

# Highland Drive Corridor Study

Prepared for:  
City of Millcreek

November 2019

UT19-2146

FEHR  PEERS

# Executive Summary

The Highland Drive corridor between Richmond Street and 3300 South is a four-lane road that is currently designed as an auto-oriented corridor serving both regional travel demand and local circulation and access needs. As the City pursues the goals and vision for redevelopment laid out in the Millcreek City Center Master Plan, Highland Drive will need to accommodate a wider variety of users and purposes than it has in the past while providing access to more intensive land uses.

This study examined the impacts of implementing two potential concepts for reconfiguring Highland Drive to better meet the goals and intent of the City Center Master Plan under existing conditions and a market-based redevelopment scenario. Based on this analysis (detailed in Chapter 2), reconfiguring Highland Drive from its current four-lane cross-section to a three-lane cross-section (one lane in each direction with center turn lane) with existing intersection controls was determined to be a feasible option from the standpoint of traffic operations under likely future (2030) conditions.

This alternative was then evaluated against a 'greatest impact' redevelopment scenario (detailed in Chapter 3), reflecting the maximum quantity of new development that would be expected under contemplated land use regulations. When trips generated by this greatest impact scenario were added to the road network in the Millcreek City Center area, traffic analysis indicated that:

- Under the greatest impact scenario conditions, several intersections will be near-failing or failing, most notably Highland Drive and 3300 South.
- The Highland Drive reconfiguration adds substantial delay for northbound and southbound traffic on Highland. Northbound trips are delayed due to northbound throughs merging at 3300 South, and queues spilling back to 3350 South, while southbound trips experience delays due to the lane drop north of Elgin Avenue, as well as queues spilling back from Miller Avenue to Gunn Avenue.
- The travel time on Highland Drive approximately doubles from existing conditions in the future greatest impact scenario conditions with the Highland Drive reconfiguration, mostly due to the bottlenecks at the intersections where Highland Drive cross-section drops from two lanes to one lane in each direction.

- Potential mitigations to the Highland reconfiguration help improve delay at the side-streets on Highland Drive, but adds strain to the traffic on 3300 South, especially at the intersection of Highland Drive / 3300 South. These mitigations do not resolve the fundamental bottleneck at Highland Drive / 3300 South.
- Highland Drive is a Millcreek facility; the City may therefore choose its own relative prioritization of economic development, placemaking objectives, and vehicle mobility. However, UDOT may have concerns about operational impacts to east/west traffic on 3300 South under the Highland Drive reconfiguration.
- This greatest impact scenario posits a large quantity of redevelopment in the study area, and with reduced capacity on Highland Drive, the impacts on traffic operations caused by the trips generated under the greatest impact scenario are difficult to address without mitigations that enhance capacity and/or connectivity in the City Center's road network.

Lastly, the study provides an assessment of potential complete streets improvements if Millcreek were to implement a lane reconfiguration on Highland Drive (detailed in Chapter 4). This reconfiguration would provide opportunities to enhance bicycle, pedestrian, and transit facilities, improve safety for all users, and enhance the aesthetic quality and sense of place on Highland Drive to make it a distinctive and welcoming gateway into Millcreek's City Center.

## Maximum Buildout Evaluation - Existing Peak Hour Level of Service Summary

Intersection				Existing	Existing + Greatest Impact	Existing + Greatest Impact – Highland Reconfiguration	Existing + Greatest Impact – Highland Reconfiguration with Mitigations
ID	Location	Control	Period	LOS & Sec/Veh	LOS & Sec/Veh	LOS & Sec/Veh	LOS & Sec/Veh
1	1300 East / 3300 South	Signal	AM	22 / C	30 / C	30 / C	29 / C
			PM	24 / C	46 / D	48 / D	49 / D
2	1300 East / Brickyard Road	Signal	AM	4 / A	4 / A	4 / A	4 / A
			PM	11 / B	11 / B	11 / B	11 / B
3	Richmond Street / Miller Avenue	Side-Street Stop	AM	8 / A	13 / B	14 / B	14 / B
			PM	9 / A	14 / B	14 / B	17 / C
4	Richmond Street / Gunn Avenue	Side-Street Stop	AM	7 / A	16 / C	15 / C	22 / C
			PM	8 / A	16 / C	17 / C	21 / C
5	Richmond Street / Elgin Avenue	Side-Street Stop	AM	9 / A	12 / B	11 / B	14 / B
			PM	17 / C	23 / C	20 / C	26 / D
6	Highland Drive / Richmond Street	Signal	AM	22 / C	26 / C	25 / C	25 / C
			PM	32 / C	62 / E	67 / E	64 / E
7	Highland Drive / Elgin Avenue	Side-Street Stop	AM	14 / B	15 / C	22 / C	12 / B
			PM	19 / C	22 / C	66 / F	96 / F
8	Highland Drive / Gunn Avenue	Side-Street Stop	AM	8 / A	16 / C	28 / D	13 / B
			PM	13 / B	17 / C	73 / F	43 / E
9	Highland Drive / Miller Avenue	Signal	AM	4 / A	9 / A	9 / A	10 / A
			PM	5 / A	11 / B	22 / C	23 / C
10	Highland Drive / Woodland Avenue	Side-Street Stop	AM	9 / A	8 / A	13 / B	14 / B
			PM	13 / B	15 / C	60 / F	23 / C
11	Highland Drive / 3300 South	Signal	AM	24 / C	29 / C	38 / D	36 / D
			PM	26 / C	47 / D	64 / E	64 / E
12	Highland Drive / 3350 South	Side-Street Stop	AM	11 / B	17 / C	77 / F	32 / D
			PM	12 / B	63 / F	212 / F	81 / F
13	Highland Drive / Luck Lane	Signal	AM	2 / A	2 / A	2 / A	2 / A
			PM	5 / A	7 / A	5 / A	26 / C



## Maximum Buildout Evaluation - Future Peak Hour Level of Service Summary

Intersection				Future	Future + Greatest Impact	Future + Greatest Impact – Highland Reconfiguration	Future + Greatest Impact – Highland Reconfiguration with Mitigations
ID	Location	Control	Period	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>
1	1300 East / 3300 South	Signal <sup>2</sup>	AM	23 / C	33 / C	31 / C	33 / C
			PM	25 / C	56 / E	61 / E	64 / E
2	1300 East / Brickyard Road	Signal	AM	4 / A	4 / A	4 / A	4 / A
			PM	11 / B	11 / B	11 / B	13 / B
3	Richmond Street / Miller Avenue	Side-Street Stop	AM	7 / A	14 / B	14 / B	14 / B
			PM	9 / A	15 / B	14 / B	16 / C
4	Richmond Street / Gunn Avenue	Side-Street Stop	AM	7 / A	15 / C	15 / C	25 / C
			PM	10 / B	19 / C	18 / C	20 / C
5	Richmond Street / Elgin Avenue	Side-Street Stop	AM	9 / A	11 / B	11 / B	13 / B
			PM	21 / C	26 / D	22 / C	19 / C
6	Highland Drive / Richmond Street	Signal <sup>2</sup>	AM	23 / C	27 / C	27 / C	26 / C
			PM	36 / D	58 / E	60 / E	77 / E
7	Highland Drive / Elgin Avenue	Side-Street Stop	AM	15 / C	15 / C	25 / D	13 / B
			PM	19 / C	21 / D	120 / F	179 / F
8	Highland Drive / Gunn Avenue	Side-Street Stop	AM	8 / A	15 / C	32 / D	12 / B
			PM	11 / B	19 / C	112 / F	52 / F
9	Highland Drive / Miller Avenue	Signal	AM	4 / A	9 / A	10 / A	10 / B
			PM	5 / A	12 / B	23 / C	26 / C
10	Highland Drive / Woodland Avenue	Side-Street Stop	AM	10 / A	13 / B	18 / C	14 / B
			PM	13 / B	16 / C	65 / F	27 / D
11	Highland Drive / 3300 South	Signal	AM	25 / C	30 / C	44 / D	39 / D
			PM	27 / C	58 / E	95 / F	82 / F
12	Highland Drive / 3350 South	Side-Street Stop	AM	10 / B	16 / C	112 / F	53 / F
			PM	16 / C	109 / F	250 / F	139 / F
13	Highland Drive / Luck Lane	Signal	AM	2 / A	2 / A	4 / A	3 / A
			PM	5 / A	12 / B	42 / D	42 / D

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# Introduction

## Study Context

The City of Millcreek directed Fehr & Peers to conduct a study of roadway alternatives for Highland Drive in the vicinity of the planned Millcreek City Center area. The Highland Drive corridor between Richmond Street and 3300 South is a four-lane road that is currently designed as an auto-oriented corridor serving both regional travel demand and local circulation and access needs. As the City pursues the goals and vision for redevelopment laid out in the Millcreek City Center Master Plan, Highland Drive will need to accommodate a wider variety of users and purposes than it has in the past while providing access to more intensive land uses. Therefore, this study:

- Examines existing and projected future traffic conditions on Highland Drive;
- Evaluates the feasibility of different street configurations and intersection treatments across the study area based on anticipated development by 2030;
- Evaluates the performance of selected street configurations under a 'greatest impact' development scenario;
- Recommends complete street features that accommodate the needs of pedestrians, cyclists, drivers, and transit users, as well as redefining the corridor as a human-scaled urban space.

# Data Collection

## Study Area

The study area for our analysis is defined as Highland Drive between Richmond Street and 3350 South, and Richmond Street between Highland Drive and 3300 South. Richmond Street was included in this assessment in order to understand impacts on the Millcreek City Center's principal roadways as a connected system, and in particular to ensure that effects of traffic diversion from Highland Drive to Richmond Street could be modeled if warranted. The study area and study intersections are shown on Figure 1 on the following page.

## Traffic Counts

Traffic counts were collected at each of the following study intersections on February 21<sup>st</sup>, 2019 during AM (7:00-9:00AM) and PM (4:00-6:00PM) peak hours.

- 1) 1300 East / 3300 South
- 2) 1300 East / Brickyard Road
- 3) Richmond Street / Miller Avenue
- 4) Richmond Street / Gunn Avenue
- 5) Richmond Street / Elgin Avenue
- 6) Highland Drive / Richmond Street
- 7) Highland Drive / Elgin Avenue
- 8) Highland Drive / Gunn Avenue
- 9) Highland Drive / Miller Avenue
- 10) Highland Drive / Woodland Avenue
- 11) Highland Drive / 3300 South
- 12) Highland Drive / 3350 South

Due to signal construction work, counts at intersection 1 (1300 East / 3300 South) did not reflect typical conditions. Accordingly, counts from the September 2018 Millcreek Town Center Traffic Impact Study were substituted at this location after confirming that they were consistent with the new turning movement counts.







① Study Intersection

Figure 1  
Study Area Overview

## Travel Times

Travel time data was collected on February 21<sup>st</sup>, 2019 and March 28<sup>th</sup>, 2019 in order to understand existing travel times through both the Highland Drive and Richmond Street corridors during PM peak conditions and calibrate model results. Average travel times are depicted on Table 1 below. Note that due to a small sample size of travel time runs, observed northbound travel times on Highland Drive did not include delays at the 3300 South / Highland Drive signal, which artificially reduced travel times.

**Table 1: Observed Travel Times**

Existing PM Travel Times	
Highland Drive	Average Time
Northbound	1:48
Southbound	1:43
Richmond Street	Average Time
Northbound	1:25
Southbound	1:31

## Projected Growth

Projected growth in traffic volumes in the study area is derived from two sources: background growth in regional travel, and trips associated with redevelopment occurring within the study area. Both sources of growth are estimated and accounted for in future year traffic analyses presented in the following chapter. All projections are based on a 2030 horizon year.

### Background Traffic Growth

In order to estimate potential growth in background trips through the study area, we examined current and projected future trip volumes from the Wasatch Front Regional Council's (WFRC) travel demand model (version 8.3b, 2050 horizon year), as well as historical trends reported in the Utah Department of Transportation's (UDOT) average annual daily traffic (AADT) statistics.

Both of these data sources point towards minimal levels of background growth in traffic through the study area. The WFRC model results showed growth rates of approximately 0.3% per year for volumes on Highland Drive, or an approximate growth rate of 3.3% between 2019 and 2030. The WFRC model projected growth rates on Richmond Street are approximately 0.3%, suggesting that the low levels of growth on Highland Drive are consistent across the study area.





Historic trends in AADT within the study area also point to modest levels of growth. Comparing 2006 and 2016 AADT shows an increase in trips from 18,000 to 19,000 over this ten-year period (equivalent to a linear annual growth rate of 0.55%), while trips on Richmond Street during the same time period were stable at 18,000.

Based on these data points, a growth rate of 5% was applied to observed 2018 vehicle volumes throughout the study area to reflect 2030 background conditions.

### **Millcreek City Center Planned Development**

The adopted Millcreek City Center Master Plan was adopted in June 2019, and lays out a plan for the redevelopment of an area centered on the ‘wedge’ between 3300 South, Richmond Street, and Highland Drive. The goal of this Plan is to create an “identifiable, vibrant City Center” in this area that—in addition to providing safer transportation connections, high-quality urban design, and public spaces for the community—would encourage mixed-use infill development at a higher density than existing land uses in this area.

This study assumes that a substantial portion of the development associated with this plan, as well as other nearby planned developments, will be completed by 2030. Anticipated development was split into three geographic areas in the following quantities:

- Between Highland Drive and Richmond Street (east/west) and Elgin Avenue and Miller Avenue (north/south): approximately 580 units of multifamily housing and 28,000 feet of commercial/retail space;
- Between Highland Drive and Richmond Street (east/west) and Miller Avenue and 3300 South (north/south): approximately 445 units of multifamily housing and 14,000 feet of commercial/retail and office space;
- Southwest of the Highland Drive / 3300 South intersection: approximately 150 units of multifamily housing and 86,950 square feet of lodging and commercial/retail space.

The total quantity of anticipated new development (in square feet for non-residential development, and dwelling units for residential development), as well as estimated quantities of existing land uses that would be displaced by redevelopment, is summarized in **Table 2**.

**Table 2: Anticipated New and Displaced Development**

Area	New Development		Existing Displaced
	Sq. ft. (Non-Residential)	Dwelling Units	Sq. ft.
Elgin – Miller	28,000 SF	580	0 SF
Miller – 3300 S	140,000 SF	445	99,417 SF
South of 3300 S	86,950 SF	150	54,500 SF

Source: Fehr & Peers, Zion's Bank Public Finance

### Trip Generation

Trip generation for the anticipated redevelopment was computed using trip generation rates published in the Institute of Transportation Engineers (ITE) *Trip Generation, 10th Edition, 2017*, and Fehr & Peers' mixed-use development (MXD) methodology via MainStreet, web application that captures the traffic reduction benefits of mixed-use developments by looking at interactions among the mixture of land uses, built environment factors, and patron usage of alternative modes (i.e. transit, bicycling, and/or walking).

The MXD trip generation methodology accurately captures the trip-reducing benefits of mixed-use development projects and is used throughout the United States to help developers, agencies, and the public to quantify these trip reductions. The MXD trip generation model is promoted by the United States Environmental Protection Agency (EPA) and has been adopted by the San Diego Association of Governments (SANDAG), American Society of Civil Engineers (ASCE), American Planning Association (APA), and many others as a recommended resource for trip generation of smart-growth developments. The MXD model uses ITE trip generation rates and applies additional variables to those trip generation rates. Some of the additional variables include:

- Employment
- (Population + Employment) per square mile
- Land area
- Total jobs / population diversity
- Retail jobs / population diversity
- Number of intersections per square mile
- Employment within a mile



- Employment within a 30-minute trip by transit
- Average household size
- Vehicles owned per capita

### **Trip Distribution and Assignment**

Redevelopment-generated traffic was assigned to the roadway network based on the proximity of the developments to the roadway network, high population densities, and regional trip attractions. The redevelopment-generated trips were distributed to and from these directions, in the corresponding percentages:

- 10% North (using Highland Drive)
- 25% North (using Richmond Street)
- 6% West (using Elgin Avenue and Brickyard Road)
- 15% West (using 3300 South)
- 4% East (using Elgin Avenue and Miller Avenue)
- 15% East (using 3300 South)
- 10% South (using 1300 East)
- 15% South (using Highland Drive)



# Alternatives Evaluation & Traffic Analysis

## Purpose

The purpose of the traffic analysis is to provide a summary of the potential transportation-related impacts from the proposed redevelopment in the area, and how different infrastructure alternatives would perform from a traffic circulation standpoint under those conditions. This study analyzes the traffic operations and impacts for the following scenarios across the 12 study intersections listed on page 2 (above).

- Existing conditions
- Future background conditions (not including the proposed redevelopment)
- Existing plus Redevelopment and Future plus Redevelopment conditions under three configurations:
  - Existing Roadway Configuration
  - Highland Drive Reconfiguration Alt 1 (*with signalized intersections*)
  - Highland Drive Reconfiguration Alt 2 (*with roundabout intersections*)

## Analysis Methodology

Level of Service (LOS) is a term that describes the operating performance of an intersection or roadway. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst. **Table 3** provides a brief description of each LOS letter designation and an accompanying average delay per vehicle for both signalized and unsignalized intersections. The Highway Capacity Manual (HCM) 6th Edition methodology was used in this study. This methodology has different quantitative evaluations for signalized and unsignalized intersections. For signalized intersections, the LOS is provided for the overall intersection (weighted average of all approach delays).

**Table 3: Level of Service Descriptions**

LOS	Description	Signalized Intersections	Unsignalized Intersections
		Avg. Delay (sec/veh) <sup>1</sup>	Avg. Delay (sec/veh) <sup>2</sup>
A	<i>Free Flow / Insignificant Delay</i> Extremely favorable progression. Individual users are virtually unaffected by others in the traffic stream.	< 10.0	< 10.0
B	<i>Stable Operations / Minimum Delays</i> Good progression. The presence of other users in the traffic stream becomes noticeable.	> 10.0 to 20.0	> 10.0 to 15.0
C	<i>Stable Operations / Acceptable Delays</i> Fair progression. The operation of individual users is affected by interactions with others in the traffic stream	> 20.0 to 35.0	> 15.0 to 25.0
D	<i>Approaching Unstable Flows / Tolerable Delays</i> Marginal progression. Operating conditions are noticeably more constrained.	> 35.0 to 55.0	> 25.0 to 35.0
E	<i>Unstable Operations / Significant Delays Can Occur</i> Poor progression. Operating conditions are at or near capacity.	> 55.0 to 80.0	> 35.0 to 50.0
F	<i>Forced, Unpredictable Flows / Excessive Delays</i> Unacceptable progression with forced or breakdown of operating conditions.	> 80.0	> 50.0

1. Overall intersection LOS and average delay (seconds/vehicle) for all approaches.

2. Worst movement LOS and delay (seconds/vehicle) only.

3. Volume to capacity (v/c) rate, average values.

Source: Fehr & Peers descriptions, based on the *Highway Capacity Manual 6<sup>th</sup> Edition*.

## Existing Background Conditions

### Purpose

The purpose of the existing background conditions analysis is to evaluate the study intersections during the peak travel periods of the day under existing traffic and geometric conditions. This analysis provides a baseline model for understanding existing traffic operations, identifying existing deficiencies, and evaluating the performance of future no-build and build scenarios.

### Traffic Volumes

Traffic counts were recorded for the AM and PM peak periods from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on Thursday, February 21, 2019 at the study intersections listed previously.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the existing background weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 4**. As shown in **Table 4**, all intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in existing background conditions.

Turning movement counts and levels of service for each study intersection under existing background conditions are provided in **Figure 2** below.





**Table 4 Existing Background Conditions AM & PM Peak Hour Level of Service**

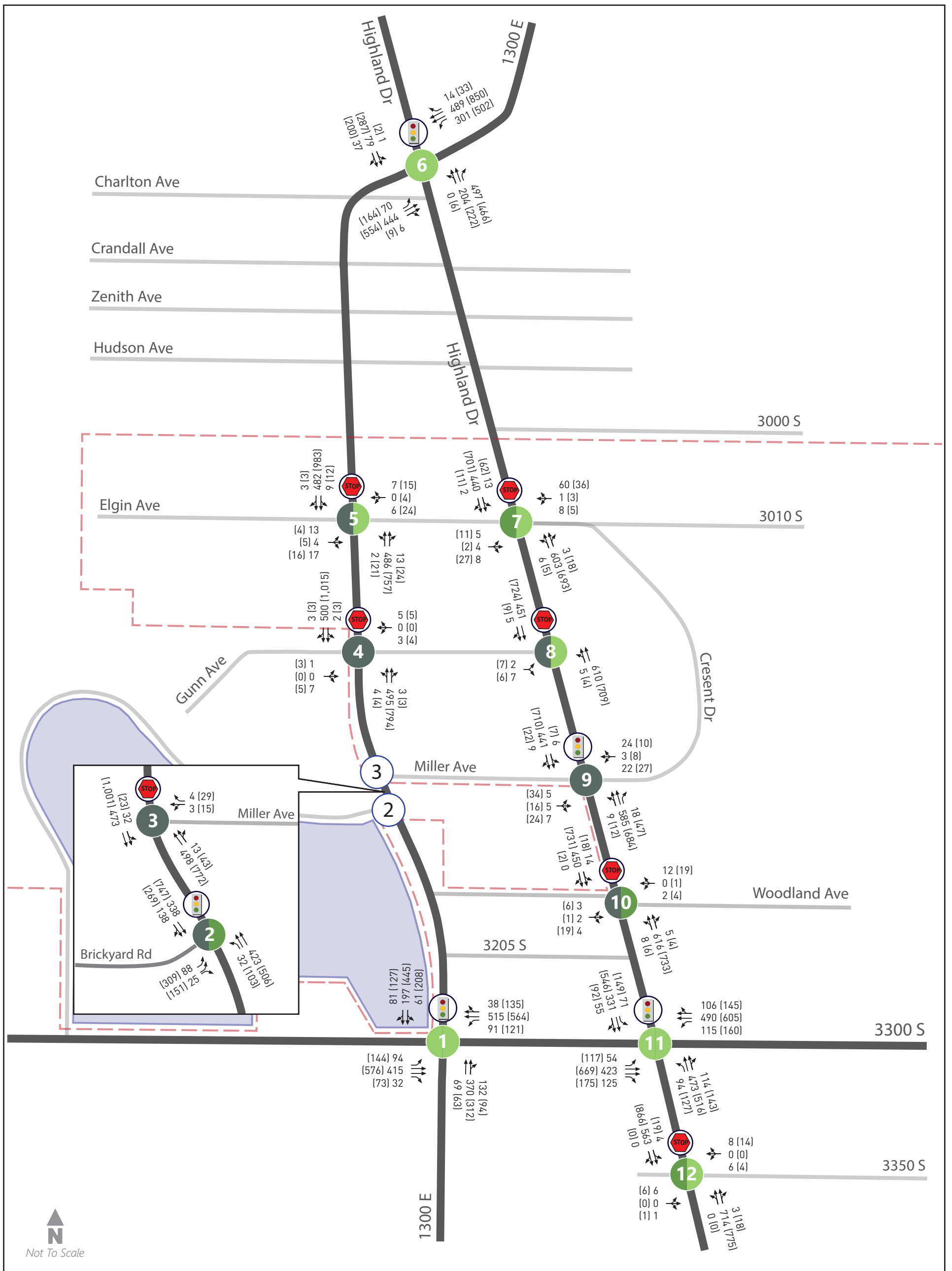
Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	22	C
		PM		-	-	-	24	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	9	A	-	-
		PM		WB LT	9	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	EB RT	7	A	-	-
		PM		WB LT	7	A	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB TH	16	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	23	C
		PM		-	-	-	33	C
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	WB LT	11	B	-	-
		PM		EB LT	17	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB RT	7	A	-	-
		PM		EB LT	12	B	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	3	A
		PM		-	-	-	6	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	EB LT	10	A	-	-
		PM		EB LT	13	B	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	24	C
		PM		-	-	-	24	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	15	B	-	-
		PM		EB LT	16	C	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.



AM | PM **A B C D E F**

XXX (XXX)

AM (PM) Peak Hour Volume

--- Millcreek Town Boundary



Intersection Level of Service



Traffic Signal



Turning Movement



Stop Sign

Not To Scale

Figure 2

Existing Background Conditions

## Future Background Conditions

### Purpose

The purpose of the future background conditions analysis is to evaluate the study intersections during the peak travel periods of the day under projected future traffic volumes. This analysis provides a baseline condition for the future, which can be used to determine future impacts of road reconfiguration options.

### Traffic Volumes

Fehr & Peers projected future 2030 volumes assuming a total uniform growth of 5% across all roadways in the study area, as detailed in the Background Traffic Growth section on pages 4-5 (above).

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the future background weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 5**. As shown in **Table 5**, all intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in future background conditions.

**Table 5 Future Background Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	23	C
		PM		-	-	-	24	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	7	A	-	-
		PM		WB LT	9	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	8	A	-	-
		PM		WB LT	11	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	EB TH	9	A	-	-
		PM		WB TH	19	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	23	C
		PM		-	-	-	36	D
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	EB TH	13	B	-	-
		PM		EB LT	19	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	7	A	-	-
		PM		EB LT	12	B	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	4	A
		PM		-	-	-	6	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	WB LT	10	A	-	-
		PM		EB LT	13	B	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	24	C
		PM		-	-	-	25	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	12	B	-	-
		PM		EB LT	13	B	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.



## Existing Plus Redevelopment Conditions

### Purpose

The purpose of the existing plus redevelopment conditions analysis is to evaluate the impact of the proposed redevelopment traffic on the study intersections during the peak travel periods of the day under existing conditions.

### Traffic Volumes

Redevelopment-generated traffic was added to the existing volumes to yield “existing plus redevelopment” weekday AM and PM peak hour traffic volumes at the study intersections.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the existing plus project weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 6**. As shown in **Table 6**, all intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in existing plus project conditions. This shows that the project trips have minimal impact to traffic operations under existing conditions.

**Table 6 Existing Plus Project Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	22	C
		PM		-	-	-	25	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	8	A	-	-
		PM		WB LT	9	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB LT	13	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB TH	18	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	23	C
		PM		-	-	-	42	D
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	WB LT	12	B	-	-
		PM		WB LT	19	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	14	B	-	-
		PM		EB LT	14	B	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	4	A
		PM		-	-	-	7	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	WB RT	8	A	-	-
		PM		WB LT	13	B	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	25	C
		PM		-	-	-	27	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	14	B	-	-
		PM		EB LT	17	C	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.



## Future Plus Redevelopment Conditions

### Purpose

The purpose of the future plus redevelopment conditions analysis is to evaluate the combined impact of redevelopment-generated traffic as well as projected background growth by 2030 on the study intersections during the peak travel periods of the day.

### Traffic Volumes

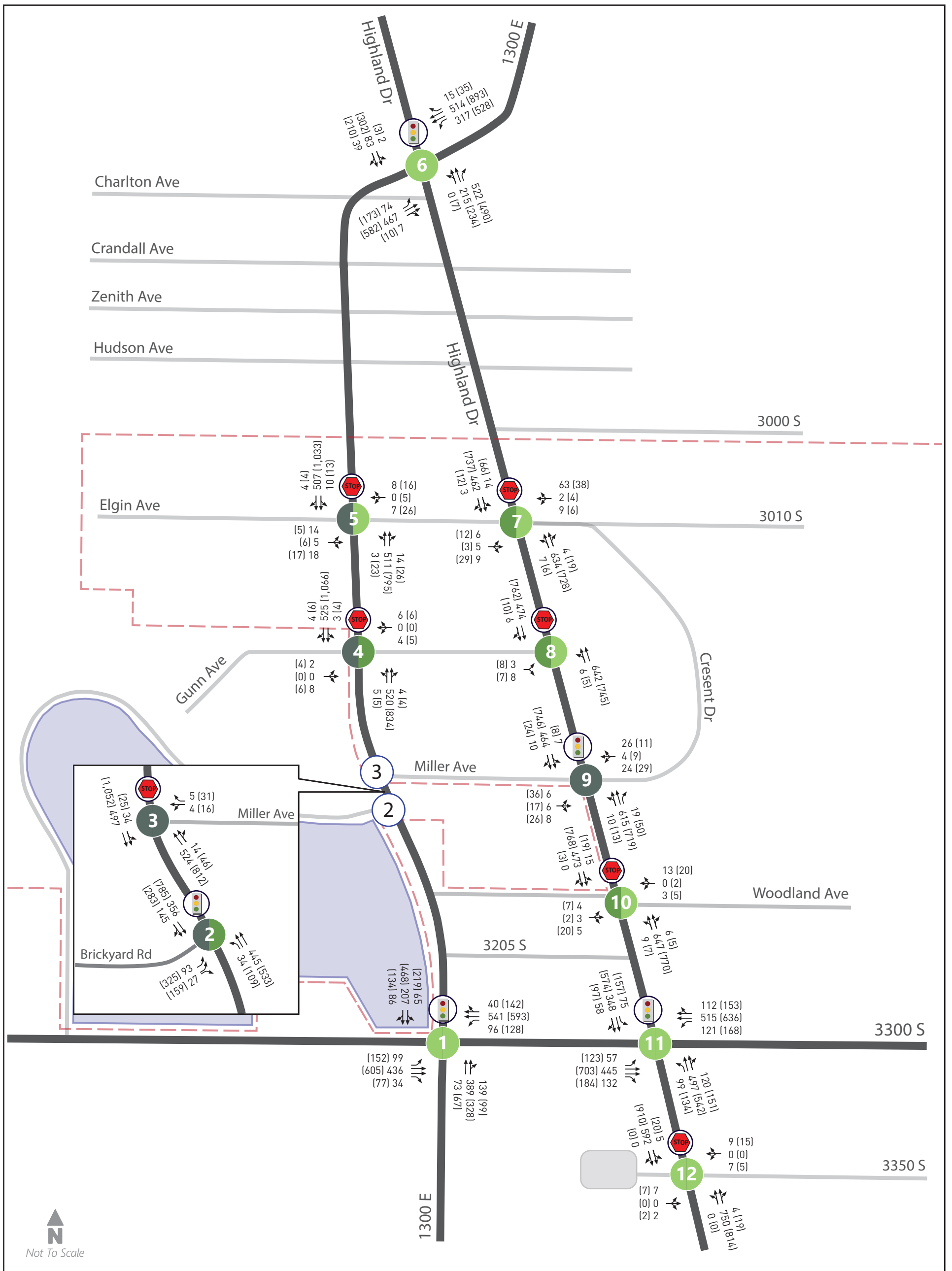
Redevelopment-generated traffic was added to the future background volumes to yield “future plus redevelopment” weekday AM and PM peak hour traffic volumes at the study intersections.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the future plus project weekday AM and PM peak hour LOS were computed for each study intersection. Initial results indicated that Intersection 6 experienced increased delay (LOS E) under these conditions; however, signal timing optimizations at this location resolved this issue and resulted in slightly better operations (LOS C) at this location. These optimizations were carried forward for future conditions analysis of Alternatives 1 and 2.

The results are presented in **Table 6**. As shown in **Table 6**, all intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in future plus project conditions. This shows that the redevelopment-generated trips have minimal impacts on traffic operations in the future conditions.

Turning movement counts and levels of service for each study intersection under future plus redevelopment conditions are provided in **Figure 3** below.



Not To Scale

- AM | PM **A B C D E F**  
 Intersection Level of Service
- XXX (XXX) AM (PM) Peak Hour Volume
- Traffic Signal
- Mill Creek Town Boundary
- Turning Movement
- Stop Sign

Figure 3  
Future Redevelopment Conditions - Existing Roadway Configuration



**Table 7 Future Plus Redevelopment Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	23	C
		PM		-	-	-	26	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	8	A	-	-
		PM		WB LT	10	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	10	A	-	-
		PM		WB LT	14	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	8	A	-	-
		PM		WB TH	22	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	24	C
		PM		-	-	-	32	C <sup>4</sup>
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	EB TH	13	B	-	-
		PM		WB LT	19	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	11	B	-	-
		PM		EB LT	17	C	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	4	A
		PM		-	-	-	7	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	EB LT	10	B	-	-
		PM		EB LT	16	C	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	25	C
		PM		-	-	-	28	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	15	C	-	-
		PM		EB LT	19	C	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

4. The LOS shown at intersection 6 is improved vs. baseline conditions due to signal optimizations.

Source: Fehr & Peers, 2019.

## Alternative 1 (Lane Reduction with Signalized Intersections) Conditions

### Purpose

The purpose of the Alternative 1 analysis is to evaluate the impact of the proposed lane reduction on Highland Drive on the study intersections during the peak travel periods of the day under existing and future conditions. This reconfiguration was assumed to reduce travel lanes from two in each direction to one in each direction plus left turn lanes on Highland Drive between 3000 South (just north of the Elgin Avenue / Highland Drive intersection) and 3300 South.

### Traffic Volumes

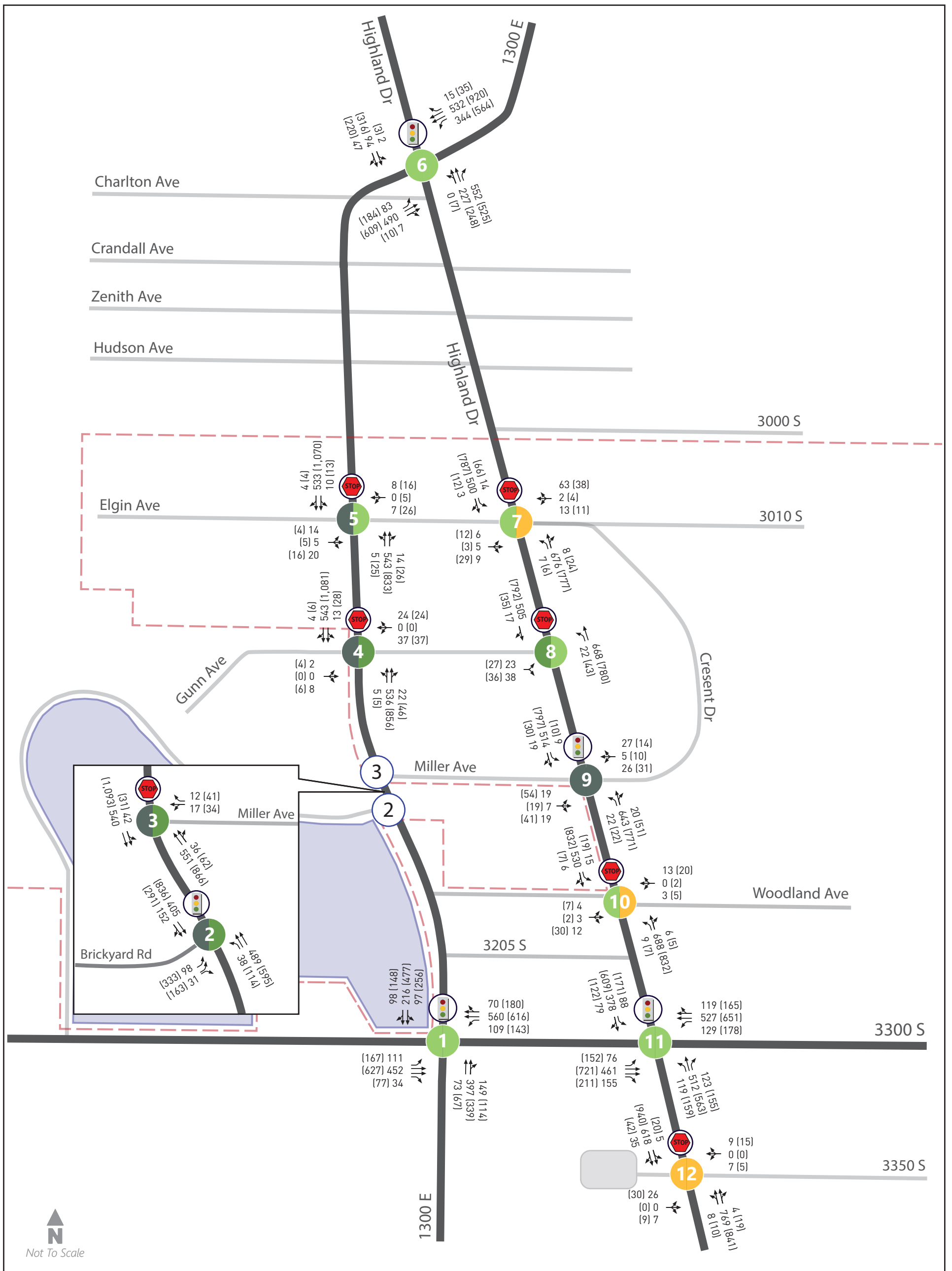
The existing plus project and future plus project weekday AM and PM peak hour traffic volumes were used for this analysis.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the existing plus redevelopment with lane reduction and future plus redevelopment with lane reduction weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 8** and **Table 9**. As shown in **Table 8** and **Table 9**, all intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in both existing plus project and future plus project conditions with the lane reduction on Highland Drive. This shows that the lane reduction has minimal impacts on traffic operations under both existing and future conditions.

Turning movement counts and levels of service for each study intersection under Alternative 1 future conditions are provided in **Figure 4** below.





AM | PM **A B C D E F**

XXX (XXX) AM (PM) Peak Hour Volume

--- Millcreek Town Boundary

(XX) Intersection Level of Service

Traffic Signal

Turning Movement

Stop Sign



Figure 4

Alternative 1 (Lane Reduction with Existing Intersections) Future Conditions

**Table 8 Existing Plus Redevelopment Alternative 1 Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	21	C
		PM		-	-	-	24	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	8	A	-	-
		PM		WB LT	9	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB LT	13	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB LT	18	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	22	C
		PM		-	-	-	43	D
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	WB LT	19	C	-	-
		PM		WB LT	28	D	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	16	C	-	-
		PM		EB LT	23	C	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	5	A
		PM		-	-	-	8	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	WB RT	13	B	-	-
		PM		EB LT	17	C	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	26	C
		PM		-	-	-	30	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	27	D	-	-
		PM		EB LT	27	D	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.



**Table 9 Future Plus Redevelopment Alternative 1 Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	22	C
		PM		-	-	-	26	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	8	A	-	-
		PM		WB LT	10	B	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	10	A	-	-
		PM		WB LT	14	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB TH	22	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	22	C
		PM		-	-	-	32	C <sup>4</sup>
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	WB LT	19	C	-	-
		PM		WB LT	28	D	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	13	B	-	-
		PM		EB LT	21	C	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	6	A
		PM		-	-	-	8	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	EB TH	16	C	-	-
		PM		EB LT	28	D	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	27	C
		PM		-	-	-	32	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	27	D	-	-
		PM		EB LT	34	D	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

4. The LOS shown at intersection 6 is improved vs. baseline conditions due to signal optimizations.

Source: Fehr & Peers, 2019.

## Alternative 2 (Lane Reduction with Roundabouts/Intersection Improvements) Conditions

### Purpose

The purpose of the Alternative 2 conditions analysis is to evaluate the impact of the lane reduction evaluated in Alternative 1, as well as implementing several intersection modifications on Highland Drive. The following modifications to Alternative 1 were included in this analysis:

- Single lane roundabouts at Elgin Avenue and Miller Avenue on Highland Drive;
- Re-align Woodland Avenue west of Highland Drive to eliminate the offset with Woodland Avenue east of Highland Drive;

### Traffic Volumes

The existing plus project and future plus project weekday AM and PM peak hour traffic volumes were used for this analysis.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the alternative existing plus project and alternative future plus project weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 10** and **Table 11**. As shown in **Table 10** and **Table 11**, most intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in both existing plus project and future plus project conditions with the alternative intersection configurations. However, the Highland Drive / Elgin Avenue intersection and the Highland Drive / 3350 South intersection operate at LOS E during the PM peak hour under future plus project conditions. The roundabouts at Elgin Avenue and Miller Avenue do not operate as efficiently as the current intersection configurations due to unbalanced volumes at the intersection: because the traffic on Highland Drive is much higher than the traffic on the side-streets (Elgin Avenue and Miller Avenue), side-street traffic at these locations has difficulty finding acceptable gaps to enter the roundabouts. Elsewhere on the corridor, side streets and driveways will have difficulty finding acceptable gaps to turn onto Highland Drive due to the continuous flow characteristics of roundabouts.

Turning movement counts and levels of service for each study intersection under existing background conditions are provided in Figure 5 below.



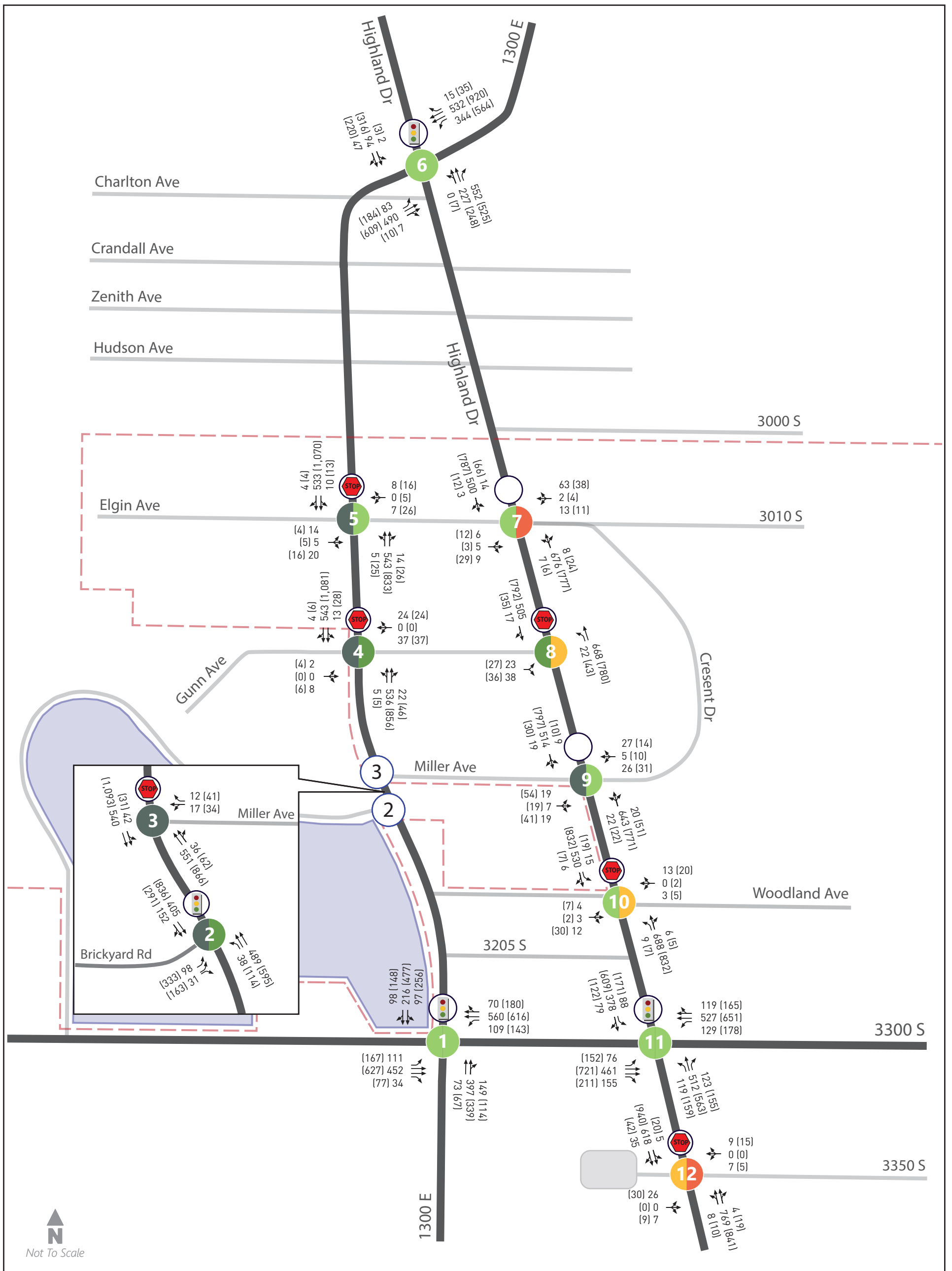


Figure 5  
Alternative 2 (Lane Reduction with Roundabouts) Future Conditions

**Table 10 Existing Plus Redevelopment Alternative 2 Conditions AM & PM Peak Hour Level of Service**

Intersection		Period	Control	Worst Movement <sup>1</sup>			Overall Intersection	
ID	Location			Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	22	C
		PM		-	-	-	24	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	8	A	-	-
		PM		WB LT	9	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB LT	13	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB LT	17	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	22	C
		PM		-	-	-	43	D
7	Highland Drive / Elgin Avenue	AM	Roundabout	-	-	-	10	B
		PM		-	-	-	24	C
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	15	C	-	-
		PM		EB LT	19	C	-	-
9	Highland Drive / Miller Avenue	AM	Roundabout	-	-	-	7	A
		PM		-	-	-	15	C
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	WB RT	15	B	-	-
		PM		EB RT	23	C	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	25	C
		PM		-	-	-	29	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	26	D	-	-
		PM		EB LT	29	D	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.





**Table 11 Future Plus Redevelopment Alternative 2 Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	22	C
		PM		-	-	-	26	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	9	A	-	-
		PM		WB LT	10	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	10	A	-	-
		PM		WB LT	13	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB TH	21	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	23	C
		PM		-	-	-	31	C <sup>4</sup>
7	Highland Drive / Elgin Avenue	AM	Roundabout	-	-	-	10	A
		PM		-	-	-	43	E
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	14	B	-	-
		PM		EB LT	29	D	-	-
9	Highland Drive / Miller Avenue	AM	Roundabout	-	-	-	7	A
		PM		-	-	-	22	C
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	WB RT	15	C	-	-
		PM		EB LT	32	D	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	26	C
		PM		-	-	-	32	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	28	D	-	-
		PM		EB LT	42	E	-	-

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

4. The LOS shown at intersection 6 is improved vs. baseline conditions due to signal optimizations.

Source: Fehr & Peers, 2019.

## Conclusions and Recommendations

The LOS summary of the existing conditions and future conditions for all scenarios are presented in **Table 12** and **Table 13**, respectively.

**Table 12 Existing Peak Hour LOS Summary**

Intersection				Existing	Existing + Redev.	Existing + Project – Alt. 1	Existing + Project – Alt. 2
ID	Location	Control	Period	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>
1	1300 East / 3300 South	Signal	AM	22 / C	22 / C	21 / C	22 / C
			PM	24 / C	25 / C	24 / C	24 / C
2	1300 East / Brickyard Road	Signal	AM	4 / A	4 / A	4 / A	4 / A
			PM	11 / B	11 / B	11 / B	11 / B
3	Richmond Street / Miller Avenue	Side-Street Stop	AM	9 / A	8 / A	8 / A	8 / A
			PM	9 / A	9 / A	9 / A	9 / A
4	Richmond Street / Gunn Avenue	Side-Street Stop	AM	7 / A	9 / A	9 / A	9 / A
			PM	7 / A	13 / B	13 / B	13 / B
5	Richmond Street / Elgin Avenue	Side-Street Stop	AM	9 / A	9 / A	9 / A	9 / A
			PM	16 / C	18 / C	18 / C	17 / C
6	Highland Drive / Richmond Street	Signal	AM	23 / C	23 / C	22 / C	22 / C
			PM	33 / C	42 / D	43 / D	43 / D
7	Highland Drive / Elgin Avenue	Side-Street Stop / Roundabout	AM	11 / B	12 / B	19 / C	10 / B
			PM	17 / C	19 / C	28 / D	24 / C
8	Highland Drive / Gunn Avenue	Side-Street Stop	AM	7 / A	14 / B	16 / C	15 / C
			PM	12 / B	14 / B	23 / C	19 / C
9	Highland Drive / Miller Avenue	Signal / Roundabout	AM	3 / A	4 / A	5 / A	7 / A
			PM	6 / A	7 / A	8 / A	15 / C
10	Highland Drive / Woodland Avenue	Side-Street Stop	AM	10 / A	8 / A	13 / B	15 / B
			PM	13 / B	13 / B	17 / C	23 / C
11	Highland Drive / 3300 South	Signal	AM	24 / C	25 / C	26 / C	25 / C
			PM	24 / C	27 / C	30 / C	29 / C
12	Highland Drive / 3350 South	Side-Street Stop	AM	15 / B	14 / B	27 / C	26 / D
			PM	16 / C	17 / C	27 / D	29 / D

1. Overall intersection LOS and average delay (seconds/vehicle) for the signalized intersections and worst movement LOS and average delay for the unsignalized intersections.  
Source: Fehr & Peers, 2019



**Table 13 Future Peak Hour LOS Summary**

Intersection				Future	Future + Redev.	Existing + Project – Alt. 1	Existing + Project – Alt. 2
ID	Location	Control	Period	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>
1	1300 East / 3300 South	Signal	AM	23 / C	23 / C	22 / C	22 / C
			PM	24 / C	26 / C	26 / C	26 / C
2	1300 East / Brickyard Road	Signal	AM	4 / A	4 / A	4 / A	4 / A
			PM	11 / B	11 / B	11 / B	11 / B
3	Richmond Street / Miller Avenue	Side-Street Stop	AM	7 / A	8 / A	8 / A	9 / A
			PM	9 / A	10 / A	10 / B	10 / A
4	Richmond Street / Gunn Avenue	Side-Street Stop	AM	8 / A	10 / A	10 / A	10 / A
			PM	11 / B	14 / B	14 / B	13 / B
5	Richmond Street / Elgin Avenue	Side-Street Stop	AM	9 / A	8 / A	9 / A	9 / A
			PM	19 / C	22 / C	22 / C	21 / C
6	Highland Drive / Richmond Street	Signal	AM	23 / C	24 / C	22 / C	23 / C
			PM	36 / D	32 / C <sup>2</sup>	32 / C <sup>2</sup>	31 / C <sup>2</sup>
7	Highland Drive / Elgin Avenue	Side-Street Stop / Roundabout	AM	13 / B	13 / B	19 / C	10 / A
			PM	19 / C	19 / C	28 / D	<b>43 / E</b>
8	Highland Drive / Gunn Avenue	Side-Street Stop	AM	7 / A	11 / B	13 / B	14 / B
			PM	12 / B	17 / C	21 / C	29 / D
9	Highland Drive / Miller Avenue	Signal / Roundabout	AM	4 / A	4 / A	6 / A	7 / A
			PM	6 / A	7 / A	8 / A	22 / C
10	Highland Drive / Woodland Avenue	Side-Street Stop	AM	10 / A	10 / B	16 / C	15 / C
			PM	13 / B	16 / C	28 / D	32 / D
11	Highland Drive / 3300 South	Signal	AM	24 / C	25 / C	27 / C	26 / C
			PM	25 / C	28 / C	32 / C	32 / C
12	Highland Drive / 3350 South	Side-Street Stop	AM	12 / B	15 / C	27 / D	28 / D
			PM	13 / B	19 / C	34 / D	<b>42 / E</b>

1. Overall intersection LOS and average delay (seconds/vehicle) for the signalized intersections and worst movement LOS and average delay for the unsignalized intersections.

2. Intersection 6 LOS improved under Future + Redev., Alt. 1, and Alt. 2 due to signal optimizations.

Source: Fehr & Peers, 2019

Travel times under existing, future, and Alternative scenarios is shown below in **Table 14**.

**Table 14 Existing and Future PM Travel Time Summary**

Direction	Travel Time (min:sec) <sup>1</sup>				
	Existing PM	Future Background PM	Future + Project PM	Alternative 1: Future + Project PM – Road Diet	Alternative 2: Future + Project PM – Road Diet + Roundabouts
Northbound	2:45	2:45	2:45	3:00	3:15
Southbound	2:00	2:00	2:15	2:45	2:45

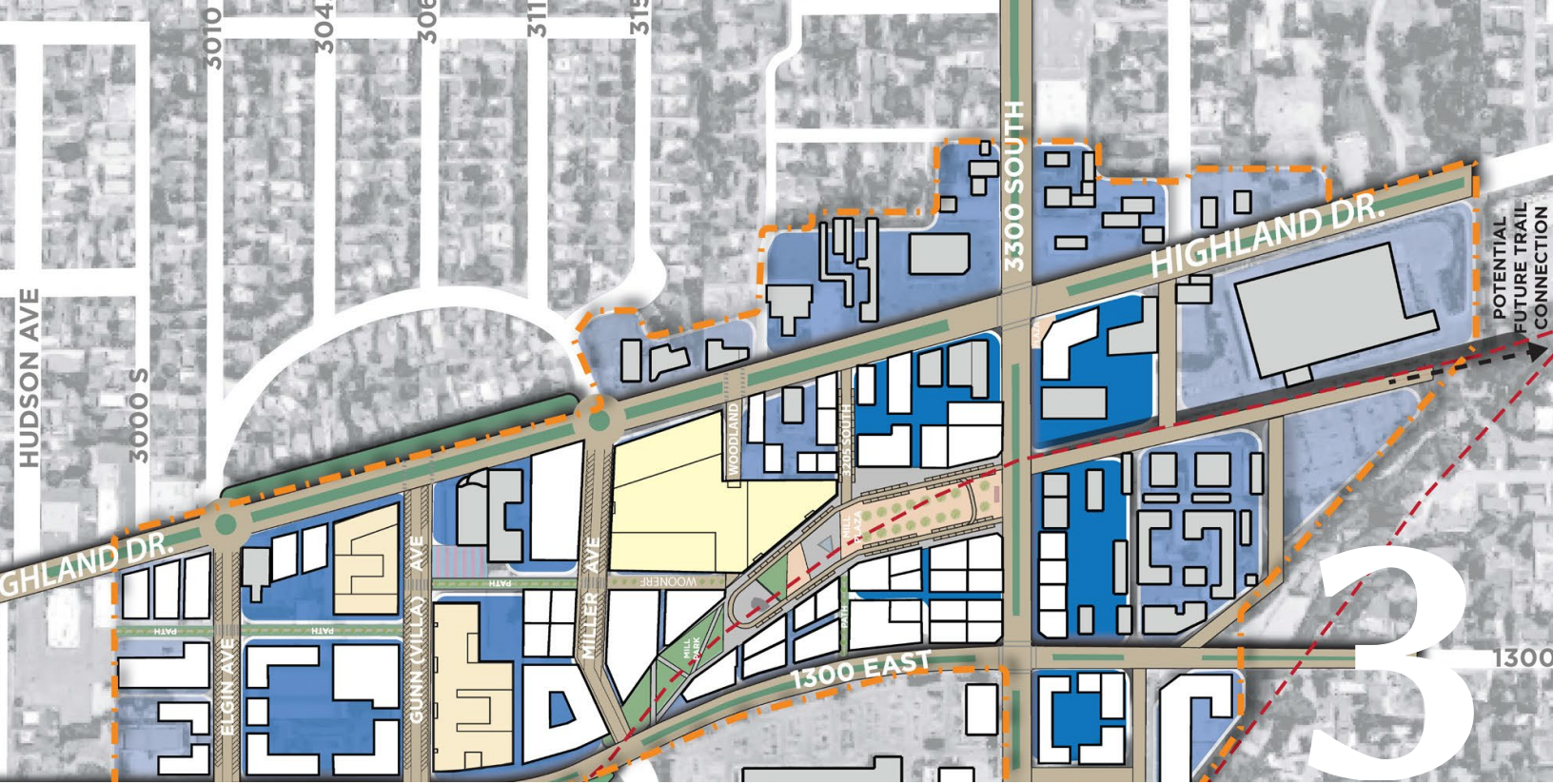
1. Travel time rounded to nearest 15 seconds.

Source: Fehr & Peers, 2019

As shown in **Table 12, 13, and 14** and as mentioned previously, the roundabouts on Highland Drive do not operate as efficiently as the current intersection configurations. Roundabouts do provide benefits for the Highland Drive corridor in terms of providing an entry gateway feature and traffic calming, but are likely to increase delays at these intersections. Because many of the advantages of roundabouts can be achieved with the use of center planted medians and other traffic calming strategies, the traffic operational impacts noted above suggest that Alternative 2 is not an ideal strategy for Highland Drive. We recommended that other measures be considered to accomplish goals of installing entry gateway features in center medians and traffic calming treatments.

By contrast, re-alignment of Woodland Avenue would provide safety benefits over the current alignment. A re-alignment would eliminate the offset between the roadway on the east and west of Highland Drive, thereby removing the conflict point between northbound and southbound vehicles making left turns onto Woodland Avenue. Because such a realignment would likely require at least one full property take, timing such a project to coincide with redevelopment adjacent to this intersection may provide significant cost savings.





# Maximum Buildout Evaluation

## Purpose

Based on the conclusions of the Alternatives Analysis presented in Chapter 2, the project team was asked to examine the impacts of a 'Greatest Impact Scenario', under which the Millcreek Center study area would be built out the maximum extent feasible under contemplated zoning regulations, on both the existing road network and the Alternative 1 roadway configuration discussed in Chapter 2. In order to fully capture the impacts of this Scenario and take advantage of the availability of additional data, the model network was expanded to include the intersection of Luck Lane and Highland Drive. Accordingly, the scenarios examined in this exercise include the following:

- Existing conditions, inclusive of Luck Lane.
- Future background conditions, inclusive of Luck Lane (not including traffic generated by development under the Greatest Impact scenario).
- Existing plus Greatest Impact and Future plus Greatest Impact conditions under Existing Roadway Configuration.
- Existing plus Greatest Impact and Future plus Greatest Impact conditions under Highland Drive Reconfiguration (Alt 1).

- Existing plus Greatest Impact and Future plus Greatest Impact conditions under Highland Drive Reconfiguration (Alt 1) with mitigations.

## Data Collection and Methodology

### Traffic Counts

In addition to the traffic counts previously collected as described in Chapter 1 (above), traffic counts for the intersection of Luck Lane and Highland Drive were collected on October 3, 2019 during the AM (7:00-9:00AM) and PM (4:00-6:00PM) peak periods. The study area, including the Highland Drive and Luck Lane intersection, is shown in **Figure 6**.

### Millcreek City Center Maximum Development Scenario

As mentioned in Chapter 1 (above), the adopted Millcreek City Center Master Plan provides a framework for future development of the Millcreek City Center neighborhood. The project team was provided by Millcreek City with a *Greatest Impact Scenario* depicting potential future land use if the Millcreek City Center area were to be fully redeveloped. This scenario reflects full redevelopment of the City Center area based on the Millcreek City Center Master Plan and contemplated zoning regulations, and is allocated between three different districts. These districts and associated quantities of development are shown in **Figure 7**.

The Neighborhood District is located on the northern end of the City Center and is roughly bounded by 3000 South, Richmond Street, Miller Avenue, and Highland Drive. The Mill Center area forms the heart of the redevelopment area and is bounded by Miller Avenue, Richmond Street, 3300 South, and Highland Drive. (For the purposes of this analysis, the Mill Park area that bisects this district is combined with Mill Center.) Lastly, the Marketplace District includes eight full or partial blocks adjacent to the Mill Center area with frontage on Highland Drive and/or 3300 South.

Based on the extent of redevelopment shown in each district, estimates of the quantity of existing land uses that would be displaced by new land uses were developed in consultation with City staff. The net quantity of new development was calculated by subtracting the estimated square footage/housing units of displaced land uses from the planned quantities of new development. Quantities of planned, estimated displaced, and net new development contemplated in the Greatest Impact Scenario are summarized in Table 15.







Study Intersection

Figure 6  
Study Area Overview





Millcreek  
3330 South 1300 East  
Millcreek, UT 84106  
(801) 214-2700

Published:  
06 August 2019

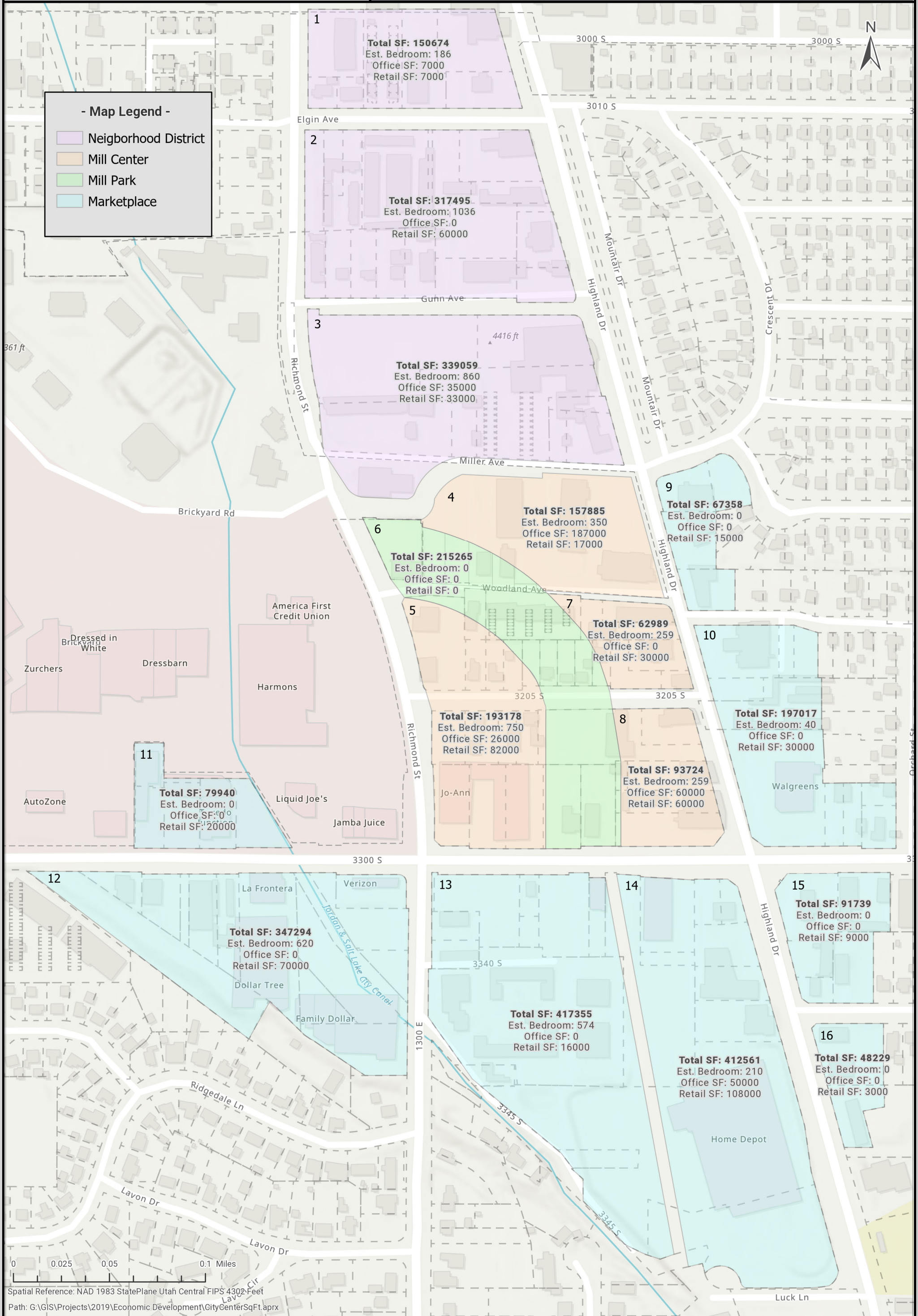
Sources:  
Millcreek

# CITY CENTER PLAN GREATEST IMPACT SCENARIO



**- Map Legend -**

- Neighborhood District
- Mill Center
- Mill Park
- Marketplace



0 0.025 0.05 0.1 Miles

Spatial Reference: NAD 1983 StatePlane Utah Central FIPS 4302 Feet  
Path: G:\GIS\Projects\2019\Economic Development\CityCenterSqFt.aprx

**Table 15 Greatest Impact Scenario Summary**

Area	New Development		Existing Displaced		Net Change	
	Sq. ft. (Non-Residential)	Dwelling Units	Sq. ft. (Non-Residential)	Dwelling Units	Sq. ft. (Non-Residential)	Dwelling Units
Neighborhood District	142,000 SF	1666	156,100 SF	26	-14,100 SF	1640
Mill Center	472,000 SF	1100	192,600 SF	41	279,400 SF	1059
Marketplace	321,000 SF	1042	223,600 SF	36	97,400 SF	1006

### Trip Generation

Trip generation for the anticipated redevelopment was computed using trip generation rates published in the Institute of Transportation Engineers (ITE) *Trip Generation, 10th Edition, 2017*, and Fehr & Peers’ mixed-use development (MXD) methodology, as described in Chapter 1 (above).

### Trip Distribution, Assignment, and Diversion

Traffic generated by the greatest impact scenario was assigned to the roadway network based on the proximity of the developments to the roadway network, high population densities, and regional trip attractions. The redevelopment-generated trips were distributed to and from these directions, in the corresponding percentages:

- 10% North (using Highland Drive)
- 25% North (using Richmond Street)
- 6% West (using Elgin Avenue and Brickyard Road)
- 15% West (using 3300 South)
- 4% East (using Elgin Avenue and Miller Avenue)
- 15% East (using 3300 South)
- 10% South (using 1300 East)
- 15% South (using Highland Drive)

Review of the resulting volumes of existing and redevelopment-generated trips showed significant numbers of eastbound vehicles on 3300 South vehicles proceeding making eastbound left turns at the intersection of 3300 South and Highland Drive. In the context of the

overall demand volumes at this intersection during the PM peak under the greatest impact scenario, it is likely that some drivers would choose to take 1300 East to their destination. Therefore, 25% of vehicles making this movement were diverted to make eastbound lefts on 1300 East instead and proceed to their final destination accordingly.

### Analysis Methodology

Level of Service (LOS) is a term that describes the operating performance of an intersection or roadway. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst. **Table 3** in Chapter 2 (above) provides a brief description of each LOS letter designation and an accompanying average delay per vehicle for both signalized and unsignalized intersections. The Highway Capacity Manual (HCM) 6th Edition methodology was used in this study. This methodology has different quantitative evaluations for signalized and unsignalized intersections. For signalized intersections, the LOS is provided for the overall intersection (weighted average of all approach delays).

## Existing Background Conditions

### Purpose

The purpose of the existing background conditions analysis is to evaluate the study intersections during the peak travel periods of the day under existing traffic and geometric conditions. This analysis provides a baseline model for understanding existing traffic operations, identifying existing deficiencies, and evaluating the performance of existing and future Greatest Impact scenarios.

### Traffic Volumes

Traffic counts were recorded for the AM and PM peak periods from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on Thursday, February 21, 2019 at the study intersections listed previously.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the existing background weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 16**. As shown in **Table 16**, all intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in existing background conditions. It should be noted that the results shown in **Table 16** do not match





exactly with the results shown in **Table 4** because the analysis was modified to include Highland Drive / Luck Lane, which had minor effects on the other study intersections.

**Table 16 Existing Background Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	22	C
		PM		-	-	-	24	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	8	A	-	-
		PM		WB LT	9	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	EB RT	7	A	-	-
		PM		WB LT	8	A	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	9	A	-	-
		PM		WB TH	17	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	22	C
		PM		-	-	-	32	C
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	WB LT	14	B	-	-
		PM		EB LT	19	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	8	A	-	-
		PM		EB LT	13	B	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	4	A
		PM		-	-	-	5	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	EB TH	9	A	-	-
		PM		EB LT	13	B	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	24	C
		PM		-	-	-	26	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	11	B	-	-
		PM		EB LT	12	B	-	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	2	A
		PM		-	-	-	5	A

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

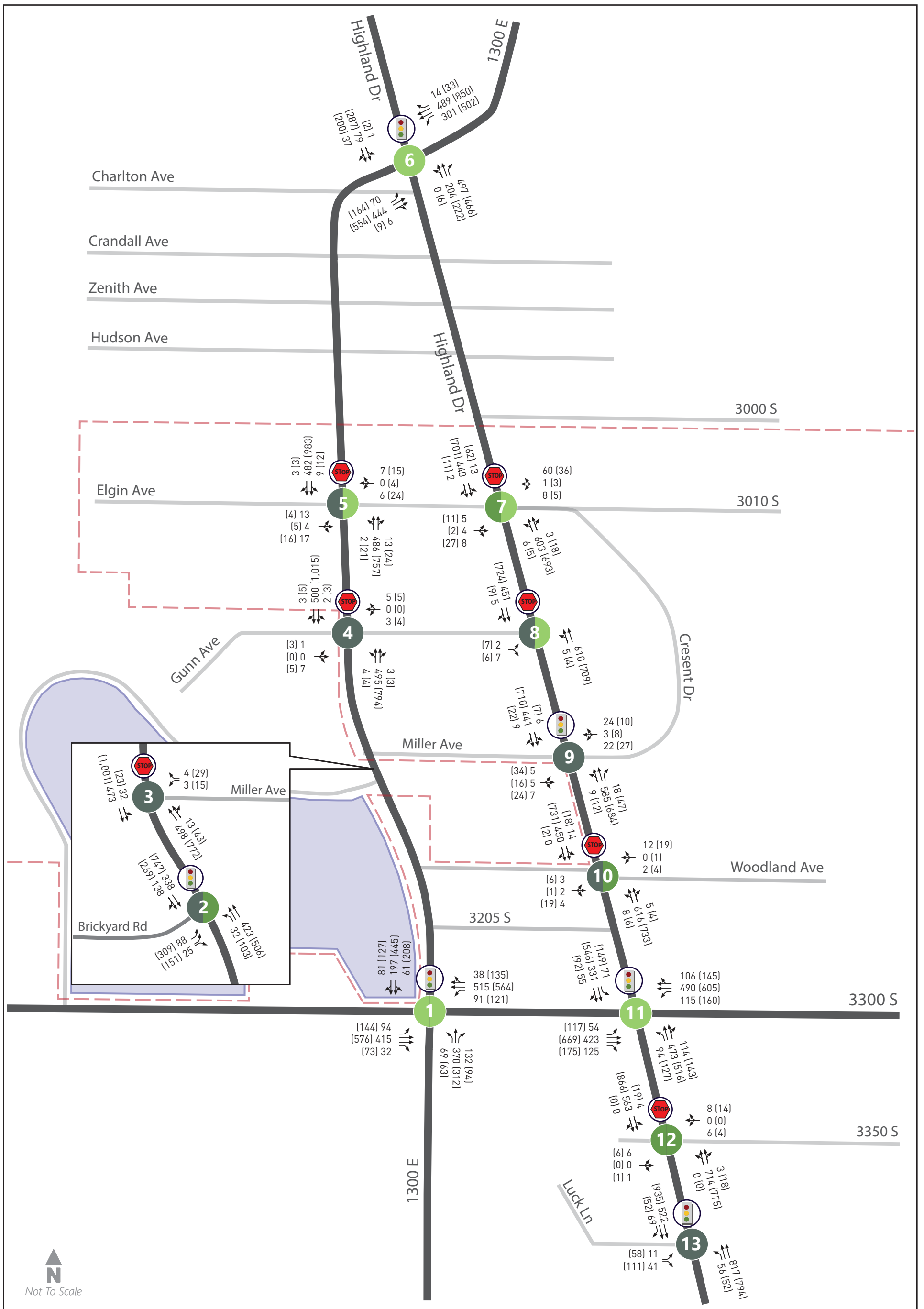
2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.

Turning movement counts and levels of service for each study intersection under existing background conditions are provided in **Figure 8** below.





AM PM **A B C D E F**  
 (XX) Intersection Level of Service  
 ↗ Turning Movement

XXX (XXX) AM (PM) Peak Hour Volume  
 Traffic Signal  
 Stop Sign

--- Millcreek Town Boundary

Figure 8  
 Existing Background Conditions

## Future Background Conditions

### Purpose

The purpose of the future background conditions analysis is to evaluate the study intersections during the peak travel periods of the day under projected future traffic volumes. This analysis provides a baseline condition for the future, which can be used to determine future impacts of road reconfiguration options.

### Traffic Volumes

Fehr & Peers projected future 2030 volumes assuming a total uniform growth of 5% across all roadways in the study area, as detailed in the Background Traffic Growth section on pages 4-5 (above).

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the future background weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 17**. As shown in **Table 17**, all intersections operate within acceptable LOS (D or better) for both AM and PM peak hours in future background conditions. It should be noted that the results shown in **Table 17** do not match exactly with the results shown in **Table 5** because the analysis was modified to include Highland Drive / Luck Lane, which had minor effects on the other study intersections.





**Table 17 Future Background Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	23	C
		PM		-	-	-	25	C
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	7	A	-	-
		PM		WB LT	9	A	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	EB RT	7	A	-	-
		PM		WB LT	10	B	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	EB TH	9	A	-	-
		PM		WB TH	21	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	23	C
		PM		-	-	-	36	D
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	WB LT	15	C	-	-
		PM		EB LT	19	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	8	A	-	-
		PM		EB LT	11	B	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	4	A
		PM		-	-	-	5	A
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	WB LT	10	A	-	-
		PM		EB LT	13	B	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	25	C
		PM		-	-	-	27	C
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	10	B	-	-
		PM		EB LT	16	C	-	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	2	A
		PM		-	-	-	5	A

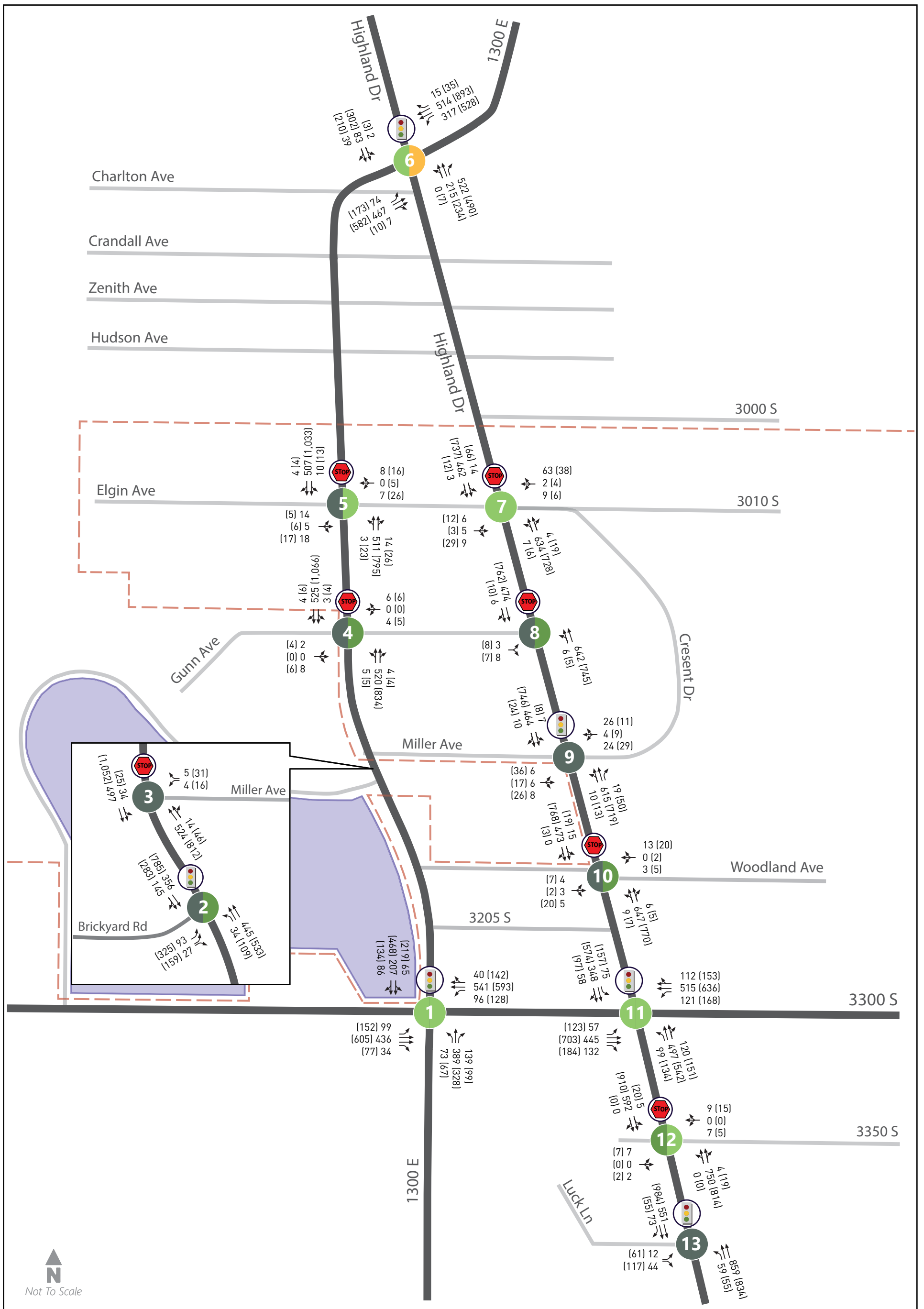
1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.

Turning movement counts and levels of service for each study intersection under future background conditions are provided in **Figure 9** below.



Not To Scale



- AM | PM
- A B C D E F
- XXX (XXX) AM (PM) Peak Hour Volume
- Millcreek Town Boundary
- Intersection Level of Service
- Traffic Signal
- Stop Sign
- Turning Movement

Figure 9  
Future Background Conditions - Existing Roadway Configuration

## Existing Plus Greatest Impact Scenario Conditions

### Purpose

The purpose of the existing plus Greatest Impact Scenario conditions analysis is to evaluate the impact of traffic generated by the Greatest Impact Scenario on the study intersections during the peak travel periods of the day under existing conditions.

### Traffic Volumes

Traffic generated by the Greatest Impact Scenario was added to the existing volumes to yield “existing plus Greatest Impact Scenario” weekday AM and PM peak hour traffic volumes at the study intersections.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the existing plus Greatest Impact Scenario weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 18** and **Figure 10**, below.

While all intersections operate acceptably (LOS D or better) during the AM peak hour, the intersection of Highland Drive / Richmond Street experiences near-failing conditions (LOS E) and the intersection of Highland Drive / 3350 South experiences LOS F conditions during the PM peak hour.

At the Highland Drive / Richmond Street intersection, the additional project traffic impacts signal operations, especially in the westbound direction. The signal phase time required to allow pedestrians to cross Richmond Street on the north/south crosswalks leave little time within the current cycle length to provide better signal operations for the east/west traffic.

The intersection of Highland Drive and 3350 South operates acceptably for the northbound, southbound, and westbound approaches during the PM peak hour; however, both left and right turning vehicles at the eastbound approach experience LOS F conditions at that time. These delays are caused by high conflicting northbound and southbound traffic volumes making it difficult for eastbound vehicles (especially eastbound lefts) to find acceptable gaps in order to egress from proposed development on the western side of Highland Drive.

**Table 18 Existing Plus Greatest Impact Scenario Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	30	C
		PM		-	-	-	46	D
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	13	B	-	-
		PM		WB LT	14	B	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	16	C	-	-
		PM		WB LT	16	C	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	12	B	-	-
		PM		WB TH	23	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	26	C
		PM		-	-	-	62	E
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	EB LT	15	C	-	-
		PM		WB LT	22	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	16	C	-	-
		PM		EB LT	17	C	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	9	A
		PM		-	-	-	11	B
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	WB RT	9	A	-	-
		PM		EB LT	15	C	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	29	C
		PM		-	-	-	47	D
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	17	C	-	-
		PM		EB LT	63	F	-	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	2	A
		PM		-	-	-	7	A

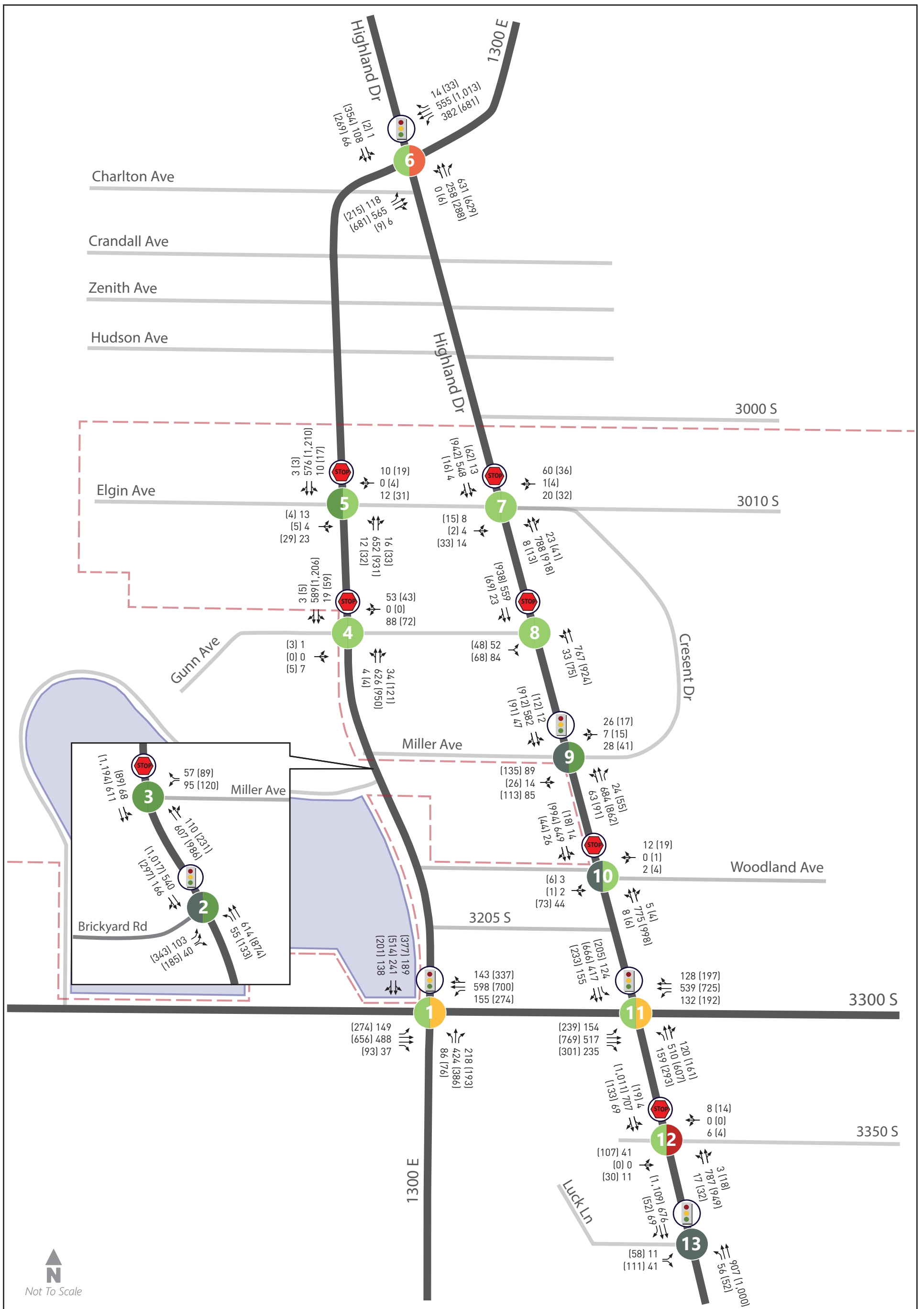
1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.





Not To Scale

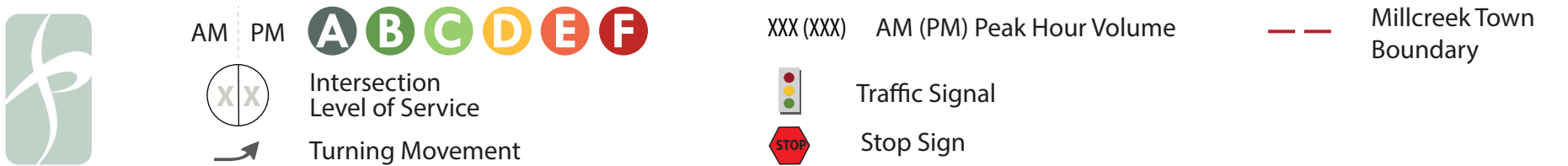


Figure 10  
Existing Plus Greatest Impact Scenario with Existing Roadway Configuration

## Future Plus Greatest Impact Scenario Conditions

### Purpose

The purpose of the future plus Greatest Impact Scenario conditions analysis is to evaluate the impact of traffic generated by the Greatest Impact Scenario on the study intersections during the peak travel periods of the day under existing conditions.

### Traffic Volumes

Traffic generated by the Greatest Impact Scenario was added to the future background volumes to yield “future plus Greatest Impact Scenario” weekday AM and PM peak hour traffic volumes at the study intersections.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the future plus Greatest Impact Scenario weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 19** and **Figure 11**, below.

While all intersections operate acceptably (LOS D or better) during the AM peak hour, the intersections of 1300 East / 3300 South and 1300 East / Highland Drive experience near-failing conditions (LOS E), and the intersection of Highland Drive and 3350 South experiences LOS F conditions during the PM peak hour. Additionally, eastbound/westbound movements operating at LOS E and F at the intersection of Highland Drive and 3300 South may be an additional area of concern for UDOT.

At the 1300 East / 3300 South intersection during the PM peak hour, the northbound approach experiences failing conditions for all movements; additionally, the southbound left and eastbound left turning movements operate at LOS F, and the westbound left turning movement operates at LOS E.

At the Highland Drive / Richmond Street intersection, the additional project traffic impacts signal operations, especially in the westbound direction. The signal phase time required to allow pedestrians to cross Richmond Street on the north/south crosswalks leave little time within the current cycle length to provide better signal operations for the east/west traffic.



The intersection of Highland Drive / 3350 South operates acceptably for the northbound, southbound, and westbound approaches during the PM peak hour; however, both left and right turning vehicles at the eastbound approach experience LOS E/F conditions at that time. These delays are caused by high conflicting northbound and southbound traffic volumes making it difficult for eastbound vehicles (especially eastbound lefts) to find acceptable gaps in order to egress from proposed development on the western side of Highland Drive.



**Table 19 Future Plus Greatest Impact Scenario Conditions AM & PM Peak Hour Level of Service**

Intersection		Period	Control	Worst Movement <sup>1</sup>			Overall Intersection	
ID	Location			Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	33	C
		PM		-	-	-	56	E
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	14	B	-	-
		PM		WB LT	15	B	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB Stop	WB LT	15	C	-	-
		PM		WB LT	19	C	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB Stop	WB LT	11	B	-	-
		PM		WB TH	26	D	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	27	C
		PM		-	-	-	58	E
7	Highland Drive / Elgin Avenue	AM	EB/WB Stop	WB LT	15	C	-	-
		PM		EB LT	21	C	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	15	C	-	-
		PM		EB LT	19	C	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	9	A
		PM		-	-	-	12	B
10	Highland Drive / Woodland Avenue	AM	EB/WB Stop	EB TH	13	B	-	-
		PM		EB LT	16	C	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	30	C
		PM		-	-	-	58	E
12	Highland Drive / 3350 South	AM	EB/WB Stop	EB LT	16	C	-	-
		PM		EB LT	109	F	-	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	2	A
		PM		-	-	-	12	B

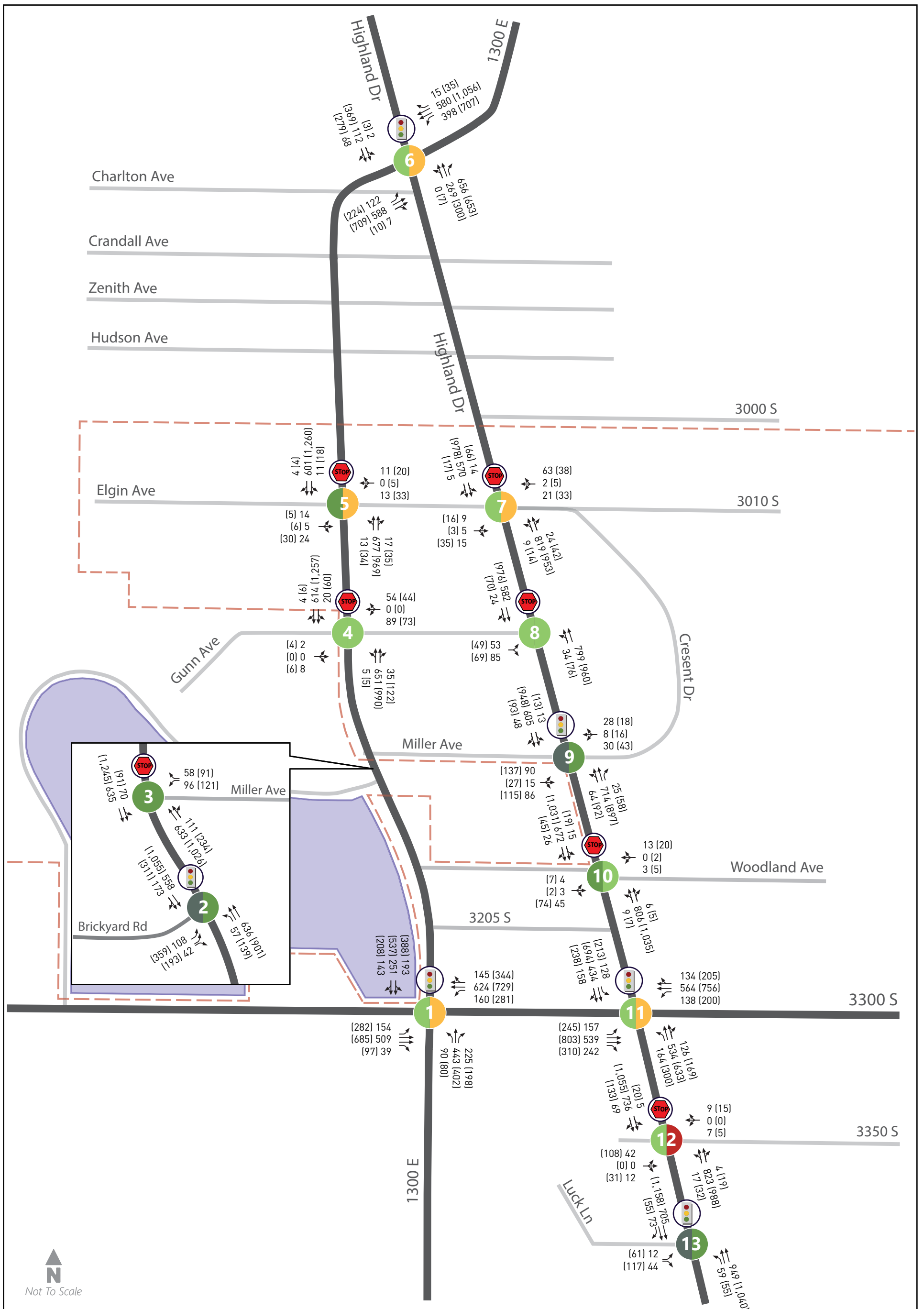
1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.





AM | PM

**A B C D E F**

Intersection Level of Service

Turning Movement

XXX (XXX) AM (PM) Peak Hour Volume

Traffic Signal

Stop Sign

--- Millcreek Town Boundary

Figure 11  
 Future Plus Greatest Impact Scenario with Existing Roadway Configuration

## Existing Plus Greatest Impact Scenario with Highland Drive Reconfiguration

### Purpose

The purpose of the existing plus Greatest Impact Scenario with Highland Drive Reconfiguration conditions analysis is to evaluate the impact of traffic generated by the Greatest Impact Scenario on the study intersections during the peak travel periods of the day under the proposed Alternative 1 Highland Drive reconfiguration. This reconfiguration was assumed to reduce travel lanes from two in each direction to one in each direction plus left turn lanes on Highland Drive between 3000 South (just north of the Elgin Avenue / Highland Drive intersection) and 3300 South.

### Traffic Volumes

Traffic generated by the Greatest Impact Scenario was added to existing volumes to yield “existing plus Greatest Impact Scenario” weekday AM and PM peak hour traffic volumes at the study intersections.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the existing plus Greatest Impact Scenario with Highland Drive Reconfiguration weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 20** and **Figure 12**, below.



**Table 20 Existing Plus Greatest Impact Scenario with Highland Drive Reconfiguration  
Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	30	C
		PM		-	-	-	48	D
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	14	B	-	-
		PM		WB LT	14	B	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB	WB LT	15	C	-	-
		PM	Stop	WB LT	17	C	-	-
5	Richmond Street / Elgin Avenue	AM	EB/WB	WB LT	11	B	-	-
		PM	Stop	WB TH	20	C	-	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	25	C
		PM		-	-	-	67	E
7	Highland Drive / Elgin Avenue	AM	EB/WB	WB LT	22	C	-	-
		PM	Stop	WB LT	66	F	-	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	28	D	-	-
		PM		EB LT	73	F	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	9	A
		PM		-	-	-	22	C
10	Highland Drive / Woodland Avenue	AM	EB/WB	WB RT	13	B	-	-
		PM	Stop	EB LT	60	F	-	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	38	D
		PM		-	-	-	64	E
12	Highland Drive / 3350 South	AM	EB/WB	EB LT	77	F	-	-
		PM	Stop	EB LT	212	F	-	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	2	A
		PM		-	-	-	5	A

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.

The intersection of Highland Drive / 3350 South experiences LOS F conditions during the AM peak hour, primarily due to difficulties in eastbound lefts egressing from proposed development sites finding acceptable gaps in Highland Drive traffic flows. The intersections of Highland Drive / Richmond Street and Highland Drive / 3300 South experience near-failing conditions (LOS E)

and the intersections Highland Drive / Elgin Avenue, Highland Drive / Gunn Avenue, Highland Drive / Woodland Avenue, and Highland Drive / 3350 South experiences LOS F conditions during the PM peak hour.

At the Highland Drive / Richmond Street intersection, the additional project traffic impacts signal operations, especially in the westbound direction. The signal phase time required to allow pedestrians to cross Richmond Street on the north/south crosswalks leave little time within the current cycle length to provide better signal operations for the east/west traffic.

The delays at the intersections of Highland Drive / Elgin Avenue, Highland Drive / Gunn Avenue, and Highland Drive / Woodland Avenue are caused by high conflicting northbound and southbound traffic volumes making it difficult for the side-street vehicles (especially left turns) to find acceptable gaps. The lane reduction makes it even more difficult for the side-street vehicles to turn onto Highland Drive.

The capacity is reduced at the intersection of Highland Drive / 3300 South due to the loss of a northbound through lane on Highland Drive. This causes the northbound queue at the intersection to build up past the Highland Drive / 3350 South intersection, making it even more difficult for eastbound vehicles (especially eastbound lefts) at the Highland Drive / 3350 South intersection to turn onto Highland Drive. This is what causes the high delays at the intersections of Highland Drive / 3300 South and Highland Drive / 3350 South.



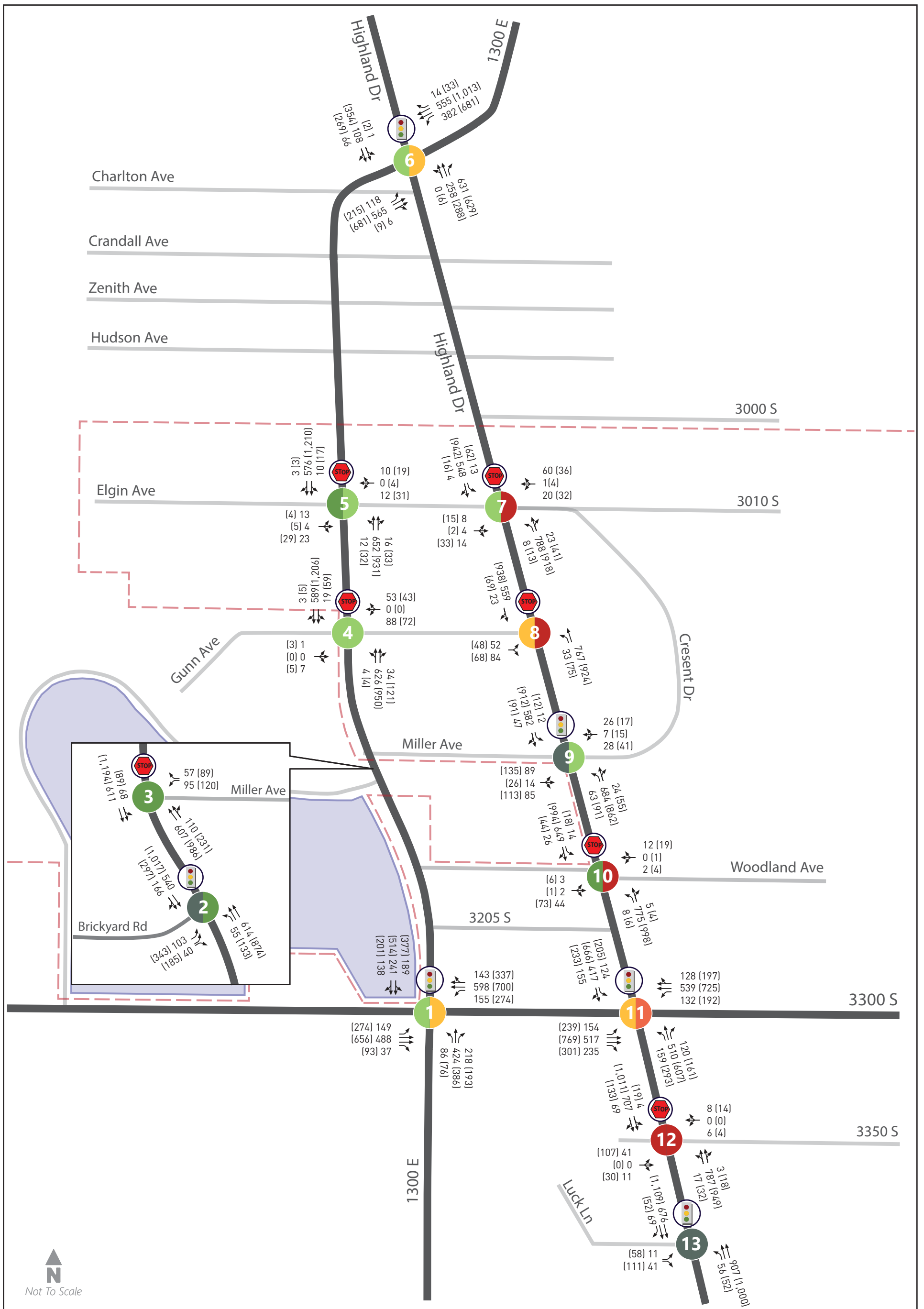


Figure 12

Existing Plus Greatest Impact Scenario with Highland Drive Reconfiguration

## Future Plus Greatest Impact Scenario with Highland Drive Reconfiguration

### Purpose

The purpose of the future plus Greatest Impact Scenario with Highland Drive Reconfiguration conditions analysis is to evaluate the impact of traffic generated by the Greatest Impact Scenario on the study intersections during the peak travel periods of the day under the proposed Alternative 1 Highland Drive reconfiguration. This reconfiguration was assumed to reduce travel lanes from two in each direction to one in each direction plus left turn lanes on Highland Drive between 3000 South (just north of the Elgin Avenue / Highland Drive intersection) and 3300 South.

### Traffic Volumes

Traffic generated by the Greatest Impact Scenario was added to future background volumes to yield “future plus Greatest Impact Scenario” weekday AM and PM peak hour traffic volumes at the study intersections.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the future background weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 21** and **Figure 13**, below.





**Table 21 Future Plus Greatest Impact Scenario with Highland Drive Reconfiguration  
Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	31	C
		PM		-	-	-	61	E
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	14	B	-	-
		PM		WB LT	14	B	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB	WB LT	15	B	-	-
		PM		Stop	WB LT	18	C	-
5	Richmond Street / Elgin Avenue	AM	EB/WB	WB LT	11	B	-	-
		PM		Stop	WB TH	22	C	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	27	C
		PM		-	-	-	60	E
7	Highland Drive / Elgin Avenue	AM	EB/WB	WB LT	25	D	-	-
		PM		Stop	SB TH	120	F	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB LT	32	D	-	-
		PM		EB LT	112	F	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	10	A
		PM		-	-	-	23	C
10	Highland Drive / Woodland Avenue	AM	EB/WB	EB TH	18	B	-	-
		PM		Stop	EB LT	65	F	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	44	D
		PM		-	-	-	95	F
12	Highland Drive / 3350 South	AM	EB/WB	EB LT	112	F	-	-
		PM		Stop	EB LT	250	F	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	4	A
		PM		-	-	-	42	D

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.

The intersection of Highland Drive / 3350 South experiences LOS F conditions during the AM peak hour, primarily due to difficulties in eastbound lefts egressing from proposed development sites finding acceptable gaps in Highland Drive traffic flows. The intersections of 1300 East / 3300 South and Highland Drive / Richmond Street experience near-failing conditions (LOS E)

and the intersections Highland Drive / Elgin Avenue, Highland Drive / Gunn Avenue, Highland Drive / Woodland Avenue, Highland Drive / 3300 South, and Highland Drive / 3350 South experiences LOS F conditions during the PM peak hour.

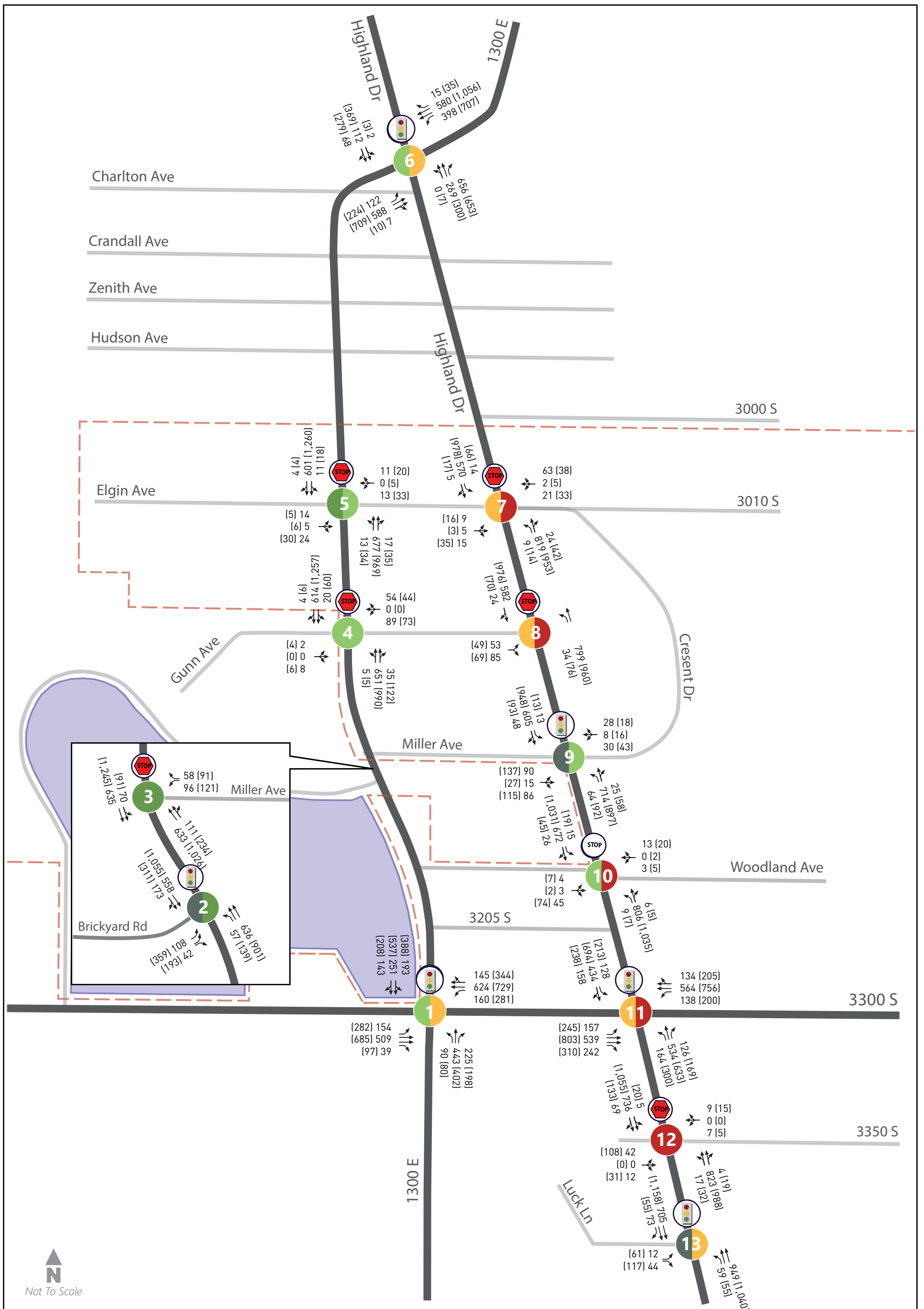
At the 1300 East / 3300 South intersection during the PM peak hour, the northbound approach experiences failing conditions for all movements; additionally, the southbound left and eastbound left turning movements operate at LOS F, and the westbound left turning movement operates at LOS E.

At the Highland Drive / Richmond Street intersection, the additional project traffic impacts signal operations, especially in the westbound direction. The signal phase time required to allow pedestrians to cross Richmond Street on the north/south crosswalks leave little time within the current cycle length to provide better signal operations for the east/west traffic.

The delays at the intersections of Highland Drive / Elgin Avenue, Highland Drive / Gunn Avenue, and Highland Drive / Woodland Avenue are caused by high conflicting northbound and southbound traffic volumes making it difficult for the side-street vehicles (especially left turns) to find acceptable gaps. The lane reduction makes it even more difficult for the side-street vehicles to turn onto Highland Drive.

The capacity is reduced at the intersection of Highland Drive / 3300 South due to a northbound through lane being taken away due to the lane reduction on Highland Drive. This causes the northbound queue at the intersection to build up past the Highland Drive / 3350 South intersection, making it even more difficult for eastbound vehicles (especially eastbound lefts) at the Highland Drive / 3350 South intersection to turn onto Highland Drive. This is what causes the high delays at the intersections of Highland Drive / 3300 South and Highland Drive / 3350 South.





Not To Scale

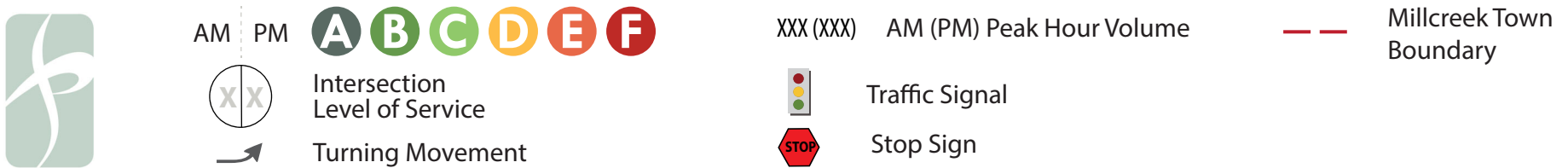


Figure 13  
 Future Plus Greatest Impact Scenario with Highland Drive Reconfiguration

## Existing Plus Greatest Impact Scenario with Highland Drive Reconfiguration (Mitigated)

### Purpose

The purpose of the existing plus Greatest Impact Scenario with Highland Drive Reconfiguration (Mitigated) conditions analysis is to evaluate the impact of traffic generated by the Greatest Impact Scenario on the study intersections during the peak travel periods of the day under the proposed Alternative 1 Highland Drive reconfiguration with the addition of mitigation measures intended to reduce operational impacts. In addition to the reconfiguration described previously, left turns out of the side-streets were restricted at the following locations:

- Eastbound and westbound approach at Highland Drive / Elgin Avenue (right turn only onto Highland Drive)
- Eastbound approach at Highland Drive / Gunn Avenue (right turn only onto Highland Drive)
- Eastbound and westbound approach at Highland Drive / Woodland Avenue (right turn only onto Highland Drive)
- Eastbound approach at Highland Drive / 3350 South (right turn only onto Highland Drive)

The traffic on the restricted movements were re-directed to their original destinations via Richmond Street and 3300 South.

### Traffic Volumes

Traffic generated by the Greatest Impact Scenario was added to existing volumes to yield "existing plus Greatest Impact Scenario" weekday AM and PM peak hour traffic volumes at the study intersections. Left turn movements out of the side streets listed above onto Highland Drive were diverted to Richmond Street, resulting in a slight increase in total traffic volumes on Richmond Street and a slight reduction in volumes on Highland Drive.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the mitigated weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 22** and **Figure 14**, below.



**Table 22 Existing Plus Greatest Impact Scenario with Highland Drive Reconfiguration (Mitigated) Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	29	C
		PM		-	-	-	49	D
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	11	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	14	B	-	-
		PM		WB LT	17	C	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB	WB LT	22	C	-	-
		PM		Stop	WB LT	21	C	-
5	Richmond Street / Elgin Avenue	AM	EB/WB	WB LT	14	B	-	-
		PM		Stop	WB TH	26	D	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	25	C
		PM		-	-	-	64	E
7	Highland Drive / Elgin Avenue	AM	EB/WB	WB RT	12	B	-	-
		PM		Stop	SB TH	96	F	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB RT	13	B	-	-
		PM		SB TH	43	E	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	10	A
		PM		-	-	-	23	C
10	Highland Drive / Woodland Avenue	AM	EB/WB	WB RT	14	B	-	-
		PM		Stop	EB RT	23	C	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	36	D
		PM		-	-	-	64	E
12	Highland Drive / 3350 South	AM	EB/WB	NB TH	32	D	-	-
		PM		Stop	NB TH	81	F	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	2	A
		PM		-	-	-	26	C

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.

While all intersections operate acceptably (LOS D or better) during the AM peak hour, the intersections of Highland Drive / Richmond Street, Highland Drive / Gunn Avenue, and Highland Drive / 3300 South experience near-failing conditions (LOS E) and the intersections of Highland

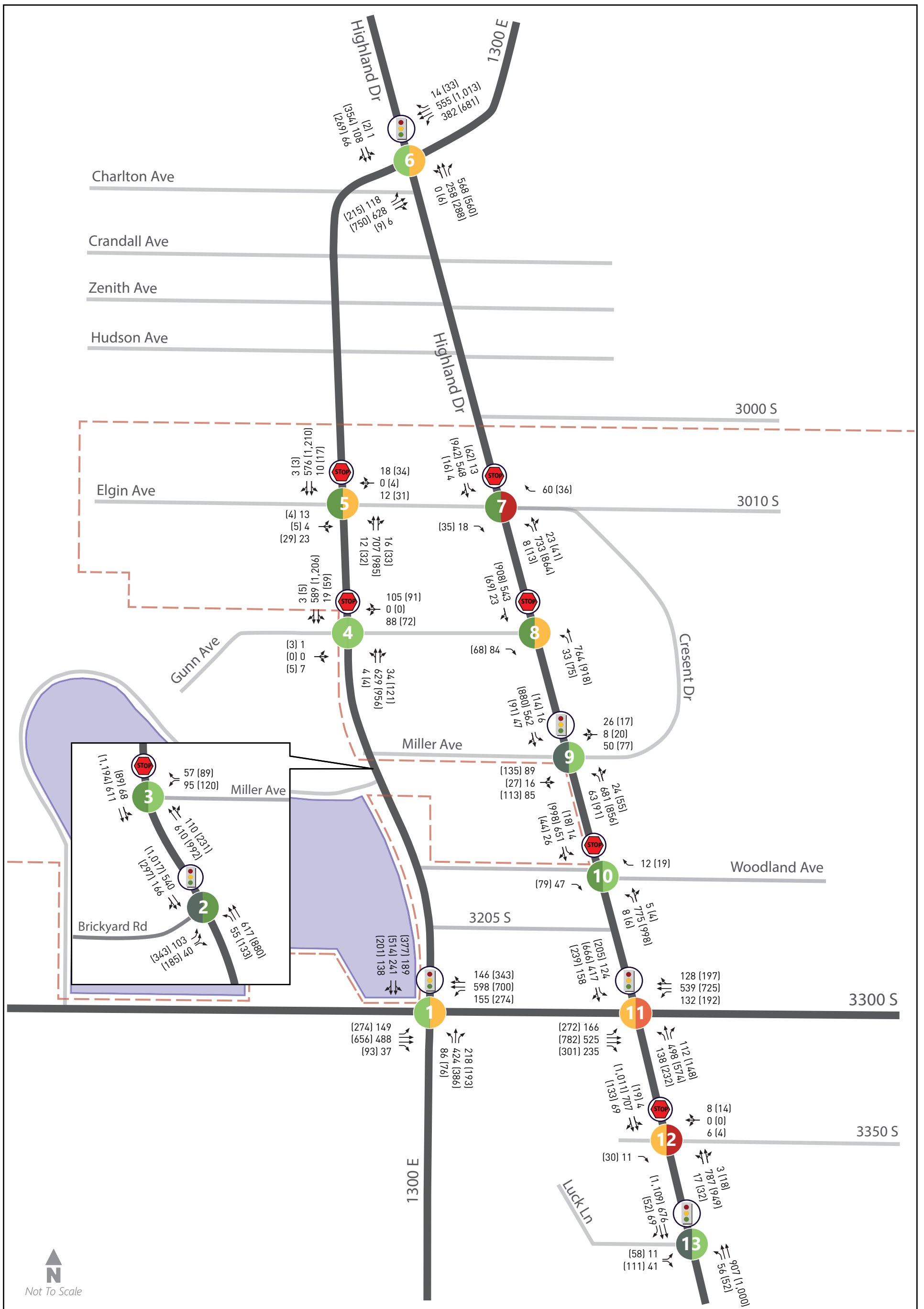
Drive / Elgin Avenue and Highland Drive / 3350 South experience LOS F conditions during the PM peak hour.

At the Highland Drive / Richmond Street intersection, the additional project traffic impacts signal operations, especially in the westbound direction. The signal phase time required to allow pedestrians to cross Richmond Street on the north/south crosswalks leave little time within the current cycle length to provide better signal operations for the east/west traffic.

The increase in delays at the intersections of Highland Drive / Elgin Avenue and Highland Drive / Gunn Avenue are caused by the added southbound congestion on Highland Drive due to some signal re-timing at Highland Drive / 3300 South to accommodate for additional traffic on 3300 South due to the diversion of traffic with the mitigations. The Highland Drive / Elgin Avenue intersection is the more severely affected of these two locations, due to its direct proximity to the lane drop from two to one southbound lane. However, the issues of the side-street delay at these locations are improved due to the mitigations of restricting movements to right turn only onto Highland Drive.

As mentioned above, the signal timing at the intersection of Highland Drive / 3300 South was re-timed to accommodate for the additional traffic on 3300 South due to the diversion of traffic. This impacted the northbound approach at that location, still causing queues to build up past the Highland Drive / 3350 South intersection. Due to the mitigations, the side-street delay is improved at the Highland Drive / 3350 South intersection, but the northbound approach now experiences high delays.





Not To Scale



AM PM **A B C D E F**  
 (XX) Intersection Level of Service  
 ↗ Turning Movement

XXX (XXX) AM (PM) Peak Hour Volume  
 Traffic Signal  
 Stop Sign

--- Millcreek Town Boundary

Figure 14  
 Existing Plus Greatest Impact Scenario with Highland Drive Reconfiguration with Mitigations



## Future Plus Greatest Impact Scenario with Highland Drive Reconfiguration (Mitigated)

### Purpose

The purpose of the future plus Greatest Impact Scenario with Highland Drive Reconfiguration (Mitigated) conditions analysis is to evaluate the impact of traffic generated by the Greatest Impact Scenario on the study intersections during the peak travel periods of the day under the proposed Alternative 1 Highland Drive reconfiguration with the addition of mitigation measures intended to reduce operational impacts. In addition to the reconfiguration described previously, left turns out of the side-streets were restricted at the following locations:

- Eastbound and westbound approach at Highland Drive / Elgin Avenue (right turn only onto Highland Drive)
- Eastbound approach at Highland Drive / Gunn Avenue (right turn only onto Highland Drive)
- Eastbound and westbound approach at Highland Drive / Woodland Avenue (right turn only onto Highland Drive)
- Eastbound approach at Highland Drive / 3350 South (right turn only onto Highland Drive)

The traffic on the restricted movements were re-directed to their original destinations via Richmond Street and 3300 South.

### Traffic Volumes

Traffic generated by the Greatest Impact Scenario was added to future background volumes to yield "existing plus Greatest Impact Scenario" weekday AM and PM peak hour traffic volumes at the study intersections. Left turn movements out of the side streets listed above onto Highland Drive were diverted to Richmond Street, resulting in a slight increase in total traffic volumes on Richmond Street and a slight reduction in volumes on Highland Drive.

### Level of Service Analysis

Using VISSIM software and the HCM 6<sup>th</sup> Edition delay thresholds introduced previously, the future mitigated weekday AM and PM peak hour LOS were computed for each study intersection. The results are presented in **Table 23** and **Figure 15**, below.



**Table 23 Future Plus Greatest Impact Scenario with Highland Drive Reconfiguration (Mitigated) Conditions AM & PM Peak Hour Level of Service**

Intersection		Worst Movement <sup>1</sup>					Overall Intersection	
ID	Location	Period	Control	Movement <sup>3</sup>	Delay (sec/veh)	LOS	Avg. Delay (sec/veh) <sup>2</sup>	LOS
1	1300 East / 3300 South	AM	Signal	-	-	-	33	C
		PM		-	-	-	64	E
2	1300 East / Brickyard Road	AM	Signal	-	-	-	4	A
		PM		-	-	-	13	B
3	Richmond Street / Miller Avenue	AM	WB Stop	WB LT	14	B	-	-
		PM		WB LT	16	C	-	-
4	Richmond Street / Gunn Avenue	AM	EB/WB	WB LT	25	C	-	-
		PM		Stop	WB LT	20	C	-
5	Richmond Street / Elgin Avenue	AM	EB/WB	WB LT	13	B	-	-
		PM		Stop	WB LT	19	C	-
6	Highland Drive / Richmond Street	AM	Signal	-	-	-	26	C
		PM		-	-	-	77	E
7	Highland Drive / Elgin Avenue	AM	EB/WB	WB RT	13	B	-	-
		PM		Stop	SB TH	179	F	-
8	Highland Drive / Gunn Avenue	AM	EB Stop	EB RT	12	B	-	-
		PM		SB TH	52	F	-	-
9	Highland Drive / Miller Avenue	AM	Signal	-	-	-	10	B
		PM		-	-	-	26	C
10	Highland Drive / Woodland Avenue	AM	EB/WB	WB RT	14	B	-	-
		PM		Stop	NB LT	27	D	-
11	Highland Drive / 3300 South	AM	Signal	-	-	-	39	D
		PM		-	-	-	82	F
12	Highland Drive / 3350 South	AM	EB/WB	NB TH	53	F	-	-
		PM		Stop	NB TH	139	F	-
13	Highland Drive / Luck Lane	AM	Signal	-	-	-	3	A
		PM		-	-	-	42	D

1. This represents the worst movement LOS and delay (seconds/vehicle) and is only reported for unsignalized intersections.

2. This represents the overall intersection LOS and delay (seconds/vehicle) and is reported for signalized intersections and roundabouts.

3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound, LT=Left-turn, RT=Right-turn, TH=Through

Source: Fehr & Peers, 2019.

The intersection of Highland Drive / 3350 South experiences LOS F conditions during the AM peak hour. The intersections of 1300 East / 3300 South and Highland Drive / Richmond Street experience near-failing conditions (LOS E) and the intersections of Highland Drive / Elgin

Avenue, Highland Drive / Gunn Avenue, Highland Drive / 3300 South, and Highland Drive / 3350 South experience LOS F conditions during the PM peak hour.

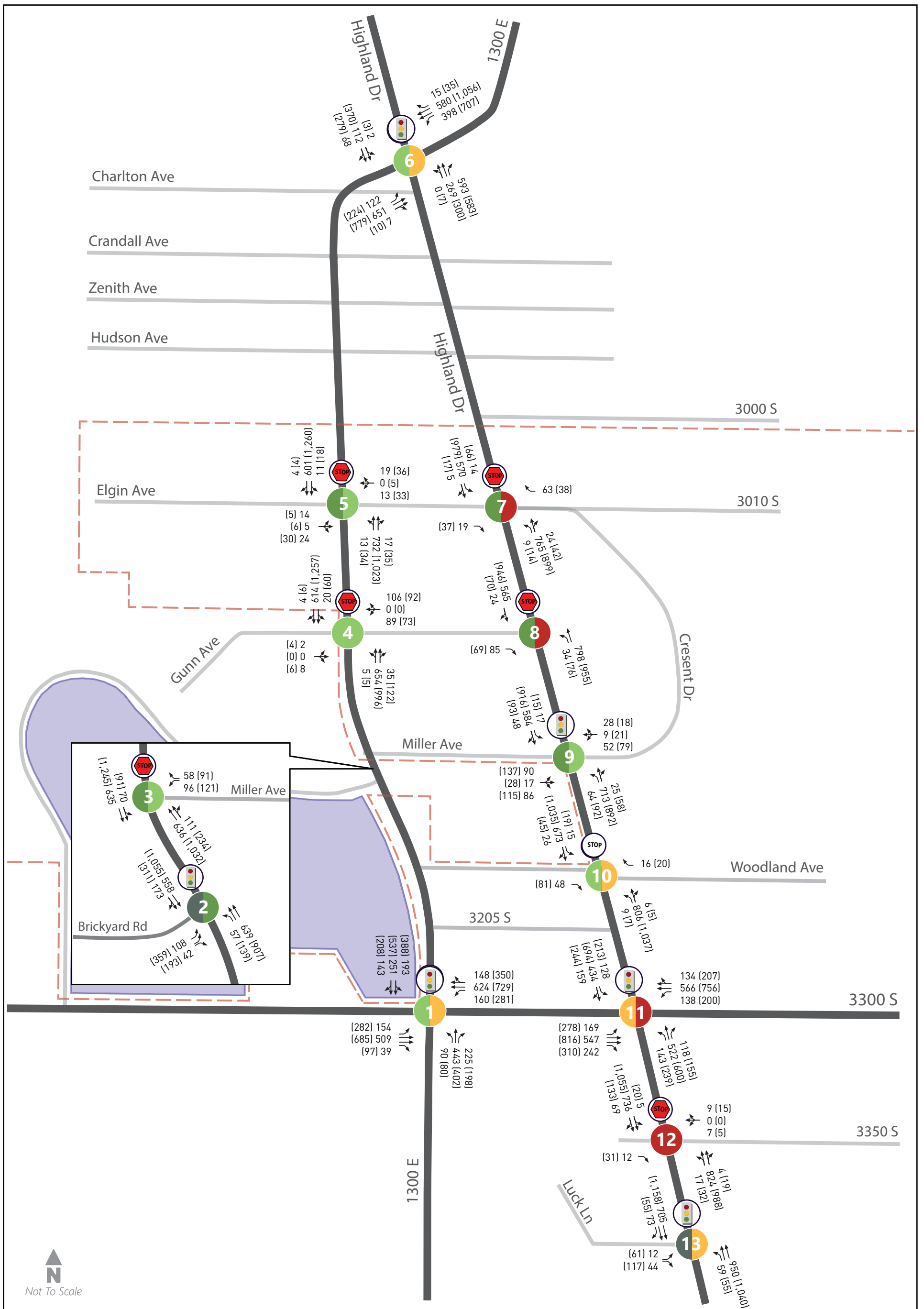
At the 1300 East / 3300 South intersection during the PM peak hour, the northbound approach experiences failing conditions for all movements; additionally, the southbound left and eastbound left turning movements operate at LOS F, and the westbound left turning movement operates at LOS E.

At the Highland Drive / Richmond Street intersection, the additional project traffic impacts signal operations, especially in the westbound direction. The signal phase time required to allow pedestrians to cross Richmond Street on the north/south crosswalks leave little time within the current cycle length to provide better signal operations for the east/west traffic.

The increase in delays at the intersections of Highland Drive / Elgin Avenue and Highland Drive / Gunn Avenue are caused by the added southbound congestion on Highland Drive due to some signal re-timing at Highland Drive / 3300 South to accommodate additional traffic on 3300 South due to the diversion of traffic that occurs with mitigations in place. The Highland Drive / Elgin Avenue intersection is the more severely affected of these two locations, due to its direct proximity to the lane drop from two to one southbound lane. However, the issues of the side-street delay at these locations are improved due to the mitigations of restricting movements to right turn only onto Highland Drive.

As mentioned above, the signal timing at the intersection of Highland Drive / 3300 South was re-timed to accommodate for the additional traffic on 3300 South due to the diversion of traffic. This impacted the northbound approach at that location, still causing queues to build up past the Highland Drive / 3350 South intersection. Due to the mitigations, the side-street delay is improved at the Highland Drive / 3350 South intersection, but the northbound approach now experiences high delays.





Not To Scale



AM PM **A B C D E F**  
 (XX) Intersection Level of Service  
 ↗ Turning Movement

XXX (XXX) AM (PM) Peak Hour Volume  
 Traffic Signal  
 Stop Sign

--- Millcreek Town Boundary

Figure 15

Future Plus Greatest Impact Scenario with Highland Drive Reconfiguration with Mitigations

## Conclusions and Recommendations

The LOS summary of the existing conditions and future conditions for all scenarios are presented in **Table 24** and **Table 25**, respectively. The travel time on Highland Drive between Luck Lane and Richmond Street was also measured from the models, and the results are presented in **Table 26**.

When traffic generated by the greatest impact scenario is added to the road network in the Millcreek City Center area, the analysis indicated that:

- Under the greatest impact scenario conditions, several intersections will be near-failing or failing, most notably including Highland Drive and 3300 South.
- The Highland Drive reconfiguration adds substantial delay for northbound and southbound traffic on Highland. Northbound trips are delayed due to northbound throughs merging at 3300 South, and queues spilling back to 3350 South, while southbound trips experience delays due to the lane drop north of Elgin Avenue, as well as queues spilling back from Miller Avenue to Gunn Avenue.
- The travel time on Highland Drive nearly doubles from existing conditions in the future greatest impact scenario conditions with the Highland Drive reconfiguration, mostly due to the bottlenecks at the intersections where Highland Drive cross-section drops from two lanes to one lane in each direction.
- Mitigations to the Highland reconfiguration help improve delay at the side-streets on Highland Drive, but adds strain to the traffic on 3300 South, especially at the intersection of Highland Drive / 3300 South. The mitigations do not resolve the fundamental bottleneck at Highland Drive / 3300 South.
- Highland Drive is a Millcreek facility; the City may therefore choose its own relative prioritization of economic development, placemaking objectives, and vehicle mobility. However, UDOT may have concerns about operational impacts to east/west traffic on 3300 South under the Highland Drive reconfiguration.
- This greatest impact scenario posits a substantial quantity of redevelopment in the study area, and with reduced capacity on Highland Drive, the impacts on traffic operations caused by the trips generated under the greatest impact scenario are difficult to address without mitigations that enhance capacity and/or connectivity in the City Center's road network.



**Table 24 Existing Peak Hour Level of Service Summary**

Intersection				Existing	Existing + Greatest Impact	Existing + Greatest Impact – Highland Reconfiguration	Existing + Greatest Impact – Highland Reconfiguration with Mitigations
ID	Location	Control	Period	LOS & Sec/Veh	LOS & Sec/Veh	LOS & Sec/Veh	LOS & Sec/Veh
1	1300 East / 3300 South	Signal	AM	22 / C	30 / C	30 / C	29 / C
			PM	24 / C	46 / D	48 / D	49 / D
2	1300 East / Brickyard Road	Signal	AM	4 / A	4 / A	4 / A	4 / A
			PM	11 / B	11 / B	11 / B	11 / B
3	Richmond Street / Miller Avenue	Side-Street Stop	AM	8 / A	13 / B	14 / B	14 / B
			PM	9 / A	14 / B	14 / B	17 / C
4	Richmond Street / Gunn Avenue	Side-Street Stop	AM	7 / A	16 / C	15 / C	22 / C
			PM	8 / A	16 / C	17 / C	21 / C
5	Richmond Street / Elgin Avenue	Side-Street Stop	AM	9 / A	12 / B	11 / B	14 / B
			PM	17 / C	23 / C	20 / C	26 / D
6	Highland Drive / Richmond Street	Signal	AM	22 / C	26 / C	25 / C	25 / C
			PM	32 / C	62 / E	67 / E	64 / E
7	Highland Drive / Elgin Avenue	Side-Street Stop	AM	14 / B	15 / C	22 / C	12 / B
			PM	19 / C	22 / C	66 / F	96 / F
8	Highland Drive / Gunn Avenue	Side-Street Stop	AM	8 / A	16 / C	28 / D	13 / B
			PM	13 / B	17 / C	73 / F	43 / E
9	Highland Drive / Miller Avenue	Signal	AM	4 / A	9 / A	9 / A	10 / A
			PM	5 / A	11 / B	22 / C	23 / C
10	Highland Drive / Woodland Avenue	Side-Street Stop	AM	9 / A	8 / A	13 / B	14 / B
			PM	13 / B	15 / C	60 / F	23 / C
11	Highland Drive / 3300 South	Signal	AM	24 / C	29 / C	38 / D	36 / D
			PM	26 / C	47 / D	64 / E	64 / E
12	Highland Drive / 3350 South	Side-Street Stop	AM	11 / B	17 / C	77 / F	32 / D
			PM	12 / B	63 / F	212 / F	81 / F
13	Highland Drive / Luck Lane	Signal	AM	2 / A	2 / A	2 / A	2 / A
			PM	5 / A	7 / A	5 / A	26 / C

**Table 25 Future Peak Hour Level of Service Summary**

ID	Intersection			Future	Future + Greatest Impact	Future + Greatest Impact – Highland Reconfiguration	Future + Greatest Impact – Highland Reconfiguration with Mitigations
	Location	Control	Period	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>	LOS & Sec/Veh <sup>1</sup>
1	1300 East / 3300 South	Signal <sup>2</sup>	AM	23 / C	33 / C	31 / C	33 / C
			PM	25 / C	56 / E	61 / E	64 / E
2	1300 East / Brickyard Road	Signal	AM	4 / A	4 / A	4 / A	4 / A
			PM	11 / B	11 / B	11 / B	13 / B
3	Richmond Street / Miller Avenue	Side-Street Stop	AM	7 / A	14 / B	14 / B	14 / B
			PM	9 / A	15 / B	14 / B	16 / C
4	Richmond Street / Gunn Avenue	Side-Street Stop	AM	7 / A	15 / C	15 / C	25 / C
			PM	10 / B	19 / C	18 / C	20 / C
5	Richmond Street / Elgin Avenue	Side-Street Stop	AM	9 / A	11 / B	11 / B	13 / B
			PM	21 / C	26 / D	22 / C	19 / C
6	Highland Drive / Richmond Street	Signal <sup>2</sup>	AM	23 / C	27 / C	27 / C	26 / C
			PM	36 / D	58 / E	60 / E	77 / E
7	Highland Drive / Elgin Avenue	Side-Street Stop	AM	15 / C	15 / C	25 / D	13 / B
			PM	19 / C	21 / D	120 / F	179 / F
8	Highland Drive / Gunn Avenue	Side-Street Stop	AM	8 / A	15 / C	32 / D	12 / B
			PM	11 / B	19 / C	112 / F	52 / F
9	Highland Drive / Miller Avenue	Signal	AM	4 / A	9 / A	10 / A	10 / B
			PM	5 / A	12 / B	23 / C	26 / C
10	Highland Drive / Woodland Avenue	Side-Street Stop	AM	10 / A	13 / B	18 / C	14 / B
			PM	13 / B	16 / C	65 / F	27 / D
11	Highland Drive / 3300 South	Signal	AM	25 / C	30 / C	44 / D	39 / D
			PM	27 / C	58 / E	95 / F	82 / F
12	Highland Drive / 3350 South	Side-Street Stop	AM	10 / B	16 / C	112 / F	53 / F
			PM	16 / C	109 / F	250 / F	139 / F
13	Highland Drive / Luck Lane	Signal	AM	2 / A	2 / A	4 / A	3 / A
			PM	5 / A	12 / B	42 / D	42 / D



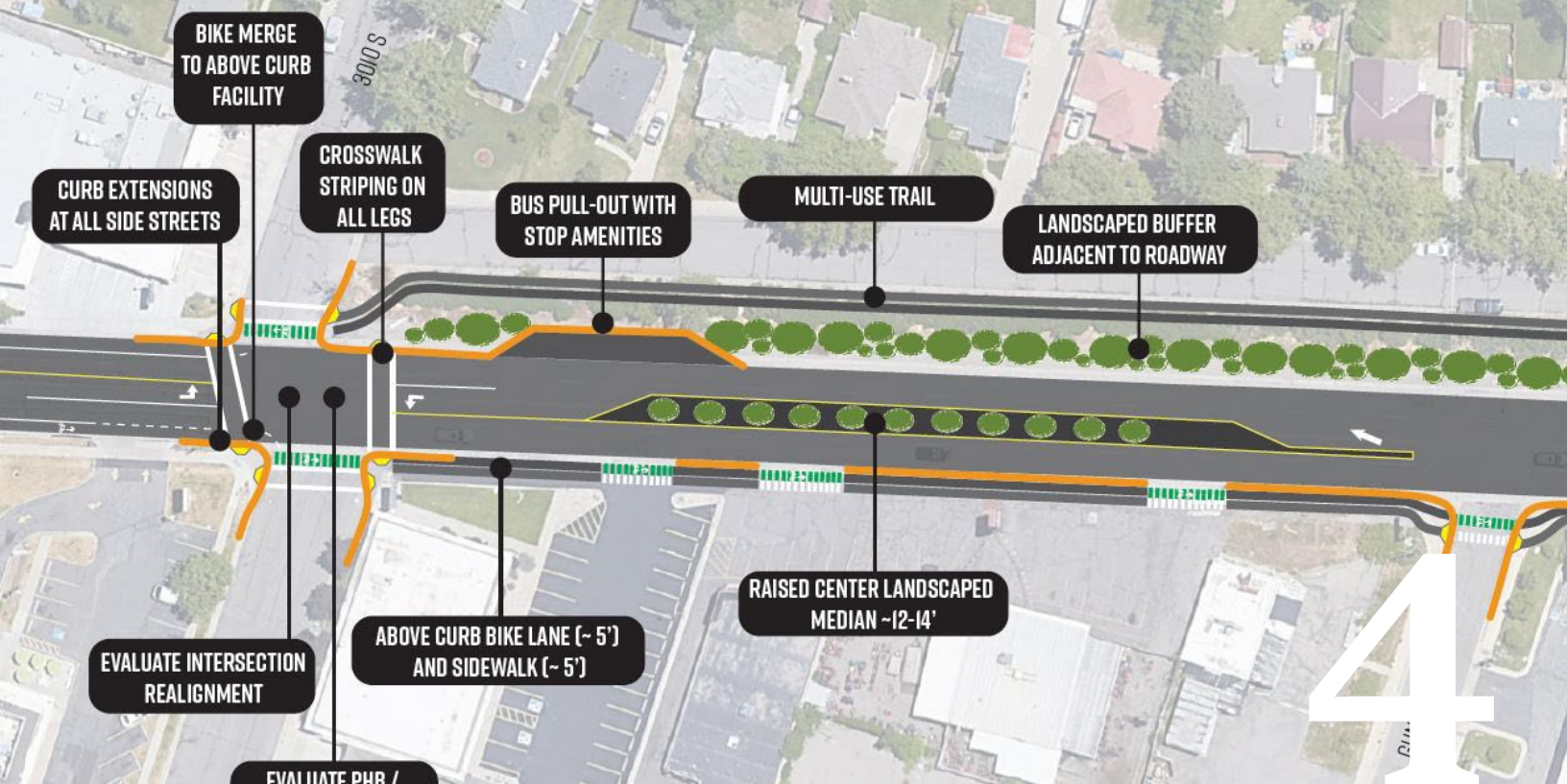


**Table 26 Highland Drive Travel Time Summary**

Direction	Travel Time (min:sec) <sup>1</sup>				
	Existing PM	Future Background PM	Future + Greatest Impact PM	Future + Greatest Impact PM – Highland Reconfiguration	Future + Greatest Impact PM – Highland Reconfiguration with Mitigations
<b>Northbound</b>	2:45	2:45	3:15	5:30	5:45
<b>Southbound</b>	2:45	2:45	3:15	5:30	6:30

1. Travel time rounded to nearest 15 seconds.

Source: Fehr & Peers, 2019



# Complete Streets Evaluation

## Complete Streets Evaluation

Based on the results of the traffic analysis described in Chapter 2 (above), the project team examined how space made available through a lane reconfiguration of Highland Drive could be reallocated to improve the street's functionality for non-automotive modes (including transit, bicycles, scooters, and pedestrians), enhance safety for all users, and create a more pleasant streetscape than what currently exists on this corridor. Transforming Highland Drive into a *complete street* that provides safe and comfortable facilities for all modes of transportation will provide a foundation for planned redevelopment and create a distinctive and aesthetically pleasing gateway into Millcreek's City Center neighborhood.

Today, Highland Drive's design is primarily oriented towards vehicular mobility and access to adjacent land uses. The existing four-lane cross-section precludes many other uses of the roadway, including parking, transit facilities, and bike lanes. As a consequence of this allocation of road space, a number of existing issues are present in this corridor:

- Vehicles tend to travel above the posted speed limit of 35MPH, due to the straight and open character of the roadway, lack of intersection controls through the corridor, and lack of street trees or other features with a traffic calming effect.

- Lack of a center turn lane results in left turning vehicles blocking the inside through lane, which results in weaving by vehicles who want to avoid stopping behind the vehicles waiting to turn left. Abrupt lane weaving is a safety concern.
- Curb radii at intersections are often designed to prioritize vehicular turning movements at the expense of longer and more exposed pedestrian crossings.
- The outer travel lanes leave little room for a shoulder or buffer between vehicles traveling at high speeds, and people walking on adjacent sidewalks or waiting for a bus.
- The lack of bicycle facilities on Highland Drive, coupled with high vehicular travel speeds, make this an uncomfortable route for cyclists who are not confident taking a full lane and riding in mixed traffic.
- Frequent and extended accesses to private parking lots are prevalent across the corridor, particularly on the western side of Highland Drive, creating large areas in which pedestrians and vehicles entering/exiting adjacent land uses are in conflict with each other.
- Street lighting is only provided sporadically through the corridor, creating areas that may feel unsafe for non-motorists outside of daylight hours.
- Pedestrian crossings across Highland Drive are only provided at selected intersections; this inhibits pedestrian access from adjacent neighborhoods, as well as encouraging visitors to drive rather than walk between local destinations if they are patronizing multiple businesses.
- The landscaped buffer to the east of Highland between Elgin Avenue and Miller Avenue is underutilized and under-maintained.

Millcreek’s adopted [City Center Master Plan](#) lays out a set of goals and vision statements that describe what the community would like to see the City Center area become. Two of these goals are to create “a walkable urban place that is iconic” and that “design should support transportation alternatives.” Envisioning Highland Drive as a complete street directly supports these key goals by creating a streetscape where:

- People can safely travel on foot or by bicycle;
- The street includes greenery, shade, lighting, and gateway features that make it a visually appealing place to live, work, and visit;
- Transit users can wait for, board, and alight from buses in safety and comfort;
- Vehicle speeds, lane weaving, and noise are reduced.

## Recommended Improvements

In order to address the conditions and deficiencies describe above, the project team assessed opportunities to implement complete streets design elements on Highland Drive between Millcreek's northern municipal boundary and 3300 South. Illustrations depicting key recommendations for the corridor are presented in Appendix A, while a conceptual cross-section illustration is shown in **Figure 16** (below).

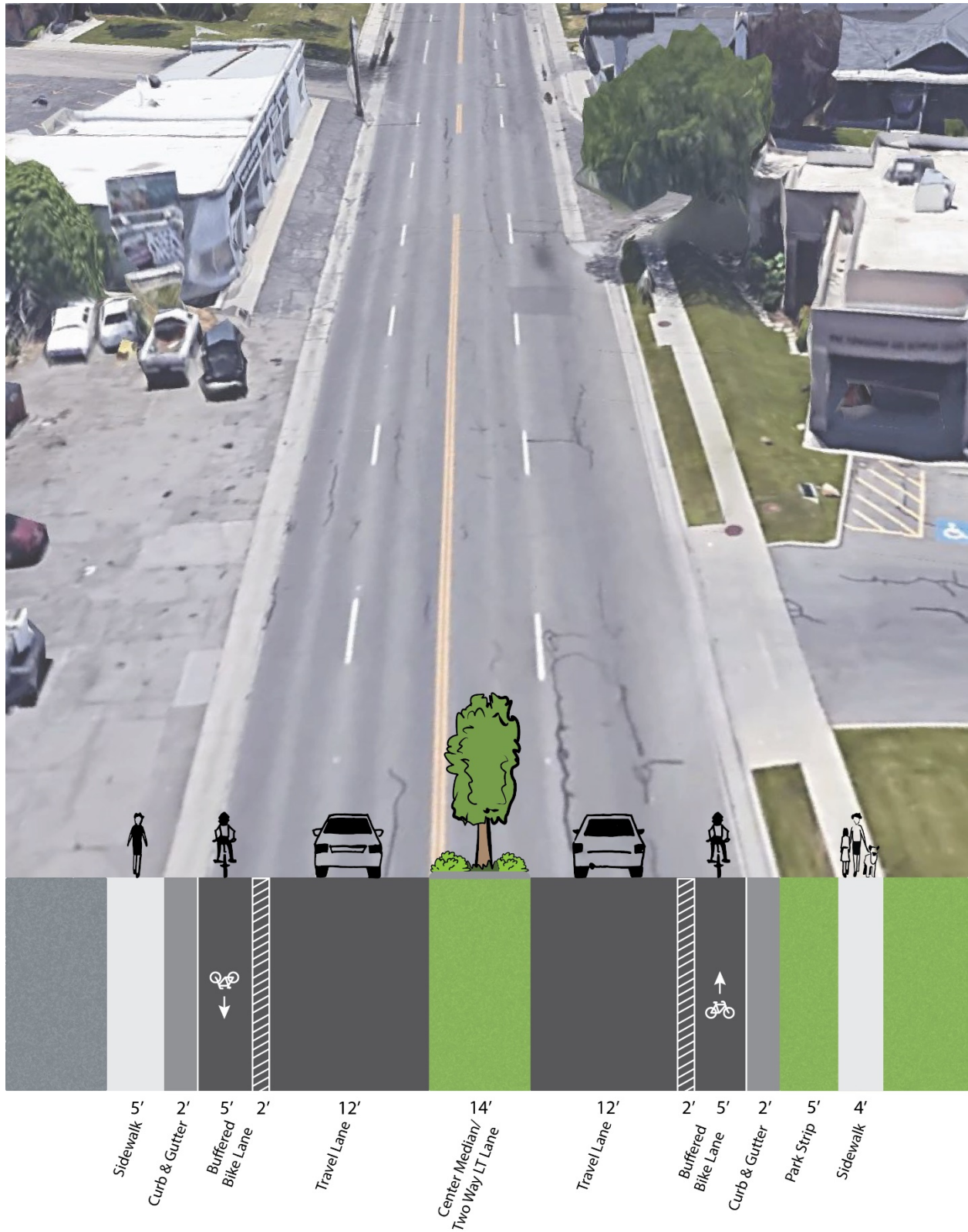
Recommendations for implementation throughout the corridor include the following:

- Implementing dedicated bicycle facilities running in both directions, ranging from unbuffered bike lanes to a fully separated multi-use path, depending on right-of-way availability.
- Creating center raised medians with trees and/or other vegetation, where appropriate, which provide benefits including beautification, traffic calming, access management, and creating opportunities for monument signage or other gateway features that provide a sense of arrival and define the City Center area as a distinctive place.
- Consolidating business accesses where feasible, in order to reduce conflict points with bicyclists and pedestrians and improve traffic flow; this may include formalizing accesses to businesses that currently have continuous access to Highland Drive, and replacing rolled curbs with vertical curb and gutter to better delineate space for pedestrians and vehicles.
- Creating curb bulb-outs and marked crosswalks at Highland Drive intersections where these features do not currently exist to improve pedestrian visibility, reduce pedestrian crossing distances, and slow turning vehicles, all of which enhance pedestrian safety and comfort.
- Enhancing street lighting to provide a consistently lit corridor for pedestrians and other users wherever sidewalks are present.





Figure 16: Highland Drive Proposed Cross-Section Illustration



In conversations with businesses owners, city staff heard concerns that delivery vehicles (including truck and trailer vehicles) used by existing businesses may have difficulty navigating recommended improvements, such as reduced access widths, curb bulb-outs, and center raised medians/left turn restrictions. At locations where delivery vehicle access may conflict with these recommendations, refined designs should accommodate existing delivery vehicles while limiting their interactions with pedestrian and bicycle facilities to the greatest extent feasible.

Access management, a process of regulating public access to and from properties adjacent to a roadway corridor, is an important recommendation of this plan. Common access management tools include curbed medians, driveway consolidation, and turn restrictions (e.g. right-in-right-out driveway). Where access is managed, driveways and side streets are designed to enable vehicles to enter and leave the roadway with minimal disruption to vehicle flow. Where there is no access management, turning vehicles can increase crash potential, reduce capacity, and erode the mobility of a corridor. The reduction in frequency and severity of crashes is important from a public safety perspective, but crash reduction also improves travel reliability since crash incidents can create substantial traffic congestion. In the context of study area, good access management practices may forestall need for roadway widening and improve safety for cyclists and pedestrians using the multi-use trail that crosses driveways and sidestreets.

Several locations were also considered in greater detail. At 3000 South, vehicles making westbound left turns have limited space to do so due to the intersection's close proximity to 3010 South. Vehicles making this turning movement may face high volumes of conflicting vehicular traffic and have difficulty making this movement safely. Signage restricting left turns during the AM and PM peak hours may be appropriate in this location.

At the Elgin Avenue/3010 South intersection, the two side-street approaches are misaligned with each other. Reconfiguration of Highland Drive may present an opportunity to realign this intersection, which may be feasible with limited or no private property acquisitions. Currently, existing pedestrian volumes at this location do not warrant additional intersection controls. However, as redevelopment occurs this location may become a candidate for installing pedestrian crossing signals, such as a pedestrian hybrid beacon (PHB).

The existing vegetated strip between Highland Drive and Mountair Drive provides an opportunity for both beautification and new amenities. Relocating the landscaped buffer to be immediately adjacent to the roadway would allow for a multi-use path to be installed on the

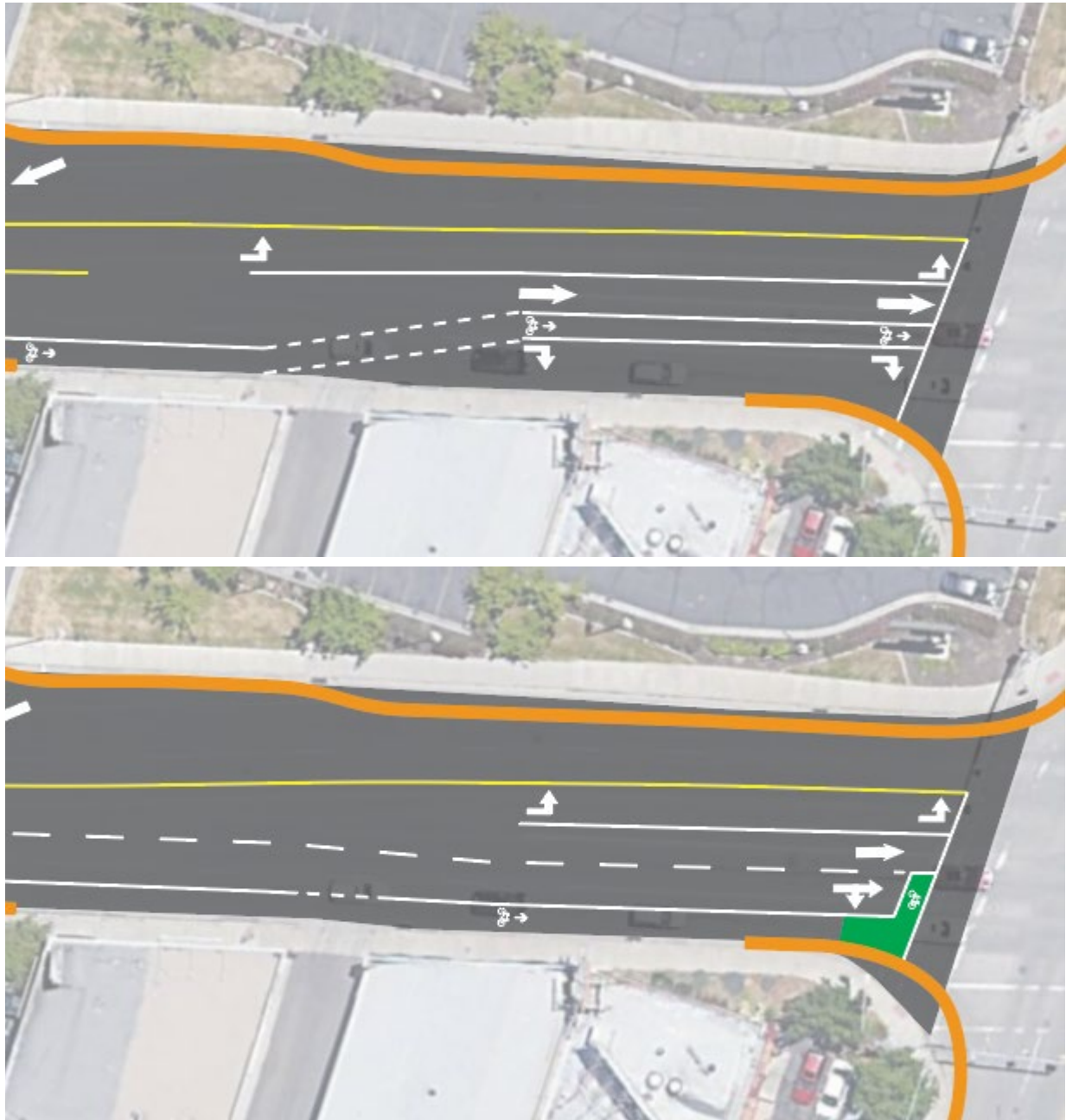


eastern side of this property. This would serve a dual function of providing traffic calming effects on Highland Drive, as well as creating a higher-comfort environment for pedestrians and bicyclists. The existing bus stops along this strip could be improved to provide bus pull-outs and improved stop amenities.

The eastern and western legs of Woodland Avenue as it intersects Highland Drive are offset by approximately 60'. Because Woodland's eastern leg is located to the south of its western leg, two vehicles attempting to simultaneously make northbound and southbound left turns onto Woodland from a two-way left turn lane at this location would conflict with each other. While the existing volumes of vehicles observed making these left turn movements at this location are fairly low (<10 potential conflicts per peak hour), restricting either northbound or southbound left turns is necessary to prevent conflicts. Under both observed conditions and projected future conditions, a northbound left turn restriction is less impactful and is therefore recommended. However, as redevelopment occurs in the City Center area, opportunities to realign this intersection and eliminate the offset between the eastern and western legs of Woodland should be sought out.

At the southern terminus of the study area, a painted 'bike box' should be provided in front of the head of the outer lane of traffic. The bike box is a painted area of pavement that provides a visible place for bicyclists to queue ahead of traffic during a red signal phase, and helps to prevent 'right hook' accidents with vehicles making right turns when the green signal phase begins. However, use of the bike box requires a right turn on red prohibition for the southbound approach to the intersection. If preserving right turns on red is desired at this location, an alternative configuration would be to reduce the number of southbound through lanes at this approach from two to one; provide a dedicated right turn lane; and provide a through bike lane to the left of the right turn lane, with clear striping, coloring, and signage. **Figure 17** below shows a comparison of these two potential options for the southbound approach to the Highland Drive/3300 South intersection.





*Figure 17: Through Bike Lane with Right Turn Lane (Top) and Bike Box with Shared Through/Right (Bottom) at Highland Drive/3300 South Intersection*





# Recommendations and Implementation

Based on the project team’s analysis of current and future traffic conditions and conceptual design analysis, reconfiguration of Highland Drive into a three-lane cross-section with complete streets improvements can enhance the street’s character, support redevelopment of the Millcreek City Center area, and improve safety and accessibility for bicyclists, pedestrians, and transit users, while preserving acceptable automotive traffic operations through the study area under market-driven estimates of 2030 background and redevelopment conditions. However, under the maximum buildout conditions posited by the ‘greatest impact’ scenario assessed in Chapter 3, the complete streets enhancements would come with a tradeoff of substantially increased delay, congestion, and travel times through the Highland Drive corridor.

Our analysis of traffic conditions under existing intersection controls compared to roundabouts suggests that existing intersection controls will provide better circulation through the study area, as roundabouts are likely to increase delays for side-street approaches to Highland Drive. Many of the desired benefits of roundabouts (including traffic calming, gateway features, and green space) can be achieved through the use of planted center medians where full left-turn access is not required.

The removal of two through lanes in favor of a two-way left turn lane on Highland Drive does not cause unacceptable impacts to traffic operations under market-driven estimates of 2030

development. However, this removal of roadway capacity under the 'greatest impact' scenario results in substantial congestion and delay, especially at the northbound and southbound chokepoints where Highland Drive's cross-section goes from two through lanes to one. Operational impacts at these locations may affect upstream intersections, including having potential negative effects on east/west operations on 3300 South.

The lane reconfiguration provides opportunities to implement dedicated bike lanes, install center medians, fill in sidewalk gaps, provide left turn lanes, build intersection bulb-outs, and create dedicated bus pull-out locations. Complementary measures such as lighting enhancements, gateway features (e.g. monument signage and/or public art in center medians), landscaping, and street furnishings should be pursued to enhance the value of these measures and further create a streetscape that is inviting and aesthetically pleasing. Finally, longer-term opportunities that should be considered include realignment of misaligned intersections, consolidation/formalization of business accesses, and installation of pedestrian hybrid beacons or other treatments.

In order to ensure that the final design for an improved Highland Drive meets the goals of Millcreek and local stakeholders, a phased implementation approach may be desirable. For example, a first phase could involve restriping the road to implement the new lane configuration, including buffered and unbuffered bike lanes and marked pedestrian crossings. This phase could also include low-cost temporary installations of raised medians, curb extensions, and turn restrictions in order to evaluate how these features perform with respect to delivery vehicle access and queuing in left turn lanes. Permanent installations of planted center raised medians, curb extensions, new/enhanced sidewalks and above-curb bike facilities, bus pull-outs, street lighting, and similar amenities could then be implemented as a more intensive second phase. Any remaining improvements that are not possible or prioritized during phase two implementation could be reserved for a third phase as funding and/or redevelopment opportunities allow.

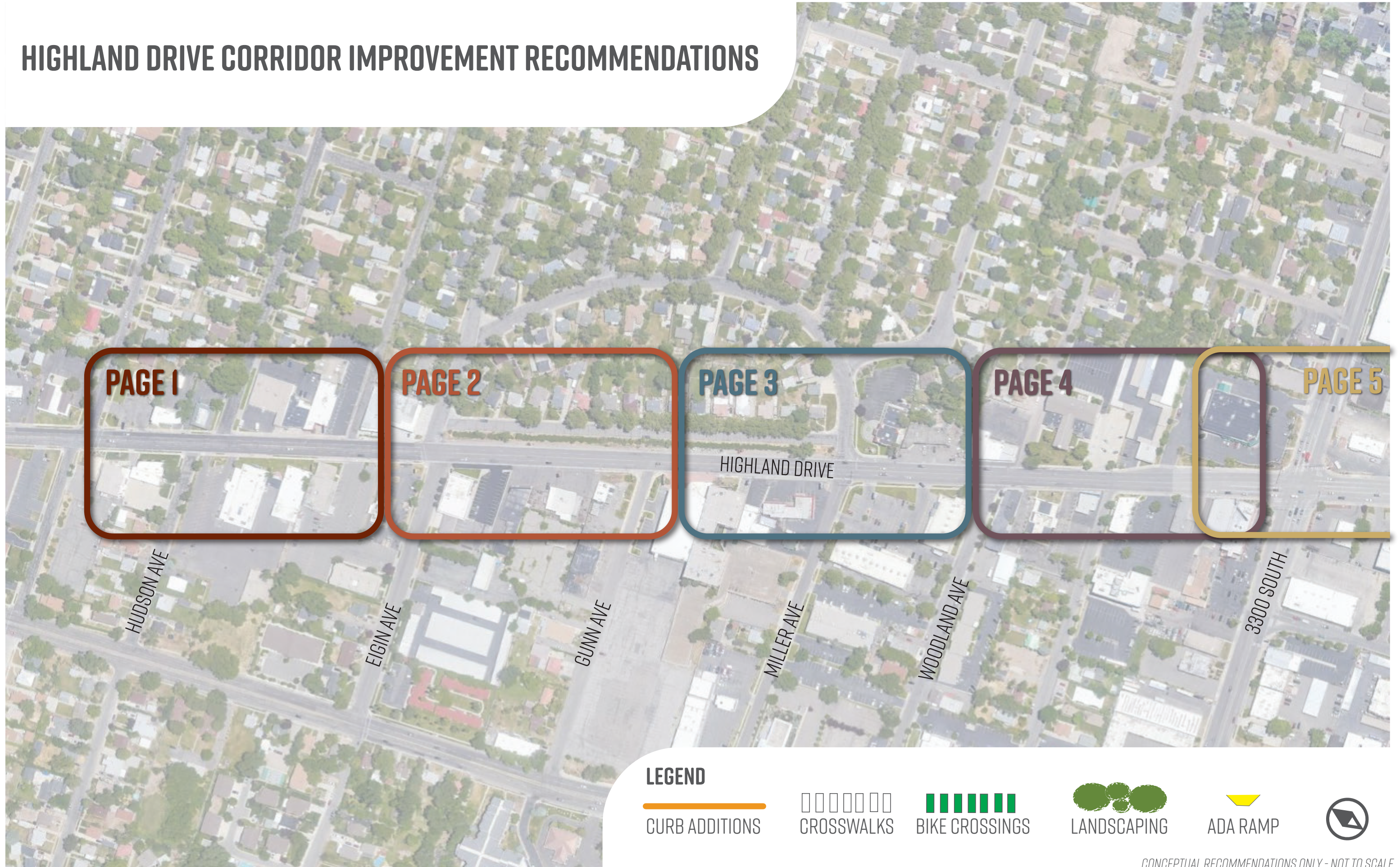


# Appendix A:

## Highland Drive Concept Illustrations



# HIGHLAND DRIVE CORRIDOR IMPROVEMENT RECOMMENDATIONS



## LEGEND

 CURB ADDITIONS

 CROSSWALKS

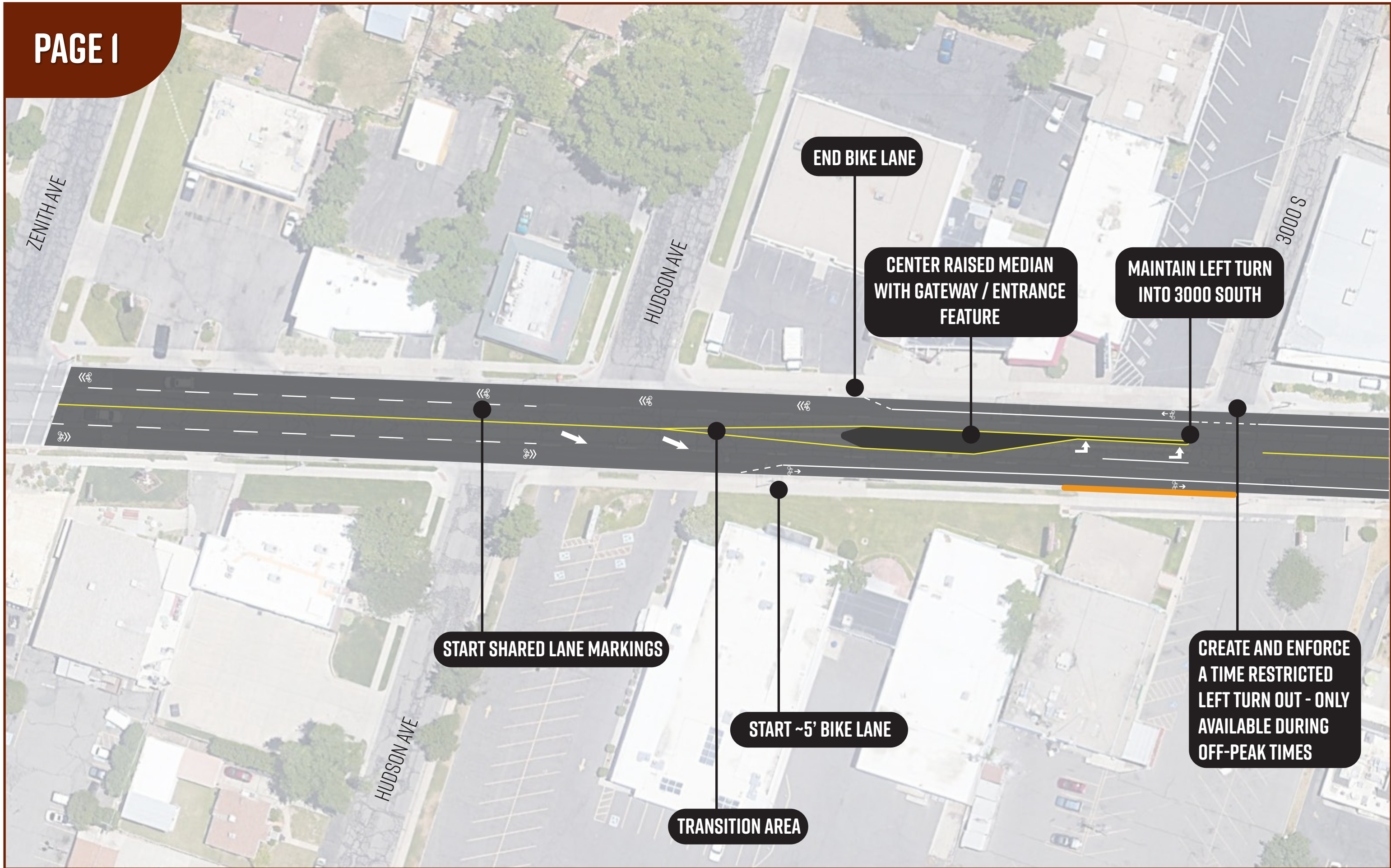
 BIKE CROSSINGS

 LANDSCAPING

 ADA RAMP







END BIKE LANE

CENTER RAISED MEDIAN WITH GATEWAY / ENTRANCE FEATURE

MAINTAIN LEFT TURN INTO 3000 SOUTH

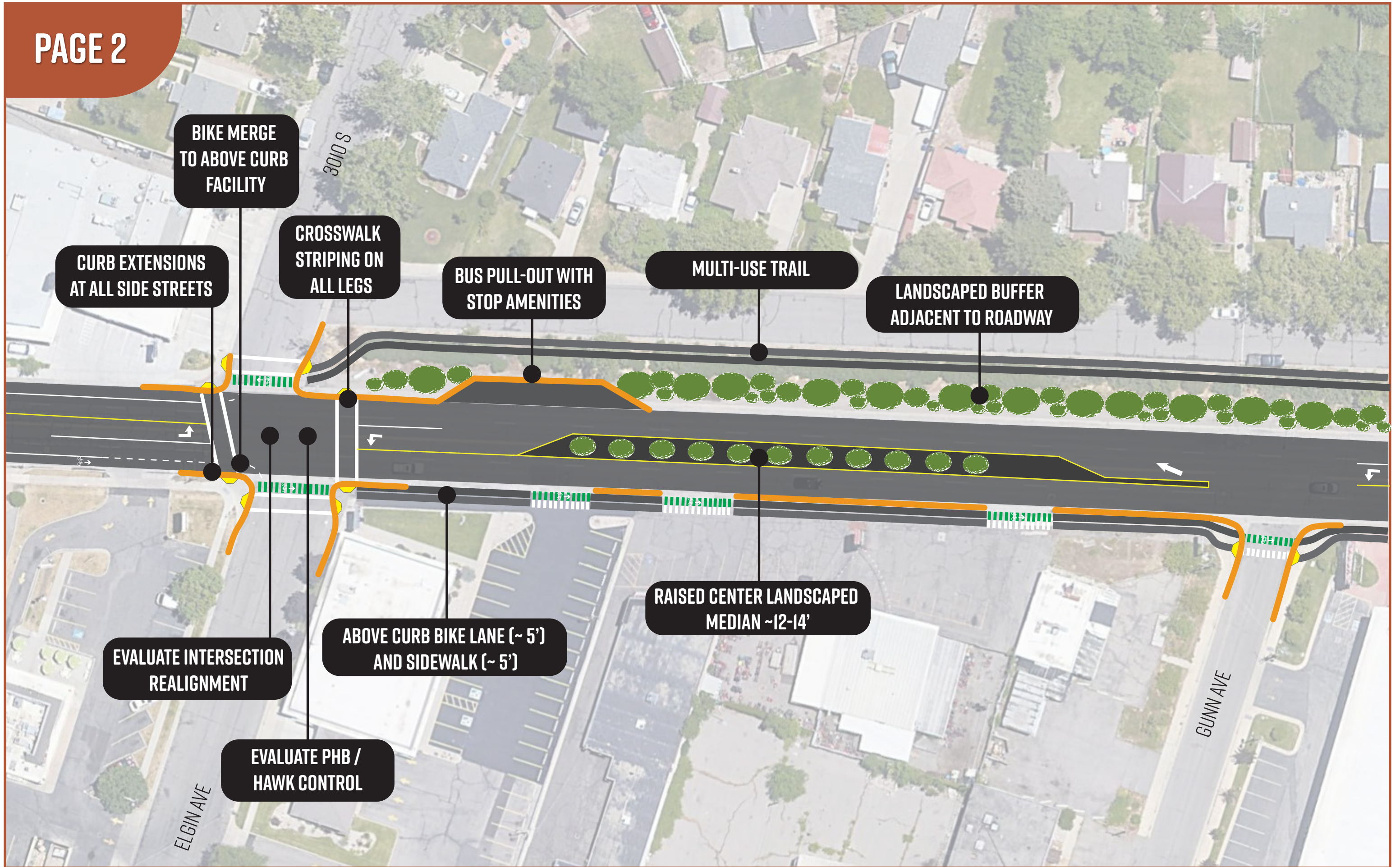
START SHARED LANE MARKINGS

START ~5' BIKE LANE

TRANSITION AREA

CREATE AND ENFORCE A TIME RESTRICTED LEFT TURN OUT - ONLY AVAILABLE DURING OFF-PEAK TIMES





BIKE MERGE TO ABOVE CURB FACILITY

CURB EXTENSIONS AT ALL SIDE STREETS

CROSSWALK STRIPING ON ALL LEGS

BUS PULL-OUT WITH STOP AMENITIES

MULTI-USE TRAIL

LANDSCAPED BUFFER ADJACENT TO ROADWAY

EVALUATE INTERSECTION REALIGNMENT

EVALUATE PHB / HAWK CONTROL

ABOVE CURB BIKE LANE (~ 5') AND SIDEWALK (~ 5')

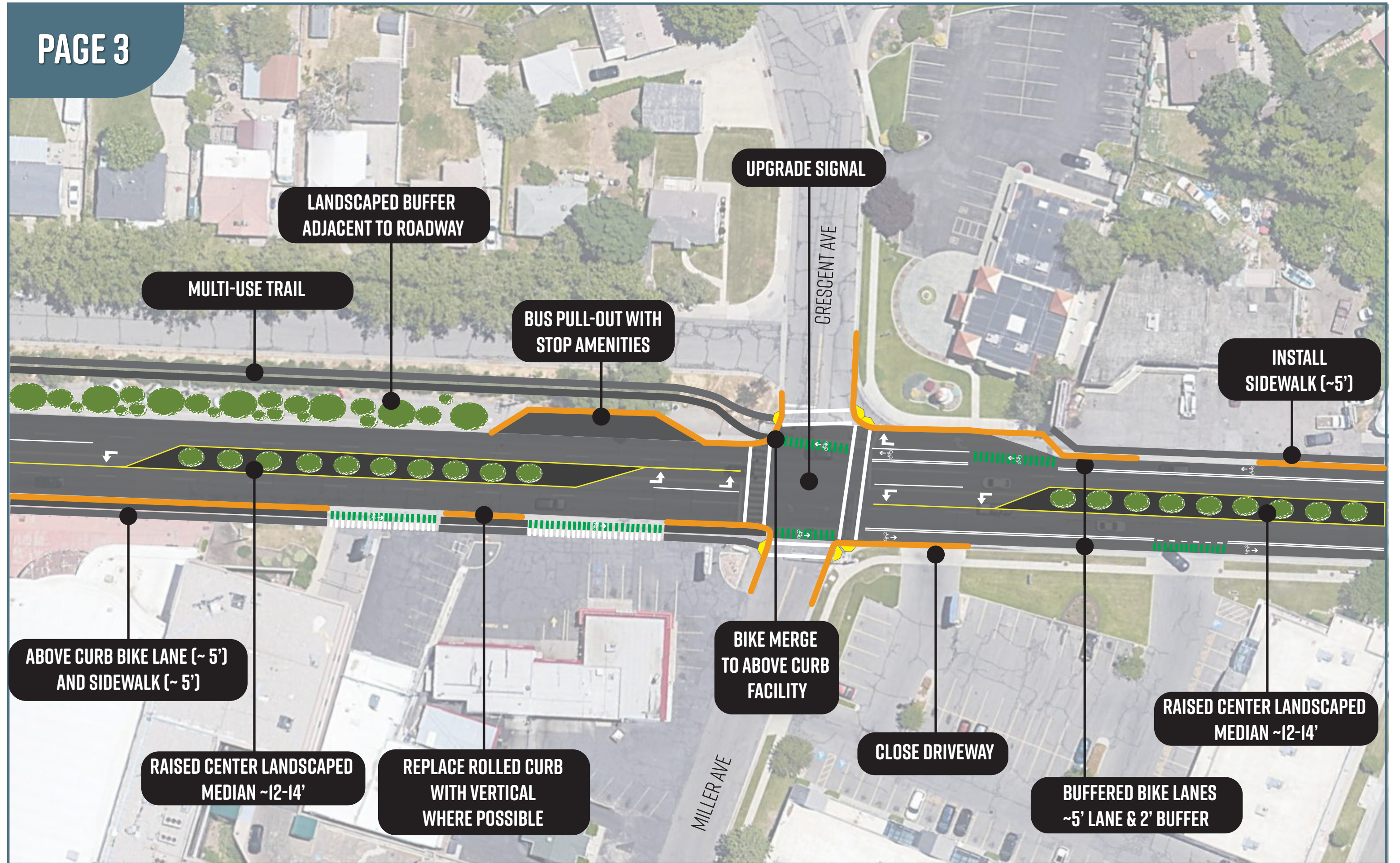
RAISED CENTER LANDSCAPED MEDIAN ~12-14'

3010 S

ELGIN AVE

GUNN AVE





LANDSCAPED BUFFER  
ADJACENT TO ROADWAY

MULTI-USE TRAIL

BUS PULL-OUT WITH  
STOP AMENITIES

UPGRADE SIGNAL

INSTALL  
SIDEWALK (~5')

ABOVE CURB BIKE LANE (~ 5')  
AND SIDEWALK (~ 5')

BIKE MERGE  
TO ABOVE CURB  
FACILITY

CLOSE DRIVEWAY

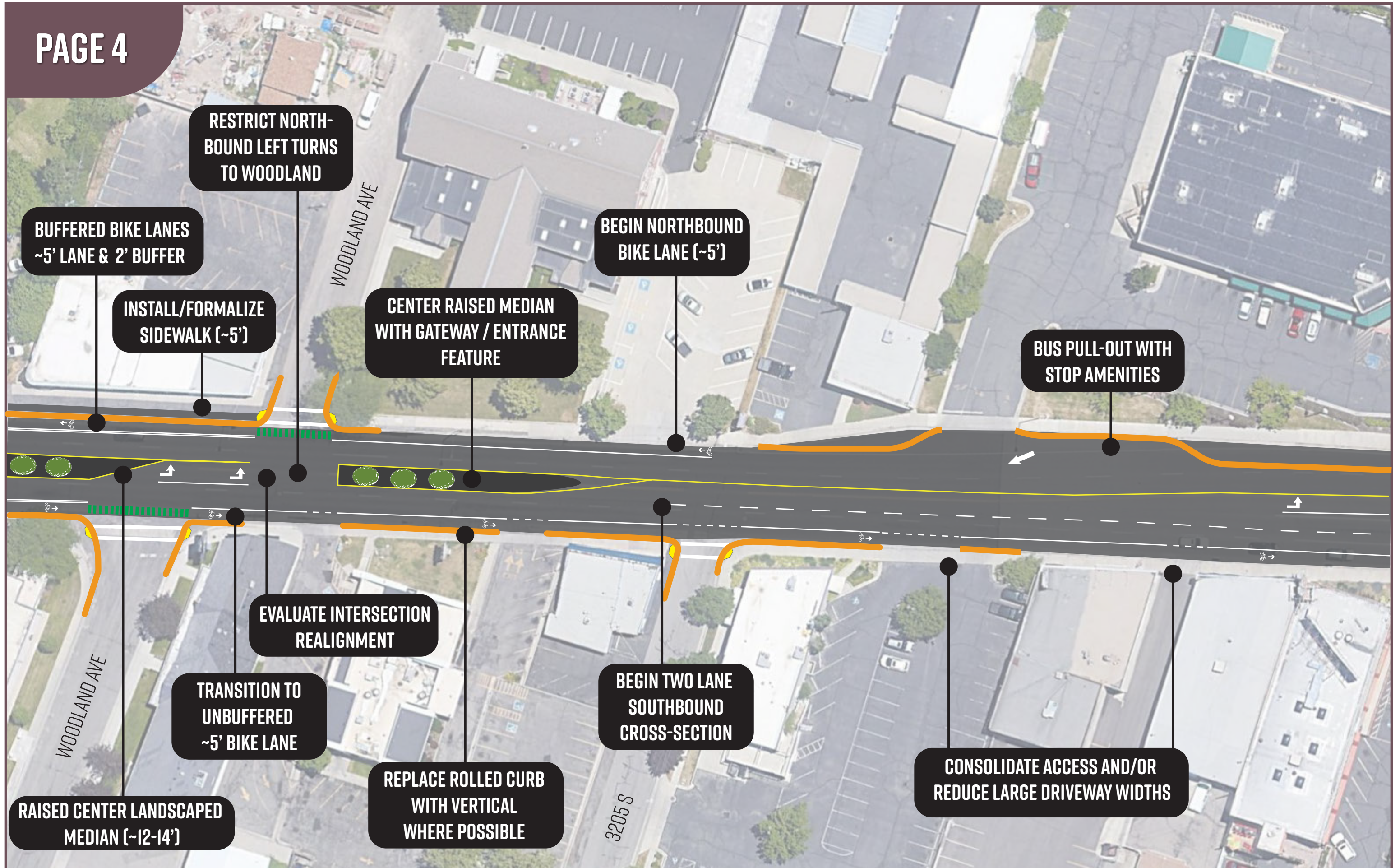
RAISED CENTER LANDSCAPED  
MEDIAN ~12-14'

RAISED CENTER LANDSCAPED  
MEDIAN ~12-14'

REPLACE ROLLED CURB  
WITH VERTICAL  
WHERE POSSIBLE

BUFFERED BIKE LANES  
~5') LANE & 2') BUFFER





**RESTRICT NORTH-BOUND LEFT TURNS TO WOODLAND**

**BUFFERED BIKE LANES ~5' LANE & 2' BUFFER**

**INSTALL/FORMALIZE SIDEWALK (~5')**

**CENTER RAISED MEDIAN WITH GATEWAY / ENTRANCE FEATURE**

**BEGIN NORTHBOUND BIKE LANE (~5')**

**BUS PULL-OUT WITH STOP AMENITIES**

**EVALUATE INTERSECTION REALIGNMENT**

**TRANSITION TO UNBUFFERED ~5' BIKE LANE**

**BEGIN TWO LANE SOUTHBOUND CROSS-SECTION**

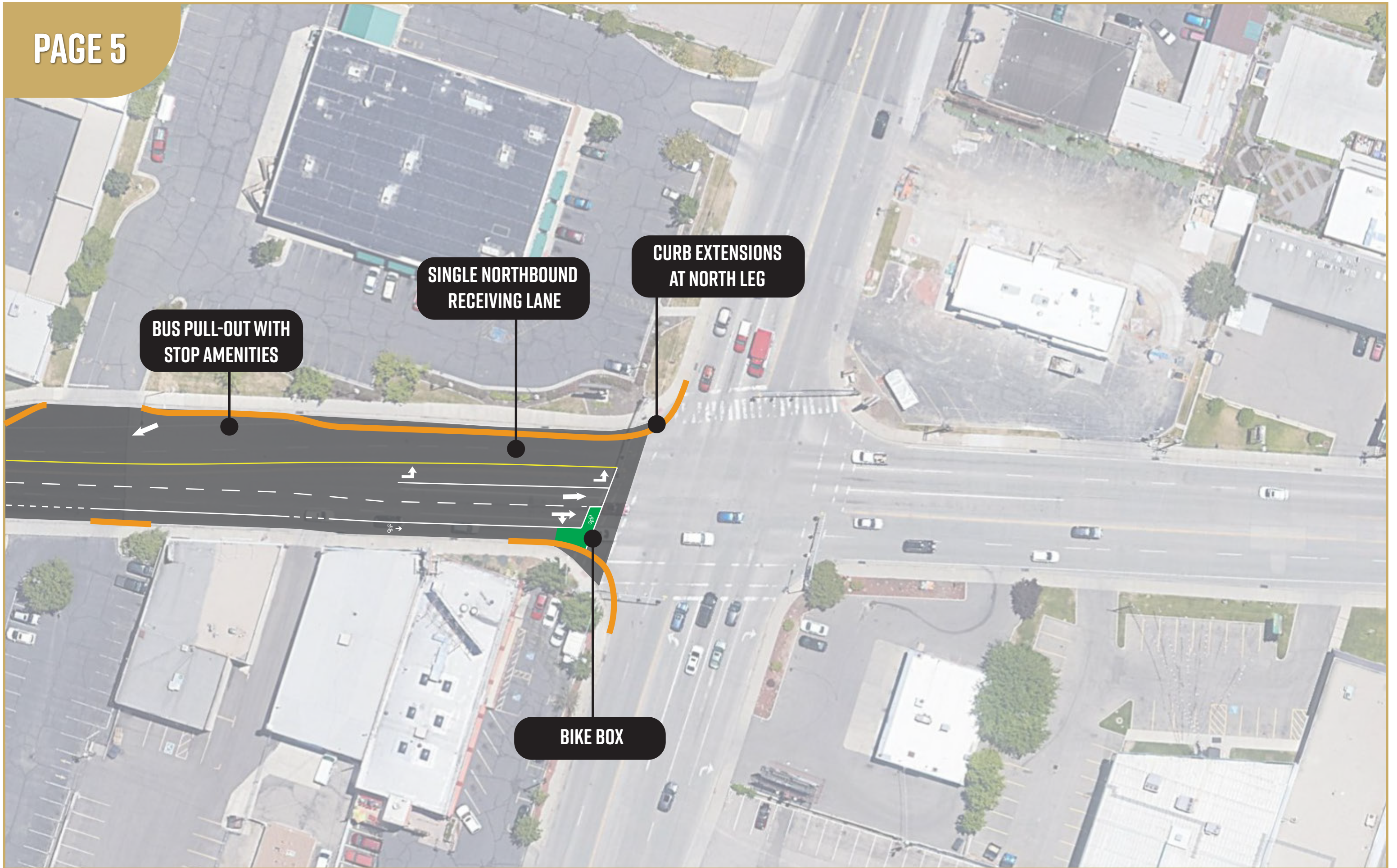
**CONSOLIDATE ACCESS AND/OR REDUCE LARGE DRIVEWAY WIDTHS**

**RAISED CENTER LANDSCAPED MEDIAN (~12-14')**

**REPLACE ROLLED CURB WITH VERTICAL WHERE POSSIBLE**

3205 S





**BUS PULL-OUT WITH  
STOP AMENITIES**

**SINGLE NORTHBOUND  
RECEIVING LANE**

**CURB EXTENSIONS  
AT NORTH LEG**

**BIKE BOX**



# Appendix B:

## Traffic Analysis Results

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	69	72	104.5%	44.5	6.8	D
	Through	370	365	98.7%	42.7	8.7	D
	Right Turn	132	134	101.7%	27.7	6.7	C
	Subtotal	571	572	100.1%	39.5	8.1	D
SB	Left Turn	61	59	97.2%	57.6	10.3	E
	Through	197	193	98.1%	40.4	5.5	D
	Right Turn	81	81	100.0%	5.4	1.2	A
	Subtotal	339	334	98.4%	35.7	4.0	D
EB	Left Turn	94	86	91.4%	17.0	4.3	B
	Through	415	423	101.8%	10.0	2.8	A
	Right Turn	32	32	98.8%	6.3	4.2	A
	Subtotal	541	540	99.8%	10.8	2.6	B
WB	Left Turn	91	93	102.3%	9.1	3.7	A
	Through	515	516	100.1%	6.5	2.0	A
	Right Turn	38	36	94.7%	4.2	3.5	A
	Subtotal	644	645	100.1%	6.7	2.0	A
Total		2,095	2,090	99.8%	21.6	3.2	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	32	100.6%	4.8	2.7	A
	Through	423	409	96.7%	2.2	0.5	A
	Right Turn						
	Subtotal	455	441	97.0%	2.4	0.6	A
SB	Left Turn						
	Through	338	336	99.4%	2.2	0.5	A
	Right Turn	138	142	103.2%	0.5	0.3	A
	Subtotal	476	479	100.5%	1.7	0.3	A
EB	Left Turn	88	88	99.5%	24.2	3.8	C
	Through						
	Right Turn	25	24	97.2%	4.7	1.1	A
	Subtotal	113	112	99.0%	20.7	3.3	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,044	1,032	98.8%	4.3	0.6	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	498	484	97.1%	0.1	0.0	A
	Right Turn	13	13	100.8%	0.0	0.0	A
	Subtotal	511	497	97.2%	0.1	0.0	A
SB	Left Turn	32	31	97.8%	2.9	1.7	A
	Through	473	476	100.7%	1.9	0.4	A
	Right Turn						
	Subtotal	505	508	100.5%	2.0	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	3	2	66.7%	9.0	9.3	A
	Through						
	Right Turn	4	3	72.5%	1.5	2.4	A
	Subtotal	7	5	70.0%	10.5	7.8	B
Total		1,023	1,009	98.7%	1.1	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	5	122.5%	0.5	0.4	A
	Through	495	479	96.8%	0.1	0.0	A
	Right Turn	3	3	83.3%	0.1	0.2	A
	Subtotal	502	487	97.0%	0.1	0.0	A
SB	Left Turn	2	2	105.0%	0.2	0.5	A
	Through	500	503	100.6%	0.2	0.0	A
	Right Turn	3	2	80.0%	0.4	0.6	A
	Subtotal	505	508	100.5%	0.2	0.0	A
EB	Left Turn	1	0	30.0%	0.9	2.7	A
	Through						
	Right Turn	7	7	95.7%	7.2	0.7	A
	Subtotal	8	7	87.5%	7.3	0.7	A
WB	Left Turn	3	2	76.7%	4.3	4.9	A
	Through						
	Right Turn	5	5	94.0%	5.6	0.9	A
	Subtotal	8	7	87.5%	6.1	0.9	A
Total		1,023	1,008	98.6%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	2	2	105.0%	0.1	0.1	A
	Through	486	472	97.1%	0.2	0.1	A
	Right Turn	13	11	84.6%	0.4	0.3	A
	Subtotal	501	485	96.8%	0.2	0.1	A
SB	Left Turn	9	10	110.0%	2.7	3.6	A
	Through	482	486	100.9%	0.3	0.2	A
	Right Turn	3	3	96.7%	0.4	0.4	A
	Subtotal	494	499	101.1%	0.4	0.2	A
EB	Left Turn	13	12	91.5%	6.5	0.7	A
	Through	4	4	87.5%	3.7	3.9	A
	Right Turn	17	17	97.6%	5.9	0.4	A
	Subtotal	34	32	94.1%	6.3	0.5	A
WB	Left Turn	6	5	86.7%	9.4	3.9	A
	Through						
	Right Turn	7	8	110.0%	6.0	0.4	A
	Subtotal	13	13	99.2%	8.0	1.7	A
Total		1,042	1,029	98.8%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	204	201	98.7%	61.5	5.2	E
	Right Turn	497	489	98.4%	3.1	0.9	A
	Subtotal	701	690	98.5%	21.2	2.8	C
SB	Left Turn	1	1	50.0%	26.7	44.0	C
	Through	79	79	99.4%	53.6	6.8	D
	Right Turn	37	38	101.4%	25.3	10.7	C
	Subtotal	117	117	99.6%	45.0	7.6	D
EB	Left Turn	70	68	96.4%	72.6	6.8	E
	Through	444	429	96.7%	6.6	1.1	A
	Right Turn	6	6	101.7%	5.7	8.6	A
	Subtotal	520	503	96.7%	14.9	2.8	B
WB	Left Turn	301	292	96.9%	56.1	10.7	E
	Through	489	497	101.6%	6.6	1.7	A
	Right Turn	14	15	103.6%	2.0	1.4	A
	Subtotal	804	803	99.9%	23.8	2.8	C
Total		2,142	2,113	98.6%	22.5	1.0	C



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	7	108.3%	0.9	1.0	A
	Through	603	597	99.0%	0.5	0.1	A
	Right Turn	3	2	76.7%	0.2	0.2	A
	Subtotal	612	606	99.0%	0.5	0.1	A
SB	Left Turn	13	13	98.5%	1.0	1.1	A
	Through	440	430	97.7%	0.3	0.1	A
	Right Turn	2	2	105.0%	0.1	0.2	A
	Subtotal	455	445	97.8%	0.3	0.1	A
EB	Left Turn	5	5	102.0%	7.0	8.7	A
	Through	4	5	117.5%	3.9	8.7	A
	Right Turn	8	7	90.0%	2.4	3.2	A
	Subtotal	17	17	100.0%	12.4	7.4	B
WB	Left Turn	8	7	91.3%	11.2	4.3	B
	Through	1	1	80.0%	3.9	5.8	A
	Right Turn	60	60	100.0%	8.4	1.1	A
	Subtotal	69	68	98.7%	8.8	1.5	A
Total		1,153	1,136	98.5%	1.2	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	94.0%	0.4	0.5	A
	Through	610	605	99.1%	0.2	0.0	A
	Right Turn						
	Subtotal	615	609	99.1%	0.2	0.0	A
SB	Left Turn						
	Through	451	439	97.3%	0.2	0.1	A
	Right Turn	5	6	110.0%	0.2	0.2	A
	Subtotal	456	444	97.5%	0.2	0.1	A
EB	Left Turn	2	2	75.0%	1.6	2.6	A
	Through						
	Right Turn	7	6	78.6%	6.8	3.0	A
	Subtotal	9	7	77.8%	6.9	3.0	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,080	1,061	98.2%	0.2	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	7	82.2%	1.5	1.5	A
	Through	585	578	98.8%	1.0	0.3	A
	Right Turn	18	16	88.9%	1.0	1.4	A
	Subtotal	612	601	98.3%	1.0	0.3	A
SB	Left Turn	6	5	80.0%	4.9	9.3	A
	Through	441	428	97.1%	3.9	1.3	A
	Right Turn	9	9	96.7%	1.5	1.9	A
	Subtotal	456	442	96.9%	3.9	1.3	A
EB	Left Turn	5	6	118.0%	17.9	16.3	B
	Through	5	5	98.0%	13.7	13.1	B
	Right Turn	7	6	91.4%	5.1	3.4	A
	Subtotal	17	17	101.2%	17.3	8.1	B
WB	Left Turn	22	21	96.4%	25.8	8.2	C
	Through	3	3	106.7%	10.5	17.7	B
	Right Turn	24	25	102.5%	8.8	5.9	A
	Subtotal	49	49	100.0%	17.5	6.5	B
Total		1,134	1,110	97.8%	3.3	0.8	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	8	97.5%	3.0	3.8	A
	Through	616	607	98.5%	0.5	0.2	A
	Right Turn	5	5	90.0%	0.3	0.3	A
	Subtotal	629	619	98.4%	0.5	0.2	A
SB	Left Turn	14	16	110.7%	3.9	2.8	A
	Through	450	436	96.8%	0.2	0.2	A
	Right Turn						
	Subtotal	464	451	97.2%	0.4	0.3	A
EB	Left Turn	3	2	70.0%	9.8	10.0	A
	Through	2	2	120.0%	6.7	8.5	A
	Right Turn	4	4	87.5%	5.3	3.0	A
	Subtotal	9	8	88.9%	10.6	3.3	B
WB	Left Turn	2	2	100.0%	5.0	3.6	A
	Through						
	Right Turn	12	10	83.3%	7.3	1.2	A
	Subtotal	14	12	85.7%	7.2	1.2	A
Total		1,116	1,090	97.7%	0.7	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	94	98	104.6%	48.8	10.5	D
	Through	473	463	97.9%	39.9	4.4	D
	Right Turn	114	116	101.8%	32.1	5.7	C
	Subtotal	681	677	99.5%	39.8	4.2	D
SB	Left Turn	71	68	95.4%	45.4	7.6	D
	Through	331	314	95.0%	37.7	4.5	D
	Right Turn	55	57	103.1%	27.5	7.0	C
	Subtotal	457	439	96.0%	37.4	4.0	D
EB	Left Turn	54	53	97.8%	13.6	5.3	B
	Through	423	433	102.3%	8.7	2.4	A
	Right Turn	125	124	99.4%	3.0	0.6	A
	Subtotal	602	610	101.3%	8.0	1.8	A
WB	Left Turn	115	118	103.0%	17.7	4.1	B
	Through	490	486	99.1%	13.1	1.9	B
	Right Turn	106	106	100.2%	8.0	3.3	A
	Subtotal	711	710	99.9%	13.2	2.0	B
Total		2,451	2,436	99.4%	24.0	1.7	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	714	711	99.6%	0.3	0.0	A
	Right Turn	3	3	103.3%	0.2	0.3	A
	Subtotal	717	714	99.6%	0.3	0.0	A
SB	Left Turn	4	2	60.0%	0.5	0.8	A
	Through	563	550	97.7%	0.1	0.0	A
	Right Turn						
	Subtotal	567	552	97.4%	0.1	0.0	A
EB	Left Turn	6	5	86.7%	14.8	5.2	B
	Through						
	Right Turn	1	1	80.0%	1.7	3.5	A
	Subtotal	7	6	85.7%	14.6	5.3	B
WB	Left Turn	6	4	70.0%	3.4	3.8	A
	Through						
	Right Turn	8	8	97.5%	3.5	3.9	A
	Subtotal	14	12	85.7%	6.1	2.6	A
Total		1,305	1,284	98.4%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	65	102.5%	42.0	3.5	D
	Through	312	307	98.5%	42.3	3.7	D
	Right Turn	94	96	102.4%	23.0	6.1	C
	Subtotal	469	468	99.9%	38.3	3.7	D
SB	Left Turn	208	205	98.4%	46.7	6.4	D
	Through	445	441	99.0%	39.8	3.8	D
	Right Turn	127	129	101.3%	7.3	1.4	A
	Subtotal	780	774	99.2%	36.7	2.6	D
EB	Left Turn	144	136	94.5%	21.0	2.6	C
	Through	576	580	100.7%	14.9	1.5	B
	Right Turn	73	75	103.0%	12.1	4.5	B
	Subtotal	793	791	99.8%	15.6	1.4	B
WB	Left Turn	121	119	98.0%	16.3	3.9	B
	Through	564	564	100.1%	9.0	1.4	A
	Right Turn	135	133	98.8%	5.9	2.4	A
	Subtotal	820	816	99.6%	9.6	1.3	A
Total		2,862	2,850	99.6%	23.8	1.2	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	103	101	97.8%	10.3	3.1	B
	Through	506	492	97.3%	2.8	0.7	A
	Right Turn						
	Subtotal	609	593	97.3%	4.0	0.7	A
SB	Left Turn						
	Through	747	743	99.4%	1.8	0.2	A
	Right Turn	269	271	100.8%	0.0	0.0	A
	Subtotal	1,016	1,014	99.8%	1.3	0.1	A
EB	Left Turn	309	306	98.9%	51.7	5.0	D
	Through						
	Right Turn	151	154	101.9%	5.9	0.6	A
	Subtotal	460	460	99.9%	36.9	3.6	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,085	2,066	99.1%	11.0	1.0	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	772	758	98.1%	0.2	0.0	A
	Right Turn	43	40	93.5%	0.0	0.0	A
	Subtotal	815	798	97.9%	0.2	0.0	A
SB	Left Turn	23	23	100.4%	2.9	2.3	A
	Through	1,001	1,001	100.0%	2.4	0.4	A
	Right Turn						
	Subtotal	1,024	1,024	100.0%	2.4	0.4	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	15	13	86.0%	9.0	4.4	A
	Through						
	Right Turn	29	28	97.2%	5.4	0.4	A
	Subtotal	44	41	93.4%	6.4	1.0	A
Total		1,883	1,863	98.9%	1.6	0.2	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	100.0%	3.3	8.8	A
	Through	794	781	98.4%	0.1	0.0	A
	Right Turn	3	3	83.3%	0.2	0.2	A
	Subtotal	801	787	98.3%	0.1	0.0	A
SB	Left Turn	3	3	90.0%	1.8	3.2	A
	Through	1,015	1,017	100.2%	0.3	0.0	A
	Right Turn	5	5	100.0%	0.4	0.4	A
	Subtotal	1,023	1,025	100.1%	0.3	0.0	A
EB	Left Turn	3	2	66.7%	4.0	5.4	A
	Through						
	Right Turn	5	5	102.0%	4.0	3.5	A
	Subtotal	8	7	88.8%	8.0	2.4	A
WB	Left Turn	4	2	50.0%	7.4	5.0	A
	Through						
	Right Turn	5	4	80.0%	4.0	3.7	A
	Subtotal	9	6	66.7%	8.1	3.4	A
Total		1,841	1,825	99.1%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	18	87.6%	8.0	3.3	A
	Through	757	746	98.6%	0.4	0.2	A
	Right Turn	24	22	91.7%	0.6	0.2	A
	Subtotal	802	787	98.1%	0.5	0.3	A
SB	Left Turn	12	15	123.3%	4.7	2.2	A
	Through	983	984	100.1%	0.8	0.2	A
	Right Turn	3	3	106.7%	0.4	0.6	A
	Subtotal	998	1,002	100.4%	0.9	0.2	A
EB	Left Turn	4	4	95.0%	6.4	6.5	A
	Through	5	4	88.0%	7.6	5.7	A
	Right Turn	16	16	98.1%	5.8	0.3	A
	Subtotal	25	24	95.6%	6.9	1.7	A
WB	Left Turn	24	24	99.6%	12.4	6.9	B
	Through	4	5	125.0%	15.6	17.0	C
	Right Turn	15	14	94.0%	8.2	2.1	A
	Subtotal	43	43	100.0%	11.3	2.7	B
Total		1,868	1,856	99.3%	1.0	0.2	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	7	120.0%	50.7	46.0	D
	Through	222	223	100.4%	53.9	5.5	D
	Right Turn	466	461	98.8%	2.3	0.7	A
	Subtotal	694	691	99.5%	18.8	2.2	B
SB	Left Turn	2	2	85.0%	14.2	31.3	B
	Through	287	287	100.1%	43.8	3.4	D
	Right Turn	200	198	98.9%	35.4	5.8	D
	Subtotal	489	487	99.5%	40.4	3.9	D
EB	Left Turn	164	160	97.6%	60.7	9.1	E
	Through	554	547	98.6%	28.7	2.2	C
	Right Turn	9	9	96.7%	18.8	9.5	B
	Subtotal	727	715	98.4%	35.6	3.4	D
WB	Left Turn	502	492	97.9%	64.8	23.7	E
	Through	850	852	100.2%	19.8	3.0	B
	Right Turn	33	35	106.7%	3.0	0.8	A
	Subtotal	1,385	1,379	99.5%	35.2	9.6	D
Total		3,295	3,271	99.3%	32.6	4.6	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	4	74.0%	0.3	0.4	A
	Through	693	693	100.0%	0.3	0.1	A
	Right Turn	18	18	100.6%	0.6	0.3	A
	Subtotal	716	715	99.8%	0.3	0.1	A
SB	Left Turn	62	67	108.4%	1.0	0.3	A
	Through	701	687	98.0%	0.5	0.1	A
	Right Turn	11	10	92.7%	0.5	0.2	A
	Subtotal	774	764	98.8%	0.5	0.1	A
EB	Left Turn	11	11	99.1%	17.3	7.6	C
	Through	2	3	140.0%	6.1	5.5	A
	Right Turn	27	26	97.0%	8.0	2.2	A
	Subtotal	40	40	99.8%	11.0	2.9	B
WB	Left Turn	5	4	84.0%	16.4	14.4	C
	Through	3	3	113.3%	6.3	5.8	A
	Right Turn	36	37	101.7%	7.8	1.3	A
	Subtotal	44	44	100.5%	9.1	1.6	A
Total		1,574	1,563	99.3%	1.0	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	95.0%	1.2	2.1	A
	Through	709	709	99.9%	0.2	0.1	A
	Right Turn						
	Subtotal	713	712	99.9%	0.2	0.1	A
SB	Left Turn						
	Through	724	709	97.9%	0.3	0.1	A
	Right Turn	9	9	95.6%	0.6	0.3	A
	Subtotal	733	717	97.8%	0.3	0.1	A
EB	Left Turn	7	7	92.9%	12.4	8.8	B
	Through						
	Right Turn	6	6	93.3%	4.0	2.8	A
	Subtotal	13	12	93.1%	9.4	3.7	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,459	1,442	98.8%	0.3	0.1	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	12	11	92.5%	5.4	4.5	A
	Through	684	685	100.1%	4.1	0.7	A
	Right Turn	47	46	98.3%	1.7	0.7	A
	Subtotal	743	742	99.8%	4.0	0.7	A
SB	Left Turn	7	6	82.9%	8.0	7.5	A
	Through	710	696	98.0%	4.5	1.0	A
	Right Turn	22	21	94.1%	3.9	3.5	A
	Subtotal	739	722	97.7%	4.6	1.0	A
EB	Left Turn	34	35	104.1%	21.9	5.2	C
	Through	16	14	85.6%	27.9	8.5	C
	Right Turn	24	25	103.8%	12.5	7.9	B
	Subtotal	74	74	100.0%	19.1	5.2	B
WB	Left Turn	27	27	98.9%	19.7	7.2	B
	Through	8	9	110.0%	27.8	5.2	C
	Right Turn	10	10	97.0%	8.0	6.8	A
	Subtotal	45	45	100.4%	19.1	4.8	B
Total		1,601	1,583	98.9%	5.6	0.5	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	98.3%	3.6	4.6	A
	Through	733	731	99.7%	0.5	0.2	A
	Right Turn	4	4	97.5%	0.2	0.5	A
	Subtotal	743	741	99.7%	0.6	0.2	A
SB	Left Turn	18	18	100.0%	5.1	3.2	A
	Through	731	717	98.1%	0.3	0.1	A
	Right Turn	2	1	70.0%	0.2	0.2	A
	Subtotal	751	736	98.1%	0.4	0.2	A
EB	Left Turn	6	6	100.0%	12.8	3.1	B
	Through	1	0	30.0%	0.7	2.3	A
	Right Turn	19	17	91.6%	8.5	1.0	A
	Subtotal	26	24	91.2%	9.9	1.3	A
WB	Left Turn	4	5	112.5%	9.9	6.5	A
	Through	1	1	110.0%	2.9	6.5	A
	Right Turn	19	19	97.9%	7.7	1.7	A
	Subtotal	24	24	100.8%	8.9	2.4	A
Total		1,544	1,525	98.8%	0.8	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	127	129	101.8%	64.1	14.9	E
	Through	516	512	99.1%	37.8	3.8	D
	Right Turn	143	143	99.8%	31.9	4.8	C
	Subtotal	786	784	99.7%	41.3	4.2	D
SB	Left Turn	149	143	96.0%	30.7	5.2	C
	Through	546	533	97.6%	19.9	3.6	B
	Right Turn	92	93	100.7%	15.0	4.8	B
	Subtotal	787	769	97.7%	21.5	2.9	C
EB	Left Turn	117	119	101.5%	25.4	5.2	C
	Through	669	669	100.0%	17.6	1.6	B
	Right Turn	175	175	99.8%	4.7	0.9	A
	Subtotal	961	962	100.1%	16.2	1.7	B
WB	Left Turn	160	167	104.4%	25.6	3.6	C
	Through	605	598	98.9%	20.8	2.2	C
	Right Turn	145	143	98.8%	21.0	5.7	C
	Subtotal	910	909	99.9%	21.5	2.1	C
Total		3,444	3,423	99.4%	24.4	1.0	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	775	774	99.8%	0.3	0.0	A
	Right Turn	18	18	98.9%	0.6	0.4	A
	Subtotal	793	791	99.8%	0.3	0.0	A
SB	Left Turn	19	17	87.4%	4.3	2.9	A
	Through	866	861	99.5%	0.1	0.0	A
	Right Turn						
	Subtotal	885	878	99.2%	0.2	0.1	A
EB	Left Turn	6	5	81.7%	15.5	4.5	C
	Through						
	Right Turn	1	1	110.0%	2.1	4.5	A
	Subtotal	7	6	85.7%	15.4	4.5	C
WB	Left Turn	4	3	85.0%	2.5	5.3	A
	Through						
	Right Turn	14	13	90.0%	5.2	4.2	A
	Subtotal	18	16	88.9%	7.7	4.1	A
Total		1,703	1,691	99.3%	0.4	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	73	76	104.7%	45.1	10.7	D
	Through	389	383	98.4%	43.0	6.4	D
	Right Turn	139	141	101.4%	31.4	10.2	C
	Subtotal	601	600	99.8%	40.6	7.0	D
SB	Left Turn	65	62	95.4%	54.9	12.4	D
	Through	207	201	97.3%	35.5	6.7	D
	Right Turn	86	86	99.9%	5.8	1.3	A
	Subtotal	358	349	97.6%	30.7	4.6	C
EB	Left Turn	99	91	92.3%	19.2	6.1	B
	Through	436	444	101.7%	12.1	2.5	B
	Right Turn	34	34	99.7%	8.1	4.0	A
	Subtotal	569	569	100.0%	13.2	2.5	B
WB	Left Turn	96	98	101.9%	15.0	2.9	B
	Through	541	539	99.6%	8.9	1.8	A
	Right Turn	40	38	95.0%	5.7	3.0	A
	Subtotal	677	675	99.7%	9.6	1.7	A
Total		2,205	2,193	99.4%	22.6	1.9	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	35	101.8%	4.6	1.5	A
	Through	445	431	96.8%	2.0	0.5	A
	Right Turn						
	Subtotal	479	465	97.1%	2.2	0.5	A
SB	Left Turn						
	Through	356	351	98.6%	2.5	0.4	A
	Right Turn	145	149	102.4%	0.2	0.3	A
	Subtotal	501	500	99.7%	1.8	0.3	A
EB	Left Turn	93	92	98.9%	23.7	4.5	C
	Through						
	Right Turn	27	27	98.5%	4.8	0.8	A
	Subtotal	120	119	98.8%	20.0	3.8	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,100	1,084	98.5%	4.2	0.6	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	524	508	96.9%	0.1	0.0	A
	Right Turn	14	15	107.1%	0.0	0.0	A
	Subtotal	538	523	97.2%	0.1	0.0	A
SB	Left Turn	34	33	96.5%	1.6	1.0	A
	Through	497	497	99.9%	2.0	0.4	A
	Right Turn						
	Subtotal	531	530	99.7%	1.9	0.4	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	4	3	75.0%	7.4	1.2	A
	Through						
	Right Turn	5	4	80.0%	5.3	0.7	A
	Subtotal	9	7	77.8%	6.2	0.8	A
Total		1,078	1,059	98.3%	1.1	0.2	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	94.0%	0.3	0.3	A
	Through	520	503	96.8%	0.1	0.0	A
	Right Turn	4	4	100.0%	0.2	0.3	A
	Subtotal	529	512	96.8%	0.1	0.0	A
SB	Left Turn	3	3	86.7%	0.5	1.0	A
	Through	525	527	100.4%	0.2	0.1	A
	Right Turn	4	3	80.0%	0.2	0.3	A
	Subtotal	532	533	100.2%	0.2	0.1	A
EB	Left Turn	2	1	65.0%	3.3	4.4	A
	Through						
	Right Turn	8	7	83.8%	7.1	0.7	A
	Subtotal	10	8	80.0%	7.3	0.8	A
WB	Left Turn	4	3	67.5%	7.5	5.9	A
	Through						
	Right Turn	6	5	88.3%	5.7	1.0	A
	Subtotal	10	8	80.0%	6.9	2.0	A
Total		1,081	1,061	98.1%	0.4	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	3	3	83.3%	0.7	1.1	A
	Through	511	494	96.7%	0.2	0.1	A
	Right Turn	14	14	98.6%	0.5	0.2	A
	Subtotal	528	510	96.6%	0.2	0.1	A
SB	Left Turn	10	11	109.0%	4.6	3.7	A
	Through	507	509	100.5%	0.4	0.1	A
	Right Turn	4	4	102.5%	0.3	0.4	A
	Subtotal	521	524	100.7%	0.5	0.2	A
EB	Left Turn	14	13	93.6%	7.1	1.1	A
	Through	5	5	92.0%	8.9	4.4	A
	Right Turn	18	18	102.2%	6.3	0.8	A
	Subtotal	37	36	97.6%	7.0	0.7	A
WB	Left Turn	7	5	74.3%	2.8	3.7	A
	Through						
	Right Turn	8	8	96.3%	3.7	3.3	A
	Subtotal	15	13	86.0%	6.5	1.1	A
Total		1,101	1,084	98.4%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	215	214	99.7%	58.0	3.0	E
	Right Turn	522	513	98.2%	3.2	1.2	A
	Subtotal	737	727	98.6%	18.9	1.9	B
SB	Left Turn	2	1	70.0%	28.8	37.7	C
	Through	83	82	98.4%	54.3	9.4	D
	Right Turn	39	39	98.7%	25.9	10.5	C
	Subtotal	124	122	98.1%	44.1	9.1	D
EB	Left Turn	74	71	96.1%	78.3	5.8	E
	Through	467	443	94.9%	9.4	1.2	A
	Right Turn	7	7	105.7%	4.2	3.4	A
	Subtotal	548	522	95.2%	19.7	2.3	B
WB	Left Turn	317	310	97.7%	53.3	3.6	D
	Through	514	519	101.0%	7.7	1.5	A
	Right Turn	15	15	98.0%	3.0	2.0	A
	Subtotal	846	844	99.7%	24.5	1.4	C
Total		2,255	2,214	98.2%	22.8	1.3	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	6	80.0%	0.7	0.9	A
	Through	634	627	98.9%	0.4	0.1	A
	Right Turn	4	4	100.0%	0.2	0.2	A
	Subtotal	645	637	98.7%	0.4	0.1	A
SB	Left Turn	14	15	105.0%	1.2	0.7	A
	Through	462	450	97.3%	0.6	0.1	A
	Right Turn	3	4	123.3%	0.4	0.5	A
	Subtotal	479	468	97.7%	0.6	0.1	A
EB	Left Turn	6	6	98.3%	9.3	3.9	A
	Through	5	5	98.0%	12.9	6.4	B
	Right Turn	9	8	91.1%	8.1	2.1	A
	Subtotal	20	19	95.0%	10.0	1.8	B
WB	Left Turn	9	8	91.1%	7.8	3.8	A
	Through	2	3	135.0%	4.5	7.6	A
	Right Turn	63	62	98.7%	7.8	0.7	A
	Subtotal	74	73	98.8%	8.1	0.9	A
Total		1,218	1,197	98.3%	1.1	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	7	110.0%	1.2	1.3	A
	Through	642	634	98.8%	0.2	0.1	A
	Right Turn						
	Subtotal	648	641	98.9%	0.2	0.1	A
SB	Left Turn						
	Through	474	459	96.9%	0.2	0.1	A
	Right Turn	6	6	105.0%	0.5	0.3	A
	Subtotal	480	466	97.0%	0.2	0.1	A
EB	Left Turn	3	2	76.7%	6.7	5.6	A
	Through						
	Right Turn	8	8	96.3%	5.8	1.1	A
	Subtotal	11	10	90.9%	6.9	1.8	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,139	1,117	98.0%	0.3	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	9	90.0%	1.5	2.3	A
	Through	615	608	98.9%	1.6	0.5	A
	Right Turn	19	16	85.3%	0.5	0.2	A
	Subtotal	644	633	98.3%	1.6	0.6	A
SB	Left Turn	7	7	97.1%	3.9	5.1	A
	Through	464	450	97.0%	3.7	1.1	A
	Right Turn	10	9	92.0%	1.9	1.8	A
	Subtotal	481	466	96.9%	3.7	1.1	A
EB	Left Turn	6	7	116.7%	22.8	12.5	C
	Through	6	6	93.3%	15.2	15.2	B
	Right Turn	8	8	95.0%	6.8	5.9	A
	Subtotal	20	20	101.0%	16.7	9.0	B
WB	Left Turn	24	22	92.9%	20.7	3.3	C
	Through	4	4	102.5%	18.9	18.5	B
	Right Turn	26	26	98.8%	8.7	2.3	A
	Subtotal	54	52	96.5%	14.9	3.0	B
Total		1,199	1,172	97.7%	3.6	0.4	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	9	102.2%	2.5	2.4	A
	Through	647	638	98.5%	0.6	0.2	A
	Right Turn	6	5	78.3%	0.2	0.2	A
	Subtotal	662	651	98.4%	0.6	0.2	A
SB	Left Turn	15	15	100.7%	5.0	3.3	A
	Through	473	456	96.5%	0.2	0.2	A
	Right Turn						
	Subtotal	488	471	96.6%	0.4	0.5	A
EB	Left Turn	4	4	90.0%	9.4	13.2	A
	Through	3	3	110.0%	5.8	5.6	A
	Right Turn	5	5	102.0%	7.2	1.3	A
	Subtotal	12	12	100.0%	9.1	3.3	A
WB	Left Turn	3	3	113.3%	9.5	8.6	A
	Through						
	Right Turn	13	11	81.5%	7.9	1.9	A
	Subtotal	16	14	87.5%	8.8	2.4	A
Total		1,178	1,149	97.5%	0.8	0.2	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
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AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	99	103	104.3%	47.7	5.1	D
	Through	497	487	98.0%	37.8	3.3	D
	Right Turn	120	121	101.1%	25.3	7.0	C
	Subtotal	716	712	99.4%	37.2	2.9	D
SB	Left Turn	75	74	98.0%	45.6	6.5	D
	Through	348	332	95.4%	37.3	3.6	D
	Right Turn	58	58	99.5%	22.9	10.7	C
	Subtotal	481	463	96.3%	36.8	3.6	D
EB	Left Turn	57	55	97.0%	16.7	4.5	B
	Through	445	454	102.1%	9.7	2.4	A
	Right Turn	132	130	98.7%	2.7	0.6	A
	Subtotal	634	640	100.9%	8.9	2.1	A
WB	Left Turn	121	126	104.0%	17.3	3.7	B
	Through	515	510	99.0%	14.7	3.5	B
	Right Turn	112	112	99.6%	11.0	3.0	B
	Subtotal	748	747	99.9%	14.4	2.8	B
Total		2,579	2,562	99.3%	24.0	1.6	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	750	747	99.6%	0.4	0.1	A
	Right Turn	4	4	90.0%	0.3	0.3	A
	Subtotal	754	751	99.5%	0.4	0.1	A
SB	Left Turn	5	3	66.0%	2.8	4.5	A
	Through	592	581	98.2%	0.1	0.0	A
	Right Turn						
	Subtotal	597	585	97.9%	0.1	0.0	A
EB	Left Turn	7	5	77.1%	11.9	3.9	B
	Through						
	Right Turn	2	2	80.0%	1.7	3.7	A
	Subtotal	9	7	77.8%	11.8	4.0	B
WB	Left Turn	7	6	87.1%	8.5	1.7	A
	Through						
	Right Turn	9	9	98.9%	6.5	0.5	A
	Subtotal	16	15	93.8%	7.3	0.9	A
Total		1,376	1,357	98.6%	0.5	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	67	69	102.5%	39.4	7.5	D
	Through	328	322	98.0%	39.7	3.5	D
	Right Turn	99	101	101.5%	25.0	4.7	C
	Subtotal	494	491	99.3%	36.5	3.4	D
SB	Left Turn	219	215	98.1%	51.4	9.5	D
	Through	468	464	99.1%	35.7	2.3	D
	Right Turn	134	135	100.4%	7.3	1.3	A
	Subtotal	821	813	99.0%	35.8	3.6	D
EB	Left Turn	152	144	94.8%	23.0	5.8	C
	Through	605	607	100.4%	15.0	2.7	B
	Right Turn	77	81	105.2%	13.4	3.7	B
	Subtotal	834	832	99.8%	16.3	2.5	B
WB	Left Turn	128	124	96.8%	19.5	6.5	B
	Through	593	592	99.8%	10.2	2.6	B
	Right Turn	142	139	98.1%	7.8	2.6	A
	Subtotal	863	855	99.1%	11.1	1.9	B
Total		3,012	2,991	99.3%	24.2	1.5	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	109	109	99.9%	10.9	4.6	B
	Through	533	515	96.7%	3.3	0.7	A
	Right Turn						
	Subtotal	642	624	97.2%	4.6	0.7	A
SB	Left Turn						
	Through	785	780	99.3%	1.9	0.3	A
	Right Turn	283	285	100.8%	0.0	0.1	A
	Subtotal	1,068	1,065	99.7%	1.4	0.2	A
EB	Left Turn	325	321	98.8%	51.7	4.3	D
	Through						
	Right Turn	159	162	101.6%	5.8	0.7	A
	Subtotal	484	483	99.7%	37.2	3.8	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,194	2,172	99.0%	11.3	0.9	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	812	791	97.4%	0.2	0.1	A
	Right Turn	46	45	97.8%	0.0	0.0	A
	Subtotal	858	836	97.5%	0.2	0.1	A
SB	Left Turn	25	25	100.8%	2.5	2.5	A
	Through	1,052	1,051	99.9%	2.1	0.3	A
	Right Turn						
	Subtotal	1,077	1,076	99.9%	2.2	0.3	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	16	14	90.0%	8.7	1.9	A
	Through						
	Right Turn	31	31	99.4%	5.3	0.5	A
	Subtotal	47	45	96.2%	6.4	0.7	A
Total		1,982	1,958	98.8%	1.4	0.2	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	94.0%	1.2	1.5	A
	Through	834	816	97.8%	0.1	0.0	A
	Right Turn	4	3	85.0%	0.2	0.2	A
	Subtotal	843	824	97.7%	0.1	0.0	A
SB	Left Turn	4	4	97.5%	0.5	0.7	A
	Through	1,066	1,068	100.1%	0.3	0.0	A
	Right Turn	6	5	88.3%	0.5	0.3	A
	Subtotal	1,076	1,077	100.1%	0.3	0.0	A
EB	Left Turn	4	3	67.5%	0.0	0.0	A
	Through						
	Right Turn	6	5	90.0%	1.5	3.2	A
	Subtotal	10	8	81.0%	1.5	3.2	A
WB	Left Turn	5	4	86.0%	10.8	6.9	B
	Through						
	Right Turn	6	6	95.0%	2.8	3.1	A
	Subtotal	11	10	90.9%	9.8	3.6	A
Total		1,940	1,919	98.9%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	23	20	87.8%	10.0	6.6	A
	Through	795	780	98.1%	0.5	0.2	A
	Right Turn	26	23	88.1%	0.6	0.1	A
	Subtotal	844	823	97.5%	0.7	0.3	A
SB	Left Turn	13	15	116.9%	6.4	7.3	A
	Through	1,033	1,035	100.2%	1.0	0.3	A
	Right Turn	4	5	115.0%	0.3	0.4	A
	Subtotal	1,050	1,055	100.4%	1.0	0.3	A
EB	Left Turn	5	5	94.0%	5.8	2.1	A
	Through	6	5	86.7%	8.1	6.6	A
	Right Turn	17	16	94.1%	6.0	0.4	A
	Subtotal	28	26	92.5%	7.0	1.5	A
WB	Left Turn	26	26	99.2%	16.7	5.6	C
	Through	5	6	126.0%	18.8	11.5	C
	Right Turn	16	15	92.5%	8.8	3.8	A
	Subtotal	47	47	99.8%	15.0	4.7	B
Total		1,969	1,950	99.1%	1.3	0.4	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	7	97.1%	61.5	26.3	E
	Through	234	234	100.0%	49.5	6.8	D
	Right Turn	490	481	98.1%	2.3	0.5	A
	Subtotal	731	722	98.7%	17.5	3.1	B
SB	Left Turn	3	2	80.0%	15.7	32.8	B
	Through	302	300	99.4%	43.7	5.0	D
	Right Turn	210	208	99.2%	32.0	4.5	C
	Subtotal	515	511	99.2%	38.5	3.5	D
EB	Left Turn	173	167	96.3%	55.2	8.8	E
	Through	582	572	98.3%	28.6	2.8	C
	Right Turn	10	10	97.0%	16.9	12.4	B
	Subtotal	765	749	97.8%	34.2	3.1	C
WB	Left Turn	528	513	97.1%	86.4	27.5	F
	Through	893	893	100.0%	23.3	3.9	C
	Right Turn	35	38	107.1%	5.3	1.9	A
	Subtotal	1,456	1,443	99.1%	44.8	9.9	D
Total		3,467	3,425	98.8%	35.9	4.2	D

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

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PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	93.3%	0.6	0.5	A
	Through	728	722	99.1%	0.3	0.1	A
	Right Turn	19	19	101.6%	0.5	0.5	A
	Subtotal	753	746	99.1%	0.3	0.1	A
SB	Left Turn	66	72	108.5%	0.9	0.3	A
	Through	737	718	97.4%	0.5	0.1	A
	Right Turn	12	10	83.3%	0.5	0.3	A
	Subtotal	815	799	98.1%	0.5	0.1	A
EB	Left Turn	12	12	96.7%	18.8	8.8	C
	Through	3	4	120.0%	11.0	10.1	B
	Right Turn	29	27	92.1%	10.5	6.0	B
	Subtotal	44	42	95.2%	13.2	5.4	B
WB	Left Turn	6	5	83.3%	15.3	10.7	C
	Through	4	5	120.0%	10.2	8.8	B
	Right Turn	38	37	98.4%	8.4	0.9	A
	Subtotal	48	47	98.3%	9.9	1.2	A
Total		1,660	1,635	98.5%	1.1	0.2	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	4	78.0%	1.1	1.7	A
	Through	745	739	99.2%	0.1	0.0	A
	Right Turn						
	Subtotal	750	743	99.1%	0.2	0.0	A
SB	Left Turn						
	Through	762	741	97.3%	0.3	0.1	A
	Right Turn	10	8	82.0%	0.6	0.5	A
	Subtotal	772	750	97.1%	0.3	0.1	A
EB	Left Turn	8	6	78.8%	11.6	6.7	B
	Through						
	Right Turn	7	6	82.9%	4.3	3.2	A
	Subtotal	15	12	80.7%	9.5	3.9	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,537	1,505	97.9%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	12	90.0%	9.7	4.8	A
	Through	719	713	99.2%	4.8	0.9	A
	Right Turn	50	50	100.6%	2.4	1.4	A
	Subtotal	782	775	99.1%	4.7	1.0	A
SB	Left Turn	8	8	100.0%	6.8	7.5	A
	Through	746	725	97.2%	4.7	0.7	A
	Right Turn	24	22	91.7%	3.5	2.5	A
	Subtotal	778	755	97.0%	4.7	0.7	A
EB	Left Turn	36	37	102.8%	21.1	3.8	C
	Through	17	14	83.5%	24.2	9.6	C
	Right Turn	26	26	99.6%	8.4	3.2	A
	Subtotal	79	77	97.6%	17.3	3.8	B
WB	Left Turn	29	28	97.9%	22.1	5.1	C
	Through	9	10	107.8%	24.2	7.7	C
	Right Turn	11	10	92.7%	6.1	5.2	A
	Subtotal	49	48	98.6%	18.8	3.5	B
Total		1,688	1,656	98.1%	5.9	0.5	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	8	107.1%	2.4	2.8	A
	Through	770	764	99.2%	0.4	0.1	A
	Right Turn	5	5	104.0%	0.4	0.3	A
	Subtotal	782	777	99.3%	0.4	0.1	A
SB	Left Turn	19	17	86.8%	5.0	4.4	A
	Through	768	748	97.4%	0.4	0.2	A
	Right Turn	3	3	90.0%	0.2	0.2	A
	Subtotal	790	767	97.1%	0.4	0.3	A
EB	Left Turn	7	7	104.3%	13.1	7.8	B
	Through	2	1	65.0%	5.9	11.3	A
	Right Turn	20	19	95.5%	7.5	1.0	A
	Subtotal	29	28	95.5%	9.3	1.4	A
WB	Left Turn	5	5	102.0%	7.3	4.7	A
	Through	2	2	80.0%	3.4	5.6	A
	Right Turn	20	19	93.0%	8.8	2.0	A
	Subtotal	27	25	93.7%	9.3	1.7	A
Total		1,628	1,597	98.1%	0.8	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	134	135	100.7%	80.4	24.3	F
	Through	542	537	99.1%	38.1	2.5	D
	Right Turn	151	151	100.2%	31.3	3.1	C
	Subtotal	827	823	99.6%	44.2	4.3	D
SB	Left Turn	157	150	95.5%	29.8	7.1	C
	Through	574	555	96.6%	14.5	3.5	B
	Right Turn	97	98	100.9%	12.0	5.6	B
	Subtotal	828	802	96.9%	17.2	3.3	B
EB	Left Turn	123	123	100.2%	27.2	4.4	C
	Through	703	700	99.5%	18.7	1.7	B
	Right Turn	184	185	100.3%	4.4	1.0	A
	Subtotal	1,010	1,008	99.8%	17.3	1.5	B
WB	Left Turn	168	175	104.4%	30.9	6.2	C
	Through	636	627	98.6%	22.2	3.1	C
	Right Turn	153	151	98.8%	18.5	4.1	B
	Subtotal	957	954	99.7%	23.3	2.3	C
Total		3,622	3,587	99.0%	25.1	1.6	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	814	811	99.6%	0.3	0.0	A
	Right Turn	19	19	98.4%	0.6	0.2	A
	Subtotal	833	829	99.6%	0.3	0.0	A
SB	Left Turn	20	18	88.5%	3.0	1.6	A
	Through	910	900	98.9%	0.1	0.0	A
	Right Turn						
	Subtotal	930	918	98.7%	0.2	0.1	A
EB	Left Turn	7	5	71.4%	14.2	5.4	B
	Through						
	Right Turn	2	2	100.0%	2.6	4.2	A
	Subtotal	9	7	77.8%	13.1	4.5	B
WB	Left Turn	5	5	104.0%	7.2	5.9	A
	Through						
	Right Turn	15	15	98.7%	6.6	0.7	A
	Subtotal	20	20	100.0%	7.2	0.9	A
Total		1,792	1,774	99.0%	0.4	0.0	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	69	71	102.8%	41.5	8.2	D
	Through	378	372	98.3%	41.0	7.2	D
	Right Turn	142	146	102.6%	27.8	7.1	C
	Subtotal	589	588	99.9%	37.7	7.0	D
SB	Left Turn	93	91	97.4%	44.9	9.6	D
	Through	206	201	97.5%	31.9	4.0	C
	Right Turn	93	95	101.7%	5.9	1.2	A
	Subtotal	392	386	98.5%	27.6	3.5	C
EB	Left Turn	106	99	93.1%	18.9	4.8	B
	Through	431	437	101.5%	12.9	1.1	B
	Right Turn	32	33	103.4%	8.4	3.5	A
	Subtotal	569	569	100.0%	13.8	1.4	B
WB	Left Turn	104	104	100.4%	13.3	4.6	B
	Through	534	531	99.5%	10.5	2.2	B
	Right Turn	68	68	99.7%	7.1	2.1	A
	Subtotal	706	703	99.6%	10.6	1.6	B
Total		2,256	2,247	99.6%	21.6	2.2	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	36	36	100.6%	4.2	1.5	A
	Through	467	455	97.4%	2.3	0.4	A
	Right Turn						
	Subtotal	503	491	97.7%	2.5	0.4	A
SB	Left Turn						
	Through	387	386	99.7%	2.3	0.4	A
	Right Turn	145	150	103.2%	0.6	0.4	A
	Subtotal	532	536	100.7%	1.9	0.3	A
EB	Left Turn	93	90	97.2%	23.8	4.6	C
	Through						
	Right Turn	29	28	97.2%	4.8	0.7	A
	Subtotal	122	119	97.2%	20.0	4.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,157	1,145	99.0%	4.2	0.6	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	525	511	97.4%	0.1	0.0	A
	Right Turn	35	34	97.4%	0.0	0.0	A
	Subtotal	560	545	97.4%	0.1	0.0	A
SB	Left Turn	40	41	102.8%	2.4	1.6	A
	Through	516	519	100.6%	1.9	0.7	A
	Right Turn						
	Subtotal	556	560	100.8%	2.0	0.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	16	16	101.9%	7.9	1.5	A
	Through						
	Right Turn	11	10	89.1%	5.3	0.7	A
	Subtotal	27	26	96.7%	6.8	0.8	A
Total		1,143	1,132	99.0%	1.3	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	0.8	1.3	A
	Through	511	497	97.3%	0.1	0.1	A
	Right Turn	21	20	95.2%	0.4	0.1	A
	Subtotal	536	521	97.2%	0.1	0.1	A
SB	Left Turn	12	11	87.5%	0.4	0.2	A
	Through	518	522	100.8%	0.2	0.0	A
	Right Turn	3	3	110.0%	0.5	0.3	A
	Subtotal	533	536	100.6%	0.2	0.0	A
EB	Left Turn	1	0	30.0%	0.9	2.7	A
	Through						
	Right Turn	7	7	95.7%	7.3	0.7	A
	Subtotal	8	7	87.5%	7.4	0.6	A
WB	Left Turn	36	35	95.8%	9.3	1.5	A
	Through						
	Right Turn	23	22	95.7%	7.0	1.0	A
	Subtotal	59	57	95.8%	8.4	1.2	A
Total		1,136	1,121	98.7%	1.0	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	2.1	4.5	A
	Through	518	504	97.2%	0.1	0.0	A
	Right Turn	13	11	83.8%	0.6	0.5	A
	Subtotal	535	519	97.0%	0.2	0.1	A
SB	Left Turn	9	10	113.3%	1.6	1.9	A
	Through	508	510	100.5%	0.3	0.1	A
	Right Turn	3	3	93.3%	0.5	1.1	A
	Subtotal	520	523	100.7%	0.4	0.1	A
EB	Left Turn	13	12	94.6%	6.2	0.4	A
	Through	4	4	100.0%	4.0	4.2	A
	Right Turn	19	20	104.2%	5.4	1.9	A
	Subtotal	36	36	100.3%	6.3	0.5	A
WB	Left Turn	6	5	86.7%	8.6	4.1	A
	Through						
	Right Turn	7	8	110.0%	6.2	0.5	A
	Subtotal	13	13	99.2%	7.9	1.8	A
Total		1,104	1,091	98.8%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	216	214	99.0%	58.3	3.2	E
	Right Turn	527	519	98.4%	3.0	1.2	A
	Subtotal	743	733	98.6%	19.7	2.7	B
SB	Left Turn	1	1	70.0%	0.6	1.6	A
	Through	90	89	98.7%	54.1	7.0	D
	Right Turn	45	45	100.7%	27.6	12.1	C
	Subtotal	136	135	99.1%	46.1	6.7	D
EB	Left Turn	79	77	96.8%	68.6	7.4	E
	Through	467	450	96.4%	8.8	1.7	A
	Right Turn	6	6	103.3%	3.0	3.0	A
	Subtotal	552	533	96.5%	17.0	3.5	B
WB	Left Turn	328	319	97.3%	51.5	3.1	D
	Through	507	514	101.4%	7.2	1.3	A
	Right Turn	14	14	97.1%	2.5	2.1	A
	Subtotal	849	847	99.7%	23.5	2.3	C
Total		2,280	2,247	98.5%	22.6	1.6	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	101.7%	0.5	0.5	A
	Through	645	639	99.1%	0.3	0.1	A
	Right Turn	7	7	105.7%	0.4	0.4	A
	Subtotal	658	653	99.2%	0.3	0.1	A
SB	Left Turn	13	14	106.9%	0.7	0.4	A
	Through	478	465	97.3%	0.6	0.1	A
	Right Turn	2	1	60.0%	0.1	0.3	A
	Subtotal	493	480	97.4%	0.6	0.1	A
EB	Left Turn	5	5	102.0%	9.1	6.0	A
	Through	4	5	117.5%	11.1	5.0	B
	Right Turn	8	7	90.0%	8.1	4.0	A
	Subtotal	17	17	100.0%	10.4	3.6	B
WB	Left Turn	2	12	595.0%	12.2	5.1	B
	Through	1	1	100.0%	3.7	6.3	A
	Right Turn	60	60	100.2%	7.3	0.6	A
	Subtotal	63	73	115.9%	8.0	0.8	A
Total		1,231	1,223	99.4%	1.0	0.2	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	19	91.4%	1.6	1.0	A
	Through	636	632	99.4%	0.2	0.1	A
	Right Turn						
	Subtotal	657	651	99.1%	0.2	0.1	A
SB	Left Turn						
	Through	482	469	97.3%	0.2	0.1	A
	Right Turn	16	16	97.5%	0.6	0.3	A
	Subtotal	498	485	97.3%	0.2	0.1	A
EB	Left Turn	22	22	97.7%	13.7	7.6	B
	Through						
	Right Turn	37	36	96.2%	6.9	1.7	A
	Subtotal	59	57	96.8%	9.2	3.0	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,214	1,193	98.3%	0.4	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	21	101.9%	2.8	2.5	A
	Through	613	606	98.8%	1.6	0.8	A
	Right Turn	19	17	91.1%	0.8	0.8	A
	Subtotal	653	644	98.7%	1.6	0.7	A
SB	Left Turn	8	8	96.3%	3.3	4.5	A
	Through	491	480	97.7%	4.5	1.2	A
	Right Turn	18	16	91.1%	2.6	2.2	A
	Subtotal	517	504	97.4%	4.4	1.2	A
EB	Left Turn	18	20	108.9%	23.3	4.3	C
	Through	6	4	70.0%	13.2	17.4	B
	Right Turn	18	18	98.3%	8.5	4.6	A
	Subtotal	42	42	98.8%	17.5	2.2	B
WB	Left Turn	24	23	94.2%	21.3	3.5	C
	Through	4	4	105.0%	18.8	18.5	B
	Right Turn	25	25	101.2%	9.1	2.6	A
	Subtotal	53	52	98.3%	15.4	2.8	B
Total		1,265	1,242	98.2%	4.1	0.5	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	9	116.3%	2.5	3.4	A
	Through	657	652	99.2%	0.5	0.1	A
	Right Turn	5	5	102.0%	0.3	0.2	A
	Subtotal	670	666	99.4%	0.5	0.1	A
SB	Left Turn	14	14	97.9%	5.7	4.2	A
	Through	507	492	97.0%	0.4	0.2	A
	Right Turn	6	7	121.7%	0.3	0.2	A
	Subtotal	527	513	97.3%	0.5	0.3	A
EB	Left Turn	3	3	83.3%	4.4	7.8	A
	Through	2	2	85.0%	2.5	4.1	A
	Right Turn	11	11	98.2%	5.9	3.7	A
	Subtotal	16	15	93.8%	8.4	3.3	A
WB	Left Turn	2	2	100.0%	5.0	8.2	A
	Through						
	Right Turn	12	10	83.3%	8.0	2.2	A
	Subtotal	14	12	85.7%	8.7	3.0	A
Total		1,227	1,206	98.3%	0.6	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	114	119	103.9%	48.1	9.2	D
	Through	488	480	98.4%	37.7	2.9	D
	Right Turn	117	117	99.7%	29.2	8.3	C
	Subtotal	719	715	99.5%	38.1	3.7	D
SB	Left Turn	84	82	97.7%	43.0	4.1	D
	Through	361	346	95.9%	35.9	4.5	D
	Right Turn	76	76	99.9%	25.0	8.3	C
	Subtotal	521	504	96.8%	35.7	3.5	D
EB	Left Turn	73	76	103.7%	16.5	6.0	B
	Through	439	441	100.5%	11.0	2.2	B
	Right Turn	148	146	98.6%	3.0	0.9	A
	Subtotal	660	663	100.5%	9.9	1.6	A
WB	Left Turn	123	127	103.5%	18.8	4.6	B
	Through	502	496	98.9%	15.0	2.2	B
	Right Turn	113	113	100.4%	12.8	3.6	B
	Subtotal	738	737	99.9%	15.3	2.1	B
Total		2,638	2,620	99.3%	24.6	1.5	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	91.3%	1.5	1.7	A
	Through	733	730	99.5%	0.6	0.4	A
	Right Turn	3	3	86.7%	0.6	1.0	A
	Subtotal	744	740	99.4%	0.6	0.4	A
SB	Left Turn	4	4	107.5%	2.4	4.0	A
	Through	589	578	98.2%	0.1	0.0	A
	Right Turn	35	32	91.7%	0.1	0.1	A
	Subtotal	628	615	97.9%	0.1	0.0	A
EB	Left Turn	25	24	96.0%	14.3	2.9	B
	Through						
	Right Turn	6	5	86.7%	6.8	5.1	A
	Subtotal	31	29	94.2%	13.6	2.6	B
WB	Left Turn	6	4	71.7%	0.0	0.0	A
	Through						
	Right Turn	8	8	96.3%	0.5	1.7	A
	Subtotal	14	12	85.7%	0.5	1.7	A
Total		1,417	1,396	98.5%	0.6	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	65	102.5%	44.0	6.6	D
	Through	323	318	98.5%	39.4	5.8	D
	Right Turn	109	112	102.6%	21.5	6.5	C
	Subtotal	495	495	99.9%	35.7	5.1	D
SB	Left Turn	245	242	98.8%	53.0	11.3	D
	Through	454	447	98.5%	38.1	3.3	D
	Right Turn	141	142	100.9%	8.2	1.4	A
	Subtotal	840	831	99.0%	38.2	3.9	D
EB	Left Turn	159	152	95.8%	22.7	2.5	C
	Through	598	601	100.4%	15.0	2.9	B
	Right Turn	73	77	104.8%	12.5	4.4	B
	Subtotal	830	830	99.9%	16.2	2.6	B
WB	Left Turn	136	127	93.5%	16.5	4.4	B
	Through	587	591	100.7%	11.7	3.2	B
	Right Turn	173	172	99.2%	7.8	2.7	A
	Subtotal	896	890	99.3%	11.6	3.1	B
Total		3,061	3,045	99.5%	24.6	2.5	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	108	108	100.3%	13.1	5.5	B
	Through	568	553	97.3%	3.2	0.9	A
	Right Turn						
	Subtotal	676	661	97.8%	4.9	1.3	A
SB	Left Turn						
	Through	798	792	99.3%	1.7	0.2	A
	Right Turn	277	279	100.6%	0.1	0.3	A
	Subtotal	1,075	1,071	99.6%	1.3	0.2	A
EB	Left Turn	317	313	98.8%	51.8	4.5	D
	Through						
	Right Turn	155	157	101.5%	5.8	0.7	A
	Subtotal	472	470	99.7%	37.0	4.1	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,223	2,202	99.1%	10.9	1.1	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	826	810	98.0%	0.2	0.0	A
	Right Turn	59	56	94.2%	0.0	0.0	A
	Subtotal	885	865	97.8%	0.1	0.0	A
SB	Left Turn	29	28	97.2%	2.3	1.2	A
	Through	1,042	1,039	99.7%	2.1	0.3	A
	Right Turn						
	Subtotal	1,071	1,067	99.6%	2.1	0.3	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	33	33	99.4%	8.8	2.9	A
	Through						
	Right Turn	39	38	98.2%	5.3	0.4	A
	Subtotal	72	71	98.8%	6.9	1.1	A
Total		2,028	2,003	98.8%	1.4	0.1	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	5	112.5%	2.3	2.8	A
	Through	816	796	97.5%	0.2	0.1	A
	Right Turn	45	47	104.2%	0.5	0.3	A
	Subtotal	865	847	98.0%	0.2	0.1	A
SB	Left Turn	27	28	104.8%	1.6	0.7	A
	Through	1,030	1,028	99.8%	0.4	0.1	A
	Right Turn	5	4	70.0%	0.3	0.3	A
	Subtotal	1,062	1,060	99.8%	0.4	0.1	A
EB	Left Turn	3	2	66.7%	3.7	5.1	A
	Through						
	Right Turn	5	5	102.0%	4.2	3.6	A
	Subtotal	8	7	88.8%	7.8	2.4	A
WB	Left Turn	36	34	95.0%	13.0	3.4	B
	Through						
	Right Turn	23	22	95.7%	8.2	2.8	A
	Subtotal	59	56	95.3%	11.2	2.7	B
Total		1,994	1,970	98.8%	0.7	0.1	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	23	20	87.0%	4.9	3.8	A
	Through	795	775	97.5%	0.3	0.1	A
	Right Turn	24	24	98.3%	0.5	0.1	A
	Subtotal	842	819	97.2%	0.4	0.3	A
SB	Left Turn	12	14	120.0%	4.8	2.7	A
	Through	1,020	1,019	99.9%	0.9	0.4	A
	Right Turn	3	3	103.3%	1.1	1.8	A
	Subtotal	1,035	1,037	100.2%	1.0	0.4	A
EB	Left Turn	4	4	92.5%	3.7	3.2	A
	Through	5	4	80.0%	6.5	3.8	A
	Right Turn	18	17	95.6%	6.1	0.5	A
	Subtotal	27	25	92.2%	6.4	0.5	A
WB	Left Turn	24	24	99.2%	17.9	10.3	C
	Through	4	5	127.5%	11.8	9.7	B
	Right Turn	15	14	93.3%	7.9	1.8	A
	Subtotal	43	43	99.8%	12.9	2.4	B
Total		1,947	1,923	98.8%	1.1	0.3	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	101.7%	56.6	34.9	E
	Through	236	239	101.4%	53.0	6.5	D
	Right Turn	501	494	98.5%	3.4	2.0	A
	Subtotal	743	739	99.4%	19.0	3.4	B
SB	Left Turn	2	2	85.0%	6.7	21.3	A
	Through	301	299	99.3%	43.7	4.4	D
	Right Turn	210	207	98.5%	33.6	5.3	C
	Subtotal	513	507	98.9%	39.2	4.1	D
EB	Left Turn	175	168	96.2%	55.9	6.3	E
	Through	581	571	98.3%	28.9	3.3	C
	Right Turn	9	8	93.3%	23.1	15.9	C
	Subtotal	765	748	97.8%	34.8	3.6	C
WB	Left Turn	538	514	95.5%	114.7	46.4	F
	Through	877	875	99.8%	27.6	7.1	C
	Right Turn	33	35	104.8%	5.7	3.7	A
	Subtotal	1,448	1,424	98.3%	57.4	19.8	E
Total		3,469	3,418	98.5%	41.7	7.8	D

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	96.0%	0.3	0.3	A
	Through	742	741	99.9%	0.3	0.1	A
	Right Turn	23	21	92.6%	0.6	0.4	A
	Subtotal	770	767	99.7%	0.3	0.1	A
SB	Left Turn	62	63	100.8%	1.0	0.3	A
	Through	751	723	96.2%	0.5	0.1	A
	Right Turn	11	12	109.1%	1.1	0.9	A
	Subtotal	824	797	96.7%	0.5	0.1	A
EB	Left Turn	11	11	100.0%	12.7	6.8	B
	Through	2	3	135.0%	7.9	8.2	A
	Right Turn	27	26	97.0%	8.0	1.0	A
	Subtotal	40	40	99.8%	10.1	2.6	B
WB	Left Turn	10	9	91.0%	18.9	11.9	C
	Through	3	3	96.7%	8.3	9.5	A
	Right Turn	36	36	100.6%	9.1	1.9	A
	Subtotal	49	48	98.4%	11.4	2.8	B
Total		1,683	1,653	98.2%	1.1	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	43	103.3%	5.2	1.7	A
	Through	744	742	99.8%	0.3	0.2	A
	Right Turn						
	Subtotal	786	786	100.0%	0.6	0.3	A
SB	Left Turn						
	Through	754	726	96.3%	0.3	0.0	A
	Right Turn	34	32	93.5%	0.6	0.2	A
	Subtotal	788	758	96.2%	0.4	0.0	A
EB	Left Turn	26	26	100.0%	13.7	4.7	B
	Through						
	Right Turn	35	35	98.6%	8.3	3.2	A
	Subtotal	61	61	99.2%	10.5	3.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,635	1,604	98.1%	0.9	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	23	109.5%	6.2	5.4	A
	Through	736	733	99.5%	5.5	1.2	A
	Right Turn	48	47	97.5%	2.6	1.1	A
	Subtotal	805	802	99.7%	5.4	1.1	A
SB	Left Turn	9	9	96.7%	5.2	5.7	A
	Through	761	733	96.3%	5.3	0.6	A
	Right Turn	28	27	95.4%	4.1	2.3	A
	Subtotal	798	768	96.3%	5.3	0.6	A
EB	Left Turn	52	55	106.5%	22.9	4.1	C
	Through	18	17	93.3%	19.7	6.1	B
	Right Turn	39	36	92.3%	11.7	3.3	B
	Subtotal	109	108	99.3%	18.8	2.3	B
WB	Left Turn	29	29	98.3%	20.6	4.8	C
	Through	9	10	111.1%	20.1	9.1	C
	Right Turn	13	12	90.0%	6.4	3.5	A
	Subtotal	51	50	98.4%	17.8	4.6	B
Total		1,763	1,729	98.1%	6.8	0.5	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	8	125.0%	1.7	2.2	A
	Through	795	793	99.7%	0.4	0.1	A
	Right Turn	4	4	97.5%	0.1	0.2	A
	Subtotal	805	804	99.9%	0.4	0.1	A
SB	Left Turn	18	16	91.1%	6.7	5.5	A
	Through	795	767	96.5%	0.4	0.2	A
	Right Turn	6	5	90.0%	0.2	0.2	A
	Subtotal	819	789	96.3%	0.5	0.2	A
EB	Left Turn	6	6	106.7%	11.8	6.4	B
	Through	1	1	50.0%	2.5	5.6	A
	Right Turn	29	28	95.2%	8.7	1.0	A
	Subtotal	36	35	95.8%	9.4	2.0	A
WB	Left Turn	4	5	112.5%	12.5	10.5	B
	Through	1	1	110.0%	3.3	7.1	A
	Right Turn	19	19	98.4%	9.3	2.7	A
	Subtotal	24	24	101.3%	10.4	3.1	B
Total		1,684	1,652	98.1%	0.8	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	152	154	101.6%	103.7	30.4	F
	Through	537	532	99.0%	40.8	2.7	D
	Right Turn	147	145	98.9%	33.7	4.5	C
	Subtotal	836	832	99.5%	52.1	8.8	D
SB	Left Turn	163	155	95.1%	29.3	7.7	C
	Through	581	557	95.8%	14.0	3.0	B
	Right Turn	117	116	99.4%	9.7	2.4	A
	Subtotal	861	828	96.1%	16.3	3.2	B
EB	Left Turn	146	147	100.3%	30.3	6.2	C
	Through	687	683	99.4%	18.4	1.9	B
	Right Turn	202	204	101.1%	4.1	1.1	A
	Subtotal	1,035	1,034	99.9%	17.6	1.3	B
WB	Left Turn	170	177	103.9%	29.8	3.8	C
	Through	620	611	98.5%	23.5	2.7	C
	Right Turn	157	157	99.9%	20.8	2.3	C
	Subtotal	947	945	99.7%	24.3	2.5	C
Total		3,679	3,638	98.9%	26.9	2.4	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	10	103.0%	1.8	1.7	A
	Through	802	799	99.6%	0.4	0.2	A
	Right Turn	18	18	100.6%	0.6	0.1	A
	Subtotal	830	827	99.7%	0.5	0.2	A
SB	Left Turn	19	18	92.1%	3.8	2.5	A
	Through	896	882	98.5%	0.1	0.0	A
	Right Turn	42	42	99.3%	0.1	0.1	A
	Subtotal	957	942	98.4%	0.2	0.1	A
EB	Left Turn	29	28	96.9%	17.1	3.5	C
	Through						
	Right Turn	8	7	88.8%	12.7	9.5	B
	Subtotal	37	35	95.1%	16.8	3.8	C
WB	Left Turn	4	3	85.0%	1.7	3.8	A
	Through						
	Right Turn	14	13	90.0%	4.4	3.2	A
	Subtotal	18	16	88.9%	6.2	2.8	A
Total		1,842	1,820	98.8%	0.7	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	73	75	102.5%	44.4	9.8	D
	Through	397	390	98.2%	39.7	4.8	D
	Right Turn	149	152	102.2%	25.7	5.0	C
	Subtotal	619	617	99.6%	36.6	4.4	D
SB	Left Turn	97	95	97.9%	47.5	6.8	D
	Through	216	210	97.0%	36.0	4.9	D
	Right Turn	98	101	102.6%	6.3	1.4	A
	Subtotal	411	405	98.6%	30.3	3.3	C
EB	Left Turn	111	103	93.1%	20.9	4.1	C
	Through	452	458	101.3%	14.9	2.2	B
	Right Turn	34	35	102.9%	15.2	4.4	B
	Subtotal	597	596	99.8%	16.0	1.8	B
WB	Left Turn	109	107	98.2%	15.6	3.8	B
	Through	560	559	99.9%	10.4	1.4	B
	Right Turn	70	70	99.6%	8.6	3.3	A
	Subtotal	739	736	99.6%	11.0	1.3	B
Total		2,366	2,354	99.5%	22.5	1.3	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	38	38	100.3%	4.1	1.7	A
	Through	489	475	97.1%	2.3	0.7	A
	Right Turn						
	Subtotal	527	513	97.3%	2.4	0.8	A
SB	Left Turn						
	Through	405	403	99.4%	2.5	0.4	A
	Right Turn	152	156	102.4%	0.4	0.4	A
	Subtotal	557	558	100.2%	1.9	0.3	A
EB	Left Turn	98	96	98.2%	23.9	4.0	C
	Through						
	Right Turn	31	31	98.4%	4.5	0.4	A
	Subtotal	129	127	98.2%	19.5	3.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,213	1,198	98.7%	4.2	0.7	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	551	536	97.3%	0.2	0.0	A
	Right Turn	36	35	97.2%	0.0	0.0	A
	Subtotal	587	571	97.3%	0.1	0.0	A
SB	Left Turn	42	43	103.3%	3.6	1.7	A
	Through	540	541	100.3%	2.2	0.5	A
	Right Turn						
	Subtotal	582	585	100.5%	2.3	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	17	17	98.8%	7.9	1.4	A
	Through						
	Right Turn	12	10	85.0%	5.3	0.3	A
	Subtotal	29	27	93.1%	6.8	0.7	A
Total		1,198	1,183	98.7%	1.4	0.2	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	98.0%	0.4	0.4	A
	Through	536	519	96.8%	0.1	0.0	A
	Right Turn	22	22	101.4%	0.4	0.2	A
	Subtotal	563	546	96.9%	0.1	0.0	A
SB	Left Turn	13	11	87.7%	1.1	0.9	A
	Through	543	545	100.3%	0.3	0.1	A
	Right Turn	4	5	115.0%	0.5	0.3	A
	Subtotal	560	561	100.1%	0.3	0.1	A
EB	Left Turn	2	1	65.0%	3.4	4.5	A
	Through						
	Right Turn	8	7	83.8%	7.1	0.7	A
	Subtotal	10	8	80.0%	7.3	0.7	A
WB	Left Turn	37	37	100.0%	9.8	1.4	A
	Through						
	Right Turn	24	23	97.5%	6.9	0.6	A
	Subtotal	61	60	99.0%	8.7	1.0	A
Total		1,194	1,175	98.4%	1.1	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	90.0%	1.8	4.4	A
	Through	543	527	97.0%	0.1	0.1	A
	Right Turn	14	12	84.3%	0.5	0.1	A
	Subtotal	562	543	96.6%	0.2	0.1	A
SB	Left Turn	10	11	113.0%	1.6	1.5	A
	Through	533	535	100.3%	0.3	0.1	A
	Right Turn	4	4	102.5%	0.3	0.3	A
	Subtotal	547	550	100.5%	0.4	0.1	A
EB	Left Turn	14	13	92.9%	6.5	0.4	A
	Through	5	5	94.0%	5.0	4.7	A
	Right Turn	20	20	101.5%	5.2	1.9	A
	Subtotal	39	38	97.4%	6.5	0.7	A
WB	Left Turn	7	5	74.3%	8.4	4.1	A
	Through						
	Right Turn	8	8	96.3%	6.3	0.7	A
	Subtotal	15	13	86.0%	7.7	1.4	A
Total		1,163	1,144	98.3%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	227	228	100.3%	57.5	4.0	E
	Right Turn	552	543	98.4%	5.3	1.6	A
	Subtotal	779	771	99.0%	20.9	2.8	C
SB	Left Turn	2	2	80.0%	27.5	32.8	C
	Through	94	91	97.1%	51.0	6.8	D
	Right Turn	47	48	102.8%	24.5	5.9	C
	Subtotal	143	141	98.7%	41.3	4.5	D
EB	Left Turn	83	80	96.5%	66.8	6.4	E
	Through	490	472	96.3%	12.3	2.3	B
	Right Turn	7	7	100.0%	8.8	8.4	A
	Subtotal	580	559	96.4%	19.7	3.0	B
WB	Left Turn	344	336	97.6%	53.3	4.7	D
	Through	532	538	101.0%	9.2	1.9	A
	Right Turn	15	15	99.3%	3.0	2.0	A
	Subtotal	891	888	99.7%	26.6	1.8	C
Total		2,393	2,359	98.6%	24.0	1.8	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	8	115.7%	0.4	0.3	A
	Through	678	669	98.7%	0.4	0.1	A
	Right Turn	8	9	112.5%	0.4	0.3	A
	Subtotal	693	686	99.0%	0.4	0.1	A
SB	Left Turn	14	15	105.7%	2.6	6.2	A
	Through	500	486	97.3%	0.6	0.1	A
	Right Turn	3	3	93.3%	0.6	1.0	A
	Subtotal	517	504	97.5%	0.6	0.1	A
EB	Left Turn	6	6	98.3%	10.5	4.8	B
	Through	5	5	98.0%	13.0	5.6	B
	Right Turn	9	8	91.1%	7.5	1.2	A
	Subtotal	20	19	95.0%	10.6	2.1	B
WB	Left Turn	13	13	97.7%	8.6	3.9	A
	Through	2	2	110.0%	8.3	9.9	A
	Right Turn	63	62	98.7%	7.0	0.6	A
	Subtotal	78	77	98.8%	7.9	1.0	A
Total		1,308	1,286	98.3%	1.1	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	21	95.5%	1.5	1.6	A
	Through	668	663	99.2%	0.2	0.0	A
	Right Turn						
	Subtotal	690	684	99.1%	0.2	0.1	A
SB	Left Turn						
	Through	505	492	97.4%	0.2	0.1	A
	Right Turn	17	15	90.6%	0.4	0.1	A
	Subtotal	522	508	97.2%	0.2	0.1	A
EB	Left Turn	23	23	100.0%	11.4	3.9	B
	Through						
	Right Turn	38	37	98.2%	7.5	0.8	A
	Subtotal	61	60	98.9%	9.1	1.8	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,273	1,252	98.3%	0.7	0.1	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	21	96.4%	3.4	2.6	A
	Through	643	637	99.1%	1.5	0.5	A
	Right Turn	20	17	84.5%	1.0	0.6	A
	Subtotal	685	676	98.6%	1.5	0.5	A
SB	Left Turn	9	9	102.2%	6.5	3.8	A
	Through	514	499	97.1%	4.6	1.1	A
	Right Turn	19	20	102.6%	3.4	1.7	A
	Subtotal	542	528	97.4%	4.6	1.0	A
EB	Left Turn	19	20	106.3%	23.2	5.4	C
	Through	7	5	70.0%	12.4	14.6	B
	Right Turn	19	19	100.0%	8.2	2.6	A
	Subtotal	45	44	98.0%	16.5	2.5	B
WB	Left Turn	26	25	95.0%	22.1	4.5	C
	Through	5	6	120.0%	21.1	13.2	C
	Right Turn	27	26	97.8%	10.0	3.0	B
	Subtotal	58	57	98.4%	16.6	3.3	B
Total		1,330	1,304	98.1%	4.2	0.6	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	12	132.2%	3.3	3.5	A
	Through	688	683	99.2%	0.6	0.4	A
	Right Turn	6	7	113.3%	0.4	0.3	A
	Subtotal	703	701	99.7%	0.7	0.5	A
SB	Left Turn	15	16	105.3%	5.1	3.2	A
	Through	530	513	96.8%	0.5	0.4	A
	Right Turn	6	7	110.0%	0.2	0.2	A
	Subtotal	551	535	97.2%	0.6	0.5	A
EB	Left Turn	4	3	85.0%	10.2	7.9	B
	Through	3	3	93.3%	3.2	5.6	A
	Right Turn	12	11	90.0%	7.2	1.8	A
	Subtotal	19	17	89.5%	9.0	2.7	A
WB	Left Turn	3	3	113.3%	6.1	5.9	A
	Through						
	Right Turn	13	11	81.5%	7.4	1.3	A
	Subtotal	16	14	87.5%	8.3	1.3	A
Total		1,289	1,268	98.3%	0.9	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	119	123	103.1%	50.0	6.9	D
	Through	512	507	98.9%	36.0	2.8	D
	Right Turn	123	122	99.2%	27.8	6.4	C
	Subtotal	754	751	99.6%	37.2	2.9	D
SB	Left Turn	88	86	97.6%	43.6	7.2	D
	Through	378	363	96.1%	37.0	4.3	D
	Right Turn	79	78	98.9%	30.9	9.8	C
	Subtotal	545	527	96.8%	37.4	4.1	D
EB	Left Turn	76	80	105.3%	15.2	4.5	B
	Through	461	462	100.2%	12.0	3.1	B
	Right Turn	155	154	99.0%	2.8	0.6	A
	Subtotal	692	695	100.5%	10.2	2.3	B
WB	Left Turn	129	134	103.6%	19.0	3.4	B
	Through	527	522	99.0%	15.0	3.0	B
	Right Turn	119	119	100.0%	12.1	2.9	B
	Subtotal	775	774	99.9%	15.2	2.5	B
Total		2,766	2,748	99.3%	24.9	1.2	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	87.5%	3.1	4.6	A
	Through	769	767	99.8%	0.7	0.5	A
	Right Turn	4	4	90.0%	0.6	0.5	A
	Subtotal	781	778	99.6%	0.7	0.5	A
SB	Left Turn	5	5	108.0%	1.6	1.6	A
	Through	618	609	98.5%	0.1	0.0	A
	Right Turn	35	32	90.9%	0.1	0.1	A
	Subtotal	658	646	98.1%	0.1	0.0	A
EB	Left Turn	26	26	99.2%	15.2	2.9	C
	Through						
	Right Turn	7	6	90.0%	7.1	5.0	A
	Subtotal	33	32	97.3%	14.3	2.5	B
WB	Left Turn	7	6	88.6%	6.6	6.4	A
	Through						
	Right Turn	9	9	97.8%	3.3	3.5	A
	Subtotal	16	15	93.8%	9.1	3.9	A
Total		1,488	1,471	98.8%	0.7	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	67	68	101.9%	37.0	7.5	D
	Through	339	333	98.2%	36.8	4.5	D
	Right Turn	114	116	102.1%	21.6	5.9	C
	Subtotal	520	518	99.5%	33.3	4.8	C
SB	Left Turn	256	252	98.4%	60.4	15.1	E
	Through	477	474	99.3%	36.5	4.6	D
	Right Turn	148	149	100.9%	7.2	1.7	A
	Subtotal	881	875	99.3%	39.4	5.1	D
EB	Left Turn	167	159	95.4%	25.9	4.3	C
	Through	627	631	100.7%	18.7	2.8	B
	Right Turn	77	79	103.1%	14.7	5.2	B
	Subtotal	871	870	99.9%	19.7	2.5	B
WB	Left Turn	143	135	94.1%	22.3	6.2	C
	Through	616	620	100.6%	10.7	1.9	B
	Right Turn	180	179	99.3%	8.4	4.1	A
	Subtotal	939	933	99.4%	12.1	2.2	B
Total		3,211	3,196	99.5%	25.8	1.9	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	114	114	100.1%	12.8	4.7	B
	Through	595	578	97.2%	3.1	0.9	A
	Right Turn						
	Subtotal	709	692	97.6%	4.7	1.1	A
SB	Left Turn						
	Through	836	835	99.8%	1.9	0.1	A
	Right Turn	291	293	100.8%	0.1	0.1	A
	Subtotal	1,127	1,128	100.1%	1.4	0.1	A
EB	Left Turn	333	328	98.6%	50.6	4.1	D
	Through						
	Right Turn	163	165	101.5%	6.8	1.4	A
	Subtotal	496	494	99.5%	36.5	2.9	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,332	2,314	99.2%	10.8	0.9	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	866	849	98.0%	0.2	0.0	A
	Right Turn	62	57	92.3%	0.0	0.0	A
	Subtotal	928	906	97.7%	0.2	0.0	A
SB	Left Turn	31	29	94.8%	3.7	1.9	A
	Through	1,093	1,095	100.2%	2.9	0.6	A
	Right Turn						
	Subtotal	1,124	1,124	100.0%	2.9	0.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	34	33	98.2%	9.7	2.7	A
	Through						
	Right Turn	41	40	97.3%	5.5	0.4	A
	Subtotal	75	73	97.7%	7.2	1.1	A
Total		2,127	2,104	98.9%	1.8	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	104.0%	1.2	1.9	A
	Through	856	836	97.6%	0.2	0.0	A
	Right Turn	46	48	105.2%	0.5	0.2	A
	Subtotal	907	889	98.0%	0.2	0.0	A
SB	Left Turn	28	30	105.7%	2.2	1.0	A
	Through	1,081	1,083	100.2%	0.5	0.1	A
	Right Turn	6	5	85.0%	0.5	0.5	A
	Subtotal	1,115	1,118	100.3%	0.5	0.1	A
EB	Left Turn	4	3	67.5%	3.2	4.2	A
	Through						
	Right Turn	6	5	90.0%	4.2	3.6	A
	Subtotal	10	8	81.0%	7.4	1.2	A
WB	Left Turn	37	37	99.7%	13.5	4.9	B
	Through						
	Right Turn	24	23	97.5%	9.1	2.7	A
	Subtotal	61	60	98.9%	11.8	3.9	B
Total		2,093	2,075	99.2%	0.8	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	25	24	94.4%	9.2	5.8	A
	Through	833	814	97.7%	0.3	0.2	A
	Right Turn	26	23	88.8%	0.6	0.2	A
	Subtotal	884	861	97.4%	0.5	0.2	A
SB	Left Turn	13	15	116.2%	4.6	3.6	A
	Through	1,070	1,076	100.6%	1.1	0.2	A
	Right Turn	4	4	102.5%	0.7	1.1	A
	Subtotal	1,087	1,095	100.7%	1.1	0.2	A
EB	Left Turn	5	6	110.0%	6.7	3.0	A
	Through	6	5	83.3%	8.4	9.0	A
	Right Turn	19	18	95.8%	6.1	0.4	A
	Subtotal	30	29	95.7%	7.2	1.8	A
WB	Left Turn	26	26	99.2%	20.1	6.4	C
	Through	5	6	126.0%	22.0	16.4	C
	Right Turn	16	15	92.5%	7.3	2.0	A
	Subtotal	47	47	99.8%	16.7	4.7	C
Total		2,048	2,032	99.2%	1.3	0.2	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	6	80.0%	70.3	34.7	E
	Through	248	251	101.3%	55.2	4.8	E
	Right Turn	525	518	98.6%	3.8	2.4	A
	Subtotal	780	775	99.3%	21.7	4.0	C
SB	Left Turn	3	2	80.0%	25.5	45.6	C
	Through	316	315	99.7%	47.1	8.9	D
	Right Turn	220	220	99.9%	36.8	7.3	D
	Subtotal	539	537	99.6%	42.9	7.4	D
EB	Left Turn	184	177	96.1%	67.5	17.0	E
	Through	609	600	98.4%	38.9	9.4	D
	Right Turn	10	10	95.0%	20.6	27.0	C
	Subtotal	803	786	97.9%	45.4	10.5	D
WB	Left Turn	564	555	98.4%	38.3	7.3	D
	Through	920	922	100.2%	19.8	1.9	B
	Right Turn	35	37	106.3%	4.4	1.2	A
	Subtotal	1,519	1,514	99.7%	26.3	3.8	C
Total		3,641	3,611	99.2%	32.2	4.0	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	5	86.7%	0.3	0.2	A
	Through	777	772	99.4%	0.3	0.1	A
	Right Turn	24	24	98.3%	0.6	0.3	A
	Subtotal	807	801	99.2%	0.3	0.1	A
SB	Left Turn	66	68	102.6%	1.0	0.1	A
	Through	787	774	98.3%	0.6	0.1	A
	Right Turn	12	13	109.2%	1.0	0.9	A
	Subtotal	865	855	98.8%	0.6	0.1	A
EB	Left Turn	12	12	98.3%	14.2	6.8	B
	Through	3	3	113.3%	12.0	10.8	B
	Right Turn	29	27	92.1%	8.3	1.9	A
	Subtotal	44	42	95.2%	11.6	3.5	B
WB	Left Turn	11	10	88.2%	19.1	13.0	C
	Through	4	4	90.0%	10.3	9.5	B
	Right Turn	38	38	99.5%	8.4	1.9	A
	Subtotal	53	51	96.4%	11.4	4.0	B
Total		1,769	1,749	98.8%	0.9	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	43	44	101.4%	5.9	3.7	A
	Through	780	776	99.5%	0.3	0.1	A
	Right Turn						
	Subtotal	823	820	99.6%	0.6	0.3	A
SB	Left Turn						
	Through	792	777	98.1%	0.3	0.1	A
	Right Turn	35	34	96.0%	0.7	0.2	A
	Subtotal	827	811	98.0%	0.4	0.1	A
EB	Left Turn	27	26	96.7%	16.6	6.2	C
	Through						
	Right Turn	36	34	95.3%	7.6	1.4	A
	Subtotal	63	60	95.9%	11.1	2.3	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,713	1,691	98.7%	0.8	0.1	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	23	106.4%	8.2	4.9	A
	Through	771	765	99.2%	5.8	0.8	A
	Right Turn	51	48	93.5%	2.5	1.1	A
	Subtotal	844	836	99.1%	5.7	0.8	A
SB	Left Turn	10	10	95.0%	8.1	7.8	A
	Through	797	781	97.9%	4.7	0.6	A
	Right Turn	30	29	96.7%	3.6	1.8	A
	Subtotal	837	819	97.9%	4.7	0.6	A
EB	Left Turn	54	58	107.0%	24.6	4.9	C
	Through	19	18	93.7%	18.3	6.3	B
	Right Turn	41	38	91.5%	10.5	2.3	B
	Subtotal	114	113	99.2%	19.2	2.2	B
WB	Left Turn	31	30	97.1%	23.7	4.1	C
	Through	10	11	108.0%	16.8	6.5	B
	Right Turn	14	12	87.9%	8.2	4.1	A
	Subtotal	55	53	96.7%	18.7	3.2	B
Total		1,850	1,822	98.5%	6.7	0.3	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	9	124.3%	1.6	1.2	A
	Through	832	828	99.5%	0.4	0.1	A
	Right Turn	5	4	88.0%	0.4	0.5	A
	Subtotal	844	841	99.6%	0.4	0.1	A
SB	Left Turn	19	17	90.0%	8.5	9.1	A
	Through	832	816	98.0%	0.3	0.1	A
	Right Turn	7	6	80.0%	0.3	0.2	A
	Subtotal	858	838	97.7%	0.4	0.2	A
EB	Left Turn	7	7	97.1%	15.9	12.4	C
	Through	2	2	120.0%	7.8	9.0	A
	Right Turn	30	27	90.7%	7.9	1.2	A
	Subtotal	39	36	93.3%	9.7	2.7	A
WB	Left Turn	5	5	102.0%	9.1	8.2	A
	Through	2	2	80.0%	6.9	14.0	A
	Right Turn	20	18	92.0%	8.0	1.3	A
	Subtotal	27	25	93.0%	10.1	2.8	B
Total		1,768	1,741	98.5%	0.8	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	159	161	101.1%	76.1	16.4	E
	Through	563	558	99.1%	39.5	4.3	D
	Right Turn	155	154	99.6%	32.9	3.1	C
	Subtotal	877	873	99.6%	45.4	3.6	D
SB	Left Turn	171	164	96.1%	27.6	4.3	C
	Through	609	590	96.9%	16.3	2.8	B
	Right Turn	122	123	100.7%	11.6	3.4	B
	Subtotal	902	877	97.3%	17.9	2.0	B
EB	Left Turn	152	152	100.2%	43.0	15.2	D
	Through	721	718	99.6%	22.1	3.6	C
	Right Turn	211	213	101.1%	4.3	0.8	A
	Subtotal	1,084	1,084	100.0%	22.0	3.6	C
WB	Left Turn	178	185	104.2%	36.5	4.6	D
	Through	651	641	98.5%	27.3	2.9	C
	Right Turn	165	165	99.9%	23.0	3.3	C
	Subtotal	994	992	99.8%	28.4	2.6	C
Total		3,857	3,826	99.2%	28.2	1.7	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	11	106.0%	3.5	3.7	A
	Through	841	836	99.4%	0.9	0.7	A
	Right Turn	19	20	104.2%	0.9	0.4	A
	Subtotal	870	866	99.6%	0.9	0.7	A
SB	Left Turn	20	20	97.5%	4.5	4.8	A
	Through	940	932	99.1%	0.1	0.0	A
	Right Turn	42	42	99.5%	0.2	0.2	A
	Subtotal	1,002	993	99.1%	0.2	0.2	A
EB	Left Turn	30	31	101.7%	18.8	8.6	C
	Through						
	Right Turn	9	9	95.6%	11.8	9.4	B
	Subtotal	39	39	100.3%	17.9	8.0	C
WB	Left Turn	5	5	104.0%	5.5	5.1	A
	Through						
	Right Turn	15	15	98.7%	8.0	1.4	A
	Subtotal	20	20	100.0%	8.3	1.2	A
Total		1,931	1,919	99.4%	1.0	0.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	69	71	102.9%	41.4	4.3	D
	Through	378	372	98.4%	40.6	3.3	D
	Right Turn	142	146	102.5%	25.6	3.5	C
	Subtotal	589	588	99.9%	36.8	2.7	D
SB	Left Turn	93	91	97.4%	47.6	6.6	D
	Through	206	201	97.5%	39.1	7.0	D
	Right Turn	93	95	101.7%	6.3	1.7	A
	Subtotal	392	386	98.5%	33.6	3.6	C
EB	Left Turn	106	99	93.0%	17.8	4.6	B
	Through	431	437	101.5%	11.7	2.7	B
	Right Turn	32	33	103.4%	9.7	9.4	A
	Subtotal	569	569	100.0%	12.8	2.4	B
WB	Left Turn	104	104	100.4%	12.2	3.8	B
	Through	534	531	99.4%	7.7	1.4	A
	Right Turn	68	68	99.6%	5.3	3.3	A
	Subtotal	706	703	99.6%	8.2	1.7	A
Total		2,256	2,247	99.6%	21.4	1.2	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	36	36	100.6%	4.8	1.9	A
	Through	467	455	97.5%	2.2	0.6	A
	Right Turn						
	Subtotal	503	491	97.7%	2.4	0.6	A
SB	Left Turn						
	Through	387	386	99.7%	2.3	0.3	A
	Right Turn	145	150	103.2%	0.6	0.4	A
	Subtotal	532	536	100.7%	1.9	0.3	A
EB	Left Turn	93	90	97.2%	23.8	4.6	C
	Through						
	Right Turn	29	28	97.2%	4.8	0.7	A
	Subtotal	122	119	97.2%	20.0	4.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,157	1,146	99.0%	4.2	0.7	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	525	511	97.4%	0.2	0.1	A
	Right Turn	35	34	97.4%	0.0	0.0	A
	Subtotal	560	545	97.4%	0.2	0.1	A
SB	Left Turn	40	41	102.8%	2.2	1.4	A
	Through	516	519	100.6%	2.0	0.6	A
	Right Turn						
	Subtotal	556	560	100.8%	2.0	0.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	16	16	101.9%	8.0	1.6	A
	Through						
	Right Turn	11	10	89.1%	5.3	0.8	A
	Subtotal	27	26	96.7%	6.9	0.9	A
Total		1,143	1,132	99.0%	1.3	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	0.4	0.6	A
	Through	511	496	97.1%	0.1	0.1	A
	Right Turn	21	20	95.2%	0.5	0.1	A
	Subtotal	536	521	97.1%	0.1	0.1	A
SB	Left Turn	12	11	87.5%	0.8	1.2	A
	Through	518	522	100.8%	0.2	0.0	A
	Right Turn	3	3	110.0%	0.5	0.3	A
	Subtotal	533	536	100.6%	0.2	0.1	A
EB	Left Turn	1	0	30.0%	0.9	2.7	A
	Through						
	Right Turn	7	7	95.7%	7.2	0.6	A
	Subtotal	8	7	87.5%	7.3	0.6	A
WB	Left Turn	36	35	95.8%	9.0	1.0	A
	Through						
	Right Turn	23	22	95.7%	6.8	0.8	A
	Subtotal	59	57	95.8%	8.2	0.8	A
Total		1,136	1,120	98.6%	1.0	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	1.2	2.0	A
	Through	518	503	97.2%	0.2	0.1	A
	Right Turn	13	11	83.8%	0.5	0.1	A
	Subtotal	535	518	96.9%	0.2	0.1	A
SB	Left Turn	9	10	113.3%	1.7	2.3	A
	Through	508	511	100.6%	0.3	0.1	A
	Right Turn	3	3	93.3%	0.3	0.2	A
	Subtotal	520	524	100.7%	0.4	0.1	A
EB	Left Turn	13	12	94.6%	7.0	1.2	A
	Through	4	4	100.0%	3.3	4.6	A
	Right Turn	19	20	104.2%	5.8	0.3	A
	Subtotal	36	36	100.3%	6.4	0.5	A
WB	Left Turn	6	5	86.7%	8.6	8.6	A
	Through						
	Right Turn	7	8	110.0%	7.7	3.6	A
	Subtotal	13	13	99.2%	8.6	4.5	A
Total		1,104	1,091	98.8%	0.5	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	216	213	98.7%	48.5	4.8	D
	Right Turn	527	517	98.2%	2.4	0.8	A
	Subtotal	743	730	98.3%	15.0	2.0	B
SB	Left Turn	1	1	70.0%	6.8	19.9	A
	Through	90	89	98.7%	51.3	10.4	D
	Right Turn	45	45	100.7%	21.4	10.5	C
	Subtotal	136	135	99.1%	40.5	8.8	D
EB	Left Turn	79	77	96.8%	66.1	7.3	E
	Through	467	450	96.4%	10.6	1.9	B
	Right Turn	6	6	105.0%	9.0	16.1	A
	Subtotal	552	533	96.6%	19.1	2.7	B
WB	Left Turn	328	319	97.2%	53.2	5.6	D
	Through	507	514	101.4%	7.9	1.9	A
	Right Turn	14	14	97.1%	2.9	1.5	A
	Subtotal	849	846	99.7%	25.1	3.7	C
Total		2,280	2,245	98.5%	21.6	2.5	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	100.0%	1.0	0.8	A
	Through	645	638	98.9%	1.0	0.1	A
	Right Turn	7	7	104.3%	1.0	1.0	A
	Subtotal	658	651	99.0%	1.0	0.1	A
SB	Left Turn	13	14	106.9%	0.8	0.8	A
	Through	478	466	97.4%	1.5	0.5	A
	Right Turn	2	1	60.0%	0.1	0.3	A
	Subtotal	493	481	97.5%	1.5	0.5	A
EB	Left Turn	5	5	102.0%	10.9	6.8	B
	Through	4	5	117.5%	10.9	5.5	B
	Right Turn	8	7	90.0%	5.8	0.7	A
	Subtotal	17	17	100.0%	9.4	1.7	A
WB	Left Turn	2	12	590.0%	18.8	14.4	C
	Through	1	1	100.0%	4.4	9.4	A
	Right Turn	60	60	100.3%	10.3	2.7	B
	Subtotal	63	73	115.9%	11.3	2.8	B
Total		1,231	1,222	99.3%	1.9	0.3	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	19	91.4%	1.1	0.9	A
	Through	636	630	99.1%	0.6	0.1	A
	Right Turn						
	Subtotal	657	650	98.9%	0.6	0.1	A
SB	Left Turn						
	Through	482	469	97.4%	0.9	0.3	A
	Right Turn	16	16	97.5%	0.8	0.3	A
	Subtotal	498	485	97.4%	0.9	0.2	A
EB	Left Turn	22	21	97.3%	15.8	7.4	C
	Through						
	Right Turn	37	36	96.2%	9.7	3.7	A
	Subtotal	59	57	96.6%	11.9	4.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,214	1,192	98.1%	1.0	0.2	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	21	101.4%	5.6	3.8	A
	Through	613	605	98.6%	3.6	1.3	A
	Right Turn	19	17	90.0%	1.4	1.2	A
	Subtotal	653	643	98.5%	3.6	1.3	A
SB	Left Turn	8	8	96.3%	5.2	5.0	A
	Through	491	480	97.7%	4.4	1.3	A
	Right Turn	18	16	91.1%	4.1	3.3	A
	Subtotal	517	504	97.5%	4.4	1.3	A
EB	Left Turn	18	20	108.9%	23.9	4.9	C
	Through	6	4	70.0%	13.2	17.4	B
	Right Turn	18	18	98.3%	9.3	4.9	A
	Subtotal	42	42	98.8%	18.1	2.2	B
WB	Left Turn	24	23	94.2%	21.4	3.5	C
	Through	4	4	105.0%	18.9	18.4	B
	Right Turn	25	25	101.2%	8.3	2.4	A
	Subtotal	53	52	98.3%	15.0	3.0	B
Total		1,265	1,241	98.1%	5.2	0.9	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	8	105.0%	5.0	7.8	A
	Through	657	650	99.0%	2.2	0.6	A
	Right Turn	5	5	98.0%	1.3	2.0	A
	Subtotal	670	664	99.1%	2.2	0.6	A
SB	Left Turn	14	14	97.9%	9.1	6.9	A
	Through	507	492	97.0%	0.8	0.4	A
	Right Turn	6	7	121.7%	0.4	0.2	A
	Subtotal	527	513	97.3%	1.0	0.5	A
EB	Left Turn	3	2	80.0%	6.3	14.6	A
	Through	2	2	85.0%	3.5	6.0	A
	Right Turn	11	11	98.2%	7.1	5.4	A
	Subtotal	16	15	93.1%	10.9	6.6	B
WB	Left Turn	2	2	100.0%	4.1	5.5	A
	Through						
	Right Turn	12	10	83.3%	13.0	10.1	B
	Subtotal	14	12	85.7%	11.2	5.4	B
Total		1,227	1,203	98.1%	1.8	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	114	119	103.9%	41.3	9.5	D
	Through	488	479	98.2%	40.7	5.9	D
	Right Turn	117	117	99.9%	7.5	1.9	A
	Subtotal	719	715	99.4%	35.7	5.5	D
SB	Left Turn	84	82	97.3%	58.6	14.9	E
	Through	361	346	95.9%	34.9	4.9	C
	Right Turn	76	76	99.5%	23.4	6.8	C
	Subtotal	521	504	96.7%	36.8	4.3	D
EB	Left Turn	73	76	104.2%	23.5	6.5	C
	Through	439	441	100.5%	14.2	2.2	B
	Right Turn	148	146	98.4%	3.2	0.5	A
	Subtotal	660	663	100.4%	12.7	1.2	B
WB	Left Turn	123	127	103.5%	23.5	3.8	C
	Through	502	496	98.9%	18.8	1.5	B
	Right Turn	113	113	100.4%	16.3	3.0	B
	Subtotal	738	737	99.9%	19.1	1.3	B
Total		2,638	2,618	99.2%	25.6	1.6	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	91.3%	5.4	5.8	A
	Through	733	730	99.6%	3.6	1.0	A
	Right Turn	3	3	86.7%	0.6	1.0	A
	Subtotal	744	740	99.4%	3.6	0.9	A
SB	Left Turn	4	4	107.5%	7.1	14.3	A
	Through	589	578	98.2%	0.1	0.0	A
	Right Turn	35	32	91.7%	0.1	0.1	A
	Subtotal	628	615	97.9%	0.1	0.1	A
EB	Left Turn	25	24	96.4%	26.7	6.1	D
	Through						
	Right Turn	6	5	86.7%	7.1	5.3	A
	Subtotal	31	29	94.5%	23.7	4.7	C
WB	Left Turn	6	4	71.7%	0.0	0.0	A
	Through						
	Right Turn	8	8	96.3%	0.5	1.7	A
	Subtotal	14	12	85.7%	0.5	1.7	A
Total		1,417	1,396	98.5%	2.6	0.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	65	102.5%	33.7	4.4	C
	Through	323	319	98.7%	37.9	3.8	D
	Right Turn	109	112	102.7%	22.1	5.7	C
	Subtotal	495	495	100.1%	33.6	4.2	C
SB	Left Turn	245	242	98.8%	56.5	12.3	E
	Through	454	448	98.6%	34.8	3.0	C
	Right Turn	141	142	100.9%	7.1	1.4	A
	Subtotal	840	832	99.0%	37.0	4.6	D
EB	Left Turn	159	152	95.8%	23.7	3.6	C
	Through	598	600	100.3%	16.6	2.0	B
	Right Turn	73	76	104.7%	16.0	5.5	B
	Subtotal	830	828	99.8%	18.0	2.3	B
WB	Left Turn	136	127	93.4%	21.2	7.5	C
	Through	587	591	100.6%	9.7	3.0	A
	Right Turn	173	172	99.2%	6.7	3.0	A
	Subtotal	896	889	99.2%	11.0	2.7	B
Total		3,061	3,045	99.5%	24.4	1.6	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	108	108	99.9%	13.3	3.5	B
	Through	568	553	97.3%	3.4	0.9	A
	Right Turn						
	Subtotal	676	661	97.7%	5.1	1.2	A
SB	Left Turn						
	Through	798	792	99.3%	1.8	0.2	A
	Right Turn	277	279	100.7%	0.1	0.2	A
	Subtotal	1,075	1,071	99.6%	1.4	0.1	A
EB	Left Turn	317	313	98.8%	51.8	4.5	D
	Through						
	Right Turn	155	157	101.5%	5.8	0.7	A
	Subtotal	472	470	99.7%	37.0	4.1	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,223	2,202	99.1%	11.1	1.2	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
PM Peak Hour

**Intersection 3**                      **Richmond Street/Miller Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	826	810	98.1%	0.2	0.1	A
	Right Turn	59	55	93.9%	0.0	0.0	A
	Subtotal	885	865	97.8%	0.2	0.1	A
SB	Left Turn	29	28	97.2%	2.3	1.5	A
	Through	1,042	1,039	99.7%	2.4	0.4	A
	Right Turn						
	Subtotal	1,071	1,067	99.6%	2.4	0.4	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	33	33	99.4%	8.9	1.3	A
	Through						
	Right Turn	39	38	98.5%	6.0	1.4	A
	Subtotal	72	71	98.9%	7.1	1.2	A
Total		2,028	2,004	98.8%	1.6	0.2	A

**Intersection 4**                      **Richmond Street/Gunn Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	5	112.5%	2.7	4.1	A
	Through	816	796	97.6%	0.2	0.1	A
	Right Turn	45	47	103.8%	0.5	0.1	A
	Subtotal	865	847	98.0%	0.2	0.0	A
SB	Left Turn	27	28	104.8%	2.3	0.9	A
	Through	1,030	1,029	99.9%	0.4	0.1	A
	Right Turn	5	4	74.0%	0.3	0.3	A
	Subtotal	1,062	1,061	99.9%	0.4	0.1	A
EB	Left Turn	3	2	66.7%	3.2	4.3	A
	Through						
	Right Turn	5	5	102.0%	4.1	3.6	A
	Subtotal	8	7	88.8%	7.3	1.4	A
WB	Left Turn	36	34	95.3%	13.0	1.9	B
	Through						
	Right Turn	23	22	95.7%	7.8	2.0	A
	Subtotal	59	56	95.4%	10.8	1.4	B
Total		1,994	1,972	98.9%	0.7	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 5                      Richmond Street/Elgin Avenue                      Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	23	20	87.0%	5.4	4.7	A
	Through	795	776	97.6%	0.3	0.2	A
	Right Turn	24	24	97.9%	0.6	0.2	A
	Subtotal	842	819	97.3%	0.4	0.3	A
SB	Left Turn	12	14	119.2%	4.6	2.7	A
	Through	1,020	1,020	100.0%	0.8	0.4	A
	Right Turn	3	3	103.3%	0.6	0.9	A
	Subtotal	1,035	1,037	100.2%	0.9	0.4	A
EB	Left Turn	4	4	92.5%	3.8	3.2	A
	Through	5	4	80.0%	5.9	3.2	A
	Right Turn	18	17	95.6%	6.0	0.4	A
	Subtotal	27	25	92.2%	6.3	0.4	A
WB	Left Turn	24	24	98.8%	17.9	13.9	C
	Through	4	5	127.5%	13.2	11.3	B
	Right Turn	15	14	93.3%	7.7	1.8	A
	Subtotal	43	43	99.5%	12.8	2.5	B
Total		1,947	1,924	98.8%	1.0	0.3	A

Intersection 6                      Highland Drive/Richmond Street                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	101.7%	45.5	35.1	D
	Through	236	239	101.1%	47.2	5.8	D
	Right Turn	501	494	98.5%	2.4	0.9	A
	Subtotal	743	738	99.4%	16.3	2.2	B
SB	Left Turn	2	2	85.0%	6.4	20.1	A
	Through	301	299	99.3%	43.0	5.2	D
	Right Turn	210	207	98.6%	33.7	4.7	C
	Subtotal	513	508	99.0%	38.9	4.1	D
EB	Left Turn	175	169	96.6%	58.9	10.4	E
	Through	581	571	98.2%	28.8	3.2	C
	Right Turn	9	8	92.2%	18.9	11.8	B
	Subtotal	765	748	97.8%	35.5	4.3	D
WB	Left Turn	538	513	95.4%	118.9	53.4	F
	Through	877	875	99.7%	29.7	9.6	C
	Right Turn	33	35	104.8%	6.2	5.7	A
	Subtotal	1,448	1,423	98.2%	60.1	23.4	E
Total		3,469	3,417	98.5%	42.5	9.4	D

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	96.0%	0.8	0.9	A
	Through	742	740	99.7%	1.0	0.1	A
	Right Turn	23	21	91.7%	1.0	0.5	A
	Subtotal	770	766	99.4%	1.0	0.1	A
SB	Left Turn	62	61	98.5%	0.8	0.2	A
	Through	751	723	96.3%	2.1	0.4	A
	Right Turn	11	12	109.1%	3.1	3.0	A
	Subtotal	824	797	96.7%	2.0	0.4	A
EB	Left Turn	11	11	100.0%	14.0	4.7	B
	Through	2	3	135.0%	11.3	16.4	B
	Right Turn	27	26	97.0%	6.1	0.5	A
	Subtotal	40	40	99.8%	9.1	1.6	A
WB	Left Turn	10	9	91.0%	28.2	21.1	D
	Through	3	3	96.7%	10.8	11.8	B
	Right Turn	36	36	100.6%	11.9	3.5	B
	Subtotal	49	48	98.4%	15.5	5.3	C
Total		1,683	1,650	98.1%	2.2	0.3	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	43	102.4%	16.0	4.1	C
	Through	744	741	99.6%	0.5	0.1	A
	Right Turn						
	Subtotal	786	784	99.7%	1.4	0.3	A
SB	Left Turn						
	Through	754	726	96.3%	1.4	0.4	A
	Right Turn	34	32	95.3%	1.2	0.5	A
	Subtotal	788	758	96.2%	1.4	0.4	A
EB	Left Turn	26	26	100.0%	22.9	8.1	C
	Through						
	Right Turn	35	34	98.3%	15.0	6.2	C
	Subtotal	61	60	99.0%	17.7	6.4	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,635	1,603	98.0%	2.0	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	23	109.5%	15.3	6.5	B
	Through	736	730	99.2%	6.9	0.7	A
	Right Turn	48	47	97.1%	6.9	2.4	A
	Subtotal	805	800	99.4%	7.1	0.7	A
SB	Left Turn	9	8	93.3%	9.3	9.1	A
	Through	761	733	96.3%	6.5	0.8	A
	Right Turn	28	26	93.9%	4.9	2.8	A
	Subtotal	798	767	96.2%	6.5	0.8	A
EB	Left Turn	52	55	106.5%	23.3	4.4	C
	Through	18	17	93.3%	20.6	6.9	C
	Right Turn	39	36	92.3%	14.9	4.6	B
	Subtotal	109	108	99.3%	20.2	2.9	C
WB	Left Turn	29	29	98.3%	20.8	4.8	C
	Through	9	10	111.1%	20.1	9.1	C
	Right Turn	13	12	90.0%	6.1	3.5	A
	Subtotal	51	50	98.4%	17.7	4.7	B
Total		1,763	1,726	97.9%	8.2	0.8	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	98.3%	4.6	6.4	A
	Through	795	790	99.4%	2.1	0.6	A
	Right Turn	4	4	92.5%	0.6	1.0	A
	Subtotal	805	800	99.3%	2.1	0.6	A
SB	Left Turn	18	17	91.7%	12.6	8.3	B
	Through	795	765	96.2%	1.2	0.5	A
	Right Turn	6	5	90.0%	0.3	0.2	A
	Subtotal	819	787	96.0%	1.5	0.6	A
EB	Left Turn	6	6	103.3%	16.6	15.9	C
	Through	1	1	50.0%	1.8	5.7	A
	Right Turn	29	28	94.8%	12.3	6.1	B
	Subtotal	36	34	95.0%	13.3	7.6	B
WB	Left Turn	4	5	112.5%	7.0	8.0	A
	Through	1	1	110.0%	2.8	6.0	A
	Right Turn	19	19	98.4%	12.5	3.1	B
	Subtotal	24	24	101.3%	12.9	2.9	B
Total		1,684	1,645	97.7%	2.3	0.5	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	152	155	101.8%	54.9	9.1	D
	Through	537	529	98.6%	38.8	5.6	D
	Right Turn	147	146	99.1%	11.9	4.1	B
	Subtotal	836	830	99.3%	37.4	4.7	D
SB	Left Turn	163	155	95.0%	45.3	8.0	D
	Through	581	557	95.9%	23.9	2.1	C
	Right Turn	117	115	98.2%	15.1	4.6	B
	Subtotal	861	827	96.0%	26.8	3.1	C
EB	Left Turn	146	148	101.0%	36.4	7.9	D
	Through	687	685	99.6%	24.3	2.1	C
	Right Turn	202	205	101.4%	4.7	1.5	A
	Subtotal	1,035	1,037	100.2%	22.5	2.1	C
WB	Left Turn	170	177	103.9%	42.6	9.9	D
	Through	620	613	98.8%	32.0	3.9	C
	Right Turn	157	157	100.2%	29.2	4.3	C
	Subtotal	947	947	100.0%	33.6	4.7	C
Total		3,679	3,640	98.9%	29.8	2.1	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	10	103.0%	17.2	23.0	C
	Through	802	799	99.6%	4.3	1.9	A
	Right Turn	18	18	100.6%	0.7	0.3	A
	Subtotal	830	827	99.7%	4.3	2.0	A
SB	Left Turn	19	18	93.7%	9.6	4.0	A
	Through	896	882	98.5%	0.1	0.0	A
	Right Turn	42	42	99.5%	0.1	0.0	A
	Subtotal	957	942	98.4%	0.3	0.1	A
EB	Left Turn	29	28	96.6%	27.4	12.8	D
	Through						
	Right Turn	8	7	88.8%	9.6	6.2	A
	Subtotal	37	35	94.9%	25.7	12.5	D
WB	Left Turn	4	3	85.0%	4.9	6.9	A
	Through						
	Right Turn	14	13	90.0%	6.6	1.1	A
	Subtotal	18	16	88.9%	7.4	1.8	A
Total		1,842	1,820	98.8%	2.7	0.9	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	73	75	102.5%	42.2	6.8	D
	Through	397	390	98.2%	38.9	2.8	D
	Right Turn	149	152	101.9%	25.5	5.0	C
	Subtotal	619	616	99.6%	35.9	3.2	D
SB	Left Turn	97	95	97.7%	48.9	6.3	D
	Through	216	210	97.4%	35.9	6.2	D
	Right Turn	98	100	102.3%	6.6	2.0	A
	Subtotal	411	405	98.6%	30.7	4.1	C
EB	Left Turn	111	104	93.3%	20.3	4.4	C
	Through	452	458	101.3%	14.5	1.9	B
	Right Turn	34	35	102.9%	14.5	4.5	B
	Subtotal	597	596	99.9%	15.5	1.5	B
WB	Left Turn	109	107	98.3%	14.1	4.2	B
	Through	560	559	99.9%	9.3	1.3	A
	Right Turn	70	70	99.7%	6.0	2.5	A
	Subtotal	739	736	99.6%	9.7	1.2	A
Total		2,366	2,354	99.5%	21.8	0.7	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	38	38	100.3%	4.8	1.6	A
	Through	489	476	97.3%	2.2	0.7	A
	Right Turn						
	Subtotal	527	514	97.5%	2.5	0.7	A
SB	Left Turn						
	Through	405	403	99.4%	2.5	0.3	A
	Right Turn	152	156	102.5%	0.4	0.3	A
	Subtotal	557	558	100.2%	1.9	0.3	A
EB	Left Turn	98	96	98.2%	23.9	4.0	C
	Through						
	Right Turn	31	31	98.4%	4.5	0.4	A
	Subtotal	129	127	98.2%	19.5	3.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,213	1,199	98.8%	4.2	0.6	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	551	537	97.5%	0.1	0.0	A
	Right Turn	36	35	97.2%	0.0	0.0	A
	Subtotal	587	572	97.4%	0.1	0.0	A
SB	Left Turn	42	43	103.3%	2.7	2.2	A
	Through	540	541	100.3%	2.4	0.9	A
	Right Turn						
	Subtotal	582	585	100.5%	2.4	1.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	17	17	99.4%	8.3	2.5	A
	Through						
	Right Turn	12	10	85.0%	2.2	2.4	A
	Subtotal	29	27	93.4%	6.9	1.2	A
Total		1,198	1,184	98.8%	1.3	0.5	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	100.0%	0.6	1.0	A
	Through	536	519	96.8%	0.1	0.1	A
	Right Turn	22	22	101.4%	0.4	0.1	A
	Subtotal	563	546	97.0%	0.1	0.1	A
SB	Left Turn	13	11	87.7%	2.7	5.2	A
	Through	543	545	100.4%	0.2	0.1	A
	Right Turn	4	5	115.0%	0.3	0.2	A
	Subtotal	560	561	100.2%	0.3	0.1	A
EB	Left Turn	2	1	65.0%	3.2	4.2	A
	Through						
	Right Turn	8	7	83.8%	6.5	2.5	A
	Subtotal	10	8	80.0%	7.5	0.9	A
WB	Left Turn	37	37	100.0%	9.9	2.5	A
	Through						
	Right Turn	24	23	97.5%	6.0	1.1	A
	Subtotal	61	60	99.0%	8.4	1.9	A
Total		1,194	1,176	98.5%	0.5	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	90.0%	2.4	6.3	A
	Through	543	527	97.0%	0.2	0.1	A
	Right Turn	14	12	85.7%	0.4	0.1	A
	Subtotal	562	543	96.7%	0.2	0.1	A
SB	Left Turn	10	11	114.0%	1.6	1.4	A
	Through	533	535	100.4%	0.3	0.1	A
	Right Turn	4	4	102.5%	0.2	0.3	A
	Subtotal	547	551	100.7%	0.3	0.1	A
EB	Left Turn	14	13	92.9%	6.5	0.4	A
	Through	5	5	94.0%	4.6	4.0	A
	Right Turn	20	20	101.5%	5.2	1.9	A
	Subtotal	39	38	97.4%	6.4	0.5	A
WB	Left Turn	7	5	74.3%	8.5	4.1	A
	Through						
	Right Turn	8	8	96.3%	6.2	0.7	A
	Subtotal	15	13	86.0%	7.7	1.4	A
Total		1,163	1,145	98.4%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	227	227	100.0%	47.1	5.3	D
	Right Turn	552	540	97.9%	2.7	0.8	A
	Subtotal	779	767	98.5%	16.2	2.4	B
SB	Left Turn	2	2	80.0%	28.0	33.4	C
	Through	94	91	97.1%	50.3	6.7	D
	Right Turn	47	48	102.8%	23.8	5.7	C
	Subtotal	143	141	98.7%	40.6	4.8	D
EB	Left Turn	83	80	96.4%	66.4	5.4	E
	Through	490	472	96.3%	12.2	3.2	B
	Right Turn	7	7	98.6%	6.8	7.6	A
	Subtotal	580	559	96.4%	19.5	3.4	B
WB	Left Turn	344	336	97.5%	52.7	3.3	D
	Through	532	538	101.0%	9.4	2.1	A
	Right Turn	15	15	99.3%	3.0	2.0	A
	Subtotal	891	888	99.7%	26.4	1.3	C
Total		2,393	2,355	98.4%	22.3	1.3	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	8	115.7%	0.7	1.2	A
	Through	678	668	98.5%	1.1	0.1	A
	Right Turn	8	9	111.3%	0.7	0.7	A
	Subtotal	693	685	98.8%	1.0	0.1	A
SB	Left Turn	14	15	105.0%	2.8	6.5	A
	Through	500	487	97.3%	1.2	0.2	A
	Right Turn	3	3	93.3%	1.1	1.5	A
	Subtotal	517	504	97.5%	1.2	0.2	A
EB	Left Turn	6	6	98.3%	11.5	5.9	B
	Through	5	5	98.0%	12.2	6.3	B
	Right Turn	9	8	91.1%	6.6	1.3	A
	Subtotal	20	19	95.0%	10.3	2.4	B
WB	Left Turn	13	13	97.7%	18.8	11.1	C
	Through	2	2	105.0%	8.3	10.0	A
	Right Turn	63	62	98.7%	9.7	1.6	A
	Subtotal	78	77	98.7%	11.2	2.2	B
Total		1,308	1,285	98.2%	1.9	0.2	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	21	96.4%	2.6	3.1	A
	Through	668	662	99.1%	0.7	0.2	A
	Right Turn						
	Subtotal	690	683	99.0%	0.8	0.2	A
SB	Left Turn						
	Through	505	492	97.4%	1.0	0.2	A
	Right Turn	17	15	90.0%	0.7	0.5	A
	Subtotal	522	507	97.2%	1.0	0.2	A
EB	Left Turn	23	23	99.6%	13.3	4.3	B
	Through						
	Right Turn	38	37	98.2%	9.8	2.1	A
	Subtotal	61	60	98.7%	11.1	2.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,273	1,251	98.3%	1.6	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	21	96.4%	9.0	6.4	A
	Through	643	636	99.0%	3.5	1.0	A
	Right Turn	20	17	84.5%	4.0	4.5	A
	Subtotal	685	674	98.5%	3.7	1.0	A
SB	Left Turn	9	9	101.1%	11.3	11.3	B
	Through	514	499	97.0%	5.1	0.8	A
	Right Turn	19	20	103.2%	4.5	2.4	A
	Subtotal	542	528	97.3%	5.2	0.9	A
EB	Left Turn	19	20	106.3%	23.3	5.5	C
	Through	7	5	70.0%	12.5	14.5	B
	Right Turn	19	19	99.5%	10.0	2.7	B
	Subtotal	45	44	97.8%	17.3	2.5	B
WB	Left Turn	26	25	95.0%	22.2	4.5	C
	Through	5	6	120.0%	21.1	13.2	C
	Right Turn	27	26	97.8%	9.3	3.3	A
	Subtotal	58	57	98.4%	16.3	3.5	B
Total		1,330	1,303	98.0%	5.6	0.7	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	9	104.4%	3.7	3.0	A
	Through	688	682	99.1%	1.9	0.5	A
	Right Turn	6	6	105.0%	1.4	1.5	A
	Subtotal	703	698	99.2%	1.9	0.5	A
SB	Left Turn	15	16	105.3%	10.7	8.1	B
	Through	530	513	96.8%	0.6	0.2	A
	Right Turn	6	7	110.0%	0.3	0.2	A
	Subtotal	551	536	97.2%	0.9	0.4	A
EB	Left Turn	4	3	85.0%	6.0	5.0	A
	Through	3	3	93.3%	16.0	13.1	C
	Right Turn	12	11	90.0%	8.8	2.1	A
	Subtotal	19	17	89.5%	11.1	3.0	B
WB	Left Turn	3	3	113.3%	9.9	8.1	A
	Through						
	Right Turn	13	11	81.5%	11.8	4.0	B
	Subtotal	16	14	87.5%	12.2	3.8	B
Total		1,289	1,264	98.1%	1.9	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	119	122	102.9%	46.9	10.8	D
	Through	512	505	98.7%	42.5	3.3	D
	Right Turn	123	122	99.3%	8.5	2.9	A
	Subtotal	754	750	99.5%	37.9	1.8	D
SB	Left Turn	88	85	97.0%	58.5	5.7	E
	Through	378	364	96.2%	33.0	3.9	C
	Right Turn	79	79	99.5%	19.8	6.0	B
	Subtotal	545	528	96.8%	35.5	2.5	D
EB	Left Turn	76	79	104.3%	25.7	9.4	C
	Through	461	462	100.1%	15.1	3.1	B
	Right Turn	155	153	99.0%	3.4	0.6	A
	Subtotal	692	694	100.3%	13.6	2.5	B
WB	Left Turn	129	134	103.6%	22.4	3.9	C
	Through	527	522	99.0%	20.5	1.9	C
	Right Turn	119	119	100.0%	18.0	2.3	B
	Subtotal	775	774	99.9%	20.4	1.9	C
Total		2,766	2,746	99.3%	26.6	1.2	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	88.8%	13.1	15.8	B
	Through	769	767	99.8%	4.8	1.0	A
	Right Turn	4	4	90.0%	0.6	0.5	A
	Subtotal	781	778	99.6%	4.9	1.1	A
SB	Left Turn	5	5	108.0%	8.0	9.6	A
	Through	618	609	98.5%	0.1	0.0	A
	Right Turn	35	32	91.7%	0.1	0.1	A
	Subtotal	658	646	98.2%	0.2	0.2	A
EB	Left Turn	26	26	99.6%	27.3	8.2	D
	Through						
	Right Turn	7	6	90.0%	9.8	9.4	A
	Subtotal	33	32	97.6%	25.3	6.6	D
WB	Left Turn	7	6	88.6%	6.1	6.0	A
	Through						
	Right Turn	9	9	97.8%	3.2	3.5	A
	Subtotal	16	15	93.8%	8.6	3.6	A
Total		1,488	1,472	98.9%	3.4	0.7	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	67	68	101.8%	37.5	7.9	D
	Through	339	333	98.2%	36.5	4.8	D
	Right Turn	114	116	102.0%	22.4	6.3	C
	Subtotal	520	517	99.5%	33.3	5.1	C
SB	Left Turn	256	252	98.5%	63.3	17.6	E
	Through	477	474	99.3%	36.1	4.9	D
	Right Turn	148	149	100.7%	7.6	1.2	A
	Subtotal	881	875	99.3%	40.1	6.1	D
EB	Left Turn	167	159	95.3%	26.9	4.7	C
	Through	627	631	100.6%	18.5	3.0	B
	Right Turn	77	79	103.0%	14.4	5.1	B
	Subtotal	871	869	99.8%	19.8	3.0	B
WB	Left Turn	143	134	93.9%	19.9	5.7	B
	Through	616	622	100.9%	10.1	1.9	B
	Right Turn	180	178	99.1%	7.7	2.0	A
	Subtotal	939	934	99.5%	11.2	2.1	B
Total		3,211	3,196	99.5%	25.7	2.0	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	114	114	100.1%	14.3	4.1	B
	Through	595	578	97.1%	3.2	0.9	A
	Right Turn						
	Subtotal	709	692	97.6%	5.0	1.0	A
SB	Left Turn						
	Through	836	834	99.8%	1.9	0.1	A
	Right Turn	291	293	100.8%	0.0	0.1	A
	Subtotal	1,127	1,128	100.1%	1.4	0.1	A
EB	Left Turn	333	328	98.6%	50.6	4.1	D
	Through						
	Right Turn	163	165	101.5%	6.5	1.3	A
	Subtotal	496	494	99.5%	36.4	3.0	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,332	2,314	99.2%	10.9	0.9	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	866	849	98.0%	0.2	0.0	A
	Right Turn	62	57	92.3%	0.0	0.0	A
	Subtotal	928	906	97.6%	0.2	0.0	A
SB	Left Turn	31	29	94.8%	2.7	1.4	A
	Through	1,093	1,094	100.1%	3.0	0.5	A
	Right Turn						
	Subtotal	1,124	1,124	100.0%	3.0	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	34	33	98.2%	10.0	2.9	B
	Through						
	Right Turn	41	40	97.3%	5.5	0.4	A
	Subtotal	75	73	97.7%	7.3	1.1	A
Total		2,127	2,103	98.9%	1.9	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	104.0%	2.3	3.2	A
	Through	856	835	97.6%	0.2	0.1	A
	Right Turn	46	48	105.2%	0.5	0.1	A
	Subtotal	907	889	98.0%	0.2	0.1	A
SB	Left Turn	28	30	105.7%	1.8	1.1	A
	Through	1,081	1,082	100.1%	0.4	0.1	A
	Right Turn	6	5	85.0%	0.5	0.4	A
	Subtotal	1,115	1,116	100.1%	0.5	0.1	A
EB	Left Turn	4	3	67.5%	8.4	3.9	A
	Through						
	Right Turn	6	5	90.0%	7.4	1.1	A
	Subtotal	10	8	81.0%	8.0	1.2	A
WB	Left Turn	37	37	99.7%	13.5	3.3	B
	Through						
	Right Turn	24	23	97.5%	6.3	1.8	A
	Subtotal	61	60	98.9%	11.3	3.6	B
Total		2,093	2,074	99.1%	0.7	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	25	24	94.0%	10.1	7.6	B
	Through	833	814	97.7%	0.3	0.2	A
	Right Turn	26	23	88.8%	0.6	0.3	A
	Subtotal	884	861	97.4%	0.6	0.3	A
SB	Left Turn	13	15	116.2%	5.6	2.8	A
	Through	1,070	1,073	100.3%	1.1	0.3	A
	Right Turn	4	4	102.5%	0.6	1.0	A
	Subtotal	1,087	1,092	100.5%	1.2	0.3	A
EB	Left Turn	5	6	110.0%	6.0	2.3	A
	Through	6	5	83.3%	6.3	4.0	A
	Right Turn	19	18	95.8%	6.1	0.4	A
	Subtotal	30	29	95.7%	6.6	0.7	A
WB	Left Turn	26	26	99.2%	18.1	5.2	C
	Through	5	6	126.0%	22.2	17.8	C
	Right Turn	16	15	92.5%	8.3	2.6	A
	Subtotal	47	47	99.8%	15.9	4.8	C
Total		2,048	2,028	99.0%	1.3	0.3	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	6	78.6%	45.1	29.2	D
	Through	248	251	101.2%	47.0	6.2	D
	Right Turn	525	517	98.4%	2.5	1.2	A
	Subtotal	780	773	99.1%	17.2	4.0	B
SB	Left Turn	3	2	80.0%	29.1	34.5	C
	Through	316	315	99.7%	45.3	3.9	D
	Right Turn	220	220	99.9%	33.5	5.9	C
	Subtotal	539	537	99.7%	40.5	3.7	D
EB	Left Turn	184	178	96.5%	66.9	8.7	E
	Through	609	600	98.4%	37.3	4.0	D
	Right Turn	10	9	94.0%	32.6	8.9	C
	Subtotal	803	786	97.9%	43.4	3.8	D
WB	Left Turn	564	555	98.4%	42.7	5.8	D
	Through	920	922	100.2%	21.4	1.6	C
	Right Turn	35	37	106.3%	3.2	0.9	A
	Subtotal	1,519	1,514	99.7%	28.6	2.2	C
Total		3,641	3,611	99.2%	31.5	1.4	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	5	86.7%	0.7	0.8	A
	Through	777	771	99.2%	1.0	0.1	A
	Right Turn	24	24	97.9%	1.3	0.8	A
	Subtotal	807	800	99.1%	1.0	0.1	A
SB	Left Turn	66	68	102.3%	0.8	0.2	A
	Through	787	774	98.4%	1.8	0.5	A
	Right Turn	12	13	109.2%	1.7	1.3	A
	Subtotal	865	855	98.8%	1.7	0.4	A
EB	Left Turn	12	12	98.3%	21.8	12.6	C
	Through	3	3	113.3%	17.4	17.7	C
	Right Turn	29	27	92.1%	8.0	2.4	A
	Subtotal	44	42	95.2%	12.8	4.6	B
WB	Left Turn	11	10	89.1%	28.0	14.4	D
	Through	4	4	90.0%	10.1	14.6	B
	Right Turn	38	38	99.5%	14.3	4.7	B
	Subtotal	53	51	96.6%	16.9	4.8	C
Total		1,769	1,747	98.8%	2.3	0.4	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	43	44	101.2%	14.8	3.6	B
	Through	780	774	99.3%	0.5	0.1	A
	Right Turn						
	Subtotal	823	818	99.4%	1.3	0.3	A
SB	Left Turn						
	Through	792	777	98.1%	1.7	0.5	A
	Right Turn	35	34	96.0%	1.6	1.2	A
	Subtotal	827	810	98.0%	1.7	0.5	A
EB	Left Turn	27	26	96.7%	21.1	8.4	C
	Through						
	Right Turn	36	34	95.3%	11.8	3.0	B
	Subtotal	63	60	95.9%	15.8	4.5	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,713	1,689	98.6%	2.0	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	23	106.4%	12.0	5.8	B
	Through	771	765	99.3%	7.6	0.8	A
	Right Turn	51	48	93.9%	6.0	1.6	A
	Subtotal	844	837	99.1%	7.6	0.8	A
SB	Left Turn	10	10	95.0%	11.6	10.2	B
	Through	797	779	97.7%	5.8	0.8	A
	Right Turn	30	29	96.3%	5.1	2.5	A
	Subtotal	837	817	97.6%	5.8	0.8	A
EB	Left Turn	54	58	107.0%	24.2	5.2	C
	Through	19	18	93.7%	18.4	6.2	B
	Right Turn	41	38	91.7%	13.2	3.4	B
	Subtotal	114	113	99.3%	19.8	2.6	B
WB	Left Turn	31	30	97.1%	23.5	3.4	C
	Through	10	11	108.0%	16.7	6.4	B
	Right Turn	14	12	87.9%	7.8	3.6	A
	Subtotal	55	53	96.7%	18.3	2.8	B
Total		1,850	1,820	98.4%	8.1	0.3	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	7	102.9%	16.2	15.8	C
	Through	832	827	99.4%	2.9	1.3	A
	Right Turn	5	4	84.0%	0.8	1.1	A
	Subtotal	844	838	99.3%	3.0	1.3	A
SB	Left Turn	19	17	88.9%	11.7	9.0	B
	Through	832	813	97.7%	1.2	0.7	A
	Right Turn	7	6	80.0%	0.3	0.2	A
	Subtotal	858	836	97.4%	1.4	0.9	A
EB	Left Turn	7	7	97.1%	27.5	15.4	D
	Through	2	2	120.0%	11.6	11.3	B
	Right Turn	30	27	90.3%	13.8	3.3	B
	Subtotal	39	36	93.1%	16.3	4.3	C
WB	Left Turn	5	5	102.0%	9.6	6.9	A
	Through	2	2	80.0%	5.9	9.6	A
	Right Turn	20	19	92.5%	13.5	6.4	B
	Subtotal	27	25	93.3%	14.5	3.8	B
Total		1,768	1,735	98.2%	2.8	0.7	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	159	162	101.8%	64.7	15.4	E
	Through	563	558	99.1%	42.9	11.0	D
	Right Turn	155	155	99.9%	12.9	5.6	B
	Subtotal	877	875	99.7%	42.1	9.7	D
SB	Left Turn	171	166	96.8%	44.9	9.2	D
	Through	609	593	97.3%	22.2	2.9	C
	Right Turn	122	123	101.1%	13.5	2.9	B
	Subtotal	902	881	97.7%	25.6	3.3	C
EB	Left Turn	152	153	100.5%	49.5	8.2	D
	Through	721	717	99.5%	26.7	3.4	C
	Right Turn	211	213	101.1%	4.5	0.6	A
	Subtotal	1,084	1,083	99.9%	26.0	2.8	C
WB	Left Turn	178	186	104.7%	45.6	10.5	D
	Through	651	642	98.6%	33.9	2.8	C
	Right Turn	165	164	99.6%	29.7	4.9	C
	Subtotal	994	992	99.8%	35.4	3.5	D
Total		3,857	3,832	99.3%	32.1	2.0	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	11	106.0%	10.5	5.3	B
	Through	841	837	99.5%	5.0	2.6	A
	Right Turn	19	20	104.7%	0.7	0.5	A
	Subtotal	870	867	99.7%	5.0	2.6	A
SB	Left Turn	20	20	98.0%	8.5	8.6	A
	Through	940	934	99.4%	0.1	0.0	A
	Right Turn	42	42	99.8%	0.1	0.0	A
	Subtotal	1,002	996	99.4%	0.3	0.1	A
EB	Left Turn	30	31	102.0%	34.3	17.4	D
	Through						
	Right Turn	9	9	96.7%	17.4	6.2	C
	Subtotal	39	39	100.8%	29.2	12.1	D
WB	Left Turn	5	5	104.0%	4.5	8.9	A
	Through						
	Right Turn	15	15	98.7%	6.8	3.9	A
	Subtotal	20	20	100.0%	8.7	4.3	A
Total		1,931	1,922	99.5%	3.3	1.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	69	71	102.9%	40.8	8.6	D
	Through	378	372	98.4%	41.1	4.7	D
	Right Turn	142	146	102.5%	30.0	7.1	C
	Subtotal	589	588	99.9%	38.2	4.4	D
SB	Left Turn	93	91	97.6%	47.6	9.7	D
	Through	206	201	97.5%	33.2	4.0	C
	Right Turn	93	95	101.7%	6.0	1.2	A
	Subtotal	392	386	98.5%	29.0	3.9	C
EB	Left Turn	106	99	93.1%	19.0	4.5	B
	Through	431	437	101.5%	12.6	1.5	B
	Right Turn	32	33	103.4%	7.9	4.0	A
	Subtotal	569	569	100.0%	13.6	1.9	B
WB	Left Turn	104	104	100.3%	13.5	3.4	B
	Through	534	531	99.4%	9.5	2.8	A
	Right Turn	68	68	99.6%	5.7	2.4	A
	Subtotal	706	703	99.6%	9.7	2.0	A
Total		2,256	2,247	99.6%	21.6	1.6	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	36	36	100.8%	4.0	1.4	A
	Through	467	455	97.5%	2.0	0.5	A
	Right Turn						
	Subtotal	503	491	97.7%	2.2	0.5	A
SB	Left Turn						
	Through	387	386	99.7%	2.3	0.3	A
	Right Turn	145	150	103.2%	0.6	0.4	A
	Subtotal	532	536	100.7%	1.8	0.3	A
EB	Left Turn	93	90	97.2%	23.8	4.6	C
	Through						
	Right Turn	29	28	97.2%	4.9	0.7	A
	Subtotal	122	119	97.2%	20.0	4.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,157	1,146	99.0%	4.1	0.7	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	525	511	97.4%	0.2	0.1	A
	Right Turn	35	34	97.1%	0.0	0.0	A
	Subtotal	560	545	97.4%	0.2	0.1	A
SB	Left Turn	40	41	102.8%	2.6	1.6	A
	Through	516	519	100.6%	1.8	0.7	A
	Right Turn						
	Subtotal	556	560	100.8%	1.9	0.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	16	16	101.9%	8.1	1.6	A
	Through						
	Right Turn	11	10	89.1%	5.3	0.8	A
	Subtotal	27	26	96.7%	6.9	1.0	A
Total		1,143	1,132	99.0%	1.3	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	0.2	0.2	A
	Through	511	497	97.2%	0.1	0.0	A
	Right Turn	21	20	96.2%	0.4	0.2	A
	Subtotal	536	521	97.2%	0.1	0.0	A
SB	Left Turn	12	11	87.5%	0.5	0.2	A
	Through	518	522	100.8%	0.2	0.0	A
	Right Turn	3	3	110.0%	0.2	0.2	A
	Subtotal	533	536	100.6%	0.2	0.0	A
EB	Left Turn	1	0	30.0%	0.0	0.0	A
	Through						
	Right Turn	7	7	95.7%	0.0	0.0	A
	Subtotal	8	7	87.5%	0.0	0.0	A
WB	Left Turn	36	35	95.8%	9.2	1.5	A
	Through						
	Right Turn	23	22	95.7%	6.5	1.2	A
	Subtotal	59	57	95.8%	8.1	1.0	A
Total		1,136	1,121	98.6%	0.5	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	1.3	2.7	A
	Through	518	504	97.2%	0.1	0.0	A
	Right Turn	13	11	83.8%	0.5	0.3	A
	Subtotal	535	519	96.9%	0.2	0.0	A
SB	Left Turn	9	10	113.3%	1.5	1.4	A
	Through	508	511	100.5%	0.3	0.1	A
	Right Turn	3	3	93.3%	0.5	1.1	A
	Subtotal	520	524	100.7%	0.4	0.1	A
EB	Left Turn	13	12	94.6%	6.2	0.4	A
	Through	4	4	100.0%	4.9	5.6	A
	Right Turn	19	20	104.2%	5.5	1.9	A
	Subtotal	36	36	100.3%	6.5	0.8	A
WB	Left Turn	6	5	86.7%	8.9	3.8	A
	Through						
	Right Turn	7	8	110.0%	6.3	0.7	A
	Subtotal	13	13	99.2%	8.0	1.6	A
Total		1,104	1,091	98.8%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	216	213	98.8%	45.5	3.9	D
	Right Turn	527	517	98.2%	2.1	0.6	A
	Subtotal	743	731	98.3%	14.0	1.8	B
SB	Left Turn	1	1	70.0%	6.9	19.9	A
	Through	90	89	98.7%	51.3	10.3	D
	Right Turn	45	45	100.7%	20.7	10.8	C
	Subtotal	136	135	99.1%	40.2	8.2	D
EB	Left Turn	79	77	97.7%	67.1	8.7	E
	Through	467	450	96.4%	10.6	2.0	B
	Right Turn	6	6	105.0%	9.0	15.2	A
	Subtotal	552	534	96.7%	19.2	2.7	B
WB	Left Turn	328	319	97.2%	55.5	6.1	E
	Through	507	514	101.4%	7.9	1.6	A
	Right Turn	14	14	97.1%	2.9	1.4	A
	Subtotal	849	846	99.7%	26.0	3.9	C
Total		2,280	2,246	98.5%	21.6	2.3	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Roundabout

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	5	80.0%	2.5	2.9	A
	Through	645	636	98.6%	4.3	0.7	A
	Right Turn	7	7	104.3%	2.9	3.1	A
	Subtotal	658	648	98.4%	4.3	0.7	A
SB	Left Turn	13	14	106.9%	14.7	11.0	B
	Through	478	465	97.3%	16.3	4.3	C
	Right Turn	2	1	60.0%	3.7	9.0	A
	Subtotal	493	480	97.4%	16.3	4.3	C
EB	Left Turn	5	5	102.0%	7.1	9.0	A
	Through	4	5	117.5%	7.0	10.5	A
	Right Turn	8	7	90.0%	7.7	7.0	A
	Subtotal	17	17	100.0%	8.9	5.0	A
WB	Left Turn	2	12	605.0%	9.2	7.4	A
	Through	1	1	100.0%	0.1	0.2	A
	Right Turn	60	60	100.2%	14.1	9.4	B
	Subtotal	63	73	116.2%	13.0	7.7	B
Total		1,231	1,218	99.0%	10.0	1.8	B

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	19	91.0%	2.5	1.9	A
	Through	636	629	98.9%	0.3	0.0	A
	Right Turn						
	Subtotal	657	648	98.6%	0.3	0.0	A
SB	Left Turn						
	Through	482	469	97.3%	0.7	0.4	A
	Right Turn	16	16	97.5%	0.8	0.3	A
	Subtotal	498	485	97.3%	0.7	0.4	A
EB	Left Turn	22	21	97.3%	15.1	7.3	C
	Through						
	Right Turn	37	36	96.2%	9.0	1.8	A
	Subtotal	59	57	96.6%	10.9	1.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,214	1,190	98.0%	0.8	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Roundabout

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	21	101.0%	6.3	3.0	A
	Through	613	604	98.5%	6.7	0.6	A
	Right Turn	19	17	88.9%	5.6	2.7	A
	Subtotal	653	642	98.3%	6.6	0.6	A
SB	Left Turn	8	3	31.3%	3.0	3.9	A
	Through	491	479	97.6%	4.8	1.6	A
	Right Turn	18	17	92.2%	5.0	2.9	A
	Subtotal	517	498	96.4%	4.9	1.6	A
EB	Left Turn	18	20	108.9%	8.0	5.4	A
	Through	6	4	70.0%	8.0	10.8	A
	Right Turn	18	18	98.3%	6.6	5.3	A
	Subtotal	42	42	98.8%	7.8	3.3	A
WB	Left Turn	24	23	94.2%	23.8	10.1	C
	Through	4	4	105.0%	12.6	18.8	B
	Right Turn	25	25	100.8%	15.0	6.0	B
	Subtotal	53	52	98.1%	18.6	5.1	C
Total		1,265	1,234	97.5%	6.7	0.9	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	8	103.8%	5.0	5.7	A
	Through	657	649	98.8%	2.5	0.4	A
	Right Turn	5	5	98.0%	1.9	2.6	A
	Subtotal	670	662	98.8%	2.5	0.4	A
SB	Left Turn	14	14	100.0%	9.6	9.7	A
	Through	507	492	97.0%	0.2	0.0	A
	Right Turn	6	7	121.7%	0.4	0.2	A
	Subtotal	527	513	97.3%	0.5	0.2	A
EB	Left Turn	3	2	80.0%	8.5	18.1	A
	Through	2	2	85.0%	3.2	5.3	A
	Right Turn	11	11	98.2%	8.3	6.1	A
	Subtotal	16	15	93.1%	13.1	8.0	B
WB	Left Turn	2	2	100.0%	9.6	15.2	A
	Through						
	Right Turn	12	10	83.3%	14.5	10.0	B
	Subtotal	14	12	85.7%	14.8	7.3	B
Total		1,227	1,202	98.0%	1.8	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	114	118	103.8%	44.8	6.1	D
	Through	488	478	97.9%	41.6	5.9	D
	Right Turn	117	117	99.9%	7.5	2.2	A
	Subtotal	719	713	99.2%	36.8	4.9	D
SB	Left Turn	84	82	97.5%	46.6	8.1	D
	Through	361	346	95.8%	31.3	3.1	C
	Right Turn	76	76	99.6%	15.9	4.1	B
	Subtotal	521	504	96.6%	31.5	3.0	C
EB	Left Turn	73	76	104.7%	24.7	6.0	C
	Through	439	441	100.5%	14.0	1.6	B
	Right Turn	148	146	98.4%	3.2	0.4	A
	Subtotal	660	663	100.5%	12.6	1.1	B
WB	Left Turn	123	127	103.5%	23.5	3.5	C
	Through	502	496	98.9%	18.6	1.6	B
	Right Turn	113	113	100.4%	16.1	2.4	B
	Subtotal	738	737	99.9%	19.0	1.3	B
Total		2,638	2,616	99.2%	25.0	1.5	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	91.3%	5.5	5.6	A
	Through	733	730	99.6%	3.7	0.7	A
	Right Turn	3	3	86.7%	0.6	1.0	A
	Subtotal	744	740	99.4%	3.7	0.7	A
SB	Left Turn	4	4	107.5%	2.4	3.5	A
	Through	589	578	98.1%	0.1	0.0	A
	Right Turn	35	32	91.1%	0.1	0.1	A
	Subtotal	628	614	97.8%	0.1	0.0	A
EB	Left Turn	25	24	96.4%	25.5	8.7	D
	Through						
	Right Turn	6	5	86.7%	7.5	5.8	A
	Subtotal	31	29	94.5%	22.7	6.5	C
WB	Left Turn	6	4	71.7%	0.0	0.0	A
	Through						
	Right Turn	8	8	96.3%	0.5	1.7	A
	Subtotal	14	12	85.7%	0.5	1.7	A
Total		1,417	1,395	98.5%	2.6	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	65	102.5%	34.2	5.4	C
	Through	323	318	98.5%	38.6	4.1	D
	Right Turn	109	112	102.7%	23.9	6.0	C
	Subtotal	495	495	100.0%	34.6	4.4	C
SB	Left Turn	245	241	98.5%	55.4	16.1	E
	Through	454	447	98.5%	34.6	3.1	C
	Right Turn	141	142	100.8%	7.5	2.1	A
	Subtotal	840	831	98.9%	36.6	5.0	D
EB	Left Turn	159	153	95.9%	23.4	4.3	C
	Through	598	600	100.4%	16.2	2.5	B
	Right Turn	73	76	104.7%	15.2	5.8	B
	Subtotal	830	829	99.9%	17.5	2.4	B
WB	Left Turn	136	127	93.5%	22.0	7.7	C
	Through	587	590	100.5%	9.4	2.5	A
	Right Turn	173	172	99.3%	6.7	2.2	A
	Subtotal	896	889	99.2%	10.9	2.4	B
Total		3,061	3,043	99.4%	24.3	1.8	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	108	108	99.8%	12.3	3.6	B
	Through	568	553	97.4%	3.4	1.0	A
	Right Turn						
	Subtotal	676	661	97.8%	4.9	1.1	A
SB	Left Turn						
	Through	798	791	99.2%	1.8	0.2	A
	Right Turn	277	278	100.5%	0.1	0.2	A
	Subtotal	1,075	1,070	99.5%	1.4	0.2	A
EB	Left Turn	317	313	98.8%	51.8	4.5	D
	Through						
	Right Turn	155	157	101.5%	5.8	0.7	A
	Subtotal	472	470	99.7%	37.0	4.1	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,223	2,201	99.0%	11.0	1.1	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	826	811	98.1%	0.2	0.1	A
	Right Turn	59	56	94.1%	0.0	0.0	A
	Subtotal	885	866	97.9%	0.2	0.1	A
SB	Left Turn	29	28	97.2%	2.0	0.9	A
	Through	1,042	1,037	99.6%	2.3	0.5	A
	Right Turn						
	Subtotal	1,071	1,066	99.5%	2.3	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	33	33	99.7%	8.9	1.9	A
	Through						
	Right Turn	39	38	98.5%	5.6	0.7	A
	Subtotal	72	71	99.0%	7.2	1.0	A
Total		2,028	2,003	98.8%	1.6	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	5	112.5%	2.7	4.1	A
	Through	816	797	97.7%	0.2	0.1	A
	Right Turn	45	47	104.2%	0.5	0.1	A
	Subtotal	865	849	98.1%	0.2	0.0	A
SB	Left Turn	27	28	104.8%	1.6	0.9	A
	Through	1,030	1,027	99.7%	0.4	0.1	A
	Right Turn	5	4	72.0%	0.4	0.4	A
	Subtotal	1,062	1,059	99.7%	0.4	0.1	A
EB	Left Turn	3	2	66.7%	3.5	4.6	A
	Through						
	Right Turn	5	5	102.0%	4.1	3.6	A
	Subtotal	8	7	88.8%	7.6	1.4	A
WB	Left Turn	36	34	95.3%	13.3	2.9	B
	Through						
	Right Turn	23	22	95.7%	8.0	2.5	A
	Subtotal	59	56	95.4%	11.2	2.3	B
Total		1,994	1,971	98.8%	0.7	0.1	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	23	20	87.0%	8.9	4.7	A
	Through	795	776	97.6%	0.4	0.3	A
	Right Turn	24	24	98.3%	0.6	0.2	A
	Subtotal	842	820	97.4%	0.7	0.4	A
SB	Left Turn	12	14	119.2%	6.3	4.4	A
	Through	1,020	1,018	99.8%	0.8	0.3	A
	Right Turn	3	3	103.3%	0.7	0.8	A
	Subtotal	1,035	1,035	100.0%	0.9	0.3	A
EB	Left Turn	4	4	92.5%	3.2	3.4	A
	Through	5	4	80.0%	3.9	6.0	A
	Right Turn	18	17	95.6%	6.3	0.7	A
	Subtotal	27	25	92.2%	6.7	1.0	A
WB	Left Turn	24	24	98.8%	16.9	5.2	C
	Through	4	5	127.5%	15.7	13.6	C
	Right Turn	15	14	93.3%	8.1	2.4	A
	Subtotal	43	43	99.5%	14.7	3.2	B
Total		1,947	1,923	98.8%	1.2	0.2	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	101.7%	44.5	31.0	D
	Through	236	240	101.6%	40.1	5.8	D
	Right Turn	501	492	98.2%	1.7	0.6	A
	Subtotal	743	738	99.3%	13.9	2.4	B
SB	Left Turn	2	2	85.0%	6.5	20.5	A
	Through	301	299	99.2%	43.2	4.1	D
	Right Turn	210	207	98.3%	33.6	5.0	C
	Subtotal	513	507	98.8%	38.9	3.7	D
EB	Left Turn	175	169	96.5%	55.3	7.6	E
	Through	581	572	98.4%	29.1	3.1	C
	Right Turn	9	8	93.3%	24.6	16.4	C
	Subtotal	765	749	97.9%	34.8	3.5	C
WB	Left Turn	538	511	94.9%	129.6	61.2	F
	Through	877	873	99.6%	28.5	6.8	C
	Right Turn	33	35	104.8%	7.7	6.3	A
	Subtotal	1,448	1,418	97.9%	63.3	24.9	E
Total		3,469	3,412	98.3%	43.2	9.8	D

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Roundabout

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	3	56.0%	3.8	3.9	A
	Through	742	738	99.4%	7.3	2.6	A
	Right Turn	23	21	92.2%	7.6	5.6	A
	Subtotal	770	762	98.9%	7.3	2.6	A
SB	Left Turn	62	62	100.5%	42.0	21.4	E
	Through	751	718	95.6%	38.9	15.8	E
	Right Turn	11	12	110.9%	47.3	35.9	E
	Subtotal	824	792	96.1%	39.3	16.5	E
EB	Left Turn	11	11	99.1%	31.8	24.6	D
	Through	2	3	135.0%	35.3	42.8	E
	Right Turn	27	26	95.2%	40.3	13.7	E
	Subtotal	40	39	98.3%	40.3	15.3	E
WB	Left Turn	10	9	91.0%	18.7	15.7	C
	Through	3	3	96.7%	4.4	13.1	A
	Right Turn	36	36	101.1%	18.9	10.2	C
	Subtotal	49	48	98.8%	18.0	10.5	C
Total		1,683	1,642	97.6%	24.2	9.8	C

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	44	104.0%	9.9	6.1	A
	Through	744	738	99.2%	1.1	1.6	A
	Right Turn						
	Subtotal	786	782	99.5%	1.7	1.5	A
SB	Left Turn						
	Through	754	720	95.5%	6.3	11.7	A
	Right Turn	34	32	93.5%	5.4	10.4	A
	Subtotal	788	752	95.5%	6.3	11.6	A
EB	Left Turn	26	26	100.0%	18.8	7.8	C
	Through						
	Right Turn	35	35	98.6%	13.1	4.3	B
	Subtotal	61	61	99.2%	15.8	5.4	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,635	1,595	97.5%	4.4	5.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Roundabout

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	23	109.0%	9.8	4.1	A
	Through	736	729	99.1%	8.9	1.5	A
	Right Turn	48	46	96.7%	8.4	3.3	A
	Subtotal	805	799	99.2%	8.9	1.5	A
SB	Left Turn	9	3	34.4%	6.1	8.4	A
	Through	761	727	95.5%	12.6	3.3	B
	Right Turn	28	26	93.2%	10.6	2.2	B
	Subtotal	798	756	94.8%	12.5	3.3	B
EB	Left Turn	52	54	104.2%	56.3	32.4	F
	Through	18	17	91.7%	55.2	31.0	F
	Right Turn	39	36	91.8%	57.8	30.5	F
	Subtotal	109	107	97.7%	57.0	28.6	F
WB	Left Turn	29	28	97.6%	34.5	28.5	D
	Through	9	10	110.0%	34.5	30.2	D
	Right Turn	13	12	90.8%	31.3	23.9	D
	Subtotal	51	50	98.0%	34.8	23.9	D
Total		1,763	1,711	97.1%	15.1	4.0	C

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	95.0%	9.3	8.1	A
	Through	795	789	99.2%	3.6	1.9	A
	Right Turn	4	4	92.5%	0.9	2.3	A
	Subtotal	805	798	99.1%	3.7	1.9	A
SB	Left Turn	18	16	90.6%	8.2	7.0	A
	Through	795	761	95.7%	0.3	0.0	A
	Right Turn	6	5	88.3%	0.4	0.3	A
	Subtotal	819	782	95.5%	0.4	0.1	A
EB	Left Turn	6	6	105.0%	20.4	12.8	C
	Through	1	1	50.0%	2.0	4.3	A
	Right Turn	29	28	95.2%	23.2	9.8	C
	Subtotal	36	34	95.6%	23.5	9.0	C
WB	Left Turn	4	5	112.5%	12.1	8.8	B
	Through	1	1	110.0%	3.3	7.9	A
	Right Turn	19	19	98.4%	13.7	9.3	B
	Subtotal	24	24	101.3%	14.0	8.8	B
Total		1,684	1,639	97.3%	2.9	0.8	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	152	153	100.5%	51.8	18.2	D
	Through	537	530	98.8%	39.0	9.3	D
	Right Turn	147	146	99.0%	10.9	4.5	B
	Subtotal	836	829	99.1%	36.8	9.4	D
SB	Left Turn	163	155	94.8%	38.0	8.7	D
	Through	581	553	95.2%	22.0	1.4	C
	Right Turn	117	116	99.3%	14.8	3.5	B
	Subtotal	861	824	95.7%	24.1	2.4	C
EB	Left Turn	146	147	100.7%	37.8	7.8	D
	Through	687	683	99.4%	24.5	3.1	C
	Right Turn	202	205	101.3%	4.5	1.3	A
	Subtotal	1,035	1,034	99.9%	22.8	2.6	C
WB	Left Turn	170	176	103.7%	39.5	9.8	D
	Through	620	611	98.5%	31.5	4.8	C
	Right Turn	157	157	100.0%	28.7	4.6	C
	Subtotal	947	944	99.7%	32.7	5.0	C
Total		3,679	3,631	98.7%	28.9	1.9	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	10	101.0%	16.1	18.6	C
	Through	802	798	99.5%	4.4	3.0	A
	Right Turn	18	18	100.0%	0.7	0.2	A
	Subtotal	830	826	99.5%	4.4	3.1	A
SB	Left Turn	19	18	93.2%	8.7	4.9	A
	Through	896	878	98.0%	0.2	0.2	A
	Right Turn	42	41	98.6%	0.2	0.2	A
	Subtotal	957	937	97.9%	0.3	0.3	A
EB	Left Turn	29	28	96.6%	29.3	9.8	D
	Through						
	Right Turn	8	7	88.8%	11.2	8.1	B
	Subtotal	37	35	94.9%	27.5	9.0	D
WB	Left Turn	4	3	85.0%	4.9	6.8	A
	Through						
	Right Turn	14	13	90.0%	6.6	1.1	A
	Subtotal	18	16	88.9%	7.4	1.7	A
Total		1,842	1,814	98.5%	2.8	1.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	73	75	102.3%	40.7	6.7	D
	Through	397	390	98.1%	39.7	3.8	D
	Right Turn	149	152	102.1%	25.9	5.5	C
	Subtotal	619	616	99.6%	36.2	3.8	D
SB	Left Turn	97	95	97.6%	48.2	5.2	D
	Through	216	211	97.5%	33.9	4.4	C
	Right Turn	98	101	102.6%	6.3	1.8	A
	Subtotal	411	406	98.7%	29.4	3.1	C
EB	Left Turn	111	104	93.2%	20.2	4.7	C
	Through	452	458	101.3%	14.9	2.1	B
	Right Turn	34	35	102.9%	14.2	5.1	B
	Subtotal	597	596	99.9%	15.8	1.6	B
WB	Left Turn	109	107	98.3%	14.1	4.1	B
	Through	560	559	99.8%	9.2	1.4	A
	Right Turn	70	70	99.4%	7.0	2.9	A
	Subtotal	739	735	99.5%	9.8	1.1	A
Total		2,366	2,354	99.5%	21.8	1.4	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	38	38	100.3%	4.6	1.3	A
	Through	489	476	97.3%	2.3	0.5	A
	Right Turn						
	Subtotal	527	514	97.5%	2.5	0.5	A
SB	Left Turn						
	Through	405	403	99.4%	2.5	0.3	A
	Right Turn	152	156	102.4%	0.4	0.3	A
	Subtotal	557	558	100.2%	1.9	0.2	A
EB	Left Turn	98	96	98.2%	23.9	4.0	C
	Through						
	Right Turn	31	31	98.4%	4.5	0.4	A
	Subtotal	129	127	98.2%	19.5	3.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,213	1,199	98.8%	4.2	0.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	551	537	97.4%	0.1	0.0	A
	Right Turn	36	35	96.9%	0.0	0.0	A
	Subtotal	587	572	97.4%	0.1	0.0	A
SB	Left Turn	42	43	103.3%	2.9	2.1	A
	Through	540	541	100.3%	2.4	1.0	A
	Right Turn						
	Subtotal	582	585	100.5%	2.4	1.1	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	17	17	99.4%	8.6	3.3	A
	Through						
	Right Turn	12	10	85.0%	2.2	2.4	A
	Subtotal	29	27	93.4%	7.1	1.5	A
Total		1,198	1,184	98.8%	1.3	0.6	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	100.0%	0.2	0.2	A
	Through	536	519	96.8%	0.1	0.1	A
	Right Turn	22	22	101.4%	0.4	0.2	A
	Subtotal	563	546	97.0%	0.1	0.1	A
SB	Left Turn	13	11	87.7%	0.8	0.7	A
	Through	543	545	100.3%	0.3	0.1	A
	Right Turn	4	5	115.0%	0.5	0.3	A
	Subtotal	560	561	100.1%	0.3	0.1	A
EB	Left Turn	2	1	65.0%	3.3	4.4	A
	Through						
	Right Turn	8	7	83.8%	7.1	0.7	A
	Subtotal	10	8	80.0%	7.3	0.8	A
WB	Left Turn	37	37	100.0%	9.5	1.4	A
	Through						
	Right Turn	24	23	97.5%	7.0	0.7	A
	Subtotal	61	60	99.0%	8.5	1.1	A
Total		1,194	1,176	98.5%	1.1	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	90.0%	2.5	6.3	A
	Through	543	527	97.0%	0.2	0.1	A
	Right Turn	14	12	85.7%	0.5	0.2	A
	Subtotal	562	543	96.7%	0.2	0.1	A
SB	Left Turn	10	11	113.0%	1.7	1.5	A
	Through	533	535	100.4%	0.3	0.1	A
	Right Turn	4	4	102.5%	0.2	0.3	A
	Subtotal	547	550	100.6%	0.4	0.1	A
EB	Left Turn	14	13	92.9%	6.5	0.4	A
	Through	5	5	94.0%	4.5	4.0	A
	Right Turn	20	20	101.5%	5.2	1.9	A
	Subtotal	39	38	97.4%	6.4	0.5	A
WB	Left Turn	7	5	74.3%	8.8	4.5	A
	Through						
	Right Turn	8	8	96.3%	6.1	0.3	A
	Subtotal	15	13	86.0%	7.5	1.4	A
Total		1,163	1,145	98.4%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	227	227	99.9%	47.2	3.5	D
	Right Turn	552	540	97.8%	2.5	0.7	A
	Subtotal	779	766	98.4%	15.9	1.5	B
SB	Left Turn	2	2	80.0%	28.3	32.7	C
	Through	94	91	97.1%	50.6	6.1	D
	Right Turn	47	48	102.8%	25.3	6.6	C
	Subtotal	143	141	98.7%	41.3	3.9	D
EB	Left Turn	83	80	96.1%	66.9	6.8	E
	Through	490	471	96.2%	12.3	2.5	B
	Right Turn	7	7	98.6%	5.7	8.1	A
	Subtotal	580	558	96.2%	19.5	2.8	B
WB	Left Turn	344	335	97.4%	55.5	6.7	E
	Through	532	538	101.0%	9.3	1.7	A
	Right Turn	15	15	99.3%	2.9	1.6	A
	Subtotal	891	888	99.6%	27.4	2.5	C
Total		2,393	2,353	98.3%	22.7	1.1	C



**Intersection 7 Highland Drive/Elgin Avenue Roundabout**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	6	84.3%	3.0	3.1	A
	Through	678	666	98.3%	4.8	0.8	A
	Right Turn	8	9	112.5%	4.3	7.1	A
	Subtotal	693	681	98.3%	4.8	0.8	A
SB	Left Turn	14	15	105.0%	10.6	4.2	B
	Through	500	486	97.3%	15.0	3.0	B
	Right Turn	3	3	93.3%	6.7	12.4	A
	Subtotal	517	504	97.4%	14.9	2.9	B
EB	Left Turn	6	6	98.3%	18.2	15.8	C
	Through	5	5	98.0%	11.8	13.1	B
	Right Turn	9	8	91.1%	18.0	12.3	C
	Subtotal	20	19	95.0%	17.9	9.9	C
WB	Left Turn	13	13	96.2%	19.3	13.0	C
	Through	2	2	110.0%	4.1	12.1	A
	Right Turn	63	62	98.3%	13.5	6.6	B
	Subtotal	78	77	98.2%	13.0	4.7	B
Total		1,308	1,281	97.9%	9.9	1.1	A

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	21	94.5%	3.9	3.2	A
	Through	668	661	98.9%	0.3	0.0	A
	Right Turn						
	Subtotal	690	681	98.7%	0.4	0.1	A
SB	Left Turn						
	Through	505	492	97.4%	0.6	0.1	A
	Right Turn	17	15	90.6%	0.8	0.3	A
	Subtotal	522	507	97.1%	0.6	0.1	A
EB	Left Turn	23	23	100.0%	13.7	2.5	B
	Through						
	Right Turn	38	37	98.4%	9.6	2.4	A
	Subtotal	61	60	99.0%	11.1	2.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,273	1,249	98.1%	1.1	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Roundabout

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	21	96.4%	7.0	3.2	A
	Through	643	635	98.8%	6.3	0.7	A
	Right Turn	20	17	84.0%	6.2	3.1	A
	Subtotal	685	673	98.2%	6.3	0.6	A
SB	Left Turn	9	4	42.2%	7.5	8.0	A
	Through	514	500	97.2%	5.3	1.4	A
	Right Turn	19	20	102.6%	4.6	2.7	A
	Subtotal	542	523	96.5%	5.4	1.4	A
EB	Left Turn	19	20	107.4%	9.0	5.9	A
	Through	7	5	70.0%	3.0	3.6	A
	Right Turn	19	19	100.0%	8.7	4.6	A
	Subtotal	45	44	98.4%	9.0	4.0	A
WB	Left Turn	26	25	94.6%	18.6	4.5	C
	Through	5	6	120.0%	15.7	12.0	C
	Right Turn	27	26	97.8%	18.1	8.9	C
	Subtotal	58	57	98.3%	18.9	4.1	C
Total		1,330	1,297	97.5%	6.8	0.6	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	10	105.6%	3.5	3.6	A
	Through	688	680	98.9%	2.5	0.7	A
	Right Turn	6	6	105.0%	3.3	5.7	A
	Subtotal	703	696	99.0%	2.5	0.7	A
SB	Left Turn	15	16	106.0%	9.3	8.6	A
	Through	530	514	97.0%	0.2	0.0	A
	Right Turn	6	7	110.0%	0.3	0.2	A
	Subtotal	551	537	97.4%	0.5	0.3	A
EB	Left Turn	4	3	85.0%	6.9	9.3	A
	Through	3	3	90.0%	7.1	12.8	A
	Right Turn	12	11	90.0%	7.9	3.9	A
	Subtotal	19	17	88.9%	13.6	6.4	B
WB	Left Turn	3	3	113.3%	10.4	12.7	B
	Through						
	Right Turn	13	11	81.5%	15.4	8.8	C
	Subtotal	16	14	87.5%	14.3	6.5	B
Total		1,289	1,264	98.1%	1.9	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	119	122	102.4%	44.2	10.0	D
	Through	512	504	98.5%	42.5	5.7	D
	Right Turn	123	122	99.3%	10.1	3.3	B
	Subtotal	754	748	99.2%	37.7	4.7	D
SB	Left Turn	88	85	96.7%	51.7	10.7	D
	Through	378	363	96.0%	28.5	2.9	C
	Right Turn	79	78	99.2%	15.0	2.7	B
	Subtotal	545	526	96.6%	30.3	2.3	C
EB	Left Turn	76	79	103.9%	25.6	9.8	C
	Through	461	462	100.1%	15.7	2.7	B
	Right Turn	155	153	98.8%	3.4	0.5	A
	Subtotal	692	694	100.2%	14.0	2.1	B
WB	Left Turn	129	134	103.6%	20.9	3.3	C
	Through	527	522	99.0%	20.6	1.9	C
	Right Turn	119	119	100.0%	17.9	3.1	B
	Subtotal	775	774	99.9%	20.2	1.8	C
Total		2,766	2,743	99.2%	25.7	1.5	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	88.8%	11.0	19.3	B
	Through	769	767	99.7%	4.7	1.6	A
	Right Turn	4	4	90.0%	0.6	0.4	A
	Subtotal	781	777	99.5%	4.7	1.8	A
SB	Left Turn	5	5	108.0%	5.6	7.3	A
	Through	618	609	98.5%	0.1	0.0	A
	Right Turn	35	32	90.9%	0.1	0.0	A
	Subtotal	658	646	98.1%	0.2	0.2	A
EB	Left Turn	26	26	99.6%	27.9	7.9	D
	Through						
	Right Turn	7	6	90.0%	10.0	9.5	A
	Subtotal	33	32	97.6%	26.0	6.4	D
WB	Left Turn	7	6	88.6%	6.2	6.1	A
	Through						
	Right Turn	9	9	97.8%	3.2	3.5	A
	Subtotal	16	15	93.8%	8.6	3.7	A
Total		1,488	1,470	98.8%	3.3	1.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	67	68	101.8%	38.0	7.2	D
	Through	339	333	98.1%	36.8	4.7	D
	Right Turn	114	116	102.1%	22.5	7.0	C
	Subtotal	520	517	99.5%	33.6	5.0	C
SB	Left Turn	256	252	98.3%	60.7	16.4	E
	Through	477	474	99.3%	36.0	4.2	D
	Right Turn	148	149	100.8%	7.3	1.2	A
	Subtotal	881	875	99.3%	39.2	5.3	D
EB	Left Turn	167	159	95.4%	27.0	4.0	C
	Through	627	631	100.6%	18.4	3.4	B
	Right Turn	77	79	103.1%	14.4	5.4	B
	Subtotal	871	869	99.8%	19.8	2.9	B
WB	Left Turn	143	135	94.1%	19.6	5.6	B
	Through	616	619	100.5%	10.4	1.6	B
	Right Turn	180	178	99.0%	7.8	2.7	A
	Subtotal	939	932	99.2%	11.4	2.0	B
Total		3,211	3,193	99.4%	25.6	1.9	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	114	114	100.0%	12.7	4.4	B
	Through	595	577	97.0%	3.4	0.7	A
	Right Turn						
	Subtotal	709	691	97.5%	4.9	0.6	A
SB	Left Turn						
	Through	836	835	99.9%	1.9	0.2	A
	Right Turn	291	293	100.8%	0.0	0.0	A
	Subtotal	1,127	1,128	100.1%	1.4	0.1	A
EB	Left Turn	333	328	98.6%	50.6	4.1	D
	Through						
	Right Turn	163	165	101.5%	6.5	1.3	A
	Subtotal	496	494	99.5%	36.4	3.0	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,332	2,313	99.2%	10.9	0.8	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	866	848	97.9%	0.2	0.1	A
	Right Turn	62	57	92.3%	0.0	0.0	A
	Subtotal	928	905	97.5%	0.2	0.1	A
SB	Left Turn	31	29	94.8%	2.4	1.6	A
	Through	1,093	1,095	100.2%	2.9	0.5	A
	Right Turn						
	Subtotal	1,124	1,124	100.0%	2.8	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	34	33	98.2%	9.7	2.8	A
	Through						
	Right Turn	41	40	97.3%	5.6	0.3	A
	Subtotal	75	73	97.7%	7.2	1.1	A
Total		2,127	2,103	98.9%	1.8	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	104.0%	2.0	4.1	A
	Through	856	835	97.5%	0.2	0.0	A
	Right Turn	46	48	105.2%	0.5	0.2	A
	Subtotal	907	889	98.0%	0.2	0.0	A
SB	Left Turn	28	30	106.1%	2.3	0.8	A
	Through	1,081	1,082	100.1%	0.5	0.2	A
	Right Turn	6	5	85.0%	0.4	0.4	A
	Subtotal	1,115	1,117	100.1%	0.5	0.2	A
EB	Left Turn	4	3	67.5%	3.5	4.8	A
	Through						
	Right Turn	6	5	90.0%	4.2	3.6	A
	Subtotal	10	8	81.0%	7.7	1.7	A
WB	Left Turn	37	37	99.7%	13.0	3.8	B
	Through						
	Right Turn	24	23	97.5%	9.4	3.4	A
	Subtotal	61	60	98.9%	11.4	3.4	B
Total		2,093	2,074	99.1%	0.8	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	25	24	94.4%	10.0	4.9	B
	Through	833	814	97.7%	0.4	0.2	A
	Right Turn	26	23	88.5%	0.6	0.2	A
	Subtotal	884	861	97.3%	0.7	0.3	A
SB	Left Turn	13	15	116.9%	5.9	3.1	A
	Through	1,070	1,072	100.2%	1.1	0.3	A
	Right Turn	4	4	102.5%	0.7	1.1	A
	Subtotal	1,087	1,092	100.4%	1.2	0.3	A
EB	Left Turn	5	6	110.0%	6.7	3.0	A
	Through	6	5	83.3%	7.3	5.9	A
	Right Turn	19	18	95.8%	6.1	0.5	A
	Subtotal	30	29	95.7%	6.9	1.1	A
WB	Left Turn	26	26	99.2%	19.7	4.8	C
	Through	5	6	126.0%	21.4	15.2	C
	Right Turn	16	15	92.5%	7.2	1.9	A
	Subtotal	47	47	99.8%	16.5	4.5	C
Total		2,048	2,028	99.0%	1.4	0.3	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	6	80.0%	63.0	33.4	E
	Through	248	250	100.6%	42.1	5.3	D
	Right Turn	525	516	98.4%	1.8	0.8	A
	Subtotal	780	772	98.9%	15.5	2.9	B
SB	Left Turn	3	2	80.0%	30.5	36.1	C
	Through	316	315	99.7%	45.3	2.9	D
	Right Turn	220	220	99.9%	33.9	6.0	C
	Subtotal	539	537	99.6%	40.8	3.0	D
EB	Left Turn	184	177	96.4%	64.4	9.3	E
	Through	609	600	98.5%	36.6	3.3	D
	Right Turn	10	10	95.0%	33.2	10.5	C
	Subtotal	803	787	98.0%	42.4	3.7	D
WB	Left Turn	564	556	98.5%	41.5	3.6	D
	Through	920	922	100.2%	21.1	1.9	C
	Right Turn	35	37	106.3%	3.2	0.7	A
	Subtotal	1,519	1,515	99.7%	28.0	1.7	C
Total		3,641	3,610	99.2%	30.8	1.1	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Roundabout

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	3	56.7%	6.7	6.5	A
	Through	777	771	99.2%	9.9	4.9	A
	Right Turn	24	23	97.5%	11.4	8.4	B
	Subtotal	807	798	98.8%	9.9	4.9	A
SB	Left Turn	66	66	100.2%	70.9	22.7	F
	Through	787	760	96.5%	74.7	29.8	F
	Right Turn	12	13	105.8%	47.3	22.7	E
	Subtotal	865	838	96.9%	74.0	28.9	F
EB	Left Turn	12	11	91.7%	77.7	65.2	F
	Through	3	3	113.3%	58.3	117.3	F
	Right Turn	29	26	90.0%	84.2	58.1	F
	Subtotal	44	41	92.0%	77.0	51.2	F
WB	Left Turn	11	10	89.1%	53.5	52.3	F
	Through	4	4	90.0%	1.8	4.5	A
	Right Turn	38	38	100.0%	35.3	22.4	E
	Subtotal	53	51	97.0%	38.1	30.1	E
Total		1,769	1,728	97.7%	43.3	13.4	E

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	43	43	100.7%	11.5	4.9	B
	Through	780	773	99.1%	0.7	1.2	A
	Right Turn						
	Subtotal	823	816	99.1%	1.4	1.1	A
SB	Left Turn						
	Through	792	760	96.0%	6.8	8.8	A
	Right Turn	35	33	95.1%	5.2	7.7	A
	Subtotal	827	793	95.9%	6.7	8.8	A
EB	Left Turn	27	26	96.7%	29.4	12.2	D
	Through						
	Right Turn	36	34	95.3%	20.7	10.8	C
	Subtotal	63	60	95.9%	24.5	9.8	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,713	1,670	97.5%	4.7	4.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Roundabout

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	22	24	107.3%	11.0	4.1	B
	Through	771	761	98.7%	10.2	1.5	B
	Right Turn	51	48	93.7%	9.6	4.7	A
	Subtotal	844	832	98.6%	10.3	1.7	B
SB	Left Turn	10	5	45.0%	11.4	7.4	B
	Through	797	761	95.4%	15.1	3.3	C
	Right Turn	30	29	97.0%	14.4	4.5	B
	Subtotal	837	794	94.9%	15.1	3.2	C
EB	Left Turn	54	57	106.3%	102.5	77.6	F
	Through	19	18	92.6%	113.9	70.3	F
	Right Turn	41	37	91.0%	90.9	67.8	F
	Subtotal	114	112	98.5%	102.4	71.7	F
WB	Left Turn	31	30	97.4%	39.6	29.2	E
	Through	10	11	108.0%	30.2	30.0	D
	Right Turn	14	13	89.3%	43.2	23.2	E
	Subtotal	55	54	97.3%	41.4	24.4	E
Total		1,850	1,792	96.9%	22.0	7.8	C

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	7	102.9%	6.8	7.5	A
	Through	832	823	98.9%	2.3	0.9	A
	Right Turn	5	4	84.0%	0.2	0.3	A
	Subtotal	844	835	98.9%	2.4	0.9	A
SB	Left Turn	19	16	86.3%	11.9	8.3	B
	Through	832	796	95.6%	0.3	0.0	A
	Right Turn	7	6	81.4%	0.4	0.2	A
	Subtotal	858	818	95.3%	0.6	0.3	A
EB	Left Turn	7	7	97.1%	31.7	17.4	D
	Through	2	2	120.0%	8.2	12.0	A
	Right Turn	30	27	90.7%	18.1	10.4	C
	Subtotal	39	36	93.3%	21.8	8.5	C
WB	Left Turn	5	5	102.0%	16.5	10.2	C
	Through	2	2	80.0%	7.6	11.9	A
	Right Turn	20	19	93.0%	12.7	4.0	B
	Subtotal	27	25	93.7%	14.0	3.5	B
Total		1,768	1,714	97.0%	2.1	0.6	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet + Roundabouts  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	159	160	100.8%	71.0	29.7	E
	Through	563	554	98.5%	45.1	13.4	D
	Right Turn	155	155	99.9%	13.5	5.9	B
	Subtotal	877	870	99.1%	44.8	14.5	D
SB	Left Turn	171	161	93.9%	41.1	6.6	D
	Through	609	579	95.1%	22.2	3.2	C
	Right Turn	122	121	99.5%	14.7	4.0	B
	Subtotal	902	861	95.5%	24.8	2.9	C
EB	Left Turn	152	151	99.6%	47.6	9.2	D
	Through	721	719	99.7%	27.0	3.4	C
	Right Turn	211	213	101.1%	4.6	0.7	A
	Subtotal	1,084	1,084	100.0%	25.9	2.5	C
WB	Left Turn	178	186	104.6%	43.5	9.9	D
	Through	651	642	98.6%	33.0	2.6	C
	Right Turn	165	165	99.7%	28.7	4.8	C
	Subtotal	994	993	99.9%	34.3	3.0	C
Total		3,857	3,807	98.7%	32.2	2.7	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	11	106.0%	22.1	20.9	C
	Through	841	836	99.4%	7.6	5.1	A
	Right Turn	19	20	104.7%	0.9	0.4	A
	Subtotal	870	867	99.6%	7.6	5.1	A
SB	Left Turn	20	20	98.0%	14.2	9.7	B
	Through	940	921	98.0%	0.1	0.1	A
	Right Turn	42	41	97.4%	0.1	0.0	A
	Subtotal	1,002	981	97.9%	0.5	0.4	A
EB	Left Turn	30	31	101.7%	41.9	27.5	E
	Through						
	Right Turn	9	9	96.7%	11.9	6.2	B
	Subtotal	39	39	100.5%	37.6	23.8	E
WB	Left Turn	5	5	104.0%	7.8	10.7	A
	Through						
	Right Turn	15	15	98.7%	6.8	1.3	A
	Subtotal	20	20	100.0%	8.0	2.4	A
Total		1,931	1,907	98.8%	4.6	2.9	A

# Appendix C:

## Maximum Buildout Traffic Analysis

### Results

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	69	72	104.5%	42.0	6.1	D
	Through	370	364	98.5%	42.8	8.2	D
	Right Turn	132	134	101.7%	29.0	7.2	C
	Subtotal	571	571	99.9%	39.4	7.7	D
SB	Left Turn	61	59	97.2%	53.9	10.7	D
	Through	197	193	98.1%	39.3	5.0	D
	Right Turn	81	81	100.0%	4.8	1.6	A
	Subtotal	339	334	98.4%	34.4	3.4	C
EB	Left Turn	94	86	91.4%	18.3	4.5	B
	Through	415	423	101.8%	10.4	3.3	B
	Right Turn	32	32	98.8%	6.7	4.2	A
	Subtotal	541	540	99.8%	11.4	2.8	B
WB	Left Turn	91	93	102.6%	11.3	4.6	B
	Through	515	513	99.6%	7.6	1.3	A
	Right Turn	38	36	95.0%	7.1	4.3	A
	Subtotal	644	643	99.8%	8.2	1.5	A
Total		2,095	2,087	99.6%	22.1	3.1	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	32	100.3%	4.7	3.1	A
	Through	423	409	96.6%	2.3	0.5	A
	Right Turn						
	Subtotal	455	441	96.9%	2.5	0.7	A
SB	Left Turn						
	Through	338	336	99.4%	2.3	0.5	A
	Right Turn	138	142	103.2%	0.4	0.4	A
	Subtotal	476	478	100.5%	1.8	0.4	A
EB	Left Turn	88	88	99.5%	24.2	3.8	C
	Through						
	Right Turn	25	24	97.2%	4.7	1.1	A
	Subtotal	113	112	99.0%	20.7	3.3	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,044	1,031	98.8%	4.4	0.6	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	498	483	97.1%	0.1	0.0	A
	Right Turn	13	13	100.8%	0.0	0.0	A
	Subtotal	511	497	97.2%	0.1	0.0	A
SB	Left Turn	32	31	97.8%	2.7	1.5	A
	Through	473	476	100.7%	1.9	0.6	A
	Right Turn						
	Subtotal	505	508	100.5%	1.9	0.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	3	2	66.7%	7.6	7.4	A
	Through						
	Right Turn	4	3	72.5%	1.4	2.3	A
	Subtotal	7	5	70.0%	9.0	6.0	A
Total		1,023	1,009	98.6%	1.1	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	5	122.5%	0.2	0.2	A
	Through	495	479	96.8%	0.1	0.1	A
	Right Turn	3	3	83.3%	0.2	0.2	A
	Subtotal	502	487	96.9%	0.1	0.1	A
SB	Left Turn	2	2	105.0%	0.2	0.2	A
	Through	500	503	100.6%	0.2	0.1	A
	Right Turn	3	2	80.0%	0.3	0.6	A
	Subtotal	505	508	100.5%	0.2	0.1	A
EB	Left Turn	1	0	30.0%	0.0	0.0	A
	Through						
	Right Turn	7	7	95.7%	7.2	0.8	A
	Subtotal	8	7	87.5%	7.2	0.8	A
WB	Left Turn	3	2	76.7%	5.2	5.3	A
	Through						
	Right Turn	5	5	94.0%	2.9	4.0	A
	Subtotal	8	7	87.5%	8.1	3.2	A
Total		1,023	1,008	98.6%	0.2	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 5                      Richmond Street/Elgin Avenue                      Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	2	2	105.0%	0.4	0.7	A
	Through	486	471	97.0%	0.1	0.1	A
	Right Turn	13	11	85.4%	0.6	0.2	A
	Subtotal	501	485	96.7%	0.2	0.1	A
SB	Left Turn	9	10	110.0%	2.3	2.8	A
	Through	482	485	100.7%	0.2	0.1	A
	Right Turn	3	3	96.7%	0.3	0.2	A
	Subtotal	494	498	100.9%	0.3	0.1	A
EB	Left Turn	13	12	91.5%	7.7	2.0	A
	Through	4	4	87.5%	2.8	3.6	A
	Right Turn	17	17	97.6%	5.8	0.3	A
	Subtotal	34	32	94.1%	6.6	0.6	A
WB	Left Turn	6	5	86.7%	8.6	8.2	A
	Through						
	Right Turn	7	8	110.0%	7.6	3.5	A
	Subtotal	13	13	99.2%	8.8	4.6	A
Total		1,042	1,028	98.6%	0.5	0.1	A

Intersection 6                      Highland Drive/Richmond Street                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	204	202	98.8%	61.8	3.3	E
	Right Turn	497	490	98.6%	4.6	1.5	A
	Subtotal	701	692	98.7%	21.7	2.1	C
SB	Left Turn	1	1	50.0%	27.1	44.9	C
	Through	79	79	99.5%	53.5	6.8	D
	Right Turn	37	38	101.4%	26.7	9.0	C
	Subtotal	117	117	99.7%	45.4	7.7	D
EB	Left Turn	70	68	96.7%	74.1	7.6	E
	Through	444	428	96.4%	6.5	1.7	A
	Right Turn	6	6	101.7%	2.2	2.8	A
	Subtotal	520	502	96.5%	15.0	3.1	B
WB	Left Turn	301	292	97.1%	52.6	5.9	D
	Through	489	497	101.6%	7.0	1.6	A
	Right Turn	14	15	103.6%	2.3	2.0	A
	Subtotal	804	803	99.9%	22.9	1.9	C
Total		2,142	2,113	98.7%	22.4	1.4	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	103.3%	0.4	0.7	A
	Through	603	594	98.5%	0.4	0.1	A
	Right Turn	3	4	116.7%	0.3	0.3	A
	Subtotal	612	604	98.6%	0.4	0.1	A
SB	Left Turn	13	13	96.9%	0.9	1.1	A
	Through	440	429	97.5%	0.3	0.1	A
	Right Turn	2	2	105.0%	0.1	0.2	A
	Subtotal	455	444	97.5%	0.4	0.1	A
EB	Left Turn	5	5	102.0%	7.0	8.1	A
	Through	4	5	117.5%	2.2	4.6	A
	Right Turn	8	7	90.0%	2.5	3.3	A
	Subtotal	17	17	100.0%	11.1	4.8	B
WB	Left Turn	8	7	91.3%	13.7	7.9	B
	Through	1	1	90.0%	4.0	5.8	A
	Right Turn	60	60	100.0%	8.6	1.6	A
	Subtotal	69	68	98.8%	9.3	2.3	A
Total		1,153	1,132	98.2%	1.2	0.2	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	98.0%	1.8	2.4	A
	Through	610	602	98.7%	0.2	0.0	A
	Right Turn						
	Subtotal	615	607	98.7%	0.2	0.0	A
SB	Left Turn						
	Through	451	438	97.2%	0.2	0.0	A
	Right Turn	5	6	110.0%	0.3	0.2	A
	Subtotal	456	444	97.3%	0.2	0.0	A
EB	Left Turn	2	2	75.0%	8.4	13.4	A
	Through						
	Right Turn	7	6	78.6%	4.9	5.3	A
	Subtotal	9	7	77.8%	12.1	11.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,080	1,058	97.9%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	9	94.4%	5.4	5.0	A
	Through	585	576	98.4%	1.4	0.5	A
	Right Turn	18	15	85.6%	0.8	0.7	A
	Subtotal	612	600	98.0%	1.5	0.6	A
SB	Left Turn	6	5	81.7%	7.7	8.7	A
	Through	441	429	97.2%	4.1	1.2	A
	Right Turn	9	9	96.7%	1.8	3.0	A
	Subtotal	456	442	97.0%	4.2	1.1	A
EB	Left Turn	5	6	118.0%	18.3	17.7	B
	Through	5	5	98.0%	19.1	17.2	B
	Right Turn	7	6	91.4%	7.0	3.3	A
	Subtotal	17	17	101.2%	16.2	9.1	B
WB	Left Turn	22	21	96.4%	19.7	5.9	B
	Through	3	3	106.7%	9.8	15.3	A
	Right Turn	24	25	102.5%	7.0	1.4	A
	Subtotal	49	49	100.0%	13.5	4.7	B
Total		1,134	1,108	97.7%	3.6	0.5	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	82.5%	2.1	2.3	A
	Through	616	608	98.7%	0.5	0.2	A
	Right Turn	5	5	104.0%	0.3	0.2	A
	Subtotal	629	620	98.5%	0.5	0.2	A
SB	Left Turn	14	15	110.0%	1.5	0.9	A
	Through	450	436	96.8%	0.3	0.2	A
	Right Turn						
	Subtotal	464	451	97.2%	0.3	0.3	A
EB	Left Turn	3	2	70.0%	2.8	5.4	A
	Through	2	2	120.0%	8.5	11.8	A
	Right Turn	4	4	87.5%	6.2	2.7	A
	Subtotal	9	8	88.9%	10.2	4.9	B
WB	Left Turn	2	2	100.0%	4.8	6.5	A
	Through						
	Right Turn	12	10	83.3%	6.6	0.7	A
	Subtotal	14	12	85.7%	7.1	1.2	A
Total		1,116	1,091	97.7%	0.6	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	94	96	101.7%	37.0	6.3	D
	Through	473	465	98.3%	33.8	3.5	C
	Right Turn	114	119	104.3%	25.0	4.7	C
	Subtotal	681	680	99.8%	32.8	2.4	C
SB	Left Turn	71	68	95.6%	52.4	11.8	D
	Through	331	316	95.5%	35.6	5.9	D
	Right Turn	55	57	103.3%	28.5	7.9	C
	Subtotal	457	441	96.5%	37.5	5.7	D
EB	Left Turn	54	53	97.8%	16.2	5.8	B
	Through	423	433	102.4%	10.8	2.1	B
	Right Turn	125	124	99.4%	3.4	0.6	A
	Subtotal	602	610	101.3%	9.7	1.6	A
WB	Left Turn	115	118	102.8%	20.1	4.9	C
	Through	490	486	99.1%	15.8	2.4	B
	Right Turn	106	106	100.2%	9.7	4.3	A
	Subtotal	711	710	99.8%	15.6	2.5	B
Total		2,451	2,440	99.6%	24.4	1.6	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	714	714	100.1%	0.8	0.4	A
	Right Turn	3	3	113.3%	0.4	0.5	A
	Subtotal	717	718	100.1%	0.8	0.4	A
SB	Left Turn	4	4	90.0%	1.7	2.1	A
	Through	563	551	97.8%	0.1	0.0	A
	Right Turn						
	Subtotal	567	554	97.7%	0.1	0.0	A
EB	Left Turn	6	5	81.7%	10.7	3.4	B
	Through						
	Right Turn	1	1	110.0%	1.3	2.8	A
	Subtotal	7	6	85.7%	10.4	3.3	B
WB	Left Turn	6	4	70.0%	4.1	4.5	A
	Through						
	Right Turn	8	8	97.5%	4.4	5.3	A
	Subtotal	14	12	85.7%	7.3	3.3	A
Total		1,305	1,290	98.8%	0.6	0.3	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
AM Peak Hour

Intersection 13

Highland Drive/Luck Lane

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	56	57	102.0%	3.9	1.2	A
	Through	817	817	100.0%	1.4	0.4	A
	Right Turn						
	Subtotal	873	874	100.1%	1.5	0.4	A
SB	Left Turn						
	Through	522	510	97.7%	1.7	0.9	A
	Right Turn	69	65	94.2%	1.8	0.8	A
	Subtotal	591	575	97.3%	1.7	0.8	A
EB	Left Turn	11	11	101.8%	38.9	5.6	D
	Through						
	Right Turn	41	41	99.5%	7.3	0.7	A
	Subtotal	52	52	100.0%	15.0	2.2	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,516	1,501	99.0%	2.1	0.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	65	102.4%	35.0	8.8	D
	Through	312	307	98.4%	41.6	5.8	D
	Right Turn	94	96	102.2%	26.1	6.8	C
	Subtotal	469	468	99.7%	37.5	5.6	D
SB	Left Turn	208	204	98.3%	48.0	8.6	D
	Through	445	440	98.9%	39.2	3.1	D
	Right Turn	127	129	101.3%	7.9	1.4	A
	Subtotal	780	773	99.1%	37.0	4.4	D
EB	Left Turn	144	136	94.7%	21.4	4.3	C
	Through	576	581	100.9%	14.1	1.9	B
	Right Turn	73	76	103.4%	11.9	3.0	B
	Subtotal	793	793	100.0%	15.2	2.1	B
WB	Left Turn	121	119	97.9%	15.7	5.9	B
	Through	564	564	99.9%	9.8	1.4	A
	Right Turn	135	134	99.1%	7.3	2.5	A
	Subtotal	820	816	99.5%	10.2	1.7	B
Total		2,862	2,850	99.6%	24.0	1.5	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	103	101	97.6%	10.0	3.0	A
	Through	506	493	97.5%	2.6	0.9	A
	Right Turn						
	Subtotal	609	594	97.5%	3.9	0.8	A
SB	Left Turn						
	Through	747	742	99.4%	1.7	0.3	A
	Right Turn	269	271	100.7%	0.0	0.1	A
	Subtotal	1,016	1,013	99.7%	1.3	0.2	A
EB	Left Turn	309	306	98.9%	51.8	5.1	D
	Through						
	Right Turn	151	154	101.9%	5.9	0.6	A
	Subtotal	460	460	99.9%	37.0	3.7	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,085	2,066	99.1%	11.0	1.1	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	772	759	98.3%	0.1	0.0	A
	Right Turn	43	40	93.3%	0.0	0.0	A
	Subtotal	815	799	98.0%	0.1	0.0	A
SB	Left Turn	23	23	100.4%	2.8	2.7	A
	Through	1,001	1,000	99.9%	2.5	0.4	A
	Right Turn						
	Subtotal	1,024	1,023	99.9%	2.5	0.4	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	15	13	86.0%	9.2	4.0	A
	Through						
	Right Turn	29	28	97.2%	5.3	0.5	A
	Subtotal	44	41	93.4%	6.4	1.0	A
Total		1,883	1,863	98.9%	1.6	0.2	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	1.1	1.7	A
	Through	794	781	98.4%	0.1	0.0	A
	Right Turn	3	3	83.3%	0.2	0.2	A
	Subtotal	801	788	98.3%	0.1	0.0	A
SB	Left Turn	3	3	90.0%	0.7	1.3	A
	Through	1,015	1,015	100.0%	0.3	0.1	A
	Right Turn	5	5	100.0%	0.5	0.4	A
	Subtotal	1,023	1,022	99.9%	0.3	0.1	A
EB	Left Turn	3	2	66.7%	3.7	5.0	A
	Through						
	Right Turn	5	5	102.0%	4.0	3.5	A
	Subtotal	8	7	88.8%	7.7	1.9	A
WB	Left Turn	4	2	50.0%	7.8	5.5	A
	Through						
	Right Turn	5	4	80.0%	4.0	3.7	A
	Subtotal	9	6	66.7%	8.0	2.9	A
Total		1,841	1,823	99.0%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 5                      Richmond Street/Elgin Avenue                      Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	18	87.6%	8.5	4.1	A
	Through	757	746	98.6%	0.3	0.2	A
	Right Turn	24	22	92.1%	0.6	0.2	A
	Subtotal	802	787	98.1%	0.5	0.3	A
SB	Left Turn	12	15	122.5%	5.2	2.5	A
	Through	983	983	100.0%	0.8	0.2	A
	Right Turn	3	3	106.7%	0.6	1.0	A
	Subtotal	998	1,001	100.3%	0.9	0.2	A
EB	Left Turn	4	4	95.0%	6.7	7.4	A
	Through	5	4	88.0%	7.5	6.3	A
	Right Turn	16	16	98.1%	5.8	0.3	A
	Subtotal	25	24	95.6%	6.8	1.9	A
WB	Left Turn	24	24	99.2%	14.6	9.9	B
	Through	4	5	125.0%	17.4	20.8	C
	Right Turn	15	14	94.0%	7.7	2.1	A
	Subtotal	43	43	99.8%	12.3	4.2	B
Total		1,868	1,854	99.3%	1.1	0.2	A

Intersection 6                      Highland Drive/Richmond Street                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	103.3%	26.2	34.5	C
	Through	222	222	99.8%	46.2	8.7	D
	Right Turn	466	457	98.0%	2.5	0.5	A
	Subtotal	694	685	98.6%	16.2	2.7	B
SB	Left Turn	2	2	85.0%	14.1	31.4	B
	Through	287	287	100.1%	44.3	3.9	D
	Right Turn	200	198	98.9%	34.1	5.9	C
	Subtotal	489	487	99.6%	40.2	3.9	D
EB	Left Turn	164	159	97.1%	59.4	6.1	E
	Through	554	546	98.6%	28.1	3.1	C
	Right Turn	9	9	97.8%	20.2	10.2	C
	Subtotal	727	714	98.2%	34.7	3.2	C
WB	Left Turn	502	493	98.1%	63.9	24.9	E
	Through	850	852	100.2%	19.7	3.1	B
	Right Turn	33	35	106.7%	3.3	1.4	A
	Subtotal	1,385	1,380	99.6%	34.8	9.7	C
Total		3,295	3,265	99.1%	31.8	5.0	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	102.0%	0.2	0.2	A
	Through	693	687	99.1%	0.3	0.1	A
	Right Turn	18	19	104.4%	0.6	0.4	A
	Subtotal	716	711	99.3%	0.3	0.1	A
SB	Left Turn	62	67	108.5%	0.9	0.3	A
	Through	701	688	98.2%	0.5	0.1	A
	Right Turn	11	10	92.7%	0.6	0.3	A
	Subtotal	774	766	98.9%	0.5	0.1	A
EB	Left Turn	11	11	99.1%	18.7	8.2	C
	Through	2	3	140.0%	6.6	6.0	A
	Right Turn	27	26	97.0%	8.3	2.8	A
	Subtotal	40	40	99.8%	11.3	3.3	B
WB	Left Turn	5	4	84.0%	9.0	4.7	A
	Through	3	3	113.3%	8.4	7.7	A
	Right Turn	36	37	101.7%	7.7	1.0	A
	Subtotal	44	44	100.5%	8.5	1.5	A
Total		1,574	1,561	99.2%	1.0	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	5	115.0%	1.3	2.8	A
	Through	709	705	99.5%	0.1	0.0	A
	Right Turn						
	Subtotal	713	710	99.6%	0.2	0.0	A
SB	Left Turn						
	Through	724	710	98.0%	0.3	0.1	A
	Right Turn	9	9	95.6%	0.6	0.3	A
	Subtotal	733	718	98.0%	0.3	0.1	A
EB	Left Turn	7	7	92.9%	12.7	5.8	B
	Through						
	Right Turn	6	6	93.3%	3.9	2.8	A
	Subtotal	13	12	93.1%	9.4	2.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,459	1,440	98.7%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	12	12	102.5%	4.3	4.8	A
	Through	684	678	99.2%	2.6	0.5	A
	Right Turn	47	45	94.9%	1.5	0.7	A
	Subtotal	743	735	99.0%	2.6	0.5	A
SB	Left Turn	7	6	82.9%	9.6	10.2	A
	Through	710	697	98.1%	4.7	1.0	A
	Right Turn	22	21	94.5%	3.6	3.0	A
	Subtotal	739	723	97.9%	4.8	1.1	A
EB	Left Turn	34	35	104.1%	21.9	5.2	C
	Through	16	14	85.6%	27.9	8.5	C
	Right Turn	24	25	103.8%	12.6	7.9	B
	Subtotal	74	74	100.0%	19.1	5.2	B
WB	Left Turn	27	27	98.9%	19.7	7.2	B
	Through	8	9	110.0%	27.8	5.2	C
	Right Turn	10	10	97.0%	8.2	6.9	A
	Subtotal	45	45	100.4%	19.1	4.8	B
Total		1,601	1,578	98.5%	5.2	0.9	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	103.3%	2.6	4.3	A
	Through	733	727	99.2%	0.4	0.2	A
	Right Turn	4	4	97.5%	0.3	0.2	A
	Subtotal	743	737	99.2%	0.4	0.2	A
SB	Left Turn	18	18	99.4%	4.6	3.3	A
	Through	731	718	98.2%	0.3	0.1	A
	Right Turn	2	1	70.0%	0.2	0.2	A
	Subtotal	751	738	98.2%	0.4	0.1	A
EB	Left Turn	6	6	100.0%	13.0	7.9	B
	Through	1	0	30.0%	1.0	3.1	A
	Right Turn	19	17	91.6%	9.2	2.8	A
	Subtotal	26	24	91.2%	10.5	3.9	B
WB	Left Turn	4	5	112.5%	9.2	5.2	A
	Through	1	1	110.0%	1.5	3.3	A
	Right Turn	19	19	97.9%	8.3	2.6	A
	Subtotal	24	24	100.8%	8.7	1.9	A
Total		1,544	1,523	98.6%	0.8	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	127	129	101.7%	33.3	5.7	C
	Through	516	513	99.4%	32.9	4.2	C
	Right Turn	143	147	102.5%	27.1	5.1	C
	Subtotal	786	789	100.3%	31.9	4.0	C
SB	Left Turn	149	143	95.8%	39.1	4.9	D
	Through	546	534	97.8%	28.8	4.0	C
	Right Turn	92	93	100.8%	22.9	6.6	C
	Subtotal	787	770	97.8%	30.1	3.9	C
EB	Left Turn	117	118	100.8%	28.6	6.5	C
	Through	669	671	100.3%	19.9	1.9	B
	Right Turn	175	175	99.8%	5.1	1.1	A
	Subtotal	961	964	100.3%	18.3	2.5	B
WB	Left Turn	160	166	104.0%	30.1	5.8	C
	Through	605	600	99.2%	24.1	3.2	C
	Right Turn	145	144	99.2%	23.6	5.4	C
	Subtotal	910	911	100.1%	25.0	3.6	C
Total		3,444	3,432	99.7%	26.1	1.3	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	775	781	100.8%	0.6	0.4	A
	Right Turn	18	15	85.0%	0.8	0.5	A
	Subtotal	793	796	100.4%	0.6	0.4	A
SB	Left Turn	19	19	98.9%	4.4	2.9	A
	Through	866	859	99.2%	0.1	0.0	A
	Right Turn						
	Subtotal	885	878	99.2%	0.2	0.1	A
EB	Left Turn	6	5	81.7%	12.4	3.7	B
	Through						
	Right Turn	1	1	110.0%	2.1	3.4	A
	Subtotal	7	6	85.7%	11.2	2.9	B
WB	Left Turn	4	3	82.5%	7.7	5.0	A
	Through						
	Right Turn	14	13	90.7%	7.8	1.4	A
	Subtotal	18	16	88.9%	8.2	2.0	A
Total		1,703	1,697	99.6%	0.5	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing Conditions  
PM Peak Hour

Intersection 13 Highland Drive/Luck Lane Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	52	52	99.0%	9.7	1.3	A
	Through	794	795	100.1%	2.5	0.4	A
	Right Turn						
	Subtotal	846	846	100.0%	3.0	0.3	A
SB	Left Turn						
	Through	935	928	99.3%	3.7	0.6	A
	Right Turn	52	50	96.3%	1.8	0.5	A
	Subtotal	987	979	99.1%	3.6	0.5	A
EB	Left Turn	58	59	100.9%	31.8	4.6	C
	Through						
	Right Turn	111	111	99.6%	10.2	1.3	B
	Subtotal	169	169	100.1%	17.6	1.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,002	1,994	99.6%	4.6	0.5	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	73	76	104.5%	46.6	10.2	D
	Through	389	383	98.4%	43.8	7.0	D
	Right Turn	139	141	101.2%	29.2	4.9	C
	Subtotal	601	600	99.8%	40.7	7.2	D
SB	Left Turn	65	62	95.7%	49.2	6.2	D
	Through	207	202	97.4%	39.8	6.6	D
	Right Turn	86	86	99.8%	5.7	1.7	A
	Subtotal	358	350	97.7%	33.9	3.7	C
EB	Left Turn	99	91	92.2%	17.9	6.7	B
	Through	436	444	101.7%	12.0	2.6	B
	Right Turn	34	34	99.7%	8.4	8.6	A
	Subtotal	569	569	99.9%	12.9	2.6	B
WB	Left Turn	96	98	102.3%	13.7	4.3	B
	Through	541	537	99.2%	8.3	1.5	A
	Right Turn	40	38	95.0%	4.1	2.4	A
	Subtotal	677	673	99.4%	8.9	1.6	A
Total		2,205	2,191	99.4%	23.0	2.4	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	35	102.1%	5.0	1.5	A
	Through	445	430	96.7%	2.1	0.5	A
	Right Turn						
	Subtotal	479	465	97.1%	2.3	0.5	A
SB	Left Turn						
	Through	356	351	98.6%	2.4	0.3	A
	Right Turn	145	149	102.4%	0.3	0.4	A
	Subtotal	501	500	99.7%	1.8	0.3	A
EB	Left Turn	93	92	98.9%	23.7	4.5	C
	Through						
	Right Turn	27	27	98.5%	4.8	0.8	A
	Subtotal	120	119	98.8%	20.0	3.8	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,100	1,083	98.5%	4.2	0.7	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	524	507	96.8%	0.1	0.0	A
	Right Turn	14	15	107.9%	0.0	0.0	A
	Subtotal	538	523	97.1%	0.1	0.0	A
SB	Left Turn	34	33	96.5%	1.7	1.1	A
	Through	497	497	99.9%	1.8	0.5	A
	Right Turn						
	Subtotal	531	529	99.7%	1.8	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	4	3	75.0%	7.4	1.3	A
	Through						
	Right Turn	5	4	80.0%	5.3	0.7	A
	Subtotal	9	7	77.8%	6.2	0.9	A
Total		1,078	1,059	98.2%	1.0	0.2	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	94.0%	0.2	0.2	A
	Through	520	503	96.8%	0.1	0.0	A
	Right Turn	4	4	100.0%	0.2	0.3	A
	Subtotal	529	512	96.7%	0.1	0.0	A
SB	Left Turn	3	3	86.7%	0.2	0.2	A
	Through	525	526	100.2%	0.2	0.0	A
	Right Turn	4	3	80.0%	0.2	0.3	A
	Subtotal	532	532	100.0%	0.2	0.0	A
EB	Left Turn	2	1	65.0%	3.3	4.4	A
	Through						
	Right Turn	8	7	83.8%	7.2	0.7	A
	Subtotal	10	8	80.0%	7.4	0.7	A
WB	Left Turn	4	3	67.5%	6.9	4.4	A
	Through						
	Right Turn	6	5	88.3%	5.7	0.9	A
	Subtotal	10	8	80.0%	6.7	1.4	A
Total		1,081	1,060	98.0%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	3	3	83.3%	2.3	3.6	A
	Through	511	494	96.6%	0.2	0.1	A
	Right Turn	14	14	97.9%	0.4	0.2	A
	Subtotal	528	510	96.6%	0.2	0.1	A
SB	Left Turn	10	11	109.0%	5.0	3.8	A
	Through	507	508	100.2%	0.4	0.1	A
	Right Turn	4	4	102.5%	0.3	0.3	A
	Subtotal	521	523	100.4%	0.5	0.2	A
EB	Left Turn	14	13	93.6%	7.0	1.2	A
	Through	5	5	92.0%	9.0	4.4	A
	Right Turn	18	18	102.2%	6.3	0.7	A
	Subtotal	37	36	97.6%	7.0	0.8	A
WB	Left Turn	7	5	74.3%	3.1	4.1	A
	Through						
	Right Turn	8	8	96.3%	3.8	3.5	A
	Subtotal	15	13	86.0%	6.9	1.6	A
Total		1,101	1,082	98.3%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	215	212	98.6%	60.7	3.9	E
	Right Turn	522	510	97.7%	4.7	1.4	A
	Subtotal	737	722	97.9%	21.4	2.8	C
SB	Left Turn	2	1	70.0%	23.8	39.2	C
	Through	83	82	98.6%	55.6	4.0	E
	Right Turn	39	39	98.7%	29.3	11.4	C
	Subtotal	124	122	98.1%	47.3	5.1	D
EB	Left Turn	74	72	96.8%	73.2	8.8	E
	Through	467	445	95.3%	8.3	1.7	A
	Right Turn	7	7	105.7%	2.8	3.8	A
	Subtotal	548	524	95.6%	16.6	4.1	B
WB	Left Turn	317	309	97.5%	54.7	5.0	D
	Through	514	519	101.0%	6.9	1.5	A
	Right Turn	15	15	98.0%	2.9	2.2	A
	Subtotal	846	843	99.6%	24.3	2.5	C
Total		2,255	2,211	98.0%	23.3	2.3	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	8	107.1%	0.9	0.8	A
	Through	634	623	98.2%	0.5	0.1	A
	Right Turn	4	5	115.0%	0.5	0.6	A
	Subtotal	645	635	98.4%	0.5	0.1	A
SB	Left Turn	14	15	104.3%	1.0	0.7	A
	Through	462	449	97.1%	0.3	0.1	A
	Right Turn	3	4	123.3%	0.3	0.5	A
	Subtotal	479	467	97.5%	0.4	0.1	A
EB	Left Turn	6	6	98.3%	4.5	6.2	A
	Through	5	5	98.0%	1.8	3.8	A
	Right Turn	9	8	91.1%	3.1	3.4	A
	Subtotal	20	19	95.0%	8.4	2.7	A
WB	Left Turn	9	8	90.0%	15.4	7.4	C
	Through	2	3	135.0%	12.7	8.6	B
	Right Turn	63	62	98.7%	9.4	1.6	A
	Subtotal	74	73	98.6%	10.2	2.1	B
Total		1,218	1,193	98.0%	1.3	0.2	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	5	86.7%	1.0	1.8	A
	Through	642	632	98.4%	0.2	0.0	A
	Right Turn						
	Subtotal	648	637	98.3%	0.2	0.0	A
SB	Left Turn						
	Through	474	459	96.8%	0.2	0.0	A
	Right Turn	6	6	105.0%	0.4	0.3	A
	Subtotal	480	465	96.9%	0.2	0.1	A
EB	Left Turn	3	2	76.7%	7.6	7.3	A
	Through						
	Right Turn	8	8	96.3%	6.5	1.3	A
	Subtotal	11	10	90.9%	7.5	1.6	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,139	1,112	97.6%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	10	97.0%	5.2	4.5	A
	Through	615	605	98.3%	1.2	0.5	A
	Right Turn	19	17	90.5%	1.0	1.0	A
	Subtotal	644	631	98.0%	1.2	0.5	A
SB	Left Turn	7	7	97.1%	5.9	9.2	A
	Through	464	450	96.9%	4.4	1.2	A
	Right Turn	10	9	91.0%	1.9	1.9	A
	Subtotal	481	466	96.8%	4.4	1.2	A
EB	Left Turn	6	7	116.7%	22.4	15.6	C
	Through	6	6	93.3%	21.8	16.2	C
	Right Turn	8	8	95.0%	6.6	5.5	A
	Subtotal	20	20	101.0%	19.2	10.0	B
WB	Left Turn	24	22	92.9%	21.0	8.2	C
	Through	4	4	102.5%	14.6	15.1	B
	Right Turn	26	26	98.8%	8.3	3.3	A
	Subtotal	54	52	96.5%	16.5	5.8	B
Total		1,199	1,169	97.5%	3.7	0.9	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	8	88.9%	2.9	4.7	A
	Through	647	637	98.5%	0.4	0.1	A
	Right Turn	6	6	93.3%	0.4	0.3	A
	Subtotal	662	651	98.3%	0.4	0.2	A
SB	Left Turn	15	15	100.7%	3.6	4.7	A
	Through	473	456	96.3%	0.2	0.2	A
	Right Turn						
	Subtotal	488	471	96.5%	0.3	0.3	A
EB	Left Turn	4	4	90.0%	6.4	7.5	A
	Through	3	3	110.0%	6.2	6.1	A
	Right Turn	5	5	102.0%	8.5	3.4	A
	Subtotal	12	12	100.0%	9.3	3.3	A
WB	Left Turn	3	3	113.3%	9.7	10.4	A
	Through						
	Right Turn	13	11	81.5%	7.3	1.1	A
	Subtotal	16	14	87.5%	8.2	2.5	A
Total		1,178	1,148	97.4%	0.7	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	99	101	102.4%	34.7	5.1	C
	Through	497	487	98.0%	33.9	3.8	C
	Right Turn	120	126	104.7%	26.4	4.7	C
	Subtotal	716	714	99.7%	32.6	3.6	C
SB	Left Turn	75	74	98.1%	51.0	13.0	D
	Through	348	333	95.7%	36.5	5.0	D
	Right Turn	58	58	99.1%	23.8	5.2	C
	Subtotal	481	464	96.5%	37.3	4.2	D
EB	Left Turn	57	55	97.2%	19.7	4.4	B
	Through	445	454	102.0%	11.7	3.2	B
	Right Turn	132	130	98.6%	3.3	1.0	A
	Subtotal	634	640	100.9%	10.6	2.5	B
WB	Left Turn	121	126	103.8%	19.6	4.1	B
	Through	515	510	99.0%	17.3	3.5	B
	Right Turn	112	112	99.6%	14.3	3.7	B
	Subtotal	748	747	99.9%	17.2	2.9	B
Total		2,579	2,565	99.4%	25.1	1.0	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	750	749	99.9%	0.4	0.2	A
	Right Turn	4	5	117.5%	0.4	0.3	A
	Subtotal	754	754	100.0%	0.4	0.2	A
SB	Left Turn	5	5	90.0%	1.4	1.8	A
	Through	592	581	98.1%	0.1	0.0	A
	Right Turn						
	Subtotal	597	586	98.1%	0.1	0.0	A
EB	Left Turn	7	5	72.9%	10.2	2.3	B
	Through						
	Right Turn	2	2	95.0%	2.8	3.7	A
	Subtotal	9	7	77.8%	9.6	2.3	A
WB	Left Turn	7	6	84.3%	4.5	3.9	A
	Through						
	Right Turn	9	9	101.1%	4.5	5.2	A
	Subtotal	16	15	93.8%	8.3	2.2	A
Total		1,376	1,361	98.9%	0.4	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
AM Peak Hour

Intersection 13 Highland Drive/Luck Lane Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	59	60	100.8%	4.1	1.6	A
	Through	859	857	99.8%	1.5	0.3	A
	Right Turn						
	Subtotal	918	917	99.9%	1.7	0.3	A
SB	Left Turn						
	Through	551	540	98.1%	1.5	0.9	A
	Right Turn	73	70	95.2%	1.4	0.3	A
	Subtotal	624	610	97.7%	1.5	0.8	A
EB	Left Turn	12	12	99.2%	40.7	5.0	D
	Through						
	Right Turn	44	43	96.6%	7.3	0.7	A
	Subtotal	56	54	97.1%	15.5	2.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,598	1,581	98.9%	2.2	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	67	69	102.5%	38.0	5.3	D
	Through	328	322	98.0%	40.3	4.3	D
	Right Turn	99	101	101.6%	24.5	6.2	C
	Subtotal	494	491	99.4%	36.5	4.4	D
SB	Left Turn	219	215	98.1%	52.9	10.9	D
	Through	468	464	99.1%	36.6	2.6	D
	Right Turn	134	135	100.4%	7.3	1.7	A
	Subtotal	821	814	99.1%	36.7	3.6	D
EB	Left Turn	152	144	94.8%	23.6	5.6	C
	Through	605	608	100.5%	15.0	1.6	B
	Right Turn	77	81	105.2%	13.6	4.0	B
	Subtotal	834	833	99.9%	16.4	1.7	B
WB	Left Turn	128	124	97.2%	19.3	6.9	B
	Through	593	593	100.0%	12.0	3.1	B
	Right Turn	142	139	97.7%	8.3	2.0	A
	Subtotal	863	856	99.2%	12.5	2.6	B
Total		3,012	2,994	99.4%	24.7	1.2	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	109	108	99.4%	12.7	4.8	B
	Through	533	516	96.9%	3.0	0.7	A
	Right Turn						
	Subtotal	642	625	97.3%	4.7	0.8	A
SB	Left Turn						
	Through	785	780	99.3%	1.9	0.2	A
	Right Turn	283	285	100.6%	0.1	0.1	A
	Subtotal	1,068	1,064	99.6%	1.4	0.1	A
EB	Left Turn	325	321	98.8%	51.6	4.2	D
	Through						
	Right Turn	159	162	101.6%	5.8	0.7	A
	Subtotal	484	483	99.7%	37.2	3.7	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,194	2,172	99.0%	11.3	1.0	B



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	812	793	97.6%	0.2	0.1	A
	Right Turn	46	45	97.8%	0.0	0.0	A
	Subtotal	858	838	97.6%	0.2	0.1	A
SB	Left Turn	25	25	100.8%	2.2	2.2	A
	Through	1,052	1,050	99.8%	2.3	0.5	A
	Right Turn						
	Subtotal	1,077	1,075	99.8%	2.3	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	16	14	89.4%	9.3	1.8	A
	Through						
	Right Turn	31	31	99.4%	5.3	0.4	A
	Subtotal	47	45	96.0%	6.5	0.6	A
Total		1,982	1,958	98.8%	1.5	0.3	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	94.0%	1.6	1.9	A
	Through	834	816	97.9%	0.1	0.0	A
	Right Turn	4	3	85.0%	0.2	0.2	A
	Subtotal	843	824	97.8%	0.1	0.0	A
SB	Left Turn	4	4	97.5%	0.9	2.1	A
	Through	1,066	1,067	100.1%	0.3	0.1	A
	Right Turn	6	5	88.3%	0.5	0.2	A
	Subtotal	1,076	1,077	100.1%	0.3	0.1	A
EB	Left Turn	4	3	67.5%	0.0	0.0	A
	Through						
	Right Turn	6	5	90.0%	0.6	1.9	A
	Subtotal	10	8	81.0%	0.6	1.9	A
WB	Left Turn	5	4	86.0%	10.3	6.4	B
	Through						
	Right Turn	6	6	95.0%	2.8	3.1	A
	Subtotal	11	10	90.9%	9.5	3.6	A
Total		1,940	1,919	98.9%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 5                      Richmond Street/Elgin Avenue                      Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	23	20	88.3%	8.3	4.5	A
	Through	795	780	98.1%	0.4	0.2	A
	Right Turn	26	23	88.1%	0.6	0.1	A
	Subtotal	844	823	97.5%	0.6	0.3	A
SB	Left Turn	13	15	117.7%	7.7	4.2	A
	Through	1,033	1,037	100.3%	1.0	0.3	A
	Right Turn	4	5	115.0%	0.4	0.6	A
	Subtotal	1,050	1,057	100.6%	1.1	0.3	A
EB	Left Turn	5	5	94.0%	5.8	2.1	A
	Through	6	5	86.7%	7.6	6.8	A
	Right Turn	17	16	94.1%	5.9	0.4	A
	Subtotal	28	26	92.5%	6.8	1.5	A
WB	Left Turn	26	26	99.2%	16.3	6.3	C
	Through	5	6	126.0%	20.5	13.7	C
	Right Turn	16	15	92.5%	6.9	1.1	A
	Subtotal	47	47	99.8%	14.6	3.1	B
Total		1,969	1,953	99.2%	1.3	0.3	A

Intersection 6                      Highland Drive/Richmond Street                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	6	88.6%	54.9	35.6	D
	Through	234	233	99.7%	44.2	6.4	D
	Right Turn	490	474	96.8%	2.6	1.0	A
	Subtotal	731	714	97.6%	16.0	2.5	B
SB	Left Turn	3	2	76.7%	15.2	32.1	B
	Through	302	300	99.3%	43.8	5.2	D
	Right Turn	210	208	99.0%	31.2	4.0	C
	Subtotal	515	510	99.0%	38.3	3.3	D
EB	Left Turn	173	167	96.6%	60.4	9.8	E
	Through	582	573	98.4%	28.8	3.5	C
	Right Turn	10	10	96.0%	21.9	7.9	C
	Subtotal	765	750	98.0%	35.7	4.4	D
WB	Left Turn	528	512	97.0%	89.2	33.7	F
	Through	893	894	100.1%	23.3	3.1	C
	Right Turn	35	37	106.9%	5.1	1.9	A
	Subtotal	1,456	1,443	99.1%	45.8	12.0	D
Total		3,467	3,417	98.5%	36.4	4.8	D

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	7	115.0%	0.5	0.4	A
	Through	728	713	97.9%	0.3	0.1	A
	Right Turn	19	19	100.5%	0.6	0.4	A
	Subtotal	753	739	98.1%	0.3	0.1	A
SB	Left Turn	66	72	108.5%	1.1	0.3	A
	Through	737	716	97.2%	0.6	0.1	A
	Right Turn	12	10	84.2%	1.1	1.5	A
	Subtotal	815	798	97.9%	0.7	0.2	A
EB	Left Turn	12	12	96.7%	18.5	7.0	C
	Through	3	4	120.0%	11.8	9.6	B
	Right Turn	29	27	92.1%	8.6	2.0	A
	Subtotal	44	42	95.2%	12.4	3.0	B
WB	Left Turn	6	5	83.3%	10.9	9.0	B
	Through	4	5	120.0%	10.9	9.9	B
	Right Turn	38	37	98.2%	8.5	2.3	A
	Subtotal	48	47	98.1%	9.8	2.8	A
Total		1,660	1,626	98.0%	1.2	0.2	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	4	88.0%	0.4	0.6	A
	Through	745	733	98.3%	0.1	0.0	A
	Right Turn						
	Subtotal	750	737	98.3%	0.1	0.0	A
SB	Left Turn						
	Through	762	740	97.1%	0.3	0.1	A
	Right Turn	10	8	83.0%	0.5	0.3	A
	Subtotal	772	749	97.0%	0.3	0.1	A
EB	Left Turn	8	6	78.8%	10.8	5.2	B
	Through						
	Right Turn	7	6	82.9%	4.7	3.5	A
	Subtotal	15	12	80.7%	9.8	3.0	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,537	1,498	97.4%	0.3	0.0	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	13	101.5%	4.5	4.0	A
	Through	719	706	98.1%	2.6	0.6	A
	Right Turn	50	49	97.4%	1.0	0.3	A
	Subtotal	782	768	98.1%	2.5	0.6	A
SB	Left Turn	8	8	100.0%	8.5	9.3	A
	Through	746	724	97.0%	5.0	1.0	A
	Right Turn	24	22	92.9%	5.0	2.5	A
	Subtotal	778	754	96.9%	5.1	1.0	A
EB	Left Turn	36	37	102.8%	23.6	2.8	C
	Through	17	14	83.5%	25.0	8.6	C
	Right Turn	26	26	99.6%	11.3	3.8	B
	Subtotal	79	77	97.6%	19.7	3.2	B
WB	Left Turn	29	28	97.9%	22.3	3.5	C
	Through	9	10	107.8%	20.9	9.7	C
	Right Turn	11	10	92.7%	7.1	3.7	A
	Subtotal	49	48	98.6%	19.4	4.1	B
Total		1,688	1,647	97.6%	5.2	0.5	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	8	108.6%	4.1	5.4	A
	Through	770	759	98.5%	0.5	0.2	A
	Right Turn	5	6	114.0%	0.3	0.2	A
	Subtotal	782	772	98.7%	0.6	0.2	A
SB	Left Turn	19	16	86.3%	5.6	4.6	A
	Through	768	747	97.3%	0.4	0.2	A
	Right Turn	3	3	86.7%	0.2	0.2	A
	Subtotal	790	766	96.9%	0.5	0.2	A
EB	Left Turn	7	7	104.3%	13.2	5.1	B
	Through	2	1	65.0%	7.3	12.8	A
	Right Turn	20	19	95.5%	8.1	1.5	A
	Subtotal	29	28	95.5%	10.0	2.0	A
WB	Left Turn	5	5	102.0%	7.3	4.9	A
	Through	2	2	80.0%	3.6	6.0	A
	Right Turn	20	19	92.5%	7.6	1.7	A
	Subtotal	27	25	93.3%	8.8	1.8	A
Total		1,628	1,591	97.7%	0.9	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	134	137	102.3%	32.7	5.4	C
	Through	542	536	99.0%	33.2	3.5	C
	Right Turn	151	154	102.3%	26.4	6.0	C
	Subtotal	827	828	100.1%	31.8	3.5	C
SB	Left Turn	157	150	95.8%	36.8	6.9	D
	Through	574	554	96.5%	31.3	3.8	C
	Right Turn	97	98	100.9%	22.4	7.3	C
	Subtotal	828	802	96.9%	31.2	3.2	C
EB	Left Turn	123	124	100.4%	32.4	9.2	C
	Through	703	699	99.4%	21.8	2.5	C
	Right Turn	184	184	100.2%	4.9	1.0	A
	Subtotal	1,010	1,007	99.7%	20.1	2.1	C
WB	Left Turn	168	175	104.0%	34.6	6.8	C
	Through	636	625	98.3%	26.0	1.8	C
	Right Turn	153	151	98.6%	23.8	6.4	C
	Subtotal	957	951	99.3%	27.2	1.7	C
Total		3,622	3,587	99.0%	27.4	1.4	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	814	816	100.3%	0.5	0.2	A
	Right Turn	19	17	87.4%	0.6	0.2	A
	Subtotal	833	833	100.0%	0.5	0.2	A
SB	Left Turn	20	18	92.0%	4.7	2.4	A
	Through	910	898	98.7%	0.1	0.0	A
	Right Turn						
	Subtotal	930	917	98.6%	0.2	0.1	A
EB	Left Turn	7	5	72.9%	15.5	8.0	C
	Through						
	Right Turn	2	2	95.0%	3.8	5.2	A
	Subtotal	9	7	77.8%	13.9	5.0	B
WB	Left Turn	5	5	98.0%	6.1	6.4	A
	Through						
	Right Turn	15	15	100.7%	7.2	0.8	A
	Subtotal	20	20	100.0%	8.0	2.2	A
Total		1,792	1,777	99.1%	0.5	0.1	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future Background Conditions  
PM Peak Hour

Intersection 13 Highland Drive/Luck Lane Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	55	54	97.8%	10.4	6.4	B
	Through	834	835	100.1%	2.7	0.7	A
	Right Turn						
	Subtotal	889	889	100.0%	3.1	0.6	A
SB	Left Turn						
	Through	984	969	98.5%	3.8	0.9	A
	Right Turn	55	53	96.5%	1.8	0.7	A
	Subtotal	1,039	1,023	98.4%	3.7	0.8	A
EB	Left Turn	61	60	98.0%	31.8	2.8	C
	Through						
	Right Turn	117	117	99.8%	9.1	1.0	A
	Subtotal	178	177	99.2%	16.5	1.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,106	2,088	99.1%	4.6	0.6	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	86	88	102.3%	45.8	12.1	D
	Through	424	417	98.2%	48.3	8.0	D
	Right Turn	218	226	103.8%	34.9	10.1	C
	Subtotal	728	731	100.4%	43.8	8.7	D
SB	Left Turn	189	185	97.7%	73.0	25.2	E
	Through	241	238	98.6%	29.1	5.0	C
	Right Turn	138	138	100.1%	5.4	1.1	A
	Subtotal	568	560	98.6%	38.9	10.6	D
EB	Left Turn	149	139	93.4%	28.3	5.6	C
	Through	488	495	101.5%	22.3	4.3	C
	Right Turn	37	40	107.6%	16.8	6.2	B
	Subtotal	674	674	100.0%	23.1	3.5	C
WB	Left Turn	155	151	97.5%	24.1	6.5	C
	Through	598	604	100.9%	16.5	3.1	B
	Right Turn	143	142	99.2%	12.9	4.0	B
	Subtotal	896	896	100.0%	17.4	2.9	B
Total		2,866	2,862	99.8%	30.3	3.7	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	55	55	99.6%	5.9	2.7	A
	Through	614	597	97.3%	2.1	0.3	A
	Right Turn						
	Subtotal	669	652	97.5%	2.4	0.3	A
SB	Left Turn						
	Through	540	538	99.6%	2.2	0.4	A
	Right Turn	166	163	98.4%	0.8	0.6	A
	Subtotal	706	702	99.4%	1.9	0.4	A
EB	Left Turn	103	102	99.2%	22.3	4.2	C
	Through						
	Right Turn	40	39	98.5%	4.3	0.7	A
	Subtotal	143	142	99.0%	17.3	3.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,518	1,495	98.5%	3.7	0.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	607	599	98.7%	0.4	0.2	A
	Right Turn	110	100	91.0%	0.0	0.0	A
	Subtotal	717	699	97.5%	0.4	0.1	A
SB	Left Turn	68	70	102.2%	5.0	2.4	A
	Through	611	606	99.1%	3.3	0.7	A
	Right Turn						
	Subtotal	679	675	99.5%	3.5	0.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	95	96	100.9%	13.3	3.3	B
	Through						
	Right Turn	57	54	95.3%	9.6	1.3	A
	Subtotal	152	150	98.8%	11.9	2.4	B
Total		1,548	1,525	98.5%	3.7	0.5	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	0.6	1.1	A
	Through	626	616	98.4%	0.1	0.0	A
	Right Turn	34	32	94.4%	0.4	0.1	A
	Subtotal	664	652	98.3%	0.1	0.0	A
SB	Left Turn	19	17	87.4%	0.8	0.9	A
	Through	589	589	100.1%	0.3	0.1	A
	Right Turn	3	4	116.7%	0.4	0.2	A
	Subtotal	611	610	99.8%	0.3	0.1	A
EB	Left Turn	1	0	30.0%	0.9	2.7	A
	Through						
	Right Turn	7	7	95.7%	7.2	0.8	A
	Subtotal	8	7	87.5%	7.3	0.7	A
WB	Left Turn	88	85	96.3%	15.5	2.8	C
	Through						
	Right Turn	53	55	103.8%	12.7	1.7	B
	Subtotal	141	140	99.1%	14.4	2.3	B
Total		1,424	1,409	98.9%	2.8	0.4	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	12	13	105.0%	1.0	0.9	A
	Through	652	645	98.9%	0.1	0.0	A
	Right Turn	16	15	91.3%	0.5	0.2	A
	Subtotal	680	672	98.8%	0.1	0.0	A
SB	Left Turn	10	11	114.0%	6.0	5.8	A
	Through	576	578	100.3%	0.5	0.2	A
	Right Turn	3	2	76.7%	0.2	0.3	A
	Subtotal	589	592	100.4%	0.6	0.3	A
EB	Left Turn	13	12	93.1%	7.1	0.9	A
	Through	4	4	97.5%	2.4	4.0	A
	Right Turn	23	22	96.1%	5.8	0.4	A
	Subtotal	40	38	95.3%	6.6	0.4	A
WB	Left Turn	12	10	84.2%	12.1	5.8	B
	Through						
	Right Turn	10	10	97.0%	6.7	0.9	A
	Subtotal	22	20	90.0%	8.9	2.0	A
Total		1,331	1,321	99.3%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	258	257	99.5%	54.8	4.1	D
	Right Turn	631	622	98.6%	3.5	1.0	A
	Subtotal	889	879	98.8%	19.3	1.9	B
SB	Left Turn	1	1	70.0%	6.4	20.2	A
	Through	108	104	96.4%	47.0	5.2	D
	Right Turn	66	69	104.2%	23.4	5.0	C
	Subtotal	175	174	99.2%	36.9	5.0	D
EB	Left Turn	118	115	97.5%	61.6	6.5	E
	Through	565	550	97.3%	13.9	1.1	B
	Right Turn	6	7	111.7%	8.2	9.1	A
	Subtotal	689	672	97.5%	22.6	2.5	C
WB	Left Turn	382	378	99.0%	62.0	20.3	E
	Through	555	556	100.2%	11.1	1.7	B
	Right Turn	14	14	99.3%	2.8	0.9	A
	Subtotal	951	948	99.7%	31.2	7.4	C
Total		2,704	2,672	98.8%	25.8	3.3	C

**Intersection 7 Highland Drive/Elgin Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	9	111.3%	0.3	0.3	A
	Through	788	781	99.1%	0.3	0.1	A
	Right Turn	23	23	97.8%	0.7	0.4	A
	Subtotal	819	813	99.2%	0.3	0.1	A
SB	Left Turn	13	15	114.6%	0.7	0.3	A
	Through	548	534	97.4%	0.7	0.1	A
	Right Turn	4	3	82.5%	0.7	1.1	A
	Subtotal	565	552	97.7%	0.7	0.1	A
EB	Left Turn	8	8	98.8%	15.1	6.2	C
	Through	4	4	92.5%	12.1	12.0	B
	Right Turn	14	12	88.6%	8.7	2.4	A
	Subtotal	26	24	92.3%	12.6	2.4	B
WB	Left Turn	20	19	95.5%	12.8	2.6	B
	Through	1	0	30.0%	0.0	0.0	A
	Right Turn	60	59	97.5%	8.1	0.7	A
	Subtotal	81	78	96.2%	9.2	0.6	A
Total		1,491	1,467	98.4%	1.1	0.1	A

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	33	31	94.2%	1.4	1.6	A
	Through	767	758	98.8%	0.2	0.1	A
	Right Turn						
	Subtotal	800	789	98.6%	0.2	0.1	A
SB	Left Turn						
	Through	559	543	97.2%	0.3	0.1	A
	Right Turn	23	23	98.7%	0.6	0.3	A
	Subtotal	582	566	97.2%	0.3	0.1	A
EB	Left Turn	52	55	105.4%	15.9	5.9	C
	Through						
	Right Turn	84	80	94.8%	12.7	4.5	B
	Subtotal	136	134	98.8%	14.0	5.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,518	1,489	98.1%	2.2	0.7	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	67	106.8%	11.6	3.9	B
	Through	684	672	98.2%	5.2	1.1	A
	Right Turn	24	24	100.8%	1.8	1.0	A
	Subtotal	771	763	99.0%	5.7	1.2	A
SB	Left Turn	12	13	106.7%	15.4	8.1	B
	Through	582	561	96.3%	8.0	1.0	A
	Right Turn	47	48	101.9%	6.1	2.3	A
	Subtotal	641	621	96.9%	8.1	1.0	A
EB	Left Turn	89	92	102.9%	20.1	2.1	C
	Through	14	14	96.4%	21.5	8.4	C
	Right Turn	85	83	97.1%	13.9	1.6	B
	Subtotal	188	188	99.8%	17.3	1.6	B
WB	Left Turn	28	26	93.9%	19.6	5.8	B
	Through	7	8	114.3%	21.0	13.5	C
	Right Turn	26	26	98.1%	7.8	2.5	A
	Subtotal	61	60	98.0%	14.3	4.0	B
Total		1,661	1,632	98.3%	8.6	0.6	A

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	11	141.3%	3.9	3.7	A
	Through	775	768	99.1%	0.5	0.2	A
	Right Turn	5	5	104.0%	0.3	0.3	A
	Subtotal	788	785	99.6%	0.5	0.2	A
SB	Left Turn	14	14	101.4%	5.5	5.4	A
	Through	649	626	96.4%	0.4	0.3	A
	Right Turn	26	24	93.1%	0.3	0.1	A
	Subtotal	689	664	96.4%	0.5	0.4	A
EB	Left Turn	3	3	96.7%	3.6	6.1	A
	Through	2	2	80.0%	3.0	6.6	A
	Right Turn	44	44	99.1%	8.1	1.2	A
	Subtotal	49	48	98.2%	8.5	1.2	A
WB	Left Turn	2	2	100.0%	3.0	3.9	A
	Through						
	Right Turn	12	10	83.3%	9.0	2.3	A
	Subtotal	14	12	85.7%	8.5	1.9	A
Total		1,540	1,509	98.0%	0.8	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	159	165	103.7%	42.3	11.1	D
	Through	510	502	98.4%	37.1	3.6	D
	Right Turn	120	123	102.6%	29.5	4.2	C
	Subtotal	789	790	100.1%	37.2	4.2	D
SB	Left Turn	124	123	99.3%	55.0	12.9	E
	Through	417	394	94.5%	42.5	2.6	D
	Right Turn	155	154	99.4%	38.5	4.7	D
	Subtotal	696	671	96.4%	43.9	3.6	D
EB	Left Turn	154	160	103.8%	22.0	5.3	C
	Through	517	513	99.2%	14.9	2.7	B
	Right Turn	235	237	100.9%	4.5	1.6	A
	Subtotal	906	910	100.4%	13.4	1.6	B
WB	Left Turn	132	136	103.0%	23.4	5.0	C
	Through	539	533	98.9%	21.3	3.8	C
	Right Turn	128	128	99.9%	17.4	5.8	B
	Subtotal	799	797	99.8%	21.1	3.4	C
Total		3,190	3,168	99.3%	29.4	1.4	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	17	17	98.8%	4.4	2.5	A
	Through	787	788	100.2%	2.3	1.6	A
	Right Turn	3	3	100.0%	1.1	2.6	A
	Subtotal	807	808	100.1%	2.3	1.6	A
SB	Left Turn	4	3	82.5%	1.9	4.1	A
	Through	707	690	97.6%	0.3	0.1	A
	Right Turn	69	69	99.7%	0.4	0.2	A
	Subtotal	780	762	97.7%	0.3	0.1	A
EB	Left Turn	41	41	100.5%	16.5	4.4	C
	Through						
	Right Turn	11	11	99.1%	7.7	3.1	A
	Subtotal	52	52	100.2%	14.8	3.6	B
WB	Left Turn	6	4	70.0%	4.0	4.4	A
	Through						
	Right Turn	8	8	97.5%	5.2	7.0	A
	Subtotal	14	12	85.7%	7.7	3.8	A
Total		1,653	1,635	98.9%	1.9	0.9	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 13 Highland Drive/Luck Lane Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	56	53	95.0%	5.4	1.4	A
	Through	907	908	100.1%	1.5	0.4	A
	Right Turn						
	Subtotal	963	961	99.8%	1.7	0.3	A
SB	Left Turn						
	Through	676	659	97.5%	1.1	0.4	A
	Right Turn	69	65	94.2%	1.2	0.5	A
	Subtotal	745	724	97.2%	1.1	0.3	A
EB	Left Turn	11	12	104.5%	39.8	4.9	D
	Through						
	Right Turn	41	41	99.5%	7.4	0.6	A
	Subtotal	52	52	100.6%	15.4	2.3	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,760	1,738	98.7%	2.0	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	76	77	100.9%	61.4	18.9	E
	Through	386	375	97.1%	67.0	17.8	E
	Right Turn	193	197	101.8%	51.4	17.4	D
	Subtotal	655	648	98.9%	61.3	17.6	E
SB	Left Turn	377	365	96.7%	64.9	22.8	E
	Through	514	506	98.4%	26.8	2.8	C
	Right Turn	201	207	103.0%	7.3	1.4	A
	Subtotal	1,092	1,078	98.7%	35.5	7.8	D
EB	Left Turn	274	265	96.6%	60.9	17.5	E
	Through	656	657	100.2%	42.0	4.1	D
	Right Turn	93	97	104.3%	39.0	6.5	D
	Subtotal	1,023	1,019	99.6%	46.3	4.8	D
WB	Left Turn	274	269	98.3%	49.5	4.6	D
	Through	700	689	98.4%	47.2	5.8	D
	Right Turn	337	334	99.1%	42.1	5.3	D
	Subtotal	1,311	1,292	98.6%	46.4	4.6	D
Total		4,081	4,037	98.9%	45.9	5.1	D

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	133	128	96.0%	18.5	8.4	B
	Through	874	853	97.6%	4.5	1.2	A
	Right Turn						
	Subtotal	1,007	980	97.3%	6.5	2.4	A
SB	Left Turn						
	Through	1,017	1,004	98.7%	2.0	0.2	A
	Right Turn	297	295	99.2%	0.2	0.3	A
	Subtotal	1,314	1,299	98.8%	1.6	0.1	A
EB	Left Turn	343	337	98.3%	52.6	6.0	D
	Through						
	Right Turn	185	188	101.7%	6.9	1.7	A
	Subtotal	528	525	99.5%	37.0	3.6	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,849	2,804	98.4%	10.7	1.5	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	986	971	98.5%	1.1	0.5	A
	Right Turn	231	219	94.7%	0.0	0.0	A
	Subtotal	1,217	1,190	97.8%	0.9	0.4	A
SB	Left Turn	89	88	98.5%	7.2	1.9	A
	Through	1,194	1,175	98.4%	3.9	0.8	A
	Right Turn						
	Subtotal	1,283	1,263	98.4%	4.1	0.8	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	120	124	103.5%	13.8	3.7	B
	Through						
	Right Turn	89	84	94.4%	9.3	1.8	A
	Subtotal	209	208	99.6%	11.9	2.8	B
Total		2,709	2,661	98.2%	3.5	0.6	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	3.8	5.5	A
	Through	950	937	98.6%	0.2	0.1	A
	Right Turn	121	115	95.0%	0.6	0.1	A
	Subtotal	1,075	1,056	98.2%	0.3	0.1	A
SB	Left Turn	59	57	95.8%	2.4	1.0	A
	Through	1,206	1,189	98.6%	0.7	0.2	A
	Right Turn	5	5	96.0%	0.4	0.4	A
	Subtotal	1,270	1,251	98.5%	0.7	0.3	A
EB	Left Turn	3	2	66.7%	4.7	6.6	A
	Through						
	Right Turn	5	5	102.0%	4.0	3.4	A
	Subtotal	8	7	88.8%	8.7	3.7	A
WB	Left Turn	72	70	97.2%	16.2	2.5	C
	Through						
	Right Turn	43	44	102.1%	10.7	3.0	B
	Subtotal	115	114	99.0%	14.2	1.8	B
Total		2,468	2,428	98.4%	1.3	0.2	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	32	98.8%	9.1	4.0	A
	Through	931	920	98.9%	0.5	0.2	A
	Right Turn	33	32	97.3%	0.6	0.2	A
	Subtotal	996	984	98.8%	0.8	0.3	A
SB	Left Turn	17	18	102.9%	4.9	2.2	A
	Through	1,210	1,192	98.5%	1.0	0.4	A
	Right Turn	3	3	113.3%	0.4	0.2	A
	Subtotal	1,230	1,213	98.6%	1.1	0.4	A
EB	Left Turn	4	5	115.0%	4.1	3.7	A
	Through	5	4	70.0%	5.9	10.3	A
	Right Turn	29	29	100.0%	6.4	0.7	A
	Subtotal	38	37	97.6%	6.9	1.7	A
WB	Left Turn	31	29	94.8%	15.7	5.9	C
	Through	4	5	120.0%	23.0	15.6	C
	Right Turn	19	18	93.2%	9.7	4.2	A
	Subtotal	54	52	96.1%	14.9	5.2	B
Total		2,318	2,286	98.6%	1.4	0.2	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	103.3%	39.0	40.7	D
	Through	288	280	97.3%	46.4	2.5	D
	Right Turn	629	621	98.7%	3.5	1.2	A
	Subtotal	923	907	98.3%	16.1	2.3	B
SB	Left Turn	2	2	85.0%	4.7	10.0	A
	Through	354	349	98.7%	42.8	5.9	D
	Right Turn	269	269	100.0%	33.2	8.8	C
	Subtotal	625	620	99.2%	38.5	6.5	D
EB	Left Turn	215	210	97.7%	76.7	12.2	E
	Through	681	683	100.2%	41.7	4.2	D
	Right Turn	9	10	107.8%	37.4	21.1	D
	Subtotal	905	902	99.7%	49.5	5.0	D
WB	Left Turn	681	633	93.0%	133.2	50.3	F
	Through	1,013	979	96.7%	87.0	49.6	F
	Right Turn	33	32	97.0%	47.0	36.7	D
	Subtotal	1,727	1,645	95.2%	103.9	49.4	F
Total		4,180	4,074	97.5%	61.6	18.8	E



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	11	81.5%	0.5	0.2	A
	Through	918	908	98.9%	0.3	0.0	A
	Right Turn	41	38	92.9%	0.6	0.3	A
	Subtotal	972	957	98.4%	0.3	0.0	A
SB	Left Turn	62	63	101.5%	0.8	0.3	A
	Through	942	896	95.1%	0.5	0.1	A
	Right Turn	16	14	86.9%	0.5	0.5	A
	Subtotal	1,020	973	95.4%	0.5	0.1	A
EB	Left Turn	15	15	100.0%	12.6	7.7	B
	Through	2	2	100.0%	7.5	11.0	A
	Right Turn	33	31	93.3%	7.5	0.8	A
	Subtotal	50	48	95.6%	10.8	1.8	B
WB	Left Turn	32	32	100.6%	22.1	8.8	C
	Through	4	4	107.5%	13.1	16.4	B
	Right Turn	36	35	96.1%	10.7	3.3	B
	Subtotal	72	71	98.8%	16.5	3.7	C
Total		2,114	2,048	96.9%	1.0	0.2	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	75	74	98.7%	6.0	3.2	A
	Through	924	905	98.0%	0.4	0.3	A
	Right Turn						
	Subtotal	999	979	98.0%	0.8	0.5	A
SB	Left Turn						
	Through	938	891	95.0%	0.4	0.1	A
	Right Turn	69	68	99.0%	0.9	0.3	A
	Subtotal	1,007	959	95.3%	0.5	0.1	A
EB	Left Turn	48	52	107.9%	16.9	3.7	C
	Through						
	Right Turn	68	65	95.3%	11.2	1.5	B
	Subtotal	116	117	100.5%	13.8	2.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,122	2,055	96.8%	1.4	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	91	93	101.6%	20.2	6.9	C
	Through	862	846	98.1%	9.5	3.0	A
	Right Turn	55	56	102.2%	3.7	1.4	A
	Subtotal	1,008	995	98.7%	10.2	3.2	B
SB	Left Turn	12	13	111.7%	17.2	5.4	B
	Through	912	869	95.2%	9.1	0.7	A
	Right Turn	91	81	89.3%	7.9	1.7	A
	Subtotal	1,015	963	94.9%	9.1	0.7	A
EB	Left Turn	135	134	99.6%	21.7	2.0	C
	Through	26	30	113.5%	22.8	6.2	C
	Right Turn	113	108	95.1%	16.3	3.0	B
	Subtotal	274	271	99.1%	19.6	2.4	B
WB	Left Turn	41	41	99.8%	21.2	4.9	C
	Through	15	15	98.7%	16.9	11.1	B
	Right Turn	17	17	99.4%	10.5	8.2	B
	Subtotal	73	73	99.5%	17.5	6.1	B
Total		2,370	2,302	97.1%	11.3	1.5	B

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	8	128.3%	5.1	4.7	A
	Through	998	987	98.9%	0.6	0.2	A
	Right Turn	4	4	87.5%	0.6	0.8	A
	Subtotal	1,008	998	99.0%	0.7	0.2	A
SB	Left Turn	18	16	90.6%	7.8	3.6	A
	Through	994	945	95.1%	1.7	1.4	A
	Right Turn	44	41	93.6%	0.7	0.9	A
	Subtotal	1,056	1,003	94.9%	1.7	1.3	A
EB	Left Turn	6	5	80.0%	13.3	7.1	B
	Through	1	1	90.0%	5.4	11.4	A
	Right Turn	73	72	98.1%	10.8	2.2	B
	Subtotal	80	77	96.6%	11.0	2.4	B
WB	Left Turn	4	5	112.5%	15.4	8.0	C
	Through	1	1	120.0%	3.3	7.0	A
	Right Turn	19	19	97.9%	8.9	2.6	A
	Subtotal	24	24	101.3%	11.3	2.3	B
Total		2,168	2,102	97.0%	1.9	0.7	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	293	291	99.2%	78.0	21.5	E
	Through	607	597	98.4%	50.7	28.0	D
	Right Turn	161	162	100.5%	28.0	5.3	C
	Subtotal	1,061	1,050	98.9%	54.7	22.5	D
SB	Left Turn	205	197	96.1%	61.0	10.1	E
	Through	666	629	94.4%	65.0	11.8	E
	Right Turn	233	222	95.3%	64.7	15.8	E
	Subtotal	1,104	1,048	94.9%	64.2	11.4	E
EB	Left Turn	239	241	100.7%	48.2	7.8	D
	Through	769	754	98.1%	31.2	5.3	C
	Right Turn	301	300	99.6%	7.9	2.0	A
	Subtotal	1,309	1,295	98.9%	28.9	3.4	C
WB	Left Turn	192	201	104.5%	47.3	18.6	D
	Through	725	716	98.7%	37.0	5.1	D
	Right Turn	197	197	99.8%	34.3	7.3	C
	Subtotal	1,114	1,113	99.9%	38.4	6.8	D
Total		4,588	4,506	98.2%	46.7	7.2	D

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	30	93.4%	17.2	23.2	C
	Through	949	947	99.7%	18.1	43.5	C
	Right Turn	18	17	92.8%	9.7	27.7	A
	Subtotal	999	993	99.4%	17.9	42.4	C
SB	Left Turn	19	21	111.1%	4.0	3.4	A
	Through	1,011	982	97.1%	0.5	0.2	A
	Right Turn	133	129	96.9%	0.5	0.2	A
	Subtotal	1,163	1,132	97.3%	0.6	0.2	A
EB	Left Turn	107	103	95.9%	63.3	70.3	F
	Through						
	Right Turn	30	27	90.3%	48.5	54.3	E
	Subtotal	137	130	94.7%	60.1	67.6	F
WB	Left Turn	4	3	82.5%	2.1	4.9	A
	Through						
	Right Turn	14	13	90.7%	5.3	4.2	A
	Subtotal	18	16	88.9%	7.4	4.0	A
Total		2,317	2,270	98.0%	12.2	22.0	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Existing + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 13 Highland Drive/Luck Lane Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	52	54	103.3%	12.2	10.2	B
	Through	1,000	994	99.4%	9.4	23.0	A
	Right Turn						
	Subtotal	1,052	1,048	99.6%	9.6	22.3	A
SB	Left Turn						
	Through	1,109	1,074	96.8%	3.0	1.5	A
	Right Turn	52	48	93.1%	1.6	0.5	A
	Subtotal	1,161	1,122	96.7%	3.0	1.5	A
EB	Left Turn	58	60	102.9%	37.3	12.4	D
	Through						
	Right Turn	111	110	98.7%	7.9	1.3	A
	Subtotal	169	169	100.2%	18.5	5.5	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,340	98.2%	7.2	11.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	90	93	102.9%	54.7	20.5	D
	Through	443	433	97.7%	57.1	15.4	E
	Right Turn	225	233	103.5%	46.7	15.2	D
	Subtotal	758	759	100.1%	53.6	15.8	D
SB	Left Turn	193	189	97.9%	74.4	22.0	E
	Through	251	245	97.6%	28.7	5.2	C
	Right Turn	143	142	99.4%	5.5	1.7	A
	Subtotal	587	576	98.2%	38.4	7.3	D
EB	Left Turn	154	145	94.4%	30.5	6.4	C
	Through	509	514	101.0%	20.9	4.2	C
	Right Turn	39	42	106.4%	20.2	6.2	C
	Subtotal	702	701	99.9%	22.8	3.8	C
WB	Left Turn	160	154	96.1%	23.9	5.8	C
	Through	624	628	100.7%	16.7	3.1	B
	Right Turn	145	145	99.7%	14.5	4.0	B
	Subtotal	929	927	99.7%	17.6	2.9	B
Total		2,976	2,962	99.5%	32.9	4.8	C

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	57	56	98.4%	7.6	2.8	A
	Through	636	616	96.8%	2.1	0.6	A
	Right Turn						
	Subtotal	693	672	96.9%	2.6	0.6	A
SB	Left Turn						
	Through	558	555	99.4%	2.5	0.4	A
	Right Turn	173	171	98.8%	0.6	0.4	A
	Subtotal	731	725	99.2%	2.0	0.3	A
EB	Left Turn	108	107	98.7%	24.3	3.5	C
	Through						
	Right Turn	42	41	98.1%	5.4	1.9	A
	Subtotal	150	148	98.5%	19.0	3.2	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,574	1,545	98.2%	4.2	0.5	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	633	622	98.3%	0.4	0.2	A
	Right Turn	111	100	90.1%	0.0	0.0	A
	Subtotal	744	722	97.0%	0.4	0.1	A
SB	Left Turn	70	73	104.3%	6.8	4.3	A
	Through	635	628	98.9%	3.5	0.8	A
	Right Turn						
	Subtotal	705	701	99.4%	3.9	0.9	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	96	98	102.2%	13.6	4.0	B
	Through						
	Right Turn	58	56	97.1%	10.4	1.7	B
	Subtotal	154	154	100.3%	12.4	3.0	B
Total		1,603	1,577	98.4%	3.9	0.8	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	102.0%	0.9	1.1	A
	Through	651	641	98.4%	0.1	0.0	A
	Right Turn	35	32	91.4%	0.5	0.2	A
	Subtotal	691	678	98.1%	0.1	0.1	A
SB	Left Turn	20	17	86.0%	0.9	0.6	A
	Through	614	614	99.9%	0.4	0.1	A
	Right Turn	4	4	110.0%	0.3	0.2	A
	Subtotal	638	635	99.6%	0.4	0.1	A
EB	Left Turn	2	1	65.0%	3.6	5.0	A
	Through						
	Right Turn	8	7	83.8%	7.2	0.7	A
	Subtotal	10	8	80.0%	7.5	0.8	A
WB	Left Turn	89	85	95.5%	15.0	1.8	C
	Through						
	Right Turn	54	56	103.1%	11.9	1.9	B
	Subtotal	143	141	98.4%	13.8	1.7	B
Total		1,482	1,462	98.6%	2.6	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	14	103.8%	2.4	2.1	A
	Through	677	668	98.6%	0.2	0.0	A
	Right Turn	17	16	95.3%	0.5	0.1	A
	Subtotal	707	698	98.7%	0.2	0.1	A
SB	Left Turn	11	12	112.7%	4.6	2.2	A
	Through	601	600	99.9%	0.5	0.1	A
	Right Turn	4	4	97.5%	0.3	0.3	A
	Subtotal	616	617	100.1%	0.5	0.1	A
EB	Left Turn	14	13	95.0%	7.0	0.9	A
	Through	5	5	106.0%	4.6	7.6	A
	Right Turn	24	24	97.9%	5.9	0.5	A
	Subtotal	43	42	97.9%	6.8	0.8	A
WB	Left Turn	13	12	90.8%	10.9	6.3	B
	Through						
	Right Turn	11	10	90.9%	7.1	2.2	A
	Subtotal	24	22	90.8%	8.4	1.9	A
Total		1,390	1,378	99.1%	0.6	0.1	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	269	268	99.5%	54.6	4.4	D
	Right Turn	656	647	98.6%	3.8	1.5	A
	Subtotal	925	915	98.9%	19.4	2.9	B
SB	Left Turn	2	2	85.0%	20.2	39.1	C
	Through	112	108	96.3%	46.9	6.6	D
	Right Turn	68	70	103.1%	24.3	4.1	C
	Subtotal	182	180	98.7%	37.6	4.4	D
EB	Left Turn	122	120	98.0%	63.1	6.7	E
	Through	588	573	97.5%	16.7	1.6	B
	Right Turn	7	7	101.4%	10.2	7.6	B
	Subtotal	717	700	97.6%	25.0	2.5	C
WB	Left Turn	398	394	98.9%	59.7	16.4	E
	Through	580	581	100.1%	12.4	3.4	B
	Right Turn	15	15	98.7%	2.9	1.8	A
	Subtotal	993	989	99.6%	31.7	9.4	C
Total		2,817	2,783	98.8%	26.8	4.3	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 7 Highland Drive/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	11	122.2%	0.5	0.2	A
	Through	819	809	98.8%	0.3	0.1	A
	Right Turn	24	24	97.9%	0.6	0.4	A
	Subtotal	852	844	99.0%	0.3	0.1	A
SB	Left Turn	14	16	112.9%	1.2	0.9	A
	Through	570	557	97.7%	0.6	0.0	A
	Right Turn	5	5	106.0%	0.4	0.7	A
	Subtotal	589	578	98.1%	0.7	0.1	A
EB	Left Turn	9	9	100.0%	14.3	4.7	B
	Through	5	5	100.0%	10.2	5.9	B
	Right Turn	15	13	86.7%	7.5	1.5	A
	Subtotal	29	27	93.1%	10.8	1.5	B
WB	Left Turn	21	20	94.8%	15.1	7.6	C
	Through	2	1	65.0%	3.2	6.7	A
	Right Turn	63	62	97.9%	9.0	2.7	A
	Subtotal	86	83	96.4%	10.8	3.7	B
Total		1,556	1,532	98.4%	1.2	0.1	A

Intersection 8 Highland Drive/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	32	94.7%	2.8	3.4	A
	Through	799	790	98.8%	0.2	0.1	A
	Right Turn						
	Subtotal	833	822	98.7%	0.3	0.1	A
SB	Left Turn						
	Through	582	567	97.4%	0.3	0.1	A
	Right Turn	24	24	100.0%	0.7	0.2	A
	Subtotal	606	591	97.5%	0.4	0.1	A
EB	Left Turn	53	56	105.3%	15.1	4.7	C
	Through						
	Right Turn	85	80	94.5%	13.9	4.3	B
	Subtotal	138	136	98.6%	14.3	4.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,577	1,549	98.2%	2.2	0.6	A



**Intersection 9 Highland Drive/Miller Avenue Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	64	66	103.4%	12.7	3.0	B
	Through	714	702	98.3%	5.4	1.4	A
	Right Turn	25	25	100.4%	1.2	1.1	A
	Subtotal	803	793	98.7%	5.8	1.4	A
SB	Left Turn	13	13	100.8%	15.3	8.7	B
	Through	605	583	96.4%	8.0	1.4	A
	Right Turn	48	48	100.8%	7.6	2.2	A
	Subtotal	666	645	96.8%	8.1	1.4	A
EB	Left Turn	90	93	102.9%	20.7	2.5	C
	Through	15	14	95.3%	20.1	6.2	C
	Right Turn	86	83	97.0%	12.4	1.7	B
	Subtotal	191	190	99.6%	17.0	1.8	B
WB	Left Turn	30	29	95.3%	18.3	6.8	B
	Through	8	8	105.0%	19.1	14.7	B
	Right Turn	28	28	98.9%	9.4	3.6	A
	Subtotal	66	65	98.0%	14.5	5.7	B
Total		1,726	1,692	98.1%	8.6	0.9	A

**Intersection 10 Highland Drive/Woodland Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	12	132.2%	4.4	3.7	A
	Through	806	796	98.8%	0.9	0.5	A
	Right Turn	6	7	116.7%	0.4	0.3	A
	Subtotal	821	815	99.3%	0.9	0.6	A
SB	Left Turn	15	16	103.3%	4.4	3.6	A
	Through	672	649	96.5%	0.3	0.1	A
	Right Turn	26	24	90.4%	0.4	0.2	A
	Subtotal	713	688	96.5%	0.4	0.2	A
EB	Left Turn	4	4	90.0%	7.6	10.3	A
	Through	3	4	116.7%	13.1	17.2	B
	Right Turn	45	44	97.8%	8.0	1.0	A
	Subtotal	52	51	98.3%	9.0	2.0	A
WB	Left Turn	3	4	116.7%	4.7	8.2	A
	Through						
	Right Turn	13	11	81.5%	8.5	3.9	A
	Subtotal	16	14	88.1%	10.7	4.1	B
Total		1,602	1,568	97.9%	1.0	0.3	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	164	167	102.0%	47.3	17.0	D
	Through	534	526	98.4%	35.5	4.0	D
	Right Turn	126	129	102.7%	29.4	4.5	C
	Subtotal	824	822	99.8%	37.0	4.5	D
SB	Left Turn	128	126	98.8%	63.6	12.8	E
	Through	434	410	94.4%	40.1	4.5	D
	Right Turn	158	157	99.4%	37.3	3.4	D
	Subtotal	720	693	96.3%	43.7	3.8	D
EB	Left Turn	157	163	103.7%	23.7	7.1	C
	Through	539	536	99.5%	15.9	1.8	B
	Right Turn	242	243	100.2%	4.9	1.0	A
	Subtotal	938	942	100.4%	14.3	1.7	B
WB	Left Turn	138	143	103.4%	24.3	5.4	C
	Through	564	557	98.7%	22.3	3.3	C
	Right Turn	134	134	99.9%	18.1	6.0	B
	Subtotal	836	833	99.7%	22.0	3.1	C
Total		3,318	3,290	99.2%	29.6	1.9	C

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	17	17	100.0%	4.0	2.1	A
	Through	823	825	100.2%	2.1	1.3	A
	Right Turn	4	4	102.5%	1.1	0.7	A
	Subtotal	844	846	100.2%	2.1	1.3	A
SB	Left Turn	5	5	106.0%	3.6	6.4	A
	Through	736	718	97.6%	0.2	0.1	A
	Right Turn	69	68	99.1%	0.4	0.2	A
	Subtotal	810	792	97.8%	0.3	0.1	A
EB	Left Turn	42	41	96.4%	16.0	4.0	C
	Through						
	Right Turn	12	12	96.7%	8.2	4.0	A
	Subtotal	54	52	96.5%	14.4	3.1	B
WB	Left Turn	7	6	84.3%	5.0	6.7	A
	Through						
	Right Turn	9	9	101.1%	8.1	6.1	A
	Subtotal	16	15	93.8%	11.2	4.7	B
Total		1,724	1,705	98.9%	1.8	0.7	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
AM Peak Hour

Intersection 13 Highland Drive/Luck Lane Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	59	57	97.3%	5.3	1.5	A
	Through	949	950	100.1%	1.8	0.3	A
	Right Turn						
	Subtotal	1,008	1,007	99.9%	2.0	0.3	A
SB	Left Turn						
	Through	705	688	97.6%	1.6	0.7	A
	Right Turn	73	69	94.2%	1.2	0.4	A
	Subtotal	778	757	97.3%	1.6	0.7	A
EB	Left Turn	12	12	100.8%	40.6	4.9	D
	Through						
	Right Turn	44	42	95.9%	7.2	0.8	A
	Subtotal	56	54	97.0%	16.0	2.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,842	1,818	98.7%	2.3	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 1                      1300 East/3300 South                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	80	80	100.0%	100.5	25.6	F
	Through	402	387	96.2%	105.7	24.2	F
	Right Turn	198	200	101.0%	89.3	24.7	F
	Subtotal	680	667	98.0%	100.4	24.3	F
SB	Left Turn	388	375	96.8%	76.1	37.0	E
	Through	537	533	99.3%	28.7	2.9	C
	Right Turn	208	216	103.8%	8.1	2.9	A
	Subtotal	1,133	1,124	99.2%	40.9	14.6	D
EB	Left Turn	282	270	95.7%	66.3	21.5	E
	Through	685	686	100.1%	37.2	3.8	D
	Right Turn	97	101	104.0%	31.7	5.4	C
	Subtotal	1,064	1,057	99.3%	44.9	6.7	D
WB	Left Turn	281	276	98.2%	55.2	12.6	E
	Through	729	719	98.7%	56.5	7.9	E
	Right Turn	344	340	98.8%	48.9	8.7	D
	Subtotal	1,354	1,335	98.6%	54.4	6.9	D
Total		4,231	4,183	98.9%	56.4	5.5	E

Intersection 2                      1300 East/Brickyard Road                      Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	139	133	95.6%	25.3	9.4	C
	Through	901	874	97.0%	4.4	1.3	A
	Right Turn						
	Subtotal	1,040	1,007	96.8%	7.3	2.7	A
SB	Left Turn						
	Through	1,055	1,053	99.8%	2.0	0.2	A
	Right Turn	311	309	99.5%	0.2	0.3	A
	Subtotal	1,366	1,362	99.7%	1.6	0.1	A
EB	Left Turn	359	354	98.7%	52.1	4.4	D
	Through						
	Right Turn	193	196	101.5%	6.8	1.5	A
	Subtotal	552	550	99.7%	36.8	3.1	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,958	2,919	98.7%	11.0	1.5	B

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 3 Richmond Street/Miller Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,026	1,007	98.2%	1.0	0.5	A
	Right Turn	234	221	94.4%	0.0	0.0	A
	Subtotal	1,260	1,228	97.5%	0.9	0.4	A
SB	Left Turn	91	90	98.8%	6.9	2.6	A
	Through	1,245	1,236	99.3%	3.5	1.0	A
	Right Turn						
	Subtotal	1,336	1,326	99.2%	3.7	1.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	121	126	103.8%	14.5	4.3	B
	Through						
	Right Turn	91	87	95.3%	10.9	4.5	B
	Subtotal	212	212	100.1%	13.1	4.1	B
Total		2,808	2,766	98.5%	3.4	0.9	A

Intersection 4 Richmond Street/Gunn Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	4	86.0%	2.8	8.2	A
	Through	990	974	98.4%	0.3	0.1	A
	Right Turn	122	116	94.9%	0.7	0.2	A
	Subtotal	1,117	1,094	97.9%	0.3	0.1	A
SB	Left Turn	60	59	99.0%	2.8	0.8	A
	Through	1,257	1,250	99.4%	0.9	0.2	A
	Right Turn	6	6	93.3%	1.0	0.6	A
	Subtotal	1,323	1,315	99.4%	1.0	0.2	A
EB	Left Turn	4	3	67.5%	5.1	8.1	A
	Through						
	Right Turn	6	5	90.0%	4.1	3.6	A
	Subtotal	10	8	81.0%	9.2	5.6	A
WB	Left Turn	73	71	97.0%	19.4	6.7	C
	Through						
	Right Turn	44	45	102.5%	11.9	7.1	B
	Subtotal	117	116	99.1%	16.6	7.2	C
Total		2,567	2,533	98.7%	1.5	0.4	A

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	32	94.4%	9.5	6.7	A
	Through	969	956	98.7%	0.5	0.4	A
	Right Turn	35	34	98.0%	0.8	0.7	A
	Subtotal	1,038	1,023	98.5%	0.8	0.5	A
SB	Left Turn	18	19	105.6%	7.0	2.7	A
	Through	1,260	1,253	99.5%	1.3	0.2	A
	Right Turn	4	4	90.0%	1.4	2.3	A
	Subtotal	1,282	1,276	99.5%	1.4	0.3	A
EB	Left Turn	5	6	114.0%	7.2	4.9	A
	Through	6	4	71.7%	6.7	2.5	A
	Right Turn	30	30	100.7%	6.5	0.7	A
	Subtotal	41	40	98.0%	7.1	1.0	A
WB	Left Turn	33	32	95.8%	18.9	6.2	C
	Through	5	6	116.0%	26.4	21.8	D
	Right Turn	20	19	93.5%	12.5	11.8	B
	Subtotal	58	56	96.7%	18.0	5.8	C
Total		2,419	2,395	99.0%	1.6	0.4	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	8	107.1%	56.8	36.4	E
	Through	300	293	97.7%	41.8	5.2	D
	Right Turn	653	641	98.2%	3.6	1.3	A
	Subtotal	960	942	98.1%	15.3	2.8	B
SB	Left Turn	3	3	83.3%	16.1	19.0	B
	Through	369	364	98.7%	43.2	4.3	D
	Right Turn	279	279	100.1%	34.5	3.6	C
	Subtotal	651	646	99.2%	39.4	3.8	D
EB	Left Turn	224	217	96.7%	112.2	26.0	F
	Through	709	704	99.3%	77.7	27.3	E
	Right Turn	10	10	100.0%	61.1	44.1	E
	Subtotal	943	931	98.7%	85.2	26.9	F
WB	Left Turn	707	674	95.4%	98.8	51.3	F
	Through	1,056	1,038	98.3%	62.7	50.6	E
	Right Turn	35	35	98.6%	30.0	34.4	C
	Subtotal	1,798	1,747	97.2%	75.9	50.5	E
Total		4,352	4,265	98.0%	58.0	22.0	E

**Intersection 7 Highland Drive/Elgin Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	14	13	95.0%	0.6	0.4	A
	Through	953	939	98.5%	0.3	0.1	A
	Right Turn	42	38	89.8%	0.7	0.3	A
	Subtotal	1,009	990	98.1%	0.3	0.1	A
SB	Left Turn	66	69	104.7%	0.8	0.2	A
	Through	978	942	96.3%	0.5	0.1	A
	Right Turn	17	15	88.8%	0.7	0.6	A
	Subtotal	1,061	1,026	96.7%	0.5	0.1	A
EB	Left Turn	16	17	103.1%	20.6	13.6	C
	Through	3	3	110.0%	7.6	8.7	A
	Right Turn	35	33	94.9%	8.1	2.3	A
	Subtotal	54	53	98.1%	12.6	3.5	B
WB	Left Turn	33	33	99.7%	17.6	5.9	C
	Through	5	5	104.0%	9.1	12.0	A
	Right Turn	38	36	95.5%	10.9	3.1	B
	Subtotal	76	74	97.9%	14.2	3.5	B
Total		2,200	2,143	97.4%	1.0	0.1	A

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	76	73	96.3%	8.8	4.4	A
	Through	960	937	97.6%	0.4	0.2	A
	Right Turn						
	Subtotal	1,036	1,011	97.5%	1.0	0.6	A
SB	Left Turn						
	Through	976	938	96.1%	0.5	0.0	A
	Right Turn	70	70	99.4%	0.9	0.1	A
	Subtotal	1,046	1,008	96.3%	0.5	0.0	A
EB	Left Turn	49	52	106.1%	18.6	5.6	C
	Through						
	Right Turn	69	64	93.2%	12.3	4.6	B
	Subtotal	118	116	98.6%	14.8	4.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,200	2,135	97.0%	1.5	0.3	A

**Intersection 9 Highland Drive/Miller Avenue Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	92	93	101.2%	28.5	10.6	C
	Through	897	872	97.2%	10.3	2.5	B
	Right Turn	58	59	101.6%	4.0	1.7	A
	Subtotal	1,047	1,024	97.8%	11.7	3.0	B
SB	Left Turn	13	14	110.0%	11.1	6.6	B
	Through	948	909	95.9%	9.3	0.6	A
	Right Turn	93	86	92.2%	6.4	1.3	A
	Subtotal	1,054	1,009	95.7%	9.1	0.6	A
EB	Left Turn	137	137	99.9%	20.5	2.3	C
	Through	27	31	113.3%	20.3	6.2	C
	Right Turn	115	109	94.9%	15.9	2.2	B
	Subtotal	279	277	99.1%	18.7	1.7	B
WB	Left Turn	43	42	97.2%	18.3	3.1	B
	Through	16	16	97.5%	15.1	6.5	B
	Right Turn	18	18	100.0%	10.2	4.6	B
	Subtotal	77	75	97.9%	15.4	1.5	B
Total		2,457	2,385	97.1%	11.7	1.3	B

**Intersection 10 Highland Drive/Woodland Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	10	138.6%	8.5	8.5	A
	Through	1,035	1,015	98.1%	0.6	0.2	A
	Right Turn	5	5	102.0%	1.0	1.6	A
	Subtotal	1,047	1,030	98.3%	0.6	0.2	A
SB	Left Turn	19	18	92.1%	9.3	5.9	A
	Through	1,031	986	95.6%	1.4	1.0	A
	Right Turn	45	42	94.0%	0.5	0.5	A
	Subtotal	1,095	1,045	95.5%	1.5	1.0	A
EB	Left Turn	7	5	77.1%	15.7	8.5	C
	Through	2	2	115.0%	18.6	15.2	C
	Right Turn	74	72	96.6%	11.0	1.0	B
	Subtotal	83	79	95.4%	11.5	1.0	B
WB	Left Turn	5	5	102.0%	8.7	6.4	A
	Through	2	2	90.0%	8.0	12.2	A
	Right Turn	20	18	92.0%	10.1	2.2	B
	Subtotal	27	25	93.7%	11.0	2.4	B
Total		2,252	2,180	96.8%	1.8	0.6	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	300	298	99.2%	77.2	36.3	E
	Through	633	621	98.1%	65.4	58.3	E
	Right Turn	169	170	100.7%	23.7	6.8	C
	Subtotal	1,102	1,089	98.8%	62.8	42.3	E
SB	Left Turn	213	205	96.4%	46.4	6.7	D
	Through	694	658	94.8%	48.9	7.9	D
	Right Turn	238	231	97.1%	46.1	7.9	D
	Subtotal	1,145	1,094	95.6%	48.0	6.6	D
EB	Left Turn	245	245	99.8%	77.7	28.1	E
	Through	803	789	98.3%	40.6	9.3	D
	Right Turn	310	308	99.4%	9.2	2.9	A
	Subtotal	1,358	1,342	98.8%	40.8	10.6	D
WB	Left Turn	200	208	104.2%	131.2	61.9	F
	Through	756	747	98.8%	74.2	26.0	E
	Right Turn	205	203	99.2%	73.3	28.0	E
	Subtotal	1,161	1,158	99.8%	85.0	30.8	F
Total		4,766	4,683	98.3%	58.4	12.3	E

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	31	95.6%	19.6	20.8	C
	Through	988	985	99.7%	34.9	59.0	D
	Right Turn	19	18	93.7%	24.7	46.9	C
	Subtotal	1,039	1,033	99.4%	34.1	57.3	D
SB	Left Turn	20	20	101.0%	6.6	4.4	A
	Through	1,055	1,027	97.4%	0.4	0.1	A
	Right Turn	133	130	98.0%	0.5	0.2	A
	Subtotal	1,208	1,178	97.5%	0.5	0.1	A
EB	Left Turn	108	98	91.0%	108.5	117.0	F
	Through						
	Right Turn	31	27	87.1%	83.5	91.1	F
	Subtotal	139	125	90.1%	101.7	110.2	F
WB	Left Turn	5	5	98.0%	7.2	11.8	A
	Through						
	Right Turn	15	15	100.7%	8.2	3.4	A
	Subtotal	20	20	100.0%	10.1	5.2	B
Total		2,406	2,356	97.9%	19.8	28.8	C

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Greatest Impact Scenario  
PM Peak Hour

Intersection 13		Highland Drive/Luck Lane			Signal		
Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	55	56	102.5%	18.1	14.2	B
	Through	1,040	1,035	99.5%	18.7	34.6	B
	Right Turn						
	Subtotal	1,095	1,091	99.6%	18.6	33.4	B
SB	Left Turn						
	Through	1,158	1,124	97.1%	4.0	2.2	A
	Right Turn	55	52	95.3%	1.6	0.4	A
	Subtotal	1,213	1,177	97.0%	3.9	2.1	A
EB	Left Turn	61	61	100.0%	38.3	10.8	D
	Through						
	Right Turn	117	116	99.1%	8.4	1.3	A
	Subtotal	178	177	99.4%	19.3	5.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,486	2,444	98.3%	11.6	16.0	B

**Intersection 1 1300 East/3300 South Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	88	102.2%	46.9	14.3	D
	Through	424	416	98.1%	49.7	10.7	D
	Right Turn	218	225	103.4%	37.7	12.4	D
	Subtotal	728	729	100.2%	45.7	11.4	D
SB	Left Turn	189	185	97.6%	70.2	22.5	E
	Through	241	238	98.7%	29.8	3.8	C
	Right Turn	138	138	100.1%	5.0	1.1	A
	Subtotal	568	561	98.7%	37.8	9.0	D
EB	Left Turn	149	140	93.8%	28.1	4.1	C
	Through	488	495	101.5%	21.8	4.4	C
	Right Turn	37	40	107.6%	15.4	6.2	B
	Subtotal	674	675	100.1%	22.7	3.2	C
WB	Left Turn	155	151	97.4%	22.8	4.7	C
	Through	598	602	100.7%	14.7	2.1	B
	Right Turn	143	142	99.1%	11.2	2.5	B
	Subtotal	896	895	99.9%	15.7	2.0	B
Total		2,866	2,859	99.8%	30.0	4.7	C

**Intersection 2 1300 East/Brickyard Road Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	55	55	99.3%	6.2	2.8	A
	Through	614	597	97.2%	2.0	0.4	A
	Right Turn						
	Subtotal	669	652	97.4%	2.4	0.5	A
SB	Left Turn						
	Through	540	538	99.6%	2.3	0.4	A
	Right Turn	166	164	98.6%	0.6	0.4	A
	Subtotal	706	702	99.4%	1.9	0.3	A
EB	Left Turn	103	102	99.2%	22.4	4.2	C
	Through						
	Right Turn	40	39	98.5%	4.3	0.7	A
	Subtotal	143	142	99.0%	17.3	3.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,518	1,495	98.5%	3.7	0.6	A

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement AM Peak Hour

## Intersection 3

## Richmond Street/Miller Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	607	599	98.7%	0.4	0.2	A
	Right Turn	110	100	91.1%	0.0	0.0	A
	Subtotal	717	699	97.5%	0.4	0.1	A
SB	Left Turn	68	70	102.4%	4.9	1.8	A
	Through	611	606	99.1%	3.3	0.6	A
	Right Turn						
	Subtotal	679	675	99.5%	3.5	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	95	96	101.1%	13.7	4.2	B
	Through						
	Right Turn	57	54	95.3%	9.8	1.5	A
	Subtotal	152	150	98.9%	12.2	3.1	B
Total		1,548	1,525	98.5%	3.8	0.7	A

## Intersection 4

## Richmond Street/Gunn Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	0.9	1.2	A
	Through	626	616	98.4%	0.1	0.0	A
	Right Turn	34	32	93.8%	0.4	0.1	A
	Subtotal	664	652	98.1%	0.1	0.0	A
SB	Left Turn	19	17	87.4%	0.9	0.8	A
	Through	589	589	100.0%	0.3	0.1	A
	Right Turn	3	4	116.7%	0.4	0.3	A
	Subtotal	611	609	99.7%	0.3	0.1	A
EB	Left Turn	1	0	30.0%	0.9	2.7	A
	Through						
	Right Turn	7	7	95.7%	7.1	0.7	A
	Subtotal	8	7	87.5%	7.2	0.7	A
WB	Left Turn	88	85	96.3%	15.2	2.3	C
	Through						
	Right Turn	53	55	103.8%	12.4	2.0	B
	Subtotal	141	140	99.1%	14.1	2.0	B
Total		1,424	1,407	98.8%	2.7	0.4	A

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement AM Peak Hour

## Intersection 5

## Richmond Street/Elgin Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	12	13	105.0%	1.4	1.4	A
	Through	652	644	98.8%	0.1	0.0	A
	Right Turn	16	15	90.6%	0.5	0.2	A
	Subtotal	680	671	98.7%	0.2	0.0	A
SB	Left Turn	10	11	114.0%	3.3	3.4	A
	Through	576	577	100.2%	0.5	0.2	A
	Right Turn	3	2	76.7%	0.2	0.3	A
	Subtotal	589	591	100.3%	0.5	0.3	A
EB	Left Turn	13	12	93.1%	7.0	1.0	A
	Through	4	4	97.5%	2.4	4.0	A
	Right Turn	23	22	96.1%	5.9	0.4	A
	Subtotal	40	38	95.3%	6.6	0.5	A
WB	Left Turn	12	10	84.2%	11.1	5.1	B
	Through						
	Right Turn	10	10	97.0%	7.0	1.1	A
	Subtotal	22	20	90.0%	8.6	2.0	A
Total		1,331	1,320	99.2%	0.6	0.1	A

## Intersection 6

## Highland Drive/Richmond Street

## Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	258	256	99.2%	47.6	3.8	D
	Right Turn	631	619	98.1%	2.5	0.6	A
	Subtotal	889	875	98.4%	16.7	1.6	B
SB	Left Turn	1	1	70.0%	6.3	20.0	A
	Through	108	104	96.5%	46.4	5.0	D
	Right Turn	66	69	104.2%	24.0	5.1	C
	Subtotal	175	174	99.3%	37.0	4.9	D
EB	Left Turn	118	115	97.5%	61.0	7.0	E
	Through	565	548	97.1%	13.8	1.2	B
	Right Turn	6	7	111.7%	8.0	9.7	A
	Subtotal	689	670	97.3%	22.4	2.0	C
WB	Left Turn	382	378	98.8%	61.8	18.4	E
	Through	555	556	100.2%	11.2	1.6	B
	Right Turn	14	14	99.3%	2.8	0.8	A
	Subtotal	951	948	99.7%	31.3	7.6	C
Total		2,704	2,667	98.6%	25.0	3.2	C

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement AM Peak Hour

## Intersection 7

## Highland Drive/Elgin Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	9	111.3%	0.7	1.3	A
	Through	788	777	98.6%	1.2	0.3	A
	Right Turn	23	22	96.5%	1.4	0.9	A
	Subtotal	819	808	98.6%	1.2	0.3	A
SB	Left Turn	13	15	114.6%	0.5	0.3	A
	Through	548	534	97.4%	1.7	0.3	A
	Right Turn	4	3	82.5%	0.8	1.2	A
	Subtotal	565	552	97.7%	1.7	0.3	A
EB	Left Turn	8	8	98.8%	16.0	7.1	C
	Through	4	4	92.5%	13.8	14.0	B
	Right Turn	14	12	88.6%	6.9	1.3	A
	Subtotal	26	24	92.3%	12.0	2.9	B
WB	Left Turn	20	19	96.5%	21.5	9.3	C
	Through	1	0	30.0%	0.0	0.0	A
	Right Turn	60	59	97.7%	11.6	2.0	B
	Subtotal	81	78	96.5%	13.5	2.3	B
Total		1,491	1,462	98.0%	2.2	0.2	A

## Intersection 8

## Highland Drive/Gunn Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	33	31	94.8%	5.2	4.2	A
	Through	767	754	98.3%	0.6	0.1	A
	Right Turn						
	Subtotal	800	785	98.2%	0.7	0.2	A
SB	Left Turn						
	Through	559	543	97.2%	1.7	0.7	A
	Right Turn	23	23	98.7%	1.2	0.7	A
	Subtotal	582	566	97.2%	1.7	0.7	A
EB	Left Turn	52	55	105.2%	28.4	13.3	D
	Through						
	Right Turn	84	80	94.8%	23.6	10.5	C
	Subtotal	136	134	98.8%	25.6	11.5	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,518	1,485	97.9%	4.3	1.6	A

**Intersection 9 Highland Drive/Miller Avenue Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	66	105.4%	17.9	3.6	B
	Through	684	667	97.5%	6.9	1.2	A
	Right Turn	24	24	100.4%	6.5	5.0	A
	Subtotal	771	758	98.3%	7.8	1.2	A
SB	Left Turn	12	13	105.8%	17.0	6.5	B
	Through	582	561	96.4%	7.3	1.4	A
	Right Turn	47	48	101.7%	6.1	2.3	A
	Subtotal	641	621	96.9%	7.4	1.4	A
EB	Left Turn	89	92	102.9%	20.2	2.5	C
	Through	14	14	96.4%	21.6	8.3	C
	Right Turn	85	82	96.9%	15.8	2.2	B
	Subtotal	188	188	99.7%	18.2	2.2	B
WB	Left Turn	28	26	93.9%	20.0	7.3	C
	Through	7	8	114.3%	22.0	12.5	C
	Right Turn	26	26	98.1%	7.6	3.8	A
	Subtotal	61	60	98.0%	14.6	5.1	B
Total		1,661	1,626	97.9%	9.3	0.8	A

**Intersection 10 Highland Drive/Woodland Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	9	110.0%	9.2	7.0	A
	Through	775	763	98.4%	2.2	0.7	A
	Right Turn	5	5	100.0%	2.5	5.6	A
	Subtotal	788	777	98.6%	2.3	0.8	A
SB	Left Turn	14	14	102.1%	9.7	8.4	A
	Through	649	626	96.4%	0.9	0.6	A
	Right Turn	26	24	93.1%	0.5	0.2	A
	Subtotal	689	664	96.4%	1.1	0.6	A
EB	Left Turn	3	3	96.7%	6.4	11.3	A
	Through	2	2	80.0%	4.5	11.0	A
	Right Turn	44	44	99.1%	10.3	1.8	B
	Subtotal	49	48	98.2%	11.2	2.8	B
WB	Left Turn	2	2	100.0%	6.4	10.0	A
	Through						
	Right Turn	12	10	83.3%	12.5	7.4	B
	Subtotal	14	12	85.7%	11.8	4.6	B
Total		1,540	1,501	97.5%	2.0	0.7	A

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement AM Peak Hour

## Intersection 11

## Highland Drive/3300 South

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	159	164	103.1%	49.1	13.6	D
	Through	510	496	97.3%	80.4	22.2	F
	Right Turn	120	122	102.0%	20.1	6.7	C
	Subtotal	789	783	99.2%	65.4	16.3	E
SB	Left Turn	124	124	99.8%	71.9	23.0	E
	Through	417	393	94.2%	39.5	3.1	D
	Right Turn	155	153	98.8%	29.2	4.1	C
	Subtotal	696	670	96.2%	42.9	4.5	D
EB	Left Turn	154	159	103.4%	23.4	6.8	C
	Through	517	514	99.4%	15.9	3.0	B
	Right Turn	235	237	100.7%	4.2	0.7	A
	Subtotal	906	910	100.4%	14.1	1.2	B
WB	Left Turn	132	136	103.0%	25.7	3.5	C
	Through	539	533	98.9%	23.0	3.7	C
	Right Turn	128	128	100.0%	19.1	5.5	B
	Subtotal	799	797	99.8%	22.9	3.1	C
Total		3,190	3,159	99.0%	37.6	4.8	D

## Intersection 12

## Highland Drive/3350 South

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	17	17	98.8%	9.5	8.3	A
	Through	787	790	100.3%	38.0	18.8	E
	Right Turn	3	3	100.0%	12.9	16.3	B
	Subtotal	807	809	100.3%	37.1	18.2	E
SB	Left Turn	4	3	82.5%	8.5	18.1	A
	Through	707	689	97.4%	0.2	0.1	A
	Right Turn	69	69	99.6%	0.3	0.2	A
	Subtotal	780	761	97.5%	0.3	0.2	A
EB	Left Turn	41	41	100.7%	76.6	50.8	F
	Through						
	Right Turn	11	11	99.1%	21.0	39.8	C
	Subtotal	52	52	100.4%	67.7	48.7	F
WB	Left Turn	6	4	70.0%	4.9	6.5	A
	Through						
	Right Turn	8	8	97.5%	3.8	4.2	A
	Subtotal	14	12	85.7%	7.9	5.1	A
Total		1,653	1,634	98.9%	22.6	11.1	C



Intersection 13

Highland Drive/Luck Lane

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	56	53	95.0%	4.3	1.8	A
	Through	907	908	100.1%	1.7	0.4	A
	Right Turn						
	Subtotal	963	961	99.8%	1.8	0.3	A
SB	Left Turn						
	Through	676	657	97.2%	1.3	0.4	A
	Right Turn	69	65	93.9%	1.5	0.8	A
	Subtotal	745	722	96.9%	1.3	0.4	A
EB	Left Turn	11	12	104.5%	40.0	4.6	D
	Through						
	Right Turn	41	41	99.5%	7.5	0.7	A
	Subtotal	52	52	100.6%	15.7	2.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,760	1,736	98.6%	2.1	0.2	A

**Intersection 1 1300 East/3300 South Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	76	76	100.5%	64.7	17.6	E
	Through	386	376	97.5%	70.4	18.5	E
	Right Turn	193	197	102.2%	55.0	18.1	D
	Subtotal	655	650	99.2%	64.7	18.1	E
SB	Left Turn	377	361	95.8%	68.5	30.3	E
	Through	514	504	98.1%	27.1	3.4	C
	Right Turn	201	207	102.9%	7.0	1.5	A
	Subtotal	1,092	1,072	98.2%	36.6	10.8	D
EB	Left Turn	274	265	96.9%	55.6	12.1	E
	Through	656	657	100.2%	42.2	4.7	D
	Right Turn	93	97	104.3%	38.8	5.0	D
	Subtotal	1,023	1,019	99.6%	45.2	3.5	D
WB	Left Turn	274	265	96.6%	51.9	10.7	D
	Through	700	677	96.7%	51.6	5.9	D
	Right Turn	337	328	97.4%	47.3	6.9	D
	Subtotal	1,311	1,270	96.9%	50.6	5.6	D
Total		4,081	4,012	98.3%	47.9	5.3	D

**Intersection 2 1300 East/Brickyard Road Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	133	128	96.1%	19.5	5.9	B
	Through	874	849	97.2%	4.7	1.4	A
	Right Turn						
	Subtotal	1,007	977	97.0%	6.7	1.9	A
SB	Left Turn						
	Through	1,017	1,001	98.5%	2.3	0.7	A
	Right Turn	297	293	98.6%	0.3	0.2	A
	Subtotal	1,314	1,294	98.5%	1.8	0.5	A
EB	Left Turn	343	339	98.8%	52.7	5.2	D
	Through						
	Right Turn	185	188	101.6%	8.6	5.4	A
	Subtotal	528	527	99.8%	37.6	2.6	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,849	2,798	98.2%	11.0	1.1	B

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement PM Peak Hour

## Intersection 3

## Richmond Street/Miller Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	986	970	98.4%	1.0	0.5	A
	Right Turn	231	218	94.5%	0.0	0.0	A
	Subtotal	1,217	1,189	97.7%	0.8	0.4	A
SB	Left Turn	89	87	98.0%	6.3	2.2	A
	Through	1,194	1,169	97.9%	4.4	2.7	A
	Right Turn						
	Subtotal	1,283	1,257	97.9%	4.5	2.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	120	125	103.8%	13.7	2.3	B
	Through						
	Right Turn	89	84	94.5%	9.2	2.3	A
	Subtotal	209	209	99.8%	11.9	2.3	B
Total		2,709	2,654	98.0%	3.6	1.3	A

## Intersection 4

## Richmond Street/Gunn Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	1.6	1.7	A
	Through	950	935	98.5%	0.2	0.1	A
	Right Turn	121	115	94.8%	0.6	0.1	A
	Subtotal	1,075	1,054	98.1%	0.3	0.1	A
SB	Left Turn	59	57	95.8%	2.6	0.9	A
	Through	1,206	1,183	98.1%	0.7	0.2	A
	Right Turn	5	5	100.0%	0.3	0.4	A
	Subtotal	1,270	1,245	98.0%	0.8	0.3	A
EB	Left Turn	3	2	66.7%	3.2	4.1	A
	Through						
	Right Turn	5	5	102.0%	4.0	3.5	A
	Subtotal	8	7	88.8%	7.2	0.7	A
WB	Left Turn	72	70	97.2%	17.3	2.7	C
	Through						
	Right Turn	43	44	102.1%	11.4	2.5	B
	Subtotal	115	114	99.0%	15.1	2.5	C
Total		2,468	2,420	98.0%	1.4	0.2	A

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement PM Peak Hour

## Intersection 5

## Richmond Street/Elgin Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	31	97.2%	10.3	6.3	B
	Through	931	918	98.6%	0.7	0.4	A
	Right Turn	33	32	97.6%	0.7	0.2	A
	Subtotal	996	982	98.5%	1.0	0.5	A
SB	Left Turn	17	18	102.9%	7.2	3.1	A
	Through	1,210	1,185	97.9%	1.2	0.4	A
	Right Turn	3	3	113.3%	0.7	0.6	A
	Subtotal	1,230	1,206	98.0%	1.3	0.5	A
EB	Left Turn	4	5	115.0%	4.4	4.1	A
	Through	5	4	70.0%	5.8	10.2	A
	Right Turn	29	29	100.0%	6.3	0.7	A
	Subtotal	38	37	97.6%	7.0	1.9	A
WB	Left Turn	31	29	94.8%	16.4	4.6	C
	Through	4	5	120.0%	19.6	17.0	C
	Right Turn	19	18	93.2%	10.3	3.6	B
	Subtotal	54	52	96.1%	14.9	3.4	B
Total		2,318	2,276	98.2%	1.6	0.2	A

## Intersection 6

## Highland Drive/Richmond Street

## Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	100.0%	21.3	23.9	C
	Through	288	274	95.1%	42.5	4.3	D
	Right Turn	629	603	95.9%	2.4	0.5	A
	Subtotal	923	883	95.7%	14.1	2.1	B
SB	Left Turn	2	2	85.0%	5.4	11.7	A
	Through	354	350	98.8%	42.9	4.9	D
	Right Turn	269	270	100.2%	34.7	6.7	C
	Subtotal	625	621	99.4%	39.2	4.9	D
EB	Left Turn	215	209	97.0%	80.4	13.2	F
	Through	681	681	99.9%	43.4	6.3	D
	Right Turn	9	10	107.8%	27.7	20.2	C
	Subtotal	905	899	99.3%	51.5	7.5	D
WB	Left Turn	681	631	92.7%	145.3	45.5	F
	Through	1,013	971	95.9%	99.6	51.2	F
	Right Turn	33	32	96.4%	56.6	35.8	E
	Subtotal	1,727	1,634	94.6%	116.4	47.7	F
Total		4,180	4,037	96.6%	66.8	17.8	E

## Intersection 7

## Highland Drive/Elgin Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	10	78.5%	1.0	0.7	A
	Through	918	883	96.2%	1.1	0.1	A
	Right Turn	41	37	89.8%	1.1	0.3	A
	Subtotal	972	930	95.7%	1.1	0.1	A
SB	Left Turn	62	61	97.7%	34.7	53.5	D
	Through	942	852	90.4%	78.3	80.4	F
	Right Turn	16	14	85.0%	65.6	70.1	F
	Subtotal	1,020	926	90.8%	75.0	78.4	F
EB	Left Turn	15	15	98.7%	34.0	15.6	D
	Through	2	2	100.0%	7.5	15.2	A
	Right Turn	33	31	93.0%	19.3	12.8	C
	Subtotal	50	48	95.0%	23.0	13.1	C
WB	Left Turn	32	32	99.1%	66.1	38.8	F
	Through	4	4	105.0%	30.8	27.0	D
	Right Turn	36	35	95.8%	37.8	37.3	E
	Subtotal	72	70	97.8%	51.9	37.0	F
Total		2,114	1,974	93.4%	34.9	33.3	D

## Intersection 8

## Highland Drive/Gunn Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	75	71	94.7%	19.4	8.3	C
	Through	924	880	95.2%	0.5	0.1	A
	Right Turn						
	Subtotal	999	951	95.1%	1.9	0.7	A
SB	Left Turn						
	Through	938	843	89.9%	21.9	13.1	C
	Right Turn	69	65	93.6%	18.2	11.1	C
	Subtotal	1,007	908	90.1%	21.6	13.0	C
EB	Left Turn	48	52	107.7%	73.2	64.9	F
	Through						
	Right Turn	68	65	95.4%	64.8	59.9	F
	Subtotal	116	117	100.5%	68.7	62.7	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,122	1,975	93.1%	14.8	7.8	B

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement PM Peak Hour

Intersection 9 Highland Drive/Miller Avenue Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	91	89	98.1%	74.9	19.8	E
	Through	862	818	94.8%	14.2	2.6	B
	Right Turn	55	55	99.3%	12.8	2.2	B
	Subtotal	1,008	962	95.4%	20.2	5.5	C
SB	Left Turn	12	12	101.7%	26.7	17.6	C
	Through	912	820	89.9%	23.6	9.5	C
	Right Turn	91	78	85.2%	34.3	40.4	C
	Subtotal	1,015	910	89.6%	24.5	9.5	C
EB	Left Turn	135	134	99.5%	23.7	4.4	C
	Through	26	30	113.5%	22.4	7.4	C
	Right Turn	113	108	95.4%	20.1	4.7	C
	Subtotal	274	272	99.1%	22.1	4.4	C
WB	Left Turn	41	41	99.5%	24.7	4.8	C
	Through	15	15	98.7%	19.0	9.5	B
	Right Turn	17	17	99.4%	10.2	9.4	B
	Subtotal	73	73	99.3%	19.6	5.8	B
Total		2,370	2,215	93.5%	21.9	4.7	C

Intersection 10 Highland Drive/Woodland Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	6	98.3%	7.7	8.2	A
	Through	998	952	95.4%	10.0	7.4	A
	Right Turn	4	3	85.0%	2.2	3.7	A
	Subtotal	1,008	962	95.4%	9.9	7.3	A
SB	Left Turn	18	16	86.1%	13.1	6.3	B
	Through	994	903	90.9%	11.7	5.2	B
	Right Turn	44	39	89.5%	5.8	3.6	A
	Subtotal	1,056	958	90.7%	11.4	5.1	B
EB	Left Turn	6	5	80.0%	60.0	34.3	F
	Through	1	1	90.0%	10.4	17.0	B
	Right Turn	73	72	97.9%	26.5	7.5	D
	Subtotal	80	77	96.5%	28.1	7.4	D
WB	Left Turn	4	5	112.5%	16.3	10.5	C
	Through	1	1	120.0%	12.8	27.8	B
	Right Turn	19	19	97.4%	20.0	9.8	C
	Subtotal	24	24	100.8%	20.3	7.7	C
Total		2,168	2,021	93.2%	11.9	5.4	B

Average Results from 10 Runs Existing + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
Volume and Delay by Movement PM Peak Hour

## Intersection 11

## Highland Drive/3300 South

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	293	284	96.8%	68.4	8.7	E
	Through	607	563	92.8%	118.4	44.6	F
	Right Turn	161	157	97.5%	22.5	6.5	C
	Subtotal	1,061	1,004	94.6%	90.2	25.7	F
SB	Left Turn	205	189	92.1%	74.0	16.8	E
	Through	666	601	90.2%	56.5	5.9	E
	Right Turn	233	212	90.9%	49.7	10.0	D
	Subtotal	1,104	1,001	90.7%	58.3	7.0	E
EB	Left Turn	239	239	99.9%	97.0	37.3	F
	Through	769	753	97.9%	41.2	10.0	D
	Right Turn	301	297	98.7%	9.1	2.5	A
	Subtotal	1,309	1,288	98.4%	43.7	13.0	D
WB	Left Turn	192	200	104.0%	93.9	26.5	F
	Through	725	714	98.5%	59.5	12.0	E
	Right Turn	197	196	99.4%	53.0	15.7	D
	Subtotal	1,114	1,109	99.6%	64.9	13.5	E
Total		4,588	4,403	96.0%	63.7	6.0	E

## Intersection 12

## Highland Drive/3350 South

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	30	93.8%	31.5	24.0	D
	Through	949	935	98.5%	78.3	42.1	F
	Right Turn	18	17	91.7%	44.9	38.0	E
	Subtotal	999	982	98.3%	76.3	41.2	F
SB	Left Turn	19	21	108.9%	33.1	29.2	D
	Through	1,011	952	94.2%	0.4	0.1	A
	Right Turn	133	126	94.6%	0.5	0.2	A
	Subtotal	1,163	1,099	94.5%	1.0	0.6	A
EB	Left Turn	107	74	69.4%	212.3	65.7	F
	Through						
	Right Turn	30	20	67.3%	173.4	73.3	F
	Subtotal	137	95	69.0%	204.6	65.1	F
WB	Left Turn	4	3	82.5%	41.5	59.4	E
	Through						
	Right Turn	14	13	90.7%	9.5	4.1	A
	Subtotal	18	16	88.9%	19.0	13.0	C
Total		2,317	2,191	94.6%	43.0	20.4	E

Intersection 13

Highland Drive/Luck Lane

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	52	54	103.3%	10.7	4.1	B
	Through	1,000	995	99.5%	3.1	0.7	A
	Right Turn						
	Subtotal	1,052	1,049	99.7%	3.5	0.8	A
SB	Left Turn						
	Through	1,109	1,040	93.8%	3.7	1.3	A
	Right Turn	52	47	90.8%	1.9	0.7	A
	Subtotal	1,161	1,088	93.7%	3.7	1.3	A
EB	Left Turn	58	60	102.6%	32.6	3.2	C
	Through						
	Right Turn	111	110	98.7%	9.1	0.9	A
	Subtotal	169	169	100.1%	17.2	1.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,305	96.8%	4.7	0.8	A



**Intersection 1**

**1300 East/3300 South**

**Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	90	92	102.0%	59.8	12.3	E
	Through	443	431	97.4%	57.8	10.3	E
	Right Turn	225	232	103.2%	45.1	14.9	D
	Subtotal	758	755	99.6%	54.0	11.7	D
SB	Left Turn	193	188	97.6%	52.7	11.0	D
	Through	251	245	97.6%	29.1	5.8	C
	Right Turn	143	142	99.4%	6.0	1.2	A
	Subtotal	587	575	98.0%	31.2	4.8	C
EB	Left Turn	154	145	94.0%	29.3	4.4	C
	Through	509	514	101.0%	21.5	3.1	C
	Right Turn	39	42	106.4%	18.2	4.8	B
	Subtotal	702	701	99.8%	22.9	2.0	C
WB	Left Turn	160	153	95.8%	22.5	5.6	C
	Through	624	626	100.3%	18.4	2.4	B
	Right Turn	145	144	99.6%	14.6	6.0	B
	Subtotal	929	924	99.4%	18.4	2.3	B
Total		2,976	2,955	99.3%	31.1	3.3	C

**Intersection 2**

**1300 East/Brickyard Road**

**Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	57	56	98.1%	7.4	1.9	A
	Through	636	614	96.5%	2.2	0.4	A
	Right Turn						
	Subtotal	693	670	96.6%	2.6	0.5	A
SB	Left Turn						
	Through	558	555	99.4%	2.3	0.3	A
	Right Turn	173	171	98.6%	0.6	0.4	A
	Subtotal	731	725	99.2%	2.0	0.3	A
EB	Left Turn	108	107	98.7%	24.3	3.5	C
	Through						
	Right Turn	42	41	98.1%	5.4	1.9	A
	Subtotal	150	148	98.5%	19.0	3.2	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,574	1,543	98.0%	4.1	0.5	A

Average Results from 10 Runs    Future + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
 Volume and Delay by Movement    AM Peak Hour

## Intersection 3

## Richmond Street/Miller Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	633	621	98.0%	0.5	0.3	A
	Right Turn	111	99	89.5%	0.0	0.0	A
	Subtotal	744	720	96.8%	0.4	0.3	A
SB	Left Turn	70	73	104.3%	6.7	5.7	A
	Through	635	628	98.9%	3.6	0.8	A
	Right Turn						
	Subtotal	705	701	99.4%	3.9	1.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	96	98	102.0%	14.2	4.8	B
	Through						
	Right Turn	58	56	97.1%	11.0	2.3	B
	Subtotal	154	154	100.1%	13.0	3.7	B
Total		1,603	1,575	98.2%	4.1	1.0	A

## Intersection 4

## Richmond Street/Gunn Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	102.0%	1.3	2.5	A
	Through	651	639	98.2%	0.1	0.1	A
	Right Turn	35	32	91.1%	0.5	0.2	A
	Subtotal	691	676	97.8%	0.1	0.1	A
SB	Left Turn	20	17	86.0%	1.2	0.8	A
	Through	614	614	99.9%	0.4	0.1	A
	Right Turn	4	4	110.0%	0.3	0.2	A
	Subtotal	638	635	99.6%	0.4	0.1	A
EB	Left Turn	2	1	65.0%	3.7	5.0	A
	Through						
	Right Turn	8	7	83.8%	7.1	0.7	A
	Subtotal	10	8	80.0%	7.5	0.8	A
WB	Left Turn	89	85	95.5%	14.9	1.9	B
	Through						
	Right Turn	54	56	103.1%	11.8	2.1	B
	Subtotal	143	141	98.4%	13.7	1.8	B
Total		1,482	1,460	98.5%	2.6	0.3	A

## Intersection 5

## Richmond Street/Elgin Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	13	103.1%	3.2	4.2	A
	Through	677	667	98.4%	0.1	0.0	A
	Right Turn	17	16	94.7%	0.6	0.3	A
	Subtotal	707	696	98.4%	0.2	0.1	A
SB	Left Turn	11	12	112.7%	3.9	3.8	A
	Through	601	600	99.9%	0.6	0.4	A
	Right Turn	4	4	97.5%	0.4	0.4	A
	Subtotal	616	617	100.1%	0.7	0.5	A
EB	Left Turn	14	13	95.0%	6.8	0.3	A
	Through	5	5	106.0%	8.6	4.8	A
	Right Turn	24	24	97.9%	6.2	0.4	A
	Subtotal	43	42	97.9%	6.7	0.5	A
WB	Left Turn	13	12	90.8%	11.4	2.5	B
	Through						
	Right Turn	11	10	90.9%	6.8	1.4	A
	Subtotal	24	22	90.8%	9.4	1.6	A
Total		1,390	1,377	99.0%	0.9	0.2	A

## Intersection 6

## Highland Drive/Richmond Street

## Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	269	265	98.4%	47.1	4.4	D
	Right Turn	656	640	97.6%	2.8	0.8	A
	Subtotal	925	905	97.8%	16.5	1.8	B
SB	Left Turn	2	2	85.0%	21.0	41.2	C
	Through	112	108	96.3%	46.9	6.7	D
	Right Turn	68	70	103.2%	25.7	6.4	C
	Subtotal	182	180	98.8%	38.2	5.5	D
EB	Left Turn	122	119	97.5%	63.5	5.4	E
	Through	588	571	97.1%	16.5	2.2	B
	Right Turn	7	7	101.4%	10.2	9.6	B
	Subtotal	717	697	97.2%	24.8	2.6	C
WB	Left Turn	398	392	98.4%	63.5	27.6	E
	Through	580	581	100.1%	12.2	2.5	B
	Right Turn	15	15	98.7%	2.9	2.1	A
	Subtotal	993	987	99.4%	33.5	14.7	C
Total		2,817	2,769	98.3%	26.6	6.5	C

Average Results from 10 Runs    Future + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
 Volume and Delay by Movement    AM Peak Hour

## Intersection 7

## Highland Drive/Elgin Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	11	120.0%	1.2	0.6	A
	Through	819	802	97.9%	1.1	0.2	A
	Right Turn	24	23	95.8%	0.9	0.3	A
	Subtotal	852	835	98.0%	1.1	0.2	A
SB	Left Turn	14	16	113.6%	0.6	0.6	A
	Through	570	556	97.5%	1.4	0.2	A
	Right Turn	5	5	104.0%	0.5	0.6	A
	Subtotal	589	577	97.9%	1.4	0.2	A
EB	Left Turn	9	9	100.0%	8.0	12.5	A
	Through	5	5	100.0%	2.4	5.3	A
	Right Turn	15	13	86.7%	3.2	2.8	A
	Subtotal	29	27	93.1%	10.3	7.3	B
WB	Left Turn	21	20	94.3%	25.3	6.5	D
	Through	2	1	65.0%	13.1	19.9	B
	Right Turn	63	62	97.8%	17.6	4.8	C
	Subtotal	86	83	96.2%	19.4	4.5	C
Total		1,556	1,522	97.8%	2.6	0.3	A

## Intersection 8

## Highland Drive/Gunn Avenue

## Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	32	93.5%	3.9	2.1	A
	Through	799	780	97.6%	0.6	0.1	A
	Right Turn						
	Subtotal	833	812	97.4%	0.7	0.1	A
SB	Left Turn						
	Through	582	565	97.1%	1.7	0.5	A
	Right Turn	24	24	99.2%	1.3	0.6	A
	Subtotal	606	589	97.1%	1.7	0.5	A
EB	Left Turn	53	56	105.5%	31.9	17.9	D
	Through						
	Right Turn	85	81	94.7%	24.8	12.1	C
	Subtotal	138	136	98.8%	27.7	14.4	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,577	1,537	97.4%	4.5	1.9	A

Average Results from 10 Runs    Future + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
 Volume and Delay by Movement    AM Peak Hour

**Intersection 9**                      **Highland Drive/Miller Avenue**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	64	65	101.9%	20.5	7.2	C
	Through	714	692	96.9%	7.3	0.9	A
	Right Turn	25	25	98.8%	6.4	3.5	A
	Subtotal	803	782	97.3%	8.4	0.9	A
SB	Left Turn	13	13	102.3%	17.3	7.6	B
	Through	605	583	96.3%	7.4	1.2	A
	Right Turn	48	48	100.2%	7.1	1.4	A
	Subtotal	666	644	96.7%	7.7	1.3	A
EB	Left Turn	90	93	102.9%	21.1	2.8	C
	Through	15	14	95.3%	20.3	6.3	C
	Right Turn	86	83	97.0%	14.8	1.3	B
	Subtotal	191	190	99.6%	18.3	1.7	B
WB	Left Turn	30	29	95.3%	18.8	7.1	B
	Through	8	8	105.0%	18.4	13.3	B
	Right Turn	28	28	98.9%	8.2	3.9	A
	Subtotal	66	65	98.0%	14.2	6.0	B
Total		1,726	1,680	97.4%	9.6	0.7	A

**Intersection 10**                      **Highland Drive/Woodland Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	11	116.7%	5.1	4.8	A
	Through	806	786	97.6%	1.9	0.4	A
	Right Turn	6	6	106.7%	0.4	0.4	A
	Subtotal	821	803	97.8%	1.9	0.4	A
SB	Left Turn	15	16	103.3%	6.6	3.6	A
	Through	672	648	96.4%	0.8	0.3	A
	Right Turn	26	24	90.4%	0.6	0.4	A
	Subtotal	713	687	96.3%	0.9	0.4	A
EB	Left Turn	4	4	90.0%	11.9	11.9	B
	Through	3	4	116.7%	18.1	14.5	C
	Right Turn	45	44	97.8%	11.3	2.2	B
	Subtotal	52	51	98.3%	12.6	2.4	B
WB	Left Turn	3	4	116.7%	10.7	12.0	B
	Through						
	Right Turn	13	11	81.5%	10.5	3.5	B
	Subtotal	16	14	88.1%	12.3	4.6	B
Total		1,602	1,555	97.1%	2.0	0.2	A

## Intersection 11

## Highland Drive/3300 South

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	164	165	100.3%	60.6	19.0	E
	Through	534	516	96.7%	124.0	46.3	F
	Right Turn	126	129	102.3%	22.2	7.6	C
	Subtotal	824	810	98.3%	94.7	28.4	F
SB	Left Turn	128	126	98.2%	74.6	38.5	E
	Through	434	409	94.1%	42.3	2.8	D
	Right Turn	158	156	98.9%	31.3	4.4	C
	Subtotal	720	691	95.9%	45.2	8.5	D
EB	Left Turn	157	162	103.4%	23.4	4.7	C
	Through	539	535	99.2%	18.1	2.0	B
	Right Turn	242	241	99.7%	4.0	1.0	A
	Subtotal	938	939	100.1%	15.4	1.6	B
WB	Left Turn	138	143	103.3%	23.8	4.0	C
	Through	564	557	98.7%	22.2	2.8	C
	Right Turn	134	134	99.9%	19.1	5.3	B
	Subtotal	836	833	99.7%	22.0	2.4	C
Total		3,318	3,272	98.6%	44.4	8.6	D

## Intersection 12

## Highland Drive/3350 South

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	17	17	99.4%	27.7	31.7	D
	Through	823	821	99.8%	78.5	40.1	F
	Right Turn	4	4	102.5%	39.6	44.0	E
	Subtotal	844	842	99.8%	77.6	39.6	F
SB	Left Turn	5	5	104.0%	19.2	17.9	C
	Through	736	716	97.3%	0.4	0.2	A
	Right Turn	69	68	98.8%	0.3	0.2	A
	Subtotal	810	790	97.5%	0.6	0.3	A
EB	Left Turn	42	41	96.4%	112.3	62.7	F
	Through						
	Right Turn	12	12	96.7%	53.6	53.2	F
	Subtotal	54	52	96.5%	97.8	49.1	F
WB	Left Turn	7	6	84.3%	21.9	19.0	C
	Through						
	Right Turn	9	9	101.1%	11.5	8.9	B
	Subtotal	16	15	93.8%	16.9	13.6	C
Total		1,724	1,699	98.5%	44.5	22.4	E

## Intersection 13

## Highland Drive/Luck Lane

## Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	59	57	97.3%	5.4	2.0	A
	Through	949	950	100.1%	5.4	5.5	A
	Right Turn						
	Subtotal	1,008	1,008	100.0%	5.4	5.2	A
SB	Left Turn						
	Through	705	686	97.3%	1.2	0.6	A
	Right Turn	73	69	94.0%	1.4	0.5	A
	Subtotal	778	755	97.0%	1.2	0.5	A
EB	Left Turn	12	12	100.8%	38.9	12.1	D
	Through						
	Right Turn	44	42	95.9%	7.7	1.7	A
	Subtotal	56	54	97.0%	15.2	4.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,842	1,817	98.6%	4.0	3.2	A

Average Results from 10 Runs    Future + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
 Volume and Delay by Movement    PM Peak Hour

## Intersection 1

## 1300 East/3300 South

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	80	80	99.9%	94.0	30.7	F
	Through	402	388	96.5%	96.2	26.3	F
	Right Turn	198	201	101.4%	79.4	23.1	E
	Subtotal	680	668	98.3%	91.1	25.8	F
SB	Left Turn	388	363	93.5%	121.8	81.3	F
	Through	537	526	97.9%	29.8	6.6	C
	Right Turn	208	213	102.2%	10.1	6.3	B
	Subtotal	1,133	1,101	97.2%	56.3	28.5	E
EB	Left Turn	282	271	96.0%	98.9	50.7	F
	Through	685	685	99.9%	44.9	12.2	D
	Right Turn	97	101	104.0%	39.6	3.8	D
	Subtotal	1,064	1,056	99.3%	59.5	16.4	E
WB	Left Turn	281	262	93.4%	61.4	17.2	E
	Through	729	685	94.0%	48.6	8.4	D
	Right Turn	344	326	94.8%	39.9	8.9	D
	Subtotal	1,354	1,274	94.1%	49.1	9.5	D
Total		4,231	4,099	96.9%	60.6	10.8	E

## Intersection 2

## 1300 East/Brickyard Road

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	139	130	93.8%	24.0	6.6	C
	Through	901	862	95.7%	4.6	1.1	A
	Right Turn						
	Subtotal	1,040	993	95.5%	7.2	1.8	A
SB	Left Turn						
	Through	1,055	1,047	99.2%	2.0	0.2	A
	Right Turn	311	307	98.8%	0.3	0.3	A
	Subtotal	1,366	1,354	99.1%	1.6	0.1	A
EB	Left Turn	359	356	99.0%	52.0	4.0	D
	Through						
	Right Turn	193	194	100.7%	6.8	1.4	A
	Subtotal	552	550	99.6%	36.8	3.0	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,958	2,897	97.9%	11.0	1.1	B



Average Results from 10 Runs    Future + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
 Volume and Delay by Movement    PM Peak Hour

**Intersection 3**                      **Richmond Street/Miller Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,026	1,000	97.4%	1.0	0.4	A
	Right Turn	234	219	93.4%	0.0	0.0	A
	Subtotal	1,260	1,218	96.7%	0.8	0.3	A
SB	Left Turn	91	90	98.8%	7.0	3.2	A
	Through	1,245	1,230	98.8%	4.0	0.8	A
	Right Turn						
	Subtotal	1,336	1,320	98.8%	4.3	0.9	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	121	126	104.0%	14.1	3.3	B
	Through						
	Right Turn	91	87	95.3%	10.0	4.0	A
	Subtotal	212	213	100.3%	12.4	3.4	B
Total		2,808	2,750	97.9%	3.5	0.7	A

**Intersection 4**                      **Richmond Street/Gunn Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	4	86.0%	6.9	11.4	A
	Through	990	967	97.6%	0.2	0.0	A
	Right Turn	122	115	94.3%	0.6	0.2	A
	Subtotal	1,117	1,086	97.2%	0.3	0.1	A
SB	Left Turn	60	59	98.7%	3.1	1.3	A
	Through	1,257	1,247	99.2%	1.3	1.8	A
	Right Turn	6	6	93.3%	0.3	0.3	A
	Subtotal	1,323	1,312	99.2%	1.4	1.8	A
EB	Left Turn	4	3	67.5%	5.6	7.6	A
	Through						
	Right Turn	6	5	90.0%	3.5	3.7	A
	Subtotal	10	8	81.0%	9.1	5.3	A
WB	Left Turn	73	71	97.0%	17.9	3.5	C
	Through						
	Right Turn	44	45	102.5%	10.8	2.2	B
	Subtotal	117	116	99.1%	15.1	2.3	C
Total		2,567	2,522	98.2%	1.7	1.0	A

Average Results from 10 Runs    Future + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
 Volume and Delay by Movement    PM Peak Hour

**Intersection 5**                      **Richmond Street/Elgin Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	32	95.3%	9.4	6.6	A
	Through	969	949	97.9%	0.5	0.3	A
	Right Turn	35	34	97.1%	0.7	0.1	A
	Subtotal	1,038	1,015	97.8%	0.8	0.5	A
SB	Left Turn	18	19	106.7%	6.3	4.6	A
	Through	1,260	1,253	99.5%	1.3	0.3	A
	Right Turn	4	4	90.0%	1.4	2.2	A
	Subtotal	1,282	1,276	99.5%	1.3	0.4	A
EB	Left Turn	5	6	114.0%	6.8	4.3	A
	Through	6	4	71.7%	6.7	2.5	A
	Right Turn	30	30	100.7%	6.6	0.8	A
	Subtotal	41	40	98.0%	7.1	0.9	A
WB	Left Turn	33	32	95.5%	20.3	6.3	C
	Through	5	6	116.0%	21.5	17.6	C
	Right Turn	20	19	93.5%	9.9	4.7	A
	Subtotal	58	56	96.6%	18.1	5.1	C
Total		2,419	2,387	98.7%	1.6	0.3	A

**Intersection 6**                      **Highland Drive/Richmond Street**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	7	100.0%	27.1	27.6	C
	Through	300	275	91.8%	45.4	4.1	D
	Right Turn	653	602	92.1%	2.5	0.6	A
	Subtotal	960	884	92.1%	16.6	1.2	B
SB	Left Turn	3	3	83.3%	13.2	30.9	B
	Through	369	364	98.6%	46.1	4.7	D
	Right Turn	279	280	100.2%	35.2	6.8	D
	Subtotal	651	646	99.2%	41.4	5.2	D
EB	Left Turn	224	213	95.2%	128.9	26.9	F
	Through	709	697	98.3%	86.8	25.6	F
	Right Turn	10	10	102.0%	66.7	32.5	E
	Subtotal	943	921	97.6%	96.6	24.5	F
WB	Left Turn	707	669	94.6%	95.1	50.9	F
	Through	1,056	1,036	98.1%	53.0	41.7	D
	Right Turn	35	35	98.9%	22.1	28.7	C
	Subtotal	1,798	1,740	96.8%	68.9	44.7	E
Total		4,352	4,190	96.3%	59.7	19.8	E

**Intersection 7 Highland Drive/Elgin Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	14	12	88.6%	0.5	0.4	A
	Through	953	884	92.7%	1.2	0.2	A
	Right Turn	42	35	82.9%	1.1	0.5	A
	Subtotal	1,009	931	92.3%	1.2	0.2	A
SB	Left Turn	66	65	98.2%	44.1	52.3	E
	Through	978	870	89.0%	119.7	58.5	F
	Right Turn	17	15	85.9%	92.8	55.9	F
	Subtotal	1,061	950	89.5%	113.4	58.3	F
EB	Left Turn	16	16	100.0%	47.8	18.2	E
	Through	3	3	113.3%	26.7	29.7	D
	Right Turn	35	33	94.0%	24.8	8.3	C
	Subtotal	54	52	96.9%	32.1	10.4	D
WB	Left Turn	33	32	97.6%	51.5	15.2	F
	Through	5	5	102.0%	41.9	34.1	E
	Right Turn	38	36	94.2%	26.8	16.1	D
	Subtotal	76	73	96.2%	39.7	12.5	E
Total		2,200	2,006	91.2%	53.0	27.4	F

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	76	69	90.5%	20.9	8.2	C
	Through	960	880	91.7%	0.5	0.1	A
	Right Turn						
	Subtotal	1,036	949	91.6%	2.1	0.8	A
SB	Left Turn						
	Through	976	864	88.5%	28.1	10.1	D
	Right Turn	70	65	92.4%	23.9	9.3	C
	Subtotal	1,046	928	88.8%	27.8	10.1	D
EB	Left Turn	49	51	104.5%	111.5	67.8	F
	Through						
	Right Turn	69	64	92.5%	113.3	74.6	F
	Subtotal	118	115	97.5%	111.6	69.8	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,200	1,992	90.6%	20.8	6.4	C

Average Results from 10 Runs    Future + Project Conditions - Highland Road Diet - Greatest Impact Scenario  
 Volume and Delay by Movement    PM Peak Hour

## Intersection 9

## Highland Drive/Miller Avenue

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	92	86	92.9%	96.8	42.1	F
	Through	897	809	90.2%	14.9	3.2	B
	Right Turn	58	54	92.4%	14.0	4.6	B
	Subtotal	1,047	948	90.6%	23.2	8.3	C
SB	Left Turn	13	13	100.8%	32.0	8.3	C
	Through	948	839	88.5%	23.7	3.4	C
	Right Turn	93	78	83.5%	25.4	11.6	C
	Subtotal	1,054	930	88.2%	24.0	3.7	C
EB	Left Turn	137	137	99.9%	23.8	5.3	C
	Through	27	31	113.3%	25.3	10.9	C
	Right Turn	115	109	95.0%	21.5	5.4	C
	Subtotal	279	277	99.2%	23.1	5.5	C
WB	Left Turn	43	42	97.0%	25.6	5.8	C
	Through	16	16	97.5%	13.6	7.8	B
	Right Turn	18	18	100.0%	8.6	4.1	A
	Subtotal	77	75	97.8%	18.7	4.9	B
Total		2,457	2,230	90.8%	23.1	4.3	C

## Intersection 10

## Highland Drive/Woodland Avenue

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	8	117.1%	11.4	9.7	B
	Through	1,035	937	90.5%	18.0	16.6	C
	Right Turn	5	5	90.0%	10.4	19.6	B
	Subtotal	1,047	950	90.7%	18.0	16.5	C
SB	Left Turn	19	17	88.4%	20.7	11.3	C
	Through	1,031	926	89.8%	10.3	3.3	B
	Right Turn	45	40	88.0%	4.4	5.1	A
	Subtotal	1,095	982	89.7%	10.2	3.4	B
EB	Left Turn	7	6	78.6%	65.3	34.6	F
	Through	2	2	115.0%	27.8	35.8	D
	Right Turn	74	71	96.5%	33.3	21.2	D
	Subtotal	83	79	95.4%	34.9	20.8	D
WB	Left Turn	5	5	102.0%	23.4	25.4	C
	Through	2	2	90.0%	6.6	9.8	A
	Right Turn	20	18	90.5%	27.5	14.4	D
	Subtotal	27	25	92.6%	26.1	14.7	D
Total		2,252	2,036	90.4%	15.3	8.9	C

## Intersection 11

## Highland Drive/3300 South

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	300	270	90.0%	89.4	22.1	F
	Through	633	554	87.6%	140.1	74.7	F
	Right Turn	169	155	91.7%	18.1	9.0	B
	Subtotal	1,102	979	88.9%	106.6	44.4	F
SB	Left Turn	213	195	91.4%	83.7	29.2	F
	Through	694	619	89.2%	52.6	8.0	D
	Right Turn	238	216	90.9%	43.0	10.8	D
	Subtotal	1,145	1,030	90.0%	57.4	6.2	E
EB	Left Turn	245	230	93.9%	125.2	21.1	F
	Through	803	768	95.7%	57.5	15.1	E
	Right Turn	310	300	96.8%	10.6	2.4	B
	Subtotal	1,358	1,298	95.6%	58.7	11.9	E
WB	Left Turn	200	205	102.3%	204.4	81.7	F
	Through	756	733	96.9%	151.7	67.7	F
	Right Turn	205	201	97.8%	161.4	78.6	F
	Subtotal	1,161	1,138	98.0%	163.2	69.4	F
Total		4,766	4,445	93.3%	95.1	23.4	F

## Intersection 12

## Highland Drive/3350 South

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	29	89.1%	46.8	38.3	E
	Through	988	921	93.2%	96.4	36.6	F
	Right Turn	19	16	84.7%	69.3	41.9	F
	Subtotal	1,039	966	92.9%	94.6	36.7	F
SB	Left Turn	20	20	98.5%	54.5	36.2	F
	Through	1,055	982	93.1%	0.4	0.1	A
	Right Turn	133	124	93.4%	0.6	0.2	A
	Subtotal	1,208	1,126	93.2%	1.3	0.8	A
EB	Left Turn	108	60	55.6%	249.5	55.5	F
	Through						
	Right Turn	31	18	57.1%	203.0	50.2	F
	Subtotal	139	78	56.0%	237.6	44.9	F
WB	Left Turn	5	5	96.0%	43.0	52.3	E
	Through						
	Right Turn	15	15	100.7%	9.4	4.3	A
	Subtotal	20	20	99.5%	20.4	15.5	C
Total		2,406	2,190	91.0%	50.9	16.5	F

Intersection 13

Highland Drive/Luck Lane

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	55	56	100.9%	74.7	89.1	E
	Through	1,040	992	95.4%	94.5	104.6	F
	Right Turn						
	Subtotal	1,095	1,048	95.7%	93.2	103.4	F
SB	Left Turn						
	Through	1,158	1,075	92.9%	6.4	3.2	A
	Right Turn	55	50	91.1%	2.1	0.5	A
	Subtotal	1,213	1,126	92.8%	6.2	3.0	A
EB	Left Turn	61	61	100.0%	52.1	19.2	D
	Through						
	Right Turn	117	116	99.1%	8.5	1.4	A
	Subtotal	178	177	99.4%	22.0	5.5	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,486	2,350	94.5%	42.4	40.7	D

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 1**                      **1300 East/3300 South**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	88	102.4%	54.2	13.3	D
	Through	424	416	98.2%	52.2	12.3	D
	Right Turn	218	225	103.2%	39.0	13.1	D
	Subtotal	728	729	100.2%	48.2	12.4	D
SB	Left Turn	189	183	97.0%	55.3	10.2	E
	Through	241	240	99.7%	26.8	5.0	C
	Right Turn	138	138	100.0%	6.1	1.3	A
	Subtotal	568	562	98.9%	30.4	3.8	C
EB	Left Turn	149	140	93.8%	26.2	3.2	C
	Through	488	495	101.5%	21.2	3.6	C
	Right Turn	37	40	107.3%	16.2	5.7	B
	Subtotal	674	675	100.1%	21.9	2.8	C
WB	Left Turn	155	150	96.9%	21.6	3.7	C
	Through	598	600	100.3%	16.0	1.9	B
	Right Turn	146	145	99.2%	13.8	2.9	B
	Subtotal	899	895	99.6%	16.5	2.0	B
<b>Total</b>		<b>2,869</b>	<b>2,861</b>	<b>99.7%</b>	<b>28.8</b>	<b>3.5</b>	<b>C</b>

**Intersection 2**                      **1300 East/Brickyard Road**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	55	54	97.5%	6.4	2.6	A
	Through	617	601	97.4%	2.2	0.5	A
	Right Turn						
	Subtotal	672	655	97.4%	2.5	0.5	A
SB	Left Turn						
	Through	540	540	99.9%	2.3	0.4	A
	Right Turn	166	163	98.1%	0.6	0.5	A
	Subtotal	706	703	99.5%	1.9	0.4	A
EB	Left Turn	103	102	99.2%	22.4	4.2	C
	Through						
	Right Turn	40	39	98.5%	4.3	0.7	A
	Subtotal	143	142	99.0%	17.3	3.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>1,521</b>	<b>1,499</b>	<b>98.5%</b>	<b>3.8</b>	<b>0.6</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 3**                      **Richmond Street/Miller Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	610	602	98.7%	0.5	0.3	A
	Right Turn	110	102	92.3%	0.0	0.0	A
	Subtotal	720	704	97.7%	0.4	0.3	A
SB	Left Turn	68	70	103.4%	4.7	1.9	A
	Through	611	607	99.3%	3.0	0.5	A
	Right Turn						
	Subtotal	679	677	99.7%	3.2	0.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	95	96	101.1%	13.7	4.2	B
	Through						
	Right Turn	57	54	95.3%	9.8	1.4	A
	Subtotal	152	150	98.9%	12.3	3.1	B
<b>Total</b>		<b>1,551</b>	<b>1,531</b>	<b>98.7%</b>	<b>3.7</b>	<b>0.7</b>	<b>A</b>

**Intersection 4**                      **Richmond Street/Gunn Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	102.5%	0.4	0.5	A
	Through	629	619	98.3%	0.1	0.0	A
	Right Turn	34	33	95.6%	0.4	0.1	A
	Subtotal	667	655	98.2%	0.1	0.0	A
SB	Left Turn	19	17	87.4%	0.9	0.6	A
	Through	589	590	100.1%	0.3	0.1	A
	Right Turn	3	4	116.7%	0.4	0.2	A
	Subtotal	611	610	99.8%	0.3	0.1	A
EB	Left Turn	1	0	30.0%	0.9	2.7	A
	Through						
	Right Turn	7	7	95.7%	7.3	0.7	A
	Subtotal	8	7	87.5%	7.3	0.7	A
WB	Left Turn	88	85	96.1%	22.4	4.6	C
	Through						
	Right Turn	105	107	102.3%	20.7	6.0	C
	Subtotal	193	192	99.5%	21.4	5.2	C
<b>Total</b>		<b>1,479</b>	<b>1,464</b>	<b>99.0%</b>	<b>5.0</b>	<b>1.3</b>	<b>A</b>



**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 5**                      **Richmond Street/Elgin Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	12	12	99.2%	1.5	1.6	A
	Through	707	700	99.1%	0.2	0.1	A
	Right Turn	16	14	87.5%	0.9	0.7	A
	Subtotal	735	726	98.8%	0.2	0.1	A
SB	Left Turn	10	11	114.0%	3.8	3.6	A
	Through	576	577	100.2%	0.4	0.1	A
	Right Turn	3	2	76.7%	0.2	0.3	A
	Subtotal	589	591	100.3%	0.5	0.2	A
EB	Left Turn	13	12	93.1%	8.1	2.3	A
	Through	4	4	97.5%	2.4	4.0	A
	Right Turn	23	22	96.1%	6.0	0.4	A
	Subtotal	40	38	95.3%	7.1	1.0	A
WB	Left Turn	12	11	90.8%	13.8	6.1	B
	Through						
	Right Turn	18	18	98.9%	7.6	2.8	A
	Subtotal	30	29	95.7%	10.7	3.9	B
<b>Total</b>		<b>1,394</b>	<b>1,384</b>	<b>99.3%</b>	<b>0.7</b>	<b>0.1</b>	<b>A</b>

**Intersection 6**                      **Highland Drive/Richmond Street**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	258	255	98.8%	48.8	4.3	D
	Right Turn	568	557	98.1%	2.2	0.5	A
	Subtotal	826	812	98.3%	17.6	1.7	B
SB	Left Turn	1	1	70.0%	6.3	19.9	A
	Through	108	104	96.1%	46.9	5.1	D
	Right Turn	66	69	104.2%	24.0	4.3	C
	Subtotal	175	173	99.0%	37.1	4.2	D
EB	Left Turn	118	117	99.5%	59.1	5.5	E
	Through	628	612	97.5%	15.9	1.7	B
	Right Turn	6	7	111.7%	12.5	7.3	B
	Subtotal	752	737	97.9%	23.2	2.8	C
WB	Left Turn	382	378	98.9%	59.7	15.3	E
	Through	555	557	100.3%	11.1	1.6	B
	Right Turn	14	14	99.3%	2.9	1.1	A
	Subtotal	951	949	99.8%	30.3	5.2	C
<b>Total</b>		<b>2,704</b>	<b>2,671</b>	<b>98.8%</b>	<b>25.3</b>	<b>2.5</b>	<b>C</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 7 Highland Drive/Elgin Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	9	113.8%	1.2	0.6	A
	Through	733	722	98.5%	1.2	0.2	A
	Right Turn	23	23	100.9%	1.2	0.5	A
	Subtotal	764	754	98.7%	1.2	0.2	A
SB	Left Turn	13	15	115.4%	1.0	2.1	A
	Through	548	534	97.4%	1.4	0.3	A
	Right Turn	4	3	82.5%	0.3	0.4	A
	Subtotal	565	552	97.8%	1.4	0.3	A
EB	Left Turn						
	Through						
	Right Turn	18	17	94.4%	5.7	1.0	A
	Subtotal	18	17	94.4%	5.7	1.0	A
WB	Left Turn						
	Through						
	Right Turn	60	59	98.7%	12.1	1.1	B
	Subtotal	60	59	98.7%	12.1	1.1	B
Total		1,407	1,383	98.3%	1.9	0.2	A

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	33	32	96.7%	5.4	5.2	A
	Through	764	754	98.7%	0.6	0.1	A
	Right Turn						
	Subtotal	797	786	98.6%	0.7	0.2	A
SB	Left Turn						
	Through	543	529	97.5%	1.4	0.5	A
	Right Turn	23	23	97.8%	1.1	0.7	A
	Subtotal	566	552	97.5%	1.4	0.5	A
EB	Left Turn						
	Through						
	Right Turn	84	82	98.1%	12.5	6.0	B
	Subtotal	84	82	98.1%	12.5	6.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,447	1,420	98.1%	2.0	0.6	A

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 9 Highland Drive/Miller Avenue Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	63	66	104.1%	19.2	7.1	B
	Through	681	666	97.8%	7.0	1.1	A
	Right Turn	24	24	99.6%	7.6	4.2	A
	Subtotal	768	756	98.4%	8.1	1.5	A
SB	Left Turn	16	17	104.4%	17.2	9.0	B
	Through	562	546	97.1%	7.5	1.3	A
	Right Turn	47	48	101.9%	6.8	1.7	A
	Subtotal	625	610	97.6%	7.8	1.0	A
EB	Left Turn	89	92	103.4%	20.1	3.1	C
	Through	16	16	98.1%	23.1	5.9	C
	Right Turn	85	83	97.4%	15.8	1.5	B
	Subtotal	190	191	100.3%	18.5	1.4	B
WB	Left Turn	50	48	96.8%	20.0	3.7	B
	Through	8	7	92.5%	19.6	9.8	B
	Right Turn	26	27	105.0%	8.3	2.3	A
	Subtotal	84	83	98.9%	15.9	2.8	B
<b>Total</b>		<b>1,667</b>	<b>1,639</b>	<b>98.3%</b>	<b>9.9</b>	<b>0.6</b>	<b>A</b>

**Intersection 10 Highland Drive/Woodland Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	8	7	90.0%	6.7	5.8	A
	Through	775	766	98.8%	2.4	0.9	A
	Right Turn	5	5	104.0%	0.7	0.8	A
	Subtotal	788	778	98.7%	2.4	0.9	A
SB	Left Turn	14	15	109.3%	11.8	7.5	B
	Through	651	630	96.8%	1.0	0.5	A
	Right Turn	26	24	92.3%	0.8	1.0	A
	Subtotal	691	670	96.9%	1.2	0.6	A
EB	Left Turn						
	Through						
	Right Turn	47	44	93.6%	9.9	1.9	A
	Subtotal	47	44	93.6%	9.9	1.9	A
WB	Left Turn						
	Through						
	Right Turn	12	10	84.2%	14.3	4.2	B
	Subtotal	12	10	84.2%	14.3	4.2	B
<b>Total</b>		<b>1,538</b>	<b>1,502</b>	<b>97.7%</b>	<b>2.1</b>	<b>0.6</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 11 Highland Drive/3300 South Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	138	143	103.6%	46.0	6.2	D
	Through	498	487	97.8%	74.5	23.4	E
	Right Turn	112	115	102.3%	15.8	6.5	B
	Subtotal	748	744	99.5%	60.7	17.0	E
SB	Left Turn	124	124	99.8%	70.3	21.0	E
	Through	417	394	94.4%	38.3	2.7	D
	Right Turn	158	154	97.5%	29.9	6.2	C
	Subtotal	699	671	96.1%	42.2	3.7	D
EB	Left Turn	166	171	103.0%	23.9	4.9	C
	Through	525	520	99.0%	18.0	3.3	B
	Right Turn	235	236	100.6%	4.7	1.1	A
	Subtotal	926	927	100.1%	15.7	2.3	B
WB	Left Turn	132	136	102.9%	25.2	4.8	C
	Through	539	533	98.9%	23.0	3.6	C
	Right Turn	128	128	99.9%	19.2	5.7	B
	Subtotal	799	797	99.7%	22.8	3.3	C
Total		3,172	3,140	99.0%	36.1	5.1	D

**Intersection 12 Highland Drive/3350 South Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	17	16	94.7%	5.7	3.9	A
	Through	787	790	100.4%	32.0	19.4	D
	Right Turn	3	3	106.7%	11.7	26.9	B
	Subtotal	807	810	100.3%	31.3	18.9	D
SB	Left Turn	4	3	77.5%	6.7	11.4	A
	Through	707	688	97.2%	0.2	0.1	A
	Right Turn	69	70	101.3%	0.3	0.2	A
	Subtotal	780	761	97.5%	0.3	0.1	A
EB	Left Turn						
	Through						
	Right Turn	11	9	81.8%	8.1	1.7	A
Subtotal	11	9	81.8%	8.1	1.7	A	
WB	Left Turn	6	4	70.0%	26.2	72.0	D
	Through						
	Right Turn	8	8	97.5%	3.8	4.1	A
	Subtotal	14	12	85.7%	29.2	70.9	D
Total		1,612	1,591	98.7%	17.8	10.6	C

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 13**                      **Highland Drive/Luck Lane**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	56	53	95.0%	4.7	1.3	A
	Through	907	908	100.1%	2.0	1.5	A
	Right Turn						
	Subtotal	963	961	99.8%	2.2	1.4	A
SB	Left Turn						
	Through	676	654	96.7%	1.3	0.5	A
	Right Turn	69	66	95.5%	1.4	0.6	A
	Subtotal	745	720	96.6%	1.3	0.4	A
EB	Left Turn	11	12	104.5%	40.7	5.4	D
	Through						
	Right Turn	41	41	99.5%	7.3	0.5	A
	Subtotal	52	52	100.6%	15.4	2.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>1,760</b>	<b>1,734</b>	<b>98.5%</b>	<b>2.3</b>	<b>0.8</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 1**                      **1300 East/3300 South**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	76	76	100.0%	73.6	26.1	E
	Through	386	373	96.7%	74.7	20.4	E
	Right Turn	193	196	101.3%	58.3	20.6	E
	Subtotal	655	645	98.5%	69.3	21.2	E
SB	Left Turn	377	363	96.2%	64.9	28.8	E
	Through	514	507	98.5%	26.4	3.8	C
	Right Turn	201	206	102.6%	6.7	1.0	A
	Subtotal	1,092	1,075	98.5%	35.1	9.7	D
EB	Left Turn	274	266	96.9%	60.2	13.1	E
	Through	656	657	100.2%	41.4	3.8	D
	Right Turn	93	97	104.0%	38.0	7.5	D
	Subtotal	1,023	1,019	99.6%	45.5	4.7	D
WB	Left Turn	274	262	95.6%	54.9	9.5	D
	Through	700	681	97.3%	53.6	5.7	D
	Right Turn	343	329	95.8%	49.7	6.2	D
	Subtotal	1,317	1,272	96.5%	52.8	5.7	D
<b>Total</b>		<b>4,087</b>	<b>4,011</b>	<b>98.1%</b>	<b>49.0</b>	<b>4.6</b>	<b>D</b>

**Intersection 2**                      **1300 East/Brickyard Road**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	133	127	95.6%	21.2	11.2	C
	Through	880	848	96.4%	4.5	1.1	A
	Right Turn						
	Subtotal	1,013	975	96.3%	6.8	2.3	A
SB	Left Turn						
	Through	1,017	1,007	99.0%	2.4	1.1	A
	Right Turn	297	290	97.6%	0.2	0.2	A
	Subtotal	1,314	1,297	98.7%	1.9	0.8	A
EB	Left Turn	343	338	98.6%	52.3	4.6	D
	Through						
	Right Turn	185	188	101.7%	7.6	3.9	A
	Subtotal	528	526	99.7%	37.0	3.1	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>2,855</b>	<b>2,798</b>	<b>98.0%</b>	<b>11.0</b>	<b>1.4</b>	<b>B</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 3**                      **Richmond Street/Miller Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	992	970	97.8%	1.2	0.9	A
	Right Turn	231	217	94.0%	0.0	0.0	A
	Subtotal	1,223	1,187	97.1%	1.0	0.8	A
SB	Left Turn	89	88	99.1%	10.1	5.6	B
	Through	1,194	1,173	98.3%	5.1	5.2	A
	Right Turn						
	Subtotal	1,283	1,261	98.3%	5.5	5.2	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	120	124	103.3%	16.5	10.7	C
	Through						
	Right Turn	89	84	94.4%	10.8	5.2	B
	Subtotal	209	208	99.5%	14.4	8.8	B
<b>Total</b>		<b>2,715</b>	<b>2,657</b>	<b>97.8%</b>	<b>4.5</b>	<b>3.8</b>	<b>A</b>

**Intersection 4**                      **Richmond Street/Gunn Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	4	4	110.0%	1.2	2.2	A
	Through	956	936	97.9%	0.2	0.0	A
	Right Turn	121	114	94.4%	0.6	0.1	A
	Subtotal	1,081	1,055	97.6%	0.2	0.0	A
SB	Left Turn	59	57	96.1%	2.5	1.0	A
	Through	1,206	1,190	98.7%	0.8	0.4	A
	Right Turn	5	5	92.0%	0.5	0.6	A
	Subtotal	1,270	1,251	98.5%	0.8	0.4	A
EB	Left Turn	3	2	66.7%	5.3	8.6	A
	Through						
	Right Turn	5	5	102.0%	4.1	3.5	A
	Subtotal	8	7	88.8%	9.4	6.2	A
WB	Left Turn	72	68	94.9%	20.8	6.0	C
	Through						
	Right Turn	91	93	102.6%	12.3	3.4	B
	Subtotal	163	162	99.2%	16.0	3.8	C
<b>Total</b>		<b>2,522</b>	<b>2,475</b>	<b>98.1%</b>	<b>1.8</b>	<b>0.4</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 5**                      **Richmond Street/Elgin Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	30	92.2%	8.4	5.8	A
	Through	985	970	98.5%	0.4	0.2	A
	Right Turn	33	32	96.1%	0.6	0.3	A
	Subtotal	1,050	1,031	98.2%	0.7	0.4	A
SB	Left Turn	17	18	103.5%	6.0	3.1	A
	Through	1,210	1,193	98.6%	1.1	0.4	A
	Right Turn	3	4	116.7%	0.5	1.3	A
	Subtotal	1,230	1,214	98.7%	1.2	0.5	A
EB	Left Turn	4	5	115.0%	5.1	2.7	A
	Through	5	4	70.0%	4.3	3.7	A
	Right Turn	29	29	100.0%	6.0	0.4	A
	Subtotal	38	37	97.6%	6.2	0.3	A
WB	Left Turn	31	30	97.4%	18.2	5.9	C
	Through	4	4	90.0%	26.4	26.5	D
	Right Turn	34	34	100.6%	8.7	2.3	A
	Subtotal	69	68	98.6%	14.6	2.6	B
Total		2,387	2,350	98.4%	1.4	0.4	A

**Intersection 6**                      **Highland Drive/Richmond Street**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	4	73.3%	50.6	43.8	D
	Through	288	272	94.5%	42.9	3.8	D
	Right Turn	560	534	95.3%	2.3	0.5	A
	Subtotal	854	810	94.9%	15.6	1.8	B
SB	Left Turn	2	2	85.0%	5.5	11.8	A
	Through	354	349	98.6%	44.1	5.2	D
	Right Turn	269	269	100.0%	35.1	7.2	D
	Subtotal	625	620	99.2%	40.1	5.2	D
EB	Left Turn	215	207	96.4%	94.2	14.9	F
	Through	750	749	99.9%	49.6	10.5	D
	Right Turn	9	10	111.1%	36.7	21.7	D
	Subtotal	974	967	99.2%	58.4	10.4	E
WB	Left Turn	681	635	93.3%	134.5	46.6	F
	Through	1,013	984	97.1%	81.6	47.4	F
	Right Turn	33	32	96.7%	39.7	31.8	D
	Subtotal	1,727	1,651	95.6%	100.8	45.7	F
Total		4,180	4,048	96.8%	63.8	16.9	E



**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 7 Highland Drive/Elgin Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	14	110.8%	0.7	0.4	A
	Through	864	822	95.1%	1.1	0.1	A
	Right Turn	41	37	90.2%	1.2	0.4	A
	Subtotal	918	873	95.1%	1.1	0.1	A
SB	Left Turn	62	61	97.9%	34.0	32.6	D
	Through	942	850	90.2%	96.4	58.6	F
	Right Turn	16	13	83.8%	57.7	38.6	F
	Subtotal	1,020	924	90.6%	91.2	56.1	F
EB	Left Turn						
	Through						
	Right Turn	35	34	96.9%	14.3	6.2	B
	Subtotal	35	34	96.9%	14.3	6.2	B
WB	Left Turn						
	Through						
	Right Turn	36	34	95.0%	12.5	4.8	B
	Subtotal	36	34	95.0%	12.5	4.8	B
Total		2,009	1,865	92.8%	42.1	25.0	E

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	75	72	95.6%	16.6	4.2	C
	Through	918	874	95.2%	0.5	0.1	A
	Right Turn						
	Subtotal	993	946	95.2%	1.9	0.5	A
SB	Left Turn						
	Through	908	808	89.0%	43.0	18.9	E
	Right Turn	69	66	95.8%	37.6	21.2	E
	Subtotal	977	874	89.5%	42.6	18.9	E
EB	Left Turn						
	Through						
	Right Turn	68	69	100.7%	33.3	9.3	D
	Subtotal	68	69	100.7%	33.3	9.3	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,038	1,888	92.7%	20.3	7.6	C

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 9 Highland Drive/Miller Avenue Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	91	90	98.7%	85.9	27.7	F
	Through	856	809	94.5%	14.5	2.4	B
	Right Turn	55	55	100.0%	13.3	3.1	B
	Subtotal	1,002	954	95.2%	21.1	4.1	C
SB	Left Turn	14	14	102.1%	29.5	13.7	C
	Through	880	787	89.4%	25.2	5.5	C
	Right Turn	91	78	85.4%	22.3	3.3	C
	Subtotal	985	879	89.2%	25.1	5.3	C
EB	Left Turn	135	136	100.4%	26.1	6.2	C
	Through	27	31	113.7%	23.6	5.6	C
	Right Turn	113	108	95.5%	23.8	5.6	C
	Subtotal	275	274	99.7%	25.0	4.9	C
WB	Left Turn	77	72	94.0%	24.6	7.1	C
	Through	20	21	105.0%	16.0	8.7	B
	Right Turn	17	19	110.6%	8.7	6.6	A
	Subtotal	114	112	98.4%	20.4	5.5	C
Total		2,376	2,219	93.4%	23.1	3.7	C

**Intersection 10 Highland Drive/Woodland Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	6	4	68.3%	14.0	20.0	B
	Through	998	952	95.4%	10.0	6.0	B
	Right Turn	4	2	52.5%	2.0	4.8	A
	Subtotal	1,008	958	95.0%	10.1	6.0	B
SB	Left Turn	18	15	82.8%	13.4	9.4	B
	Through	998	899	90.1%	12.4	3.7	B
	Right Turn	44	41	93.4%	5.7	3.1	A
	Subtotal	1,060	955	90.1%	12.1	3.5	B
EB	Left Turn						
	Through						
	Right Turn	79	76	96.1%	22.9	6.3	C
	Subtotal	79	76	96.1%	22.9	6.3	C
WB	Left Turn						
	Through						
	Right Turn	19	17	90.0%	20.9	9.8	C
	Subtotal	19	17	90.0%	20.9	9.8	C
Total		2,166	2,006	92.6%	11.9	4.0	B

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 11 Highland Drive/3300 South Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	232	226	97.6%	73.9	18.7	E
	Through	574	530	92.3%	119.2	85.4	F
	Right Turn	148	145	98.1%	19.1	9.6	B
	Subtotal	954	902	94.5%	91.9	54.9	F
SB	Left Turn	205	187	91.0%	95.8	39.0	F
	Through	666	595	89.4%	58.0	5.8	E
	Right Turn	239	214	89.5%	52.0	5.9	D
	Subtotal	1,110	996	89.7%	64.3	9.1	E
EB	Left Turn	272	266	97.6%	92.2	32.4	F
	Through	782	757	96.8%	47.0	13.0	D
	Right Turn	301	296	98.2%	9.6	3.0	A
	Subtotal	1,355	1,318	97.3%	47.4	12.6	D
WB	Left Turn	192	201	104.7%	82.1	26.7	F
	Through	725	716	98.8%	57.1	15.8	E
	Right Turn	197	197	99.9%	63.7	30.9	E
	Subtotal	1,114	1,114	100.0%	63.3	18.0	E
<b>Total</b>		<b>4,533</b>	<b>4,330</b>	<b>95.5%</b>	<b>63.5</b>	<b>16.5</b>	<b>E</b>

**Intersection 12 Highland Drive/3350 South Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	30	92.8%	33.6	31.9	D
	Through	949	911	96.0%	81.0	59.2	F
	Right Turn	18	17	91.7%	65.6	58.7	F
	Subtotal	999	958	95.8%	79.2	58.0	F
SB	Left Turn	19	19	100.0%	24.9	15.5	C
	Through	1,011	954	94.4%	0.4	0.1	A
	Right Turn	133	122	91.7%	0.5	0.2	A
	Subtotal	1,163	1,095	94.1%	0.9	0.5	A
EB	Left Turn						
	Through						
	Right Turn	30	29	97.3%	9.0	2.2	A
	Subtotal	30	29	97.3%	9.0	2.2	A
WB	Left Turn	4	3	80.0%	19.1	25.3	C
	Through						
	Right Turn	14	13	90.7%	9.8	3.0	A
	Subtotal	18	16	88.3%	12.2	6.0	B
<b>Total</b>		<b>2,210</b>	<b>2,098</b>	<b>94.9%</b>	<b>36.5</b>	<b>26.6</b>	<b>E</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
Existing + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 13**                      **Highland Drive/Luck Lane**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	52	54	102.9%	45.4	76.7	D
	Through	1,000	978	97.8%	48.5	94.4	D
	Right Turn						
	Subtotal	1,052	1,032	98.1%	48.4	93.4	D
SB	Left Turn						
	Through	1,109	1,050	94.7%	5.6	3.8	A
	Right Turn	52	48	93.1%	1.9	0.8	A
	Subtotal	1,161	1,098	94.6%	5.4	3.6	A
EB	Left Turn	58	59	101.6%	42.7	17.3	D
	Through						
	Right Turn	111	110	98.6%	9.5	1.1	A
	Subtotal	169	168	99.6%	20.4	5.4	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>2,382</b>	<b>2,298</b>	<b>96.5%</b>	<b>26.0</b>	<b>44.3</b>	<b>C</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 1**                      **1300 East/3300 South**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	90	93	103.2%	51.7	20.4	D
	Through	443	433	97.6%	52.8	15.2	D
	Right Turn	225	232	103.0%	41.6	13.5	D
	Subtotal	758	757	99.9%	49.2	15.0	D
SB	Left Turn	193	187	97.1%	87.5	35.4	F
	Through	251	248	98.6%	27.0	4.4	C
	Right Turn	143	142	99.1%	5.1	1.6	A
	Subtotal	587	577	98.2%	41.7	11.7	D
EB	Left Turn	154	145	94.2%	33.1	7.8	C
	Through	509	514	101.0%	22.5	3.8	C
	Right Turn	39	42	106.4%	20.7	5.3	C
	Subtotal	702	701	99.8%	24.6	3.7	C
WB	Left Turn	160	154	96.4%	23.9	4.3	C
	Through	624	628	100.6%	15.2	2.2	B
	Right Turn	148	148	99.7%	14.1	3.3	B
	Subtotal	932	929	99.7%	16.6	2.0	B
<b>Total</b>		<b>2,979</b>	<b>2,964</b>	<b>99.5%</b>	<b>32.5</b>	<b>5.3</b>	<b>C</b>

**Intersection 2**                      **1300 East/Brickyard Road**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	57	56	98.4%	7.7	2.8	A
	Through	639	621	97.1%	2.2	0.2	A
	Right Turn						
	Subtotal	696	677	97.2%	2.6	0.3	A
SB	Left Turn						
	Through	558	555	99.5%	2.3	0.3	A
	Right Turn	173	170	98.3%	0.7	0.4	A
	Subtotal	731	725	99.2%	2.0	0.3	A
EB	Left Turn	108	107	98.7%	24.3	3.5	C
	Through						
	Right Turn	42	41	98.1%	5.4	1.9	A
	Subtotal	150	148	98.5%	19.0	3.2	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>1,577</b>	<b>1,550</b>	<b>98.3%</b>	<b>4.2</b>	<b>0.6</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 3**                      **Richmond Street/Miller Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	636	626	98.4%	0.5	0.3	A
	Right Turn	111	102	91.5%	0.0	0.0	A
	Subtotal	747	727	97.3%	0.4	0.2	A
SB	Left Turn	70	73	103.6%	7.4	4.5	A
	Through	635	628	98.9%	3.7	0.8	A
	Right Turn						
	Subtotal	705	700	99.3%	4.1	1.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	96	98	102.0%	14.2	3.7	B
	Through						
	Right Turn	58	56	97.1%	11.0	1.9	B
	Subtotal	154	154	100.1%	13.0	2.8	B
<b>Total</b>		<b>1,606</b>	<b>1,582</b>	<b>98.5%</b>	<b>4.1</b>	<b>0.8</b>	<b>A</b>

**Intersection 4**                      **Richmond Street/Gunn Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	5	98.0%	0.5	0.7	A
	Through	654	644	98.4%	0.1	0.1	A
	Right Turn	35	32	92.0%	0.5	0.2	A
	Subtotal	694	681	98.1%	0.1	0.1	A
SB	Left Turn	20	18	87.5%	0.9	0.8	A
	Through	614	613	99.8%	0.3	0.1	A
	Right Turn	4	4	107.5%	0.4	0.3	A
	Subtotal	638	635	99.5%	0.3	0.1	A
EB	Left Turn	2	1	65.0%	4.9	7.3	A
	Through						
	Right Turn	8	7	83.8%	7.1	0.7	A
	Subtotal	10	8	80.0%	7.9	1.4	A
WB	Left Turn	89	85	95.7%	24.9	6.9	C
	Through						
	Right Turn	106	108	101.9%	21.9	6.1	C
	Subtotal	195	193	99.1%	23.2	6.2	C
<b>Total</b>		<b>1,537</b>	<b>1,517</b>	<b>98.7%</b>	<b>5.3</b>	<b>1.3</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 5**                      **Richmond Street/Elgin Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	13	13	103.1%	2.5	2.2	A
	Through	732	724	98.9%	0.2	0.1	A
	Right Turn	17	15	88.2%	0.6	0.2	A
	Subtotal	762	753	98.8%	0.3	0.1	A
SB	Left Turn	11	12	112.7%	5.1	4.9	A
	Through	601	600	99.8%	0.5	0.1	A
	Right Turn	4	4	97.5%	0.3	0.2	A
	Subtotal	616	616	100.0%	0.5	0.1	A
EB	Left Turn	14	13	95.0%	7.4	1.9	A
	Through	5	5	106.0%	3.8	5.5	A
	Right Turn	24	24	97.9%	6.3	1.3	A
	Subtotal	43	42	97.9%	7.1	1.3	A
WB	Left Turn	13	12	92.3%	12.8	5.1	B
	Through						
	Right Turn	19	18	93.7%	7.0	1.3	A
	Subtotal	32	30	93.1%	10.1	2.5	B
<b>Total</b>		<b>1,453</b>	<b>1,441</b>	<b>99.1%</b>	<b>0.7</b>	<b>0.1</b>	<b>A</b>

**Intersection 6**                      **Highland Drive/Richmond Street**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	269	263	97.7%	43.5	2.1	D
	Right Turn	593	580	97.9%	3.0	0.9	A
	Subtotal	862	843	97.8%	15.5	1.5	B
SB	Left Turn	2	2	85.0%	25.2	40.5	C
	Through	112	108	96.3%	43.6	6.5	D
	Right Turn	68	70	103.2%	23.2	7.0	C
	Subtotal	182	180	98.7%	35.9	6.0	D
EB	Left Turn	122	121	98.9%	64.0	6.0	E
	Through	651	636	97.7%	18.6	2.5	B
	Right Turn	7	8	107.1%	8.4	8.9	A
	Subtotal	780	764	98.0%	26.0	2.1	C
WB	Left Turn	398	392	98.4%	61.2	20.1	E
	Through	580	581	100.1%	10.9	1.5	B
	Right Turn	15	15	98.7%	3.8	3.1	A
	Subtotal	993	987	99.4%	32.2	8.9	C
<b>Total</b>		<b>2,817</b>	<b>2,774</b>	<b>98.5%</b>	<b>25.5</b>	<b>3.2</b>	<b>C</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 7 Highland Drive/Elgin Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	9	94.4%	1.4	0.6	A
	Through	765	749	97.8%	1.2	0.1	A
	Right Turn	24	25	105.8%	1.0	0.4	A
	Subtotal	798	782	98.0%	1.2	0.1	A
SB	Left Turn	14	16	112.9%	0.4	0.3	A
	Through	570	556	97.5%	1.3	0.2	A
	Right Turn	5	5	108.0%	0.3	0.3	A
	Subtotal	589	577	97.9%	1.3	0.2	A
EB	Left Turn						
	Through						
	Right Turn	19	17	89.5%	5.9	1.1	A
	Subtotal	19	17	89.5%	5.9	1.1	A
WB	Left Turn						
	Through						
	Right Turn	63	61	97.1%	12.8	1.4	B
	Subtotal	63	61	97.1%	12.8	1.4	B
<b>Total</b>		<b>1,469</b>	<b>1,437</b>	<b>97.8%</b>	<b>1.9</b>	<b>0.1</b>	<b>A</b>

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	33	97.6%	3.0	1.9	A
	Through	798	782	97.9%	0.6	0.1	A
	Right Turn						
	Subtotal	832	815	97.9%	0.7	0.1	A
SB	Left Turn						
	Through	565	549	97.1%	1.6	0.9	A
	Right Turn	24	24	97.9%	1.1	0.4	A
	Subtotal	589	572	97.1%	1.6	0.8	A
EB	Left Turn						
	Through						
	Right Turn	85	84	99.3%	12.3	2.8	B
	Subtotal	85	84	99.3%	12.3	2.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>1,506</b>	<b>1,471</b>	<b>97.7%</b>	<b>2.0</b>	<b>0.5</b>	<b>A</b>



**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 9 Highland Drive/Miller Avenue Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	64	67	104.7%	19.8	5.3	B
	Through	713	696	97.6%	8.4	1.0	A
	Right Turn	25	23	93.2%	9.7	4.2	A
	Subtotal	802	786	98.0%	9.3	1.1	A
SB	Left Turn	17	18	104.7%	22.7	7.0	C
	Through	584	565	96.7%	7.4	1.0	A
	Right Turn	48	49	101.0%	6.3	2.0	A
	Subtotal	649	631	97.3%	7.8	0.9	A
EB	Left Turn	90	91	101.3%	20.7	4.2	C
	Through	17	17	100.6%	21.6	9.7	C
	Right Turn	86	82	95.7%	14.9	2.9	B
	Subtotal	193	191	98.8%	18.2	2.2	B
WB	Left Turn	52	49	95.0%	19.9	3.1	B
	Through	9	8	91.1%	16.9	11.5	B
	Right Turn	28	30	105.4%	8.6	1.9	A
	Subtotal	89	87	97.9%	15.5	3.2	B
<b>Total</b>		<b>1,733</b>	<b>1,695</b>	<b>97.8%</b>	<b>10.3</b>	<b>0.7</b>	<b>B</b>

**Intersection 10 Highland Drive/Woodland Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	9	9	101.1%	5.5	6.6	A
	Through	806	791	98.2%	2.5	0.8	A
	Right Turn	6	5	90.0%	1.4	2.2	A
	Subtotal	821	806	98.1%	2.5	0.8	A
SB	Left Turn	15	16	106.7%	14.5	8.4	B
	Through	673	648	96.3%	0.9	0.4	A
	Right Turn	26	25	94.6%	0.9	1.0	A
	Subtotal	714	689	96.5%	1.2	0.5	A
EB	Left Turn						
	Through						
	Right Turn	48	48	100.2%	9.5	1.0	A
	Subtotal	48	48	100.2%	9.5	1.0	A
WB	Left Turn						
	Through						
	Right Turn	16	14	87.5%	14.0	5.5	B
	Subtotal	16	14	87.5%	14.0	5.5	B
<b>Total</b>		<b>1,599</b>	<b>1,556</b>	<b>97.3%</b>	<b>2.2</b>	<b>0.5</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 11 Highland Drive/3300 South Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	143	147	102.4%	61.3	22.4	E
	Through	522	506	96.9%	97.9	32.1	F
	Right Turn	118	121	102.4%	19.6	5.3	B
	Subtotal	783	773	98.8%	78.4	22.7	E
SB	Left Turn	128	126	98.8%	73.0	25.0	E
	Through	434	411	94.6%	40.2	3.0	D
	Right Turn	159	156	98.0%	29.4	3.9	C
	Subtotal	721	693	96.1%	43.6	5.8	D
EB	Left Turn	169	174	103.1%	25.3	5.1	C
	Through	547	542	99.1%	16.8	2.4	B
	Right Turn	242	242	99.9%	3.8	0.6	A
	Subtotal	958	958	100.0%	15.0	1.4	B
WB	Left Turn	138	143	103.4%	27.5	3.8	C
	Through	566	560	98.9%	22.8	2.9	C
	Right Turn	134	134	100.0%	18.8	2.9	B
	Subtotal	838	837	99.8%	23.0	2.3	C
Total		3,300	3,260	98.8%	39.3	7.0	D

**Intersection 12 Highland Drive/3350 South Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	17	16	91.8%	14.3	15.4	B
	Through	824	825	100.1%	53.0	30.4	F
	Right Turn	4	5	117.5%	16.0	28.4	C
	Subtotal	845	846	100.1%	52.3	30.0	F
SB	Left Turn	5	6	110.0%	4.3	8.8	A
	Through	736	716	97.3%	0.3	0.1	A
	Right Turn	69	70	101.0%	0.3	0.2	A
	Subtotal	810	792	97.7%	0.3	0.1	A
EB	Left Turn						
	Through						
	Right Turn	12	9	75.8%	7.3	1.4	A
	Subtotal	12	9	75.8%	7.3	1.4	A
WB	Left Turn	7	6	84.3%	22.1	36.4	C
	Through						
	Right Turn	9	9	101.1%	11.4	9.7	B
	Subtotal	16	15	93.8%	17.7	25.6	C
Total		1,683	1,661	98.7%	28.9	17.0	D

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
**Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario**  
**AM Peak Hour**

**Intersection 13**                      **Highland Drive/Luck Lane**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	59	58	97.6%	5.6	2.9	A
	Through	950	951	100.1%	2.7	2.1	A
	Right Turn						
	Subtotal	1,009	1,009	100.0%	2.8	1.9	A
SB	Left Turn						
	Through	705	683	96.8%	1.2	0.4	A
	Right Turn	73	69	94.8%	1.3	0.4	A
	Subtotal	778	752	96.6%	1.3	0.4	A
EB	Left Turn	12	12	100.8%	40.4	3.5	D
	Through						
	Right Turn	44	42	95.9%	7.1	0.5	A
	Subtotal	56	54	97.0%	16.0	3.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>1,843</b>	<b>1,815</b>	<b>98.5%</b>	<b>2.8</b>	<b>1.3</b>	<b>A</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 1**                      **1300 East/3300 South**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	80	80	100.3%	95.3	24.2	F
	Through	402	389	96.7%	100.9	15.7	F
	Right Turn	198	195	98.3%	83.9	16.4	F
	Subtotal	680	664	97.6%	95.4	16.5	F
SB	Left Turn	388	365	94.1%	112.1	61.5	F
	Through	537	523	97.5%	30.9	7.7	C
	Right Turn	208	209	100.3%	11.8	7.2	B
	Subtotal	1,133	1,097	96.9%	55.4	25.7	E
EB	Left Turn	282	273	96.7%	122.3	64.6	F
	Through	685	683	99.8%	45.4	12.0	D
	Right Turn	97	101	103.9%	39.8	12.4	D
	Subtotal	1,064	1,057	99.3%	65.6	24.5	E
WB	Left Turn	281	260	92.6%	61.3	19.1	E
	Through	729	689	94.5%	51.1	7.4	D
	Right Turn	350	326	93.2%	45.2	14.1	D
	Subtotal	1,360	1,275	93.8%	51.8	10.4	D
<b>Total</b>		<b>4,237</b>	<b>4,093</b>	<b>96.6%</b>	<b>63.7</b>	<b>12.4</b>	<b>E</b>

**Intersection 2**                      **1300 East/Brickyard Road**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	139	130	93.2%	104.5	223.9	F
	Through	907	864	95.2%	4.1	1.5	A
	Right Turn						
	Subtotal	1,046	993	95.0%	9.2	6.1	A
SB	Left Turn						
	Through	1,055	1,036	98.2%	4.3	5.9	A
	Right Turn	311	305	98.1%	0.2	0.2	A
	Subtotal	1,366	1,341	98.2%	3.4	4.7	A
EB	Left Turn	359	355	98.9%	49.9	3.1	D
	Through						
	Right Turn	193	198	102.4%	22.0	47.7	C
	Subtotal	552	553	100.1%	41.2	18.4	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>2,964</b>	<b>2,887</b>	<b>97.4%</b>	<b>12.8</b>	<b>7.8</b>	<b>B</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 3**                      **Richmond Street/Miller Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,032	998	96.7%	1.3	0.6	A
	Right Turn	234	220	94.1%	0.0	0.0	A
	Subtotal	1,266	1,218	96.2%	1.1	0.5	A
SB	Left Turn	91	90	98.4%	11.3	8.6	B
	Through	1,245	1,219	97.9%	4.0	1.2	A
	Right Turn						
	Subtotal	1,336	1,309	97.9%	4.5	1.6	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	121	125	103.4%	15.6	4.3	C
	Through						
	Right Turn	91	88	96.3%	9.7	3.0	A
	Subtotal	212	213	100.3%	13.1	3.6	B
<b>Total</b>		<b>2,814</b>	<b>2,740</b>	<b>97.4%</b>	<b>3.9</b>	<b>1.1</b>	<b>A</b>

**Intersection 4**                      **Richmond Street/Gunn Avenue**                      **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	5	4	72.0%	2.6	7.2	A
	Through	996	967	97.1%	0.3	0.0	A
	Right Turn	122	114	93.4%	0.7	0.1	A
	Subtotal	1,123	1,084	96.5%	0.3	0.0	A
SB	Left Turn	60	58	96.8%	3.4	0.9	A
	Through	1,257	1,235	98.3%	0.7	0.2	A
	Right Turn	6	6	103.3%	0.5	0.3	A
	Subtotal	1,323	1,300	98.2%	0.8	0.2	A
EB	Left Turn	4	3	70.0%	3.6	4.9	A
	Through						
	Right Turn	6	5	86.7%	4.1	3.6	A
	Subtotal	10	8	80.0%	7.6	2.1	A
WB	Left Turn	73	70	95.5%	20.4	7.1	C
	Through						
	Right Turn	92	94	102.1%	12.4	3.4	B
	Subtotal	165	164	99.2%	15.8	5.5	C
<b>Total</b>		<b>2,621</b>	<b>2,555</b>	<b>97.5%</b>	<b>1.7</b>	<b>0.4</b>	<b>A</b>

Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
PM Peak Hour

Intersection 5 Richmond Street/Elgin Avenue Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	34	30	87.9%	10.6	5.7	B
	Through	1,023	1,000	97.7%	0.5	0.1	A
	Right Turn	35	33	92.9%	0.6	0.2	A
	Subtotal	1,092	1,062	97.3%	0.8	0.3	A
SB	Left Turn	18	19	106.1%	10.4	6.0	B
	Through	1,260	1,237	98.2%	1.6	0.9	A
	Right Turn	4	3	85.0%	0.4	0.6	A
	Subtotal	1,282	1,260	98.3%	1.7	0.9	A
EB	Left Turn	5	5	102.0%	5.4	4.3	A
	Through	6	4	70.0%	4.7	4.1	A
	Right Turn	30	31	103.3%	6.2	0.4	A
	Subtotal	41	40	98.3%	6.6	0.7	A
WB	Left Turn	33	31	94.8%	18.7	6.9	C
	Through	5	5	98.0%	17.5	19.2	C
	Right Turn	36	37	101.7%	9.2	2.7	A
	Subtotal	74	73	98.4%	14.7	3.1	B
Total		2,489	2,435	97.8%	1.8	0.5	A

Intersection 6 Highland Drive/Richmond Street Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	6	80.0%	48.8	41.6	D
	Through	300	280	93.4%	39.3	5.0	D
	Right Turn	583	548	93.9%	2.1	0.4	A
	Subtotal	890	834	93.7%	14.1	1.8	B
SB	Left Turn	3	3	83.3%	22.8	25.7	C
	Through	370	365	98.7%	51.7	12.3	D
	Right Turn	279	278	99.5%	38.9	9.4	D
	Subtotal	652	645	99.0%	46.0	10.3	D
EB	Left Turn	224	207	92.5%	169.3	32.1	F
	Through	779	745	95.6%	130.5	30.3	F
	Right Turn	10	10	100.0%	99.3	47.8	F
	Subtotal	1,013	962	94.9%	138.8	29.9	F
WB	Left Turn	707	661	93.4%	111.1	62.0	F
	Through	1,056	1,027	97.2%	72.0	54.5	E
	Right Turn	35	35	99.7%	36.8	37.1	D
	Subtotal	1,798	1,722	95.8%	86.0	57.4	F
Total		4,353	4,163	95.6%	77.1	26.9	E

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
 Future + Project Conditions - Highland Road Diet Mitigated - Greatest Impact Scenario  
**PM Peak Hour**

**Intersection 7 Highland Drive/Elgin Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	14	15	104.3%	0.9	0.5	A
	Through	899	842	93.6%	1.1	0.2	A
	Right Turn	42	38	89.5%	1.1	0.2	A
	Subtotal	955	894	93.6%	1.1	0.2	A
SB	Left Turn	66	63	95.0%	88.0	44.3	F
	Through	979	850	86.8%	178.9	43.3	F
	Right Turn	17	13	75.9%	99.8	50.2	F
	Subtotal	1,062	925	87.1%	171.9	43.0	F
EB	Left Turn						
	Through						
	Right Turn	37	36	95.9%	17.3	9.1	C
	Subtotal	37	36	95.9%	17.3	9.1	C
WB	Left Turn						
	Through						
	Right Turn	38	37	97.6%	11.4	3.0	B
	Subtotal	38	37	97.6%	11.4	3.0	B
<b>Total</b>		<b>2,092</b>	<b>1,892</b>	<b>90.4%</b>	<b>76.9</b>	<b>16.9</b>	<b>F</b>

**Intersection 8 Highland Drive/Gunn Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	76	72	94.5%	15.3	4.6	C
	Through	955	895	93.7%	0.4	0.1	A
	Right Turn						
	Subtotal	1,031	967	93.8%	1.7	0.6	A
SB	Left Turn						
	Through	946	815	86.2%	51.9	17.4	F
	Right Turn	70	63	90.4%	45.9	9.8	E
	Subtotal	1,016	879	86.5%	51.3	16.3	F
EB	Left Turn						
	Through						
	Right Turn	69	69	99.3%	35.3	10.8	E
	Subtotal	69	69	99.3%	35.3	10.8	E
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>2,116</b>	<b>1,914</b>	<b>90.4%</b>	<b>23.8</b>	<b>4.6</b>	<b>C</b>

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

**Millcreek Corridor Study**  
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**PM Peak Hour**

**Intersection 9 Highland Drive/Miller Avenue Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	92	86	93.2%	93.2	47.7	F
	Through	892	825	92.5%	16.0	1.3	B
	Right Turn	58	56	95.9%	13.3	3.9	B
	Subtotal	1,042	967	92.8%	22.9	5.3	C
SB	Left Turn	15	16	106.0%	35.7	17.9	D
	Through	916	794	86.7%	28.9	7.1	C
	Right Turn	93	78	83.5%	29.5	19.9	C
	Subtotal	1,024	888	86.7%	29.1	6.9	C
EB	Left Turn	137	139	101.2%	27.5	8.0	C
	Through	28	30	108.6%	31.1	19.2	C
	Right Turn	115	110	95.2%	26.2	9.0	C
	Subtotal	280	279	99.5%	27.6	9.7	C
WB	Left Turn	79	75	94.3%	27.1	6.7	C
	Through	21	24	112.9%	20.5	9.4	C
	Right Turn	18	19	106.7%	12.4	10.5	B
	Subtotal	118	117	99.5%	23.2	6.5	C
Total		2,464	2,250	91.3%	25.8	4.4	C

**Intersection 10 Highland Drive/Woodland Avenue Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	7	7	95.7%	26.8	30.8	D
	Through	1,037	960	92.6%	9.9	8.4	A
	Right Turn	5	4	82.0%	1.8	4.3	A
	Subtotal	1,049	971	92.6%	10.1	8.5	B
SB	Left Turn	19	16	82.1%	13.0	7.3	B
	Through	1,035	908	87.7%	7.1	2.5	A
	Right Turn	45	45	98.9%	4.6	5.0	A
	Subtotal	1,099	968	88.1%	7.1	2.5	A
EB	Left Turn						
	Through						
	Right Turn	81	79	97.7%	23.7	10.3	C
	Subtotal	81	79	97.7%	23.7	10.3	C
WB	Left Turn						
	Through						
	Right Turn	20	19	96.0%	20.8	9.6	C
	Subtotal	20	19	96.0%	20.8	9.6	C
Total		2,249	2,037	90.6%	8.7	4.8	A



Vissim Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

Millcreek Corridor Study  
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PM Peak Hour

Intersection 11 Highland Drive/3300 South Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	239	222	92.7%	94.7	32.4	F
	Through	600	537	89.4%	164.0	50.8	F
	Right Turn	155	145	93.4%	26.2	12.7	C
	Subtotal	994	903	90.8%	124.9	34.3	F
SB	Left Turn	213	193	90.8%	91.8	38.6	F
	Through	694	607	87.4%	58.1	6.4	E
	Right Turn	244	214	87.8%	48.7	9.2	D
	Subtotal	1,151	1,014	88.1%	63.0	7.9	E
EB	Left Turn	278	262	94.2%	109.8	23.0	F
	Through	816	776	95.1%	53.1	13.9	D
	Right Turn	310	293	94.6%	8.7	1.6	A
	Subtotal	1,404	1,331	94.8%	55.0	12.0	E
WB	Left Turn	200	207	103.5%	136.6	43.8	F
	Through	756	747	98.8%	90.4	39.0	F
	Right Turn	207	205	99.2%	88.5	44.8	F
	Subtotal	1,163	1,159	99.7%	99.4	37.2	F
Total		4,712	4,407	93.5%	82.2	12.7	F

Intersection 12 Highland Drive/3350 South Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	32	28	88.8%	62.4	27.4	F
	Through	988	911	92.2%	138.5	37.2	F
	Right Turn	19	17	88.4%	108.0	33.6	F
	Subtotal	1,039	956	92.0%	135.5	37.0	F
SB	Left Turn	20	18	90.0%	34.5	29.0	D
	Through	1,055	970	91.9%	0.3	0.1	A
	Right Turn	133	123	92.1%	0.4	0.2	A
	Subtotal	1,208	1,110	91.9%	1.0	0.7	A
EB	Left Turn						
	Through						
	Right Turn	31	29	93.9%	9.0	2.0	A
	Subtotal	31	29	93.9%	9.0	2.0	A
WB	Left Turn	5	5	92.0%	39.6	42.2	E
	Through						
	Right Turn	15	15	99.3%	18.9	20.4	C
	Subtotal	20	20	97.5%	25.4	30.4	D
Total		2,298	2,115	92.0%	59.0	12.6	F

**Vissim Post-Processor**  
**Average Results from 10 Runs**  
**Volume and Delay by Movement**

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**PM Peak Hour**

**Intersection 13**                      **Highland Drive/Luck Lane**                      **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	55	55	100.2%	65.3	73.4	E
	Through	1,040	993	95.5%	87.2	100.4	F
	Right Turn						
	Subtotal	1,095	1,048	95.7%	86.1	99.1	F
SB	Left Turn						
	Through	1,158	1,069	92.3%	7.1	3.0	A
	Right Turn	55	50	90.2%	2.3	1.0	A
	Subtotal	1,213	1,119	92.2%	6.9	2.9	A
EB	Left Turn	61	61	99.3%	54.2	17.9	D
	Through						
	Right Turn	117	116	99.0%	8.8	1.2	A
	Subtotal	178	176	99.1%	24.0	8.5	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
<b>Total</b>		<b>2,486</b>	<b>2,343</b>	<b>94.3%</b>	<b>41.7</b>	<b>44.8</b>	<b>D</b>