity Utilization 84.0%		ICU Level of Service E	
Analysis Period (min) 15			

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

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	59	22	34	20	8
Future Vol, veh/h	22	59	22	34	20	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	64	24	37	22	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	112	27	31	0	-	0
Stage 1	27	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	885	1048	1582	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	872	1048	1582	-	-	-
Mov Cap-2 Maneuver	872	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	938	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1582	-	994	-	-
HCM Lane V/C Ratio	0.015	-	0.089	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	59	21	34	71	8
Future Vol, veh/h	22	59	21	34	71	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	64	23	37	77	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	165	82	86	0	-	0
Stage 1	82	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	826	978	1510	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	978	1510	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	2.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1510	-	927	-	-
HCM Lane V/C Ratio	0.015	-	0.095	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

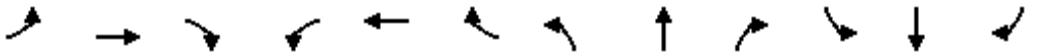
Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	28	451	14	14	913
Future Vol, veh/h	28	28	451	14	14	913
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	30	490	15	15	992

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1520	498	0	0	505	0
Stage 1	498	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	131	572	-	-	1060	-
Stage 1	611	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	127	572	-	-	1060	-
Mov Cap-2 Maneuver	127	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	336	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.3	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	208	1060	-
HCM Lane V/C Ratio	-	-	0.293	0.014	-
HCM Control Delay (s)	-	-	29.3	8.4	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	124	45	128	69	20	50	1001	300	41	507	145
Future Volume (vph)	274	124	45	128	69	20	50	1001	300	41	507	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.986				0.850			0.850
Flt Protected		0.967			0.971		0.950			0.950		
Satd. Flow (prot)	0	1821	1601	0	3426	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.649			0.560		0.438			0.181		
Satd. Flow (perm)	0	1222	1601	0	1976	0	825	3579	1601	341	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		15				326			158
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	135	49	139	75	22	54	1088	326	45	551	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	433	49	0	236	0	54	1088	326	45	551	158
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3		6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		27.7	27.7		27.7		38.8	38.8	38.8	38.8	38.8	38.8

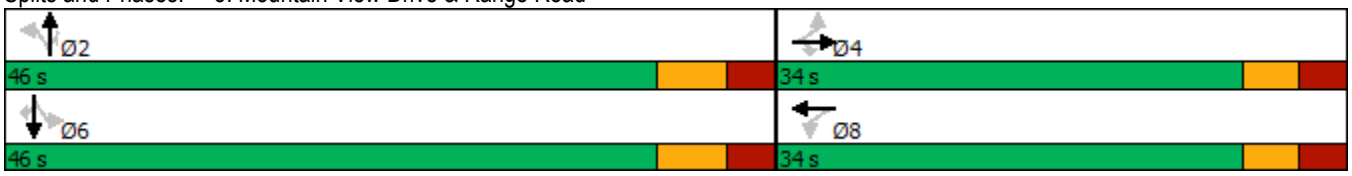
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.35	0.35		0.35		0.48	0.48	0.48	0.48	0.48	0.48
v/c Ratio		1.02	0.08		0.34		0.14	0.63	0.35	0.27	0.32	0.18
Control Delay		78.9	5.0		19.8		12.5	17.3	2.6	17.8	13.2	2.6
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		78.9	5.0		19.8		12.5	17.3	2.6	17.8	13.2	2.6
LOS		E	A		B		B	B	A	B	B	A
Approach Delay		71.4			19.8			13.8			11.2	
Approach LOS		E			B			B			B	
Queue Length 50th (m)		~71.5	0.0		13.4		4.5	64.3	0.0	4.1	26.7	0.0
Queue Length 95th (m)		#130.3	6.0		23.1		11.2	84.8	12.7	12.2	37.7	9.2
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0				90.0		55.0	145.0		75.0
Base Capacity (vph)		423	591		693		400	1735	944	165	1735	857
Starvation Cap Reductn		0	0		0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0		0	0	0	0	0	0
Reduced v/c Ratio		1.02	0.08		0.34		0.14	0.63	0.35	0.27	0.32	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 23.1		Intersection LOS: C	
Intersection Capacity Utilization 86.8%		ICU Level of Service E	
Analysis Period (min) 15			

~ 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.

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	40	62	27	35	23
Future Vol, veh/h	15	40	62	27	35	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	43	67	29	38	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	214	51	63	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	774	1017	1540	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	740	1017	1540	-	-	-
Mov Cap-2 Maneuver	740	-	-	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	866	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	5.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1540	-	923	-	-
HCM Lane V/C Ratio	0.044	-	0.065	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	39	62	74	52	23
Future Vol, veh/h	15	39	62	74	52	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	42	67	80	57	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	284	70	82	0	-	0
Stage 1	70	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	706	993	1515	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	674	993	1515	-	-	-
Mov Cap-2 Maneuver	674	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	822	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	3.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1515	-	878	-	-
HCM Lane V/C Ratio	0.044	-	0.067	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

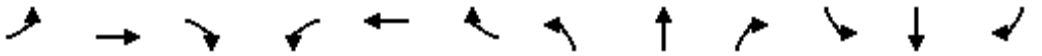
Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	21	953	29	29	817
Future Vol, veh/h	21	21	953	29	29	817
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	23	1036	32	32	888

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2004	1052	0	0	1068	0
Stage 1	1052	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	65	275	-	-	653	-
Stage 1	336	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	59	275	-	-	653	-
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	336	-	-	-	-	-
Stage 2	339	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	71.5	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	97	653	-
HCM Lane V/C Ratio	-	-	0.471	0.048	-
HCM Control Delay (s)	-	-	71.5	10.8	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	2	0.2	-

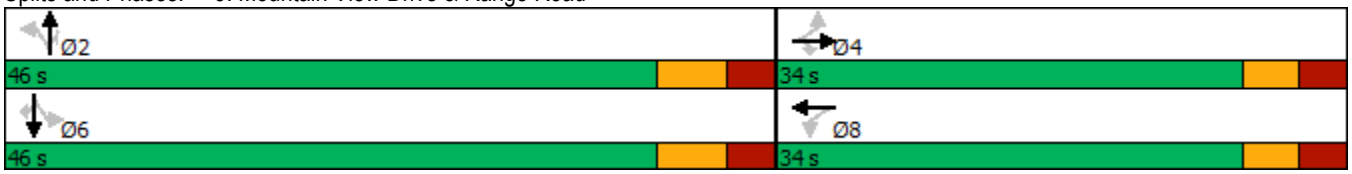


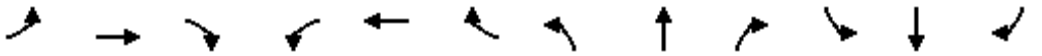
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	34	49	247	119	22	51	285	51	20	1195	269
Future Volume (vph)	134	34	49	247	119	22	51	285	51	20	1195	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.976				0.850			0.850
Flt Protected		0.962		0.950			0.950			0.950		
Satd. Flow (prot)	0	1812	1601	1789	1838	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.670		0.642			0.139			0.563		
Satd. Flow (perm)	0	1262	1601	1209	1838	0	262	3579	1601	1060	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		13				55			292
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	146	37	53	268	129	24	55	310	55	22	1299	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	183	53	268	153	0	55	310	55	22	1299	292
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3	6.3	6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		20.4	20.4	20.4	20.4		39.1	39.1	39.1	39.1	39.1	39.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.28	0.28	0.28	0.28		0.54	0.54	0.54	0.54	0.54	0.54
v/c Ratio		0.52	0.11	0.80	0.29		0.39	0.16	0.06	0.04	0.68	0.29
Control Delay		27.4	5.7	42.0	19.7		23.1	10.0	3.6	10.4	15.8	2.4
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		27.4	5.7	42.0	19.7		23.1	10.0	3.6	10.4	15.8	2.4
LOS		C	A	D	B		C	A	A	B	B	A
Approach Delay		22.5			33.9			10.8			13.3	
Approach LOS		C			C			B			B	
Queue Length 50th (m)		22.0	0.0	35.4	15.6		4.4	11.3	0.0	1.4	68.3	0.0
Queue Length 95th (m)		40.4	6.8	62.5	29.4		18.1	21.3	5.6	5.6	109.7	12.1
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0	75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)		482	646	461	710		140	1914	882	567	1914	992
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		0.38	0.08	0.58	0.22		0.39	0.16	0.06	0.04	0.68	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 73			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 81.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Mountain View Drive & Range Road



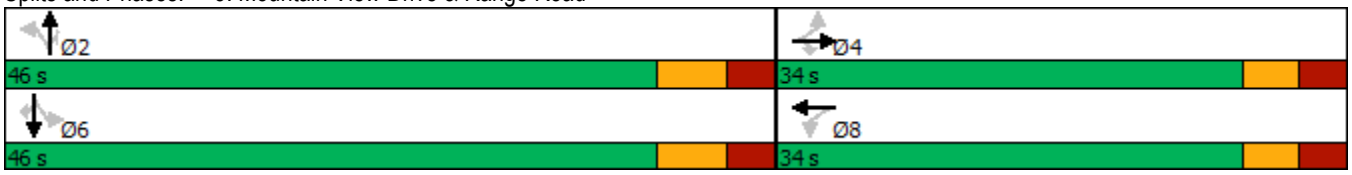


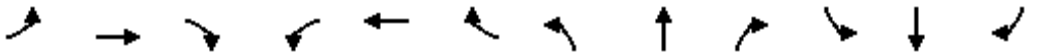
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	105	45	104	57	18	50	1001	272	31	507	145
Future Volume (vph)	274	105	45	104	57	18	50	1001	272	31	507	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.963				0.850			0.850
Flt Protected		0.965		0.950			0.950			0.950		
Satd. Flow (prot)	0	1818	1601	1789	1814	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.734		0.325			0.443			0.188		
Satd. Flow (perm)	0	1382	1601	612	1814	0	834	3579	1601	354	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		20				296			158
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	114	49	113	62	20	54	1088	296	34	551	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	412	49	113	82	0	54	1088	296	34	551	158
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-0.5	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.8	6.3	6.3	6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		26.0	25.5	25.5	25.5		38.9	38.9	38.9	38.9	38.9	38.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.33	0.33	0.33	0.33		0.50	0.50	0.50	0.50	0.50	0.50
v/c Ratio		0.89	0.09	0.56	0.14		0.13	0.61	0.31	0.19	0.31	0.18
Control Delay		48.6	5.0	34.1	15.0		12.4	16.3	2.5	15.3	12.6	2.6
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		48.6	5.0	34.1	15.0		12.4	16.3	2.5	15.3	12.6	2.6
LOS		D	A	C	B		B	B	A	B	B	A
Approach Delay		44.0			26.1			13.3			10.6	
Approach LOS		D			C			B			B	
Queue Length 50th (m)		59.8	0.0	14.3	6.6		4.5	64.3	0.0	2.9	26.7	0.0
Queue Length 95th (m)		#111.0	6.0	32.2	16.1		11.2	84.8	12.1	9.2	37.7	9.2
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0	75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)		501	606	217	659		416	1785	947	176	1785	877
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		0.82	0.08	0.52	0.12		0.13	0.61	0.31	0.19	0.31	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 77.9			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 79.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



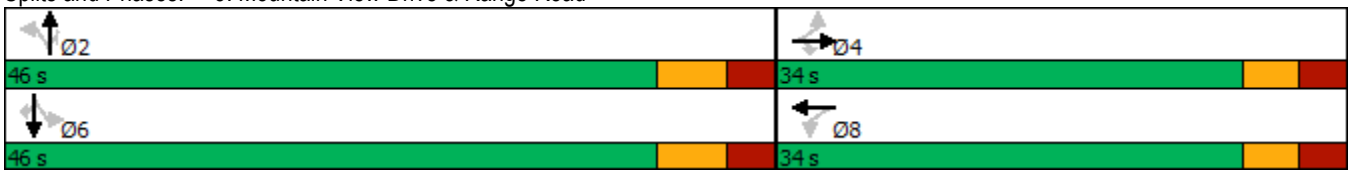


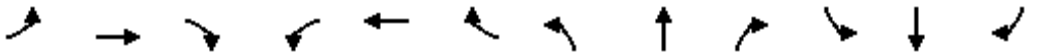
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	40	49	282	136	25	51	285	61	24	1195	269
Future Volume (vph)	134	40	49	282	136	25	51	285	61	24	1195	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	80.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.977				0.850			0.850
Flt Protected		0.963		0.950			0.950			0.950		
Satd. Flow (prot)	0	1814	1601	1789	1840	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.664		0.639			0.131			0.563		
Satd. Flow (perm)	0	1251	1601	1204	1840	0	247	3579	1601	1060	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		13				66			292
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	146	43	53	307	148	27	55	310	66	26	1299	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	189	53	307	175	0	55	310	66	26	1299	292
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3	6.3	6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		22.8	22.8	22.8	22.8		39.0	39.0	39.0	39.0	39.0	39.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.30	0.30	0.30	0.30		0.52	0.52	0.52	0.52	0.52	0.52
v/c Ratio		0.50	0.10	0.85	0.31		0.43	0.17	0.08	0.05	0.70	0.30
Control Delay		26.2	5.6	46.3	19.7		26.8	10.8	3.4	11.0	17.3	2.5
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.2	5.6	46.3	19.7		26.8	10.8	3.4	11.0	17.3	2.5
LOS		C	A	D	B		C	B	A	B	B	A
Approach Delay		21.7			36.6			11.7			14.5	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		22.9	0.0	42.4	18.3		5.1	12.9	0.0	1.9	77.7	0.0
Queue Length 95th (m)		41.9	6.8	#81.7	33.5		#20.2	21.3	6.1	6.2	109.7	12.1
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0	80.0			90.0		55.0	145.0		75.0
Base Capacity (vph)		462	627	444	687		127	1851	860	548	1851	969
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		0.41	0.08	0.69	0.25		0.43	0.17	0.08	0.05	0.70	0.30

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 75.3			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 84.0%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



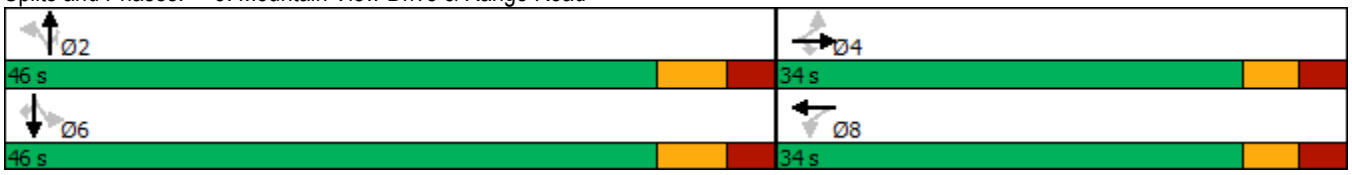


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	124	45	128	69	20	50	1001	300	41	507	145
Future Volume (vph)	274	124	45	128	69	20	50	1001	300	41	507	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	80.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.966				0.850			0.850
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1821	1601	1789	1819	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.735		0.297			0.441			0.186		
Satd. Flow (perm)	0	1384	1601	559	1819	0	831	3579	1601	350	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		20				326			158
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	298	135	49	139	75	22	54	1088	326	45	551	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	433	49	139	97	0	54	1088	326	45	551	158
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3	6.3	6.3	6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		27.2	26.2	26.2	26.2		38.9	38.9	38.9	38.9	38.9	38.9

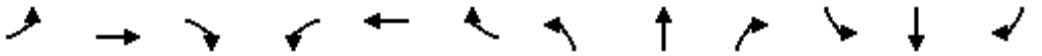
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.35	0.33	0.33	0.33		0.49	0.49	0.49	0.49	0.49	0.49
v/c Ratio		0.90	0.09	0.75	0.16		0.13	0.62	0.34	0.26	0.31	0.18
Control Delay		49.4	5.0	50.1	15.5		12.5	16.7	2.6	17.3	12.8	2.6
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		49.4	5.0	50.1	15.5		12.5	16.7	2.6	17.3	12.8	2.6
LOS		D	A	D	B		B	B	A	B	B	A
Approach Delay		44.8			35.9			13.4			10.9	
Approach LOS		D			D			B			B	
Queue Length 50th (m)		63.5	0.0	19.1	8.3		4.5	64.3	0.0	4.1	26.7	0.0
Queue Length 95th (m)		#117.9	6.0	#49.1	18.6		11.2	84.8	12.7	12.1	37.7	9.2
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0	80.0			90.0		55.0	145.0		75.0
Base Capacity (vph)		506	601	197	654		411	1768	956	172	1768	870
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		0.86	0.08	0.71	0.15		0.13	0.62	0.34	0.26	0.31	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 78.6			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 86.0%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



APPENDIX H – SYNCHRO REPORTS – 2042 WEEKDAY BACKGROUND TRAFFIC CONDITION



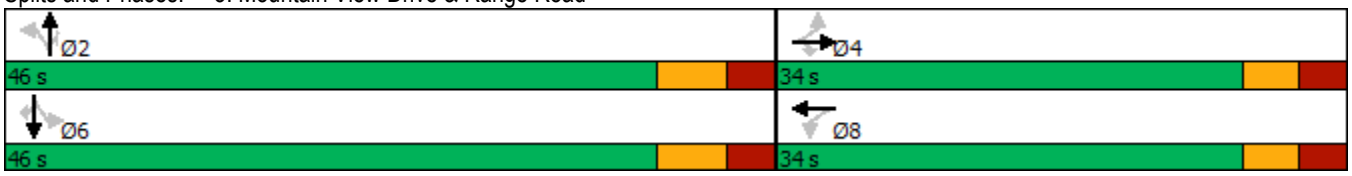
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	31	59	251	120	35	62	510	48	27	1879	423
Future Volume (vph)	241	31	59	251	120	35	62	510	48	27	1879	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	90.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.966				0.850			0.850
Flt Protected		0.958		0.950			0.950			0.950		
Satd. Flow (prot)	0	1804	1601	1789	1819	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.637		0.487			0.103			0.442		
Satd. Flow (perm)	0	1200	1601	917	1819	0	194	3579	1601	832	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57		20				52			388
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	34	64	273	130	38	67	554	52	29	2042	460
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	296	64	273	168	0	67	554	52	29	2042	460
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3	6.3	6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		25.1	25.1	25.1	25.1		38.9	38.9	38.9	38.9	38.9	38.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.32	0.32	0.32	0.32		0.50	0.50	0.50	0.50	0.50	0.50
v/c Ratio		0.76	0.11	0.92	0.28		0.69	0.31	0.06	0.07	1.14	0.46
Control Delay		37.8	6.9	63.2	18.1		57.4	12.5	3.7	11.6	91.6	4.2
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		37.8	6.9	63.2	18.1		57.4	12.5	3.7	11.6	91.6	4.2
LOS		D	A	E	B		E	B	A	B	F	A
Approach Delay		32.3			46.0			16.3			74.8	
Approach LOS		C			D			B			E	
Queue Length 50th (m)		40.4	0.7	40.0	16.6		8.0	27.0	0.0	2.4	~208.8	5.9
Queue Length 95th (m)		#77.5	8.7	#84.9	31.3		#31.8	38.0	5.5	6.9	#252.4	22.4
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0	90.0			90.0		55.0	145.0		75.0
Base Capacity (vph)		429	609	328	663		97	1794	829	417	1794	996
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		0.69	0.11	0.83	0.25		0.69	0.31	0.06	0.07	1.14	0.46

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 77.6			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 58.0		Intersection LOS: E	
Intersection Capacity Utilization 97.3%		ICU Level of Service F	
Analysis Period (min) 15			

~ 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.

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	10.5

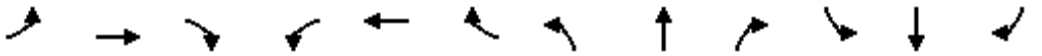
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	7	808	7	7	1636
Future Vol, veh/h	7	7	808	7	7	1636
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	8	878	8	8	1778

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2676	882	0	0	886	0
Stage 1	882	-	-	-	-	-
Stage 2	1794	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	24	345	-	-	764	-
Stage 1	405	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 3	345	-	-	764	-
Mov Cap-2 Maneuver	~ 3	-	-	-	-	-
Stage 1	405	-	-	-	-	-
Stage 2	19	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, $	1847.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	6	764	-
HCM Lane V/C Ratio	-	-	2.536	0.01	-
HCM Control Delay (s)	-	-	$ 1847.5	9.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	3	0	-

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	101	55	94	53	28	61	1642	290	35	908	260
Future Volume (vph)	450	101	55	94	53	28	61	1642	290	35	908	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	90.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850		0.949				0.850			0.850
Flt Protected		0.961		0.950			0.950			0.950		
Satd. Flow (prot)	0	1810	1601	1789	1787	0	1789	3579	1601	1789	3579	1601
Flt Permitted		0.706		0.144			0.219			0.103		
Satd. Flow (perm)	0	1330	1601	271	1787	0	412	3579	1601	194	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60		7				231			283
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	489	110	60	102	58	30	66	1785	315	38	987	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	599	60	102	88	0	66	1785	315	38	987	283
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	4	4	4	8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.3	33.3	33.3	33.3	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	34.0	34.0	34.0	34.0	34.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	42.5%		57.5%	57.5%	57.5%	57.5%	57.5%	57.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3	6.3	6.3	6.3		7.2	7.2	7.2	7.2	7.2	7.2
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)		27.7	27.7	27.7	27.7		38.8	38.8	38.8	38.8	38.8	38.8

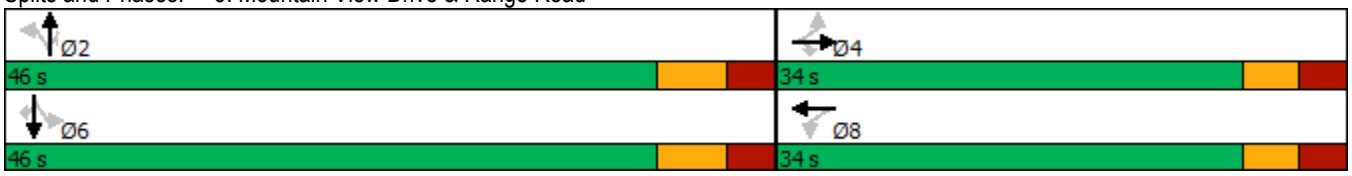
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.35	0.35	0.35	0.35		0.48	0.48	0.48	0.48	0.48	0.48
v/c Ratio		1.30	0.10	1.10	0.14		0.33	1.03	0.35	0.40	0.57	0.31
Control Delay		177.7	5.8	154.1	17.3		18.6	51.5	4.9	29.1	16.3	2.5
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		177.7	5.8	154.1	17.3		18.6	51.5	4.9	29.1	16.3	2.5
LOS		F	A	F	B		B	D	A	C	B	A
Approach Delay		162.0			90.8			43.7			13.7	
Approach LOS		F			F			D			B	
Queue Length 50th (m)		~124.6	0.0	~18.6	8.7		6.2	~163.1	7.0	3.7	56.1	0.0
Queue Length 95th (m)		#186.5	7.6	#49.0	18.8		16.6	#206.0	20.9	#14.8	74.5	11.9
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)			150.0	90.0			90.0		55.0	145.0		75.0
Base Capacity (vph)		460	593	93	623		199	1735	895	94	1735	922
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		1.30	0.10	1.10	0.14		0.33	1.03	0.35	0.40	0.57	0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Natural Cycle: 130			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.30			
Intersection Signal Delay: 54.7		Intersection LOS: D	
Intersection Capacity Utilization 98.8%		ICU Level of Service F	
Analysis Period (min) 15			

~ 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.

Splits and Phases: 3: Mountain View Drive & Range Road



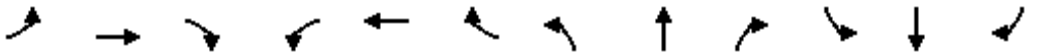
Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	7	1706	7	7	1462
Future Vol, veh/h	7	7	1706	7	7	1462
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	8	1854	8	8	1589

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2669	931	0	0	1862	0
Stage 1	1858	-	-	-	-	-
Stage 2	811	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	18	268	-	-	320	-
Stage 1	109	-	-	-	-	-
Stage 2	397	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	14	268	-	-	320	-
Mov Cap-2 Maneuver	14	-	-	-	-	-
Stage 1	109	-	-	-	-	-
Stage 2	312	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	248.6	0	1.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	27	320	-
HCM Lane V/C Ratio	-	-	0.564	0.024	-
HCM Control Delay (s)	-	-	248.6	16.5	1.7
HCM Lane LOS	-	-	F	C	A
HCM 95th %tile Q(veh)	-	-	1.8	0.1	-

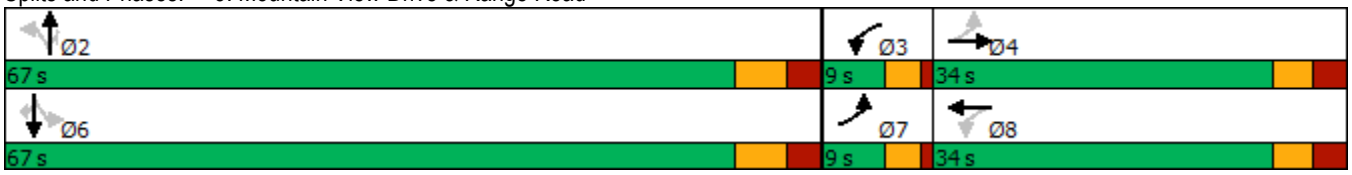


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	31	59	251	120	35	62	510	48	27	1879	423
Future Volume (vph)	241	31	59	251	120	35	62	510	48	27	1879	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	150.0		0.0	90.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.902			0.966				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1699	0	1789	1819	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.651			0.562			0.065			0.443		
Satd. Flow (perm)	1226	1699	0	1058	1819	0	122	3579	1601	834	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			13				72			318
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	34	64	273	130	38	67	554	52	29	2042	460
Shared Lane Traffic (%)												
Lane Group Flow (vph)	262	98	0	273	168	0	67	554	52	29	2042	460
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	9.0	34.0		9.0	34.0		67.0	67.0	67.0	67.0	67.0	67.0
Total Split (%)	8.2%	30.9%		8.2%	30.9%		60.9%	60.9%	60.9%	60.9%	60.9%	60.9%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.3	0.0		-0.7	0.0		-2.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	2.7	6.3		3.3	6.3		5.2	7.2	7.2	7.2	5.2	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	22.2	14.5		24.3	14.8		62.1	60.1	60.1	60.1	62.1	60.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.23	0.15		0.25	0.15		0.64	0.62	0.62	0.62	0.64	0.62
v/c Ratio	0.83	0.36		0.83	0.59		0.87	0.25	0.05	0.06	0.90	0.42
Control Delay	54.7	31.3		54.8	43.2		97.4	9.6	1.6	9.7	22.9	4.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	31.3		54.8	43.2		97.4	9.6	1.6	9.7	22.9	4.6
LOS	D	C		D	D		F	A	A	A	C	A
Approach Delay		48.3			50.4			17.8			19.4	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	43.5	13.3		46.1	28.8		9.2	22.8	0.0	2.0	155.3	10.4
Queue Length 95th (m)	66.9	27.8		#71.1	48.9		#29.6	44.1	3.6	7.6	#298.2	36.1
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)	150.0			90.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	315	501		329	528		77	2204	1014	513	2278	1108
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	0.83	0.20		0.83	0.32		0.87	0.25	0.05	0.06	0.90	0.42

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 97.5			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 25.1		Intersection LOS: C	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	14	808	7	7	1636
Future Vol, veh/h	0	14	808	7	7	1636
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	878	8	8	1778

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	443	0	0	886	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	562	-	-	760	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	562	-	-	760	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	4.2
HCM LOS	B		

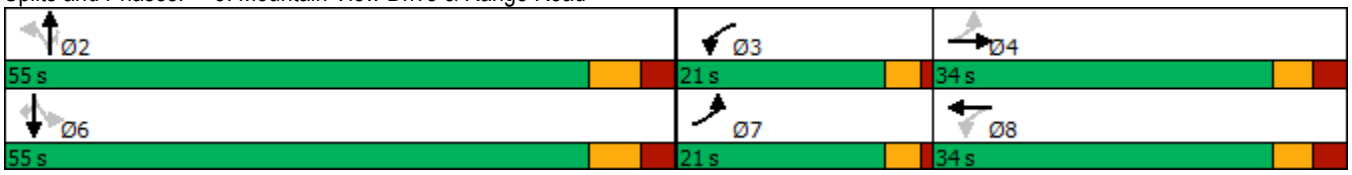
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	562	760	-
HCM Lane V/C Ratio	-	-	0.027	0.01	-
HCM Control Delay (s)	-	-	11.6	9.8	4.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	101	55	94	53	28	61	1642	290	35	908	260
Future Volume (vph)	450	101	55	94	53	28	61	1642	290	35	908	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	90.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.947			0.949				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1784	0	1789	1787	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.598			0.650			0.225			0.083		
Satd. Flow (perm)	1126	1784	0	1224	1787	0	424	3579	1601	156	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			23				153			283
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	489	110	60	102	58	30	66	1785	315	38	987	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	170	0	102	88	0	66	1785	315	38	987	283
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	21.0	34.0		21.0	34.0		55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	19.1%	30.9%		19.1%	30.9%		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-2.0	0.0		0.0	0.0		0.0	-2.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	2.0	6.3		4.0	6.3		7.2	5.2	7.2	7.2	7.2	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	33.9	19.0		20.6	11.5		48.5	50.5	48.5	48.5	48.5	48.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.37	0.21		0.22	0.13		0.53	0.55	0.53	0.53	0.53	0.53
v/c Ratio	0.88	0.44		0.31	0.36		0.29	0.91	0.34	0.46	0.52	0.29
Control Delay	43.1	31.3		22.7	32.4		20.6	28.7	8.9	41.5	17.2	2.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	31.3		22.7	32.4		20.6	28.7	8.9	41.5	17.2	2.9
LOS	D	C		C	C		C	C	A	D	B	A
Approach Delay		40.0			27.2			25.6			14.8	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	76.3	24.2		12.7	11.4		6.5	146.6	14.9	4.2	59.4	0.0
Queue Length 95th (m)	109.8	44.2		23.2	25.0		22.9	#283.5	45.0	#24.3	110.9	15.3
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)				90.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	556	577		490	563		224	1970	918	82	1891	979
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	0.88	0.29		0.21	0.16		0.29	0.91	0.34	0.46	0.52	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 91.7			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 24.6		Intersection LOS: C	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	0.9

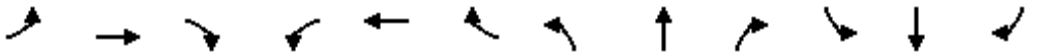
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	14	1706	7	7	1462
Future Vol, veh/h	0	14	1706	7	7	1462
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	1854	8	8	1589

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	931	0	0	1862	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	268	-	-	320	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	268	-	-	320	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.2	0	1.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	268	320	-
HCM Lane V/C Ratio	-	-	0.057	0.024	-
HCM Control Delay (s)	-	-	19.2	16.5	1.7
HCM Lane LOS	-	-	C	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

APPENDIX I – SYNCHRO REPORTS – 2042 WEEKDAY TOTAL TRAFFIC CONDITION

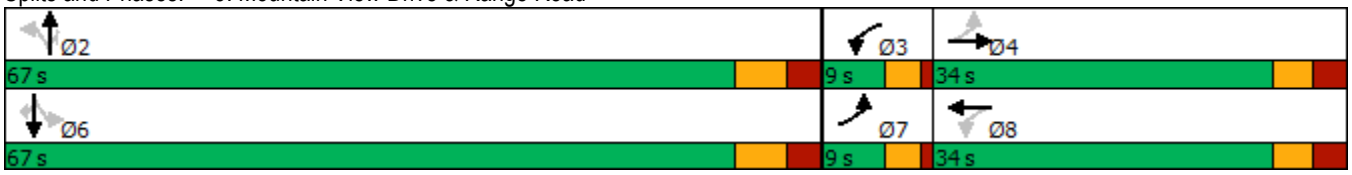


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	39	59	292	140	37	62	510	60	30	1879	423
Future Volume (vph)	241	39	59	292	140	37	62	510	60	30	1879	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	150.0		0.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.909			0.969				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1712	0	1789	1825	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.508			0.689			0.065			0.443		
Satd. Flow (perm)	957	1712	0	1298	1825	0	122	3579	1601	834	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			12				72			318
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	42	64	317	152	40	67	554	65	33	2042	460
Shared Lane Traffic (%)												
Lane Group Flow (vph)	262	106	0	317	192	0	67	554	65	33	2042	460
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	9.0	34.0		9.0	34.0		67.0	67.0	67.0	67.0	67.0	67.0
Total Split (%)	8.2%	30.9%		8.2%	30.9%		60.9%	60.9%	60.9%	60.9%	60.9%	60.9%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.6	0.0		-1.3	0.0		-2.0	0.0	0.0	0.0	-2.1	0.0
Total Lost Time (s)	2.4	6.3		2.7	6.3		5.2	7.2	7.2	7.2	5.1	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	26.4	15.9		25.8	15.9		62.0	60.0	60.0	60.0	62.1	60.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.27	0.16		0.26	0.16		0.63	0.61	0.61	0.61	0.63	0.61
v/c Ratio	0.84	0.36		0.85	0.63		0.88	0.25	0.06	0.06	0.90	0.42
Control Delay	54.6	30.9		54.3	45.3		100.4	10.0	2.5	10.0	24.0	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	30.9		54.3	45.3		100.4	10.0	2.5	10.0	24.0	4.7
LOS	D	C		D	D		F	A	A	A	C	A
Approach Delay		47.8			50.9			18.1			20.3	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	43.3	14.6		54.6	33.9		9.7	24.0	0.0	2.4	162.5	10.8
Queue Length 95th (m)	66.6	29.8		81.9	56.1		#29.6	44.1	5.5	8.3	#297.8	36.1
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)	150.0			75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	312	500		371	524		76	2181	1004	508	2258	1100
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	0.84	0.21		0.85	0.37		0.88	0.25	0.06	0.06	0.90	0.42

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 98.5			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 89.1%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	32	12	27	19	4
Future Vol, veh/h	12	32	12	27	19	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	35	13	29	21	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	78	23	25	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	925	1054	1589	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	968	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	918	1054	1589	-	-	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1589	-	1013	-	-
HCM Lane V/C Ratio	0.008	-	0.047	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	31	11	27	47	4
Future Vol, veh/h	12	31	11	27	47	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	34	12	29	51	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	106	53	55	0	-	0
Stage 1	53	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	892	1014	1550	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	885	1014	1550	-	-	-
Mov Cap-2 Maneuver	885	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1550	-	974	-	-
HCM Lane V/C Ratio	0.008	-	0.048	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

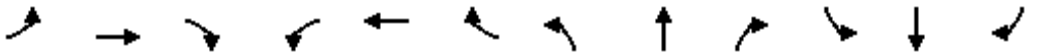
Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	38	808	11	11	1636
Future Vol, veh/h	0	38	808	11	11	1636
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	41	878	12	12	1778

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	445	0	0	890	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	561	-	-	757	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	561	-	-	757	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	4.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	561	757	-
HCM Lane V/C Ratio	-	-	0.074	0.016	-
HCM Control Delay (s)	-	-	11.9	9.8	4.9
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

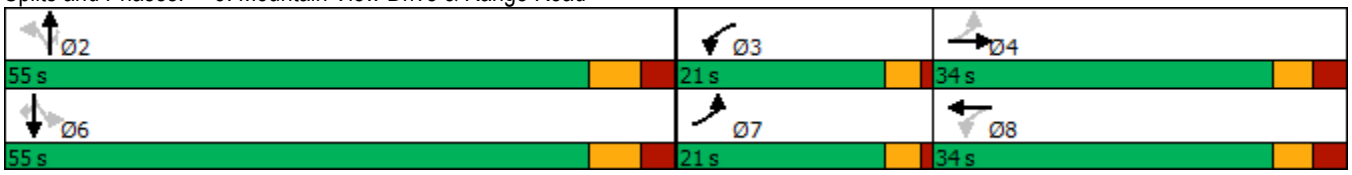


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	123	55	121	66	29	61	1642	324	46	908	260
Future Volume (vph)	450	123	55	121	66	29	61	1642	324	46	908	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.954			0.954				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1797	0	1789	1797	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.595			0.636			0.220			0.083		
Satd. Flow (perm)	1121	1797	0	1198	1797	0	414	3579	1601	156	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			19				171			283
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	489	134	60	132	72	32	66	1785	352	50	987	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	194	0	132	104	0	66	1785	352	50	987	283
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	21.0	34.0		21.0	34.0		55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	19.1%	30.9%		19.1%	30.9%		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-2.0	0.0		0.0	0.0		0.0	-2.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	2.0	6.3		4.0	6.3		7.2	5.2	7.2	7.2	7.2	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	35.9	17.3		22.6	12.1		48.2	50.3	48.2	48.2	48.2	48.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.38	0.19		0.24	0.13		0.52	0.54	0.52	0.52	0.52	0.52
v/c Ratio	0.85	0.56		0.37	0.42		0.31	0.93	0.39	0.62	0.53	0.29
Control Delay	39.3	37.0		23.9	35.2		21.5	31.4	9.3	58.2	17.9	2.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	37.0		23.9	35.2		21.5	31.4	9.3	58.2	17.9	2.9
LOS	D	D		C	D		C	C	A	E	B	A
Approach Delay		38.6			28.9			27.6			16.2	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	76.3	29.8		16.8	15.2		6.7	150.8	17.4	6.3	61.0	0.0
Queue Length 95th (m)	109.8	52.5		29.0	30.1		23.1	#283.5	50.3	#33.2	110.9	15.3
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)				75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	576	560		486	551		213	1925	909	80	1848	963
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	0.85	0.35		0.27	0.19		0.31	0.93	0.39	0.63	0.53	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 93.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 25.9		Intersection LOS: C	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	21	34	23	27	12
Future Vol, veh/h	8	21	34	23	27	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	23	37	25	29	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	135	36	42	0	-	0
Stage 1	36	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	859	1037	1567	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	838	1037	1567	-	-	-
Mov Cap-2 Maneuver	838	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	925	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	4.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1567	-	973	-	-
HCM Lane V/C Ratio	0.024	-	0.032	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	20	33	49	36	12
Future Vol, veh/h	8	20	33	49	36	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	22	36	53	39	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	171	46	52	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	819	1023	1554	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	799	1023	1554	-	-	-
Mov Cap-2 Maneuver	799	-	-	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1554	-	947	-	-
HCM Lane V/C Ratio	0.023	-	0.032	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

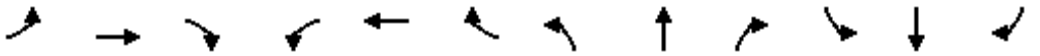
Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	1706	19	19	1462
Future Vol, veh/h	0	30	1706	19	19	1462
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	33	1854	21	21	1589

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	938	0	0	1875	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	266	-	-	317	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	266	-	-	317	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.4	0	4.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	266	317	-
HCM Lane V/C Ratio	-	-	0.123	0.065	-
HCM Control Delay (s)	-	-	20.4	17.1	4.7
HCM Lane LOS	-	-	C	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

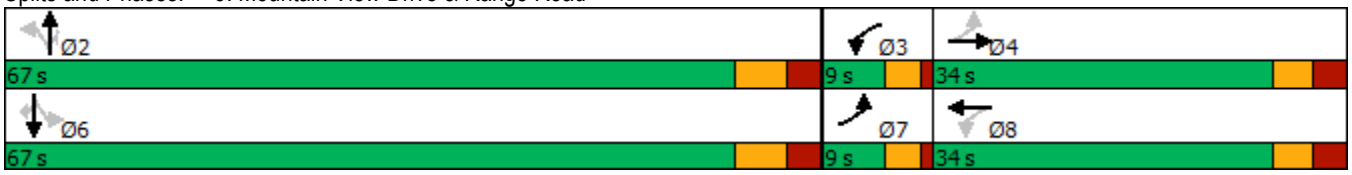


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	45	59	327	157	40	62	510	70	34	1879	423
Future Volume (vph)	241	45	59	327	157	40	62	510	70	34	1879	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	150.0		0.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.915			0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1723	0	1789	1827	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.455			0.684			0.065			0.443		
Satd. Flow (perm)	857	1723	0	1288	1827	0	122	3579	1601	834	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			11				76			318
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	49	64	355	171	43	67	554	76	37	2042	460
Shared Lane Traffic (%)												
Lane Group Flow (vph)	262	113	0	355	214	0	67	554	76	37	2042	460
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	9.0	34.0		9.0	34.0		67.0	67.0	67.0	67.0	67.0	67.0
Total Split (%)	8.2%	30.9%		8.2%	30.9%		60.9%	60.9%	60.9%	60.9%	60.9%	60.9%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.6	0.0		-1.3	0.0		-2.0	0.0	0.0	0.0	-2.1	0.0
Total Lost Time (s)	2.4	6.3		2.7	6.3		5.2	7.2	7.2	7.2	5.1	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	26.7	16.2		26.1	16.2		61.9	59.9	59.9	59.9	62.0	59.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.27	0.16		0.26	0.16		0.63	0.61	0.61	0.61	0.63	0.61
v/c Ratio	0.89	0.38		0.95	0.69		0.88	0.25	0.08	0.07	0.91	0.42
Control Delay	63.4	32.9		71.1	48.9		100.8	9.9	2.5	9.7	24.1	4.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	32.9		71.1	48.9		100.8	9.9	2.5	9.7	24.1	4.6
LOS	E	C		E	D		F	A	A	A	C	A
Approach Delay		54.2			62.8			17.8			20.4	
Approach LOS		D			E			B			C	
Queue Length 50th (m)	43.3	16.5		62.7	38.8		10.1	25.0	0.0	2.8	169.6	11.3
Queue Length 95th (m)	#79.4	32.8		#108.2	63.3		#27.7	40.2	6.2	8.4	#278.5	32.5
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)	150.0			75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	294	500		372	522		76	2174	1002	506	2250	1097
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	0.89	0.23		0.95	0.41		0.88	0.25	0.08	0.07	0.91	0.42

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 98.6			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 28.8		Intersection LOS: C	
Intersection Capacity Utilization 90.2%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	59	22	37	23	8
Future Vol, veh/h	22	59	22	37	23	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	64	24	40	25	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	118	30	34	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	88	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	878	1044	1578	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	935	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	864	1044	1578	-	-	-
Mov Cap-2 Maneuver	864	-	-	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1578	-	988	-	-
HCM Lane V/C Ratio	0.015	-	0.089	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	59	21	37	74	8
Future Vol, veh/h	22	59	21	37	74	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	64	23	40	80	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	171	85	89	0	-	0
Stage 1	85	-	-	-	-	-
Stage 2	86	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	819	974	1506	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	937	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	806	974	1506	-	-	-
Mov Cap-2 Maneuver	806	-	-	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	937	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1506	-	922	-	-
HCM Lane V/C Ratio	0.015	-	0.095	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	58	808	15	15	1636
Future Vol, veh/h	0	58	808	15	15	1636
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	63	878	16	16	1778

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	447	0	0	894	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	559	-	-	755	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	559	-	-	755	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	4.8
HCM LOS	B		

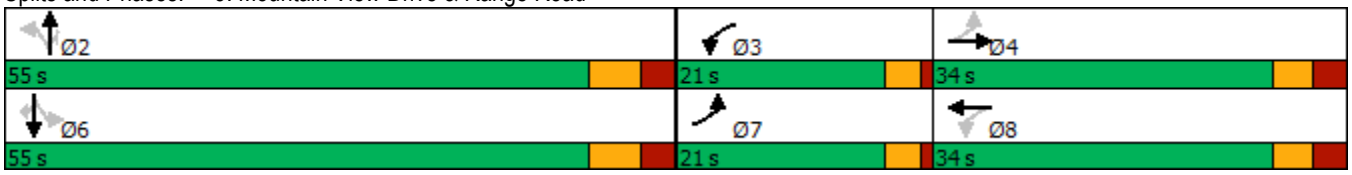
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	559	755	-
HCM Lane V/C Ratio	-	-	0.113	0.022	-
HCM Control Delay (s)	-	-	12.3	9.9	4.8
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	142	55	145	78	31	61	1642	352	56	908	260
Future Volume (vph)	450	142	55	145	78	31	61	1642	352	56	908	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.958			0.957				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1804	0	1789	1802	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.600			0.624			0.217			0.083		
Satd. Flow (perm)	1130	1804	0	1175	1802	0	409	3579	1601	156	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			17				186			283
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	489	154	60	158	85	34	66	1785	383	61	987	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	214	0	158	119	0	66	1785	383	61	987	283
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	21.0	34.0		21.0	34.0		55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	19.1%	30.9%		19.1%	30.9%		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-2.0	0.0		0.0	0.0		0.0	-2.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	2.0	6.3		4.0	6.3		7.2	5.2	7.2	7.2	7.2	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	38.4	18.9		26.5	13.0		48.0	50.0	48.0	48.0	48.0	48.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.40	0.20		0.28	0.14		0.50	0.52	0.50	0.50	0.50	0.50
v/c Ratio	0.84	0.58		0.40	0.46		0.32	0.95	0.43	0.78	0.55	0.30
Control Delay	37.6	38.8		23.3	37.4		22.4	35.9	9.9	84.1	18.9	3.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	38.8		23.3	37.4		22.4	35.9	9.9	84.1	18.9	3.0
LOS	D	D		C	D		C	D	A	F	B	A
Approach Delay		38.0			29.3			31.1			18.5	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	76.3	34.8		20.4	18.3		6.9	154.5	19.5	8.7	62.4	0.0
Queue Length 95th (m)	109.8	59.9		34.1	34.7		23.3	#283.5	55.3	#41.2	110.9	15.3
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)				75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	585	540		507	536		205	1871	896	78	1796	944
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	0.84	0.40		0.31	0.22		0.32	0.95	0.43	0.78	0.55	0.30

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 95.7			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 28.3		Intersection LOS: C	
Intersection Capacity Utilization 94.5%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	40	62	30	38	23
Future Vol, veh/h	15	40	62	30	38	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	43	67	33	41	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	221	54	66	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	167	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	767	1013	1536	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	733	1013	1536	-	-	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1536	-	917	-	-
HCM Lane V/C Ratio	0.044	-	0.065	-	-
HCM Control Delay (s)	7.5	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	39	62	77	55	23
Future Vol, veh/h	15	39	62	77	55	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	42	67	84	60	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	291	73	85	0	-	0
Stage 1	73	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	700	989	1512	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	668	989	1512	-	-	-
Mov Cap-2 Maneuver	668	-	-	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	818	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	3.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1512	-	873	-	-
HCM Lane V/C Ratio	0.045	-	0.067	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	44	1706	30	30	1462
Future Vol, veh/h	0	44	1706	30	30	1462
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	48	1854	33	33	1589

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	944	0	0	1887	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	263	-	-	313	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	263	-	-	313	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.7	0	7.9
HCM LOS	C		

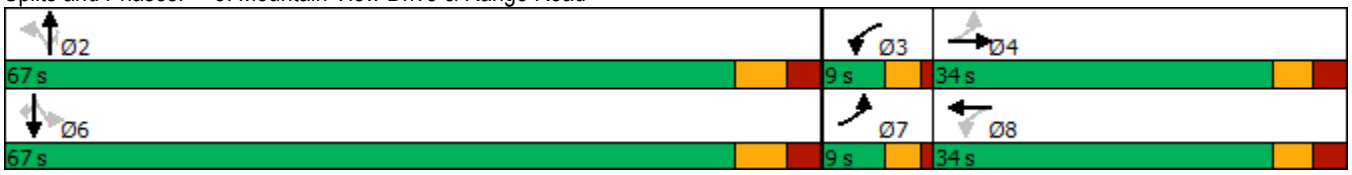
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	263	313	-
HCM Lane V/C Ratio	-	-	0.182	0.104	-
HCM Control Delay (s)	-	-	21.7	17.8	7.7
HCM Lane LOS	-	-	C	C	A
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-

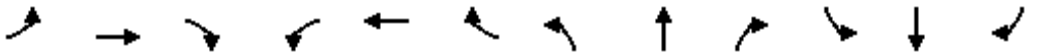
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	39	59	292	140	37	62	510	60	30	1879	423
Future Volume (vph)	241	39	59	292	140	37	62	510	60	30	1879	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	150.0		0.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.909			0.969				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1712	0	1789	1825	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.508			0.689			0.065			0.443		
Satd. Flow (perm)	957	1712	0	1298	1825	0	122	3579	1601	834	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			12				72			318
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	42	64	317	152	40	67	554	65	33	2042	460
Shared Lane Traffic (%)												
Lane Group Flow (vph)	262	106	0	317	192	0	67	554	65	33	2042	460
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	9.0	34.0		9.0	34.0		67.0	67.0	67.0	67.0	67.0	67.0
Total Split (%)	8.2%	30.9%		8.2%	30.9%		60.9%	60.9%	60.9%	60.9%	60.9%	60.9%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.6	0.0		-1.3	0.0		-2.0	0.0	0.0	0.0	-2.1	0.0
Total Lost Time (s)	2.4	6.3		2.7	6.3		5.2	7.2	7.2	7.2	5.1	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	26.4	15.9		25.8	15.9		62.0	60.0	60.0	60.0	62.1	60.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.27	0.16		0.26	0.16		0.63	0.61	0.61	0.61	0.63	0.61
v/c Ratio	0.84	0.36		0.85	0.63		0.88	0.25	0.06	0.06	0.90	0.42
Control Delay	54.6	30.9		54.3	45.3		100.4	10.0	2.5	10.0	24.0	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	30.9		54.3	45.3		100.4	10.0	2.5	10.0	24.0	4.7
LOS	D	C		D	D		F	A	A	A	C	A
Approach Delay		47.8			50.9			18.1			20.3	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	43.3	14.6		54.6	33.9		9.7	24.0	0.0	2.4	162.5	10.8
Queue Length 95th (m)	66.6	29.8		81.9	56.1		#29.6	44.1	5.5	8.3	#297.8	36.1
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)	150.0			75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	312	500		371	524		76	2181	1004	508	2258	1100
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	0.84	0.21		0.85	0.37		0.88	0.25	0.06	0.06	0.90	0.42

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 98.5			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 89.1%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



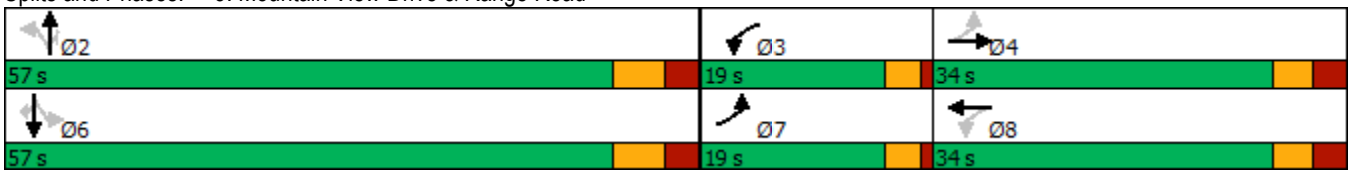


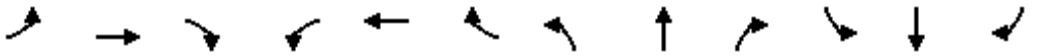
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	123	55	121	66	29	61	1642	324	46	908	260
Future Volume (vph)	450	123	55	121	66	29	61	1642	324	46	908	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.954			0.954				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1797	0	1789	1797	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.598			0.636			0.226			0.080		
Satd. Flow (perm)	1126	1797	0	1198	1797	0	426	3579	1601	151	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			19				177			283
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	489	134	60	132	72	32	66	1785	352	50	987	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	194	0	132	104	0	66	1785	352	50	987	283
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	19.0	34.0		19.0	34.0		57.0	57.0	57.0	57.0	57.0	57.0
Total Split (%)	17.3%	30.9%		17.3%	30.9%		51.8%	51.8%	51.8%	51.8%	51.8%	51.8%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-2.0	0.0		0.0	0.0		0.0	-2.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	2.0	6.3		4.0	6.3		7.2	5.2	7.2	7.2	7.2	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.6	16.0		23.1	12.5		50.2	52.2	50.2	50.2	50.2	50.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.37	0.17		0.25	0.13		0.53	0.55	0.53	0.53	0.53	0.53
v/c Ratio	0.90	0.60		0.37	0.41		0.29	0.90	0.38	0.62	0.52	0.29
Control Delay	46.9	40.3		24.8	34.6		19.8	27.9	8.5	58.1	16.7	2.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	40.3		24.8	34.6		19.8	27.9	8.5	58.1	16.7	2.8
LOS	D	D		C	C		B	C	A	E	B	A
Approach Delay		45.1			29.1			24.6			15.3	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	79.3	30.8		17.4	15.2		6.3	142.4	15.8	6.0	57.7	0.0
Queue Length 95th (m)	#119.0	54.1		30.0	30.1		22.0	#275.4	47.3	#33.1	106.8	14.7
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)				75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	546	548		449	545		226	1983	935	80	1906	985
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	0.90	0.35		0.29	0.19		0.29	0.90	0.38	0.63	0.52	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 94.2			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 25.2		Intersection LOS: C	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	45	59	327	157	40	62	510	70	34	1879	423
Future Volume (vph)	241	45	59	327	157	40	62	510	70	34	1879	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	150.0		0.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.915			0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1723	0	1789	1827	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.455			0.684			0.067			0.440		
Satd. Flow (perm)	857	1723	0	1288	1827	0	126	3579	1601	829	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			11				76			306
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	262	49	64	355	171	43	67	554	76	37	2042	460
Shared Lane Traffic (%)												
Lane Group Flow (vph)	262	113	0	355	214	0	67	554	76	37	2042	460
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	11.0	34.0		11.0	34.0		65.0	65.0	65.0	65.0	65.0	65.0
Total Split (%)	10.0%	30.9%		10.0%	30.9%		59.1%	59.1%	59.1%	59.1%	59.1%	59.1%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.6	0.0		-1.3	0.0		-2.0	0.0	0.0	0.0	-2.1	0.0
Total Lost Time (s)	2.4	6.3		2.7	6.3		5.2	7.2	7.2	7.2	5.1	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	28.7	16.2		28.1	16.2		59.9	57.9	57.9	57.9	60.0	57.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.29	0.16		0.28	0.16		0.61	0.59	0.59	0.59	0.61	0.59
v/c Ratio	0.79	0.37		0.87	0.69		0.88	0.26	0.08	0.08	0.94	0.43
Control Delay	47.1	30.4		53.4	48.9		101.6	10.9	2.8	10.6	28.5	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	30.4		53.4	48.9		101.6	10.9	2.8	10.6	28.5	5.2
LOS	D	C		D	D		F	B	A	B	C	A
Approach Delay		42.0			51.7			18.7			24.1	
Approach LOS		D			D			B			C	
Queue Length 50th (m)	41.9	15.2		60.8	38.8		10.4	26.5	0.0	3.0	180.8	13.1
Queue Length 95th (m)	#68.1	31.3		#95.3	63.3		#27.7	42.3	6.6	8.8	#286.6	36.5
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)	150.0			75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	330	505		408	522		76	2101	971	486	2177	1066
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	0.79	0.22		0.87	0.41		0.88	0.26	0.08	0.08	0.94	0.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 98.6			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 28.5		Intersection LOS: C	
Intersection Capacity Utilization 90.2%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

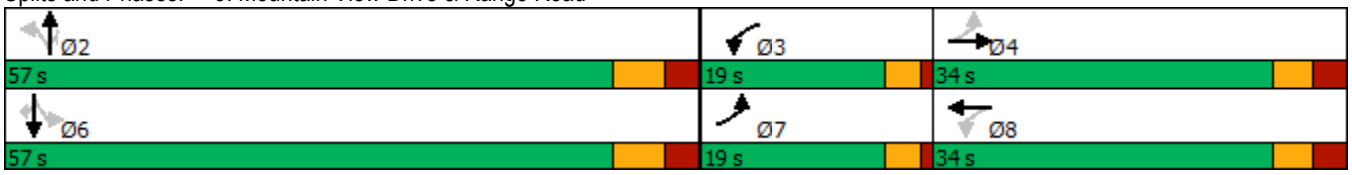
Splits and Phases: 3: Mountain View Drive & Range Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	142	55	145	78	31	61	1642	352	56	908	260
Future Volume (vph)	450	142	55	145	78	31	61	1642	352	56	908	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		150.0	75.0		0.0	90.0		55.0	145.0		75.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.958			0.957				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1804	0	1789	1802	0	1789	3579	1601	1789	3579	1601
Flt Permitted	0.604			0.599			0.223			0.080		
Satd. Flow (perm)	1138	1804	0	1128	1802	0	420	3579	1601	151	3579	1601
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			17				192			283
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		135.8			689.1			428.6			655.7	
Travel Time (s)		9.8			49.6			22.0			33.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	489	154	60	158	85	34	66	1785	383	61	987	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	489	214	0	158	119	0	66	1785	383	61	987	283
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	33.3		9.0	33.3		45.2	45.2	45.2	45.2	45.2	45.2
Total Split (s)	19.0	34.0		19.0	34.0		57.0	57.0	57.0	57.0	57.0	57.0
Total Split (%)	17.3%	30.9%		17.3%	30.9%		51.8%	51.8%	51.8%	51.8%	51.8%	51.8%
Yellow Time (s)	3.0	3.3		3.0	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.0	3.0		1.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-2.0	0.0		0.0	0.0		0.0	-2.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	2.0	6.3		4.0	6.3		7.2	5.2	7.2	7.2	7.2	7.2
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		Max	Max	Max	Max	Max	Max
Act Effct Green (s)	36.9	17.6		27.4	13.8		50.0	52.0	50.0	50.0	50.0	50.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.38	0.18		0.28	0.14		0.52	0.54	0.52	0.52	0.52	0.52
v/c Ratio	0.89	0.62		0.40	0.44		0.30	0.92	0.42	0.78	0.53	0.29
Control Delay	45.6	42.1		24.2	36.3		20.8	31.3	9.2	83.8	17.8	2.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	42.1		24.2	36.3		20.8	31.3	9.2	83.8	17.8	2.8
LOS	D	D		C	D		C	C	A	F	B	A
Approach Delay		44.6			29.4			27.2			17.7	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	79.3	35.9		21.2	18.3		6.7	151.6	18.5	8.8	61.3	0.0
Queue Length 95th (m)	#122.1	61.5		35.3	34.7		22.1	#275.4	52.0	#41.0	106.8	14.7
Internal Link Dist (m)		111.8			665.1			404.6			631.7	
Turn Bay Length (m)				75.0			90.0		55.0	145.0		75.0
Base Capacity (vph)	550	532		467	531		217	1930	922	78	1855	966
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	0.89	0.40		0.34	0.22		0.30	0.92	0.42	0.78	0.53	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 96.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 27.2		Intersection LOS: C	
Intersection Capacity Utilization 94.5%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Mountain View Drive & Range Road



Morrison Hershfield