11.2 Traffic Study

LSA

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May 8, 2014

Ms. Jen Daugherty
Community and Economic Development Department
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Subject: The Inn at the Village Project – Traffic Analysis

Dear Ms. Daugherty:

This is a traffic analysis for The Inn at the Village Project located at 50 Canyon Boulevard in the Town of Mammoth Lakes (Town). Figure 1 (all figures provided as Attachment 1) illustrates the project location.

The initial design proposal for Building C (the third and final building) of the 8050 Complex consisted of 73 bedrooms. A valet parking stacking analysis was prepared (dated October 23, 2013) to address potential stacking on site as a result of the proposed project and its valet parking operation. Based on the results of this valet parking stacking analysis, the proposed valet operation with three valet parking attendants would not adversely affect on-site circulation. The driveway entry and valet drop-off area would provide adequate storage for vehicles entering the site without queuing onto Canyon Road.

The project description has since been revised (i.e., reduced by six bedrooms) from 73 bedrooms to 67 bedrooms. Potential vehicle stacking has already been addressed. Therefore, the purpose of this traffic analysis is to identify potential circulation impacts based on the current project description of 67 bedrooms, as described below.

The 8050 Complex (including The Inn at the Village) is located in the Resort General (RG) zone of the North Village Specific Plan (NVSP). With an NVSP allowable density of 55 bedrooms per acre, the 1.84-acre 8050 Complex property has an allowable density of 101 bedrooms on site. The existing Buildings A and B include 28 units (with 57 bedrooms) and 3,335 square feet (sf) of ground-floor commercial space including fine dining. With the NVSP-mandated conversion of commercial space to bedrooms (450 sf of commercial space equals one bedroom), the existing 3,335 sf of commercial space is equivalent to seven bedrooms. Therefore, the existing site (Buildings A and B) is equivalent to 64 bedrooms. A maximum of 37 new bedrooms could be constructed on site (Building C) in order for the project to be within the allowable density of the NVSP.

The proposed Building C includes 67 one-bedroom units. At project completion, 131 total bedrooms would be located on the 8050 Complex site (64 existing bedrooms in Buildings A and B, and 67 proposed bedrooms in Building C). The proposed project expansion of 67 bedrooms would result in 30 bedrooms over the maximum allowable density.

As such, a traffic analysis is required to evaluate the potential impacts. One analysis will address the project's impacts on the existing environment resulting from addition of the project (67 bedrooms). A second analysis will assess the impacts of the project on a cumulative condition (i.e., existing

environment plus approved Town projects). The third analysis will determine the impacts of the 30 bedrooms over the current maximum allowable density on the build-out of the current General Plan.

In order to exceed the maximum allowable density on site by 30 bedrooms but remain within the overall maximum density of the entire NVSP, 30 bedrooms will be "transferred" to the project site from another site within the NVSP. Mammoth Crossings, which is located in the NVSP, has been identified as the site where the project will obtain 30 bedrooms. Two alternative parcels within the Mammoth Crossings site (i.e., Whiskey Creek, at the northwest corner of Minaret Road/Lake Mary Road–Main Street, or Uller, at the southeast corner of Minaret Road/Lake Mary Road–Main Street) could serve as the "sending site."

The proposed project also includes 10,700 sf of accessory, guest-serving retail uses (i.e., food and beverage service, spa, etc.). These uses are intended to be amenities to the proposed project and its guests.

Study Area

Based on review of the 8050 Complex site plan, location, and the magnitude of the overall project, the study area is comprised of the following four intersections and seven roadway segments:

Intersections

1. Canyon Boulevard/Lake Mary Road
2. Minaret Road/Lake Mary Road–Main Street
3. Minaret Road/Forest Trail
4. Forest Trail/Main Street

Roadway Segments

1. Canyon Boulevard north of Lake Mary Road
2. Minaret Road north of Lake Mary Road–Main Street
3. Minaret Road south of Lake Mary Road–Main Street
4. Lake Mary Road west of Canyon Boulevard
5. Lake Mary Road–Main Street between Canyon Boulevard and Minaret Road
6. Main Street east of Minaret Road
7. Forest Trail east of Minaret Road

Weekend peak-hour intersection and roadway segment counts were obtained from the *Town of Mammoth Lakes Travel Demand Model Final Report* (LSC Transportation Consultants, Inc. 2011) for locations in the project vicinity. For purposes of the traffic analysis, the Existing and Alternative X (Buildout "Baseline" + Existing Network) traffic volumes were used.

Analysis Methodology and Performance Criteria

To determine the peak-hour operations of intersections within the study area, the Highway Capacity Manual (HCM) 2010 methodology was used. The peak-hour operation of the future roundabout at Minaret Road/Forest Trail was determined using the *SIDRA 6* software. The HCM and *SIDRA 6* worksheets for existing (and all future) conditions are provided as Attachments 3 and 4, respectively.

The Town's level of service (LOS) (which is defined using letter grades A–F) standard for intersections is LOS D, which corresponds to a delay of 55.0 seconds or less for signalized intersections. An intersection is considered satisfactory when it operates in the range of LOS A to D. An unsignalized intersection would be considered deficient if an individual minor street movement operates at LOS E or F (greater than 35.0 seconds of delay) and the total minor approach delay exceeds four vehicle hours for a single-lane approach and five vehicle hours for a multilane approach, consistent with the adopted Circulation Element and General Plan.

Roadway segment volume-to-capacity (v/c) ratios and LOS were determined using the Town's peak-hour roadway capacities. The Town's LOS standard for roadway segments is also LOS D. A significant impact occurs on a roadway segment operating at unsatisfactory LOS E or F when deficiencies are identified at the adjacent intersections or driveways as described above.

Baseline (No Project) Conditions

Using available data from the *Town of Mammoth Lakes Travel Demand Model Final Report*, the peak-hour operations of the study area intersections and roadway segments have been determined for Existing, Cumulative, and Buildout (Alternative X) baseline (no project) conditions.

The Buildout (Alternative X) baseline (no project) volumes from the *Town of Mammoth Lakes Travel Demand Model Final Report* were used to develop the Cumulative peak-hour intersection and roadway segment volumes. Because the Town's model includes the maximum allowable density on the project site (8050 Complex), including uses and bedrooms not currently built, the manual reduction of peak-hour trips equivalent to 37 bedrooms from the project site has been applied to the Buildout (Alternative X) baseline (no project) volumes to represent the Cumulative baseline conditions. The peak-hour trips of 37 total bedrooms from the project site were removed from the study area intersection and roadway segment volumes. The volume adjustments are provided as Attachment 5.

Existing Conditions. A summary of Existing (baseline) intersection LOS is presented in Table A (all tables provided as Attachment 2). As this table indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street currently operate at satisfactory LOS C or better. The two-way stop-controlled (TWSC) intersections of Minaret Road/Forest Trail and Forest Trail Main Street currently operate at satisfactory LOS D. It should be noted that Minaret Road/Forest Trail will be converted to a roundabout under future (Cumulative) conditions as required by a cumulative project on the east side of Minaret Road.

Existing (baseline) peak-hour roadway segment traffic volumes and v/c ratios are presented in Table B. As this table indicates, all study area roadway segments currently operate at satisfactory LOS C or better, with the exception of Canyon Boulevard north of Lake Mary Road (LOS F).

Cumulative Conditions. A summary of Cumulative (baseline) intersection LOS is presented in Table C (and Table E). As this table indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street, as well as the Minaret Road/Forest Trail roundabout, are forecast to operate at satisfactory LOS D or better. Although the LOS calculation for the TWSC intersection of Forest Trail/Main Street indicates LOS F, the total minor (multilane) approach delay is less than five vehicle hours (i.e., 3.228 vehicle hours). Therefore, all study area intersections are forecast to operate at satisfactory LOS.

Historically, Forest Trail/Main Street would have been improved through installation of other traffic signals along Main Street at Center Street or Mountain Boulevard, thus creating gaps in traffic for pedestrians and vehicles. However, the California Department of Transportation (Caltrans) has indicated that traffic signal warrants are not based on Saturday (weekend) peak volumes during ski season but on annual average volumes per the California Manual of Uniform Traffic Control Devices (CAMUTCD). Because the peak activity within the Town occurs during a few months out of the year and on the weekends, the annual average volumes may not satisfy the need for a signal. Caltrans has suggested analysis of a coordinated signal system (Warrant 6 of the CAMUTCD). However, Forest Trail/Main Street is located less than 1,000 feet west of an existing signal. Therefore, the coordinated signal system warrant may not be applicable. Caltrans has also noted that meeting a traffic signal warrant(s) does not guarantee the initiation of a project to install a signal. Furthermore, two primary issues that would need to be addressed prior to consideration of a signal at this intersection are frontage road connections and funding by the various parties involved (i.e., Caltrans, the Town, and the property owner[s] of the south leg driveway). In this context, there are no direct, feasible improvements to address this condition.

Cumulative (baseline) peak-hour roadway segment traffic volumes and v/c ratios are presented in Table D (and Table F). As this table indicates, Canyon Boulevard north of Lake Mary Road and Minaret Road south of Lake Mary Road–Main Street are forecast to operate at unsatisfactory LOS E or F. All other study area roadway segments are forecast to operate at satisfactory LOS D or better (v/c less than or equal to 0.90).

Buildout Conditions. A summary of Buildout (baseline) intersection LOS is presented in Table G (and Table I). As this table indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street, as well as the Minaret Road/Forest Trail roundabout, are forecast to operate at satisfactory LOS D or better. Although the LOS calculation for the TWSC intersection of Forest Trail/Main Street indicates LOS F, the total minor (multilane) approach delay is less than five vehicle hours (i.e., 3.310 vehicle hours). Therefore, all study area intersections are forecast to operate at satisfactory LOS.

Buildout (baseline) peak-hour roadway segment traffic volumes and v/c ratios are presented in Table H (and Table J). As this table indicates, Canyon Boulevard north of Lake Mary Road, Minaret Road south of Lake Mary Road–Main Street, and Lake Mary Road–Main Street between Canyon Boulevard and Minaret Road are forecast to operate at unsatisfactory LOS E or F. All other study area roadway segments are forecast to operate at satisfactory LOS D or better (v/c less than or equal to 0.90).

Project Trip Generation, Distribution, and Assignment

Typical winter weekend peak-hour trips were generated for the proposed 67-unit project (67 additional bedrooms and 30 bedrooms beyond the maximum allowable density) using empirical survey data from

a study conducted in the Village in February and March 2008 (provided as Attachment 6). This study evaluated trip generation characteristics of occupied units in the North Village (Village Lodges and Westin Hotel) and included trip generation consideration of guest-serving uses within these projects such as restaurants, bars, spas, pools, conference facilities, etc. For example, guest-serving amenities in the Westin Hotel include a full-service restaurant/bar, meeting spaces (2,050 sf), lobby used for drinks/snacks and presentations, workout/fitness studio, heated outdoor pool (2,000 sf), and ski/snowboard storage/rental.

The trip rate applied in this study is 0.28 trip per occupied unit which is the high end of the survey results. The project trip generation for the 10,700 sf of guest-serving uses (i.e., food and beverage service, spa, etc.) is incorporated within the 0.28 trip rate applied to each occupied unit.

The basis for using an observed/measured rate from the Village Lodges is that the data reflects the net vehicular trip generation while recognizing the proximity of its resort units to accessory retail and restaurant uses, as well as to the gondola and other retail and restaurant attractions in the North Village area. The surveyed trip rate of 0.28 trip per occupied unit (with 54 percent inbound and 46 percent outbound) is conservative and inclusive of all vehicle trip types (i.e., resort trips only, accessory retail [non-hotel] trips only, and trips for multiple uses). Therefore, no additional guest-serving retail trips have been included in the trip generation for the proposed 67 one-bedroom units.

As such, for purposes of the Existing Plus Project impact assessment, 67 bedrooms would generate 19 peak-hour trips (10 inbound and 9 outbound) on a typical weekend. These 19 peak-hour trips were overlaid onto the Existing baseline traffic volumes.

For purposes of the Cumulative Plus Project (Whiskey Creek or Uller) impact assessment, the peak-hour trips associated with 67 bedrooms (including the current maximum allowable density of 37 bedrooms on the project site and 30 bedrooms from the Mammoth Crossing [Whiskey Creek or Uller] sending site to exceed the this maximum allowable density) were applied to the Cumulative baseline traffic volumes. The 37 bedrooms of the maximum allowable density would generate approximately 10 peak-hour trips (5 inbound and 5 outbound). The 30 bedrooms beyond the maximum allowable density would generate 9 peak-hour trips (5 inbound and 4 outbound). 10 peak-hour trips were overlaid onto the Cumulative baseline traffic volumes, and 9 peak-hour trips were redistributed (or transferred) from the Mammoth Crossing (Whiskey Creek or Uller) sending site to the project site using the Cumulative baseline traffic volumes.

For purposes of the impact assessment of Buildout Plus Project conditions, the 9 peak-hour trips associated with 30 bedrooms beyond the maximum allowable density were redistributed (or transferred) from the Mammoth Crossing (Whiskey Creek or Uller) sending site to the project site using the Buildout baseline traffic volumes.

Project-related trips were distributed through the study area intersections and roadway segments based on expected travel patterns between the project and local destinations. Based on review of the trip distribution percentages the approved Mammoth Crossings project in relation to the project location, approximately 15 percent of the project trips are destined to/from the northwest along Minaret Road, 30 percent of the project trips are destined to/from the south along Minaret Road, 35 percent of the project trips are destined to/from the east along Main Street, 20 percent of the project trips are destined to the west along Canyon Boulevard (i.e., 15 percent) and Lake Mary Road (i.e., 5 percent). The project trip distribution and assignment are illustrated on Figure 2.

Project Impact Assessment

A traffic analysis was prepared to address potential impacts to the surrounding circulation network based on collection of study area traffic data from the *Town of Mammoth Lakes Travel Demand Model Final Report*. Specifically, an analysis of Existing Plus Project (67 bedrooms), Cumulative Plus Project (67 bedrooms) for Whiskey Creek or Uller, and Buildout Plus Project (30 bedrooms beyond the maximum allowable density) for Whiskey Creek or Uller traffic conditions at the study area intersections and roadway segments was conducted to determine the ability of the circulation system to accommodate the proposed project. The resulting traffic volumes were examined to determine peak-hour intersection LOS. The traffic volumes were also used to calculate peak-hour roadway segment v/c ratios and LOS. The following discussion presents the results of the Plus Project analysis.

The project trip generation and assignment of 19 peak-hour trips (10 inbound and 9 outbound) at the unsignalized project driveway along Canyon Boulevard would have a nominal effect on the Town's LOS standards and delay thresholds (including the minor street approach delay). Therefore, the focus of the impact analysis is on study area intersections and roadway segments.

Existing Plus Project Conditions. As Table A indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street would operate at satisfactory LOS C or better under Existing Plus Project conditions. The TWSC intersections of Minaret Road/Forest Trail and Forest Trail/Main Street would operate at satisfactory LOS D. Therefore, the project would not create a significant impact to a study area intersection under Existing Plus Project conditions.

As Table B indicates, all study area roadway segments would operate at satisfactory LOS C or better under Existing Plus Project conditions, with the exception of Canyon Boulevard north of Lake Mary Road (LOS F). Although the project would increase the v/c at this segment, significant impacts would not occur at the adjacent intersections of Canyon Boulevard/Lake Mary Road or Minaret Road/Lake Mary Road–Main Street. Therefore, the project would not create an impact to the study area roadway segments under Existing Plus Project conditions.

Cumulative Plus Project (Whiskey Creek) Conditions. As Table C indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street, as well as the Minaret Road/Forest Trail roundabout, would operate at satisfactory LOS D or better under Cumulative Plus Project (Whiskey Creek) conditions. Although the LOS calculation for the TWSC intersection of Forest Trail/Main Street indicates LOS F, the total minor (multilane) approach delay would not exceed five vehicle hours (i.e., 3.310 vehicle hours). Therefore, the project would not create a significant impact to a study area intersection under Cumulative Plus Project (Whiskey Creek) conditions.

As Table D indicates, Canyon Boulevard north of Lake Mary Road, Minaret Road south of Lake Mary Road–Main Street, and Lake Mary Road–Main Street between Canyon Boulevard and Minaret Road would operate at unsatisfactory LOS E or F under Cumulative Plus Project (Whiskey Creek) conditions. Although the project would increase the v/c at these three roadway segments, the project would add 8 or fewer peak-hour trips to these locations. Furthermore, significant impacts would not occur at the adjacent intersections. Therefore, the project would not create an impact to the study area roadway segments under Cumulative Plus Project (Whiskey Creek) conditions.

Cumulative Plus Project (Uller) Conditions. As Table E indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street, as well as the Minaret Road/Forest Trail roundabout, would operate at satisfactory LOS D or better under Cumulative Plus Project (Uller) conditions. Although the LOS calculation for the TWSC intersection of Forest Trail/Main Street indicates LOS F, the total minor (multilane) approach delay would not exceed five vehicle hours (i.e., 3.310 vehicle hours). Therefore, the project would not create a significant impact to a study area intersection under Cumulative Plus Project (Uller) conditions.

As Table F indicates, Canyon Boulevard north of Lake Mary Road, Minaret Road south of Lake Mary Road–Main Street, and Lake Mary Road–Main Street between Canyon Boulevard and Minaret Road would operate at unsatisfactory LOS E or F under Cumulative Plus Project (Uller) conditions. Although the project would increase the v/c at these three roadway segments, the project would add 13 or fewer peak-hour trips to these locations. Furthermore, significant impacts would not occur at the adjacent intersections. Therefore, the project would not create an impact to the study area roadway segments under Cumulative Plus Project (Uller) conditions.

Buildout Plus Project (Whiskey Creek) Conditions. As Table G indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street, as well as the Minaret Road/Forest Trail roundabout, would operate at satisfactory LOS D or better under Buildout Plus Project (Whiskey Creek) conditions. Although the LOS calculation for the TWSC intersection of Forest Trail/Main Street indicates LOS F, the total minor (multilane) approach delay would not exceed five vehicle hours (i.e., 3.3107 vehicle hours). Therefore, based on the transfer of 30 bedrooms from Whiskey Creek to the project site (and the redistribution of the equivalent peak-hour trips), the project would not create a significant impact to a study area intersection under Buildout Plus Project (Whiskey Creek) conditions.

As Table H indicates, Canyon Boulevard north of Lake Mary Road, Minaret Road south of Lake Mary Road–Main Street, and Lake Mary Road–Main Street between Canyon Boulevard and Minaret Road would operate at unsatisfactory LOS E or F under Buildout Plus Project (Whiskey Creek) conditions. However, the transfer of 30 bedrooms from Whiskey Creek to the project site (and the redistribution of the equivalent peak-hour trips) would not increase the v/c at these three roadway segments. Furthermore, significant impacts would not occur at the adjacent intersections. Therefore, the project would not create an impact to the study area roadway segments under Buildout Plus Project (Whiskey Creek) conditions.

Buildout Plus Project (Uller) Conditions. As Table I indicates, the signalized intersections of Canyon Boulevard/Lake Mary Road and Minaret Road/Lake Mary Road–Main Street, as well as the Minaret Road/Forest Trail roundabout, would operate at satisfactory LOS D or better under Buildout Plus Project (Uller) conditions. Although the LOS calculation for the TWSC intersection of Forest Trail/Main Street indicates LOS F, the total minor (multilane) approach delay would not exceed five vehicle hours (i.e., 3.310 vehicle hours). Therefore, based on the transfer of 30 bedrooms from Uller to the project site (and the redistribution of the equivalent peak-hour trips), the project would not create a significant impact to a study area intersection under Buildout Plus Project (Uller) conditions.

As Table J indicates, Canyon Boulevard north of Lake Mary Road, Minaret Road south of Lake Mary Road–Main Street, and Lake Mary Road–Main Street between Canyon Boulevard and Minaret Road would operate at unsatisfactory LOS E or F under Buildout Plus Project (Uller) conditions. Although the transfer of 30 bedrooms from Uller to the project site (and the redistribution of the equivalent peak-hour trips) would increase the v/c at the roadway segment of Canyon Boulevard north of Lake Mary Road, significant impacts would not occur at the adjacent intersections. Therefore, the project would not create an impact to the study area roadway segments under Buildout Plus Project (Uller) conditions.

Conclusion

The surrounding circulation network could accommodate the proposed project of 67 bedrooms (and 30 bedrooms over the maximum allowable density) and 10,700 sf of guest-serving amenities on site. Based on evaluation of study area intersections and roadway segments, The Inn at the Village project would not result in any significant impacts. Therefore, 30 bedrooms could be transferred to the project site from one of two alternative parcels within the Mammoth Crossings site (i.e., Whiskey Creek or Uller) in order to remain within the overall maximum density of the entire NVSP. The project will also be required to pay applicable Development Impact Fees toward town-wide transportation projects.

Sincerely,

LSA ASSOCIATES, INC.

Les Card, P.E.
Principal and CEO

Attachments:
Attachment 1 – Figures 1 and 2 (2 pages)
Attachment 2 – Tables A through J (10 pages)
Attachment 3 – HCM 2010 worksheets (14 pages)
Attachment 4 – *SIDRA 6* worksheets and Forest Trail/Main Street volumes (7 pages)
Attachment 5 – Volume Adjustments (5 pages)
Attachment 6 – Trip Generation Study (5 pages)

ATTACHMENT 1

FIGURES 1 AND 2

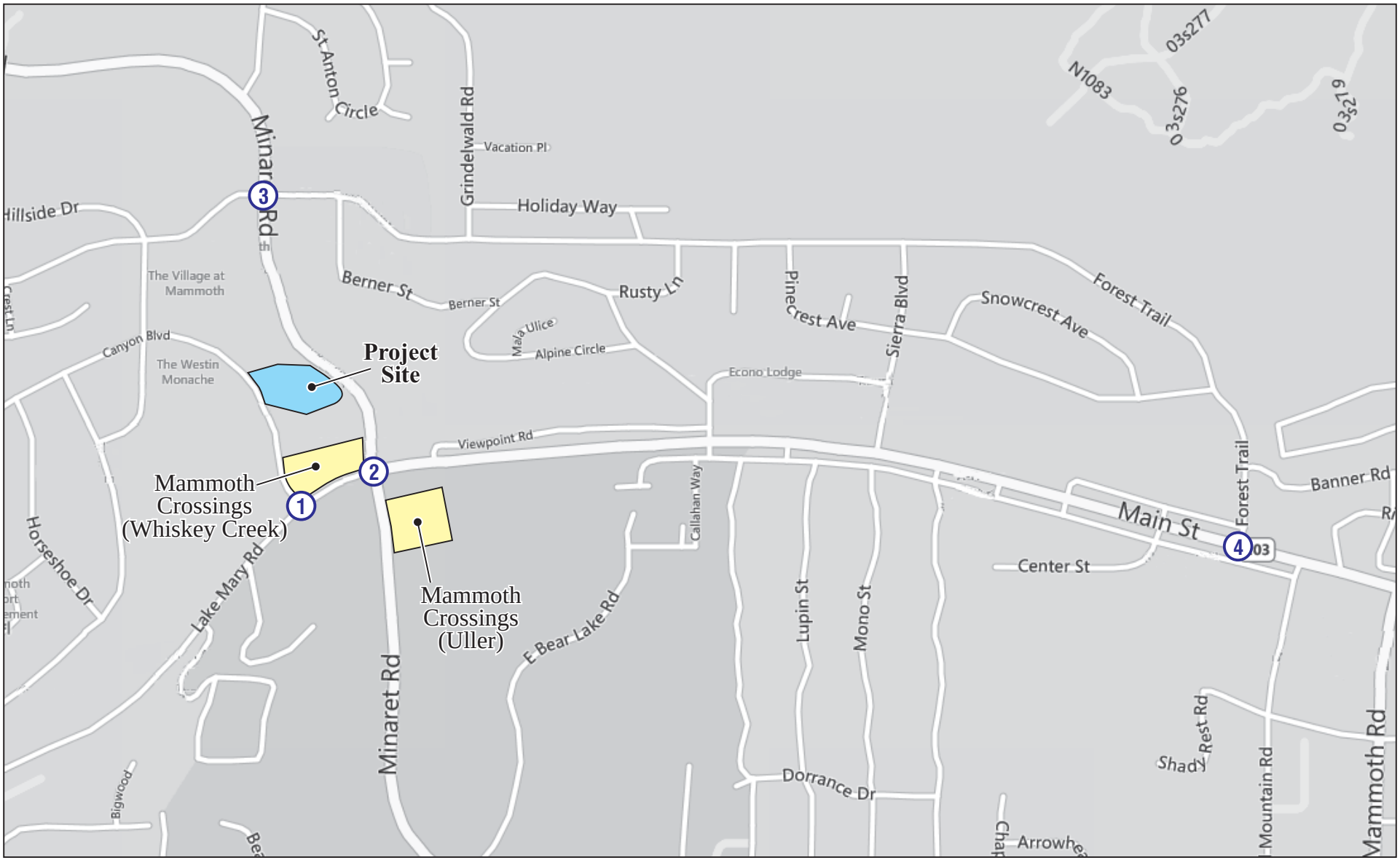

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FIGURE 1

LEGEND

(1) - Study Area Intersections

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0 340 680

FEET

SOURCE: Bing Maps

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The Inn at the Village

Project Location and Study Area Intersections

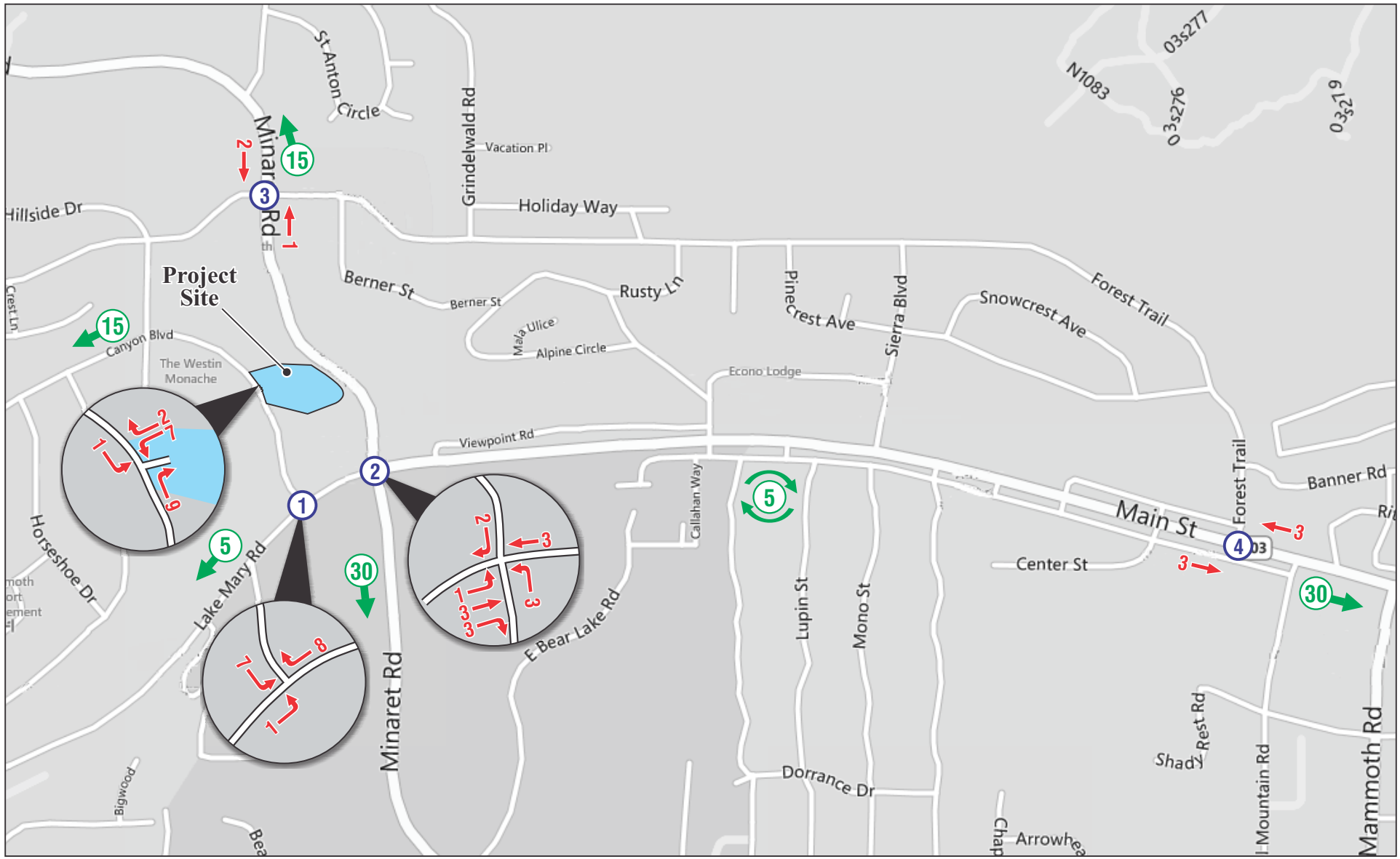

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FIGURE 2

LEGEND

(1) - Study Area Intersections

(X) - Project Trip Distribution Percentage

X - Total Project (67 Bedrooms) Peak Hour Trips

0 340 680

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SOURCE: Bing Maps

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The Inn at the Village

Project Trip Distribution and Assignment

ATTACHMENT 2

TABLES A THROUGH J

Table A: Existing and Existing Plus Project Intersection LOS Summary

	Intersection	Traffic Control	Existing Baseline		Existing Plus Project		Peak-Hour Δ in Delay	Signficant Project Impact?
			Delay[1]	LOS	Delay[1]	LOS		
1	Canyon Blvd/Lake Mary Rd	Signal	9.8 sec	A	9.9 sec	A	0.1 sec	No
2	Minaret Rd/Lake Mary Rd-Main St	Signal	30.0 sec	C	30.0 sec	C	0.0 sec	No
3	Minaret Rd/Forest Trail	TWSC	0.386 hr	D	0.388 hr	D	0.002 hr	No
4	Forest Trail/Main St	TWSC	1.123 hr	D	1.130 hr	D	0.007 hr	No

LOS = level of service

TWSC = two-way stop-controlled

[1] For signalized intersections, delay is the average intersection delay in seconds (sec).

The Town's LOS standard for signalized intersections is LOS D (less than 55.0 sec of delay).

For TWSC intersections, delay is the worst-case total minor street approach delay in hours (hr).

The Town's LOS standard for unsignalized intersections is LOS D (less than 35.0 sec of delay) and less than four vehicle hours of total minor approach delay for a single-lane approach (or five vehicle hours of total minor approach delay for a multilane approach).

Table B: Existing and Existing Plus Project Roadway Segment LOS Summary

Roadway	Segment	Capacity	Existing Baseline			Existing Plus Project			Significant Project Impact?[1]
			Peak-Hour Volume	V/C	LOS	Peak-Hour Volume	V/C	LOS	
Canyon Blvd	north of Lake Mary Rd	800	875	1.09	F	894	1.12	F	No
Minaret Rd	north of Lake Mary Rd-Main St	1,500	934	0.62	B	937	0.62	B	No
	south of Lake Mary Rd-Main St	1,400	718	0.51	A	724	0.52	A	No
Lake Mary Rd-Main St	west of Canyon Blvd	800	327	0.41	A	328	0.41	A	No
	between Canyon and Minaret	1,600	1,211	0.76	C	1,226	0.77	C	No
	east of Minaret Rd	3,200	1,596	0.50	A	1,603	0.50	A	No
Forest Trail	east of Minaret Rd	500	129	0.26	A	129	0.26	A	No

LOS = level of service

V/C = volume-to-capacity ratio

[1] The Town's LOS standard for roadway segments is LOS D. A significant project impact occurs on a roadway segment operating at LOS E or F when a significant project impact is identified at an adjacent (upstream or downstream) intersection.

Table C: Cumulative and Cumulative Plus Project (Whiskey Creek) Intersection LOS Summary

	Intersection	Traffic Control	Cumulative Baseline		Cumulative Plus Project (Whiskey Creek)		Peak-Hour Δ in Delay	Signficant Project Impact?
			Delay[1]	LOS	Delay[1]	LOS		
1	Canyon Blvd/Lake Mary Rd	Signal	9.9 sec	A	9.9 sec	A	0.0 sec	No
2	Minaret Rd/Lake Mary Rd-Main St	Signal	39.6 sec	D	39.9 sec	D	0.3 sec	No
3	Minaret Rd/Forest Trail[2]	Roundabout[3]	43.3 sec	D	43.5 sec	D	0.2 sec	No
4	Forest Trail/Main St	TWSC	3.228 hr	F	3.310 hr	F	0.082 hr	No

LOS = level of service

TWSC = two-way stop-controlled

[1] For signalized intersections, delay is the average intersection delay in seconds (sec).

The Town's LOS standard for signalized intersections is LOS D (less than 55.0 sec of delay).

For TWSC intersections, delay is the worst-case total minor street approach delay in hours (hr).

The Town's LOS standard for unsignalized intersections is LOS D (less than 35.0 sec of delay) and less than four vehicle hours of total minor approach delay for a single-lane approach (or five vehicle hours of total minor approach delay for a multilane approach).

[2] This intersection will be improved from TWSC to a roundabout as required by a cumulative project on the east side of Minaret Road.

[3] Roundabout analyzed using SIDRA 6 software and the "SIDRA Standard" capacity model and the Highway Capacity Manual 2010 LOS methodology.

Table D: Cumulative and Cumulative Plus Project (Whiskey Creek) Roadway Segment LOS Summary

Roadway	Segment	Capacity	Cumulative Baseline			Cumulative Plus Project (Whiskey Creek)			Significant Project Impact?[1]
			Peak-Hour Volume	V/C	LOS	Peak-Hour Volume	V/C	LOS	
Canyon Blvd	north of Lake Mary Rd	800	935	1.17	F	943	1.18	F	No
Minaret Rd	north of Lake Mary Rd-Main St	1,500	1,236	0.82	D	1,238	0.83	D	No
	south of Lake Mary Rd-Main St	1,400	1,378	0.98	E	1,382	0.99	E	No
Lake Mary Rd-Main St	west of Canyon Blvd	800	396	0.50	A	396	0.50	A	No
	between Canyon and Minaret	1,600	1,446	0.90	D	1,454	0.91	E	No
	east of Minaret Rd	3,200	2,007	0.63	B	2,011	0.63	B	No
Forest Trail	east of Minaret Rd	500	237	0.47	A	237	0.47	A	No

LOS = level of service

V/C = volume-to-capacity ratio

[1] The Town's LOS standard for roadway segments is LOS D. A significant project impact occurs on a roadway segment operating at LOS E or F when a significant project impact is identified at an adjacent (upstream or downstream) intersection.

Table E: Cumulative and Cumulative Plus Project (Uller) Intersection LOS Summary

	Intersection	Traffic Control	Cumulative Baseline		Cumulative Plus Project (Uller)		Peak-Hour Δ in Delay	Signficant Project Impact?
			Delay[1]	LOS	Delay[1]	LOS		
1	Canyon Blvd/Lake Mary Rd	Signal	9.9 sec	A	9.9 sec	A	0.0 sec	No
2	Minaret Rd/Lake Mary Rd-Main St	Signal	39.6 sec	D	39.9 sec	D	0.3 sec	No
3	Minaret Rd/Forest Trail[2]	Roundabout[3]	43.3 sec	D	43.5 sec	D	0.2 sec	No
4	Forest Trail/Main St	TWSC	3.228 hr	F	3.310 hr	F	0.082 hr	No

LOS = level of service

TWSC = two-way stop-controlled

[1] For signalized intersections, delay is the average intersection delay in seconds (sec).

The Town's LOS standard for signalized intersections is LOS D (less than 55.0 sec of delay).

For TWSC intersections, delay is the worst-case total minor street approach delay in hours (hr).

The Town's LOS standard for unsignalized intersections is LOS D (less than 35.0 sec of delay) and less than four vehicle hours of total minor approach delay for a single-lane approach (or five vehicle hours of total minor approach delay for a multilane approach).

[2] This intersection will be improved from TWSC to a roundabout as required by a cumulative project on the east side of Minaret Road.

[3] Roundabout analyzed using SIDRA 6 software and the "SIDRA Standard" capacity model and the Highway Capacity Manual 2010 LOS methodology.

Table F: Cumulative and Cumulative Plus Project (Uller) Roadway Segment LOS Summary

Roadway	Segment	Capacity	Cumulative Baseline			Cumulative Plus Project (Uller)			Significant Project Impact?[1]
			Peak-Hour Volume	V/C	LOS	Peak-Hour Volume	V/C	LOS	
Canyon Blvd	north of Lake Mary Rd	800	935	1.17	F	948	1.19	F	No
	north of Lake Mary Rd-Main St	1,500	1,236	0.82	D	1,238	0.83	D	No
Minaret Rd	south of Lake Mary Rd-Main St	1,400	1,378	0.98	E	1,378	0.98	E	No
	west of Canyon Blvd	800	396	0.50	A	397	0.50	A	No
Lake Mary Rd-	between Canyon and Minaret	1,600	1,446	0.90	D	1,459	0.91	E	No
Main St	east of Minaret Rd	3,200	2,007	0.63	B	2,011	0.63	B	No
Forest Trail	east of Minaret Rd	500	237	0.47	A	237	0.47	A	No

LOS = level of service

V/C = volume-to-capacity ratio

[1] The Town's LOS standard for roadway segments is LOS D. A significant project impact occurs on a roadway segment operating at LOS E or F when a significant project impact is identified at an adjacent (upstream or downstream) intersection.

Table G: Buildout and Buildout Plus Project (Whiskey Creek) Intersection LOS Summary

	Intersection	Traffic Control	Buildout Baseline		Buildout Plus Project (Whiskey Creek)		Peak-Hour Δ in Delay	Signficant Project Impact?
			Delay[1]	LOS	Delay[1]	LOS		
1	Canyon Blvd/Lake Mary Rd	Signal	9.9 sec	A	9.9 sec	A	0.0 sec	No
2	Minaret Rd/Lake Mary Rd-Main St	Signal	39.9 sec	D	39.9 sec	D	0.0 sec	No
3	Minaret Rd/Forest Trail[2]	Roundabout[3]	43.5 sec	D	43.5 sec	D	0.0 sec	No
4	Forest Trail/Main St	TWSC	3.310 hr	F	3.310 hr	F	0.000 hr	No

LOS = level of service

TWSC = two-way stop-controlled

[1] For signalized intersections, delay is the average intersection delay in seconds (sec).

The Town's LOS standard for signalized intersections is LOS D (less than 55.0 sec of delay).

For TWSC intersections, delay is the worst-case total minor street approach delay in hours (hr).

The Town's LOS standard for unsignalized intersections is LOS D (less than 35.0 sec of delay) and less than four vehicle hours of total minor approach delay for a single-lane approach (or five vehicle hours of total minor approach delay for a multilane approach).

[2] This intersection will be improved from TWSC to a roundabout as required by a cumulative project on the east side of Minaret Road.

[3] Roundabout analyzed using SIDRA 6 software and the "SIDRA Standard" capacity model and the Highway Capacity Manual 2010 LOS methodology.

Table H: Buildout and Buildout Plus Project (Whiskey Creek) Roadway Segment LOS Summary

Roadway	Segment	Capacity	Buildout Baseline			Buildout Plus Project (Whiskey Creek)			Significant Project Impact?[1]
			Peak-Hour Volume	V/C	LOS	Peak-Hour Volume	V/C	LOS	
Canyon Blvd	north of Lake Mary Rd	800	943	1.18	F	943	1.18	F	No
Minaret Rd	north of Lake Mary Rd-Main St	1,500	1,238	0.83	D	1,238	0.83	D	No
	south of Lake Mary Rd-Main St	1,400	1,382	0.99	E	1,382	0.99	E	No
Lake Mary Rd-Main St	west of Canyon Blvd	800	396	0.50	A	396	0.50	A	No
	between Canyon and Minaret	1,600	1,454	0.91	E	1,454	0.91	E	No
	east of Minaret Rd	3,200	2,011	0.63	B	2,011	0.63	B	No
Forest Trail	east of Minaret Rd	500	237	0.47	A	237	0.47	A	No

LOS = level of service

V/C = volume-to-capacity ratio

[1] The Town's LOS standard for roadway segments is LOS D. A significant project impact occurs on a roadway segment operating at LOS E or F when a significant project impact is identified at an adjacent (upstream or downstream) intersection.

Table I: Buildout and Buildout Plus Project (Uller) Intersection LOS Summary

	Intersection	Traffic Control	Buildout Baseline		Buildout Plus Project (Uller)		Peak-Hour Δ in Delay	Signficant Project Impact?
			Delay[1]	LOS	Delay[1]	LOS		
1	Canyon Blvd/Lake Mary Rd	Signal	9.9 sec	A	9.9 sec	A	0.0 sec	No
2	Minaret Rd/Lake Mary Rd-Main St	Signal	39.9 sec	D	39.9 sec	D	0.0 sec	No
3	Minaret Rd/Forest Trail[2]	Roundabout[3]	43.5 sec	D	43.5 sec	D	0.0 sec	No
4	Forest Trail/Main St	TWSC	3.310 hr	F	3.310 hr	F	0.000 hr	No

LOS = level of service

TWSC = two-way stop-controlled

[1] For signalized intersections, delay is the average intersection delay in seconds (sec).

The Town's LOS standard for signalized intersections is LOS D (less than 55.0 sec of delay).

For TWSC intersections, delay is the worst-case total minor street approach delay in hours (hr).

The Town's LOS standard for unsignalized intersections is LOS D (less than 35.0 sec of delay) and less than four vehicle hours of total minor approach delay for a single-lane approach (or five vehicle hours of total minor approach delay for a multilane approach).

[2] This intersection will be improved from TWSC to a roundabout as required by a cumulative project on the east side of Minaret Road.

[3] Roundabout analyzed using SIDRA 6 software and the "SIDRA Standard" capacity model and the Highway Capacity Manual 2010 LOS methodology.

Table J: Buildout and Buildout Plus Project (Uller) Roadway Segment LOS Summary

Roadway	Segment	Capacity	Buildout Baseline			Buildout Plus Project (Uller)			Significant Project Impact?[1]
			Peak-Hour Volume	V/C	LOS	Peak-Hour Volume	V/C	LOS	
Canyon Blvd	north of Lake Mary Rd	800	943	1.18	F	948	1.19	F	No
Minaret Rd	north of Lake Mary Rd-Main St	1,500	1,238	0.83	D	1,239	0.83	D	No
	south of Lake Mary Rd-Main St	1,400	1,382	0.99	E	1,378	0.98	E	No
Lake Mary Rd-Main St	west of Canyon Blvd	800	396	0.50	A	396	0.50	A	No
	between Canyon and Minaret	1,600	1,454	0.91	E	1,459	0.91	E	No
	east of Minaret Rd	3,200	2,011	0.63	B	2,011	0.63	B	No
Forest Trail	east of Minaret Rd	500	237	0.47	A	237	0.47	A	No

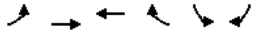
LOS = level of service

V/C = volume-to-capacity ratio

[1] The Town's LOS standard for roadway segments is LOS D. A significant project impact occurs on a roadway segment operating at LOS E or F when a significant project impact is identified at an adjacent (upstream or downstream) intersection.

ATTACHMENT 3

HCM 2010 WORKSHEETS



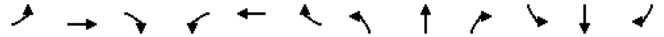
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	160	185	205	435	10
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	17	178	206	228	493	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	472	723	723	615	1378	627
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.00
Sat Flow, veh/h	951	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	17	178	206	228	493	0
Grp Sat Flow(s),veh/h/ln	951	1863	1863	1583	1774	1615
Q Serve(g_s), s	0.5	2.7	3.1	4.2	4.1	0.0
Cycle Q Clear(g_c), s	3.6	2.7	3.1	4.2	4.1	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	472	723	723	615	1378	627
V/C Ratio(X)	0.04	0.25	0.28	0.37	0.36	0.00
Avail Cap(c_a), veh/h	472	723	723	615	1378	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.9	8.5	8.7	9.0	9.0	0.0
Incr Delay (d2), s/veh	0.1	0.8	1.0	1.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.5	1.8	2.1	2.1	0.0
LnGrp Delay(d),s/veh	10.1	9.3	9.7	10.7	9.7	0.0
LnGrp LOS	B	A	A	B	A	
Approach Vol, veh/h		195	434		493	
Approach Delay, s/veh		9.4	10.2		9.7	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.6		4.6		4.6
Max Green Setting (Gmax), s				16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s				5.6		6.1		6.2
Green Ext Time (p_c), s				4.9		3.4		4.7

Intersection Summary	
HCM 2010 Ctrl Delay	9.8
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	85	385	125	70	295	125	305	240	85	475	50	105
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	94	428	139	78	328	139	339	267	94	568	0	117
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	323	748	334	289	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	94	428	139	78	328	139	339	267	94	568	0	117
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	3.3	8.7	6.1	2.7	6.4	6.1	13.2	9.4	3.5	11.8	0.0	4.9
Cycle Q Clear(g_c), s	3.3	8.7	6.1	2.7	6.4	6.1	13.2	9.4	3.5	11.8	0.0	4.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	748	334	289	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.29	0.57	0.42	0.27	0.44	0.41	0.64	0.48	0.20	0.71	0.00	0.33
Avail Cap(c_a), veh/h	323	748	334	289	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.6	28.3	27.3	22.5	27.3	27.2	24.2	22.9	20.8	28.6	0.0	25.9
Incr Delay (d2), s/veh	2.3	3.2	3.8	2.3	1.8	3.7	5.7	2.9	0.9	5.3	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.5	3.0	1.5	3.3	3.0	7.3	5.3	1.7	6.4	0.0	2.4
LnGrp Delay(d),s/veh	24.8	31.5	31.1	24.8	29.2	30.9	30.0	25.8	21.8	33.9	0.0	28.4
LnGrp LOS	C	C	C	C	C	C	C	C	C	C		C
Approach Vol, veh/h		661			545			700			685	
Approach Delay, s/veh		30.4			29.0			27.3			33.0	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		15.2	4.7	10.7		13.8	5.3	8.4
Green Ext Time (p_c), s		3.8	0.0	4.1		2.3	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	20	25	90	15	15	10	70	165	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	28	100	17	17	11	78	183	28

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1273	1273	761	1322	1314	197	817	0	0
Stage 1	906	906	-	353	353	-	-	-	-
Stage 2	367	367	-	969	961	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	144	167	405	133	158	844	811	-	-
Stage 1	331	355	-	664	631	-	-	-	-
Stage 2	653	622	-	305	335	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	113	134	405	77	127	844	811	-	-
Mov Cap-2 Maneuver	215	233	-	99	188	-	-	-	-
Stage 1	295	320	-	592	562	-	-	-	-
Stage 2	557	554	-	189	302	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	25.9	34.7	2.7
HCM LOS	D	D	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	811	-	-	319	165	1360	-	-
HCM Lane V/C Ratio	0.096	-	-	0.47	0.269	0.053	-	-
HCM Control Delay (s)	9.9	0	-	25.9	34.7	7.8	0	-
HCM Lane LOS	A	A	-	D	D	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.4	1	0.2	-	-

Total Minor Street Approach Delay = 40 vehicles x 34.7 seconds per vehicle / 3,600 seconds per hour = 0.386 vehicle hours

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	65	635	100
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	90	90	90
Heavy Vehicles, %	2	2	2
Mvmt Flow	72	706	111

Major/Minor	Major2		
Conflicting Flow All	211	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1360	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1360	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.6
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	870	15	15	535	60	15	0	20	125	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	967	17	17	594	67	17	0	22	139	6	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	661	0	0	983	0	0	1341	1702	492	1178	1678	331
Stage 1	-	-	-	-	-	-	1008	1008	-	661	661	-
Stage 2	-	-	-	-	-	-	333	694	-	517	1017	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	923	-	-	698	-	-	111	91	522	146	94	665
Stage 1	-	-	-	-	-	-	258	316	-	418	458	-
Stage 2	-	-	-	-	-	-	654	442	-	509	313	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	923	-	-	698	-	-	100	87	522	~ 135	90	665
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	200	-	259	199	-
Stage 1	-	-	-	-	-	-	253	310	-	410	447	-
Stage 2	-	-	-	-	-	-	599	431	-	478	307	-

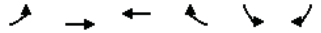
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	18.5	31.1
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	306	923	-	-	698	-	-	256	665
HCM Lane V/C Ratio	0.127	0.018	-	-	0.024	-	-	0.564	0.05
HCM Control Delay (s)	18.5	9	-	-	10.3	-	-	35.8	10.7
HCM Lane LOS	C	A	-	-	B	-	-	E	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	3.2	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 130 vehicles x 31.1 seconds per vehicle / 3,600 seconds per hour = 1.123 vehicle hours



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	160	185	213	442	10
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	18	178	206	237	501	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	469	723	723	615	1378	627
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.00
Sat Flow, veh/h	943	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	18	178	206	237	501	0
Grp Sat Flow(s),veh/h/ln	943	1863	1863	1583	1774	1615
Q Serve(g_s), s	0.6	2.7	3.1	4.4	4.1	0.0
Cycle Q Clear(g_c), s	3.7	2.7	3.1	4.4	4.1	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	469	723	723	615	1378	627
V/C Ratio(X)	0.04	0.25	0.28	0.39	0.36	0.00
Avail Cap(c_a), veh/h	469	723	723	615	1378	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.9	8.5	8.7	9.1	9.0	0.0
Incr Delay (d2), s/veh	0.2	0.8	1.0	1.8	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.5	1.8	2.2	2.2	0.0
LnGrp Delay(d),s/veh	10.1	9.3	9.7	10.9	9.7	0.0
LnGrp LOS	B	A	A	B	A	
Approach Vol, veh/h		196	443		501	
Approach Delay, s/veh		9.4	10.3		9.7	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.6		4.6		4.6
Max Green Setting (Gmax), s				16.0		16.0		16.0
Max Q Clear Time (g_c+I1), s				5.7		6.1		6.4
Green Ext Time (p_c), s				4.9		3.4		4.6

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	86	388	128	70	299	125	308	240	85	475	50	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	96	431	142	78	332	139	342	267	94	568	0	119
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	748	334	288	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	96	431	142	78	332	139	342	267	94	568	0	119
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	3.3	8.7	6.2	2.7	6.5	6.1	13.4	9.4	3.5	11.8	0.0	5.0
Cycle Q Clear(g_c), s	3.3	8.7	6.2	2.7	6.5	6.1	13.4	9.4	3.5	11.8	0.0	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	748	334	288	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.30	0.58	0.42	0.27	0.44	0.41	0.64	0.48	0.20	0.71	0.00	0.33
Avail Cap(c_a), veh/h	321	748	334	288	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.6	28.3	27.3	22.5	27.4	27.2	24.3	22.9	20.8	28.6	0.0	26.0
Incr Delay (d2), s/veh	2.4	3.2	3.9	2.3	1.9	3.7	5.9	2.9	0.9	5.3	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.6	3.1	1.5	3.4	3.0	7.4	5.3	1.7	6.4	0.0	2.4
LnGrp Delay(d),s/veh	25.0	31.6	31.2	24.8	29.3	30.9	30.1	25.8	21.8	33.9	0.0	28.5
LnGrp LOS	C	C	C	C	C	C	C	C	C	C		C
Approach Vol, veh/h		669			549			703			687	
Approach Delay, s/veh		30.5			29.0			27.4			33.0	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		15.4	4.7	10.7		13.8	5.3	8.5
Green Ext Time (p_c), s		3.8	0.0	4.0		2.3	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	20	25	90	15	15	10	70	166	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	28	100	17	17	11	78	184	28

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1276	1276	763	1326	1317	198	819	0	0
Stage 1	908	908	-	354	354	-	-	-	-
Stage 2	368	368	-	972	963	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	144	167	404	133	157	843	810	-	-
Stage 1	330	354	-	663	630	-	-	-	-
Stage 2	652	621	-	304	334	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	112	134	404	77	126	843	810	-	-
Mov Cap-2 Maneuver	214	232	-	99	187	-	-	-	-
Stage 1	294	319	-	590	561	-	-	-	-
Stage 2	556	553	-	188	301	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	26	34.9	2.7
HCM LOS	D	D	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	810	-	-	318	164	1358	-	-
HCM Lane V/C Ratio	0.096	-	-	0.472	0.271	0.053	-	-
HCM Control Delay (s)	9.9	0	-	26	34.9	7.8	0	-
HCM Lane LOS	A	A	-	D	D	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.4	1	0.2	-	-

Total Minor Street Approach Delay = 40 vehicles x 34.9 seconds per vehicle / 3,600 seconds per hour = 0.388 vehicle hours

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	65	637	100
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	90	90	90
Heavy Vehicles, %	2	2	2
Mvmt Flow	72	708	111

Major/Minor	Major2		
Conflicting Flow All	212	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1358	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1358	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.6
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	873	15	15	538	60	15	0	20	125	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	970	17	17	598	67	17	0	22	139	6	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	664	0	0	987	0	0	1347	1710	493	1182	1684	332
Stage 1	-	-	-	-	-	-	1012	1012	-	664	664	-
Stage 2	-	-	-	-	-	-	335	698	-	518	1020	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	921	-	-	696	-	-	110	90	522	145	93	664
Stage 1	-	-	-	-	-	-	256	315	-	416	456	-
Stage 2	-	-	-	-	-	-	653	440	-	509	312	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	921	-	-	696	-	-	99	86	522	~ 134	89	664
Mov Cap-2 Maneuver	-	-	-	-	-	-	196	199	-	258	198	-
Stage 1	-	-	-	-	-	-	251	309	-	408	445	-
Stage 2	-	-	-	-	-	-	598	429	-	478	306	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	18.5	31.3
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	305	921	-	-	696	-	-	255	664
HCM Lane V/C Ratio	0.128	0.018	-	-	0.024	-	-	0.566	0.05
HCM Control Delay (s)	18.5	9	-	-	10.3	-	-	36.1	10.7
HCM Lane LOS	C	A	-	-	B	-	-	E	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	3.2	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 130 vehicles x 31.3 seconds per vehicle / 3,600 seconds per hour = 1.130 vehicle hours

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	25	220	255	231	491	15
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	28	244	283	257	562	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	430	751	751	638	1430	651
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	862	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	28	244	283	257	562	0
Grp Sat Flow(s),veh/h/ln	862	1863	1863	1583	1774	1615
Q Serve(g_s), s	1.0	3.7	4.4	4.8	4.6	0.0
Cycle Q Clear(g_c), s	5.4	3.7	4.4	4.8	4.6	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	430	751	751	638	1430	651
V/C Ratio(X)	0.07	0.33	0.38	0.40	0.39	0.00
Avail Cap(c_a), veh/h	430	751	751	638	1430	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	8.5	8.7	8.8	8.7	0.0
Incr Delay (d2), s/veh	0.3	1.2	1.4	1.9	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	2.5	2.4	2.4	0.0
LnGrp Delay(d),s/veh	10.8	9.6	10.1	10.7	9.5	0.0
LnGrp LOS	B	A	B	B	A	
Approach Vol, veh/h		272	540		562	
Approach Delay, s/veh		9.7	10.4		9.5	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				16.6		16.6		16.6
Max Q Clear Time (g_c+I1), s				7.4		6.6		6.8
Green Ext Time (p_c), s				5.6		3.9		5.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	114	498	188	105	383	160	463	320	125	615	75	139
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	127	553	209	117	426	178	514	356	139	742	0	154
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	748	334	249	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	127	553	209	117	426	178	514	356	139	742	0	154
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	4.5	11.7	9.6	4.1	8.6	8.0	22.8	13.2	5.4	16.4	0.0	6.7
Cycle Q Clear(g_c), s	4.5	11.7	9.6	4.1	8.6	8.0	22.8	13.2	5.4	16.4	0.0	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	748	334	249	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.44	0.74	0.62	0.47	0.57	0.53	0.97	0.64	0.29	0.93	0.00	0.43
Avail Cap(c_a), veh/h	286	748	334	249	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	29.5	28.7	23.5	28.2	27.9	27.6	24.2	21.5	30.4	0.0	26.6
Incr Delay (d2), s/veh	4.9	6.5	8.5	6.3	3.1	5.8	31.4	5.5	1.6	18.7	0.0	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.4	5.0	2.4	4.5	4.0	15.8	7.6	2.6	10.1	0.0	3.3
LnGrp Delay(d),s/veh	28.2	36.0	37.2	29.8	31.3	33.8	59.0	29.7	23.0	49.1	0.0	30.4
LnGrp LOS	C	D	D	C	C	C	E	C	C	D		C
Approach Vol, veh/h		889			721			1009			896	
Approach Delay, s/veh		35.2			31.7			43.7			45.9	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		24.8	6.1	13.7		18.4	6.5	10.6
Green Ext Time (p_c), s		0.0	0.0	2.6		0.0	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	39.6
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	993	15	15	608	80	15	0	20	170	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	1103	17	17	676	89	17	0	22	189	6	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	764	0	0	1120	0	0	1519	1943	560	1338	1906	382
Stage 1	-	-	-	-	-	-	1145	1145	-	753	753	-
Stage 2	-	-	-	-	-	-	374	798	-	585	1153	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	845	-	-	619	-	-	82	64	472	~ 111	68	616
Stage 1	-	-	-	-	-	-	212	272	-	368	416	-
Stage 2	-	-	-	-	-	-	619	396	-	464	270	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	845	-	-	619	-	-	72	61	472	~ 102	65	616
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	168	-	223	168	-
Stage 1	-	-	-	-	-	-	208	267	-	361	405	-
Stage 2	-	-	-	-	-	-	551	385	-	433	265	-

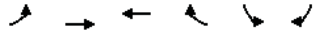
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	21.3	66.4
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	259	845	-	-	619	-	-	221	616
HCM Lane V/C Ratio	0.15	0.02	-	-	0.027	-	-	0.88	0.072
HCM Control Delay (s)	21.3	9.3	-	-	11	-	-	79	11.3
HCM Lane LOS	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	7	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 175 vehicles x 66.4 seconds per vehicle / 3,600 seconds per hour = 3.228 vehicle hours



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	25	220	255	235	495	15
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	28	244	283	261	566	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	429	751	751	638	1430	651
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	859	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	28	244	283	261	566	0
Grp Sat Flow(s),veh/h/ln	859	1863	1863	1583	1774	1615
Q Serve(g_s), s	1.0	3.7	4.4	4.9	4.7	0.0
Cycle Q Clear(g_c), s	5.4	3.7	4.4	4.9	4.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	429	751	751	638	1430	651
V/C Ratio(X)	0.07	0.33	0.38	0.41	0.40	0.00
Avail Cap(c_a), veh/h	429	751	751	638	1430	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	8.5	8.7	8.8	8.7	0.0
Incr Delay (d2), s/veh	0.3	1.2	1.4	1.9	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	2.5	2.4	2.4	0.0
LnGrp Delay(d),s/veh	10.8	9.6	10.1	10.7	9.6	0.0
LnGrp LOS	B	A	B	B	A	
Approach Vol, veh/h		272	544		566	
Approach Delay, s/veh		9.7	10.4		9.6	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				16.6		16.6		16.6
Max Q Clear Time (g_c+I1), s				7.4		6.7		6.9
Green Ext Time (p_c), s				5.6		3.9		5.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	115	500	190	105	385	160	465	320	125	615	75	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	128	556	211	117	428	178	517	356	139	742	0	156
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	748	334	248	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	128	556	211	117	428	178	517	356	139	742	0	156
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	4.5	11.8	9.7	4.1	8.7	8.0	23.0	13.2	5.4	16.4	0.0	6.8
Cycle Q Clear(g_c), s	4.5	11.8	9.7	4.1	8.7	8.0	23.0	13.2	5.4	16.4	0.0	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.45	0.74	0.63	0.47	0.57	0.53	0.97	0.64	0.29	0.93	0.00	0.44
Avail Cap(c_a), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	29.5	28.7	23.5	28.2	27.9	27.7	24.2	21.5	30.4	0.0	26.7
Incr Delay (d2), s/veh	5.0	6.6	8.7	6.3	3.1	5.8	32.6	5.5	1.6	18.7	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.4	5.0	2.4	4.5	4.0	16.0	7.6	2.6	10.1	0.0	3.3
LnGrp Delay(d),s/veh	28.3	36.1	37.4	29.9	31.3	33.8	60.2	29.7	23.0	49.1	0.0	30.5
LnGrp LOS	C	D	D	C	C	C	E	C	C	D		C
Approach Vol, veh/h		895			723			1012			898	
Approach Delay, s/veh		35.3			31.7			44.4			45.9	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		25.0	6.1	13.8		18.4	6.5	10.7
Green Ext Time (p_c), s		0.0	0.0	2.6		0.0	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	995	15	15	610	80	15	0	20	170	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	1106	17	17	678	89	17	0	22	189	6	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	767	0	0	1122	0	0	1522	1947	561	1342	1912	383
Stage 1	-	-	-	-	-	-	1147	1147	-	756	756	-
Stage 2	-	-	-	-	-	-	375	800	-	586	1156	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	842	-	-	618	-	-	81	64	471	~ 110	67	615
Stage 1	-	-	-	-	-	-	212	272	-	366	414	-
Stage 2	-	-	-	-	-	-	618	395	-	463	269	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	842	-	-	618	-	-	71	61	471	~ 101	64	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	168	-	221	167	-
Stage 1	-	-	-	-	-	-	208	267	-	359	403	-
Stage 2	-	-	-	-	-	-	550	384	-	432	264	-

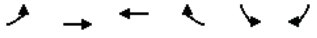
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	21.4	68.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	258	842	-	-	618	-	-	219	615
HCM Lane V/C Ratio	0.151	0.02	-	-	0.027	-	-	0.888	0.072
HCM Control Delay (s)	21.4	9.4	-	-	11	-	-	81.1	11.3
HCM Lane LOS	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	7.1	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 175 vehicles x 68.1 seconds per vehicle / 3,600 seconds per hour = 3.310 vehicle hours



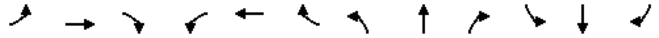
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	26	220	255	238	497	15
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	29	244	283	264	568	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	428	751	751	638	1430	651
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	856	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	29	244	283	264	568	0
Grp Sat Flow(s),veh/h/ln	856	1863	1863	1583	1774	1615
Q Serve(g_s), s	1.0	3.7	4.4	4.9	4.7	0.0
Cycle Q Clear(g_c), s	5.4	3.7	4.4	4.9	4.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	428	751	751	638	1430	651
V/C Ratio(X)	0.07	0.33	0.38	0.41	0.40	0.00
Avail Cap(c_a), veh/h	428	751	751	638	1430	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	8.5	8.7	8.8	8.7	0.0
Incr Delay (d2), s/veh	0.3	1.2	1.4	2.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	2.5	2.5	2.5	0.0
LnGrp Delay(d),s/veh	10.9	9.6	10.1	10.8	9.6	0.0
LnGrp LOS	B	A	B	B	A	
Approach Vol, veh/h		273	547		568	
Approach Delay, s/veh		9.7	10.4		9.6	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				16.6		16.6		16.6
Max Q Clear Time (g_c+I1), s				7.4		6.7		6.9
Green Ext Time (p_c), s				5.6		3.9		5.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	115	501	190	103	387	160	465	319	124	615	74	141
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	128	557	211	114	430	178	517	354	138	742	0	157
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	748	334	248	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	128	557	211	114	430	178	517	354	138	742	0	157
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	4.5	11.8	9.7	4.0	8.7	8.0	23.0	13.1	5.3	16.4	0.0	6.8
Cycle Q Clear(g_c), s	4.5	11.8	9.7	4.0	8.7	8.0	23.0	13.1	5.3	16.4	0.0	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.45	0.74	0.63	0.46	0.57	0.53	0.97	0.63	0.29	0.93	0.00	0.44
Avail Cap(c_a), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	29.5	28.7	23.5	28.2	27.9	27.7	24.2	21.5	30.4	0.0	26.7
Incr Delay (d2), s/veh	5.1	6.6	8.7	6.0	3.1	5.8	32.6	5.4	1.5	18.7	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.4	5.0	2.3	4.6	4.0	16.0	7.5	2.5	10.1	0.0	3.4
LnGrp Delay(d),s/veh	28.3	36.2	37.4	29.6	31.4	33.8	60.2	29.6	23.0	49.1	0.0	30.6
LnGrp LOS	C	D	D	C	C	C	E	C	C	D		C
Approach Vol, veh/h		896			722			1009			899	
Approach Delay, s/veh		35.4			31.7			44.4			45.8	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		25.0	6.0	13.8		18.4	6.5	10.7
Green Ext Time (p_c), s		0.0	0.0	2.6		0.0	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	995	15	15	610	80	15	0	20	170	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	1106	17	17	678	89	17	0	22	189	6	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	767	0	0	1122	0	0	1522	1947	561	1342	1912	383
Stage 1	-	-	-	-	-	-	1147	1147	-	756	756	-
Stage 2	-	-	-	-	-	-	375	800	-	586	1156	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	842	-	-	618	-	-	81	64	471	~ 110	67	615
Stage 1	-	-	-	-	-	-	212	272	-	366	414	-
Stage 2	-	-	-	-	-	-	618	395	-	463	269	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	842	-	-	618	-	-	71	61	471	~ 101	64	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	168	-	221	167	-
Stage 1	-	-	-	-	-	-	208	267	-	359	403	-
Stage 2	-	-	-	-	-	-	550	384	-	432	264	-

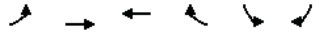
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	21.4	68.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	258	842	-	-	618	-	-	219	615
HCM Lane V/C Ratio	0.151	0.02	-	-	0.027	-	-	0.888	0.072
HCM Control Delay (s)	21.4	9.4	-	-	11	-	-	81.1	11.3
HCM Lane LOS	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	7.1	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 175 vehicles x 68.1 seconds per vehicle / 3,600 seconds per hour = 3.310 vehicle hours



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	25	220	255	235	495	15
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	28	244	283	261	566	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	429	751	751	638	1430	651
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	859	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	28	244	283	261	566	0
Grp Sat Flow(s),veh/h/ln	859	1863	1863	1583	1774	1615
Q Serve(g_s), s	1.0	3.7	4.4	4.9	4.7	0.0
Cycle Q Clear(g_c), s	5.4	3.7	4.4	4.9	4.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	429	751	751	638	1430	651
V/C Ratio(X)	0.07	0.33	0.38	0.41	0.40	0.00
Avail Cap(c_a), veh/h	429	751	751	638	1430	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	8.5	8.7	8.8	8.7	0.0
Incr Delay (d2), s/veh	0.3	1.2	1.4	1.9	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	2.5	2.4	2.4	0.0
LnGrp Delay(d),s/veh	10.8	9.6	10.1	10.7	9.6	0.0
LnGrp LOS	B	A	B	B	A	
Approach Vol, veh/h		272	544		566	
Approach Delay, s/veh		9.7	10.4		9.6	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				16.6		16.6		16.6
Max Q Clear Time (g_c+I1), s				7.4		6.7		6.9
Green Ext Time (p_c), s				5.6		3.9		5.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	115	500	190	105	385	160	465	320	125	615	75	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	128	556	211	117	428	178	517	356	139	742	0	156
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	748	334	248	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	128	556	211	117	428	178	517	356	139	742	0	156
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	4.5	11.8	9.7	4.1	8.7	8.0	23.0	13.2	5.4	16.4	0.0	6.8
Cycle Q Clear(g_c), s	4.5	11.8	9.7	4.1	8.7	8.0	23.0	13.2	5.4	16.4	0.0	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.45	0.74	0.63	0.47	0.57	0.53	0.97	0.64	0.29	0.93	0.00	0.44
Avail Cap(c_a), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	29.5	28.7	23.5	28.2	27.9	27.7	24.2	21.5	30.4	0.0	26.7
Incr Delay (d2), s/veh	5.0	6.6	8.7	6.3	3.1	5.8	32.6	5.5	1.6	18.7	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.4	5.0	2.4	4.5	4.0	16.0	7.6	2.6	10.1	0.0	3.3
LnGrp Delay(d),s/veh	28.3	36.1	37.4	29.9	31.3	33.8	60.2	29.7	23.0	49.1	0.0	30.5
LnGrp LOS	C	D	D	C	C	C	E	C	C	D		C
Approach Vol, veh/h		895			723			1012			898	
Approach Delay, s/veh		35.3			31.7			44.4			45.9	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		25.0	6.1	13.8		18.4	6.5	10.7
Green Ext Time (p_c), s		0.0	0.0	2.6		0.0	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	995	15	15	610	80	15	0	20	170	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	1106	17	17	678	89	17	0	22	189	6	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	767	0	0	1122	0	0	1522	1947	561	1342	1912	383
Stage 1	-	-	-	-	-	-	1147	1147	-	756	756	-
Stage 2	-	-	-	-	-	-	375	800	-	586	1156	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	842	-	-	618	-	-	81	64	471	~ 110	67	615
Stage 1	-	-	-	-	-	-	212	272	-	366	414	-
Stage 2	-	-	-	-	-	-	618	395	-	463	269	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	842	-	-	618	-	-	71	61	471	~ 101	64	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	168	-	221	167	-
Stage 1	-	-	-	-	-	-	208	267	-	359	403	-
Stage 2	-	-	-	-	-	-	550	384	-	432	264	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	21.4	68.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	258	842	-	-	618	-	-	219	615
HCM Lane V/C Ratio	0.151	0.02	-	-	0.027	-	-	0.888	0.072
HCM Control Delay (s)	21.4	9.4	-	-	11	-	-	81.1	11.3
HCM Lane LOS	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	7.1	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 175 vehicles x 68.1 seconds per vehicle / 3,600 seconds per hour = 3.310 vehicle hours

HCM 2010 Signalized Intersection Summary
1: Lake Mary Road & Canyon Boulevard

Future Plus Project Plus Whiskey Creek
Saturday Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	25	220	255	235	495	15
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	28	244	283	261	566	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	429	751	751	638	1430	651
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	859	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	28	244	283	261	566	0
Grp Sat Flow(s),veh/h/ln	859	1863	1863	1583	1774	1615
Q Serve(g_s), s	1.0	3.7	4.4	4.9	4.7	0.0
Cycle Q Clear(g_c), s	5.4	3.7	4.4	4.9	4.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	429	751	751	638	1430	651
V/C Ratio(X)	0.07	0.33	0.38	0.41	0.40	0.00
Avail Cap(c_a), veh/h	429	751	751	638	1430	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	8.5	8.7	8.8	8.7	0.0
Incr Delay (d2), s/veh	0.3	1.2	1.4	1.9	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	2.5	2.4	2.4	0.0
LnGrp Delay(d),s/veh	10.8	9.6	10.1	10.7	9.6	0.0
LnGrp LOS	B	A	B	B	A	
Approach Vol, veh/h		272	544		566	
Approach Delay, s/veh		9.7	10.4		9.6	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				16.6		16.6		16.6
Max Q Clear Time (g_c+I1), s				7.4		6.7		6.9
Green Ext Time (p_c), s				5.6		3.9		5.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
2: Minaret Road & Lake Mary Road/Main Street

Future Plus Project Plus Whiskey Creek
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	115	500	190	105	385	160	465	320	125	615	75	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	128	556	211	117	428	178	517	356	139	742	0	156
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	748	334	248	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	128	556	211	117	428	178	517	356	139	742	0	156
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	4.5	11.8	9.7	4.1	8.7	8.0	23.0	13.2	5.4	16.4	0.0	6.8
Cycle Q Clear(g_c), s	4.5	11.8	9.7	4.1	8.7	8.0	23.0	13.2	5.4	16.4	0.0	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.45	0.74	0.63	0.47	0.57	0.53	0.97	0.64	0.29	0.93	0.00	0.44
Avail Cap(c_a), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	29.5	28.7	23.5	28.2	27.9	27.7	24.2	21.5	30.4	0.0	26.7
Incr Delay (d2), s/veh	5.0	6.6	8.7	6.3	3.1	5.8	32.6	5.5	1.6	18.7	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.4	5.0	2.4	4.5	4.0	16.0	7.6	2.6	10.1	0.0	3.3
LnGrp Delay(d),s/veh	28.3	36.1	37.4	29.9	31.3	33.8	60.2	29.7	23.0	49.1	0.0	30.5
LnGrp LOS	C	D	D	C	C	C	E	C	C	D		C
Approach Vol, veh/h		895			723			1012			898	
Approach Delay, s/veh		35.3			31.7			44.4			45.9	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		25.0	6.1	13.8		18.4	6.5	10.7
Green Ext Time (p_c), s		0.0	0.0	2.6		0.0	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	995	15	15	610	80	15	0	20	170	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	1106	17	17	678	89	17	0	22	189	6	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	767	0	0	1122	0	0	1522	1947	561	1342	1912	383
Stage 1	-	-	-	-	-	-	1147	1147	-	756	756	-
Stage 2	-	-	-	-	-	-	375	800	-	586	1156	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	842	-	-	618	-	-	81	64	471	~ 110	67	615
Stage 1	-	-	-	-	-	-	212	272	-	366	414	-
Stage 2	-	-	-	-	-	-	618	395	-	463	269	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	842	-	-	618	-	-	71	61	471	~ 101	64	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	168	-	221	167	-
Stage 1	-	-	-	-	-	-	208	267	-	359	403	-
Stage 2	-	-	-	-	-	-	550	384	-	432	264	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	21.4	68.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	258	842	-	-	618	-	-	219	615
HCM Lane V/C Ratio	0.151	0.02	-	-	0.027	-	-	0.888	0.072
HCM Control Delay (s)	21.4	9.4	-	-	11	-	-	81.1	11.3
HCM Lane LOS	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	7.1	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 175 vehicles x 68.1 seconds per vehicle / 3,600 seconds per hour = 3.310 vehicle hours

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	25	220	255	238	497	15
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h	28	244	283	264	568	0
Adj No. of Lanes	1	1	1	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	428	751	751	638	1430	651
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	856	1863	1863	1583	3548	1615
Grp Volume(v), veh/h	28	244	283	264	568	0
Grp Sat Flow(s),veh/h/ln	856	1863	1863	1583	1774	1615
Q Serve(g_s), s	1.0	3.7	4.4	4.9	4.7	0.0
Cycle Q Clear(g_c), s	5.4	3.7	4.4	4.9	4.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	428	751	751	638	1430	651
V/C Ratio(X)	0.07	0.33	0.38	0.41	0.40	0.00
Avail Cap(c_a), veh/h	428	751	751	638	1430	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	8.5	8.7	8.8	8.7	0.0
Incr Delay (d2), s/veh	0.3	1.2	1.4	2.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	2.5	2.5	2.5	0.0
LnGrp Delay(d),s/veh	10.9	9.6	10.1	10.8	9.6	0.0
LnGrp LOS	B	A	B	B	A	
Approach Vol, veh/h		272	547		568	
Approach Delay, s/veh		9.7	10.4		9.6	
Approach LOS		A	B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		20.6		20.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				16.6		16.6		16.6
Max Q Clear Time (g_c+I1), s				7.4		6.7		6.9
Green Ext Time (p_c), s				5.6		3.9		5.8

Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	116	501	190	103	387	160	466	319	124	615	74	141
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	129	557	211	114	430	178	518	354	138	742	0	157
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	748	334	248	752	336	532	559	475	798	0	356
Arrive On Green	0.06	0.21	0.21	0.06	0.21	0.21	0.30	0.30	0.30	0.22	0.00	0.22
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	129	557	211	114	430	178	518	354	138	742	0	157
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	4.6	11.8	9.7	4.0	8.7	8.0	23.1	13.1	5.3	16.4	0.0	6.8
Cycle Q Clear(g_c), s	4.6	11.8	9.7	4.0	8.7	8.0	23.1	13.1	5.3	16.4	0.0	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
V/C Ratio(X)	0.45	0.74	0.63	0.46	0.57	0.53	0.97	0.63	0.29	0.93	0.00	0.44
Avail Cap(c_a), veh/h	285	748	334	248	752	336	532	559	475	798	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	29.5	28.7	23.5	28.2	27.9	27.7	24.2	21.5	30.4	0.0	26.7
Incr Delay (d2), s/veh	5.1	6.6	8.7	6.0	3.1	5.8	32.9	5.4	1.5	18.7	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.4	5.0	2.3	4.6	4.0	16.1	7.5	2.5	10.1	0.0	3.4
LnGrp Delay(d),s/veh	28.4	36.2	37.4	29.6	31.4	33.8	60.6	29.6	23.0	49.1	0.0	30.6
LnGrp LOS	C	D	D	C	C	C	E	C	C	D		C
Approach Vol, veh/h		897			722			1010			899	
Approach Delay, s/veh		35.4			31.7			44.6			45.8	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		28.0	9.1	20.9		22.0	9.0	21.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		24.0	5.1	16.9		18.0	5.0	17.0
Max Q Clear Time (g_c+I1), s		25.1	6.0	13.8		18.4	6.6	10.7
Green Ext Time (p_c), s		0.0	0.0	2.6		0.0	0.0	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	995	15	15	610	80	15	0	20	170	5	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	350	-	-	250	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	1106	17	17	678	89	17	0	22	189	6	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	767	0	0	1122	0	0	1522	1947	561	1342	1912	383
Stage 1	-	-	-	-	-	-	1147	1147	-	756	756	-
Stage 2	-	-	-	-	-	-	375	800	-	586	1156	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	842	-	-	618	-	-	81	64	471	~ 110	67	615
Stage 1	-	-	-	-	-	-	212	272	-	366	414	-
Stage 2	-	-	-	-	-	-	618	395	-	463	269	-
Platoon blocked, %			-			-						
Mov Cap-1 Maneuver	842	-	-	618	-	-	71	61	471	~ 101	64	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	168	-	221	167	-
Stage 1	-	-	-	-	-	-	208	267	-	359	403	-
Stage 2	-	-	-	-	-	-	550	384	-	432	264	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	21.4	68.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	258	842	-	-	618	-	-	219	615
HCM Lane V/C Ratio	0.151	0.02	-	-	0.027	-	-	0.888	0.072
HCM Control Delay (s)	21.4	9.4	-	-	11	-	-	81.1	11.3
HCM Lane LOS	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.1	-	-	7.1	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total Minor Street Approach Delay = 175 vehicles x 68.1 seconds per vehicle / 3,600 seconds per hour = 3.310 vehicle hours

ATTACHMENT 4

SIDRA 6 WORKSHEETS

INTERSECTION SUMMARY - Minaret Road/Forest Trail Cumulative Baseline

Site: Mammoth lake

New Site
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	1628	veh/h	1954	pers/h
Percent Heavy Vehicles (Demand)	3.0	%		
Degree of Saturation	1.037			
Practical Spare Capacity	-18.0	%		
Effective Intersection Capacity	1571	veh/h		
Control Delay (Total)	19.59	veh-h/h	23.51	pers-h/h
Control Delay (Average)	43.3	sec	43.3	sec
Control Delay (Worst Lane)	58.5	sec		
Control Delay (Worst Movement)	58.5	sec	58.5	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	43.3	sec		
Idling Time (Average)	32.7	sec		
Intersection Level of Service (LOS)	LOS D			
95% Back of Queue - Vehicles (Worst Lane)	56.5	veh		
95% Back of Queue - Distance (Worst Lane)	1446.5	ft		
Queue Storage Ratio (Worst Lane)	1.19			
Total Effective Stops	1675	veh/h	2010	pers/h
Effective Stop Rate	1.03	per veh	1.03	per pers
Proportion Queued	0.87		0.87	
Performance Index	196.4		196.4	
Travel Distance (Total)	624.7	veh-mi/h	749.7	pers-mi/h
Travel Distance (Average)	2026	ft	2026	ft
Travel Time (Total)	38.2	veh-h/h	45.9	pers-h/h
Travel Time (Average)	84.6	sec	84.6	sec
Travel Speed	16.3	mph	16.3	mph
Cost (Total)	586.76	$/h	586.76	$/h
Fuel Consumption (Total)	19.2	gal/h		
Carbon Dioxide (Total)	171.8	kg/h		
Hydrocarbons (Total)	0.095	kg/h		
Carbon Monoxide (Total)	0.599	kg/h		
NOx (Total)	0.206	kg/h		

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	781,565	veh/y	937,878	pers/y
Delay	9,405	veh-h/y	11,286	pers-h/y
Effective Stops	804,133	veh/y	964,960	pers/y
Travel Distance	299,869	veh-mi/y	359,843	pers-mi/y
Travel Time	18,360	veh-h/y	22,032	pers-h/y
Cost	281,643	$/y	281,643	$/y
Fuel Consumption	9,236	gal/y		
Carbon Dioxide	82,457	kg/y		
Hydrocarbons	45	kg/y		
Carbon Monoxide	287	kg/y		
NOx	99	kg/y		

INTERSECTION SUMMARY - Minaret Road/Forest Trail
Cumulative Plus Project (Whiskey Creek)

Site: Mammoth lake

New Site
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	1630	veh/h	1957	pers/h
Percent Heavy Vehicles (Demand)	3.0	%		
Degree of Saturation	1.038			
Practical Spare Capacity	-18.1	%		
Effective Intersection Capacity	1571	veh/h		
Control Delay (Total)	19.71	veh-h/h	23.65	pers-h/h
Control Delay (Average)	43.5	sec	43.5	sec
Control Delay (Worst Lane)	58.8	sec		
Control Delay (Worst Movement)	58.8	sec	58.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	43.5	sec		
Idling Time (Average)	32.9	sec		
Intersection Level of Service (LOS)	LOS D			
95% Back of Queue - Vehicles (Worst Lane)	56.8	veh		
95% Back of Queue - Distance (Worst Lane)	1453.7	ft		
Queue Storage Ratio (Worst Lane)	1.20			
Total Effective Stops	1683	veh/h	2020	pers/h
Effective Stop Rate	1.03	per veh	1.03	per pers
Proportion Queued	0.87		0.87	
Performance Index	197.3		197.3	
Travel Distance (Total)	625.6	veh-mi/h	750.7	pers-mi/h
Travel Distance (Average)	2026	ft	2026	ft
Travel Time (Total)	38.4	veh-h/h	46.1	pers-h/h
Travel Time (Average)	84.8	sec	84.8	sec
Travel Speed	16.3	mph	16.3	mph
Cost (Total)	588.81	$/h	588.81	$/h
Fuel Consumption (Total)	19.3	gal/h		
Carbon Dioxide (Total)	172.3	kg/h		
Hydrocarbons (Total)	0.095	kg/h		
Carbon Monoxide (Total)	0.601	kg/h		
NOx (Total)	0.206	kg/h		

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	782,609	veh/y	939,130	pers/y
Delay	9,460	veh-h/y	11,352	pers-h/y
Effective Stops	807,908	veh/y	969,490	pers/y
Travel Distance	300,266	veh-mi/y	360,319	pers-mi/y
Travel Time	18,426	veh-h/y	22,111	pers-h/y
Cost	282,627	$/y	282,627	$/y
Fuel Consumption	9,263	gal/y		
Carbon Dioxide	82,697	kg/y		
Hydrocarbons	46	kg/y		
Carbon Monoxide	288	kg/y		
NOx	99	kg/y		

INTERSECTION SUMMARY - Minaret Road/Forest Trail Cumulative Plus Project (Uller)

Site: Mammoth lake

New Site
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	1630	veh/h	1957	pers/h
Percent Heavy Vehicles (Demand)	3.0	%		
Degree of Saturation	1.038			
Practical Spare Capacity	-18.1	%		
Effective Intersection Capacity	1571	veh/h		
Control Delay (Total)	19.71	veh-h/h	23.65	pers-h/h
Control Delay (Average)	43.5	sec	43.5	sec
Control Delay (Worst Lane)	58.8	sec		
Control Delay (Worst Movement)	58.8	sec	58.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	43.5	sec		
Idling Time (Average)	32.9	sec		
Intersection Level of Service (LOS)	LOS D			
95% Back of Queue - Vehicles (Worst Lane)	56.8	veh		
95% Back of Queue - Distance (Worst Lane)	1453.7	ft		
Queue Storage Ratio (Worst Lane)	1.20			
Total Effective Stops	1683	veh/h	2020	pers/h
Effective Stop Rate	1.03	per veh	1.03	per pers
Proportion Queued	0.87		0.87	
Performance Index	197.3		197.3	
Travel Distance (Total)	625.6	veh-mi/h	750.7	pers-mi/h
Travel Distance (Average)	2026	ft	2026	ft
Travel Time (Total)	38.4	veh-h/h	46.1	pers-h/h
Travel Time (Average)	84.8	sec	84.8	sec
Travel Speed	16.3	mph	16.3	mph
Cost (Total)	588.81	$/h	588.81	$/h
Fuel Consumption (Total)	19.3	gal/h		
Carbon Dioxide (Total)	172.3	kg/h		
Hydrocarbons (Total)	0.095	kg/h		
Carbon Monoxide (Total)	0.601	kg/h		
NOx (Total)	0.206	kg/h		

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	782,609	veh/y	939,130	pers/y
Delay	9,460	veh-h/y	11,352	pers-h/y
Effective Stops	807,908	veh/y	969,490	pers/y
Travel Distance	300,266	veh-mi/y	360,319	pers-mi/y
Travel Time	18,426	veh-h/y	22,111	pers-h/y
Cost	282,627	$/y	282,627	$/y
Fuel Consumption	9,263	gal/y		
Carbon Dioxide	82,697	kg/y		
Hydrocarbons	46	kg/y		
Carbon Monoxide	288	kg/y		
NOx	99	kg/y		

INTERSECTION SUMMARY - Minaret Road/Forest Trail Buildout Baseline

Site: Mammoth lake

New Site
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	1630	veh/h	1957	pers/h
Percent Heavy Vehicles (Demand)	3.0	%		
Degree of Saturation	1.038			
Practical Spare Capacity	-18.1	%		
Effective Intersection Capacity	1571	veh/h		
Control Delay (Total)	19.71	veh-h/h	23.65	pers-h/h
Control Delay (Average)	43.5	sec	43.5	sec
Control Delay (Worst Lane)	58.8	sec		
Control Delay (Worst Movement)	58.8	sec	58.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	43.5	sec		
Idling Time (Average)	32.9	sec		
Intersection Level of Service (LOS)	LOS D			
95% Back of Queue - Vehicles (Worst Lane)	56.8	veh		
95% Back of Queue - Distance (Worst Lane)	1453.7	ft		
Queue Storage Ratio (Worst Lane)	1.20			
Total Effective Stops	1683	veh/h	2020	pers/h
Effective Stop Rate	1.03	per veh	1.03	per pers
Proportion Queued	0.87		0.87	
Performance Index	197.3		197.3	
Travel Distance (Total)	625.6	veh-mi/h	750.7	pers-mi/h
Travel Distance (Average)	2026	ft	2026	ft
Travel Time (Total)	38.4	veh-h/h	46.1	pers-h/h
Travel Time (Average)	84.8	sec	84.8	sec
Travel Speed	16.3	mph	16.3	mph
Cost (Total)	588.81	$/h	588.81	$/h
Fuel Consumption (Total)	19.3	gal/h		
Carbon Dioxide (Total)	172.3	kg/h		
Hydrocarbons (Total)	0.095	kg/h		
Carbon Monoxide (Total)	0.601	kg/h		
NOx (Total)	0.206	kg/h		

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	782,609	veh/y	939,130	pers/y
Delay	9,460	veh-h/y	11,352	pers-h/y
Effective Stops	807,908	veh/y	969,490	pers/y
Travel Distance	300,266	veh-mi/y	360,319	pers-mi/y
Travel Time	18,426	veh-h/y	22,111	pers-h/y
Cost	282,627	$/y	282,627	$/y
Fuel Consumption	9,263	gal/y		
Carbon Dioxide	82,697	kg/y		
Hydrocarbons	46	kg/y		
Carbon Monoxide	288	kg/y		
NOx	99	kg/y		

INTERSECTION SUMMARY - Minaret Road/Forest Trail Buildout Plus Project (Whiskey Creek)

Site: Mammoth lake

New Site
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	1630	veh/h	1957	pers/h
Percent Heavy Vehicles (Demand)	3.0	%		
Degree of Saturation	1.038			
Practical Spare Capacity	-18.1	%		
Effective Intersection Capacity	1571	veh/h		
Control Delay (Total)	19.71	veh-h/h	23.65	pers-h/h
Control Delay (Average)	43.5	sec	43.5	sec
Control Delay (Worst Lane)	58.8	sec		
Control Delay (Worst Movement)	58.8	sec	58.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	43.5	sec		
Idling Time (Average)	32.9	sec		
Intersection Level of Service (LOS)	LOS D			
95% Back of Queue - Vehicles (Worst Lane)	56.8	veh		
95% Back of Queue - Distance (Worst Lane)	1453.7	ft		
Queue Storage Ratio (Worst Lane)	1.20			
Total Effective Stops	1683	veh/h	2020	pers/h
Effective Stop Rate	1.03	per veh	1.03	per pers
Proportion Queued	0.87		0.87	
Performance Index	197.3		197.3	
Travel Distance (Total)	625.6	veh-mi/h	750.7	pers-mi/h
Travel Distance (Average)	2026	ft	2026	ft
Travel Time (Total)	38.4	veh-h/h	46.1	pers-h/h
Travel Time (Average)	84.8	sec	84.8	sec
Travel Speed	16.3	mph	16.3	mph
Cost (Total)	588.81	$/h	588.81	$/h
Fuel Consumption (Total)	19.3	gal/h		
Carbon Dioxide (Total)	172.3	kg/h		
Hydrocarbons (Total)	0.095	kg/h		
Carbon Monoxide (Total)	0.601	kg/h		
NOx (Total)	0.206	kg/h		

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	782,609	veh/y	939,130	pers/y
Delay	9,460	veh-h/y	11,352	pers-h/y
Effective Stops	807,908	veh/y	969,490	pers/y
Travel Distance	300,266	veh-mi/y	360,319	pers-mi/y
Travel Time	18,426	veh-h/y	22,111	pers-h/y
Cost	282,627	$/y	282,627	$/y
Fuel Consumption	9,263	gal/y		
Carbon Dioxide	82,697	kg/y		
Hydrocarbons	46	kg/y		
Carbon Monoxide	288	kg/y		
NOx	99	kg/y		

INTERSECTION SUMMARY - Minaret Road/Forest Trail Buildout Plus Project (Uller)

Site: Mammoth lake

New Site
Roundabout

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	1630	veh/h	1957	pers/h
Percent Heavy Vehicles (Demand)	3.0	%		
Degree of Saturation	1.038			
Practical Spare Capacity	-18.1	%		
Effective Intersection Capacity	1571	veh/h		
Control Delay (Total)	19.71	veh-h/h	23.65	pers-h/h
Control Delay (Average)	43.5	sec	43.5	sec
Control Delay (Worst Lane)	58.8	sec		
Control Delay (Worst Movement)	58.8	sec	58.8	sec
Geometric Delay (Average)	0.0	sec		
Stop-Line Delay (Average)	43.5	sec		
Idling Time (Average)	32.9	sec		
Intersection Level of Service (LOS)	LOS D			
95% Back of Queue - Vehicles (Worst Lane)	56.8	veh		
95% Back of Queue - Distance (Worst Lane)	1453.7	ft		
Queue Storage Ratio (Worst Lane)	1.20			
Total Effective Stops	1683	veh/h	2020	pers/h
Effective Stop Rate	1.03	per veh	1.03	per pers
Proportion Queued	0.87		0.87	
Performance Index	197.3		197.3	
Travel Distance (Total)	625.6	veh-mi/h	750.7	pers-mi/h
Travel Distance (Average)	2026	ft	2026	ft
Travel Time (Total)	38.4	veh-h/h	46.1	pers-h/h
Travel Time (Average)	84.8	sec	84.8	sec
Travel Speed	16.3	mph	16.3	mph
Cost (Total)	588.81	$/h	588.81	$/h
Fuel Consumption (Total)	19.3	gal/h		
Carbon Dioxide (Total)	172.3	kg/h		
Hydrocarbons (Total)	0.095	kg/h		
Carbon Monoxide (Total)	0.601	kg/h		
NOx (Total)	0.206	kg/h		

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values				
Performance Measure	**Vehicles**		**Persons**	
Demand Flows (Total)	782,609	veh/y	939,130	pers/y
Delay	9,460	veh-h/y	11,352	pers-h/y
Effective Stops	807,908	veh/y	969,490	pers/y
Travel Distance	300,266	veh-mi/y	360,319	pers-mi/y
Travel Time	18,426	veh-h/y	22,111	pers-h/y
Cost	282,627	$/y	282,627	$/y
Fuel Consumption	9,263	gal/y		
Carbon Dioxide	82,697	kg/y		
Hydrocarbons	46	kg/y		
Carbon Monoxide	288	kg/y		
NOx	99	kg/y		

Minaret Road/Forest Trail Volumes

Scanarios	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Cumulative Baseline	80	194	40	100	744	115	25	35	105	25	20	15
Cumulative Plus Project Plus Whiskey Creek	80	195	40	100	745	115	25	35	105	25	20	15
Cumulative Plus Project Plus Uller	80	195	40	100	745	115	25	35	105	25	20	15
Buildout Baseline	80	195	40	100	745	115	25	35	105	25	20	15
Buildout Plus Project Plus Whiskey Creek	80	195	40	100	745	115	25	35	105	25	20	15
Buildout Plus Project Plus Uller	80	195	40	100	745	115	25	35	105	25	20	15

ATTACHMENT 5

VOLUME ADJUSTMENTS

The Inn at the Village - Cumulative Baseline Volume Adjustments

Total Volume Adjustments to be applied to Town of Mammoth Lakes Travel Demand Alternative X Volumes (-37 Building C Bedrooms)

1. Canyon/Lake Mary

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	-4	**-4**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	-4	0	**-4**
Total	-4	-4	**-8**

2. Minaret/Lake Mary-Main

	Sat Volume		
	In	Out	Total
NBL	-2	0	**-2**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	-1	0	**-1**
EBL	0	-1	**-1**
EBT	0	-2	**-2**
EBR	0	-2	**-2**
WBL	0	0	**0**
WBT	-2	0	**-2**
WBR	0	0	**0**
Total	-5	-5	**-10**

3. Minaret/Forest Trail

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	-1	**-1**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	-1	0	**-1**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	-1	-1	**-2**

4. Forest Trail/Main

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	-2	**-2**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	-2	0	**-2**
WBR	0	0	**0**
Total	-2	-2	**-4**

The Inn at the Village - Cumulative + Project (Whiskey Creek) Volume Adjustments

Volume Adjustments for Building C (-37 Bedrooms):

Sat		
In	**Out**	**Total**
-5	-5	-10

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	-4	**-4**
SBT		5%	0	0	**0**
SBR			0	0	**0**
EBL	5%		0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		-4	0	**-4**
Total	85%	85%	-4	-4	**-8**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		-2	0	**-2**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		-1	0	**-1**
EBL		15%	0	-1	**-1**
EBT		35%	0	-2	**-2**
EBR		30%	0	-2	**-2**
WBL			0	0	**0**
WBT	35%		-2	0	**-2**
WBR			0	0	**0**
Total	80%	80%	-5	-5	**-10**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	-1	**-1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	-1	-1	**-2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	-2	**-2**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		-2	0	**-2**
WBR			0	0	**0**
Total	30%	30%	-2	-2	**-4**

Volume Adjustments for Whiskey Creek (-30 Bedrooms):

Sat		
In	**Out**	**Total**
-5	-4	-9

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	-3	**-3**
SBT			0	0	**0**
SBR		5%	0	0	**0**
EBL	5%		0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		-4	0	**-4**
Total	85%	85%	-4	-3	**-7**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		-1	0	**-1**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		-1	0	**-1**
EBL		15%	0	-1	**-1**
EBT		35%	0	-1	**-1**
EBR		30%	0	-1	**-1**
WBL			0	0	**0**
WBT	35%		-2	0	**-2**
WBR			0	0	**0**
Total	80%	80%	-4	-3	**-7**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	-1	**-1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	-1	-1	**-2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	-1	**-1**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		-1	0	**-1**
WBR			0	0	**0**
Total	30%	30%	-1	-1	**-2**

Project Trip Generation and Assignment (67 Bedrooms):

Sat		
In	**Out**	**Total**
10	9	19

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	7	**7**
SBT		5%	0	0	**0**
SBR			0	0	**0**
EBL	5%		0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		8	0	**8**
Total	85%	85%	8	7	**15**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		3	0	**3**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		2	0	**2**
EBL		15%	0	2	**2**
EBT		35%	0	3	**3**
EBR		30%	0	3	**3**
WBL			0	0	**0**
WBT	35%		4	0	**4**
WBR			0	0	**0**
Total	80%	80%	9	8	**17**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	2	**2**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		2	0	**2**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	2	2	**4**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	3	**3**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		3	0	**3**
WBR			0	0	**0**
Total	30%	30%	3	3	**6**

Total Volume Adjustments to be applied to Town of Mammoth Lakes Travel Demand Alternative X Volumes

1. Canyon/Lake Mary

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

2. Minaret/Lake Mary-Main

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

3. Minaret/Forest Trail

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

4. Forest Trail/Main

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

The Inn at the Village - Cumulative + Project (Uller) Volume Adjustments

Volume Adjustments for Building C (-37 Bedrooms):

In	Sat Out	Total
-5	-5	-10

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	-4	**-4**
SBT		5%	0	0	**0**
SBR			0	0	**0**
EBL	5%		0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		-4	0	**-4**
Total	85%	85%	-4	-4	**-8**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		-2	0	**-2**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		-1	0	**-1**
EBL		15%	0	-1	**-1**
EBT		35%	0	-2	**-2**
EBR		30%	0	-2	**-2**
WBL			0	0	**0**
WBT	35%		-2	0	**-2**
WBR			0	0	**0**
Total	80%	80%	-5	-5	**-10**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	-1	**-1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	-1	-1	**-2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	-2	**-2**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		-2	0	**-2**
WBR			0	0	**0**
Total	30%	30%	-2	-2	**-4**

Volume Adjustments for Uller (-30 Bedrooms):

In	Sat Out	Total
-5	-4	-9

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL	15%		-1	0	**-1**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT	5%		0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT		5%	0	0	**0**
WBR		15%	0	-1	**-1**
Total	20%	20%	-1	-1	**-2**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL		20%	0	-1	**-1**
NBT		15%	0	-1	**-1**
NBR		35%	0	-1	**-1**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR	20%		-1	0	**-1**
WBL	35%		-2	0	**-2**
WBT			0	0	**0**
WBR			0	0	**0**
Total	70%	70%	-4	-3	**-7**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	-1	**-1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	-1	-1	**-2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	-1	**-1**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		-1	0	**-1**
WBR			0	0	**0**
Total	30%	30%	-1	-1	**-2**

Project Trip Generation and Assignment (67 Bedrooms):

In	Sat Out	Total
10	9	19

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	7	**7**
SBT		5%	0	0	**0**
SBR			0	0	**0**
EBL	5%		1	0	**1**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		8	0	**8**
Total	85%	85%	9	7	**16**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		3	0	**3**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		2	0	**2**
EBL		15%	0	1	**1**
EBT		35%	0	3	**3**
EBR		30%	0	3	**3**
WBL			0	0	**0**
WBT	35%		4	0	**4**
WBR			0	0	**0**
Total	80%	80%	9	7	**16**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	2	**2**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		2	0	**2**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	2	2	**4**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	3	**3**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		3	0	**3**
WBR			0	0	**0**
Total	30%	30%	3	3	**6**

Total Volume Adjustments to be applied to Town of Mammoth Lakes Travel Demand Alternative X Volumes

1. Canyon/Lake Mary

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	-1	3	**2**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	1	0	**1**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	4	-1	**3**
Total	4	2	**6**

2. Minaret/Lake Mary-Main

	Sat Volume		
	In	Out	Total
NBL	1	-1	**0**
NBT	0	-1	**-1**
NBR	0	-1	**-1**
SBL	0	0	**0**
SBT	-1	0	**-1**
SBR	1	0	**1**
EBL	0	0	**0**
EBT	0	1	**1**
EBR	-1	1	**0**
WBL	-2	0	**-2**
WBT	2	0	**2**
WBR	0	0	**0**
Total	0	-1	**-1**

3. Minaret/Forest Trail

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

4. Forest Trail/Main

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

The Inn at the Village - Buildout + Project (Whiskey Creek) Volume Adjustments

Volume Adjustments for Whiskey Creek (-30 Bedrooms):

	Sat	
In	**Out**	**Total**
-5	-4	-9

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	-3	**-3**
SBT			0	0	**0**
SBR		5%	0	0	**0**
EBL	5%		0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		-4	0	**-4**
Total	85%	85%	-4	-3	**-7**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		-2	0	**-2**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		-1	0	**-1**
EBL		15%	0	-1	**-1**
EBT		35%	0	-1	**-1**
EBR		30%	0	-1	**-1**
WBL			0	0	**0**
WBT	35%		-2	0	**-2**
WBR			0	0	**0**
Total	80%	80%	-5	-3	**-8**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	-1	**-1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	-1	-1	**-2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	-1	**-1**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		-2	0	**-2**
WBR			0	0	**0**
Total	30%	30%	-2	-1	**-3**

Project Trip Generation and Assignment (30 Bedrooms):

	Sat	
In	**Out**	**Total**
5	4	9

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	3	**3**
SBT			0	0	**0**
SBR		5%	0	0	**0**
EBL	5%		0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		4	0	**4**
Total	85%	85%	4	3	**7**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		2	0	**2**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		1	0	**1**
EBL		15%	0	1	**1**
EBT		35%	0	1	**1**
EBR		30%	0	1	**1**
WBL			0	0	**0**
WBT	35%		2	0	**2**
WBR			0	0	**0**
Total	80%	80%	5	3	**8**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	1	**1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		1	0	**1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	1	1	**2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	1	**1**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		2	0	**2**
WBR			0	0	**0**
Total	30%	30%	2	1	**3**

Total Volume Adjustments to be applied to Town of Mammoth Lakes Travel Demand Alternative X Volumes

1. Canyon/Lake Mary

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

2. Minaret/Lake Mary-Main

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

3. Minaret/Forest Trail

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

4. Forest Trail/Main

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

The Inn at the Village - Buildout + Project (Uller) Volume Adjustments

Volume Adjustments for Uller (-30 Bedrooms):

Sat In	Sat Out	Sat Total
-5	-4	-9

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL	15%		-1	0	**-1**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT	5%		0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT		5%	0	0	**0**
WBR		15%	0	-1	**-1**
Total	20%	20%	-1	-1	**-2**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL		20%	0	-1	**-1**
NBT		15%	0	-1	**-1**
NBR		35%	0	-1	**-1**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR	20%		-1	0	**-1**
WBL	35%		-2	0	**-2**
WBT			0	0	**0**
WBR			0	0	**0**
Total	70%	70%	-4	-3	**-7**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	-1	**-1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		-1	0	**-1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	-1	-1	**-2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	-1	**-1**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		-2	0	**-2**
WBR			0	0	**0**
Total	30%	30%	-2	-1	**-3**

Project Trip Generation and Assignment (30 Bedrooms):

Sat In	Sat Out	Sat Total
5	4	9

1. Canyon/Lake Mary

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL		80%	0	3	**3**
SBT			0	0	**0**
SBR		5%	0	0	**0**
EBL	5%		0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR	80%		4	0	**4**
Total	85%	85%	4	3	**7**

2. Minaret/Lake Mary-Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL	30%		2	0	**2**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR	15%		1	0	**1**
EBL		15%	0	1	**1**
EBT		35%	0	1	**1**
EBR		30%	0	1	**1**
WBL			0	0	**0**
WBT	35%		2	0	**2**
WBR			0	0	**0**
Total	80%	80%	5	3	**8**

3. Minaret/Forest Trail

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT		15%	0	1	**1**
NBR			0	0	**0**
SBL			0	0	**0**
SBT	15%		1	0	**1**
SBR			0	0	**0**
EBL			0	0	**0**
EBT			0	0	**0**
EBR			0	0	**0**
WBL			0	0	**0**
WBT			0	0	**0**
WBR			0	0	**0**
Total	15%	15%	1	1	**2**

4. Forest Trail/Main

	Distribution %		Sat Volume		
	In	Out	In	Out	Total
NBL			0	0	**0**
NBT			0	0	**0**
NBR			0	0	**0**
SBL			0	0	**0**
SBT			0	0	**0**
SBR			0	0	**0**
EBL			0	0	**0**
EBT		30%	0	1	**1**
EBR			0	0	**0**
WBL			0	0	**0**
WBT	30%		2	0	**2**
WBR			0	0	**0**
Total	30%	30%	2	1	**3**

Total Volume Adjustments to be applied to Town of Mammoth Lakes Travel Demand Alternative X Volumes

1. Canyon/Lake Mary

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	-1	3	**2**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	4	-1	**3**
Total	3	2	**5**

2. Minaret/Lake Mary-Main

	Sat Volume		
	In	Out	Total
NBL	2	-1	**1**
NBT	0	-1	**-1**
NBR	0	-1	**-1**
SBL	0	0	**0**
SBT	-1	0	**-1**
SBR	1	0	**1**
EBL	0	1	**1**
EBT	0	1	**1**
EBR	-1	1	**0**
WBL	-2	0	**-2**
WBT	2	0	**2**
WBR	0	0	**0**
Total	1	0	**1**

3. Minaret/Forest Trail

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

4. Forest Trail/Main

	Sat Volume		
	In	Out	Total
NBL	0	0	**0**
NBT	0	0	**0**
NBR	0	0	**0**
SBL	0	0	**0**
SBT	0	0	**0**
SBR	0	0	**0**
EBL	0	0	**0**
EBT	0	0	**0**
EBR	0	0	**0**
WBL	0	0	**0**
WBT	0	0	**0**
WBR	0	0	**0**
Total	0	0	**0**

ATTACHMENT 6

TRIP GENERATION STUDY

SOURCE: Mammoth Crossings Traffic Impact Analysis
(LSA Associates, Inc., May 21, 2008)

APPENDIX A

EXISTING COUNT DATA

EXISTING COUNT DATA

Hotel Trip Generation Counts

Traffic counts were conducted on Saturday, February 9, 2008, and March 1, 2008, at the Forest Trail Entrance of The Lodges (Grand Sierra, White Mountain, and Lincoln House) from 3:30 p.m. to 5:30 p.m. and on Saturday, March 1, 2008, at the Hillside Drive entrance to the Westin Hotel from 3:30 p.m. to 5:30 p.m. Detailed count sheets are provided following this page.

Data used in this study is derived from the February 9, 2008, count at The Lodges. The peak hour is from 4:30 p.m. to 5:30 p.m., with 54 peak-hour trips, 25 inbound and 29 outbound. Data from MMSA indicated that there were 190 occupied hotel units (98 percent occupancy) that day and 17,559 skiers. This closely represents a peak winter Saturday condition. The resultant occupied hotel unit p.m. peak hour trip generation is 0.28 trips per unit. The breakdown of the 190 units is as follows:

The Lodges (Grand Sierra, White Mountain, and Lincoln House)

- 88 studios/one-bedroom units (46 percent)
- 88 two-bedroom units (46 percent)
- 11 three-bedroom units (6 percent)
- 3 four-bedroom units (2 percent)

  190 units

Additional counts were taken on March 1, 2008, at The Lodges and Westin Hotel. The occupancy was 98 percent (188 units) at The Lodges and 92 percent at the Westin Hotel (130 units), with 11,582 skiers. These counts reflect a lower per-unit trip generation of 0.24 and 0.18 trip per occupied unit at The Lodges and Westin, respectively. The breakdown of the units at the Westin is as follows:

The Westin Hotel

- 117 studios/one-bedroom units (83 percent)
- 24 two-bedroom units (17 percent)

  141 units

It should also be noted that the Westin trips attributed to the restaurant were isolated (4 inbound and 3 outbound), and if added to the hotel unit rate would be 0.23 trip per hotel plus restaurant.

It should further be noted that both The Lodges and The Westin have comparable amenities to The Crossings, such as offices, reception/check-in facilities, meeting spaces, and common areas.

Walking distances are also similar and within acceptable ranges. Distances from the Grand Sierra Lodge are approximately 700 ft, which are comparable to Site 1. Walking distances from Sites 2 and 3 range up to approximately 1,200 ft, but are still within acceptable lengths considering the time and expense of attempting to drive this same distance.

For comparison, the Mammoth Crossings unit mix is as follows:

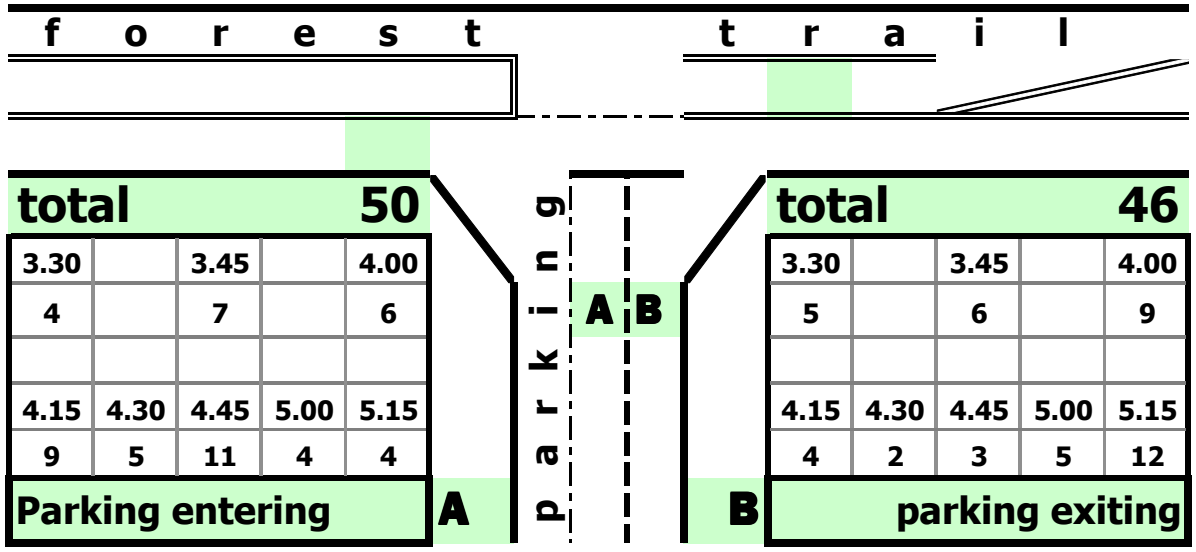
Mammoth Crossings

- 319 one-bedroom units, 2 bedrooms with lock-offs units (59 percent)
- 126 two-bedroom units (23 percent)
- 84 three-bedroom units (16 percent)
- 10 four-bedroom units (2 percent)

  539 units (including lock-offs)

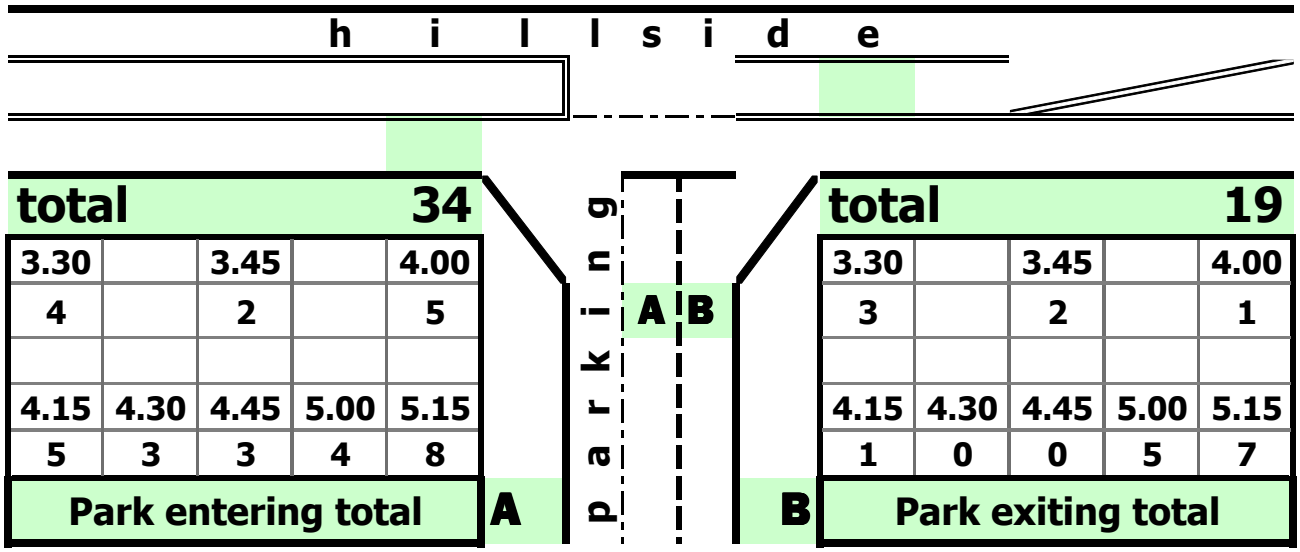
Village Parking summary pm (15 minute time interval)

Saturday, March 1, 2008



Westin Valet summary pm (15 minute time interval)

Saturday, March 1, 2008



total				34
3.30		3.45		4.00
4		2		5
4.15	4.30	4.45	5.00	5.15
5	3	3	4	8
Park entering total				

total				19
3.30		3.45		4.00
3		2		1
4.15	4.30	4.45	5.00	5.15
1	0	0	5	7
Park exiting total				

3.30		3.45		4.00
2		1		1
4.15	4.30	4.45	5.00	5.15
2	1	1	1	1
Park enter hotel valet				

3.30		3.45		4.00
1				
4.15	4.30	4.45	5.00	5.15
			1	4
Park exit hotel valet				

3.30		3.45		4.00
4.15	4.30	4.45	5.00	5.15
1		1	1	2
Enter restaurant valet				

3.30		3.45		4.00
4.15	4.30	4.45	5.00	5.15
			2	1
exit restaurant valet				

3.30		3.45		4.00
2		1		4
4.15	4.30	4.45	5.00	5.15
2	2	1	2	5
Park enter self park				

3.30		3.45		4.00
2		2		1
4.15	4.30	4.45	5.00	5.15
1			2	2
Park exit self park				

LSA ASSOCIATES, INC.
20 EXECUTIVE PARK, SUITE 200
IRVINE, CALIFORNIA 92614

949.553.0666 TEL
949.553.8076 FAX

BERKELEY
CARLSBAD
FORT COLLINS
FRESNO
PALM SPRINGS
PT. RICHMOND
RIVERSIDE
ROCKLIN
SAN LUIS OBISPO

October 23, 2013

Ms. Jen Daugherty
Community and Economic Development Department
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Subject: 50 Canyon Boulevard (The Inn at The Village): Valet Operation

Dear Ms. Daugherty:

LSA Associates, Inc. (LSA) is pleased to present this revised analysis of the proposed valet operation for the 50 Canyon Boulevard Project in the North Village Specific Plan (NVSP) area of the Town of Mammoth Lakes (Town). The 63 proposed resort hotel units (Building C) represent the third and final building of the 8050 Complex, which currently has 28 resort hotel units and 3,335 square feet (sf) of commercial use (Buildings A and B at 6085 Minaret Road). At project completion, 91 total resort hotel units will be provided on site.

The project will meet the Town's on-site parking requirements within the existing 171-space parking structure that serves the 8050 Complex. The 171 spaces provide for 97 required spaces for the 91 existing/proposed units, 8 required spaces for the 3,335 sf of commercial use, 50 spaces for the Fireside Homeowners Association (HOA), and an excess (or overage) of 16 spaces for residents and guests of Buildings A–C only. All residents and guests of Buildings A–C will be required to use the valet operation to access 100 percent of its parking spaces. Therefore, the proposed project meets all NVSP parking requirements (including guest access to a minimum of 10 percent of the total number of required spaces). Ingress to the project site is provided via Canyon Road and egress is provided via Minaret Road. Figure 1 (all architect plans and figures attached) illustrates the project site plan.

The purpose of this work effort is to ensure that the access design and valet parking operation do not result in vehicles queuing onto Canyon Road. A stacking analysis was conducted to determine the potential queues that may form at the project entry and valet/drop-off area. An evaluation of the subterranean parking structure drive aisles was also provided to address the adequacy of in-aisle valet parking and circulation.

Project Access Description

The project site is bound by the Village Plaza and gondola on the north, Mammoth Crossing Site 1 on the south, Minaret Road on the east, and Canyon Road on the west. Guests will access the project site by turning into the Canyon Road project driveway and turning left into the valet/drop-off area. The circular valet/drop-off area will have a circumference of approximately 200 feet (ft).

As shown on Figure 1, approximately seven vehicles could be accommodated within the valet/drop-off area, excluding the three check-in parking spaces. Approximately 45 ft is planned from the back of the Canyon Road curb to the valet/drop-off area entry, which could accommodate two additional vehicles. A total of 245 ft of inbound vehicle storage will be provided (200 ft within the proposed valet/drop-off area and 45 ft from the valet/drop-off area entry to the Canyon Road curb). A total of nine inbound vehicles could be accommodated on site.

Project Trip Generation

For purposes of the valet parking stacking analysis, LSA generated vehicle trips for the total existing and proposed resort hotel units using a surveyed trip generation rate as documented in Appendix A of the Mammoth Crossings Traffic Impact Analysis, dated May 21, 2008 (attached). The trip generation characteristics for the proposed project as well as for other similar uses within the North Village are unique to the Town. The ability to walk to the gondola, the immediate accessibility of retail and restaurant uses, and access to a transit hub with all bus routes available make it possible to park a vehicle and leave it for the duration of a trip.

The trip generation rate for the proposed resort hotel (0.28 trip per occupied unit), specifically in the Saturday p.m. peak hour, was based upon vehicular count data (inbound and outbound) at the Village Lodges (Grand Sierra, White Mountain, and Lincoln House) parking garage. The count was conducted on Saturday, February 9, 2008. The basis for using an observed/measured rate from the Village Lodges is that the data reflects the net vehicular trip generation while recognizing the proximity of its resort hotel units to the gondola and other retail and restaurant attractions in the North Village area.

As shown in Table A.1 (all tables attached), a resort hotel of 91 occupied units could generate 26 Saturday peak-hour trips (14 inbound and 12 outbound). Inbound traffic movements, which represent a portion of the total project trip generation, are used for estimating the queue formation as described below.

Valet Analysis

In order to determine the potential queues that may form at the proposed valet/drop-off area, a vehicle stacking analysis was prepared based on the methodology described in the Robert Crommelin report titled *Entrance-Exit Design and Control for Major Parking Facilities*. Applying this Poisson distribution statistical methodology, vehicular reservoir needs at a parking facility can be determined for a given traffic volume and the service rate of the control device. For purposes of this project, the control device is the proposed valet parking operation (i.e., valet parking attendant).

Based on the location/distance of the valet area in relation to the subterranean parking spaces (or more specifically, the time it would take for a valet attendant to drive a vehicle down to the subterranean structure, park it, and return to the valet area), it is estimated that the maximum valet parking service rate (average headway) is 180 seconds per vehicle, as shown in Table A.2. Based on the volume of inbound traffic and the design capacity (i.e., service rate) presented in Table A.2, the traffic intensity is determined. Traffic intensity is the ratio between the average arrival rate (volume) and average service rate per valet attendant, which results in the length (22 ft per vehicle) necessary for adequate reservoir space.

Because a resort hotel may not have uniform vehicle arrival/departure rates in the Saturday peak hour (i.e., approximately half of the peak-hour trip generation shown in Table A.1 may occur within a 15-minute period during each peak hour), a peak 15-minute valet parking stacking analysis has been prepared to evaluate these worst-case, short-term conditions.

Table A.3 presents the results of the peak 15-minute valet parking stacking analysis with three valet attendants. According to the Reservoir Needs vs. Traffic Intensity chart in the Crommelin report (attached), on average, the minimum storage length for a valet parking operation with three valet attendants should be 22 ft (equivalent to one vehicle) to accommodate the peak 15-minute inbound volume of seven vehicles, excluding the three check-in parking spaces. The 95th percentile storage length (not to be exceeded 5 times in 100) should be 44 ft (equivalent to two vehicles). The 99th percentile storage length (not to be exceeded 1

time in 100) should be 66 ft (equivalent to three vehicles). Two valet attendants would not be sufficient with the available storage capacity.

As stated above, the valet parking/drop-off area can accommodate approximately seven vehicles (equivalent to 154 ft). An additional two vehicles (equivalent to 44 ft) can be stored between the Canyon Road curb and the valet/drop-off area entry. Storage for a total of nine vehicles (or 198 ft) is provided on site. Based on this analysis, adequate storage is provided if three valet attendants are included in the valet parking operation.

Parking Structure Valet Area Aisle Widths

Figures 2a and 2b illustrate the subterranean parking plans for the upper and lower levels from the project application and set of plans. The subterranean parking structure will provide 24 ft wide drive aisles, which will be consistent with the minimum 24 ft aisle widths required by the Town of Mammoth Lakes Standard Plans for Public Works. As previously discussed, valet parking will be required for all hotel guests except as noted below. The valet operations include managed parking to utilize in-aisle parking spaces in selected drive aisles. As shown on Figures 2a and 2b, valet attendants may utilize up to 32 valet spaces within the 24 ft drive aisles.

The parking layout provides parking spaces oriented at 90 degrees from the primary 24 ft drive aisles. Valet-managed aisle parking is planned along one side of selected aisles. It should be noted that 50 self-park spaces for the Fireside HOA have been designated (and illustrated on Figure 2a) on the upper level of the parking structure; however, these spaces will not be utilized for valet parking. Valet parking (for residents and guests of Buildings A–C only) will not be provided along drive aisles adjacent to the 50 spaces dedicated to the Fireside HOA. Therefore, consistent with the Town's standards for aisle widths, the Fireside HOA will have 24 ft aisle widths available at all times when entering, exiting, and parking in the structure.

As seen on Figures 2a and 2b, a 16 ft drive aisle would be present when a vehicle is valet parked along the aisle (standard 24 ft drive aisle minus 8 ft for a parallel-parked vehicle). This 16 ft aisle is wider than a standard roadway lane (which is 12 ft) and provides adequate bypass and emergency vehicle circulation in the subterranean parking structure in the event of an emergency.

Conclusion

This analysis has determined that the proposed valet parking operation would not adversely affect the on-site circulation with three valet parking attendants. The current driveway entry and valet/drop-off area would provide adequate storage for vehicles entering the site without queuing onto Canyon Road. Adequate drive aisle width would be provided in the subterranean parking structure for vehicular circulation and valet parking operations.

If you have any questions, please call me at (949) 553-0666.

Sincerely,

LSA ASSOCIATES, INC.

Les Card, P.E.
Principal and CEO

Dean Arizabal
Senior Transportation Planner

Attachments: Appendix A of the Mammoth Crossings Traffic Impact Analysis (5 pages)
Architect Plans (5 sheets)
Figures 1, 2a, and 2b (3 sheets)
Tables A.1 through A.3 (1 page)
Robert Crommelin, Reservoir Needs vs. Traffic Intensity Chart (1 page)

SOURCE: Mammoth Crossings Traffic Impact Analysis
(LSA Associates, Inc., May 21, 2008)

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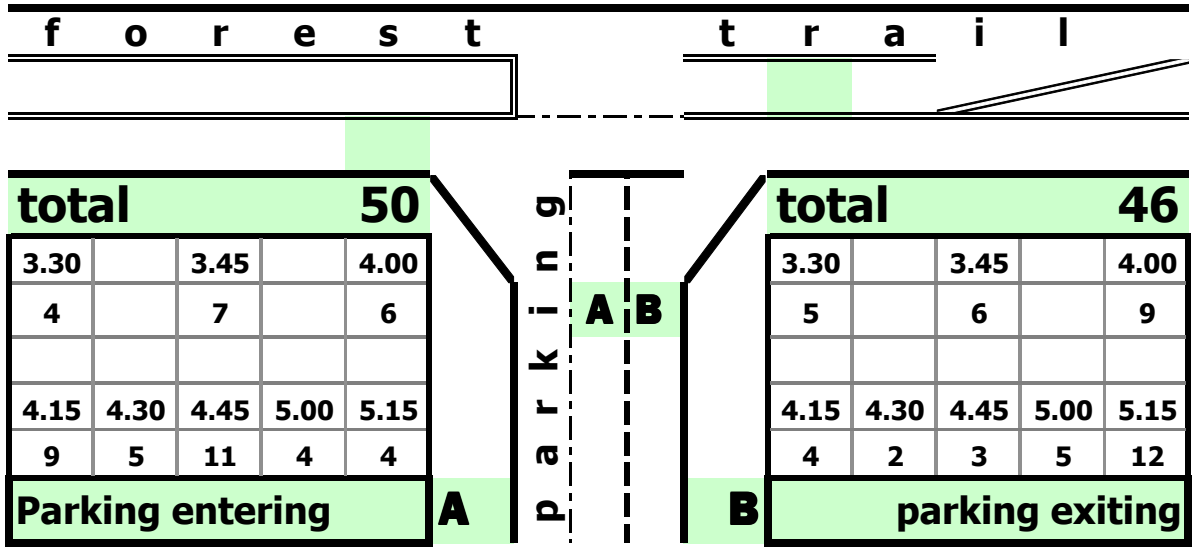
- 10 four-bedroom units (2 percent)

  539 units (including lock-offs)

Village Parking summary pm (15 minute time interval)

Saturday, March 1, 2008



total				50
3.30		3.45		4.00
4		7		6
4.15	4.30	4.45	5.00	5.15
9	5	11	4	4

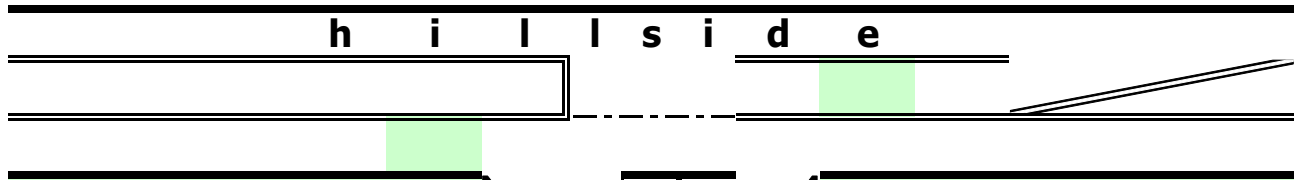
Parking entering A

total				46
3.30		3.45		4.00
5		6		9
4.15	4.30	4.45	5.00	5.15
4	2	3	5	12

B parking exiting

Westin Valet summary pm (15 minute time interval)

Saturday, March 1, 2008



total				34
3.30		3.45		4.00
4		2		5
4.15	4.30	4.45	5.00	5.15
5	3	3	4	8
Park entering total				

A

p a r k i n g

A B

B

total				19
3.30		3.45		4.00
3		2		1
4.15	4.30	4.45	5.00	5.15
1	0	0	5	7
Park exiting total				

3.30		3.45		4.00
2		1		1
4.15	4.30	4.45	5.00	5.15
2	1	1	1	1
Park enter hotel valet				

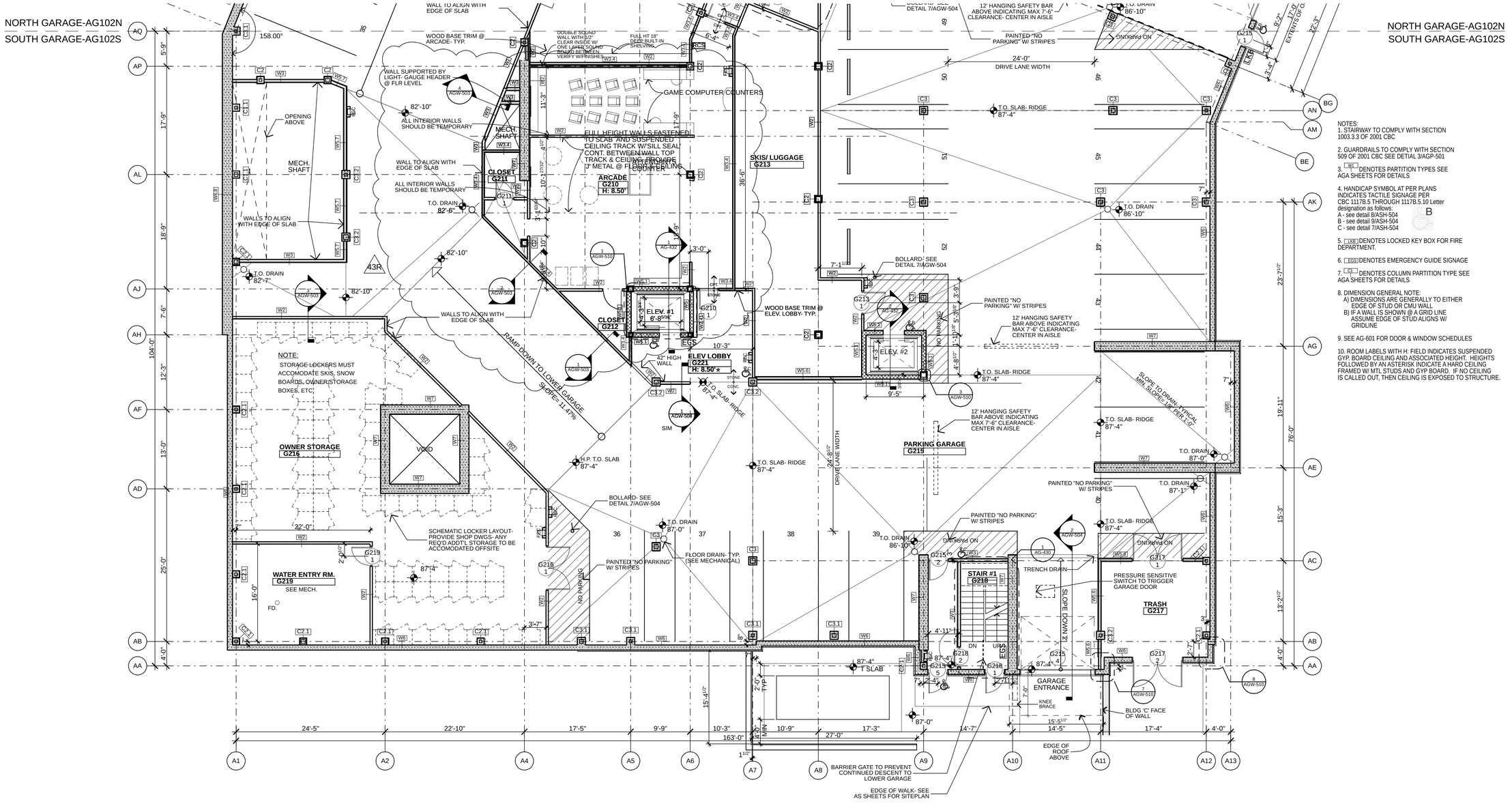
3.30		3.45		4.00
1				
4.15	4.30	4.45	5.00	5.15
			1	4
Park exit hotel valet				

3.30		3.45		4.00
4.15	4.30	4.45	5.00	5.15
1		1	1	2
Enter restaurant valet				

3.30		3.45		4.00
4.15	4.30	4.45	5.00	5.15
			2	1
exit restaurant valet				

3.30		3.45		4.00
2		1		4
4.15	4.30	4.45	5.00	5.15
2	2	1	2	5
Park enter self park				

3.30		3.45		4.00
2		2		1
4.15	4.30	4.45	5.00	5.15
1			2	2
Park exit self park				



1 UPPER GARAGE LEVEL

1/8" = 1'-0"

NOTES:
1. STAIRWAY TO COMPLY WITH SECTION 1003.3.3 OF 2001 CBC

2. GUARDRAILS TO COMPLY WITH SECTION 509 OF 2001 CBC SEE DETIAL 3/AGP-501

3. W1 DENOTES PARTITION TYPES SEE AGA SHEETS FOR DETAILS

4. HANDICAP SYMBOL AT PER PLANS INDICATES TACTILE SIGNAGE PER CBC 1117B.5 THROUGH 1117B.5.10 Letter designation as follows:
A - see detail 8/ASH-504
B - see detail 9/ASH-504
C - see detail 7/ASH-504

5. LKB DENOTES LOCKED KEY BOX FOR FIRE DEPARTMENT.

6. EGS DENOTES EMERGENCY GUIDE SIGNAGE

7. C1 DENOTES COLUMN PARTITION TYPE SEE AGA SHEETS FOR DETAILS

8. DIMENSION GENERAL NOTE:
A) DIMENSIONS ARE GENERALLY TO EITHER EDGE OF STUD OR CMU WALL
B) IF A WALL IS SHOWN @ A GRID LINE ASSUME EDGE OF STUD ALIGNS W/ GRIDLINE

9. SEE AG-601 FOR DOOR & WINDOW SCHEDULES

10. ROOM LABELS WITH H: FIELD INDICATES SUSPENDED GYP. BOARD CEILING AND ASSOCIATED HEIGHT. HEIGHTS FOLLOWED BY AN ASTERISK INDICATE A HARD CEILING FRAMED W/ MTL STUDS AND GYP BOARD. IF NO CEILING IS CALLED OUT, THEN CEILING IS EXPOSED TO STRUCTURE.

REVISION KEY
ASI-8 04/29/05
PR-3 05/19/05
ASI-15 06/10/05
ASI-15R 07/13/05

stryker brown
ARCHITECTURE
119 SOUTH SPRING STREET
ASPEN, COLORADO 81611
(Ph) 970/925-2100 (Fax) 970/925-2258

PHASE 1

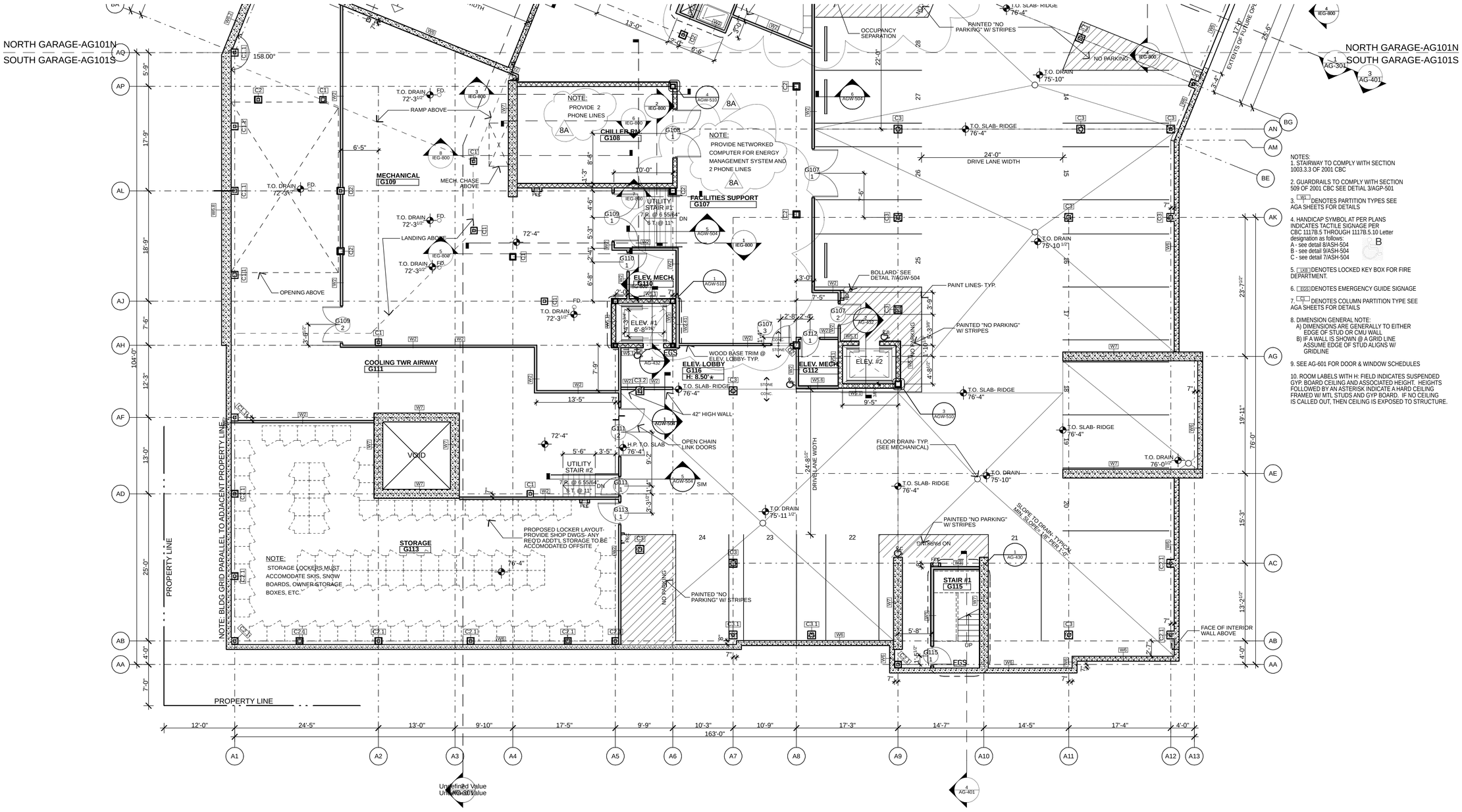
80|50
PRIVATE RESIDENCE CLUB
Mammoth Lake, California

DATE	ISSUE
11/26/2003	Land Use Permit
12/05/2003	Use Permit Review
06/04/2004	Amended Use Permit
07/16/2004	DD Review Set
08/23/2004	Building Permit Review Set
10/05/2004	Building Permit Revised Set
11/05/2004	Building Permit Revised Set
12/01/2004	Building Permit
12/15/2004	Lender Review Set
01/25/2005	Review
02/07/2005	For Construction

3/22/07 7:23 AM

SHEET TITLE
UPPER GARAGE SOUTH

AG-102S



1 LOWER GARAGE LEVEL

1/8" = 1'-0"

REVISION KEY
ASI-8 04/29/05

NOTES:
1. STAIRWAY TO COMPLY WITH SECTION 1003.3.3 OF 2001 CBC

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3. [W] DENOTES PARTITION TYPES SEE AGA SHEETS FOR DETAILS

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B - see detail 9/ASH-504
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7. [C] DENOTES COLUMN PARTITION TYPE SEE AGA SHEETS FOR DETAILS

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stryker brown
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12/01/2004	Building Permit
12/15/2004	Lender Review Set
01/25/2005	Review
02/07/2005	For Construction

3/22/07 7:23 AM

SHEET TITLE
LOWER GARAGE
SOUTH

AG-101S

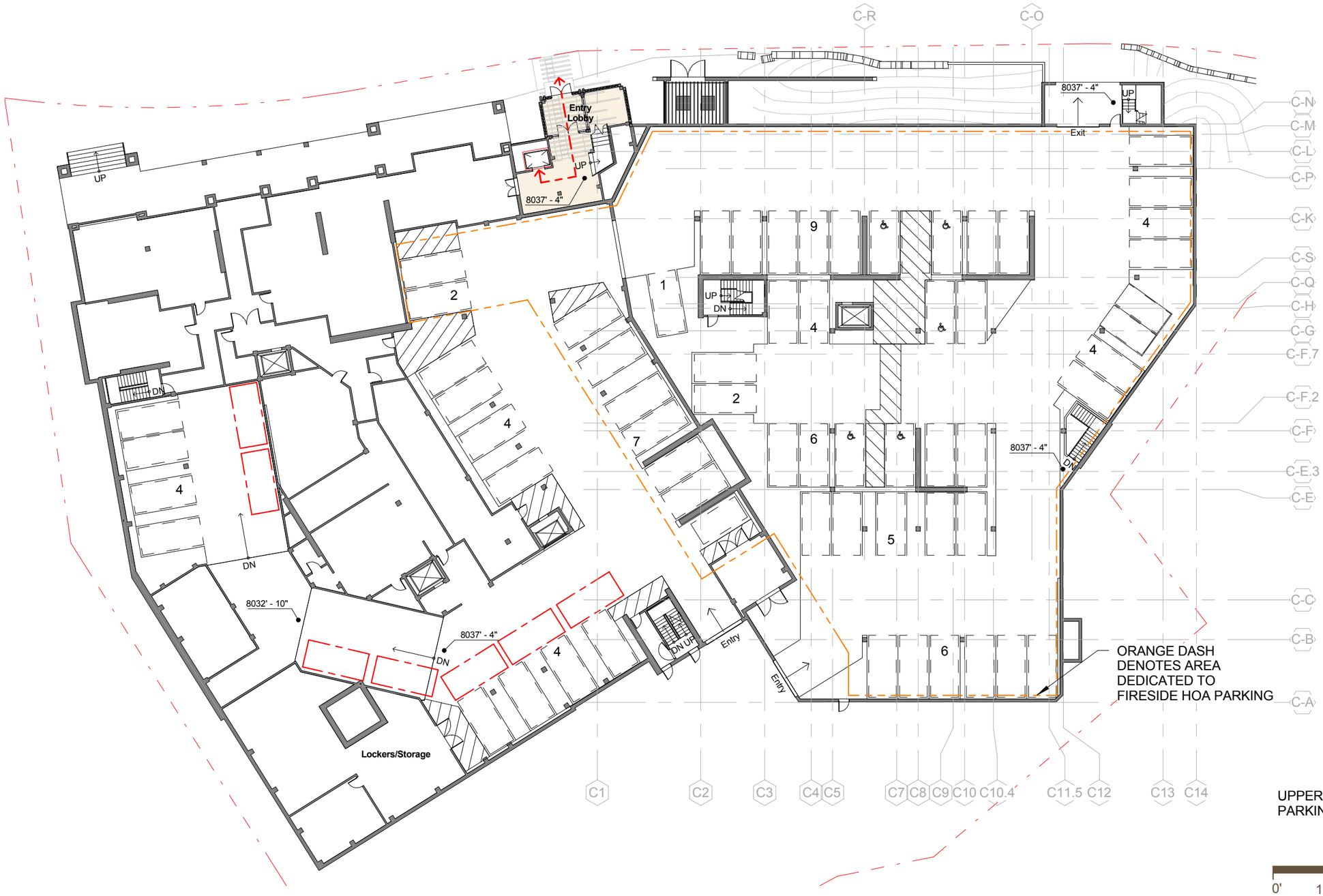
PLAZA LEVEL PLAN

Legend

Program Areas

- BOH/Admin
- Circulation
- Common Area
- Fitness/Spa
- Kitchen
- Accessible Route

0' 15' 30' 60'



Legend

Program Areas

- Circulation
- Accessible Route
- Valet Parking Space
- Standard Parking Space

Parking Requirements & Tabulation per NVSP:

Room Type:	1-Bedroom	2-Bedroom	3+-Bedroom
Req'd Parking/Unit	1 space	1 space	1.5 spaces
8050 Building			
Building "A"	5	4	9
Building "B"	3	7	0
Building "C"	59	1	3
Subtotals:	67	12	12

Residential Parking Required:
67 spaces + 12 spaces + 18 spaces = 97 spaces
Building "B" Commercial Parking Required:
3,335sf @ 2.4 spaces/1,000sf - = 8 spaces
Total Parking Required: 105 spaces

Existing 8050 Parking Structure Capacity:

Lower Level	74 spaces
Upper Level	62 spaces
Valet Parking	32 spaces
Street Level	3 spaces
Total Capacity:	**171 cars**
Less Fireside HOA	-50 cars

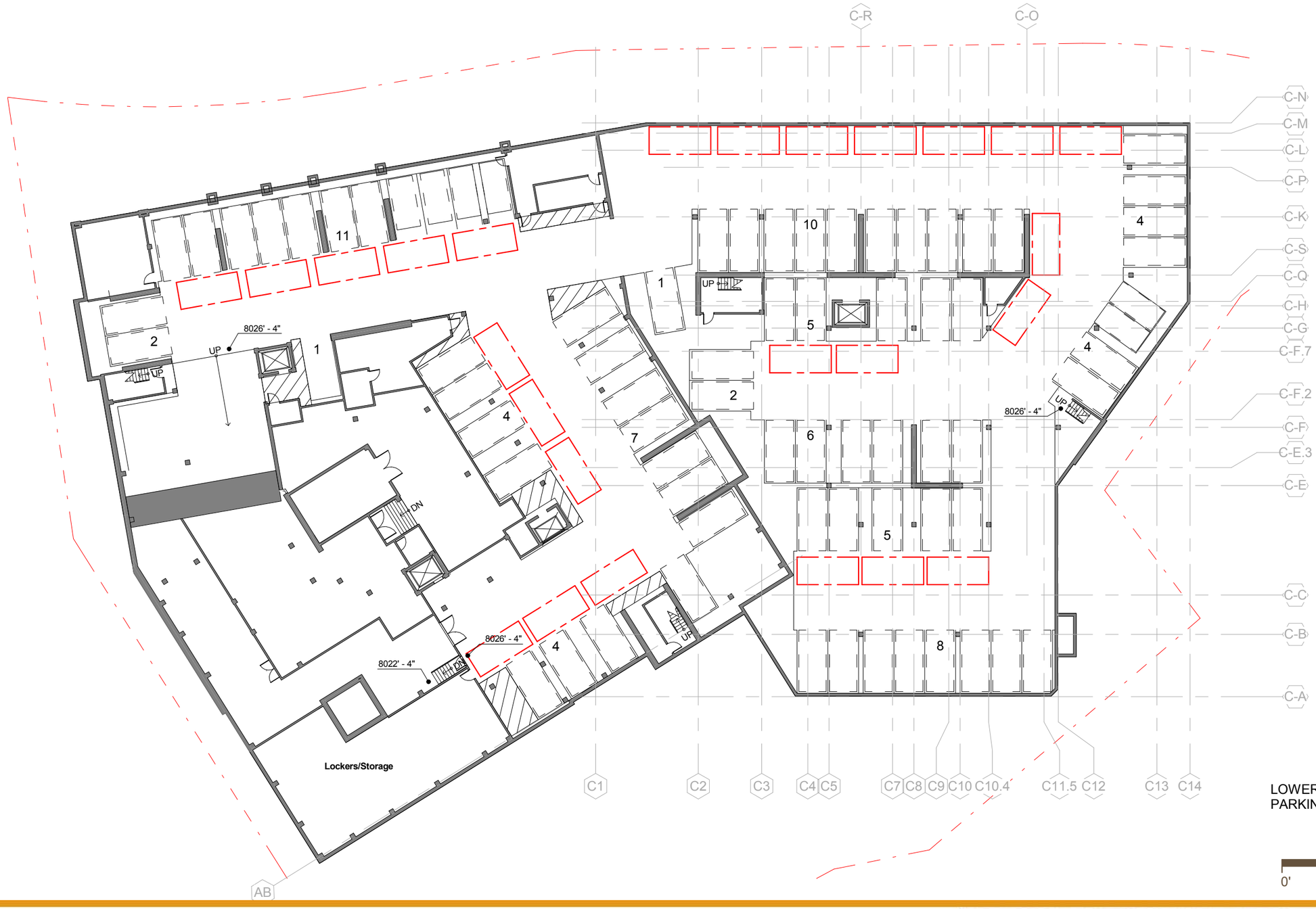
(Per agreement by and between iStar and Fireside Condominium HOA)

Total Available Capacity:	**121 cars**
Parking Req'd (per above):	105 cars
Overage:	16 cars
Total Accessible Spaces:	**6 spaces**

UPPER GARAGE LEVEL EXISTING PARKING STALLS: 62 SPACES

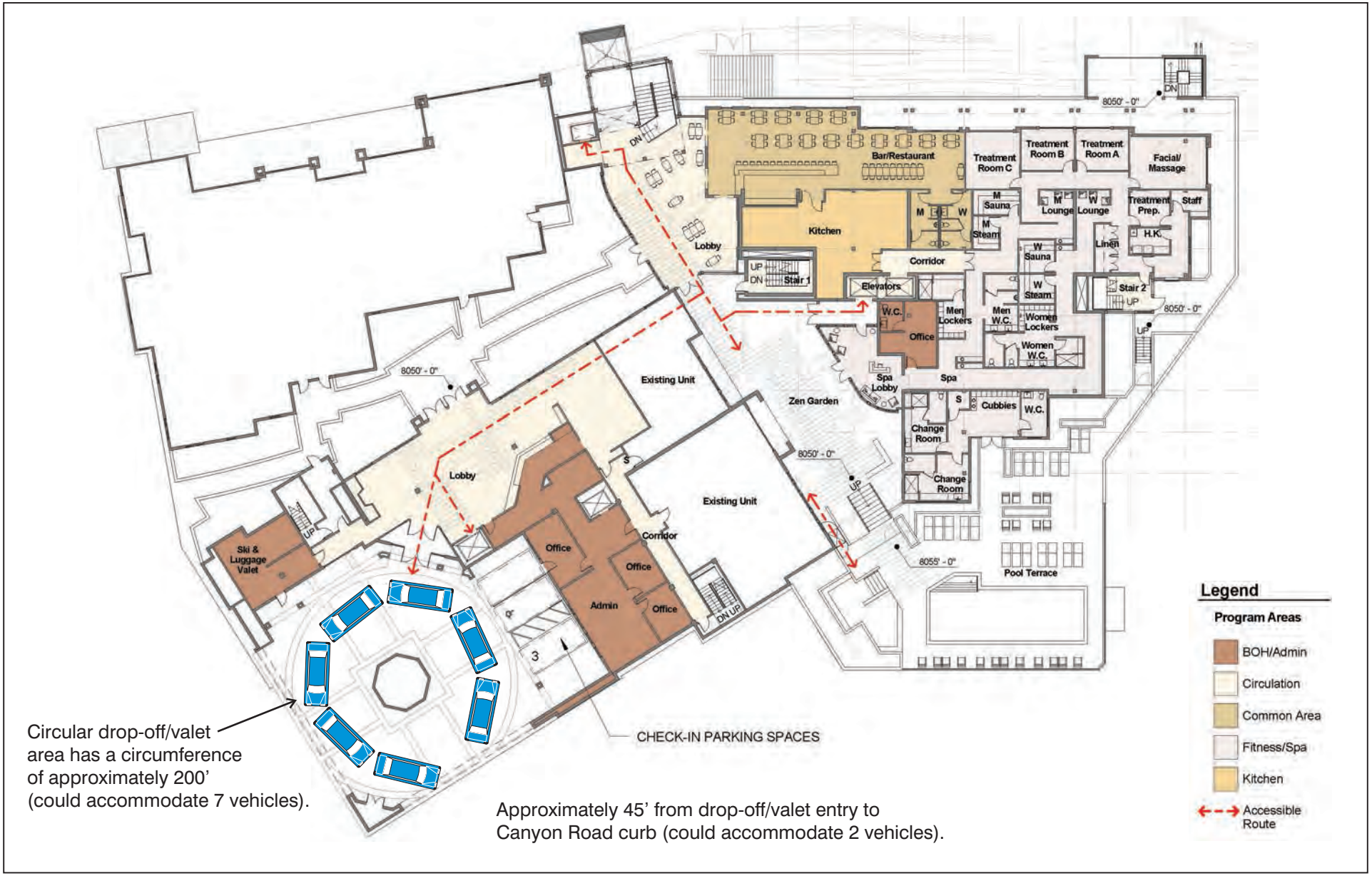
0' 15' 30' 60'

GARAGE LOWER



LOWER GARAGE LEVEL EXISTING
PARKING STALLS: 74 SPACES

0' 15' 30' 60'



LSA

FIGURE 1

N

0 20 40

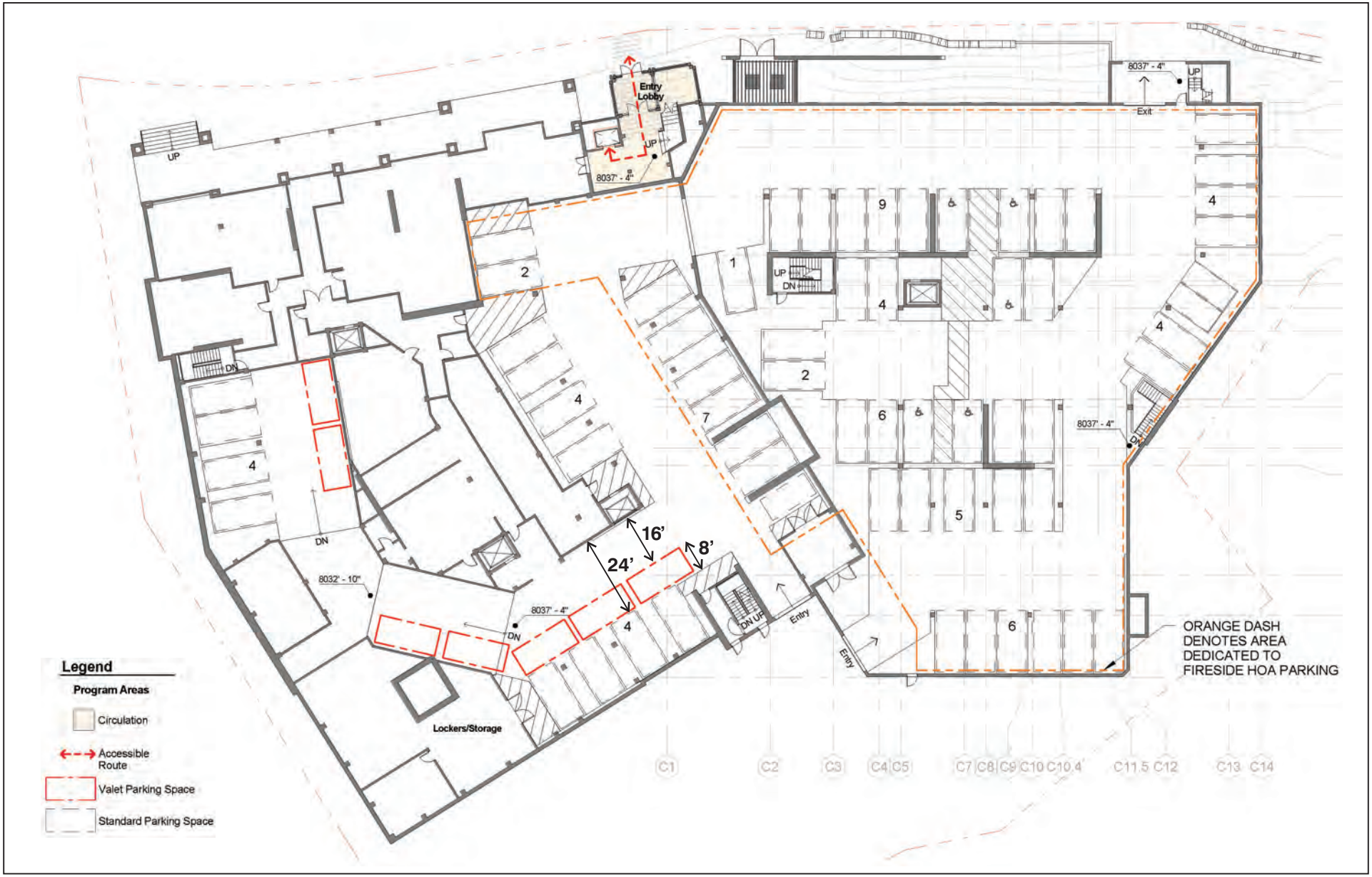
FEET

SOURCE: Bull Stockwell Allen

I:\SMM1301\G\Site Plan.cdr (9/6/13)

50 Canyon Boulevard

Site Plan



LSA

FIGURE 2a

N

0 20 40

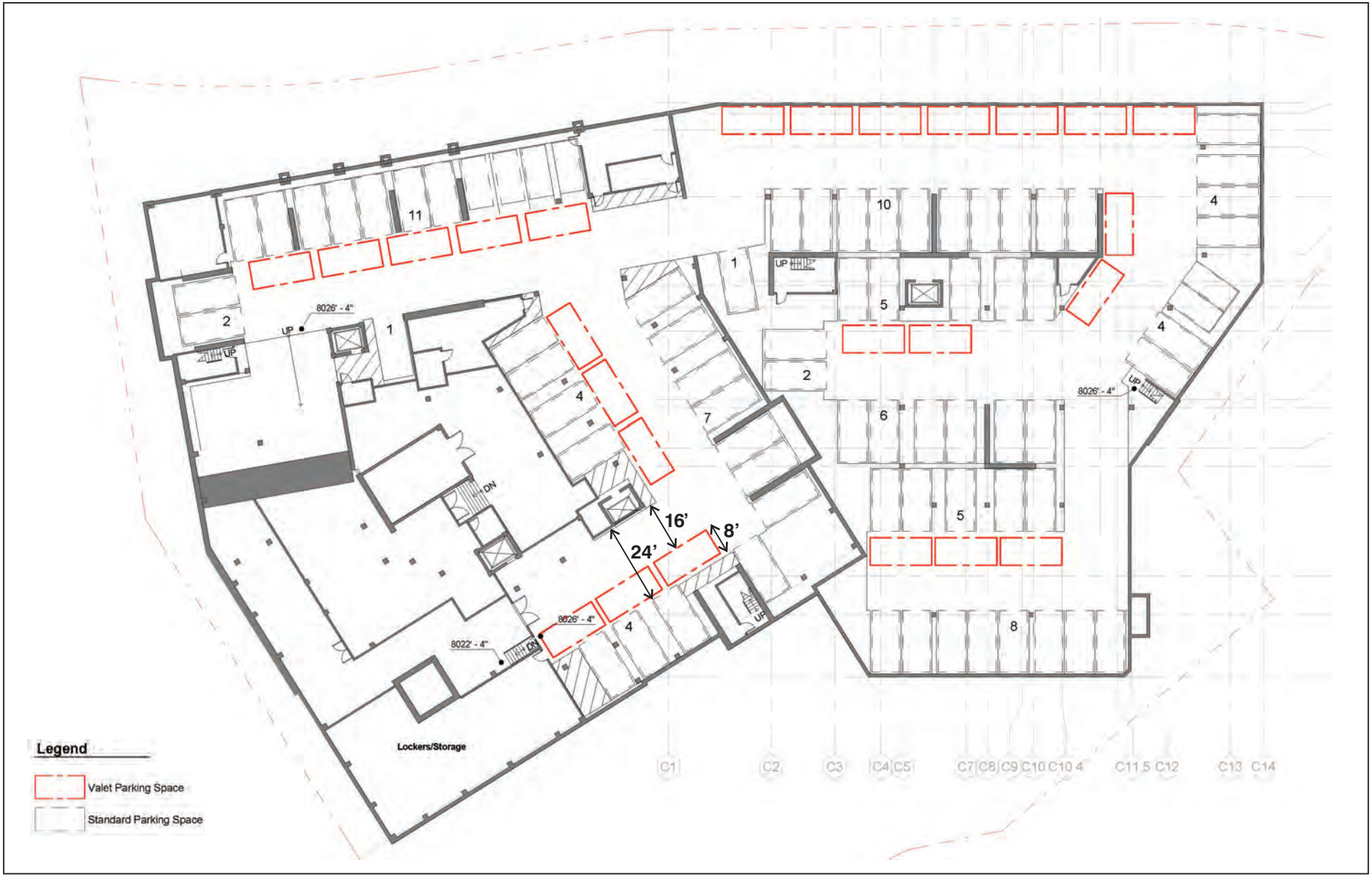
FEET

SOURCE: Bull Stockwell Allen

50 Canyon Boulevard

Subterranean Parking Plan (Upper Level)

I:\SMM1301\G\Parking-Upper.cdr (10/21/13)



LSA

FIGURE 2b

N

0 20 40

FEET

SOURCE: Bull Stockwell Allen

50 Canyon Boulevard

Subterranean Parking Plan (Lower Level)

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Table A.1: 8050 Complex Project Trip Generation

Land Use	Size	Unit	Saturday Peak Hour		
			In	Out	Total
Trip Rates[1]					
Condominium		unit	0.151	0.129	0.280
Project Trip Generation					
Condominium	91	unit	14	12	26

[1] Trip rate referenced from observed Intrawest North Village (Grand Sierra, White Mountain, and Lincoln House) count on February 9, 2008 for the Mammoth Crossings Traffic Impact Analysis (May 21, 2008).

Table A.2: Peak 15-Minute Valet Parking Service Rates

Service Rates per Lane		
Average Headway (sec/veh)[1]	Design Capacity (veh/0.25 hr)[2]	Maximum Capacity (veh/0.25 hr)[3]
180.0	4	5

[1] Average Headway is based on approximate time for valet attendant to park a vehicle in the subterranean garage and return to the valet pick-up/drop-off area.

[2] Design Capacity is 80 percent of the Maximum Capacity, as explained in the Crommelin report.

[3] Maximum Capacity is determined by dividing 900 seconds (15 minutes) by the Average Headway.

sec/veh = seconds per vehicle

veh/0.25 hr = vehicles per 0.25 hour

Table A.3: Peak 15-Minute Valet Parking Stacking Analysis

Valet Attendants	Service Rate[1]	Arrival Rate (Peak 15-Min Volume)	Traffic Intensity[2]	Reservoir Required (ft)[3]	
				Average	95th %
3	4	7	0.58	**22**	**44**

[1] The Service Rate is the Design Capacity.

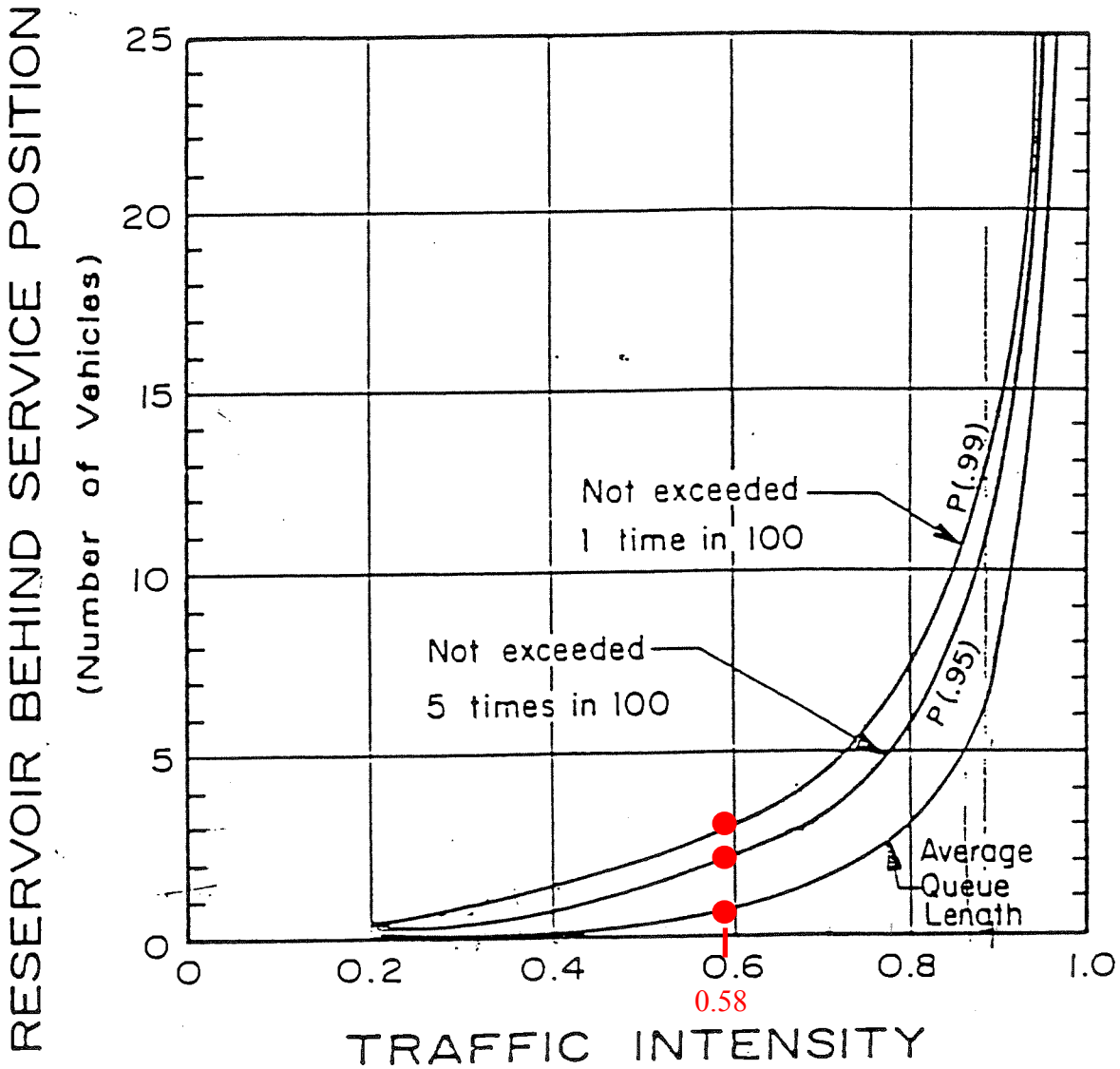
[2] Traffic Intensity is the Arrival Rate (peak-hour volume) ÷ Service Rate per the "Reservoir Needs vs. Traffic Intensity" table in the Crommelin report. Traffic Intensity is also a function of the number of valet attendants; therefore, Traffic Intensity = Arrival Rate ÷ (Service Rate * Valet Attendants).

[3] Number of feet indicated in the "Reservoir Needs vs. Traffic Intensity" table (based on the highest of the AM, PM, and Saturday Traffic Intensity). 22 feet equates to 1 vehicle.
"Average" is the reservoir required for the average queue, "95th %" is the reservoir required so a queue does not exceed the reservoir 5 times in 100.

Min = minute

ft = feet

RESERVOIR NEEDS VS TRAFFIC INTENSITY



×22' (autos)

×35' (service)

Assumptions:

1. Arrivals follow a Poisson Distribution
2. Service rate can be represented by an exponential probability function.
3. Flow is equally divided between each lane if more than one is available.

Note: To obtain reservoir length, use 22 feet per vehicle.