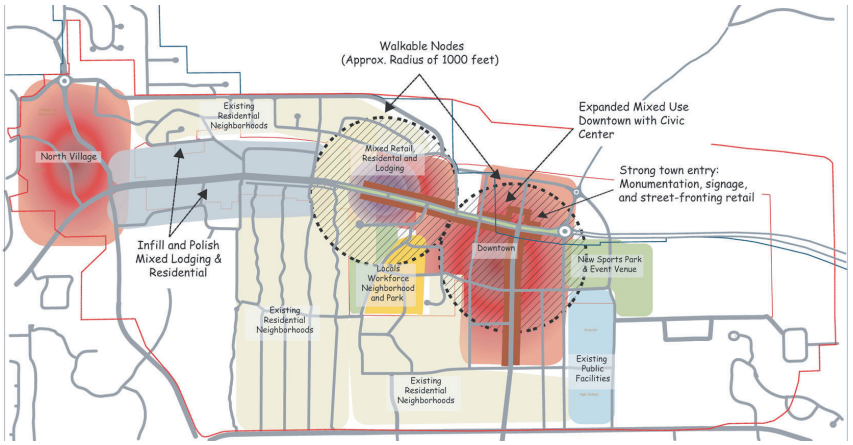

Town of Mammoth Lakes

Commercial Corridor Management Plan

February 2011

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Attachment 3: Town Travel Demand Model Technical Memorandum
Attachment 4: Pedestrian Count Data
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Attachment 6: Meeting Notes – Caltrans and Town Staff

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1.0 PURPOSE

The Commercial Corridor Management Plan (CCMP) is a companion document to the Town of Mammoth Lakes "Downtown Concept for Main Street (DCMS)." Preparation of the CCMP and DCMS was partially funded through a Caltrans Community Based Transportation Planning Grant awarded in Fiscal Year 2009/2010. The DCMS constitutes the final study report that was prepared following a ten month community-based planning process to develop a land use and transportation plan for Mammoth Lakes' Downtown area, which encompasses the Highway 203/Main Street corridor (Main Street), the North Old Mammoth Road corridor, and the adjacent 25-acre Shady Rest Site.

The CCMP focuses on the additional technical transportation-oriented information and data that was used to help prepare the DCMS and that will be utilized to support future implementation of the recommendations contained in the DCMS and other related planning and programming documents. The CCMP includes comprehensive multimodal transportation data to document existing conditions within the Downtown area and Main Street and provides further analysis and refinement of the mobility concepts identified in the DCMS.

2.0 BACKGROUND

The DCMS, which is provided in Attachment 1, was accepted by the Town of Mammoth Lakes Town Council on September 1, 2010 following an extensive Neighborhood District Planning (NDP) process for the Downtown area.[1] The Downtown NDP process was conducted over ten months and involved significant public input and feedback to identify the desired character and function of the Downtown area, as well as actions to achieve that vision.

Public participation was a key component of the Downtown NDP process. Chapter 2, Section D of the DCMS describes the public engagement process, which included the involvement of a Focus Group of stakeholders, a series of public workshops, meetings with the Planning Commission and Town Council, and consultations with various agencies and organizations with interests in the study area, including Caltrans, the United States Forest Service (USFS), Mono County, and Mammoth Unified School District.

Because Main Street is the primary transportation corridor in town and provides access to Mammoth Lakes' key commercial and recreation destinations, transportation and mobility were a key focus throughout the Downtown NDP process. This key transportation corridor is fundamentally linked to the entire local street system. The Town's 2007 General Plan includes a number of objectives to improve the operations,

[1] Neighborhood District Planning (NDP) is a concept defined in the 2007 General Plan that calls for focused, community-driven planning processes to be undertaken for certain areas of town that have special considerations or conditions.

safety, and character of the Main Street corridor, including improvements to pedestrian safety, vehicle level of service, signage and wayfinding, parking, and streetscape. Additionally, the General Plan speaks to a number of mobility goals that encourage "feet-first" connectivity and the development of "Complete Streets," as mandated by Assembly Bill 1358 (AB 1358) and Caltrans Deputy Directive DD-64-R1, "Complete Streets: Integrating the Transportation System." Caltrans DD-64-R1 is provided in Attachment 2.

As such, existing transportation issues and potential solutions were widely discussed among the public and stakeholders, contributing to the formulation of a series of guiding principles, project "Framework," and the development of concept alternatives and a "Preferred Concept."

Guiding Principles

The Guiding Principles were established as part of the Framework, which was approved early in the Downtown NDP process to guide the planning effort. They included several transportation related concepts and characteristics to guide planning in the study area, particularly for the Main Street corridor. These include:

- Create a grand boulevard. Determine how to improve the appearance of State Route 203 and the entrance to town ("sense of arrival"), including appropriate traffic calming.
- Improve connectivity and circulation with bike and pedestrian paths, sidewalks, roads, and transit; emphasize connectivity, especially "feet-first" connections to the North Village and the resort corridor. Incorporate suitable traffic calming measures and effective snow removal strategies (e.g. assessment districts).
- Create pedestrian-oriented streetscapes that are walkable year-round, landscaped, accessible, and safe.
- Assess strategic parking solutions tailored to context and location; Provide convenient public parking facilities, structured parking, small-scale surface parking, and shared and pooled parking.

3.0 EXISTING CONDITIONS

Chapter 3 of the DCMS provides a comprehensive summary of the existing land use, zoning, aesthetic character, and the general conditions within the study area. To supplement this broad survey of information, Town staff also conducted additional focused technical data collection to further establish the baseline transportation conditions in and around the study area.

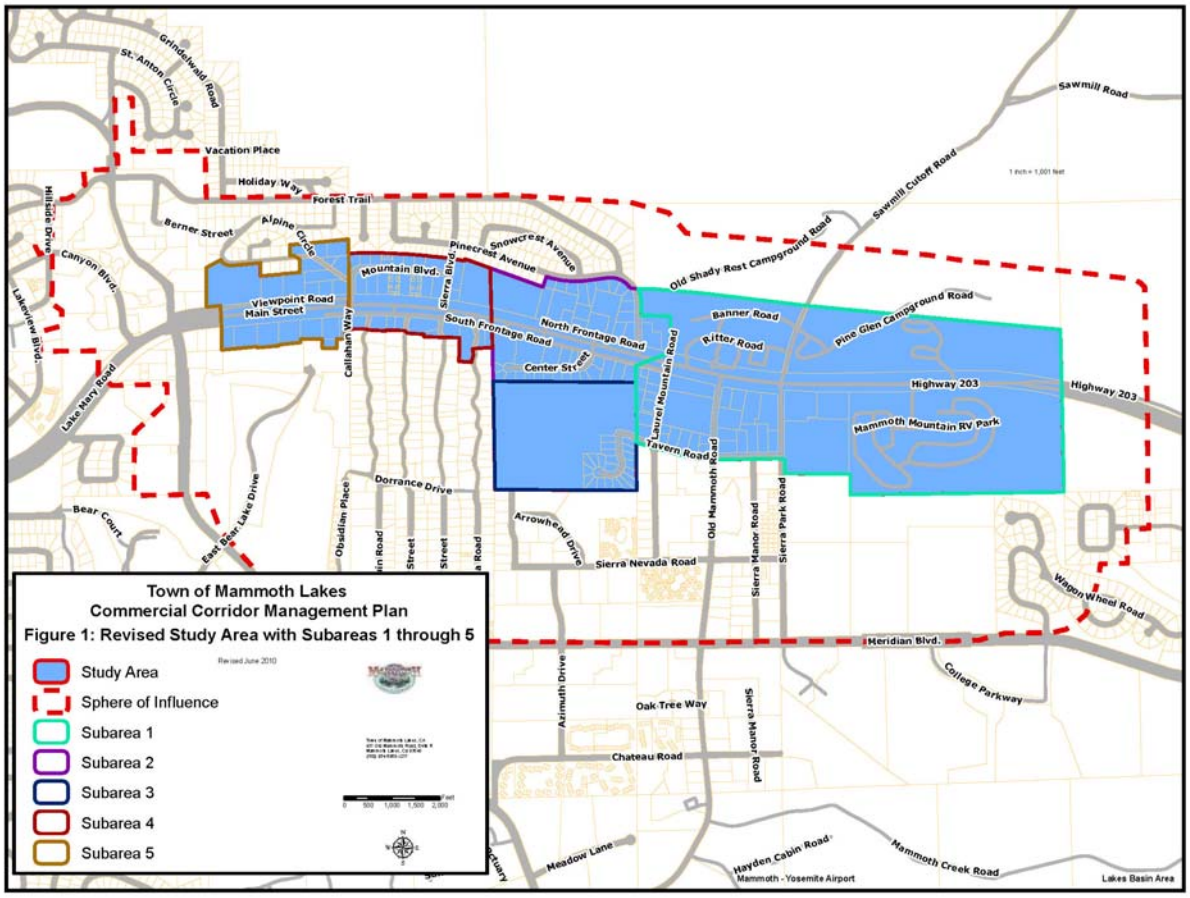
Study Area

The study area, which is approximately 210 acres, extends from the North Village to the Welcome Centre near the east entry of town on Main Street. The study area and sphere of influence includes multiple districts within and adjacent to the Main Street corridor. The study area is split into five subareas, based on their location and characteristics.

Figure 1 depicts the study area, sphere of influence and the five subareas, which are as follows:

- **Subarea 1** – North Old Mammoth Road, Civic Center site, RV Park, and Welcome Center,
- **Subarea 2** – Center Street and the Post Office,
- **Subarea 3** – Shady Rest District,
- **Subarea 4** – Mountain Boulevard and north/commercial end of Sierra Valley, and
- **Subarea 5** – Viewpoint Road and commercial lodging uses.

Figure 1: Study Area and Subareas



Existing Issues and Constraints Summary
A number of key transportation issues were identified during the Downtown NDP process. In general, the lack of a walkable, "feet-first" environment that provides multimodal connectivity was of key concern to the public and stakeholders, particularly along Main Street. Issues identified include (the complete list of issues is provided in Appendix B of the DCMS):

- Lack year-round pedestrian and bicycle infrastructure and connectivity;
- Pedestrian and bicyclist safety (including safe crossings, lighting, and infrastructure to safely move pedestrians and bicyclists);
- Intersection level of service and operations;
- Existing surface parking is inefficient, unattractive, and is not the best use of land;
- Cut-through traffic, which is perceived as a problem by residents of adjacent neighborhoods;
- Need for better signage and wayfinding, and for the mobility/circulation plan to be better integrated with recreation nodes and the trail system components within and beyond the district;
- Access management and parking (lack of managed access to businesses, unconsolidated driveways);
- Lack of traditional "main street" character that is not pedestrian-friendly;
- Varied topography, particularly along Main Street, creates a challenge for the implementation of new transportation facilities;
- Snow management and storage (need effective snow removal to improve roadway operations, safety, emergency access and response, and access to businesses); and
- Caltrans' control of Main Street limits the Town's ability to make significant changes to the street's functions and operations.

Vehicle Traffic and Level of Service
As a State highway and arterial street, Main Street is Mammoth Lakes' principal transportation corridor. The right-of-way (the area reserved by Caltrans and/or the Town for public roadways and associated infrastructure) is close to 200 feet for most of Main Street's length; however, the actual primary roadway width and number of lanes varies considerably within the study area. While the primary roadway includes four travel lanes, the eastern part of Main Street from Old Mammoth Road to Manzanita Road includes a two-way center turn lane. Two way frontage roads parallel Main Street along much of its south side and parts of the north side. From Manzanita Road to Minaret Road, Main Street consists of four travel lanes with no center turn lane.

There are two signalized intersections within the study area: Main Street/Old Mammoth Road and Main Street/Minaret Road/Lake Mary. Other signalized intersection within the sphere of influence include: Lake Mary Road/Canyon Boulevard, Meridian

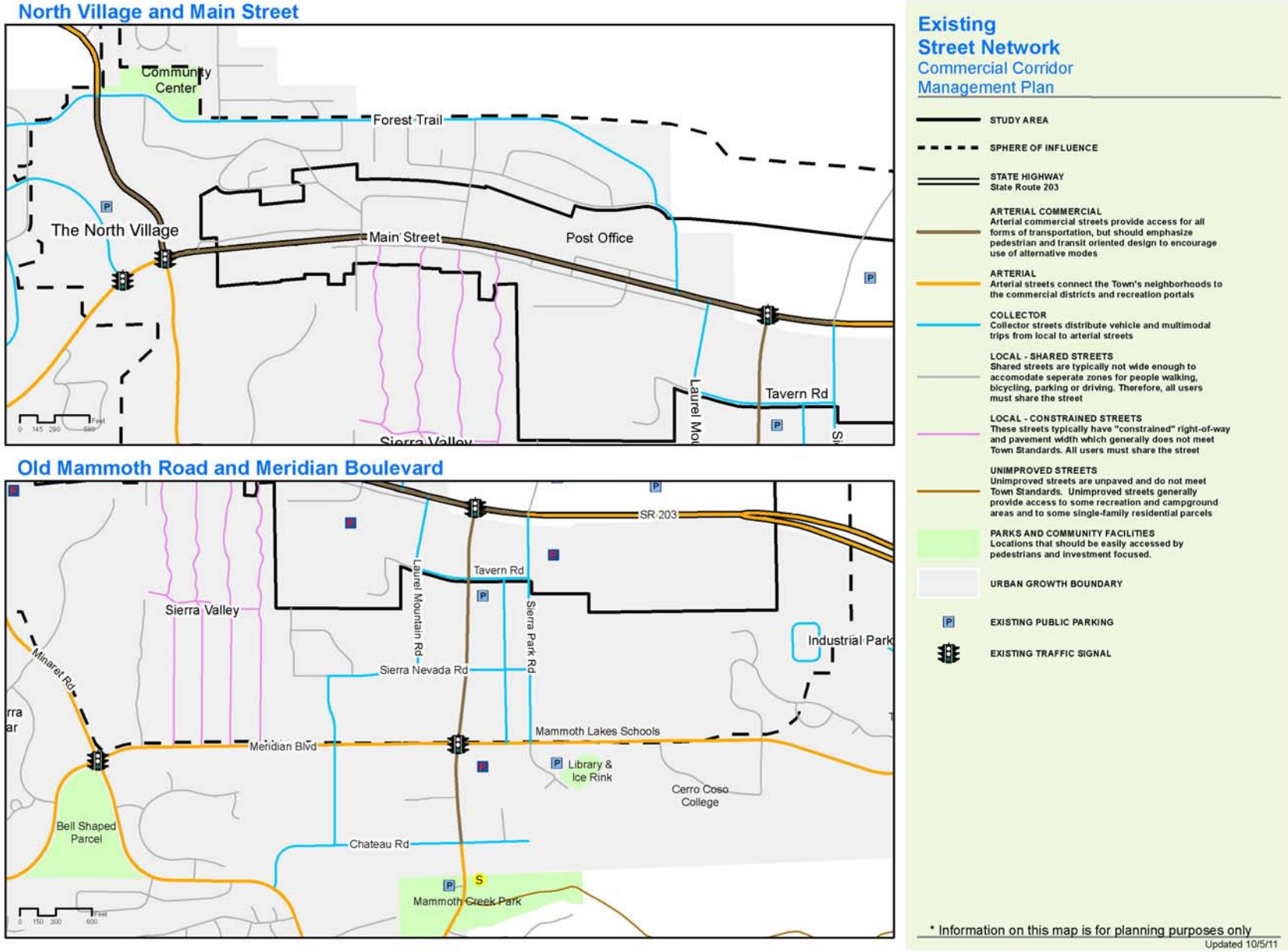
Boulevard/Minaret Road, and Meridian Boulevard/Old Mammoth Road. Figure 2 depicts the existing street network within the study area and sphere of influence.

Volumes and Level of Service

In January and February of 2009, Town staff completed a comprehensive traffic volume data collection effort throughout town as part of the update to the traffic model (travel demand model). Both peak-hour and daily traffic volume counts were taken in order to establish an accurate baseline of existing traffic and level of service conditions. Peak-hour traffic counts were conducted at 18 intersections on Friday, January 30 and Saturday, January 31, 2009. Daily volume counts, or "link volumes," were also collected at 21 locations throughout town using tube counters. The collected volumes were then adjusted to represent a typical winter Saturday peak-hour as established by the Town's General Plan Final Environmental Impact Report:

> *"Policy 1.7: Establish and maintain a Level of Service D or better on a typical winter Saturday peak-hour for signalized intersections and for primary through movements for unsignalized intersections along arterial and collector roads. This standard is expressly not applied to absolute peak conditions, as it would result in construction of roadway improvements that are warranted only a limited number of days per year and that would unduly impact pedestrian and visual conditions."*

Figure 2: Existing Street Network



Currently, an average of between 10,000 and 18,000 vehicles are carried daily on Main Street between Minaret Road and Old Mammoth Road; peak hour volumes average between 1,000 and 1,600 vehicles. On Old Mammoth Road between Main Street and Meridian, current daily volumes are approximately 10,000 to 11,000 and peak-hour volumes are approximately 850 to 1,000.

The existing level of service for intersections within the study area and sphere of influence is provided in Table 1. In general, all signalized intersections operate within the acceptable level of service; however, several existing unsignalized intersections are operating at a deficient level of service (LOS D or below). Additional information about the traffic model update, including detailed information about the methodology used to develop the model, is provided in the technical memorandum prepared by LSC Transportation Consultants, Inc. in Attachment 3.

Table 1: Existing Level of Service

Intersection	Control	LOS[1]	Delay (sec/veh)[2]
Lake Mary Road/Canyon Boulevard	Signal	A	9.2
Main Street/Minaret Road	Signal	C	29.7
Main Street/Old Mammoth Road	Signal	B	14.3
Meridian Boulevard/Old Mammoth Road	Signal	B	19.7
Minaret Road/Forest Trail	Unsignalized	**F**	0.37 v/c
Main Street/Mountain Boulevard	Unsignalized	D	32.2
Main Street/Center Street	Unsignalized	D	31.9
Main Street/Forest Trail	Unsignalized	**F**	1.17 v/c
Main Street/Laurel Mountain Road	Unsignalized	**F**	0.87 v/c
Main Street/Sierra Park Road/Sawmill Cutoff	Unsignalized	B	13.4
Old Mammoth Road/Tavern Road	Unsignalized	C	23.9
Old Mammoth Road/Sierra Nevada Road	Unsignalized	**E**	35.4
Meridian Boulevard/Sierra Park Road	Unsignalized	A	8.2

Notes:
1. Performed in the Synchro capacity analysis software using the 2000 Highway Capacity Manual methodology.
2. For unsignalized intersections with a level of service "F," critical approach volume-to-capacity ratio is reported instead of delay.

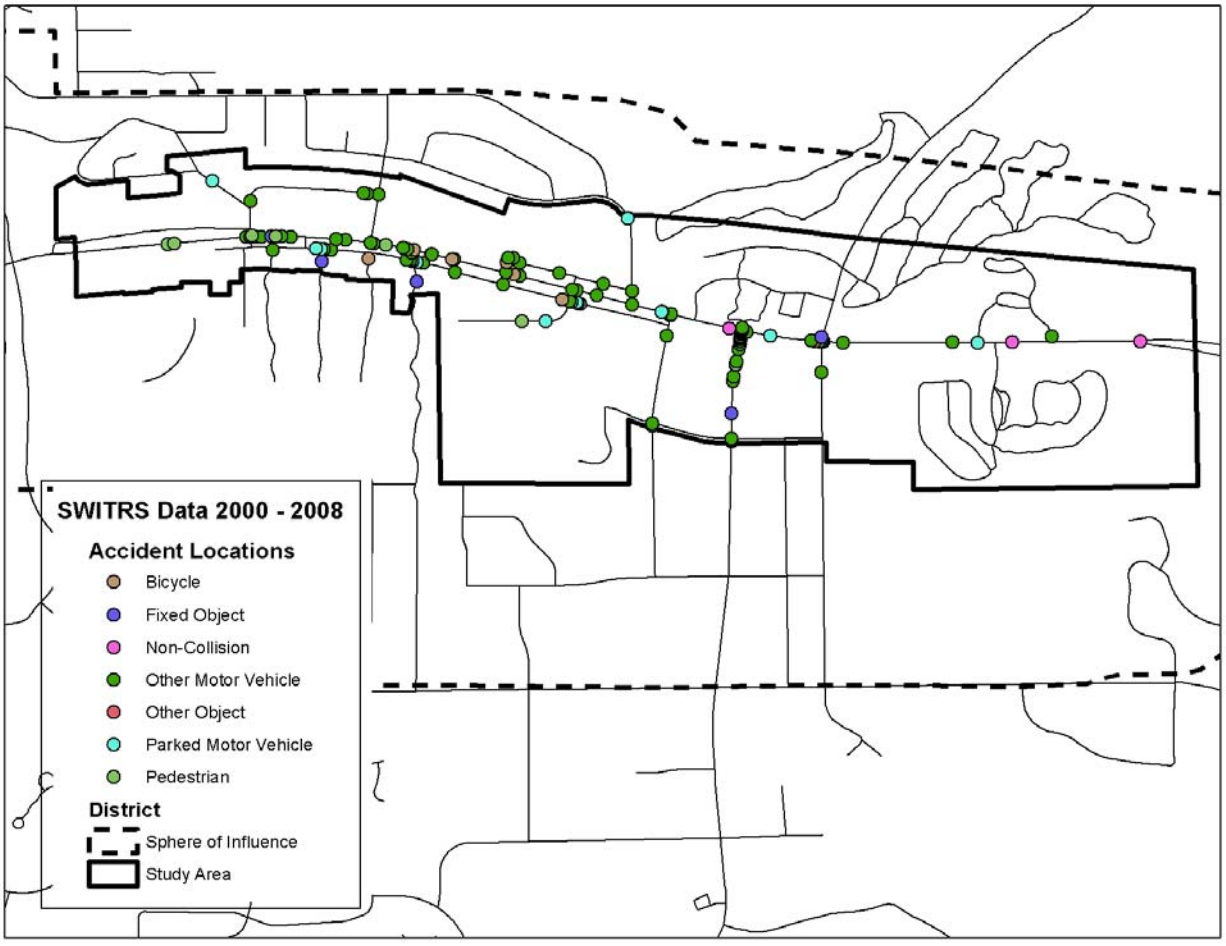
These level of service results from the Town's traffic model are generally consistent with the findings of the Feasibility Study Report (FSR) for Highway 203 completed by Caltrans in June 2010. The FSR provides valuable data and analysis about the current and potential future operations and level of service for intersections and roadway segments on SR 203. The data indicates that several intersections along Main Street, as well as the roadway segment of Minaret Road between West Forest Trail and Main Street, are currently operating at a deficient level of service. The FSR also indicates that these existing deficiencies will continue to deteriorate and that additional intersections will become deficient under future conditions.

Collision Data

Figure 3 illustrates the accident data from the Statewide Integrated Traffic Records System (SWITRS) database between 2000 and 2008. The SWITRS database stores traffic collision data submitted by Police Department traffic officers and can be used to map collisions and calculate rates.

There were 183 documented collisions within the study area during between 2000 and 2008. Of these, the most collisions occurred on Fridays (30), Tuesdays and Thursdays (29 each), and Saturdays (28). Collisions with other motor vehicles were the most common (133) and collisions between a car and a pedestrian were the second most common (11). The most collisions occurred at or near the intersection of Main and Old Mammoth Road (36), Main and Mountain Boulevard. (21), and Main and Laurel Mountain Road (11).

Figure 3: Statewide Integrated Traffic Records System – 2000 through 2008



University of California Berkeley Traffic Safety Evaluation

Early in the Downtown NDP process, the Town applied for and was accepted to receive a free Traffic Safety Evaluation (TSE) through a grant program provided by the University of California Berkeley, Institute of Transportation Studies. The TSE, which was

performed on February 4th and 5th, 2010, assessed town-wide and area-specific traffic safety issues from both an engineering and a law enforcement standpoint by looking at potential physical design issues, collision data, and enforcement data.

Referencing data obtained through the SWITRS database, the evaluators performed field evaluations of collision locations and also specific locations in town that were requested by staff. Main Street and Old Mammoth Road were a primary focus of the evaluation.

The TSE, which was completed in April 2010, provides recommendations to improve traffic safety, including pedestrian safety. Because the final TSE is property of the University of California Berkeley, the report is not available to the public. However, many of the recommendations and concepts from the TSE were discussed during the Downtown NDP process and are included in the Downtown Concept for Main Street. Additionally, the full TSE report was provided to Caltrans staff in May 2010. The following recommendations from the final report are relevant to the Downtown NDP because they discuss issues within the study area and sphere of influence:

General Traffic Safety

1. Based on the SWITRS database, almost 40% of Mammoth Lakes' collisions occur within intersections, while the remaining 60% occur mid-block. The most common Primary Collision Factor (PCF) for collisions within intersections in Mammoth Lakes was unsafe speed in snow conditions, leading to both rear end collisions and broadsides from right-of-way violations. Mid-block, or segment collisions, were also most commonly caused by unsafe speed during snow conditions, leading to rear end collisions.
2. The Office of Traffic Safety (OTS) collision ranking for Mammoth Lakes has not been in the top ten percent for the past five years in terms of the highest number of collisions involving fatalities or injuries. Collision rankings are based on population.
3. Analysis of five years of SWITRS data (2004 – 2008) shows that the highest number of traffic collisions occurs on Mondays, Fridays, and peaks on Saturdays and between 7:00 AM and 5:00 PM.

Pedestrian Safety:

1. Pedestrian crossing treatments installed by the Town and by Caltrans should be consistent for two and four lane streets.
2. The Hawk Beacon[2] should be considered for installation at heavily used pedestrian crossings. The Hawk Beacon has proven to be the most effective treatment for marked crosswalks at an uncontrolled location on higher traffic volume and higher speed multilane arterial streets. The Hawk Beacon is approved for use in the Federal 2009 Manual on Uniform Traffic Control Devices

[2] A HAWK Beacon (High-Intensity Activated crossWalK beacon) is a traffic signal used to stop road traffic and allow pedestrians to cross safely. It is officially known as a "pedestrian hybrid beacon". The purpose of a HAWK beacon is to allow protected pedestrian crossings, stopping road traffic only as needed.

(MUTCD) and will most likely be included in the California MUTCD Update, scheduled for January 2012.

Traffic Engineering and Calming
Main Street

1. The Town should work with Caltrans to install vehicular wayfinding signage and "speed limit reduction" signs for westbound traffic on Main Street east of the Old Mammoth Road and Main Street intersection.
2. The installation of a roundabout should be considered at the Main Street and Sierra Park road intersection as a traffic calming feature to reduce the speed of westbound traffic approaching Old Mammoth Road.
3. The installation of additional signals on Main Street should be considered. Any new signals should be coordinated with the existing signals at Old Mammoth Road and at Minaret Road. The installation of new signals should be based on traffic volume, collision data, and intersection spacing. Evaluator recommendations include the addition of signals at Main Street and Mountain Boulevard and at Main Street and Forest Trail as priorities. [Note: The Town and Caltrans should conduct further evaluation of these recommendations.]
4. Redesign of the Main Street cross-section should be considered. Recommendations include conversion of the frontage roads into the primary travel lanes (i.e. removal of frontage roads), thereby providing space to accommodate sidewalks, bike lanes, on-street parking, and right-turn lanes (Note: Additional vacation of right-of-way may also be possible). These improvements would increase pedestrian, bicycle, and transit rider safety and accessibility. [Note: This recommendation is consistent with Downtown NDP recommendations. The Town and Caltrans should conduct further evaluation of these recommendations.]
5. Access management techniques should be considered for Main Street, including medians and turn-pockets to improve vehicle and pedestrian safety. [Note: This recommendation is consistent with Downtown NDP recommendations.]
6. Consider the use of alternative pedestrian crossing safety devices on Main Street.

Old Mammoth Road

1. Consider installation of a traffic signal at the intersection of Old Mammoth Road and Sierra Nevada Road. [Note: This recommendation is consistent with the Clearwater Specific Plan and the Old Mammoth Place Use Permit.]
2. Provide enhanced roadway delineation on Old Mammoth Road south of Chateau Road to improve safety and reduce single-vehicle collisions. Enhanced delineation includes installation of reflectors on snow-poles, improved signage, and wider striping.

3. Review of speed survey data and field evaluation does not suggest improperly signed speed limits on Old Mammoth Road. However, use of feasible traffic calming strategies and/or treatments should be further studied.
4. Provide an additional speed monitoring sign between Chateau Road and Fairway Drive.

Pedestrian Facilities and Activity

Figure 4 depicts existing pedestrian infrastructure, including multiuse paths and other pedestrian facilities such as sidewalks and the "promenade" on Main Street. Multiuse paths, while technically considered Class I bikeways, are also a significant component of the pedestrian network. As can be seen in Figure 4, pedestrian facilities within the study area, as well as the sphere of influence are limited. Sections of the Main Street promenade have been implemented over time, but many significant gaps remain. Although the Main Street promenade is fairly complete along the eastern end of Main Street, it is not completely connected, requires street crossings from north to south, and does not exist at all on the west end of Main Street (see Figure 5).

The lack of pedestrian infrastructure, particularly in the highly-visited commercial areas of Main Street and Old Mammoth Road, creates safety issues, as pedestrians are often forced to walk in the street. This issue is compounded during the winter since many existing pedestrian facilities are not cleared of snow and by the general lack of street lighting.

Figure 4: Existing Pedestrian Network

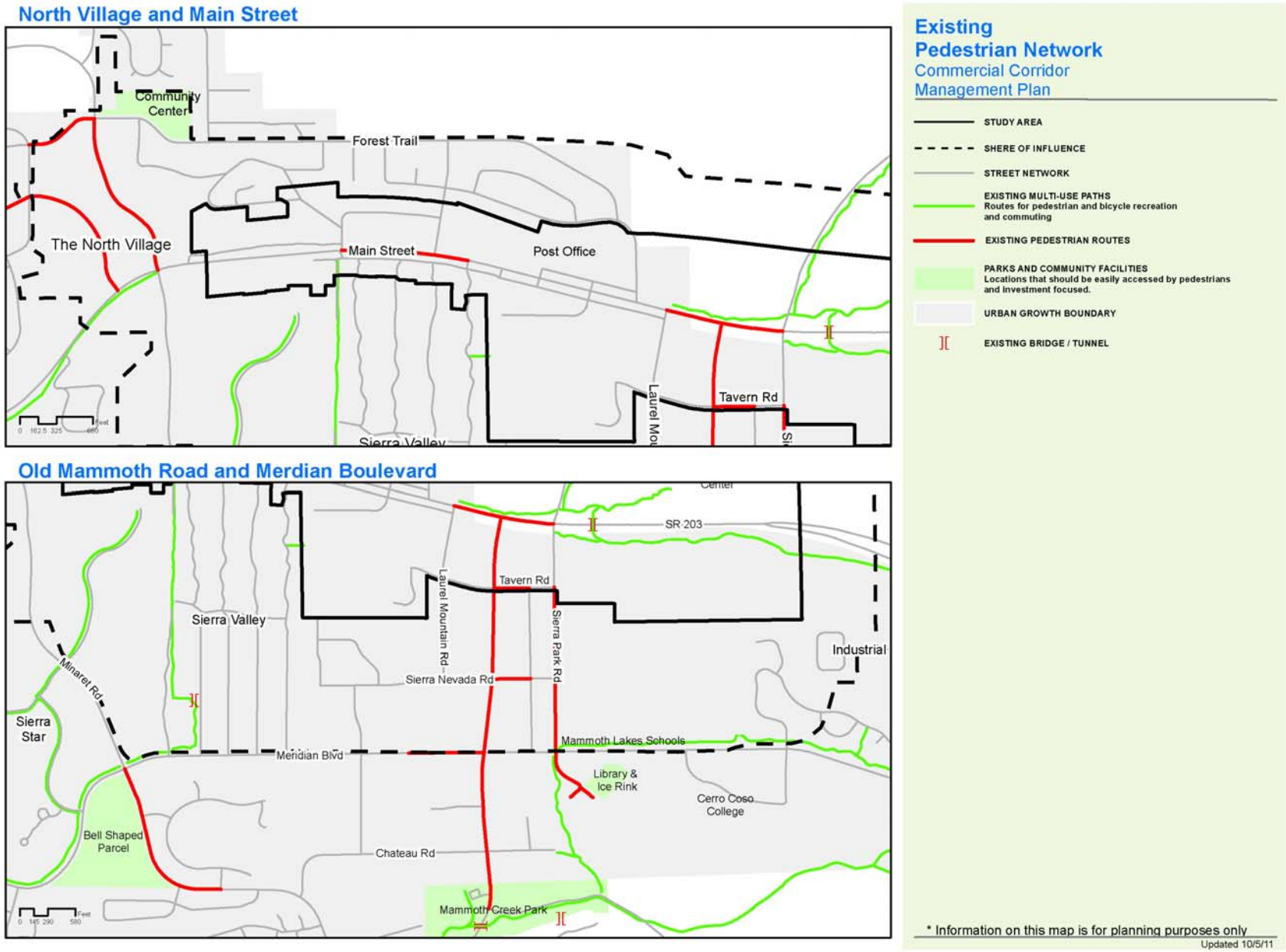


Figure 5: Main Street East of Minaret Road

Main Street cross-section east of Minaret Road looking east. Pedestrian travel in this section of Main Street is particularly challenging due to the lack of sidewalk and often uncleared shoulders.

Street crossings, particularly on Main Street, are also a challenge. The typical crossing distance on Main Street is approximately 78 feet (not including parkways or frontage roads). While the three pedestrian activated crossing signals on Highway 203 (Laurel Mountain Road, the Post Office, and on Minaret Road in the North Village) improve pedestrian crossing safety in these locations, the majority of Highway 203 lacks safe pedestrian crossings. As noted in the previous section, the University of California Berkeley, Institute of Transportation Studies noted that the Town and Caltrans should use consistent pedestrian crossing treatments for two and four-lane streets and that the Town and Caltrans should consider the use of the Hawk Beacon at heavily used pedestrian crossings.

Figure 6: Main Street Cross-Section

Main Street cross-section looking west near Laurel Mountain Road (prior to installation of pedestrian activated signal.

Pedestrian Count Data

In August 2010, the Town conducted pedestrian and vehicle counts at various intersection locations along Main Street/Highway 203 and other areas of town. Table 2 outlines the pedestrian and vehicle data collection locations, dates, and hours.

As can be seen in Table 2, it was only possible to collect pedestrian and vehicle volume data for a limited number of hours at many of the intersections within the study area due to limited staffing resources. In order to try to get a better idea of the potential pedestrian volumes over a 24-hour period, the collected data was extrapolated and factored using vehicle volumes from the Town's traffic model as compared to the collected vehicle volumes.

Table 2: Pedestrian and Vehicle Volume Data Collection Schedule

Location	Hours	# Field Hours	Date
Main Street / Sierra Park Road	10:30 AM to 12:30 PM	2	Saturday, Aug. 28, 2010
Main Street / Old Mammoth Road	10:00 AM to 8:00 PM	10	Saturday, Aug. 28, 2010
Main Street / Laurel Mountain Road	8:00 AM to 10:00 AM	2	Saturday, Aug. 28, 2010
Main Street / W. Forest Trail	8:00 AM to 10:00 AM	2	Saturday, Aug. 28, 2010
Main Street and Sierra Boulevard	10:30 AM to 12:30 PM	2	Saturday, Aug. 28, 2010
Main Street / Post Office	7:00 AM to 6:00 PM	11	Friday, Aug. 20, 2010
Main Street / Mountain Boulevard	10:30 AM to 12:30 PM	2	Saturday, Aug. 28, 2010
Main Street / Minaret Road / Lake Mary	10:00 AM to 8:00 PM	10	Saturday, Aug. 28, 2010
Minaret Road / Village crosswalk and surrounding	10:00 AM to 8:00 PM	10	Saturday, Aug. 28, 2010
Minaret Road / Forest Trail	1:00 PM to 3:00 PM	2	Saturday, Aug. 28, 2010
Old Mammoth Road / Minaret Road	1:00 PM to 3:00 PM	2	Saturday, Aug. 28, 2010
Old Mammoth Road / Chateau Road	1:00 PM to 3:00 PM	2	Saturday, Aug. 28, 2010
College Parkway / Meridian	1:00 PM to 3:00 PM	2	Saturday, Aug. 28, 2010

Table 3 summarizes the factored pedestrian volumes and provides a “rank” for each intersection based on the level of pedestrian and vehicle volume activity, with 1 being the highest level of activity and 10 being the lowest. The pedestrian count data is provided in Attachment 4, as well as the vehicle volume data from Caltrans.

Table 3: Pedestrian Volume Data

Location	Total Daily Pedestrian Volume	Average Pedestrian Volume / Hour	Rank
Minaret Road / Forest Trail	3177	132	1
Main Street / Post Office	3065	128	2
Minaret Road / Village crosswalk and surrounding	3048	127	3
Main Street / Minaret Road / Lake Mary	760	32	4
Old Mammoth Road / Chateau Road	759	32	5
Main Street / Laurel Mountain Road	708	30	6
Main Street / Mountain Boulevard	666	28	7
Main Street / W. Forest Trail	463	19	8
Main Street and Sierra Boulevard	431	18	9
Main Street / Sierra Park Road	378	16	10
Old Mammoth Road / Minaret Road	276	12	11
Main Street / Old Mammoth Road	125	5	12
College Parkway / Meridian	93	4	13

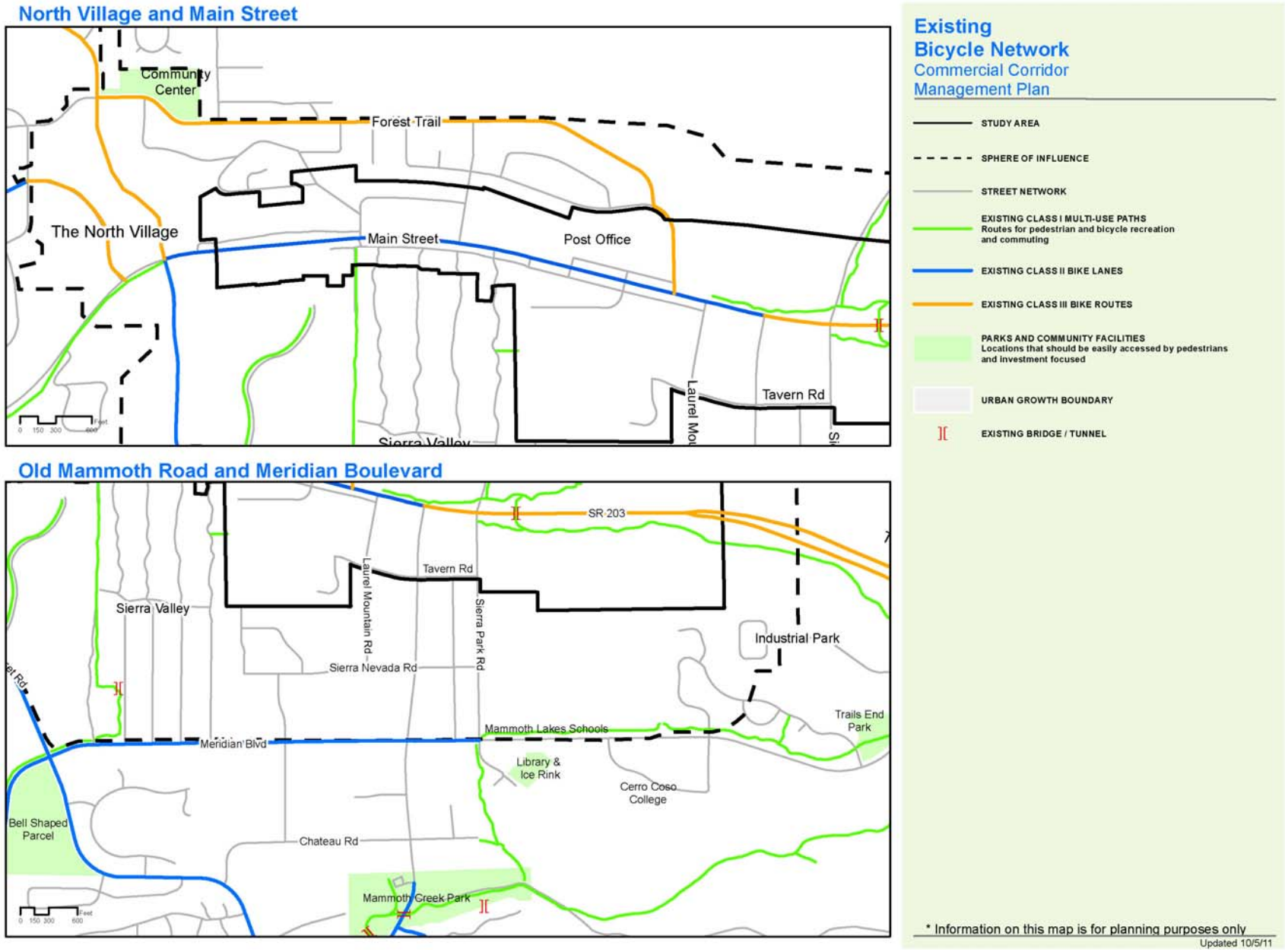
As is shown in Table 3, the highest pedestrian volumes are generally experienced in the North Village, both at the intersection of Forest Trail and at the Minaret Road crosswalk, which has a pedestrian activated signal, and at the Main Street/Post Office intersection, which also has a pedestrian activated signal. Generally, pedestrian volumes along Main Street are generally the second highest within the study area. While intersections along Old Mammoth Road generally have less pedestrian activity than the North Village or Main Street, it should be noted that the intersection of Old Mammoth Road and Chateau Road receives the fifth highest pedestrian activity of the intersections studied.

Bicycle Facilities and Activity

Figure 7 depicts the existing bicycle facilities within the study area and sphere of influence, including multiuse paths (Class I), bike lanes (Class II), and bike routes (Class III). While some recent bicycle facility improvements have been made, most notably the Town and Caltrans' implementation of a Class II bike lane on Main Street between the Welcome Center and the intersection with Minaret Road/Lake Mary in Fall 2011, there are still significant gaps in the network and many existing facilities are inadequate in terms of width and signage. Currently there are no existing bike lanes or routes on many of the streets within the North Old Mammoth Road commercial district, including Old Mammoth Road between Main Street and Chateau Road.

As with many of Mammoth Lake' existing pedestrian facilities, most existing bicycle facilities are also either not maintained or inadequately maintained in the winter. In most cases, bike lanes and/or routes are used for snow storage and are therefore unusable. Additionally, a general lack of secure bicycle parking, both short-term and long-term, further discourages bicycle travel.

Figure 7: Existing Bicycle Network



Transit Facilities and Ridership

Transit in Mammoth Lakes is currently provided through two separate operators, Mammoth Mountain Ski Area (MMSA) and the Eastern Sierra Transit Authority (ESTA). During the winter, MMSA provides the primary transit service within Mammoth Lakes, primarily moving riders from town to the ski portals, but also throughout town. The Town contracts with ESTA to provide transit service throughout the year, supplementing the MMSA service during the winter. Figure 9 depicts the summer transit system and Figure 10 depicts the winter transit system.

All fixed-route transit services within Mammoth Lakes are fare-free. The Town of Mammoth Lakes designates 1.0% percent of its Transient Occupancy Tax (room tax) to fund transit services. Operations provided by MMSA are fully funded by MMSA.

Red Line Ridership Summary

Both the Town of Mammoth Lakes and MMSA operate multiple transit lines in the community; however, the Red Line is the primary transit route through the study area, therefore the following transit data and information is focused exclusively on this route. The Red Line travels primarily along the commercial corridors of Main Street/Highway 203 and Old Mammoth Road. The route differs slightly between winter and summer, but generally extends from the southern end of Town near Snowcreek Athletic Club to the Village at Mammoth, Canyon Lodge, and the Main Lodge (in winter).

Winter Service – Mammoth Mountain Ski Area Transit System

Transit ridership on a town-wide basis is highest during the winter months (generally December through April). The MMSA transit system serves the majority of riders during this time, carrying approximately 550,000 riders between December and April of the 2010 winter ski season (Figure 8). The MMSA Red Line is the most popular route on the MMSA system, carrying approximately 65% of the total MMSA ridership.

Figure 8: Mammoth Mountain Ski Area Transit Ridership

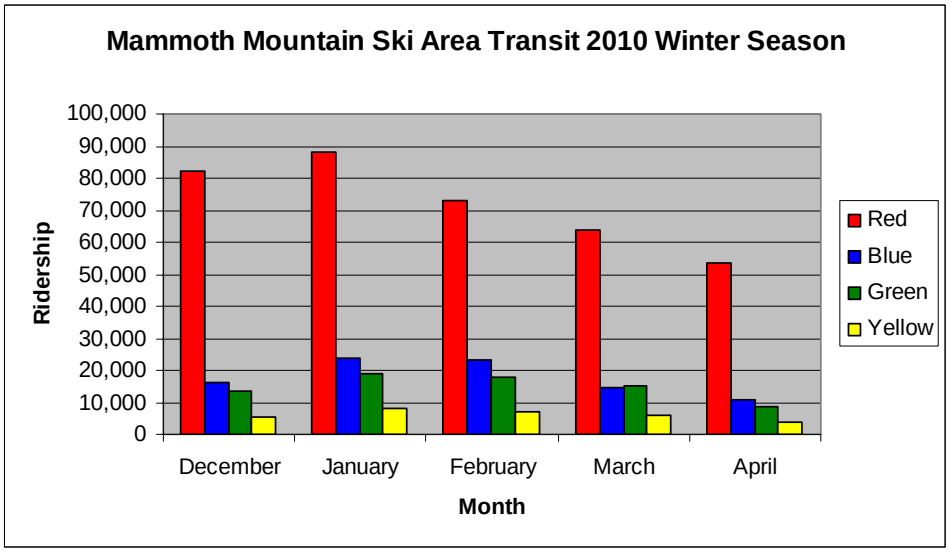


Figure 9: Summer Transit Network

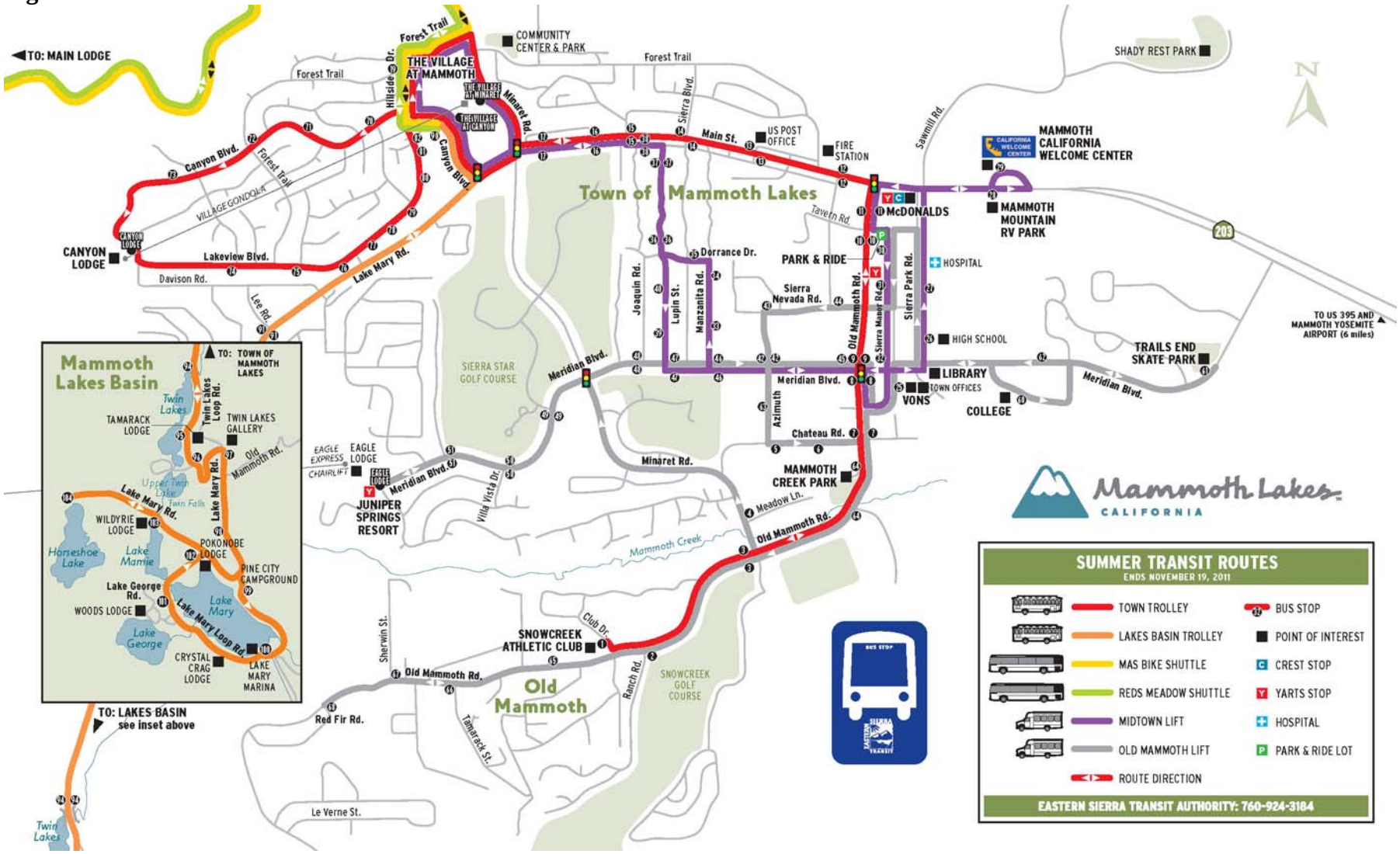
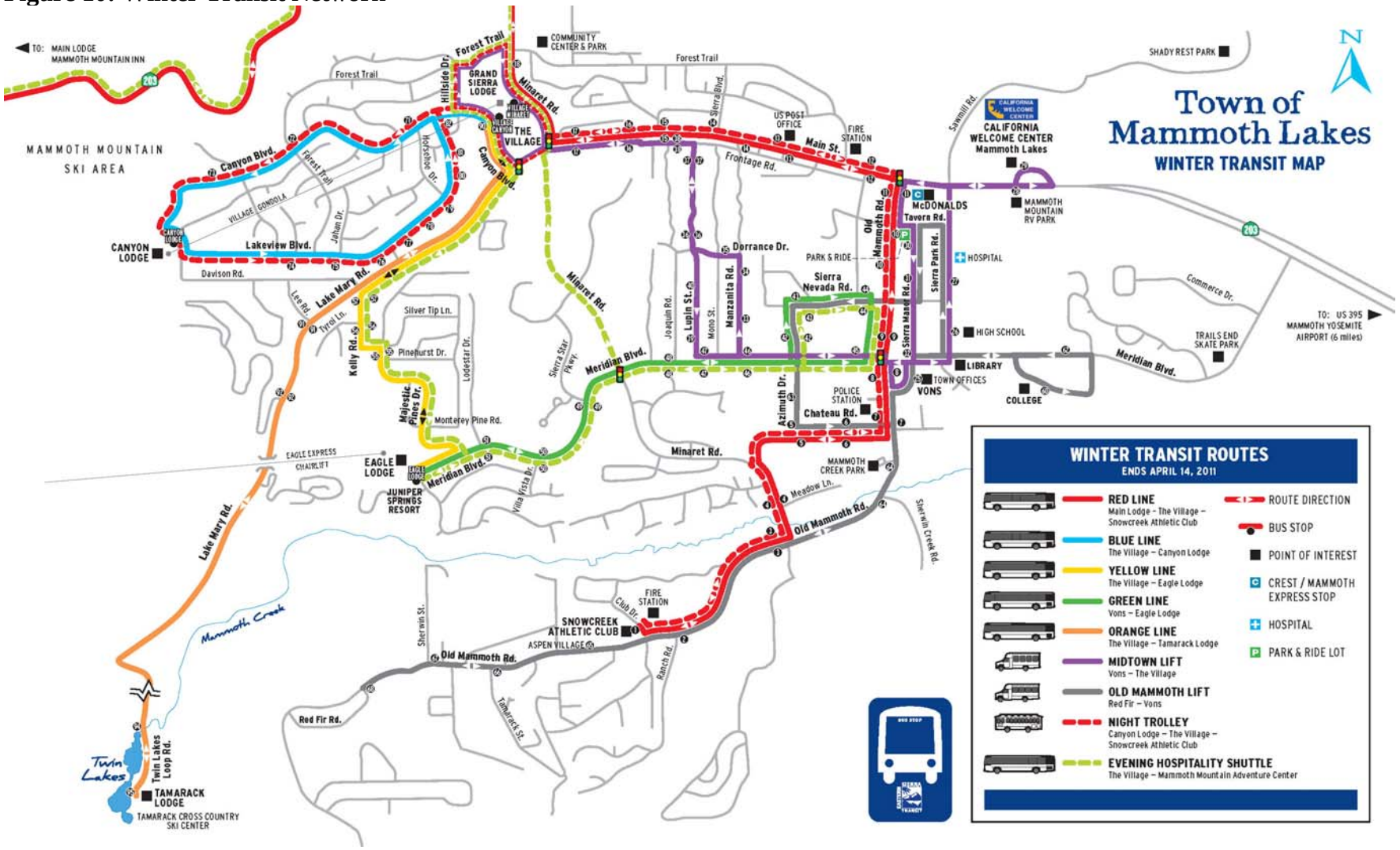
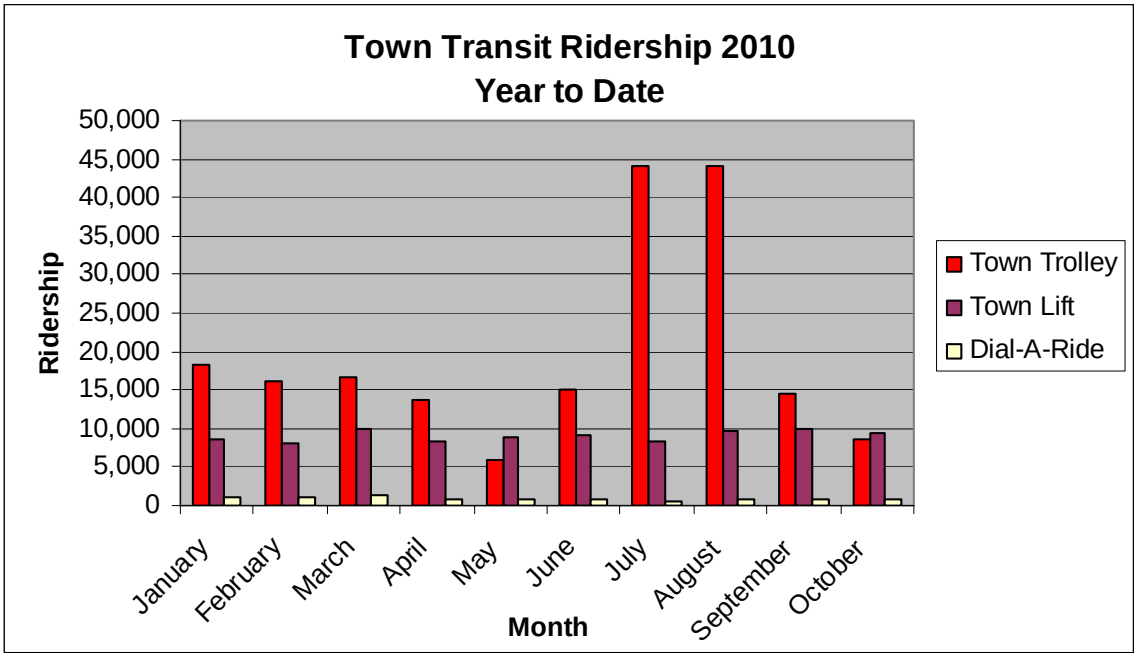


Figure 10: Winter Transit Network



Summer Service – Town of Mammoth Lakes Transit System
As part of the Town of Mammoth Lakes' transit system (served through ESTA), the Red Line, or Trolley, also receives the most ridership annually (Figure 11). However, since the Town's transit system is designed to supplement the MMSA transit system, the peak ridership on the Town's system occurs during the summer months, particularly in July and August where Red Line ridership typically exceeds 40,000 per month.

Figure 11: Town of Mammoth Lakes Transit Ridership



As shown, the Red Line plays an important role in not only the transit system, but the overall Mammoth Lakes transportation system, by providing a convenient and free transportation option to residents and guests, which furthers the goals and objectives of the Town related to the reduction of congestion, greenhouse gases, and air pollution by reducing vehicle traffic on the roadway network.

Red Line (MMSA and Town of Mammoth Lakes) Ridership Patterns
On Saturday, January 23, 2010 Town staff collected sample ridership and boarding (getting on the bus) and alighting (getting off the bus) data at each transit stop while riding one MMSA Red Line bus. Data was collected between 9:00 am and 1:00 pm and between 3:00 pm and 5:00 pm in an effort to capture the peak ridership patterns that typically occur on a winter Saturday on the Red Line.

As shown in Table 4, MMSA Red Line ridership is generally consistent between the hours of 9:00 AM and 12:00 PM in the uphill direction (Snowcreek to Main Lodge), while peak ridership occurs between approximately 3:45 and 5:00 PM in the downhill direction (Main Lodge to Snowcreek). This data is consistent with typical skier recreation arrival and departure patterns in Mammoth Lakes.

Data collection also included counting the number of passengers that were left at a stop if the arriving bus was full (demand exceeds capacity). During the data collection effort, the ridership demand exceeded the capacity on two occasions, both of which occurred at the Main Lodge stop in the late afternoon (after 3:00 pm) as skiers were attempting to board buses headed back into town. MMSA operates a demand-responsive system in which it adds capacity (sending additional buses) to a route or location as and when deficiencies occur. On the day of data collection, MMSA sent a direct bus to the Main Lodge to alleviate the afternoon capacity deficiency.

Table 4: MMSA Red Line Winter Boarding and Alighting Data by Trip Direction

Red Line Transit Survey (Saturday, January 23, 2010)				
Time	**Number Alighting**	**Number Boarding**	**Number. Remaining (Left-behind)[1]**	**Direction[2]**
9:00 AM	23	60	0	A
9:45 AM	5	4	0	B
10:06 AM	13	17	0	A
10:30 AM	21	21	0	B
11:05 AM	50	50	0	A
11:50 AM	34	43	0	B
12:19 PM	70	65	0	A
1:00 PM	37	39	0	B
3:15 PM	17	20	0	A
3:47 PM	73	74	Approx 90	B
4:17 PM	0	0	0	A
4:40 PM	84	79	Approx 200	B

Notes:
1. Number of passengers that were left at a stop if the arriving bus was full (demand exceeds capacity).
2. Direction A = Snowcreek Athletic Center to Main Lodge; Direction B = Main Lodge to Snowcreek Athletic Center

Table 5 details the number of riders boarding and alighting at each stop along the Red Line in each direction during the study period. This data was collected in order to gather information about which stops along the Red Line are most used, which is information that can be used to guide future planning and capital decisions.

Table 5: MMSA Red Line Winter Boarding and Alighting Data by Stop

Red Line Transit Survey (Saturday, January 23, 2010)					
Stop Number	**Stop Location**	**Number Alighting**	**Number Boarding**	**Number. Remaining (Left-behind)[1]**	**Total On/Off**
1	Snowcreek Athletic Club	21	14	0	35
2	Old Mammoth Rd / Ranch Rd	0	0	0	0
3	Old Mammoth Rd / Fairway Rch	0	0	0	0
4	Minaret Rd / Meadow Ln	8	24	0	32
5	Chateau Rd / Azimuth	19	15	0	34
6	Chateau Rd / Chateau Blanc	19	1	0	20
7	Old Mammoth Rd / Chateau Rd	7	5	0	12
8	Old Mammoth Rd / Vons	15	26	0	41
9	Old Mammoth Rd / Meridian Blvd	18	7	0	25
10	Old Mammoth Rd / Park & Ride	19	33	0	52
11	Old Mammoth Rd / Main St	25	18	0	43
12	Main St / Laurel Mtn. Rd	6	7	0	13
13	Main St / Outlet Mall	18	16	0	34
14	Main St / Manzanita Rd	14	9	0	23
14	Main St / Sierra Blvd	19	5	0	24
15	Main St / Mountain Blvd	4	2	0	6
16	Main St / Viewpoint Rd	0	5	0	5
17	Main St / Minaret Rd	2	0	0	2
18	Village South Bound	62	33	0	95
90	8050 / Canyon Blvd	21	44	5	65
18	Village North bound	37	33	6	70
Sledz	Highway 203 / Sledz	3	7	0	10
Chair 2	Highway / Chair 2	26	2	0	28
Main Lodge	Main Lodge	64	166	Approx 290	230

Table 5 shows that, as expected, the Main Lodge is the principal boarding and alighting location along the Red Line, since it serves as the primary destination for riders wishing to access the ski area. The transit stops near the Village at Mammoth (18, 90) collectively serve as the second most popular transit area along the route, with between 65 and 90 riders boarding and alighting at each location during the study period. This higher level of use is consistent with the transit-oriented design of the Village at Mammoth and its intended use as a transit hub.

The third most popular transit stop on the Red Line is located on Old Mammoth Road near the Town's Park & Ride facility. The popularity of this stop is somewhat surprising, since the Park & Ride facility is largely underutilized. Instead, it is likely that the level of use at this stop is related to the relative abundance of mixed-use development in the vicinity as well as the presence of a high-quality transit shelter, as pictured in Figure 12.

Other popular transit stops include Old Mammoth Road near the Vons shopping center, as well as various locations along Main Street, including the stop near the intersection of Old Mammoth Road and Main Street and near the Luxury Outlet Mall.

Transit Shelters and Transit Access

In general, most transit stops within Mammoth Lakes do not include transit shelters. However, there are six existing transit shelters along Main Street that primarily serve riders of the Red Line. Currently, all of the transit shelters on Main Street are located on the north side of the street. These shelters were originally purchased by Caltrans, which also contributes a yearly maintenance fee to the Town.

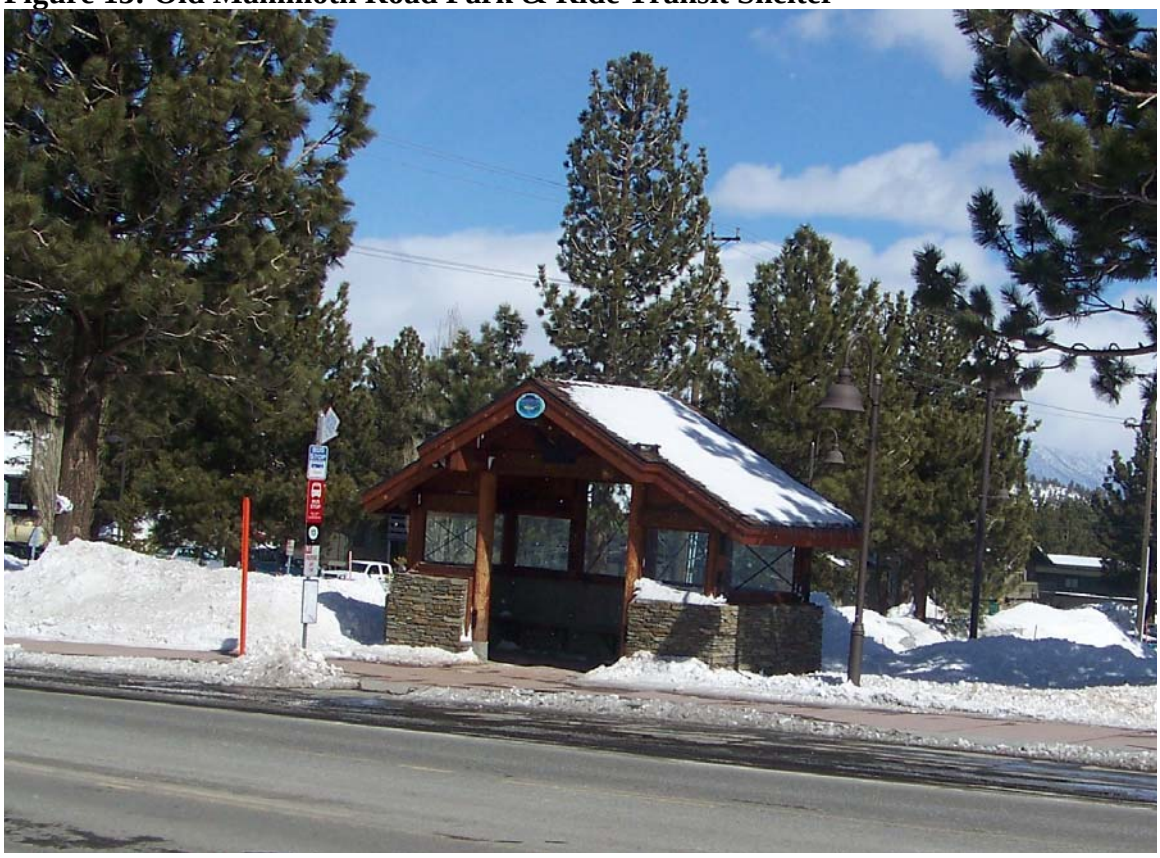
The existing transit shelters on Main Street do not provide adequate space for waiting riders and do not provide suitable shelter from winter weather. Currently, none of the shelters are accessible by sidewalks and there are no turnouts along Main Street for buses to pull out of the traffic lane for loading and unloading.

Figure 12: Main Street (Highway 203) Transit Shelter

Existing transit shelter on Main Street without pedestrian access and lack of shelters on south side of Main Street.

Figure 13 depicts the transit shelter located on Old Mammoth Road adjacent to the Town's Park & Ride facility, which was constructed in 2003 by the Town of Mammoth Lakes in conjunction with the Old Mammoth Road reconstruction project. This transit shelter design has been identified as an ideal design for future transit shelters, although the scale of the design may be altered to accommodate locational constraints. More recently, the Town, in partnership with the United States Forest Service, installed four similar transit shelters in the Lakes Basin as part of the Lakes Basin Path project.

Figure 13: Old Mammoth Road Park & Ride Transit Shelter



Signage and Wayfinding

During the Downtown NDP process, the need for improved signage and wayfinding was discussed. Comprehensive and cohesive signage and wayfinding can improve the visitor experience by guiding visitors to their destinations more efficiently and effectively, whether by vehicle, walking, biking, or taking transit. A signage and wayfinding system, appropriately implemented, can also help to reduce vehicle miles traveled by encouraging "feet-first" travel.

In general, existing directional signage is inconsistent in terms of messaging and design. Over the years, signage (directional, regulatory, informational, etc.) has been added in an ad hoc manner, in some cases creating visual clutter and confusion.

For example, as shown in Figure 14, existing signage on Main Street/Highway 203 that provides directional guidance to Mammoth Mountain Ski Area's Main Lodge refers to the destination in three different ways: "Mammoth Ski Area," "Ski Area," and "Mammoth Mountain."

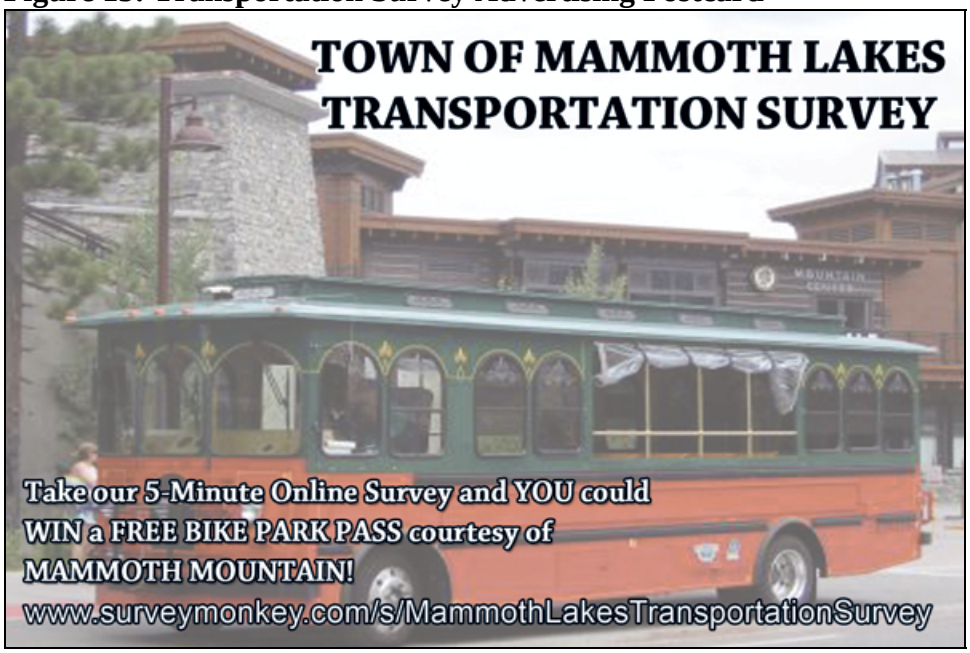
Figure 14: Directional Signage to Mammoth Mountain Ski Area on Main Street/Highway 203

Also discussed was perceived signage clutter, particularly along Main Street, and the need to identify signage that could be removed or consolidated, as well as needed signage. In September of 2011, Town staff, in partnership with Mono County, began compiling a GIS database of existing street signage. The database includes information about sign location, type, content, condition, material, post type, and color. The database establishes a comprehensive baseline that will be used to identify signage needs and issues. The data will be used for various Town planning projects, such as the Municipal Wayfinding and Community Messaging Project, and maintenance tracking.

Transportation Survey

As part of the public participation process, the Town developed and initiated an online transportation survey to gather information about the existing transportation choices, preferences, and patterns of Mammoth Lakes' residents, visitors, business owners, and workers. The online survey was launched on July 2, 2010 and was available for approximately 30 days. Figure 15 shows the postcard that was distributed to all property and business owners within the study area (Main Street district).

Figure 15: Transportation Survey Advertising Postcard



The survey was primarily focused on the Main Street District and included questions related to travel to, from, and within the District. The survey included a total of 47 questions; however, because the survey was logic-based (questions would change depending on how the previous question was answered), no individual participant was given all 47 questions.

Approximately 144 people completed the survey and the information gathered helped to inform the Downtown NDP process, as well as other Town transportation-related programs/projects.

Approximately two-thirds of the survey participants were full-time residents of Mammoth Lakes and/or worked in Mammoth Lakes. The remaining participants were either second homeowners or visitors. The following are general results from the transportation survey:

Full-time Residents

- Approximately 90% of full-time residents have lived in Mammoth Lakes for 4 years or longer; approximately 60% of those between 4 and 15 years; and approximately 27% more than 16 years.
- Most full-time residents that participated in the survey do not have children (78%); Of those with children, only 13% have children that currently attend school in Mammoth Lakes.
- Most full-time residents live outside of the study area (Main Street District) (92%).
- The majority of full-time residents live in Sierra Valley Sites, Majestic Pines, or in neighborhoods around Old Mammoth Road and Meridian Boulevard.
- Most full-time residents visit businesses (retail, restaurant, offices, post office, etc.) within the study area between 2 and 10 times per week. (63%).
- Approximately 59% of full-time residents travel to the study area by car; 15% walk; 10% bike; and 2% use transit.

Visitors/Second Homeowners

- Approximately 90% of visitors/second homeowners surveyed visit Mammoth Lakes for recreation purposes; 10% for business purposes.
- Approximately 28% of visitors/second homeowners stay in a condo they own; 20% rent a condo; 20% rent a hotel/motel; 10% stay in a house they own; 15% stay in a campground.
- Half of visitors/second homeowners surveyed own or usually rent a place in the study area (54%); 7.7% were not sure.
- Approximately 36% of visitors/second homeowners travel to Mammoth 2 to 4 times per year; 26% 11 or more times per year; 23% 1 time per year; 15% 5 to 10 times per year.

- Most visitors/second homeowners stay between 4 and 5 days (41%); 28% stay 2 to 3 days; 18% 6 to 7 days; 10% more than 7 days.
- 95% of visitors/second homeowners surveyed travel to Mammoth Lakes by car and 66% continue to travel within Mammoth Lakes by car once they've arrived; 18% typically use transit; and 16 % walk or bike.
- 39% of visitors/second homeowners surveyed visit businesses (retail, restaurant, offices, etc.) "very often"; 31% "often"; 28% "sometimes"; 3% "rarely."

Work in Mammoth Lakes (Both Residents and Non-Residents)

- Approximately 71% of those that work in Mammoth Lakes travel to work by car; 15% walk; 9% bike; and 3% use transit.
- Close to 60% of workers travel to work 5 days per week; 25% less than 5 days per week; and 16% more than 5 days per week.

All Respondents

Transit

- Approximately 27% use transit in Mammoth Lakes "seldom"; 26% "occasionally"; 22% "never"; 17% "often"; 7% "very often."
- Respondents use transit most often in the winter (43%); throughout the year consistently (31%); summer (27%).
- When using transit, it is most often to go skiing (or participate in some other recreation activity) (79%); Shopping (30%); Work (12%); Dining/Entertainment (9%); 3% school.
- When asked what would encourage them to ride transit more often, 32% of respondents said to expand service to currently unserved areas of town; 21% said to increase existing service; 11% said to improve bus shelters/turnouts.

Vehicles/Driving/Parking

- When asked if speeding is a problem in Mammoth Lakes, 38% of respondents indicated that speeding is "a moderate problem"; 32% said "a minor problem"; 13% said "not a problem"; and 10% said "a major problem."
- When asked about their preference between a traffic signal, a roundabout, and a stop sign at a major intersection, 40% of respondents indicated that they preferred a traffic signal; 38% said roundabout; and 15% said stop sign.
- The vast majority of respondents indicated that "traffic congestion" in Mammoth Lakes is either a "minor problem" or "not at problem" (73%); 21% said it was "a moderate problem."

Pedestrian/Walking

- When asked to rate various transportation issues against each other, 42% of respondents indicted that "a lack of pedestrian facilities (sidewalks, paths)" was a "major problem."

- The majority of respondents indicated that providing "safe routes to school" was "very important" among pedestrian-specific improvements (67%); 42% said ranked pedestrian facilities "to/from recreational/trailhead/park areas" as "very important"; and 38% said "in commercial/employment/entertainment areas."
- In general, the North Village area, Main Street area, and North Old Mammoth Road area were ranked highest in need of pedestrian improvements.

A copy of the survey, including the detailed results and a flowchart illustrating the survey logic design is included in Attachment 5.

4.0 ALTERNATIVES ANALYSIS

Chapter 4 of the DCMS provides information about the development of the concept alternatives for the study area. Early input to develop the alternatives included brainstorming ideas with the stakeholder focus group about the potential future form, function and character of each of the study area's five subareas. Many of the ideas, which covered a broad range of issues and themes, were incorporated into the concept alternatives.

Alternatives development and review was a three-step process, including review and input by the focus group, the public, and key interests such as Caltrans and the USFS, to narrow down and focus on the strongest consensus ideas and arrive at a Preferred Concept:

- Development and review of four Preliminary Alternative Concepts,
- Revision of the four Preliminary Alternative Concepts to two Refined Alternative Concepts, and
- Creation of a single Preferred Concept, which was a synthesis based on the preferred components from the two Refined Alternative Concepts.

As discussed earlier, transportation was a significant focus of the Downtown NDP and Caltrans played an integral role in the review process, helping to identify potential issues or needs for additional study. Notes from meetings with Caltrans and Town staff are provided in Attachment 6.

Preliminary Concept Alternatives

The four Preliminary Concept Alternatives (Figures 4-1 through 4-4 of the DCMS) generally reflected a range of potential future change with regard to transportation, from minimal in the "Polished Plan" to a more substantial level of change in the "Walkable Nodes" concept. The four alternatives, ranging from the least to the greatest degree of change were:

- Alternative 1: Polished Plan – limited investment in transportation and other infrastructure; study area to remain largely unchanged in terms of land use and transportation.

- Alternative 2: Linked Anchors/Small Median and Roundabouts – included a modestly-sized center median with turn pockets on Main Street, as well as roundabouts at various intersections to help calm traffic. Main Street would function as the primary transportation link between the major mixed use anchors of the North Village and North Old Mammoth Road; limited changed to land use in the study area.
- Alternative 3: Linked Anchors/Greenway – similar to the Linked Anchors/Small Median and Roudabouts Concept, but provides a much more substantial center median on Main Street in the form of a greenway measuring up to 100 feet and including pedestrian facilities and potentially a gondola connection within; limited change to land use in the study area.
- Alternative 4: Walkable Nodes – includes substantial changes to transportation and land use; the cross section of Main Street would be narrowed to two lanes and would include "central squares" to calm traffic. Additional roadway connections to distribute traffic, increased transit and pedestrian access, and more intense mixed use development would be support the lane reduction by reducing vehicle trips on Main Street.

Refined Concept Alternatives

From the above preliminary concepts, two refined alternatives were developed. These two alternatives were generally formed around Alternatives 3 and 4, Linked Anchors/Greenway and Walkable Nodes. Process participants generally felt that these two concepts were the strongest in terms of achieving the desired vision and goals for the study area, particularly the Main Street corridor. While all alternatives included the concepts of "feet-first" and complete streets, these two alternatives possessed the most significant change in terms of transportation infrastructure within the study area and the cross-section of Main Street. Based on the feedback received, the two alternatives were adjusted to create two refined alternatives, which were renamed the Greenway Alternative and the Downtown Alternative. The transportation related qualities of each alternative are described below.

<u>Greenway Alternative</u>

Main Street becomes a more attractive, functional and efficient corridor, including a central greenway (up to 100 feet in width), linking the North Village and North Old Mammoth Road anchors. The Greenway Alternative is depicted in Figure 16. The alternative includes the following transportation related changes:

- An expansive Main Street greenway from Sierra Park Road to Manzanita Road that provides an aesthetic and functional median, and effectively pushes the street to the front of the buildings (by eliminating frontage roads), while maintaining efficient traffic flow.
- Provision of on-street parking and strategically located parking structures.
- Improving "feet-first" mobility via "complete streets," completing gaps in existing pedestrian and bicycle networks, providing safer pedestrian crossings,

and expansion of the transit system via a gondola, tram, rapid bus line, or other transit mode.

In general, the public and focus group supported the idea of a median greenway on Main street; however concerns about maintenance costs and practicality were raised, including the use of the median for snow storage, which may just cause similar visual and access impacts as what occurs now. Some members of the public also noted that Greenway Alternative may not create enough of a sense of change to allow for the guiding principles to be meaningfully achieved.

The concept of a gondola within the median greenway was also met with varied opinions, including some who thought that it would be too expensive and would hurt Main Street businesses by taking people off of the street-level and moving them straight to the North Village. However, some members of the public thought that the gondola would encourage reduced vehicle use and would be a "signature" icon for Mammoth Lakes.

Downtown Alternative

Main Street is defined by a series of strong, well-integrated and walkable nodes to unify and connect its north and south sides, which are currently difficult to cross. The alternative is framed around a more traditional "main street character," supported by a greater mode split and improved traffic management to a more connected street grid. The Downtown Alternative is depicted in Figure 17. The alternative includes the following transportation related changes:

- Main Street is narrowed to two lanes and a center turn lane, frontage roads are eliminated, "central squares" are added, and buildings are moved to the street.
- Three "nodes" or walkable centers are provided along Main Street: a Town Center with civic center node, Mixed Retail/Residential node, and a High Intensity Lodging node.
- Multiple new roads included to serve potential new land uses, including a Civic Center complex north of Main Street/Old Mammoth Road, an events/sports park at the east end of Main Street, and other developments or expansions, such as the hospital and schools.
- Provision of on-street parking and strategically located parking structures.
- Improving "feet-first" mobility via "complete streets," completing gaps in existing pedestrian and bicycle networks, providing safer pedestrian crossings, and traffic calming "central squares."

In general, the public and focus group were much more supportive of the changes associated with the Downtown Alternative, particularly the functional transportation changes, including the walkable nodes concept; however, although there was support for the removal of frontage roads on Main Street, there was concern about reducing the number of travel lanes from four with a center turn lane to two with a center turn lane and there was concern regarding the feasibility of implementing central squares within the Main Street cross-section.

Figure 16: Greenway Concept

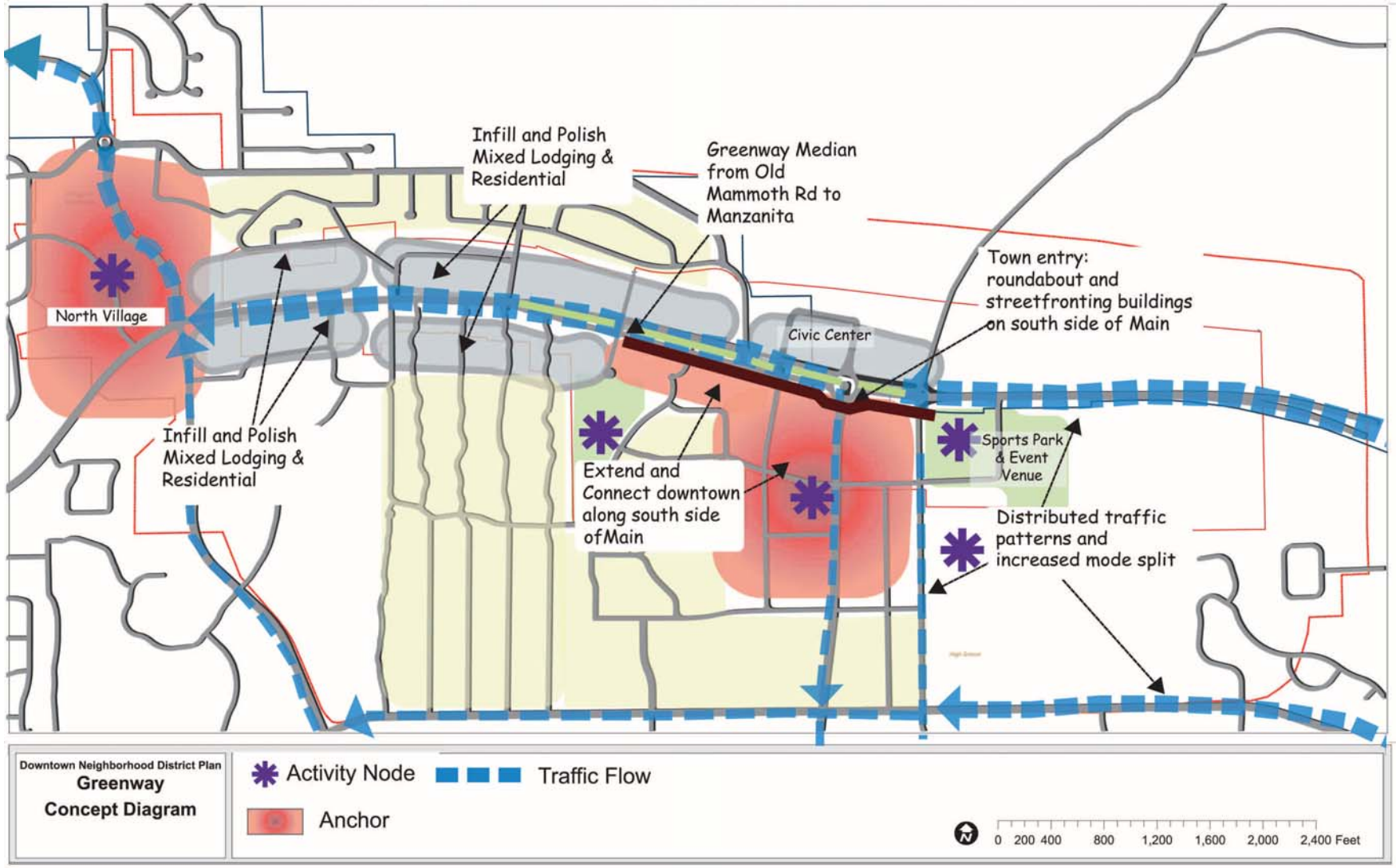
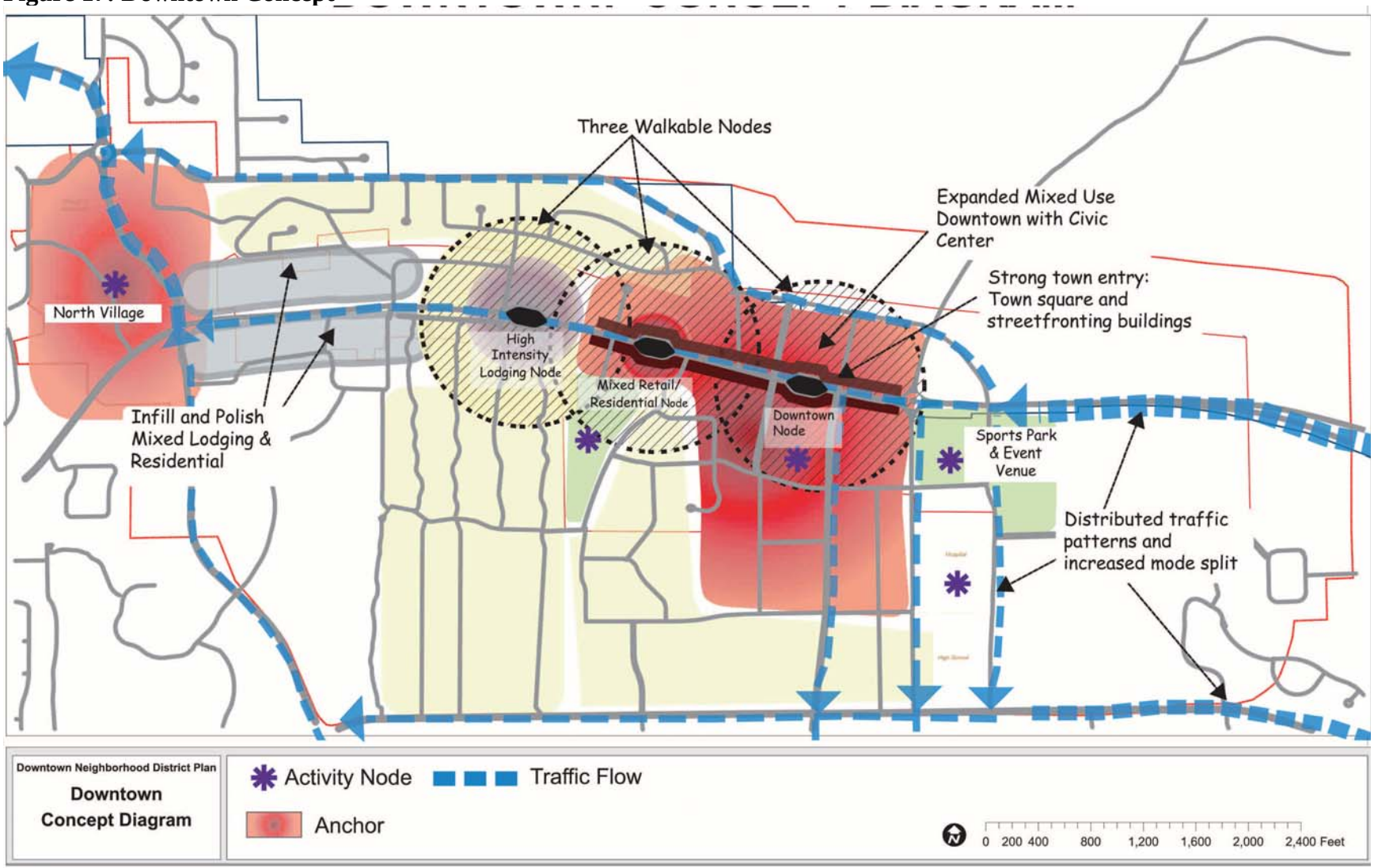


Figure 17: Downtown Concept



5.0 PREFERRED CONCEPT

Chapter 5 of the DCMS describes the "Preferred Concept" for the study area, which was formulated based on the approved Framework (Appendix B of the DCMS) and the refinement of the broad range of concept alternatives based on consensus feedback from the public and the Focus Group.

It should be noted that the Preferred Concept requires refinement to lead to a final plan for the Downtown area. Additional technical analyses and feasibility assessments (both physical and financial), particularly with regard to major transportation infrastructure improvements, will be necessary. These additional studies, which are described in Section 6.0 as part of the anticipated "next steps," will likely lead to refinements and changes to the concepts and recommendations contained in the Preferred Concept, which are intended to serve as a starting point for additional study.

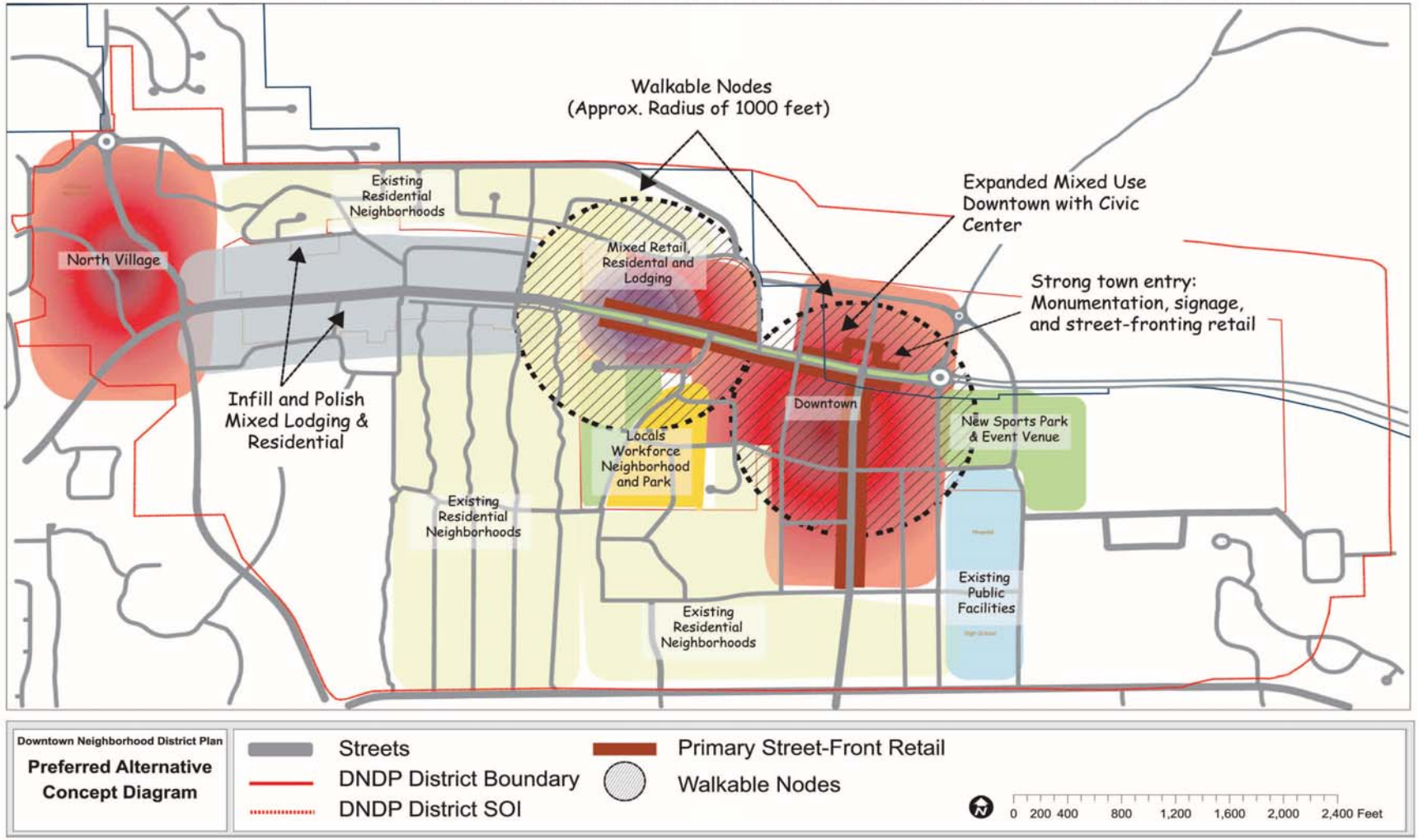
Figure 18 illustrates the land use and transportation changes envisioned under the Preferred Concept for the study area and sphere of influence. The transportation system forms the "backbone" of the Preferred Concept, since it is the network and configuration of streets and associated facilities that help define the function and structure of the built environment. Major transportation related components that form the Preferred Concept include the following, which are described in more detail below:

- Four travel lanes on Main Street, with a moderately sized median along the eastern portion of the street, and an improved streetscape.
- Expanded and more connected street network.
- Street fronting buildings on primary retail streets (removal of frontage roads).
- Year-round pedestrian facilities and connectivity along the length of Main Street.
- On-street public parking.
- Emphasis on increasing alternate transportation modes, such as walking, transit and biking.
- Calm traffic, but do not push traffic to adjacent neighborhoods.
- Implement an aggressive snow management program.

Vehicle Network and Level of Service

An integral component of the Preferred Concept is the principle of "complete streets." Caltrans defines a complete street as "a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility." This principle is implemented in the Preferred Concept through the expansion of the street network and associated facilities in order to create a more efficient and connected transportation system that provides alternative routes for traffic, pedestrians, bicyclists, transit and emergency services.

Figure 18: Preferred Concept – Land Use and Transportation Diagram



The reconfiguration of the Main Street cross-section is also intended to implement the principle of "complete streets" by removing the existing frontage roads and reallocating some of the new land area to streetscape improvements, including pedestrian and bicycle facilities, as well as on-street parking. The expanded street network is intended to provide additional support for this objective by distributing traffic and reducing vehicle trips on Main Street. Figures 19 and 20 depict the typical conceptual cross-sections for Main Street in the Downtown area, as well as west of Manzanita.

Figure 19: Main Street Cross-Section in Downtown Area

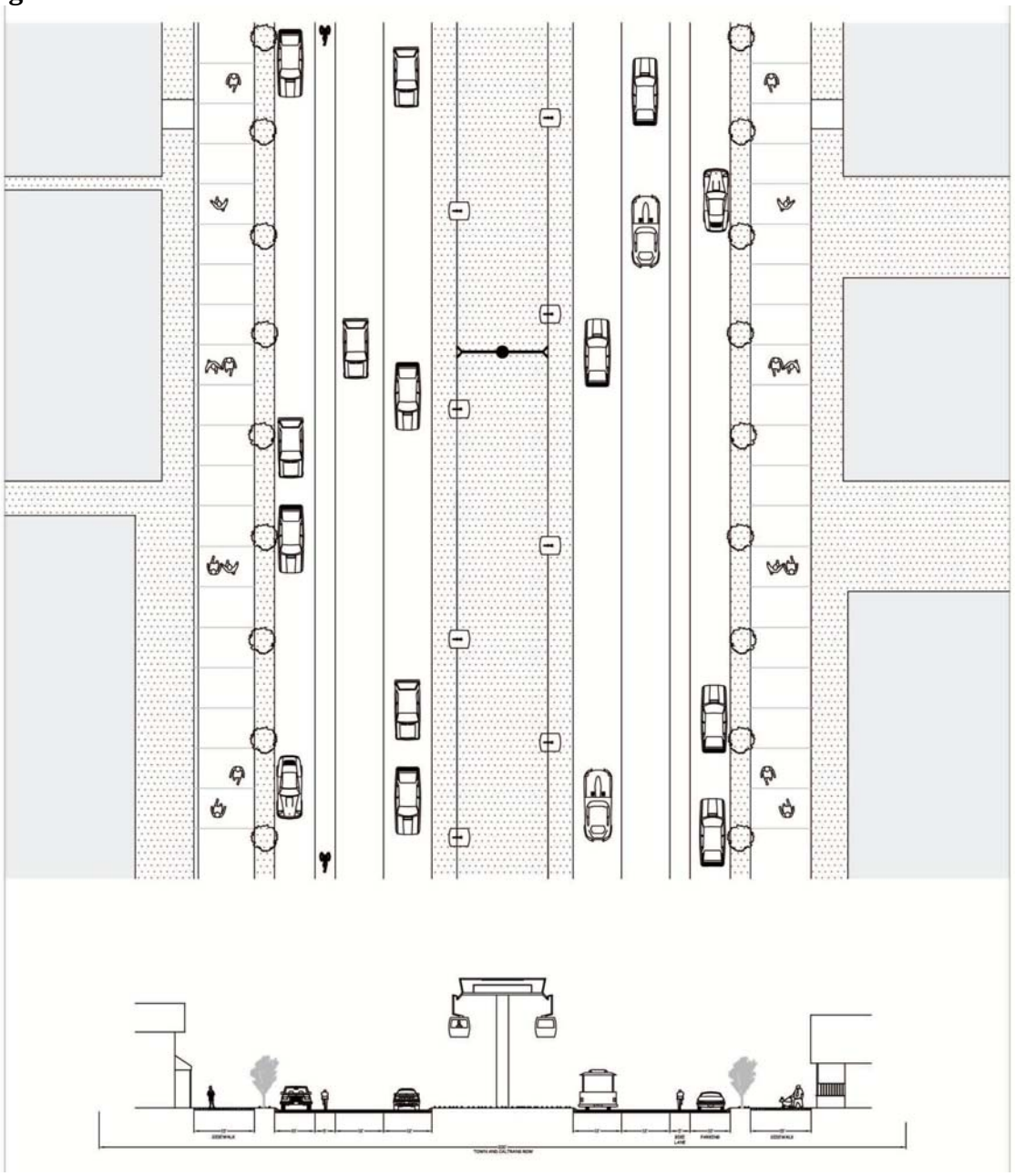
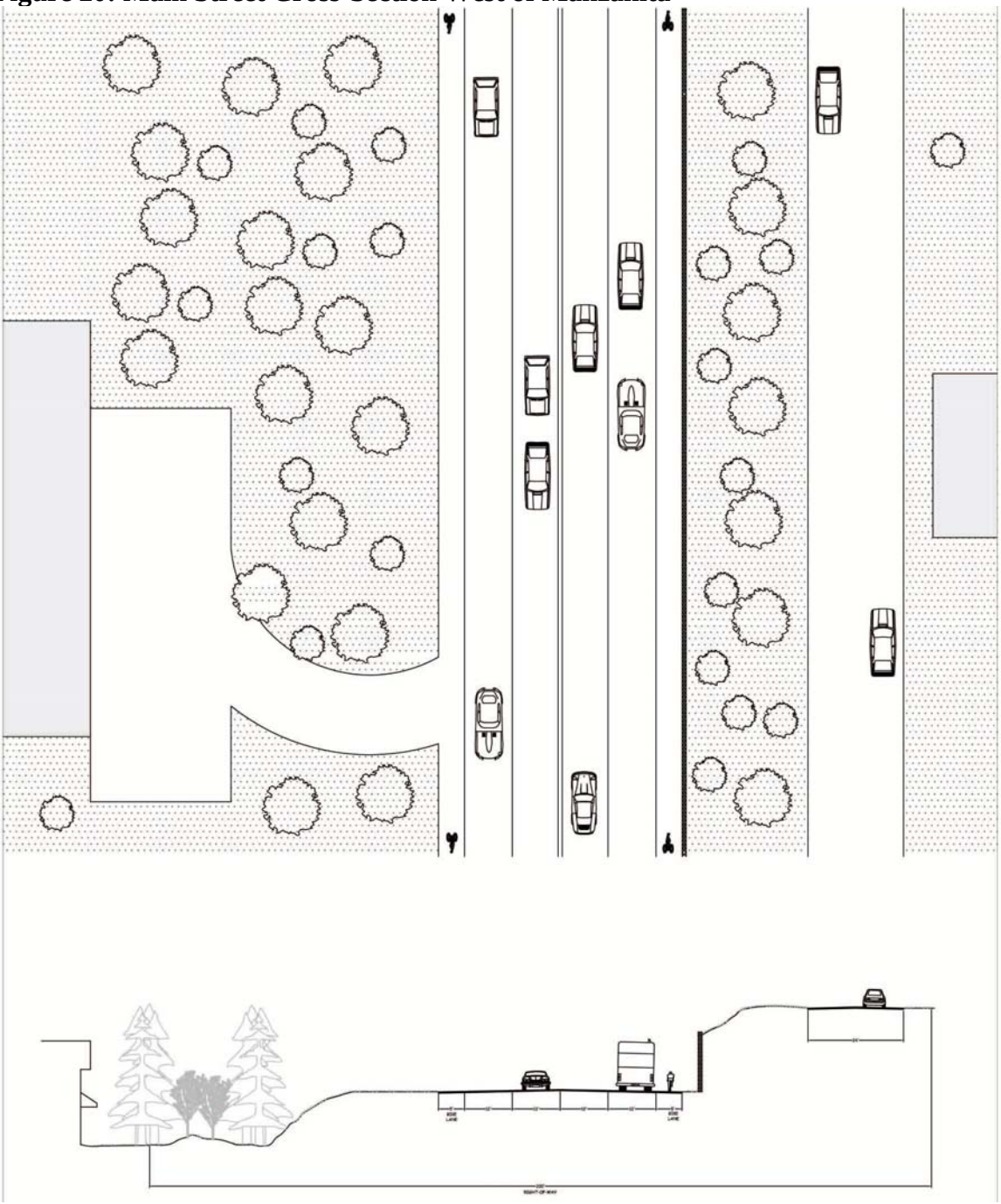


Figure 20: Main Street Cross-Section West of Manzanita

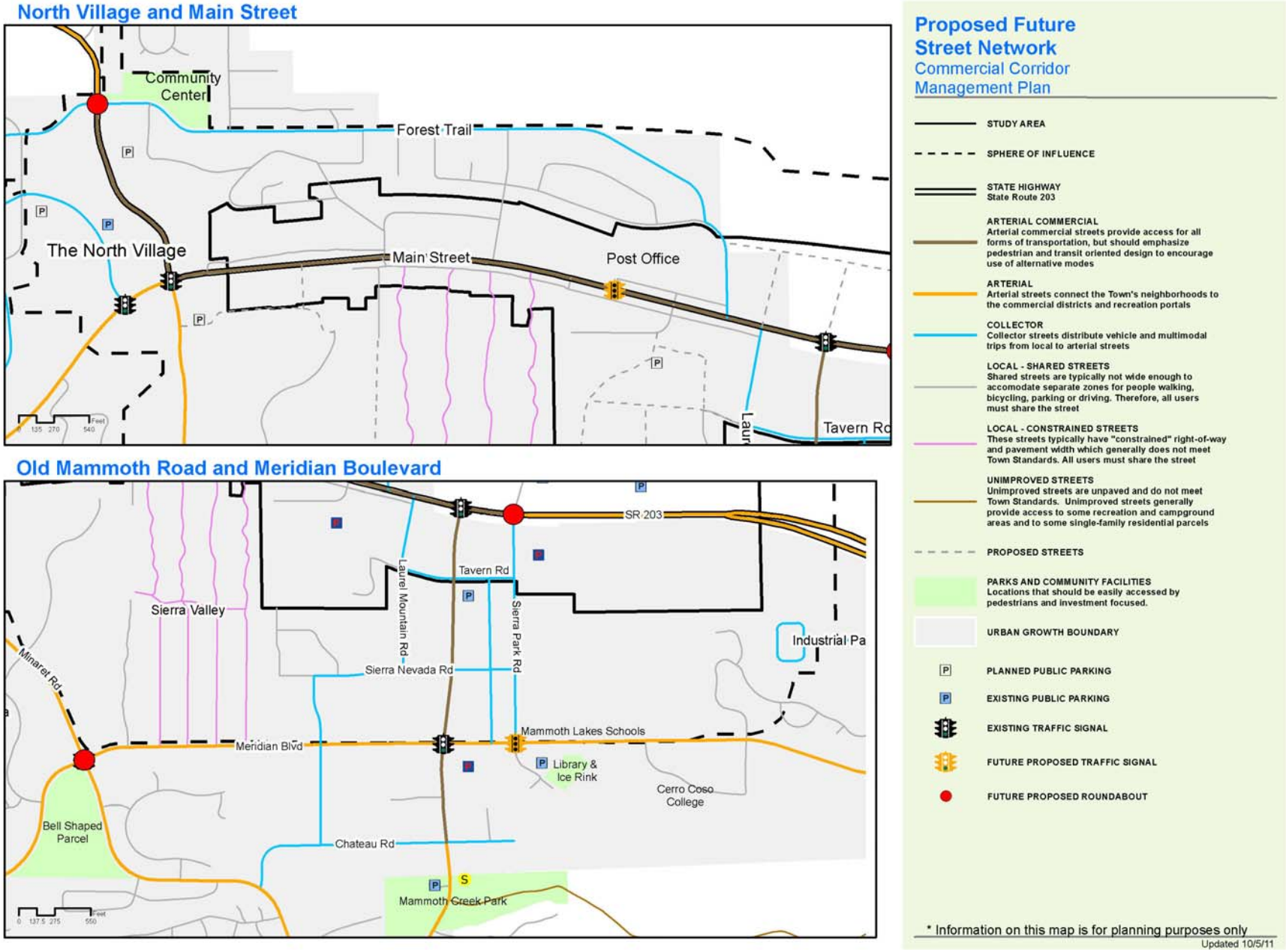


New Street Connections

The expanded street network recommended in the DCMS consists of several potential new streets. A number of these roadways are already included in Town planning documents like the Mobility Diagram, as facilities that are planned or projected to occur with new development. It should be noted that many of these roads are outside of the study area and sphere of influence, recognizing that circulation for a study area this large can only be effectively considered on a town-wide basis, looking at the entire street network and traffic flow. Figure 21 depicts the future proposed street network and potential new street connections are discussed below:

- United States Forest Service Property Connections – Provides connections within the USFS lands that are currently used for offices and housing on the north side of Main Street. These connections would provide improved connectivity on the north side of Main Street and would be considered in accordance with potential future USFS development plans.
- Thompsons Way – Creates a new north-south street connection between Main Street and the Sierra Nevada Road Extension, parallel to Sierra Park Road that will provide access to the new County Courthouse, Mammoth Hospital and the schools.
- Tavern Road Extension – Extends Tavern Road to the east, which connects to Thompsons way. This extension would primarily serve Mammoth Hospital and potential future development of the Civic Center parcel south of the new County Courthouse.
- Sierra Nevada Road Extension – Extends Sierra Nevada Road to the east to connect to the new Thompsons Way. The street extension may proceed east to provide additional access to the Mammoth Unified School District properties and potentially provide emergency access to the Industrial Park. This connection creates an additional east-west connection parallel to Meridian Boulevard near the schools and hospital.
- Sierra Park Road Extension – Extends Sierra Park Road south to Chateau Road, then continuing to Sherwin Creek Road via a bridge over Mammoth Creek. This connection would create an additional north-south connection parallel to Old Mammoth Road.
- Shady Rest Site Connections – Provides connections within the Shady Rest Site between Center Street, Tavern Road, Dorrance Drive, and Chapparal Road/Arrowhead Drive. These connections would improve east-west and north-south connectivity in the center of town and would likely occur with development of the Shady Rest Site.
- Callahan Way Extension – Extends Callahan Way south to Dorrance Drive. This connection would provide improved access to Main Street from the Sierra Valley neighborhood. This connection would likely occur with development of Sierra Star (Lodestar).

Figure 21: Proposed Future Street Network



- 7B Road (Sierra Star Connector) – Connects Minaret Road to East Bear Lake Drive, as well as to Main Street. This connection provides required access to the future (approved) Mammoth Crossing and Tanavista projects, as well as to Sierra Star (Lodestar). The connection also provides enhanced emergency access to the Holiday Haus (approved) and the Chutes (existing) properties. This connection would likely occur with development of Sierra Star and Mammoth Crossing.
- Waterford Connection – Provides a bridge over Mammoth Creek to connect Waterford Avenue. This connection would provide improved north-south access and a key emergency access route for the Old Mammoth and lower Majestic Pines neighborhoods.

Although these alignments are included as part of the concept, the actual necessity for each roadway, and details of its specific design, classification, and alignment are subject to change based on the timing and level of future development, as well as additional technical analyses.

Traffic Model and Level of Service

Preliminary analysis using the Town's updated traffic model was conducted to evaluate the effectiveness of these potential street connections, as well as various mode split scenarios and land use assumptions described in the Preferred Concept. A series of alternatives were developed and tested with the updated traffic model. The alternatives represent a "layered" approach to future street network and land use changes. The model alternatives are summarized as follows:

- Future Baseline – Models buildout "baseline" land uses with the existing street network (i.e. no new street connections added).
- Alternative 1 – Models buildout "baseline" land uses with new streets that are anticipated to be implemented with new development.
- Alternative 2 – Models buildout "baseline" land uses with all new streets that would be anticipated to be constructed as part of the complete circulation network as recommended in the Preferred Concept. (This alternative maintains the Main Street Frontage Roads).
- Alternative 3 – Same as above Alterative 2; however, the Main Street Frontage Roads are removed.
- Alternative 4 – Same as Alternative 3; however, the land use assumptions are increased to include additional residential and commercial space as described in the Preferred Concept.
- Alternative 5 – Same as Alternative 4; however, an additional transit line is added to Minaret Road to serve planned development.

Based on the traffic model results, it is anticipated that an average of between 18,000 and 24,000 vehicles will be carried on Main Street between Minaret Road and Old Mammoth Road; peak hour volumes are anticipated to average between 1,600 and 2,000 vehicles under future baseline conditions. On Old Mammoth Road between Main Street and

Meridian, anticipated future daily volumes are approximately 11,000 to 12,000 and peak-hour volumes are approximately1,100 to 1,200.

Table 6 summarizes the anticipated future level of service at intersections within the study area and sphere of influence under future baseline conditions. Level of service results for all model alternatives are provided in the technical memorandum prepared by LSC Transportation Consultants, Inc. in Attachment 3.

Table 6: Future Level of Service (Buildout "Baseline" Without New Streets)

Intersection	Control	LOS[1]	Delay (sec/veh)[2]
Lake Mary Road/Canyon Boulevard	Signal	A	8.8
Main Street/Minaret Road	Signal	D	37.2
Main Street/Old Mammoth Road	Signal	B	14.8
Meridian Boulevard/Old Mammoth Road	Signal	C	22.6
Minaret Road/Forest Trail	Unsignalized	**F**	1.24
Main Street/Mountain Boulevard	Unsignalized	**F**	1.3
Main Street/Center Street	Unsignalized	**F**	1.19
Main Street/Forest Trail	Unsignalized	**F**	2.09
Main Street/Laurel Mountain Road	Unsignalized	**F**	1.46
Main Street/Sierra Park Road/Sawmill Cutoff	Unsignalized	C	16.3
Old Mammoth Road/Tavern Road	Unsignalized	E	47.9
Old Mammoth Road/Sierra Nevada Road	Unsignalized	**F**	1.0
Meridian Boulevard/Sierra Park Road	Unsignalized	A	8.4

Notes:
1. Performed in the Synchro capacity analysis software using the 2000 Highway Capacity Manual methodology.
2. For unsignalized intersections with a level of service "F," critical approach volume-to-capacity ratio is reported instead of delay.

As is shown in Table 6, all signalized intersections are expected to operate within the acceptable level of service under future baseline conditions; however, several existing unsignalized intersections, which are currently operating at a deficient level of service (LOS D or below), are expected to worsen in the future. While not included in Table 6, the level of service results for each alternative (provided in Attachment 3), suggest that existing signalized intersections will improve modestly with the addition of new roadway links and increased transit service, and there does not appear to be a significant impact to the level of service at intersections under alternatives 4 and 5, in which increases in land use along Main Street are modeled consistent with recommendations of the Preferred Concept.

However, a number of existing *unsignalized* intersections currently operate, or are close to operating, at an unacceptable LOS (LOS D or worse), particularly along Main Street and Old Mammoth Road. The LOS for many of these intersections is expected to worsen in the future, even with the addition of new street connections and increased transit service. It is likely that intersection improvements, such as adding traffic signals,

roundabouts, turn-lanes, or other capacity enhancing measures, will be necessary to improve LOS to an acceptable level. Figure 21 also depicts potential new signals and roundabouts within the study area and sphere of influence.

Further analysis of potential new signals and roundabouts will be necessary as part of project-specific analysis, including signal warrant analysis per the Manual on Uniform Traffic Control Devices (MUTCD) methodology. The Town will also work with Caltrans to plan for and implement necessary or desired intersection and roadway improvements on Main Street.

Alternate Transportation Modes

While providing alternate routes and expansion of the road network is important to the success of the Preferred Concept, equally important is the concept of increased "mode split," which means the balance between the numbers of people using alternate modes of transportation to the private automobile. The Preferred Concept assumes increased mode split in the form of increased transit ridership (facilitated by additional stops and improved service); a reduction of trips within the Downtown by locating housing and lodging close to shopping and services so that driving between destinations becomes less necessary (known as "internal capture"); and an improved walking environment.

Pedestrian Facilities

An integral part of increasing mode split is improving the environment for pedestrians. Numerous studies have shown that willingness to walk to a destination increases greatly when conditions are perceived as safer for travel by foot, when pedestrian facilities are connected and well-maintained, and when the walking occurs in an attractive, interesting and pedestrian-scaled environment.

Creating a safe and walkable downtown is central to the Preferred Concept. This would be facilitated by providing year-round pedestrian facilities (i.e. sidewalks and paths cleared of snow in the winter), additional safe crossing opportunities, particularly on Main Street, and providing better connectivity and wayfinding with regard to the broader trails and pedestrian network. Figure 22 depicts the proposed pedestrian network described in the Preferred Concept with additional detail regarding pedestrian priority zones and routes.

Primary Pedestrian Zone

These zones represent a walking radius of 500 feet and indicate areas with the highest demand for pedestrian connectivity and should receive the highest level of investment. Land uses within these areas should be mixed-use, compact, and oriented to pedestrians. Higher density uses and public gathering spaces are appropriate in these areas.

Secondary Pedestrian Zone

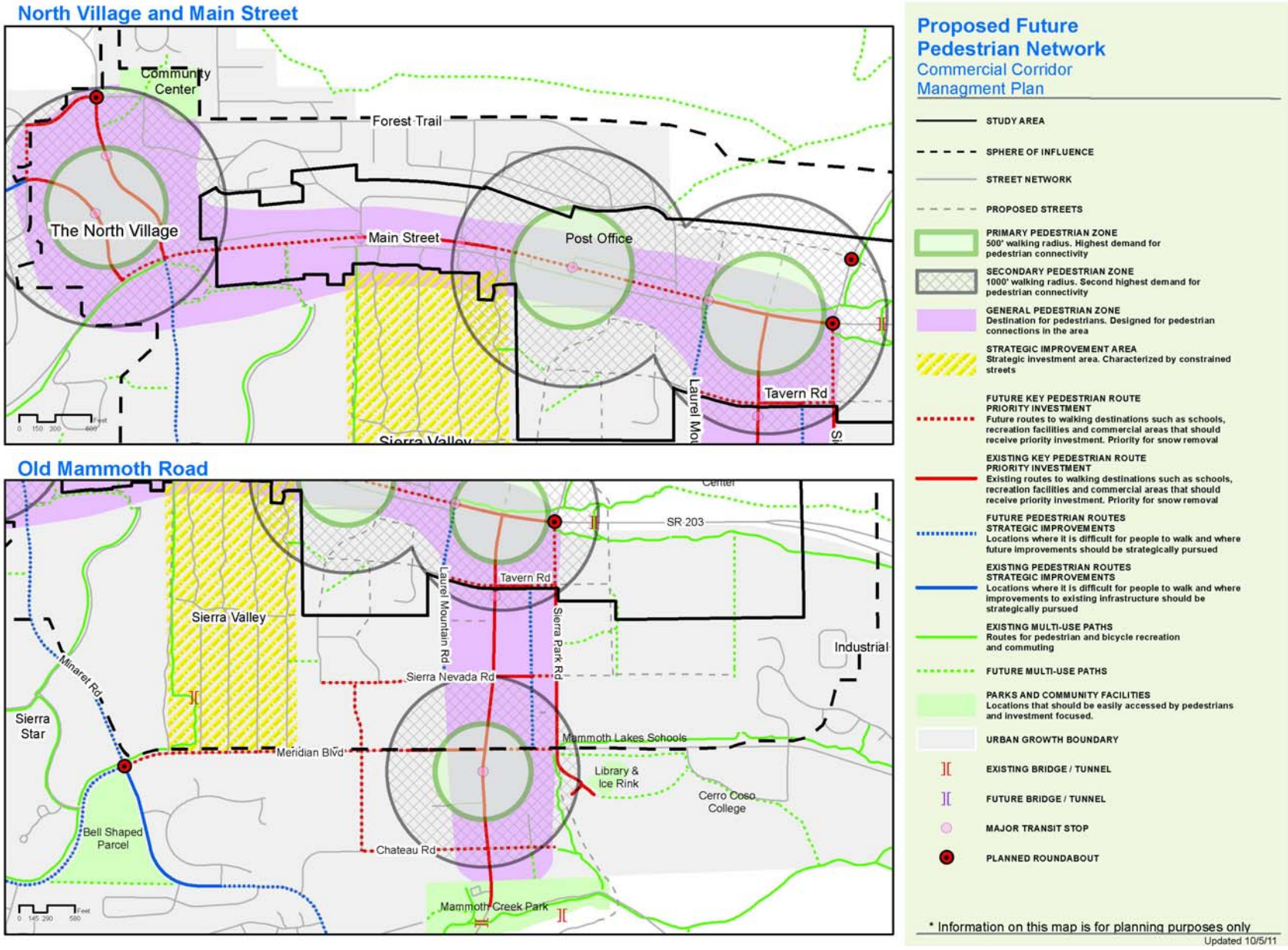
These zones represent a walking radius of 1000 feet and indicate areas with the second highest demand for pedestrian connectivity and should receive the second highest level of investment. Land uses within these areas should be mixed-use, compact, and oriented to pedestrians. Moderate density uses are appropriate in these areas.

General Pedestrian Zone
The general pedestrian zone corresponds to the commercial corridors and indicates that connectivity along these corridors should be emphasized.

Key Pedestrian Routes – Priority Investments
In Mammoth Lakes, specific pedestrian routes that should receive priority investment are those that provide access to schools and commercial areas that serve both residents and visitors, such as the Main Street Promenade, Sierra Park Road, Meridian Boulevard, Tavern Road, and Sierra Nevada Road. Priority should also be given to improvements that close key infrastructure gaps. Key pedestrian routes should also be a priority for snow removal.

Pedestrian Routes – Strategic Improvements
These routes represent locations where walking is difficult and strategic improvements should be made, such as along Minaret Road, Canyon Boulevard, and near Eagle Lodge and Sierra Star on Meridian Boulevard. While pedestrian connectivity in these areas is important, these improvements are not the highest priority.

Figure 22: Proposed Pedestrian Network



Bicycle Facilities

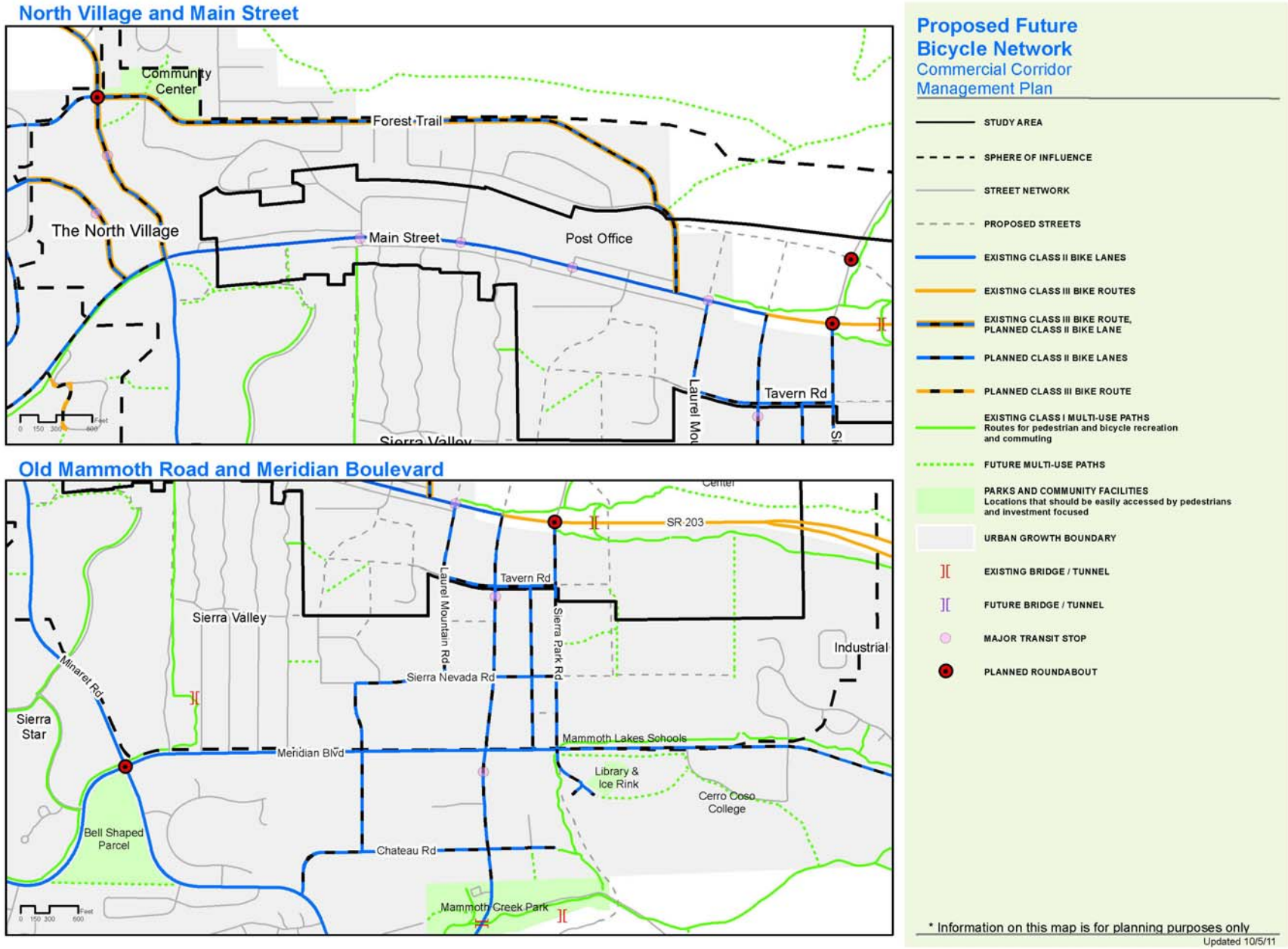
Figure 23 illustrates the existing and future proposed bicycle facilities, including multiuse paths, bike lanes, bike routes, and existing bike routes that are recommended to be upgraded to bike lanes. Expanding and filling in key gaps in the multiuse path system to provide more connectivity and access to key destinations should be prioritized among bicycle facility improvements, including the Main Street Promenade and Old Mammoth Road.

Although Mammoth Lakes currently has designated bike lanes on some streets, such as portions of Main Street, Minaret Road, and Meridian Boulevard, these facilities should include more clearly marked pavement and signage to encourage bicycle use. Additionally, widening shoulders to accommodate bike lanes, or converting existing bike routes to bike lanes, should be incorporated into street maintenance (paving) and reconstruction projects when feasible. Some existing bike routes, such as those on Minaret Road and Canyon Boulevard in the North Village, Forest Trail, and Majestic Pines Drive, are recommended to be upgraded to bike lanes.

Secure, weather-protected, and functional bicycle parking is also important to provide in visitor and resident destinations, such as commercial areas, parks, recreation portals, schools, and employment centers. Designing bicycle parking to be removable (or moveable) during the winter months as bicycle use decreases, could provide flexibility to increase snow storage space or parking spaces for carpools or fuel efficient cars. Additionally, secured long-term storage areas that accommodate all bicycle types should be provided within new residential developments. Bicycle parking should be more convenient than auto parking at all destinations. The Town's recently updated, but not yet adopted, parking ordinance now includes requirements for the inclusion of both short and long-term bicycle parking.

Additionally, in Fiscal Year 2012-2013, the Town will be preparing an update of its General Bikeway Plan, which serves as Bicycle Transportation Plan. The update will provide further opportunity to study recommended bicycle facilities and related improvements.

Figure 23: Proposed Bicycle Network



Transit Facilities

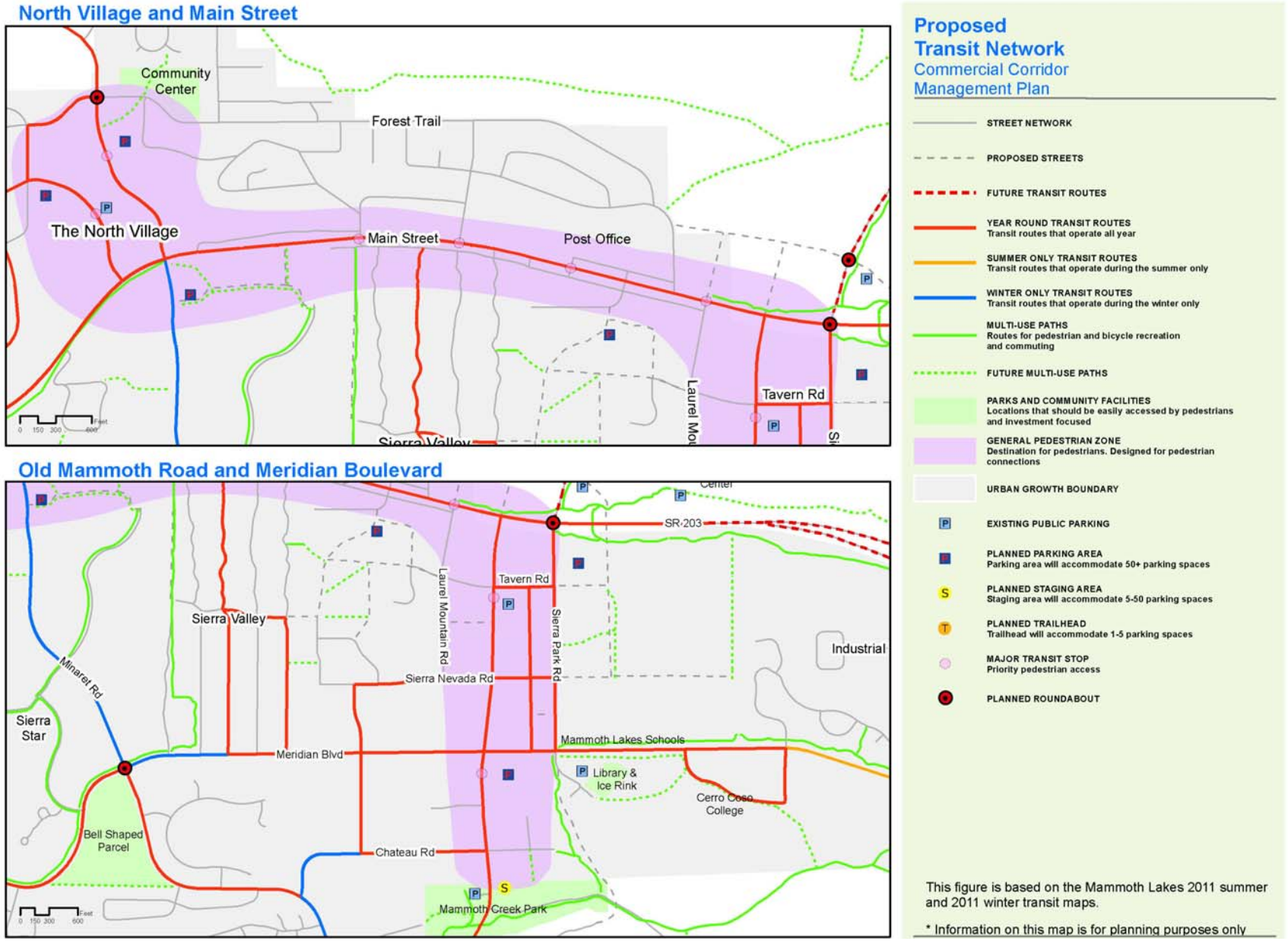
The Preferred Concept recognizes that high-quality transit, particularly on the key corridors of Main Street and Old Mammoth Road, is essential to reducing vehicle use in Mammoth Lakes and furthering the community's sustainability goals. Investments in the system to increase reliability, decrease travel time, increase the availability of service, improve access, and ensure rider safety are key objectives for transit service within the study area and townwide.

Figure 24 illustrates both existing (year-round, summer only, and winter only) and future potential transit routes in Mammoth Lakes. Expansion of the system (new routes, route extensions, or more frequent headways) is likely to occur when new development occurs in areas such as Snowcreek and Main Street.

As described earlier, most transit stops within Mammoth Lakes do not include transit shelters (or existing shelters are inadequate), suitable space for buses to pull out of the traffic lane for loading and unloading, or safe pedestrian access, particularly in the North Village, and on Main Street and Old Mammoth Road. Stops that receive the most ridership, such as in the North Village, Vons, and Main Street should be prioritized for investment in high-quality shelters, and adequate turnouts. Pedestrian access to these stops should also be prioritized.

The DCMS also describes the concept of extending the gondola from the North Village down Main Street, carrying large numbers of people and acting as a "signature" feature for Main Street. During the Downtown NDP process, there was considerable disagreement as to whether this extension of the gondola system was appropriate for the district and whether it was feasible. However, the concept of additional and/or improved transit that could quickly transport people to and from the Downtown area, whether in the form of a gondola, tram, or bus rapid transit line was well-received.

Figure 24: Proposed Transit Network



Parking

The need for adequate, well-designed public parking was a key issue raised during the Downtown NDP. Business owners in particular were concerned that a lack of convenient public parking can have a negative effect on trade. Currently, much of the parking in the Downtown area is provided in surface parking lots; there is limited sharing of parking, and it is not efficiently sited.

The Preferred Concept envisions a series of strategically located public parking facilities, in the form of surface and underground parking structures and shared parking lots, conveniently located near transit and within an easy walking distance of businesses and restaurants. On-street parking would be provided along Main Street as part of the Main Street "complete street."

Work completed for the Town by Nelson/Nygaard, a well known transportation consulting firm, has suggested the value of effective parking management strategies, such as the use of timed and/or metered parking to ensure that spaces are used as efficiently as possible. Nelson/Nygaard has also advocated for the use of tailored parking standards that account for factors such as proximity to transit, shared parking opportunities, and mixed use characteristics of an area, to avoid "overparking."

The Town has recently worked with Nelson/Nygaard to prepare a draft updated parking ordinance, which seeks to update the Town's parking requirements to reflect best-practices and implement progressive parking standards in a way that addresses these community goals, while also accounting for Mammoth's unique visitation and weather conditions. Specifically, the updated parking requirements of the draft code are intended to implement recommendations of the Preferred Concept as follows:

- Reduce environmental, economic, and social impacts associated with parking,
- Reduce the amount of land devoted to parking,
- Reduce inefficient, dispersed, and single-use reserved parking,
- Provide on-street parking opportunities as appropriate,
- Encourage the use of feet-first alternative transportation modes and reduce vehicle use,
- Improve community livability, walkability, and character, and
- Provide flexibility in accommodating changes in demand and use.

The updated code includes a number of measures aimed to achieve the above objectives, both by carrying forward requirements of the current code that are still appropriate and by including new requirements that emphasize and encourage shared parking among complementary uses, mixed-use districts, flexibility in satisfying transportation demand, and shifting travel from the personal vehicle to alternative modes.

Snow Management

Due to Mammoth's winter climate, snow management is an important consideration. Snow deposited during winter storms and pushed or blown into large berms affects traffic and pedestrian flow and safety, and can impact access and visibility for local businesses during winter months.

The Downtown NDP concept calls for an aggressive and effective snow management strategy for Main Street, similar to that currently in place on Old Mammoth Road and in the North Village, which is funded through assessment districts.

Instead of creating large berms or piles of snow along each side of Main Street, snow would be pushed and stored on a short term basis within areas reserved for on-street parking immediately following a storm, avoiding snow being blown or pushed onto sidewalks. Then, snow would be blown into trucks for removal and storage elsewhere. As is discussed later in this chapter, because this method of snow removal is more costly, a funding mechanism to handle the increased cost of snow management would have to be found.

6.0 RECOMMENDATIONS AND NEXT STEPS

Recommendations

The following recommendations are excerpted from the DCMS and relate specifically to transportation:

Recommendation 1.1. Off-street parking on designated retail streets should generally be located behind, to the side of buildings, or underground.

Recommendation 1.2. Curb cuts along Main Street should be limited to provide safe, convenient vehicular access without compromising pedestrian safety. Shared driveways shall be required to the greatest extent possible and maximum driveway width standards shall be enforced.

Recommendation 3.1. Provide vehicular and pedestrian mid-block connectors to create a more finely-grained network of streets and pedestrian routes that can connect neighborhoods and allow alternate circulation routes.

Recommendation 3.2. Implement the new streets and connectors associated with the expanded street network depicted in Figure 21; subject to additional technical analysis:

- Thompsons Way, which provides access to the new Courthouse, and which would be extended to the south to connect to Meridian Boulevard.
- Sierra Nevada Road Extension.
- Commerce Drive connector from Sierra Park Road to the industrial park (emergency access only).

- Extension of Sierra Park Road from Meridian to connect with Chateau Road and Mammoth Creek Road.
- New roads through the USFS property.
- Sierra Star Connector from Minaret Road to Callahan Way.
- Callahan Way extension.
- Shady Rest Site connector roads, connecting from Center Street to Tavern Road and Chaparral Way/Arrowhead Road.
- Waterford Street connection.

Recommendation 3.3. Implement roundabouts instead of traffic signals where feasible. Possible locations for roundabouts include the intersections of Meridian Boulevard and Main Street, and intersection of Old Mammoth Road and Main Street. Further analysis shall be completed by a traffic engineer to identify specifications for these roundabouts to determine feasibility.

Recommendation 3.4. Traffic calming measures should be incorporated into new and existing streets, particularly to reduce auto speeds in areas heavily used by pedestrians and bicyclists, as well as in residential neighborhoods, to improve safety and reduce the use of residential streets as cut-through routes.

Recommendation 3.5. Install signage and way finding to improve traffic flow, reduce trips on Main Street and Old Mammoth Road and safely direct pedestrians, bicyclists, and other users to their destinations.

Recommendation 3.6. Narrow and reconfigure Main Street to eliminate the existing frontage roads, and create a four-lane cross section with a median, including turn pockets to allow safe turning movements.

Recommendation 3.7. All new streets should be designed as complete streets, including pedestrian and bicycle facilities. Minimum design standards shall be complied with to achieve safe separation of cars, bicycles, and pedestrians.

Recommendation 3.8. Limit curb cuts on arterial streets, and consolidate existing driveways where possible. Garage entrances should be minimal and not interrupt the pedestrian flow. All garage and egress/ingress access points must meet the MLFPD standards.

Recommendation 3.9. Provide adequate street right-of-way dimensions to move traffic in a reasonable manner, maintain adequate response times and emergency access, provide on-street parking where feasible, accommodate bike lanes and landscape/“green” features, and promote a safe and comfortable pedestrian environment.

Recommendation 3.10. On-street public parking should be provided in commercial areas and along mid-block connector streets where feasible. Traffic analysis and cross section studies will determine the most appropriate on-street parking configuration(s).

Recommendation 3.11. Shared public and private parking throughout the study area is encouraged. Shared parking facilities should be strategically located and designed to reduce the amount of land dedicated to parking.

Recommendation 3.12. Private parking for commercial and lodging properties should be provided (in order of preference) underground or understructure, or within surface parking lots at the rear or side of the property. Surface parking in the front of properties should be strongly discouraged.

Recommendation 3.13. A comprehensive parking management plan should be developed for the downtown area, which should:

- Evaluate current parking ratios and determine appropriate standards for mixed use areas and uses.
- Determine strategies to achieve the most efficient use of public parking spaces, such as metering, time-limits, and/or paid off-street parking.
- Determine appropriate sites for shared/joint use public parking facilities.
- Evaluate the feasibility of underground parking structures (e.g. cost, etc).

Recommendation 3.14. Require multi-use paths or sidewalks to be provided in conjunction with all new development. Feet-first infrastructure such as multi-use paths and sidewalks should be continuous throughout the district.

Recommendation 3.15. Conduct further assessment to determine the most appropriate and safest locations for pedestrian and bicycle crossings on Main Street.

Recommendation 3.16. Provide bicycle parking in publicly accessible areas throughout the study area, including at all activity nodes, transit hubs, and public open spaces. Bicycle parking should be evaluated alongside auto parking requirements and included in future development projects where appropriate. Amenities for cyclists, such as showers and locker rooms, should be encouraged.

Recommendation 3.17. Provide for pedestrian and bicycle connections to key access points and nodes that provide access to surrounding public lands, and ensure appropriate signage and wayfinding for those routes, consistent with the Trails System Master Plan, and signage and wayfinding program.

Recommendation 3.18. Transit should be encouraged and accommodated with necessary pull-outs, shelters, and signage, and safe and convenient year-round access to transit stops should be provided.

Recommendation 3.19. Transit should be improved and enhanced to increase mode split and reduce the number of private vehicles on the streets. Options such as an expanded gondola system and rapid bus should be further evaluated and studied to determine feasibility; however, the preferred concept should be able to accommodate these types of future transit infrastructure.

Recommendation 3.20. Transit hubs and stops shall be coordinated with areas of higher density and adequate parking facilities.

Recommendation 4.1. Develop a detailed snow management strategy to address snow storage and removal along Main Street, including clearing of pedestrian facilities. The strategy should address operations, maintenance, and financing and be coordinated with Caltrans.

Next Steps

Since the acceptance of the DCMS in September 2010, a number of short-term action steps have been taken to implementation of the above recommendations. Examples of these include:

- Draft parking ordinance update completed as part of the Zoning Code Update (to be adopted with completion of CEQA).
- Existing signage data collection and initiation of a master plan process for future signage and wayfinding.
- Completion of the draft General Plan Mobility Element to support implementation of the expanded street network (to be adopted with completion of CEQA).
- Main Street restriping to include bike lanes and associated signage.

Caltrans Community Based Transportation Planning Grant

As discussed earlier, the Preferred Concept requires refinement to lead to the final plan for the Downtown NDP study area, and implementation of the recommendations and concepts contained in the DCMS will require additional technical analysis and feasibility evaluation, some of which will be performed during the next couple of years using funding that was recently awarded through a follow-up Caltrans Community Based Transportation Planning Grant. The objective of the grant-funded work will be to prepare a Transportation Capital Facilities Implementation and Financing Plan (TCFIFP) for the study area and sphere of influence of the DCMS/CCMP.

The TCFIFP will evaluate an array of financing mechanisms and implementation measures intended to advance recommendations and tasks identified in the DCMS/CCMP. The following tasks will be performed as part of the upcoming grant funded project.

- A detailed feasibility analysis of potential financing mechanisms needed to implement recommendations and tasks of the DCMS and CCMP. Financing

mechanisms to be evaluated include Benefit Assessment District creation, Community Facilities District creation, real-estate opportunities, public-private partnerships, bonds, development fees, and other potential financing measures.

- Analysis of potential right-of-way, real-estate, and operations/maintenance transfer(s) needed to implement CCMP recommendations. This analysis will include the evaluation of potential relinquishment of State Highway 203 to the Town of Mammoth Lakes.
- Comprehensive pedestrian and vehicle access management plan. The plan would evaluate alternatives for curb-cut consolidation, turn-lane installation through raised medians or other treatments (current cross-section includes continuous center turn-lane), and changes to operation of frontage roads.
- A detailed snow management implementation plan. This analysis will take place as part of the analysis of financial mechanisms and relinquishment study.
- A pedestrian and vehicle signage and wayfinding plan for the District to complement the Town's trail system signage and wayfinding program.
- Alternate transportation system feasibility and mode split impact analysis, including analysis of transit-oriented development alternatives for bus rapid transit and/or an extended gondola system that connects to the existing ski portal gondola in the North Village.
- Parking demand, shared parking, and financial feasibility study. Analysis will include a district-wide utilization study and assessment of parking opportunity sites.

These deliverables will be presented as a comprehensive implementation and financing plan for the Main Street District (TCFIFP), furthering the transportation and land use recommendations and tasks identified through the CCMP and other recent Town planning efforts related to the project study area including the North Old Mammoth Road District Special Study (completed November 2008), North Village District Planning Study (completed July 2009), Mobility Plan (in progress), and the Town's Municipal Code update (in progress).

It is anticipated that exploration of public and/or private financing mechanisms necessary to implement transportation infrastructure recommendations will require significant public outreach and collection of feedback from the community at large and also from local stakeholders, including business and property owners, agencies such as the United States Forest Service (USFS) and Caltrans staff, Mammoth Mountain Ski Area (MMSA), and non-profit organizations such as Mammoth Lakes Trails and Public Access (MLTPA), Mammoth Lakes Housing (MLH), the Chamber of Commerce, and Inyo Mono Advocates for Community Action (IMACA). The project will also seek to solicit public input on the results of various detailed data collection and evaluation efforts regarding snow management, access management, signage and wayfinding, alternative transportation, streetscaping, safety, and parking.