# **EVWHS Development Application - Exhibit 6**

### **Transportation Impact Study**

for

### Triumph Development's East Vail Residential



February 14, 2019 Revised May 21, 0219

PREPARED FOR:

**Triumph Development** 

Attn. Michael O'Connor 12 Vail Road, Suite 700 Vail, CO 81657

PREPARED BY:

**McDowell Engineering, LLC** 

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Contact: Kari J. McDowell Schroeder, PE, PTOE

Project Number: 1379

### **Statement of Engineering Qualifications**

Kari J. McDowell Schroeder, PE, PTOE is a Transportation and Traffic Engineer for McDowell Engineering, LLC. Ms. McDowell Schroeder has over twenty-two years of extensive traffic and transportation engineering experience. She has completed numerous transportation studies and roadway design projects throughout the State of Colorado. Ms. McDowell Schroeder is a licensed Professional Engineer in the State of Colorado and has her certification as a Professional Traffic Operations Engineer from the Institute of Transportation Engineers.

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### 1.0 Project Description

The East Vail Residential project is proposing a new residential apartment complex. The development will provide both market rate housing and affordable housing to the local workforce. The purpose of this CDOT Level 2 study is to forecast and analyze the impacts of the site's additional traffic volumes on the surrounding roadway network. This traffic analysis was scoped with both the Town of Vail and CDOT prior to completion.

The proposed site is located north and west of the existing I-70 and East Vail interchange. The site is proposing to take access directly from the north I-70 Frontage Road. The project location is shown in **Figure 1**. A conceptual site plan is shown in **Figure 2**.

Figure 1: Vicinity Map

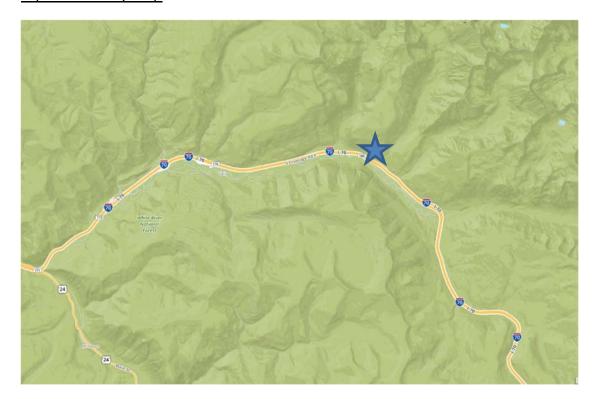
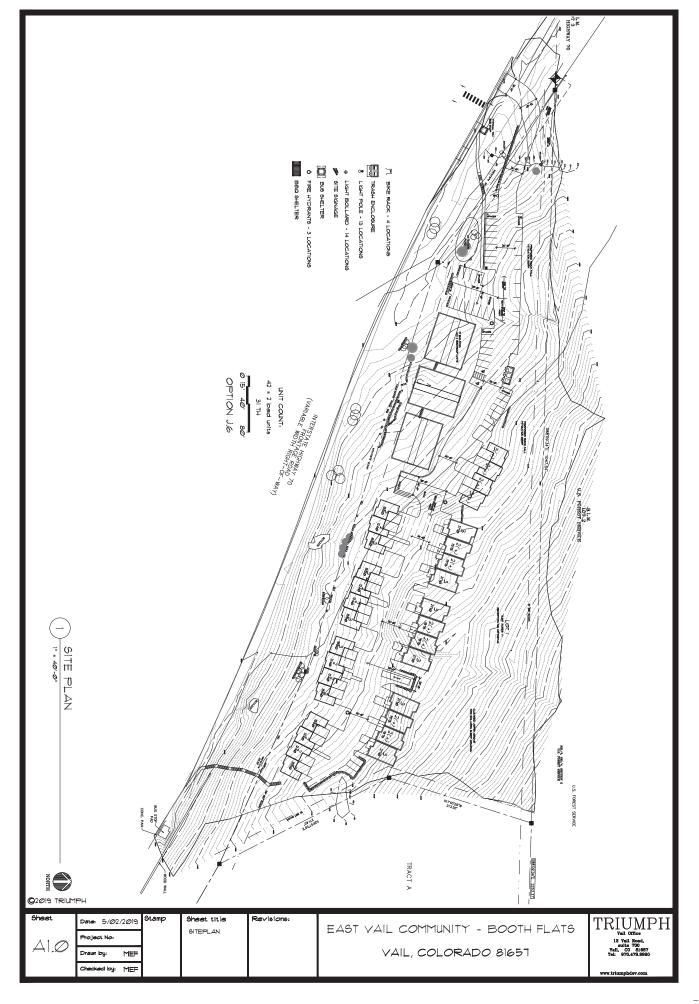


Figure 2: Conceptual Site Plan



### 2.0 Existing Conditions

### 2.1 Description of Existing Transportation System

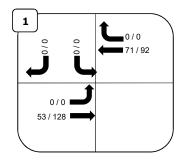
North I-70 Frontage Road: The North I-70 Frontage Road is a two-lane, paved roadway that parallels the north side of I-70. This Frontage Road connects East Vail to Main Vail and West Vail, sometimes crossing under I-70 as a South Frontage Road. In the vicinity of the site, the North I-70 Frontage Road has a posted speed limit of 25mph eastbound and 45mph westbound.

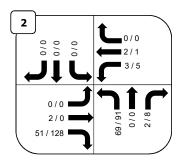
<u>Big Horn Road</u>: Big Horn Road is a paved, two-lane road that connects the residential homes in East Vail to the East Vail I-70 interchange. The posted speed limit on Big Horn Road is 40mph.

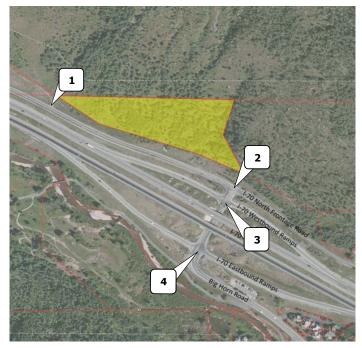
### 2.2 Traffic Data Collection

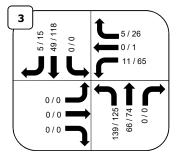
<u>Existing Traffic Volumes</u>: Existing turning movement counts were collected by McDowell Engineering. Traffic data was collected on Saturday, December 30, 2017 per direction of the Town of Vail Engineer. Turning movement counts were collected from 7:00 – 9:00am and 4:00 – 6:00pm. This count date and time are considered a seasonal peak for the Town of Vail.

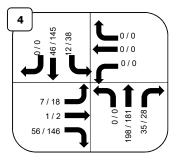
The resulting Year 2017 traffic volumes for the weekday morning peak hour and weekday afternoon peak hour are shown in **Figure 3**. The raw traffic data is also included in the **Appendix**.

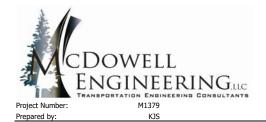












**LEGEND**:
Directional Distribution = Inbound% (Outbound %)

AM/PM Volumes = XX/XX VPH (in PCEs)

Turning Movements



### 3.0 Future Traffic Projections

### 3.1 Existing & Committed Capital Improvement Projects

There are no existing or committed capital improvement projects that will impact this analysis.

### 3.2 Planned or Existing Land Development Projects

There are no planned or existing land development projects in the immediate vicinity.

### 3.3 Seasonal Adjustment Factor

The data collection date and times are considered a seasonal peak for the Town of Vail. Therefore, no seasonal adjustment factor is required for this analysis.

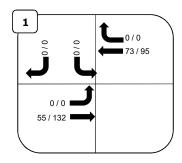
### 3.4 Background Traffic Growth

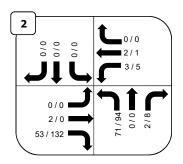
Long-term background growth was based upon the Town of Vail's historic 1.5% annual growth rate. This is consistent with the Town's latest Vail Master Plan forecast methods.

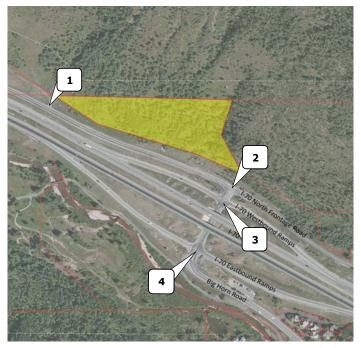
### 3.5 Background Traffic Forecasts

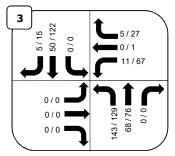
The resulting peak hour forecasted Year 2019 and forecasted Year 2040 background traffic volumes can be seen in **Figure 4** and **Figure 5**, respectively.

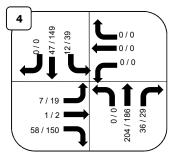
### Figure 4: Year 2019 Background Traffic

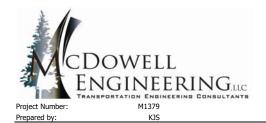












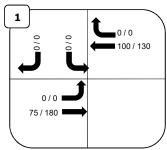
**LEGEND**:
Directional Distribution = Inbound% (Outbound %)

AM/PM Volumes = XX/XX VPH (in PCEs)

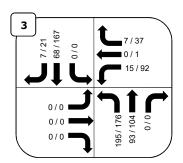
Turning Movements



### Figure 5: Year 2040 Background Traffic



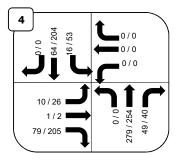




2

0/0

72 / 180





**LEGEND**:
Directional Distribution = Inbound% (Outbound %)

AM/PM Volumes = XX/XX VPH (in PCEs)

Turning Movements



### 4.0 Project Traffic

### 4.1 Existing Site Traffic

The project site is currently vacant and is not producing any significant traffic.

### 4.2 Proposed Land Use

The proposed development will include up to 73 dwelling units. This includes 31 market rate townhomes and 42 affordable housing apartments. The proposed townhomes will serve a mix of local residents and second homeowners. The apartment units are intended to be affordable for Vail's ski resort and hospitality employees.

### 4.3 Trip Generation Analysis

These dwelling units fall under two separate land use definitions. The market rate townhomes are included in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* a land use #221 Multifamily Dwelling Unit. This land use applies whether the units are occupied as primary dwelling units or as second homes. ITE's trip generation rates were utilized for this analysis.

The Lions Ridge and Timber Ridge Apartments in Vail have similar characteristics to the proposed affordable housing apartments. They primarily serve work force housing, have similar amenities, and have direct access to Vail's transit system. The site is located within walking and bus proximity to recreation and amenities. Both CDOT and the Town agreed that the trip generation data from the Lions Ridge and Timber Ridge accesses could be applied to the anticipated trip generation calculations for this development.

### 4.4 Multimodal Reduction

A 10% multimodal trip reduction was used when calculating the total number of vehicular trips from the market rate townhomes. This reduction was used to accommodate the projected number of transit trips from the site's bus stop to the resort and local businesses.

The multimodal reduction for the affordable apartments was intrinsically included in the Lions Ridge and Timber Ridge Apartments observations. Many residents were observed using the adjacent transit stop.

### 4.5 Site-Generated Traffic

The buildout of the site is expected to generate a total of 290 external vehicle trips over the course of an average weekday, including 17 trips during the morning peak hour and 24 trips during the afternoon/evening peak hour. Refer to **Table 1** and **Table 2** for trip generation calculations and further breakdown of these trips.



PROJECT NUMBER: PREPARED BY: DATE: M1379 KJS 2019-05-21

REVISED:

### Table 1: Existing Timber Ridge and Lions Ridge Trip Generation Analysis

### Vail, Colorado Estimated Site-Generated Traffic<sup>1</sup>

		Trip Ger	eration	Rates <sup>1</sup>	Average Weekday <sup>3</sup>		orning F ound		our ound		ening ound	Peak H Outb	our oound
ITE Code	Units <sup>2</sup>	Avg. Weekd ay	AM Peak Hour	PM Peak Hour	Trips (VPD)	% Trips	Trips	% Trips	Trips	% Trips	Trips	% Trips	Trips
Existing Timber Ridge and Lions Ridge Apartments	210 DU	3.29	0.21	0.33	690	32%	14	68%	30	54%	37	46%	32
Observed Trip Generation					690		14		30		37		32

### Table 2: Proposed East Vail Residential Trip Generation Analysis

### Vail, Colorado Estimated Site-Generated Traffic<sup>1</sup>

			Trip Gen	eration	Rates <sup>1</sup>	Average Weekday <sup>3</sup>	Morning F Inbound			our		ening ound	Peak Hour Outbound		
ITE Code	Un	its <sup>2</sup>	Avg. Weekd ay	AM Peak Hour	PM Peak Hour	Trips (VPD)	% Trips	Trips	% Trips	Trips	% Trips	Trips	% Trips	Trips	
			•				-						-		
Proposed East Vail Apartments - Workforce Housing <sup>1,5</sup>	42	DU	3.29	0.21	0.33	138	32%	3	68%	6	54%	7	46%	6	
Subtotal						138		3		6		7		6	
Proposed East Vail Townhomess - Second	31	DU	5.44	0.32	0.41	169	27%	3	73%	7	60%	8	40%	5	
Homes <sup>4</sup> (ITE Land Use 221)															
Multimodal Reduction		-10%				-17		0		-1		-1		-1	
Subtotal						152		3		6		7		4	
Anticipated Trip Generation						290		5		12		14		10	

#### Notes

<sup>&</sup>lt;sup>1</sup> Values obtained from field counts at the Timber Ridge and Lions Ridge Apartment Accesses during ski season on December 1, 2018.

<sup>&</sup>lt;sup>2</sup> kSF = 1,000 Square Feet; DU = Dwelling Units

<sup>&</sup>lt;sup>3</sup> Assumes a dhv of 10% of ADT.

<sup>&</sup>lt;sup>4</sup> Values obtained from *Trip Generation, 10th Edition,* Institute of Transportation Engineers, 2017.

<sup>&</sup>lt;sup>5</sup> Multimodal reductions are intrinsically included in the Timbar Ridge and Lions Ridge trip generation rates.

### 4.6 Site-Generated Directional Distribution

The directional distribution of site-generated traffic on adjacent roadways is influenced by several factors, including the following:

- The location of the site relative to other facilities and the roadway network,
- The configuration of the existing and proposed adjacent roadway network,
- Relative location of neighboring population centers.

Within the Town of Vail, it is often easier for residents and employees to take local transit than to drive a personal vehicle and find parking.

Google Maps driving directions were used to compare travel times between the site and the closest grocery store, post office, Vail Village, etc. This analysis supported the following project-generated directional distribution:

- Eighty percent (80%) of site-generated traffic will originate to/from the I-70 interchange. Of this traffic, sixty percent (60%) was assumed to originate from the west. Twenty percent (20%) was assumed to come from the east on I-70.
- Twenty percent (20%) of site-generated traffic will originate to/from the west on the North I-70 Frontage Road.

**Figure** shows the project generated directional distribution.

Per CDOT's request a sensitivity analysis of alternate distribution assumptions were also reviewed assuming a 30%/70% split and 10%/90% split. Refer to **Section 5.4**.

### 4.7 Site-Generated Traffic Assignment

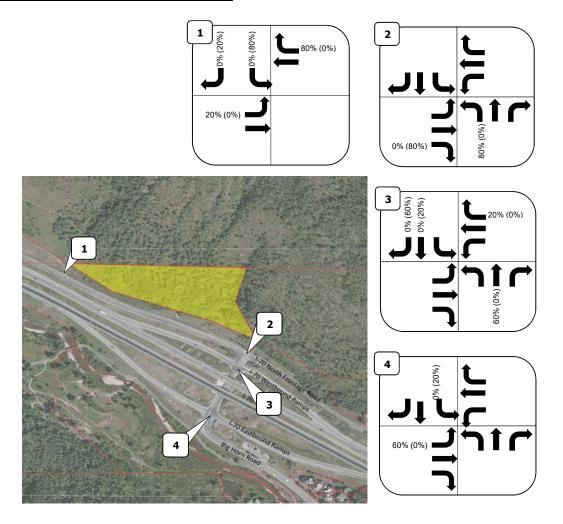
When the trip generation expected for this site is applied to the estimated trip distribution, the result is the anticipated assignment of trips on the roadway system. **Figure** depicts the traffic assignment.

### 4.8 Total Traffic

For the short term forecasted Year 2019, the background traffic (Figure 4) added to the site-generated traffic (Figure 7) yields the total Year 2019 traffic in Figure .

Similarly, for Year 2040, background traffic (Error! Reference source not found.) is added to the site-generated traffic (Figure ) to yield the total Year 2040 traffic in Figure .

Figure 6: Site-Generated Directional Distribution



- 1. Cooley Mesa Road / Site Access
  2. Cooley Mesa Road / Spring Creek Road / Eldon Wilson Road (West Airport Access)
  3. Cooley Mesa Road / Buckhorn Valley Blvd. / Eldon Wilson Road (East Airport Access)



### LEGEND:

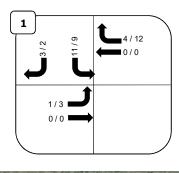
Directional Distribution = Inbound% (Outbound %)

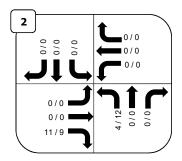
AM/PM Volumes = XX/XX VPH (in PCEs)

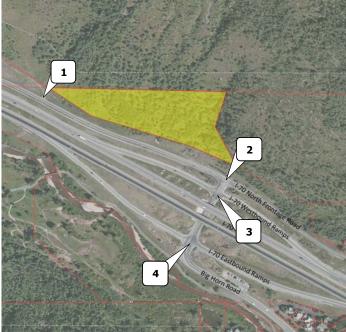
Turning Movements

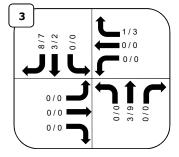


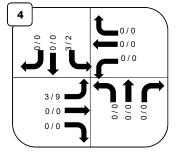
Figure 7: Site-Generated Traffic Assignment













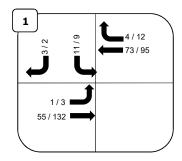
**LEGEND**:
Directional Distribution = Inbound% (Outbound %)

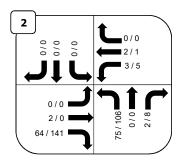
AM/PM Volumes = XX/XX VPH (in PCEs)

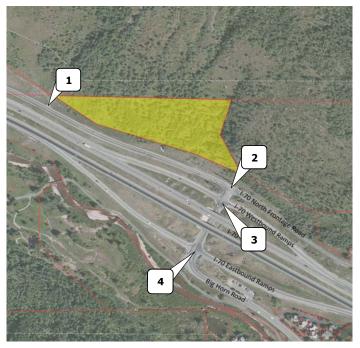
Turning Movements

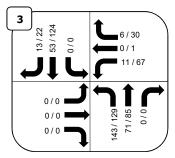


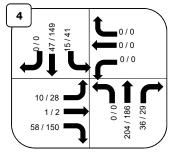
### Figure 8: Year 2019 Total Traffic













**LEGEND**:
Directional Distribution = Inbound% (Outbound %)

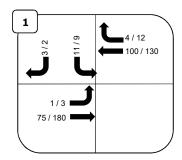
AM/PM Volumes = XX/XX VPH (in PCEs)

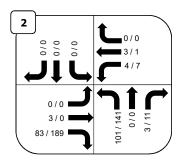
Turning Movements

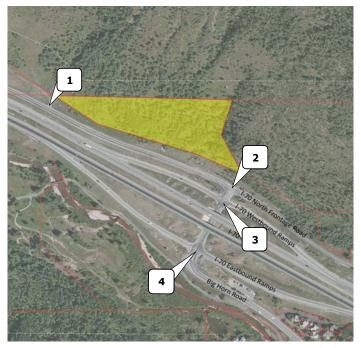


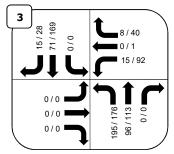
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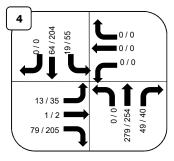
### Figure 9: Year 2040 Total Traffic













**LEGEND**:
Directional Distribution = Inbound% (Outbound %)

AM/PM Volumes = XX/XX VPH (in PCEs)

Turning Movements



Prepared by:

### 5.0 Transportation Impact Analysis

### 5.1 Site Design and Traffic Circulation Evaluation

The conceptual site plan (**Figure**) depicts the site's proposed access to the North I-70 Frontage Road. The proposed site access is located on the northwest corner of the site and meets the minimum access spacing distance of 400 feet per Section 4.4 and Table 4-1 of the *Access Code*.

Internal circulation has been designed to accommodate two-way traffic and backing motions from parking stalls.

### 5.2 Multi Modal Connectivity

The applicant is currently working with the Town of Vail staff to determine a new bus stop location and layout at the northwest corner of the site on the frontage road. Multimodal connection details such as paths and sidewalks will be determined with Town of Vail staff as the project develops.

### 5.3 Auxiliary Turn Lane Requirements

Turn lane storage is determined by CDOT'S *State Highway Access Code*. Based upon each roadway's posted speed limits and projected Year 2040 traffic volumes, additional auxiliary turn lanes will not be required. Refer to **Table 3**.

<u>North I-70 Frontage Road & Site Access</u>: The anticipated traffic volumes at the site access do not warrant the need for construction of auxiliary turn lanes at the site access.

North I-70 Frontage Road & Big Horn Road: No additional auxiliary turn lanes are required at this intersection.

<u>I-70 Westbound Ramps & Big Horn Road</u>: No additional auxiliary turn lanes are required at this intersection.

<u>I-70 Eastbound Ramps & Big Horn Road</u>: No additional auxiliary turn lanes are required at this intersection.

Table 3: Auxiliary Turn Lane Requirements

#	Intersection	N.A. west	Posted Speed	SHAC Trigger	Year Exis		Year B		Year B	2040 G	Year To		Year To		Existing	Access Code Required	Trigger Year &
#	intersection	IVIVITIL	Limit (MPH)	Volume (VPH)	AM	PM	AM	PM	АМ	PM	AM	PM	АМ	PM	Turn Lane	Turn Lane <sup>1</sup>	Condition
1	North I-70	EBL	25	>25	N/A	N/A	N/A	N/A	N/A	N/A	1	3	1	3	None	None	
	Frontage	WBR	45	>25	N/A	N/A	N/A	N/A	N/A	N/A	4	11	4	11	None	None	
		EBR	25	>50	51	128	53	132	72	180	63	140	82	188	None	None	EBR is major movement.
	North I-70	WBL	25	>25	3	5	3	5	4	7	3	5	4	7	None	None	
2	Frontage Road & Big Horn Road	NBL	40	>25	69	91	71	94	97	129	75	105	101	140	None	Yes	Existing 60' NBL is maximum available distance between intersections.
		NBR	40	>50	2	8	2	8	3	11	2	8	3	11	None	None	
3	I-70 Westbound Ramps & Big Horn Road	NBL	40	>25	139	125	143	129	195	176	143	129	195	176	None	Yes	Existing 125' NBL is maximum available distance with back to back turn lanes to ramps.
		SBR	40	> 50	5	15	5	15	7	21	12	21	14	27	None	None	
		NBR	40	>50	35	28	36	29	49	40	36	29	49	40	None	None	
4	I-70 Eastbound Ramps & Big Horn Road	SBL	40	>25	12	38	12	39	16	53	14	41	18	55	None	Yes	Existing 125' SBL is maximum available distance with back to back turn lanes to ramps.

<sup>&</sup>lt;sup>1</sup>Based upon State Highway Access Code requirements for an R-A roadway with posted speed of 45mph.

EBL = Eastbound left, EBR = Eastbound right, WBL = Westbound left, WBR = Westbound right, NBL = Northbound left, NBR = Northbound right, SBL = Southbound left, SBR = Southbound right

Triggered by State Highway Access Code Volumes

### 5.4 Sensitivity Analysis

A sensitivity analysis was performed for directional distribution shift of 10% in either direction of the original analysis. Based upon this analysis, there is no change in the turn lane recommendations.

### 5.5 Site Access Sight Distance

The proposed site access to the North Frontage Road has sight distance in either direction that exceeds the 450' requirement per Table 4-2 of the *Access Code*.

### 5.6 State Highway Access Permit

The proposed development will require a new State Highway Access Permit for the site access onto CDOT's North I-70 Frontage Road.

### 6.0 Recommendations and Conclusions

The East Vail Residential project is proposing a new residential apartment complex. The development will provide both market rate housing and affordable housing to the local workforce. The purpose of this CDOT Level 2 study is to forecast and analyze the impacts of the site's additional traffic volumes on the surrounding roadway network. This traffic analysis was scoped with both the Town of Vail and CDOT prior to completion.

<u>Site Access and Circulation</u>: The site is proposing to take access directly from the north I-70 Frontage Road. Sight distance meets the minimum spacing sight distance requirements per CDOT's *State Highway Access Code*.

<u>Trip Generation</u>: The buildout of the site is expected to generate a total of 290 external vehicle trips over the course of an average weekday, including 17 trips during the morning peak hour and 24 trips during the afternoon/evening peak hour.

<u>Auxiliary Turn Lane Requirements</u>: No additional auxiliary turn lane construction is required.

<u>State Highway Access Permit</u>: The project will require a new State Highway Access Permit for the proposed North I-70 Frontage Road access.

<u>Transportation Recommendations</u>: Based upon the analysis and recommendations presented in this report, the East Vail Residential Apartments are anticipated to be successfully incorporated into the Town of Vail's roadway network.

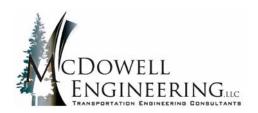
## 7.0 Appendix

### **Reference Documents**

- 1. State Highway Access Code. State of Colorado, 2002.
- 2. CDOT OTIS Data. http://dtdapps.coloradodot.info/otis

### **Included Documents**

- 1. Scoping Form
- 2. 2017 Existing Traffic Counts



# **Traffic Study Scoping Form**

Contact In	formation	
Consultant	Name:	McDowell Engineering
	Tele:	970-623-0788
	E-mail:	kari@mcdowelleng.com
Developer/C	Owner Name:	Triumph Development

Project Name:		East Vail	Residential					
Project Location:		3700 Nor	th Frontage Road Wes	t, Vail. Par	cel # 2101-	-024-03-001		
Project Description: Application type (rezonin subdivision), acreage, ned development, etc.	•							
Existing / Proposed	ITE Code	#units or	Existing / Proposed	ITE Code	#units or	Existing / Proposed	ITE Code	#units o
Land Uses		Size	Land Uses		Size	Land Uses		Size
Apartments	#221	143						

Assumptions								
Study Horizons	Current Y	ear: 20	)18		Buildout `	Year:	2019	Long Term Year: 2040
Study Area Boundaries	North:	North Front	age Road		South:	I-70 Eastb	ound Ramp	os .
(Attach map if needed.)	East:	Big Horn Ro	oad		West:	Site Acces	SS	
ntersections to be Evaluated	1.	All site entra	nces		6.			
(Attach map if needed.)	2.	North Fronta	ge Rd & Big Ho	rn	7.			
	3.	Big Horn & I	-70 Westbound	Ramps	8.			
	4.	Big Horn & I	-70 Eastbound R	Ramps	9.			
	5.				10.			
Trip Distribution	See attaci	hed sketch.						
Trip Reductions*	Internal Capture	Use:		0	%	Pass By	Use:	0 %
	Multi- Modal	Use:		25	%		Use:	%
*Include in Trip Genera	tion table	if provided.	Submit calculat	tions bo	ased upon	<i>ITE's</i> Trip	Generation	Handbook.

CDOWLL LNGINERING.			McDowell Eng	gineering 1	raffic Study Scoping Form
<b>Assumptions (cont</b>	inued)				
Anticipated Future Traffic Growth Rates	D1	on Linearity days	Study Time Periods		AM (7-9)
(Describe methodology.)	Based up	on historic data	(Check all that apply.)		PM (4-6)
					SAT (noon)
					Other:
Other Factors (Proposed/assumed transportation improvements, other studies, nearby proposed developments, etc.)	Counts w	vere collected in December 2017	with direction from the	Town of Va	il and CDOT.
Analysis Methods &	**	Synchro			
Issues		HCS			
(Check all that apply.)		aaSidra or Rodel			
		Intersections			
		Roadway Sections			
		Signal Warrants			
		Safety/Sight Distance			
		Queuing & Storage			
		CDOT (Access Permit, etc.)			
		Identify Bicycle, Pedestrian & T	ransit Accommodation	S	
		TDM			
		Neighborhood Impacts			
		Other:			
Attachments, Note	es, & Oth	er Assumptions:			
Signed: Til Milbrell	fehroedet		Review Agency:		
(Applicant or Consulta	nt)		Department:		

Print Name:

Signed:

Date:

Print Name: Kari McDowell Schroeder, PE, PTOE

(Applicant or Consultant)

11/13/2018

Date:

Page 2 of 2



#### Intersection: N. FRONTAGE RD & LIONS RIDGE APARTMENT COMPLEX

Location: VAIL, COLORADO

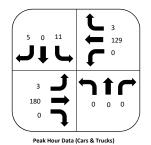
Traffic Data Collection Date: SATURDAY, DECEMBER 1, 2018

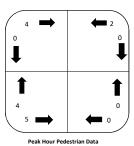
Weather: SNOWING

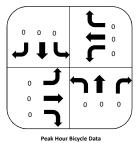


		N Frontage Rd					N Fron	tage Rd								N/	A							Lions	Ridge Apt	Complex			
		Eastbound					West	bound								Northb	ound								Southbou	nd			
Time	Left	Thru	Right		Left		TI	nru		Rig	ht		L	_eft		Thr	u		Righ	t		Left			Thru			Right	;
	Car Trk Bus Ped Bik SWL	Car Trk Bus Ped Bik SWR	Car Trk Bus Ped Bik	Ca	ar Trk Bus Pe NE		Car Trk B	us Ped I NER	Bik Car	Trk Bu	ıs Ped Bik	Car	Trk I	Bus Ped Bi SEL	ik Car	r Trk Bus	Ped Bik	Car	Γrk Bus	Ped Bik	Car T		Ped Bik NWL	Car Ti		Ped Bik NWR	Car	Trk Bus	Ped Bik
	1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 1 0	14         4         2         1         1         1         2         0         2         0         0         2         4         4         1         0         0         0         3         35         4         2         0         0         0         31         5         1         0         0         0         31         2         1         0         0         0         31         2         1         0         0         0         47         3         2         5         0 </th <th></th> <th>0 0 0</th> <th></th> <th>0 0 0 0 0 0</th> <th>15 2 37 4 20 2 28 3 27 3</th> <th>1 0 2 0 2 0 1 2 2 0 1 0</th> <th>0 2 0 0 0 0 1 0 1 0 0 0 2</th> <th>0 0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0</th> <th>0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th> <th></th> <th>3 0 1 1 4 1 6 1 6 1 1 1 1 1 1 1 1 1 1 1 1 1</th> <th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0</th> <th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th> <th>0 0</th> <th>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th> <th>1 1 2 1 0 4</th> <th>0 0 0 0 0 0 0 0 0 0 0 0</th> <th>0 0 0 0 0 0 0 0 0 1 0 2 0 4 0 3 0</th>		0 0 0		0 0 0 0 0 0	15 2 37 4 20 2 28 3 27 3	1 0 2 0 2 0 1 2 2 0 1 0	0 2 0 0 0 0 1 0 1 0 0 0 2	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		3 0 1 1 4 1 6 1 6 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 2 1 0 4	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 1 0 2 0 4 0 3 0
Total	5 0 0 4 0	262 26 11 8 1	0 0 0 0 0	0	0 0 0	0	200 23 1	2 2	0 6	0 0	0 0	0	0	0 0 0	0	0 0	0 0	0	0 0	0 0	20	0 0	4 0	0 (	0 0	0 0	9	0 0	10 0
Peak Hour Total	3 0 0 4 0	163 12 5 5 0	0 0 0 0 0	0	0 0 0	0	113 11	5 2	0 3	0 0	0 0	0	0	0 0 0	0	0 0	0 0	0	0 0	0 0	11 (	0 0	4 0	0 (	0 0	0 0	5	0 0	10 0
Peak Hour Total		180 vph 5 pph	0 vph 0 pph		0 vph	0 pph	129 vph	2 pj	ph 3	vph	0 pph	(	) vph	0 pp	h (	0 vph	0 pph	0 v	oh	0 pph	11 vp	h	4 pph	0 vp	h	0 pph	5 v	ph	10 pph
	ments Only: (8:00 - 9:00AM)	)							6	0 0	0 0	1									20	0 0	4 0				9	0 0	10 0
	3 0 0 4 0									0 0													4 0						10 0
Peak Hour Total	3 vph 4 pph	0 vph 0 pph	0 vph 0 pph		0 vph	0 pph	0 vph	0 p	ph 3	vph	0 pph		) vph	0 рр	h (	0 vph	0 pph	0 v	oh	0 pph	11 vp	h	4 pph	0 vp	h	0 pph	5 v	ph	10 pph

Total Peak Hour Vehicle Traffic at Intersection	331	vph
Total Peak Hour Peds/Bikes at Intersection	25	pph
Total Peak Hour Traffic (All Modes) at Intersection	356	pph
Percentage Peak Hour Trucks at Intersection	6.5	%
Peak Hour Factor	0.85	







#### Intersection: N. FRONTAGE RD & LIONS RIDGE APARTMENT COMPLEX

Location: VAIL, COLORADO

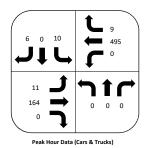
Traffic Data Collection Date: SATURDAY, DECEMBER 1, 2018

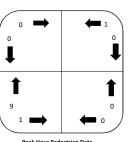
Weather: SNOWING

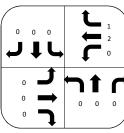


	1											TRANSPORT	TION ENSINEERING CONSULTANTS
		N Frontage Rd			N Frontag	e Rd			N/A			Lions Ridge Apt Complex	
		Eastbound			Westbou	nd			Northbound			Southbound	
Time	Left	Thru	Right	Left	Thru		Right	Left	Thru	Right	Left	Thru	Right
Time	Car Trk Bus Ped Bik SWL	Car Trk Bus Ped Bik SWR	Car Trk Bus Ped Bik	Car Trk Bus Pec		Ped Bik NER	Car Trk Bus Ped Bik	Car Trk Bus Ped Bik SEL	Car Trk Bus Ped Bik SER	Car Trk Bus Ped Bik	Car Trk Bus Ped Bik NWL	Car Trk Bus Ped Bik NWR	Car Trk Bus Ped Bik
2:00 PM 2:15 PM 2:30 PM 3:30 PM 3:15 PM 3:35 PM 4:00 PM 4:15 PM 4:30 PM 4:45 PM 5:00 PM 5:15 PM	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	29   3   0   0   0   0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 52 2 2 2 0 52 5 2 1 1 0 47 4 2 0 100 6 4 4 0 110 4 2 0 91 1 3 0 60 8 4 4 0 76 4 1 0 62 3 1 0 76 4 3 0 78 3 2 0 59 5 3	0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 1 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2
Overall Inters	section: (3:00 - 4:00PM)												
Total	28 0 0 17 0	471 43 20 11 0	0 0 0 0 0	0 0 0 0	0 1089 56 34	5 2	40 0 0 10 1	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	29 1 0 3 0	0 0 0 0 0	22 0 0 9 0
Peak Hour Total	11 0 0 9 0	142 15 7 1 0	0 0 0 0 0	0 0 0 0	0 465 17 13	1 2	9 0 0 4 1	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	10 0 0 0 0	0 0 0 0 0	6 0 0 3 0
Peak Hour Total	11 vph 9 pph	164 vph 1 pph	0 vph 0 pph	0 vph	) pph 495 vph	3 pph	9 vph 5 pph	0 vph 0 pph	0 vph 0 pph	0 vph 0 pph	10 vph 0 pph	0 vph 0 pph	6 vph 3 pph
	ments Only: (3:15 - 4:15PN	۸)		1									
Total	28 0 0 17 0						40 0 0 10 1				29 1 0 3 0		22 0 0 9 0
Peak Hour Total	10 0 0 8 0						11 0 0 1 1				9 0 0 0 0		9 0 0 5 0
Peak Hour Total	10 vph 8 pph	0 vph 0 pph	0 vph 0 pph	0 vph	O pph O vph	0 pph	11 vph 2 pph	0 vph 0 pph	0 vph 0 pph	0 vph 0 pph	9 vph 0 pph	0 vph 0 pph	9 vph 5 pph
Total Peak Hour	Vehicle Traffic at Intersection		695 vph										

l	Peak Hour Total	10 vph	8 pph	0 vph	0 pph	0 vph	0 pph
l	Total Peak Hour	Vehicle Traffic at I	ntersection			695	vph
ſ	Total Peak Hour	Peds/Bikes at Inte	rsection			21	pph
•							
I	Total Peak Hour	Traffic (All Modes	) at Intersection	on		716	pph
•							
Ì	Percentage Peak	4.5	%				
٠							
ſ	Peak Hour Factor	,				0.82	







Peak Hour Pedestrian Data

Peak Hour Bicycle Data

#### Intersection: N. FRONTAGE RD & TIMBER RIDGE APARTMENT COMPLEX

Location: VAIL, COLORADO

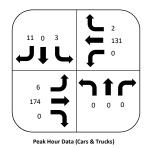
Traffic Data Collection Date: SATURDAY, DECEMBER 1, 2018

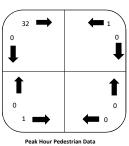
Weather: SNOWING

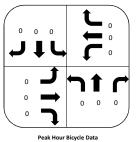


		N Frontage Rd			N Frontage Rd			N/A		Timber Ridge Apt Complex								
		Eastbound			Westbound			Northbound		Southbound								
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru Right	L	eft Thru	Right							
	Car Trk Bus Ped Bi SWL	k Car Trk Bus Ped Bik SWR	Car Trk Bus Ped Bik	Car Trk Bus Ped E NEL	k Car Trk Bus Ped Bik NER	Car Trk Bus Ped Bik	Car Trk Bus Ped Bik SEL	Car Trk Bus Ped Bik Car Trk Bus Ped Bi	Car Trk E	Bus Ped Bik Car Trk Bus Ped B NWL NWR	ik Car Trk Bus Ped Bik							
7:00 AM 7:15 AM 7:30 AM 7:35 AM 8:00 AM 8:15 AM 8:30 AM 8:45 AM	1 0 0 0 0 0 0 0 1 0 0 1 0 0 0 0 0 1 0	21 4 1 0 0 32 4 2 0 0 27 5 1 0 0 34 2 1 1 0 42 3 2 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 20 2 1 0 0 0 16 2 2 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0	1 0 1 0 4 0 1 0 1 0 1 0 1 0 0 0	0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0								
Peak Hour Total	6 0 0 0 0	157 12 5 1 0	0 0 0 0 0	0 0 0 0	116 10 5 1 0	2 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 0 0	3 0	0 32 0 0 0 0 0	0 11 0 0 1 0							
Peak Hour Total		174 vph 1 pph	0 vph 0 pph	0 vph 0 pp	h 131 vph 1 pph	2 vph 0 pph	0 vph 0 pph	0 vph 0 pph 0 vph 0 ppl	3 vph	32 pph 0 vph 0 pp	h 11 vph 1 pph							
Access Moven Total	nents Only: (8:00 - 9:00A			1		2 0 0 0 0			9 0	0 57 0	20 0 0 1 0							
Peak Hour Total						2 0 0 0 0				0 32 0	11 0 0 1 0							
Peak Hour Total	6 vph 0 pph	0 vph 0 pph	0 vph 0 pph	0 vph 0 pp	h 0 vph 0 pph	2 vph 0 pph	0 vph 0 pph	0 vph 0 pph 0 vph 0 ppl	3 vph	32 pph 0 vph 0 pp	h 11 vph 1 pph							

0 pph 0 vph	0 pph	0 vph	0 pph
·			
t Intersection		327	vph
tersection		35	pph
es) at Intersection		362	pph
ntersection		6.1	%
		0.84	
	t Intersection tersection es) at Intersection	t Intersection tersection ses) at Intersection	t Intersection 327  tersection 35  ess) at Intersection 362  ntersection 6.1







#### Intersection: N. FRONTAGE RD & TIMBER RIDGE APARTMENT COMPLEX

Location: VAIL, COLORADO

Traffic Data Collection Date: SATURDAY, DECEMBER 1, 2018 Weather: SNOWING



ı													_															_																					Bell	т.	ANSFOR	TATION	ENGINE	ERING C	CHBULTA	NTB
	N Frontage Rd												N Frontage Rd N/A										Timber Ridge Apt Complex																																	
	Eastbound											Westbound								Northbound													Southbound																							
Time	Left Thru					Right						Left		Left			Thru			Right			Left			Thru				Right					Le	eft				Th	ru				Righ	it										
	Car Trl		Ped Bil	Car	Trk		ed E WR	Bik (	ar T	rk B	lus F	Ped	Bik	Car	rk Bu	ıs Pe		Car	Trk		Ped NER	Bik	Car	Trk	Bus P	ed B	Bik	Car	Trk		ed Bi	ik Ca	ır Trk	k Bu	us Pe		k Ca	ır Tri	Bus	s Pec	d Bik		Car T	rk B		ed B WL	ik C	ar Tr	k Bu	s Pe		k Ca	ır Tri	Bus	Ped	Bik
2:00 PM 2:15 PM 2:30 PM 2:45 PM 3:00 PM 3:15 PM 3:30 PM 4:00 PM 4:15 PM 4:30 PM 4:30 PM 5:50 PM	2 0 3 0 1 0 1 0 0 0 1 1 1 3 0 3 0 2 0 1 0 2 0 2 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	27 32 37 33 31 48 35 39 37 32 36	4 1 3 3 3 4 4 4 3 2 3 2 3	2 1 1 2 1 2 2 2 2 1 2 2 1 2 2 2 1 2 2	1 2 0 0 0 0 0 1 1 0 0 0 1 1 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				53 50 64 50 83 164 110 90 86 77 61 77 78 61	5 1 3 6 6 4 4 2 5 3 4 3	1 2 1 2 4 4 2 3 4 1 1 1 3 2 3	0 1 0 0 0 0 0 0 0 0 1 1 0 0	0 0 0 0 0 0 0 2 0 0 0	2 0 0 1 2 1 4 2 0 1 2	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	4 5 5 1 0 10 8 6 5 11	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0									0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0			0 : 3 : 0 : 1 : 1 : 1 : 1 : 1 : 4 : 0 : 0 : 0 : 3 : 1	2 (0 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1 (1				0 0 0				0 0 2 2 1 1 2 2 1 1 1 1 2 2 1 1 1 3 3 4 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 0 1 0 0 0 0 0 0 0	0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0
Overall Inters	, , , , ,	<b>3:15 - 4:</b> 1		483	41	20	6	0	0	0 (	0	0	0	0	0 0	) 0	0	1104	53	33	3	2	17	1	0 :	73	0	0	0	0	0 0	) 0	. 0	. 0	) (	) (	) 0	0	0	0	0	] [:	16 1	19 (	0 (	0 (	) (	0 0	0	C	) (	) 24	1 3	0	0	0
Peak Hour Total	7 1	. 0	0 0	153	14	7	1	0	0	0 (	0	0	0	0	0 0	) 0	0	450	16	13	0	2	9	0	0 :	19	0	0	0	0	0 0	) 0	0	0	) (	) (	) (	0	0	0	0		6 !	5 (	0	0 (	) (	0 0	0	C	) (	) 5	0	0	0	0
Peak Hour Total	8 vph	ı	0 pph	174	vph		1 pp	ph	0 vp	h		0 р	ph	0 v	h		0 pph	479	vph		2	pph	9 v	vph		19 pp	oh	0	/ph		0 ppl	h	0 vph	1		0 ppł	n	0 vph			0 pph		11 vp	h		0 рр	h	0 vph	1		0 ppł	n	5 vph		0	pph
Access Moven Total Peak Hour Total	28 1	0	0 0																						0 7																	1 [	16 1 6 !			0 (									0	
Peak Hour Total	8 vph	ı	0 pph	0	vph		0 pp	ph	0 vp	h		0 р	ph	0 v	h		0 pph	0	vph		0	pph	9 \	vph		19 pp	oh	0	/ph		0 ppl	h	0 vph	1		0 ppł	n	0 vph			0 pph		11 vp	h		0 рр	h	0 vph	1		0 ppł	n	5 vph		0	pph
Total Peak Hour	Vehicle Tra	affic at Int	ersection							686		vį	ph																																											
Total Peak Hour	Peds/Bikes	s at Inters	ection							22		p	ph																																											

Peak Hour Total	8 vph	0 pph	0 vph	0 pph	0 vph	0 pph
Total Peak Hour V	ehicle Traffic a	t Intersection			686	vph
T . IO III .	1 (0:1				22	
Total Peak Hour P	eus/ bikes at in	tersection			22	pph
Total Peak Hour T	raffic (All Mode	as) at Intersection	ın		708	pph
TOTAL TEAK HOUL T	iamic (Ali iviode	s) at intersection	/II		700	ppn
Percentage Peak I	lour Trucks at I	ntersection			5.1	%

