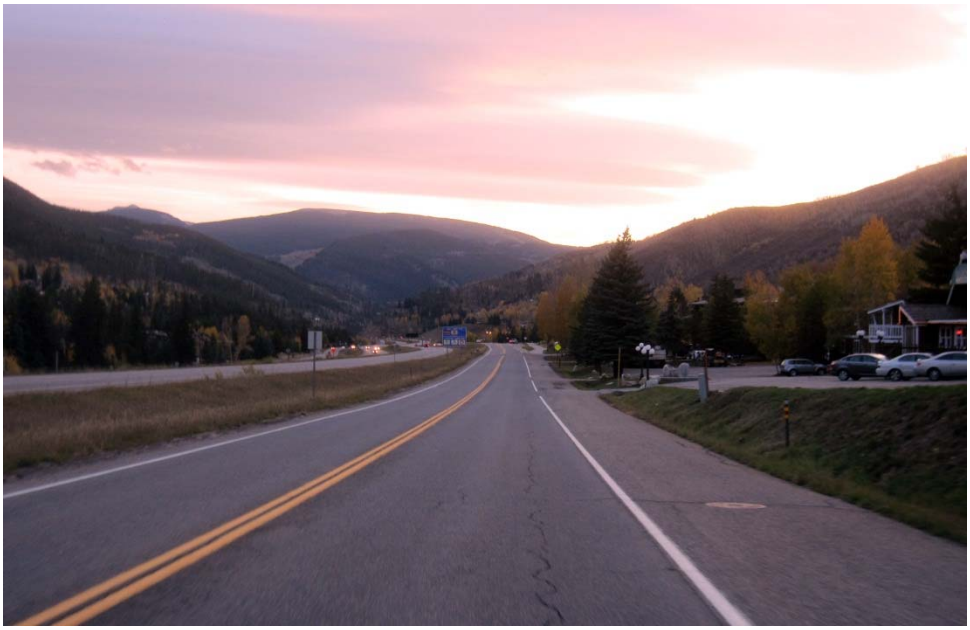
Transportation Impact Study

for

Vail Marriott Residence Inn Redevelopment



August 5, 2016
Revised September 30, 2016

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Project Number: M1234

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 nineteen 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.

Transportation Impact Study for Vail Marriott Residence Inn Redevelopment

Table of Contents

Tables and Figures

1.0 Project Description

The Vail Marriott Residence Inn, a proposed 1.9 acre redevelopment, is located near the intersection of the Interstate 70 North Frontage Road and Buffehr Creek Road within the Town of Vail. The proposed project will replace the former Roost Lodge that was located on the property.

The southern boundary of the property abuts the Frontage Road and starts approximately 250 feet north east of the Buffehr Creek Road intersection with the Frontage Road. The property is also bordered on the north by Meadow Ridge Road, but is does not and is not anticipated to take access from it due to the grade differential. The location of this property in relation to the surrounding area can be seen in **Figure 1**.

This site was previously approved for redevelopment.

Figure 1: Area Map

The proposed redevelopment is expected to include a Marriott Residence Inn, it's associated support facilities and deed restricted, local employee, long-term rental units.

Specifically, the Vail Marriott Residence Inn project is currently anticipated to consist of:

- 170 Hotel Rooms
- Lobby, Library, Lounge and Associated Guest Facilities
- 113 Long-Term Rental Local Employee Housing Units

A concept plan of the proposed development can be seen in **Figure 2**.

The site was formerly occupied by the Roost Lodge, which included a 72-room hotel and 1 employee housing unit. The Roost Lodge was demolished in 2014 and the site is now vacant.

The Vail Marriott Residence Inn redevelopment has an assumed build out completion year of 2018. Analysis has been performed for existing conditions, background and total conditions for short-term Year 2018 as well as for the long-range planning Year 2040.

1.1 Previous Traffic Analysis

This site has been previously proposed for redevelopment that was not constructed. In 2013, The Vail Marriott Residence Inn was planned to include 176 Hotel Suite Rooms and 2 Employee Housing Units. This development was studied in McDowell Engineering's *Transportation Impact Study for Marriott Residence Inn Redevelopment* dated May 21, 2013. This study was previously approved by CDOT and the Town of Vail.

Figure 2

VAIL MARRIOT RESIDENCE INN
VAIL, COLORADO
OVERALL SITE PLAN
ALPINE ENGINEERING INC
SHEET C03.1
DESIGNED XXX
DRAWN XXX
CHECKED XXX
JOB NO. XXX
DATE XX/XX/XXXX
NO. DATE REVISIONS BY
(SEAL)
GRAPHIC SCALE
SCALE 1"=20'
MARRIOT RESIDENCE INN
1ST FLOOR: 8,000.00
PARKING 1: 7,989.00
PARKING 2: 7,978.00
NORTH FRONTAGE ROAD
MEADOW RIDGE RD.
NORTH EDGE OF ASPHALT - INTERSTATE 70
EXISTING EOA
PROPOSED BUS STOP
SIDEWALK
R.O.W.
LANDSCAPE AREA
SNOWMELT DRIVEWAY
HOTEL ENTRY
APARTMENT ENTRY
GARAGE ENTRY
RETAINING WALL
10' CONCRETE SIDEWALK
PROPOSED EDGE OF PARKING BELOW
SECTION 1
SECTION 2
20.0'
CUT 55' TO P2 SLAB
CUT 68' TO P2 SLAB
CUT 22' TO P2 SLAB
CUT 20' TO P2 SLAB
CUT 13' TO P2 SLAB

2.0 Existing Conditions

2.1 Description of Existing Transportation System

Interstate 70 North Frontage Road:
The I-70 North Frontage Road provides the primary local connection along the north side of Interstate 70 between the West Vail and Vail Village Interchanges. In the vicinity of the project site, this two-lane facility is classified as Access Category F-R, Frontage Road by the Colorado Department of Transportation (CDOT) and has a posted speed limit of 35 mph. There are no existing auxiliary turn lanes at the two accesses to the property.

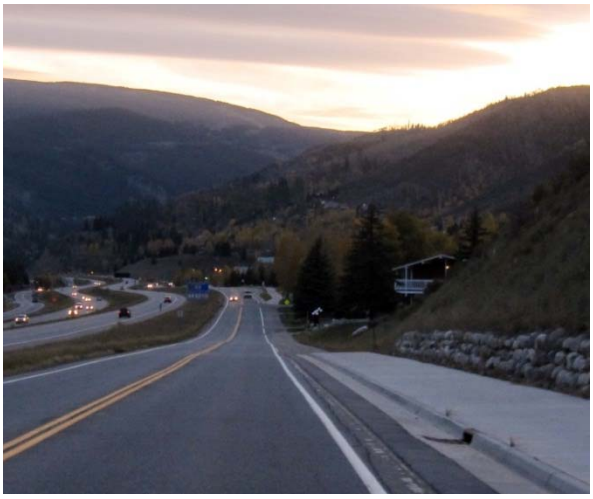
CDOT and the Town of Vail completed an Access Management Plan Map for this roadway as part of their *Vail Transportation Master Plan Update* in 2009.

Buffehr Creek Road: Buffehr Creek Road is a local two-lane roadway providing access to Chamonix Lane and residential development north of the development property. Buffehr Creek Intersects the North Frontage Road 250 feet to the southwest of the development property. The posted speed limit on this roadway is 25 mph.

Meadow Ridge Road: Meadow Ridge Road is a short, cul-de-sac roadway that forms the northwest boundary of the proposed redevelopment. The subject property does not take access from Meadow Ridge Road, nor is it expected to do so in the future due to the grade differential between the property and the road.

Pedestrian, Transit and Bicycle Facilities:

The sole existing bicycle/ pedestrian facility in the vicinity of the Vail Marriott Residence Inn redevelopment is the North Recreation Path, which connects the Vail Village and West Vail Interchanges along the north side of the North Frontage Road. The path is contiguous across the frontage of the site and consists of a widened asphalt shoulder. A concrete path with curb and gutter exists to the east of the project site and west of Buffehr Creek Road.

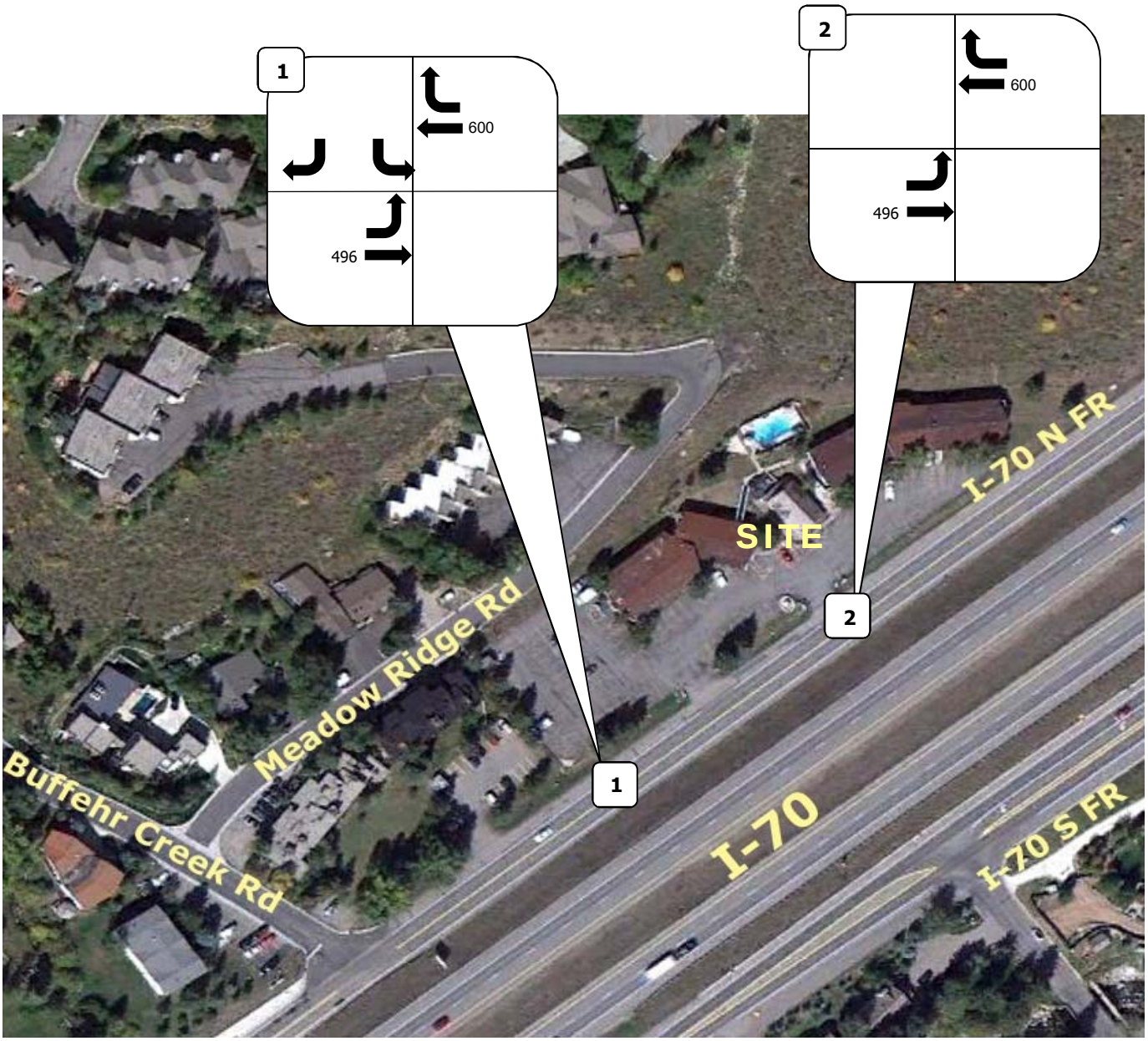


Both the Red and Green West Vail bus routes travel along the North Frontage Road adjacent to the redevelopment site. There is a bus stop for the westbound routes at the southwest corner of the property.

Year 2018 Background Traffic Volumes: Year 2018 traffic conditions are based on 2013 traffic counts provided by the Town taken at the intersection of the North Frontage Road and Buffehr Creek Road. These 2013 counts were compared to the from *Figure 15: Year 2025 Peak Hour Projections* of the *Vail Transportation Master Plan Update, 2009* at the intersection of the North Frontage Road with Buffehr Creek Road (Intersection Number 22). Refer to the **Appendix** for this data and correspondence with CDOT and the Town of Vail.

The assumed Year 2018 Background Volumes were derived from a linear interpolation between Years 2013 and 2025 as the starting and finishing years, respectively. Per Town staff, there are no other development projects that should impact these volumes. Background evening volume projections for Year 2018 can be seen in **Figure 3**.

Figure 3: Year 2018 Background Traffic



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Project Number: M1234
Prepared by: BBG

(NTS)

LEGEND :

PM Volumes = XX

Turning Movements

3.0 Future Traffic Projections

3.1 Capital Improvement Projects

Per the *Vail Transportation Master Plan Update, 2009 (Master Plan Update),* the North Frontage Road is anticipated to remain a two-lane facility through the long term planning horizon. However, the Master Plan Update anticipates the construction of an eastbound left turn deceleration lane to Buffehr Creek Road prior to Year 2035.

The Town of Vail and CDOT have begun construction on the Simba Run Underpass of I-70 as anticipated by the *Master Plan Update*. The project is anticipated to be completed by December 2017. This underpass, is located to the west of the Lionshead Village and will provide an additional connection between the parts of Vail north of I-70 and those south of the interstate. Per the *Master Plan Update*, the likely result of this underpass on project-generated traffic would be to increase the portion of traffic headed to or from the east on the North Frontage Road.

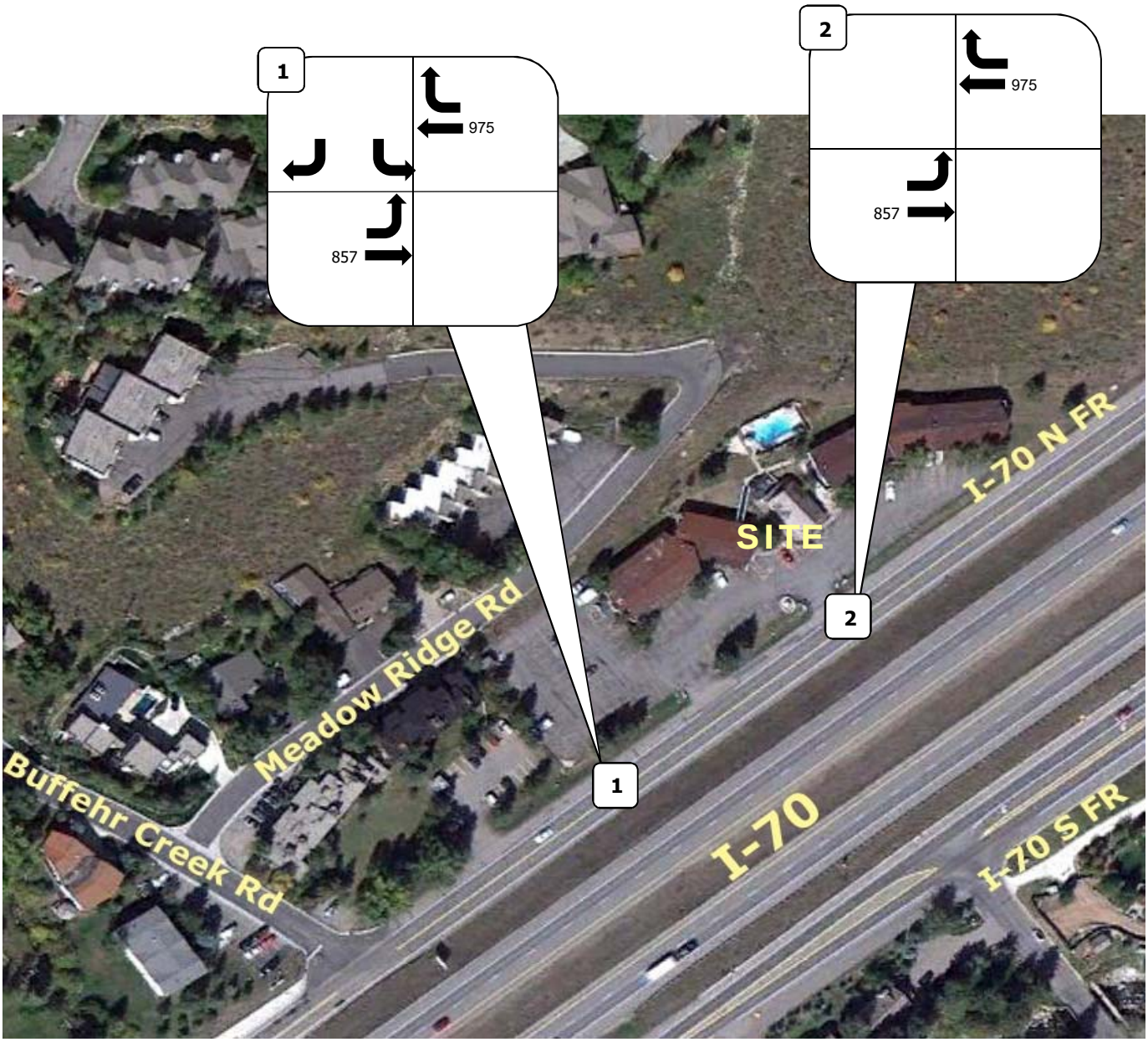
3.2 Background Traffic Growth

Long-term background growth along the North Frontage Road is based on the Year 2025 volume projections provided in the *Master Plan Update*. Correspondence with Town staff regarding the anticipated growth rates can be found in the **Appendix**. Per Town staff,

> *…these projections represent a build out scenario study with 2025 selected as full build out. This was done during the boom in Vail and a lot of large developments were on the table going thru the process. Many of those have been stopped or delayed. We suggest using the 2025 data with a modest growth rate of 0.5% from 2025 to 2035.*

This methodology was used for Year 2040 conditions. The resulting projected Year 2040 background traffic volumes with the addition of the Simba Run underpass volumes can be seen in **Figure 4**.

Figure 4: Year 2040 Background Traffic



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Project Number: M1234
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(NTS)

LEGEND :

PM Volumes = XX

Turning Movements

4.0 Project Traffic

4.1 Trip Generation

The proposed Marriott Residence Inn is anticipated to consist of:

- 170 Hotel Rooms (all with kitchens)
    - Lobby, Library, Lounge and Associated Guest Facilities
- 113 Long-Term Rental Local Employee Housing Units
- 10 Condos located on adjacent parcel
- 100 Space Parking Club (leased parking spaces)

A trip generation analysis was prepared based on ITE's *Trip Generation Manual* data for the following land uses:

- #310, Hotel
- #223, Mid-Rise Apartment
- #230, Residential Condo/Townhome

The Parking Club use does not fit into an established trip generation land use within the ITE *Trip Generation Manual*

The proposed additional parking spaces are anticipated to generate additional vehicle trips to and from the parking structure. ITE publishes national parking rates and trip generation rates for specific land uses. These rates were used to compare the number of parking spaces to the associated number of additional vehicle trips. Per their 2010 *Parking Generation Manual, 4th Edition*[7]; a hotel requires 1.54 parking spaces per hotel room. Working backwards from the 85th percentile parking rate, the additional 100 parking spaces would adequately serve 65 hotel rooms. ITE's anticipated trip generation rates (per ITE's 2012 *Trip Generation Manual, 9th Edition*) for 65 rooms is 0.52 trips per room in the morning peak hour, 0.40 trips per room in the evening peak hour, and 0.47 trips per room during the Saturday peak hour.

Because it is anticipated that these leased parking spaces would primarily be used for skier parking the Inbound / Outbound distribution from Land Use #466, Snow Ski Area was used for trip distribution.

The hotel land use also accounts for ancillary land uses such as the lobby, library and lounge for guests.

Based on the *Trip Generation Manual* and the assumptions made, this site would be expected to generate a total of 228 Saturday peak hour trips, 196 morning peak hour trips, and 200 evening peak hour trips, including all modes of travel. Refer to **Table 1** for trip generation calculations and further breakdown of these trips.

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TRANSPORTATION ENGINEERING CONSULTANTS

PROJECT NUMBER: M1234
PREPARED BY: BBG
DATE: 7/22/2016
REVISED:

Table 1 - Project Trip Generation
Marriott Residence Inn Redevelopment
Vail, Colorado
Estimated Project-Generated Traffic[1]

			Trip Generation Rates					Average Saturday	Average Weekday	Saturday Peak Hour				Morning Peak Hour				Evening Peak Hour			
										Inbound		Outbound		Inbound		Outbound		Inbound		Outbound	
ITE Code	Units		SAT Peak Hour	AM Peak Hour	PM Peak Hour	Avg. Saturday	Avg. Weekday	Trips (vpd)	Trips (vpd)	% Trips	Trips	% Trips	Trips	% Trips	Trips	% Trips	Trips	% Trips	Trips	% Trips	Trips
Existing Land Use																					
#310 Hotel	72	Rooms	0.72	0.56	0.59	8.19	8.17	590	588	56%	29	44%	23	61%	25	39%	16	53%	23	47%	20
#230 Residential Condo/Townhome	1	DU	0.47	0.44	0.52	5.67	5.81	6	6	54%	1	46%	1	17%	1	83%	1	67%	1	33%	1
Proposed Land Use																					
#310 Hotel	170	Rooms	0.72	0.56	0.59	8.19	8.17	1392	1389	56%	69	44%	54	61%	59	39%	38	53%	54	47%	48
#223 Mid-Rise Apartment[2]	113	DU	0.44	0.35	0.44	5.67	5.81	641	657	59%	30	41%	21	29%	12	71%	29	59%	30	41%	21
Parking Club[3]	100	Spaces	0.47	0.52	0.40	5.32	5.31	532	531	96%	46	4%	2	95%	50	5%	3	96%	39	4%	2
#230 Residential Condo/Townhome	10	DU	0.47	0.44	0.52	5.67	5.81	57	58	54%	3	46%	3	17%	1	83%	4	67%	4	33%	2
Proposed Total Trips								**2622**	**2635**		**148**		**80**		**122**		**74**		**127**		**73**
Resulting Additional New Trips								*2026*	*2040*		*118*		*56*		*96*		*57*		*103*		*52*
Proposed Total Trips Less 10% Non-Automobile Mode Split (Excluding Parking Club Trips)								**2413**	**2424**		**138**		**72**		**115**		**67**		**118**		**66**

[1] Values obtained from *Trip Generation, 8th Edition,* Institute of Transportation Engineers, 2012.

[2] Land Use #223 does not provide average Weekday or Saturday rates. The average rates for Land Use #230 were used to estimate these daily trips.

[3] The Parking Club Use is estimated using parking rates calculated for a Hotel. The percent inbound/outbound was used for the Ski Resort land use #466. See Section 4.1 for additional information

4.2 Trip Distribution

The distribution of project-generated vehicular traffic on adjacent roadways is influenced by several factors including the following:

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

Based upon the above factors and the current completion date of December 2017 for the Simba Run underpass, it is assumed that approximately fifty percent (50%) of site generated traffic will travel to or from the east on the North Frontage Road and fifty percent (50%) will travel to or from the west on the North Frontage Road under short term conditions.

The anticipated directional distribution of project-generated traffic is depicted in **Figure 5**. Distribution is not anticipated to change from Year 2020 to Year 2040.

4.3 Site Circulation

The *Transportation Master Plan* and *Access Management Plan Map* provide guidance for the access points to the subject property. These documents specify that the easternmost access will be ingress only and the westernmost access will be egress only.

As designed, the site is anticipated to operate most effectively with the easternmost access as ingress only and the westernmost access as a full movement. Because the site will include hotel as well as long-term rental housing it is believed that site access would operate most efficiently with this configuration. The easternmost access would be used for hotel check-in, shuttles, and deliveries. The westernmost access would be the primary access for the apartments, parking garage, and hotel guests after check-in. The Town of Vail has indicated that they would support this change from the *Access Management Plan* if the access points operate adequately as proposed. It is understood that CDOT would need to also support this change and that the *Access Management Plan* would need to be updated to reflect the change.

Per Section 4.4(1) of the *State Highway Access Code, 2002*, (*Access Code*) the minimum distance between access points should be at a minimum equal to the design sight distance along the highway. Given a 35 mph posted speed limit on the North Frontage Road, the access points should be a minimum of 250 feet apart.

Access to the adjacent parcel is approximately 120-feet west of the proposed westernmost access to the site. The Access Management Plan anticipates that the adjacent access to the North Frontage Road would be closed when this parcel is redeveloped in the future and access would be from Meadow Ridge Road. Alternately, if acceptable the adjacent property owners, access to the site could be

from the westernmost access to the Vail Marriott site allowing closure of the existing access. If the accesses are not combined, a CDOT Design Waiver would be required for the Access Spacing.

Figure 5: Directional Distribution of Project Generated Traffic

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Project Number: M1234
Prepared by: BBG
Date: 8/5/2016
Vail Marriott Residence Inn
Vail, Colorado

N
(NTS)

4.4 Trip Mode Split and Assignment

Given the available bicycle/pedestrian routes and adjacent transit stop for the local bus system, it can be assumed that a portion of site generated trips will be made by modes other than passenger car. The limited parking in Vail also encourages people to use alternative modes of transportation. An assumed multimodal reduction of ten percent (10%) would result in the reduction of the volume automobile trips by 18 trips during the Saturday peak hour, 14 trips during the weekday morning peak hour and 16 trips during the weekday evening peak hour. The multi-modal reduction was not applied to the trips generated by the parking club.

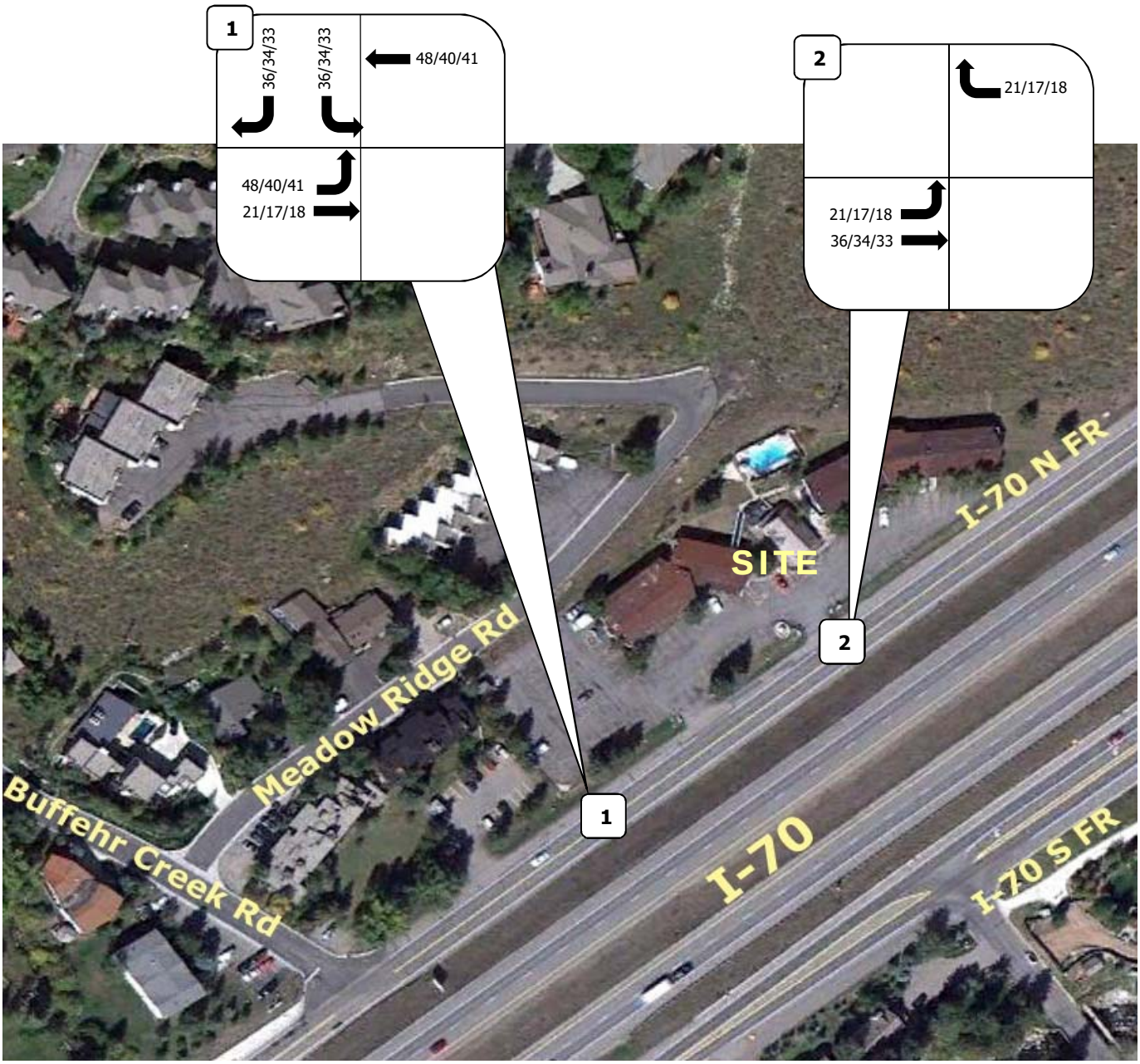
Following the removal of non-vehicular trips from the project generated traffic, the anticipated volume of vehicular trips at each site access can be calculated. The anticipated assignment of trips on the roadway system is determined by applying the external trip generation expected for this site and its corresponding mode split to the estimated trip distribution. The resulting projections of site generated traffic with the Simba Run underpass can be seen in **Figure 6**.

The Year 2018 total traffic anticipated at each intersection in question is the sum of the estimated Year 2018 background traffic **(Figure 3)** traffic with **Figure 6**, and can be seen in **Figure 7.**

Similarly, Year 2040 total traffic is the sum of Year 2018 background traffic **(Figure 3)** traffic with **Figure 4**, and can be seen in **Figure 8.**

As only evening peak hour data was available from the *Master Plan Update,* all volumes in **Figures 7 and 8** only represent the evening peak hour.

Figure 6: Assigned Project Generated Traffic



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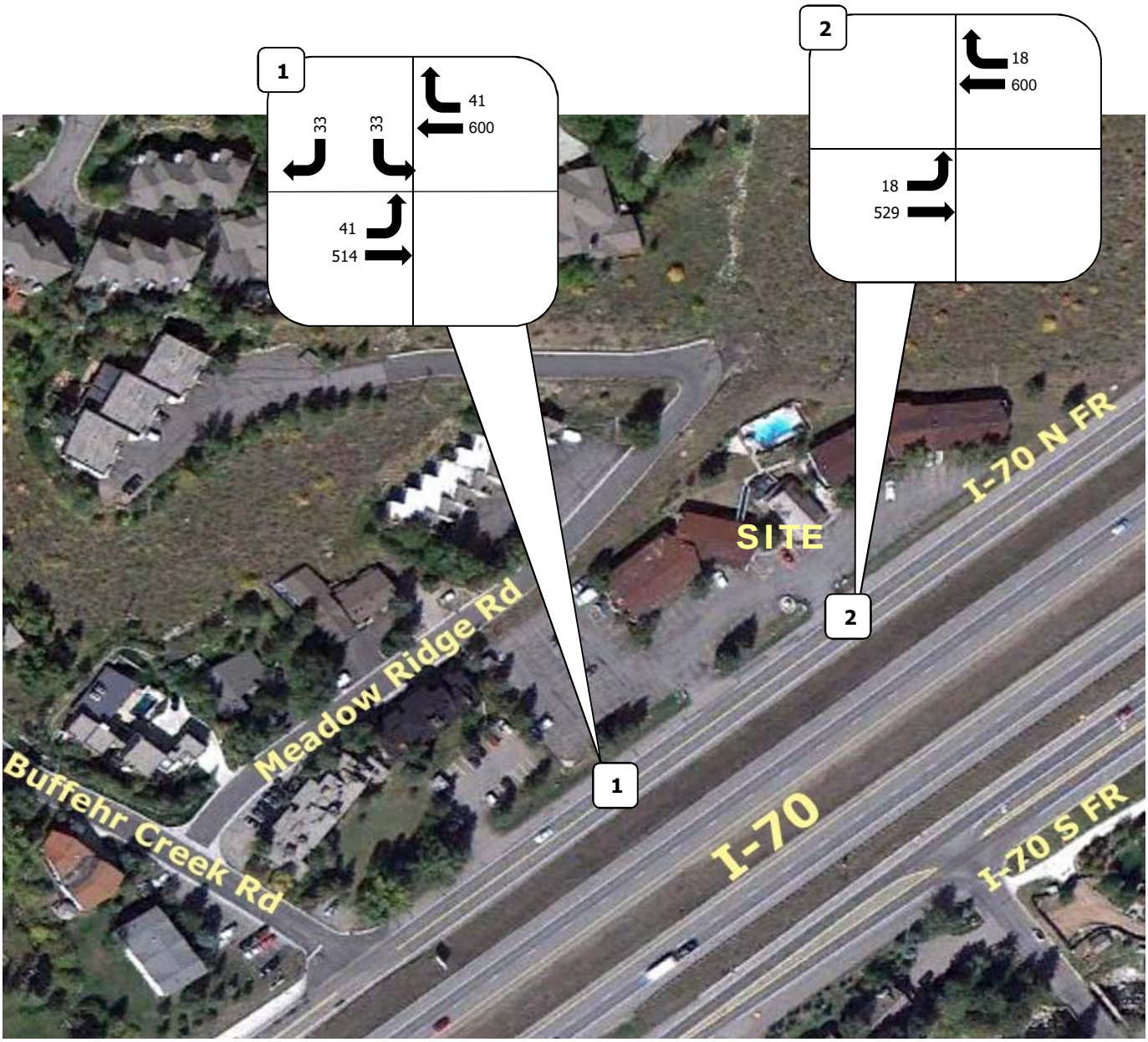
N
(NTS)

LEGEND :

SAT/AM/PM Volumes = XX/XX/XX

Turning Movements

Figure 7: Year 2018 Total Traffic



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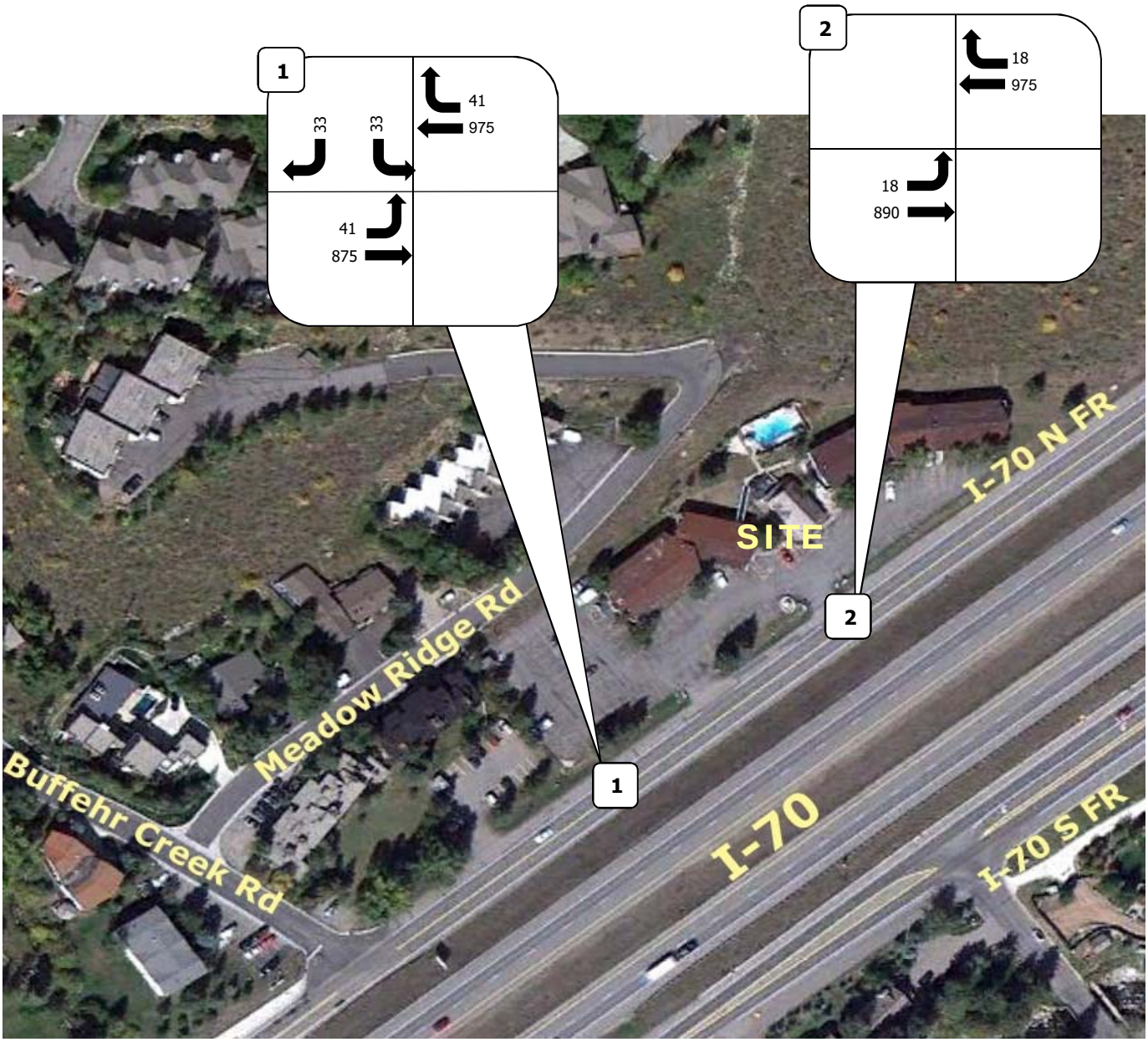
LEGEND :

PM Volumes = XX

Turning Movements

Figure 8: Year 2040 Total Traffic



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Project Number: M1234
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(NTS)

LEGEND :

PM Volumes = XX

Turning Movements

5.0 Transportation Impact Analysis

5.1 Site Access Auxiliary Turn Lanes

As the North Frontage Road is a State Highway facility of Access Category F-R, Frontage Road (Speed Limit 35 mph), the need for auxiliary turn lanes to and from the site should be addressed. Per Section 3.13(4)(c-d) of the *State Highway Access Code, 2002 (Access Code)*, as the North Frontage road has a posted speed less than 45 mph, acceleration lanes are generally not required and were not assessed further.

At the proposed eastern and western site accesses there is the potential for two auxiliary deceleration lanes, the eastbound left and westbound right movements. Neither lane currently exists at either access location.

Right Turn Deceleration:

A westbound right turn deceleration lane is required on a facility of this type when the anticipated peak hour volumes exceed 50vph. Anticipated right turn volumes entering the eastern and western site accesses range from 17-21vph and 40-48vph respectively. The volume range is given because the traffic volume is expected to vary over the morning, evening and Saturday peak hour traffic.

The Saturday peak hour volume for the western site access is on the threshold of the CDOT warrant but does not exceed the requirement. The AM and PM peak hour volumes do not CDOT's threshold at either location. Based on these volumes no westbound right turn lane should be required at either site access.

Left Turn Deceleration:

An eastbound left turn deceleration lane would be required if peak hour volumes expected to use this movement exceed 25vph. Anticipated left turn volumes entering the eastern and western site accesses range from 17-21vph and 40-48vph respectively. Peak hour volumes for the AM, PM, and Saturday are projected to exceed the CDOT threshold and at the eastbound left ingress movement at the western site access. A deceleration lane will be required at this location. Refer to **Table 2**, Auxiliary Turn Lane Requirements for a breakdown of expected conditions.

Table 2: Auxiliary Turn Lane Requirements:

Turning Movement	Maximum Peak Hour Turning Volume (from Figure 6)	Lane Required?	Turn Lane Length
Eastern Site Access			
Westbound Right	*21 vph*	*No <50vph turning*	*N/A*
Eastbound Left	*10 vph*	*No >25vph turning*	*N/A*
Western Site Access			
Westbound Right	*48 vph*	*No <50vph turning*	*N/A*
Eastbound Left	*48 vph*	***Yes** >25vph turning*	*48' Storage, 10:1 Taper*

The *Access Code* also details the required auxiliary turn lane lengths. Per Section 4, the auxiliary eastbound left lane should consist of a 10:1 taper and 48 feet of storage, for a total distance of 168 feet.

5.2 Level of Service Analysis

An HCM 2010 site access analysis was performed for both short term Year 2018 and long term Year 2040 conditions. This analysis assumes that the single deceleration lane explored as part of Section 5.1 will be constructed. The western full-movement access was anticipated to have both left and right turn lanes. **Table 4** summarizes the total level of service (LOS) and delays.

Table 4: Total Traffic Level of Service

	Intersection Control	Movement	PM Level of Service (Seconds of Delay)	
			2018	2040
West Site Access and N Frontage Road (Full Movement)	No Control	EBL	A (9)	B (11)
		EBT	A (0)	A (0)
	No Control	WBR/T	A (0)	A (0)
	SB Stop	**SB**	**C (23)**	**F (96)**
		SBL	*D (33)*	*F (163)*
		SBR	*B (14)*	*C (21)*
East Site Access and (Ingress Only)	No Control	EBL/T	A (0)	A (0)
	No Control	WBR/T	A (0)	A (0)

As can be seen in **Table 4**, the eastern site access is anticipated to operate satisfactorily following the completion of the redevelopment through the long term planning horizon.

The western site access is anticipated to operate at an acceptable LOS through the Year 2018. By Year 2040 evening peak hour traffic volumes will deteriorate to unacceptable levels of service for the southbound left turn movement due to high volumes on the North Frontage Road. This condition will occur for all accesses along the Frontage Road with or without the Vail Marriott Residence Inn project. Delays at stop control side street accesses with arterials is normal and expected in peak hours.

However, even under these conditions, the ninety-five percentile queues at the access are anticipated to remain less than three vehicles in length.

5.3 Entering Sight Distance

As the redeveloped site is expected to be a commercial facility with minimal multi-unit truck trips, Per Table 4-3 of the *Access Code*, the appropriate design vehicle for entering sight distance is a single-unit truck. Per Table 4-2 of the *Access Code*, the entering sight distance at the western access should be greater than 455 feet. From the existing western access there appears to be in excess of 500 feet to the west of the access and in excess of 700 feet east of the access. Entering sight distance exceeds *Access Code* requirements.

Eastbound sight distance at the western site (egress) access

Westbound sight distance at the western site (egress) access

5.4 Access Permitting

Given that estimated traffic volumes at the site are expected to increase in excess of twenty percent over the existing volumes and the existing accesses will be reconstructed, revised State Highway Access Permits will be required for the two site accesses.

5.5 Multimodal Pedestrian and Bicycle Facilities

The applicant shall incorporate multimodal facilities in the site design as the project progresses in the Town's review and entitlement process. These plans shall be coordinated for connectivity with the North Frontage Road bicycle and pedestrian route, as well as the transit system.

6.0 Recommendations and Conclusions

The Marriott Residence Inn redevelopment anticipates replacing the existing Roost Lodge, adjacent to the Interstate 70 North Frontage Road in Vail, with a 170-room hotel; 113 long-term, local employee, rental apartments; and 100 leased parking spaces.

As part of this effort, it is expected that the two existing site accesses will be reconstructed and reconfigured.

The *Transportation Master Plan* and *Access Management Plan Map* provide guidance for the access points to the subject property. These documents specify that the easternmost access will be ingress only and the westernmost access will be egress only.

As designed, the site is anticipated to operate most effectively with the easternmost access as ingress only and the westernmost access as a full movement. Because the site will include hotel as well as long-term rental housing it is believed that site access would operate most efficiently with this configuration. The easternmost access would be used for hotel check-in, shuttles, and deliveries. The westernmost access would be the primary access for the apartments, parking garage, and hotel guests after check-in. The Town of Vail has indicated that they would support this change from the *Access Management Plan* if the access points operate adequately as proposed. It is understood that CDOT would need to also support this change and that the *Access Management Plan* would need to be updated to reflect the change.

The proposed access spacing between the western site access and the adjacent property access is approximately 120-feet. The Access Management Plan Map anticipates that the adjacent access will be closed and the property will gain access from Meadow Ridge Road at the time of redevelopment. Per the *Access Code*, A minimum distance of 250 feet between access points is required by the Access Code along the Frontage Road.

The anticipated volumes turning left into the site are projected to exceed the requirements set forth by the *Access Code* for the construction of an eastbound left turn deceleration lane at the eastern site access. This lane should have 48 feet of storage space and a 120 foot, 10:1 transition taper.

The expected increase in vehicular demand upon the two site accesses as well as the proposed change in access design will necessitate the need for revised State Highway Access Permits at both site accesses.

Pedestrian/bicycle connectivity via the North Recreation Path, as well as transit access, should be maintained or enhanced in conformance with Town of Vail criteria.

7.0 Appendix

Reference Documents

1. *8th Edition Trip Generation Manual*. Institute of Transportation Engineers, 2008.
2. *Trip Generation Handbook, An ITE Recommended Practice*. Institute of Transportation Engineers, 2001.
3. *Manual of Uniform Traffic Control Devices.* US Department of Transportation Federal Highway Administration, 2009.
4. *Highway Capacity Manual.* Transportation Research Board, 2010.
5. *Vail Transportation Master Plan Update and Access Management Map.* Felsburg Holt & Ullevig and Town of Vail, 2009
6. *State of Colorado State Highway Access Code.* CDOT, Rev. 2002
7. *4th Edition Parking Generation Manual*. Institute of Transportation Engineers, 2010.

Included Documents

1. TIS Assumptions - Correspondence with Town of Vail and CDOT
2. Vail Transportation Master Plan Update Volume Projections
3. HCM 2010 Level of Service Calculations
    i. West Site Access
    ii. East Site Access

Gmail by Google

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Vail Marriott

Tom Kassmel <TKassmel@vailgov.com> Tue, Jul 26, 2016 at 9:08 AM
To: Ben Gerdes <ben@mcdowelleng.com>
Cc: Kari McDowell Schroeder <kari@mcdowelleng.com>

Tom Kassmel
Town Engineer

Public Works Department

TOWN OF VAIL

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Love Vail Recycle

From: Ben Gerdes [mailto:ben@mcdowelleng.com]
Sent: Thursday, July 21, 2016 1:59 PM
To: Tom Kassmel
Cc: Kari McDowell Schroeder
Subject: Vail Marriott

Tom,

I am working on updating the traffic study for the Vail Marriott project and had a few questions for you:

1. The previous study assumed that the directional distribution with the Simba Run underpass would be 50% west / 50% east. Does this distribution still seem reasonable or should it be adjusted? This seems to be a reasonable distribution
2. A 10% multi-modal reduction was applied previously. The project as now proposed would include a significant amount of long-term rental housing that will be deed restricted to local employees. Do you think 10% still applies or could the reduction be increased slightly to account for the employee housing? We would recommend maintaining the 10% reduction. We have only used a larger reduction in the Vail and Lionshead Village areas that are on the High Frequency In Town Route.
3. A 0.5% growth rate was used to project the 2025 Master Plan traffic volumes to 2035 volumes. Should the 0.5%

be used to project 2025 Master Plan volumes to 2040? Yes, though we are in the process of updating our VTMP. The numbers we will be using come from the I-70 Underpass Traffic Study. See attached.

4. Do you have updated traffic counts for this location? We previously used 2013 counts provided. The 2012/13 counts are the latest we have.

Thanks, Ben

Ben Gerdes, PE

Traffic / Transportation Engineer

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13-164 Traffic Report FINAL Stamped 08.11.15.pdf
1696K

Kari McDowell Schroeder

From: Tom Kassmel
Sent: Thursday, October 11, 2012 2:45 PM
To: 'Kari McDowell Schroeder'; Babler, Alisa
Subject: RE: Roost Lodge redevelopment in Vail (Traffic Methodology)

Thanks, that works for the Town.

From: Kari McDowell Schroeder [mailto:kari@mcdowelleng.com]
Sent: Thursday, October 11, 2012 2:10 PM
To: Tom Kassmel; Babler, Alisa
Subject: RE: Roost Lodge redevelopment in Vail (Traffic Methodology)

Tom,

Alisa is out of the office until the 16th. Therefore, we went ahead and included two alternatives in the traffic report – with and without the Simba Run underpass. Hopefully this satisfies both CDOT and the Town's requests.

Thanks!

Kari

From: Tom Kassmel [mailto:TKassmel@vailgov.com]
Sent: Friday, October 05, 2012 1:15 PM
To: 'Babler, Alisa'; Kari McDowell Schroeder (kari@mcdowelleng.com)
Subject: RE: Roost Lodge redevelopment in Vail (Traffic Methodology)

It may seem counterintuitive, but the more conservative approach would be to use the numbers with Simba Run. Simba Run actually pushes more traffic to this particular section of Frontage Rd.
2025 Peak Hr PM with Simba at the Roost: 905 (WB) 795 (EB)
2025 Peak Hr PM no Simba: 555 (WB) 630 (EB)

The Town would agree with the conservative approach and ask for volumes with Simba Run.
Sorry to keep batting this back and forth, I just now looked as the numbers.

From: Babler, Alisa [mailto:Alisa.Babler@DOT.STATE.CO.US]
Sent: Friday, October 05, 2012 11:17 AM
To: Tom Kassmel
Subject: RE: Roost Lodge redevelopment in Vail (Traffic Methodology)

I'd say we stick to not assuming Simba Run is funded for the study. It's the more conservative approach.

Otherwise, I don't have any other comments.

Alisa Babler
Permit Unit Engineer

Please note, effective October 8, 2012, I will have a new email address:
alisa.babler@state.co.us

CDOT, Region 3 Traffic & Safety Section
970-683-6287
970-683-6290 (fax)
Alisa.babler@dot.state.co.us

From: Tom Kassmel [mailto:TKassmel@vailgov.com]
Sent: Thursday, October 04, 2012 10:47 AM
To: Babler, Alisa
Subject: FW: Roost Lodge redevelopment in Vail (Traffic Methodology)

From: Tom Kassmel
Sent: Thursday, October 04, 2012 10:44 AM
To: 'Babler, Alisa'; Kari McDowell Schroeder; alisa.babler@state.co.us
Cc: Blender, Emmalee
Subject: RE: Roost Lodge redevelopment in Vail (Traffic Methodology)

Few comments below in red.

From: Babler, Alisa [mailto:Alisa.Babler@DOT.STATE.CO.US]
Sent: Thursday, October 04, 2012 8:30 AM
To: Kari McDowell Schroeder; alisa.babler@state.co.us
Cc: Tom Kassmel; Blender, Emmalee
Subject: RE: Roost Lodge redevelopment in Vail (Traffic Methodology)

Kari,

I'm good with this approach. I would not include Simba Run in the study. I don't think it is funded, in which case it shouldn't be included in the study.

Thanks
Alisa

Alisa Babler
Permit Unit Engineer

Please note, effective October 8, 2012, I will have a new email address:
alisa.babler@state.co.us

CDOT, Region 3 Traffic & Safety Section
970-683-6287
970-683-6290 (fax)
Alisa.babler@dot.state.co.us

From: Kari McDowell Schroeder [mailto:kari@mcdowelleng.com]
Sent: Wednesday, October 03, 2012 1:26 PM
To: alisa.babler@state.co.us; Babler, Alisa
Cc: Tom Kassmel
Subject: Roost Lodge redevelopment in Vail (Traffic Methodology)

Alisa,

The Roost Lodge is looking to redevelop in Vail. The site currently has a 72-room hotel with one employee housing unit. The site is to remain generally the same, but be remodeled to an Marriott Residence Inn with 152 all-suite hotel rooms and four on-site employee housing apartments. This yields almost 1,000 vpd and 80+/- vph. These volumes will require a CDOT Level 2 Traffic Study on the I-70 Frontage Road. I do not have a proposed site plan to share with you yet.

The site was previously studied in 2006 by Fox Higgins. Per conversations with Dan Roussin, I believe that an access permit was issued. The project was not constructed.

I am proposing the following methodology for this analysis:

Traffic counts and projections:

- Vail's 2009 Access Management Plan (AMP) and Transportation Master Plan (TMP) have traffic volumes for the frontage road and projections to Year 2025. I would like to use these volumes for the study, as the project-generated traffic is going to determine the need for auxiliary lane improvements, not the through traffic on the frontage road.
- The Town of Vail is going to be obtaining new traffic counts in January 2013. We would propose to do a quick comparison of the frontage road traffic volumes at that time to determine if there have been major impacts to the transportation system.
- The traffic growth rate for the frontage road is not available on CDOT's website. I would propose that we use the growth rate from the TMP and apply it forward to Year 2035. The growth rate from 2009 to 2025 is very high since the study was developed as a build out scenario study with 2025 selected as full build out. This was done during the boom in Vail and a lot of large developments were on the table going thru the process. Many of those have been stopped or delayed. We suggest using the 2025 data with a modest growth rate of 0.5% from 2025 to 2035. Once we have updated traffic numbers over this winter we can re assess the projection as needed.

Background infrastructure improvements and future development:

- The Town of Vail has identified the Simba Run underpass as a future $20 Million infrastructure project. Their 2011 CIP classifies this project as a low priority. I would like to know if we should include this connection under I-70 in our long term analysis. Tom – Do you have input on this issue? Simba Run is moving forward (slowly), CDOT and the Town are about to release a joint RFP for a PEL within the next couple months for completion next year.
- There are no know developments that are going to impact the Roost Lodge site.

Trip generation:

- We are proposing to use ITE Land Use Code #311 – All Suites Hotel for the weekday/am/pm analysis. This land use does not have Saturday data. Therefore, we are proposing to use #310 – Hotel for the weekend analysis. In addition, the four employee units would be analyzed as #220 – Apartments. Can you confirm what Hotel and EHU rates were used in the approved Fox Higgins study, we should be consistent with those.

Trip distribution:

- The previous study identified approximately 60% of traffic from the west and 40% of traffic from the east. We would propose to use the same trip distribution for our analysis.
- The AMP identifies that the site's eastern access is a one-way in and the western access is a one-way out. See attached.
- We are anticipating that the site traffic will trigger the need for an eastbound left deceleration lane at the eastern site access.

Please confirm that this approach looks acceptable. I would appreciate any feedback before we start the analysis.

Thanks!

Kari

Kari J. McDowell Schroeder, PE, PTOE
Transportation / Traffic Engineer

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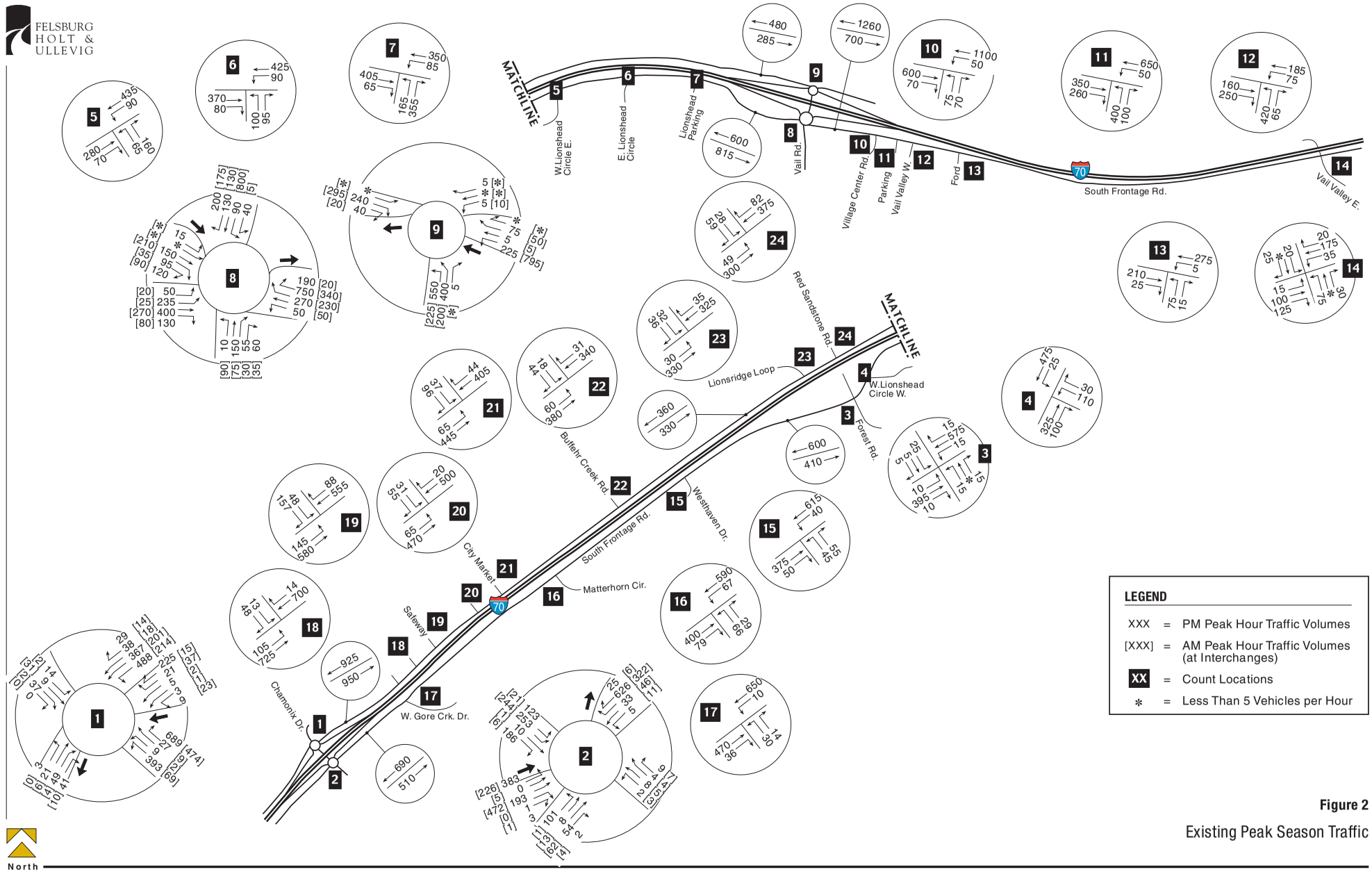


Figure 2

Existing Peak Season Traffic

FELSBURG HOLT & ULLEVIG

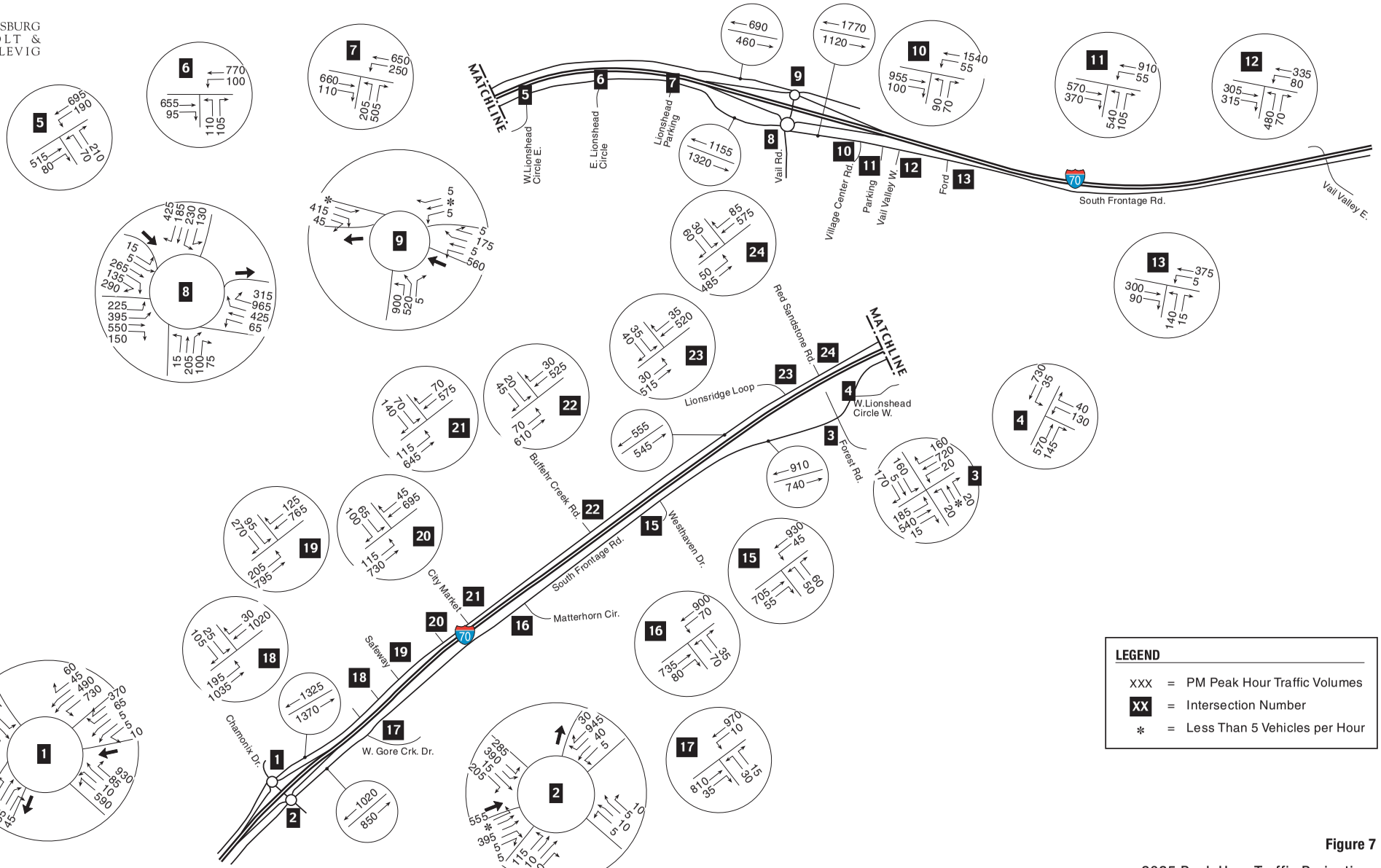


Figure 7

2025 Peak Hour Traffic Projections

North

FELSBURG HOLT & ULLEVIG

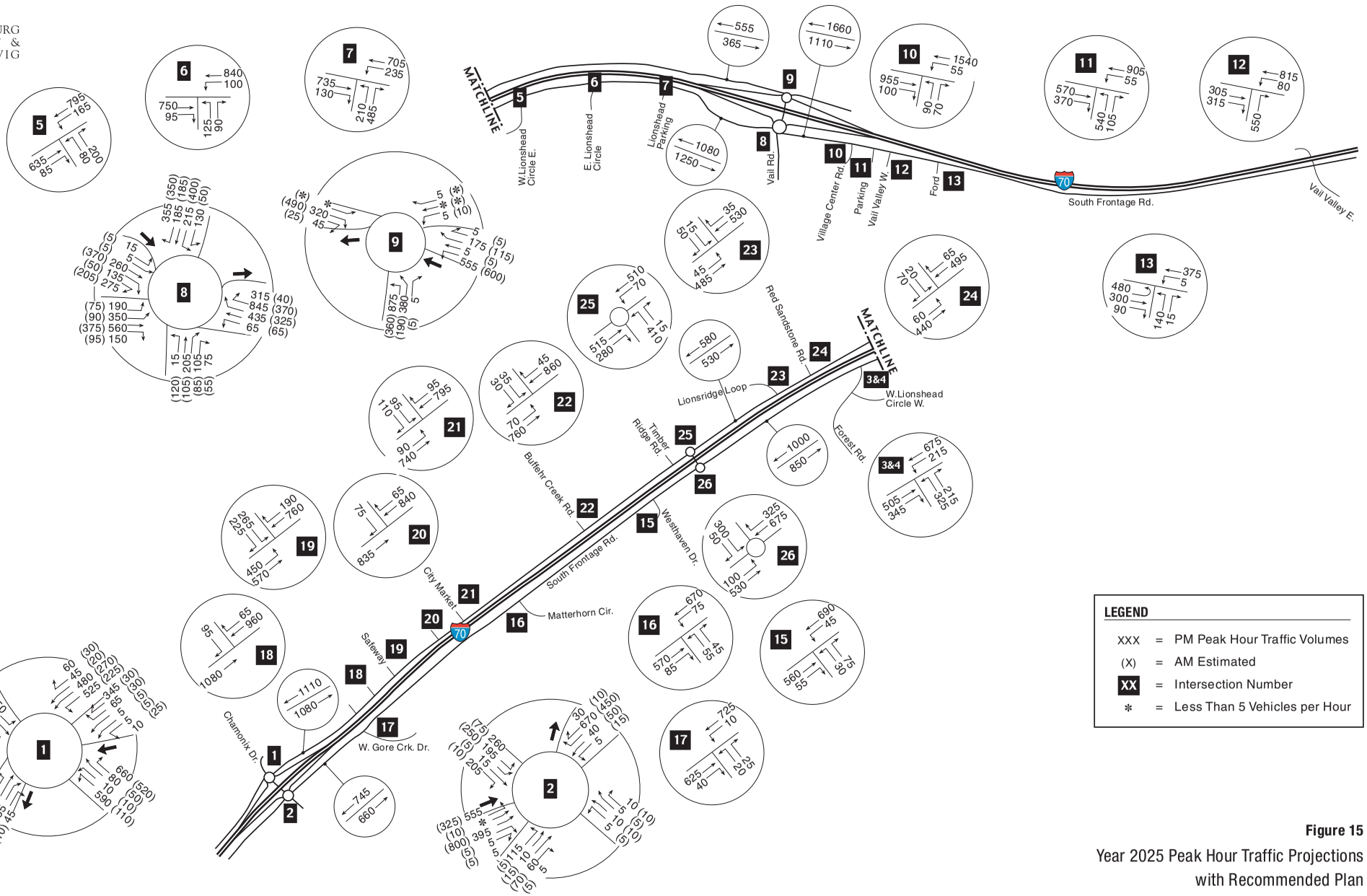
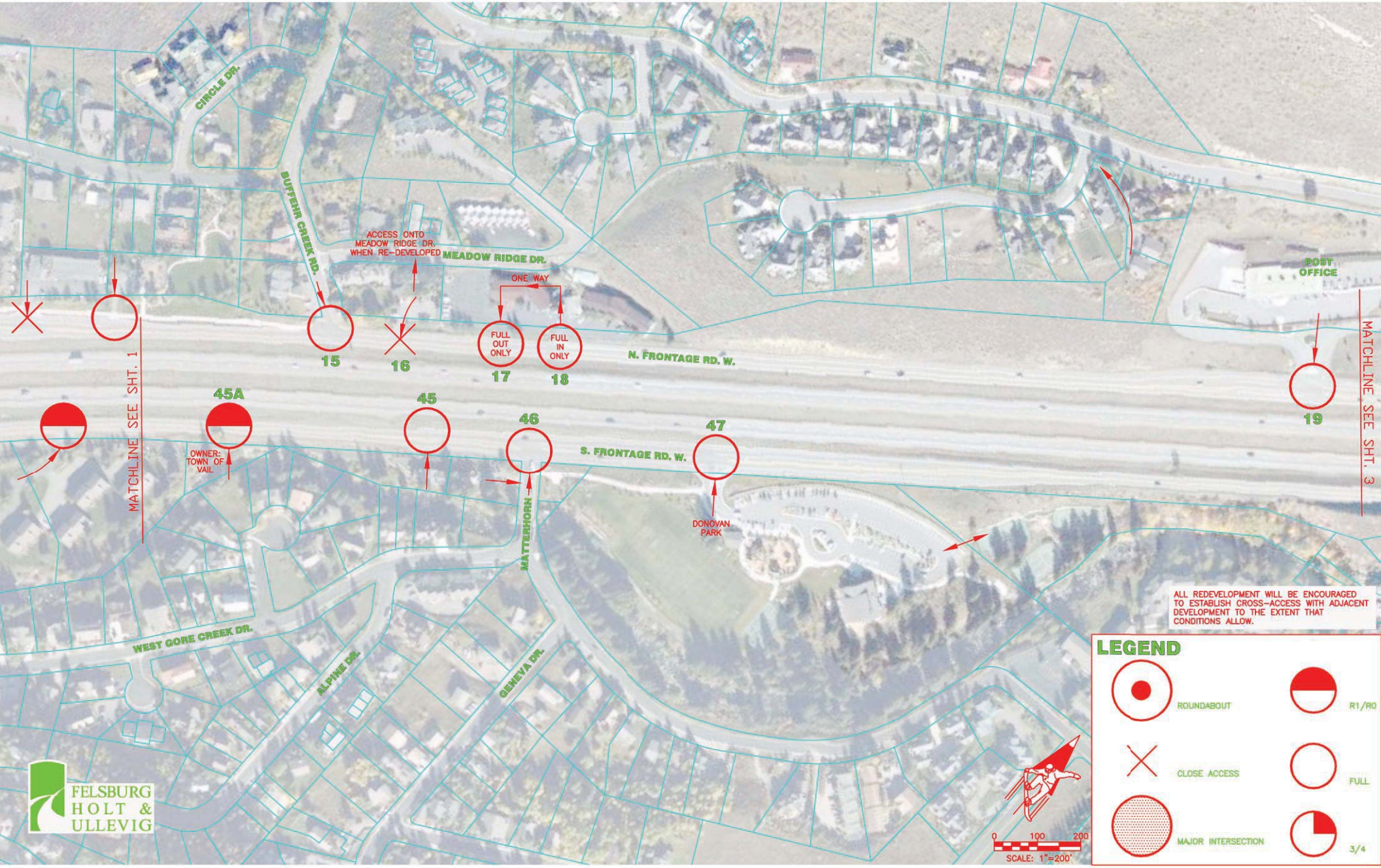


Figure 15

Year 2025 Peak Hour Traffic Projections with Recommended Plan

North


CIRCLE DR.
BUFFEHR CREEK RD.
ACCESS ONTO MEADOW RIDGE DR. WHEN RE-DEVELOPED
MEADOW RIDGE DR.
ONE WAY
FULL OUT ONLY
FULL IN ONLY
N. FRONTAGE RD. W.
POST OFFICE
MATCHLINE SEE SHT. 1
MATCHLINE SEE SHT. 3
15
16
17
18
19
45A
45
46
47
OWNER: TOWN OF VAIL
S. FRONTAGE RD. W.
MATTERHORN
DONOVAN PARK
WEST GORE CREEK DR.
ALPINE DR.
GENEVA DR.
ALL REDEVELOPMENT WILL BE ENCOURAGED TO ESTABLISH CROSS-ACCESS WITH ADJACENT DEVELOPMENT TO THE EXTENT THAT CONDITIONS ALLOW.
LEGEND
ROUNDABOUT
R1/R0
CLOSE ACCESS
FULL
MAJOR INTERSECTION
3/4
0
100
200
SCALE: 1"=200'
FELSBURG HOLT & ULLEVIG

Intersection	
Intersection Delay, s/veh	0.1

Movement	SEL	SER	NEL	NET	SWT	SWR
Vol, veh/h	0	0	18	529	600	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	20	575	652	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1276	662	672	0	-	0
Stage 1	662	-	-	-	-	-
Stage 2	614	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	184	462	919	-	-	-
Stage 1	513	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	178	462	919	-	-	-
Mov Capacity-2 Maneuver	178	-	-	-	-	-
Stage 1	513	-	-	-	-	-
Stage 2	523	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	0	0	0

Minor Lane / Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	919	-	0	-	-
HCM Lane V/C Ratio	0.021	-	+	-	-
HCM Control Delay (s)	9.002	0	0	-	-
HCM Lane LOS	A	A	A		
HCM 95th %tile Q(veh)	0.065	-	+	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.1

Movement	SEL	SER	NEL	NET	SWT	SWR
Vol, veh/h	0	0	18	890	975	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	20	967	1060	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2077	1070	1079	0	-	0
Stage 1	1070	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	59	269	646	-	-	-
Stage 1	329	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	55	269	646	-	-	-
Mov Capacity-2 Maneuver	55	-	-	-	-	-
Stage 1	329	-	-	-	-	-
Stage 2	329	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	0	0	0

Minor Lane / Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	646	-	0	-	-
HCM Lane V/C Ratio	0.03	-	+	-	-
HCM Control Delay (s)	10.747	0	0	-	-
HCM Lane LOS	B	A	A		
HCM 95th %tile Q(veh)	0.094	-	+	-	-

Notes

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Intersection	
Intersection Delay, s/veh	1.5

Movement	SEL	SER	NEL	NET	SWT	SWR
Vol, veh/h	33	33	42	514	600	42
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	47	-	-	-
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	36	36	46	559	652	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1325	675	698	0	-	0
Stage 1	675	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	172	454	898	-	-	-
Stage 1	506	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	163	454	898	-	-	-
Mov Capacity-2 Maneuver	163	-	-	-	-	-
Stage 1	506	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	23	1	0

Minor Lane / Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	898	-	163	454	-	-
HCM Lane V/C Ratio	0.051	-	0.22	0.079	-	-
HCM Control Delay (s)	9.224	-	33.2	13.6	-	-
HCM Lane LOS	A		D	B		
HCM 95th %tile Q(veh)	0.16	-	0.806	0.256	-	-

Notes

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Intersection	
Intersection Delay, s/veh	3.4

Movement	SEL	SER	NEL	NET	SWT	SWR
Vol, veh/h	33	33	42	875	975	42
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	47	-	-	-
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	36	36	46	951	1060	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2125	1083	1105	0	-	0
Stage 1	1083	-	-	-	-	-
Stage 2	1042	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	55	264	632	-	-	-
Stage 1	325	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	51	264	632	-	-	-
Mov Capacity-2 Maneuver	51	-	-	-	-	-
Stage 1	325	-	-	-	-	-
Stage 2	315	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	97	0	0

Minor Lane / Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	632	-	51	264	-	-
HCM Lane V/C Ratio	0.072	-	0.703	0.136	-	-
HCM Control Delay (s)	11.139	-	172.5	20.8	-	-
HCM Lane LOS	B		F	C		
HCM 95th %tile Q(veh)	0.233	-	2.842	0.464	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined