C. OLSON

Mammoth Lakes Trail System Plan

May, 1991

Mary Cahill
Acting Recreation Director

Prepared for the Town of Mammoth Lakes by:

L.K. Johnston and Associates
Planning, Environmental Review & Landscape Architecture
P.O. Box 1903
Mammoth Lakes, CA 93546
(619)934-4311

THE TOWN of MAMMOTH LAKES CALIFORNIA

P.O. Box 1609, Mammoth Lakes, California 93546
619-934-8983

MINUTE ORDER

SUBJECT: Approval of the Mammoth Lakes Trail System Plan

At the regular meeting of the Mammoth Lakes Town Council held on April 17, 1991, it was:

Moved by Councilmember Blazenski, seconded by Councilmember Nicolosi and unanimously carried to approve the Mammoth Lakes Trail System Plan and approve the Negative Declaration with an addendum to Section 1 that it may go on the south side of Highway 203 if the Forest Service so decides.

The foregoing is a full, true and correct copy of the original motion on file in the Office of the Town Clerk.

Attested this 16th day of May, 1991.

Pam Kraft

Pam Kraft, CMC
Town Clerk

Town of Mammoth Lakes

P.O. Box 1609, Mammoth Lakes, CA 93546
619-934-8983

Town Council

Gordon Alper, Mayor
Mike Blazenski
George Nicolosi
Kirk Stapp
Duffy Wright

Planning Commission

Hank Brown, Chairperson
Byng Hunt
Paul Oster
Mercedes Talley
Helen Thompson

Parks and Recreation Commission

Gerald Mohun, Chairperson
Jane Anderson
Scott Christensen
Gail Fetherston
Suzanne Freeman

Town Manager

Glenn M. Thompson

Table of Contents

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

Mammoth Lakes Trail System Plan

May, 1991

Introduction

Relation to the General Plan

In 1990, the Town of Mammoth Lakes adopted a Parks and Recreation Element for the Town's General Plan. The Parks and Recreation Element includes a number of recreation-related goals and policies as well as provision for implementation of a park dedication ordinance. Among the document's various considerations is the special emphasis on trails and trails development including the concept for a "Trans Mammoth Trail" system. A "Discussion Draft" of the Trans Mammoth Trail Plan was prepared and circulated among various interest groups in the community, with the Parks and Recreation Commission serving as the primary source of input and discussion, augmented by an Ad Hoc Committee formed by the Town Council to discuss trail options in the Snowcreek area of the proposed system. The subject report has been revised in response to comments and direction received through these various sources and meetings. In addition to revisions to the Draft document, the name was changed by the Parks and Recreation Commission from "Trans Mammoth Trail" to the "Mammoth Lakes Trail System Plan." After further public hearings, the final plan document has been adopted by the Town, as described below.

Brief Project Description

As originally envisioned by the Parks and Recreation Plan Map, the Mammoth Lakes Trail (MLT) System would form a continuous trail system through and around the Town. Conceptually, the MLT would connect and pass through a series of parks and open space areas and have numerous access points to schools, business areas, recreation sites, condominiums, multifamily developments and single family residences. A great many of the trails would traverse through public land administered by the Inyo National Forest including the Forest Service Visitor Center grounds and the Shady Rest Campground. The westernmost "Future/Alternative" loop of the system potentially would be associated with the Mammoth Mountain Ski Area and Mountain Bike Park. After discourse concerning the Discussion Draft, the original concept has been modified to delineate a smaller Main Path with provision for several "Future/Alternative" connecting Trails (see **Figure 1**), described in more detail in the following sections of this report. Additional trails information from the Parks and Recreation Element also has been incorporated in the Plan.

Primary Uses

The MLT System would be a multi-use trail system, accommodating a variety of trail users in both summer and winter.

Primary uses of the path would include:

- walking
- jogging
- mountain biking
- cross-country skiing
- road biking

Miscellaneous uses of the system could include skateboarding, roller skating, roller blading, handicapped use, wheelchair access and others. Horseback riding and snowmobiling could be accommodated in certain limited segments of the trail system where separate paths for these uses could be constructed. Expansion of horseback and snowmobile trail opportunities may come about in subsequent trail planning efforts regarding these uses.

Purpose of the Report

The purpose of this report is to more precisely locate and describe possible routing of the Main Path of the MLT System and associated Trails, detail problems and opportunities that might be encountered along the trail system, consider the various potential compatible uses of the MLT, identify major land owners or permit holders that might be affected along the system, provide an estimate of costs and propose a phasing schedule for the trail system. These considerations are provided in the following sections on a segment by segment basis. A summary of lengths and costs also is provided.

Mammoth Lakes Trail System Concept

The MLT System concept has evolved from the Parks and Recreation Element of the General Plan and is being promulgated to help focus recreation trail planning in the Mammoth Lakes area. The MLT is not intended to serve every conceivable trail function or need but to form the Town's trail system backbone, to build on and improve as funding and opportunities avail themselves. Currently, the Town has a trail inventory, relying heavily on unofficial privately held, disjointed trail segments or on Inyo National Forest trails adjacent to the Town. The multi-use MLT concept would be the catalyst for bringing these disjointed trail segments and trails together in a more refined trail system.

Trail Design Objectives

Design objectives of the trail system include the following:

1. The Main Path of the Mammoth Lakes Trail (MLT) System should be a continuous off-street paved path[1] able to accommodate multiple uses; on-street segments should be avoided if at all possible.
2. Future/Alternative Trails also should be continuous off-street paths, paved where feasible, accommodating as many uses as possible.
3. On-street bike routes should meet Caltrans standards in accordance with the Town's General Bikeway Plan.
4. Grade separations between vehicular travelways and trails should be constructed at all major street crossings and other streets where vehicular traffic may be heavy; the trail system should avoid numerous driveway crossings.
5. The Main Path should be readily accessible to adjacent land uses without conflicting with the land uses.
6. The Main Path should be as visible as possible from public roads for both aesthetic and safety reasons.
7. The trail system should be designed for wintertime cross-country ski use as well as summertime uses.
8. The gradient of the Main Path of the MLT System should not exceed 5% with most sections less than 2.5%.
9. Gradients of Future/Alternative Trails should not exceed 5% where road bike traffic is anticipated; other parts should not exceed 10% if possible.
10. The trail system should provide non-vehicular access to various commercial, residential, and recreational areas in the Town for both commuting and recreational purposes.

[1] As a minimum standard, the Main Path of the MLT System would adhere to the State of California Department of Transportation standard for a "Class I" Bikepath facility; this standard is depicted in the Appendix to this report.

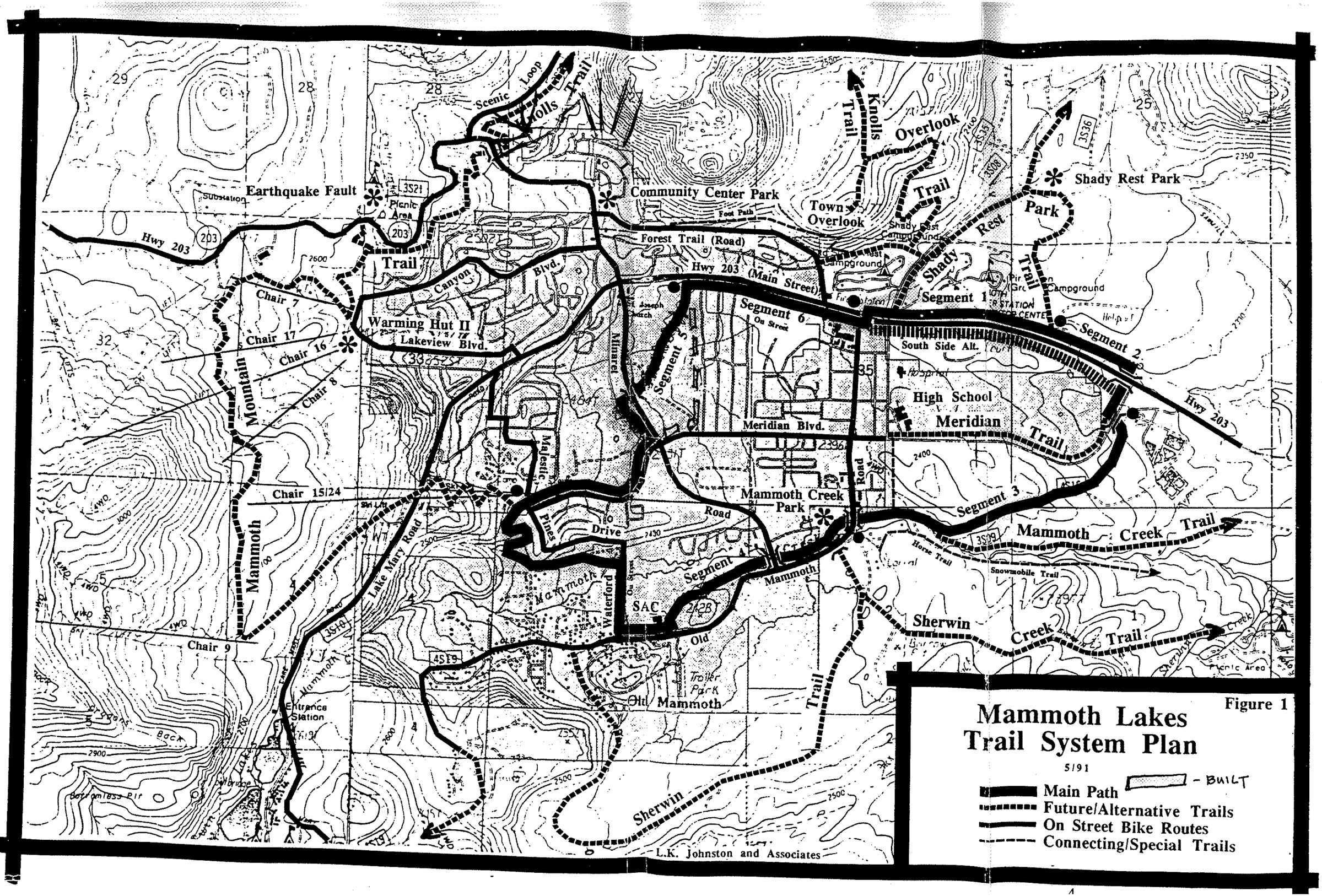


Figure 1

Mammoth Lakes Trail System Plan

5/91

- Main Path
- Future/Alternative Trails
- On Street Bike Routes
- Connecting/Special Trails

- BUILT

Trail System Description

The following sections detail the MLT System. The discussion is broken into two parts. First, the Main Path is described on a segment by segment basis, detailing potential users, problems, opportunities, length and estimated costs. Second, Future/Alternative Trails are described giving similar analysis.[2]

Main Path Description

Envisioned as the primary backbone to the Town's recreational trail system, the Main Path of the Mammoth Lakes Trail (MLT) System is described below, starting with the **Segment 1 - Shady Rest**, continuing clockwise around the Town through the remaining segments of the Main Path. This order of discussion does not imply a beginning point for construction phasing or a specific starting point for trail users. It is presented in this order for organizational purposes only. A length/cost estimate summary for the Main Path is provided at the end of this section. Proposed Phasing is described in a subsequent section of this report.

Segment 1 - Shady Rest

Shady Rest Main Path Description.

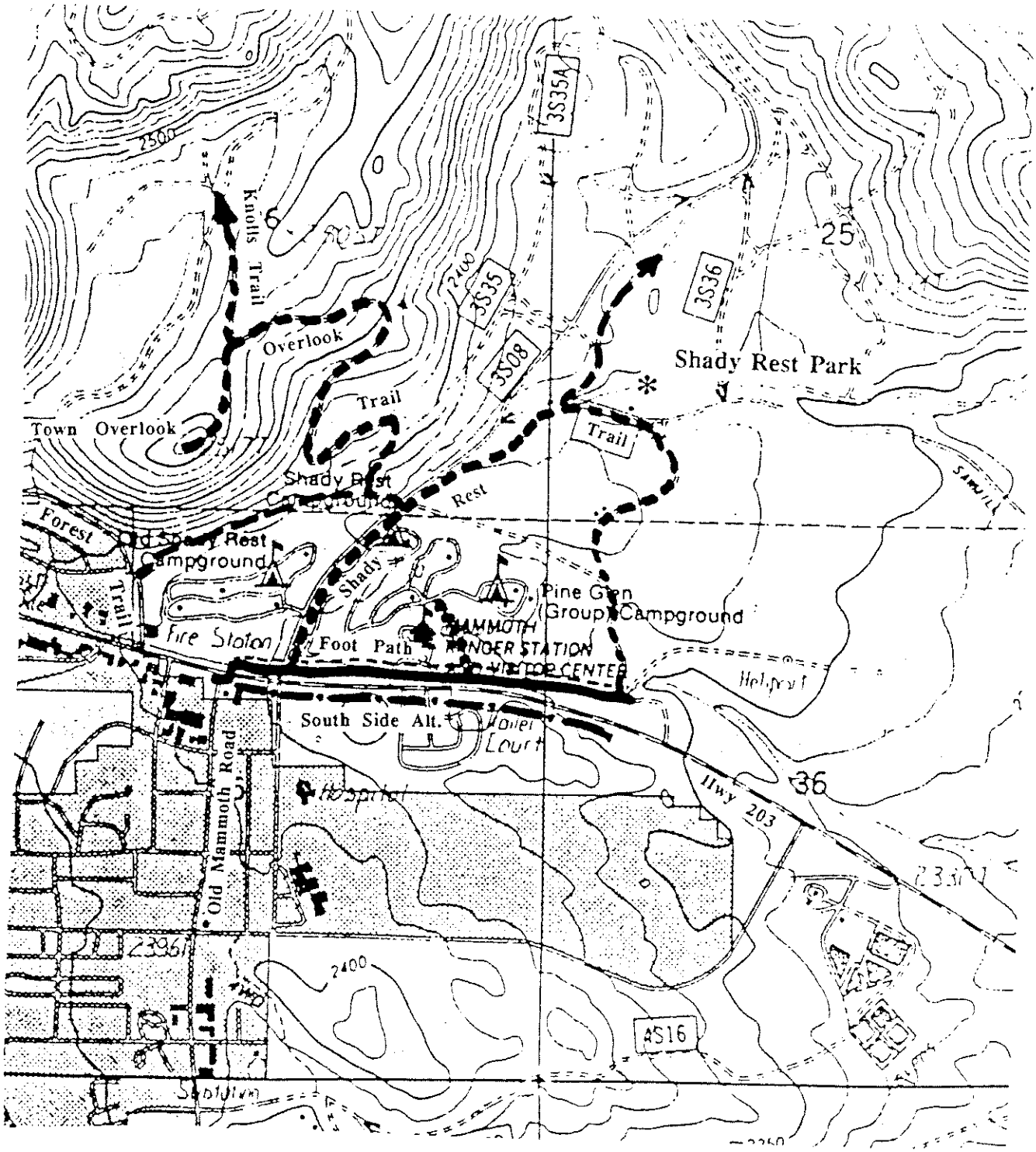
This important segment of the Main Path would be located primarily on public land administered by the Inyo National Forest (see map **Segment 1**), adjacent to the Shady Rest Campground. A short part of the Path would be on Caltrans right-of-way (mainly the crosswalks) near the intersection of Old Mammoth Road and Hwy 203. The Main Path in this segment would be a fully paved, 8' minimum width separate pathway and have an adjacent foot path. It would be able to accommodate all primary uses except Cross-Country Skiing in the short Caltrans right-of-way part. Where feasible, signing of the Path would include signage for cross country skiing as well as other uses. A "North Side Alternative" and a "South Side Alternative" are described below.

North Side Alternative. Beginning on the southwest side of the signalized intersection of Hwy 203 and Old Mammoth Road, the Main Path would cross both Old Mammoth Road and Hwy 203 at-grade in the existing crosswalks, leading to the north side of Hwy 203. (The Path could be connected to one of the sites being considered for the Town's Visitor Center at the southwest corner of Hwy 203 and Old Mammoth Road.) Once on the north side of Hwy 203, it would continue eastward via an 8' wide minimum paved path in front of the US Forest Service housing area, until coming to the proposed at-grade crossing of Sawmill Cutoff. Sawmill Cutoff is a narrow two lane paved access road to the Shady Rest Campground, to the US Forest Service housing area and to the Town's Shady Rest Community Park. Crosswalks would be installed along with appropriate warning signage at this at-grade crossing.

The Main Path would travel eastward from Sawmill Cutoff, more or less parallel with Hwy 203, meandering across the frontage of the US Forest Service Visitor Center. Two Visitor

---

[2] It should be noted that the On Street Bike Routes are described in more detail in the Town's General Bikeway Plan.



Segment 1 - Shady Rest

Center driveway access roads would have to be crossed, at-grade, utilizing crosswalks. An 8' wide paved Connector Path on the east side of the Forest Service Visitor Center would allow Shady Rest Campground visitors ready access to the Path. East of the Forest Service Visitor Center, this segment of the MLT would continue until intersecting the eastern leg of the Future/Alternate Shady Rest Park Trail. The foot path would be generally located parallel and north of the paved path and continue along the length of this Main Path segment.

South Side Alternative. The Main Path also could be located on the south side of Hwy 203. Beginning at the southeast corner of the intersection of Hwy 203 and Old Mammoth Road, the Main Path could continue directly eastward along the south side of the State Hwy, first traversing along the "Shell Mart" area and then along the frontage of the Shilo Inn and McDonalds. It would cross Sierra Park Road and continue eastward across a Church (INF Permittee) frontage. Still further east, the south side Main Path alternative would travel along the frontage of Mammoth Mountain RV Park (INF Permittee) and eventually find its way along Hwy 203 to Meridian Boulevard.

Shady Rest Main Path Uses.

Primary uses that could be accommodated along this segment include:

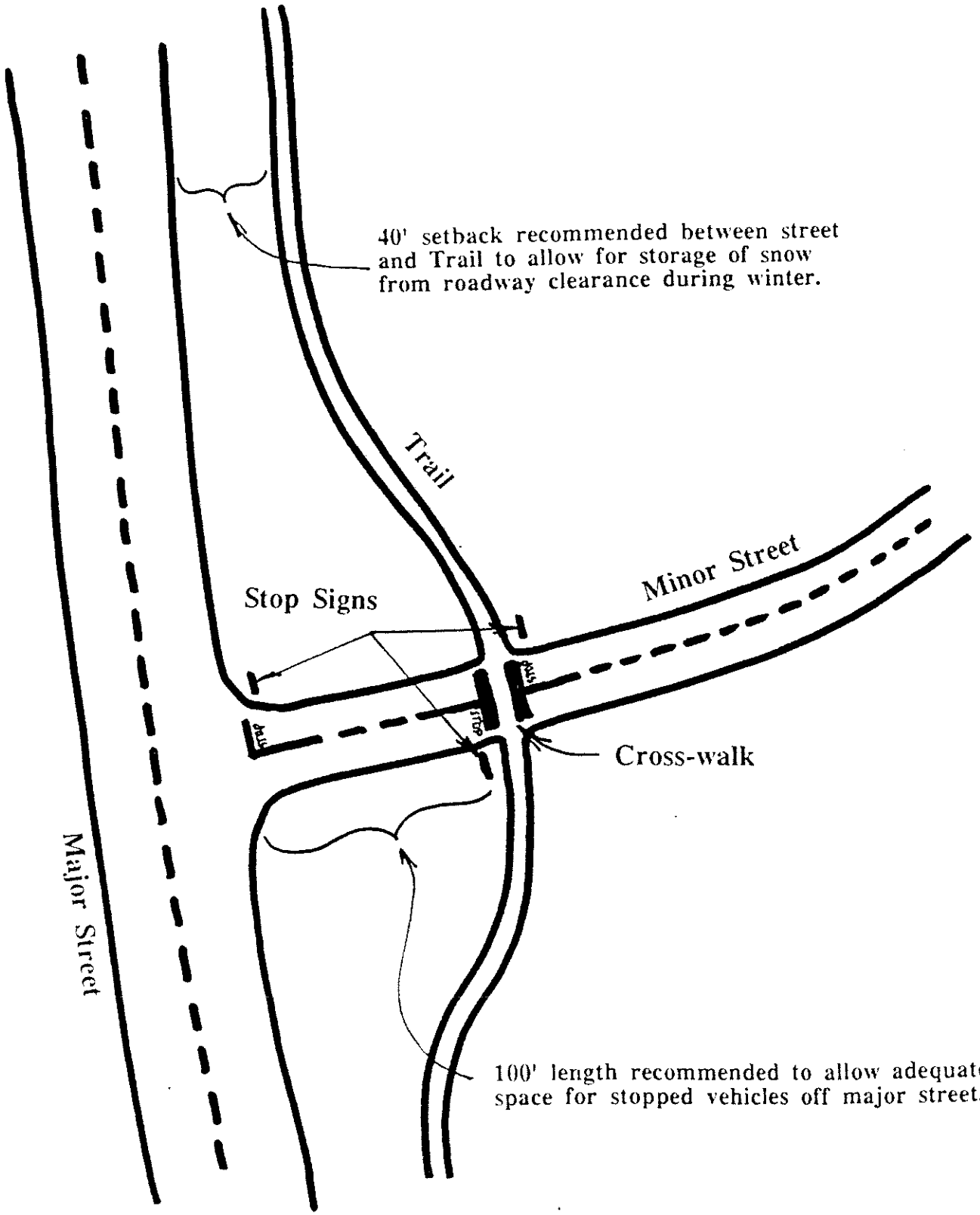
- walking (separate path available)
- jogging (separate path available)
- mountain biking
- cross-country skiing (except short portion)
- road biking

Shady Rest Main Path Potential Problems - North Side.

Five at-grade street crossings, a safety concern, are proposed as part of the Main Path in this segment. These occur at the intersection of Old Mammoth Road and Hwy 203 (south side and east side of the intersection), at Sawmill Cutoff and at the two US Forest Service Visitor Center entrances off Hwy 203. These at-grade crossings are to be well marked (with crosswalks and approved signage) and, excepting the Old Mammoth Road/Hwy 203 intersection, are not located on heavily traveled streets. Where the Path crosses these streets near intersections, the Path should be set back from Hwy 203 and stop signs considered for vehicles (see Figure 2). The crossings of Hwy 203/Old Mammoth Road at the existing signalized intersection would have to be reviewed to see that they would function adequately for the numerous trail users expected to use this crossing (note: the west side pedestrian crossing has been avoided due to heavy left-turn movements from Old Mammoth Road to west-bound Hwy 203).

The portion of the proposed Main Path in front of the US Forest Service housing area also may be a concern. Here, the potential placement of the path is restricted by the close proximity of the existing frontage road which serves as vehicular access to some of the residences. Encroachment into and/or joint use of the existing frontage road may be needed.

The increased pathway activity near the US Forest Service Visitor Center also may be of concern. For example, trail users may cause increased congestion of the parking area located at the Visitor Center. Main Path users also may be confused as to which path to



At-Grade Street Crossing

Figure 2

take and may end up in the Campground. It is felt these potential problems can be dealt with through signing and education of trail users.

Potential conflict among the primary users may be present. For example, the road bike users may conflict with people walking. This can be partially solved with the installation of the proposed foot path. The foot path also would allow hikers and joggers a "soft" path alternative to the hardened surface of the main path. A wider paved path, 10' or 12' in width, may be desirable in this segment to allow more room on the path for varied uses. An additional concern is for Cross Country Skiers who would not be able to use the Main Path at or west of the intersection of Old Mammoth Road / Hwy 203. This is a drawback of the Main Path being located along Hwy 203 west of this point (see Segment 6 description below) because it creates a discontinuity in the Main Path system for this primary user group (the Main Path is proposed as an on street system in Segment 6).

Lastly, the Path would have to accommodate utility and drainage conditions adjacent to Hwy 203. The drainage facilities along this segment are part of the Murphy Gulch drainage system and can carry significant amounts of drainage water. Path construction would necessarily be required to accommodate this drainage system. The Path is intended to follow the disturbed areas where utilities have been previously installed or where jeep roads presently exist. Utility lines both above and below ground would have to be carefully considered in final layout and construction of the Path. Sewer and water lines also appear to be present and, similarly, would have to be accommodated in any construction activities.

Shady Rest Main Path Potential Problems - South Side.

Six at-grade street crossings, a safety concern, are needed along the Main Path south side alternative. These occur at the Hwy 203 and Old Mammoth Road intersection (south cross walk), at the "Shell Mart" driveway off Hwy 203, at the Shilo Inn/McDonalds driveway, at Sierra Park Road, at the Church access from Hwy 203 and at the Mammoth Mountain RV Park. Most of these driveways and accesses have higher commercial traffic volumes which could result in greater Main Path user conflicts. There also little or no space to set back the at-grade crossing as suggested in **Figure 2.**

Near the east end of the Mammoth Mountain RV Park, the south side Main Path alternative would need to ascend a rather pronounced hill and then descend back to near the same grade as the roadway. This would necessitate additional grading and a longer path to keep the grade to less than 5%.

As compared to the north side alternative, the Main Path south side alternative would require more tree removal and grading of undisturbed land, particularly east of the Mammoth Mountain RV Park (the north side alternative mostly follows already disturbed areas such as utility corridors or old roadways.)

Access to the Shady Rest Area (Campground, Visitor Center, Park) would be hampered by a south side only route. For example, pathway users from the Campground would have to cross Hwy 203 to gain access to the Main Path. The Shady Rest Park Trail would be more cumbersome to reach from the Main Path south side alternative. The Eastern Leg of the Shady Rest Park Trail would have a dangerous crossing of Hwy 203 to negotiate if users try to connect with the south side Main Path. A valuable "loop," using the north side Main Path and the Shady Rest Park Trail, would potentially be lost unless a path segment on the north side also were built.

Shady Rest Main Path Opportunities - North Side.

Terrain along this segment is relatively flat and presents an opportunity to create an exceptionally well-used portion of the MLT System. The Main Path would drop only 100' vertical in 4200' linear, or about 2.4%, well below the recommended 5% maximum.

With construction of the Future/Alternate Shady Rest Park Trail, a 2.5± mile loop system could be formed in this vicinity for trail users. Wintertime use for Cross-Country Skiers could be integrated into the existing Forest Service cross-country trails in the area. Summertime users could access the trail from the Shady Rest Campground, from the US Forest Service Visitor Center, from the Town's Shady Rest Park and from nearby commercial and residential uses on the south side of Hwy 203.

The potential proximity of one of the Town's proposed Visitor Center sites would add to the expected heavy use and visibility of this segment. Additionally, this part of the Main Path would greet most visitors to the community and would stand as an important first-impression public amenity.

Shady Rest Main Path Opportunities - South Side.

The primary advantage to the south side Main Path Alternative is the avoidance of having to cross Hwy 203. Crossing Hwy 203, at other than a signalized intersection, is considered a major safety problem without a grade separation such as an undercrossing. Grade separations can be expensive and would require a great deal of cooperation among the various agencies involved (CALTRANS, Inyo National Forest, Town of Mammoth Lakes, and others).

Avoiding a potential conflict with the US Forest Service housing area is another advantage to a south side alternative. Likewise, at-grade crossings at the entry ways to the US Forest Service Visitor Center would be avoided. The Murphy Gulch drainage system could more easily be avoided.

If the loop formed by the Shady Rest Park Trail were still desirable, a portion of the north side Main Path alternative could also be built, along with the south side Main Path. Additionally, a foot path could be accommodated on the south side alternative.

Length/Cost[3] - Segment 1 North Side.

	Unit	Unit Cost	Cost
Main Path	4200'	$30/ft	$126,000
Foot Path	4100'	10/ft	41,000
Connector Paths	950'	30/ft	28,500
Drainage	lump sum estimate		35,000
Undercrossings	na		0
		Total	$230,500

3 Cost estimates given are for trail work where the path would have to be created essentially from scratch. In some instances, however, there may be existing roads or trails, jeep roads, or other disturbed areas that could be enhanced and therefore reduce the cost involved, depending on the final routing of the path. The costs provided should therefore be considered "high end" costs. The estimated $30 per linear foot cost for most main path construction is based on recent asphalt concrete construction costs in the Mammoth Creek Park.

Length/Cost[4] - Segment 1 South Side.

	Unit	Unit Cost	Cost
Main Path	4500'	$30/ft	$135,000
Foot Path	4100'	10/ft	41,000
Connector Paths	na	30/ft	0
Drainage	lump sum estimate		5,000
Undercrossings	na		0
		Total	$181,000

Right-of-Way Costs for Segment 1

It is assumed that any right-of-way needed would be approved at no cost to the public since this segment is already in public ownership.

[4] Cost estimates given are for trail work where the path would have to be created essentially from scratch. In some instances, however, there may be existing roads or trails, jeep roads, or other disturbed areas that could be enhanced and therefore reduce the cost involved, depending on the final routing of the path. The costs provided should therefore be considered "high end" costs. The estimated $30 per linear foot cost for most main path construction is based on recent asphalt concrete construction costs in the Mammoth Creek Park.

Segment 2- Eastern Connection

Eastern Connection Description.

This segment of the Main Path of the Mammoth Lakes Trail System would be located on public land administered by the Inyo National Forest, on Caltrans right-of-way, and on Town of Mammoth Lakes road right-of-way (see map **Segment 2**). The Main Path in this segment would be a fully paved, 8' minimum width separate pathway accommodating all primary uses. An adjacent foot path is not proposed initially for this segment but could be added in the future if needed.

The Main Path would continue eastward from the Shady Rest segment (from the eastern leg of the Shady Rest Park Trail junction) along the north side of State Highway 203. The Path would moderately descend between the roadway and the Murphy Gulch drainage (on National Forest land) until coming to the intersection of Hwy 203 and Meridian Boulevard. Just west of this intersection, the Path is proposed to cross southwestward under the State Highway in two separate 12' wide x 10' high concrete "box culvert" (or similar) undercrossings. The northernmost undercrossing (crossing under the west bound lanes of Hwy 203) would need to be approximately 50' long to accommodate the two westbound lanes and shoulders. The southernmost undercrossing (crossing under the eastbound lanes of Hwy 203) would have to be about 75' long to provide for the two eastbound lanes, two turning lanes and shoulders (see **Figure 3**). The crossing, design, dimensions and construction would have to be approved by Caltrans.

After undercrossing Hwy 203, the paved Path would continue southwesterly along the north side of Meridian Boulevard, crossing Commerce Road at-grade (the entrance to the Town's Industrial Park). This segment of the MLT System would end just west of the Commerce Road crossing.

Eastern Connection Uses.

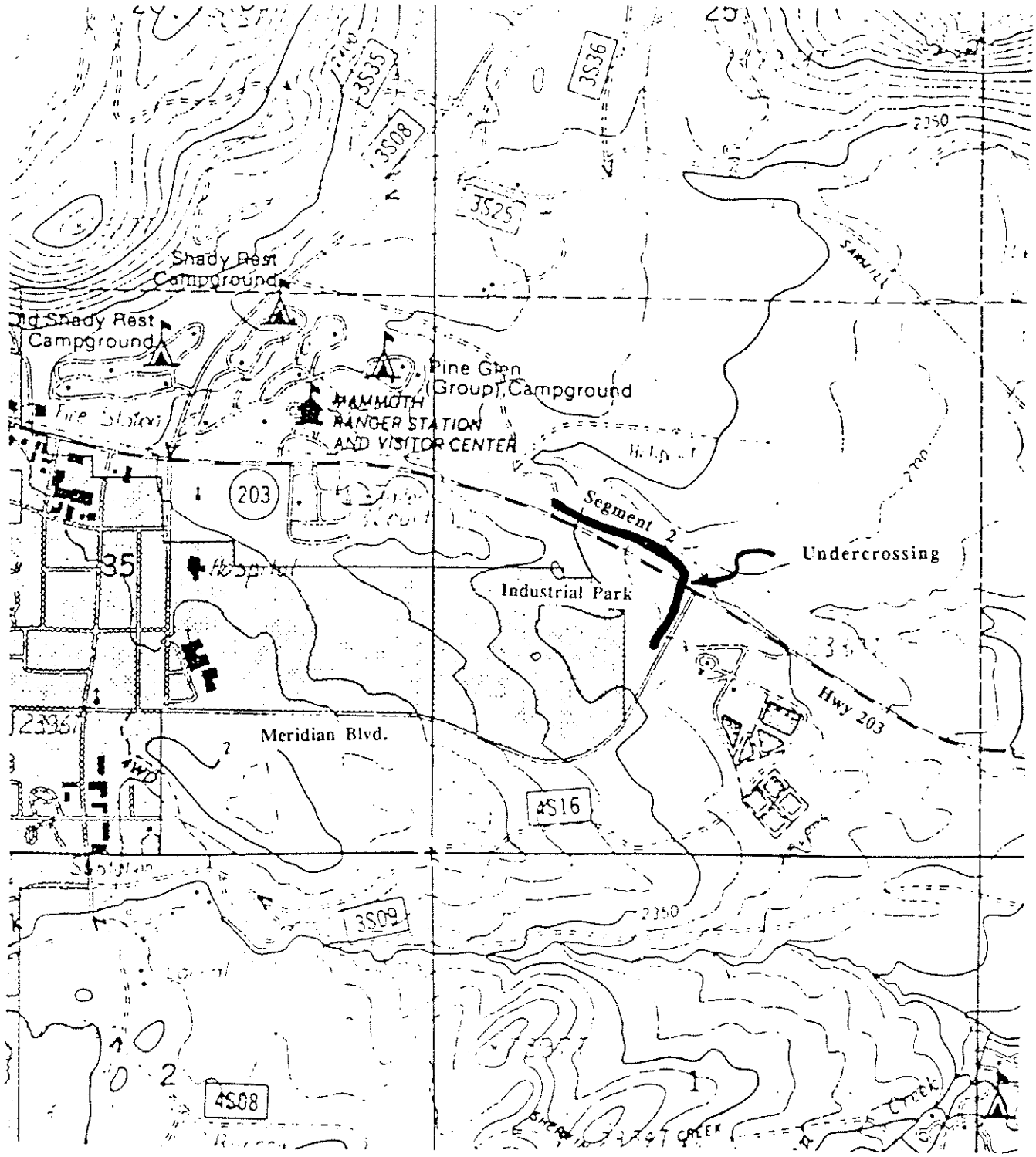
Primary uses that could be accommodated along this segment include:

- walking
- jogging
- mountain biking
- cross-country skiing
- road biking

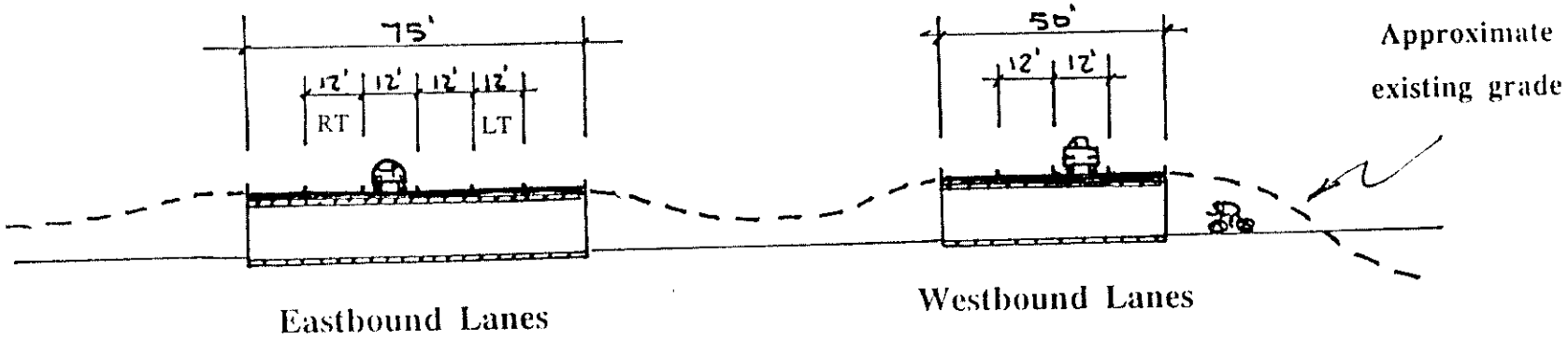
Eastern Connection Potential Problems.

The major obstacle with this segment of the Path is the proposed undercrossing of Hwy 203. Although the two separated "box culvert" (or similar) undercrossings of the highway appear feasible, the process of gaining approval, preparing plans and constructing the structures is time-consuming and expensive. Still, the need to separate pathway traffic from the high speed vehicular traffic is essential for this segment of the Path to be safe and successful.

Once constructed, the undercrossing would have to be maintained properly for year-round use. Additional concern may be for the safety of users who may perceive fear in using the undercrossing. Careful design and lighting can ease some of this concern. Having two separate undercrossings with a "safety exit" between the northbound and southbound lanes



Segment 2 - Eastern Connection



12' wide x 10' high
Box Culvert Cross Section

Conceptual Undercrossing Design at Hwy 203

Figure 3

also will help; this reduces the perceived length of the undercrossing making it seem safer.

The at-grade street crossing at Commerce Road also may be a problem if not designed carefully. Where the Path crosses this street, it should be set back from Meridian Boulevard and stop signs considered for vehicles using Commerce Road, depending on the amount of traffic present, similar to the configuration shown in **Figure 2.**

Dealing with the Murphy Gulch drainage should not be a major problem, however, care must be taken in layout of the pathway to accommodate this drainage. There also appear to be rock outcroppings along this area which could make Path construction more difficult and expensive; this potential increased cost is reflected in the cost estimates below.

Even though the grade of this section is not steep, there is a perceptible elevation drop of some 70' in 2000' linear feet (3.5%) and then a gain of 40' in 1200' (3.3%). At Meridian and Hwy 203, the Main Path is at the lowest point of the entire MLT System (7640'± above sea level). Once again, layout of the Main Path should take into consideration these topographic conditions so as to make the Path as safe and useable as possible.

Eastern Connection Opportunities.

The most important aspect of this segment of the MLT System is the undercrossing of Hwy 203. If this can be achieved, it would eliminate a major stumbling block for making the MLT a continuous and safe pathway system from the northerly side of Town to the southerly side.

With the completion of this segment, both summertime uses and wintertime primary uses could be accommodated without discontinuity between the north and south parts of the MLT.

Like the Shady Rest segment described above, this segment of the Main Path would greet most visitors to the community and would stand as an important first-impression public amenity.

Length/Cost - Segment 2.

	Unit	Unit Cost	Cost
Main Path	3300'	$35/ft	$115,500
Foot Path	na	na	0
Connector Paths	na	na	0
Undercrossings	two sections (125')	1,300/ft[5]	162,500
		Total	**$278,000**

Right-of-Way Costs for Segment 2

It is assumed that any right-of-way needed would be approved at no cost to the public since this segment is already in public ownership.

---

[5] Undercrossing costs are based on the cost of the new snowmobile box culvert undercrossing north of Mammoth Lakes on US Hwy 395. The snowmobile undercrossing is in two sections with the western section being 84' in length and the eastern section being 64' in length; total cost was $97,000 or about $655 per linear foot (source: J Jensen, Caltrans, June 4, 1990). The estimate above of $1,300 per linear foot has been doubled to take into consideration the need to construct in existing roadway, the possibility of utilities, variations in terrain and other unforeseen factors. It also should be noted that the undercrossing at this point would not be needed here if the south side alternative for the Main Path in Segment 1 were to be pursued.

Segment 3- East Mammoth Creek

East Mammoth Creek Description.

This segment of the MLT Main Path is associated with Mammoth Creek east of Old Mammoth Road on the southeastern side of the Town (see map **Segment 3**). The Main Path would be a fully paved, 8' minimum width pathway accommodating all primary uses.

The Path would connect with the Eastern Connection (Segment 2 described above) just west of Commerce Road and immediately cross under the Town's Meridian Boulevard, heading south across public land administered by the Inyo National Forest. The undercrossing of Meridian, some 60' in length, would be located at an existing drainage swale so that grade changes and excavation costs could be reduced.

The Main Path would continue south a short distance eventually turning west where it would intersect an existing unpaved narrow jeep road (this road is the location of a sewer trunk line which leads to the Water District's sewage treatment facility further east). Assuming there is compatibility with utilities, this roadway would be paved over with the new path. Leading still further west, the roadway intersects another unpaved road which is the old road into Mammoth Lakes from US Hwy 395. A Future/Alternative Trail, the "Mammoth Creek Trail" would originate in this area (see Future/Alternative Trail section). Here, the Main Path would continue west following the old road (which is still used by some vehicles) along Mammoth Creek until coming to Old Mammoth Road in the proposed Mammoth Creek Park (east side). At Old Mammoth Road, the Path is proposed to undercross Old Mammoth Road in an 80' "box culvert" (1/2 the cost attributable to this segment). Two connector paths are included in this segment: one crossing Mammoth Creek to the Mammoth Historical Museum and the other connecting to the future parking lot in Mammoth Creek Park. A short segment of foot path also is proposed between the Main Path and Mammoth Creek.

Depending on the desires of the community and the Forest Service, the old road from US Hwy 395 could either be closed to vehicular traffic or left open. If left open, the Path would have to be constructed adjacent to the old road.

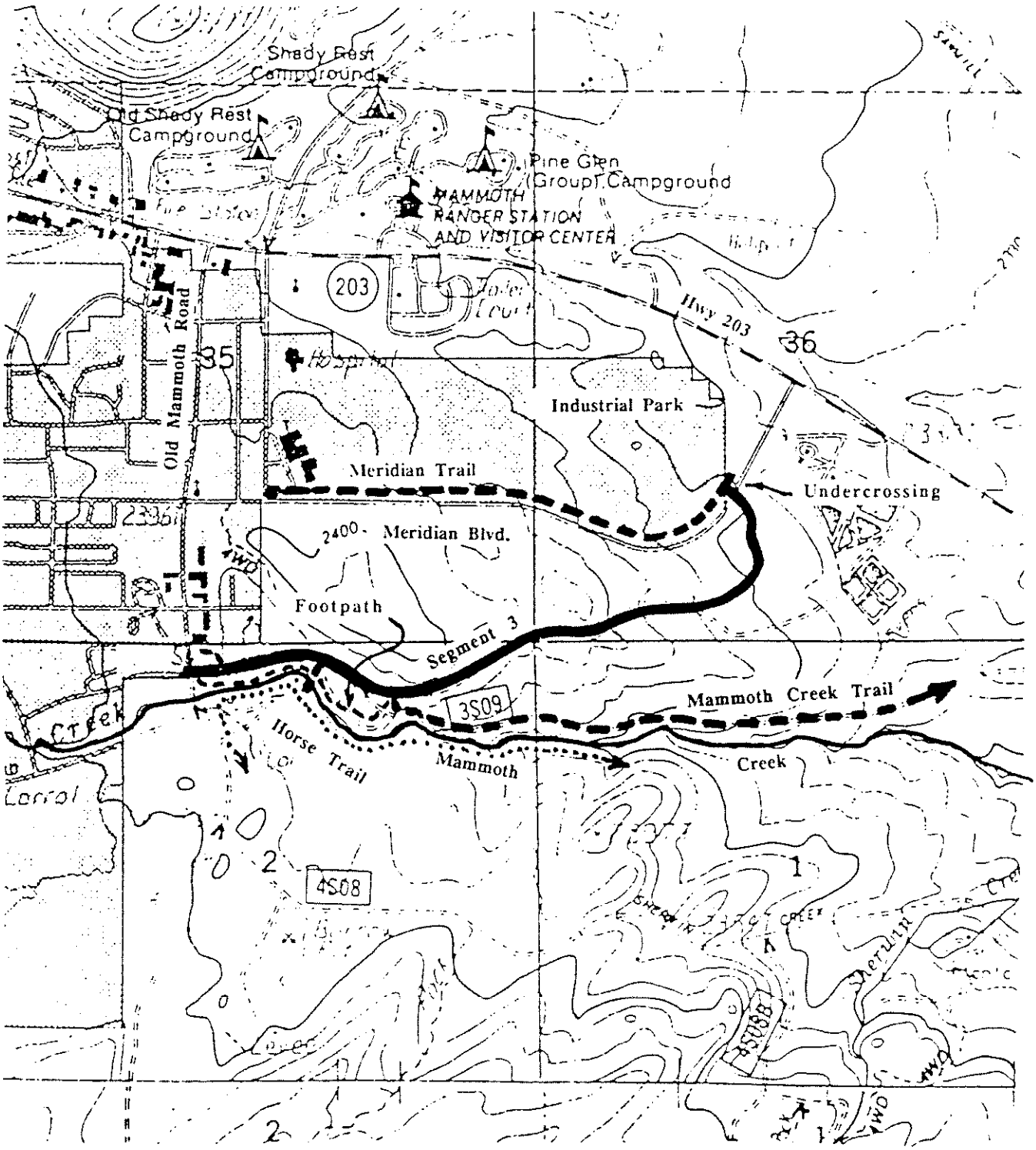
Along this segment, there may be potential to integrate a parallel horse trail which would lead along Mammoth Creek, on the south side of the Creek. During the winter, this same horse trail possibly could be designated for snowmobile use.

The Meridian Trail, a Future/Alternative Trail (described more fully in the Future/Alternative section) would connect at the undercrossing near Commerce Road and lead to the High School. If the Meridian Trail also were constructed, a separate paved loop of some 2.4 miles in length would be present for users in the southeastern part of the Town (the complete loop, say starting and ending at Mammoth Creek Park, would require use of on-street pathways along Meridian and Old Mammoth Road).

East Mammoth Creek Uses.

Primary uses that could be accommodated along this segment include:

- walking (separate path available - portion)
- jogging (separate path available - portion)
- mountain biking
- cross-country skiing
- road biking



Segment 3 - East Mammoth Creek

Supplemental uses that could be associated with this segment with establishment of a separate special trail include:

- horseback riding
- snowmobiling

East Mammoth Creek Potential Problems.

There do not appear to be any major physical problems with this segment of the MLT System. For the most part, the Main Path could be accommodated along existing roads and/or right-of-ways. A 2200' section of the Path would be located on undisturbed Inyo National Forest Service land on the south side of Meridian Boulevard near the proposed undercrossing. This relatively short section would have to be reviewed carefully for environmental considerations/specific routing.

The proposed undercrossing of Meridian Boulevard (near Commerce Road) does not present any readily apparent problems. The same is true for the proposed undercrossing of Old Mammoth Road.

The gradient of the Path also appears acceptable with a grade change of only 150' vertical in 7600' linear (2.0%).

The question of whether to leave open or close the old road from US Hwy 395 will have to be considered. As noted above, if left open, the Main Path would have to be located so as to not interfere with the roadway and vice-versa.

A horse trail/snowmobile trail has been conceptually shown along this segment of the MLT as a separate path on the south side of Mammoth Creek. This location would appear to minimize conflicts among primary users if this "third level" of pathway were incorporated in the plan for the Main Path corridor.

The main problem (which may not be a problem) will be gaining approval and coordinating among the various agencies involved along this segment of the Path. These include the various Town of Mammoth Lakes Departments, the Mammoth County Water District, and the Inyo National Forest.

East Mammoth Creek Opportunities.

The East Mammoth Creek segment of the MLT System would be of significant importance from several points of view. First, installation of the Main Path in this segment would enable the MLT to be paved to the Eastern Connection (Segment 2 described above), thus promoting the continuity of the MLT in a very scenic part of the trail along Mammoth Creek. If a loop is established utilizing the Future/Alternative Meridian Trail (with staging areas at either end), the trail user would be provided with an excellent trail experience of about 2.4 miles in length. The Main Path also would provide an almost direct, non-motorized access from the southern parts of the Town to the Industrial Park and Water Company.

Another important opportunity lies in providing this trail amenity in the Mammoth Creek Park (east side). With the undercrossing of Old Mammoth Road and the construction of the Main Path through this designated recreational area, the park experience would be considered by many to be significantly enhanced.

Visibility of the Main Path and first impressions of the community would be considered good by many people accessing the Town along Meridian Boulevard. Further, visibility from Old Mammoth Road of the Path through Mammoth Creek Park would be important.

Length/Cost - Segment 3.

	Unit	Unit Cost	Cost
Main Path	7600'	$30/ft	$228,000
Footpath	1700'	10/ft	17,000
Connector Paths	850'	20/ft	17,000
Undercrossings	1 (60')	1,300/ft	78,000
	1/2 (40')	1,300/ft	52,000
		Total	**$392,000**

(Does not include costs for horse trail/snowmobile trail)

Right-of-Way Costs for Segment 3

It is assumed that any right-of-way needed would be approved at no cost to the public since this segment is already in public ownership.

Segment 4- Mammoth Creek Park to Chair 15

Mammoth Creek Park to Chair 15 Description.

This segment of the Main Path is perhaps one of the more interesting parts of the system. The Path would cross through the developing Mammoth Creek Community Park (west side), follow along Mammoth Creek through the Snowcreek Resort area, pass through the northern side of Old Mammoth and finally wind its way up to the western terminus of Meridian Boulevard at Chair 15. Except for a section along Waterford Avenue, the path would be a fully paved, 8' minimum width pathway with adjacent foot path accommodating all primary uses. The description is broken into the subsegments as follows (see map **Segment 4**):

Subsegment 4a - Mammoth Creek Park to Minaret Road.
Subsegment 4b - Minaret Road to Waterford Avenue.
Subsegment 4c - Waterford Avenue to Chair 15.

Subsegment 4a - Mammoth Creek Park to Minaret Road.

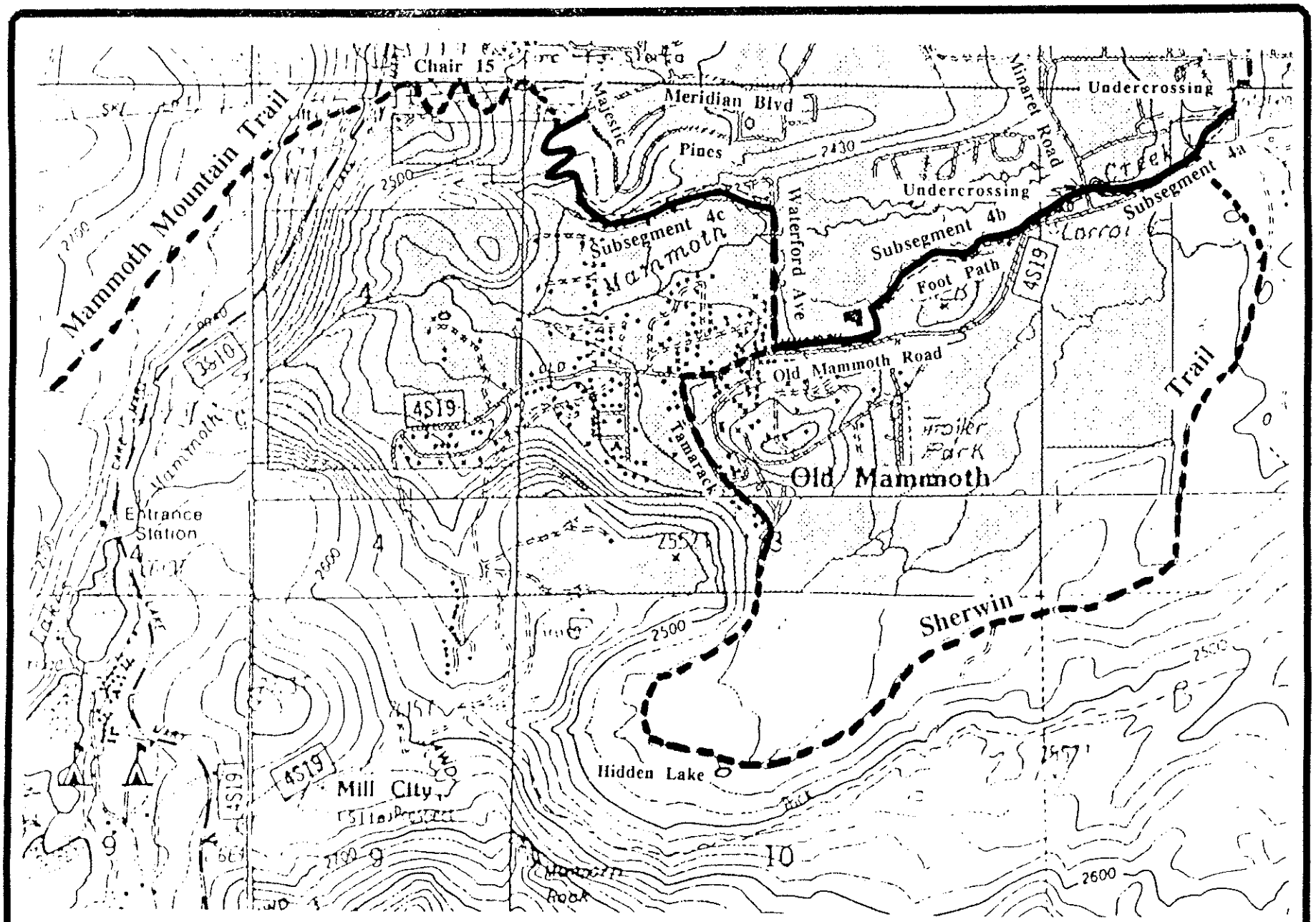
The Main Path would connect with the East Mammoth Creek segment (Segment 3 described above) at Old Mammoth Road in the developing Mammoth Creek Park (west side) where a paved pathway recently has been constructed as part of the Mammoth Creek Park improvements. A proposed 12' x 10' x 80' undercrossing of Old Mammoth Road (1/2 the undercrossing cost attributable to this segment) would still be needed to provide a safe crossing of Old Mammoth Road to actually connect to the East Mammoth Creek segment of the MLT. Once connected, the Main Path would follow the existing paved path through the park and cross to the south side of Mammoth Creek on the existing bridge at the weir structure operated by the Water District. From there it would follow westward between the Creek and Old Mammoth Road until coming to the west edge of Mammoth Creek Park where the existing paved pathway ends. The northern part of the Park is owned by the Town of Mammoth Lakes while the southern part of the Park is administered by the Inyo National Forest with a use permit given to the Town for park purposes. The existing path through the Park received a State grant for its construction in the summer of 1990.

The Main Path would continue west of the Park through an existing easement along the south side of the Creek (the underlying property is owned by Mammoth Creek Condos). Still further west, the Path would cross through a right-of-way to be acquired, potentially by dedication, from owner T. Lizza. Here the Main Path would come to Minaret Road which would be undercrossed in another box culvert, 60' in length (1/2 the undercrossing cost attributable to this Subsegment 4a). The undercrossing could serve as an auxiliary flood control structure for the Mammoth Creek floodway. A foot path is proposed to generally parallel this entire subsegment.

Subsegment 4b - Minaret Road to Waterford Avenue.

This part of Segment 4 would traverse though the Snowcreek Resort area. The property is currently owned by the Dempsey Corporation and the Snowcreek Homeowners Associations. An Ad Hoc Committee was formed by the Town Council to consider alternative routing of the Main Path through this subsegment. The Ad Hoc Committee considered several routes for the path during their deliberations.

Two identified routes (Routes A and B) for the path went directly west from the Minaret Road undercrossing generally paralleling Mammoth Creek through the meadow area of the Snowcreek development. These routes for the Path would have been located in the "Linear



Segment 4 - Mammoth Creek Park to Chair 15

Park" identified in the Town's Parks and Recreation Element. Another possible routing (Route D) followed from the Minaret Road undercrossing, parallel with and adjacent to Old Mammoth Road. Several other possible routings also were explored for the pathway but eventually Route C was recommended (see **Figure 4**).

Route C, the Ad Hoc Committee recommended Main Path, would begin at the undercrossing at Minaret Road and swing southerly, generally paralleling Old Mammoth Road until approaching the Snowcreek Sales/Rental Office. Here, the Main Path would skirt the Office on its north border and then hug the north shore of the man-made "duck pond" on the west side of the Office. It would then cross Golden Creek (a private road) at-grade, and continue along the southerly side of the private road.

Before entering the Snowcreek IV complex, the Main Path would turn southwesterly following along a man-made drainage basin until coming to the Snowcreek Athletic Club (SAC) where the Path would cross Golden Creek (private road) again, at-grade, and then turn almost southeasterly, crossing through part of the SAC parking lot and entryway. On the southerly side of the SAC parking lot, the pathway would come to Old Mammoth Road and continue almost directly west along the SAC tennis courts until coming to Waterford Avenue. Here, the off-street pathway would transition to an on-street pathway described in Subsegment 4c. Again, a foot path is proposed to generally parallel this entire subsegment.

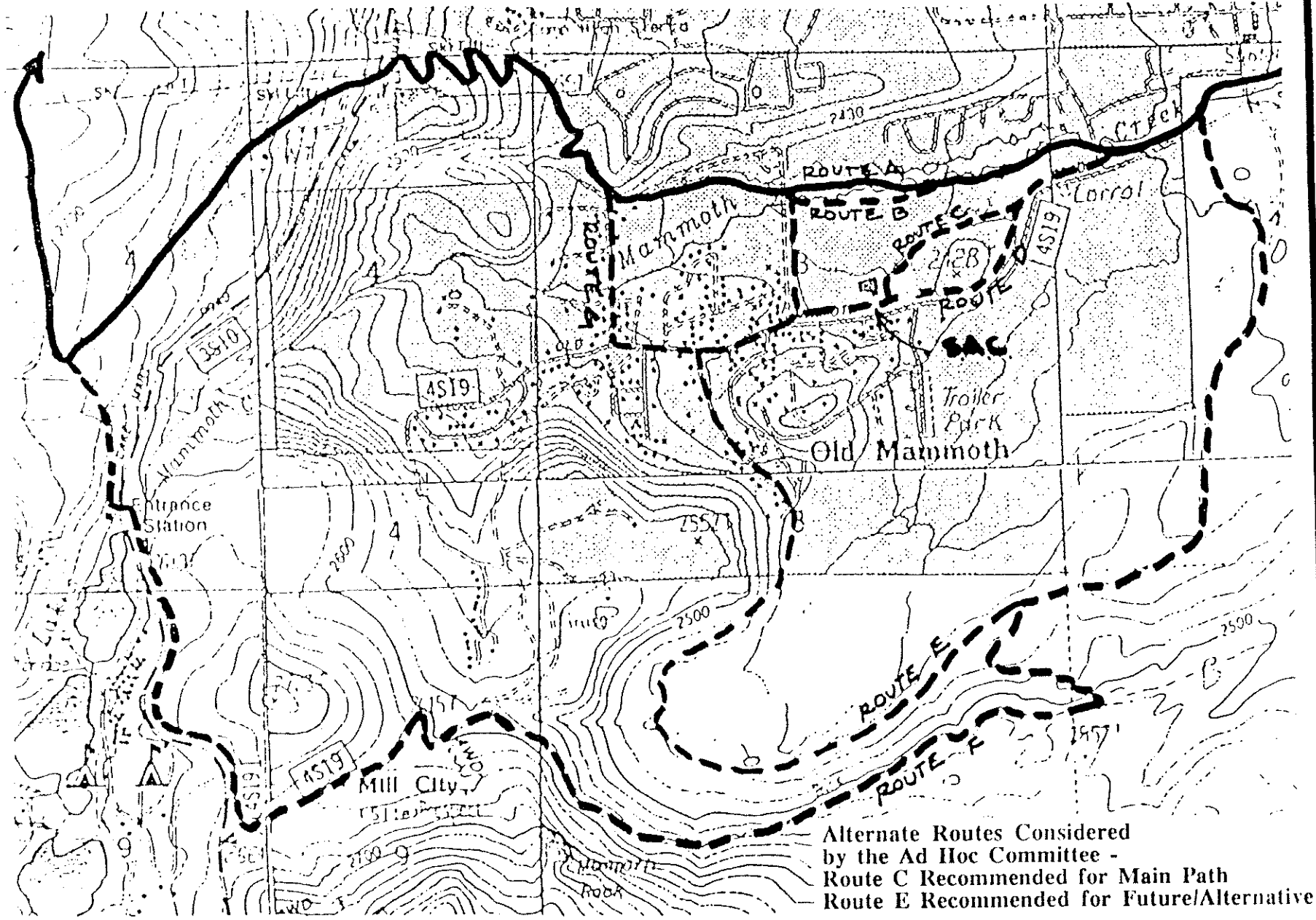
Subsegment 4c. At Waterford Avenue, the Main Path would turn north, continuing as an on-street pathway, along existing residential uses on the west and a proposed 13-lot single family subdivision, "Laurel Meadows", owned by S. Hudec, on the east. The path would follow Waterford Avenue, which is paved for about the first 900'. The remaining part of Waterford Avenue is not much more than a wide, unpaved jeep road posted as "not a through street." Waterford Avenue is shown on the Town's Circulation Map as a continuous "local street," crossing Mammoth Creek and connecting with Majestic Pines Drive.

The Main Path would cross Mammoth Creek on Waterford Avenue (if constructed) or on a temporary crossing. From there, the Path is proposed to run westerly through the "Old Mammoth" Park Site (the park site is shown on the Parks and Recreation Plan Map), generally north of 'Aspen Creek' until coming to Chair 15, where it would connect with Majestic Pines Drive at Meridian Boulevard. An abandoned dirt roadway along the north side of Aspen Creek could be used for most of the route. Switchbacks would be needed to negotiate the grade as the Path makes its way up from the Aspen Creek Drainage to the Chair 15 area. Additionally, a foot path is proposed to generally parallel this entire subsegment, except in the switchback area near Chair 15 and along Waterford Avenue. Property ownership along this subsegment includes Hudec and Aspen Creek/Deer Creek Condominiums.

Mammoth Creek Park to Chair 15 Uses.

Primary uses that could be accommodated along this segment include:

- walking (separate path provided)
- jogging (separate path provided)
- mountain biking
- cross-country skiing (except Waterford Ave.)
- road biking



Alternate Routes

Figure 4

Mammoth Creek Park to Chair 15 Potential Problems.

Physical problems associated with this segment might involve construction of the pathway in potentially unstable soils areas and in the grade change needed to rise from Aspen Creek to the Chair 15 area.

Before any construction could commence, analysis would have to be conducted to ascertain soil conditions along the route (this also applies to all areas of the MLT). This would help determine how much existing base material would have to be replaced with construction grade base material (e.g., base rock) to achieve adequate compaction for paving. The use of geotextile construction fabrics also may be needed in certain areas. The finished surface of the pathway would not exceed 6" above the existing grade. During construction, restrictions should be placed on the contracting agency to limit disturbance to a 12' wide swath (which includes the 8' wide asphalt surface and 2' shoulders on each side). Construction vehicles would be allowed to enter and exit only at the approved locations. Revegetation along the shoulders of the 8' wide paved area should be immediately undertaken after construction.

Near the Chair 15 area, the Path would need to rise from elevation 8000' to elevation 8080' in about 1800' of switchbacks. This is a grade of 4.5% which is just under the maximum recommended maximum grade of 5%. Nevertheless, it is still steep and the switchbacks would have to be carefully located and constructed to accommodate the pathway. It also should be noted that the final Main Path location will have to be integrated with development proposals which are pending in the vicinity of Chair 15.

There are four at-grade crossing along Subsegment 4b; two crossing Golden Creek (private road), one crossing through the SAC parking/entry area and one crossing a Mammoth Water Company access road to the west of SAC. These would have to be signed and marked so as to reduce potential safety problems. Depending on the amount of pathway traffic versus auto traffic, it may be advisable to utilize stop signs for autos and/or trail users (see **Figure 5** for concept for crossing through the SAC parking/entry area).

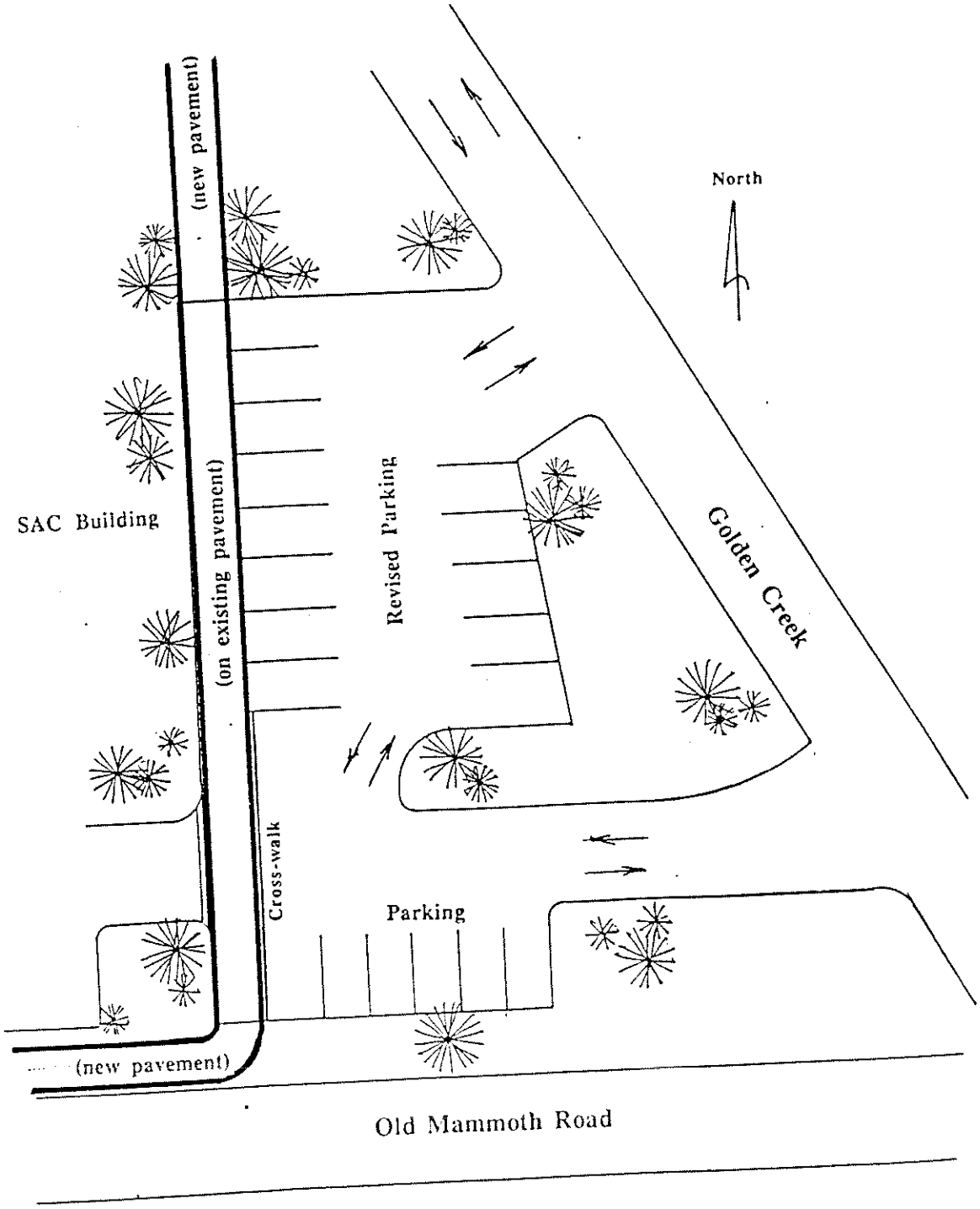
The Path would also have to traverse private property owned by the Dempsey Corporation along Old Mammoth Road[5], through the Snowcreek area and along the Snowcreek Athletic Club. Existing landscaped areas along SAC may have to be altered to accommodate the pathway. Preliminary indications from the property owner appear favorable for dedicating the area needed for the Path (a representative from the Dempsey Corporation served on the Ad Hoc Committee).

Where the route turns north at Waterford Avenue, the Main Path would be an on-street pathway with existing residential units on the west side of Waterford and the recently approved 13 single family lot subdivision on the east side of Waterford. The owners of these properties may have concerns about the proximity of the proposed path.

Pathway construction along the unpaved part of Waterford Avenue may be complicated by the pending consideration for completion of the street itself. If the Path is designated along the street after the street is completed, then the Path could utilize the existing paving and stream crossings constructed as part of the street. However if the Main Path is constructed before the street is built, then the Path would have to provide both the paving and the stream crossings. In this case, it may be desirable to construct "temporary" facilities (e.g.,

---

[5] There is an apparent discrepancy in exactly who owns part of the frontage of Old Mammoth Road along the tennis courts of the SAC. This would have to be cleared up in order to construct the Path through this area.



Conceptual Trail Route Through SAC Parking Area

(not to scale)

Figure 5

culverts instead of an elaborate bridge) for the stream crossings. There may also be a way to construct the paved portion of the Path so that if the street is ever constructed, the two could be compatible. Indeed, if done correctly, the Main Path could serve as a temporary/long term, one-way emergency vehicular connection from Old Mammoth Road to Majestic Pines Drive (see example in **Figure 6**).

Cross-country skiing along Subsegment 4b would be hampered by the discontinuity encountered in the on-street segment along Waterford Avenue. Alternative routing for the Main Path may be desirable for wintertime use.

Mammoth Creek Park to Chair 15 Opportunities.

The location of the Main Path along Mammoth Creek west of Mammoth Creek Park presents one of the Town's best opportunities to provide such a trail facility for both residents and visitors. The Path would be essentially flat (except for the west end) and easy to use. It would travel through some of the Town's most scenic areas and allow public access through designated open space and park lands.

It may be possible to add interpretive facilities along parts of the Main Path dealing with prehistoric and historic use of the area.

Access to and from adjacent condominium areas would be readily available. Likewise, users from nearly all of Old Mammoth would be provided with a commuter trail facility that would lead, in a non-motorized fashion, to many other areas of Town such as Mammoth Creek Park, central commercial areas and the Industrial Park.

Main Path access to and from the Snowcreek Athletic Club also would be enhanced. Parking, restrooms and other support facilities would be provided at Mammoth Creek Park.

If the Path along Waterford Avenue were constructed similar to that shown in **Figure 6**, it could serve as a temporary/long term, one-way emergency vehicular connection from Old Mammoth Road to Majestic Pines Drive.

If an alternate path can be found for cross-country ski use, avoiding the on street portion along Waterford Avenue, this segment would offer an ideal wintertime amenity.

Length/Cost - Segment 4.

Subsegment 4a

	Unit	Unit Cost	Cost
Main Path	900'	$30/ft	$27,000
Footpath	1600'	10/ft	16,000
Connector Paths	350'	20/ft	7,000
Undercrossings	1/2 (40')	1,300/ft	52,000
	1/2 (30')	1,300/ft	39,000
		Sub Total	$141,000

Waterford Avenue On-Street Portion
Potential Construction Method
Cross-Section

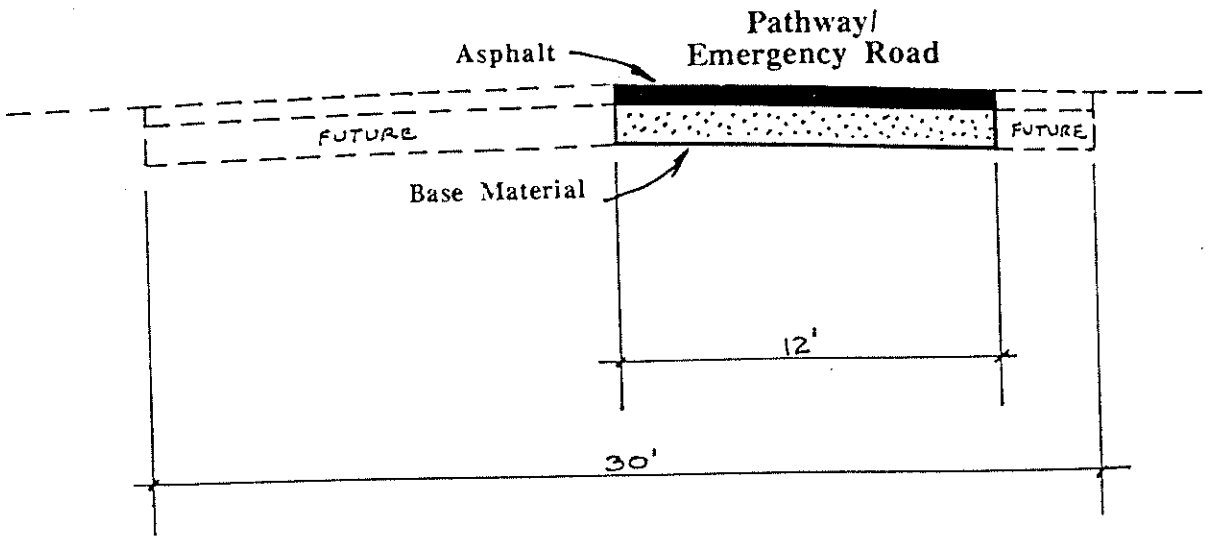


Figure 6

Subsegment 4b

	Unit	Unit Cost	Cost
Main Path	4300'	~~$30/ft~~	$129,000
Footpath	3200'	10/ft	32,000
Connector Paths	300'	20/ft	6,000
Undercrossings	1/2 (30')	1,300/ft	39,000
Culvert Crossings	3	5,000	15,000
		Sub Total	$221,000

Subsegment 4c

	Unit	Unit Cost	Cost
Main Path (off street)	4500'	$30/ft	$135,000
Main Path (on street)[6]	900'	10/ft	9,000
(new paving)	600'	35/ft	21,000
Footpath	2100'	10/ft	21,000
Connector Paths	350'	20/ft	7,000
Culvert Crossings	6	5,000	30,000
		Sub Total	$223,000
		Total	**$585,000**

Right-of-Way Costs for Segment 4

Right-of-way costs have not been included in the above cost estimates for this section of the MLT because the cost could vary for several reasons. First, there is uncertainty as to whether the right-of-way needed will be dedicated by the owners involved. Requests for such dedications have been informally discussed with some of the owners (if the property is dedicated, there may be tax or other advantages to the property owners). Dedication of property for the MLT and/or park land also may be required as part of future development approvals with no out-of-pocket costs to the public for acquisition. Yet another uncertainty is the actual value of the right-of-way involved. For example, the value of certain parts along Segment 4 may be much less than the value of developable property. Additionally, the town holds easement rights along portions of the route which may reduce or eliminate public acquisition costs for right-of-way. For these reasons and others, right-of-way costs have not been included in the above estimates.

[6] This estimate assumes that the the existing pavement along Waterford Avenue will be utilized for the first 900'. For the next 600 feet, a 12' wide paved section is assumed to be constructed; the 12' section could later be used as one lane of Waterford Avenue or used indefinitely as an emergency accessway connecting Old Mammoth Road with Majestic Pines Drive.

Segment 5- Lodestar

Lodestar Description.

This segment of the Main Path MLT would pass through the "Lodestar at Mammoth" proposed 210 acre development. The goal of this segment of the Main Path would be to construct the Path from the above Segment 4 at Chair 15 leading easterly and then northerly through the Lodestar area, eventually connecting with Hwy 203 (see map Segment 5). Since the Lodestar project is still in the review stages, the Main Path description which follows should be considered tentative for discussion purposes only. The Trail Design Objectives, described previously, should be utilized in the final design for this segment.

Beginning at the end of Segment 4, the Main Path would cross Majestic Pines Drive, at-grade, and continue easterly on the north side of Meridian Boulevard as an 8' minimum width, off-street paved path. The Path would meander in the space between the Meridian Boulevard road surface and the proposed golf course of the Lodestar development, acting as a "sidewalk" for the street as well as the continuation of the MLT. The Path could be located in part of the right-of-way of Meridian or on an easement (the Lodestar "ski back" easement might be useable for a part of this section). A foot path also could be accommodated along this segment. Two access roads from Meridian Boulevard (one existing and one proposed) to the Lodestar development would have to be crossed at-grade on the way to the intersection of Minaret Road and Meridian Boulevard.

At Minaret Road, the Path would swing north meandering along the west side of Minaret, between the golf course and the road, similar to the route described above along Meridian. About midway through the proposed development, the Path could share the existing undercrossing of Minaret Road (recently constructed with the completion of Minaret Road) and continue northeasterly, generally paralleling "Hole 8" of the Lodestar Land Use Diagram (see Figure 7). The off-street path could continue, crossing another internal Lodestar street at-grade, and then connect to Hwy 203 (Main Street) via an existing 40' wide accessway. Here the Main Path would continue as an on-street facility in Segment 6.

Lodestar Uses.

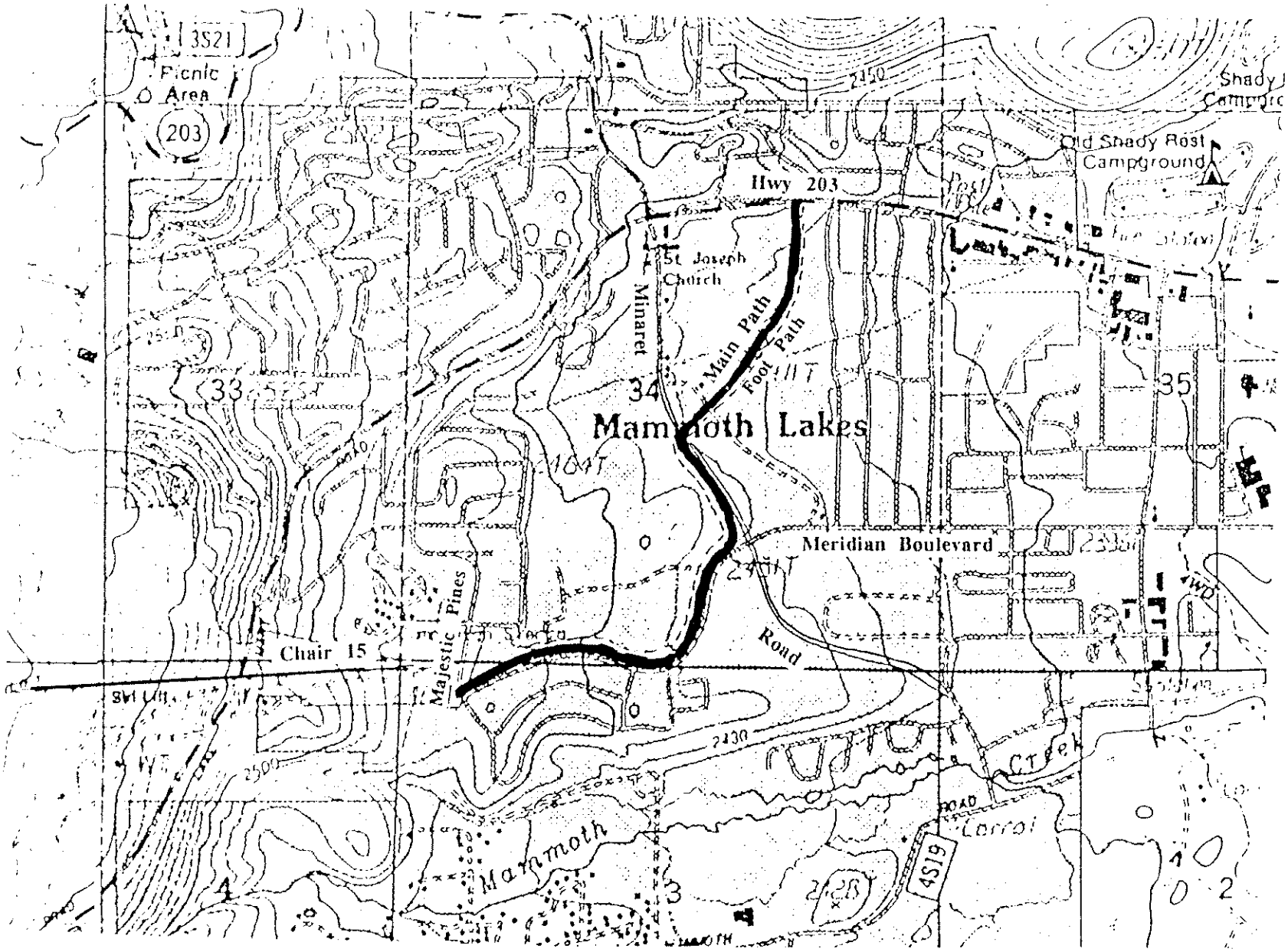
Primary uses that could be accommodated along this segment include:

- walking (separate path provided)
- jogging (separate path provided)
- mountain biking
- cross-country skiing
- road biking

Lodestar Potential Problems.

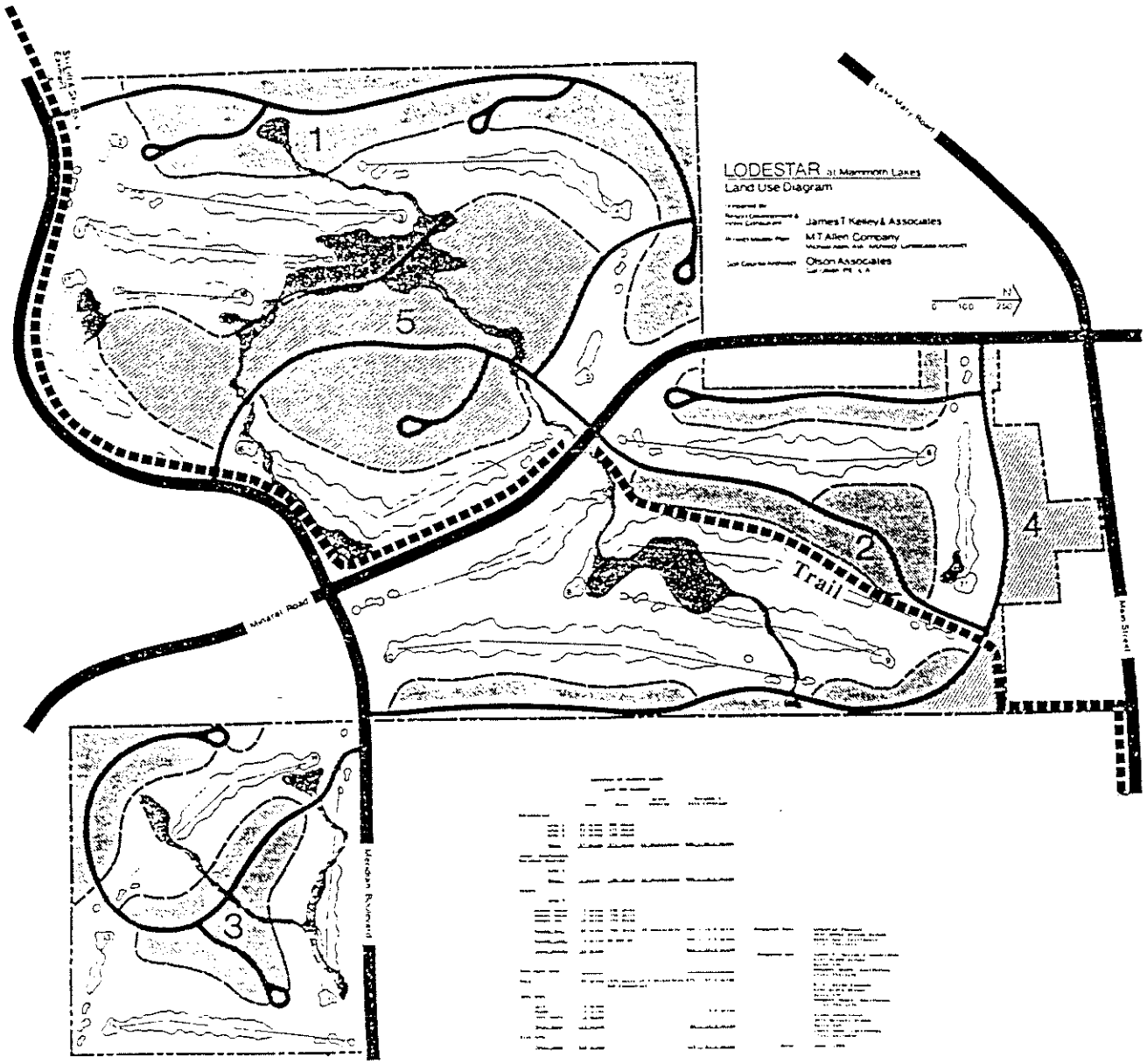
There appear to be limited physical problems associated with this segment. The main concern would be integrating the path with the proposed land uses of the Lodestar development.

The largest grade change is from the Chair 15 area to Minaret Road, 100' vertical drop in 3500' lineal, or 2.8%; still well within recommended standards.



Segment 5 - Lodestar

To Chair 15



Conceptual Trail Route Through the Lodestar Development Proposal

Figure 7

L. K. Johnston and Associates

Locating the pathway alongside fairways of the golf course may be of concern. It would be advisable to maintain a buffer of trees between the course and the Main Path to help intercept errant golf balls. Concern also may be present as to course security from trail users.

The joint use of the existing undercrossing of Minaret Road may be a potential problem, assuming golf carts and golf players also would be using the structure. It is quite wide (20'±), however, and it would appear joint use could be accommodated.

Another concern may arise from the number of additional trees that would have to be removed to accommodate the pathway. The area is quite heavily forested, although compared to the proposed golf course and the accompanying urban development of the Lodestar project, the Path would have relatively little additional impact on tree removal. This would be particularly true if the Main Path follows closely along existing roadways where tree clearance has already occurred.

There would be three at-grade crossings along this potential route: two along Meridian and one across an internal street in the northern part of the Lodestar area. These would have to be signed and marked so as to reduce potential safety problems. Depending on the amount of Main Path traffic versus auto traffic, it may be advisable to utilize stop signs for autos and/or trail users. Since two of these roads have not yet been constructed, they could be designed with trail undercrossings. These crossings also would tend to interupt Cross-Country Ski travel unless covered with snow.

Lodestar Opportunities.

The location of the Main Path through this area represents one of the last opportunities to connect the MLT back to the north side trail system through a yet-to-be developed area. The Path could be constructed as an integral part of the Lodestar project, providing an additional amenity to the overall Lodestar plan.

The Main Path would be relatively flat and generally easy to use. It would travel through a scenic forested area in proximity to a golf course and large scale resort development.

Access to and from the proposed adjacent Lodestar developments would be readily available. Further, a commuter trail facility would be provided that would lead, in a non-motorized fashion, to many other areas of Town such as the central commercial areas along Main Street.

Joint use of the existing undercrossing of Minaret Road would help reduce costs for the continuation of the trail, while adding another interesting safety amenity to the overall trail system. It would appear desirable to construct trail undercrossing as part of the yet-to-be constructed internal access streets.

Cross-country ski use along the Path would offer an important wintertime activity, complementing the Lodestar project as well as connecting with other parts of the Main Path.

Length/Cost[7] - Segment 5.

	Unit	Unit Cost	Cost
Main Path	7700'	$30/ft	$231,000
Footpath	7000'	10/ft	70,000
Connector Paths	150'	20/ft	3,000
Undercrossings	(1 existing)	na	0
		Total	$304,000

Right-of-Way Costs for Segment 5

It is assumed that any right-of-way needed would be dedicated by the Lodestar development at no cost to the public.

[7] Assumes no contribution for construction costs from the Lodestar development except the existing undercrossing.

Segment 6- Main Street

Main Street Description.

This segment of the MLT would constitute the last segment of the Main Path and lead back to Segment 1. Where the Path leaves the Lodestar segment (Segment 5), it would turn eastward and follow the existing frontage street adjacent to the south side of Hwy 203. It would be an on-street pathway[8] for almost this entire segment utilizing existing Caltrans/Town of Mammoth Lakes right-of-way (see map Segment 6).

The Path would utilize the existing pavement of the frontage street and, like the frontage street, encounter numerous intersections with other streets and the short access streets connecting with Hwy 203. For almost the entire route, pathway construction would be limited to signing and safety improvements along the existing frontage street.

The path would first intersect with Joaquin, Lupin, Mono and Manzanita Streets. It would then pass the shopping centers along the south side of Main Street and continue eastward intersecting Center Street, finally coming to Laurel Mountain Road. On the east side of Laurel Mountain Road, the Path would be constructed as an 8' minimum width paved route utilizing part of the the landscaped Hwy 203 right-of-way along the present Bank of America and Village Sports Center. The paved path would end at Old Mammoth Road where Segment 1 begins.

Main Street Uses.

Primary uses that could be accommodated along this segment include:

- walking
- jogging
- mountain biking
- road biking

Main Street Potential Problems.

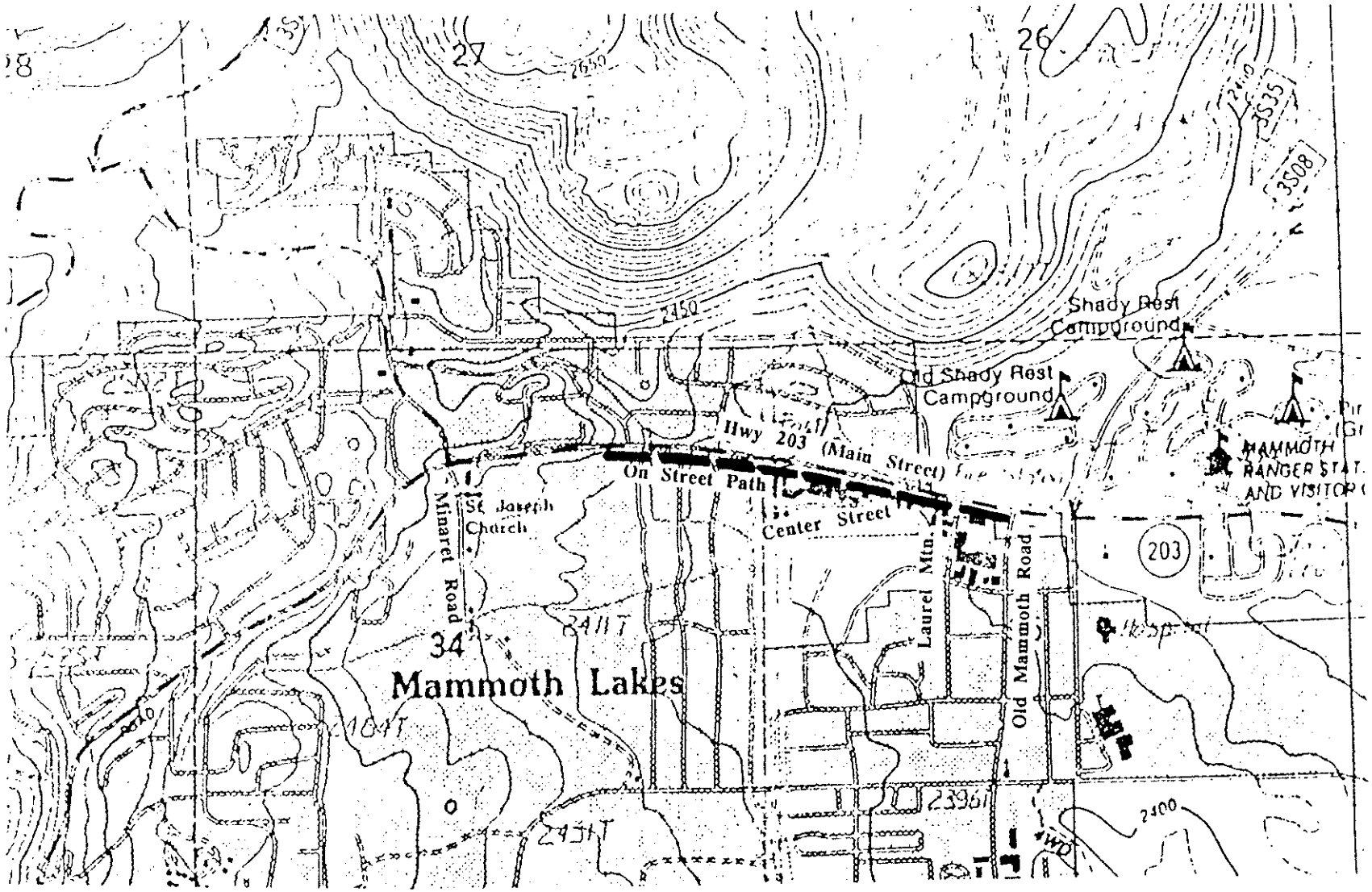
Since there would be very limited construction associated with this segment, physical problems would appear to be minimal. The main concern would be making the on-street path compatible with vehicular use.

As proposed, the Main Path would be signed for joint use with vehicular traffic on the existing pavement. The speeds of vehicular travel are low along this frontage street and the mixing of path users with vehicles would appear to be possible. Concerns would still be present for some path users, such as children on bicycles, who may be intimidated by the vehicular use present.

There may be increased potential for vehicular/path user accidents, particularly at street intersections, at access streets leading off Hwy 203 to the frontage street and at access points to the shopping areas. Stop signs are present at most of the street intersections; however, some trail users may ignore the stop signs and thus increase accident potential

---

[8] The pathway in this segment would be consistent with the State of California Department of Transportation standard "Class III Bike Route."



Segment 6 - Main Street

with vehicles who may not be aware that pathway users may be present. Due to the momentum created in cycling, bicyclists may not always heed stop signs and the number of stop signs present along this segment would certainly tempt even the most conscientious cyclist.

Walkers and Joggers also would have to share the roadway with vehicles. This may increase safety problems along this segment depending on the number of walkers and joggers present. Aesthetically, this part of the Main Path might be considered undesirable and the use level for this type of user may be limited.

The overall increased non-vehicular traffic may be a safety concern for trucks and delivery vehicles servicing the commercial areas along this segment; they tend to have reduced visibility, particularly when backing. The same problem would be present for autos backing from parking spaces located along the frontage street.

The grade change from the western end to the eastern end of this segment is 120' vertical drop in 3500' lineal, or 3.4%; noticeable but within recommended standards.

The Hwy 203 frontage along the Bank of America/Village Sports Center is presently landscaped, including a great deal of turf area. It also appears to serve as a drainage area along the street. Concern may be present in substituting a swath of this landscaped area for a paved pathway. On the other hand, the turf area uses a great deal of water and removing some of the lawn may be water conserving. As far as the drainage is concerned, the Path would have to be constructed so as to accommodate the existing drainage. This might involve culverts. It might also be noted that snow removal operations along Hwy 203 might affect this off-street pathway.

Lastly, cross-country ski use obviously would be not be possible along this segment (except perhaps on occasion when the streets are not yet cleared of snow).

Main Street Opportunities.

Segment 6 is not as scenic as some of the other segments, nevertheless, the designation of the Main Path through this area would complete the pathway and connect it back to the "beginning" at Segment 1, forming a 7.1 mile loop around and through the Town.

This segment would be readily accessible for nearby residential areas and would allow access to the commercial areas along Hwy 203 (Main Street). There may be some "spin off" positive economic effects on these commercial areas who would experience increased visibility from pathway users.

The cost of this segment would be lowered by the fact that it would utilize existing paving along the frontage road, which already exists. The main construction would involve signing and safety improvements along all but 450' of the Path. On this 450' part, the Main Path would be constructed to "Class I" standards and act like an extra wide sidewalk as well as part of the Main Path along Hwy 203.

Another opportunity might be present if a separate pedestrian facility were eventually provided along the frontage road. The costs shown below do not reflect the cost of such a facility, but it would appear to be a desirable amenity. With the completion of the Main Path and increased pedestrian use along this segment, the need for a separate facility may become paramount, sooner rather than later.

Lastly, the pathway would be highly visible to residents and visitors who frequently use Main Street and the commercial areas that border thereon.

Length/Cost - Segment 6.

	Unit	Unit Cost	Cost
Main Path (on-street)	3050'	$10/ft	$30,500
Main Path (off-street)	450'	$30/ft	$13,500
Foot Path	na	na	0
Connector Paths	na	na	0
Undercrossings	na	na	0
		Total	**$44,000**

Right-of-Way Costs for Segment 6

It is assumed that any right-of-way needed would be approved at no cost to the public from Caltrans (the frontage street is currently a Town-operated facility with the underlying right-of-way held by Caltrans).

Main Path Length/Cost Summary

Segment	Main Path	Foot Path	Connector Path	Under-crossings	Segment Cost
1	4200'	4100'	950'	na	$230,500[10]
2	3300'	na	na	1	$278,000
3	7600'	1700'	850'	1.5	$392,000
4a	900'	1600'	350'	1	$141,000
4b	4300'	3200'	300'	0.5	$221,000
4c	6000'	2100'	350'	na	$223,000
5	7700'	7000'	150'	1 existing	$304,000
6	3500'	na	na	na	$44,000
Total	**37,500'** (7.1 mi)	**19,700'** (3.7 mi)	**2,950'** (0.6 mi)	**5**	**$1,833,500** ($160,833/mi)

[10] Cost shown for Segment 1 is for north side alternative which is the highest cost alternative for this segment.

Future/Alternative Trail Descriptions

In addition to the Main Path of the Mammoth Lakes Trail System described above, there are several Future/Alternative Trails that could be considered for construction in addition to the Main Path trail network (some of these have been mentioned in the above sections). These Future/Alternative Trails are described below, starting with the **Shady Rest Park Trail** and continuing clockwise around the Town describing other Future/Alternative Trails that appear to offer various opportunities for the Community. A length/cost estimate summary for these Future/Alternative Trails is provided at the end of this section. Phasing is described in a subsequent section of this report.

Future/Alternative - Shady Rest Park Trail

Shady Rest Park Trail Description.

This Future/Alternative Trail has been briefly described above in the Segment 1 description of the Main Path of the MLT. In conjunction with the Main Path, the Shady Rest Park Trail would form a 2.5± mile continuous loop in the vicinity of the Town's Shady Rest Community Park. This Trail would start from the Main Path, near the intersection of Sawmill Cutoff and Hwy 203, and continue as an 8' minimum width paved path along the east side of Sawmill Cutoff, following the existing dirt pathway that leads to Shady Rest Park. Along the way, the Trail would skirt the Forest Service's Shady Rest Campground. An adjacent foot path is proposed along the western leg of the Trail to help reduce user conflicts. At Shady Rest Park, it would turn east, then southward following disturbed "jeep" roads and utility corridors, eventually leading back to the Main Path, connecting to it on the east side of the US Forest Service Visitor Center (see map **Segment 1**). Two future connecting trails could lead from the Shady Rest Park Trail: one heading west through the old part of the Shady Rest Campground to Forest Trail (road) and the other following north along Sawmill Road. The former would allow connection to the Overlook Trail and the Knolls Trail.

Shady Rest Park Trail Uses.

Primary uses that could be accommodated along this segment include:

- walking (separate path provided - portion)
- jogging (separate path provided - portion)
- mountain biking
- road biking
- cross-country skiing

Shady Rest Park Trail Potential Problems.

Physical problems with the Trail appear to be minimal primarily because it would follow an existing dirt pathway and already disturbed jeep/utility corridors.

Along the existing dirt pathway, there would be the need to widen the path and remove some additional trees to accommodate the standard paved section (12' minimum clear area). Additionally, certain sections of the dirt pathway would need to be straightened for safety reasons and site distance requirements.

Because the Trail would be located quite near some of the campsites of the Shady Rest Campground, there may be concerns regarding privacy, noise and safety of campers along this part. Consideration might be given to buffering these campsites with additional trees, rock barriers, etc.

Two at-grade Trail crossings at the entry to the Shady Rest Campground are proposed. These would have to be appropriately marked with warning signs and pavement markings. At Shady Rest Park, an existing at-grade crossing should serve adequately to help safely access the park facilities, restrooms and play fields.

Walkers and Joggers would also have to share the pathway with other primary users. For this reason, an adjacent foot path is proposed along the western leg of the Trail to help reduce user conflicts.

The grade change from the beginning of the Shady Rest Park Trail western leg to the end of the eastern leg is 100' vertical drop in 6200' lineal, or 1.6%, well within recommended standards. It should be noted, however, there is a descent of about 60' in the last 2400' (2.5%) of the eastern leg of the Trail.

Sawmill Cutoff is used in the wintertime by snowmobiles to access Shady Rest Park and the vicinity beyond. Care should be taken to avoid conflicts with wintertime users of the Shady Rest Park Trail and snowmobiles.

Lastly, cross-country ski use of the Shady Rest Trail would have to be coordinated with existing ski trails in the vicinity of the Forest Service Visitor Center. There could be a great deal of confusion if the wintertime use of the Trail is not carefully integrated with the exiting marked ski trails.

Shady Rest Park Trail Opportunities.

The Shady Rest Park Trail Future/Alternative has a great deal to offer in terms of access to users, facilities, and terrain. The relatively flat Trail, combined with the Main Path of the MLT, could stand alone as one of the most well-used recreational trails in the area. The proximity to the campground, to Shady Rest Park and to the Visitor Center(s) make the potential for use very high.

Another feature of the Shady Rest Park Trail is the safety it would provide for users who might otherwise be using Sawmill Cutoff to access the Park. The narrow roadway along Sawmill Cutoff is dangerous for vehicles, much less for non-vehicular traffic. The addition of an adjacent foot path along the western leg also will add a margin of user safety to the Shady Rest Park Trail. Further, campground users could easily access the Park area without using their vehicles. It also provides additional access to the overall MLT System and to other Trails, such as the Knolls Trail and the Overlook Trail.

The rest rooms, water and other recreational facilities of Shady Rest Park are existing features that can serve the Trail users at little or no additional cost.

It should be noted that the Town has received a grant for construction of a portion of the cost of the Trail along the western leg (the construction is pending a final decision on concerns for vehicle access to the Park).

Lastly, the pathway would be very highly visible to residents and visitors who frequently use Shady Rest Park and or the Shady Rest Campground.

Length/Cost - Shady Rest Park Trail.

	Unit	Unit Cost	Cost
Paved Path	6200'	$30/ft	$186,000
Foot Path	3400'	10/ft	34,000
Connector Paths	na	na	0
Undercrossings	na	na	0
		Total	**$220,000**

(Note: about 65% of the cost is attributable to the western leg, or about $143,000.)

Right-of-Way Costs for Shady Rest Park Trail

It is assumed that any right-of-way needed would be approved at no cost to the public since it is already in public ownership.

Future/Alternative - Meridian Trail

Meridian Trail Description.

From the end of the Eastern Connection (Main Path Segment 2) near Commerce Road, a major Future/Alternative Trail called the "Meridian Trail" is proposed to follow along the north side of Meridian Boulevard. The 8' minimum width paved pathway would lead west along the industrial park, the "Trails" single family subdivision, the Mammoth Elementary School and finally the Mammoth High School (see map Segment 3)

Right-of-way along the industrial park is already in the Town's ownership while trail easements have been dedicated along the Trails subdivision. The school district has an existing unpaved path between the Elementary School and the High School. This path could be improved and extended to serve as part of the Meridian Trail. The school district has supported construction of a trail along this route (note: a grant for construction of a paved path along the schools has recently been awarded to the Town).

The terminus of the Meridian Trail would be at the High School, near the corner of Meridian Boulevard and Sierra Park Road, where it could connect with on-street bikeways. Parking for trail users could be accommodated in the existing High School parking lot. It may be desirable to develop a small staging area at this location, including benches, bike racks, water and restroom facilities. The school district would have to give approval for such development.

Meridian Trail Uses.

Primary uses that could be accommodated along this segment include:

- walking
- jogging
- mountain biking
- road biking
- cross-country skiing

Meridian Trail Potential Problems.

There does not appear to be any significant physical problems with the Trail. The grade of the path appears acceptable although there is a noticeable grade change of 170' in 5100' (3.3%) along the way.

There are three at-grade street crossings along Meridian Trail: two places where Wagon Wheel Road (a loop street) intersects Meridian Boulevard and one at the entrance to the Elementary School. These roadways are generally low volume/low speed streets which should not cause significant problems for Meridian Trail (peak volumes at the Elementary School may be important, however). Where the Trail crosses these streets, it should be set back from Meridian Boulevard as suggested in Figure 2.

Meridian Trail Opportunities

One of the most important aspects of the Meridian Trail is in the provision of a safe off-street route to the two schools. Additionally, the Trail would serve local residents by providing a safe off-street path along the single family subdivision and to the Town's Industrial Park.

Another major feature of the Trail would be the "loop" that would be formed with the East Mammoth Creek segment of the Main Path (Segment 3). Trail users along the loop could have a 2.4 mile off-street trail that would carry them from the High School to Mammoth Creek Park (on-street bikeways would have to be utilized to complete an entire loop).

Length/Cost - Meridian Trail.

	Unit	Unit Cost	Cost
Paved Path	5100'	$30/ft	$153,000
Foot Path	na	na	0
Connector Paths	na	na	0
Undercrossings	na	na	0
		Total	$153,000

(Note: about $50,000 of this amount will come from a State Grant for the section along the schools, known as the Schools Bikepath Project.)

Right-of-Way Costs for Meridian Trail

It is assumed that any right-of-way needed would be approved at no cost to the public since it is already in public ownership or has been dedicated to the public for Trail use.

Future/Alternative - Mammoth Creek Trail

Mammoth Creek Trail Description.

Briefly introduced here is a Future/Alternative Trail that would continue eastward along Mammoth Creek (see map Segment 3). In concept, it would be a paved path that follows the existing old road from Mammoth Lakes to US Hwy 395 along the north side of Mammoth Creek. Perhaps one day it could be extended under Hwy 395 and connect to the County facilities and maybe beyond (to the Fish Hatchery or even Hot Creek?). The existing unpaved road can be used now by several of the primary uses without any construction. Future planning along this area may include formalizing this corridor for additional trail enhancements.

Length/Cost - Mammoth Creek Trail.

No length/cost estimates are included at this time.

Future/Alternative - Sherwin Trail

Sherwin Trail Description.

Near the southern end of Mammoth Creek Park, a Future/Alternative Trail, the Sherwin Trail, would connect with the Main Path and head south toward the Sherwin Mountain range, the site of the proposed Sherwin Ski Area (see map Segment 4). It would appear all primary uses could be accommodated along this Trail.

In concept, the 8' minimum width paved path would undercross Old Mammoth Road and work its way through the yet-to-be constructed "second nine" holes of the Snowcreek golf course through public land administered by the US Forest Service. To the south of the golf course, the Trail would climb to the southwest, skirting the proposed base facilities of the Sherwin Ski Area. A large hotel and condominium development is contemplated in this vicinity. In theory, the Sherwin Trail would have connector paths allowing easy access for trail users.

The trail would continue southwesterly, passing Hidden Lake along the foot of the Sherwins before turning northerly at the west end of the large meadow. The west end of the Trail would utilize Tamarack Road and part of Old Mammoth Road as on-street pathways before reconnecting with the Main Path at Waterford Avenue. A separate foot path could accompany the paved path for nearly the entire distance.

Sherwin Trail Uses.

Primary uses that could be accommodated along this segment include:

- walking (separate path provided)
- jogging (separate path provided)
- mountain biking
- road biking
- cross-country skiing

Sherwin Trail Potential Problems.

There does not appear to be any significant physical problems with the proposed Trail. The main challenge would be to integrate the Sherwin Trail with development proposals in the area.

Although the precise location of the path is not yet determined, the grade appears very acceptable with a change of only 120' vertical in 16,000' linear (0.8%), relativley flat.

The on-street parts (along Tamarack and Old Mammoth) of the Sherwin Trail are not that desirable, however, there are few other options for reconnecting the Trail with the Main Path of the MLT System.

Sherwin Trail Opportunities

One of the best attributes of this Trail is the opportunity to incorporate it as an integral part of the development that is occurring in the area. Too often, trail systems are left out of initial planning and problems are caused, such as lack of right-of-way.

The development proposals in the vicinity would create a major destination for visitors. As such, a well-designed trail system could add another dimension to the project while at the same time, promoting non-vehicular access to other parts of the Town.

Another major feature of the Sherwin Trail would be the "loop" that would be formed in combination with the Main Path (Segment 4). Trail users along the loop could have a 3.3± mile trail in one of the flattest and scenic sections of the entire MLT System.

Length/Cost - Sherwin Trail.

	Unit	Unit Cost	Cost
Paved Path	16,000'±	$30/ft	$480,000
Foot Path	15,000'±	10/ft	150,000
Connector Paths	500'±	20/ft	10,000
Undercrossings	1 (80')	1300/ft	104,000
		Total	**$744,000**

Right-of-Way Costs for Sherwin Trail

It is assumed that any right-of-way needed would be approved at no cost to the public as part of development proposals in the area.

Future/Alternative - Sherwin Creek Trail

Sherwin Creek Trail Description.

Briefly introduced here is a Future/Alternative Trail that would continue eastward from the Sherwin Trail, accessing the Sherwin Creek Campground and eventually following Sherwin Creek (see Figure 1). Conceptually, the Trail would follow the existing Sherwin Creek Road from Mammoth Lakes to US Hwy 395. The Trail may warrant paving at a future time to accommodate Road Biking and other miscellaneous uses. However, the existing unpaved road can be used now by several of the primary uses without any additional construction. Future planning along this area may include formalizing this corridor for additional trail enhancements.

Length/Cost - Sherwin Creek Trail.

No length/cost estimates are included at this time.

Future/Alternative - Mammoth Mountain Trail

Mammoth Mountain Trail Description.

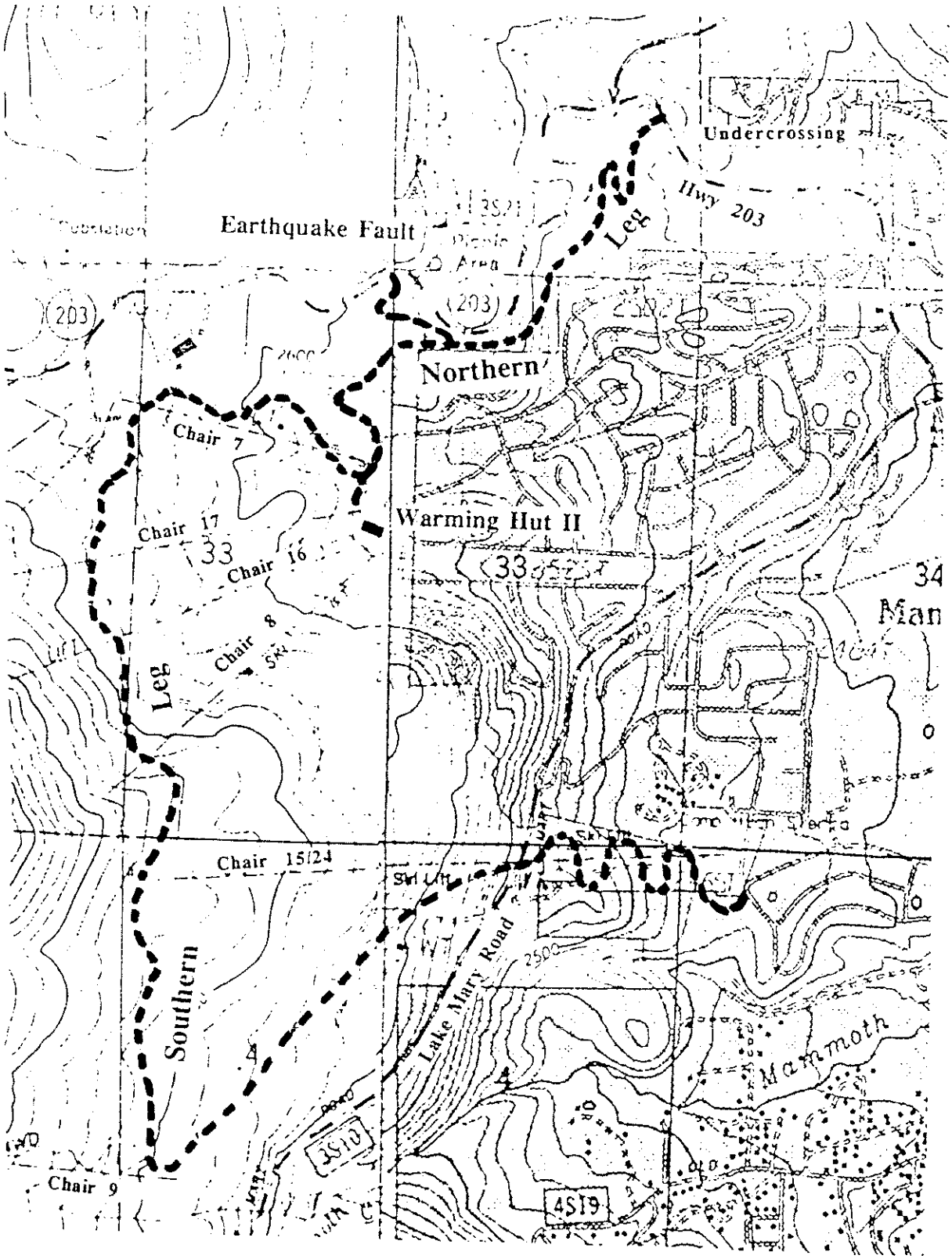
The Mammoth Mountain Trail is proposed to be within the Mammoth Mountain Ski Area (MMSA) and recently established Mountain Bike Park (see map **Mammoth Mountain Trail**). The property is under permit for skiing and biking from the Inyo National Forest. The Trail would be more limited in the primary users due to the steeper terrain and would not be paved. Trail width would be about 5'. The path could form the western side of the Mammoth Lakes Trail System and provide a connection from the southern parts of the Main Path to the northern sections. The following paragraphs describe a possible routing of the Mammoth Mountain Trail through the MMSA area with the intent of being coincident with segments of the eastern Mammoth Mountain Bike Park trails. The southern leg of the Trail is described first, followed by the northern leg.

Beginning at the Chair 15/24 area where the Main Path (Segment 4) would end at Meridian Boulevard and Majestic Pines Drive, the southern leg of the Mammoth Mountain Trail would wind its way up generally under Chair 15/24. At Lake Mary Road, the path would utilize the existing ski run overcrossing of Lake Mary Road and continue alongside the ski run known as "Sleepy Hollow." The Trail would be relatively steep from the Base of Chair 15/24 to Lake Mary Road with an elevation change of 270' in about 3000' of switchbacks, a grade of 9.0% (substantially more switchbacks would be needed to reduce the grade to that recommended for road bike use). From Lake Mary Road, the grade increases to about 10.2% as the path heads southwesterly some 4600' along Sleepy Hollow away from Chair 15/24 to near the base of Chair 9 at an elevation of 8820'. From Chair 9, the Trail would turn northerly and lead back 2800' along "Holiday" ski run to the top of Chair 15/24, the highest point of the Mammoth Lakes Trail System at an elevation of 9050'. The grade from Chair 9 to the top of Chair 15/24 would be about 8.2%. The average grade change from the beginning of Segment 7 at the base of Chair 15/24 to the top of Chair 15/24 would be 9.3% in about 2 miles (10,400') of pathway.

The Mammoth Mountain Trail would continue north following the Mammoth Mountain Bike Park National XC trail under Chairs 8, 22, 16 and 17 across to near the top of Chair 7. The grade would be downhill, dropping 380' in about 5300' of trail (7.1%).

From near the top of Chair 7, the Mammoth Mountain Trail would continue down another 330' (to elevation 8340') in about 3100' of trail (10.6%) to the bottom of Chair 7 in close proximity to Warming Hut II. A connector path would provide access to Canyon Boulevard and the parking area at Warming Hut II. The average grade from the top of Chair 15/24 to the base of Chair 7 would be 8.5% in about 1.6 miles (8400'). Again, the Trail location is described for discussion purposes only and could have many different alignments.

The northern leg of the Mammoth Mountain Trail would proceed from the Warming Hut II area (at the connector path from the Warming Hut II parking lot) to an undercrossing of Hwy 203 near the Scenic Loop intersection. It would proceed north and then east from the base of Chair 7 along the north side of the Mammoth Ski and Racquet Club. A connector path could lead to the Earthquake Fault geologic site on the north side of Hwy 203. Terrain is moderately steep along this part with the trail first ascending from elevation 8340' to elevation 8400' and then descending back to elevation 8340' before turning directly north toward the Scenic Loop.



Mammoth Mountain Trail

L.K. Johnston and Associates

The northern leg of the Mammoth Mountain Trail would continue to descend, generally parallel to Hwy 203. There would be at least one large switchback encountered before arriving at the proposed undercrossing of Hwy 203, elevation 8210'. The grade change would be uphill 5.2% for the first 1150' and then 3.5% downhill for the next 5500'. At Hwy 203, the northern leg would end at the beginning of the "Knolls Trail" with the path undercrossing Hwy 203 in a 12' x 10' x 60' concrete box culvert.

Mammoth Mountain Trail Uses.

Primary uses that could be accommodated along this segment include:

- walking
- jogging
- mountain biking
- cross-country skiing

Mammoth Mountain Trail Potential Problems.

The most important physical problem is the elevation change along the Trail as it finds its way along the Mammoth Mountain ski and mountain bike trails. It does not appear that the northern leg of the Trail could be paved with the grades involved.

From Warming Hut II to the Scenic Loop, there are parts with steep cross slopes and paving of the path would be costly with much more grading involved. However, the overall grade change (2% in 1.3 miles) may lend itself to future paving.

There are no Bike Park or ski runs present in the Hut II to Scenic Loop northern leg so there should be fewer potential conflicts as compared to the southern leg of the Mammoth Mountain Trail. It should be noted that future MMSA plans may include a ski return in the same general location as the northern leg. When and if this ski run is constructed, it would have to be coordinated with whatever Trail might be present and vice-versa.

Since the northern part of the Mammoth Mountain Trail passes near residential areas, there may be perceived encroachment and/or privacy considerations from homeowners along the north side of the Town. Except for the Mammoth Ski and Racquet Club, the Trail is more than 200' from the nearest residence. The path comes within 50' of one group of condominiums in the Mammoth Ski and Racquet Club complex.

The undercrossing of Hwy 203 would require coordination and careful planning with Caltrans. It would also be a major cost of the Trail.

Environmental considerations may be important since there are steep cross-slopes and grading would occur in potentially unstable soils.

The integration of the Mammoth Mountain Trail with the Mammoth Mountain Bike Park and Ski Area would have to meet approval of the MMSA and Forest Service. The intent of the Trail would be to follow established mountain bike trails and allow additional uses such as hiking and cross-country skiing. This may cause potential conflicts between users, especially if there is high use of the Trail. A separate foot path may be desirable in certain areas.

Another area of potential conflict might occur between downhill skiers and cross-country skiers, if allowed, and if the Trail is used extensively in the winter by cross country users. Again, this would have to be considered by the MMSA. It may be that the Trail routing in winter would have to be somewhat different than in summer to avoid conflicts.

Mammoth Mountain Trail Opportunities.

One of the most important opportunities of the Mammoth Mountain Trail is the possibility to connect the northern MLT System with the southern side, thus forming a continuous large loop around the Town. Although the grades do not readily lend themselves to paving for road bike and other uses, the use of this part of the Trail for walking, hiking, mountain biking and cross-country skiing would be very important.

The highest point along the entire Mammoth Lakes Trail System would be encountered on this Trail while almost all of this section offers outstanding views of the Town and surrounding scenery.

Another opportunity lies in access to and joint use of Mountain Bike Park Trails in conjunction with the Mammoth Lakes Trail System. Such joint use could save costs in Trail construction and at the same time promote use of the Mountain Bike Park.

The utilization of the Mammoth Mountain Trail for cross-country skiing also offers great opportunity if potential conflicts between downhill skiers and cross-country skiers can be eliminated.

Even without the southern leg of the Mammoth Mountain Trail, construction of the northern leg would allow Trail users the opportunity to reach an important destination (Warming Hut II) from the Knolls Trail and to use Warming Hut II as a staging area for the Trails. For example, a person could mountain bike from Warming Hut II to the Base of Chair 15/24 via the Knolls Trail to Shady Rest Park and then on the Main Path to Mammoth Creek Park and back to Chair 15 without crossing a major street!

Like other Trails along the north side of Town, the path potentially would help form a fire break on the north side of the Town of Mammoth Lakes.

Future paving of the northern leg of the Mammoth Mountain Trail (between Hut II and the Scenic Loop) may be possible if environmental and other considerations are mitigated.

An opportunity also exists to connect the northern leg of the Trail to the Earthquake Fault interpretive facilities as shown on the map Mammoth Mountain Trail.

Length/Cost - Mammoth Mountain Trail.

Southern Leg

	Unit	Unit Cost	Cost
Pathway[11]	18,800'	$5/ft	$94,000
Connector Paths	200'	10/ft	2,000
Undercrossings	na	na	0
		Subtotal	$96,000

[11] It is assumed that Trail costs would not exceed $5/foot since the joint use of existing mountain bike trails would be possible; the cost estimate above would include signing, minor improvements and other trail enhancements for multiple use.

Northern Leg

	Unit	Unit Cost	Cost
Pathway	6650'	$10/ft	$66,500
Connector Paths	2000'	10/ft	20,000
Undercrossings	1/2 (30')	1,300/ft	39,000
		Subtotal	$125,500
		Total	**$221,500**

Right-of-Way Costs for Mammoth Mountain Trail

It is assumed that any right-of-way needed would be approved at no cost to the public as part of the Mammoth Mountain Ski Area which is located on Forest Service lands.

Future/Alternative- Knolls/Overlook Trail

Knolls/Overlook Trail Description.

These Future/Alternative Trails would be located on public land administered by the Inyo National Forest. There have been several possible routings of the Trails presented and two of these are shown on the **Knolls/Overlook Trail** map. The intent of the Knolls Trail would be to connect the Mammoth Mountain Trail (northern leg) along the entire north perimeter of the Town to the Shady Rest Trail, eventually allowing a continuous large loop trail system around the community. Two potential routings of the Knolls Trail are described below for future consideration by the Town. (The "South Route" of the Knolls Trail has been deleted by the Parks and Recreation Commission.)

Knolls Trail - Mid Route.

From the intersection of Hwy 203 and the Mammoth Scenic Loop (where an undercrossing of Hwy 203 is suggested), the Mid Route would follow above the Mammoth Knolls subdivision, but instead of continuing along the cross-sloped terrain to the northeast of the Community Center Park, it would continue directly up the steep terrain in a series of switchbacks to the top of the "Knolls." From there, the Mid Route would be located on the more or less flatter terrain along the upper edge of the "Knolls" overlooking the Town, eventually reaching elevation 8700'±. A rapid switchback descent would be needed in the eastern part of the Mid Route to reach the Overlook Trail, which would eventually lead down to Shady Rest Park on the existing unpaved Forest Service Road #3S35.

Because the Mid Route would be cut into terrain with steep slopes, the Trail is envisioned to be a fairly narrow (5'±) unpaved path for most of the Route. The trail would climb (5.1% grade) to elevation 8700' in about 9600' and then descend to the Overlook Trail and down to elevation 7800' (5.2% grade) near the Shady Rest Park in a total of about 17,200' linear (3.25 miles).

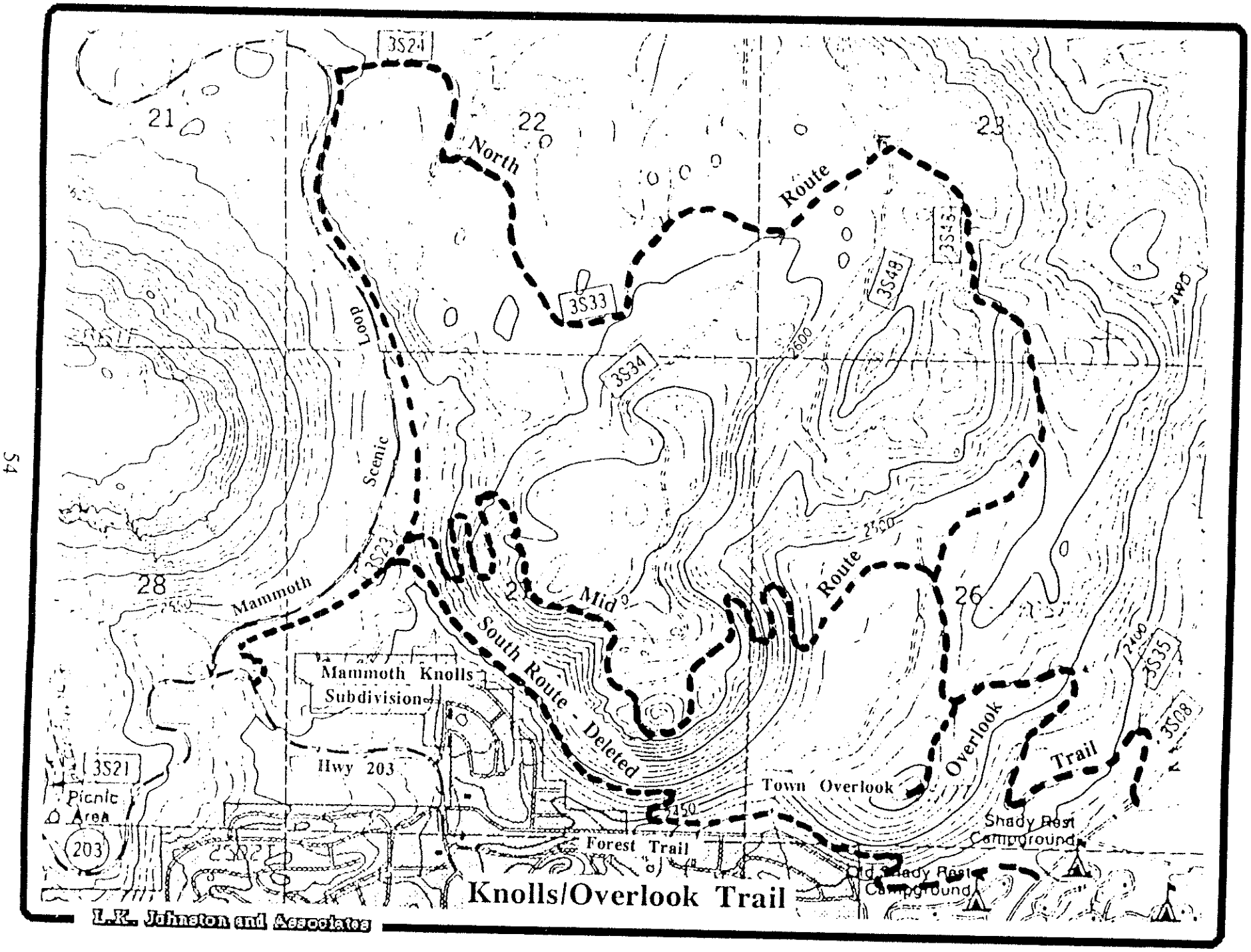
Knolls Trail - North Route.

From the intersection of Hwy 203 and the Mammoth Scenic Loop (where an undercrossing of Hwy 203 is suggested), the North Route would follow above the Mammoth Knolls subdivision, continuing north along the Mammoth Scenic Loop road until coming to the Forest Service Road #3S24. The North Route would follow this unpaved road a short distance to unpaved road #3S33. It would then follow road #3S33 to unpaved road #3S48. From there, the North Route would continue to the Overlook Trail, a part of road #3S35, which leads back to Shady Rest Park.

The North Route would require Trail construction for only the first 8000', basically alongside the Mammoth Scenic Loop road, until coming to Forest Service Road #3S24. From there the route would follow the existing Forest Service roads to Shady Rest Park. The path would climb to elevation 8530' and then descend to the Overlook Trail and down to elevation 7800' near the Shady Rest Park in about 28,000' linear (5.30 miles).

Overlook Trail .

This Future/Alternate Trail would lead to a viewpoint overlooking the Town. It would connect with the Western Leg of the Shady Rest Park Trail at Sawmill Road near Shady Rest Park. This route also is shown in the map **Knolls/Overlook Trail**. The length of the Overlook Trail is about 6800' (1.3 miles). Most of the Overlook Trail would be coincident with the Mid and North Routes of the Knolls Trail alternatives, using Forest Service Road #3S35. The Overlook Trail could "stand alone" without the Knolls Trail.


3S24
21
22
23
North
Route
3S33
3S48
3S45
Loop
3S34
2600
2400
Scenic
3S23
28
Mammoth
Mid
South Route - Deleted
Route
26
2500
Mammoth Knolls
Subdivision
Hwy 203
3S21
Picnic
Area
203
2350
Forest Trail
Town Overlook
Overlook
Trail
3S35
3S08
Shady Rest
Campground
Old Shady Rest
Campground
Knolls/Overlook Trail
L.K. Johnston and Associates

Knolls/Overlook Trail Uses.

Primary uses that could be accommodated along this segment include:

*walking
*jogging
*mountain biking
*cross-country skiing

Knolls/Overlook Trail Potential Problems.

The number one problem with the routes is the terrain that would have to be negotiated. For the Mid Route, steep terrain would require the use of many switchbacks. Construction cut/fill may create a visual problem as well as a soil stability problem.

Problems with the North Route and the Overlook Trail include the use of the Forest Service Roads by automobiles, potentially conflicting with Trail users.

Another problem with the North Route, and to a lesser extent with the Mid Route, is the relative remoteness of the alternates; they would both be much more isolated than any of the other Trails and less accessible to the general Trail user.

Concern already has been expressed from perceived encroachment and/or privacy considerations from homeowners along the northern perimeter of the Mammoth Knolls subdivision regarding possible placement of the Knolls Trail - South Route. This is the primary reason it has been deleted by the Parks and Recreation Commission.

Apparently, the Forest Service has not yet completed the use studies of the area for off-road vehicles and/or trail use. This may complicate placement of any of the Knolls Trail alternatives.

Knolls/Overlook Trail Opportunities.

The Mid Route of the Knolls Trail and the Overlook Trail would offer spectacular views of the Town and surrounding mountain scenery. The Mid Route could utilize some parts of existing Forest Service roads along the top of the "Knolls." Perceived encroachment and/or privacy concerns almost would be eliminated.

The North Route of the Knolls Trail would have the advantage of utilizing existing Forest Service roads with little additional construction. Indeed, these roads are used now for Mountain Biking. Additionally, cross-country ski trails are already in place along these roadways. Grades along this Route would be reasonable and perceived encroachment and/or privacy concerns would be eliminated.

Length/Cost - Knolls/Overlook Trail.

Mid Route

	Unit	Unit Cost	Cost
Pathway	17,200'	$10/ft	$172,000
Connector Paths	1100'	10/ft	11,000
Undercrossings	1/2 (30')	1,300/ft	39,000
		Total	$222,000

North Route

	Unit	Unit Cost	Cost
Pathway (new)	8000'	$10/ft	$80,000
Pathway (existing roads)	20,000'	5/ft	100,000
Connector Paths	1100'	10/ft	11,000
Undercrossings	1/2 (30')	1,300/ft	39,000
		Total	$230,000

Overlook Trail (alone)

	Unit	Unit Cost	Cost
Pathway (existing road)	5600'	$5/ft	$10,000
Pathway (new)	1200'	10/ft	12,000
Connector Paths	na	na	0
Undercrossings	na	na	0
		Total	$22,000

Overlook Trail (with North or Mid Routes)

	Unit	Unit Cost	Cost
Pathway (new)	1200'	10/ft	12,000
Connector Paths	na	na	0
Undercrossings	na	na	0
		Total	$12,000

Right-of-Way Costs for Knolls/Overlook Trail

It is assumed that any right-of-way needed would be approved at no cost to the public since the area is already in public ownership.

Phasing/Cost Summary[12]

5/91

Year	Segment / Description	Funding Source	Cost
1991	4a - Mam Cr Pk to Minaret	Local	$141,000
	4b - Minaret to Waterford	Local	$221,000
	Shady Rest Park Trail Western Leg	State Grant/Local	$143,000
	Meridian Trail - Schools Bikepath	State Grant/Local	$56,000
		Total	**$561,000**
1992	4c - Waterford to Chair 15	Local	$223,000
	1 - Shady Rest Main Path	State Grant/Local	$230,500
		Total	**$453,500**
1993	3 - East Mammoth Creek	State Grant/Local	$392,000
	Shady Rest Park Trail - Eastern Leg	State Grant/Local	$77,000
	Meridian Trail - Remainder	State Grant/Local	$97,000
		Total	**$566,000**
1994	5 - Lodestar	Developer/Local	$304,000
	6 - Main Street	State Grant/Local	$44,000
	2 - Eastern Connection	State Grant/Local	$278,000
		Total	**$626,000**
1995	Sherwin Trail	Developer/Local	$744,000
		Total	**$744,000**
1996	Overlook Trail	Local	$12,000
	Mammoth Mountain Trail	Local	$317,500
		Total	**$329,500**
1997	Knolls Trail (most costly route)	Local	$230,000
	Mammoth Creek Trail	Local	unknown
	Sherwin Creek Trail	Local	unknown
		Total	**$230,000+**
		Grand Total	**$3,510,000**

[12] Note: costs for the on street bike route system are not included in this cost summary.

Main Path Length/Cost Summary

Segment	Main Path	Foot Path	Connector Path	Under-crossings	Segment Cost
1	4200'	4100'	950'	na	$230,500
2	3300'	na	na	1	$278,000
3	7600'	1700'	850'	1.5	$392,000
4a	900'	1600'	350'	1	$141,000
4b	4300'	3200'	300'	0.5	$221,000
4c	6000'	2100'	350'	na	$223,000
5	7700'	7000'	150'	1 existing	$304,000
6	3500'	na	na	na	$44,000
Total	**37,500'** (7.1 mi)	**19,700'** (3.7 mi)	**2,950'** (0.6 mi)	**5**	**$1,833,500** ($160,833/mi)

Future/Alternative Length/Cost Summary

Trail	Main Path	Foot Path	Connector Path	Under-crossings	Segment Cost
Shdy Rst Prk	6200'	3400'	na	na	$220,000
Meridian	5100'	na	na	na	$153,000
Mam Creek	na	na	na	na	na
Sherwin	16,000'	15,000'	500'	1	$744,000
Mam Mtn	25,450'	na	2200'	0.5	$317,500
Knolls(nrth)	28,000'	na	1100'	0.5	$230,000
Overlook	1200'	na	na	na	$12,000
Total	**67,550'** (12.8 mi)	**18,400'** (3.5 mi)	**3,800'** (0.7 mi)	**2**	**$1,676,500** ($98,618/mi)
Grnd Total	**105,050'** (19.9 mi)	**38,100'** (7.2 mi)	**6,750'** (1.3 mi)	**2**	**$3,510,000** ($123,592/mi)

Appendix

Figure 1003.1A

Two-way Bike Path on Separate Right of Way

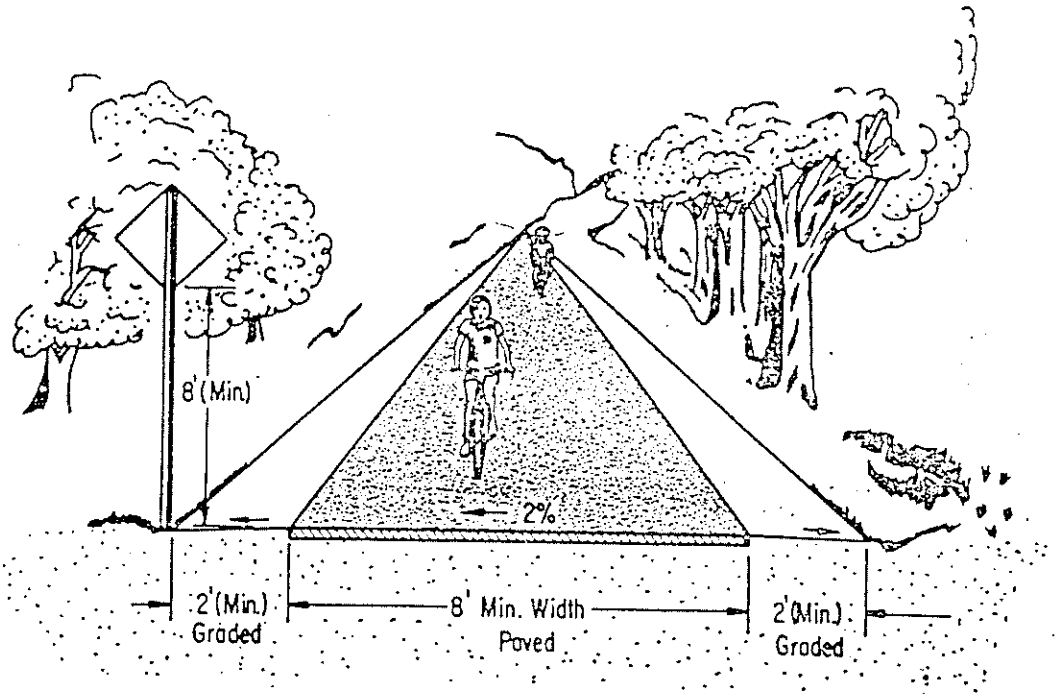
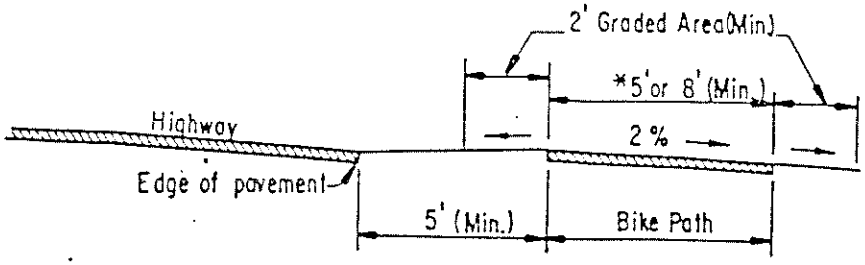


Figure 1003.1B

Typical Cross-Section of Bike Path Along Highway

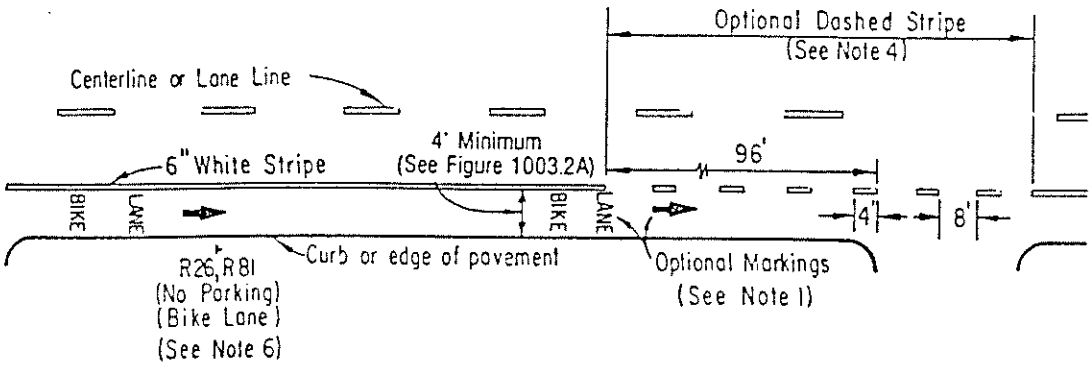


*One-Way: 5' Minimum Width
Two-Way: 8' Minimum Width

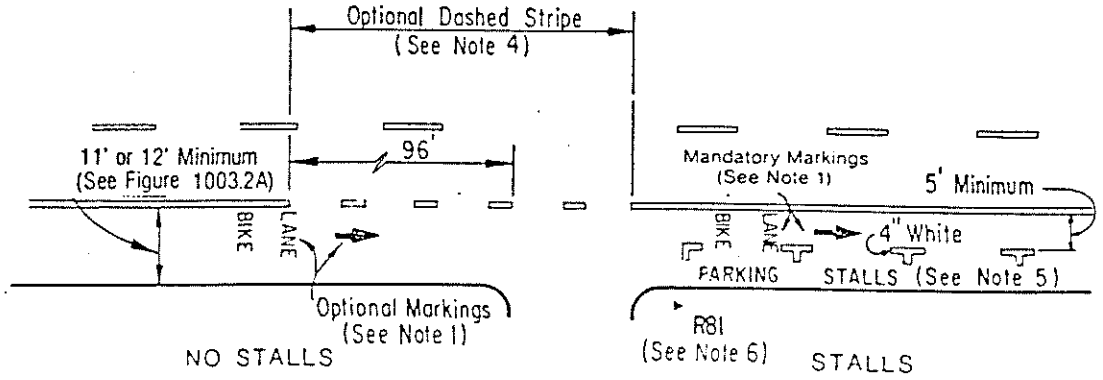
Figure 1004.3

Bike Lane Signs and Markings

WHERE VEHICLE PARKING IS PROHIBITED

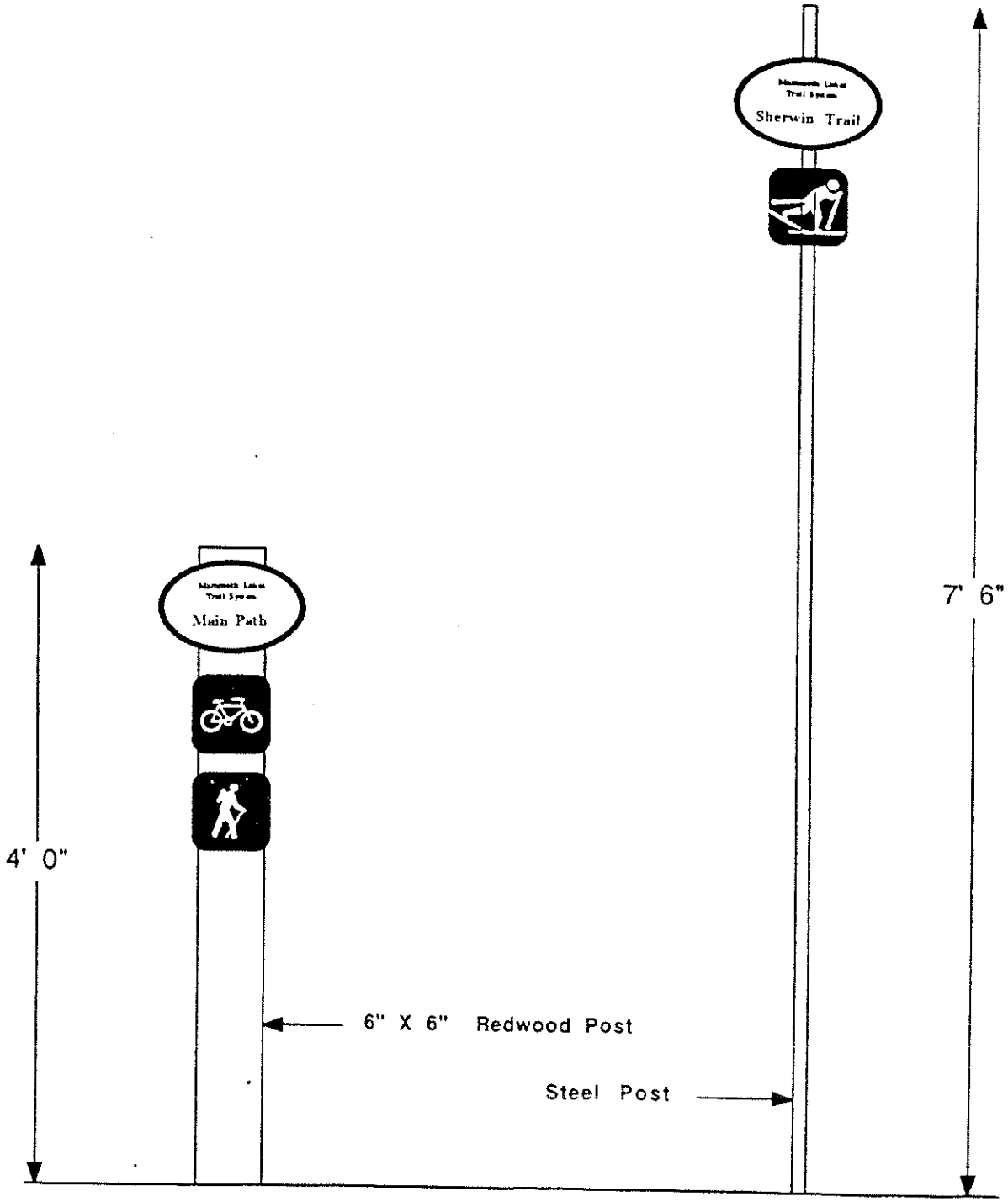


WHERE VEHICLE PARKING IS PERMITTED



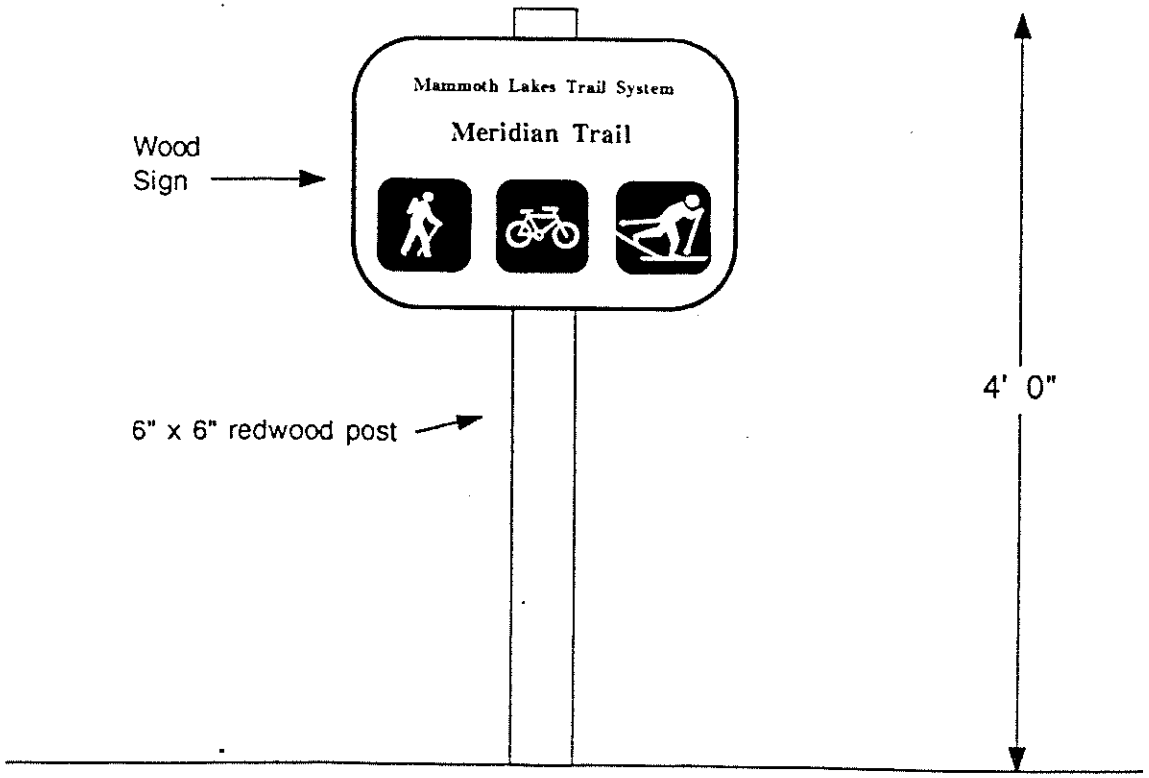
NOTES:

1. The Bike Lane pavement markings shall be placed on the far side of each intersection, and may be placed at other locations as desired.
2. The use of the bicycle symbol pavement marking to supplement the word message is optional.
3. The G93 Bike Route sign may be placed intermittently along the bike lane if desired.
4. The bike lane line may either be dropped entirely, 96' in advance of the intersection, or a dashed line carried to the intersection or through the intersection.
5. In areas where parking stalls are not necessary (because parking is light), it is permissible to paint a 4" solid white stripe to fully delineate the bike lane. This may be advisable where there is concern that motorists may misconstrue the bike lane to be a traffic lane.
6. The R81 bike lane sign shall be placed at the beginning of all bike lanes, on the far side of every arterial street intersection, at all major changes in direction, and at maximum half-mile intervals.



Mammoth Lakes Trail System Signing

Example A



Mammoth Lakes Trail System Signing

Example B

Mammoth Lakes Trail System

•Sign Provisions•

Prepared for the Town of Mammoth Lakes, CA by:

L.K. Johnston and Associates
Planning, Environmental Review, Landscape Architecture
P.O. Box 1903
Mammoth Lakes, CA 93546
(619) 934-4311

Trail Signing

Town of Mammoth Lakes Trail System

6-96

General

The intent of these signing provisions is to create an aesthetic, practical and consistent trail signing system for the Mammoth Lakes Trail System, including on-street bikeways and off-street trails.

On-Street Bicycle Lane and Route Signing

On-Street Bicycle Lanes shall utilize the Caltrans Highway Design Manual, Chapter 1000, Topic 1003.2 (for Bike Lanes) and Topic 1003.3 (for Bike Routes) for designating Bike Routes and Lanes in the Town of Mammoth Lakes. Uniform Signs and Markings and Traffic Control Devices shall be in accordance with Topic 1004 of the Highway Design Manual (Topic 1000 is attached).

Off-Street Main Path and Trail Signing

The off-street signing provisions for the Main Path of the Mammoth Lakes Trail System and the Future/Alternative Trails in the Trail System Plan shall adhere to the following provisions (see Exhibits A, B, C, D, E, F, G, H and I).

A. Sign Design

Signing for the Mammoth Lakes Trail System, including the Main Path and Future/Alternative Trails shall be installed as detailed in Exhibits A through I; there are seven sign types, Type 1 through Type 7.

Type 1 Signs. Type 1 Signs (see Exhibit A) are double faced signs to be located along the MLTS at intervals of approximately 2000 feet. Their main purpose is for periodic Trail identification along the Trail System.

Type 1 Signs are composed of standardized components (which also are reflected in the other sign types). The first component is a 2" nominal thickness redwood elliptical sign, approximately 7" x 15", containing a symbol similar to the Town's logo, i.e., blue mountain with green trees on the right side and lettering along the base of the mountain. The edges of the elliptical sign are to be smoothly rounded (12" radius) and painted "Town blue." The lettering along the base of the mountain is to be in black and read "Mammoth Lakes Trail System" (See Exhibit B). A prototype of this sign is available at the Town offices.

The second component is a changeable/replaceable name plate, 1.25" x 9", which contains the name of the path or trail, e.g., "Main Path," "Meridian Trail," etc. The name plate is affixed to the elliptical sign with vandal resistant screws. It is painted to correspond to the color of the path or trail shown on the Mammoth Lakes Trail Plan Map (e.g., the "Main Path" color shall be "Town" blue) with 3/4" white letters in "Times" font. The name plate material to be 1/16" thick steel.

The third component part is standard brown metal recreational symbol signs showing the basic uses of the Mammoth Lakes Trail System, i.e., bicycling, hiking. These signs shall be 5" x 5" for the hiker and biker symbol signs (8" x 8" are to be used for the cross-country symbol signs and snowmobile prohibition symbol signs; see Type 2 sign description below).

The fourth component part of the sign is the support structure for the above parts. The primary support structure is a rough cut, 6" x 6", treated redwood post imbedded in the ground approximately 36" with a height 60" above grade, set in concrete. The top of the post shall be beveled 1" all around the top with three 1" wide x 3/8" deep routed bands spaced 10.5" on center from the top of the post. This is the standard support post used for all sign types (except Type 6 stenciled signs) and bollards (bollards are to be 48" above grade, removable and set in concrete). The Type 1 Sign post has brackets, painted dark brown, which can hold Type 2 signs for winter cross-country skiing.

<u>Type 2 Signs.</u> Type 2 Signs are used for winter cross-country ski designation along the trail system. They are double-faced signs composed of a 2" square, self-weathering steel post with a standard brown metal recreational symbol sign, approximately 8" x 8", showing the cross-country ski symbol (see Exhibit A - snowmobile prohibition symbol signs may also be specified in certain locations, also 8" x 8"). Type 2 Signs may be used as free standing signs, set in concrete or attached to Type 1, 2 or 3 Signs with brackets as noted above. When attached to Type 1, 2 or 3 sign, they need not be extended into the ground. Minimum height above grade is to be 10' 0".

Type 3 Signs. Type 3 Signs are very similar to Type 1 signs; they have the standard elliptical sign, name plate, symbol signs, and standard post with brackets for attaching Type 2 Signs (see Exhibit D). The main difference between Type 1 and Type 3 Signs is that they are single-faced with a 8" stop sign on the back. The primary purpose of Type 3 Signs is to clearly identify Trail entry points; they are to be erected at all Trail access points. The secondary function is to act as stop signs at intersections with streets, other trails, staging areas, etc., for safety purposes.

Type 4 Signs. Type 4 Signs are the Trail System's warning / caution signs, usually in yellow with black lettering. They utilize the standard 6" x 6" redwood post with an 8"± warning symbol sign and/or a written 4" x 8" sign attached as shown in Exhibit E. Various warning messages can be conveyed utilizing the Type 4 Sign. They are usually single-faced but can be double faced as needed. They may also contain brackets for attaching Type 2 Signs.

Type 5 Signs. Type 5 Signs are the System's special identifier / information signs (see Exhibit F). Again, they utilize the standard 6" x 6" redwood post with a nominal 2" thick x 7" x 15" stained redwood sign attached to the post with two counter-sunk bolts (normally single-faced). The redwood sign has a replaceable metal plate attached to it; one inch white letters in "times" font are used on a 1/16" thick x 5" x 12" metal plate painted "Town" blue. The metal plate is attached with six vandal resistant screws. They can identify parks or other special areas; they also can convey interpretive information or contain maps of the Trail System.

Type 6 Signs. Type 6 Signs are System's "negative" signs. They indicate what uses or activities may not take place on the Trail. These signs are white-painted 3" letters stenciled on the pavement of all paved paths at entry points and periodically along the system at 2000' intervals (see Exhibit G).

Type 7 Signs. Type 7 Signs are standard vehicular Bike Xing signs used as warning signs for automobiles. They are to be located in accordance with plans and specifications in accordance with Caltrans standards (see Exhibit H).

B. Sign Mounting

Each sign assembly as described above shall be mounted either double faced or single faced as needed by the sign type or location along the trail (also see Exhibit C).

The elliptical signs shall be mounted, two inches from the top of the rough cut 6" x 6" redwood post (the primary support structure). The elliptical signs shall be affixed to the redwood post with four 1/4" x 3" hex head galvanized and plated lag bolts with washers. All four bolts shall be recessed 3/8" into the elliptical sign faces for vandal resistance, two of which shall be hidden by the detachable/replaceable name plate for added vandal resistance.

The name plates shall be mounted with plated #6, 1.5" long wood screws with vandal resistant heads for added vandal resistance (the heads only turn in one direction; a special tool is needed to remove them): one screw at both ends of the plate and one screw between the words on the plate. The screws shall be painted to match the name plate color. The name plate shall hide the lower two hex head lag bolts that secure the elliptical signs.

The 5" x 5" standard symbol bicycle and hiking signs shall be mounted directly below the elliptical signs, evenly spaced between the 1" wide x 3/8" deep routed bands, and affixed with two #6, 1.5" long wood screws with vandal resistant heads (one on top and one on the bottom). Any required INF shields shall be mounted 2" below the lowest 1" x 3/8" band with two similar screws.

The Type 2, 8" x 8" standard symbol cross-country ski signs shall be mounted, facing opposite directions, with two 1/4" x 2.5" long hex head bolts, two inches from the top of the 2" square x 10' 0" minimum above grade self weathering steel tubular post. If an 8" x 8" snowmobile prohibition symbol sign is specified, it shall be mounted directly under the cross-country ski sign, usually single face only, utilizing the same type of bolts. The self weathering steel post is to be detachable from Type 1, 3 or 4 Signs (for winter use only along the various trails of the Mammoth Lakes Trail System). The post with cross-country ski symbol signs affixed shall be inserted through brackets with the brackets permanently mounted to the non trail side of the 6" x 6" redwood post. The brackets and a securing device are to be devised to prevent theft or unwanted removal of the self-weathering steel post post and cross-country ski signs. The brackets are to be painted dark brown or be self weathering steel. When the Type 2 Sign is used free-standing, the post shall be imbedded 36" in the ground (with 10' 0" above grade) and set in concrete.

B. Sign Spacing and Location

Exhibit I indicates the general spacing and location of the various sign types. Signs shall be specified in construction documents and field marked during construction. The distance of the sign base from the edge of bike pavement shall be 3' except Type 2 Signs,

standing alone, which shall be 2' from the edge of the pavement. Type 3 Signs shall be located 5' from the street pavement edge. Type 7 signs shall be located as specified.

Type 1 and two Type 6 Signs (stenciled to face opposite directions) are to be spaced every 2000' except where closer spacing is needed, for example, at intersections with connector paths or other Trails.

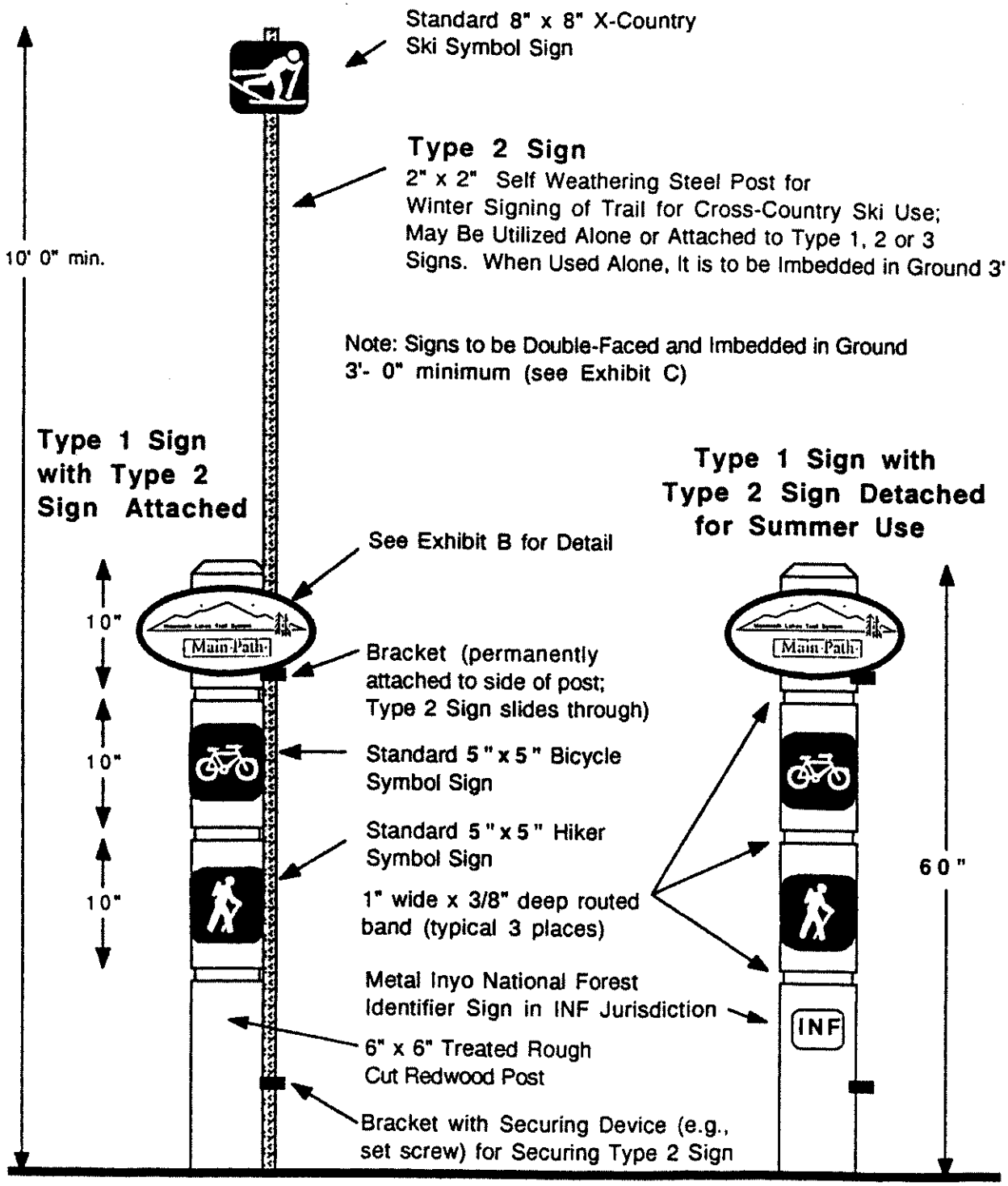
Type 2 Signs are to be placed every 200' either as free-standing units or attached to Type 1, Type 3 or Type 4 Signs, depending on spacing of the various signs.

Type 3 and Type 6 Signs are to be placed at all entry points to the system.

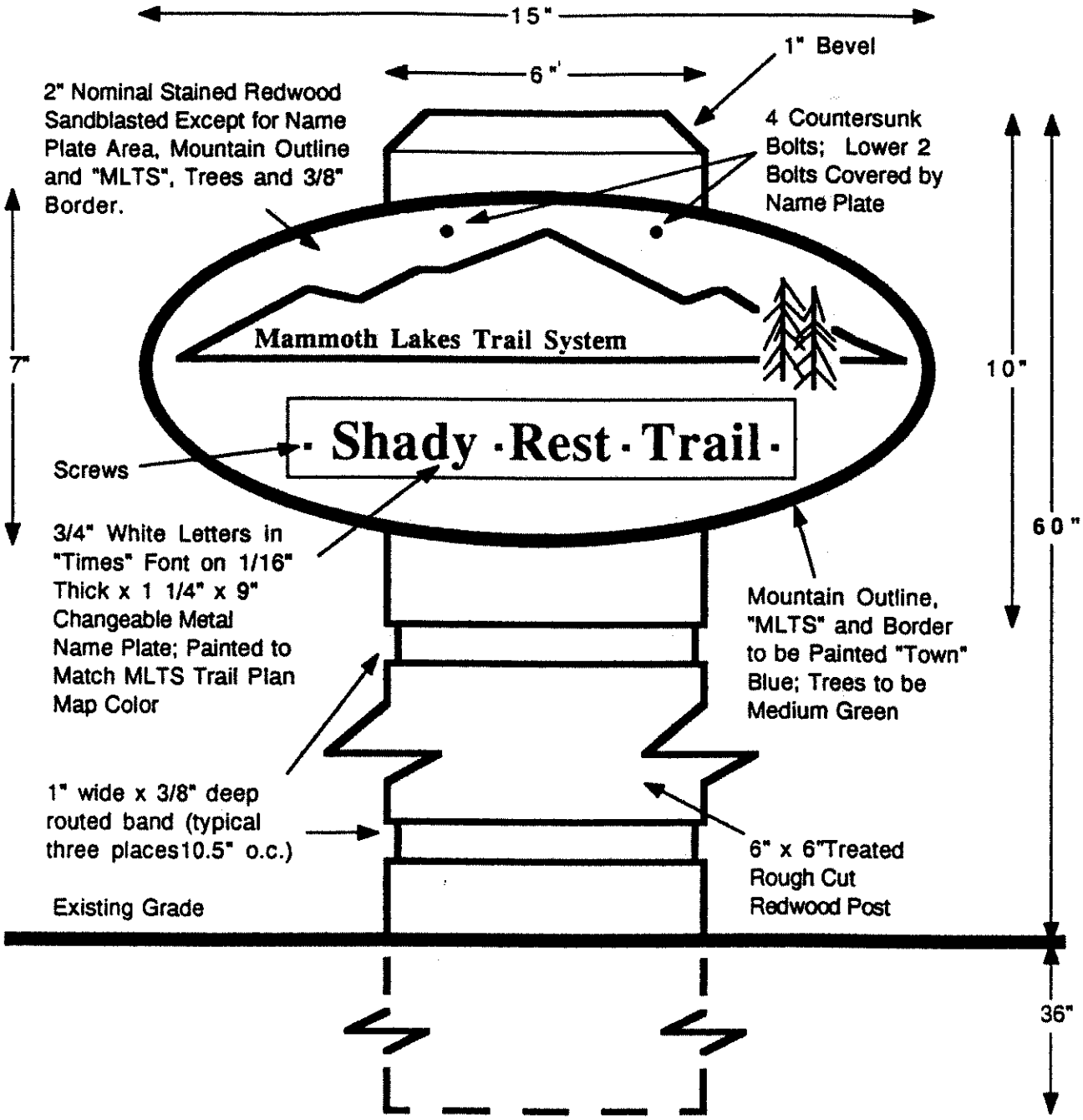
Type 4 Signs are to be placed as needed along the Trail System but coordinated with the spacing of Type 2 Signs.

Type 5 Signs, likewise are to be placed as needed along the Trail System.

Type 7 signs shall be located as specified.

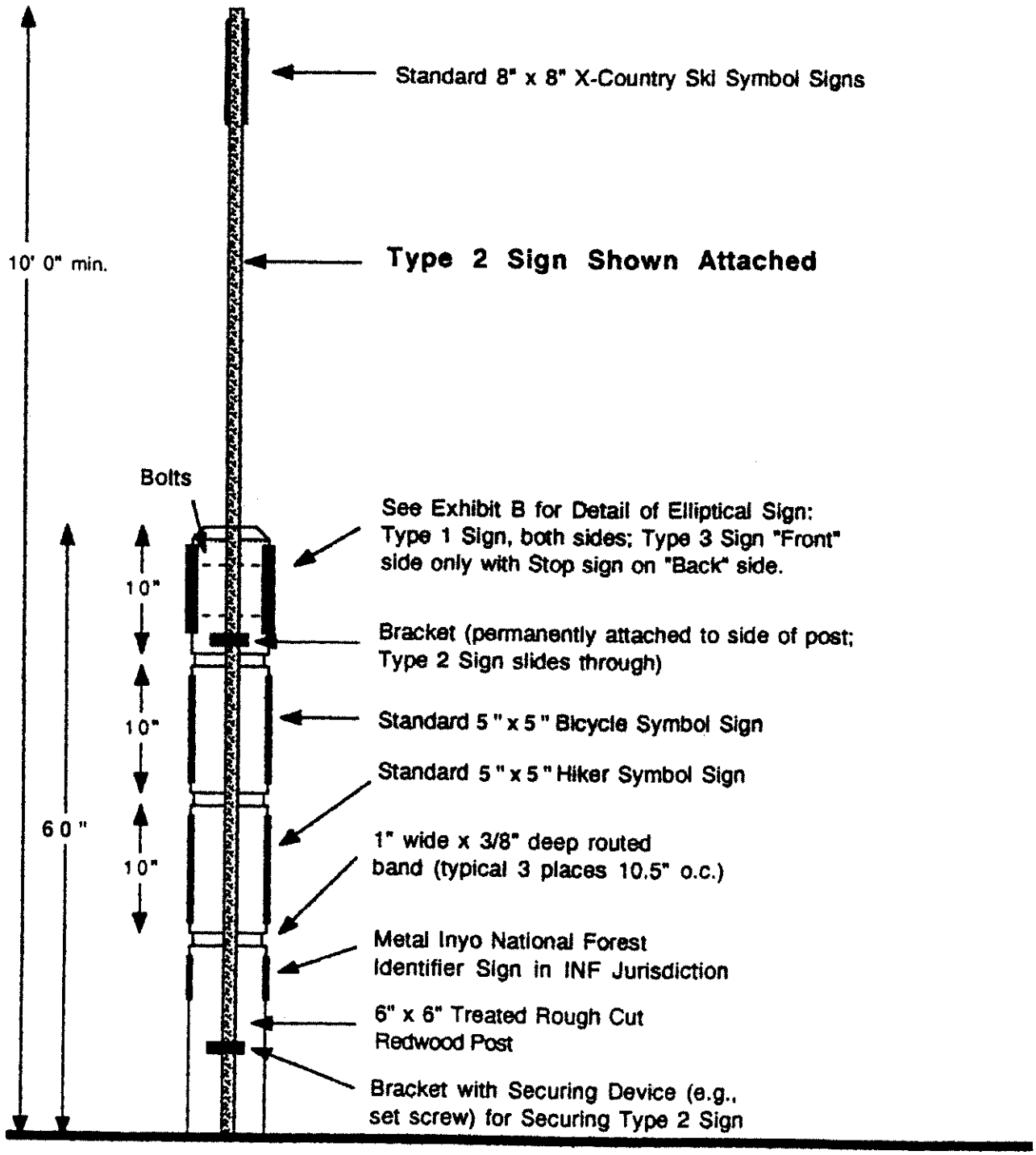


Mammoth Lakes Trail System Signing
Type 1 and Type 2 Signs
Exhibit A



Mammoth Lakes Trail System Signing

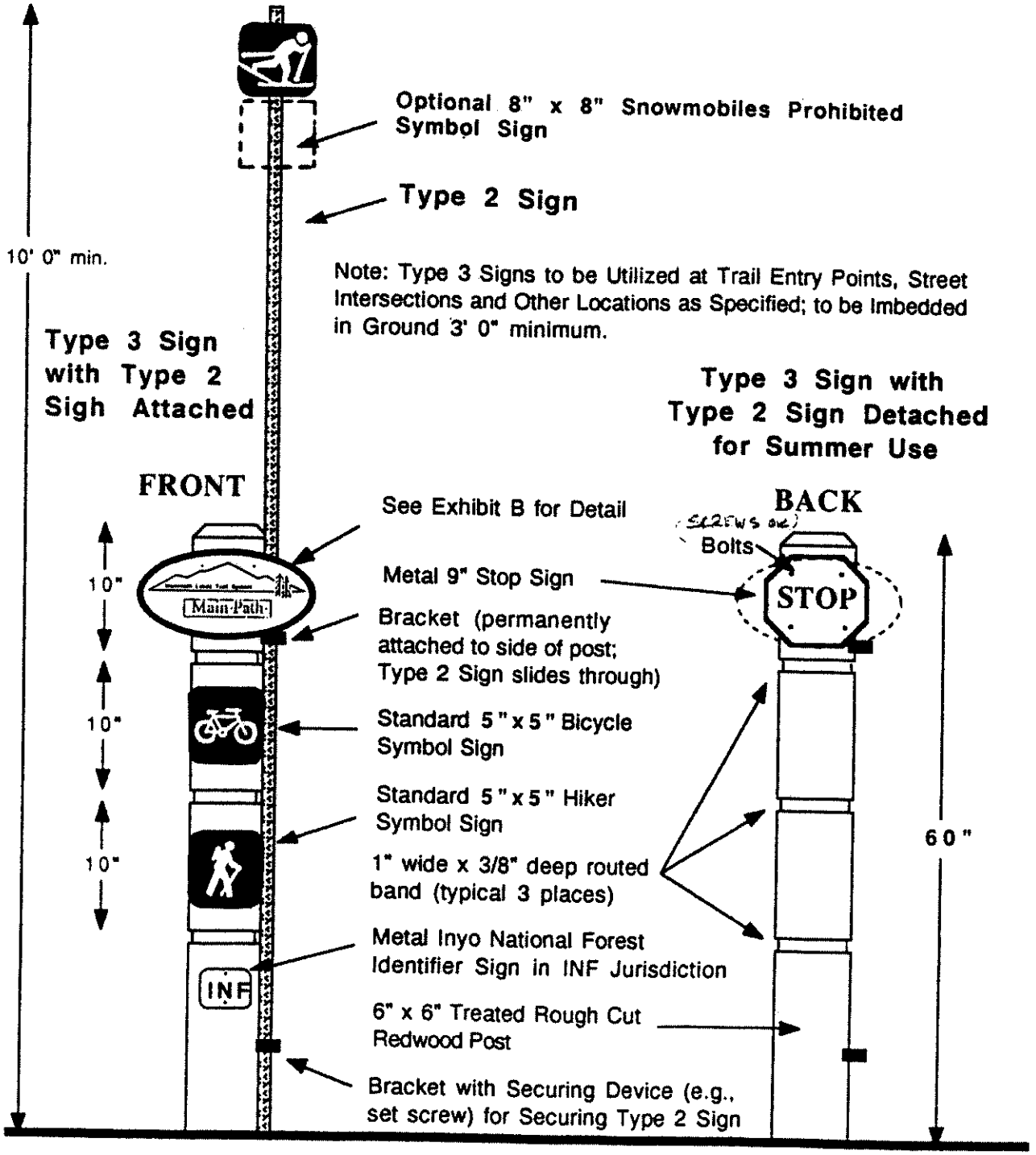
Elliptical Sign Detail
Exhibit B



Mammoth Lakes Trail System Signing

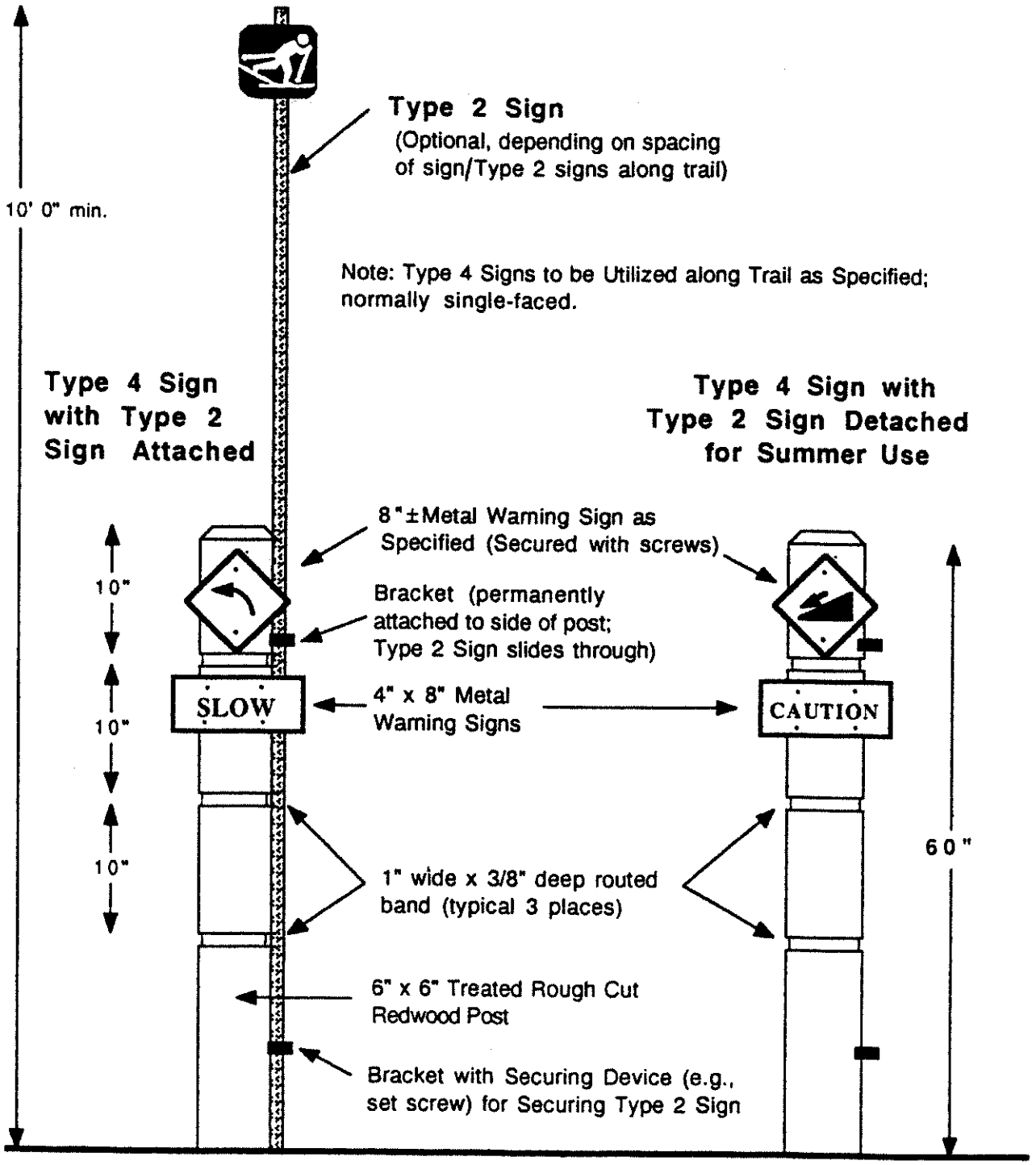
Side View Type 1, 2 and 3 Signs

Exhibit C



Mammoth Lakes Trail System Signing

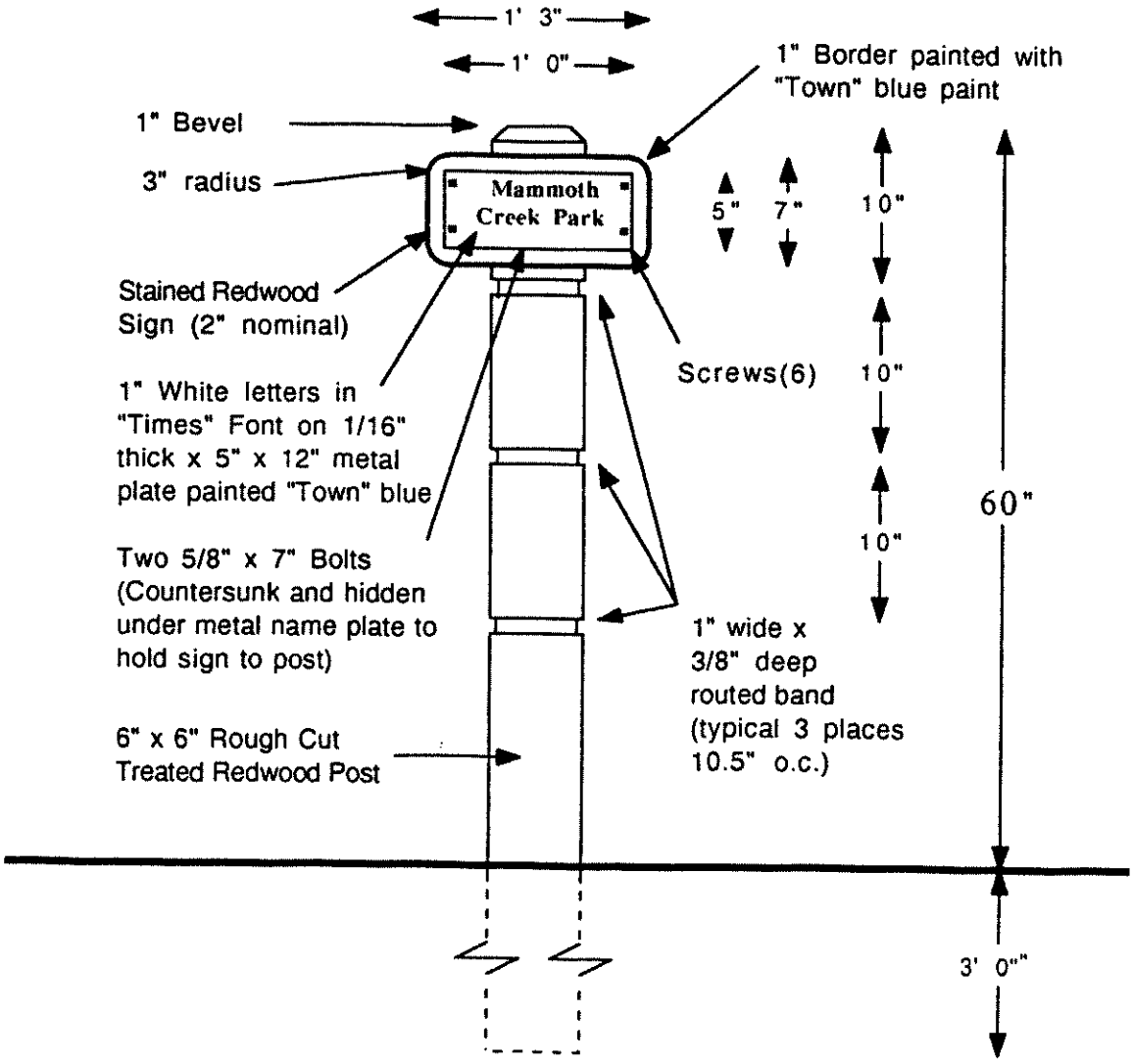
Type 3 Sign
Exhibit D



Mammoth Lakes Trail System Signing

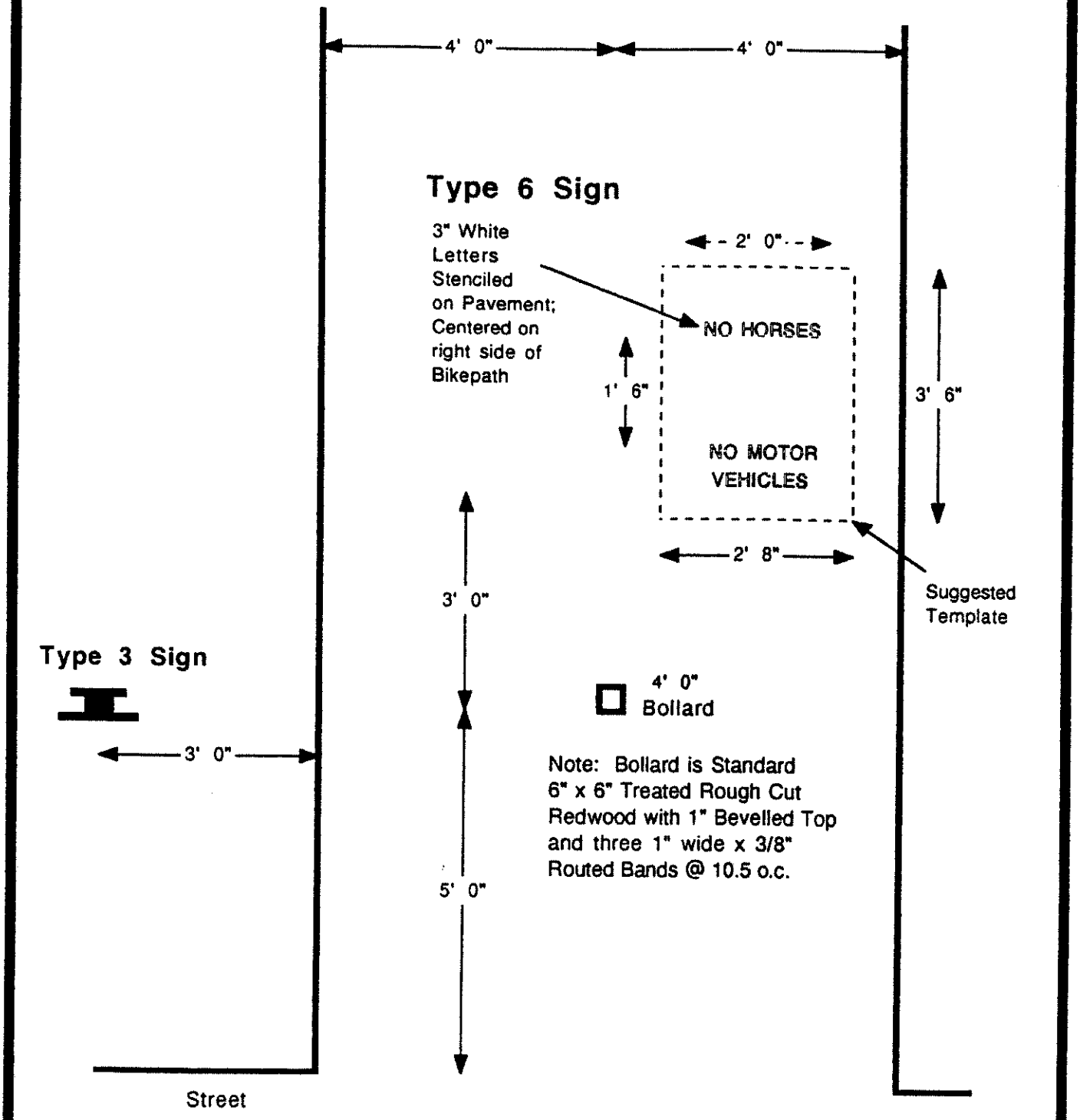
Type 4 Sign
Exhibit E

Note: Type 5 Sign to be Used as Specified to Identify Parks and other Special Areas; normally single-faced.



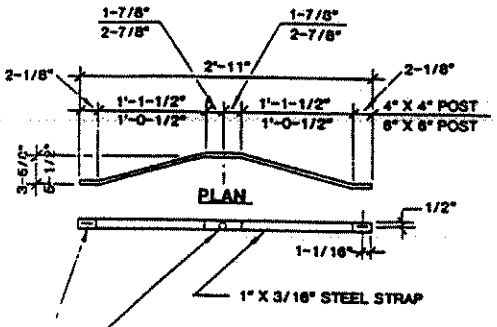
Mammoth Lakes Trail System Signing

Type 5 Sign
Exhibit F



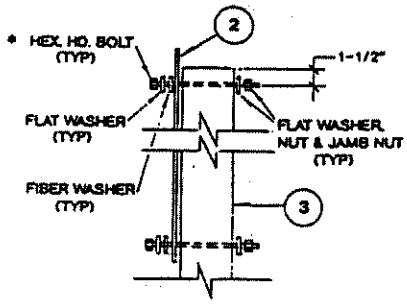
Mammoth Lakes Trail System Signing
Type 6 Sign
Exhibit G

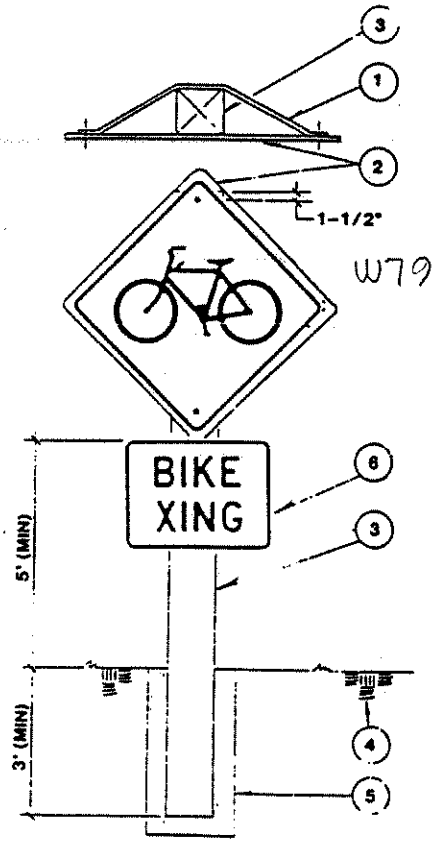
Source: Town of Mammoth Lakes Public Works Department



ELEVATION

BACK BRACE DETAIL





* 5/16" DIAMETER FOR SINGLE SHEET ALUMINUM PANEL SIGNS.
3/8" DIAMETER FOR LAMINATED PANEL SIGNS OR FRAMED SINGLE SHEET ALUMINUM SIGNS.

1. BACK BRACE
2. SIGN, 30" X 30", STANDARD SIGN W11-1
3. 6" X 6" X 12' LONG OR 4" X 4" X 12' LONG, REDWOOD POST, CONSTRUCTION GRADE, S4S.
4. UNDISTURBED SOIL
5. WASHED SAND
6. BIKE XING SIGN, 24" X 18", STANDARD SIGN W11-1

NOTES:

A. BALANCED SINGLE POLE INSTALLATIONS OF LAMINATED PANEL AND FRAMED SINGLE SHEET PANEL SIGNS REQUIRE BACK BRACES WHEN 34" OR MORE IN WIDTH. UNFRAMED SINGLE SHEET ALUMINUM PANEL SIGNS REQUIRE BACK BRACES WHEN 18" OR MORE IN DEPTH AND 34" OR MORE IN WIDTH.

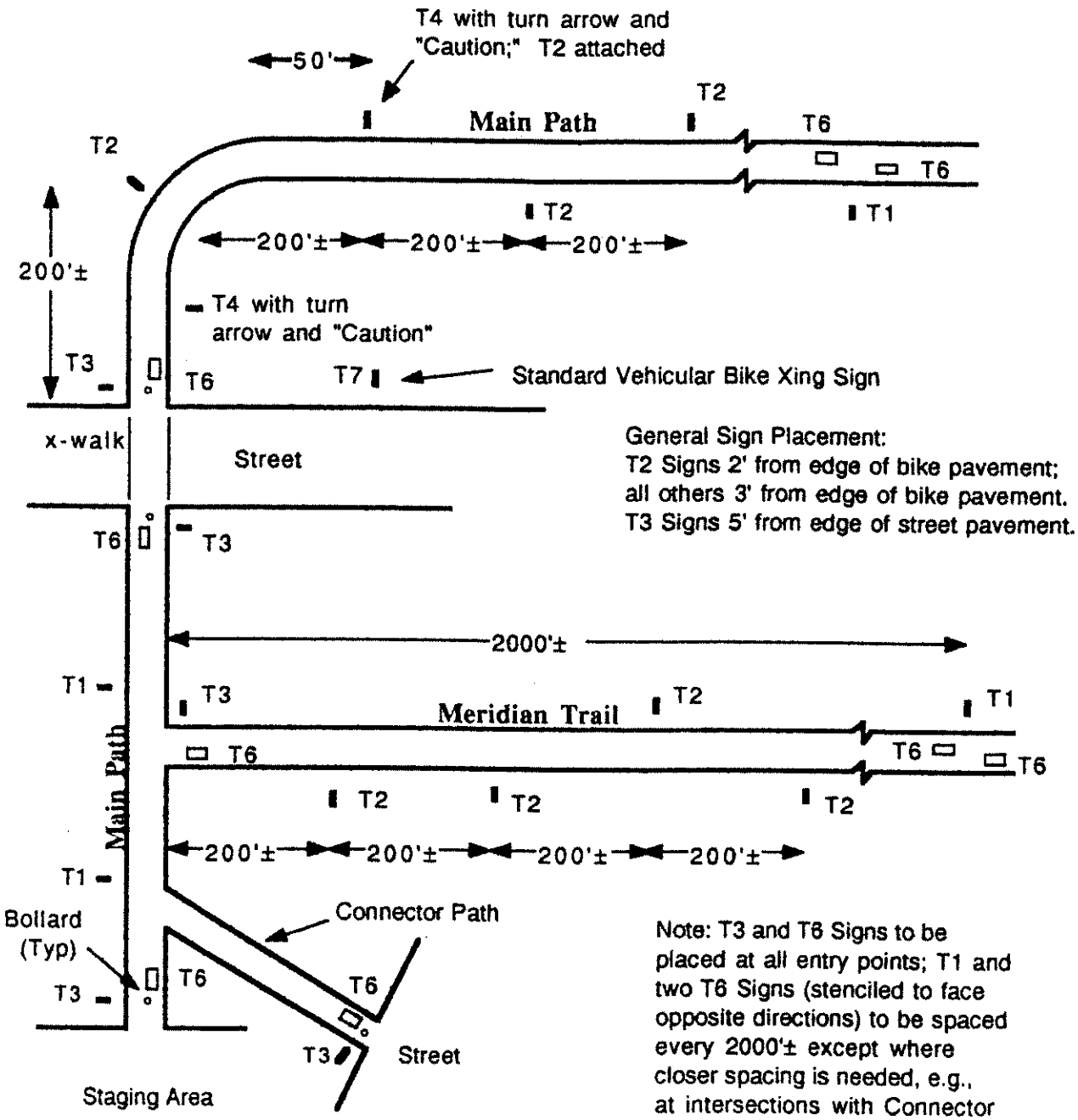
B. ALL WOOD SURFACES TO BE PAINTED WITH AN APPROVED REDWOOD PRESERVATIVE.

C. SIGNS TO BE YELLOW W/BLACK STRIPE, BLACK IMAGE.

Mammoth Lakes Trail System Signing

Type 7 Sign

Exhibit H



Mammoth Lakes Trail System Signing

Sign Placement Illustration
Exhibit I

(4) At-grade Railroad Crossings and Cattle Guards. Whenever it is necessary to cross railroad tracks with a bikeway, special care must be taken to assure that the safety of bicyclists is protected. The bikeway crossing should be at least as wide as the approaches of the bikeway. Wherever possible, the crossing should be straight and at right angles to the rails. For on-street bikeways where a skew is unavoidable, the shoulder (or bike lane) should be widened, if possible, to permit bicyclists to cross at right angles (see Figure 1003.6A). If this is not possible, special construction and materials should be considered to keep the flangeway depth and width to a minimum. Pavement should be maintained so ridge buildup does not occur next to the rails. In some cases, timber plank crossings can be justified and can provide for a smoother crossing. Where hazards to bicyclist cannot be avoided, appropriate signs should be installed to warn bicyclists of the danger.

All railroad crossings are regulated by the California Public Utilities Commission (CPUC). All new bike path railroad crossings must be approved by the CPUC. Necessary railroad protection will be determined based on a joint field review involving the applicant, the railroad company, and the CPUC.

The presence of cattle guards along any roadway where bicyclists are expected should be clearly marked with adequate advance warning.

(5) Hazard Markings. Vertical barriers and obstructions, such as abutments, piers, and other features causing bikeway constriction, should be clearly marked to gain the attention of approaching bicyclists. This treatment should be used only where unavoidable, and is by no means a substitute for good bikeway design. An example of a hazard marking is shown in Figure 1003.6B. Signs, reflectors, diagonal black and yellow markings, or other treatments will be appropriate in other instances to alert bicyclists to potential hazards.

(6) Lighting. Bikeway lighting should be considered along routes where nighttime riding is expected. This is particularly important for bike paths serving as commuter routes, such as paths leading to colleges. Adequate lighting is also important at bike path crossings of streets and for underpasses. Normally, on-street bikeways will be adequately lighted if street lights exist.

Topic 1004 - Uniform Signs, Markings and Traffic Control Devices

1004.1 Introduction

Per Section 2376 of the Streets and Highways Code, uniform signs, markings, and traffic control devices are mandatory. As such this section is mandatory, except where permissive language is used. See the Traffic Manual for detailed specifications.

1004.2 Bike Path (Class I)

An optional 4-inch yellow stripe may be placed to separate opposing directions of travel. A 3-foot stripe with a 9-foot space is the recommended striping pattern, but may be revised, depending on the situation.

Standard regulatory, warning, and guide signs used on highways may be used on bike paths, as appropriate (and may be scaled down in size). Special regulatory, warning, and guide signs may also be used to meet specific needs.

White painted word (or symbol) warning markings on the pavement may be used as an effective means of alerting bicyclists to approaching hazards, such as sharp curves, barrier posts, etc.

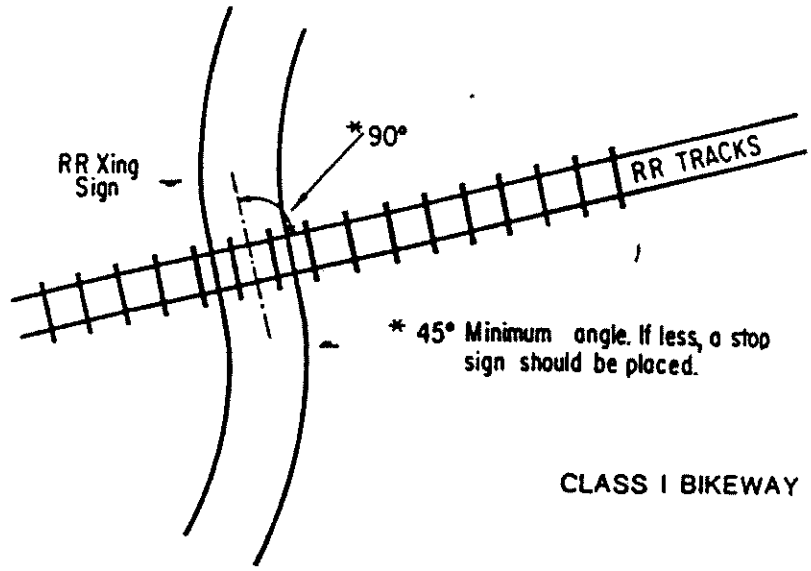
1004.3 Bike Lanes (Class II)

Bike lanes require standard signing and pavement markings as shown on Figure 1004.3.

The R81 bike lane sign shall be placed at the beginning of all bike lanes, on the far side of every arterial street intersection, at all major changes in direction, and at maximum half-mile intervals.

Bike lane pavement markings shall be placed on the far side of each intersection, and may be placed at other locations as desired.

Figure 1003.6A
Railroad Crossings



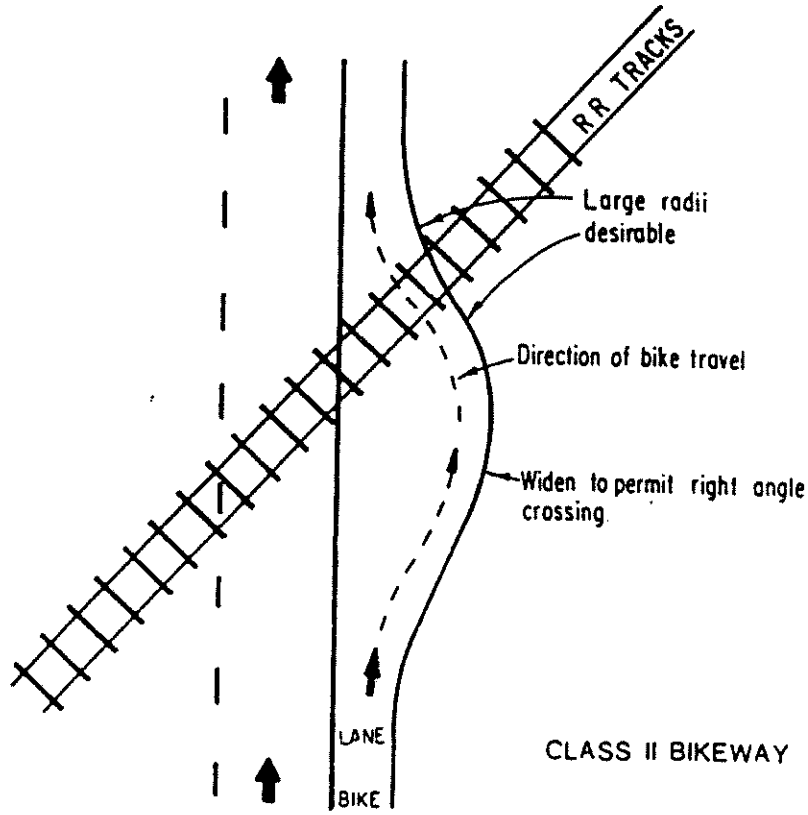
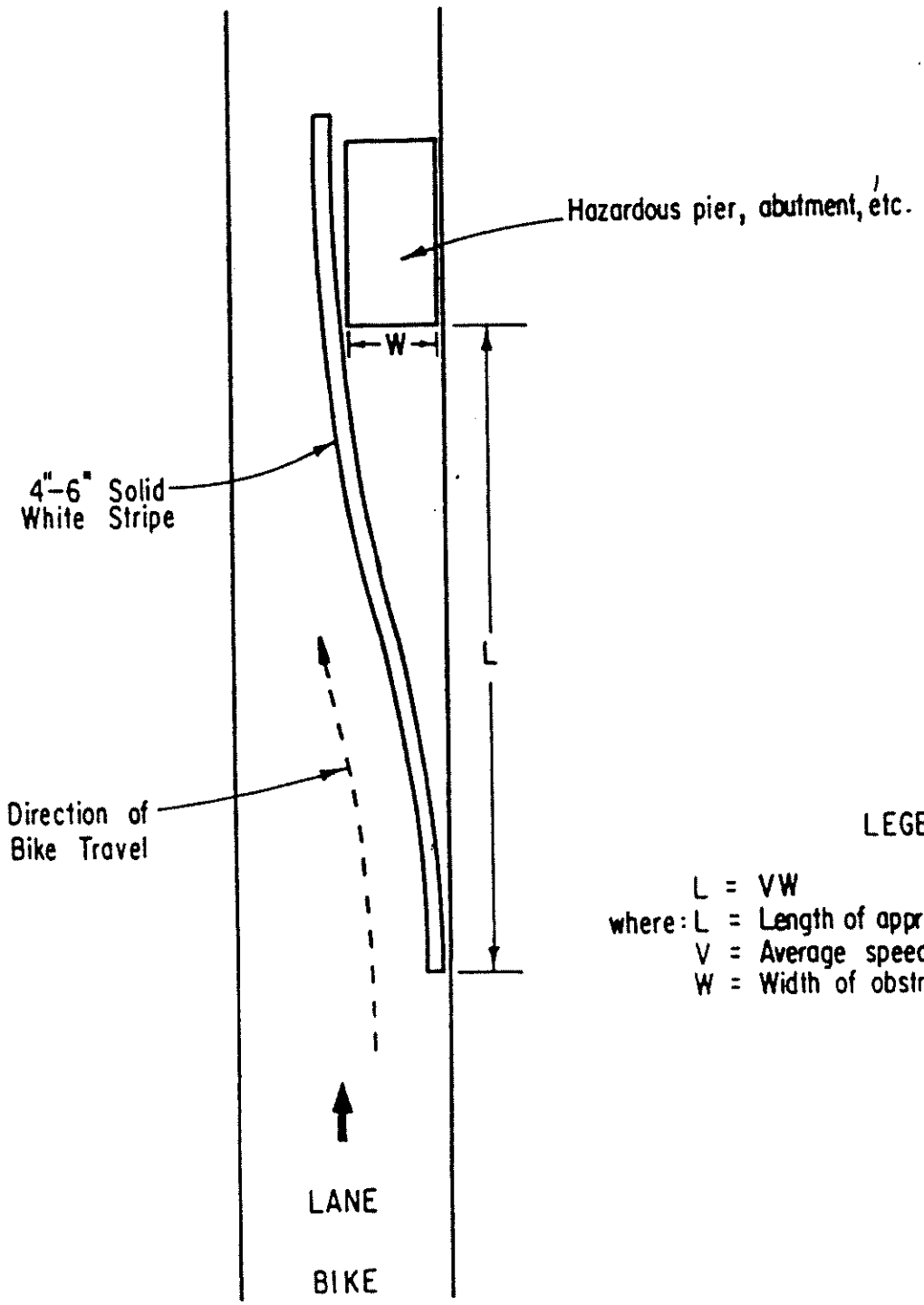


Figure 1003.6B

Hazard Markings



LEGEND

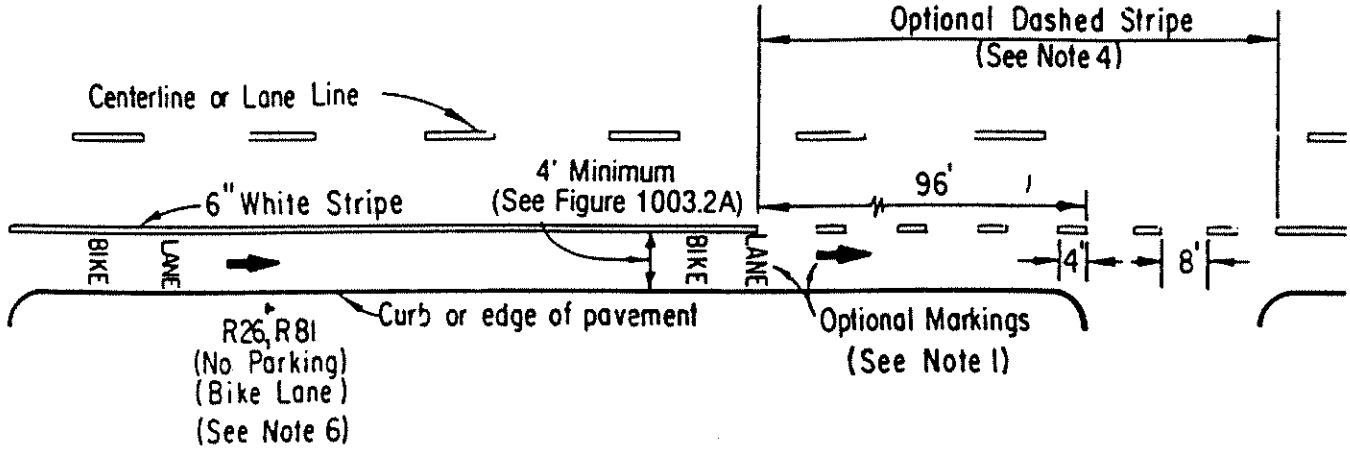
$L = VW$

where: L = Length of approach marking (Ft.)
V = Average speed of bicyclists (MPH)
W = Width of obstruction (Ft.)

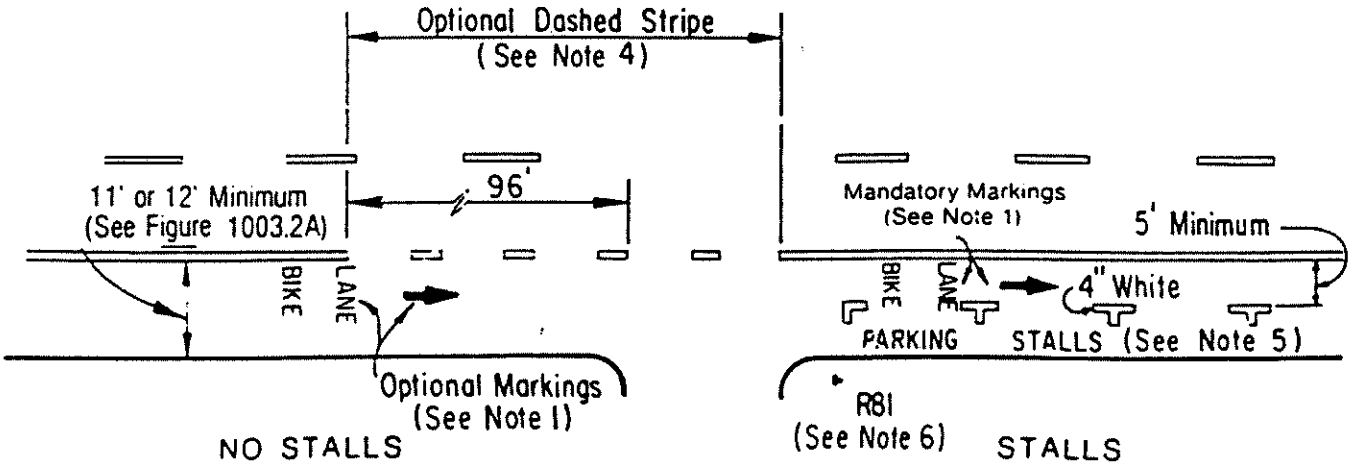
Figure 1004.3

Bike Lane Signs and Markings

WHERE VEHICLE PARKING IS PROHIBITED



WHERE VEHICLE PARKING IS PERMITTED



NOTES:

1. The Bike Lane pavement markings shall be placed on the far side of each intersection, and may be placed at other locations as desired.
2. The use of the bicycle symbol pavement marking to supplement the word message is optional.
3. The G93 Bike Route sign may be placed intermittently along the bike lane if desired.
4. The bike lane line may either be dropped entirely, 96' in advance of the intersection, or a dashed line carried to the intersection or through the intersection.
5. In areas where parking stalls are not necessary (because parking is light), it is permissible to paint a 4" solid white stripe to fully delineate the bike lane. This may be advisable where there is concern that motorists may misconstrue the bike lane to be a traffic lane.
6. The R81 bike lane sign shall be placed at the beginning of all bike lanes, on the far side of every arterial street intersection, at all major changes in direction, and at maximum half-mile intervals.

Raised pavement markers or other raised barriers shall not be used to delineate bike lanes.

The G93 Bike Route sign may also be used along bike lanes, but its primary purpose should be to provide directional signing and destination signing where necessary. A proliferation of Bike Route signs along signed and striped bike lanes serves no useful purpose.

Many signs on the roadway will also apply to bicyclists in bike lanes. Standard regulatory, warning, and guide signs used specifically in conjunction with bike lanes are shown in Chapter 4 of the Traffic Manual.

1004.4 Bike Routes (Class III)

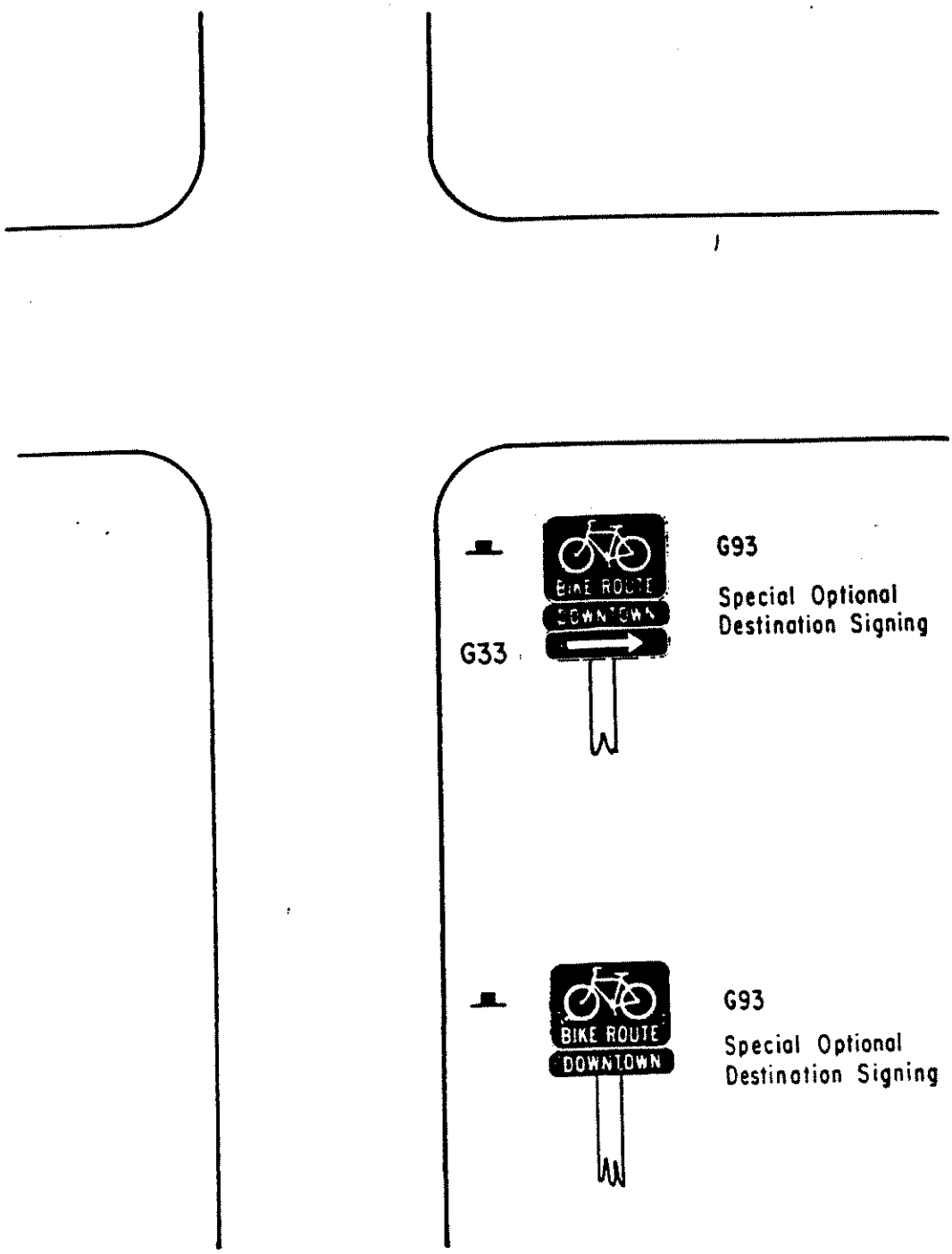
Bike routes are shared routes and do not require pavement markings. In some instances, a 4-inch white edge stripe separating the traffic lanes from the shoulder can be helpful in providing for safer shared use. This practice is particularly applicable on rural highways, and on major arterials in urban areas where there is no vehicle parking.

Bike routes are established through placement of the G93 Bike Route sign. Bike route signs are to be placed periodically along the route. At changes in direction, the bike route signs are supplemented by G33 directional arrows. Typical bike route signing is shown on Figure 1004.4. The figure shows how destination signing, through application of a special plate, can make the Bike Route sign more functional for the bicyclist. This type of signing is recommended when a bike route leads to a high demand destination (e.g., downtown, college, etc.).

Many signs on the roadway will also apply to bicyclists. Standard warning and guide signs used specifically in conjunction with bike routes are shown in Chapter 4 of the Traffic Manual.

Figure 1004.4

Bike Route Signing



NOTE: The G93 Bike Route signs shall be placed at all points where the route changes direction and periodically as necessary.