

GRAND PARK WEST

Buildout Intersection and Roadway Assessment

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I. INTRODUCTION

I.A Overview

This report provides an assessment of roadway and intersection conditions associated with completion of development within the western portion of the Grand Park development in Fraser, Colorado and is intended to supplement the prior traffic studies approved by the Town of Fraser for the Grand Park Development. Prepared to address items raised by the Town of Fraser, this report further analyzes the transportation needs associated with buildout of the site, including intersection laneage and traffic control and road classification. Buildout of this site will likely require decades, and individual planning areas within the site will be developed progressively over time.

The residential and commercial site generated traffic volumes estimated in this study are based on trip rates derived from national data from general U.S. suburban and urban neighborhoods as recorded in ITE's Trip Generation Manual (11th Edition). Inherent in these data is the assumption of consistent high levels of full time residential occupancy, likely in the 90-100 percent range. However, data published in the *Draft Town of Fraser Comprehensive Plan* (available online as of January 2026), drawing from the US Census Bureau 2022 Five-Year American Community Survey, indicates that this assumption does not reflect actual conditions in Fraser. According to the Census data, only approximately 39 percent of homes in Fraser are occupied year-round, while approximately 58 percent are classified as seasonal or vacation homes. As a result, actual residential occupancy — and corresponding daily and peak-hour traffic generation — is substantially lower than what would occur under a full-time occupancy scenario.

If these published occupancy rates were applied, residential-based traffic trips could be reduced by as much as 40 to 60 percent on an annual average basis, with higher volumes occurring only during limited peak holiday and winter weekend periods. Consequently, the trip generation and intersection volumes presented in this study should be understood as highly conservative, representing a theoretical maximum condition rather than typical or even frequent operating conditions. It is important that roadway infrastructure not be overbuilt to accommodate a 100 percent occupancy scenario that is inconsistent with documented resort-market statistics, as doing so could introduce urban-scale roadway elements into a rural resort environment. Nonetheless, the conservative nature of this analysis provides long-term assurance that the transportation system would remain adequate even under a hypothetical future scenario in which Fraser evolves into a fully year-round, suburban community.

This assessment provides an understanding of overall needs at buildout that can be phased and constructed over time as needed to serve individual portions of the development. Separate conformance analyses may be required as individual planning areas within the site are developed to ensure that each provides the infrastructure necessary to accommodate transportation needs.

I.B Prior Traffic Studies

The proposed development of the study area was previously evaluated in the following transportation studies:

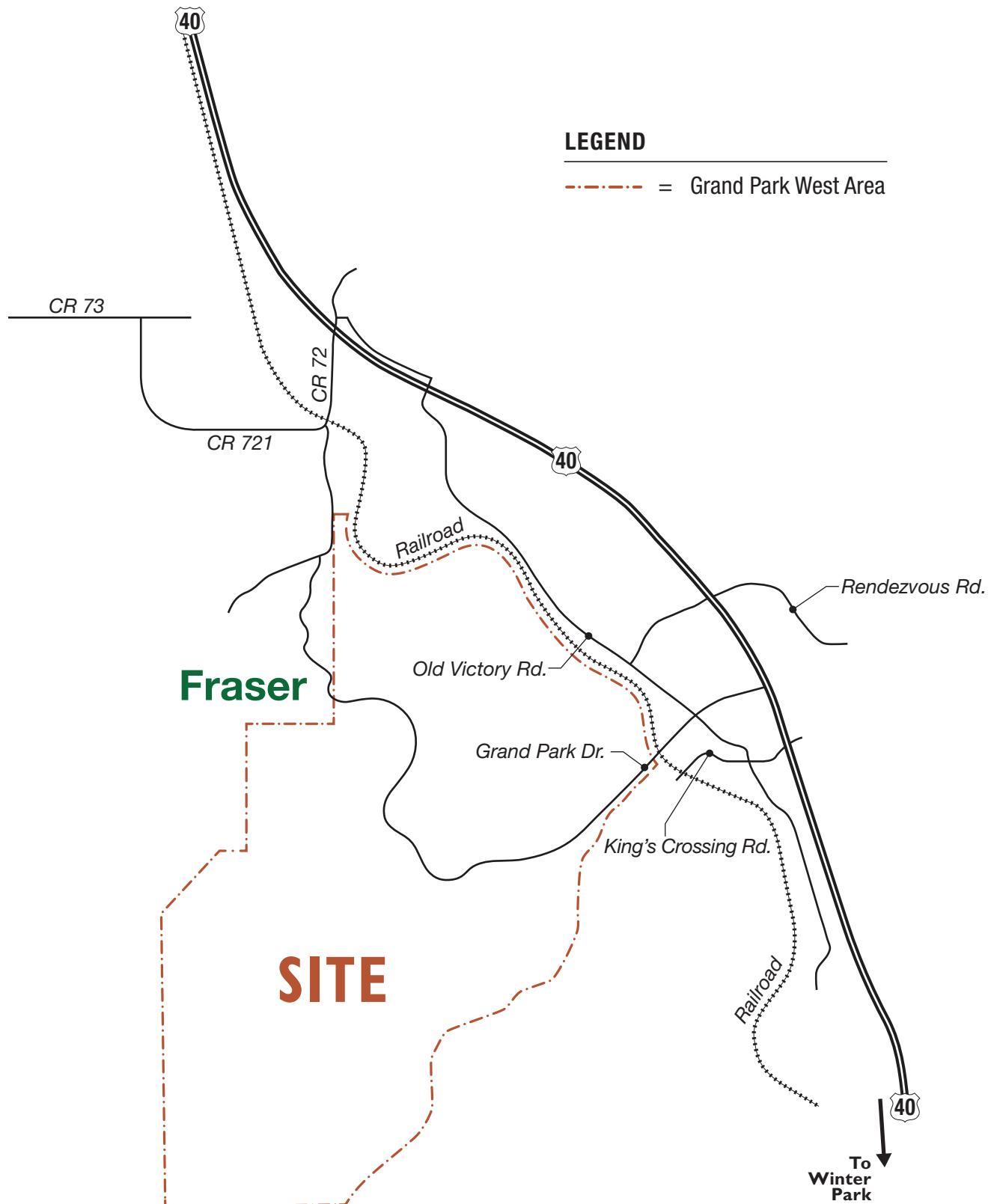
- **2004 RENDEzVOUS Traffic Impact Analysis (Master TIA).** For the study area, the Master TIA evaluated potential impacts of the development. This study addressed anticipated site access to US Highway 40 (US 40) and included traffic volume projections for roadways and intersections throughout the study area.

- **2013 Grand Park Traffic Impact Analysis.** This report was developed to address updates to proposed access to US 40 and the associated access permitting process through the Colorado Department of Transportation (CDOT). This study evaluated similar land use types and magnitudes to the Master TIA.
- **CDOT US Highway 40 Study.** In 2020, CDOT completed a study of US 40 addressing anticipated development-related growth throughout the Fraser River valley. The study incorporated development densities for all of Grand Park West and addressed impacts to intersections along US 40.

Taken together, these studies provide a reliable assessment of projected transportation conditions associated with development of Grand Park at large and Grand Park West as a portion. Over time, the infrastructure measures identified in the studies have been implemented alongside development of Grand Park as documentation has demonstrated consistency of each part with the Master TIA.

I.C Site Location and Study Area Boundaries

The Grand Park Community is located in the Upper Fraser Valley of Colorado to the west of US Highway 40 (US 40). Shown on **Figure 1**, The proposed development site lies within the portion of the Grand Park Community west of the Union Pacific Railroad (UPRR) line. The site covers approximately 1,018 Acres and proposed development types include a mix of residential, lodging/resort and commercial retail.



At buildout, Grand Park West is expected to include 1,527 residential dwellings, 630 lodgings and 65,000 square feet of commercial development.

The site plan is depicted on **Figure 2**. As shown and also on **Figure 1**, vehicular access to and through the site would be provided via Grand Park Drive, which passes under the UPRR tracks via a recently constructed underpass, then extends east to provide direct access to Old Victory Road, American Willow Drive and US 40. At the northwest end of the site, Grand Park Drive extends north to connect with County Road (CR) 72, which extends farther north to CR 721, eventually also connecting under the UPRR tracks to US 40.



NOTE: Drawing Not to Scale



NORTH

FIGURE 2

Grand Park West Overall Site Plan

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II. CONDITIONS WITHOUT DEVELOPMENT

This assessment includes a review of background (without development of Grand Park West) conditions at the time of buildout of surrounding development without any development complete within Grand Park West.

II.A Land Use and Roadway Network

Key land use activity in the vicinity of Grand Park West includes the following:

- Grand Park (East): The portion of Grand Park located east of the UPRR tracks is partially developed with commercial and residential uses including the Village at Grand Park mixed use development and Willows, Cozens Meadow, Cozens Pointe Condominiums, Elk Creek Condominiums, Elk Creek and Meadows residential neighborhoods.
- Byers Peak Ranch: The Byers Peak Ranch (BPR) development site is located on acreage north of the site and also west of the UPRR tracks. At buildout, the BPR site is expected to include nearly 1,900 dwelling and lodging units plus commercial and recreational uses. At the time of this assessment, development activity was centered on the northeastern portion of the site with the vast majority of the site yet to be developed.

The roadway network within Grand Park West as envisioned in **Figure 2** is currently incomplete, though rough unpaved roadway alignments were present at the time of this assessment. It is anticipated that Grand Park Drive through the site will serve only Grand Park West traffic as it would not provide efficient connectivity through and beyond the site.

II.B Traffic Volumes

Four intersections have been identified for analysis in this assessment, listed as follows:

To be constructed with Grand Park West development:

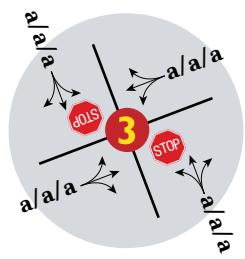
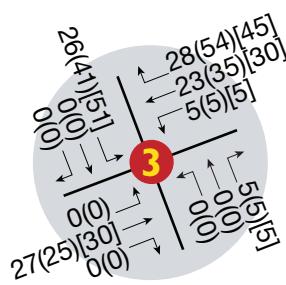
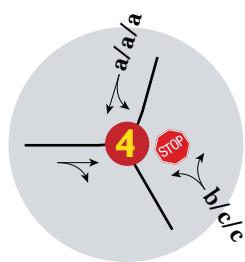
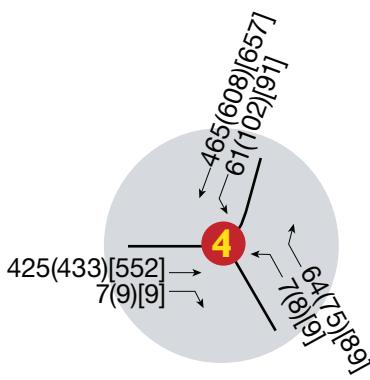
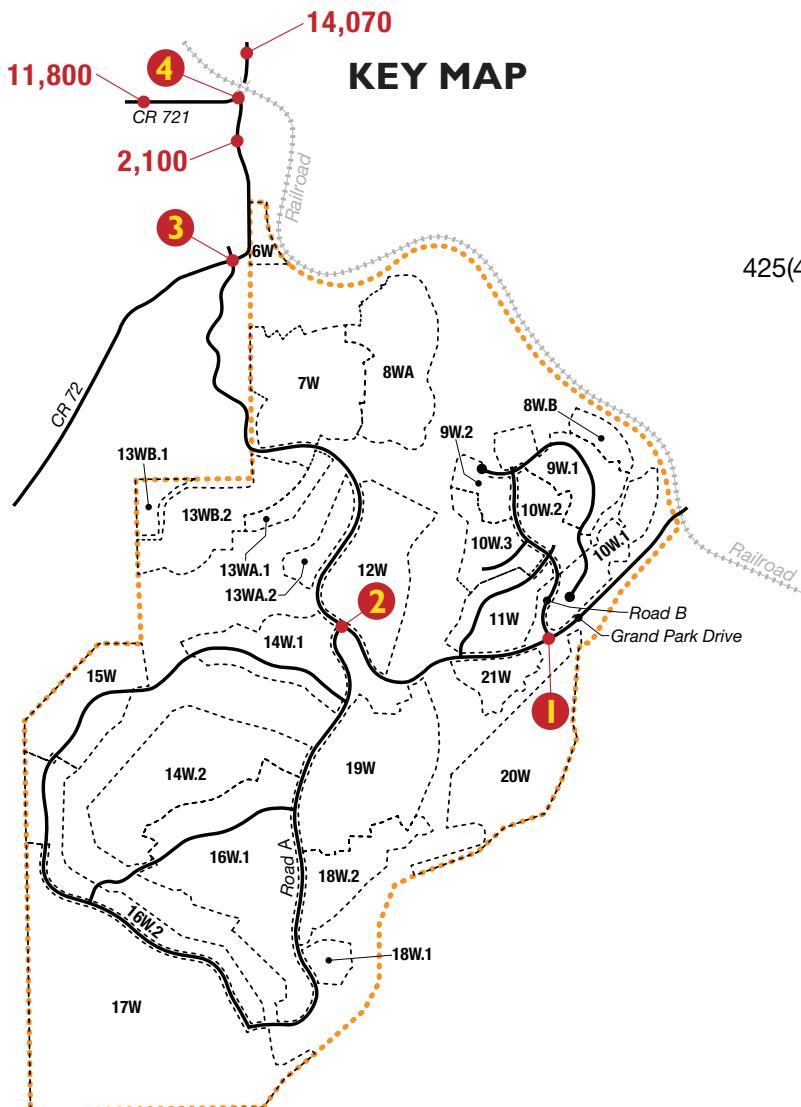
1. Grand Park Dr/Road B
2. Grand Park Dr/Road A

Currently in place:

3. Grand Park Dr/CR 72
4. CR 72/CR 721

For the purposes of projecting background traffic volumes, it was assumed that Byers Peak Ranch would be complete when buildout of Grand Park West is reached. Because intersections 1 and 2 would not exist apart from development of Grand Park West and are not expected to serve external traffic, background traffic volumes were only projected for intersections 3 and 4. **Figure 3** depicts buildout daily and peak hour background traffic volumes. Peak hours evaluated include the weekday midday and PM peak hours and the Saturday peak hour, consistent with the *Byers Peak Ranch Traffic Impact Study* completed in May of 2025. Long term future traffic volumes included in this TIS were also used to inform background projections for intersections 3 and 4.

KEY MAP



LEGEND

XXX(XXX)[XXX] = Midday(PM)[Saturday] Peak Hour Traffic Volumes
XXXX = Daily Traffic Volumes (Weekday)
 $x/x/x$ = Midday/AM/PM Peak Hour Unsignalized Movement Level of Service
 = Stop Sign

II.C Traffic Operations

Background traffic operations within the study area were evaluated according to techniques documented in the Highway Capacity Manual, 6th Edition, and executed using Trafficware's Synchro v.11 software. Operations were evaluated using the existing traffic volumes and intersection geometry. Level of Service (LOS) is a qualitative measure of traffic operational conditions based on roadway capacity and vehicle delay. LOS is described by a letter designation ranging from A to F, with LOS A representing almost free-flow travel, while LOS F represents congested conditions. For signalized intersections, LOS is reported as an average for the entire intersection.

As shown on **Figure 3**, all movements at intersections 3 and 4 are expected to operate at LOS C or better in the background condition. **Appendix A** provides the background condition LOS worksheets.

III. PROPOSED DEVELOPMENT

III.A Land Use

The plan for development of Grand Park West consists of 20 planning areas, enumerated 6W through 22W. **Figure 4** depicts the planning area layout throughout Grand Park West. Proposed commercial development lies primarily within the easternmost portion of the site in Planning Areas 8W through 11W. Proposed Single Family Detached homes are concentrated farther west. **Table I** provides a summary of planning areas and proposed land use totals.

Table I. Grand Park West Land Use Plan

Planning Area	Residential Units			Lodging Units	Commercial 1,000 Square Feet (KSF)
	Single Family Detached	Single Family Attached	Multifamily		
6W					
7W	78	28	72		
8Wa	95	104			
8Wb		44			
9W.1		56		250	6
9W.2					20
10W.1	38				
10W.2		4		238	39
10W.3			70	12	
11W	41				
12W	80			130	
13Wa.1	16				
13Wa.2	21				
13Wb.1	5				
13Wb.2	47				
14W.1	40				
14W.2	95				
15W	15				
16W.1	79				
16W.2	38				
17W	130				
18W	56				
19W	129				
20W	82				
21W		64			
TOTALS	1085	300	142	630	65

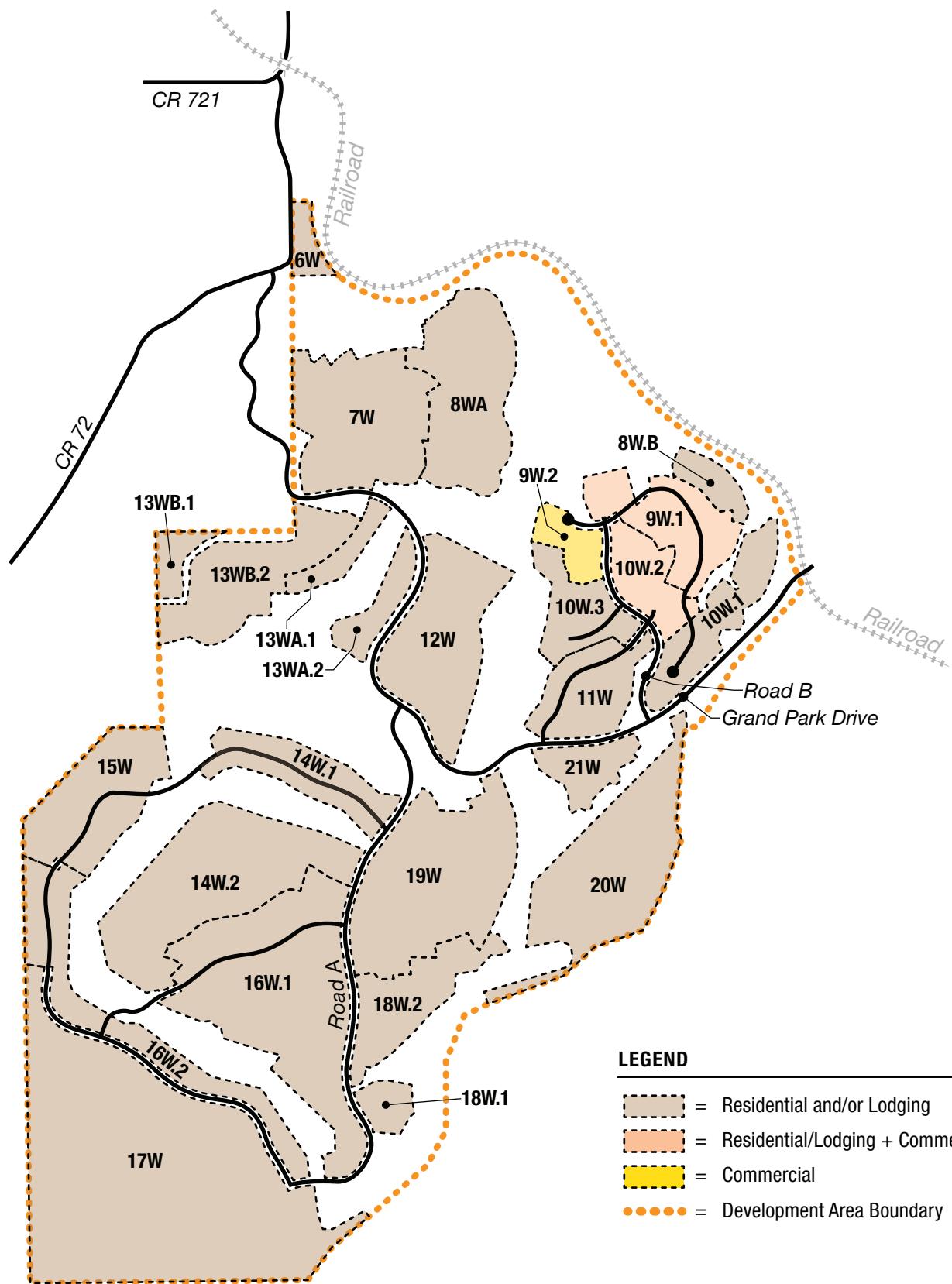


FIGURE 4
Grand Park West Land Use Plan
and Roadway Network

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III.B Trip Generation

The proposed development of Grand Park West would generate additional vehicle-trips along the surrounding roadway network. Trip generation estimates were completed using trip generation information from the *Institute of Transportation Engineers Trip Generation Manual (11th Edition)*.

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Table 2 provides a summary of estimated daily, weekday midday, weekday PM peak hour and Saturday peak hour vehicle-trip estimates.

Table 2. Grand Park West Estimated Trip Generation

Planning Area	Estimated Vehicle-Trips									
	Daily	Midday Peak Hour			PM Peak Hour			Saturday Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
7W	1423	38	36	74	78	48	126	62	56	118
8Wa	1645	46	45	91	91	57	148	75	71	146
8Wb	317	7	7	14	15	10	25	12	13	25
9W.1	2728	129	90	219	114	106	220	136	115	251
9W.2	1089	72	66	138	66	66	132	67	64	131
10W.1	358	12	11	23	22	13	35	19	16	35
10W.2	4055	235	187	422	201	198	399	228	201	429
10W.3	568	13	11	24	27	16	43	20	18	38
11W	349	12	11	23	22	13	35	18	16	34
12W	1793	76	56	132	86	66	152	93	75	168
13Wa.1	151	5	5	10	9	6	15	8	7	15

Planning Area	Estimated Vehicle-Trips										
	Daily	Midday Peak Hour			PM Peak Hour			Saturday Peak Hour			
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	
I3Wa.2	198	7	6	13	13	7	20	10	9	19	
I3Wb.1	47	2	1	3	3	2	5	3	2	5	
I3Wb.2	443	15	14	29	28	16	44	23	20	43	
I4W.1	377	12	12	24	24	14	38	20	17	37	
I4W.2	896	29	29	58	56	33	89	47	40	87	
I5W	141	5	4	9	9	5	14	8	6	14	
I6W.1	745	25	23	48	47	27	74	40	33	73	
I6W.2	358	13	11	24	22	14	36	19	16	35	
I7W	1226	41	38	79	76	46	122	64	55	119	
I8W	528	17	17	34	33	20	53	27	23	50	
I9W	1217	41	38	79	77	44	121	64	54	118	
I20W	773	26	24	50	49	28	77	41	35	76	
I21W	461	10	10	20	21	15	36	17	19	36	
TOTALS	21,886	888	752	1,640	1,189	870	2,059	1,121	981	2,102	

As shown, the proposed development of Grand Park West is estimated to generate approximately 22,000 vehicle-trips per day and up to 2,100 peak hour vehicle-trips. Upon buildout, it is likely that a portion of the estimated vehicle-trips will remain internal to Grand Park West. However, internal trips are not accounted for in this analysis as these trips would likely make use of the primary road network within Grand Park West.

Appendix B provides a comparison of these trip generation estimates with the estimates included in the Master TIA.

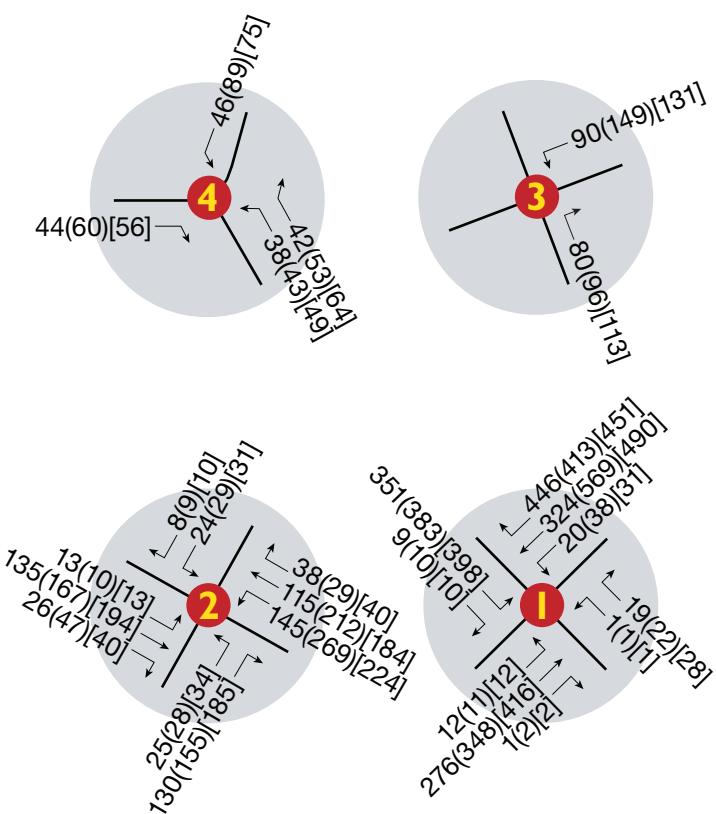
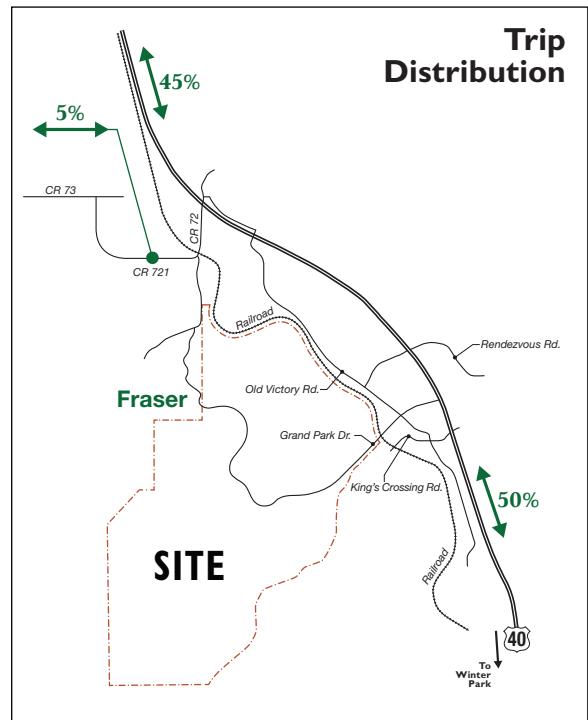
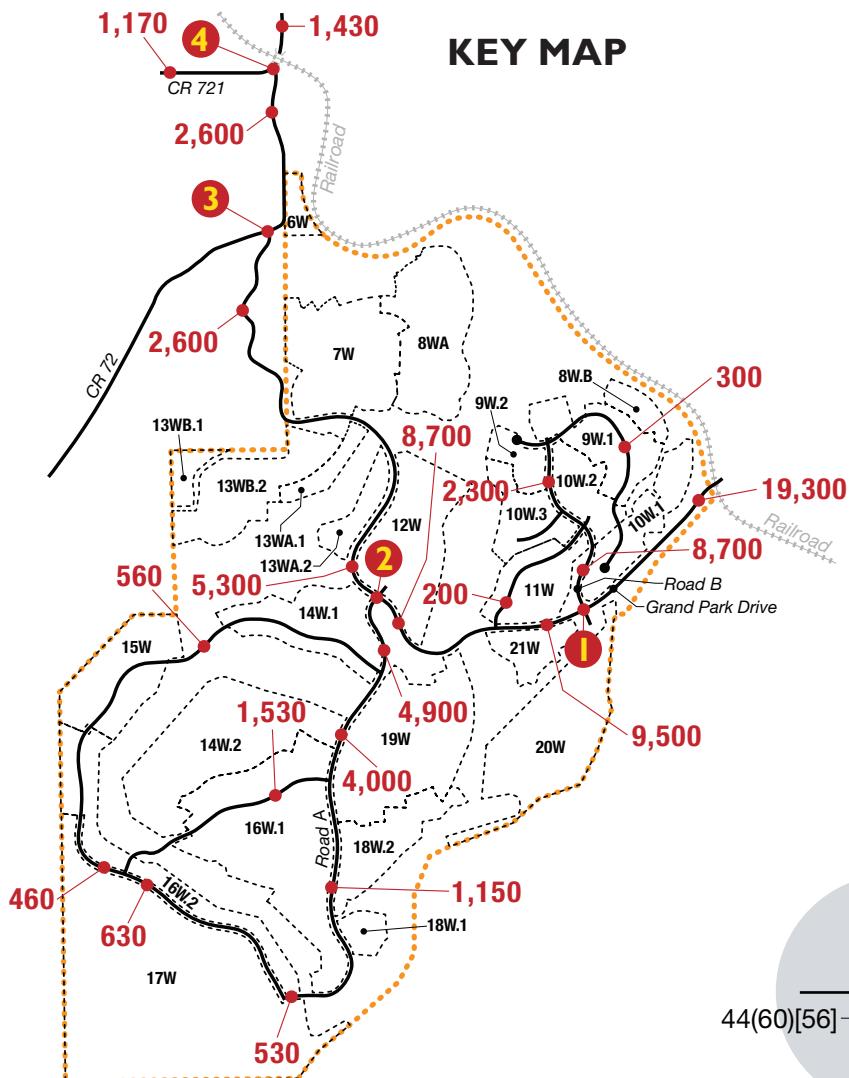
Table 3 provides a summary of trip generation rates utilized in the analysis from the Institute of Transportation Engineers *Trip Generation Manual* (11th Edition). Land Use Codes (LUC) were selected to best represent planned development types within Grand Park West.

Table 3. Trip Generation Rates Trip Generation (11th Edition)

Land Use Type	Trip Generation Rates											
	Variable	ITE LUC	Daily	Midday Peak Hour			PM Peak Hour			Saturday Peak Hour		
				IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Single-Family Detached	# Units	210	9.43	50%	50%	0.61	63%	37%	0.94	54%	46%	0.92
Single Family Attached	# Units	215	7.20	52%	48%	0.32	59%	41%	0.57	48%	52%	0.57
Multi-Family	# Units	220	6.74	52%	48%	0.23	63%	37%	0.51	50%	50%	0.41
Lodging	# Rooms	310	7.99	62%	38%	0.64	51%	49%	0.59	56%	44%	0.72
Commercial	1,000 SF	822	54.45	52%	48%	6.9	50%	50%	6.59	51%	49%	6.57

III.C Trip Assignment

The estimated site vehicle-trips were assigned to the study intersections using the site trip distribution assumptions shown on **Figure 5**. As shown, at site buildout it is assumed that generated trips will be equally split between north and south directions in the Fraser Valley. 50 percent of site trips would utilize US 40 south and 50 percent would travel to and from the north on US 40 (45 percent) or CR 721 (5 percent). **Figure 5** provides the assignment of site generated traffic volumes to the study intersections and roadways.



LEGEND

XXX(XXX)[XXX] = Midday(PM)[Saturday] Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes (Weekday)

XX% = Site Trip Distribution

FELSBURG
HOLT &
ULLEVIG

NOTE: Drawing Not to Scale

The logo consists of a dark teal triangle pointing upwards, with the word "NORTH" in a bold, dark teal, sans-serif font stacked directly beneath it.

FIGURE 5

Grand Park West Site Generated Traffic and Trip Distribution

V. BUILDOUT CONDITIONS

V.A Traffic Volumes

The site generated vehicle-trips on **Figure 5** were added to the background traffic volumes shown on **Figure 3** to arrive at the total buildout traffic volumes shown on **Figure 6**. As shown, Grand Park Drive is projected to carry the highest daily and peak hour traffic volumes – varying from 2,600 vpd on its northwest end to 19,300 vpd on its east end.

V.B Traffic Operations

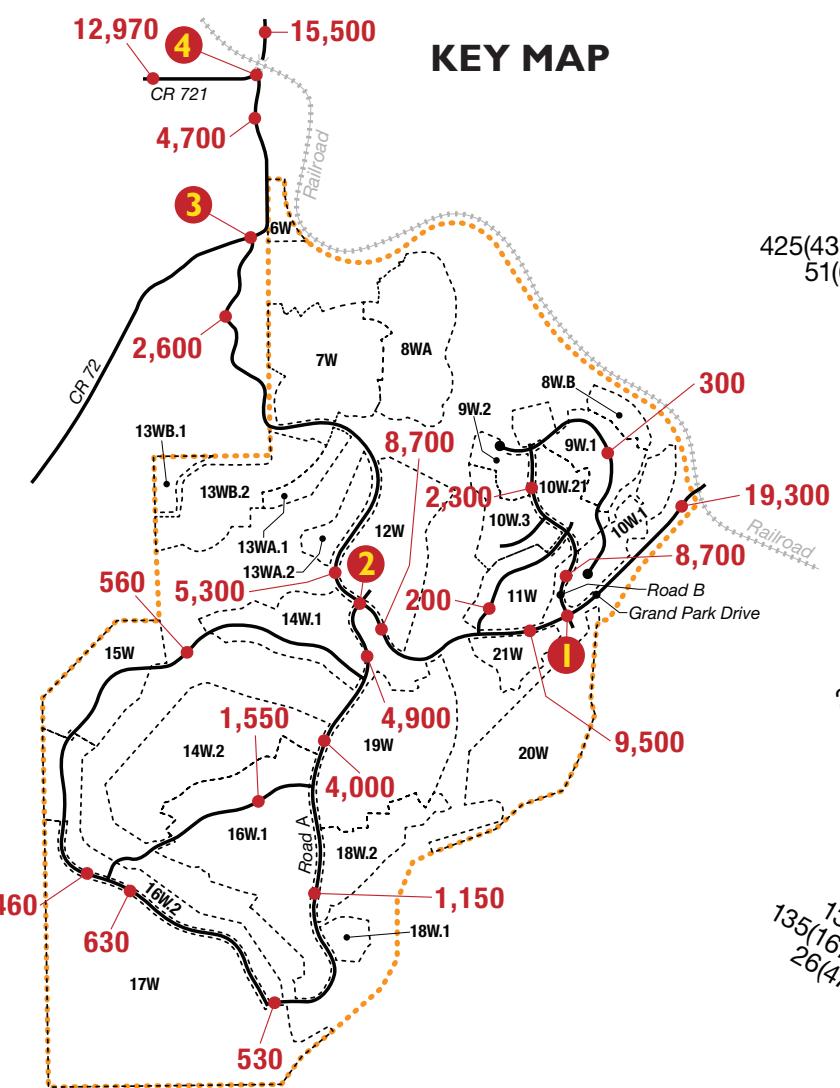
Figure 6 provides the results of LOS analyses of projected buildout conditions at the study intersections. The results are summarized below by intersection along with buildout recommendations:

1. **Grand Park Dr/Road B:** Accessing PA's 8-11, Road B is projected to carry a maximum of 8,700 vehicles per day (vpd). Operational analyses of this intersection began with the assumption of a traditional two-way stop controlled intersection with free eastbound and westbound movements along Grand Park Drive and stop control along the southbound Road B approach. In this configuration, the southbound approach movement would operate at LOS F during peak hours with volume-to-capacity (v/c) ratio exceeding 1.0 and queue lengths up to 600 feet.

Considering this substandard result, additional traffic control options were evaluated. While buildout traffic volumes at the intersection may satisfy signal warrant criteria, installation of a traffic signal at this location is not preferred given the mountainous development context. Therefore, a modern roundabout option was tested for operational benefit with the result that intersection movements could be improved to LOS C or better with a single lane roundabout. Roundabout traffic control is recommended at this intersection and is incorporated into current site plans.

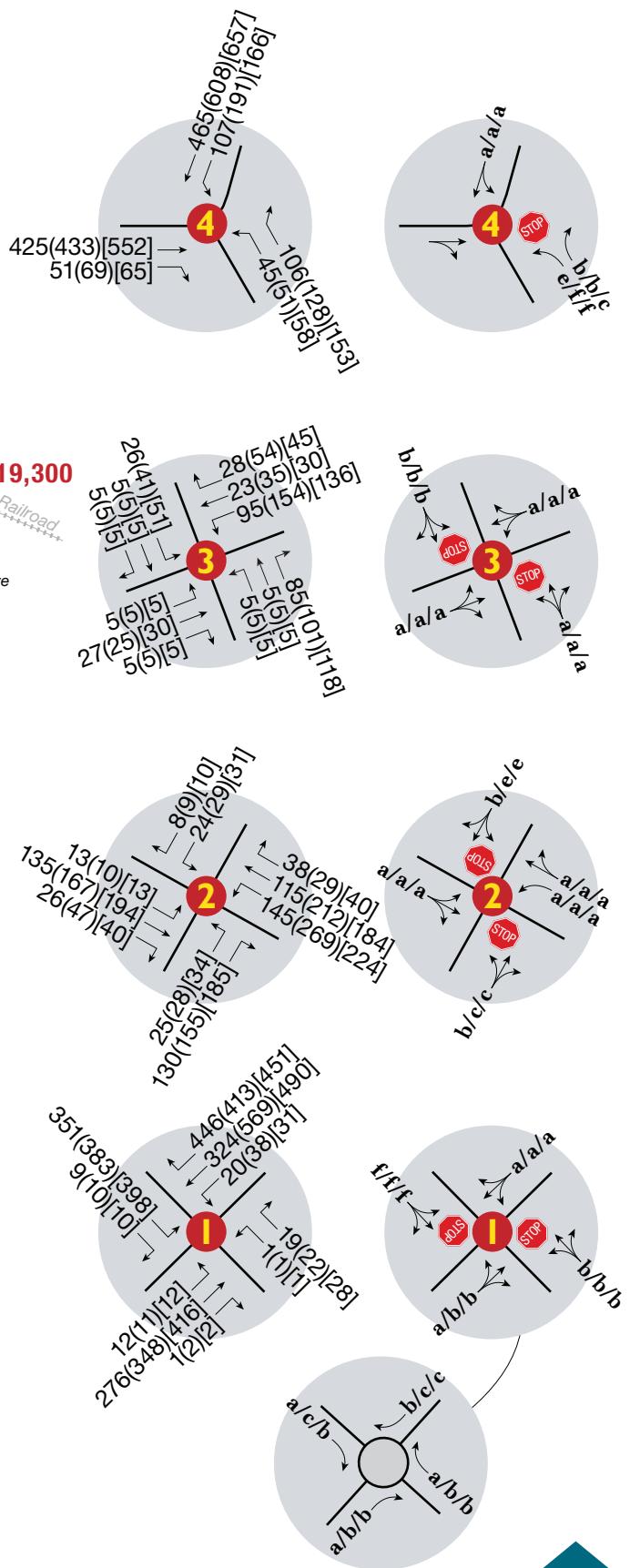
2. **Grand Park Dr/Road A:** Road A would serve PA's 14-19 and is projected to carry up to 4,900 vpd. Under stop sign control, movements through the intersection would operate at LOS C or better with v/c below 0.5 and a 75 ft or less queue length along the Road A approach. A westbound left-turn lane approximately 50 feet long is recommended to minimize interference with through traffic along Grand Park Drive.
3. **Grand Park Dr/CR 72:** Movements through this intersection would operate at LOS B or better under stop sign control, an acceptable LOS. It is recommended that stop sign control be provided along the Grand Park Drive approach to the intersection.
4. **CR 72/CR 721:** The stop-sign controlled northwest-bound left turn through this existing intersection is expected to operate at LOS F during the weekday PM and Saturday peak hours. The v/c ratio is 0.91 and the projected queue length is 125 feet. To address the LOS F condition at the time of buildout, it is recommended that the north-west bound approach be widened to provide a 125 ft. right-turn lane to help optimize operations. Based on a brief threshold analysis, it appears that the need for this widening would be triggered once development in the area reaches approximately 80 percent of full buildout levels.

Figure 6 depicts buildout traffic operations. **Appendix C** provides LOS worksheets.



LEGEND

- XXX(XXX)[XXX] = Midday(PM)[Saturday] Peak Hour Traffic Volumes
- XXXX** = Daily Traffic Volumes (Weekday)
- x/x** = Midday(PM)[Saturday] Peak Hour Unsignalized Movement Level of Service
- STOP** = Stop Sign



Roundabout Option



FIGURE 6

Grand Park West
Buildout Total Traffic Conditions

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V.C Road Classification

Applicable standards

A road classification system designates each roadway within a given network as a arterial, collector or local road based on the intended function of each. This hierarchy is routinely implemented for effective movement within and between developed communities. The Town of Fraser provides guidance on its expectations for road classification in its *Design Criteria and Construction Standards* document. Therein it is stated that, “The Town’s streets and roads are classified according to function and ADT’s (Average Daily Traffic).”

The Standards further state the following regarding road classification and function:

“The **arterial street** and road system links towns and other large traffic generators with minimal interference to through traffic movements and higher design speeds. and;

Collector streets and roads provide a link between arterial streets and roads and local streets. More moderate speeds are typical on collector streets and roads. and;

Local streets primarily provide access from collector and arterial streets and roads to adjacent neighborhoods and other developments. A local street is a street whose primary function is to provide access to residences, businesses or abutting property rather than to serve through traffic.”

As to ADT, the Town of Fraser standards establish a minimum volume of 601 vpd for arterials, 401-600 for collectors and less than 401 for local roads. The Fraser standards do not specify an assumed occupancy % for the residential density to be constructed and, as noted previously, residential site trip estimates were prepared based on typical suburban US neighborhood occupancy for this study which is greater than the occupancy level reported in the draft Fraser comprehensive plan and occupancy levels reported for vacation rentals which is more typically around 50%. The traffic trips reflected in this study are likely overstated for this reason. Therefore, daily traffic volumes throughout the site are unlikely to attain sustained levels near the values shown in this report.

Classification Recommendations

Based on a review of the projected ADT levels for the primary road network throughout the site, nearly all primary roadways in Grand Park West (Grand Park Drive, Road B, etc.) would be categorized as arterials. Exceptions may be found in the lower southwest corner of the site, where projected ADT is below 600 vpd along a number of streets. However, road classification should not be determined based solely on ADT.

Based on an assessment of the anticipated future function of each road and the overall network at buildout, it is recommended that Grand Park Drive be categorized as a arterial road through the site given its longer continuity.

Portions of connecting roads Road B and Road A should be categorized as collector roadways as these convey traffic from the arterial to local roads; the portion of Road A from Grand Park Drive to the south edge of the site and the portion of Road B from Grand Park Drive north to PA 9W.I.

The remainder of roadways within the site should be classified as local. Of note, the east-west roadway through PA 16W.I is projected to carry up to 1,550 vehicles per day under a full occupancy scenario. The role of this roadway within the Grand Park network is consistent with that of a local roadway and homes are planned to front onto this roadway. However, given the potential for higher traffic volumes at times, it is recommended that the roadway maintain a curvilinear alignment and neighborhood scale as depicted on the current site plan.

VI. TRANSIT

VI.A Transit Vision and Role in Grand Park West

Transit is envisioned as a core mobility system for Grand Park West rather than a supplemental or mitigation-only element. Given the scale of the development, its resort-oriented land use mix, and its strategic location between the Town of Fraser, the Town of Winter Park, and the Winter Park Ski Area, transit will play a primary role in daily travel, visitor movement, and peak winter transportation demand. Of note, the traffic volume estimates included in this report assumed no reduction to vehicle-trips associated with the provision of a transit system – such a reduction could be expected with the transit system envisioned herein.

Grand Park West is planned as a transit-served resort community, where residents, visitors, and employees can reliably move between residential neighborhoods, lodging, commercial destinations, recreational amenities, medical services, and regional attractions without dependence on private automobiles.

VI.B Regional Transit Integration – The Lift Transportation System

Transit service within Grand Park West should be provided through an expansion of The Lift Transportation System, operated by the Town of Winter Park. The Lift currently serves as the primary regional transit provider for the Upper Fraser Valley and is well-positioned to extend service westward into Grand Park West.

Expanding The Lift system into Grand Park West would:

- Provide direct, fare-free (or low-fare) connections to:
 - Town of Fraser
 - Town of Winter Park
 - Winter Park Ski Area
- support Fraser's commercial growth and sales tax base,
- improve access to employment, medical services and recreation, and
- reduce winter peak traffic volumes along US 40

This approach would leverage an existing, proven transit system rather than introducing a new standalone shuttle network.

VI.C Internal Transit Network Structure

Primary Spine Route – Grand Park Drive

The primary internal transit corridor within Grand Park West would be Grand Park Drive, which functions as the main internal collector roadway and connects all major land use areas.

The spine route would:

- Run the full length of Grand Park Drive
- Serve all major residential neighborhoods, lodging areas, commercial districts, and community amenities
- Provide direct connections to regional Lift routes serving Fraser, Winter Park, and the Ski Area

Neighborhood Loop Routes

To ensure full community coverage, neighborhood loop routes are envisioned to serve residential areas, club amenities, and lower-density neighborhoods located away from Grand Park Drive.

Neighborhood loops would:

- Operate with smaller shuttle vehicles,
- provide frequent, short-distance service,
- be timed to connect with the spine route, and
- minimize walking distances in winter conditions

This two-tier system ensures complete transit coverage throughout the project, including residential neighborhoods, lodging, commercial areas, and club facilities.

VI.D Transit Stop Locations and Spacing

Stop Spacing

Figure 7 provides conceptual locations for future transit stops within Grand Park West. Transit stops should be provided throughout Grand Park West with spacing appropriate for a resort community:

- Residential neighborhoods: approximately every 600–1,000 feet,
- commercial, lodging, and mixed-use areas: approximately every 800–1,200 feet, and
- major destinations: direct stop access regardless of spacing.

This spacing reflects:

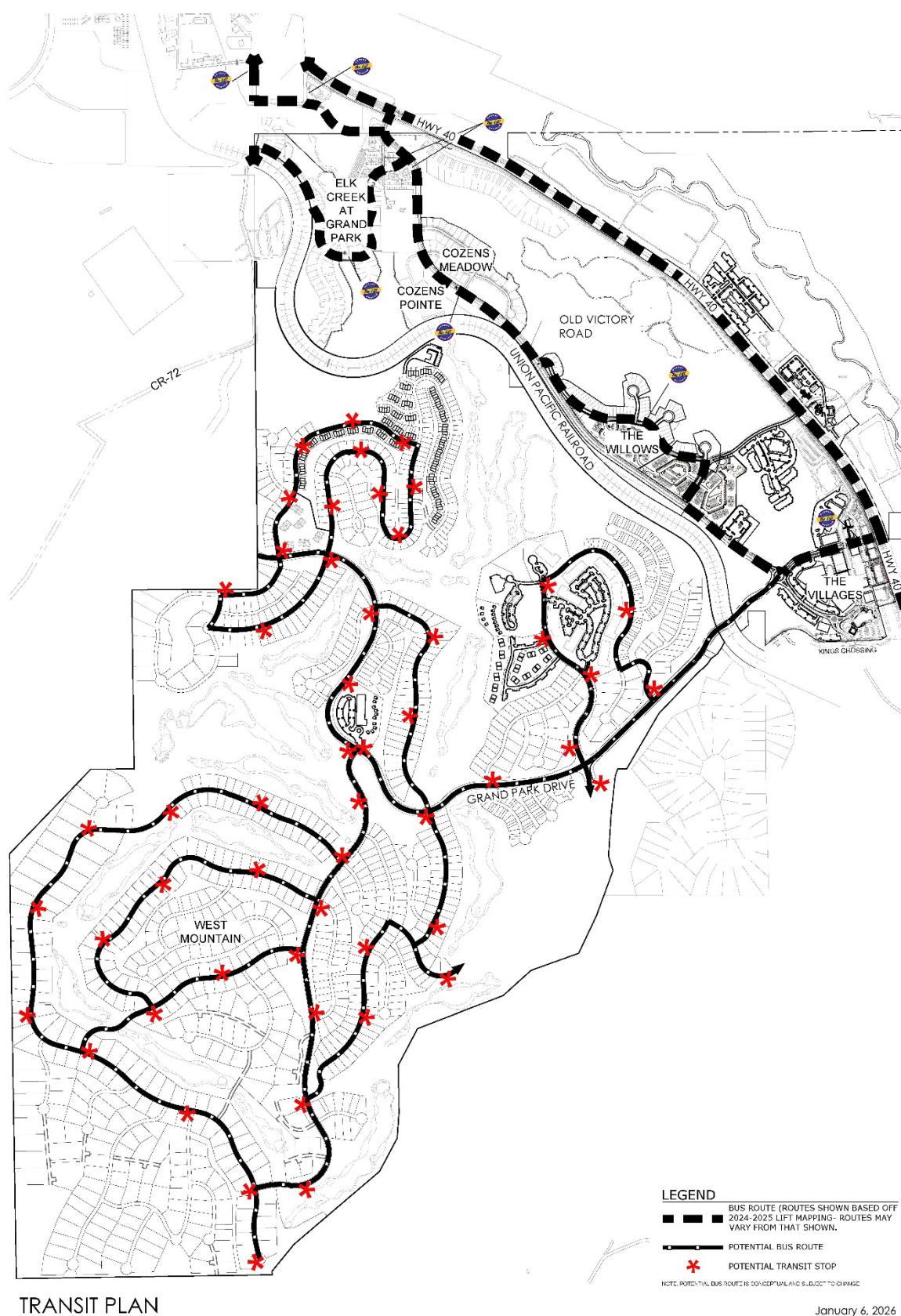
- Winter weather conditions,
- visitor travel patterns,
- the need to carry skis, groceries, and equipment, and
- industry standards in mountain resort communities

Key Transit Destinations

Transit stops should be located to directly serve the following destinations:

Within Grand Park West

- All residential planning areas,
- lodging and resort accommodations,
- commercial districts,
- private club and community amenities, and
- trailheads and open-space access points

Figure 7. Potential Future Transit Stops

January 6, 2026

Regional Destinations

- Grand Park Community Recreation Center
- Middle Park Medical / Fraser Hospital
- Foundry Bowl and Cinema
- Fraser commercial corridor and Safeway grocery store
- Town of Winter Park core
- Winter Park Ski Area base areas

Service Frequency and Seasonal Operations

Transit service should scale with seasonal demand and occupancy:

Peak Winter Season (Weekends & Holidays)

- Spine route: every 10–15 minutes
- Neighborhood loops: every 20–30 minutes

Regular Winter Weekdays

- Spine route: every 15–20 minutes
- Neighborhood loops: approximately every 30 minutes

Summer and Shoulder Seasons

- Spine route: every 20–30 minutes
- Neighborhood loops: reduced frequency or on-demand service

Off-Season

- Limited service, event-based service, or microtransit as demand warrants

Transit Implementation Thresholds

Transit implementation should be tied to occupancy, ridership, and seasonal demand, rather than unit count alone. This approach reflects the resort-oriented nature of Grand Park West and avoids premature infrastructure commitments.

Example thresholds include:

- Initiation of service with completion of first residences, or opening of first lodging and commercial areas
- Increased frequency as seasonal occupancy increases
- Expanded service hours and routes based on demonstrated ridership

VI.E Long-Term Ski Area Connectivity Opportunity

Grand Park West is uniquely positioned to potentially provide future lift-based access to the Winter Park Ski Area, specifically via a gondola connection to the Wild Spur Express lift and the Vasquez Ridge area.

A future gondola connection could:

- Substantially reduce winter peak traffic on US Highway 40,
- reduce parking demand at the Winter Park Ski Area,
- improve the visitor experience,
- provide the Town of Fraser with direct access to one of the region's largest recreational draws, and
- strengthen Fraser's identity as a resort destination.

This opportunity represents a long-term, transformative transportation strategy that complements transit investment and supports regional mobility goals. Roadway infrastructure within Grand Park West should be designed to remain compatible with this potential future connection.

VII. SUMMARY

This Buildout Intersection and Roadway Assessment and Transportation analysis provides insight into the expected travel patterns and traffic impacts associated with development of Grand Park West. Proposed development levels would include 1,527 residential units, 620 lodgings and 65 thousand square feet (KSF) of commercial development. Traffic impacts associated with the proposed development were previously addressed in the RENDEzVOUS Master Traffic Impact Analysis and other studies. The proposed land uses are consistent with prior studies. It is estimated that the proposed buildout of Grand Park West would generate more than 20,000 daily vehicle-trips and up to 2,000 vph during peak hours based on the conservative assumption of high residential occupancy rates.

If more locally accurate occupancy rates were applied to trip generation calculations, residential-based traffic trips could be reduced by as much as 40 to 60 percent on an annual average basis, with higher volumes occurring only during limited peak holiday and winter weekend periods. Consequently, the trip generation and intersection volumes presented in this study should be understood as highly conservative, representing a theoretical maximum condition rather than typical or even frequent operating conditions. It is important that roadway infrastructure not be overbuilt to accommodate a 100 percent occupancy scenario that is inconsistent with documented resort-market statistics, as doing so could introduce urban-scale roadway elements into a rural resort environment. Nonetheless, the conservative nature of this analysis provides long-term assurance that the transportation system would remain adequate even under a hypothetical future scenario in which Fraser evolves into a fully year-round, suburban community.

Findings and recommendations are described below by subject area:

Trip Generation Compliance

The current proposed development of Grand Park West is largely consistent with prior land use expectations and analyses such as those contained within the *Master TIA* and 2013 Grand Park TIA. Vehicle-trip generation estimates have increased, but primarily due to the use of the most current trip generation rates rather than appreciable difference in site land use expectations.

Traffic Operations

Four study intersections were addressed per request from the Town of Fraser. Traffic control and lane geometry recommendations follow:

1. **Grand Park Dr/Road B:** A modern roundabout option was tested for operational benefit with the result that intersection movements could be improved to LOS C or better with a single lane roundabout. Roundabout traffic control is recommended at this intersection.
2. **Grand Park Dr/Road A:** A westbound left-turn lane approximately 50 feet long is recommended to minimize interference with through traffic along Grand Park Drive.
3. **Grand Park Dr/CR 72:** Movements through this intersection would operate at LOS B or better under stop sign control, an acceptable LOS. It is recommended that stop sign control be provided along the Grand Park Drive approach to the intersection.
4. **CR 72/CR 721:** To address the LOS F condition at the time of buildout, it is recommended that the north-west bound approach be widened to provide a 125 ft. right-turn lane to help optimize operations. This widening would likely be needed when area buildout reaches approximately 80 percent of anticipated levels.

Road Classification

Grand Park Drive is categorized as a arterial road through the site, consistent with its classification. Portions of connecting roads Road B and Road A should be categorized as collector roadways as these convey traffic from the arterial to local roads; the portion of Road A from Grand Park Drive to the south edge of the site (approximately 1 mile in length through PA's 14W, 19W, 16W and 18W) and the portion of Road B from Grand Park Drive north to PA 9W.I. The remainder of roadways within the site should be classified as local.

Based on information provided by the development team, it is our understanding that the roadways within the site had previously (at the Planned District Development (PDD) stage in 2005) been specified as outlined above. Design efforts since that time have proceeded based on these classifications.

The recommendations included in this assessment are associated with full buildout of Grand Park West and are not required to be fully implemented with development of individual filings and/or planning areas. As each Planning Area is submitted to the Town of Fraser for review, its conformance with this assessment and any needed improvements triggered would be evaluated in individual conformance analyses prepared to address Town requirements.

Appendix A. Level of Service Worksheets – Background Condition

Intersection												
Int Delay, s/veh 3.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	27	5	5	23	28	5	5	5	26	5	5
Future Vol, veh/h	5	27	5	5	23	28	5	5	5	26	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	29	5	5	25	30	5	5	5	28	5	5
Major/Minor												
Major1		Major2		Minor1		Minor2						
Conflicting Flow All	55	0	0	34	0	0	97	107	32	97	94	40
Stage 1	-	-	-	-	-	-	42	42	-	50	50	-
Stage 2	-	-	-	-	-	-	55	65	-	47	44	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1550	-	-	1578	-	-	885	783	1042	885	796	1031
Stage 1	-	-	-	-	-	-	972	860	-	963	853	-
Stage 2	-	-	-	-	-	-	957	841	-	967	858	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1550	-	-	1578	-	-	872	778	1042	872	791	1031
Mov Cap-2 Maneuver	-	-	-	-	-	-	872	778	-	872	791	-
Stage 1	-	-	-	-	-	-	969	857	-	960	850	-
Stage 2	-	-	-	-	-	-	943	838	-	953	855	-
Approach												
EB			WB			NB			SB			
HCM Control Delay, s	1			0.7			9.1			9.3		
HCM LOS							A			A		
Minor Lane/Major Mvmt												
Capacity (veh/h)	884	1550	-	-	1578	-	-	878				
HCM Lane V/C Ratio	0.018	0.004	-	-	0.003	-	-	0.045				
HCM Control Delay (s)	9.1	7.3	0	-	7.3	0	-	9.3				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				

Intersection						
Int Delay, s/veh	1.4					
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	W	B		A		
Traffic Vol, veh/h	7	64	425	7	61	465
Future Vol, veh/h	7	64	425	7	61	465
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	70	462	8	66	505
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1103	466	0	0	470	0
Stage 1	466	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	234	597	-	-	1092	-
Stage 1	632	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	214	597	-	-	1092	-
Mov Cap-2 Maneuver	214	-	-	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Approach	NW	NE	SW			
HCM Control Delay, s	13.4	0	1			
HCM LOS	B					
Minor Lane/Major Mvmt	NET	NERNWLn1	SWL	SWT		
Capacity (veh/h)	-	-	507	1092	-	
HCM Lane V/C Ratio	-	-	0.152	0.061	-	
HCM Control Delay (s)	-	-	13.4	8.5	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-	

Intersection																
Int Delay, s/veh	6.8															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations	+	+	+	+	+	+	+	+	+	+	+					
Traffic Vol, veh/h	5	25	5	150	35	54	5	5	99	41	5	5				
Future Vol, veh/h	5	25	5	150	35	54	5	5	99	41	5	5				
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0				
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop				
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None				
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-				
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-				
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-				
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92				
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2				
Mvmt Flow	5	27	5	163	38	59	5	5	108	45	5	5				
Major/Minor																
Major1		Major2		Minor1		Minor2										
Conflicting Flow All	97	0	0	32	0	0	439	463	30	490	436	68				
Stage 1	-	-	-	-	-	-	40	40	-	394	394	-				
Stage 2	-	-	-	-	-	-	399	423	-	96	42	-				
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22				
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-				
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-				
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318				
Pot Cap-1 Maneuver	1496	-	-	1580	-	-	528	496	1044	489	514	995				
Stage 1	-	-	-	-	-	-	975	862	-	631	605	-				
Stage 2	-	-	-	-	-	-	627	588	-	911	860	-				
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-				
Mov Cap-1 Maneuver	1496	-	-	1580	-	-	476	440	1044	397	456	995				
Mov Cap-2 Maneuver	-	-	-	-	-	-	476	440	-	397	456	-				
Stage 1	-	-	-	-	-	-	972	859	-	629	538	-				
Stage 2	-	-	-	-	-	-	549	523	-	809	857	-				
Approach																
EB			WB			NB			SB							
HCM Control Delay, s	1.1		4.7		9.4		14.7									
HCM LOS						A		B								
Minor Lane/Major Mvmt																
Capacity (veh/h)	934	1496	-	-	1580	-	-	428								
HCM Lane V/C Ratio	0.127	0.004	-	-	0.103	-	-	0.13								
HCM Control Delay (s)	9.4	7.4	0	-	7.5	0	-	14.7								
HCM Lane LOS	A	A	A	-	A	A	-	B								
HCM 95th %tile Q(veh)	0.4	0	-	-	0.3	-	-	0.4								

Intersection						
Int Delay, s/veh	1.8					
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	W	B		A		
Traffic Vol, veh/h	8	75	433	9	102	608
Future Vol, veh/h	8	75	433	9	102	608
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	82	471	10	111	661
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1359	476	0	0	481	0
Stage 1	476	-	-	-	-	-
Stage 2	883	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	164	589	-	-	1082	-
Stage 1	625	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	137	589	-	-	1082	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	625	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Approach	NW	NE	SW			
HCM Control Delay, s	15.1	0	1.3			
HCM LOS	C					
Minor Lane/Major Mvmt	NET	NERNWLn1	SWL	SWT		
Capacity (veh/h)	-	-	447	1082	-	
HCM Lane V/C Ratio	-	-	0.202	0.102	-	
HCM Control Delay (s)	-	-	15.1	8.7	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-	

Intersection

Int Delay, s/veh 7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	30	5	132	30	45	5	5	116	51	5	5
Future Vol, veh/h	5	30	5	132	30	45	5	5	116	51	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	33	5	143	33	49	5	5	126	55	5	5

Major/Minor	Major1	Major2		Minor1		Minor2						
Conflicting Flow All	82	0	0	38	0	0	395	414	36	455	392	58
Stage 1	-	-	-	-	-	-	46	46	-	344	344	-
Stage 2	-	-	-	-	-	-	349	368	-	111	48	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1515	-	-	1572	-	-	565	529	1037	515	544	1008
Stage 1	-	-	-	-	-	-	968	857	-	671	637	-
Stage 2	-	-	-	-	-	-	667	621	-	894	855	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1515	-	-	1572	-	-	515	477	1037	415	490	1008
Mov Cap-2 Maneuver	-	-	-	-	-	-	515	477	-	415	490	-
Stage 1	-	-	-	-	-	-	965	854	-	669	576	-
Stage 2	-	-	-	-	-	-	594	561	-	778	852	-

Approach	EB	WB		NB		SB			
HCM Control Delay, s	0.9	4.8		9.4		14.6			
HCM LOS				A		B			
<hr/>									
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	
Capacity (veh/h)	954	1515	-	-	1572	-	-	442	
HCM Lane V/C Ratio	0.144	0.004	-	-	0.091	-	-	0.15	
HCM Control Delay (s)	9.4	7.4	0	-	7.5	0	-	14.6	
HCM Lane LOS	A	A	A	-	A	A	-	B	
HCM 95th %tile Q(veh)	0.5	0	-	-	0.3	-	-	0.5	

Intersection						
Int Delay, s/veh	1.9					
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	W	B		A		
Traffic Vol, veh/h	9	89	552	9	91	657
Future Vol, veh/h	9	89	552	9	91	657
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	97	600	10	99	714
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1517	605	0	0	610	0
Stage 1	605	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	131	498	-	-	969	-
Stage 1	545	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	109	498	-	-	969	-
Mov Cap-2 Maneuver	109	-	-	-	-	-
Stage 1	545	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Approach	NW	NE	SW			
HCM Control Delay, s	18.4	0	1.1			
HCM LOS	C					
Minor Lane/Major Mvmt	NET	NERNWLn1	SWL	SWT		
Capacity (veh/h)	-	-	375	969	-	
HCM Lane V/C Ratio	-	-	0.284	0.102	-	
HCM Control Delay (s)	-	-	18.4	9.1	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	1.2	0.3	-	

Appendix B. Trip Generation Conformance Review



ORIGINAL: April 22, 2025

UPDATED: September 22, 2025

Town of Fraser
153 Fraser Avenue
Fraser, CO 80442
Attn: Garrett Scott, Town Planner

RE: Grand Park West Traffic Consistency/Conformance Review
FHU Project No. 125152-01

Dear Mr. Scott:

West Mountain Development LLC requested that I provide an analysis of the West Mountain FPDP with regard to its compliance with the 2004 Traffic Impact Analysis as they prepare to develop the Western portion of the Grand Park development in Fraser, Colorado. The area, Grand Park West, encompasses approximately 1,020 Acres, lies west of the Union Pacific Railroad tracks and incorporates Grand Park Planning Areas 6W through 23W. The proposed development of Grand Park West, termed the “study area” in this letter, includes a mix of residential dwelling units, lodging and commercial development, with locations farther west within the portion more residential in nature. **Figure 1** provides the current development plan.

Per your request, this letter addresses whether the current development plan and associated transportation outcomes is consistent with previous development and traffic studies prepared for the area. The letter identifies prior traffic studies pertaining to the area, describes the current land use and transportation plan in light of prior plans, and provides a vehicle-trip trip generation comparison between the current and prior plans. After review we can confirm that the prior traffic studies provide a reliable assessment of projected transportation conditions associated with development of Grand Park and Grand Park West; and the current proposed land use and roadway network plan for Grand Park West is consistent with prior approved plans.

Prior Traffic Studies

The proposed development of the study area was previously evaluated in the following transportation studies:

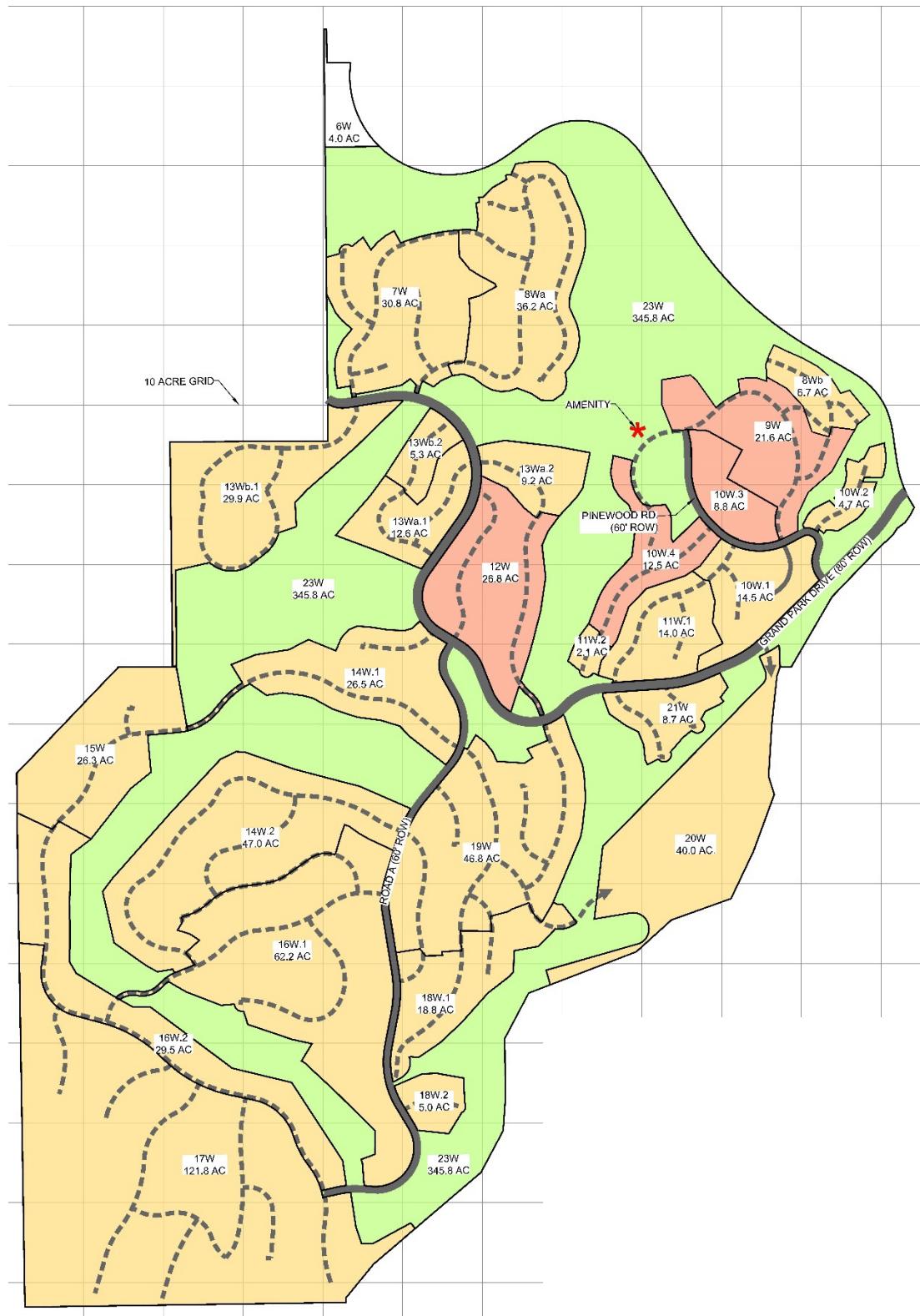
- **2004 RENDEzVOUS Traffic Impact Analysis (Master TIA).** For the study area, the Master TIA evaluated potential impacts of development of 686 detached residential dwelling units, 887 attached residential dwelling units, 700 lodging units and 50 thousand square feet of commercial development. This study addressed anticipated site access to US Highway 40 (US 40) and included traffic volume projections for roadways and intersections throughout the study area. **Figure 2** depicts the development plan from this report.
- **2013 Grand Park Traffic Impact Analysis.** This report was developed to address updates to proposed access to US 40 and the associated access permitting process through the Colorado Department of Transportation (CDOT). This study evaluated similar land use types and magnitudes to the Master TIA, anticipating approximately 843 detached dwelling units, 658 attached units, 305 lodging units and 30 thousand square feet of commercial development within the study area.
- **CDOT US Highway 40 Study.** In 2020, CDOT completed a study of US 40 addressing anticipated development-related growth throughout the Fraser River valley. The study incorporated development expectations for Grand Park West and addressed impacts to intersections along US 40.

September 22, 2025

Town of Fraser

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Figure 1. Current Grand Park West Development Plan

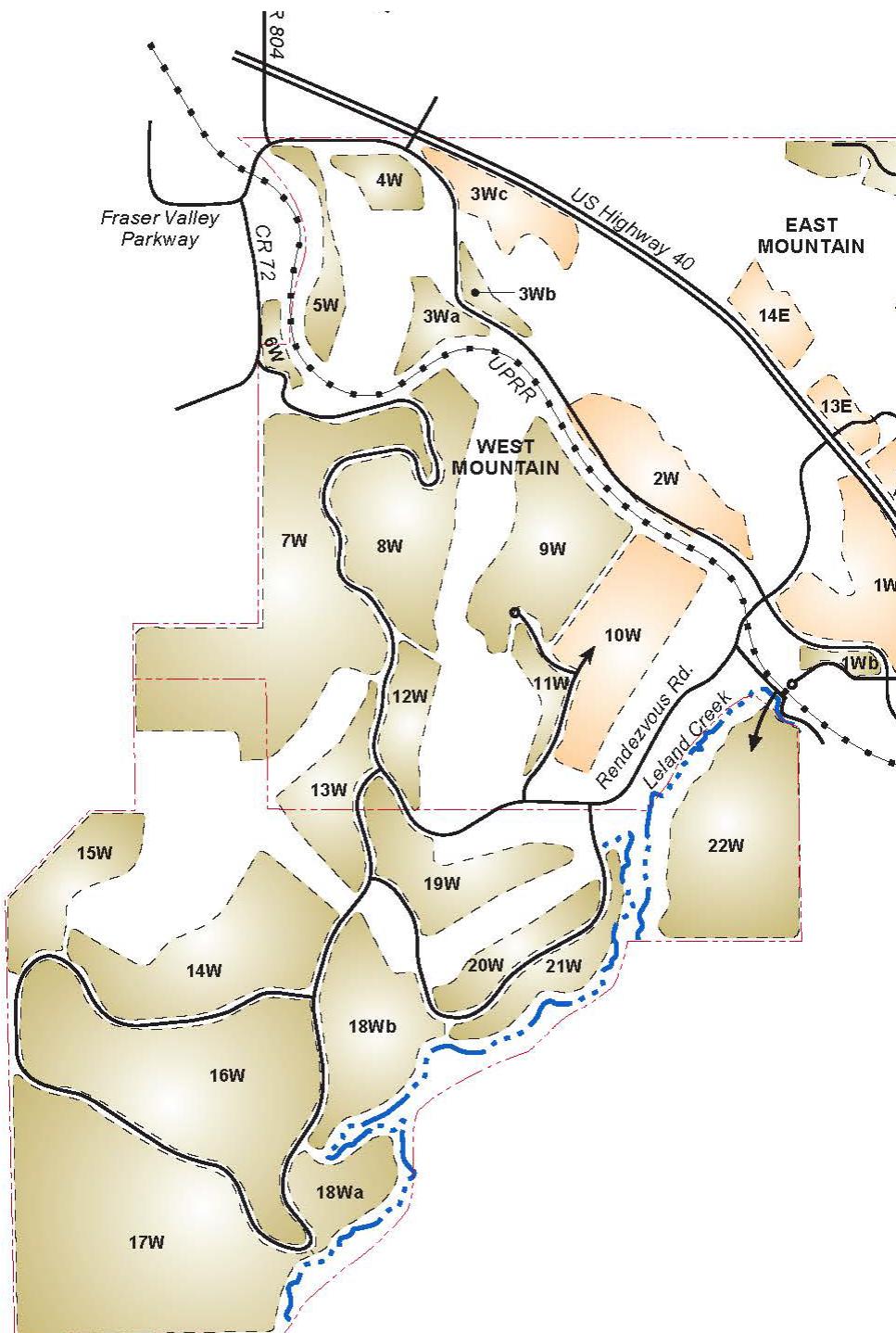


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Figure 2. Grand Park West Development Plan (2004 Study)



Taken together, these studies provide a reliable assessment of projected transportation conditions associated with development of Grand Park at large and Grand Park West as a portion. Over time, the infrastructure measures identified in the studies have been implemented alongside development of Grand Park as documentation has demonstrated consistency of each part with the Master TIA.

Development Plan Comparison

Figure 1 and **Figure 2** provide a view of the current and 2004 site plans for Grand Park West, respectively. As shown, the planning areas (6W through 22W) included within Grand Park West are similar between the two plans, though there are adjustments to land coverage of each PA and the planned alignments of streets serving the area. **Table I** provides a comparison of land use magnitude and type between the Master TIA and current land use for Grand Park West.

Table I. Grand Park West Land Use Plan Comparison – Master TIA vs. Current

Master TIA Land Use						Current Land Use					
Planning Area	Residential			Lodging	Comm KSF	Planning Area	Residential			Lodging	Comm KSF
	SFD	SFA	MF				SFD	SFA	MF		
6W						6W					
7W	45	225				7W	76	28	72		
8W	63	75				8Wa	9	190			
Blank						8Wb		52			
9W		153		200	20	9W		56		250	26
10W		118		350	30	10W	92			250	39
11W	10	24		150		11W	41				
12W		92				12W	56	24		130	
13W	50					13Wa	36				
Blank						13Wb	52				
14W	117					14W	151				
15W	12					15W	15				
16W	90					16W	117				
17W	72					17W	129				
18Wa	14					18W	56				
18Wb	47										
19W	86	93				19W	129				
20W		57				20W	82				
21W		50				21W		64			
22W	80					22W					
TOTALS	686	887	0	700	50	TOTALS	1041	414	72	630	65

SFD = Single Family Detached Units
 SFA = Single Family Attached Units
 MF = Multi-Family Units (Apartments)
 Comm KSF = Commercial 1,000 Square Feet

As shown, the land use scenario analyzed in the Master TIA anticipated similar residential totals to the current plan (1,572 vs. 1,527) but a different mix of single family detached and attached units. The current land use plan

includes more detached homes. The spread of development across the PA's is similar between the two plans – commercial and lodging opportunities lie within PA's 9 and 10 and the other PA's emphasize residential units.

The comparative analysis of land use plans indicates that the current land use plan for Grand Park West is generally consistent with prior approved plans.

Trip Generation Comparison

The proposed development of Grand Park West would generate additional vehicle-trips along the surrounding roadway network. Trip generation estimates were included in the Master TIA for Grand Park West based on trip generation rates documented in the Town of Fraser Standards current at that time and rates provided from similar mountain agencies and sources. More recent traffic analyses of area development have been completed using trip generation information from the *Institute of Transportation Engineers Trip Generation Manual (11th Edition)*. **Table 2** provides a comparison of Master TIA and current trip generation using both the Master TIA and ITE rates.

Table 2. Grand Park West Trip Generation Comparison

Scenario	Daily Trips	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
<i>Master TIA Trip Generation Rates</i>							
Master TIA	14,233	276	735	1,011	835	473	1,308
Current	15,288	301	807	1,108	885	508	1,393
Difference	+1,055	+25	+72	+97	+50	+35	+85
<i>ITE 11th Edition Trip Generation Rates</i>							
Master TIA	21,172	480	866	1,346	1,080	813	1,893
Current	21,856	495	903	1,398	1,181	871	2,052
Difference	+684	+15	+37	+52	+101	+58	+159

As shown, the current land use plan is estimated to generate more vehicle-trips per day and per peak hour than the Master TIA land use. Though the current land use plan includes fewer total residential units than the Master TIA land use, increasing the mix of detached homes with the current plan causes increased traffic levels. Detached homes typically generate higher levels of traffic than attached homes.

The estimated differences are modest, however, amounting to approximately 5-10 percent additional daily and peak hour traffic. This increase would not be expected to result in additional traffic control or infrastructure needs within the Grand Park West site or along US 40.

Summary

In summary, this conformance analysis finds that:

- Prior traffic studies capturing Grand Park West development provide a reliable assessment of projected transportation conditions associated with development of Grand Park at large and Grand Park West as a portion. Over time, the infrastructure measures identified in these studies have been implemented alongside development of Grand Park as documentation has demonstrated consistency of each part with the Master TIA.
- The current proposed land use and roadway network plan for Grand Park West is consistent with prior approved plans.

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- Vehicle-trip generation estimates for Grand Park West increase with the current plan in comparison with prior approved plans due to the introduction of additional detached homes, but the increases are modest and not expected to require additional traffic control or roadway infrastructure needs beyond those identified in prior studies.

Please feel free to contact me at (303)721-1440 or lyle.devries@fhueng.com with any questions.

Sincerely,

FELSBURG HOLT & ULLEVIG



Lyle E. DeVries, PE, PTOE
Principal

Appendix C. Level of Service Worksheets - Buildout Total Condition

Intersection												
Int Delay, s/veh 13.1												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗											
Traffic Vol, veh/h	351	0	9	1	0	19	12	276	1	20	324	446
Future Vol, veh/h	351	0	9	1	0	19	12	276	1	20	324	446
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	200
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	382	0	10	1	0	21	13	300	1	22	352	485
Major/Minor												
Minor2		Minor1			Major1			Major2				
Conflicting Flow All	733	723	352	971	1208	301	837	0	0	301	0	0
Stage 1	396	396	-	327	327	-	-	-	-	-	-	-
Stage 2	337	327	-	644	881	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 336	352	692	232	183	739	797	-	-	1260	-	-
Stage 1	629	604	-	686	648	-	-	-	-	-	-	-
Stage 2	677	648	-	461	365	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 313	333	692	219	173	739	797	-	-	1260	-	-
Mov Cap-2 Maneuver	426	424	-	219	173	-	-	-	-	-	-	-
Stage 1	616	582	-	672	635	-	-	-	-	-	-	-
Stage 2	645	635	-	438	352	-	-	-	-	-	-	-
Approach												
SE			NW			NE			SW			
HCM Control Delay, s	51.8		10.6			0.4			0.2			
HCM LOS	F		B									
Minor Lane/Major Mvmt		NEL	NET	NER	NWL	Ln1	SELn1	SELn2	SWL	SWT	SWR	
Capacity (veh/h)		797	-	-	661	426	692	1260	-	-		
HCM Lane V/C Ratio		0.016	-	-	0.033	0.896	0.014	0.017	-	-		
HCM Control Delay (s)		9.6	0	-	10.6	52.9	10.3	7.9	0	-		
HCM Lane LOS		A	A	-	B	F	B	A	A	-		
HCM 95th %tile Q(veh)		0.1	-	-	0.1	9.5	0	0.1	-	-		
Notes												
~: Volume exceeds capacity			\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon			

Intersection										
Int Delay, s/veh	5.2									
Movement	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR
Lane Configurations	Y			Y		Y	Y		Y	
Traffic Vol, veh/h	25	0	13	135	26	145	115	38	0	24
Future Vol, veh/h	25	0	13	135	26	145	115	38	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	-	-	None	-	-	None	-	None
Storage Length	0	-	-	-	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	0	14	147	28	158	125	41	0	26
Major/Minor										
Major/Minor	Minor1	Major1		Major2		Minor2				
Conflicting Flow All	664	161	166	0	0	175	0	0	722	146
Stage 1	189	-	-	-	-	-	-	-	462	-
Stage 2	475	-	-	-	-	-	-	-	260	-
Critical Hdwy	7.12	6.22	4.12	-	-	4.12	-	-	7.12	6.22
Critical Hdwy Stg 1	6.12	-	-	-	-	-	-	-	6.12	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-	-	-	6.12	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	374	884	1412	-	-	1401	-	-	342	901
Stage 1	813	-	-	-	-	-	-	-	580	-
Stage 2	570	-	-	-	-	-	-	-	745	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	329	884	1412	-	-	1401	-	-	260	901
Mov Cap-2 Maneuver	329	-	-	-	-	-	-	-	260	-
Stage 1	804	-	-	-	-	-	-	-	574	-
Stage 2	491	-	-	-	-	-	-	-	619	-
Approach										
Approach	NB	SE		NW		SW				
HCM Control Delay, s	11.8	0.6		3.8		11.9				
HCM LOS	B					B				
Minor Lane/Major Mvmt										
Minor Lane/Major Mvmt	NBLn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1		
Capacity (veh/h)	695	1401	-	-	1412	-	-	557		
HCM Lane V/C Ratio	0.242	0.112	-	-	0.01	-	-	0.062		
HCM Control Delay (s)	11.8	7.9	-	-	7.6	0	-	11.9		
HCM Lane LOS	B	A	-	-	A	A	-	B		
HCM 95th %tile Q(veh)	0.9	0.4	-	-	0	-	-	0.2		

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	+	+	+	+	+	+	+	+	+	+	+	
Traffic Vol, veh/h	5	27	5	95	23	28	5	5	85	26	5	5
Future Vol, veh/h	5	27	5	95	23	28	5	5	85	26	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	29	5	103	25	30	5	5	92	28	5	5
Major/Minor												
Major1		Major2		Minor1		Minor2						
Conflicting Flow All	55	0	0	34	0	0	293	303	32	336	290	40
Stage 1	-	-	-	-	-	-	42	42	-	246	246	-
Stage 2	-	-	-	-	-	-	251	261	-	90	44	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1550	-	-	1578	-	-	659	610	1042	618	620	1031
Stage 1	-	-	-	-	-	-	972	860	-	758	703	-
Stage 2	-	-	-	-	-	-	753	692	-	917	858	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1550	-	-	1578	-	-	616	567	1042	529	576	1031
Mov Cap-2 Maneuver	-	-	-	-	-	-	616	567	-	529	576	-
Stage 1	-	-	-	-	-	-	969	857	-	756	655	-
Stage 2	-	-	-	-	-	-	692	645	-	828	855	-
Approach												
EB			WB			NB			SB			
HCM Control Delay, s	1			4.8			9.2		11.7			
HCM LOS							A		B			
Minor Lane/Major Mvmt												
Capacity (veh/h)	964	1550	-	-	1578	-	-	574				
HCM Lane V/C Ratio	0.107	0.004	-	-	0.065	-	-	0.068				
HCM Control Delay (s)	9.2	7.3	0	-	7.4	0	-	11.7				
HCM Lane LOS	A	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0.2				

Intersection						
Int Delay, s/veh	3.3					
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	↖	↗	↑	↗	↖	↗
Traffic Vol, veh/h	45	106	425	51	107	465
Future Vol, veh/h	45	106	425	51	107	465
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	115	462	55	116	505
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1227	490	0	0	517	0
Stage 1	490	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	197	578	-	-	1049	-
Stage 1	616	-	-	-	-	-
Stage 2	473	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	167	578	-	-	1049	-
Mov Cap-2 Maneuver	167	-	-	-	-	-
Stage 1	616	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Approach	NW	NE	SW			
HCM Control Delay, s	19.5	0	1.7			
HCM LOS	C					
Minor Lane/Major Mvmt	NET	NERNWL _{n1}	NWL _{n2}	SWL	SWT	
Capacity (veh/h)	-	-	167	578	1049	-
HCM Lane V/C Ratio	-	-	0.293	0.199	0.111	-
HCM Control Delay (s)	-	-	35.2	12.8	8.9	0
HCM Lane LOS	-	-	E	B	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.7	0.4	-

Intersection				
Approach	SE	NW	NE	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	392	22	314	859
Demand Flow Rate, veh/h	400	22	320	876
Vehicles Circulating, veh/h	382	709	412	14
Vehicles Exiting, veh/h	508	23	370	717
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.0	5.7	8.0	10.7
Approach LOS	A	A	A	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	400	22	320	876
Cap Entry Lane, veh/h	935	670	906	1360
Entry HV Adj Factor	0.980	1.000	0.981	0.981
Flow Entry, veh/h	392	22	314	859
Cap Entry, veh/h	916	670	889	1334
V/C Ratio	0.428	0.033	0.353	0.644
Control Delay, s/veh	9.0	5.7	8.0	10.7
LOS	A	A	A	B
95th %tile Queue, veh	2	0	2	5

Intersection														
Int Delay, s/veh	54.3													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR		
Lane Configurations	↖	↑		↖	↖	↖	↖	↖	↖	↖	↖	↖		
Traffic Vol, veh/h	383	0	10	1	0	22	11	348	2	38	569	413		
Future Vol, veh/h	383	0	10	1	0	22	11	348	2	38	569	413		
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free		
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None		
Storage Length	0	-	-	-	-	-	-	-	-	-	-	200		
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-		
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-		
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92		
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2		
Mvmt Flow	416	0	11	1	0	24	12	378	2	41	618	449		
Major/Minor														
Minor2		Minor1			Major1			Major2						
Conflicting Flow All	1115	1104	618	1333	1552	379	1067	0	0	380	0	0		
Stage 1	700	700	-	403	403	-	-	-	-	-	-	-		
Stage 2	415	404	-	930	1149	-	-	-	-	-	-	-		
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-		
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-		
Pot Cap-1 Maneuver	~ 185	211	489	131	113	668	653	-	-	1178	-	-		
Stage 1	430	441	-	624	600	-	-	-	-	-	-	-		
Stage 2	615	599	-	321	273	-	-	-	-	-	-	-		
Platoon blocked, %								-	-	-	-	-		
Mov Cap-1 Maneuver	~ 162	186	489	117	100	668	653	-	-	1178	-	-		
Mov Cap-2 Maneuver	~ 288	291	-	117	100	-	-	-	-	-	-	-		
Stage 1	420	398	-	610	586	-	-	-	-	-	-	-		
Stage 2	579	585	-	283	247	-	-	-	-	-	-	-		
Approach														
SE			NW			NE			SW					
HCM Control Delay, s	246.5		11.8			0.3			0.3					
HCM LOS	F		B											
Minor Lane/Major Mvmt			NEL	NET	NER	NWL	NLn1	SELn1	SELn2	SWL	SWT	SWR		
Capacity (veh/h)	653		-	-	554	288	489	1178	-	-	-	-		
HCM Lane V/C Ratio	0.018		-	-	0.045	1.446	0.022	0.035	-	-	-	-		
HCM Control Delay (s)	10.6		0	-	11.8	252.6	12.5	8.2	0	-	-	-		
HCM Lane LOS	B		A	-	B	F	B	A	A	-	-	-		
HCM 95th %tile Q(veh)	0.1		-	-	0.1	22.9	0.1	0.1	-	-	-	-		
Notes														
~: Volume exceeds capacity			\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon					

Intersection										
Int Delay, s/veh	7.2									
Movement	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR
Lane Configurations										
Traffic Vol, veh/h	28	0	10	167	47	269	212	29	0	9
Future Vol, veh/h	28	0	10	167	47	269	212	29	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	-	-	None	-	-	None	-	None
Storage Length	0	-	-	-	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	0	11	182	51	292	230	32	0	10
Major/Minor										
Minor1		Major1		Major2		Minor2				
Conflicting Flow All	1065	208	262	0	0	233	0	0	1144	246
Stage 1	230	-	-	-	-	-	-	-	830	-
Stage 2	835	-	-	-	-	-	-	-	314	-
Critical Hdwy	7.12	6.22	4.12	-	-	4.12	-	-	7.12	6.22
Critical Hdwy Stg 1	6.12	-	-	-	-	-	-	-	6.12	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-	-	-	6.12	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	200	832	1302	-	-	1335	-	-	177	793
Stage 1	773	-	-	-	-	-	-	-	364	-
Stage 2	362	-	-	-	-	-	-	-	697	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	163	832	1302	-	-	1335	-	-	116	793
Mov Cap-2 Maneuver	163	-	-	-	-	-	-	-	116	-
Stage 1	765	-	-	-	-	-	-	-	360	-
Stage 2	279	-	-	-	-	-	-	-	550	-
Approach										
NB		SE		NW		SW				
HCM Control Delay, s	16.5		0.3		4.5		39.4			
HCM LOS	C						E			
Minor Lane/Major Mvmt										
NBLn1		NWL	NWT	NWR	SEL	SET	SERS	SWLn1		
Capacity (veh/h)	511		1335	-	-	1302	-	-	145	
HCM Lane V/C Ratio	0.389		0.219	-	-	0.008	-	-	0.285	
HCM Control Delay (s)	16.5		8.5	-	-	7.8	0	-	39.4	
HCM Lane LOS	C		A	-	-	A	A	-	E	
HCM 95th %tile Q(veh)	1.8		0.8	-	-	0	-	-	1.1	

Intersection																
Int Delay, s/veh 6.8																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations	+	+	+	+	+	+	+	+	+	+	+					
Traffic Vol, veh/h	5	25	5	154	35	54	5	5	101	41	5	5				
Future Vol, veh/h	5	25	5	154	35	54	5	5	101	41	5	5				
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0				
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop				
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None				
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-				
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-				
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-				
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92				
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2				
Mvmt Flow	5	27	5	167	38	59	5	5	110	45	5	5				
Major/Minor																
Major1		Major2		Minor1		Minor2										
Conflicting Flow All	97	0	0	32	0	0	447	471	30	499	444	68				
Stage 1	-	-	-	-	-	-	40	40	-	402	402	-				
Stage 2	-	-	-	-	-	-	407	431	-	97	42	-				
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22				
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-				
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-				
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318				
Pot Cap-1 Maneuver	1496	-	-	1580	-	-	522	491	1044	482	508	995				
Stage 1	-	-	-	-	-	-	975	862	-	625	600	-				
Stage 2	-	-	-	-	-	-	621	583	-	910	860	-				
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-				
Mov Cap-1 Maneuver	1496	-	-	1580	-	-	469	435	1044	390	450	995				
Mov Cap-2 Maneuver	-	-	-	-	-	-	469	435	-	390	450	-				
Stage 1	-	-	-	-	-	-	972	859	-	623	533	-				
Stage 2	-	-	-	-	-	-	543	518	-	807	857	-				
Approach																
EB			WB			NB			SB							
HCM Control Delay, s	1.1		4.8		9.4		14.8									
HCM LOS						A		B								
Minor Lane/Major Mvmt																
Capacity (veh/h)	934	1496	-	-	1580	-	-	421								
HCM Lane V/C Ratio	0.129	0.004	-	-	0.106	-	-	0.132								
HCM Control Delay (s)	9.4	7.4	0	-	7.5	0	-	14.8								
HCM Lane LOS	A	A	A	-	A	A	-	B								
HCM 95th %tile Q(veh)	0.4	0	-	-	0.4	-	-	0.5								

Intersection						
Int Delay, s/veh	6.4					
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	51	128	433	69	191	608
Future Vol, veh/h	51	128	433	69	191	608
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	139	471	75	208	661
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1586	509	0	0	546	0
Stage 1	509	-	-	-	-	-
Stage 2	1077	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	119	564	-	-	1023	-
Stage 1	604	-	-	-	-	-
Stage 2	327	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	81	564	-	-	1023	-
Mov Cap-2 Maneuver	81	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	222	-	-	-	-	-
Approach	NW	NE	SW			
HCM Control Delay, s	42.5	0	2.3			
HCM LOS	E					
Minor Lane/Major Mvmt	NET	NERNWL _{n1}	NWL _{n2}	SWL	SWT	
Capacity (veh/h)	-	-	81	564	1023	-
HCM Lane V/C Ratio	-	-	0.684	0.247	0.203	-
HCM Control Delay (s)	-	-	115.3	13.5	9.4	0
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	3.2	1	0.8	-

Intersection				
Approach	SE	NW	NE	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	427	25	392	1108
Demand Flow Rate, veh/h	435	25	400	1130
Vehicles Circulating, veh/h	673	822	466	13
Vehicles Exiting, veh/h	470	44	642	834
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.8	6.5	10.3	18.3
Approach LOS	C	A	B	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	435	25	400	1130
Cap Entry Lane, veh/h	695	597	858	1362
Entry HV Adj Factor	0.982	1.000	0.981	0.980
Flow Entry, veh/h	427	25	392	1108
Cap Entry, veh/h	682	597	842	1335
V/C Ratio	0.626	0.042	0.466	0.830
Control Delay, s/veh	16.8	6.5	10.3	18.3
LOS	C	A	B	C
95th %tile Queue, veh	4	0	3	11

Intersection												
Int Delay, s/veh 57.3												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗ ↗											
Traffic Vol, veh/h	398	0	10	1	0	28	12	416	2	31	490	451
Future Vol, veh/h	398	0	10	1	0	28	12	416	2	31	490	451
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	200
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	433	0	11	1	0	30	13	452	2	34	533	490
Major/Minor												
Minor2		Minor1			Major1			Major2				
Conflicting Flow All	1095	1081	533	1331	1570	453	1023	0	0	454	0	0
Stage 1	601	601	-	479	479	-	-	-	-	-	-	-
Stage 2	494	480	-	852	1091	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 191	218	547	132	111	607	679	-	-	1107	-	-
Stage 1	487	489	-	568	555	-	-	-	-	-	-	-
Stage 2	557	554	-	354	291	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 167	195	547	119	99	607	679	-	-	1107	-	-
Mov Cap-2 Maneuver	~ 294	306	-	119	99	-	-	-	-	-	-	-
Stage 1	474	449	-	553	541	-	-	-	-	-	-	-
Stage 2	515	540	-	319	267	-	-	-	-	-	-	-
Approach												
SE			NW			NE			SW			
HCM Control Delay, s	256.4			12.2			0.3			0.3		
HCM LOS	F			B								
Minor Lane/Major Mvmt												
Capacity (veh/h)	679	-	-	532	294	547	1107	-	-	-	-	
HCM Lane V/C Ratio	0.019	-	-	0.059	1.471	0.02	0.03	-	-	-	-	
HCM Control Delay (s)	10.4	0	-	12.2	262.5	11.7	8.4	0	-	-	-	
HCM Lane LOS	B	A	-	B	F	B	A	A	-	-	-	
HCM 95th %tile Q(veh)	0.1	-	-	0.2	24.1	0.1	0.1	-	-	-	-	
Notes												
~: Volume exceeds capacity			\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon			

Intersection										
Int Delay, s/veh	7.5									
Movement	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR
Lane Configurations	Y			Y		Y	Y		Y	
Traffic Vol, veh/h	34	0	13	194	40	224	184	40	0	10
Future Vol, veh/h	34	0	13	194	40	224	184	40	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	-	-	None	-	-	None	-	None
Storage Length	0	-	-	-	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	0	14	211	43	243	200	43	0	11
Major/Minor										
Minor1		Major1		Major2		Minor2				
Conflicting Flow All	974	233	243	0	0	254	0	0	1069	222
Stage 1	261	-	-	-	-	-	-	-	708	-
Stage 2	713	-	-	-	-	-	-	-	361	-
Critical Hdwy	7.12	6.22	4.12	-	-	4.12	-	-	7.12	6.22
Critical Hdwy Stg 1	6.12	-	-	-	-	-	-	-	6.12	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-	-	-	6.12	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	231	806	1323	-	-	1311	-	-	199	818
Stage 1	744	-	-	-	-	-	-	-	426	-
Stage 2	423	-	-	-	-	-	-	-	657	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	194	806	1323	-	-	1311	-	-	127	818
Mov Cap-2 Maneuver	194	-	-	-	-	-	-	-	127	-
Stage 1	735	-	-	-	-	-	-	-	421	-
Stage 2	340	-	-	-	-	-	-	-	487	-
Approach										
NB		SE		NW		SW				
HCM Control Delay, s	16.8		0.4		4.2		36			
HCM LOS	C						E			
Minor Lane/Major Mvmt										
NBLn1		NWL	NWT	NWR	SEL	SET	SERSWLn1			
Capacity (veh/h)	541		1311	-	-	1323	-	-	160	
HCM Lane V/C Ratio	0.44		0.186	-	-	0.011	-	-	0.279	
HCM Control Delay (s)	16.8		8.4	-	-	7.8	0	-	36	
HCM Lane LOS	C		A	-	-	A	A	-	E	
HCM 95th %tile Q(veh)	2.2		0.7	-	-	0	-	-	1.1	

HCM 6th TWSC
3: Grand Park Dr & CR 72

Buildout Condition
SAT Peak Hour

Intersection												
Int Delay, s/veh 7.2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	+	+	+	+	+	+	+	+	+	+	+	
Traffic Vol, veh/h	5	30	5	136	30	45	5	5	118	51	5	5
Future Vol, veh/h	5	30	5	136	30	45	5	5	118	51	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	33	5	148	33	49	5	5	128	55	5	5
Major/Minor												
Major1		Major2		Minor1		Minor2						
Conflicting Flow All	82	0	0	38	0	0	405	424	36	466	402	58
Stage 1	-	-	-	-	-	-	46	46	-	354	354	-
Stage 2	-	-	-	-	-	-	359	378	-	112	48	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1515	-	-	1572	-	-	556	522	1037	507	537	1008
Stage 1	-	-	-	-	-	-	968	857	-	663	630	-
Stage 2	-	-	-	-	-	-	659	615	-	893	855	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1515	-	-	1572	-	-	505	469	1037	406	482	1008
Mov Cap-2 Maneuver	-	-	-	-	-	-	505	469	-	406	482	-
Stage 1	-	-	-	-	-	-	965	854	-	661	568	-
Stage 2	-	-	-	-	-	-	585	554	-	775	852	-
Approach												
EB			WB			NB			SB			
HCM Control Delay, s	0.9			4.9			9.4		14.8			
HCM LOS							A		B			
Minor Lane/Major Mvmt												
Capacity (veh/h)	953	1515	-	-	1572	-	-	433				
HCM Lane V/C Ratio	0.146	0.004	-	-	0.094	-	-	0.153				
HCM Control Delay (s)	9.4	7.4	0	-	7.5	0	-	14.8				
HCM Lane LOS	A	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.5	0	-	-	0.3	-	-	0.5				

Intersection							
Int Delay, s/veh	9.2						
Movement	NWL	NWR	NET	NER	SWL	SWT	
Lane Configurations	↑	↑	↑	↑	↑	↑	
Traffic Vol, veh/h	58	153	552	65	166	657	
Future Vol, veh/h	58	153	552	65	166	657	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	0	-	-	-	-	
Veh in Median Storage, #	0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	63	166	600	71	180	714	
Major/Minor	Minor1	Major1		Major2			
Conflicting Flow All	1710	636	0	0	671	0	
Stage 1	636	-	-	-	-	-	
Stage 2	1074	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	-	
Pot Cap-1 Maneuver	100	478	-	-	919	-	
Stage 1	527	-	-	-	-	-	
Stage 2	328	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	68	478	-	-	919	-	
Mov Cap-2 Maneuver	68	-	-	-	-	-	
Stage 1	527	-	-	-	-	-	
Stage 2	221	-	-	-	-	-	
Approach	NW	NE	SW				
HCM Control Delay, s	64.5	0	2				
HCM LOS	F						
Minor Lane/Major Mvmt	NET	NER	NWL	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	68	478	919	-	-
HCM Lane V/C Ratio	-	-	0.927	0.348	0.196	-	-
HCM Control Delay (s)	-	-	191.1	16.5	9.9	0	-
HCM Lane LOS	-	-	F	C	A	A	-
HCM 95th %tile Q(veh)	-	-	4.6	1.5	0.7	-	-

Intersection				
Approach	SE	NW	NE	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	444	31	467	1059
Demand Flow Rate, veh/h	453	32	476	1081
Vehicles Circulating, veh/h	580	916	477	14
Vehicles Exiting, veh/h	515	37	556	934
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	14.5	7.6	12.5	16.2
Approach LOS	B	A	B	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	453	32	476	1081
Cap Entry Lane, veh/h	764	542	848	1360
Entry HV Adj Factor	0.980	0.969	0.981	0.980
Flow Entry, veh/h	444	31	467	1059
Cap Entry, veh/h	749	525	832	1333
V/C Ratio	0.593	0.059	0.561	0.795
Control Delay, s/veh	14.5	7.6	12.5	16.2
LOS	B	A	B	C
95th %tile Queue, veh	4	0	4	9