

MAMMOTH TRAIL SYSTEM MASTER PLAN TRANSPORTATION CONSIDERATIONS TECHNICAL MEMORANDUM

LSC TRANSPORTATION CONSULTANTS, INC.
APRIL 27, 2011

INTRODUCTION

This memorandum presents an evaluation of transportation considerations associated with the Town of Mammoth Lakes 2009 Trail System Master Plan (TSMP) for the Mammoth Lakes area of California. First, existing and future cumulative summer and winter conditions are described. This includes evaluation of existing multi-use path use, review of historical pedestrian-related and bicycle-related accident records, review of existing at-grade crossing locations and driver sight distance, and an inventory of parking conditions at existing recreational nodes. Applicable standards of significance are defined, and potential project impacts are analyzed. Evaluation of the following alternatives is included:

1. Proposed Project/2009 TSMP (full implementation of the 2009 TSMP improvements)
2. No Project/No Build (no additional trail improvements)
3. No Project/Existing 1991 TSMP (full implementation of the 1991 TSMP improvements)

The 2009 TSMP encompasses multi-use paths, soft-surface trail networks, trail staging areas, additional sidewalks, new bike lanes, among other elements, whereas the 1991 TSMP focused on the multi-use path network (the "Main Path"). A substantial portion of the Proposed Main Path in the 1991 TSMP has already been constructed. As such, the evaluation of the impacts associated with the 1991 TSMP includes only the elements of the plan that do not currently exist.

The following transportation impacts are evaluated for the project alternatives:

- Traffic impacts at full buildout
- Traffic impacts during construction phases
- Vehicle-Miles Traveled (VMT)
- Driver sight distance
- Trail crossing conditions
- Interface between trail system and transit system
- Consistency with other planning documents and studies
- Parking conditions

Recommendations are made to address areas of significant impact. This analysis does not include potential transportation impacts associated with special events, such as weddings or motocross events. Detailed evaluations of sidewalk-related components and on-street bicycle facilities are not included. Also, long-range visions for Main Street and Meridian Boulevard, such as a central parkway concept, are not evaluated as a part of this study.

EXISTING CONDITIONS

First, the level of non-auto travel in the Mammoth Lakes area is discussed. Next, existing usage levels along the existing multi-use paths are presented. Historical accident records involving pedestrians and bicyclists are then presented. A review of existing at-grade trail crossing locations and driver sight distance is presented. Finally, existing parking conditions are summarized.

Existing Non-Auto Travel

A key element of overall transportation conditions is the “mode split” -- the proportion of existing travel (person-trips) that occurs via the various travel modes (automobile, transit, pedestrian, and bicycle). Motor vehicle mode (autos, trucks, etc.) carries the overwhelming preponderance of travel in the Mammoth Lakes area. Non-auto travel is typically higher in the summer season than in the winter. The segment of Minaret Road in the North Village area has a relatively high level of non-auto use in the summer due to high pedestrian activity. Sierra Park Road has a relatively high level of non-auto use during the school season.

Transit service in the Mammoth Lakes area is provided primarily by the Eastern Sierra Transit Authority (ESTA) within the Town and by the Mammoth Mountain Ski Area. Bicycle racks are currently provided on the Town Trolley system. Transit ridership trends in Mammoth are generally increasing. According to ridership data from 2008 through 2010, the highest ridership on the Dial-A-Ride, Town Lift, and Trolley combined typically occurs during the summer months. The total combined ridership has increased over the last three years to a monthly maximum of approximately 54,313 in August, 2010. The total combined ridership in the winter has also increased to a monthly high of approximately 36,465 in January, 2011. Additionally, according to shuttle ridership data provided by Mammoth Mountain Ski Area for the 2009/2010 winter season, the Red Line carries more riders than the Blue, Yellow, and Green Lines combined. Total ridership on the Red Line (which runs between the Main Lodge, The Village, and Snowcreek Athletic Club) is reported to be just under 90,000 during the peak winter month.

Existing Paved Multi-Use Path Usage

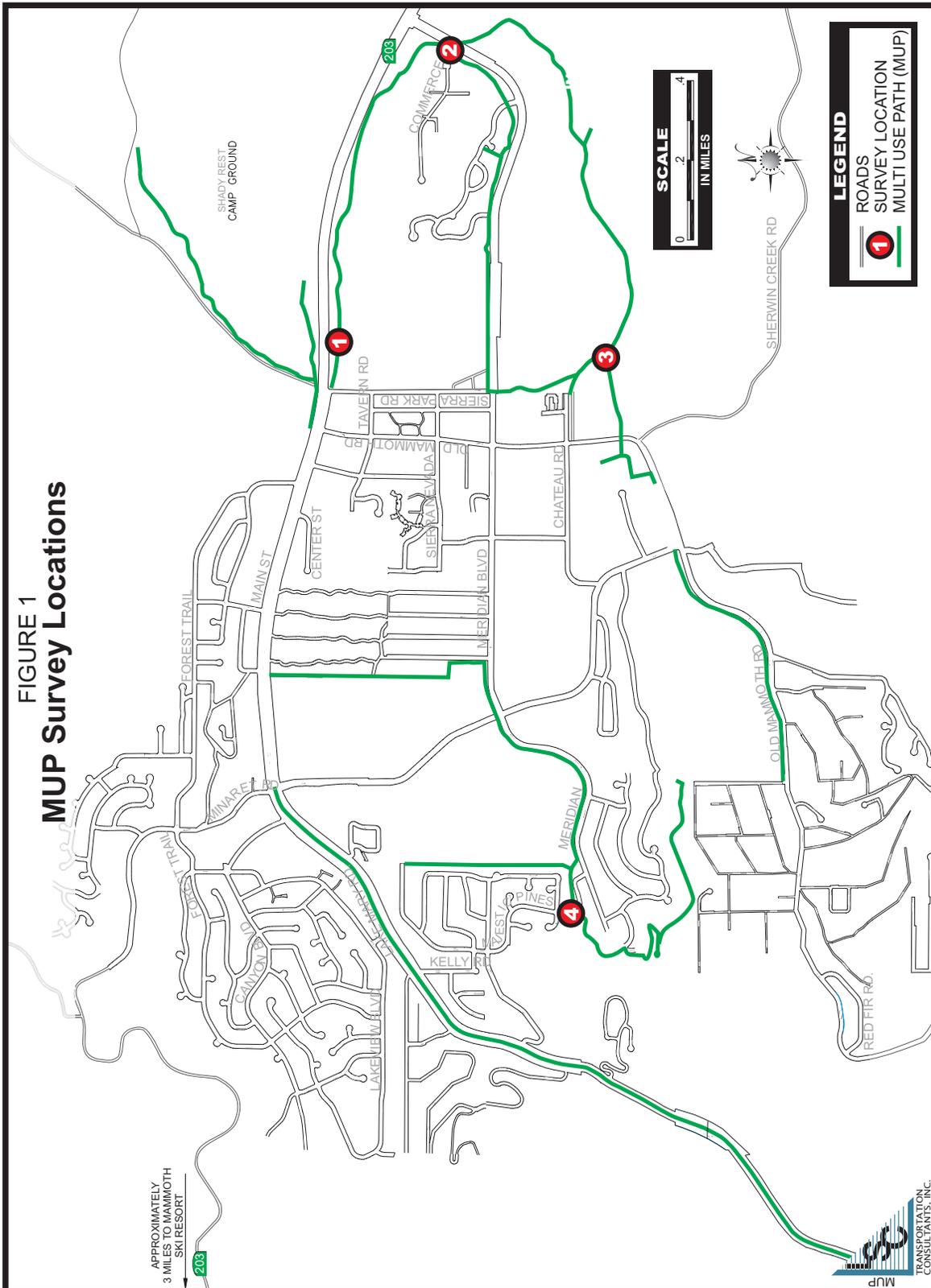
There are approximately 13.8 miles of existing paved multi-use path (MUP) in the Mammoth Lakes area. The paved MUPs are Class I facilities, which are defined as paths providing for bicycle and pedestrian travel on a paved right-of-way completely separated from any street or highway. MUP usage levels during the summer and winter seasons are described.

Summer MUP Use

Summer MUP users were surveyed and counted by Town staff at the following four sites along the existing paved MUP during August, 2010:

- Site #1 – MUP on south side of Main Street between Sierra Park Road and RV Park
- Site #2 – MUP immediately south of Commerce Drive, west of Meridian Boulevard (between skate park and tunnel under Meridian Boulevard)
- Site #3 – MUP near Mammoth Creek Road next to Creek (east side of OMR)
- Site #4 – MUP that crosses Majestic Pines Drive (near Eagle Lodge parking area)

The site locations are illustrated in Figure 1. First, the intercept survey results are summarized. Next, the user counts are summarized and the existing usage level on the paved MUPs in the summer season is estimated.



Trail User Surveys

Trail user intercept surveys were conducted by Town staff at the four MUP sites shown in Figure 1 from Saturday through Tuesday, August 14-17, 2010. The survey questions and survey results are included in Appendix A. There were a total of 106 respondents. General conclusions of the survey are as follows:

- About 33 percent of paved MUP users are riding bicycles.
- About 46 percent of paved MUP users travel on the MUP alone, about 25 percent travel in a group of two, and the remaining 29 percent were traveling in groups of 3 or more. The average reported group size is about 2. Note that the average group size for bicyclists is approximately 3, while the average group size for pedestrians is about 2.
- Most paved MUP users (about 91 percent) use the MUP for recreational trips.
- Most paved MUP users (about 66 percent to 70 percent) walk or bike to/from the trail. Approximately 23 percent of MUP users drive to/from the trail, and 5 to 8 percent get dropped-off/picked-up. Only 2 to 3 percent access the trail via transit (bus/trolley).
- Approximately 19 percent of bicyclists on the paved MUP arrive by car, and about 49 percent of pedestrians using the MUP arrive by car.
- Of the paved MUP users who drive to the trail, over one-quarter (27 percent) park at Mammoth Creek Park, and almost one-quarter (23 percent) park at Shady Rest Campground. About 15 percent park along Mammoth Creek Road. The remaining 35 percent park at other locations throughout Town.
- If the paved MUP did not exist, about 44 percent of paved MUP users would ride their bike along the road, 33 percent would not make the trip, and 18 percent would drive instead. Only 3 percent would use transit, and 2 percent would walk elsewhere.

Trail User Counts

Summer trail user counts were conducted by Town staff at the four sites along the existing MUP on Monday and Tuesday, August 16-17, 2010, between approximately 8:00 AM and 5:00 PM. In addition, traffic counts and MUP user counts were conducted on Saturday, August 21, 2010 at the existing MUP crossing on Majestic Pines Drive from 10:00 AM to 12:00 PM and at the existing MUP crossing on Commerce Drive from 1:00 PM to 3:00 PM. The count data is contained in Appendix B.

Based upon a review of the count data, the total number of MUP users at the four key locations during the summer peak hour of trail use is about 135, 33 percent of which (45) are assumed to be bicyclists and the remaining 90 are pedestrians. (For the purposes of this analysis, skateboarders and others not riding bicycles are considered to be pedestrians.) Some trail users could have been double-counted at multiple locations, or counted twice at the same location if they made a trip out and back during the count period. It is assumed that approximately 15 percent of bicyclists and 10 percent of pedestrians were double-counted. Conversely, some paved MUP users were not counted at all if they didn't pass one of the count sites. The number of MUP users counted at the key locations is estimated to reflect about 75 percent of total existing paved MUP bicyclists and 40 percent of total existing paved MUP pedestrian users. Based

upon these factors, the total existing paved MUP use during the busiest hour of trail use is estimated to be about 50 bicyclists and 200 pedestrians, for a total of about 250 MUP users.

The estimated daily-to-peak hour use factor for a Class I MUP is approximately 6.54, based upon the *Tahoe Region Bicycle and Pedestrian Use Models* (LSC Transportation Consultants, Inc., 2009). Multiplying the peak-hour MUP use (250) by this factor (6.54) yields a total of about 1,635 users per day on the paved MUP.

Winter MUP Use

During the winter, up to 2.5 miles of the MUP are intended to be groomed for cross-country skiing, 2.6 miles are cleared for mobility, and the remaining length of MUP is not maintained. Data is not available regarding the number of MUP users during the winter season; however, the level of use systemwide is expected to be considerably lower under current year conditions, due to the fact that many parts of the MUP system are not currently being groomed or cleared during winter months.

Review of Accident Records

Historical accident records from the most recent ten-year period for which data is available (1999-2009) were obtained from the California Statewide Integrated Traffic Records System (SWITRS) for the following roadway segments:

- Main Street (SR 203) from Minaret Road to Meridian Boulevard
- Minaret Road (SR 203) from Mammoth Knolls Drive to Main Street
- Minaret Road from Meadow Lane to Old Mammoth Road
- Lake Mary Road from Juniper Road to Minaret Road
- Majestic Pines Drive from Meridian Boulevard to Monterey Pine Road
- Old Mammoth Road from Tamarack Street to Chateau Road
- Meridian Boulevard from Sierra Park Road to Main Street
- Commerce Drive within 300 feet of Meridian Boulevard
- Forest Trail from Hillside Drive to Minaret
- Sawmill Cutoff within 500 feet of Main Street

These roadway segments were selected because they encompass the potential locations for pedestrian and bicycle crossing improvements discussed in the TSMP. The accident data is summarized in Table 1. A total of 35 incidents involving pedestrians or bicyclists were reported over the ten-year period, with 33 persons injured. No pedestrian or bicyclist fatalities were reported. All of the reported incidents occurred on the roadways, not on the MUPs. Some roadways listed above are not included in the table, as no incidents involving pedestrians or bicyclists were reported at these locations. The roadway location with the highest average number of incidents per year (approximately 1.6) is the segment of Main Street between Old Mammoth Road and Lupin Street.

Accidents from the most recent five-year period (2004-2009) are also included in the table. A total of 14 incidents involving pedestrians or bicyclists were reported over the five-year period, with 14 persons injured. The highest average number of incidents per year on any one roadway segment or intersection was 0.8, which is half of the annual rate over the ten-year period.

TABLE 1: Bicycle and Pedestrian Accident Records						
	10-year Period (1999-2009)		5-year Period (2004-2009)		Average Accident Rate (Accidents/Year)	
	Accidents	Injuries	Accidents	Injuries	10-year period	5-year period
Bicycle Incidents						
Main St. between Old Mammoth Rd and Lupin St.	11	11	2	2	1.1	0.4
Main St. between Minaret Rd and Lupin St.	0	0	0	0	0	0
Intersection of Minaret Rd and Main St	3	3	3	3	0.3	0.6
Old Mammoth Rd between Chateau Rd and Minaret Rd	7	7	2	2	0.7	0.4
Intersection of Minaret Rd and Forest Trail	1	0	1	0	0.1	0.2
Intersection of Minaret Rd and Canyon Blvd	0	0	0	0	0	0
Intersection of Meridian Ave and Sierra Park Rd	1	1	1	1	0.1	0.2
Commerce Drive	0	0	0	0	0	0
Sawmill Cutoff North of Main St	0	0	0	0	0	0
Majestic Pines Dr	0	0	0	0	0	0
Lake Mary Rd	0	0	0	0	0	0
Minaret Rd from Meadow Ln to Old Mammoth Rd	0	0	0	0	0	0
<i>Subtotal Bicycle Incidents</i>	23	22	9	8	2.3	1.8
Pedestrian Incidents						
Main St. between Old Mammoth Rd and Lupin St.	5	4	2	2	0.5	0.4
Main St. between Minaret Rd and Lupin St.	4	3	1	1	0.4	0.2
Intersection of Minaret Rd and Main St	1	1	1	1	0.1	0.2
Old Mammoth Rd between Chateau Rd and Minaret Rd	1	1	0	0	0.1	0
Intersection of Minaret Rd and Forest Trail	0	0	0	0	0	0
Intersection of Minaret Rd and Canyon Blvd	1	2	1	2	0.1	0.2
Intersection of Meridian Ave and Sierra Park Rd	0	0	0	0	0	0
Commerce Drive	0	0	0	0	0	0
Sawmill Cutoff North of Main St	0	0	0	0	0	0
Majestic Pines Dr	0	0	0	0	0	0
Lake Mary Rd	0	0	0	0	0	0
Minaret Rd from Meadow Ln to Old Mammoth Rd	0	0	0	0	0	0
<i>Subtotal Pedestrian Incidents</i>	12	11	5	6	1.2	1.0
TOTAL	35	33	14	14	3.5	2.8
Note: No Bicyclist or pedestrian fatalities were reported. Source: California Statewide Integrated Traffic Records System.						
						MammothAccidentSummary.xls

Existing At-Grade Multi-Use Path Crossing Locations

There are 16 existing at-grade paved MUP crossing locations, as follows:

1. Sawmill Cutoff north of Main Street
2. Commerce Drive
3. Wagon Wheel Road East
4. Wagon Wheel Road West
5. Mammoth Elementary School Driveway
6. Mammoth Middle School Eastern Driveway
7. Mammoth Middle School Western Driveway
8. Meridian Boulevard at Sierra Park Road
9. Minaret Road at Meridian Boulevard
10. Sierra Star Parkway at Meridian Boulevard
11. Lodestar Drive at Meridian Boulevard
12. Majestic Pines Drive
13. Mammoth Creek Road south of Sierra Park Road
14. Golden Creek Road at Old Mammoth Road
15. Driveway immediately east of Club Drive at Old Mammoth Road
16. Club Drive at Old Mammoth Road

Crosswalks are provided at most locations. In general, the crossing treatments provided at the existing at-grade MUP crossings are considered to be adequate, with the exception of one potential driver sight distance concern, as follows.

Existing Driver Sight Distance

Driver sight distance is a key factor in traffic safety issues. Stopping sight distance is the distance required by the driver of a vehicle to bring his/her vehicle to a stop after an object on the road becomes visible. This is the minimum distance needed for a driver to see an object in his/her path (such as a pedestrian crossing the roadway) and safely come to a stop. Stopping sight distance is measured from the driver's eyes, which are assumed to be 3.5 feet above the pavement surface, to an object 0.5-foot high on the road. Stopping sight distance was reviewed at the existing paved MUP crossing locations. There is one existing crossing location with a driver sight distance concern.

There is an existing MUP crossing along Majestic Pines Drive between Meridian Boulevard and Monterey Pine Road. The stopping sight distance provided for drivers traveling northbound along Majestic Pines Drive is limited by the horizontal curvature along the roadway and the existing embankment and vegetation. According to Caltrans standards, the stopping sight distance for drivers along Majestic Pines Drive should be at least 150 feet, based upon a design speed of 25 miles per hour. Only about 85 feet of stopping sight distance is provided for northbound drivers approaching the MUP crossing, based upon a survey performed by Town staff. This is about 65 feet short of the minimum requirement. Furthermore, the stopping sight distance during the non-winter months could be less than 85 feet when the vegetation is in bloom. This is considered to be an existing safety deficiency.

Note that approximately 250 feet of stopping sight distance is provided for southbound drivers approaching this MUP crossing. This exceeds the minimum requirement by about 100 feet, and is therefore considered to be adequate. No additional driver sight distance deficiencies are identified.

Existing Parking Conditions at Recreational Nodes

An inventory of parking spaces available at existing recreational nodes was provided by Town staff. Table 2 presents a summary of the results. In addition, parking counts were performed by Town staff at two popular winter recreation areas (Shady Rest Area and Sherwin Creek Borrow Pit Area) during various periods in the afternoons between Monday December 27, 2010 and Thursday January 6, 2011. The count results are contained in Appendix C.

The highest number of parking spaces observed to be occupied at any one time during the data collection period in the Shady Rest and Welcome Center parking lots was a total of 44, which occurred on Tuesday, December 28 at about 1:00 PM. This includes vehicles, vehicles with trailers, as well as stand-alone trailers. The maximum number of vehicles observed to be parked at one time, excluding trailers and vehicles-with-trailers, was 28. Assuming the two count locations represent about 70 percent of the total existing non-motorized groomed trail users during the count periods, the total existing non-motorized groomed trail usage in this area equates to about 39 vehicles parked at one time. This is a conservative estimate, considering that some of the vehicles without trailers are actually associated with the motorized trails.

The highest number of vehicles observed to be parked in the Borrow Pit area at one time was 17, which occurred on Tuesday, December 28 at about 1:30 PM. This included one vehicle with a trailer. A maximum of two vehicles with trailers were observed to be parked at one time, at about 1:30 PM on Tuesday, January 4, 2011.

STANDARDS OF SIGNIFICANCE

Based on a review of State CEQA Guidelines, Appendix G, as well as local and regional standards, the following standards of significance are defined for this analysis. The project would have a significant impact on transportation and circulation if it:

1. Causes intersection and roadway conditions to exceed the Level of Service (LOS) standards.
2. Results in a significant increase in Vehicle-Miles Traveled (VMT).
3. Substantially increases hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
4. Conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreases the performance or safety of such facilities.
5. Results in inadequate parking conditions.

The project alternatives are evaluated against these standards of significance.

TABLE 2: Town of Mammoth Lakes - Parking Inventory at Recreation Nodes

GIC ¹	Parking Area	Summer	Winter	Formal Parking Spaces			Informal Parking Areas		Notes
				Standard	Disabled	Bus/RV	Area Type	Minimum Number of Spaces	
13	Canyon Lodge (MMSA)		x	990					300 in Canyon Lodge lots, 690 on-street spaces.
14	Eagle Lodge (MMSA)	x	x	550					250 in Eagle Lodge lot, 300 on Meridian Blvd.
46	Main Lodge (MMSA)	x	x	1760					985 in lots, 775 on Minaret Rd.
195	Community Center Park	x	x	48	3	0	Dirt Shoulder	2-3	Dirt shoulder is near tennis courts
134	Mammoth Creek Park, East	x	x	0	0	0	Dirt parking	at least 20	20+ parking spaces available along Creek Road. Approximately 15 new spaces are anticipated in the future.
152	Mammoth Creek Park, West	x	x	42	2	0	Shoulder		Parking also available on shoulder of Old Mammoth Rd.
97	Shady Rest Town Park	x	x	158	7	0	Dirt Shoulder	15	Striping fading in lot. Dirt shoulder near skate park fits about 15 cars on both sides.
193	Trails End Park	x	x	24	2	0			
42	Earthquake Fault	x	x	19	2	2			Faded paint and no signage for ADA parking.
44	Power Plant, North side of 203		x	0	0	0			Clean empty lot. A lot of dirt parking off the road. Approximately 15 new spaces are anticipated in the future.
192	Winter Closure on Sawmill Cutoff Road		x	33	0	2			Appears that former ADA space has been repainted as standard space.
163	Sherwin Creek Road, Borrow Pit	x	x	0	0	0	Large Dirt Area	at least 50	Large dirt area. Construction taking place. Approximately 15 new spaces are anticipated in the future.
64	Sierra Blvd at Forest Trail	x	x	0	0	0	Dirt Shoulder	1-2	Approximately 15 new spaces are anticipated in the future.
28	Old Mammoth Road at Mill City		x	0	0	0	Dirt Pull-out	5-10	
38	MMSA at Austria Hof Parking Lot	x		0	0	0	Paved, Unstriped	30-40	Empty paved parking lot signed "parallel parking only".
41	Lake Mary Bike Path NE Terminus	x		0	0	0	Large Lot		Construction - unable to gather data
27	Tamarack Street	x	x	0	0	0	Dirt Shoulder	2-3	
48	Mountain View Trail			0	0	0	Dirt Pull-out	20-25	
52	Sledz - North side of SR 203, across from MMSA garage		x	0	0	0	Dirt Parking lot	20-30	Empty dirt lot. Can fit 20 to 30 cars without snow.
158	Path Along Snow Creek V Fenceline		x	0	0	0		0	No Parking - Private Property
43	Uptown Trail jurisdictional change to MMSA			0	0	0		0	No parking to all associated, some cars parked on Minaret Rd.

Note 1: GIC numbers correspond to numbers on Figures A-2 to A-5 in the TSMP.

Source: LSC Transportation Consultants, Inc. and Town Staff.

Parking Areas.xls

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ALTERNATIVE ONE - PROPOSED PROJECT/2009 TSMP

Potential transportation impacts associated with full buildout of the proposed 2009 TSMP improvements are evaluated under summer and winter conditions. Specifically, the following items are evaluated:

- Traffic impacts are assessed in terms of trip generation and traffic operations of intersections and roadways throughout Town. Traffic impacts are also evaluated for the project construction phases.
- Project impact on Vehicle-Miles Traveled (VMT)
- Project impact on driver sight distance
- Project impact on pedestrian crossing conditions
- Project's consistency with other planning documents and studies
- Impact on parking conditions

In addition, the interface between the proposed trail system and the transit system is addressed.

Traffic Impacts

Potential traffic impacts associated with the proposed 2009 TSMP are evaluated for both summer and winter conditions.

Summer Traffic Impacts

First, the potential increase in summer paved MUP trail users is estimated, in order to analyze the traffic impacts of the additional paved MUP trails. Next, the summer traffic impacts of the proposed unpaved trails are also assessed. Finally, the summer traffic impacts of the entire TSMP are summarized.

Potential Increase in Paved MUP Trail Users

The proposed TSMP includes approximately 10.1 miles of new paved MUP trail. The 0.75-mile segment of this trail between Old Mammoth Road and the Snowcreek VIII Access/Egress Point (TSMP MUP Project No. 4-5) is also included in the Sherwins Area Recreation Plan (SHARP) proposal. However, the SHARP proposal (SHARP Summer Map ID #7) describes the trail as a hard-surface or paved trail that would be ADA-accessible and open to non-motorized use only, with specific use dependent on trail surface. The SHARP includes an additional 1.2-mile ADA-accessible multi-use trail (hard-surface or paved trail) running from the Snowcreek VIII Access/Egress Point to Tamarack Street that is not reflected in the TSMP MUP Project list. For the purposes of this study, these multi-use trails are assumed to be paved, in order to analyze a worst-case scenario with respect to traffic and parking impacts. As such, the total length of new paved MUP trails is assumed to equal about 11.3 miles (10.1 miles in TSMP plus an additional 1.2 miles in SHARP).

Adding the new 11.3 miles of MUP to the existing 13.8 miles yields a total proposed paved MUP trail length of approximately 25.1 miles. This equates to an increase in total paved MUP trail mileage of about 182 percent. In order to forecast the future total use with implementation of the proposed TSMP, it is necessary to consider the relative growth in trail use that would accompany the growth in the trail network mileage. On one hand, the fact that the existing trail system already serves those most likely to desire to use a paved MUP argues that this ratio would be less than 1.0 (growth in trail use would be less than the growth in trail mileage). On the other hand, some of the proposed TSMP projects would provide better quality connections between existing trail elements and directly serve additional residential

neighborhoods, which argues that there would be a "synergetic effect" whereby trail use would increase at a rate greater than the growth in trail mileage. On balance, trail use is expected to grow roughly in proportion to the relative growth in trail mileage.

Multiplying the highest existing summer hour of paved MUP trail use (250 users) by a factor of 182 percent (or 1.82) yields a total forecast future use of roughly 450 users during the busiest hour, comprised of about 90 bicyclists and 360 pedestrians. Multiplying this figure by the daily -to- peak hour factor of 6.54 yields a total future use of about 2,945 paved MUP users per day. Subtracting the total future use from the total existing use (1,635) yields a growth in paved MUP trail use of about 1,310 users per day, including roughly 200 users during the busiest hour of trail use (40 of which are bicyclists and 160 are pedestrians).

Traffic Impacts of Additional Paved MUPs

The potential increase in vehicle trips associated with the increase in paved MUP trail users is evaluated. The proposed TSMP is expected to result in an increase of about 40 bicyclists and 160 pedestrians using the paved MUP trails during the busiest hour of trail use. Multiplying the number of users by the proportion of users arriving by car (19 percent of bicyclists and 49 percent of pedestrians using the MUP arrive by car) and dividing by the average vehicle occupancy rate (about 3 bicyclists per car and 2 pedestrians per car) yields an increase of about 3 vehicles for bicyclists and 39 vehicles for pedestrians. Therefore, an increase of about 42 vehicles is associated with the increase in trail users during the busiest hour of summer trail use. Assuming half of the trail users stay on the trails for more than an hour, about 42 vehicle trips arriving at the trails and 21 vehicle trips departing the trails, or a total of 63 one-way vehicle trips, are associated with the increase in MUP users parking during the busiest summer hour of trail use.

In addition, about 3 percent of bicyclists and 11 percent of pedestrians are dropped off at the paved MUP trails. Multiplying the number of users by the proportion dropped off and dividing by the respective average vehicle occupancy rate yields an increase of about 9 vehicles dropping off MUP trail users. As each drop off generates two one-way vehicle trips, the total increase in one-way trips generated by vehicles dropping off trail users is about 18 trips. Assuming half of the trail users dropped off are also picked up during the busiest hour, about 9 one-way trips are generated by vehicles picking up trail users, for a total of about 27 one-way trips. Adding the 63 one-way vehicle trips generated by MUP users who park at the trails to the 27 vehicle trips generated by MUP users being dropped off and picked up totals about 90 additional peak-hour one-way vehicle trips generated by the increase in MUP trail users.

Traffic Impacts of Additional Unpaved Trails

The 2009 TSMP includes potential soft-surface trails, especially in the Knolls area and in the Shady Rest area. Many of these trails or routes currently exist and are already used informally. The proposed soft-surface trail system includes formalization of some additional loop trails that are relatively close to the urbanized area, as well as provision of a higher density of trail links. This could result in a higher level of use at select trailheads. The level of trail use could be managed by how the public is provided with information regarding the trailhead. The proposed project description contains nothing to indicate an undue traffic impact would result at any one location. Considering that these trails are more like neighborhood trail systems compared to other hiking attractions in the Mammoth area (such as trails near alpine lakes), the Town-wide traffic and parking impacts associated with these potential soft-surface trails is expected to be minimal.

The SHARP proposes to construct a network of soft-surface trails, as well as improved staging areas for motorized and non-motorized use trails. Many of the soft-surface trails are already used informally. The proposed trails would improve existing trail alignments and provide connectivity between existing trails. The total length of new trails that are not currently used informally is estimated to be roughly 8 miles. Conversely, the SHARP proposes to consolidate or close some existing trails, such as some less-sustainable trails in the meadow. Implementation of the proposed soft-surface trail network is not expected to result in a significant Town-wide traffic impact, as the traffic impacts would be widely-distributed. Whether any one of the new trailheads or trail connections on its own would generate a substantial increase in trail users is a function of marketing strategies. That is, the level of trail use could be managed by how the public is provided with information regarding the trailhead. The proposed project description contains nothing to indicate an undue traffic impact would result at any one location. Although some loop trails or connectors (such as Mammoth Rock) and areas where parking improvements are provided could result in higher use at certain trailheads, the Town-wide increase in vehicle trips generated by the proposed soft-surface trails is expected to be minimal.

Implementation of the SHARP could possibly close a few USFS roads to motorized vehicles. Note that any potential closure would be pending decision by USFS, as well as potential amendment of their Travel Management Program. On the other hand, the SHARP would allow OHV's to stage at the Borrow Pit and travel along the entire length of Sherwin Creek Road from the Borrow Pit to US 395. As a result, some OHV users that currently park at other staging areas are expected to shift to the Borrow Pit parking area. No summer count data is available regarding OHV use. However, it is estimated that implementation of the SHARP would result in a modest increase in hourly traffic volumes of about 15 vehicle trips.

Summary

The 2009 TSMP and SHARP propose to add just over 11 miles of paved or hard-surface MUP trails, provide new and improved soft-surface trails, improve the trail connectivity throughout Town, provide additional sidewalks, and implement about 18 miles of new Class II bike lanes. The new bike lanes would improve bicycle commuter routes and improve access to shopping areas and other destinations. Note that no additional Class III bike routes, which are bicycle routes providing for shared use with bicyclists and motor vehicle traffic and typically identified only by signage, are proposed.

Implementation of these improvements is expected to increase the portion of trips made in Mammoth via non-auto modes during the non-winter months. Additionally, the portion of MUP users driving to/from the trails would generally decrease, as the MUP would be easier to access from the various neighborhoods by non-auto means. Conversely, the improved trail system and facilities could increase the number of persons using the trails and facilities, which could increase the number of vehicle-trips occurring over the course of a busy day as trail users drive to and from trailheads.

Implementation of the proposed TSMP and SHARP could conservatively generate an increase on the order of approximately 100 one-way vehicle trips throughout Town during the busiest summer hour of trail use. It is conservatively assumed that the busiest hour of trail use coincides with the summer peak hour of traffic activity in Mammoth, which generally occurs on weekend afternoons. Considering that the project-generated trips would be distributed to the various trailhead locations, and because the overall number of trips is small in comparison to the overall growth in traffic generated by other growth and development, no significant traffic impacts are expected to result at any one location due to implementation of the trails system. In addition, the provision of the additional pedestrian, bicycle, and

transit facilities included in the proposed TSMP and the SHARP would result in a general increase in non-auto travel, which would offset the increase in vehicle trips to some degree. No significant impact on overall traffic operations during the summer season is anticipated. The proposed project is not expected to cause intersection and roadway conditions to exceed adopted standards.

Winter Traffic Impacts

The potential increase in winter trail use is estimated, in order to analyze the traffic impacts of the proposed winter trails. First, the traffic impacts of the proposed improvements in the Shady Rest area are evaluated. Next, the traffic impacts of the SHARP Winter Proposal are assessed. Finally, the overall traffic impacts of the 2009 TSMP and SHARP during the winter season are summarized.

Shady Rest Area

The existing Shady Rest cross-country area includes about 4.5 miles of trails. Approximately 2.5 miles of the existing paved MUP from the tunnel near Shady Rest to the south is also intended to be groomed, for a total of about 7.0 miles of groomed trails. In addition, about 2.6 miles of MUP are intended to be cleared in winter for pedestrian use. As mentioned in the existing conditions section, many parts of the paved MUP system are not currently being groomed or cleared during winter months.

The 2009 TSMP includes approximately 2.7 miles of new groomed non-motorized trails in this area. The increase in total trail mileage is estimated to be about 58 percent. In order to forecast the future total use in this area with implementation of the proposed TSMP, it is necessary to consider the relative growth in trail use that would accompany the growth in the trail network mileage. On one hand, some growth is expected considering that the proposed TSMP options, such as preferred dog walking trails, a preferred non-motorized staging area, and a new trailhead at Shady Rest Park, would improve the experience for the trail user. On the other hand, the existing trail system already serves those most likely to desire to use groomed non-motorized trails. Trail use is expected to grow by roughly half of the relative growth in trail mileage, or by a factor of approximately 29 percent. In order to remain conservative in this analysis, the growth in trail use is assumed to be about 35 percent, considering that the overall trail system is expected to become more accessible with better winter management and maintenance not only at Shady Rest, but throughout town as well. Note that the growth in trail use associated with the summer trails is greater than that of the winter trails, given that the summer trails would improve the connectivity throughout Town and directly serve additional residential neighborhoods to a greater extent than the winter trails.

Increasing the existing winter peak use associated with the groomed non-motorized trails in this area (about 39 vehicles at once) by 35 percent (or multiplying it by 1.35) yields a growth in trail use of about 14 vehicles parked at once. Assuming half of the parking spaces utilized turn over during the busiest hour, the traffic impact associated with the forecast growth in trail use is estimated to be about 7 entering trips and 7 exiting trips during the winter peak hour of trail use, or a total increase of 14 peak hour vehicle trips. This equates to a traffic generation rate of about 5 peak hour vehicle trips per new mile of non-motorized groomed trail (14 trips divided by 2.7 miles).

The TSMP includes provision of additional clearing along Sawmill Cutoff Road during the winter season, which has already been implemented (starting in 2009). The additional clearing results in improved motorized access at this location, as motorized vehicle staging is now occurring at Shady Rest Park. The Forest Service is also undertaking planning for a new OHV/OSV staging area somewhere within the Shady Rest Area. Although this improvement is not specifically called out in the TSMP, it is anticipated

to be implemented within the next three years. The new staging area is planned to accommodate approximately 25 vehicles, and it will include some spaces for vehicles with trailers.

Sherwins Area (SHARP)

The SHARP Winter Proposal includes the following new trails in the Sherwins Area:

- Groomed non-motorized trails (approximately 5.1 miles of new trail)
- Groomed motorized trails (1.6 miles)
- Ungroomed non-motorized trails (2.1 miles)

In addition, the SHARP proposal contemplates formalization of existing snow play and dog walking activities that currently take place in the area, including potential establishment of a formal snow play area at Borrow Pit and a designated dogs off-leash area in Sierra Meadows.

The traffic impacts associated with the new non-motorized groomed trails are estimated based upon the impacts associated with the proposed trails in the Shady Rest area. Multiplying the total length of new trail (about 5.1 miles) by a rate of 5 peak hour vehicle trips per new mile of trail yields an increase of about 26 vehicle trips (13 entering and 13 exiting) associated with the proposed non-motorized groomed trails during the busiest hour of trail use. Transit access could potentially be provided to the various trailheads in the SHARP area. However, no additional reduction is applied for transit trips, in order to remain conservative in this analysis.

The proposed motorized groomed trails are expected to generate a modest increase in vehicle trips, considering that use by snowmobilers already occurs in this area. Any increase in traffic resulting from the formalization of the other recreational facilities, such as the snow play area and designated dog area, is expected to be minimal, considering that this area is currently utilized under existing conditions. For the purposes of this analysis, a total of about 20 new vehicle trips are estimated to be generated by the proposed motorized groomed trails and by the formalization of the other recreational facilities during the winter peak hour of trail use.

Summary

Implementation of the 2009 TSMP and SHARP could generate an increase on the order of about 46 one-way vehicle trips throughout Town during the busiest winter hour of trail use. It is conservatively assumed that the busiest hour of trail use coincides with the winter peak hour of traffic activity in Mammoth, which generally occurs between 4:00 PM and 6:00 PM. Although the project-generated trips would be more concentrated at the Shady Rest and Borrow Pit access points, no significant Town-wide traffic impacts would result from the project. The proposed project is not expected to cause intersection and roadway conditions to exceed adopted standards during the winter season.

Traffic Impacts During Construction

Traffic impacts due to the construction phases of the TSMP project are considered. Long-term roadway closures are not expected to occur during construction of the project. Construction activities may occur at multiple locations concurrently. However, any potential transportation impacts associated with the project construction activities at any one time are expected to be modest. Project-specific construction management plans will be analyzed for each project location as well.

Impact on Vehicle-Miles Traveled

The project's impact on Vehicle-Miles Traveled (VMT) is evaluated for both summer and winter conditions. The effect of the proposed project on VMT in Mammoth is dependent on the total trip generation and the length of these vehicle trips.

Summer Vehicle-Miles Traveled

Implementation of the 2009 TSMP project is not expected in and of itself to significantly increase the number of persons visiting the Mammoth area from other communities or other regions on a busy summer day, as world-class hiking trails are already provided in the Mammoth area. Although there may be a net increase in trail activity associated with the proposed trail improvements, new trail networks would be provided in the urbanized area, which would result in relatively short vehicle trips. Some trips that are currently made to trails or to other activities outside the urbanized area would shift to the new trails in or near the urbanized area. This would result in a reduction in the average trip length associated with the trails, thereby reducing total VMT.

The increase in VMT generated by the increase in vehicle trips associated with the new trails is expected to be roughly offset by the reduction in VMT resulting from the provision of trails near the urbanized area, improved neighborhood access, and improved multi-modal infrastructure, which will encourage non-auto travel throughout Town, thereby reducing trips. Overall, the proposed project is not expected to result in a significant increase in VMT over the course of a summer day.

Winter Vehicle-Miles Traveled

Similar to summer conditions, implementation of the proposed project is not expected to significantly increase the number of persons visiting the Mammoth area from other communities or other regions on a busy winter day, as the existing trails already serve those wishing to recreate. Although there may be a net increase in trail activity associated with the proposed trail improvements, new trail networks would be provided in the urbanized area, which would result in relatively short vehicle trips. Some trips that are currently made to trails outside the urbanized area would shift to the new trails in or near the urbanized area. This would result in a reduction in the average trip length associated with the trails, thereby reducing total VMT.

The increase in VMT generated by the increase in vehicle trips associated with the new trails is expected to be roughly offset by the reduction in VMT resulting from the provision of trails closer to the urbanized area and the increase in non-auto mode travel throughout Town. Overall, the proposed project is not expected to result in a significant increase in VMT over the course of a winter day.

It is worth noting that the increase in traffic volumes resulting from the TSMP project would be highest during the summer season, which does not coincide with the peak season of traffic activity in the Mammoth area (traffic volumes in Mammoth are generally highest in the winter season).

Driver Sight Distance

Driver stopping sight distance was reviewed at the proposed at-grade MUP crossing locations. In general, adequate driver sight distance is expected to be provided with the proposed project, with the exception of

one crossing location. There is an existing safety deficiency at the MUP crossing along Majestic Pines Drive between Meridian Boulevard and Monterey Pine Road. As discussed in the existing conditions chapter of this study, the stopping sight distance provided for drivers traveling northbound along Majestic Pines Drive is limited by the horizontal curvature along the roadway and the existing embankment and vegetation. As the proposed project is expected to result in an increase in the number of MUP users at this location, it would therefore exacerbate the existing safety deficiency. This is considered to be a significant impact. It is recommended that the proposed plans be modified to provide at least 150 feet of stopping sight distance for northbound drivers approaching this crossing. This could be accomplished by modifying the MUP trail alignment and/or modifying the existing landscaping and embankment. With this improvement, the 2009 TSMP project would provide adequate driver sight distance.

Trail Crossing Conditions

Table 4-8 of the 2009 TSMP includes intersection locations that are important to existing and future in-town trail access, as well as potential intersection and crossing improvements. The TSMP recommends that an engineering analysis be conducted of all pedestrian crossings in order to identify where improvements are needed most. Note that this recommended engineering analysis is not included in the scope of this EIR study, as the intersection and crossing improvements are a function of future growth and development throughout Town (especially in the North Village area), and they are not necessarily tied to the proposed TSMP project. The 2009 TSMP also provides design guidelines for the application of various crossing treatments, which are widely based upon guidelines provided by the American Association of State Highway Transportation Officials (AASHTO) and by the Caltrans Highway Design Manual.

In general, all crossing conditions are expected to be adequate with implementation of the proposed TSMP, with the exception of the driver sight distance deficiency identified along Majestic Pines Drive, and with further study warranted at the intersections along Minaret Road in the North Village area. The proposed project is not expected to result in a significant impact on trail crossing conditions, with the exception of the driver sight distance impact on Majestic Pines Drive. With the recommended modification of the existing MUP crossing along Majestic Pines Drive in order to improve driver sight distance, and with provision of an engineering analysis of all pedestrian crossings, the proposed project would provide adequate trail crossing conditions.

Project Consistency with Other Planning Documents and Studies

The project's consistency with the following documents is evaluated:

- Main Street South Frontage Road Project and Promenade Walkway
- Main Street Signal Feasibility Study
- Caltrans SR 203 Transportation Concept Report
- Minaret Road Alignment Study
- Mobility Report

Main Street South Frontage Road Project and Promenade Walkway

This Caltrans project includes the following key improvements to pedestrian and bicycle facilities along the South Frontage Road from Callahan Way to Manzanita Street:

- Four new crosswalks crossing the South Frontage Road
- Class 2 bike lanes along both sides of the South Frontage Road
- New sidewalk along the north side of the South Frontage Road

In addition, a new promenade walkway would be constructed along the north side of Main Street from Laurel Mountain Road to Old Mammoth Road, and it would tie-in to the existing walkways at these two locations. No inconsistencies are identified between this Caltrans project and the proposed TSMP project. However, it should be noted that the TSMP proposes a Class 2 bike lane along the segment of Main Street where the new promenade walkway is planned. This new bike lane along the north side of Main Street is not reflected in the Caltrans plans.

Main Street Signal Plan Feasibility Study

The SR 203 Mammoth Signal Plan Feasibility Study proposes to extend the central two-way left-turn lane (TWLTL) along Main Street from Minaret Road to the point where the existing TWLTL ends east of Manzanita Road. Two alternatives involving new traffic signals were analyzed, but neither alternative was recommended to be implemented. No inconsistencies with the proposed TSMP are identified.

SR 203 Transportation Concept Report

The Caltrans SR 203 Transportation Concept Report (TCR) was reviewed, and no inconsistencies with the proposed TSMP project are identified.

Minaret Road Alignment Study

The Minaret Alignment Study includes a roundabout at the Minaret Road/Forest Trail intersection that is designed to accommodate pedestrians. Sidewalks are included along both sides of Minaret Road. A new pedestrian crossing is included at a point on Minaret Road about 260 feet south of the existing mid-block crosswalk. This new crossing aligns with the proposed South Hotel improvements. The existing mid-block crosswalk and the adjacent driveway to the parking lot on the east side of Minaret Road would be eliminated. No inconsistencies are identified between the Minaret Alignment Study and the TSMP project, except the TSMP proposes Class 2 bike lanes along Minaret Road and along Forest Trail, which are not included in the Minaret Alignment Study.

Mobility Plan

The bicycle and pedestrian improvements included in the Mobility Plan were reviewed. There are several locations where the Mobility Plan calls for Class 2 bike lanes, but the proposed TSMP calls for Class 3 bicycle routes. Conversely, the Mobility Plan does not identify any improvements along the segment of Canyon Boulevard from Lakeview Boulevard through the Canyon Lodge parking area, but the proposed TSMP calls for a Class 2 bike lane.

Parking Impacts

The project's impact on parking demand during summer and winter conditions is estimated. The proposed increase in parking supply is summarized. Finally, conclusions and recommendations are made regarding overall parking conditions.

Summer Parking Demand

Parking Demand of Additional MUP Trail Users

The increase in parking demand associated with the increase in paved MUP trail users is evaluated. The proposed TSMP is expected to result in an increase of about 40 bicyclists and 160 pedestrians using the MUP trails during the summer peak hour. Multiplying the number of users by the proportion of users arriving by car (19 percent of bicyclists and 49 percent of pedestrians using the MUP arrive by car) and dividing by the average vehicle occupancy rate (about 3 bicyclists per car and 2 pedestrians per car) yields an increase in peak hour parking demand of about 3 spaces for bicyclists and 39 spaces for pedestrians. Therefore, the total increase in parking demand associated with the additional paved MUP trails is about 42 spaces.

Parking Demand of Additional Unpaved Trail Use

As discussed above, the parking impacts associated with the potential formalization and/or realignment of the soft-surface trails in the Knolls area and Shady Rest area are expected to be minimal. The proposed project description contains nothing to indicate an undue parking impact would result at any one location. Overall, the increase in parking demand generated by the proposed soft-surface trails is expected to be minimal. Implementation of the SHARP may close some USFS roads to motorized vehicles, but it would allow OHV's to stage at the Borrow Pit and travel along the entire length of Sherwin Creek Road from the Borrow Pit to US 395. As a result, some OHV users that currently park at other staging areas are expected to shift to the Borrow Pit parking area. No summer count data is available regarding OHV use. It is estimated that implementation of the SHARP would result in a modest increase in peak hour parking demand of 10 parking spaces.

Summary

The 2009 TSMP and SHARP propose to add just over 11 miles of paved or hard-surface MUP trails, provide new and improved soft-surface trails, improve the trail connectivity throughout Town, provide additional sidewalks, and implement about 18 miles of new Class II bike lanes. This is expected to increase the portion of trips made in Mammoth via non-auto modes during the non-winter months. Additionally, the portion of MUP users parking at the trailheads would generally decrease, as the MUP would be easier to access from the various neighborhoods by non-auto means. Conversely, the improved trail system and facilities could increase the number of persons using the trails and facilities, which could increase the parking demand occurring over the course of a busy day as trail users park at trailheads.

Implementation of the proposed TSMP and SHARP could conservatively generate an increase in parking demand on the order of approximately 52 parking spaces throughout Town during the summer peak hour. As this demand would be distributed to the various trailhead locations, no significant parking impacts are expected to result at any one location. Overall, provision of the additional pedestrian, bicycle, and transit facilities included in the proposed TSMP and the SHARP would result in a general increase in non-auto travel, which would offset the increase in parking demand to some degree. However, it is recommended that a total of at least 52 additional summer parking spaces be provided as a part of the proposed project.

Winter Parking Demand

As described above, the additional approximately 2.7 miles of non-motorized groomed trails proposed for the Shady Rest area are expected to result in an increase in winter parking demand of about 14 spaces. The additional 5.1 miles of non-motorized groomed trails in the Sherwins area are estimated to result in an increase of about 26 parking spaces (5.1 multiplied by 14 spaces per 2.7 miles). Up to 20 additional spaces could be associated with the new motorized groomed trails. The resulting total parking demand of the additional winter trails is about 46 spaces. It is therefore recommended that at least 46 additional winter parking spaces be provided as a part of the proposed project.

Proposed Increase in Parking Supply

With implementation of the proposed TSMP, approximately 15 new parking spaces are proposed to be provided at each of the following recreation nodes, for a total of about 60 new parking spaces:

- Mammoth Creek Park, East (Project Number 134, summer and winter)
- Power Plant, North Side of SR 203 (Project Number 44, winter only)
- Sherwin Creek Road Borrow Pit (Project Number 163, summer and winter)
- Sierra Boulevard at Forest Trail (Project Number 64, summer and winter)

In addition, the following new parking spaces are proposed to be constructed in the Sherwins Area:

- Three to six parking spaces at the end of Tamarack Street (SHARP Winter Project ID #5c)
- Expanded parking area at Old Mammoth Road winter closure/Mill City (SHARP Winter ID #6 and Summer ID #4)
- Develop a new parking area at the Lake Mary Road winter closure (SHARP Winter Project ID #16)

Finally, the USFS currently plans to add about 25 new spaces at Shady Rest for motorized staging. These additional spaces are planned to be constructed in the near term, however they are not tied to the TSMP project.

Conclusion

Access to recreational facilities over the course of a peak day is typically limited by the amount of parking available. However, it is recommended that a total of at least 52 additional summer parking spaces and 46 additional winter parking spaces be provided as a part of the proposed project. As more than 60 new parking spaces are included in the proposed TSMP, adequate overall parking conditions would be provided.

Interface between Trail System and Transit System

Transit service in the Mammoth Lakes area is provided primarily by the Eastern Sierra Transit Authority (ESTA) within the Town, and by the Mammoth Mountain Ski Area. Bicycle racks are currently provided on the Town Trolley system. The locations of existing and proposed transit facilities are reviewed with respect to existing and proposed trailhead locations. The proposed 2009 TSMP project impact on the interface between the trail system and the transit system is addressed under summer and winter conditions. Transit service is considered to access a trailhead if a bus route is located within one-quarter

mile of the trailhead. Some existing trailheads in Mammoth, such as the Shady Rest Park trailhead, are located more than one-quarter mile away from the existing bus routes. As a part of the 2009 TSMP, bus/trolley stops are proposed to be provided at or near all summer and winter trailheads, where feasible. Therefore, the proposed project is not expected to result in a significant impact regarding the interface between the trail system and the transit system.

Future Cumulative Conditions

As discussed above, the proposed project would not significantly change traffic volumes at any one location. Although traffic volumes in Mammoth are generally expected to increase in the future, the proposed TSMP project is not expected to result in a significant impact on traffic operations under future cumulative conditions.

Summary of Recommendations for Proposed 2009 TSMP Project

In summary, with implementation of the proposed 2009 TSMP, modifications should be made in order to provide at least 150 feet of stopping sight distance for northbound drivers approaching the MUP crossing on Majestic Pines Drive between Meridian Boulevard and Monterey Pine Road. This could be accomplished by modifying the MUP trail alignment and/or modifying the existing landscaping and embankment. With this measure, adequate driver sight distance would be provided.

ALTERNATIVE TWO - NO PROJECT/NO BUILD

Potential transportation impacts associated with the “No Build” Alternative are evaluated under summer and winter conditions. The No Build Alternative assumes no additional trail improvements are implemented. The following items are evaluated under this alternative:

- Traffic impacts are assessed in terms of trip generation and traffic operations of intersections and roadways throughout Town. Traffic impacts are also evaluated for the project construction phases.
- Project impact on Vehicle-Miles Traveled (VMT)
- Project impact on driver sight distance
- Project impact on pedestrian crossing conditions
- Impact on parking conditions

In addition, the interface between the proposed trail system and the transit system is addressed.

Traffic Impacts

Potential traffic impacts of the No Build Alternative are evaluated for both summer and winter conditions.

Summer Traffic Impacts

As no additional trails would be constructed under this alternative, no increase in summer trail users is expected. As a result, there would be no increase in vehicle trips associated with the trails. The portion of trips made in Mammoth via non-auto modes during the non-winter months is not expected to change.

Additionally, the portion of MUP users driving to/from the trails would not change. No impact on traffic operations during the summer season is expected. The No Build Alternative would not cause intersection and roadway conditions to exceed adopted standards.

Winter Traffic Impacts

Under the No Build Alternative, no additional grooming of the trails would occur. As such, no increase in winter trail use is expected. Similarly, as no additional trails would be groomed for motorized access, no increase in vehicle trips would be expected to result from this type of trail improvement. No traffic impacts would result from the No Build Alternative in the winter season, and no intersection and roadway conditions would exceed adopted standards.

Traffic Impacts During Construction

As no construction work is associated with the No Build Alternative, there is no potential for construction-related transportation impacts to occur.

Impact on Vehicle-Miles Traveled

The impact of the No Build Alternative on Vehicle-Miles Traveled (VMT) is evaluated for both summer and winter conditions. The effect of the proposed project on VMT in Mammoth is dependent on the total trip generation and the length of these vehicle trips. Implementation of the No Build Alternative is not expected to increase the number of persons visiting the Mammoth area from other communities or other regions on a busy summer day, as no additional trail improvements would be provided. Given this, and considering that there would be no change in the average trip length associated with the trails, no VMT impact is expected in the summer and winter seasons.

Driver Sight Distance

Driver stopping sight distance was reviewed at the existing at-grade MUP crossing locations. In general, adequate driver sight distance is provided, with the exception of one crossing location. There is an existing safety deficiency at the MUP crossing along Majestic Pines Drive between Meridian Boulevard and Monterey Pine Road. The stopping sight distance provided for drivers traveling northbound along Majestic Pines Drive is limited by the horizontal curvature along the roadway and the existing embankment and vegetation. A detailed discussion is provided in the existing conditions chapter. It is recommended that improvements be made to provide at least 150 feet of stopping sight distance for northbound drivers approaching this crossing. This could be accomplished by modifying the MUP trail alignment and/or modifying the existing landscaping and embankment. With this improvement, the No Build Alternative would provide adequate driver sight distance.

Trail Crossing Conditions

Existing trail crossing conditions were reviewed. In general, adequate crossing conditions are provided under the No Build Alternative, with the exception of the driver sight distance concern discussed above.

Parking Impacts

The parking impacts of the No Build Alternative are evaluated. As no increase in the number of trail users is expected, and no change in the existing non-auto mode split is expected, no change in parking demand would occur during the summer season. In the winter, no additional groomed trails would be provided, and no increase in trail users is expected. Therefore, no change in parking demand would occur. Access to recreational facilities over the course of a peak day is typically limited by the amount of parking available. The No Build Alternative is considered to provide adequate overall parking conditions.

Interface between Trail System and Transit System

The locations of existing transit facilities are reviewed with respect to existing trailhead locations. Transit service is considered to access a trailhead if a bus route is located within one-quarter mile of the trailhead. Some existing trailheads in Mammoth are located more than one-quarter mile away from the existing bus routes. No additional bus/trolley service or transit facilities are proposed to be provided under the No Build Alternative. However, as the No Build Alternative would not decrease the performance or safety of transit facilities, this is not considered to be a significant impact.

Future Cumulative Conditions

Although traffic volumes in Mammoth are generally expected to increase in the future, the No Build Alternative would not impact traffic operations under future cumulative conditions.

Summary of Recommendations for the No Build Alternative

In summary, improvement should be implemented in order to provide at least 150 feet of stopping sight distance for northbound drivers approaching the MUP crossing on Majestic Pines Drive between Meridian Boulevard and Monterey Pine Road. This could be accomplished by modifying the MUP trail alignment and/or modifying the existing landscaping and embankment. With this measure, adequate driver sight distance would be provided under the No Build Alternative.

ALTERNATIVE THREE – NO PROJECT/EXISTING 1991 TSMP

Potential transportation impacts associated with full buildout of the existing 1991 TSMP improvements are evaluated under summer and winter conditions. Specifically, the following items are evaluated:

- Traffic impacts are assessed in terms of trip generation and traffic operations of intersections and roadways throughout Town. Traffic impacts are also evaluated for the project construction phases.
- Project impact on Vehicle-Miles Traveled (VMT)
- Project impact on driver sight distance
- Project impact on pedestrian crossing conditions
- Project's consistency with other planning documents and studies
- Impact on parking conditions

In addition, the interface between the proposed trail system and the transit system is addressed.

Traffic Impacts

Potential traffic impacts are evaluated for both summer and winter conditions.

Summer Traffic Impacts

The potential increase in summer MUP trail users is estimated, in order to analyze the traffic impacts of the additional MUP trails. The summer traffic impacts of the unpaved trails are also assessed.

Potential Increase in MUP Trail Users

The 1991 TSMP includes an approximately 0.8 miles of additional MUP trails, which would fill-in the gaps in the existing “Main Path” forming a loop around Town. In addition, the 1991 plan includes a series of “Future/Alternative” trails extending out from the Main Path into the Mammoth Mountain Ski Area and other National Forest Lands. The plan does not specify whether the future trails are multi-use paths (similar to the existing MUPs) or soft-surface trails. Therefore, it is assumed that the future/alternative trails with alignments similar to the proposed 2009 MUPs, such as the trails in the Knolls area, the Shady Rest area, and through the meadow in the SHARP area, are multi-use paths. These paths are assumed to be ADA-accessible. The remaining future/alternative trails are assumed to be soft-surface trails. The future/alternative trails assumed to be MUPs total about 7.6 miles. The total increase in MUP trail length associated with the 1991 TSMP is estimated to be about 8.4 miles (0.8 plus 7.6). Adding 8.4 miles to the existing 13.8 miles yields a total proposed MUP trail length of approximately 22.2 miles. This equates to an increase in total MUP trail mileage of about 161 percent. In order to forecast the future total use with implementation of the 1991 TSMP, trail use is assumed to grow roughly equal to the relative growth in trail mileage, consistent with the assumptions for the proposed TSMP.

Multiplying the existing summer peak hour MUP trail use (250) by a factor of 161 percent (or 1.61) yields a total forecast future use of roughly 400 users during the busiest hour of trail use, comprised of about 80 bicyclists and 320 pedestrians. Multiplying this figure by the daily-to-peak hour factor of 6.54, yields a total future use of about 2,616 MUP users per day. Subtracting the total future use from the total existing use (1,635) yields a growth in MUP trail use of about 980 users per day, including roughly 150 users during the busiest summer hour (30 of which is a bicyclist and 120 are pedestrians).

Traffic Impacts of Additional MUPs

The increase in vehicle trips associated with the increase in MUP trail users was evaluated. The proposed TSMP is expected to result in an increase of about 30 bicyclist and 120 pedestrians using the MUP trails during the busiest summer hour. Multiplying the number of users by the proportion of users arriving by car (19 percent of bicyclists and 49 percent of pedestrians using the MUP arrive by car) and dividing by the average vehicle occupancy rate (about 3 bicyclists per car and 2 pedestrians per car) yields an increase of 2 vehicles for bicyclists and up to 30 vehicles for pedestrians. Therefore, an increase of about 32 vehicles is associated with the increase in trail users during the busiest hour. Assuming half of the trail users stay on the trails for more than an hour, about 32 vehicle trips arriving at the trails and 16 vehicle trips departing the trails, or a total of 48 one-way vehicle trips, are associated with the increase in MUP users parking to use the trails during the busiest summer hour.

In addition, about 3 percent of bicyclists and 11 percent of pedestrians are dropped off at the MUP trails. Multiplying the number of users by the proportion dropped off and dividing by the respective average

vehicle occupancy rate yields an increase of up to 7 vehicles dropping off MUP trail users. As each drop off generates two one-way vehicle trips, the total increase in one-way trips generated by vehicles dropping off trail users is about 14 trips. Assuming the trail users dropped off are also picked up during the busiest hour, about 7 one-way trips are generated by vehicles picking up trail users, for a total of 21 one-way trips.

Adding the 48 one-way vehicle trips generated by MUP users who park at the trails to the 21 vehicle trips generated by MUP users being dropped off and picked up totals about 69 additional peak-hour one-way vehicle trips generated by the increase in MUP trail users.

Traffic Impacts of Unpaved Trails

The 1991 TSMP includes a series of “Future/Alternative” trails extending out from the Main Path into the Mammoth Mountain Ski Area and other National Forest Lands. As discussed above, about 7.6 miles of these trails are assumed to be MUP trails, and the remaining trails are assumed to be soft-surface trails. Many of these trails are in areas where informal trail use currently takes place. Implementation of the proposed soft-surface trail network is not expected to result in a significant traffic impact, as the traffic impacts would be widely-distributed. The future/alternative soft-surface trails are not expected to generate high concentrations of trail users at any one trailhead, and the 1991 TSMP contains nothing to indicate an undue traffic impact would result at any one location. Overall, the increase in vehicle trips generated by the soft-surface trails is expected to be minimal.

Summary

The 1991 TSMP proposes to add less than 9 miles of MUP trails, provide new and improved soft-surface trails, and improve the trail connectivity throughout Town. This is expected to increase the portion of trips made in Mammoth via non-auto modes during the non-winter months. Additionally, the portion of MUP users driving to/from the trails would generally decrease, as the MUP would be easier to access from the various neighborhoods by non-auto means. Conversely, the improved trail system and facilities could increase the number of persons using the trails and facilities, which could increase the number of vehicle-trips occurring over the course of a busy day, as trail users drive to and from trailheads.

Implementation of the 1991 TSMP could conservatively generate an increase on the order of approximately 70 one-way vehicle trips throughout Town during the busiest summer hour of trail use. It is conservatively assumed that the busiest hour of trail use coincides with the summer peak hour of traffic activity in Mammoth, which generally occurs on weekend afternoons. As the project-generated trips would be distributed to the various trailhead locations, no significant Town-wide traffic impacts are expected to result. Overall, provision of the additional pedestrian and bicycle facilities included in the 1991 plan would result in a general increase in non-auto travel, which would offset the increase in vehicle trips to some degree. No significant impact on traffic operations during the summer season is anticipated. The 1991 TSMP is not expected to cause intersection and roadway conditions to exceed adopted standards.

In comparison with the proposed 2009 TSMP, the 1991 TSMP would result in a smaller increase in vehicle trips during the summer season. Specifically, the 2009 TSMP is expected to generate about 30 more one-way peak-hour vehicle trips than the 1991 TSMP.

Winter Traffic Impacts

The 1991 TSMP describes cross-country skiing as one of the primary uses to be accommodated on the Main Path. However, the extent (mileage) of trail to be groomed as a part of this plan is not specified. For the purposes of this study, it is assumed that no additional grooming of the Main Path is included beyond the approximately 2.5 miles of the eastern section of MUP that are currently authorized to be groomed during the winter. Grooming is assumed to be provided, however, along the “future/alternative” MUP assumed to be provided through the meadow in the Sherwins Area. Based on these assumptions, the potential increase in winter trail use is estimated in order to analyze the traffic impacts of the winter trails.

Additional Groomed MUPs

The traffic impacts associated with the new non-motorized groomed trails are estimated based upon the impacts associated with the proposed 2009 TSMP trails. Multiplying the total length of new trail assumed to be provided in the 1991 TSMP (about 3.7 miles of the “future/alternative” trails) by a rate of 5 peak hour vehicle trips per new mile of trail yields an increase of about 19 peak hour vehicle trips (10 entering and 9 exiting) associated with the future non-motorized groomed trails. Although the 1991 plan does not indicate if any of the future/alternative trails would be groomed for motorized access, a modest increase in vehicle trips would be expected to result from this type of trail improvement, given that informal use by snowmobilers already occurs in the area. In order to remain conservative, a total of about 5 new vehicle trips are estimated to be generated by potential motorized groomed trails during the winter peak hour. Any increase in traffic resulting from the formalization improvement of the other recreational facilities is expected to be minimal, considering that most of the areas of improvement are currently utilized under existing conditions.

Summary

Implementation of the 1991 TSMP could generate an increase on the order of about 24 one-way vehicle trips throughout Town during the busiest winter hour of trail use. It is conservatively assumed that the busiest hour of trail use coincides with the winter peak hour of traffic activity in Mammoth, which generally occurs between 4:00 PM and 6:00 PM. As the project-generated trips would be widely distributed, no significant traffic impacts would result from the project in the winter season. The 1991 TSMP is not expected to cause intersection and roadway conditions to exceed adopted standards. In comparison with the proposed 2009 TSMP, the 1991 TSMP would result in a smaller increase in vehicle trips during the winter season. Specifically, the 2009 TSMP is expected to generate about 22 more one-way peak-hour vehicle trips than the 1991 TSMP.

Traffic Impacts During Construction

Traffic impacts due to the construction phases of the 1991 TSMP project are considered. Long-term roadway closures are not expected to occur during construction of the project. Construction activities may occur at multiple locations concurrently. However, any potential transportation impacts associated with the project construction activities at any one time are expected to be modest. Project-specific construction management plans would be analyzed for each project location as well.

Impact on Vehicle-Miles Traveled

The impact of the 1991 TSMP on Vehicle-Miles Traveled (VMT) is evaluated for both summer and winter conditions. The effect of the proposed project on VMT in Mammoth is dependent on the total trip generation and the length of these vehicle trips.

Summer Vehicle-Miles Traveled

Implementation of the 1991 TSMP is not expected to increase the number of persons visiting the Mammoth area from other communities or other regions on a busy summer day, as world-class hiking trails are already provided in the Mammoth area. Although there may be a net increase in trail activity associated with the proposed trail improvements, new trail networks would be provided in the urbanized area, which would result in relatively short vehicle trips. Some trips that are currently made to trails outside the urbanized area would shift to the new trails in or near the urbanized area. This would result in a reduction in the average trip length associated with the trails, thereby reducing total VMT.

The increase in VMT generated by the increase in vehicle trips associated with the new trails is expected to be roughly offset by the reduction in VMT resulting from the provision of trails near the urbanized area and the increase in non-auto mode travel throughout Town. Overall, the proposed project is not expected to result in a significant increase in VMT over the course of a summer day.

Winter Vehicle-Miles Traveled

Similar to summer conditions, implementation of the proposed project is not expected to significantly increase the number of persons visiting the Mammoth area from other communities or other regions on a busy winter day, as the existing trails already serve those wishing to recreate. Although there may be a net increase in trail activity associated with the proposed trail improvements, new trail networks would be provided in the urbanized area, which would result in relatively short vehicle trips. Some trips that are currently made to trails outside the urbanized area would shift to the new trails in or near the urbanized area. This would result in a reduction in the average trip length associated with the trails, thereby reducing total VMT.

The increase in VMT generated by the increase in vehicle trips associated with the new trails is expected to be roughly offset by the reduction in VMT resulting from the provision of trails closer to the urbanized area and the increase in non-auto mode travel throughout Town. Overall, the 1991 TSMP is not expected to result in a significant increase in VMT over the course of a winter day.

It is worth noting that the increase in traffic volumes resulting from the TSMP project would be highest during the summer season, which does not coincide with the peak season of traffic activity in the Mammoth area (traffic volumes in Mammoth are generally highest in the winter season).

Driver Sight Distance

Driver stopping sight distance was reviewed at the at-grade MUP crossing locations included in the 1991 TSMP. In general, adequate driver sight distance is expected to be provided, with the exception of one crossing location. There is an existing safety deficiency at the MUP crossing along Majestic Pines Drive between Meridian Boulevard and Monterey Pine Road. The stopping sight distance provided for drivers traveling northbound along Majestic Pines Drive is limited by the horizontal curvature along the roadway

and the existing embankment and vegetation. A detailed evaluation is included in the existing conditions chapter of this study. As the 1991 plan is expected to result in an increase in the number of MUP users at this location, it would therefore exacerbate the existing safety deficiency. This is considered to be a significant impact. It is recommended that the 1991 plans be modified to provide at least 150 feet of stopping sight distance for northbound drivers approaching this crossing. This could be accomplished by modifying the MUP trail alignment and/or modifying the existing landscaping and embankment. With this measure, adequate driver sight distance would be provided.

Trail Crossing Conditions

Trail crossing conditions are discussed under the proposed project alternative. In general, adequate crossing conditions are expected to be provided under the 1991 TSMP Alternative, with the exception of the driver sight distance concern discussed above. The 1991 TSMP project is not expected to result in a significant impact on trail crossing conditions at the remaining trail crossings.

Consistency of 1991 TSMP With Other Planning Documents and Studies

The project's consistency with the following documents is evaluated:

- Main Street South Frontage Road Project and Promenade Walkway
- Main Street Signal Feasibility Study
- Caltrans SR 203 Transportation Concept Report
- Minaret Road Alignment Study
- Mobility Plan

Main Street South Frontage Road Project and Promenade Walkway

The only inconsistency identified between this Caltrans project and the 1991 TSMP project is that the Caltrans plan proposes a sidewalk where the 1991 plan includes a multi-use path from approximately Manzanita Street to Laurel Mountain Road.

Main Street Signal Plan Feasibility Study

No inconsistencies with the 1991 TSMP are identified.

SR 203 Transportation Concept Report

No inconsistencies between the Caltrans SR 203 Transportation Concept Report (TCR) and the 1991 TSMP are identified.

Minaret Road Alignment Study

No inconsistencies are identified between the Minaret Alignment Study and the 1991 TSMP.

Mobility Plan

No inconsistencies are identified between the Mobility Plan and the 1991 TSMP.

Parking Impacts

The impact of the 1991 TSMP on parking demand during summer and winter conditions is estimated, and conclusions and recommendations are made regarding overall parking conditions.

Summer Parking Demand

Parking Demand of Additional MUP Trail Users

The increase in parking demand associated with the increase in MUP trail users was evaluated. The 1991 TSMP is expected to result in an increase of about 30 bicyclists and 120 pedestrians using the MUP trails during the summer peak hour. Multiplying the number of users by the proportion of users arriving by car (19 percent of bicyclists and 49 percent of pedestrians using the MUP arrive by car) and dividing by the average vehicle occupancy rate (about 3 bicyclists per car and 2 pedestrians per car) yields an increase in peak hour parking demand of about 2 spaces for bicyclists and 30 spaces for pedestrians. Therefore, the total increase in parking demand associated with the additional MUP trails is about 32 spaces.

Parking Demand of Additional Unpaved Trail Use

As discussed above, the parking impacts associated with the potential soft-surface trails are expected to be minimal. The 1991 plan contains nothing to indicate an undue parking impact would result at any one location. Overall, the increase in parking demand generated by the potential soft-surface trails is expected to be minimal.

Summary

The 1991 TSMP is estimated to add just over 8 miles of MUP trails, provide new and improved soft-surface trails, and improve the trail connectivity throughout Town. This is expected to increase the portion of trips made in Mammoth via non-auto modes during the non-winter months. Additionally, the portion of MUP users parking at the trailheads would generally decrease, as the MUP would be easier to access from the various neighborhoods by non-auto means. Conversely, the improved trail system and facilities could increase the number of persons using the trails and facilities, which could increase the parking demand occurring over the course of a busy day, as trail users park at trailheads.

Implementation of the 1991 TSMP could conservatively generate an increase in parking demand on the order of approximately 32 parking spaces throughout Town during the summer peak hour. As this demand would be distributed to the various trailhead locations, no significant parking impacts are expected to result at any one location. Overall, provision of the additional pedestrian and bicycle facilities included in the 1991 TSMP would result in a general increase in non-auto travel, which would offset the increase in parking demand to some degree. However, it is recommended that a total of at least 32 additional summer parking spaces be provided as a part of the 1991 plan. In comparison, the proposed 2009 TSMP requires a total of 52 new spaces (30 more spaces than the 1991 plan).

Winter Parking Demand

As described above, the additional approximately 3.7 miles of non-motorized groomed trails assumed in the 1991 TSMP are expected to generate about 10 additional vehicles parking during the peak hour. In addition, a total of about 3 parking spaces are estimated to be generated by potential motorized groomed

trails during the winter peak hour. The total increase in winter parking demand is about 13 spaces. It is therefore recommended that at least 13 additional winter parking spaces be provided as a part of the 1991 TSMP. The number of additional parking spaces included in the 1991 plan is not specified.

Conclusion

Access to recreational facilities over the course of a peak day is typically limited by the amount of parking available. It is recommended that a total of at least 32 additional summer parking spaces and 13 additional winter parking spaces be provided as a part of the 1991 TSMP. As the 1991 TSMP does not specify the number of additional parking spaces, if any, that are included in the plan, this is a potentially significant impact. However, with provision of the recommended number of additional parking spaces, the 1991 TSMP would provide adequate overall parking conditions.

Interface between Trail System and Transit System

The locations of existing and proposed transit facilities are reviewed with respect to existing and proposed trailhead locations. Transit service is considered to access a trailhead if a bus route is located within one-quarter mile of the trailhead. Some existing trailheads in Mammoth are located more than one-quarter mile away from the existing bus routes. No additional bus/trolley service is included in the 1991 TSMP. However, as the 1991 plan would not decrease the performance or safety of transit facilities, this is not considered to be a significant impact.

Future Cumulative Conditions

As discussed above, the 1991 TSMP would not significantly change traffic volumes at any one location. Although traffic volumes in Mammoth are generally expected to increase in the future, the 1991 TSMP is not expected to result in a significant impact on traffic operations under future cumulative conditions. Regarding trail crossings, the 1991 plan includes an at-grade MUP crossing where the existing MUP terminates at a point on Minaret Road approximately 150 feet to the north of its intersection with Old Mammoth Road. If a roundabout is installed at the Minaret Road/Old Mammoth Road intersection in the future, it is recommended that the at-grade MUP trail crossing be relocated to the splitter island. With this measure, adequate trail crossing conditions are expected to be provided.

Summary of Recommendations for the 1991 TSMP Alternative

The following recommendations are made regarding the existing 1991 TSMP:

- The 1991 TSMP plans should be modified to provide at least 150 feet of stopping sight distance for northbound drivers approaching the MUP crossing on Majestic Pines Drive between Meridian Boulevard and Monterey Pine Road. This could be accomplished by modifying the MUP trail alignment and/or modifying the existing landscaping and embankment. With this measure, adequate driver sight distance would be provided.
- A total of at least 32 additional summer parking spaces and 13 additional winter parking spaces should be provided with the proposed project. With this measure, adequate overall parking conditions would be provided.

- If a roundabout is installed at the Minaret Road/Old Mammoth Road intersection, the at-grade MUP crossing on Minaret Road should be relocated to the splitter island. With this measure, adequate trail crossing conditions would be provided. Note that this issue does not apply to the proposed 2009 TSMP scenario, due to the fact that a tunnel is proposed to be constructed at this location in lieu of an at-grade crossing. Note that there is no mention of this crossing location under the No Project/No Build Alternative, as it is not an existing MUP crossing.

