MOBILITY HUB STUDY AND PROGRAM

MAMMOTH LAKES, CALIFORNIA

Administrative Draft for Working Group Review

Prepared for:
The Town of Mammoth Lakes
Department of Community & Economic Development Department
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1. INTRODUCTION

1.1. Project Introduction and Purpose

The Town of Mammoth Lakes is a year-round recreation destination for those seeking outstanding landscapes and outdoor recreation. Residents and visitors can enjoy the countless number of hiking and bicycling trails, fishing, and more. During snow season, the Town serves a worldwide audience who come to ski, snowboard, snowshoe, and take in Mammoth Mountain.

The *Mobility Hub Study and Program* ("Study" and "Project") builds upon previous mobility planning efforts with the overarching goal of promoting the Town's "feet-first" philosophy by increasing and improving use of the transit system, preventing roadway congestion, improving circulation for residents and visitors, and helping to create a sense of place in Mammoth Lakes. This can be achieved with the effective implementation of mobility hubs. Mobility hubs are often considered as a solution by communities throughout the country to address similar goals and increase the overall sustainability of the transportation network. The Town has a unique set of transportation needs and constraints as a result of its seasonal weather and tourist-oriented services. These needs include accommodating hiking and snow gear, strollers, pets, and larger recreational vehicles.

This Project will consider the unique mobility needs of the Town and identify mobility hub locations, amenities, and implementation strategies, forming a playbook that can be utilized by the Town to advance mobility hub implementation. One of the key tenets of the project, as a critical strategy to ensure implementability, is to build community support for mobility hubs and specific mobility hub recommendations by connecting with key stakeholders and the local community at project milestones. A community working group was convened at several points during the project to discuss needs and constraints, obtain input on locations, and review project recommendations. In addition, a community workshop was held to gain broader community input on proposed strategies. The Project also included a presentation to the Planning and Economic Development Commission and the Town Council.

This Report represents the culmination of the project and includes a summary of the recommendations and next steps for the Town. The Report is divided into six chapters. This first chapter introduces mobility hubs, their need in the Town, and a summary of recommendations (**Chapter 1**). This leads to a review of previous plans that were used as building blocks for this Project (**Chapter 2**). The Report then provides an analysis, more detailed than previous planning efforts, of existing and future mobility needs that aid in identifying key locations for mobility hub strategies (**Chapter 3**). Based on the analysis, the next chapter documents mobility hub typologies, amenities, and identifies proposed locations. (**Chapter 4**). Chapter 5 identifies steps to implementation for the mobility hubs, including potential funding strategies and revenue sources (**Chapter 5**). The final chapter summarizes these findings (**Chapter 6**).

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1.2. What is a Mobility Hub and Why are they Needed?

Just as the Town of Mammoth Lakes is unique, so are the Town's mobility needs. Its popularity as a destination leads to the arrival of large influxes of tourists throughout the year, which exerts tremendous demand on the Town's mobility network. In addition to localized traffic congestion, the large influx of tourists manifest in parking issues where limited availability leads to parking spillover into surrounding communities, which translates to an increase in citations and safety concerns with vehicles parked in locations that may block emergency access and vehicles. The Town's lower-density nature and relative lack of alternative mode infrastructure poses challenges to non-motorized users such as those walking, biking, and taking transit and results in a less than ideal experience.

Although the heavy tourist demand on the transportation network and unique trips in the Town pose challenges, they also present a distinct opportunity to address them in a sustainable and equitable manner supporting the Town's previous planning efforts and stated goals.

Mobility hubs, at their essence, are places where people can make seamless connections between multiple transportation options. With a physical presence and clear, prominent branding, mobility hubs offer visibility to – and connection between – public transit and shared mobility services that in turn support sustainability, connectivity, and reduced dependence on personal cars and solo driving.

Source: Mobility Hubs, A Reader's Guide

Mobility hubs can also promote community growth by improving connections between transportation modes and addressing parking availability issues. They can help improve equity and significantly improve people's ability to travel without a car, which helps increase affordability and basic mobility for non-drivers.

A mobility hub area includes both the hub itself as well as all the destinations within the mobility hub's catchment area. The size of the catchment area varies based on the type of mode and the connectivity of the roadway network, but often reflects the area reachable with a 10-minute or less trip. While each hub will work with those around it to create a cohesive network, the design and accommodations at each hub location will vary based on the unique transportation needs of the area. Some of the key considerations and themes for creating successful mobility hubs in the Town of Mammoth Lakes can be found in the following section.

1.3. Mobility Hub Types and Locations

Mobility hubs reflect both the character and transportation needs of the communities that they serve. As these factors vary even within communities, different types of mobility hubs serve different purposes and thus have different amenities, features, and scale.

The Town of Mammoth Lakes has a range of mobility needs that can be addressed by mobility hubs. These include serving regional trips into and out of the Town, trips to major tourist destinations in and around town, access to trailheads and other similar destinations, as well as local trips to shopping, entertainment, employment and schools. As the mobility solutions to facilitate the efficient and effective completion of those trips varies, mobility hubs will be categorized around those needs.

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Three general categories of mobility hubs are proposed for the Town of Mammoth Lakes. The categories are differentiated by scale, amenities, and context:

- **Recreational Gateway** – These will serve as hubs at tourist destinations, such as trailheads, with basic amenities such as covered seating areas, bicycle and snow gear racks, trash and recycle bins, and wayfinding signage. Consideration may be provided for RV or trailer parking. They allow for use of alternative transportation modes to access tourist destinations.
- **Community** – These are neighborhood oriented to provide alternative transportation options for completing trips around town by both tourists and residents alike. These stops will provide amenities for bicyclists and include snow/shade shelters. These hubs may also provide electric vehicle (EV) charging, parking spaces for Neighborhood Electric Vehicles (NEV), and other mobility options such as scooters and/or bikeshare. Further descriptions and details are provided for each amenity in **Chapter 4**. A variety of modes will be provided to connect users to lodging, places of employment, restaurants, points of interest around Town, as well as entertainment centers.
- **Regional** – The largest scale hubs will provide an interface between regional transit services and local transportation services. Regional hubs generally will require the largest footprints because of the greater intensity of their offerings and use. These hubs may include amenities such as enhanced waiting areas, dynamic and flexible curbs, real-time information, bikeshare, among others. These may be locations where the airport shuttle connects users to Eastern Sierra Transit Authority (ESTA), Yosemite Area Regional Transportation System (YARTS), and other private transportation providers.

The location and design of a successful mobility hub will vary based on the underlying goals for the hub. The effectiveness of mobility hubs is related to the effectiveness of the services that are provided. Therefore, mobility hubs should be placed in locations that support and promote the viability of sustainable transportation and mobility-as-a-service solutions. This may include considerations such as:

- Nearby land uses
  - Mobility hubs should be in locations that are in close proximity to user destinations such as community gathering places, places of employment, recreational and tourist attractions.
- Surrounding transportation network
  - The site should have or plan to have bicycle facilities (bike lanes, secure bike parking) and a connected pedestrian network.
- Population density
  - Higher density residential and employment lends itself to greater transit ridership and mobility hub utilization.
- Development opportunity
  - Opportunities for redevelopment, particularly transit-oriented development can create a symbiotic relationship with mobility hubs. The presence of mobility hub services can allow adjacent development to reduce parking supply and attract residents or employees interested in using mobility services. In turn, those additional users enhance the economic viability of shared mobility services and demonstrate the effectiveness of mobility hubs.
- Role of the mobility hub within the broader mobility network
  - A mobility hub that concurrently serves as a hub in the transit network or connects multiple high-quality bicycle facilities will see increased utilization, thereby increasing demand for shared mobility services and supporting features and amenities, such as pop-up retail.

1.3.1. Design Elements and Amenities

The design and integration of the transportation elements can determine the success or failure of a mobility hub and should be carefully and thoughtfully planned. Essential transportation elements for

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mobility hubs support major transportation modes like public transit, pedestrian travel, and bicycles. Some basic features common to successful mobility hubs include:

- Sheltered waiting areas with seating
- Lighting, which is not only functional, but that also provides safety and can be decorative
- Signage, ideally providing real-time arrival and departure information
- Visual wayfinding
- Fare payment stations, which can also be a part of an information kiosk

Other elements commonly found in mobility hubs include a broad range of available services such as:

- Public transit service and infrastructure
- Pedestrian amenities and walkways
- Bike support, storage, maintenance
- Pick-up and drop-off zones for ridesharing, shuttles, transportation network companies (TNCs), and taxis
- Micromobility stations (eScooters, eBikes)
- Electric vehicle (EV) charging
- Carpool and/or vanpool support
- Parking
- Car sharing
- Restrooms, lockers, showers
- Local delivery services
- Intelligent wayfinding and transportation services

Source: SUMC

Additional design features to consider depending on the goals, location, and budget of a mobility hub project include features that promote creative placemaking, provide needed support services, and encourage excellent urban design, such as:

- Public art
- Landscaping
- Interactive design and/or art
- Parklets
- Emphasized connection to the surrounding neighborhood
- Retail outlets
- Daycare Facilities
- Drinking fountains and/or restrooms and lactation rooms
- Storage and/or urban freight facilities
- Amazon lockers

Mobility hubs should also provide travel and tourist information along with information on other support services such as restaurants, shops, and hotels in order to facilitate efficient and enjoyable transportation. More details about individual features as well as other implementation considerations for the Town of Mammoth Lakes are presented in **Chapter 4**.

1.3.2. Accessibility and Equity Considerations

Mobility hubs can be particularly beneficial for disadvantaged populations who are traditionally more dependent on transit services and less likely to have access to an auto for all trips. Providing a range of

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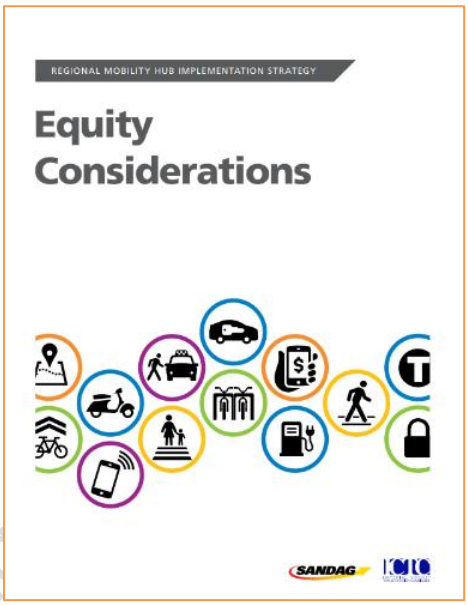
easy-to-use transportation options can reduce the need to travel by car and therefore improve accessibility to jobs, basic needs, and entertainment for disadvantaged populations.



While most mobility hub amenities and features benefit disadvantaged populations by increasing connectivity and reducing the cost of mobility, not all features are provide the same level of value. The San Diego Association of Governments (SANDAG) and the Imperial County Transportation Commission's (ICTC) *Regional Mobility Hub Implementation Strategy – Equity Considerations* provides an example of how to assess mobility hub features and their potential impact on populations such as seniors, low-income families, and minorities.

The document outlines how driving, transit, shared mobility services, active transportation, and support services may benefit, potentially benefit, not benefit, or not apply to each group. The challenge is that a specific amenity may only benefit one group, while potentially not benefitting another. The manner in which mobility hub amenities are deployed will determine their impact on equity and may help prioritize elements to include and clarify what elements may need additional research or outreach. For instance, shared mobility services such as bikeshare or carshare can allow for increased mobility for those who do not own a bike or a car; however, options for reduced payment and/or payment options that don't require access to a smartphone or credit card should be considered in order to make those services accessible to the full population. As another example, providing dedicated curb space for TNCs allows for a safer facility and one that promotes use of modes other than personal automobile. However, TNCs are generally more expensive than publicly-operated transit services, and TNCs should not be promoted at the expense of cheaper transit options, or means-based subsidies should be considered to make TNCs accessible to all.

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2. Previous Planning Efforts Related to Transportation, Mobility, and District Parking

This *Mobility Hub Study and Program* intends to utilize and build upon previous mobility-related plans and studies in order to help the Town move forward with implementing mobility hubs that will serve as valuable assets to the community. Multiple plans and studies have been completed to date that provide discussion on the Town's mobility needs and include general guidance on potential strategies for mobility hubs and suggestions for mobility hub locations.

Previously completed mobility-related plans and studies include the Main Street Plan, the Parking and Snow Management District Feasibility Study, the Walk, Bike, Ride Action Plan, the Town General Plan Mobility Element, and the Eastern Sierra Transit Authority Short Range Transit Plan.

This chapter of the *Mobility Hub Study and Program* provides an overview of mobility related discussions identified in the previous studies on a study-by-study basis and then concludes with a discussion on how these previous studies informed the current project.

2.1. Main Street Plan (2014)

The Main Street Plan is intended to "transform the Main Street corridor from an auto-dominated state highway that passes *through* downtown into a pedestrian-first, world-class mountain resort street that *is* downtown" and offers solutions for the design of Main Street as well as potential funding sources and implementation and phasing strategies. It includes strategies related to parks and open space, development, mobility, and parking for Main Street. Key recommendations that are relevant to this Mobility Hub Study include parking strategies to increase parking supply, strategies to reduce parking demand, and identification of specific locations where there are opportunities to provide unique parking and mobility investments.

Parking strategies include consideration for implementing a 'parking district' approach, in which the Town or an appointed special district develop public parking lots or structures that serve multiple businesses. The goal of the district model is to incentivize development and have developers pay in-lieu fees to support the district, rather than providing parking themselves. The plan also recommends allowing public on-street parking to count towards parking requirements.

Opportunities for new Park-and-Ride lots and Valet Lots would allow people to park and then complete their trip by a different mode (transit, walking, or biking). The Main Street Plan recommends these lots be located on the eastern edge of Town, such as the Visitor Center. Figure 1 depicts the concept of a lot at the Visitor's Center.

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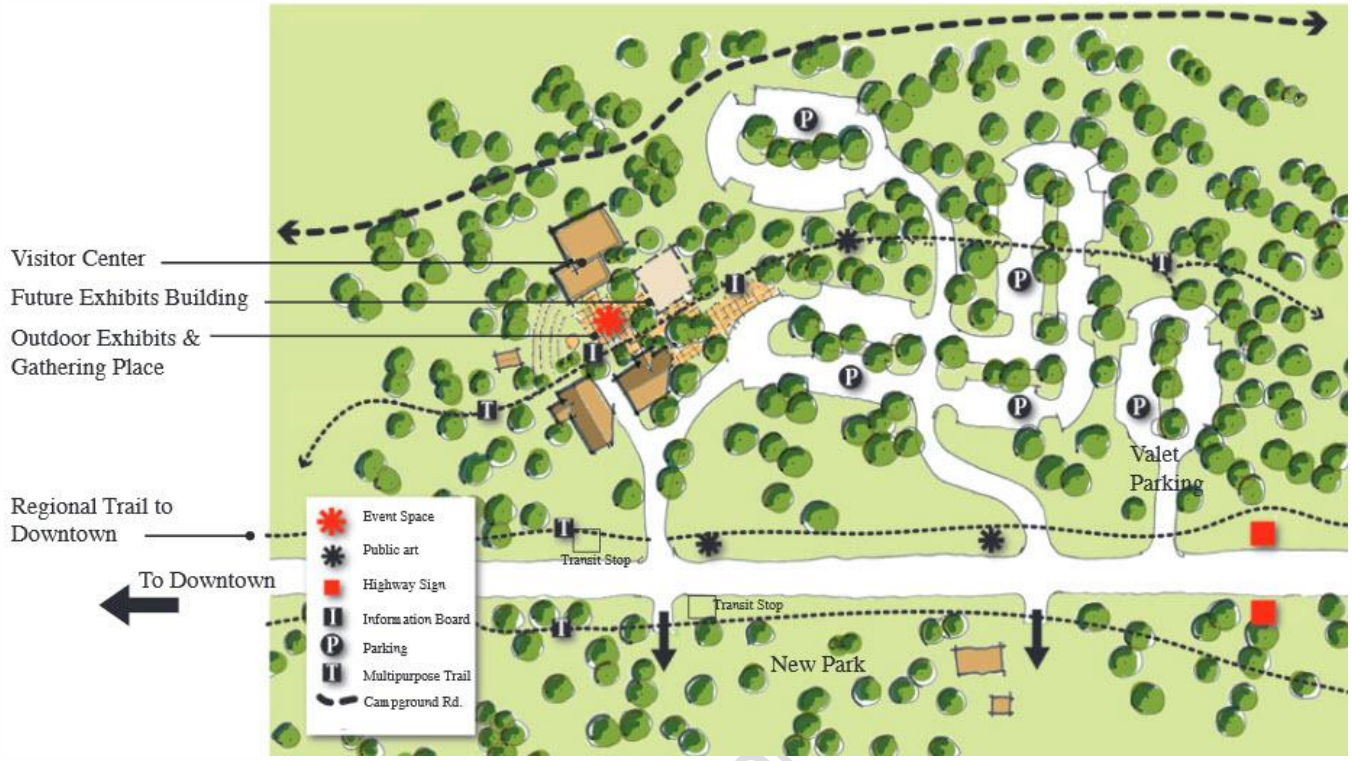

Source: Town of Mammoth Lakes Main Street Plan

Figure 1 – Park-and-Ride and Valet Lot Concept from the Main Street Plan

Enhanced transit stop designs within small public plazas are recommended to encourage more transit use by integrating transit shelters that include amenities such as bike parking, ski lockers, benches, lighting and signage. At a larger scale, the concept of a Transit Plaza is introduced, where clusters of bus stops along the corridor would be enhanced with streetscape elements and amenities such as the bus shelter, benches, planters, bike racks, pedestrian signage, public art, and ski lockers.

2.2. Parking and Snow Management District Feasibility Study (2014)

As a follow up plan to the Main Street Plan, the Parking and Snow Management District Feasibility Study was completed to test the feasibility of and recommend the most likely funding and management mechanisms that may be used to implement the Main Street Plan. The Study identifies specific locations where parking facilities could be located to serve multiple properties and a wide mix of uses. Recommendations in the Study emphasize Town efforts to coordinate and construct shared parking that can set the stage for reinvestment.

Figure 2 highlights the potential locations identified for different types of surface and structured parking. Many locations are within walking distance of the North Village Plaza and are near or adjacent to bus stops. Some examples of specific locations examined are:

- Land adjacent to Minaret Road that is identified for redevelopment where the developer is interested in partnering with the Town to provide parking.
- Existing Park-and-Ride site on Old Mammoth Road that could support redevelopment and include a two-level parking deck.
- Visitor's Center on Main Street that could function as an 'intercept' lot for day skiers who park and take the shuttle or as valet parking for hotels on Main Street

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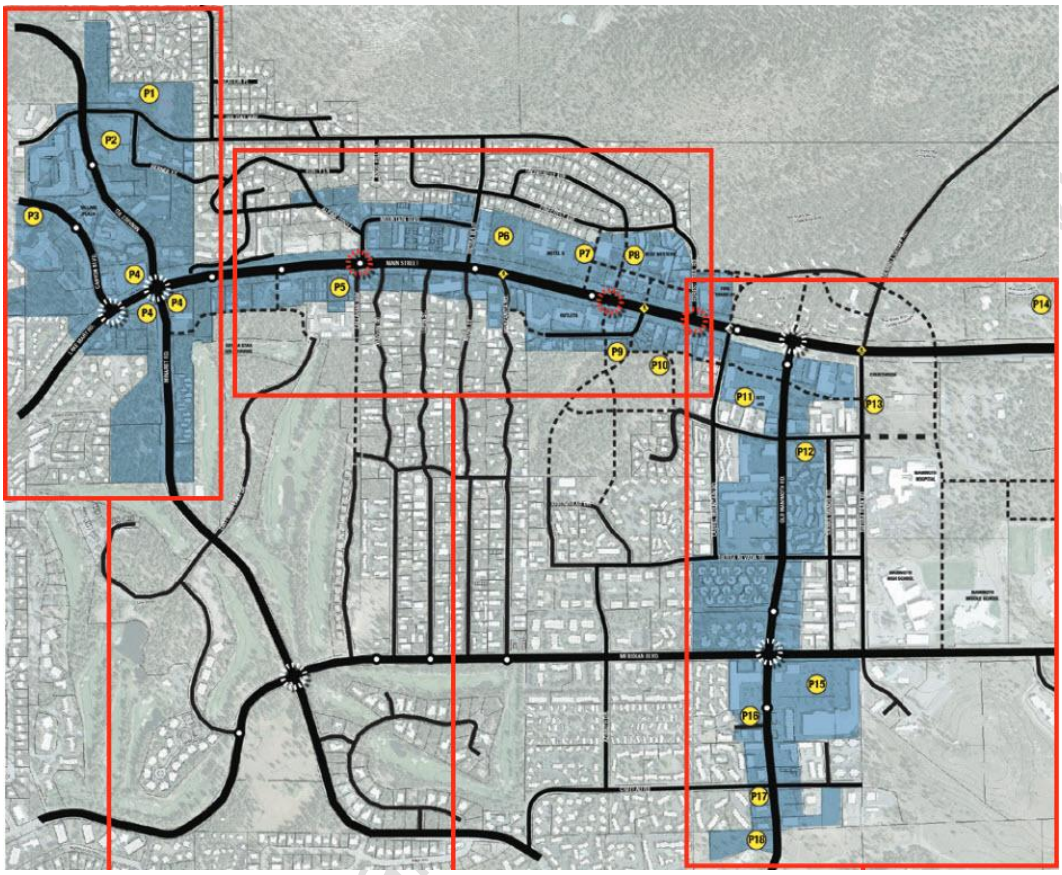
- Existing Rite Aid on Old Mammoth Road where the site owner is supportive of partnering with the Town on redevelopment opportunities.
- A variety of vacant land along Old Mammoth Road.



Source: Parking and Snow Management District Feasibility Study

Figure 2 **– Opportunity Sites for Future Parking from the Parking and Snow Management District Feasibility Study**

2.3. Mono County Regional Transportation Plan (2015)

The Mono County Regional Transportation Plan (RTP) guides transportation investments at a regional level. It provides a vision of the regional transportation goals, policies, and objectives and identifies a set of strategies based on regional transportation needs, as identified by the public and member agencies within the region. The RTP culminates in a set of specific, fiscally constrained strategies that address the needs of the region over time.

The projects identified in the RTP include those that will be funded using federal and state funds as well as locally identified projects that will be implemented using local funds. As such, the Town of Mammoth Lakes General Plan and other planning documents that identify specific projects the Town intends to invest in are often reflected in the RTP. The following items are identified in the RTP that pertain to or are related to mobility hubs or the integration of transit, parking, and other modes of travel:

- Developing multi-modal transportation facilities (i.e., pedestrian areas and trails, direct ski-lift access, Nordic [cross country] skiing and bicycle trails) in concentrated resort areas. Public

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transportation would be integrated into future concentrated resort areas to provide access to and from the resort centers to outlying areas.

- Mobility will be improved through measures such as developing parking facilities that encourage people to walk, bike or use transit;
- Continue development of a transit center and secondary transit hubs to provide:
    - Convenient transfer between different modes of transport and various regional providers,
    - A safe, comfortable, and sheltered place to wait for public transit services, and
    - A centralized location for transit information.

2.4. Eastern Sierra Transit Authority Short Range Transit Plan (2015)

The Eastern Sierra Transit Authority Short Range Transit Plan (SRTP) assesses transit and related transportation issues in Inyo and Mono Counties and provides a “road map” for improvements to the public transit program between 2015 and 2020. Because connectivity to transit is a foundational aspect of a mobility hub, the suggested improvements included in the SRTP should be considered when looking to invest in mobility hubs in the Town.

A key element that is identified as critical for the success of transit within the SRTP is the development of a central transit hub in Mammoth Lakes. The hub would facilitate direct transfers between local buses and between local and regional services, including the Yosemite Area Regional Transit Service (YARTS). It would have infrastructure to provide real-time information to passengers and would serve as a hub for other transportation alternatives, such as providing information on regional hiking trails, or locating bike racks or bicycle repair tools. Some other specific amenities identified for the central hub include:

- Bus bays for different local and regional bus route;
- A climate-controlled waiting area;
- A driver break area;
- A transit information center;
- Enhanced passenger waiting areas with amenities such as benches, lighting, and public art;
- Bicycle parking; and
- Parking for regional transit passengers.

The central mobility hub identified in the plan was a key project for the continued success and growth of transit and a way to provide a transit amenity consistent with the transit centers found in other vibrant mountain resort communities. In addition to serving ESTA local and Hwy 395 routes, this facility can serve as a stop location for Yosemite Area Regional Transit Service (YARTS) as well as serving private transportation providers.

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2.5. Town General Plan Mobility Element (2016)

The Mobility Element of the Town's General Plan establishes goals, policies, and actions necessary to achieve a progressive and comprehensive multimodal transportation system that serves the needs of residents, employees, and visitors. Mobility hubs are not directly addressed, but there are policies and goals that have direct implications and considerations related to future mobility hubs. These include:

- The 'Management' principle discusses the need to prioritize strategies to reduce demand on transportation and parking and to encourage more efficient use of the existing system.
- The 'Public Spaces and Places' principle discusses the need to invest in facilities and places that connect people to where they want to go, while still emphasizing placemaking and community interaction.
- The 'Economy' principle emphasizes the importance of a balanced transportation system that supports the Town's business districts and other destinations by improving access for residents and visitors.

These principles collectively align with the goals of a mobility hub.

There are also strategies identified in the Mobility Element that align with the goals of mobility hubs:

- Encouraging and incentivizing infill and redevelopment near existing transit and other public services to maximize transportation accessibility and affordability and encourage people to drive less and rely more on alternative forms of transportation.
- Implementing strategies to manage the demand on the transportation system, including streets and parking, to create more efficient use of the system and reduce the impacts of motor vehicle use.

The Mobility Element identifies specific popular transit stops that should be prioritized for investment in high-quality shelters, adequate turnouts, provision of real-time schedule information, and pedestrian access. Figure 3 identifies those popular transit stops located along Main Street and Old Mammoth Road as found in the Mobility Element.

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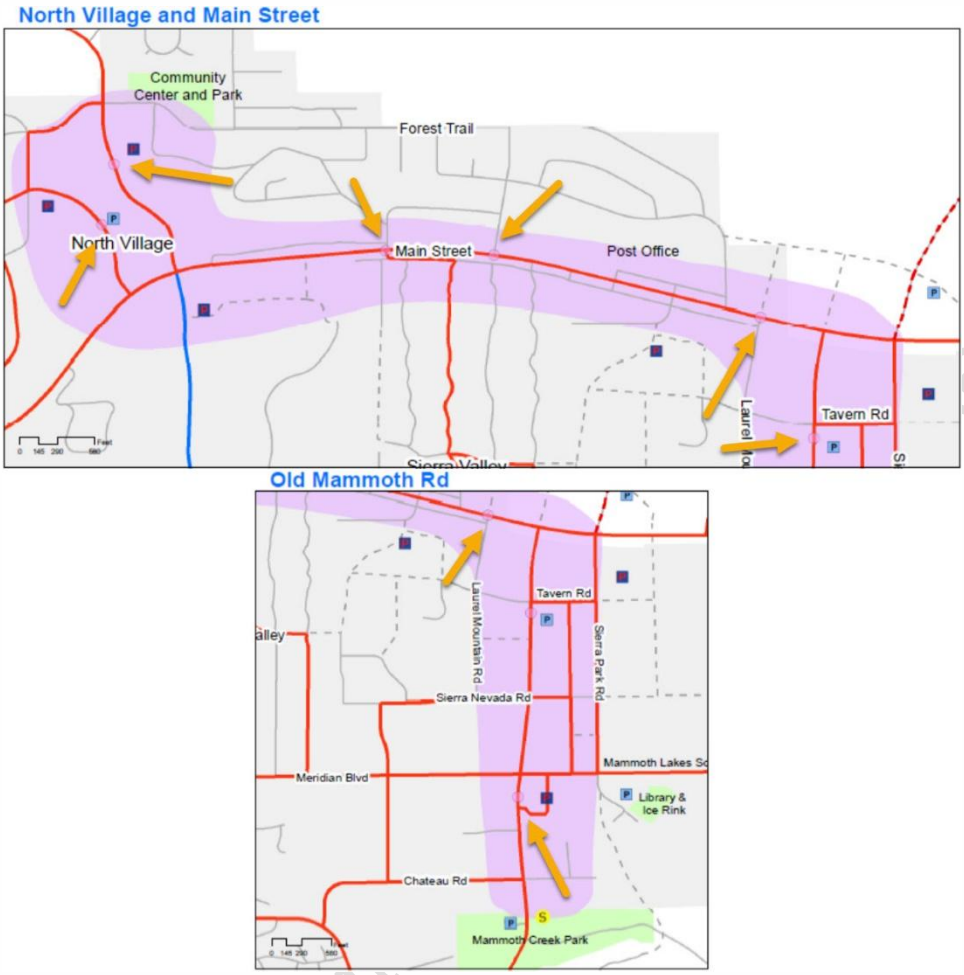

Source: Town of Mammoth Lakes General Plan – Mobility Element

Figure 3 – Popular Transit Stops In Mammoth Lakes as Identifed in the General Plan Mobility Element

Standing behind the "park-once" initiative and the view that, because every vehicle trip requires parking at its destination, parking must be an integrated component of transportation and land use planning, the Mobility Element includes parking as part of Complete Streets, Vehicle Network, and Transit Network discussions. Policy M.14.2 specifically aligns with the pursuit of mobility hubs in the Town:

Policy M.14.2. Support development of strategically located public parking facilities, including overnight parking facilities that will promote the use of alternative transportation modes and the "park once" concept.

The Mobility Element also identifies some specific locations throughout the Town where investment in transit service and associated infrastructure, combined with a mix of uses within walking distance and additional demand management, could support a reduction in vehicle trips to that area. The plan calls for special attention to be paid to the areas since the quality of pedestrian and bicycle access to these locations influences the ability to achieve greater trip reduction. These include:

- The North Village;
- The Main Street District;
- North and South Old Mammoth Road;

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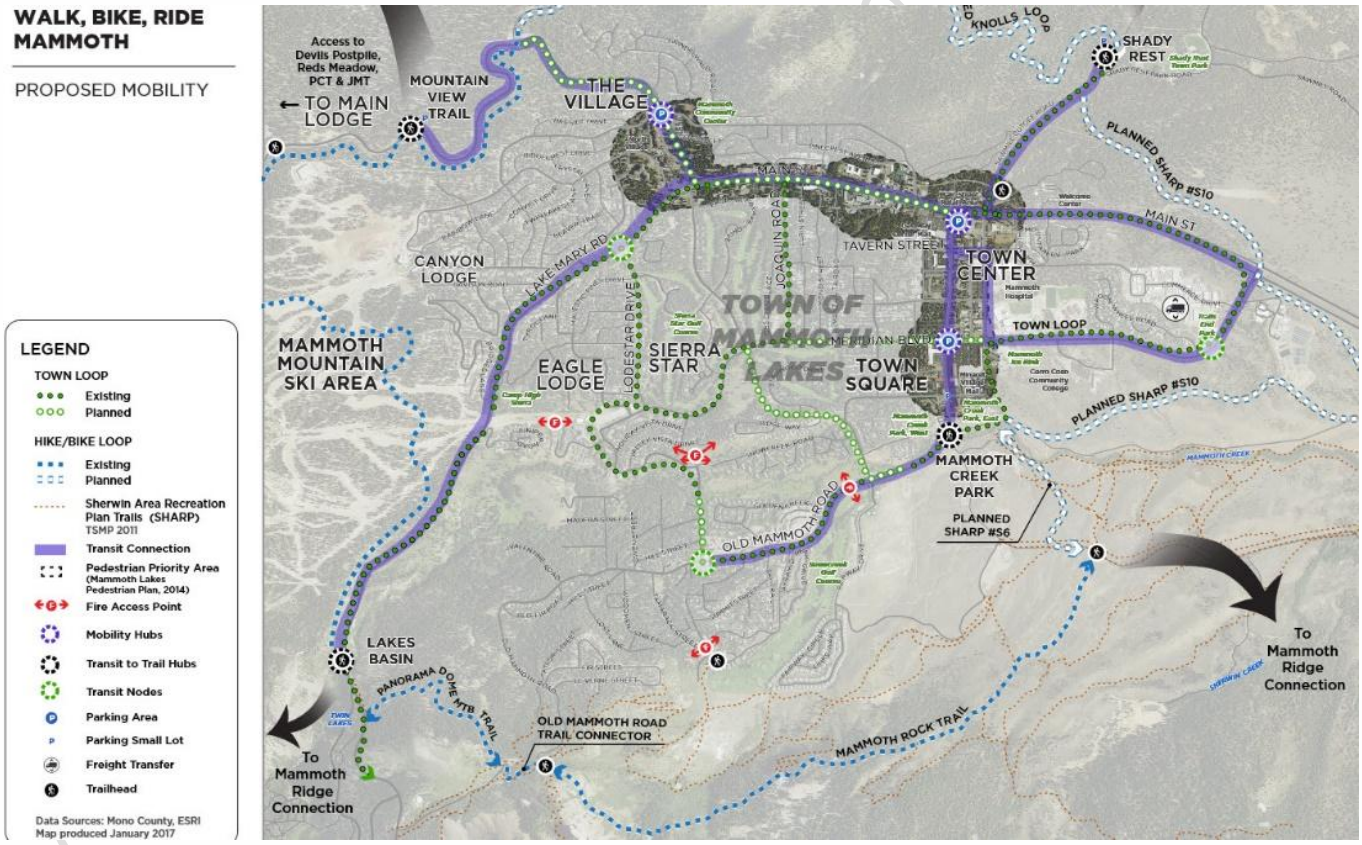
- Canyon Lodge;
- Eagle Lodge; and
- The Main Lodge.

2.6. Walk, Bike, Ride Action Plan (2017)

The Walk, Bike, Ride Action Plan provides a framework and outlines specific steps that the Town and its partners can take to improve mobility in the region and try to address dependence on private vehicles. The Plan's vision for Mammoth Lakes is for the Town to provide a unique mobility system based on hubs at key locations. The mobility hubs would function as centers for information, locations for long-term parking, and connection points between various forms of transportation within and around the Town. The concept for the hubs is that the mobility system will be designed to connect these hubs to key destinations throughout the Town and would centralize resources for visitors and residents to travel throughout the area but also to shop and live.

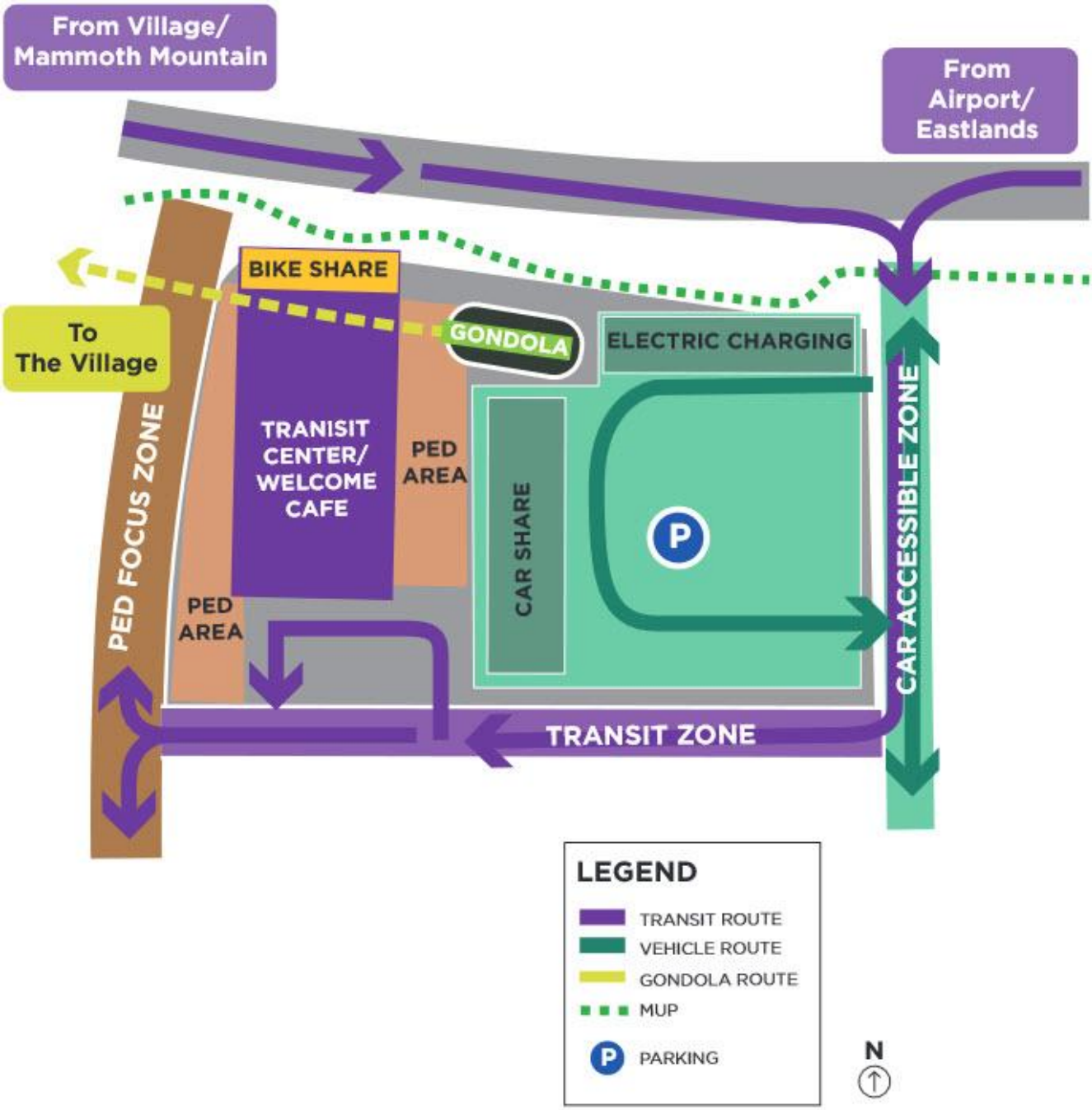
Figure 4 identifies a regional concept for mobility, including proposed mobility hubs, from the Walk, Bike, Ride Action Plan. In this concept, mobility hubs are found in two forms – traditional mobility hubs and 'transit to trail' hubs. The intention and proposed design for transit to trail hubs promote the use of transit to limit vehicle use and congestion in heavily used trails and lakes surrounding the Town.



Source: Walk, Bike, Ride Action Plan

Figure 4 – Proposed Regional Mobility Concept from the Walk, Bike, Ride Action Plan

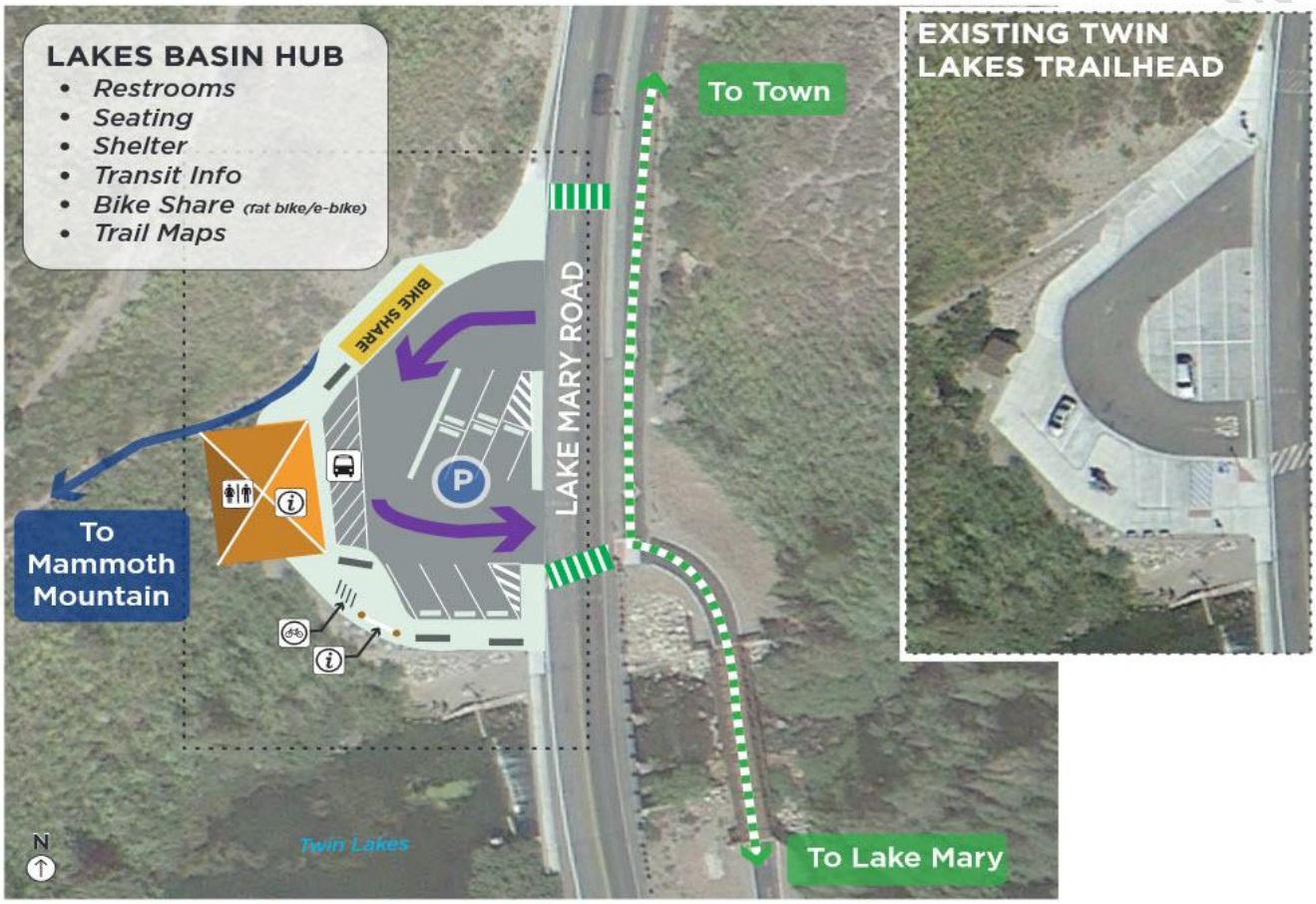
In the Walk, Bike, Ride Action Plan, traditional mobility hubs are proposed at the village, the town center which was defined as Old Mammoth Road just south of Main Street, the town square, and the airport and would include amenities such as charging stations for electric vehicles, carshare, and bicycle share, in addition to vehicular parking and access to transit. Figure 5 provides a conceptual plan for the proposed mobility hub at the town center.



Source: Walk, Bike, Ride Action Plan

Figure 5 – Example Mobility Hub Conceptual Site Plan from the Walk, Bike, Ride Action Plan

Transit to trail hubs are proposed at ten locations and include amenities such as restrooms, transit shelters, high-tech transit information areas, interpretative information, bike racks, bike share or rental kiosks, parking, and seating or picnic areas. Six 'major' hubs are proposed where transit routes connect to the previously proposed Blue and Black Loop Trails, the Reds Meadow/Devils Postpile, and at 395 above Shady Rest. Four 'minor' hubs connect to trails beyond the Town at Mammoth Mountain Inn, Inyo Craters, Horseshoe Lake and Sherwin Creek Road. Figure 6 provides a conceptual plan for the proposed transit to trail hub at the Lakes Basin.



Source: Walk, Bike, Ride Action Plan

Figure 6 – Example Transit to Trails Hub Conceptual Site Plan from the Walk, Bike, Ride Action

2.7. Incorporation into Current Study

The *Main Street Plan*, *Walk, Bike, Ride Action Plan*, and the *Town General Plan Mobility Element* although not universally calling for *mobility hubs* by name, circle the same idea with proposals of "transit plazas", "multi-modal transportation facility", and "a central transit hub". Generally, there is also a theme of improving and building facilities in an equitable and sustainable manner for users such as pedestrians, bicyclists, and transit users.

Some of these studies, particularly the *Walk, Bike, Ride Action Plan*, go a further step, and actually provide specific recommendations for "mobility hub" locations within the Town. The *Town General Plan Mobility Element* establishes goals, policies, and actions necessary to achieve a progressive and comprehensive multimodal transportation system that serves the needs of residents, employees, and visitors.

The idea of mobility hubs arose out of the previously completed studies and detailed work that has been done by the Town and its partners. This study and the idea of mobility hubs attempt to bring together elements from several of the previous planning efforts. The specific locations and areas that were proposed in previous studies were used as a starting point for the more comprehensive geospatial analysis conducted in this *Mobility Hub Study and Program* (**Chapter 3**). Additionally, the toolbox and implementation sections (**Chapter 4**) identify hub amenities, infrastructure improvements and concepts that build-off this previous work but provide a more expansive set of tools and implementation steps (**Chapter 5**) to lead towards mobility hub implementation.

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3. Mammoth Lakes Mobility Hub Existing and Future Conditions Analysis

3.1. Analysis Overview

Taking the concept of mobility hubs proposed in earlier studies one step further, this study quantitatively assesses the mobility hub need, both in terms of magnitude and location. The primary metric utilized for this purpose was parking data and future parking demand analysis. The reason for focusing on parking as an indicator of need is two-fold: 1) there have been issues reported in the community pertaining to parking that impact the safety of residents and quality of life; 2) an inherent benefit of mobility hubs, as documented in Chapter 1, provide alternative mobility options for the community, reducing dependence on auto trips and thereby reducing parking need. Mobility hubs can often include parking, particularly at regional hubs where users first enter the mobility network, but then reduce the need for widespread supply of parking as users have alternative means to access key destinations. Therefore, mobility hubs are an effective strategy for reducing excessive parking demand at key locations and instead both reducing overall levels of parking demand and concentrating that demand at a limited number of nodes.

3.1.1. Parking Citation Data

One of the methods to assess the magnitude of the parking challenge in the Town of Mammoth Lakes was to analyze parking citation data. One issue noted by local law enforcement during Kimley-Horn's investigation was that many skiers have such a difficult time finding parking, specifically near the Mammoth Mountain Canyon Lodge, that they choose to park illegally and risk receiving a citation. The difficulty in finding a parking space coupled with the annoyance of receiving a citation could significantly impact a visitor's experience and reduce the likelihood of their return to Mammoth Lakes.

Figure 7 shows parking citations issued in Mammoth Lakes between March 2019 and February 2020. As shown in Figure 7, there are two hot spots for parking violations. One area is within the residential areas near Canyon Lodge. Canyon Lodge is one of many locations at which tourists can access the mountain to ski. Other locations include Eagle Lodge and Main Lodge, in addition to the Village Gondola that connects the Village to Canyon Lodge. All these locations operate as destinations for skiers to access the mountain.

The data suggests that either parking demand exceeds capacity at the locations identified or that there needs to be better wayfinding to parking to make it easier for users to find legal parking spaces. This topic was further investigated by doing a parking assessment.

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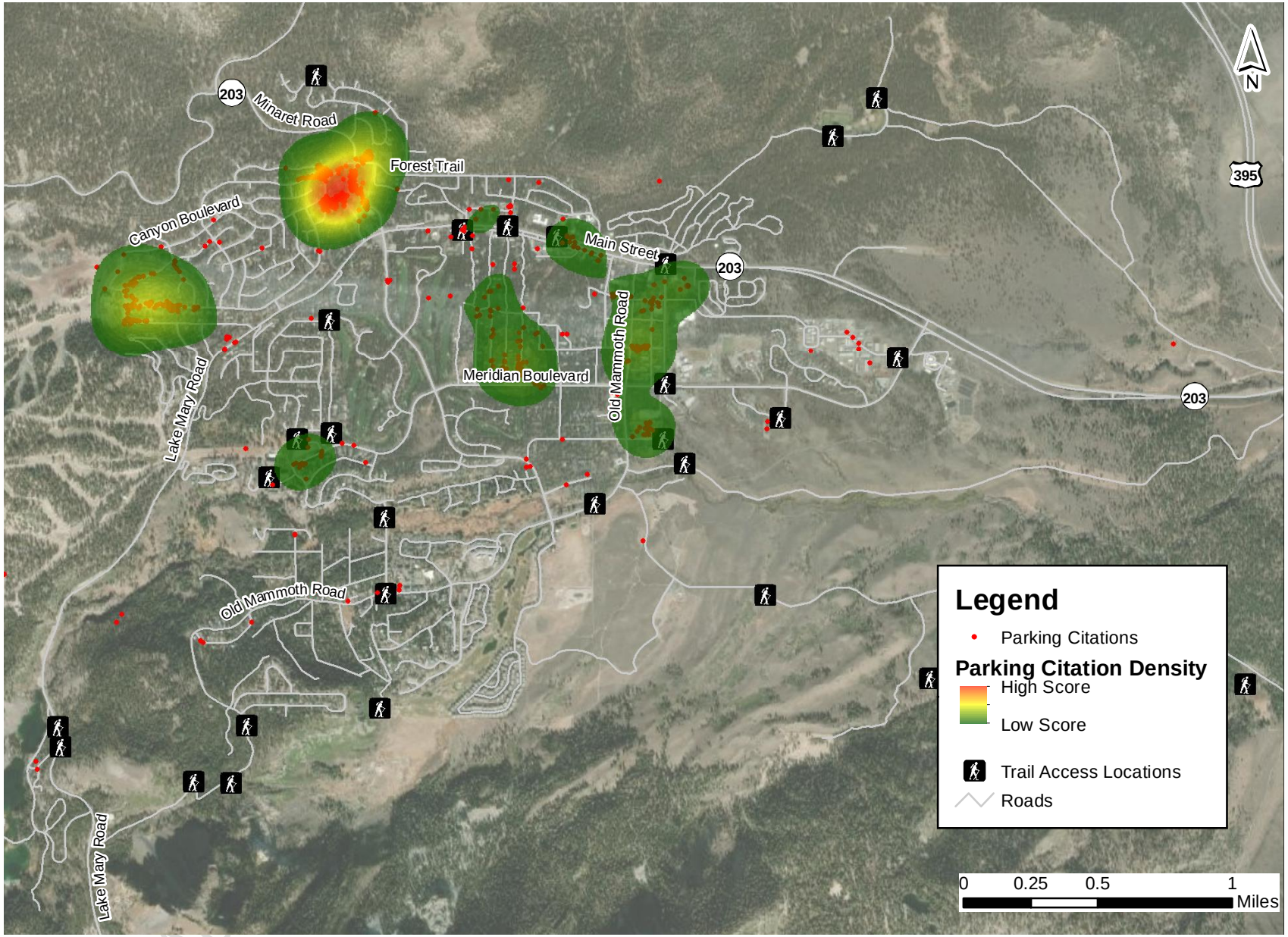

Figure 7 – Parking Citation Data

3.1.2. Parking Assessment

A parking assessment was conducted to determine whether there is inadequate parking supply or simply not enough wayfinding signage which leads to the relatively high number of citations near the mountain lodges. This was achieved by documenting parking lot inventory and conducting a parking occupancy survey.

Parking occupancy counts were conducted by Kimley-Horn on February 15, 2020 at 8:00 AM, 10:00 AM, 12:00 PM, 2:00 PM and 4:00 PM. Parking citation data analysis was based on parking enforcement data from March 2019 - February 2020 prior to COVID-19 impacts). The results of this analysis are summarized in Figures 8 through 12. In Figure 12, data was only collected in the Village Area since all other parts of town had experienced peak demand prior to the previous data collection.

Overlaid with parking demand in each figure is parking citation data for the preceding and subsequent hour. For example in Figure 8 (8:00 AM), citations between 7:01 AM and 9:00 AM throughout the year are shown. As can be seen from the figures, there is a pronounced demand for parking occurring in the Village Area starting between 8:00 AM and 10:00 AM. This time coincides with the daily opening time of Mammoth Mountain. The highest parking demand observed throughout the day was near the Village. In Figure 10 and Figure 11 (12:00 PM and 2:00 PM), a significant amount of parking citations can be observed in the Village Area. At the same time, parking demand in the Village Area is also significant, as every parking area in and around the Village is operating at or near capacity.

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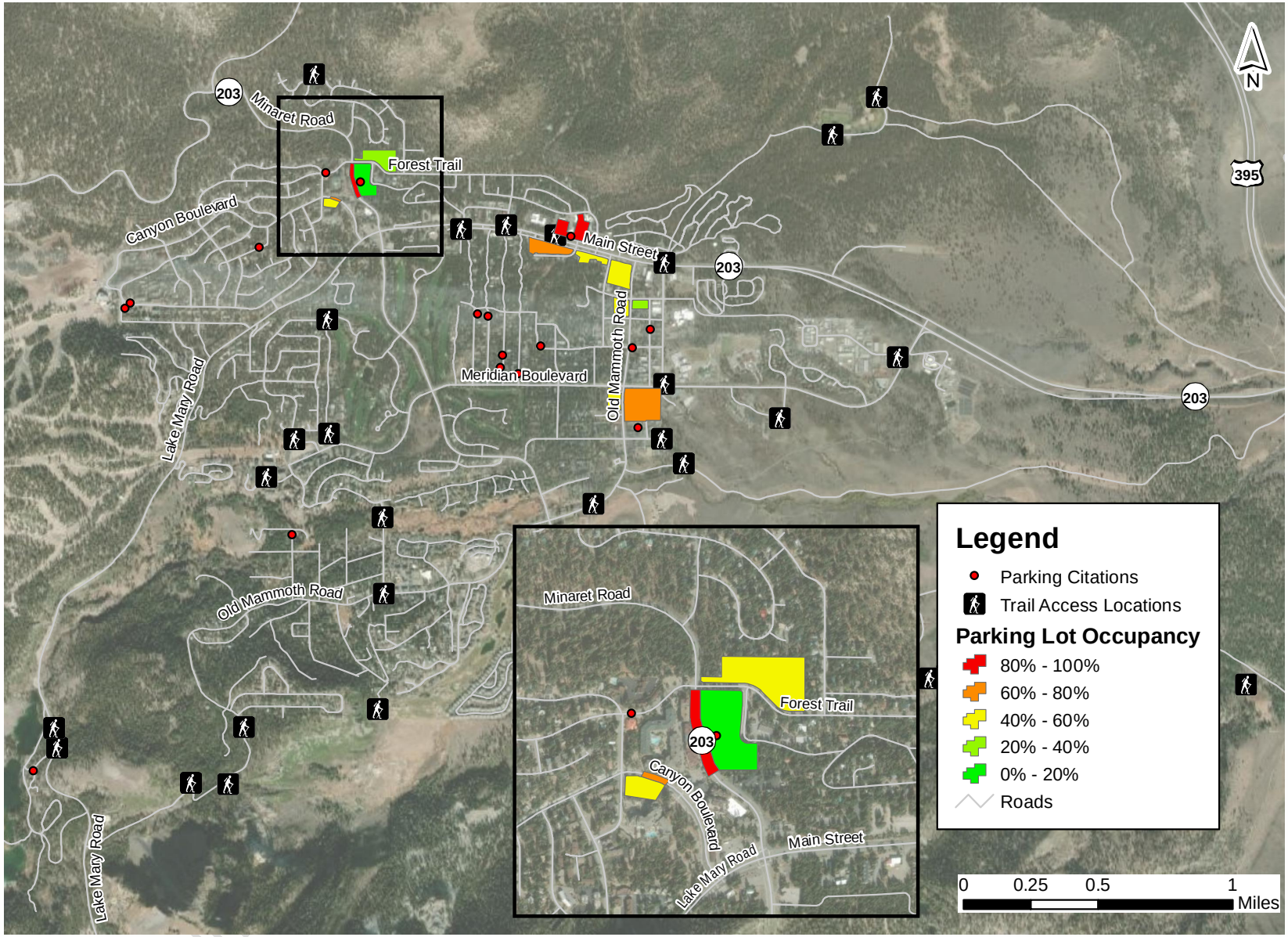
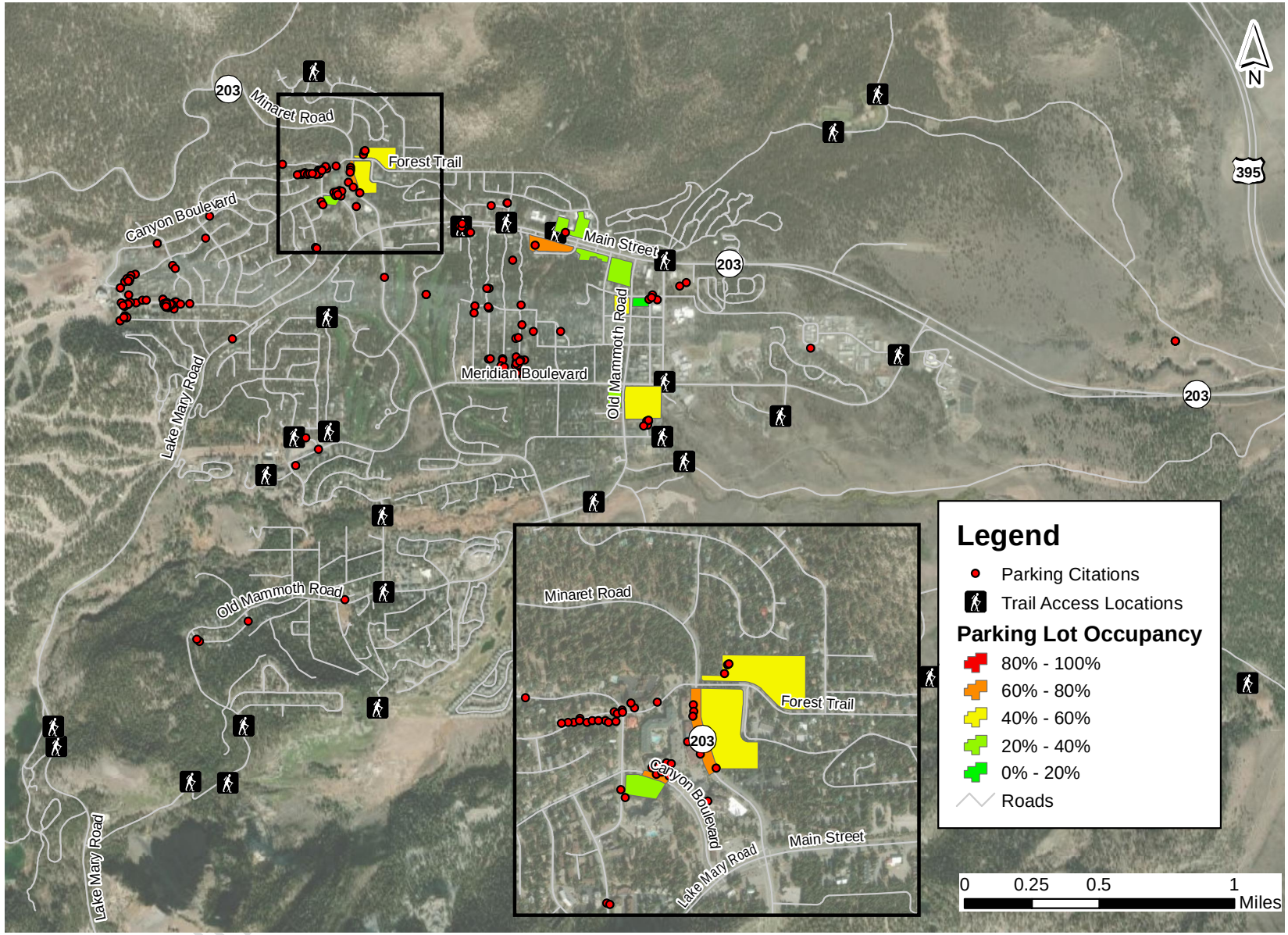


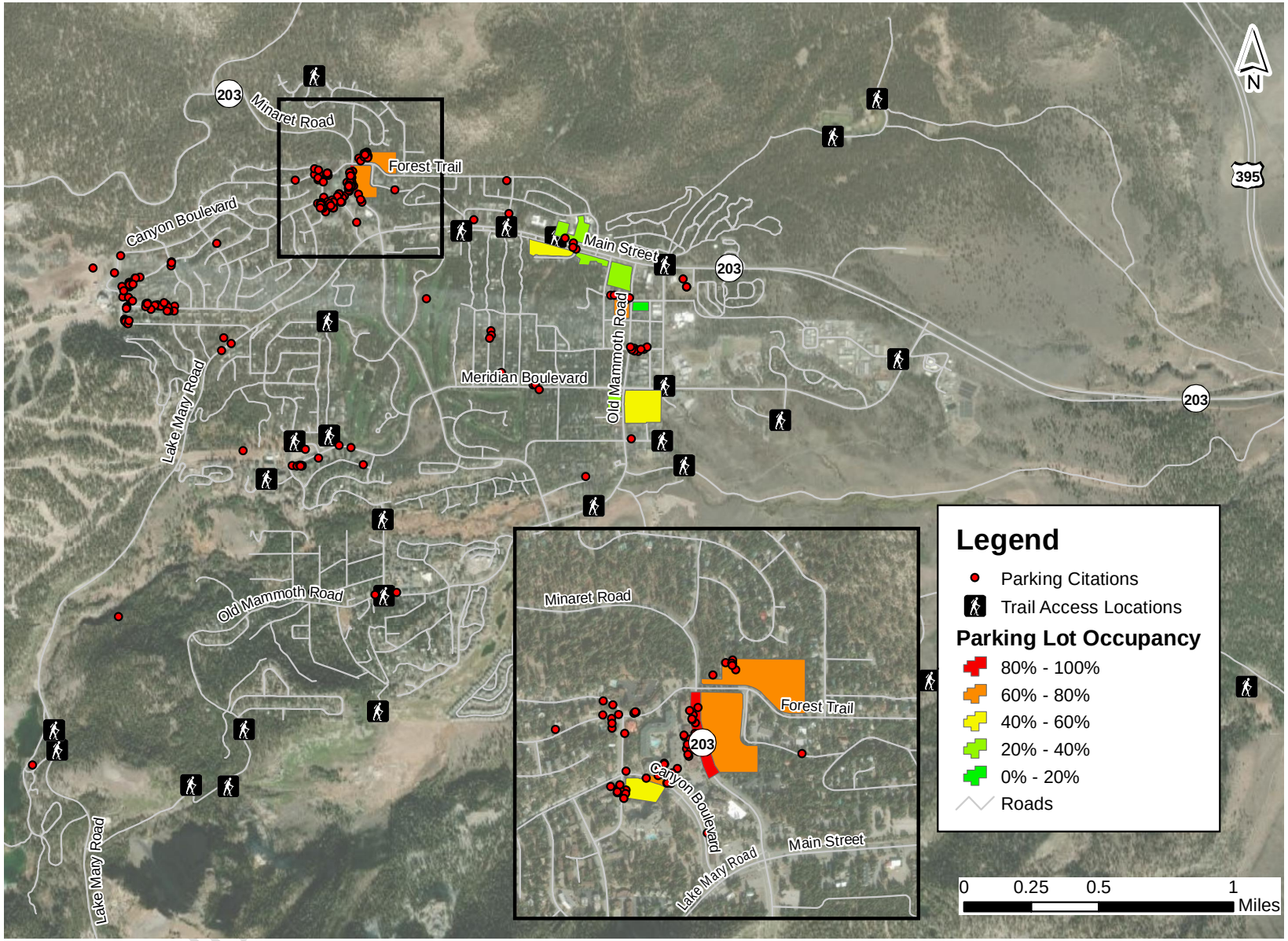
Note: Parking Data collected on Saturday, February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 8 – Parking Occupancy in Mammoth Lakes - 8:00 AM



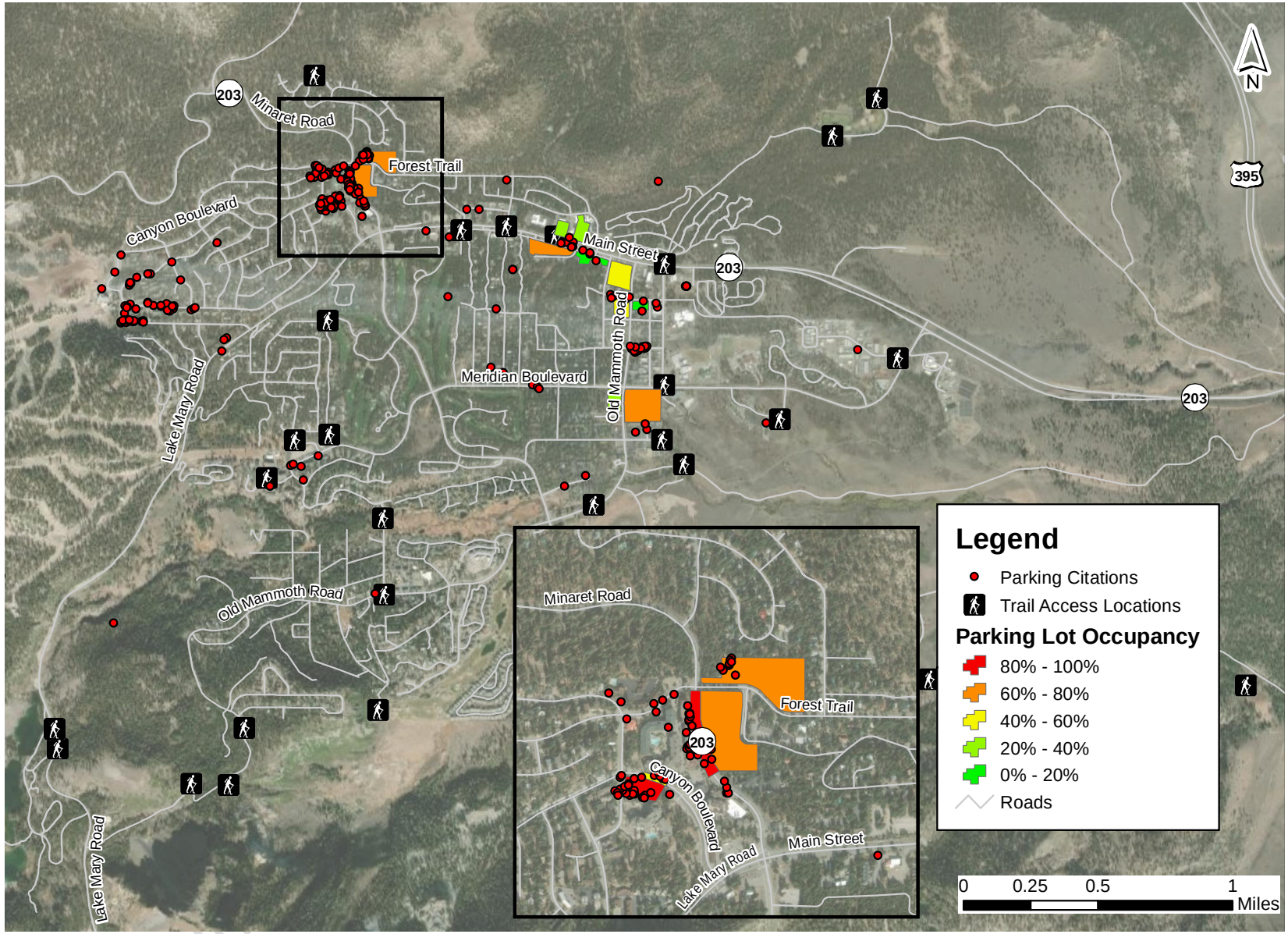
Note: Parking Data collected on Saturday, February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 9 – Parking Occupancy in Mammoth Lakes – 10:00 AM



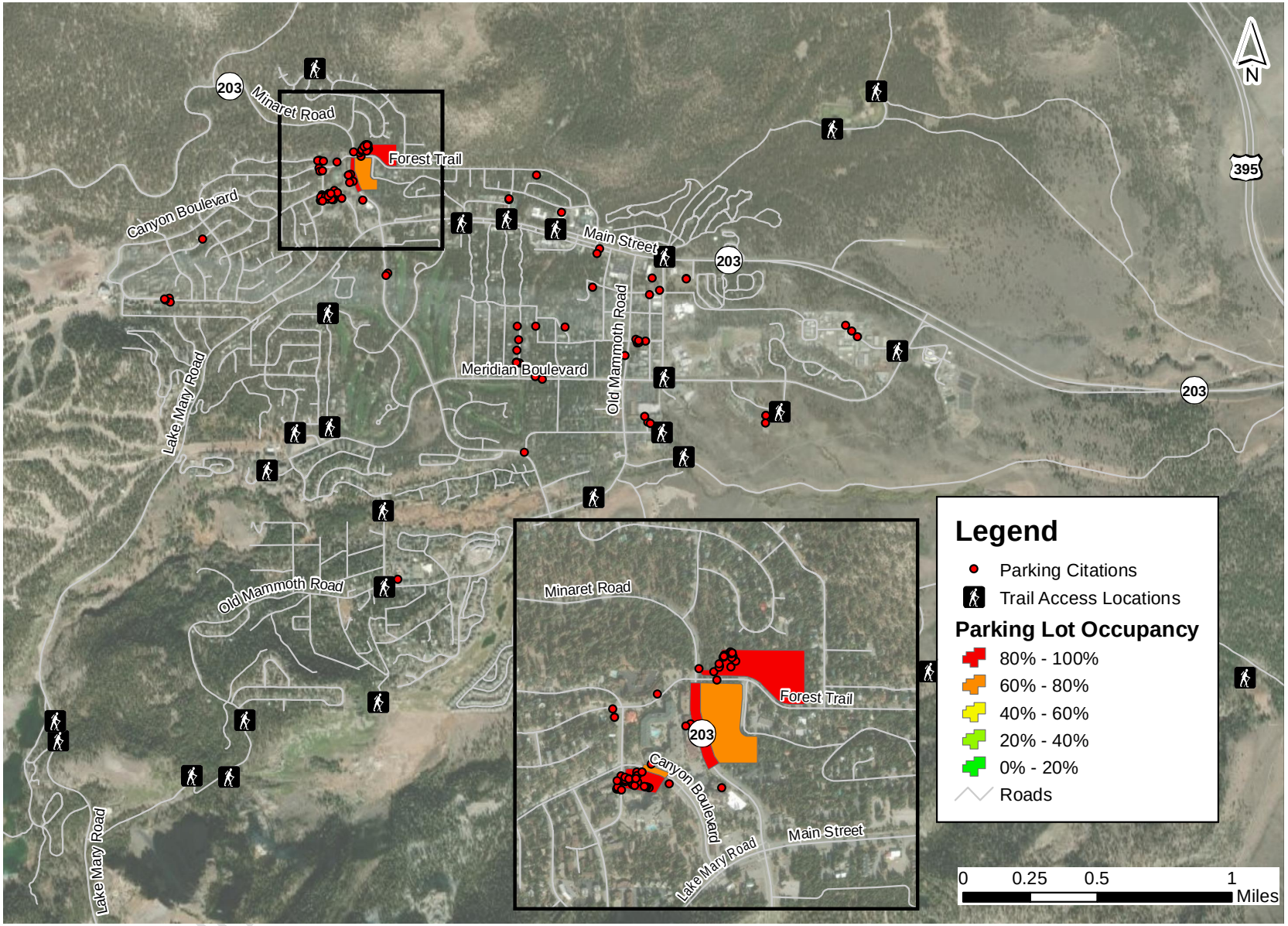
Note: Parking Data collected on Saturday, February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 10 – Parking Occupancy in Mammoth Lakes – 12:00 PM



Note: Parking Data collected on Saturday, February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 11 – Parking Occupancy in Mammoth Lakes – 2:00 PM



Note: Parking Data collected on Saturday, February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 12 – Parking Occupancy in Mammoth Lakes – 4:00 PM

The data shows that parking is not simply a wayfinding issue as occupancy, especially around the Village as well as in the residential areas near Canyon Lodge exceeds 80% through most of the day. Visitors of the mountain attempt to find parking and after failing to find any, park in non-designated areas leading to citations.

The parking occupancy assessment coupled with the citation investigation show that parking demand far exceeds supply, at least in the areas around key destinations. While one solution would be to simply build a parking structure to increase capacity to meet demand, this would result in increased traffic congestion, significant up-front capital cost, and may ultimately create new parking challenges in other areas of Town associated with the influx of vehicles. In addition, it may serve only as a stopgap as demand will likely not stop increasing without mitigative action. An analysis was conducted on future parking demand to demonstrate this point.

3.1.3. Future Parking Demand

Future parking demand in Mammoth Lakes was calculated using growth projections derived from census data and the California Department of Finance. Data from the Census was used in addition to information from Mammoth Mountain regarding projected growth for the future. Mammoth Mountain is projecting to increase daily capacity in the coming years.

Parking areas throughout the Town of Mammoth Lakes serve a variety of users including residents and visitors. Since an intercept survey of those parking in these lots was not conducted, it is not feasible to determine which areas are utilized in which proportion by tourists or the local population.

Parking demand observations were collected on February 15, 2020. On this day, Mammoth Mountain had 15,023 patrons. This represents a typical winter Saturday at Mammoth Mountain in 2020 (prior to COVID-19). Mammoth Mountain is planning to expand capacity to 24,000 daily patrons. This represents a 59.8% growth in demand to the Mountain and therefore within Mammoth Lakes. In the Town of Mammoth Lakes, according to the California Department of Finance, a growth of 5.3% can be expected by 2030. This growth rate will subsequently lead to an increase in parking demand. Along the Main Street Corridor, a blended growth rate was used as an average since there was a wide variation between the two growth rates. Around the Village Area, parking demand is projected to grow in-line with Mammoth Mountain. The trips were increased proportionally based on the current mode share assuming that mobility hubs are not built-out. Table 1 shows the growth rates used for various locations.

Table 1 – Parking Demand Growth Rates

Area	Growth Rate
Town of Mammoth Lakes	5.3%
Main Street Corridor	32.5%
Village Area	59.8%

Figure 13 through 16, show the estimated parking demand considering future growth projections throughout town. Based on the growth rates in Table 1, many of the parking areas around the Village Area will see demand exceeding capacity in the future. Parking is just one aspect of impacts around the Village Area that will come from an expansion at Mammoth Mountain. It is likely that all modes of transportation will experience increases in demand including transit as well as pedestrian and bicycling. Parking demand exceeding capacity is particularly noticeable during the hours of 12:00 PM and 2:00 PM, as shown in Figure 15 and Figure 16.

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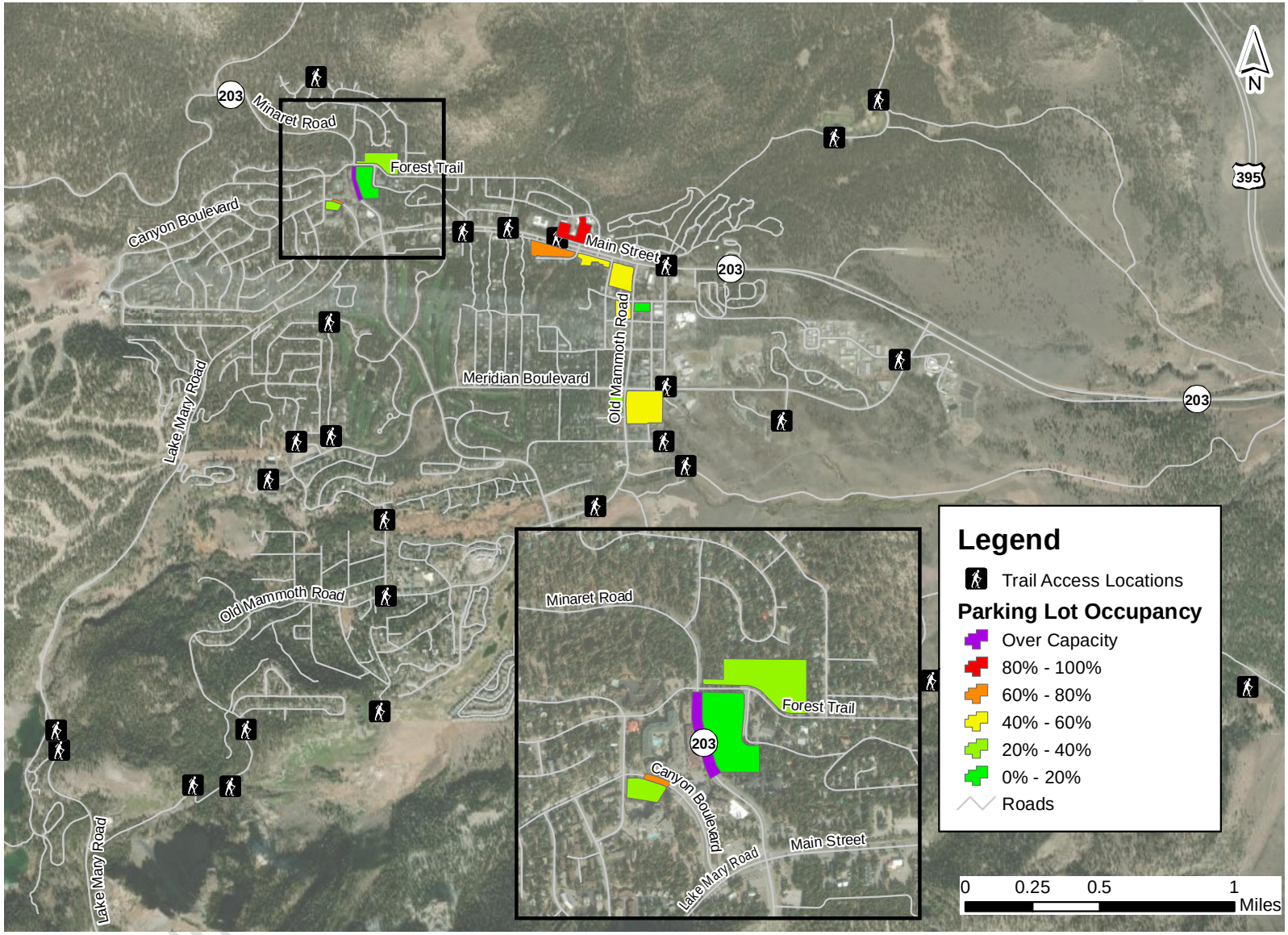
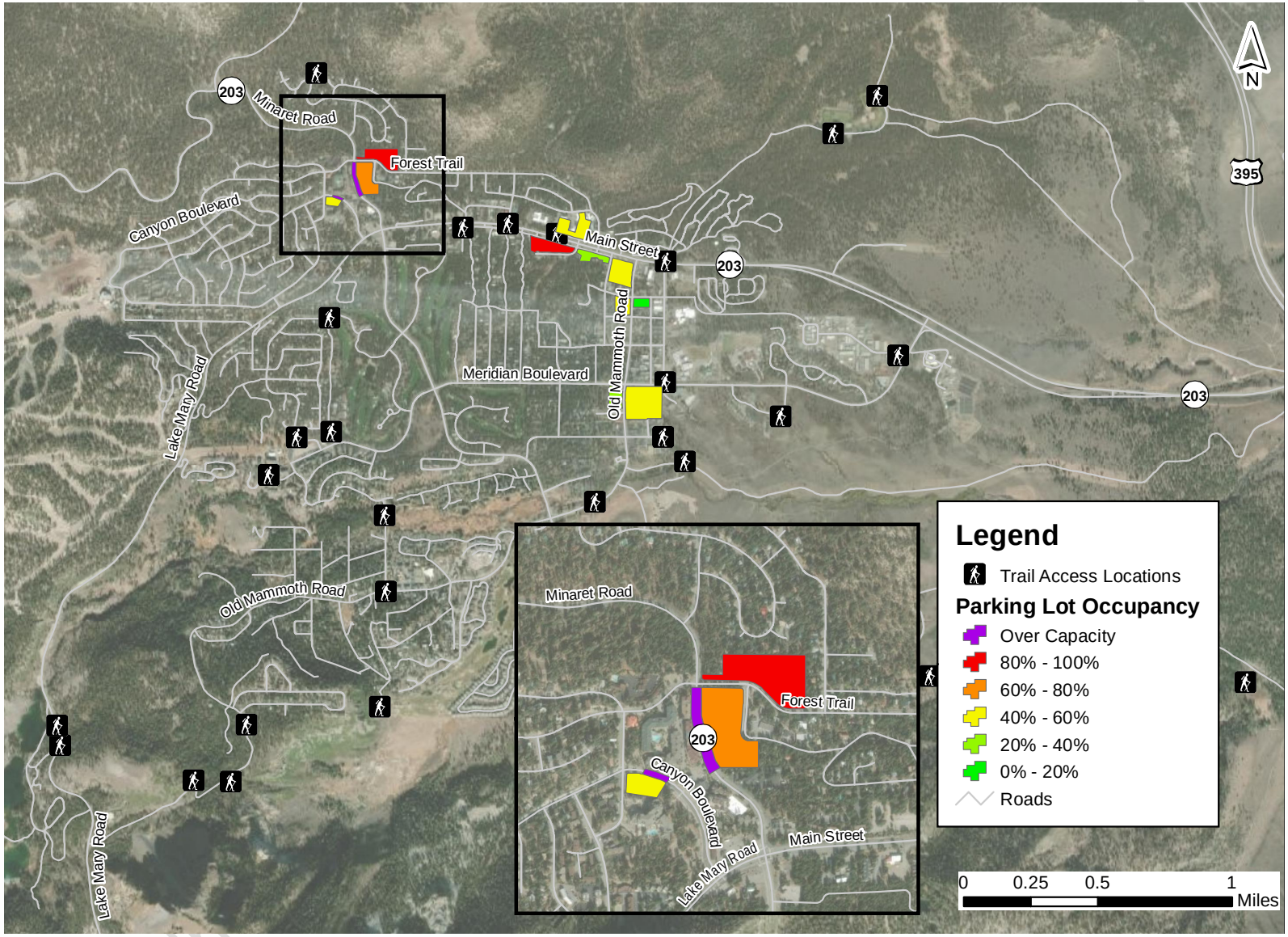


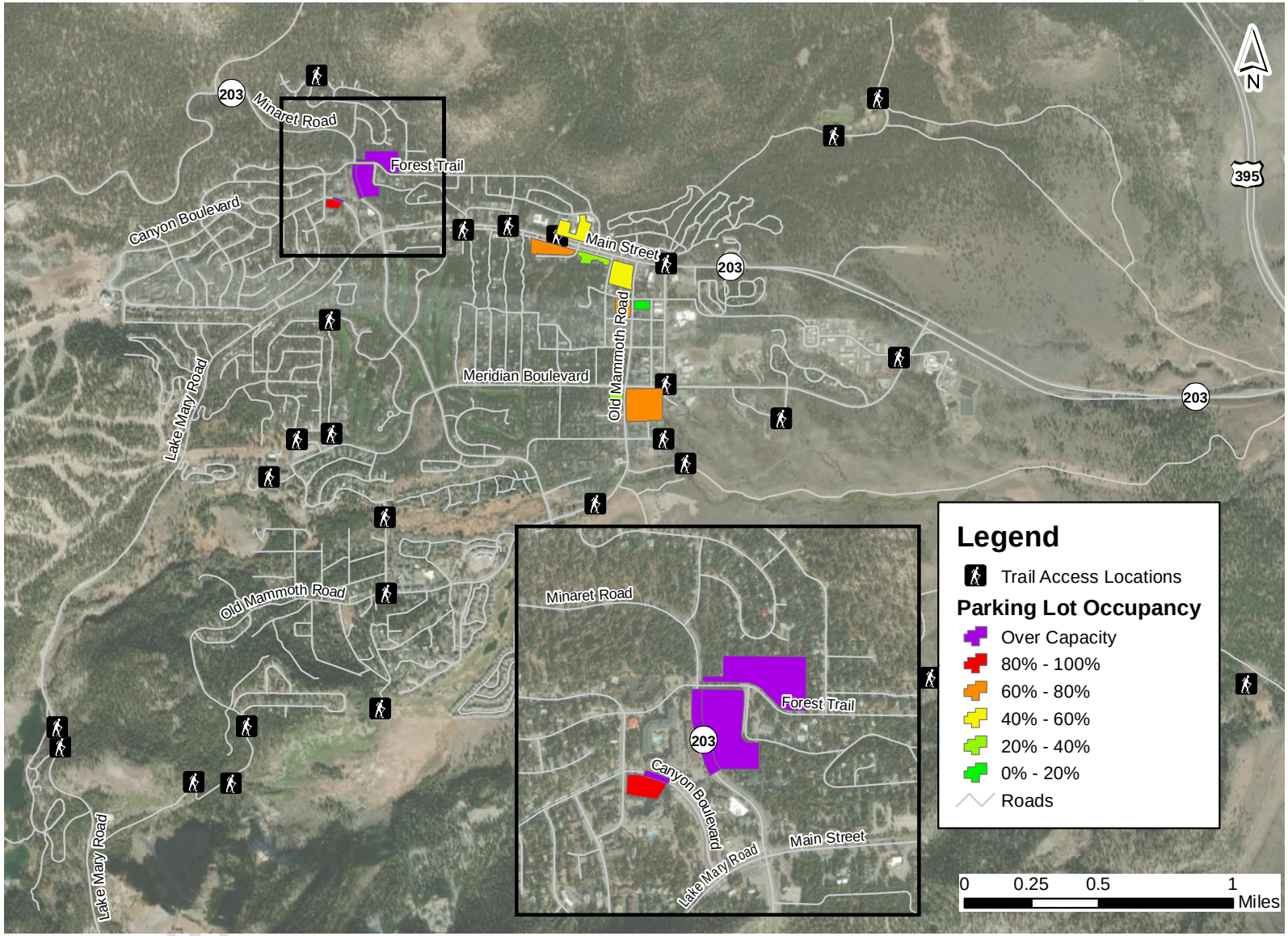
Note: Parking Data collected on February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 13 – Future Parking Occupancy in Mammoth Lakes - 8:00 AM



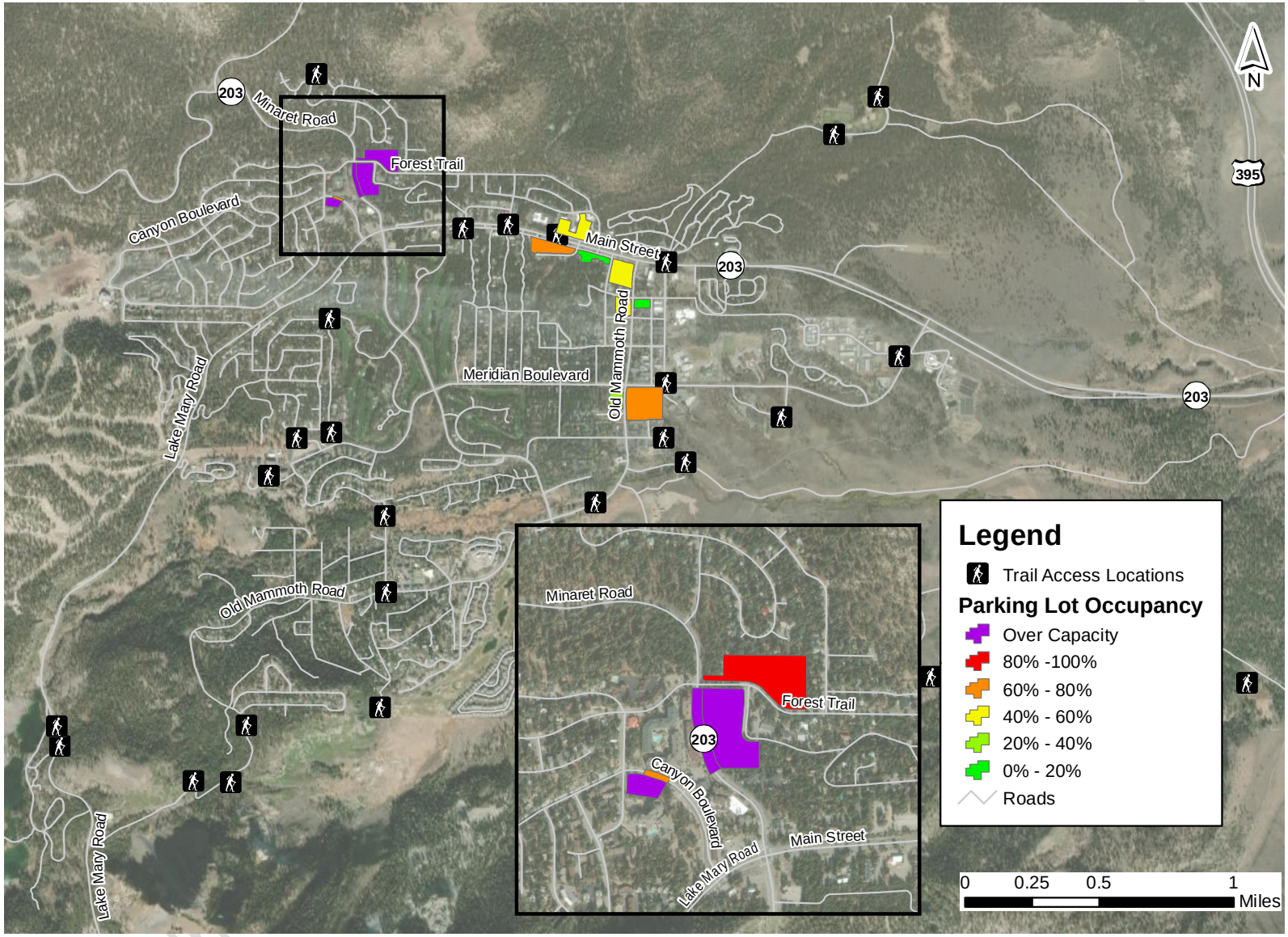
Note: Parking Data collected on February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 14 – Future Parking Occupancy in Mammoth Lakes – 10:00 AM



Note: Parking Data collected on February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 15 – Future Parking Occupancy in Mammoth Lakes – 12:00 PM



Note: Parking Data collected on February 15, 2020. Citation Data collected between March 2019 and February 2020.

Figure 16 – Future Parking Occupancy in Mammoth Lakes – 2:00 PM

Though the specific percentages presented in Table 1 may be argued to be too conservative or not enough, regardless they show the same trends. Parking demand will continue to increase. Not only will parking remain an issue near the mountain lodges but will spill onto the Main Street Corridor and other parts of the Town. To re-emphasize the point made in the earlier section, simply building more parking lots or structures will eventually lead to the same issue of demand exceeding parking capacity.

Mobility hubs address this issue in another manner. Instead of increasing parking capacity to grow with parking demand, the magnitude of parking demand itself is reduced. The build-out of a cohesive mobility hub network shifts mode share away from single-occupancy vehicles. This is achieved by improving modal connectivity and options, which makes users more likely to find an alternative method of reaching their destination. This can manifest itself in people taking shuttles to the mountain, taking transit or riding a bicycle around town, or even using rideshare. None of these modes would require build-out of more parking and at the same time, increase the efficiency of the entire mobility network.

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4. IMPLEMENTATION

This chapter identifies the specific mobility hub strategies that would address the parking challenges noted in Chapter 3 and achieve the Town's goals stated in Chapter 1. In addition, this chapter includes analysis to find potential mobility hub locations and the beneficial amenities at those locations.

4.1. Toolbox

This section provides brief descriptions of each mobility service or amenity, and implementation strategies specifically for the Town. The toolbox is broken out into four sections and each section presents different services/amenities:

- Transit services/amenities
  - Enhanced Transit Waiting Areas
  - Dynamic and Flexible Curbs
  - Real-Time Travel Information
  - Dedicated Transit Lanes
  - Transit Signal Priority
  - Microtransit
  - Neighborhood Electric Vehicles (NEV)
- Pedestrian amenities
  - Walkways
  - Street Crossings
- Bicycle amenities
  - Bikeways
  - Bicycle Parking
  - Bikeshare/Electric Bikeshare/Mountain Bikeshare
- Motorized services amenities
  - On-Demand Ridehailing
  - Electric Vehicle Charging
  - Parking Management Program
- Other services amenities
  - Wayfinding
  - Mobile Retail Services
  - Universal Transportation Account/Partnership Programs

As mentioned in **Chapter 2**, many of the amenities and services provided within the toolbox build upon the previous studies and work done by the Town and its partners.

4.1.1. Transit Services/Amenities

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Enhanced Transit Waiting Areas

Tahoe City Transit Center. Courtesy of Placer County, California

Description

Waiting areas provide a safe and comfortable place for passengers to wait for their transit or shared mobility ride. Important enhancements include seating, lighting, shade and snow cover, heating, landscaping, trash receptacles, complimentary Wi-Fi, real-time transit arrival alerts, and daily schedule information. A high-quality mobility hub will be one that is legible and navigable to new users and that provides comfort and security for regular users.

Implementation Considerations for the Town of Mammoth

- Consider how people use transit stops in order to select which features get priority. For example, stops with higher ridership or longer wait times should provide more seating; stops that will likely be used by out-of-town travelers should have clear wayfinding information.
- Determine which enhancements will provide the most benefits to the most users. Improving aesthetics with landscaping or public art may be desirable. However, these should not be installed at the expense of functional enhancements such as real-time arrival information, fare payment machines, and interactive trip planning kiosks which may give transit users a better experience overall.
- Consider other amenities that will make a waiting area more comfortable, convenient, and safe. These include adequate seating or lean bars, pedestrian-scale lighting, shade structures, heating, water fountains, restrooms, trash and recycle bins, vending machines for coffee or snacks, complimentary Wi-Fi, and USB charging ports.
- Balance designing amenities for irregular or first-time users, who might need an information kiosk, with amenities every-day riders, for whom comfort and safety are typically a larger priority.
- Provide shade at any ticket machine kiosks so people can more easily read the screens.
- Consider incorporating placemaking elements into transit stop design to integrate transit service into the surrounding community. Provide a place where upcoming neighborhood events may be advertised and where local business may be highlighted.
- Local development regulations and the Americans with Disabilities Act (ADA) may guide the design of certain enhancements in a transit waiting area, including interactive kiosks, sidewalks, and seating.
- Maintaining transit waiting areas can require a significant amount of time and money. Implementing low-maintenance design can help ameliorate some of these costs and allow more amenities to be provided for a similar cost.

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- The Transit Street Design Guide from the National Association of City Transportation Officials (NACTO) provides additional transit waiting area design guidance.

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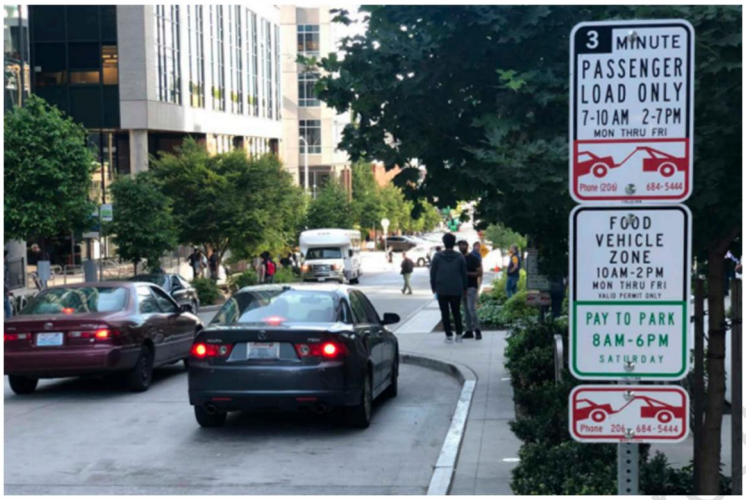
Dynamic and Flexible Curbs



Courtesy of University of Washington

Description

While parking stalls are reserved primarily for full-day park and riders, curb space near the transit stops should be reserved for high turnover uses, such as Transportation Network Companies (TNCs), kiss-and-rides, and neighborhood shuttles. These are areas in which vehicles are expected not to dwell for more than 5 minutes at a time. Depending on demand, curb space may be allocated for different purposes over the course of the day.

Implementation Considerations for the Town of Mammoth

- Signage should clearly indicate the configuration of each portion of curb for both drivers and pedestrians.
- Designating curb space for passenger loading and unloading and make the curb more efficient and reduce double-parking and idling in red curb zones.
- Curb space should be allocated to accommodate anticipated demand and should be prioritized based on the spatial efficiency of the transportation mode, i.e. the number of passengers per vehicle. Under this rubric, transit vehicles are afforded preferential zones over TNCs and kiss-and-ride.
- Flexible curb space should be monitored intermittently to determine efficacy.
- Ensure that snow removal includes pick-up/drop-off curb and loading space in winter activity areas

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Real-Time Travel Information

Courtesy of Global Display Solutions

Description

Real-time travel information allows potential transit riders and other mobility service users to know how long they can expect to wait for a vehicle to arrive and plan accordingly. While transit typically follows a set schedule, events frequently occur that disrupt this; real-time information allows riders to plan the best route to their destination given the circumstances.

Implementation Considerations for the Town of Mammoth

- Rather than developing new real-time arrival systems, existing standards or apps already used by other transit agencies and riders should be used, reducing cost and not relying on users to download a new app.
- Real-time travel information is typically provided on variable message signs that indicate transit arrival times for a given stop.
- At high-volume stops, more information may be displayed on color LED screens, providing live updates on transit arrival times, as well as availability of nearby shared vehicles and average wait time to hail a rideshare vehicle.
- Displays should be updated in real-time to account for traffic congestion, weather impacts, and other delays, rather than simply showing scheduled transit arrival times.
- All signs should employ standards of universal design, meaning that information should be conveyed both visually and audially so that hearing- and seeing-impaired users benefit as well.
- Beacon technology can be deployed to guide users to mobility services and other amenities. This tool acts by transmitting information via Bluetooth connection to a user's smartphone and can provide a wide range of services, such as directing users to wheelchair accessible facilities or assisting users with cognitive disabilities.
- On-site displays and announcements should be provided in both English and Spanish. Any third-party apps should work in both English and Spanish as well. Consider Title VI regulations with language choices.

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- When designing displays, consider any aspects of the Americans with Disability Act (ADA) that dictate requirements for font and color.
- Federal and state grants may be used to fund the installation of real-time travel information technology.

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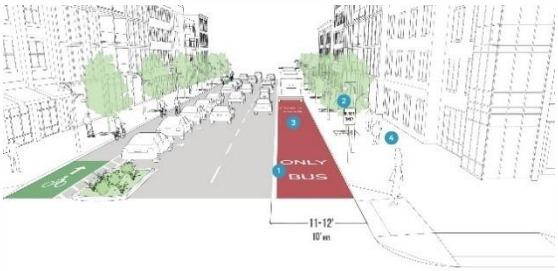
Dedicated Transit Lanes

Peak-Only Bus Lane



Curbside Transit Lane

Photos courtesy of NACTO

Description

Dedicated transit lanes allow transit vehicles to operate more efficiently and reliably by allowing them to avoid delay caused by automobile congestion. These lanes, which may be physically separated from traffic with curbs or painted a different color to discourage driver incursion, should be prioritized in locations where either a high-frequency transit line or multiple individual lines suffer from traffic congestion. By placing greater emphasis on space-efficient modes of travel, such as transit, some people who currently drive alone may see the benefit of switching modes, thus increasing overall throughput.

Implementation Considerations for the Town of Mammoth

- Transit lanes are only appropriate where warranted by sufficiently high transit service levels. See transit signal priority for additional improvements that may be considered in scenarios where service levels don't warrant dedicated lanes.
- Ensure continued business access for driveways along the transit lane
- If a peak hour-only transit lane is implemented, consider what hours and directions should be reserved for transit vehicles or when mixed traffic will be permitted. These may be most valuable for morning/afternoon mountain traffic.
- Signage should clearly communicate where private vehicles are prohibited and what fines will be levied.
- Enforcement of transit-only lanes should be carefully rolled out to prevent widespread public opposition. Early enforcement can be limited to warnings rather than fines.
- Conduct transit operational analysis and traffic study to determine benefits, costs, and needs associated with implementing dedicated transit lanes.
- The National Association of City Transpiration Officials (NACTO) Transit Street Design Guide provides additional guidance on dedicated transit lanes.

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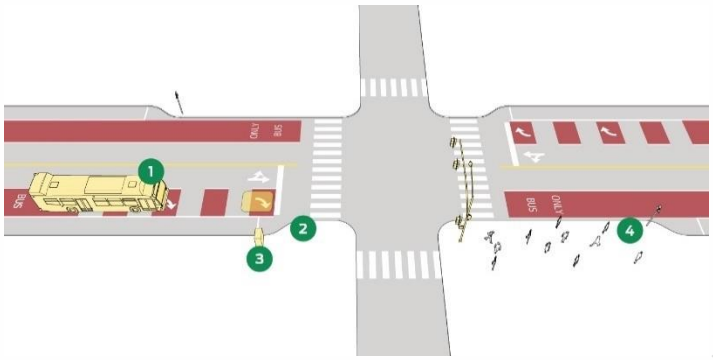
Transit Signal Priority



Courtesy of NACTO

Description

Transit Signal Priority (TSP) can improve reliability and average travel speeds of transit vehicles. TSP reflects a range of improvements at signalized intersections to promote transit efficiency and reliability. This may include queue jumps, bus bulbs, and timing solutions such as phase priority, extended green, and early green. TSP can operate independently at the signal level, connect with multiple signals in a corridor, or be integrated in a regional traffic management control system.

Implementation Considerations for the Town of Mammoth

- May require signal controller upgrades
- A range of technology solutions are available for TSP. Nearly all require some level of technology on board the vehicle, which then should be provided to a cross-section of the fleet to promote flexibility.
- Study the interoperability and features of onboard transit vehicle equipment for the TSP solution to be effective.

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Microtransit

Courtesy of Sacramento Regional Transit District

Description

Neighborhood shuttles, also referred to as “microtransit,” offer on-demand service with dynamic routing. These services can be flexible and can operate in places where density is too low to support fixed route transit or where it is too costly to operate. There are a number of vendors currently providing app-based microtransit service.

Implementation Considerations for the Town of Mammoth

- Consider the amount of demand that microtransit shuttles will receive when allocating curb space at the mobility hub.
- Microtransit vehicles, given their relatively short routes may be suitable for being powered by alternative fuels, such as lithium ion batteries or hydrogen.
- Provide vehicles that have bicycle and ski/snowboard racks for passengers.
- Consider on-demand capability with implementation to allow users to request vehicles in real time.
- Real-time information for microtransit should be available on mobile transit apps
- Can be integrated with paratransit, albeit with some complexity to coordinate on-demand and scheduled service
- A number of pilot autonomous shuttles are being deployed around the country. Autonomous shuttles are currently characterized by very low speed and may not operate in all weather conditions

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Neighborhood Electric Vehicles (NEV)

Courtesy of The Drive

Description

Neighborhood Electric Vehicles (NEV) are battery-powered vehicles with a typical top speed of 25-35 miles per hour. These vehicles, typically owner or business operated, allow users to commute with no greenhouse gas emissions and are classified in the state of California as Zero Emission Vehicles (ZEV).

Implementation Considerations for the Town of Mammoth

- Consider signage and speed limits when designating or planning for certain routes to be used by NEVs.
- Educate users of the requirements for the operation of a NEV including possession of a valid drivers license and registration.
- With increased usage, preference for NEV parking spaces may be considered.
- Certain areas within the Town may be designated for NEVs and other non-motorized vehicles only.

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4.1.2. Pedestrian Amenities

Walkways

Description

Pedestrian access to public transit and other mobility services should be provided via walkways that are wide, smooth, direct, and well-lit at night. Landscaping elements can also serve to improve the aesthetic appeal of a walkway and to buffer pedestrians from the noise generated by passing automobiles.

Implementation Considerations for the Town of Mammoth

- The National Association of City Transportation Officials (NACTO) recommends a minimum sidewalk width of five feet and desirable sidewalk width of six feet to accommodate two people walking side by side. A preferred configuration includes a landscape strip to buffer the sidewalk from the roadway. The desired sidewalk width should align with the level of pedestrian activity, but is recommended to be ten feet or greater in higher activity areas.
- The Americans with Disabilities Act (ADA) and local development codes can influence the design of pedestrian paths.
- Maintenance responsibilities, operating costs for lights and other expenses, and liability considerations should be addressed as part of the design.
- People will frequently walk along paths not technically designated as sidewalks. These pathways, called "desire lines," may be seen by noticing a path of worn ground where people walk. If such pathways, typically diagonal lines acting as a shortcut, exist near the hub, take the opportunity to formalize them by paving them.
- Ensure that pathways are maintained and well lit.
- Prioritize snow removal in walkways near mobility hubs to ensure all pedestrians are able to access facilities.
- Use wayfinding at mobility hub entrances to guide travel between transit stops and other mobility services. Coordinate the design and placement of new signs with existing sign features.
- The NACTO Urban Street Design Guide provides additional walkway design guidance, including descriptions of all sidewalk zones.

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Sample Walkway Improvements

Landscape strips to buffer from roadway

Widened sidewalks

Pedestrian-oriented lighting

Street Furniture

Photos courtesy of Federal Highway Administration, NYC DOT, Forms+Surfaces, StreetLife

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Street Crossings

Description

It is vital to have clear, safe spaces for pedestrians to cross from one side of the road to the other. According to SWITRS data, there were approximately 8 pedestrian collisions in Mono County from 2015-2019 and roughly half occurred at or near crosswalks. By controlling vehicle movement via signals, limiting vehicle speed through the use of vertical and horizontal roadway design elements, and reducing pedestrian exposure in the roadway by shortening crossing distances, street crossings can be made safer and more inviting for pedestrians. Because all transit riders are pedestrians for part of their journey, improving crossings can make riding transit easier and more comfortable.

Implementation Considerations for the Town of Mammoth

- Decisions about where and how to implement a pedestrian crossing are based on several factors, including the local context, the presence of nearby transit facilities, the amount and speed of auto traffic, the history of vehicle collisions in the area, and anticipated demand for crossings.
- Where pedestrian must cross busy streets with fast-moving traffic, signals are typically warranted. If a street is designed for slower traffic, passive infrastructure such as signage and pedestrian bulb-outs may be sufficient to provide a safe crossing.
- Crossing at signalized intersections may be improved by prohibiting driver from turning right on red or by providing a leading pedestrian interval, allowing them to enter the intersection ahead of drivers.
- Where possible, provide crossings upstream from bus stops (i.e. behind the stop rather than in front of it). This allow the transit vehicle to pull out from the stop immediately after passengers have disembarked, and permits greater visibility between drivers and people crossing the street.
- According to NACTO, crossings should be provided at all legs of every street intersection. If a block is unusually long, a mid-block crossing may be provided.
- Crossings should be provided with consideration to the location of nearby transit stops. Most transit trips are two-way and it should not be prohibitively difficult to travel between stops for the same line in opposite directions.
- The Americans with Disabilities Act (ADA) requires the construction of curb ramps at all street corners and pedestrians' crossings to ensure that users of all ages and abilities may use the facility.
- The NACTO Urban Street Design Guide provides additional crossing design guidance.

Sample Street Crossing Improvements

Re-timing Signals for Pedestrians

Signals are timed to allow a 'walk' phase long enough in duration for a pedestrian to traverse the length of the crosswalk. However, many signals assume a crossing speed typical of an able-bodied adult. In areas where there it a likelihood that some significant number of users will move more slowly, whether because they are elderly, very young, or employ mobility devices, a slower crossing speed should be used. This will increase the signal cycle time but preclude the possibility of a user still being in the crosswalk when a signal phase ends. Newer technologies deploy the use of adaptive pedestrian signals which detect pedestrians and extend the time allowed to cross the street before allowing conflicting vehicle movements. This technology may be particularly beneficial in areas with longer crossings are higher volume of pedestrians with slower walking speeds.

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Bulb-Outs

Bulb-outs, also called curb extensions, are treatments installed at intersections to shorten the distance between curbs, allowing pedestrians to spend less time in the roadway and to be more visible when waiting to cross. They also serve to reduce the radius of a curb, encouraging drivers to navigate a turn more slowly.

Mid-Block Crossings

Mid-Block crossings are designated crosswalks installed somewhere other than the intersection of two streets. Depending on the number of lanes, speed limit, and traffic volume, a signal may be needed in addition to signage and striping. While mid-block crossings are not always needed, they should be strongly considered where a shared use path intersects a street or adjacent or a busy land use.

Refuge Island

A pedestrian refuge island is a protected area halfway across a crossing that provides a place for pedestrians to wait if they are not able to traverse an intersection in the time allotted.

PHB

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A pedestrian hybrid beacon (PHB) is a traffic signal that is activated by a pedestrian or bicycle user trying to cross a roadway. Upon actuating, the beacon flashes yellow, warning motorists that they should slow or proceed with caution, before turning red, at which point they must stop and allow pedestrians to cross. This signal is warranted on higher-volume streets with multilane configurations.

RRFB

A rectangular rapid flashing beacon (RRFB) is a traffic signal that is activated by a button at a crosswalk. When activated, the beacon flashes yellow for a period of time that would allow a pedestrian to traverse the crossing, reminding drivers of their legal duty to yield to pedestrians using a crosswalk.

Raised Crosswalk

Raised crosswalks are treatments that place the crosswalk itself on a higher level than the rest of the roadway, leading to drivers slowing down on their approach and increasing the likelihood of yielding to pedestrians. They have the added benefit of being level with the sidewalk, making traversing the crosswalk easier for wheelchair users, people pushing strollers or carts, or any mobility-impaired individuals. More detailed assessments are needed before placing raised crosswalks on transit corridors.

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4.1.3. Bicycle Amenities

Bikeways

Description

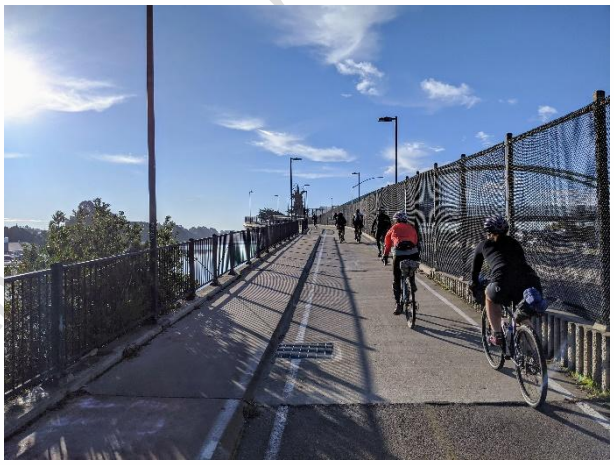
Bikeways can encourage cycling to, from, and within a mobility hub, offering bike riders easier access to transit and other nearby destinations (e.g. work, shopping, recreation). They provide a safe and comfortable riding experience for people of all ages and abilities, and alert drives to the presence of bike riders on or near the roadway. Bikeways make cycling a priority on certain routes, and an important part of the local and regional travel network.

Implementation Considerations for the Town of Mammoth

- Bikeways may take a range of forms, depending on the type of street that they are places along. Bikeways on busy streets with fast-moving traffic should provide physical separation between riders and automobiles. Bikeways on slow, neighborhood streets may consist of signage and pavement markings.
- Bikeways running to the right of automobile travel lanes must be carefully integrated with transit stops so that they do not interfere with bus operations or with passengers waiting to board.
- Snow and ice management should be considered year-round in accordance with the Town of Mammoth Lake General Plan to support its "feet-first" objective and increase accessibility for the entire year
- The National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide provides additional guidance on bikeways.

Sample Bikeway Amenities and Improvements

Class 1 Bike Path



Bike paths are physically separated from automobile traffic, either within the roadway divided by bollards or above the grade of the roadway and separated by a curb. They may also be constructed in an entirely separate right-of-way. Bike paths are shared with pedestrians and other non-motorized travel and typically have speed limits of 15 miles per hour, ensuring that users of all types do not come into conflict.

Class 2 Bike Lane

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Bike lanes are delineated area on the pavement that indicate where bicycle riders should travel. A thin line of paint shows the portion of the street reserved for bicycle users and sometimes an additional buffer is delineated to provide additional space between riders and drivers. They are typically placed to the right of the rightmost auto lane, though this frequently puts them adjacent to on-street parking, which can present a hazard to bicycle users.

Class 3 Bike Route

Bike routes are signed bikeways typically installed on streets with lower auto traffic volumes or on streets without the right-of-way width to accommodate both bike lanes and auto uses. Instead of drivers and bike users using separate areas, they share the same section of roadway. This is indicated by signage and pavement markings such as so-called “sharrows.” Due to the differential in bicycle speed (between 8-15 MPH) and typical neighborhood speed limits (25 MPH), additional treatments should be implemented to slow auto speeds.

Class 4 Cycle Track

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Cycle tracks provide separated travel lanes for bicycles and other slow rideable vehicles in the road right-of-way. Separation from vehicle traffic may be achieved via bollards, concrete, parked cars, or a combination of these features.

Bike Signals

Bike signals assist riders in moving though busy intersections, typically through reducing conflicts between through-moving bicyclists and right-turning automobiles.

Bike Boxes

Bike boxes are green-painted areas installed at an intersection between the auto stop bar and the pedestrian crosswalk. Allowing bikers to move to the front of the auto queue, making them more visible as they enter the intersection first.

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Bicycle Parking

Bicycle racks

Bicycle lockers

Description

While much attention is paid to the provision of bikeways on streets, sometimes bike parking can be overlooked. For people to choose to ride their personal bicycles for transportation, they must feel certain that their bike will still be where they left it upon their return. This is especially true for people riding a bike to transit, who must either choose to bring their bike onboard the transit vehicle or leave the bicycle at the station all day. For the latter to be a viable option, bike parking must be provided at the station that is secure from theft, protected from the elements, and easy to access on both arrival and departure.

Implementation Considerations for the Town of Mammoth

- When choosing where to locate bike parking or secure bike lockers, consider demand, surface space availability, and operational costs
- If a transit rider is going to access the mobility hub via bike but does not need the bike at their destination, they likely plan on parking it for a significant amount of time. Thus, consideration should be given to make bike parking as theft-proof as possible.
- Bike parking should be located near where riders would board a transit vehicle to encourage riding instead of driving alone.
- Secure bike parking is typically priced rather than free. This can be done on a daily basis or on a longer term. Ensure that options are available for low-income customers.
- Higher quality bike parking requires increasing cost of operation, staffing, and maintenance. Outdoor bike parking must be installed and maintained, but a bike station must employ an attendant.
- Consider whether or not there is a need or desire within a mobility hub to incorporate charging facilities for electric bikes. These would likely have to be indoors, requiring a full bike station.
- Real-time information on available bike parking should be integrated into a universal transportation account, with which users can find, access, and pay for a variety of mobility services.
- If secure bike lockers are provided, allow users to check real-time information about bike parking availability ahead of time as well as make and pay for a reservation.

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Bikeshare/Electric Bikeshare/Mountain Bikeshare

Docked bikeshare

Electric bikeshare

Description

Bikeshare or electric bikeshare provides convenient, affordable, on-demand access to bikes for short-term use while enhancing access to transit. Bikeshare stations typically are situation near transit stops and major commercial destinations. Bikeshare programs can help reduce traffic congestion, pollution, and the demand for vehicle parking. Bikeshare may also encourage people who'd rather not own a bike.

Implementation Considerations for the Town of Mammoth

- Various bikeshare implementation models exist, and there could be several parties or companies involved.
- Bikeshare ridership increases exponentially with increases in station density, according to a NACTO analysis of U.S. bikeshare system data. Stations separated by walkable distances (every 1,000 feet) is fundamental for providing an equitable bikeshare program that features convenient, on-demand mobility.
- Bikeshare stations should be situation at transit stops or within one block of the stops, and they should be made highly visible with signs. Integrating bikeshare stations with transit greatly extends the mobility network by offering people a way to reach destinations that are not directly served by scheduled transit.
- Situate bikeshare options near existing or planned bikeways and trails to further enhance the program's success.
- Any docked systems should have a dock installed near planned bike parking. Additional space should be reserved and clearly marked for the parking of non-docked system vehicles.
- Similar to other bikeshare programs, a mountain bikeshare program can be offered with locations at trailheads and other popular trails. Consideration should be given to form partnerships with local businesses.

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4.1.4. Motorized Services Amenities

On-Demand Ridehailing

Courtesy of The Verge

Description

Formally known as Transportation Network Companies (TNCs), app-based ride-hail companies such as Lyft and Uber allow users to summon a car to their location easily and reliably, with prices varying based on current demand and availability of drivers. A number of public agencies have partnered with TNCs to promote first-mile/last-mile connections to transit hubs or as an alternative to providing fixed-route transit service. These partnerships often provide discounted rates, subsidies, connections information, and other benefits to users for connecting to transit. A component of the ridehailing industry is rideshare where users are paired together by algorithms to share rides to destinations. This reduces the number of autos on the road and the environmental footprint of TNCs. In some cases, public agencies specifically subsidize the rideshare (for example, Uberpool or Lyft Line) component of TNCs.

Implementation Considerations for the Town of Mammoth

- Because TNCs allow travelers to reach a transit stop without driving and parking a vehicle, they can allow higher levels of ridership without devoting more land to parking.
- Curbspace should be reserved specifically for TNC use, given that it has a high turnover rate. This area should be clearly signed for drivers entering the area.
- Wayfinding to TNC pick-up/drop-off areas should be provided so that TNC riders know where to meet their vehicle.
- ADA-accessible rideshare services are available in some metro areas, allowing people with mobility devices to use the service
- Employers may subsidize or sponsor rides for their employees to preapproved locations
- Assessment is needed to determine how TNCs can be leveraged to increase overall transit ridership and reduce auto utilization. For example, rides can be subsidized to/from major regional transit connection hubs (such as the airport or at regional mobility hubs) to encourage use of those facilities by tourists as an alternative to driving into town.

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Electric Vehicle Charging

Description

Electric Vehicle Charging Stations (EVCS) allow battery-electric or gas-electric hybrid vehicles to be charged while parked. This can synthesize well with park & ride lots where users store cars for a relatively long period, enough time to receive a full charge.

Implementation Considerations for the Town of Mammoth

- Electric vehicle charging stations should be implemented for some percentage of the parking spots, with spacing to allow charging to be deployed to an additional percentage of the parking spot.
- Provide wayfinding to charging stations so that EV users know where they should park their vehicles to be able to plug in.
- Bollard or other barriers should be considered to protect charging stations from accidental collisions with vehicles.
- Consider how charging stations will be implemented and maintained. In many instances the service is free to the user, but if demand increases it may be something that could be monetized.
- Various smartphone applications allow drivers to locate EVCSs. Ensure that the charging stations are visible in those applications so that potential riders are not dissuaded from using the hub.
- Electric vehicle charging is a critical component for the successful deployment of NEV services. Facilities allowing for joint public/private use may best leverage infrastructure investments.
- Consider partnerships with major tourist destinations such as Mammoth Mountain to incentivize electric vehicle use through parking prioritization or reduced rates.

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Parking Management Program

Description

Parking management programs are typically enacted to more efficiently utilize parking lots and spaces. These programs can be enacted in a variety of methods, some of which are: smart parking, real-time parking availability, remote parking lots with shuttles, dynamic or managed parking pricing. Smart parking brings together traditional parking strategies with new technologies to bring about better use of existing infrastructure. This may include reserved spaces, pre-paid spaces, and prioritization for carpools/vanpools. Real-time parking availability gives users an indication of the number of spaces left to preclude unnecessary circulation in the lots.

Implementation Considerations for the Town of Mammoth

- Significant consideration should be given to how one obtains permission to park.
    - Per day spaces require a user to pay every time they want to use a spot, but no spots are reserved for a particular person.
    - Permit spots allow a user who has obtained a permit to park in a designated spot.
- The composition of a lot may be divided between permit spots and per-day or per-hour spots.
- Consideration should be given to eligibility requirements for permits and whether they should be limited in any way.
    - Eligibility may be based on disability status
    - Permits can be only granted to users who live at least a certain distance away
    - Policies can be implemented to ensure that users from the local municipality are able to use the facility.
- Day-of payment should be made possible by a variety of means, such as cash, credit card, or smart phone.
- Consider technology that monitors capacity and can display the number of available to spaces on a website or smartphone app.
- The design of park & ride lots should not in any way inhibit the quality of the transit routes they are serving (by, for example, placing the stops far from the fronting road).
- Comfortable ADA-compliant paths should be implemented for people to travel from their car to the transit stop.
- Priority parking can be designated at the part of the lot closest to the transit stop for low-emissions vehicles (e.g. motorized scooters, battery electric or hybrid electric vehicles).
- The parking management platform can be integrated with transit service information to provide clear alternatives to driving or information for how to get around if all of the parking spaces are already reserved or utilized.

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4.1.5. Other Services Amenities

Wayfinding

Description

Wayfinding is the term for all signage and guidance that allow users to find their destination. This is particularly useful in transportation hubs of all sorts, such as airports, train station, or bus depots, where people have to make time-sensitive decisions about which way to go and may not be familiar with the environment.

Implementation Consideration for the Town of Mammoth

- Wayfinding may often be treated as an afterthought, but is an important part of guiding new users to their destinations. Without proper wayfinding, a first-time transit rider may bounce off, not being able to tell where to go, and never return. Designing navigation aids that may be used by a novice is key.
- A wayfinding policy need a comprehensive strategy. One built for moving people internally within a transit center will look very different from one helping people navigate between landmarks in a small downtown.
- Though high-quality wayfinding may be dynamic and involve a touch screen display, static wayfinding may be perfectly effective and is less costly to implement.
- At the very least, users should be presented with legible maps in the relevant languages that tell them where they will find needed transit services.
- Special care should be given to ensuring that wayfinding is ADA accessible users with visual, physical, or hearing impairments.

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Mobile Retail Services

Description

Mobile retail services is the term for retail services that people need on a daily basis that are mobile. That is, these services are able to be situated where the people are instead of being in a fixed location. These services may include groceries, salons, barbers, dry cleaning, and delivery services, among others. This has the added benefit of encouraging transit use instead of driving.

Implementation Consideration for the Town of Mammoth

- Mobile retail services may be located at transit hubs or near popular destinations.
- Clear signage should be provided to guide mobile vendors where they may park and setup. This may include separate spaces for food trucks and other vendors.
- These services should work with local government to obtain permits and other required documentation.
- Mobile retail service integration most commonly targets commuters, which is less of a focus in Mammoth Lakes. Convenience retail, food, and light sporting goods may be more appropriate for the Mammoth Lakes tourist market.

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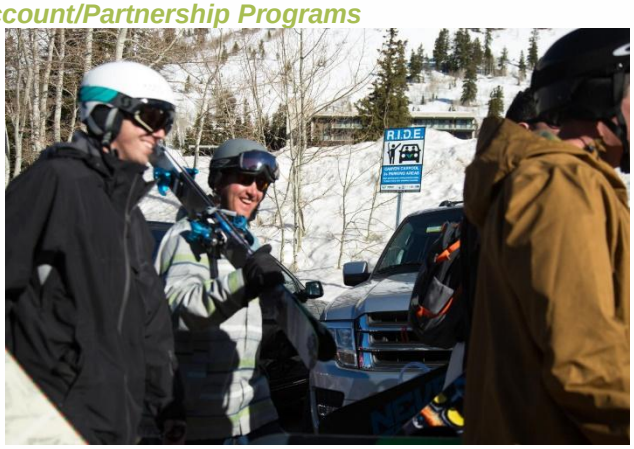
Universal Transportation Account/Partnership Programs



Courtesy of Ski City UTA (Utah)

Description

A Universal Transportation Account (UTA) can allow users to pay for a wide range of transportation services (such as transit trips, parking, tolls, shared mobility, EV charging) using the same smartphone app. Incentives can be established to promote sustainable transportation choices, benefit low-income users, and encourage broader use of a mix of transportation services.

Implementation Considerations for the Town of Mammoth

- Identify an existing system to adopt or find a vendor who will develop and maintain the system. Preference should be given to using an existing solution
- Develop a plan for testing, piloting, and implementing the system
- Identify the full list of services that should be brought under the UTA umbrella
- Ensure that the program is accessible for all users, including low-income, non-English speaking, and non-smartphone users
- Work with local mountain and tourist operators to see if the UTA can be associated with lift passes, recreational excursions, and tourist packages allowing users to seamlessly access transit services. This may be mutually beneficial to alleviate the parking demand for mountain users as well.

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4.2. Mobility Hub Categories and Typologies

Mobility hubs reflect both the character and transportation needs of the communities that they serve. As these factors vary even within communities, different types of mobility hubs serve different purposes and thus have different amenities, features, and scale.

The Town of Mammoth Lakes has a range of mobility needs that can be addressed by mobility hubs. These include serving regional trips into and out of the Town, trips to major tourist destinations in and around town, access to trailheads and other similar destinations, as well as local trips to shopping, entertainment, employment and schools. As the mobility solutions to facilitate the efficient and effective completion of those trips varies, mobility hubs will be categorized around those needs.

Three general categories of mobility hubs are proposed for the Town of Mammoth Lakes. The categories are differentiated by scale, amenities, and context. Hubs are classified as Recreational Gateway, Community, and Regional to define their role in the transportation network and the amenities they will include.

Table 3 depicts the range of mobility hub features that may be considered for each type of mobility hub. It is not expected that every mobility hub will have every amenity, but rather the amenities provided at each hub will be determined based on location-specific mobility needs, the available footprint, and the ability to secure mobility partnerships to provide services.

4.2.1. Regional

The *Regional* hubs are the largest scale hubs and will provide an interface between regional transit services and local transportation services. This would be how many tourists and longer-distance commuters would access the transportation network of the Town. Due to a higher volume of users, it is anticipated that these would be the most robust hubs, with a wide array of mobility options, as well as nearby supporting retail uses. As a result, they would likely require the largest footprint. Amenities that may be provided at a Regional hub are presented in Table 2. It is anticipated that regional hubs would only be provided at connection points to regional transportation, such as near The Village or at Mammoth Yosemite Airport.

Example Use: A tourist takes a YARTS bus to a Regional hub at The Village. They then have the option to transfer to a shuttle (public or private) to reach their lodging, can rent a carshare vehicle to access a trailhead, or can rent a bikeshare to travel around town.

4.2.2. Community

The *Community* hubs are neighborhood-oriented hubs that are embedded in local neighborhoods to allow users to access the mobility network. These hubs provide options around town for both residents and visitors. These hubs may vary significantly in size or purpose but are intended to integrate well into local communities, both in terms of footprint and amenities provided. Amenities will be focused on providing options for local community-oriented trips and bringing together users to access the transit network. A number of community hubs would be provided throughout the Town to provide mobility opportunities for all residents and visitors. Amenities that may be available at a Community hub are presented in Table 2.

Example Use: A local resident walks to a community hub to board a neighborhood electric vehicle (NEV) to take them to their place of employment in the commercial core.

4.2.3. Recreational Gateway

The *Recreational Gateway* hubs are focused on providing sustainable transportation options to access the multitude of recreational and tourist-oriented opportunities in and around the Town. These would be utilized by both residents and tourists alike, but are focused on addressing existing congestion

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challenges at recreational attractors, such as trail heads. Due to the specific objective of these hubs, they would include mobility services and amenities primarily focused on shifting existing drive-and-park users to alternative modes. It is anticipated that these would be most beneficial at sites with limited parking or existing congestion issues. One goal of the Recreational Gateway hubs is to allow tourists to visit the Town without the need for a personal vehicle to access the numerous recreational opportunities that are available in the area. This would further encourage them to take transit to the area or to leave their vehicle at their lodging for the duration of their trip. Amenities that may be available at a *Recreational Gateway* hub are presented in Table 2.

Example Use: A tourist obtains a discounted shared-ride from a TNC operator to travel to Mammoth Creek Park, where they use dynamic curb space to efficiently access their destination.

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Table 2 – Range of Amenities by Mobility Hub

Category	Recreational Gateway	Community	Regional
Enhanced Transit Waiting Areas	X	X	x
Dynamic and Flexible Curbs	X	x	x
Real-Time Travel Information	X	x	x
Dedicated Transit Lanes			x
Transit Signal Priority			x
Microtransit		x	x
Neighborhood Electric Vehicles (NEV)		x	x
Walkways	X	x	x
Street Crossings	X	x	x
Bikeways	X	x	x
Bicycle Parking	X	x	x
Bikeshare/Electric Bikeshare/Mountain Bikeshare	X	x	x
On-Demand Ridehailing	X	x	x
Electric Vehicle Charging	X	x	x
Parking Management Program	X	x	x
Wayfinding	X	x	x
Mobile Retail Services		x	x
Universal Transportation Account/Partnership Programs	X	x	x

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4.3. Location Analysis Overview

As noted in the previous section, the deployment of mobility hubs and mobility hub amenities is dependent on the specific transportation needs of the catchment area around the hub. In order to identify the areas most in need of mobility hubs to address existing or anticipated transportation challenges (such as excess parking demand) and to identify the role that mobility hubs may serve within that need, a geo-spatially based locational analysis was performed.

Chapter 3 included an analysis of areas with parking demand challenges and anticipated parking growth. In order for mobility hubs to be effective, they need to not only have transportation demand, but also interconnect with the surrounding network. Therefore, this section includes an analysis of the existing transportation network to identify areas where a supportive mobility network is already available and could be best leveraged by mobility hubs. This analysis therefore doesn't necessarily identify all of the locations where mobility hubs are ultimately needed, but rather identifies those areas that currently have the characteristics to support the near-term implementation of mobility hubs. As the multi-modal network is enhanced over time and additional data about user travel patterns (such as Big Data sources) becomes available, this analysis can be updated to identify additional mobility hub locations.

This section shows the analysis of existing transit/mobility options, pedestrian and bicyclist facilities, current zoning, site acquisition feasibility, demographics, and land uses that was performed as part of the *Mobility Hub Study and Program* to support identification of types and location areas of near-term mobility hubs in Mammoth Lakes. This analysis represents a quantitative approach that advances the mobility hub siting efforts conducted in previous studies. The location assessment serves to work in conjunction with the parking analysis completed in **Chapter 3** as it provides another tool to ensure there is consistency in the recommended locations.

4.3.1. Mobility Hub Priority Siting Criteria

In evaluating the existing mobility network in Mammoth Lakes to assess its ability to effectively support the near-term implementation mobility hubs, a variety of assessment criteria were employed in the categories of: Transit, Pedestrian and Bicycles, Site Zoning, Site Acquisition, Demographics, and Land Use. It is noted that these criteria do not necessarily indicate levels of existing mobility demand or future mobility expansion needs, but rather reflect where the current transportation network and land use characteristics support the implementation of mobility hubs. It is recommended to update and refine this analysis over time as the multimodal transportation network is expanded and additional data sources become available. This assessment can also inform the mobility hub typology that would be most appropriate at a certain location. For instance, a site identified near a community center with bicycle facilities and complete sidewalk coverage in the vicinity would align well with the amenities proposed for a community hub. As shown in Table 3, a wide array of metrics were used in the analysis. The following sections explore these metrics in further detail.

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Table 3 – Existing Conditions Evaluation Criteria

Category	Criterion	Description of Data Available	Scoring System	Max Points Available
Transit	**Transit Stop Proximity**	Stops along Transit Routes within 0.1 miles weighted by Route ridership	3: Highest Quartile of Parcels 2: Second Quartile of Parcels 1: Third Quartile of Parcels 0: Lowest Quartile of Parcels	3
	Transit Route Proximity	Transit Routes within 0.1 miles	1: Yes 0: No	1
Pedestrians and Bicycles	**Proximity to On-Street Bicycle Facilities**	Bicycle Facilities on Roadways within 0.1 miles	1: Yes 0: No	1
	Proximity to Bicycle Racks	Bicycle Racks within 0.25 miles	1: Yes 0: No	1
	Proximity to Multi-Use Paths	Multi-Use Paths within 0.25 miles	1: Yes 0: No	1
	Proximity to Sidewalks	Existing Sidewalks within 0.05 miles	1: Yes 0: No	1
	Proximity to Crosswalks	Existing Crosswalks within 0.1 miles	1: Yes 0: No	1
	Proximity to Recreational Facilities	Number of Recreational Facilities within 0.5 miles	3: Highest Quartile of Parcels 2: Second Quartile of Parcels 1: Third Quartile of Parcels 0: Lowest Quartile of Parcels	3
Site Zoning	**Compatibility with Existing Zoning**	Current Zoning	2: Parcel does not need to be rezoned 1: Parcel is adjacent to correct zoning 0: Parcel requires zoning modifications	2
Site Acquisition	**Feasibility of Site Acquisition**	Parcel Ownership	6: Parcel owned by Town 3: Lowest Quartile of Parcel Cost 2: Second Quartile of Parcel Cost 1: Third Quartile of Parcel Cost 0: Highest Quartile of Parcel Cost	6
	Development	Parcel Status	1: Undeveloped Parcel 0: Developed Parcel	1
Demographics	**Serves Low-Income Communities**	Census Block Median Income	2: Lowest Third of Census Blocks 1: Middle Third of Census Blocks 0: Highest Third of Census Blocks	2
Land Use	**Proximity to Various Land Uses**	Product of residential and nonresidential parcels within 0.25 miles	4: Highest Third of Parcels 2: Middle Third of Parcels 0: Lowest Third of Parcels	4

4.3.2. Pedestrian, Bike and Transit Assessment

The results of this analysis are summarized in this section. The criteria noted above were combined to generate three summary figures which are provided below. Figure 17 focuses on the pedestrian, bicycle and transit criteria. A primary component of a successful mobility hub includes the use and accommodation of all modes of travel.

The Town of Mammoth Lakes presents unique challenges and opportunities regarding multimodal transportation. Mammoth Lakes is well-known as a recreation destination among tourists. These recreation activities largely focus on the winter and summer months. Mammoth Lakes is at a high elevation and can receive tremendous snowfall totals in the winter months making some modes of transportation more difficult than others. Many tourists in Mammoth Lakes come from origins greater than 100 miles away, meaning that a large percentage of tourists arrive by car or plane. There are numerous free transit routes that serve both locals and tourists alike.

The summer months in Mammoth Lakes see many visitors engaging in outdoor activities such as hiking and mountain biking. Access to the trail system in the area is a critical component to successful mobility hubs within Mammoth Lakes. Given all of this, a scoring system was devised to reflect the unique nature of Mammoth Lakes. As can be seen in Figure 17, Figure 18, and Figure 19, areas within the Town of Mammoth Lakes are divided into 200' by 200' blocks throughout town. Scores were developed for each block by the scores of the parcels that intersect each block. In some cases, this could be represented by one larger parcel, or several parcels within that block. The intent of this method is to identify areas within town where the mobility network would benefit from and would support the implementation of mobility hubs in the near-term based on the current supporting infrastructure and supply of multimodal facilities.

High scores correspond to a block that already has multimodal infrastructure and lends itself to a more suitable site for mobility hubs. As mentioned earlier, although this data does not necessarily suggest that they are the areas of highest demand, they do reflect locations that would best integrate with a mobility hub compared to a block with a lower scoring rating. For example, a bike rack would typically be built-out in an area where cyclists already commute to or utilize. This would correspond well with a location where a mobility hub would benefit those users.

Additional analysis would be needed to identify areas where mobility demand is high but the multimodal facilities are not currently available to serve that demand. For these areas, it is recommended that the Town coordinate broader multimodal facility improvements in conjunction with mobility hubs in order to maximize the effectiveness of the investment.

Transit criteria included:

- Transit Stop Proximity – Documenting stops along Transit Routes within 0.1 miles weighted by Route ridership
- Transit Route Proximity – Documenting transit Routes within 0.1 miles

Pedestrian and Bicycle criteria included:

- Proximity to Bicycle Facilities - Bicycle Facilities on Roadways within 0.1 miles
- Proximity to Bicycle Racks - Bicycle Racks within 0.25 miles
- Proximity to Multi-Use Paths - Multi-Use Paths within 0.25 miles
- Proximity to Sidewalks - Existing Sidewalks within 0.05 miles
- Proximity to Crosswalks - Existing Crosswalks within 0.1 miles
- Proximity to Recreational Facilities - Number of Recreational Facilities within 0.5 miles

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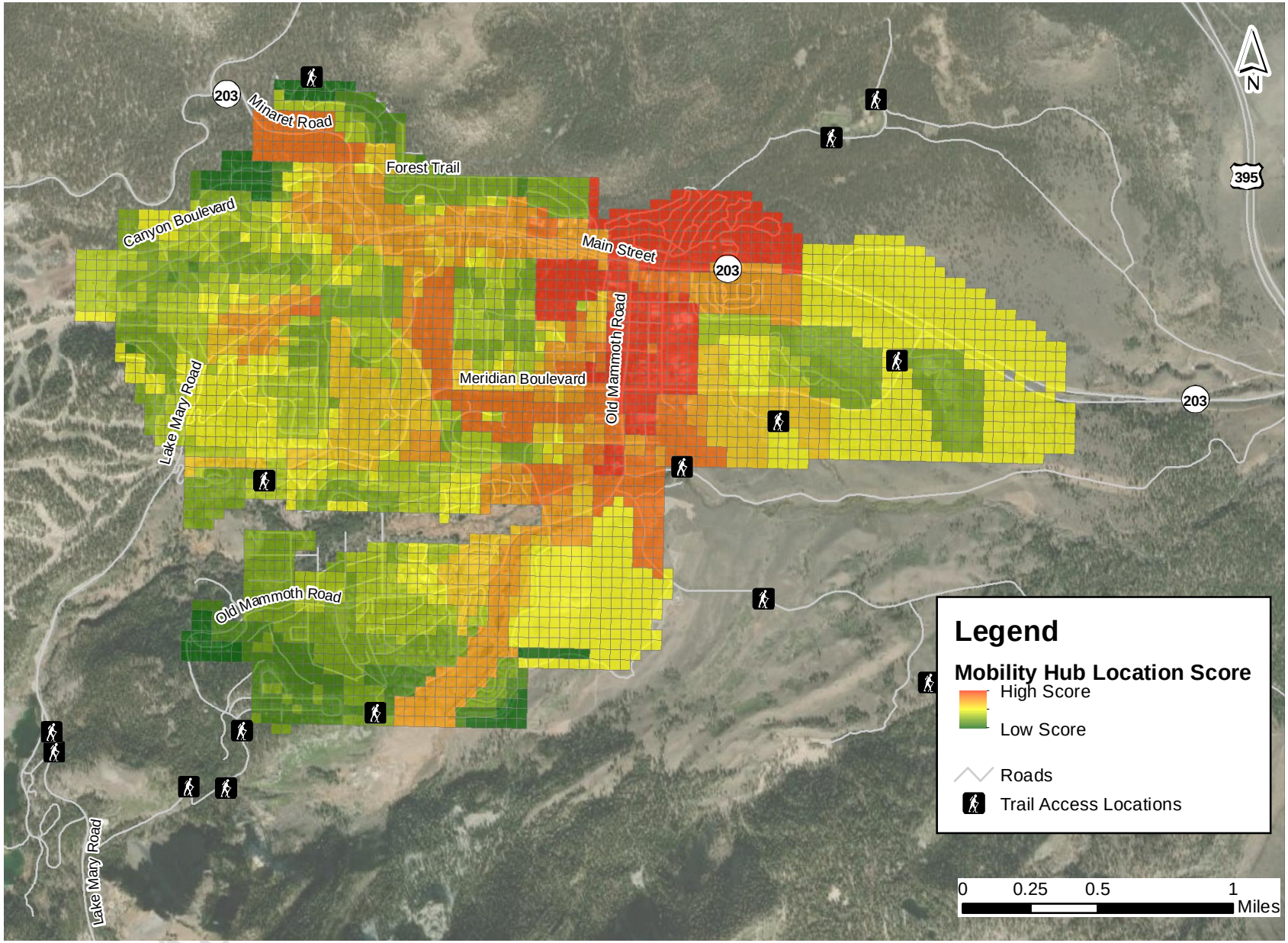

Figure 17 – Pedestrian, Bike, and Transit Score

4.3.3. Location Feasibility Assessment

While there are many important considerations in choosing suitable locations for mobility hubs including location, size, and expected usage, a comprehensive scoring system must also take implementation feasibility into account. Feasibility can be affected by existing zoning, the cost of acquisition, as well as whether an existing site is developed or not. While the scoring system incorporates many of these considerations, additional factors not included in this scoring system may also need to be considered when determining specific locations for mobility hubs in and around town. These criteria can also be used to provide some direction on the hub typologies. Understanding the development patterns and land use, both criterions in the assessment, can also help guide which amenities can be provided or if a site is suitable for a certain hub type. For example, even while meeting other criteria, if a parcel is not large enough to host the amenities needed for a regional hub, the location can be removed from the list of potential candidate sites for that typology.

Figure 18 shows how areas throughout the Town of Mammoth Lakes scored for site feasibility. Similar to the previous section, a higher rating in these categories reflect a more attainable block for mobility hubs. The reason it is needed in conjunction with the previous analysis is because a block that has all the pedestrian, bicyclist, and transit amenities in vicinity could exist, but if it does not meet the zoning requirements or the cost/ownership of the land exceed what is affordable, then it may not be feasible to pursue the site.

Site Zoning Scoring Criteria

- Current Zoning
  - Parcel does not need to be rezoned
  - Parcel is adjacent to correct zoning
  - Parcel requires zoning modifications

Site Acquisition Scoring Criteria

- Parcel Ownership
  - Parcel owned by Town
  - Lowest Quartile of Parcel Cost
  - Second Quartile of Parcel Cost
  - Third Quartile of Parcel Cost
  - Highest Quartile of Parcel Cost
- Parcel Development
  - Developed
  - Undeveloped

Other factors considered included demographic information as well as nearby land use.

Demographics Scoring Criteria

- Census Block Group Median Income
  - Lowest Third of Census Block Group
  - Middle Third of Census Block Group
  - Highest Third of Census Block Group

Land Use Scoring Criteria

- Product of residential and nonresidential parcels within 0.25 miles
  - Highest Third of Parcels

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- Middle Third of Parcels
- Lowest Third of Parcels

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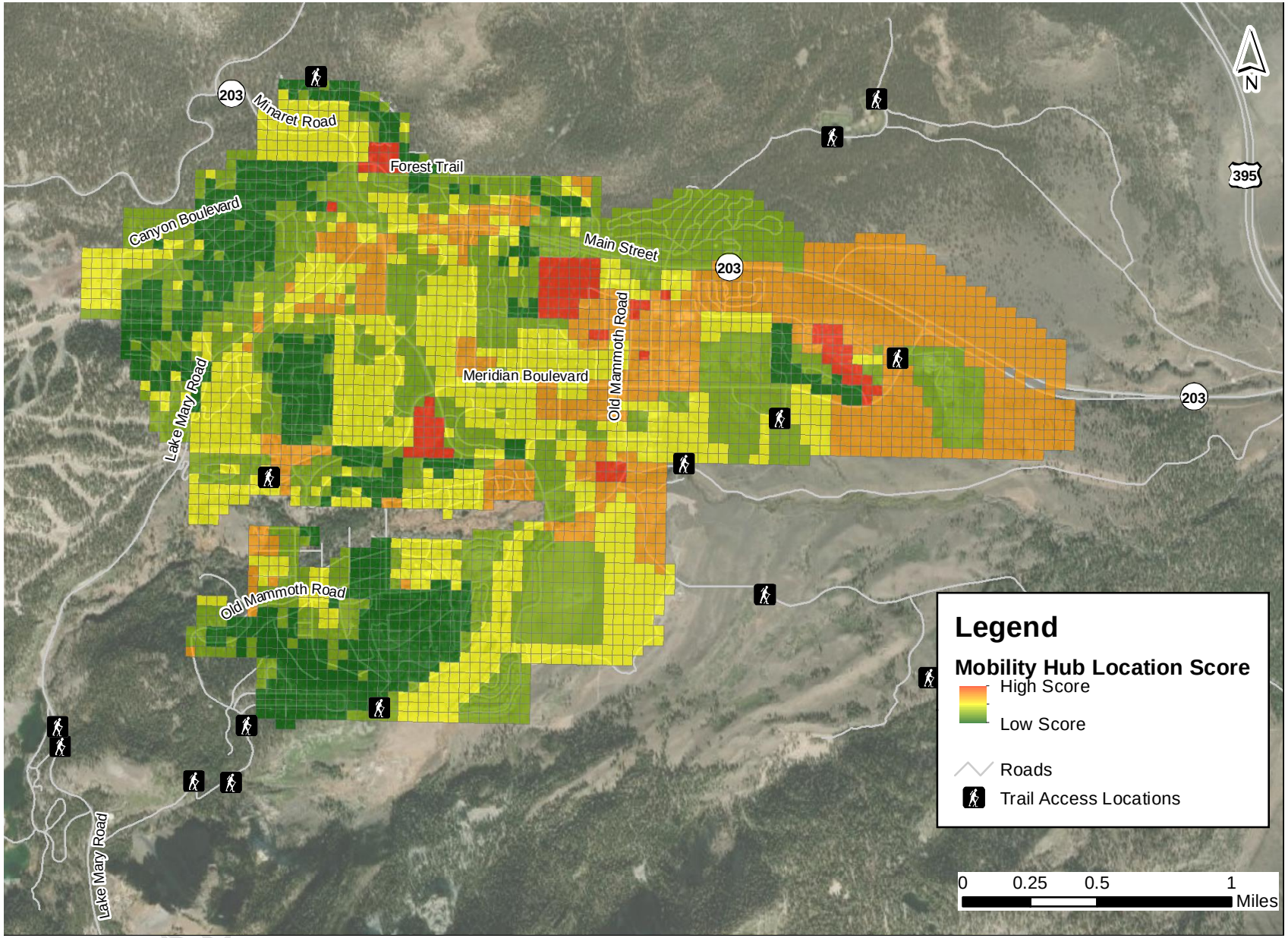

Figure 18 – Site Feasibility Score

Figure 19 shows the overall scoring for the entire Town of Mammoth Lakes, incorporating all the components of scoring shown in Table 3. Figure 20 shows the same results in a heat density map.

These figures represent a balance between Figure 17 and Figure 18 with sites that contain both facilities in close proximity to each block as well as locations that would be attainable.

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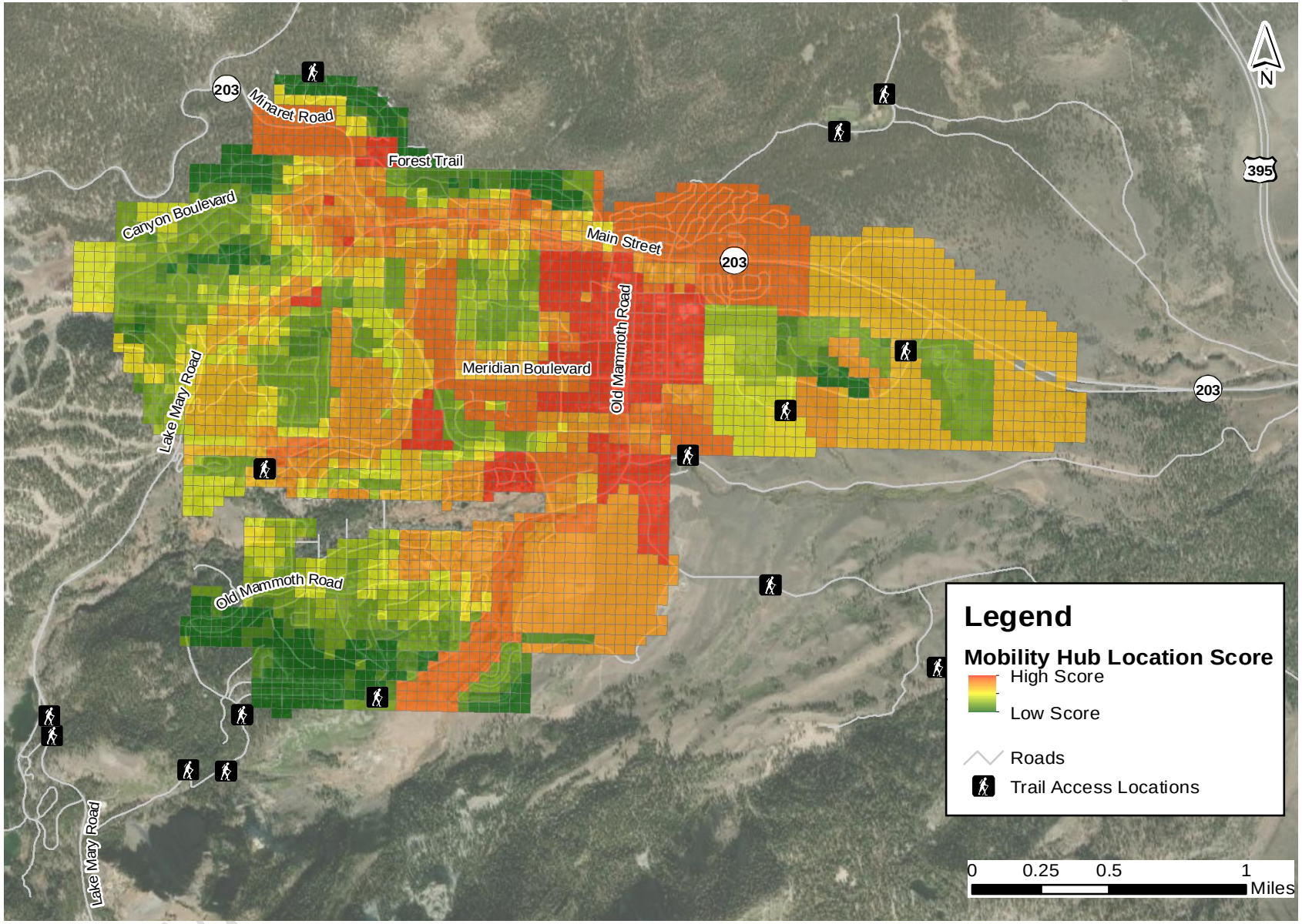

Figure 19 – Mobility Hub Location Overall Score – Block Map

Mammoth Lakes CALIFORNIA

PREPARED BY Kimley»Horn

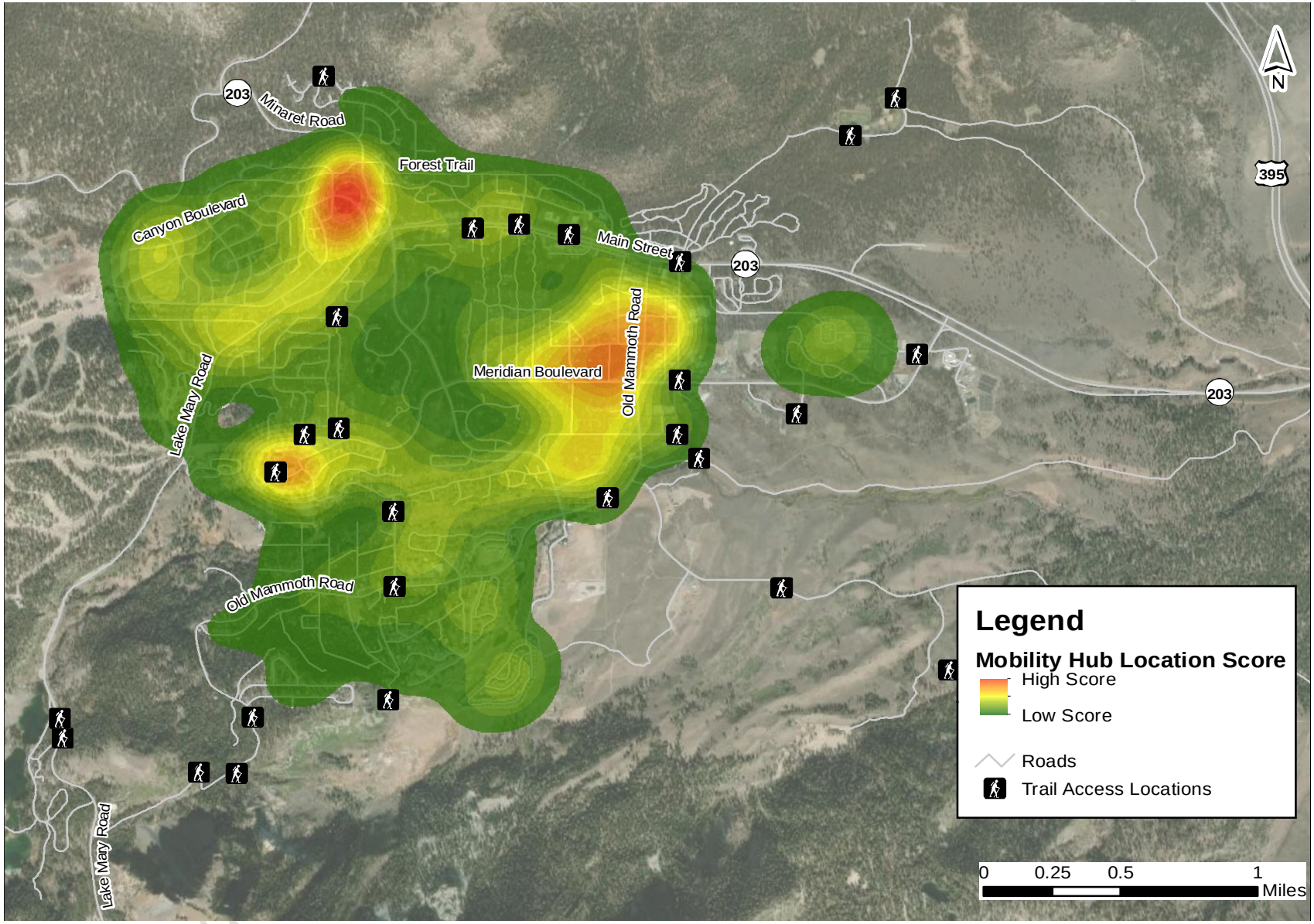

Figure 20 – Mobility Hub Location Overall Score – Heat Map

Mammoth Lakes CALIFORNIA

PREPARED BY Kimley»Horn

Based on Figure 20, there are three areas that score well for potential near-term mobility hub implementation. These locations include:

- Old Mammoth Road (Between Meridian Boulevard and Main Street)
- The Village Area
- Eagle Lodge Area

These locations were also identified in the parking analysis (**Chapter 3**) as locations with high parking demand indicating that they are destinations of interest and would benefit with mobility hubs.

It should be noted that two of these areas are reflective of locations that were also proposed in earlier planning efforts. The *Main Street Plan* and *Parking and Snow Management District Feasibility Study* suggested a transit plaza along Main Street near the Visitor Center. This would also allow the site to 'intercept' skiers so they can park and take the shuttle from hotels in Main Street where they are lodging. The *Eastern Sierra Transit Authority Short Range Transit Plan* recommended a central transit hub to facilitate transfers between local buses and regional services. At the same time, the analysis presented within this study show sites that were not previously recommended, in particular the Eagle Lodge Area.

4.3.4. Identification of Near-Term Mobility Hub Locations and Typologies

After conducting the analysis and determining suitable sites, the mobility hub locations were aligned with the typologies identified in **Chapter 4.2** based on the location and mobility assessments. Some of these locations were straight-forward since they serve a particular purpose. For instance, the Mammoth-Yosemite Airport serves regional users and would be a Regional mobility hub.

Further analysis is recommended with big data sources to allow for the consideration of mobility demand in the assessment In addition to identifying areas with high demand that may warrant mobility hub and additional multimodal investments, big data can also provide information about trip types that would then translate to determining mobility hub typologies and amenities. For instance, if the analysis indicates a majority of trips in a certain capture area were very short-distance trips, then amenities such as improved pedestrian facilities, micro-transit/NEV, or improved bicycle facilities may be more beneficial. If the analysis indicates longer distance trips from other regional centers, then the site may be more aligned with a regional hub and additional transit services and parking management solutions may be more beneficial.

Based on the locational analysis described in this chapter, the parking analysis conducted in Chapter 3, input from the Town, and previous planning efforts, several near-term mobility hub candidates were identified and typologies assigned. A map depicting locations that are representative of each mobility hub category are shown in Figure 21. These locations are not intended to be a comprehensive identification of mobility hub locations, but instead depict typical locations where mobility hubs of each category may be provided and near-term implementation may be most successful. Additional analysis using big data sources is recommend to identify additional candidate sites and appropriate typologies for the longer-term build-out of the Town's mobility hub network.

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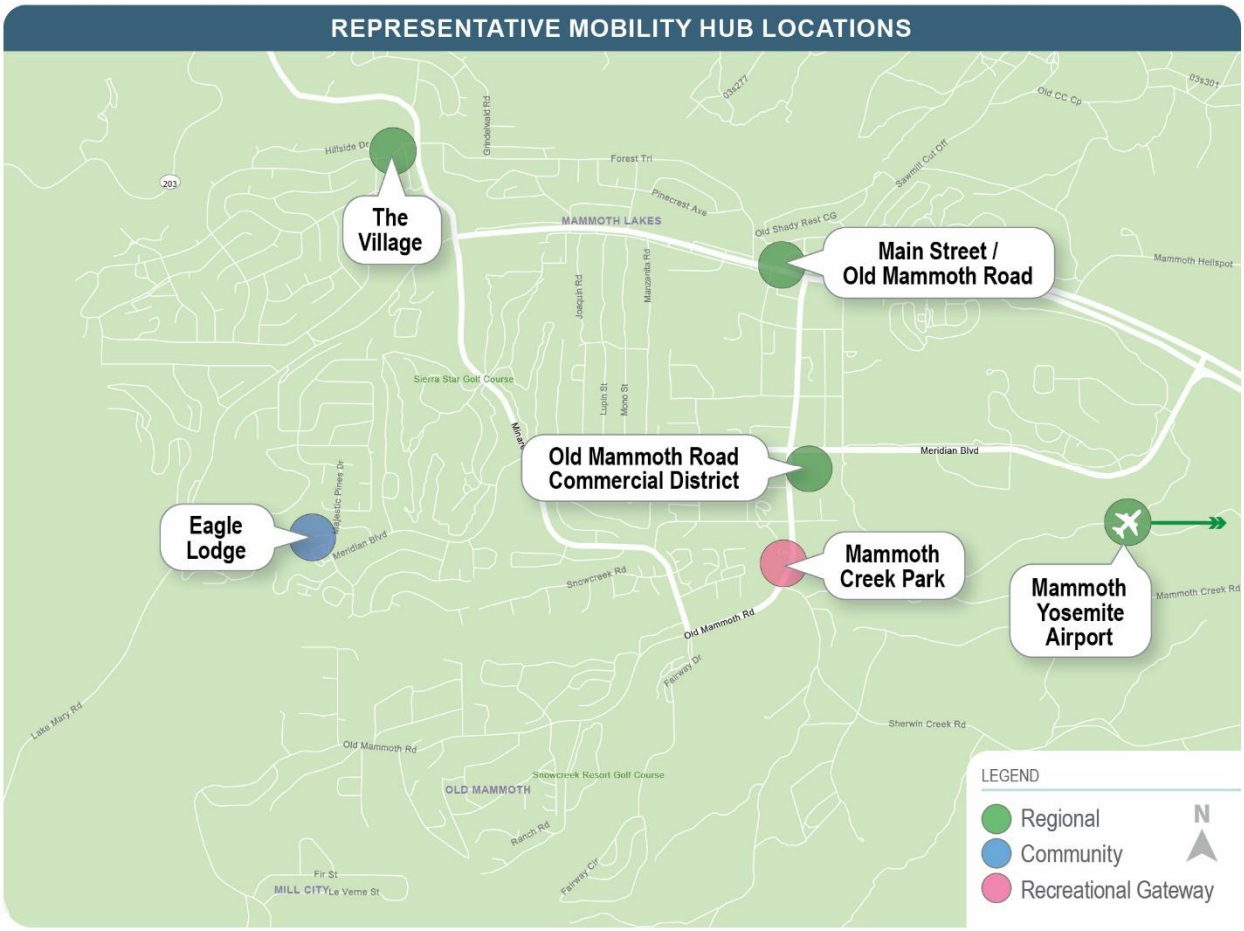

Figure 21 – Representative Mobility Hub Locations

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5. Implementation And Potential Funding Strategies for Acquisition of Real Estate

This chapter details steps to implement mobility hubs, monitor and gauge the program's success, and some of the potential funding strategies. This will include considerations from grant programs, potential recipients of these grants, and funding programs both at the state and federal levels.

5.1. Steps to Implementation

In order for mobility hubs to enhance the mobility opportunities and sustainable choices made by users, an inter-connected network of hubs and mobility services needs to be provided. The more robust the network, the easier it is for users to get where they need to go, allowing them to make more sustainable transportation choices. It is anticipated that as the mobility hub network builds out and new amenities are incorporated, the overall success of the mobility hub program will increase. However, it's noted that a robust mobility program cannot be implemented overnight. There are a number of steps needed to implement each mobility service and each mobility hub. The successful implementation of mobility hubs will be dependent on both the Town's efforts to advance the program and the success in identifying and implementing partnerships to provide mobility services.

Table 4 below identifies the key steps for the implementation of mobility hubs, including plans and policies that will enhance their effectiveness.

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Table 4 – Implementation Steps

Step	Description	Involved Parties and Responsibility
Identify and Secure Sites	This Mobility Hub Study identifies mobility hub categories, characteristics, and amenities. As a next step, the Town should further explore specific sites for pilot project implementation. As part of that process, the Town should identify publicly-owned sites that can be used, sites that are privately owned, but readily available, or opportunities to partner with existing businesses to provide a mobility hub on private property. Big data may assist in this identification effort.	- TOML (identify sites, determine site availability, communicate the advantages of siting a mobility hub at a given location, approach private entities to discuss access) - PB (work with TOML to make sites available)
Shared Mobility Partnerships	Develop public-public and public-private partnerships to increase the number of shared mobility options available in the Town of Mammoth Lakes, including identifying revenue sources and data-shared processes	- TOML and SMP (identify partnership opportunities)
Mobility Hub Configuration/ Design	Design and implement mobility hubs, including pick-up/drop-off zones, dedicated carshare spaces, and EV charging stations. Design and construct necessary utility and communications upgrades for the effective operation of mobility hub amenities.	- TOML, SMP and PB (develop design plans, identify amenities, create partnerships to place and construct mobility hub services)
Improve Access and Circulation around Mobility Hub Sites	Incorporate and plan for pedestrian pathways, improved crossings, all bikeways and bike paths, and transit signal priority for transit services within the community plan update, capital improvement plans, and service operation changes	- TOML (incorporate into planning activities)
Pick-Up/Drop-Off	Site passenger loading zones within nearby developments to facilitate safe and convenient pick-up/drop-off by on-demand rideshare during peak periods.	- TOML and PB (reconfigure site circulation to promote safe and efficient pick-up/drop-off for transit, NEVs, TNCs, and others)
Parking Management	Review and revise as necessary parking policies at commercial locations such as shopping centers, employment areas, residential complexes, and other destinations to dedicate carshare spaces,	- TOML (incorporate into Town policies and codes) - PB (leverage mobility services to reduce parking supply and/or increase charges for parking)

	EV charging stations, and smart parking features.	
Open Data	Implement open data policies to facilitate collaboration between public and private stakeholders.	- TOML (establish open data policies and databases to allow for aggregation of data to assist in monitoring of shared mobility utilization and allow for technology innovation in the sharing and packaging of mobility options)
Mobility as a Service/Mobility Aggregation Portal	Create a one-stop spot (such as a mobile smartphone application) for residents and tourists to obtain information about mobility services, plan trips, compare mobility choices, purchase tickets or make reservations. This would integrate with the Universal Transportation Account.	- TOML and/or PB (aggregate data streams and create a user-friendly application – can be achieved through Open Data by the private sector or actively managed by the Town) - SMP (allow for data integration and data sharing)
Universal Transportation Account	Address policy and technology hurdles to integrate payment for different mobility options, such as transit, bikeshare, carshare, and ride hailing and provide clear and consolidated information about mobility opportunities in one spot	- TOML, SMP, and PB (develop or allow for technology solutions to integrate payment for transit, parking and other public and private mobility services)
Marketing Partnerships	Develop a marketing and information campaign to increase awareness of mobility hub options and encourage use. Encourage partnerships with local businesses such as tourist operators and employers to integrate mobility options into their offerings, such as parking cash out, tourist packages, and transit subsidies	- TOML and SMP (develop and implement a marketing campaign) - PB (partner with TOML to enhance mobility options for employees/customers, reducing parking needs and congestion impacts)
Monitoring	Assess performance of micromobility and on-demand ridership to adjust service model, vehicle supply, and subsidy levels. Leverage Big Data to monitor transportation patterns and adjust shared mobility services to best meet changing demands.	- TOML and SMP (monitor performance and adjust mobility hub services, marketing programs, and pricing as needed)

TOML = Town of Mammoth Lakes; SMP = Shared Mobility Provider; PB = Private Business

Individual mobility hub sites will need to be prioritized based on mobility needs and community preferences. Sites should be designed to allow flexibility to include future mobility services and technologies as they emerge.

5.2. Monitoring and Key Performance Indicators

This section discusses how to encourage utilization of mobility hubs and how to monitor and gauge success.

5.2.1. Strategies to Promote Mobility Hub Utilization

There are a variety of strategies that can be employed to promote utilization of the mobility hub by the Town. Some of these strategies may include:

- Implement parking management policies to appropriately price parking, enhance parking availability information, and fund shared mobility services. This would likely entail additional enforcement measures.
- Redefine the transit network to improve service, reliability, and connectivity to mobility hub sites. Provide robust information about the service, including at stops, online, and at information centers.
- Consistent maintenance and services need to be provided to each site. A deteriorating facility may not appear as safe or provide as comfortable a user experience.
- Create a mobility smartphone application that makes it easier for users to learn about mobility choices, plan their trip, and make reservations or buy tickets. The application can then be promoted through marketing and branding campaigns supported by the Town and private partners
- Creating a supporting access network. This would include providing sidewalks and bicycle facilities that are safe, comfortable and well-connected. Many mobility services increase pedestrian and bicycle activity around hubs and thus a safe and supportive network is critical for their success.
- Forming and maintaining business partnerships. This may include subsidized transit passes for employees, marketing and other promotions, and partnerships for siting amenities. This may also include popularizing and encouraging activities such as “Transit Week”, “Bike to Work Day”, or other variants.
- Forming and maintaining relations with tourist industry partners. This includes marketing and promotional materials, bundling packages and programs with transit.
- Creating a branded mobility campaign. This may involve participation with residents, businesses, and other partners for input.

5.2.2. Monitoring Success

A “successful” mobility hub will mean different things to different users. The Town and its partners should study key performance indicators that reflect the impact on a range of users such as ridership and on-time performance, look at customer surveys, study parking, and study app utilization. Big data is also an important tool that can and should be utilized to understand travel patterns and gain insight into other behaviors that can be leveraged.

Table **5** details some of the monitoring criteria that are associated with mobility hub goals.

Table 5 – Monitoring Criteria

Mobility Hub Goal	Monitoring Criteria

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Providing pedestrians a safe and comfortable walking experience.	Length of Sidewalk Gaps in walkshed of mobility hubs Number of pedestrian-involved collisions Pedestrian counts at major intersections near mobility hubs
Encourage bicycle activity as an alternative to the automobile	Bike parking utilization Number of bicycle-involved collisions Bicycle counts at major intersections or segments near mobility hubs
Encourage residents and visitors to take transit as an alternative to driving	Bus ridership Customer satisfaction surveys
Reducing congestion and greenhouse gas emissions	Parking demand at specified sites in the Town Mode split at select screenline locations around the Town Big Data monitoring of total trips and mode split
Improve mobility option awareness	Unique users of Town mobility portal (app or website) Number of trips planned or reservations made through the portal

5.3. Potential Funding Strategies

Mobility hubs are typically funded through local revenue sources in combination with state or federal grants.

Local funding sources could include:

- Funding from local or county tax measures such as sales or use tax
- Special assessments on property within particular districts
- Parking or other use fees with allocation for transportation investment

Local and county governments may also elect to finance the capital cost of the improvements through bonding or other finance mechanisms. Taxing measures or revenue sources allocated for transportation improvement typically repay finance tools over time. Grant programs can also be utilized to support a portion of the capital cost. Grant programs are generally reimbursement-based.

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5.3.1. Considerations

Transportation grant programs generally provide financial assistance in order to implement programs or facilities that support regional, county, and goals for mobility, land use, climate action and resiliency. Most grant programs require a local match financial contribution, or a local funding source that constitutes a portion of the overall cost. Generally, transportation grants do not cover the entire project cost. As such, it is highly recommended that the Town prepares a capital cost estimate for the project(s) in order to outline its financial plan. The financial plan will outline the cost against potential revenue sources available, including financing (such as bond funds) and grant funding needed. A funding plan will also assist in the grant application process to articulate to the grantor the Town's plan to complete the project.

Grant funding for acquisition of land is typically eligible so long as the cost of the land is included as part of the overall capital cost of the project.

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5.3.2. Grantees

Grant programs are available to different levels of grantee, or recipients, which are the entities eligibility to receive and manage grant funding. The options for this project for potential grantees are:

- Town of Mammoth Lakes (Town)
- Eastern Sierra Transit Authority (ESTA)
- Mono County
- Caltrans

Depending on the grant program, it is also possible for the Town to partner with the County or ESTA to jointly apply for grants and jointly manage the funding.

5.3.3. State of California Grant Funding Programs

The State of California offers a myriad of grant programs to local communities as well as transit operators to provide funding that support mobility programs. The following programs may be opportunities for the Town, in partnership with Mono County and ESTA, to pursue. Further, demonstrating that investment in mobility hubs directly supports the local and regional transportation plan goals toward resiliency, reduction of auto trips, and climate action would likely be very favorable within State grant application criteria.

- State Transportation Improvement Program
  - Five-year Program funding improvements that increase highway system capacity including transit and active transportation projects
- Active Transportation Program
  - Funds and promotes alternative transportation options to encourage active modes
- Local Partnership Program
  - Intended to incentivize cities/counties that have passed tax measures for transportation improvements
- California Climate Investment: Cap and Trade Program
  - Eligible grantees could be either the Town or ESTA, depending on the program type
  - The State offers Technical Assistance to support communities applying for funding under these program
  - California Climate Investments seek to invest in cleaner energy and innovative means to reduce pollution. Funding within this program does include investments in cleaner transportation as well as affordable housing, zero-emission, and renewable energy. A portion of California Climate Investments also invest in low-income and disadvantaged communities.
  - Potential funding programs for Mobility Hubs:
  - Transit & Intercity Rail Capital: funds transformative capital improvements that modernize California's transit systems including bus
  - Low Carbon Transit Operations: offers capital assistance grants for transit agencies to improve mobility through new or expanded services

5.3.4. Federal Grant Programs

The United States Department of Transportation (US DOT) Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) offer many grant programs for transit

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authorities, regional and local entities to construct improvements within transportation networks. The grant programs range from formula programs whereby the monies are allocated to the State Departments of Transportation or Regional Planning organization to discretionary, competitive-application programs. The capital cost of mobility hubs generally could be eligible under the following programs:

- Grants for Bus and Bus Facilities Program
  - Competitive programs
  - Supports the investment in bus facilities such as mobility hubs
  - Grants can fund up to 80 percent of the total project cost and the grantee will be required to demonstrate funding plan
- Better Utilizing Investment to Leverage Development (BUILD)
  - Competitive program
  - Intended to invest in “shovel-ready” projects that have a significant regional or local impact
  - BUILD grants span US DOT with FTA administering for transit-related investments
  - Eligible projects include funding for re-construction activities and right-of-way acquisition
  - As a condition of award, FTA would likely require projects that involve right-of-way acquisition to commit to completing the anticipated improvements within a particular timeframe
- Congestion Mitigation and Air Quality Program (CMAQ)
  - Formula funding
  - Provides funding for nonattainment or maintenance areas for ozone, carbon monoxide, and/or particulate matter.
  - States that have no nonattainment or maintenance areas still receive a minimum apportionment of CMAQ funding for either air quality projects or other elements of flexible spending
  - Funds may be used for any transit capital expenditures otherwise eligible for FTA funding provided they have an air quality benefit
- Rural Transportation Grant Programs
  - Intended to support mobility and transit in nonurbanized areas
  - Formula and competitive grant programs exist
- Access and Mobility Partnership Grant
  - Competitive grant program
  - Grantee could be partnership of Town, County and/or other service providers
  - Provides competitive funding to support innovative projects for the transportation disadvantaged that will improve the coordination of transportation services and non-emergency medical transportation services
  - The Mobility Hub project could include innovative features to support the objectives of this grant program
  - Grant program requires project completion within 18 months of award
  - Grants can fund up to 80 percent of the total project cost and the grantee will be required to demonstrate funding plan

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5.3.5. Public-Private Partnerships

A successful build-out of mobility hubs and increasing transit ridership provides a number of benefits to local businesses. Businesses and developers may no longer need to provide as much parking, freeing up land for other revenue-generating uses or reducing barriers to development. This will increase economic activity and funding for the Town. Reducing congestion and improving mobility improves quality of life for residents and can make the Town more desirable for tourists. Providing a mobility hub at a certain location can provide a competitive edge for nearby businesses, making them more accessible to a larger market than other locations. These positive externalities associated with mobility hubs can be captured by the Town and formalized through the development of public-private partnerships.

Examples of private contributions can include land for mobility hubs, dedication of space for mobility hub services, reduced rates for shared mobility services, data to assist in identifying markets and monitoring performance, and marketing and promotion contributions.

Public-private partnerships can also benefit to ensure the provision of some services such as bikeshare, carshare, shared ride-hailing, and electric charging stations. The Town may be required to provide a benefit to a private operator in order to guarantee a certain mobility service or availability of that service, such as a subsidy, marketing, or exclusivity. These can be beneficial by allowing for the provision of a service that may not otherwise be provided, but should also allow for data sharing and not preclude the adoption of new emerging mobility technologies.

5.3.6. Other Local Funding Strategies

Other funding opportunities are also available through parking fees or fees on other uses on the transportation network. One strategy for encouraging shared mobility use is to appropriately charge for parking. Parking charges may be set to align with the cost of land or to align demand and supply where parking supply is limited. While parking charges incur some cost, such as for enforcement, signage, and revenue collection, often there is surplus revenue that can be applied to services such as transit or equity programs. This can be a valuable source to cover ongoing operating and maintenance costs.

Other potential user fee types could include:

- TNC fees that are charged per ride, as have been recently implemented in a number of cities throughout the country
- Recreational user fees that supplement day-use fees
- Lodging taxes

Local funding could also be provided for certain mobility hub amenities through a business improvement district that levies fees on local businesses in defined areas. Such mobility strategies that are commonly funded through such programs include circulator shuttles, local circulation and streetscape improvements, and marketing campaigns that promote accessibility options.

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6. CONCLUSION

The Town has a unique set of transportation needs and constraints as a result of its seasonal weather and tourist-oriented services. The limitations of the current multimodal network are reflected in localized congestion during peak hours and significant parking overflows at key destinations. Long-standing trends indicate that these challenges will continue to grow unabated over time unless the Town leverages new mobility options. The *Mobility Hub Study and Program* leveraged previous planning efforts, detailed GIS-based analysis, and consideration of mobility best-practices to identify an implementable mobility hubs program to address those transportation needs. This Report identified optimal near-term mobility hub locations and a toolbox of mobility strategies that can be implemented as the initial steps of building out a comprehensive mobility hub network that promotes the sustainable use of the transportation network and enhances the daily life of residents and tourists.

After identifying the goals of this Project and the objectives for mobility hubs in the Town, the Report documented previous planning efforts that set the stage for this effort. To identify the locations most in need of alternative mobility solutions, a parking assessment study and parking citation investigation was conducted to identify where parking supply was most severely constrained relative to demand. The analysis showed that demand exceeded supply in specific areas around key destinations and mitigative action needed to be taken. As an alternative to addressing the parking needs through expansion of the parking supply, which was determined to be an unsustainable solution and inconsistent with the Town's "park-once" and "feet-first" philosophy, the Project identifies mobility hub strategies and hub placement locations that are focused on both addressing the existing issues and also improving use of the transit system, improving circulation, and creating a sense of place in Mammoth Lakes.

While mobility hubs are an emerging solution being advanced throughout the country, the Town of Mammoth Lakes is unlike other communities. The Report includes a toolbox of mobility hub solutions focused on meeting the unique transportation conditions and needs of the Town. Three mobility hubs typologies are proposed for Mammoth Lakes to reflect the different transportation needs in different parts of the community. These hub types would all work together to form a cohesive and organized network. The typologies, differentiated by scale, amenities, and context, are: Recreational Gateway, Community, and Regional. All typologies are consistent in providing a base set of mobility options to promote the use of transit and active transportation and reduce reliance on private automobiles. They differ in the scale of improvements, each requiring different footprints, types of services, and magnitude of physical improvements.

This Study included a GIS-based quantitative analysis to identify locations that should be prioritized for near-term implementation based on both the existing supporting transportation network and the availability of sites that would meet the space and access requirements for mobility hubs. This set of criteria included proximity to transit, pedestrian, and bicycle amenities as well as feasibility of land acquisition, parcel sizes, and ownership. Taking these criteria into account as well as the findings of the parking demand analysis, three locations were identified. 1) Old Mammoth Road (between Meridian Boulevard and Main Street); 2) the Village area; and 3) Eagle Lodge area. It is not suggested that these are the only mobility hub locations, but rather that these sites have the mix of supporting transportation network, mobility need, and site availability that would support a nearer-term implementation. Additional analysis is encouraged to further assess mobility demand and supporting transportation network improvements that would allow for the identification of additional mobility hub candidate sites.

Ensuring a smooth and effective roll-out of such a program is a significant undertaking. This Report documents recommended steps such as forming shared mobility partnerships, reviewing

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parking management programs, implementing open data policies, and working towards the creation of Universal Transportation Accounts. Additionally, strategies to promote mobility hub utilization are identified along with parameters that can be used to gauge success. These include monitoring collisions, studying transit ridership and studying parking demand as well as mode share changes. A key component for implementation is funding. The Report identifies funding strategies, such as grant programs, public-private partnerships, and additional revenue sources.

Implementation of mobility hubs would allow for the realization of a vision where visitors park in the Town once (or arrive via transit and don't need a vehicle) and rely on the multimodal network to access the Town's plethora of recreational, commercial, and cultural attractions. In this vision, residents would commute to work by walking, biking or transit and experience a higher quality of life by avoiding congestion, the additional expense of automobile ownership and usage, and improved connectivity. The linchpin of this system would be strategically located mobility hubs that would allow tourists, residents, and the local work force to seamlessly connect between modes and services. Mobility hubs will provide a shift from the status quo and help the Town of Mammoth Lakes become more sustainable, equitable, and resilient.

The more robust the network, the easier it is for users to get where they need to go, allowing them to make more sustainable transportation choices. It is anticipated that as the mobility hub network builds out and new amenities are incorporated, the overall success of the mobility hub program will increase. The successful implementation of mobility hubs will be dependent on both the Town's efforts to advance the program and its success in identifying and implementing partnerships to provide mobility services.

Mobility hubs in the Town of Mammoth Lakes will support sustainability, connectivity, and reduced dependence on personal cars and solo driving. Mobility hubs can also promote community growth by improving connections between transportation modes and addressing parking availability issues. They will help improve equity and significantly improve people's ability to travel without a car, which helps increase affordability and basic mobility for non-drivers.

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