



US 40 Fraser

Fraser Valley Parkway Assessment

July 2020

Town of Fraser
Grand County

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Acronyms and Abbreviations

ADT	Average Daily Traffic
CDOT	Colorado Department of Transportation
CR	County Road
EB	eastbound
Int	intersection
ITE	Institute of Transportation Engineers
LOS	level of service
LT	left turn
NB	northbound
RT	right turn
SB	southbound
TH	through
TIS	Traffic Impact Study
TWSC	two-way stop control
US	U.S. highway
WB	westbound



1. Introduction

The Town of Fraser and Grand County sponsored an additional task to augment and complement the Colorado Department of Transportation (CDOT) U.S. Highway 40 (US 40) Fraser traffic study by assessing the CDOT study area with the addition of the proposed Fraser Valley Parkway. This facility is generally proposed to be 0.25 to 0.5 mile west of US 40 and extend between the Kings Crossing Road intersection with US 40 and the Town of Tabernash. The intent of this task was to estimate the potential change in projected traffic operating conditions on US 40 in the year 2045 with a parallel facility in the roadway network and determine if these operational changes suggest the scope of the US 40 preferred alternative could be reduced in magnitude. The change in operating conditions would result from a diversion of traffic demand from US 40 to the Fraser Valley Parkway. The work associated with the Fraser Valley Parkway Assessment is included as Appendix G of the *US 40 Fraser Traffic Report* (Jacobs 2020).



2. Year 2045 Fraser Valley Parkway Scenario

This Fraser Valley Parkway Scenario analyzes the year 2045 traffic operations throughout the US 40 corridor study limits. This scenario builds upon the Year 2045 Refined Traffic Signals Alternative roadway network and analysis volumes, using similar assumptions and processes to distribute adjusted forecasted volumes of traffic and operational results that incorporate the Fraser Valley Parkway into the overall roadway network. The following sections explain the methodologies followed to develop these travel forecasts and traffic operation results.

2.1 Methodology

The Vissim model for this scenario was based on the final version of the Year 2045 Refined Traffic Signals Alternative model, with vehicular analysis volumes revised to account for redistribution of trips to Fraser Valley Parkway. The pedestrian and bicyclist volumes at the US 40 intersections were not revised because the analysis assumes that the demand for these modes to cross US 40 and access destinations on the north side of the highway would not be altered by the addition of a parallel facility to the south. The same process followed for the CDOT US 40 Fraser traffic study scenarios to run the models, optimize signal timing, and extract results was used for this scenario that includes Fraser Valley Parkway.

2.2 Analysis Volumes

Exhibit 1 shows the forecasted US 40 intersection volumes developed for this scenario. The turning movement volumes reflect diversion of regional US 40 traffic and redistribution of development-generated trips to Fraser Valley Parkway. The volumes also reflect the additional development-generated trips per the latest Byers Peak Ranch land use projections and the redistribution of them (shown on Exhibit 2). The volumes shown on Exhibit 1 were input into the Vissim model to assess the US 40 traffic operations for this scenario.

The process to forecast the US 40 intersection volumes for this scenario involved estimating peak hour trips that would use Fraser Valley Parkway rather than US 40. Exhibit 3 shows these estimated volumes at select intersections along Fraser Valley Parkway (the red line represents an approximate alignment for the Fraser Valley Parkway). The analysis anticipates that there would be additional volume using this facility above those shown on Exhibit 3 if it were constructed. A complete forecast for Fraser Valley Parkway was not developed for the following reasons:

- The purpose of the study is to estimate future traffic operations along US 40.
- The lack of information about existing volume on Old Victory Road and other roads that would intersect this new facility inhibits the process to estimate future background traffic that may use the facility.
- The stochastic process followed to forecast volumes does not provide the ability that a dynamic travel demand model would to estimate traveler preferences for this facility over US 40 and incorporate estimates of roadway congestion into traveler route choice assignments.
- The stochastic process does not provide a reasonable method to estimate latent demand for the facility.

As a result, this process to develop analysis volumes encompassed estimating peak hour development-generated trips and regional trips that might use the Fraser Valley Parkway as an alternate route to US 40 through Fraser but did not include estimating total peak hour or daily volumes that might use this facility in the year 2045. Accordingly, Exhibit 3 is not intended to serve as a definitive set of volumes that would be appropriate for analysis or design of Fraser Valley Parkway.



2.2.1 Background Traffic Volume

The background traffic includes regional trips and trips generated by existing housing developments that currently use Old Victory Road to access US 40. This forecasting process assumed a portion of regional trips will use Fraser Valley Parkway as a bypass by accessing the facility at the Kings Crossing Road intersection to the east of the study area and continuing to the western terminus near Tabernash. A volume equal to 20 percent of the 2045 background forecast volumes entering at each end of the study area was removed from the eastbound and westbound through movements at each intersection to reflect diversion of regional trips. This 20 percent value of is an estimate intended to reflect that some travelers will use a bypass and to be conservative about how much volume would divert. Based on existing daily volume counts and the turning movements to and from the westbound and eastbound directions, the primary demand is to and from the east of and within Fraser. The westbound volume entering the study area at the east end is higher than the volume leaving at the west end. Likewise, the eastbound volume leaving the study area at the east end is greater than the entering volume. These data suggest a low proportion of the US 40 volume is regional traffic through the town. However, there is no definitive way to confirm this assumption with the available data.

For the existing housing developments adjacent to Old Victory Road, the analysis assumed that half of this residential traffic destined to and from the east would divert to Fraser Valley Parkway from US 40, east of the study area (the analysis assumed that trips to/from the west would not divert to a parallel facility due to the out of direction travel). Accordingly, half of the turn and through movement volumes related to the existing residential developments were removed from the US 40 intersection volumes. This 50 percent estimate acknowledges that this travel pattern shift is likely to occur, but low values for the existing and subsequently escalated background volumes that represent turn movements through the Old Victory Road intersection were not high enough to support a more robust effort to estimate this volume using trip generation rates. The amount of residential volume within the total background volume was estimated by assuming that all the existing left-in and right-out turns through Old Victory Road intersection are related to these existing developments. To acknowledge that some drivers may use the County Road (CR) 72 intersection to access these residences, 25 percent of the applicable turning movement volumes through Old Victory Road intersection were distributed to the CR 72 intersection.

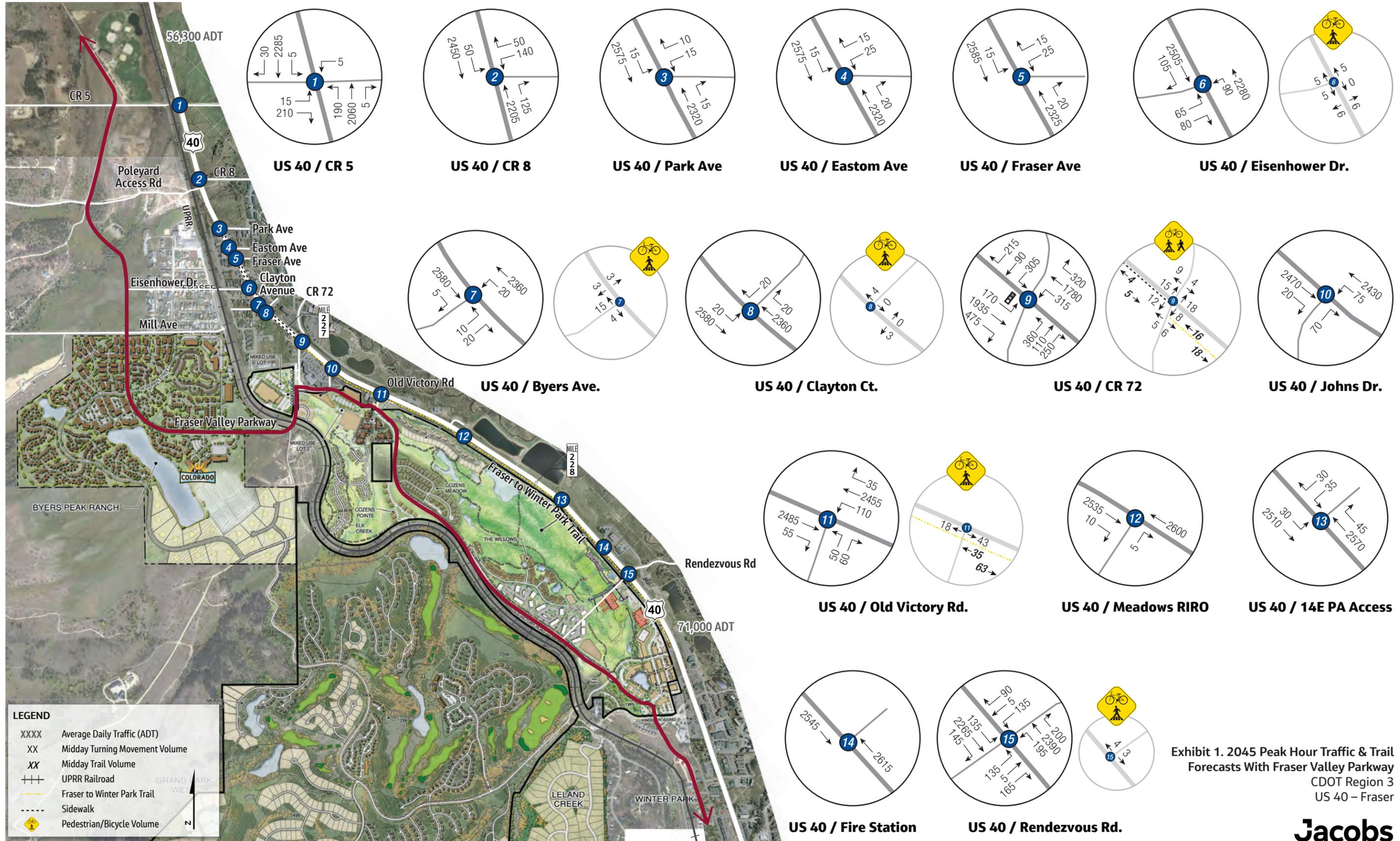


Exhibit 1. 2045 Peak Hour Traffic & Trail Forecasts With Fraser Valley Parkway
 CDOT Region 3
 US 40 – Fraser

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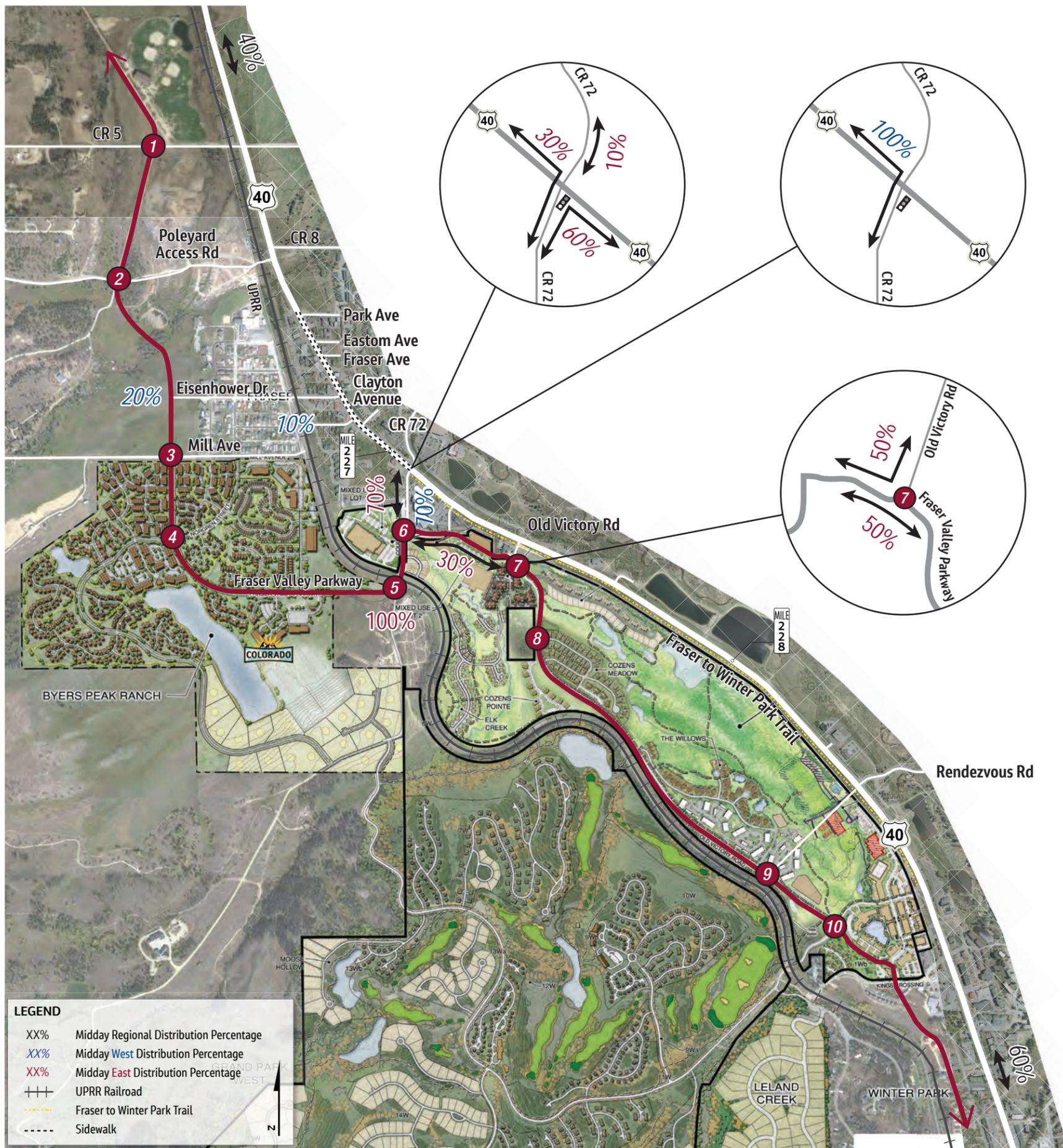
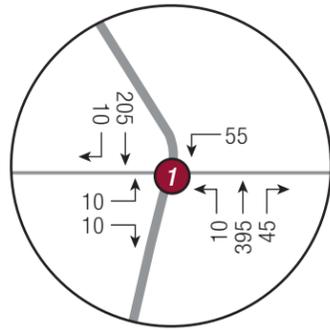
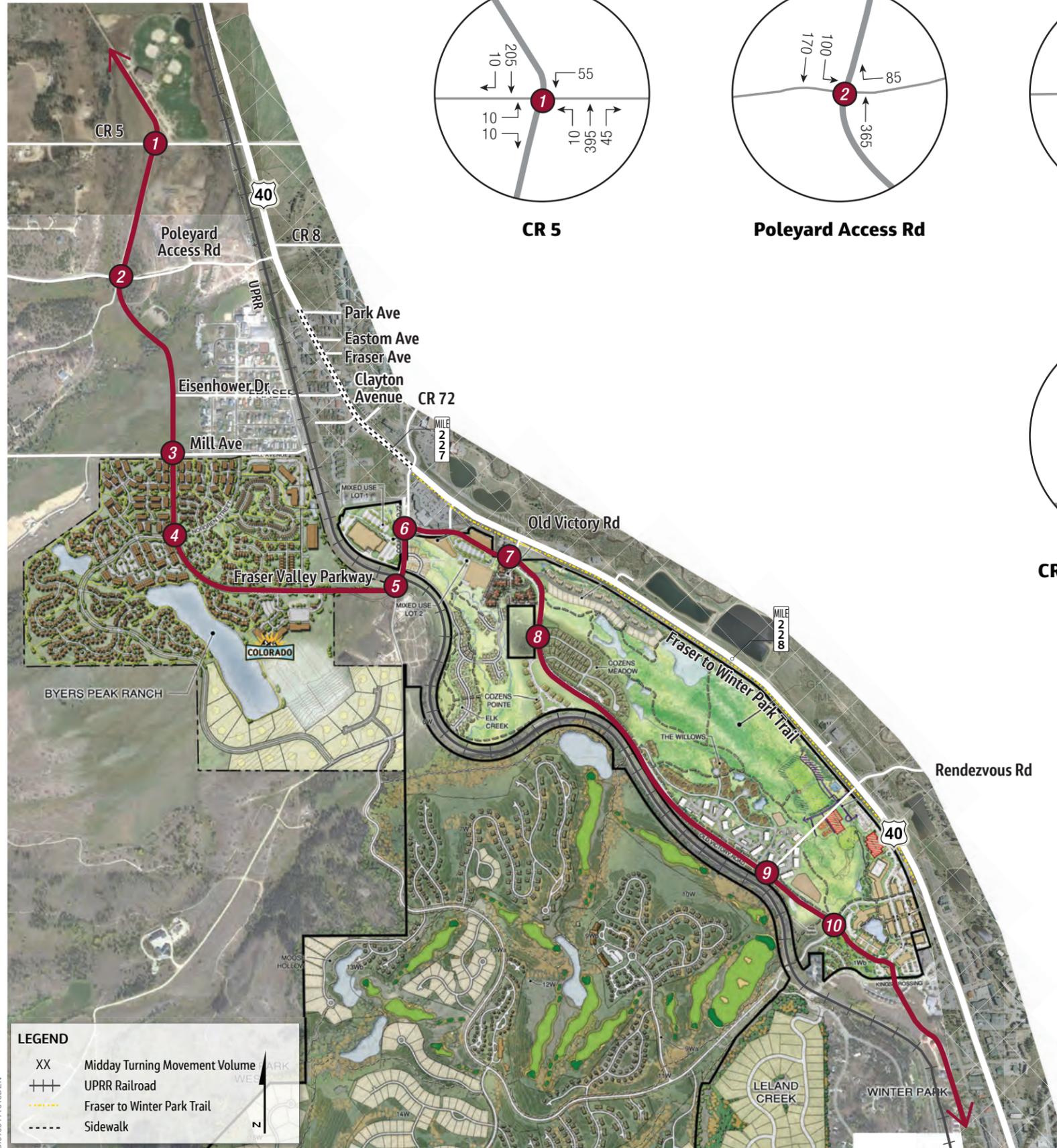
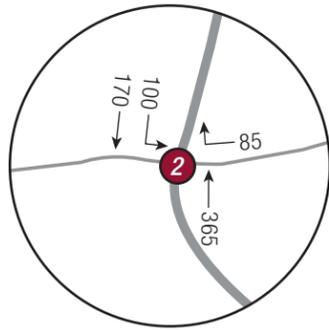


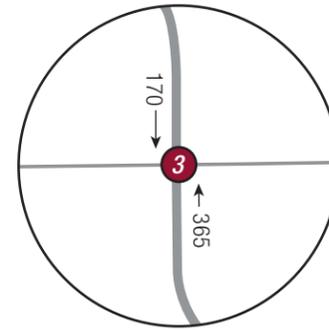
Exhibit 2. Estimated 2045 Distribution for Byers Peak Ranch Development-Generated Peak Hour Trips
 CDOT Region 3
 US 40 – Fraser



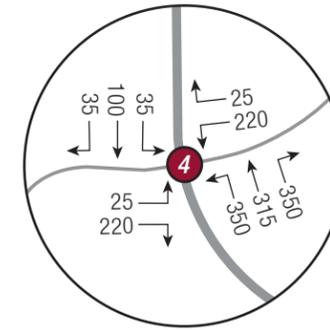
CR 5



Poleyard Access Rd



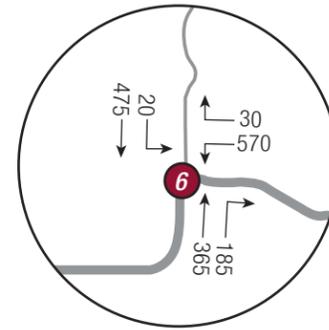
Mill Ave



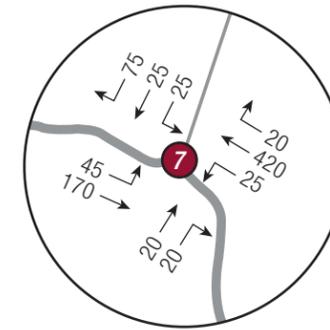
Norgren Street



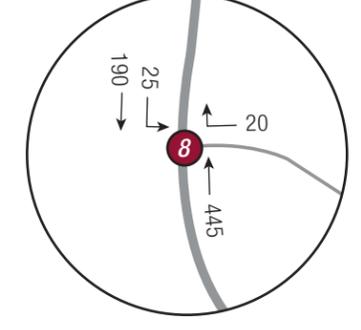
CR 72 / Fraser Valley Parkway



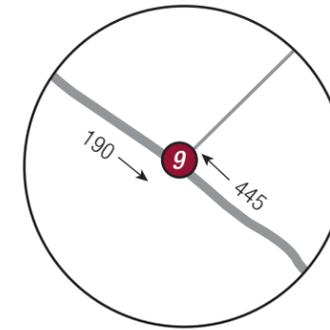
CR 72 / Old Victory Rd



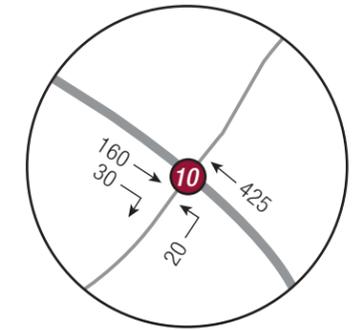
Old Victory Rd



Cozens Meadow



Rendezvous Way



Grand Park Ave

**Exhibit 3. Estimated 2045 Development-Generated and Background Peak Hour Trips Using Fraser Valley Parkway
CDOT Region 3
US 40 – Fraser**



2.2.2 Development-Generated Trips

With one exception, the trip generation effort was not repeated for this forecast because the proposed developments are independent of the roadway network (modifications to the proposed land use necessitated revisions to the trip generation and distribution for the Byers Peak Ranch development). Therefore, the forecasting effort primarily involved redistributing applicable development-generated trips away from US 40 and onto the Fraser Valley Parkway facility.

The proposed developments on the north side of US 40 were not included in the redistribution, based on the assumption that travelers would not cross US 40 and travel the extra distance to access an east-west roadway that parallels US 40. Also, no changes were made to the trips generated by the Cornerstone Recreation Center, based on the assumption that US 40 is closer to the facility and the regional draw would primarily be to and from the east. The following describes the effort to redistribute volumes by development:

- Maintenance Center: No changes were made to the US 40 analysis volumes based on the assumption that CDOT maintenance vehicles would not travel along Fraser Valley Parkway.
- Transit Center: Consistent with the redistribution of regional background trips and trips generated by developments in Winter Park, the analysis assumed a volume equal to 20 percent would divert from US 40 and onto the Fraser Valley Parkway. As a result, these trips were removed from all the study area intersections along US 40.
- Poleyard: All vehicle trips destined to and from the west were diverted from the intersection of US 40 and CR 5 to the intersection of Fraser Valley Parkway and CR 5. These turn movements at US 40 were then converted to through movements at the Fraser Valley Parkway/CR 5 intersection based on the assumption that the Fraser Valley Parkway would continue west to Tabernash.
- Byers Peak Ranch: The trip generation assumptions used to analyze all the scenarios included in the US 40 Fraser Traffic Study were revised for this Fraser Valley Parkway Assessment. This effort referenced the Land Use Summary table in the Byers Peak Ranch Sketch Plan to perform the trip generation estimates rather than the *Byers Peak Ranch Traffic Impact Study [TIS]* (Byers Peak Properties 2019). The Sketch Plan postdates this TIS by 7 months and accounts for revisions to the land uses that increased the residential units and eliminated the commercial square footage. Therefore, the trip generation does not account for internal capture, because there will be no commercial development. The Land Use Summary indicates there will be a lodge and condos adjacent to the Colorado Adventure Park. No information regarding the size or number of units was made available, so the value of 125 hotel rooms included in the Byers Peak Ranch TIS was used to perform the trip generation for this land use. The Land Use Summary table includes a 30,000-square foot barn and storage facility. Trips generated by this facility are assumed to remain internal to Byers Peak Ranch and are not distributed to Fraser Valley Parkway or US 40.

The trip distribution assumptions used to analyze all the scenarios included in the US 40 Fraser traffic study were also revised to better align with the intent that the Fraser Valley Parkway serve a larger portion of local development trips and a smaller portion of US 40 regional trips. Exhibit 2 shows the assumed distribution of the Byers Peak Ranch trips. The overall trip distribution of 45 percent to the west and 55 percent to the east of Fraser used to develop the US 40 Fraser traffic study analysis volumes was revised slightly for this assessment. The routing of the Byers Peak Ranch trips assumes 40 percent are destined to or from the west of Fraser and 60 percent remain in Fraser or travel to or from the east of Fraser. This revision acknowledges that the elimination of commercial development would reduce the regional draw of Byers Peak Ranch and the additional residential development would increase the local trips within Fraser. Furthermore, the TIS assumed 10 percent of the generated trips would originate from locations to the south of Byers Peak Ranch and not use either US 40 or Fraser Valley Parkway. Because of the elimination of the commercial land uses, this assessment assumes there will be no development-generated travel in this direction, and all the residential trips will travel along either Fraser Valley Parkway or US 40. If some of the residential trips do travel to destinations south of the development, this assessment provides a worse-case scenario.



Based on the Sketch Plan and graphics supplied by the developer, Norgren Street appears to be the primary development collector road that intersects with Fraser Valley Parkway. For simplicity, all the residential trips were routed through Norgren Street to or from Fraser Valley Parkway. The volumes accessing Fraser Valley Parkway at the Norgren Street intersection were split evenly to the north and south. The lodge and condo volumes access Fraser Valley Parkway at the cross street proposed for this particular development (not named in the Sketch Plan).

Of the 40 percent destined west of Fraser, 20 percent of these trips are assumed to use Fraser Valley Parkway and, therefore, are not included in the US 40 study area intersection volumes. Among the remainder of trips destined to the west, 10 percent are assumed to use the Eisenhower Drive intersection to access US 40 (without traveling on Fraser Valley Parkway) and the rest would travel along Fraser Valley Parkway to access US 40 at the CR 72 intersection.

The other 60 percent of Byers Peak Ranch-generated trips would travel east along Fraser Valley Parkway through intersection 5 (Exhibit 2). At intersection 6, 30 percent of these trips are assumed to stay on Fraser Valley Parkway and travel to/from intersection 7 with Old Victory Road. At intersection 7, the analysis assumes the trips split evenly between Fraser Valley Parkway and US 40 to travel to or from the east of Fraser. The trips that remain on Fraser Valley Parkway are not included in the US 40 intersection volumes on Exhibit 1.

The 70 percent of the east trips that divert from Fraser Valley Parkway at intersection 6 and remain on CR 72 split at the US 40 intersection as follows:

- 30 percent turn left to access westbound US 40 and destinations within Fraser.
 - 10 percent travel straight through the intersection and remain on CR 72.
 - 60 percent turn right to access eastbound US 40 and destinations within and outside of Fraser.
- Meadows and Grand Park: No changes were made to the volumes at the Old Victory Road or County Road 72 intersections with US 40. Based on the Rendezvous TIS (completed when the development name was Rendezvous; it was subsequently changed to Grand Park), the original distribution assumed volumes from these developments would use the existing portion of Old Victory Road that will become part of the Fraser Valley Parkway (Meadows and a portion of Grand Park) and a proposed collector road that will parallel Fraser Valley Parkway to the south (a different portion of Grand Park). These volumes are assumed to access US 40 and not continue west on Fraser Valley Parkway as a result of the short distance between US 40 and these associated Fraser Valley Parkway intersections. Continuing on Fraser Valley Parkway would likely result in a longer travel distance and time.
 - Winter Park Sitzmark, Roam, and Arrow: Consistent with the redistribution of regional background trips and Transit Center trips, the analysis assumed a volume equal to 20 percent of these trips destined for Fraser on the south side of the highway would divert from US 40 and use Fraser Valley Parkway. These trips were removed from the study area intersections as westbound and eastbound through movements and turns through the CR 72 intersection.

2.3 Average Daily Traffic Volume

The addition of Fraser Valley Parkway to the local area roadway network would likely divert some volume demand from US 40 through the Town of Fraser. However, the Average Daily Traffic (ADT) volumes on Exhibit 1 are higher than those shown on the similar exhibit for the Year 2045 Refined Traffic Signals Alternative scenario without Fraser Valley Parkway in the *US 40 Fraser Traffic Report* (Jacobs 2020). This increase represents the fact that the additional residential units for Byers Peak Ranch included in the Fraser Valley Parkway scenario generate a higher volume of peak hour and daily trips than the estimated volume for regional diversion and redistribution of development-generated trips.

If the ADT volumes were to be compared using the original Byers Peak Ranch land use assumptions for both scenarios, this analysis estimates that a daily volume reduction of 3,200 vehicles, or 6 percent, may be realized at the west end of the study area near CR 5. About 25 percent of this decrease is attributable



to development-generated trips and 75 percent to background volume that is regional and using the facility as an alternate route to US 40. The peak hour reduction is a similar 6 percent, or 80 vehicles, primarily attributed to regional trips. The daily and peak hour volume reduction estimate is approximately 5 percent at the east end of the study area, or 1,250 daily and 125 peak hour trips, mostly attributed to regional traffic. The reduction in turning movement volume at the intersections during the peak hour is primarily through movements that reflect regional trips using the Fraser Valley Parkway. The proximity of access points to US 40 from the various developments suggests that US 40 will be a more attractive facility for use in traveling within Fraser and to access the highway for regional travel. These are estimates only and it should be noted that the ideal method to estimate trip diversion is with use of a regional travel demand model.

2.4 Operations Analysis Results

This section presents the operations analysis results of the Year 2045 Fraser Valley Parkway scenario. However, the discussion does not include a comparison to the Year 2045 Refined Traffic Signals Alternative scenario (selected as the preferred alternative in the CDOT US 40 Traffic Study) because the composition of the two scenarios is different enough that comparisons are not appropriate. This Fraser Valley Parkway scenario reflects the latest available information and input from local stakeholders, some of which differs from what was known at the time the Year 2045 Refined Traffic Signals Alternative scenario was finalized and selected as the preferred alternative. The differences are summarized as follows:

- The Fraser Valley Parkway scenario incorporated different types of land uses and higher densities for the Byers Peak Ranch development in year 2045 that necessitated changes to the trip generation and distribution.
- The Fraser Valley Parkway scenario assumed the roadway would extend west of CR 5. The preferred Year 2045 Refined Traffic Signals Alternative scenario assumed the Fraser Valley Parkway would terminate at CR 5 and all trips to or from west of Fraser would be required to access the facility through the US 40 intersection with CR 5. Therefore, some turning movement volumes were removed from the US 40 intersection with CR 5 and added as through movements at the Fraser Valley Parkway intersection with CR 5.

As discussed in Section 2.2, Analysis Volumes, the volume diversion from US 40 to the Fraser Valley Parkway is based on assumptions developed during the conduct of this assessment. While these assumptions are logical and sound based on known information at this time, the preferred process to estimate the diversion is best conducted through a regional travel demand modeling exercise that can account for traveler preferences and congestion on area roadways. It is logical to assume that the high average delay values and queues predicted for both forecasts and scenarios would result in drivers seeking an alternate route to US 40. The dynamic travel demand modeling process would test multiple iterations of driver diversion decisions to achieve equilibrium of volumes and delay across all area roadways. This lack of a more definitive estimate of volume demand for the Fraser Valley Parkway is perhaps the primary reason not to draw comparisons between the two scenarios.

Table 1 summarizes the operations analysis results for the US 40 study area intersections with a Fraser Valley Parkway facility in the roadway network. The yellow highlights for the overall LOS letter designation indicate it is at the lower limit of acceptable or just into the unacceptable range. Red highlights indicate unacceptable, failing operations. Six of the intersections (four of them signalized) are predicted to operate at an unacceptable level of service (LOS) (below LOS D) during the 2045 peak hour. The two intersections at the study limits (CR 5 and Rendezvous Road) have the highest average delay per vehicle among all the intersections. Vehicles queue through multiple signal cycles and higher delays result. These intersections would not provide enough capacity to serve the peak hour demand volume shown on Exhibit 1.

As discussed in Chapter 5, Operations Analysis Results, of the *US 40 Fraser Traffic Report* (Jacobs 2020), the LOS for the other intersections appears to be better than it would be if each intersection were analyzed with its projected demand volume. However, the capacity constraints at the CR 5 and



Rendezvous Road intersections result in lower volumes being serviced through the study limits and lower delay values at the interim intersections.

As the primary intersection within the study limits, the highest turning movement volumes are projected for the CR 72 intersection (the land use and trip distribution changes for Byers Peak Ranch increased the demand for this intersection compared to the previous forecast). As more signal cycle length must be devoted to turning movements, the eastbound through-movement demand queues through the upstream intersections at Byers Avenue and Eisenhower Drive. Higher delay values result at these two intersections. The same issue occurs in the westbound direction. However, the effect of the westbound through movement queuing through the Johns Drive and Old Victory Road intersections is not as noticeable as in the eastbound direction. With lower turning movement volumes to accommodate at these intersections, more signal cycle length can be devoted to the higher through movements, and lower average delays result. To match the Year 2045 Refined Traffic Signals Alternative scenario without the Fraser Valley Parkway, this analysis assumes one left-turn lane to accommodate the westbound to southbound left-turn movement at this intersection. However, the additional Byers Peak Ranch demand in this scenario with Fraser Valley Parkway for this left-turn movement increases to a volume that is typically serviced by dual left-turn lanes (315 vehicles as shown on Exhibit 1). A model test run suggests that dual left-turn lanes and two receiving lanes on southbound CR 72 would reduce the delay and queuing at this intersection, which would in turn improve the operations at most of the other study area intersections.

Table 1. Year 2045 Build Scenario with Refined Traffic Signals Level of Service Results

Intersection	2045 Refined Traffic Signals Alternative With Fraser Valley Parkway		
	Traffic Control	Delay (seconds per vehicle)	LOS
US 40/CR 5	Signal	86	F
US 40/CR 8	Signal	54	D
US 40/Eisenhower Drive	Signal	63	E
US 40/Byers Avenue	TWSC	42	E
US 40/Clayton Avenue	TWSC	21	C
US 40/CR 72	Signal	59	E
US 40/Johns Drive	TWSC	48	E
US 40/Old Victory Road	Signal	29	C
US 40/Meadows	TWSC	6	A
US 40/14E Planning Area Access	TWSC	34	D
US 40/Fire Station Access	TWSC	19	C
US 40/Rendezvous Road	Signal	72	E
CR 72/Wapiti Drive	Signal	15	B

Note:

TWSC = two-way stop control

Table 2 provides the LOS and delay by movement. As the table shows, the highest average movement delays are generally for the left-turn volumes. The highest demand is for the through movements at each intersection, so they receive a higher proportion of the signal cycle length to optimize the signal timing and higher delays result for the turning movements. Long delays (between 2 and 3 minutes) would likely prompt some drivers to seek alternate routes such as the Fraser Valley Parkway. As previously mentioned, a dynamic travel demand modeling process would be appropriate to capture driver tolerances and preferences for route choice.



Table 2. Intersection Delay and Level of Service Summary Comparison

Approach	Movement	2045 Refined Signals Alternative With Fraser Valley Parkway					
		Traffic Control	Demand Volume (vehicles per hour)	Delay (seconds per vehicle)	LOS		
US 40/CR 5							
WB	LT	Signal	190	59			
	TH		2,050	5			
	RT		5	2			
	Total		2,245				
NB	LT		15	78			
	TH		0	0			
	RT		210	7			
	Total		225				
EB	LT		5	161			
	TH		2,285	146			
	RT		30	84			
	Total		2,320				
SB	LT		5	83			
	TH		0	0			
	RT		0	0			
	Total		5				
Int	Total		4,795	70.5	E		
US 40/CR 8							
WB	TH	Signal	2,195	15			
	RT		125	6			
	Total		2,320				
EB	LT		50	118			
	TH		2,450	81			
	Total		2,500				
SB	LT		140	63			
	RT		50	48			
	Total		190				
Int	Total			5,010		47.8	D
US 40/Eisenhower Dr							
WB	LT		Signal	90		66	
	TH	2,270		1			
	Total	2,360					
NB	LT	65		68			
	RT	80		43			
	Total	145					



Table 2. Intersection Delay and Level of Service Summary Comparison

Approach	Movement	2045 Refined Signals Alternative With Fraser Valley Parkway			
		Traffic Control	Demand Volume (vehicles per hour)	Delay (seconds per vehicle)	LOS
EB	TH		2,505	113	
	RT		105	103	
	Total		2,610		
Int	Total		5,115	56.9	E
US 40/Byers Avenue/Clayton Avenue					
WB	LT	TWSC	20	34	
	TH		2,330	2	
	RT		0	2	
	Total		2,350		
NB	LT		10	44	
	RT		20	17	
	Total		30		
EB	LT		20	0	
	TH		2560	17	
	RT		5	8	
	Total		2,585		
SB	LT		0	0	
	RT	20	22		
	Total	20			
Int	Total		4,985	43.7	E
US 40/CR 72					
WB	LT	Signal	315	130	
	TH		1,795	30	
	RT		320	5	
	Total		2,430		
NB	LT		360	108	
	TH		110	104	
	RT		250	22	
	Total		720		
EB	LT		170	141	
	TH		1,935	52	
	RT		475	22	
	Total		2,580		



Table 2. Intersection Delay and Level of Service Summary Comparison

Approach	Movement	2045 Refined Signals Alternative With Fraser Valley Parkway					
		Traffic Control	Demand Volume (vehicles per hour)	Delay (seconds per vehicle)	LOS		
SB	LT		305	63			
	TH		90	54			
	RT		215	2			
	Total		610				
Int	Total		6,340	49.5	D		
US 40/Johns Drive							
WB	LT	TWSC	75	26			
	TH		2,430	20			
	Total		2,505				
NB	RT		70	1			
	Total		70				
EB	TH		2470	1			
	RT		20	2			
	Total		2490				
Int	Total			5065		26.2	D
US 40/Old Victory Road							
WB	LT		Signal	110		61	
	TH			2,455		14	
	RT	35		6			
	Total	2,600					
NB	LT	50		70			
	TH	0		0			
	RT	60		5			
	Total	110					
EB	TH	0		11			
	RT	2,485		2			
	Total	55					
Int	Total			2,540	13.8	B	
US 40/Meadows Right-in/Right-out							
WB	TH	TWSC		2,600	2		
	Total			2,600			
NB	RT			5	6		
	Total		5				
EB	TH		2,535	1			
	RT		10	2			
	Total		2,545				



Table 2. Intersection Delay and Level of Service Summary Comparison

Approach	Movement	2045 Refined Signals Alternative With Fraser Valley Parkway					
		Traffic Control	Demand Volume (vehicles per hour)	Delay (seconds per vehicle)	LOS		
Int	Total		5,150	6.4	A		
US 40/14E Planning Area Access							
EB	LT	TWSC	30	22			
	TH		2,510	2			
	Total		2,540				
SB	LT		35	30			
	RT		30	11			
	Total		65				
WB	TH		2,570	0			
	RT		45	1			
	Total		2,615				
Int	Total			5,220		31.2	D
US 40/Fire Station Access							
WB	TH		TWSC	2,615		0	
	RT	0		0			
	Total	2,615					
EB	TH	2,545		23			
	Total	2,545					
SB	RT	0		0			
	Total	0					
Int	Total			5,160	23.4	C	
US 40/Rendezvous Road							
WB	LT	Signal		195	155		
	TH			2,390	85		
	RT			200	97		
	Total		2,785				
EB	LT		135	68			
	TH		2,265	26			
	RT		145	7			
	Total		2,545				
NB	LT		135	79			
	TH		5	71			
	RT		165	12			
	Total		305				



Table 2. Intersection Delay and Level of Service Summary Comparison

Approach	Movement	2045 Refined Signals Alternative With Fraser Valley Parkway			
		Traffic Control	Demand Volume (vehicles per hour)	Delay (seconds per vehicle)	LOS
SB	LT	Signal	135	89	E
	TH		5	86	
	RT		90	24	
	Total		230		
Int	Total		5,560	68.1	
CR 72/Wapiti Drive					
NB	LT	Signal	47	14	B
	TH		209	12	
	RT		339	6	
	Total		595		
EB	LT		3	17	
	TH		6	20	
	RT		36	6	
	Total		45		
SB	LT		40	15	
	TH		208	8	
	RT		3	6	
	Total		251		
WB	LT		351	29	
	TH		13	31	
	RT		54	10	
	Total		418		
Int	Total	1,309	14.9	B	

Notes:

- EB = eastbound
- Int = intersection
- LT = left turn
- NB = northbound
- RT = right turn
- SB = southbound
- TH = through
- WB = westbound

Table 3 provides the system-wide measures of effectiveness for this Year 2045 Fraser Valley Parkway scenario. The vehicle miles traveled along US 40 and the crossroads within the study limits are projected to be 12,785 miles in year 2045. The corresponding total of vehicle hours traveled during the peak hour within the study limits is projected to be 845 hours. The total network delay that is the sum of the delay for all vehicles that travel within the study limits during the peak hour is projected to be 563 hours despite only 89 percent of the demand being served. As previously mentioned in the operations analysis discussion, not all the demand is served because of the capacity constraints at the CR 5 and Rendezvous Road intersections. If all the demand were to be served at these two intersections, then US 40 and the



other intersections within the study limits would need increased capacity to provide acceptable LOS during the peak hour.

Table 3. Refined Traffic Signals Alternative System-wide Measures of Effectiveness

Measure of Effectiveness	2045 Refined Traffic Signals Alternative with Fraser Valley Parkway
Vehicle Miles Traveled	12,785
Vehicle Hours Traveled	845
Vehicle Hours Delay	563
Percent Demand Served	89%



3. Conclusions and Recommendations

The assumptions described in this assessment were made with the best information available at the time. While these assumptions are reasonable, the ideal method to estimate trip diversion and the true desirability of Fraser Valley Parkway to motorists is by using a regional travel demand model. The dynamic travel demand modeling process would test multiple iterations of driver route choice decisions (based on origin and destination and congestion considerations) to achieve equilibrium of volumes and delay across all area roadways. This would provide a better estimate of the demand for a parallel facility. Furthermore, this type of modeling could account for the latent demand of an alternate facility in this area of the region. A better estimate of volume demand would enable conduct of analyses to inform design considerations including cross section, intersection configuration and type of control, and pavement design for the Fraser Valley Parkway. Finally, the trip generation and distribution and volume forecasting efforts conducted as part of the US 40 traffic study and this subsequent Fraser Valley Parkway assessment would be useful input for a travel demand modeling effort.

This Fraser Valley Parkway assessment suggests that the recommendations presented in the *US 40 Fraser Traffic Report* (Jacobs 2020) to increase the capacity of the existing US 40 facility would still be applicable with the addition of Fraser Valley Parkway to the area roadway network. Although the additional roadway would serve to divert some volume, it would not likely divert enough to preclude the US 40 corridor-wide improvements (as proposed in the *US 40 Fraser Traffic Report*) to service all the projected year 2045 peak hour volume demand. Therefore, a long-term recommendation is to consider options to accommodate the excess demand to include alternative routes adjacent to US 40 (such as the Fraser Valley Parkway) at least through the length of the study area but ideally extending to the west and east of the study limits, a regional transit system or limitations to adjacent land use development and growth. Consideration of alternate capacity should ideally begin as soon as practical but no later than the completion of the short-term recommendations outlined in the *US 40 Fraser Traffic Report*.

To increase the desirability of Fraser Valley Parkway as an alternate route to US 40, this assessment recommends consideration of the following:

- Increase the distance between an alternative route and US 40. The close proximity, particularly near the Old Victory Road and CR 72 intersections, would likely prompt use of the more direct route along US 40.
- Revise the currently-proposed alignment into one that is more direct (for a shorter travel distance) and efficient (a cross section that can accommodate higher speeds and volumes).
- Identify the alignment west of CR 5 to function as a regional reliever route rather than just an alternative route option for Fraser.

In addition to alleviating some volume demand for US 40, Fraser Valley Parkway would provide other benefits within the study area. A secondary route through Fraser provides resiliency, great opportunities for local transit, and improves the capabilities of emergency services to reach an incident location (particularly if US 40 is impassable due to traffic congestion). Fraser Valley Parkway would provide access to and improve the attractiveness of proposed developments on the south side of US 40.

In addition to Fraser Valley Parkway, this assessment recommends the following be considered by CDOT, the Town of Fraser, and Grand County to improve traffic operations on US 40:

- Implement off-system improvements to facilitate internal circulation within the town and reduce the use of US 40 for local trips internal to Fraser.
- Consolidate US 40 access points to improve traffic flow and volume throughput.
- Consider modifying the posted speed limits to achieve one speed limit that will provide consistent driver expectations and result in a more homogeneous traffic stream.



4. References

These references are specific to the conduct of this assessment and reflect the materials used to modify the analysis volumes and conduct and interpret the analysis results. Refer to the *US 40 Fraser Traffic Report* (Jacobs 2020) for the references used to develop the US 40 analysis volumes that were the starting point for the development of the assessment volumes.

Byers Peak Properties. 2019. *Byers Peak Ranch Traffic Impact Study*. Prepared by Felsburg, Holt & Ullevig. May.

Cornerstone Holdings and Terracina Design. 2019. "Sheet 3 – Sketch Plan." *Byers Peak Ranch Sketch Plan*. December 6.

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Institute of Transportation Engineers. 2017. *ITE Trip Generation Manual, 10th Edition*. ITE TripGen Web-based App. <https://itetripgen.org/index.html>.

Jacobs Engineering Group (Jacobs). 2020. *US 40 Fraser Traffic Report*. Prepared for CDOT Region 3. April.

Transportation Research Board. 2016. *Highway Capacity Manual Sixth Edition: A Guide for Multimodal Mobility Analysis*.

Attachment 1
Operations Analysis Results

Int Name	Traffic Control	Appr	Mvmt	Demand DHV	Vehicle Delay (by seed #)										Average of seeds				
					101	102	103	104	105	106	107	108	109	110	Delay	% Served	Std. Dev.		
US 40/CR 5	Signal	WB	LT	190	58	53	56	56	66	55	54	56	47	56	57				
			TH	2060	5	5	4	5	7	5	6	5	5	6	5				
			RT	5	1	1	1	1	1	1	1	1	1	5	3	2			
			Total	2255															
		NB	LT	15	77	70	71	64	67	61	88	86	90	88	77				
			TH	0	0	0	0	0	0	0	0	0	0	0	0				
			RT	210	6	7	7	7	6	7	6	7	6	6	7				
			Total	225															
		EB	LT	5	163	183	269	176	173	178	159	234	290	136	181				
			TH	2285	194	182	202	193	174	172	169	177	179	188	183				
			RT	30	114	98	81	148	92	90	114	92	144	124	108				
			Total	2320															
		SB	LT	5	132	166	44	86	94	160	101	78	53	90	100				
			TH	0	0	0	0	0	0	0	0	0	0	0	0				
			RT	0	0	0	0	0	0	0	0	0	0	0	0				
			Total	5															
Int	Total	4805	89	84	94	88	82	82	82	86	87	87	86.2	F					
US 40/CR 8	Signal	WB	TH	2205	13	14	13	13	14	15	13	14	12	15	14				
			RT	125	5	5	7	4	6	7	4	6	5	6	5				
			Total	2330															
		EB	LT	50	109	126	126	117	116	119	111	143	133	124	123				
			TH	2450	102	99	104	97	94	89	95	89	95	100	96				
			Total	2500															
		SB	LT	140	59	68	60	64	70	70	65	61	60	54	63				
			RT	50	45	55	45	55	53	52	43	51	47	38	48				
			Total	190															
		Int	Total	5020	54	55	57	53	53	52	54	52	54	55	53.9	D			
US 40/Eisenhower Dr	Signal	WB	LT	90	67	66	61	57	68	67	60	67	74	65	65				
			TH	2280	1	1	0	1	0	1	1	1	1	1	1				
			Total	2370															
		NB	LT	65	77	76	75	70	72	58	65	68	63	61	68				
			RT	80	46	48	43	50	41	45	41	43	44	44	44				
			Total	145															
		EB	TH	2505	127	126	134	129	123	120	122	121	127	128	125				
			RT	105	122	116	119	119	110	112	108	112	113	117	115				
			Total	2610															
		Int	Total	5125	63	62	67	63	60	60	63	63	66	63	62.9	E			
US 40/Byers Ave/Clayton Ave	TWSC	WB	LT	20	25	22	31	34	27	26	19	29	21	41	28				
			TH	2340	2	2	2	1	2	2	2	3	2	2	2				
			RT	0	7	1	1	2	1	2	1	2	2	1	2				
		NB	LT	10	46	38	55	45	26	42	48	41	41	33	42				
			RT	20	13	15	16	33	23	19	19	23	20	11	19				
			Total	30															
		EB	LT	20	0	0	0	0	0	0	0	0	0	0	0				
			TH	2560	17	17	21	21	17	18	18	19	19	17	18				
			RT	5	22	37	19	1	11	8	12	12	4	19	15				
		SB	LT	0	0	0	0	0	0	0	0	0	0	0	0				
			RT	20	27	30	22	19	19	21	12	17	19	27	21				
			Total	20															
		Int	Total	4995												42.4	E		
		US 40/CR 72	Signal	WB	LT	320	238	119	253	210	104	230	201	264	244	227	210		
TH	1805				25	20	26	23	19	25	22	26	25	28	24				
RT	270				3	3	4	3	3	3	3	3	3	3	4	3			
Total	2395																		
NB	LT			360	173	181	152	137	175	181	178	139	170	161	165				
	TH			110	157	172	138	126	160	170	165	129	155	152	152				
	RT			250	58	59	45	35	57	60	59	35	51	49	51				
	Total			720															
EB	LT			170	128	101	181	102	101	147	168	149	130	125	135				
	TH			1935	58	59	58	60	57	58	56	56	60	57	58				
	RT			475	26	24	26	26	25	25	25	24	29	23	25				
	Total			2580															
SB	LT			305	65	67	63	60	62	66	63	60	59	70	64				
	TH			90	50	57	56	62	57	57	47	55	50	50	54				
	RT			215	2	2	2	1	2	3	2	2	2	2	2				
	Total			610															
Int	Total	6305	61	54	62	55	51	62	60	60	64	60	58.9	E			4		
US 40/Johns Dr	TWSC	WB	LT	75	83	19	82	32	18	53	50	82	63	50	48				
			TH	2395	50	7	57	23	4	48	41	70	58	49	40				
			Total	2470															
		NB	RT	70	1	1	1	1	1	1	1	1	1	1	1				
			Total	70															
		EB	TH	2470	1	1	1	1	1	1	2	1	1	1	1				
			RT	20	1	2	3	2	1	2	2	1	2	1	2				
			Total	2490															
Int	Total	5030												48.4	E				

Int Name	Traffic Control	Appr	Mvmt	Demand DHV	Vehicle Delay (by seed #)										Average of seeds		Std. Dev.	
					101	102	103	104	105	106	107	108	109	110	Delay	% Served		
US 40/Old Victory Rd	Signal	WB	LT	110	96	53	105	55	56	80	91	110	79	88	80			
			TH	2420	59	5	78	7	5	60	58	93	69	51	47			
			RT	35	30	2	53	6	3	28	30	43	55	29	27			
			Total	2565														
		NB	LT	50	85	72	96	74	67	88	95	91	70	72	81			
			TH	0	0	0	0	0	0	0	0	0	0	0	0			
			RT	60	6	4	6	6	4	9	21	6	8	5	7			
			Total	110														
		EB	LT	0	0	0	0	0	0	0	0	0	0	0	0			
			TH	2485	7	8	7	6	9	8	9	8	7	7	8			
			RT	55	1	1	2	1	2	1	2	2	2	2	2			
			Total	2540														
Int	Total	5215	35	8	43	8	8	35	34	48	37	31	28.6	C				
US 40/Fire Station Access	TWSC	WB	TH	2580	2	0	12	0	0	4	11	17	12	0	8			
			RT	0	0	0	0	0	0	0	0	0	0	0	0			
			Total	2580														
		EB	TH	2545	17	19	22	21	21	20	19	17	15	18	19			
			Total	2545														
		SB	RT	0	0	0	0	0	0	0	0	0	0	0	0			
			Total	0														
		Int	Total	5125												19.1	C	
US 40/Rendezvous Rd	Signal	WB	LT	195	140	157	168	158	159	143	170	165	164	146	157			
			TH	2355			118	115	104	101	123	128	128	102	91			
			RT	200	80	100	105	104	93	94	119	124	117	89	102			
			Total	2750														
		EB	LT	135	60	65	66	52	72	62	64	77	59	64	64			
			TH	2265	25	25	27	27	26	27	25	25	26	25	26			
			RT	145	6	10	6	7	7	6	8	7	8	7	7			
			Total	2545														
		NB	LT	135	110	72	100	79	71	73	89	185	102	77	96			
			TH	5	66	88	71	85	67	62	67	92	43	97	74			
			RT	165	12	9	15	14	11	13	11	32	19	16	15			
			Total	305														
		SB	LT	135	84	73	95	80	131	95	91	65	72	88	88			
			TH	5	54	41	151	37	111	110	134	61	95	86	87			
			RT	90	28	21	27	21	37	25	36	20	26	29	27			
			Total	230														
Int	Total	5830	62	69	75	72	69	67	76	79	78	67	71.5	E	6			
US 40/Meadows	TWSC	WB	TH	2565	37	0	68	0	0	44	54	69	52	16	33			
			Total	2565														
		NB	RT	5	6	6	6	6	6	6	6	7	7	7	6			
			Total	5														
		EB	TH	2535	1	1	1	1	1	1	1	1	1	1	1			
			RT	10	1	1	2	1	1	1	1	1	1	1	1			
			Total	2545														
		Int	Total	5115	19	6	6	6	6	6	6	7	7	7	6.4	A	4	
CR 72/Wapiti Dr	Signal	NB	LT	47	14	15	12	11	13	16	9	13	9	11	12			
			TH	209	10	13	10	10	14	10	14	10	12	12	12			
			RT	339	5	6	6	5	6	5	6	6	5	5	6			
			Total	595														
		EB	LT	3	32	38	10	19	13	17	8	26	8	11	16			
			TH	1	2	0	0	14	20	0	22	44	0	0	20			
			RT	41	6	6	6	5	6	6	6	6	7	6	6			
			Total	45														
		SB	LT	40	15	12	13	15	16	12	11	19	14	16	14			
			TH	208	6	7	8	7	7	8	9	9	9	8	8			
			RT	3	5	8	4	1	1	3	9	5	8	10	6			
			Total	251														
		WB	LT	361	28	30	31	30	33	30	31	27	26	26	29			
			TH	13	34	27	18	32	28	31	35	37	29	35	31			
			RT	44	7	8	11	12	15	14	14	7	9	8	10			
			Total	418														
Int	Total	1309	14	15	15	15	17	15	16	14	14	14	14.8	B	1			
US 40/14E PA Access	TWSC	EB	LT	30	32	11	25	22	26	21	26	29	22	31	24			
			TH	2510	0	0	1	0	1	1	1	0	1	1	1			
			Total	2540														
		SB	LT	35	32	31	39	28	39	28	43	33	35	29	34			
			RT	30	12	12	16	12	10	14	13	14	14	11	13			
			Total	65														
		WB	TH	2535	8	0	32	0	0	15	26	34	25	0	14			
			RT	45	3	1	5	1	1	4	9	10	11	1	5			
			Total	2580														
		Int	Total	5185	5	1	17	1	1	8	14	17	13	1	34.2	D	7	