



CHAPTER 2 – Environmental Assessment

Leelanau Scenic Heritage Route Trailway Plan

- 2.1 PURPOSE AND NEED**
- 2.2 APPLYING PRELIMINARY IMPACTS TO OPTIONAL ROUTES**
- 2.3 ALTERNATIVES**
- 2.4 AFFECTED ENVIRONMENT**
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2.1 PURPOSE AND NEED

The proposed Trailway plan and environmental assessment for a multi-use trail is intended to assist in the creation of a non-motorized trailway that will provide a continuous scenic pathway from M-22 and Manning Road at the south boundary of Leelanau County to the north boundary of the Lakeshore at Good Harbor Bay, County Road 651, all within Leelanau County.

The approximate 27-mile non-motorized multi-use trail will generally parallel M-22 and M-109, the major roads through the Lakeshore. The trail will be on public land, either Lakeshore lands or within the MDOT or Leelanau County road rights-of-way. The trail will be separated from the roadways wherever possible and will provide a safe, alternative transportation opportunity for park visitors and residents. It will connect the park's primary visitor sites and facilities; including the popular Dune Climb, Visitor Center, Pierce Stocking Scenic Drive, D.H. Day Campground, Glen Haven Village, the Port Oneida Rural Historic District, Lake Michigan beaches, trailheads, and other points of interest within the Lakeshore. It will also provide a non-motorized trail connection between popular park sites and the village of Empire and the community of Glen Arbor.

Over 1.1 million people visit Sleeping Bear Dunes National Lakeshore annually. The Lakeshore seeks to develop a multi-modal transportation system that will meet the park's current and future needs. This includes the development of a cohesive non-motorized multi-use trail network within the Lakeshore that connects and provides non-motorized access to the park's main visitor facilities, such as the Dune Climb (330,000+ visitors/year), Pierce Stocking Scenic Drive (430,000+ visitors/year), and Visitor Center (130,000+ visitors/year). The majority of the Lakeshore's visitation occurs between the months of June and September. These facilities would be connected by the proposed multi-use trail, which will provide park visitors with safe non-motorized access and help relieve traffic and parking congestion at these facilities. Trail use projections are estimated for the first three years at approximately 350,000 – 400,000 visitors/year.

Current and future traffic is conveyed in several ways: State Highway M-22, a two-lane paved highway, is the major corridor through the park and carries the greatest traffic volumes. It is also the main road connection between the communities of Empire, Glen Arbor, and Leland. Traffic volume (2003) for M-22 north of Empire is under 2500 vehicles/day. Traffic volume south of Empire is between 2500 and 5000 vehicles/day. Traffic also utilizes M-109 which splits off from M-22 and provides access to other areas of the park and Glen Arbor. The proposed trailway would occur along this corridor as well.

The Environmental Assessment (EA) focuses primarily on describing and comparing the opportunities and challenges of a no-action alternative with action alternatives to develop a trailway. Although this EA has been prepared together with the overall multi-use trailway plan, it has been formatted to comply with NPS guidelines and National Environmental Policy Act (NEPA) of 1969, as amended.

2.2 APPLYING PRELIMINARY IMPACTS TO OPTIONAL ROUTES

For the purposes of analyzing the Trailway in smaller sections, the approximate 27-mile long Trailway Project Area was divided into nine geographic trail **segments** beginning at the Benzie-Leelanau County line (Manning Road) and ending at Good Harbor Trail (County Road 651), near the northern boundary of the Lakeshore. Optional routes, proposed by planning team members and interested citizens, were mapped for each segment. The number of options within each segment varies from as few as one in

Segment 3, to as many as 15 in Segment 5. On the following page is a map depicting the geographic placement of the nine segments used to analyze the possible Trailway routing. (Please see the Appendix - Optional Trail Route Maps).

For this preliminary analysis, the environmental impacts and feasibility for construction of possible trail options were described. Nine preliminary impact topics were selected for analysis of environmental impacts and five preliminary impact topics were selected for analysis of impact to feasibility. Each topic was described in terms of impact and given a relative score from 0 to 3, to provide a basis of comparison between options within each trail segment (negligible-0, minor-1, moderate-2, and major-3). For operations and maintenance, no numeric score was identified, but this impact topic is analyzed in the “Environmental Consequences” chapter.

This methodology provided a comparative evaluation of impact, helped the planning team eliminate some of the earlier trail route options, and ultimately assisted in constructing the draft alternatives described in Section 2.3. Final impact topics, described in Section 2.4, have been applied to the identified alternatives for comparison, in the Environmental Consequences section (2.5).

OVERALL TRAILWAY SEGMENTS MAP

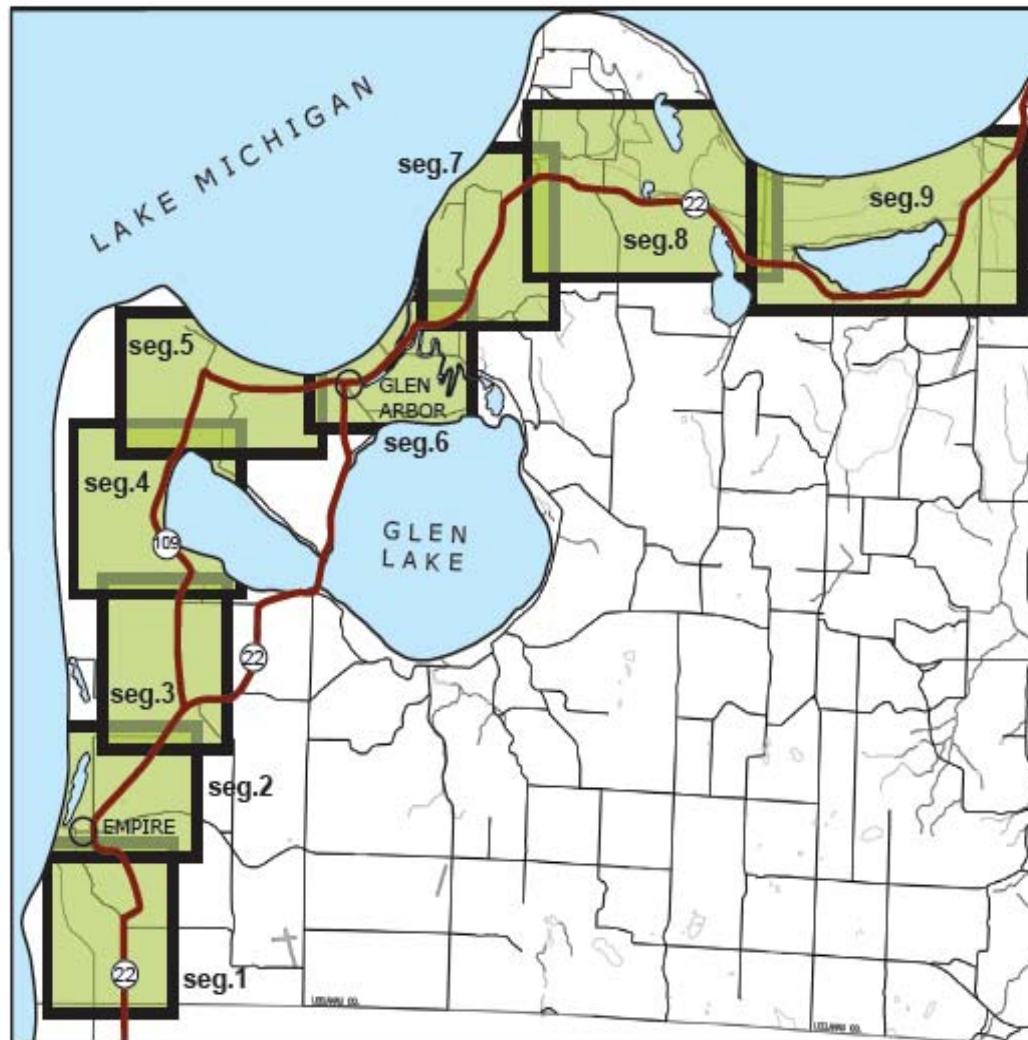


FIGURE 1:
OVERALL TRAILWAY SEGMENTS MAP
LEELANAU SCENIC HERITAGE ROUTE TRAILWAY MASTER PLAN



Map Date: Base GIS Data provided by MMD 1993
UTM Zone 18N; Gosling Czubak Engineering
Sciences, Inc.



2.3 ALTERNATIVES

The following section outlines two action alternatives that were derived for the proposed Trailway, and a no-action alternative that would continue current conditions and management. The no-action alternative would not fulfill the objectives of the Trailway Work Group as previously described in the Purpose and Needs section; however, it is used as a basis of comparison to the action alternatives.

Opportunities and constraints of various proposed trail routing options were analyzed through a series of working meetings and field evaluations by Trailway Work Group members, Lakeshore and other NPS staff, and the consultants. Several options were eliminated during this process as they were not feasible or fell within proposed wilderness areas identified in the *Sleeping Bear Dunes National Lakeshore General Management Plan*.

2.3.1 NO-ACTION ALTERNATIVE – Continue Current Conditions and Management

In the no-action alternative, there are no non-motorized, hardened surface trails within the M-22/M-109 corridors. The current Lakeshore trail system (in Leelanau County) offers hiking trails with trailheads at Empire Bluffs, Windy Moraine, Shauger Hill, Cottonwood (Pierce Stocking Scenic Drive), Dune Climb, Alligator Hill, Bay View, Pyramid Point, and Good Harbor Bay. Only the paved Pierce Stocking Scenic Drive is designated for bicycle use, with a shared lane adjacent the road surface. Currently, bicyclists are limited to the road shoulder along M-22, M-109, and county roads and there is a growing demand for a safe non-motorized facility within the Lakeshore that connects park facilities, points of interest, and local communities.

In an effort to upgrade and maintain traffic through the Lakeshore, the Michigan Department of Transportation (MDOT) is in the process of upgrading M-22 with pavement and shoulder improvements. These improvements, however, are scheduled in phases sequentially over the next 5-10 years and might only serve to provide some improved roadside non-motorized access along the corridor. The first phase of the MDOT improved shoulder work within the project area is occurring along the M-22 right-of-way in and near the Port Oneida Rural Historic District.

An evaluation of opportunities and constraints within the Lakeshore for a multi-use, non-motorized trail linkage identified a series of factors limiting visitor trail experience and impacting safe access within the park. These were documented by the Trailway Work Group from their initial field work and mapping:

- Steep gradient (topography) within the M-22 and M-109 rights-of-way
- Narrow, limited shoulder widths often constricted by guardrail
- Unimproved or undesignated pedestrian/bicycle roadway crossing areas
- Visual impairment at roadway curves, driveways and local road intersections
- Limited linkages to existing trail loops and trailheads
- Cultural and natural feature limitations such as historic structures or wetlands

The no-action alternative provides the basis for comparing existing conditions and current management with the action alternatives. For the purposes of the proposed Trailway analysis, alternative comparisons will be made on a segment by segment basis (Segments 1 – 9 as previously defined) and compared to the no-action alternative.

2.3.2 ALTERNATIVE A

Under Alternative A, a non-motorized trail would be constructed in the M-22/M-109 rights-of-way to the extent possible, only deviating where necessary due to physical or environmental constraints. It would be a contiguous non-motorized trail of over 27 miles commencing from the southern Leelanau County line at Manning Road to County Road 651 at Good Harbor Beach (Please see Figure 2. Map A). Disturbance of interior vegetated areas, or areas with steep side slope and gradients would be avoided, but the trail user experience would be closely associated with the highway right-of-way.

Access to the Trailway would be made at the existing Lakeshore trailheads and designated visitor parking areas, including the Pierce Stocking Scenic Drive lower parking area, Dune Climb, Glen Haven, Bay View Trailhead, and Lake Michigan beaches at Bohemian Road and Good Harbor Trail, and in conjunction with the Port Oneida Rural Historic District Plan and Glen Haven Rehabilitation Plan. Some new trailheads may also be proposed. Such trailheads and parking areas may be augmented with Trailway “wayfinding” maps and information and may provide bike racks, benches, picnic tables, potable water/drinking fountains, interpretive information, and restroom facilities. Universal Accessibility signage and amenities as well as trail segment, trail challenge level information and mileage markers would also be used.

The proposed routing for Alternative A is described in terms of **Segments 1-9**. Please See Alternative A Segment Maps which follow this section.

Segment 1:

The west side of M-22 would be used to establish a 10’ crushed limestone pathway from Manning Road north to Stormer Road. A new trailhead should be located near Manning Road. Consideration for the Tweddle-Treat cultural landscape would be made through use of this trail material and a width variation. A crushed limestone surfacing would be utilized to have the Trailway integrate with the cultural and historical character of the landscape and be visually less distracting than a modern asphalt surface. A variation from the right-of-way would be made to descend a steep gradient along M-22.

The route north of Stormer Road would continue within the right-of-way on the west side. Several areas of steep side slope would necessitate excavation and possible retaining walls before and after the Lakeshore entrance sign. MDOT is implementing a transportation enhancement project to develop 5’ paved shoulders from Manning Road to the Village of Empire. The Trailway segment provides access to the Empire Bluffs Trail from Wilco Road. Wayfinding information would be added at an appropriate location to assist Trailway users wishing to hike the Empire Bluffs Trail.

Segment 2:

The Trailway would enter the Village of Empire along the M-22 right-of-way. The Village Council would determine the trail route within the Village of Empire, but access to the Lakeshore Visitor Center, the downtown area, and the beach should all be considered in route planning. For purposes of this alternative however, the following possible trail route is described:

The Trailway routing could continue within the Village of Empire by using existing road right-of-way through the Quercus Alba (New Neighborhood) and Beaver Creek neighborhoods. With oversight from MDOT, a north-south oriented M-22 crossing could be implemented, and a north-south oriented M-72 crossing accessing Trailway users to the Visitor Center. The facility provides public restrooms, information, interpretive displays, and other support facilities open to the public during regular business hours. Trailway users could also have direct access to the Village of Empire. Continuing through the Beaver Creek development, the Trailway could use Ottawa Street as a crossing location at M-22 at the north end of the Village.

A new paved section in the right-of-way along the northwest side of M-22 could be developed to LaCore Road, then north to Fisher Street. From there the Trailway could travel along the east side of LaCore to Bar Lake Road in the county road right-of-way. The Trailway would cross to the north side of Voice Road and continue east to the intersection at M-22. This section would require a minor creek/wetland crossing along LaCore Road and address several side slope and grading challenges along Voice Road, including at the corner of Voice Road and M-22 where Segment 3 begins.

The Trailway segment provides a direct link to the North Bar Lake public beach access, although the existing access on Bar Lake Road is gravel. Wayfinding information could be added at the Voice Road-Bar Lake Road intersection to assist Trailway users with accessing North Bar Lake facilities.

Segment 3:

The grade falls away at the intersection of Voice Road and M-22 and includes roadway guardrail and overhead utilities. MDOT would need to approve some additional fill material and trail grading at the corner within the utility right-of-way, as well as the alignment of the trail to allow safe access around this corner. The Trailway continues from Voice Road and along M-22 to M-109 in the right-of-way on the west side of the road. The Trailway would include a new 10' wide asphalt cross-section from Voice Road to Pierce Stocking Scenic Drive. Considerations for Trailway construction in this area include side slopes, existing mature trees, and proximity to the road (see Chapter 4 - Trail Cross-section Development).

The Trailway segment provides access to hiking trailheads, loops and support facilities at Pierce Stocking Scenic Drive and the Windy Moraine Trail parking area. Wayfinding information would be added to assist Trailway users in recognizing other existing facilities in the area. Trailway users would be able to use the parking area at Pierce Stocking Scenic Drive as a trailhead. Information would be provided regarding the challenge level and safety considerations for riders interested in using the Pierce Stocking Scenic Drive, since it is a very challenging bicycling experience. A connecting trailhead link would connect the parking area to the main Trailway along M-109.

Segment 4:

From Pierce Stocking Scenic Drive, the Trailway would continue to use the M-109 right-of-way on the west side and continue to Hunter Road at the Dune Climb. Trailway users would be able to use the parking area at the Dune Climb to access this portion of the Trailway.

Several unique factors would be considered in this segment. The M-109 Corridor descends a fairly steep hill on a wide curve creating challenges to create appropriate trail gradient and visibility. Some tree removal and grading may need to occur to accomplish this route. In addition, on the northern half of the trail segment private driveways bisect the Trailway, as well as some

landscaping encroachments into the right-of-way. Cooperation with MDOT and land owners will be necessary to develop safe and viable routing through this area to Hunter Road.

Segment 5:

Alternative A would use Hunter Road as a Trailway link to the Dune Climb and the Dune Center, but it would not be the primary Trailway route. The route would follow the northwest side of the M-109 right-of-way on boardwalk. The boardwalk would continue northwest (1725 feet) to just before the Glen Lake Picnic Area, then use the historic narrow gauge railway bed that bisects the emergent wetland at the base of the dune (approximately another 1,500 feet). The initial segment would be constructed with special interpretive pavement and signage similar to that at Glen Haven. A 10' wide crushed limestone path would continue to Harwood Drive. From there, the route would continue on the old narrow gauge rail bed and connect north to Dune Valley Road and continuing into the Glen Haven Historic District (see Appendix MAP Exhibit D).

A special trail cross-section would be implemented as the Trailway approaches the Historic Village (Map 2.5.1). The crushed limestone path would change over to a concrete and timber cross-section evoking and interpreting the historic narrow gauge rail bed that once linked Glen Haven to Glen Lake. Interpretive and wayfinding signage would be placed to provide information about the Historic District and Trailway routing. The alternative allows the Trailway user to use sidewalks and crosswalks integral to the Historic District plan but introduces them into what can be a congested area. Signage would direct users to the primary Trailway link near the public restrooms across from the Sleeping Bear Inn garage. Continuing due east, the Trailway would be a 10' wide crushed limestone path utilizing an existing county road (two-track) access to D.H. Day Campground.

The Trailway would use the existing campground gravel road and connect with the M-109 corridor to the south. With oversight from MDOT, a north-south oriented M-109 crossing in alignment with Stocking Road would be developed with striped pavement markings, advance warning, and safety signage. Consideration of potential conflicts between campground traffic and trail users is warranted in this area. The Trailway would then continue on the south side of M-109 running east-west from Stocking Drive to South Forest Haven Drive, connecting to Glen Arbor (Trailway *Segment 6*). Private home driveway crossings, tree removal and grading are factors to consider in this part of the routing option.

This Trailway segment provides access to hiking trailheads, loops and support facilities at the Sleeping Bear Point Trail, Glen Haven Maritime Museum, Glen Haven Village, D.H. Day Campground, and Alligator Hill. Wayfinding information would be added to assist Trailway users in recognizing other existing facilities in the area.

Segment 6:

The Glen Arbor Township Board would determine the best way through Glen Arbor. For purposes of this alternative however, the following trail route possibility is described:

From Sylvan Street the Trailway could use the existing paved shoulder at a minimum width of 5' on both sides of M-109. Designated parallel parking exists on both sides of M-22 in Glen Arbor, creating significant safety concerns for bike lane users from door swings, and vehicles access and egress from numerous drive cuts.

From Oak Street, trail users could travel along M-22 using the 5' paved shoulder. If conditions allow the Trailway could then widen to a 10' pathway within the existing M-22 right-of-way on the southeast side of the road. A boardwalk section could be installed for several hundred feet in the vicinity of the bicycle club rest area across from the gasoline service station.

Several design challenges exist near the intersection of West Crystal View Road (CR 675) and M-22. The skewed intersection with large radii entices high traveling speeds for cars going through or making turns in any direction. A long crossing distance for walkers or bikers is also hazardous. Private residences very close to the right-of-way on the south side create a pinch point just before the intersection at West Crystal View Road. Each would need detailed design with significant safety considerations for implementation to best occur.

Once across West Crystal View Road, the Trailway would continue along M-22 on the south side as a 10' asphalt pathway within the existing M-22 right of way. A boardwalk would be installed for 330 feet along a very narrow pinch point on the approach to the auto/pedestrian bridge. From the bridge, the Trailway would continue as an off-road 10' wide asphalt path located on the south side of the right-of-way. The Trailway would then pass the entrance of The Homestead Resort to cross to the north side of M-22 near Westman Road.

Segment 7:

From Westman Road the Trailway would use the M-22 right-of-way on the west side of the road as an off-road 10' asphalt section to the intersection of M-22 and Thoreson Road. Near the split at M-22 "Y" intersection, the Trailway would leave M-22 and continue a short distance north on Thoreson Road to access to part of the Bay View Trail from Thoreson Road to Port Oneida Road where it would be maintained as a 10' crushed limestone path. The Trailway would provide access to the historic Olsen and Kelderhouse farms, the Kelderhouse cemetery, the schoolhouse, and many other properties in the Port Oneida Rural Historic District.

Segment 8:

The proposed Trailway would connect south back to M-22 along the Port Oneida road right-of-way. Wayfinding signage would guide trail users to reconnect with the primary Trailway route along M-22 and indicate to trail users that they are within the Port Oneida Rural Historic District.

From the intersection of Port Oneida Road, the Trailway would be on the north side of the M-22 right-of-way and continue as a 10' wide crushed limestone path. It would use the M-22 right-of-way past South Basch Road and North Unity School. The Trailway would then align along the M-22 right-of-way below the road embankment and guardrail at Narada Lake. A boardwalk (approximately 265 feet long) would provide a unique nature experience along this water resource, avoiding the hazardous proximity and the tight right-of-way of a roadside route.

From Narada Lake, the Trailway would continue and change to a 10' off road asphalt section on the north side of the right-of-way to the Bohemian Road (CR 669) and M-22 intersection. This Trailway segment provides access to the Good Harbor swimming beach and other Lakeshore facilities. Wayfinding information would be added along the route to assist Trailway users in recognizing the Lake Michigan beach access and facilities at the end of Bohemian Road.

Segment 9:

The Trailway continues as a 10' off-road asphalt section on the north side of M-22 up to Traverse Lake Road, past Bartunek Road and along the M-22 right-of-way to the east end of Traverse Lake Road. Difficult aspects for the Trailway alignment with this routing include a number of private driveway crossings and a stream crossing at Shetland Creek.

A crossing would occur at Traverse Lake Road and as the Trailway passes the Bufka Farm on the north side of the road, surfacing would change to crushed limestone. The Trailway would route past the Bufka property and would remain in the M-22 right-of-way, to the extent possible, only using the glacial ridges and valleys below the M-22 corridor when necessary. The steep embankment and narrow right-of-way with guardrails on both sides would be avoided with this routing; however, the lowland areas present some challenge for Trailway construction. The Trailway ends at Good Harbor Trail (CR 651) and Lake Michigan.

This Trailway segment provides access to Good Harbor Trail (CR 651) and Good Harbor Beach. Wayfinding information would be added to assist Trailway users in recognizing the existing Lakeshore facilities at the end of Good Harbor Trail. A trailhead could be located at the parking facility with improvements such as safe crossings with pavement striping, advanced warning and wayfinding signage.



MAP A

PROPOSED TRAILWAY ALTERNATIVE A
LEELANAU SCENIC HERITAGE ROUTE TRAILWAY MASTER PLAN



TRAIL LEGEND

Proposed Trailway



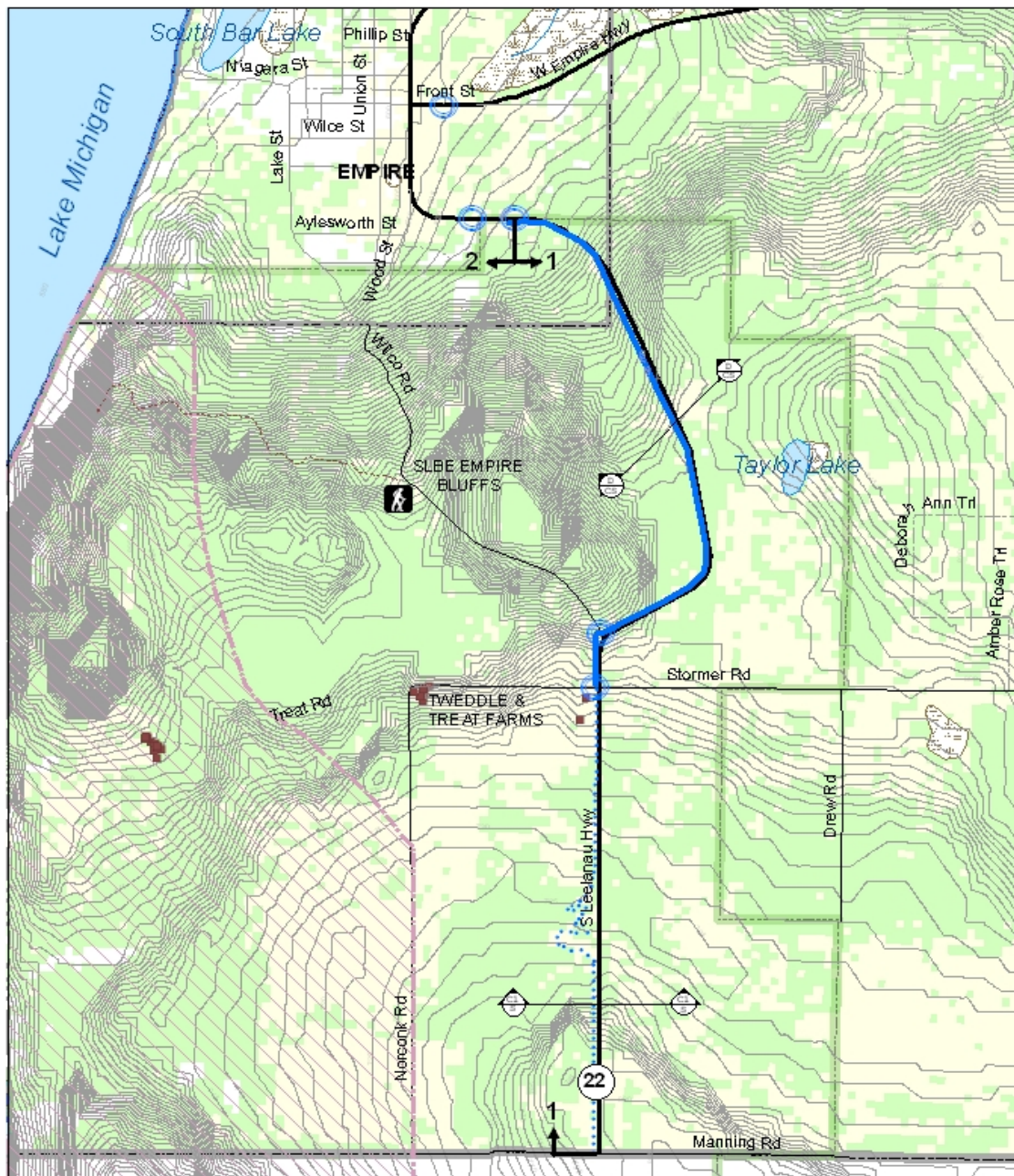
GENERAL LEGEND

- State Trunkline
- County Primary Roads
- County Local Roads
- Village Roads
- Other Roads
- Existing Hiking & Skiing Trails
- Recommended SLBE Wilderness Boundary (1981)
- SLBE Boundary
- Rivers
- Lakes
- Village Boundaries
- Township Boundaries
- Aquatic Bed
- Forested
- Agricultural



Base GIS Data: Michigan Framework Data
1992 National Land Cover Dataset
1992 National Wetlands Cover Dataset
National Park Service
NAD 1983 UTM ZONE 16N





**MAP 2.1 - PROPOSED TRAILWAY ALTERNATIVES
SEGMENT 1: ALTERNATIVE A**
LEELANAU SCENIC HERITAGE ROUTE TRAILWAY MASTER PLAN

TRAIL SURFACE LEGEND

- Asphalt
- - - - - Crushed Limestone
- ||||| Boardwalk
- - - - - On-Road Bike Lane
- Existing Gravel Road
- Road Crossing Location



GENERAL LEGEND

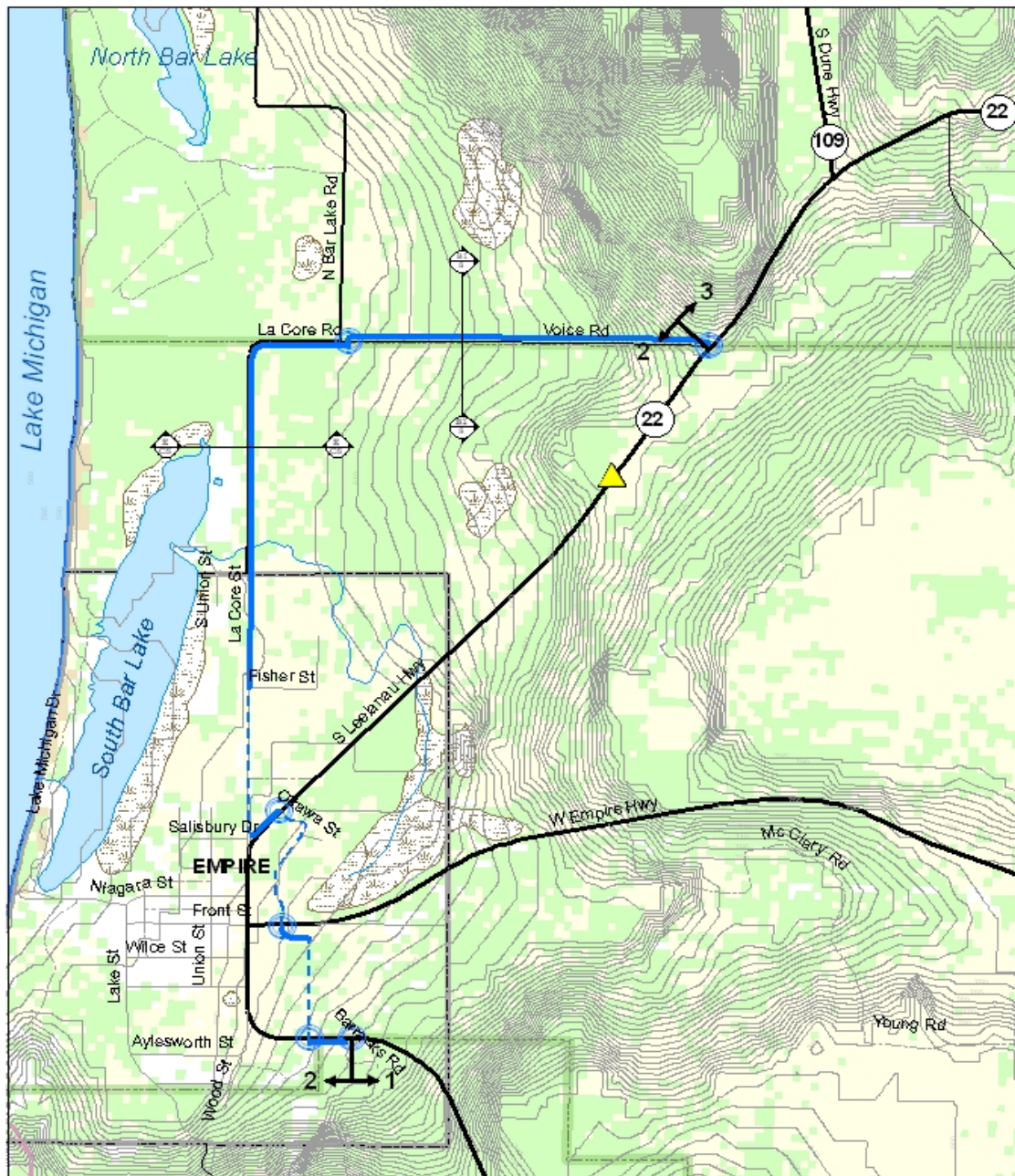
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- County Primary Roads
- County Local Roads
- Village Roads
- Other Roads
- - - - - Existing Hiking & Skiing Trails
- Historic Buildings & Structures
- ▲ Rest Areas/Scenic Turnouts
- - - - - Recommended SLBE Wilderness Boundary (1981)
- SLBE Boundary
- Rivers
- Lakes
- Village Boundaries
- Township Boundaries
- Aquatic Bed
- Forested
- Agricultural

0 375 750 1,500 2,250 3,000
Feet



Base GIS Data: Michigan Framework Data
1992 National Land Cover Dataset
1992 National Wetlands Cover Dataset
National Park Service
NAD 1983 UTM ZONE 18N

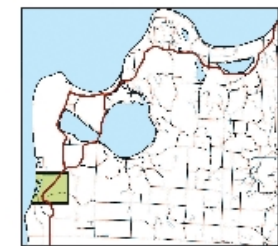




**MAP 2.2 - PROPOSED TRAILWAY ALTERNATIVES
SEGMENT 2: ALTERNATIVE A**
LEELANAU SCENIC HERITAGE ROUTE TRAILWAY MASTER PLAN

TRAIL SURFACE LEGEND

- Asphalt
- - - - Crushed Limestone
- ||||| Boardwalk
- - - - On-Road Bike Lane
- - - - Existing Gravel Road
- Road Crossing Location



GENERAL LEGEND

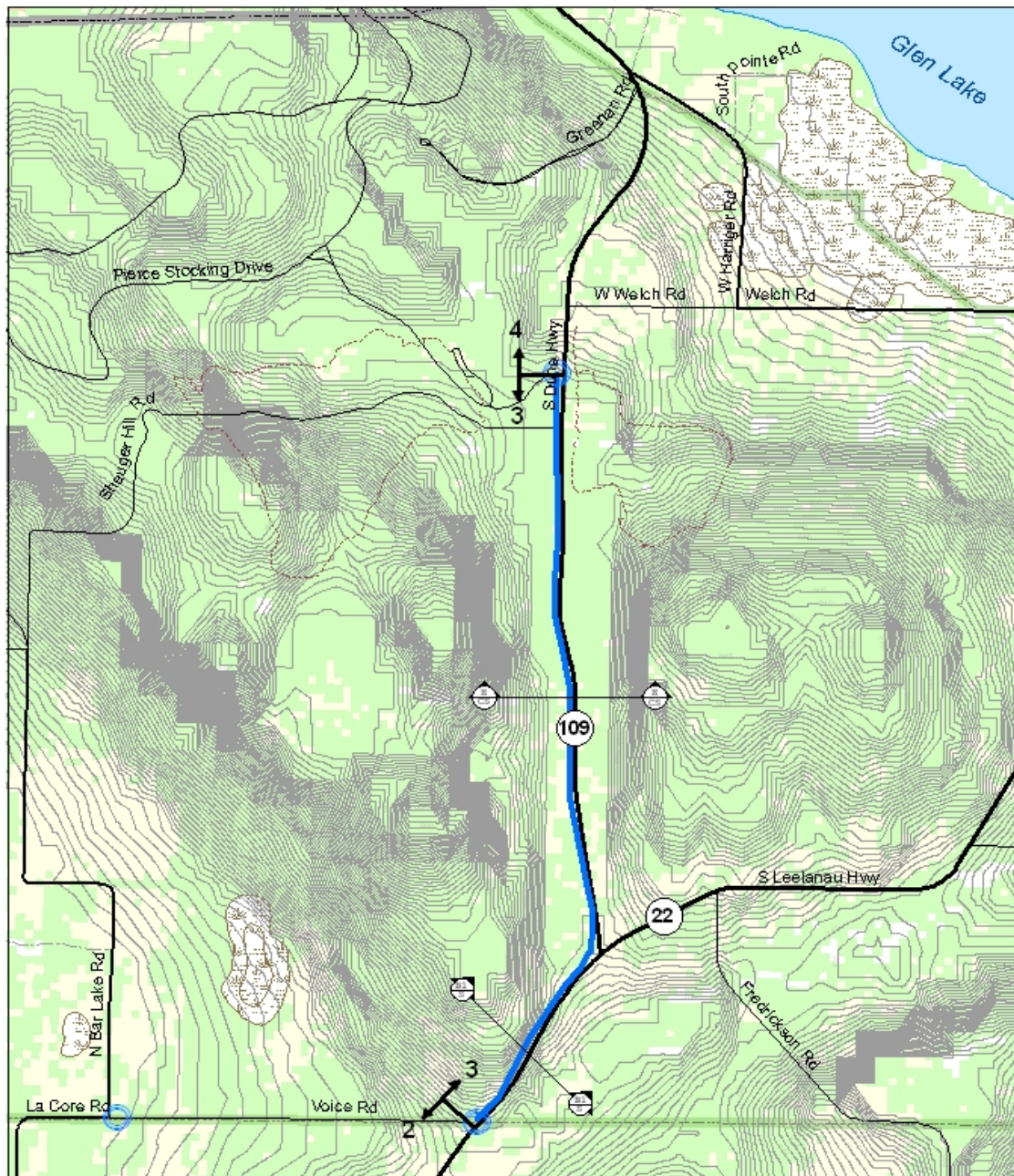
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- Township Boundaries
- Aquatic Bed
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- Agricultural

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Base: GIS Data: Michigan Framework Data
1992 National Land Cover Dataset
1992 National Wetlands Cover Dataset
National Park Service
NAD 1983 UTM ZONE 18N

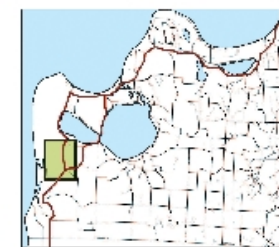




**MAP 2.3 - PROPOSED TRAILWAY ALTERNATIVES
SEGMENT 3: ALTERNATIVE A**
LEELANAU SCENIC HERITAGE ROUTE TRAILWAY MASTER PLAN

TRAIL SURFACE LEGEND

- Asphalt
- Crushed Limestone
- ||||| Boardwalk
- On-Road Bike Lane
- Existing Gravel Road
- Road Crossing Location



GENERAL LEGEND

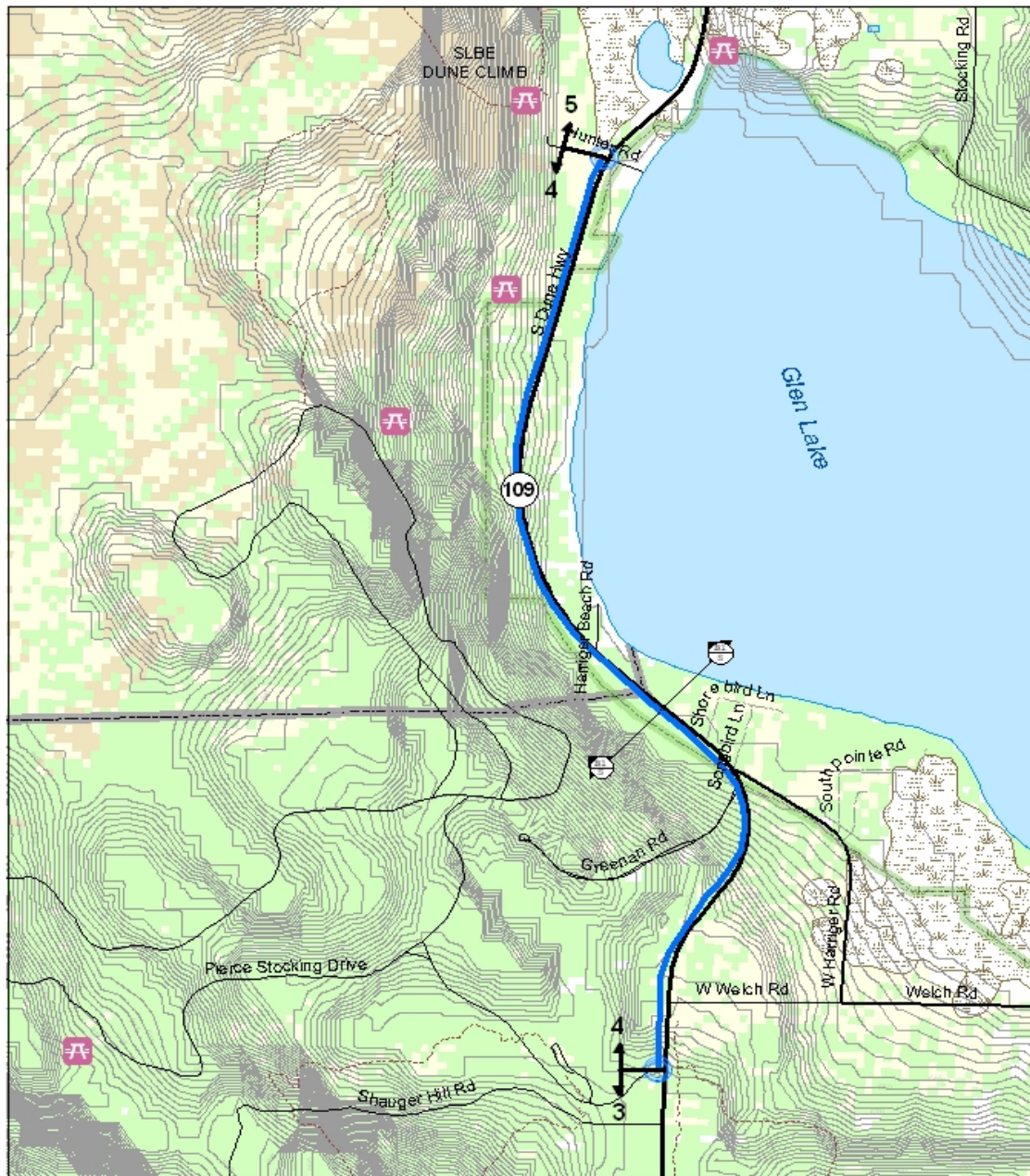
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| — State Trunkline | ~ Rivers |
| — County Primary Roads | ~ Lakes |
| — County Local Roads | ~ Village Boundaries |
| — Village Roads | ~ Township Boundaries |
| — Other Roads | ~ Aquatic Bed |
| --- Existing Hiking & Skiing Trails | ~ Forested |
| ■ Historic Buildings & Structures | ~ Agricultural |
| ▲ Rest Areas/Scenic Turnouts | |
| ~ Recommended SLBE Wilderness Boundary (1981) | |
| ~ SLBE Boundary | |

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Base GIS Data: Michigan Framework Data
1992 National Land Cover Dataset
1992 National Wetlands Cover Dataset
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NAD 1983 UTM ZONE 18N

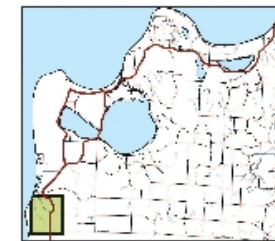




**MAP 2.4 - PROPOSED TRAILWAY ALTERNATIVES
SEGMENT 4: ALTERNATIVE A**
LEELANAU SCENIC HERITAGE ROUTE TRAILWAY MASTER PLAN

TRAIL SURFACE LEGEND

- Asphalt
- Crushed Limestone
- Boardwalk
- On-Road Bike Lane
- Existing Gravel Road
- Road Crossing Location



GENERAL LEGEND

- County Primary Roads
- County Local Roads
- Village Roads
- Other Roads
- Existing Hiking & Skiing Trails
- Historic Buildings & Structures
- Rest Areas/Scenic Turnouts
- Recommended SLBE Wildemess Boundary (1981)
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- Forested
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1992 National Land Cover Dataset
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National Park Service
NAD 1983 UTM ZONE 18N

