11.4 Traffic Impact Analysis

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TECHNICAL MEMORANDUM

DATE: July 29, 2016

TO: Eddie Torres, Michael Baker International

FROM: Sara Hawley and Leslie Suen, LSC Transportation Consultants

SUBJECT: Mammoth Community and Multi-Use Facilities Focused Traffic Impact Analysis

INTRODUCTION

In this Memo, LSC will evaluate the transportation impacts of the proposed Community and Multi-Use Facilities at Mammoth Creek Park, which is located on the west side of Old Mammoth Road between Chateau Road and Mammoth Creek Road in the Town of Mammoth Lakes, California. This project includes the relocation of the existing multi-use facility (mainly the skating rink) from the Mammoth Unified School District site and the construction of a new Community Center. Note the existing community center located on Forest Trail will remain in place.

EXISTING CONDITIONS

This study analyzes the following intersections:

- Old Mammoth Road/Meridian Boulevard
- Old Mammoth Road/Chateau Road
- Old Mammoth Road/Mammoth Creek Park Site Access

Figure 1 presents the site location and lane configuration and intersection control devices for all of the study intersections.

Year 2015 turning movement volumes were developed as part of the recent Mammoth Mobility Element EIR for all study intersections except the Mammoth Creek Park Site Access along Old Mammoth Road. These volumes were increased by a 1 percent average annual growth rate, based on Caltrans traffic volumes in Mammoth, to estimate existing year 'no project' traffic volumes. Even though the

existing park is closed in the winter, 8 existing vehicle trips are estimated to be generated (with 4 entering and 4 exiting the site) in the existing winter PM peak hour. Considering that a minimal amount of traffic uses the plowed parking lot and playground (in low snow years) or the park for snow play. The estimated 'existing no project' peak-hour traffic volumes are shown in Table 1.

FUTURE CUMULATIVE CONDITIONS

The Town of Mammoth Lakes Travel Demand Model was recently updated as part of the Mammoth Mobility Element EIR. During this process several model alternatives were developed. Town staff have directed that the 'future model with new FAR (floor area ratio) and with the new Mobility Element" version should be used for purposes of this analysis.

The Mammoth Creek Park site is in the Mammoth Travel Model as TAZ (Traffic Analysis Zone) 140. The existing model land uses in TAZ 140 are 12 acres of Public Utilities, which remains the same in the future model. In other words, the model estimates no additional land uses would be constructed in this area. Therefore the proposed project would be above and beyond the future model's estimation.

Future turning movement volumes were pulled from the Model for all study intersections with the exception of the site access driveway, as this intersection is not represented in the model. Future volumes entering and exiting the proposed site would remain unchanged in the future without the project.

TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

Project Description

The proposed project includes the relocation of the existing multi-use facility (mainly the skating rink) from the Mammoth Unified School District (MUSD) site and the construction of a new Community Center at the Mammoth Creek Park site. The current amenities (mainly the playground and bike trail access) will remain unchanged at Mammoth Creek Park. The project proposes the following components:

- Multi-Use Facility - The proposed Multi-Use Facility will include a maximum of a 100-foot by 200-foot ice rink (winter)/recreation/event area covered by a roof structure of approximately 30,000 square feet. The activity levels at the new ice rink would be similar to the existing ice rink.

- Community Center - The proposed new Community Center will include a 13,000 square foot building with 2 large conference rooms, an office, 3 small multipurpose rooms, restrooms and locker rooms.

- The area to the west of the proposed Community Multi-Use Facility would be used as an active Outdoor Recreation Area. Possible activities for this portion of the project site include a dog park, bicycle dirt track, sledding hill, and/or a community garden.

Trip Generation

"Trip generation analysis" is the process by which transportation analysts identify the number of vehicle-trips that a specific proposed land use plan would add to local roadways. First, the trip

generation of the proposed project is estimated. Next a credit for trips to be eliminated from the site of the existing ice rink is estimated. Finally, the "project net impact" on total trip generation through the study area is determined.

The *ITE Trip Generation Manual* does contain trip rates for an ice skating rink but the rates are not useable because there are too few data points available. Additionally for the proposed multi-use facility the *ITE Manual* standard trip generation rates would not accurately reflect the trip generation due to the unique activities to be offered at the facility. Therefore, trip generation for this project is based on a 'person-trip analysis'. Consistent with Town standards, the design day is a busy winter Saturday but not a peak time (such as Christmas week). A list of all activities that would take place at the new Multi-Use/Community Center is shown in Table 2. Programs/activities included in the design day are indicated with a 'yes' in the far right column. These design day activities are then listed in the daily trip generation table (Table 3).

The person trip analysis is based on the following assumptions:

- The following mode split is based on estimated transit usage from the Town of Mammoth Lakes Travel Demand Model.
    - Walking Trips = 5%
    - Transit Trips = 14%
    - Automobile Trips = 81%

- The average vehicle occupancy is estimated at 2.7 persons per vehicle. This is based on the Town of Mammoth Lakes Travel Model Report (LSC, 2011) vehicle occupancy estimates for project-related trip types.

- A significant proportion of activity participants will be dropped off and picked up, which doubles the number of trips generated (as each drop-off or pick-up generates two trips at the site driveway, one inbound and one outbound). As shown in Tables 3, pick-up/drop-off percentages vary based on activity. The portion of persons dropped-off/picked-up for each activity was estimated by Town staff.

Multiplying the persons traveling via auto by two person-trips per day dividing by the vehicle occupancy rate and adding the additional vehicles trips generated by drop-off and pick-up activity, yields the total number of vehicle trips per day at the site driveway. As shown in the right side of Table 3, it is estimated that the Multi-Use/Community Center would generate 590 daily trips. The number of these trips occurring in the peak hour is summarized in Table 4 for a total of 116 PM peak hour (62 entering, 54 exiting). Not all the trips generated by the project are "new" trips as all the ice skating rink-related trips are already on the area roadways. These trips will be shifted to the new site; therefore the net impact of the project on area roadways is 210 daily trips with 36 occurring in the peak hour (16 entering, 20 exiting).

Trip Distribution and Assignment

The distribution of traffic arriving and departing the project site is estimated based on existing traffic patterns, the location of the site relative to residential and commercial uses in the region, and regional access patterns. Based on a review of these factors, the estimated distribution pattern for trips made in

and out of the project site is summarized in Table 5. The site-generated trips are assigned through the study intersections by applying the trip distribution pattern to the trip generation from Table 3. Next the shift in existing trips from the existing ice rink to the new ice rink is estimated. Adding this shift to the new site-generated trips yields the 'project net impact' on the study intersection volumes, which is shown in Table 1. Adding these volumes to the 'no project' volumes yields the existing plus project volumes, which are also shown in Table 1.

TRAFFIC IMPACTS

The following potential areas of transportation impacts are considered in this section:

- Intersection Level of Service
- Need for Turn Lanes, Signals or Roundabouts
- Vehicle Miles Traveled

Intersection Level of Service

Level of Service Standard

Level of Service (LOS) is commonly used as a qualitative description of intersection operation and is based on the type of traffic control and delay experienced at the intersection. Intersection LOS was evaluated using Synchro software (Version 8.0, Trafficware 2013) based on the 2010 Highway Capacity Manual methodologies at all study intersections. All LOS calculations are presented in Appendix A. The HCM analysis methodology describes the operation of an intersection using a range of LOS from LOS A (free-flow conditions) to LOS F (severely congested conditions), with details provided in Appendix A.

The Town of Mammoth Lakes General Plan presents the following LOS thresholds:

- For Signalized Intersections: Total intersection LOS D or better must be maintained. Therefore, if a signalized intersection is found to operate at a total intersection LOS E or F, mitigation is required. It is assumed that this same threshold applies to roundabouts.

- For Unsignalized Intersections: In order to avoid the identification of a LOS failure for intersections that result in only a few vehicles experiencing a delay greater than 50 seconds (such as at a driveway serving a few homes that accesses onto a busy street), a LOS deficiency is not identified for all intersections with approach LOS E or F. Instead, a LOS deficiency is assumed to occur at an unsignalized intersection only if an individual minor street movement operates at LOS E or F and total minor approach delay exceeds four vehicle hours for a single lane approach and five vehicle hours for a multi-lane approach. In other words, a deficiency is found to occur if the average number of vehicles queued over the peak-hour exceeds four at a single-lane approach, or exceeds five at a multi-lane approach.

Level of Service Analysis

Traffic operations at the study intersections were assessed in terms of Level of Service (LOS) and delay. LOS analyses were performed at all of the study intersections under existing and future year scenarios, with and without the project, and the results are presented in Table 6. The results of the LOS analyses indicate that all intersections currently operate at an acceptable LOS and would continue to do so with the implementation of the proposed project although the LOS may degrade by one level under future cumulative conditions. Note the eastbound approach of Chateau Road at Old Mammoth Road does reach LOS E and F under future scenarios, but maintains an acceptable LOS with less than 4 cumulative hours of delay.

Analysis of the Need for Turn Lanes

As there are no LOS deficiencies, intersection improvements are not needed as mitigation. But turn lanes may be warranted to enhance safety by separating vehicles turning into the site from those passing by the site. Using the NCHRP 457 Guidelines, a northbound left-turn lane and a southbound right-turn lane along Old Mammoth Road into the site were evaluated. Based on the proposed volumes with the project, no turn lanes are warranted under any scenarios.

Vehicle Miles Traveled (VMT)

Existing VMT data was developed as part of the recent Mammoth Mobility Element EIR. The existing and future VMT townwide is shown on the bottom portion of Table 7. The VMT impact of the project was then assessed by calculating the average trip length for each zone, and then multiplying it by the number of trips. An additional 386 vehicle miles traveled is expected to be generated in the Town of Mammoth Lakes by this project. This VMT was then added to both the existing and future VMT to create the existing 'plus project' and future 'plus project' values. The results of this calculation can be found in Table 7. Note the increase in VMT due to the project is minimal at only approximately 0.3% of existing VMT.

MITIGATION MEASURES

No intersection mitigation measures are needed, because all intersections will operate at an acceptable LOS under their existing configurations and control. No new turn lanes are expected to be necessary along Old Mammoth Road at the site access point. Adequate traffic conditions are expected to be provided with the proposed project, so long as the final landscaping plans provide adequate drive sight distance at the site driveway.

Figure 1
Mammoth Site Map and Intersection Configuration

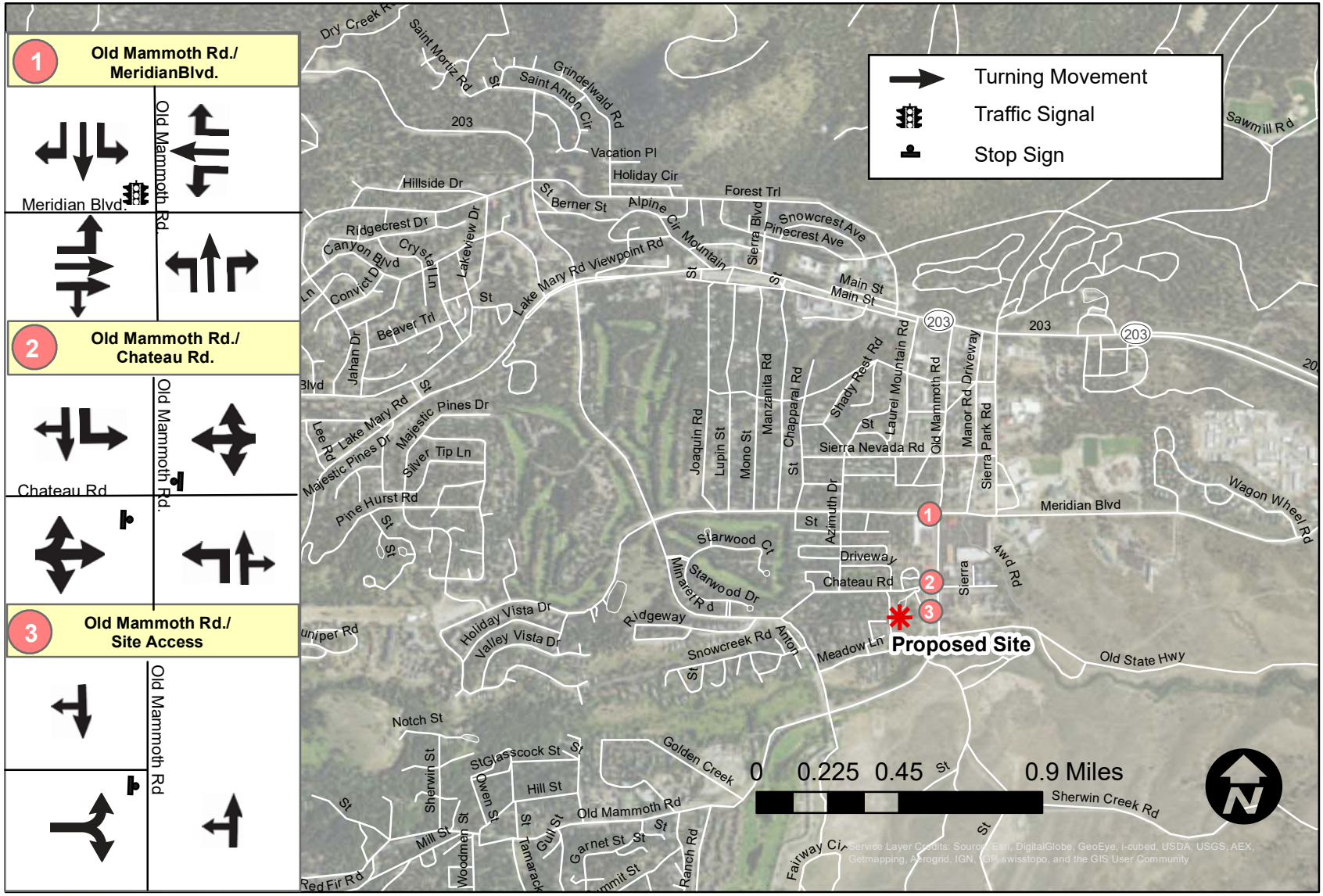

Table 1: PM Peak Hour Intersection Turning Movement Volumes

Intersection	Northbound			Southbound			Eastbound			Westbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing No Project													
Old Mammoth Road / Meridian Blvd	128	230	48	118	295	59	188	680	112	96	365	75	2394
Old Mammoth Road / Chateau Road	11	251	5	48	300	75	37	16	11	5	11	27	797
Old Mammoth Road / Mammoth Creek Park Site Access	2	259	0	0	300	2	2	0	2	0	0	0	567
Future No Project													
Old Mammoth Road / Meridian Blvd	150	270	55	130	360	65	195	700	130	110	375	85	2625
Old Mammoth Road / Chateau Road	15	350	5	95	415	90	40	30	15	5	20	55	1135
Old Mammoth Road / Mammoth Creek Park Site Access	2	370	0	0	435	2	2	0	2	0	0	0	813
Project Net Impact													
Old Mammoth Road / Meridian Blvd	25	16	-6	-14	19	0	0	-21	29	-4	-16	-10	18
Old Mammoth Road / Chateau Road	2	39	0	0	47	-1	-2	0	2	0	0	0	87
Old Mammoth Road / Mammoth Creek Park Site Access	8	-6	0	0	-5	54	47	0	7	0	0	0	105
Existing Plus Project													
Old Mammoth Road / Meridian Blvd	153	246	42	104	314	59	188	659	141	92	349	65	2412
Old Mammoth Road / Chateau Road	13	290	5	48	347	74	35	16	13	5	11	27	884
Old Mammoth Road / Mammoth Creek Park Site Access	10	253	0	0	295	56	49	0	9	0	0	0	672
Future Plus Project													
Old Mammoth Road / Meridian Blvd	175	286	49	116	379	65	195	679	159	106	359	75	2643
Old Mammoth Road / Chateau Road	17	389	5	95	462	89	38	30	17	5	20	55	1222
Old Mammoth Road / Mammoth Creek Park Site Access	10	364	0	0	430	56	49	0	9	0	0	0	918

Note: Negative volumes reflect the shift in existing traffic associated with the existing ice rink.

Source: LSC Transportation Consultants, Inc.

TABLE 2: Mammoth Multi-Use/Community Center - Determination of Design Day

Program/Activity	Winter?	Saturday?	If Saturday, What time?	PM Peak Hour?	Frequency	Max Attendees	Include in Design Day?
ICE RINK							
Recreational Skating	Yes	Yes	2 pm -10 pm	**Yes**	Daily	300	**Yes**
Youth and Adult Hockey	Yes	Yes	9 am - 11 am	No	Daily	100	**Yes**
Ice Skating/Figure Skating Program	Yes	Yes, Get up and Go Program	4:30 pm - 5:30 pm	**Yes**	Daily	50	**Yes**
Curling Program	Yes	No	-	-	Weekly	100	No
Skate Program	Yes	No	-	-	Weekly	50	No
Ice Rental	Yes	No	-	-	Weekly	50	No
Birthday Party	Yes	Yes	9 am - 9 pm	Yes	Weekly	100	No, b/c included in Rec Skating
Community Events	Yes	No	-	-	Monthly / Occasionally	200	No
Special Programs/Events	Yes	No	-	-	Monthly / Occasionally	100	No
Hockey Tournaments	Yes	Yes	6 am to 12pm, 6 pm to 12 am	No	Monthly / Occasionally	200	No
Private Rentals	Yes	No	-	-	Monthly / Occasionally	200	No
Professional/Club/College/School Rental	Yes	No	-	-	Monthly / Occasionally	200	No
COMMUNITY CENTER							
Educational Programming	Yes	No	-	-	Weekly	100	No
Adult Introductory Fitness Classes	Yes	Yes	7 pm - 9 pm	No	Weekly	50	**Yes**
Youth Introductory Fitness Classes	Yes	No	5 pm - 7 pm	No	Weekly	50	No
Games	Yes	based on availability	4 pm - 10 pm	**Yes**	Weekly	50	**Yes**
Summer Arts Camps/Craft programs	No	-	-	-	Weekly	-	No
Training/Certification & Community Board Meetings	Yes	Yes, based on availability	8 am -6 pm	**Yes**	Weekly	50	**Yes**
Breastfeeding support	Yes	based on availability	Noon - 10 pm	Yes	Weekly	10	No
County First 5 programs	Yes	No	-	-	Weekly	30	No
Youtheatre/Rehearsal space	No	-	-	-	Weekly	100	No
Drop-in Art Programs	Yes	based on availability	7 pm - 10 pm	No	Monthly	50	**Yes**
TED Talks	Yes	based on availability	6pm - 10 pm	No	Monthly	-	No
Community and Social Gathering	Yes	based on availability	Noon - 10 pm	Yes	Monthly	100	No
Indoor Venue/Staging Area	No	based on availability	Noon - 10 pm	Yes	Monthly	200	No
Rotating Art Gallery	Yes	Yes	n/a	Yes	Monthly	n/a	No
Community Variety/Talent Show		based on availability	6pm - 10 pm	No	Monthly	200	No
Teen safe space hangout					Occasionally		No
Facility rentals for events/conferences					Occasionally		No
Movie nights					Occasionally		No

Note: **Bold** indicates the activity is included in the design day.
Source: LSC Transportation Consultatnts, Inc.

Table 3: Daily Trip Generation

Activity	Persons per day	Persons in Autos[1]	Total Vehicles[2]	Percent Drop Off /Pick up	Daily Vehicle Trips at Site Driveway In	Out	Total
PROPOSED USES							
Ice Rink							
Recreational Skating	300	245	91	40%	127	127	254
Ice Skating/Figure Skating Program (Get up and Go)	50	41	15	40%	21	21	42
Youth and Adult Hockey	100	82	30	80%	42	42	84
Subtotal of Ice Skating Rink	*450*	*368*	*136*		*190*	*190*	*380*
Games	100	82	30	80%	42	42	84
Meeting or event in multipurpose rooms (2 per day)	100	82	30	40%	42	42	84
Drop-in Art Programs or Adult Fitness Class	50	41	15	20%	21	21	42
Total Proposed Uses	**700**	**573**	**211**		**295**	**295**	**590**
Total of Existing Ice Skating Rink	**450**	**368**	**136**		**190**	**190**	**380**
Net Impact of Project on Area Roadways	**250**	**205**	**75**		**105**	**105**	**210**

Note 1: Mode split includes 5% walking, 14% transit, and 81% auto.

Note 2: Assuming 2.7 persons per vehicle.

Source: LSC Transportation Consultants, Inc.

Table 4: PM Peak Hour Trip Generation

Activity	Max Persons in Peak Hour	Persons in Autos[1]	Total Vehicles[2]	Portion of trips occurring in Peak Hour		Percent Drop Off /Pick up	Peak Hour Vehicle Trips at Site Driveway		
				In	Out		In	Out	Total
PROPOSED USES									
Ice Skating Rink									
Recreational Skating	200	163	60	50%	25%	40%	36	27	63
Ice Skating/Figure Skating Program (Get up and Go)	50	41	15	50%	25%	40%	10	7	17
Subtotal of Ice Skating Rink	*250*	*204*	*75*				*46*	*34*	*80*
Games	50	41	15	50%	10%	80%	10	8	18
Meeting or event in multipurpose room (One during peak hour)	50	41	15	10%	75%	40%	6	12	18
Total Proposed Uses	**350**	**286**	**105**				**62**	**54**	**116**
Total of Existing Ice Skating Rink	**250**	**204**	**75**				**46**	**34**	**80**
Net Impact of Project on Area Roadways	**100**	**82**	**30**				**16**	**20**	**36**

Note 1: Mode split includes 5% walking, 14% transit, and 81% auto.

Note 2: Assuming 2.7 persons per vehicle.

Source: LSC Transportation Consultants, Inc.

Table 5: Mammoth - Trip Distribution

Origin	Distribution
Old Mammoth Road north of Meridian Blvd	30%
Meridian Blvd west of Old Mammoth Road	46%
Chateau Road west of Old Mammoth Road	4%
Old Mammoth Road south of Project Driveway	13%
Meridian Blvd east of Old Mammoth Road	3%
Between Chateau Road and Meridian Blvd	4%
	100%

Source: LSC Transportation Consultants, Inc.

Table 6: LOS for Study Intersections

Intersection	Traffic Control[1]	Existing Conditions Delay (sec/veh)	LOS	Existing Plus Project Delay (sec/veh)	LOS	Future No Project Delay (sec/veh)	Veh-Hrs	LOS	Future Plus Project Delay (sec/veh)	Veh-Hrs	LOS
Old Mammoth Road / Meridian Blvd	Traffic Signal	30.6	C	32.9	C	34.0	-	C	36.2		D
Old Mammoth Road / Chateau Road	Stop-Control	20.1	C	22.9	C	42.5	1.0	E	52.8	1.1	F
Old Mammoth Road / Site Access Road	Stop-Control	11.6	B	11.7	B	11.5	-	B	12.9	-	B

Note 1: LOS is reported as total intersection delay for signalized intersection and worst movement/approach for unsignalized intersections and roundabouts.

Bold = LOS threshold exceeded (Note LOS threshold not exceed under any scenarios)

Source: LSC Transportation Consultants, Inc.

Table 7: Mammoth Creek Park Vehicle Miles Traveled

Origin/Destination	Average Distance (miles)	Percent of Trips to Area	Net Increase in Daily Trips	Net Increase in Daily VMT
Old Mammoth Road north of Meridian Blvd	1.6	30%	63	101
Meridian Blvd west of Old Mammoth Road	2.5	46%	97	239
Chateau Road west of Old Mammoth Road	0.8	4%	8	7
Old Mammoth Road south of Project Driveway	1.2	13%	28	34
Meridian Blvd east of Old Mammoth Road	0.7	3%	6	4
Between Chateau Road and Meridian Blvd	0.2	4%	8	2
Project Net Impact		**100%**	**210**	**387**
Townwide VMT		Existing No Project		152,844
		Future No Project		178,638
		Project Net Impact		387
		Existing Plus Project		153,231
		Future Plus Project		179,025

Source: LSC Transportation Consultants, Inc.

Appendix A

DESCRIPTIONS OF LEVELS OF SERVICE

The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level of service A representing the best operating conditions and level of service F the worst.

Level of Service Definitions

In general, the various levels of service are defined as follows for uninterrupted flow facilities:

- **Level of service A** represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

- **Level of service B** is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

- **Level of service C** is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

- **Level of Service D** represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

- **Level of service E** represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

- **Level of service F** is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level of service F is used to describe the operating conditions within the queue, as well as the point of the breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow which causes the queue to form, and level of service F is an appropriate designation for such points.

HCM 2010 Signalized Intersection Summary
14: Old Mammoth Road & Meridian Boulevard

7/27/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	188	680	112	96	365	75	128	230	48	118	295	59
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	209	756	124	107	406	83	142	256	53	131	328	66
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	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	252	1068	175	137	533	453	178	420	357	165	406	345
Arrive On Green	0.14	0.35	0.35	0.08	0.29	0.29	0.10	0.23	0.23	0.09	0.22	0.22
Sat Flow, veh/h	1774	3045	499	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	209	439	441	107	406	83	142	256	53	131	328	66
Grp Sat Flow(s),veh/h/ln	1774	1770	1775	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	8.1	15.2	15.2	4.2	14.1	2.8	5.6	8.8	1.9	5.1	11.9	2.4
Cycle Q Clear(g_c), s	8.1	15.2	15.2	4.2	14.1	2.8	5.6	8.8	1.9	5.1	11.9	2.4
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	252	621	622	137	533	453	178	420	357	165	406	345
V/C Ratio(X)	0.83	0.71	0.71	0.78	0.76	0.18	0.80	0.61	0.15	0.79	0.81	0.19
Avail Cap(c_a), veh/h	297	683	685	192	609	517	222	499	424	197	472	401
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	1.00	1.00
Uniform Delay (d), s/veh	29.6	19.9	19.9	32.2	23.1	19.1	31.2	24.7	22.0	31.5	26.4	22.7
Incr Delay (d2), s/veh	14.7	3.3	3.3	10.8	5.4	0.3	13.5	2.0	0.3	15.5	9.5	0.4
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	5.0	7.9	8.0	2.5	8.0	1.2	3.4	4.7	0.8	3.2	7.2	1.1
LnGrp Delay(d),s/veh	44.3	23.2	23.2	42.9	28.5	19.3	44.7	26.7	22.3	47.0	35.9	23.0
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	D	C
Approach Vol, veh/h		1089			596			451			525	
Approach Delay, s/veh		27.3			29.8			31.9			37.0	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	29.8	11.2	20.4	14.2	25.2	10.7	20.9
Change Period (Y+Rc), s	4.1	4.9	4.1	4.9	4.1	4.9	4.1	4.9
Max Green Setting (Gmax), s	7.7	27.4	8.9	18.0	11.9	23.2	7.9	19.0
Max Q Clear Time (g_c+I1), s	6.2	17.2	7.6	13.9	10.1	16.1	7.1	10.8
Green Ext Time (p_c), s	0.0	5.4	0.0	1.6	0.1	4.2	0.0	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	37	16	11	5	11	27	11	251	5	48	300	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
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	41	18	12	6	12	30	12	279	6	53	333	83

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	809	791	375	803	829	282	417	0	0	284	0	0
Stage 1	482	482	-	306	306	-	-	-	-	-	-	-
Stage 2	327	309	-	497	523	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	299	322	671	302	306	757	1142	-	-	1278	-	-
Stage 1	565	553	-	704	662	-	-	-	-	-	-	-
Stage 2	686	660	-	555	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	267	305	671	272	290	757	1142	-	-	1278	-	-
Mov Cap-2 Maneuver	267	305	-	272	290	-	-	-	-	-	-	-
Stage 1	559	530	-	697	655	-	-	-	-	-	-	-
Stage 2	640	653	-	505	508	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.1	13.6	0.3	0.9
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1142	-	-	309	467	1278	-	-
HCM Lane V/C Ratio	0.011	-	-	0.23	0.102	0.042	-	-
HCM Control Delay (s)	8.2	-	-	20.1	13.6	7.9	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0.3	0.1	-	-

Existing No Project

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	2	2	2	259	300	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	2	288	333	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	626	334	336	0	-	0
Stage 1	334	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	448	708	1223	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	758	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	447	708	1223	-	-	-
Mov Cap-2 Maneuver	447	-	-	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	756	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1223	-	548	-	-
HCM Lane V/C Ratio	0.002	-	0.008	-	-
HCM Control Delay (s)	7.9	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 Signalized Intersection Summary
14: Old Mammoth Road & Meridian Boulevard

7/27/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	188	659	141	92	349	65	153	246	42	104	314	59
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	209	732	157	102	388	72	170	273	47	116	349	66
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	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	250	992	213	131	512	435	208	478	406	148	415	353
Arrive On Green	0.14	0.34	0.34	0.07	0.27	0.27	0.12	0.26	0.26	0.08	0.22	0.22
Sat Flow, veh/h	1774	2901	622	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	209	446	443	102	388	72	170	273	47	116	349	66
Grp Sat Flow(s),veh/h/ln	1774	1770	1753	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	8.4	16.3	16.4	4.2	14.1	2.5	6.9	9.4	1.7	4.7	13.2	2.5
Cycle Q Clear(g_c), s	8.4	16.3	16.4	4.2	14.1	2.5	6.9	9.4	1.7	4.7	13.2	2.5
Prop In Lane	1.00		0.35	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	605	600	131	512	435	208	478	406	148	415	353
V/C Ratio(X)	0.84	0.74	0.74	0.78	0.76	0.17	0.82	0.57	0.12	0.79	0.84	0.19
Avail Cap(c_a), veh/h	287	659	652	186	587	499	214	481	409	190	455	387
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	1.00	1.00
Uniform Delay (d), s/veh	30.8	21.3	21.3	33.5	24.5	20.3	31.7	23.8	21.0	33.1	27.4	23.2
Incr Delay (d2), s/veh	16.3	4.3	4.4	10.8	5.4	0.2	20.4	1.9	0.2	13.5	13.0	0.3
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	5.3	8.7	8.6	2.4	8.0	1.1	4.5	5.1	0.7	2.9	8.3	1.1
LnGrp Delay(d),s/veh	47.1	25.6	25.7	44.3	29.9	20.5	52.2	25.7	21.1	46.6	40.3	23.5
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	D	C
Approach Vol, veh/h		1098			562			490			531	
Approach Delay, s/veh		29.7			31.3			34.5			39.6	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	30.1	12.7	21.3	14.5	25.1	10.2	23.8
Change Period (Y+Rc), s	4.1	4.9	4.1	4.9	4.1	4.9	4.1	4.9
Max Green Setting (Gmax), s	7.7	27.4	8.9	18.0	11.9	23.2	7.9	19.0
Max Q Clear Time (g_c+I1), s	6.2	18.4	8.9	15.2	10.4	16.1	6.7	11.4
Green Ext Time (p_c), s	0.0	5.0	0.0	1.2	0.1	4.2	0.0	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	35	16	13	5	11	27	13	290	5	48	347	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
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	39	18	14	6	12	30	14	322	6	53	386	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	908	890	427	903	928	325	468	0	0	328	0	0
Stage 1	533	533	-	354	354	-	-	-	-	-	-	-
Stage 2	375	357	-	549	574	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	256	282	628	258	268	716	1094	-	-	1232	-	-
Stage 1	531	525	-	663	630	-	-	-	-	-	-	-
Stage 2	646	628	-	520	503	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	226	266	628	229	253	716	1094	-	-	1232	-	-
Mov Cap-2 Maneuver	226	266	-	229	253	-	-	-	-	-	-	-
Stage 1	524	502	-	655	622	-	-	-	-	-	-	-
Stage 2	599	620	-	469	481	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.9	14.7	0.4	0.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	272	417	1232	-	-
HCM Lane V/C Ratio	0.013	-	-	0.261	0.115	0.043	-	-
HCM Control Delay (s)	8.3	-	-	22.9	14.7	8.1	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	49	9	10	253	296	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	10	11	281	329	62

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	663	360	391	0	-	0
Stage 1	360	-	-	-	-	-
Stage 2	303	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	426	684	1168	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	422	684	1168	-	-	-
Mov Cap-2 Maneuver	591	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	742	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1168	-	604	-	-
HCM Lane V/C Ratio	0.01	-	0.107	-	-
HCM Control Delay (s)	8.1	-	11.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

HCM 2010 Signalized Intersection Summary
14: Old Mammoth Road & Meridian Boulevard

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	195	700	130	110	375	85	150	270	55	130	360	65
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	205	737	137	116	395	89	158	284	58	137	379	68
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	970	180	148	503	427	195	468	398	172	444	378
Arrive On Green	0.14	0.33	0.33	0.08	0.27	0.27	0.11	0.25	0.25	0.10	0.24	0.24
Sat Flow, veh/h	1774	2981	554	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	205	437	437	116	395	89	158	284	58	137	379	68
Grp Sat Flow(s),veh/h/ln	1774	1770	1765	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	8.3	16.4	16.4	4.7	14.5	3.2	6.4	10.0	2.1	5.6	14.4	2.5
Cycle Q Clear(g_c), s	8.3	16.4	16.4	4.7	14.5	3.2	6.4	10.0	2.1	5.6	14.4	2.5
Prop In Lane	1.00		0.31	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	576	574	148	503	427	195	468	398	172	444	378
V/C Ratio(X)	0.83	0.76	0.76	0.79	0.79	0.21	0.81	0.61	0.15	0.79	0.85	0.18
Avail Cap(c_a), veh/h	285	610	608	204	556	473	213	470	400	223	481	408
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	1.00	1.00
Uniform Delay (d), s/veh	31.1	22.4	22.4	33.3	25.0	20.9	32.2	24.5	21.5	32.7	27.0	22.4
Incr Delay (d2), s/veh	15.9	5.6	5.6	11.1	7.2	0.3	18.4	2.6	0.2	12.6	13.6	0.3
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	5.2	8.9	8.9	2.8	8.5	1.4	4.2	5.5	0.9	3.3	9.1	1.1
LnGrp Delay(d),s/veh	47.0	28.0	28.0	44.4	32.2	21.2	50.6	27.0	21.8	45.3	40.6	22.7
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	D	C
Approach Vol, veh/h		1079			600			500			584	
Approach Delay, s/veh		31.6			32.9			33.9			39.6	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	29.0	12.2	22.6	14.4	24.9	11.3	23.5
Change Period (Y+Rc), s	4.1	4.9	4.1	4.9	4.1	4.9	4.1	4.9
Max Green Setting (Gmax), s	8.5	25.5	8.9	19.1	11.9	22.1	9.3	18.7
Max Q Clear Time (g_c+I1), s	6.7	18.4	8.4	16.4	10.3	16.5	7.6	12.0
Green Ext Time (p_c), s	0.0	4.2	0.0	1.3	0.1	3.4	0.1	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	34.0
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	40	30	15	5	20	55	15	350	5	95	415	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	32	16	5	21	58	16	368	5	100	437	95

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1126	1089	484	1111	1135	371	532	0	0	374	0	0
Stage 1	684	684	-	403	403	-	-	-	-	-	-	-
Stage 2	442	405	-	708	732	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	182	215	583	186	202	675	1036	-	-	1184	-	-
Stage 1	439	449	-	624	600	-	-	-	-	-	-	-
Stage 2	594	598	-	426	427	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	140	194	583	147	182	675	1036	-	-	1184	-	-
Mov Cap-2 Maneuver	140	194	-	147	182	-	-	-	-	-	-	-
Stage 1	432	411	-	614	591	-	-	-	-	-	-	-
Stage 2	516	589	-	350	391	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.5	18.3	0.3	1.3
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1036	-	-	182	355	1184	-	-
HCM Lane V/C Ratio	0.015	-	-	0.492	0.237	0.084	-	-
HCM Control Delay (s)	8.5	-	-	42.5	18.3	8.3	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.4	0.9	0.3	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	2	2	2	370	435	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	2	389	458	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	853	459	460	0	-	0
Stage 1	459	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	330	602	1101	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	329	602	1101	-	-	-
Mov Cap-2 Maneuver	519	-	-	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	680	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1101	-	557	-	-
HCM Lane V/C Ratio	0.002	-	0.008	-	-
HCM Control Delay (s)	8.3	-	11.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	195	679	159	106	359	75	175	286	49	116	379	65
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	205	715	167	112	378	79	184	301	52	122	399	68
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	245	914	213	143	490	416	211	505	429	155	447	380
Arrive On Green	0.14	0.32	0.32	0.08	0.26	0.26	0.12	0.27	0.27	0.09	0.24	0.24
Sat Flow, veh/h	1774	2850	665	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	205	444	438	112	378	79	184	301	52	122	399	68
Grp Sat Flow(s),veh/h/ln	1774	1770	1745	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	8.4	17.1	17.1	4.6	14.1	2.9	7.6	10.5	1.9	5.1	15.5	2.6
Cycle Q Clear(g_c), s	8.4	17.1	17.1	4.6	14.1	2.9	7.6	10.5	1.9	5.1	15.5	2.6
Prop In Lane	1.00		0.38	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	245	568	560	143	490	416	211	505	429	155	447	380
V/C Ratio(X)	0.84	0.78	0.78	0.78	0.77	0.19	0.87	0.60	0.12	0.79	0.89	0.18
Avail Cap(c_a), veh/h	282	602	594	201	549	467	211	505	429	220	475	403
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	1.00	1.00
Uniform Delay (d), s/veh	31.5	23.1	23.1	33.8	25.6	21.4	32.5	23.7	20.6	33.5	27.6	22.6
Incr Delay (d2), s/veh	16.5	6.6	6.7	10.6	6.5	0.3	30.3	2.2	0.2	9.8	18.7	0.3
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	5.2	9.3	9.2	2.7	8.1	1.3	5.5	5.7	0.8	2.9	10.3	1.1
LnGrp Delay(d),s/veh	48.0	29.7	29.8	44.4	32.1	21.7	62.8	25.9	20.7	43.3	46.2	22.9
LnGrp LOS	D	C	C	D	C	C	E	C	C	D	D	C
Approach Vol, veh/h		1087			569			537			589	
Approach Delay, s/veh		33.2			33.1			38.1			42.9	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	28.9	13.0	22.9	14.5	24.6	10.7	25.2
Change Period (Y+Rc), s	4.1	4.9	4.1	4.9	4.1	4.9	4.1	4.9
Max Green Setting (Gmax), s	8.5	25.5	8.9	19.1	11.9	22.1	9.3	18.7
Max Q Clear Time (g_c+I1), s	6.6	19.1	9.6	17.5	10.4	16.1	7.1	12.5
Green Ext Time (p_c), s	0.0	3.8	0.0	0.5	0.1	3.6	0.1	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	36.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	38	30	17	5	20	55	17	389	5	95	462	89
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	32	18	5	21	58	18	409	5	100	486	94

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1220	1184	533	1206	1228	412	580	0	0	415	0	0
Stage 1	733	733	-	448	448	-	-	-	-	-	-	-
Stage 2	487	451	-	758	780	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	157	189	547	160	178	640	994	-	-	1144	-	-
Stage 1	412	426	-	590	573	-	-	-	-	-	-	-
Stage 2	562	571	-	399	406	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	118	169	547	122	159	640	994	-	-	1144	-	-
Mov Cap-2 Maneuver	118	169	-	122	159	-	-	-	-	-	-	-
Stage 1	405	389	-	579	563	-	-	-	-	-	-	-
Stage 2	483	561	-	324	371	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52.8	20.4	0.4	1.2
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	994	-	-	160	317	1144	-	-
HCM Lane V/C Ratio	0.018	-	-	0.559	0.266	0.087	-	-
HCM Control Delay (s)	8.7	-	-	52.8	20.4	8.4	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.9	1	0.3	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	49	9	10	364	431	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	9	11	383	454	59

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	887	483	513	0	-	0
Stage 1	483	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	315	584	1052	-	-	-
Stage 1	620	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	312	584	1052	-	-	-
Mov Cap-2 Maneuver	504	-	-	-	-	-
Stage 1	620	-	-	-	-	-
Stage 2	667	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1052	-	515	-	-
HCM Lane V/C Ratio	0.01	-	0.119	-	-
HCM Control Delay (s)	8.5	-	12.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-