2.0 PROJECT DESCRIPTION

This chapter describes the *Revised South Tahoe Greenway Shared-Use Trail Project* (Greenway). Sections 2.1, 2.2 and 2.3 describe the project background, previous public involvement, and anticipated future environmental process and review, respectively. Section 2.4 details the project objectives and sections 2.5 through 2.7 detail the various project components of the Greenway, including design features and construction controls, compliance measures, revegetation and restoration plans, BMPs applications, and operations, maintenance and monitoring plan.

2.1 PROJECT BACKGROUND

2.1.1 Summary of Past Actions

The current Greenway project developed through many years of public and agency consultation. Appendix A provides a complete summary of project development milestones. Public property acquisition began in the 1960's as Caltrans initiated work on a by-pass freeway intended to address traffic congestion along US Hwy 50 in South Lake Tahoe. By the 1980's, changing environmental values precluded construction of major new auto routes in the Tahoe Basin. Although Regional stakeholders agreed the freeway would not be built, TRPA affirmed the value for alternative transportation of the linear public ownership related to the by-pass route. TRPA identified this route as a suitable bike trail corridor with its adoption of the Regional Goals and Policies Plan (1987), Regional Transportation Plan (RTP) (TRPA/TMPO 2008) and Air Quality Plan (AQP) (1999 and 2003), Environmental Improvement Program (EIP) (2001) and Lake Tahoe Regional Bicycle and Pedestrian Master Plan (BPMP) (TMPO 2010).

Caltrans and the Conservancy completed a land transfer agreement for the former freeway alignment property in 2000 and bike trail feasibility and project planning began. Preliminary project plans and prior environmental analysis on a 9.6-mile trail produced a shared-use trail project and a number of alternative alignments for consideration. In 2006, public scoping for an Environmental Impact Report (CEQA)/Environmental Impact Statement (TRPA)/ Environmental Impact Statement (NEPA) (EIR/EIS/EIS) presented one range of feasible alternatives for this longer project, including access through portions of private property. The property owners objected, however, and subsequent evaluation prepared a new alternative for consideration. In 2008, another public scoping process offered a new range of alternatives for consideration and final conceptual plans and environmental analysis proceeded.

Throughout 2009 and 2010, uncertainty existed related both to the range of alternatives for the southern section of the route and the potential for securing public construction funds. In 2010, lead agencies agreed that the core of the project, securing the critical transportation connections in the center of South Lake Tahoe, should proceed as a distinct project. Potential for future southward extension of the route to Meyers remains. The revised project description now extends between Sierra Tract and Van Sickle Bi-State Park. This IS/IEC/EA evaluates the environmental effects of this smaller revised project.

2.1.2 Alternatives Considered but Rejected from Further Consideration

During the over seven years of preliminary project plan development, lead agency staff considered many different trail alignments, trying to identify the best transportation/recreation route with the fewest conflicts. Table 2 identifies the alternatives considered during project development of the revised project. In each case, project staff rejected full consideration of these alternatives for the reasons described.

Determinations for reasonableness considered compliance with Caltrans Class 1, AASHTO and ADA standards, presence of stream environment zones (SEZ) and other sensitive lands, existing land use

patterns, existing transportation links, public health and safety considerations, economic feasibility and recent regional planning activities in the context of the objectives and purpose and need of the Project. Figure 2 illustrates the location of the rejected alternative segment alignments.

Table 2

Alternatives Considered and Rejected

Alternative Alignment	Reason(s) for Elimination
Exclusive Use of Former Caltrans US Hwy 50 Bypass ROW Alignment	This alignment recognized the high value of the continuous linear public ownership and the connectivity between neighborhoods. This alignment included an alternative way to cross Trout Creek, but was rejected because of floodplain and habitat values. The alternative also resulted in more new SEZ disturbances that were deemed unnecessary when compared to an expansion of the river crossing at the existing Martin Ave Bridge. After detailed base mapping became available, project designers identified significant design constraints in some locations and rejected this alternative from further consideration. These constraints included steep grades that could not meet AASHTO and ADA requirements, dense aspen/willow vegetation, and safety concerns crossing Pioneer Trail in a location with poor sight lines. Design work began on alignment modifications to avoid the identified design constraints.
Alternative Bijou Meadow Crossing Alignment - From Al Tahoe to Ski Run Blvd	This alignment was rejected from further consideration because of its greater length and failure to reduce overall disturbance to the Bijou Meadow.
Alternative Pioneer Trail Crossing Alignment – From the Intersection of Spruce and Herbert to the Intersection of Ski Run Blvd and Pioneer Trail	Construction of this alignment required working within the constrained residential roadway ROWs and crossing numerous driveways and intersections.
Alternative South Lake Tahoe Community Play Fields to the Intersection of Spruce and Herbert	The use of the existing Class 1 trail (i.e. Al Tahoe Bike Trail) required upgrades to meet ASSHTO shared-use trail standards. This alignment required reconfiguration of Bijou Golf Course and a number of street crossings and driveway crossings that would require substantial private property encroachment.
Alternative Intersection of Aloha and Herbert to the Intersection of Ski Run Blvd and Pioneer Trail	Rejected because of private property encroachment needs, safety concerns and excessive SEZ disturbances.
Intersection of Ski Run Blvd and Pioneer Trail to the Intersection of Pioneer Trail and US Hwy 50	Rejected because of constraints present within the Pioneer Trail ROW, private property concerns, excessive crossing of driveways, business entrances, and primary and secondary streets.

Source: 2006 Notice of Preparation; 2008 Notice of Preparation; HBA 2011

2.2 PREVIOUS PUBLIC INVOLVEMENT

The Conservancy, TRPA and LTBMU staff hosted many public input opportunities related to the Greenway. Two public workshops in 2003 offered input into initial project design. Two different environmental document public scoping processes in 2006 and 2008 offered five public meeting and two public comment opportunities. Appendix B identifies the details of this public involvement. The public scoping processes involved public notice to nearby residents and other interested individuals and organizations and 30 day comment periods. Public and agency comments received during these input opportunities drove project revisions and directed elements of the environmental review process. The current IS/IEC/EA builds from these past comment opportunities:

- November 14, 2006 at Forest Service Supervisor's Office;
- November 28, 2006 at City Council Meeting;
- December 14, 2006 at TRPA Hearings Officer Meeting;
- April 17, 2008 at TRPA Hearings Officer Meeting; and
- April 22, 2008 at Forest Service Supervisor's Office.

2.3 FUTURE ENVIRONMENTAL PROCESS AND REVIEW

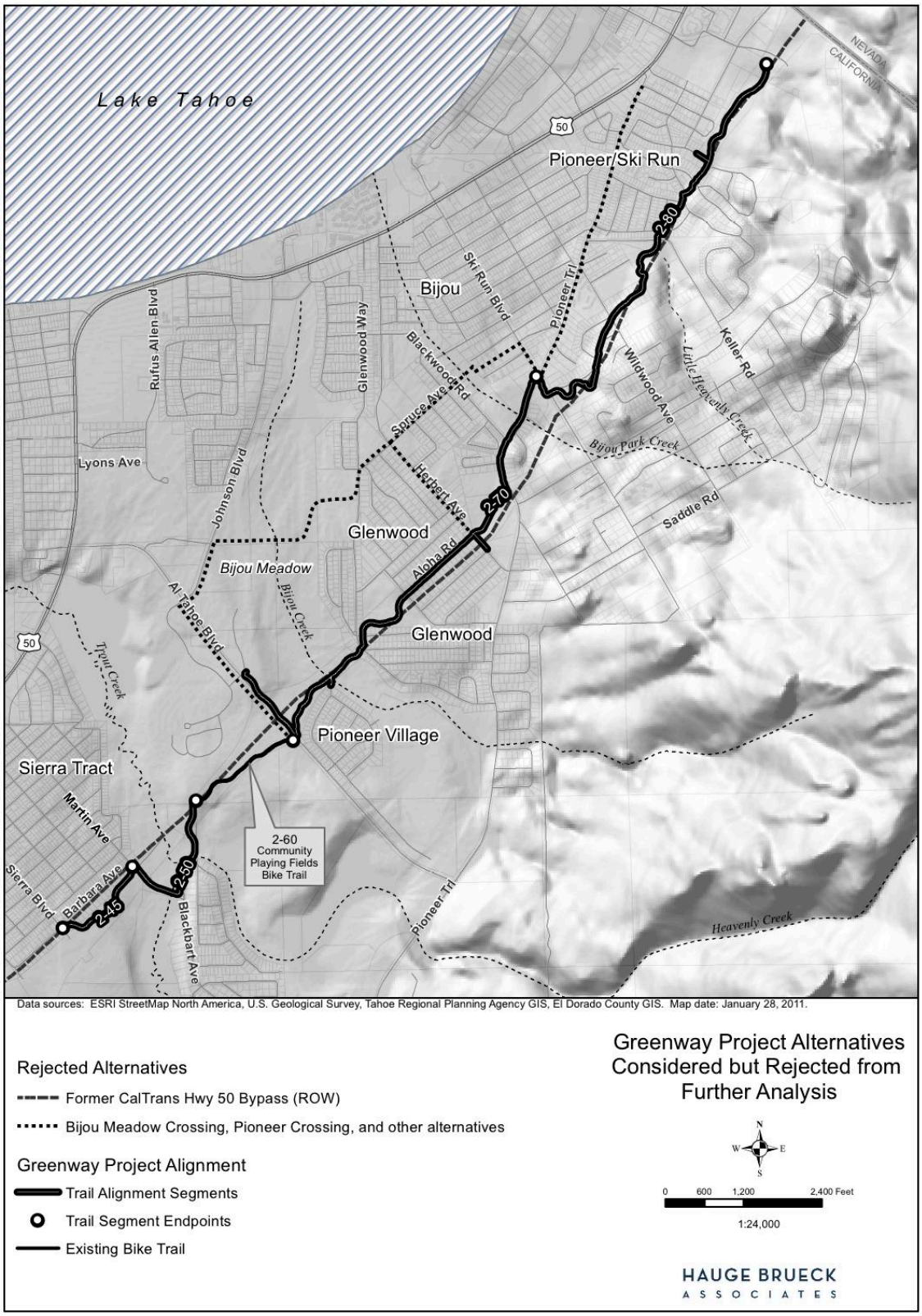
The Greenway IS/IEC/EA meets the requirements of CEQA, and the TRPA Rules of Procedures and Code of Ordinances and provides the basis for federal decisions under NEPA. This environmental document serves as a joint document to meet the environmental review requirements of NEPA for the LTBMU and USACE, CEQA for the Conservancy, Lahontan, CDFG, STPUD, and the City, and the Tahoe Regional Planning Compact for the TRPA. Each agency will use the document to make decisions based on the respective agency's planning policies and statutory requirements. Sections 1.1.1, 1.1.2 and 1.1.3 in Chapter 1 detail each agency's roles, policies, and decision responsibilities.

2.4 PROJECT PURPOSE

The purpose of the Greenway is to complete an accessible and continuous shared-use trail in the core of South Lake Tahoe that establishes a convenient non-auto transportation alternative and high quality recreational experience for residents and visitors.

Given that the Lake Tahoe south shore roadway network suffers from excessive traffic congestion and a resultant degradation of air quality, there is a need for expansion, upgrade and connectivity to the existing bike trail system. The south shore lacks continuous Class I facilities for bicycles and pedestrians that provide high quality non-motorized transportation and recreational opportunities. Regional planning documents (e.g., TRPA/TMPO RTP and Goals and Policies) identify the important role that improvements to the bicycle and pedestrian trail network play in addressing these problems.

Figure 2. Alternative Alignments Considered but Rejected from Further Consideration



2.5 PROJECT AREA

Figure 1a in Chapter 1 presents the regional location map and Figure 1b illustrates the general location of the project area and Greenway alignment in the southern portion of the Lake Tahoe Basin. The TRPA Code of Ordinances (Code) Subsection 20.3.D(1) establishes procedure for determination of project area. The Code requires incorporation of the entire area for each assessors parcel number (APNs) for parcels less than 20 acres, as outlined in Code Subsection 20.3.D(1)(a)(ii)) and a portion of APNs or other lands larger than 20 acres based on factors outlined in Code Subsection 20.3.D(1)(a)(iv). These factors include:

- The area impacted by or the sphere of influence of the project;
- The area to be actually used for the project;
- Whether the project is located in one or more hydrologically-related areas; and
- The extent of land coverage and land disturbance for the project.

Considering the issues above, the Conservancy, TRPA and LTBMU agree to define the project area as determined by the criteria listed below.

- Include the entirety of each APN that the main trail and neighborhood connections cross for Conservancy and LTBMU parcels smaller than 20 acres.
- Include the former Caltrans ROW from the Sierra Tract north, whether or not the trail passes through the individual APNs associated with the ROW acquisition.
- For LTBMU parcels and Conservancy parcels over 20 acres in size, the project area includes a 300-foot wide corridor following the main trail or the distance up to public property boundary, which for some sections may be less than 300 feet. The project area encompasses related trail amenities and interpretive areas, decommissioned access trails, and other opportunities for erosion control and SEZ enhancement.
- Define improved neighborhood connectors by a narrower corridor of 150 feet in total width. If a corridor approach to the neighborhood connectors isolates small pockets of public property, expand the project area to encompass the pockets.
- Where the shared-use trail enters other public parcels including public roadway ROWs and the fire station, define the project area very narrowly to include only new trail project features. For land coverage calculation, assume parcels are at or over allowed land coverage. Calculate coverage requirements separately for each ROW segment, assuming that required coverage is to be transferred. In this way, the project area is continuous, although some sections of the project area do not contribute base allowable land coverage for calculation purposes, resulting in a marked difference in land coverage transfer needs between the main alternative alignments.
- Expand project area boundary to include project features such as upgraded neighborhood connectors and adjacent restoration opportunities. Areas identified for off-site mitigation opportunities are not included in project area.

2.6 PROJECT DESCRIPTION

The section below describes the project components of the Greenway, including alignment segment summaries, project design features and construction controls, revegetation and restoration, trail decommissioning and BMPs, connectivity to existing trails, neighborhoods and other access points, regulatory compliance measures and operations, maintenance and management.

2.6.1 Alignment Segment Summaries

The Greenway constructs a separated bike trail linking Sierra Blvd to Van Sickle Bi-State Park. The alignment lies within the former Caltrans ROW in most of its length, deviating in some locations to

reduce impact on stream environment zones or improve travel or roadway crossing safety. The following descriptions provide project detail in logical sequence. The number labeling system relates to the historical conceptual plan development; details can be found on the plan sheets in Appendix C. Figures 3, 4 and 5 illustrate the features found within the project area of Segments 2-45, 2-50, 2-70 and 2-80 and immediate vicinity.

2.6.1.1 Sierra Tract Segment (Segment 2-45)

This short "Sierra Tract" segment of the Greenway begins at Sierra Blvd and parallels Barbara Ave towards Martin Ave. This segment includes the following features:

- Cross references with Plan sheets I-2.00-01 and L1-2.00-01
- 1,600 feet total length within the former Caltrans ROW owned by the Conservancy and a portion of Caltrans APN 031-020-45.
- 960 feet traverses Conservation PAS designation and 640 feet traverses Residential PAS designation.
- Approximately 1,600 feet of 10-foot wide asphalt trail located on high capability land.
- Requires 5,661 square feet of new land coverage and 3,827 square feet of new disturbance associated with trail clear zones. Removes 27,973 square feet of land coverage associated with existing foot trails.
- Connection to existing Class 2 trail along Sierra Blvd.
- To construct the Sierra Tract segment, removal of 12 total trees occurs in a residential PAS land use designation. Two of the 12 trees are greater than 30-inch dbh, nine trees are less than 30-inch and greater than 14-inch dbh, and one tree is less than 14-inch dbh.

2.6.1.2 Trout Creek Segment (Segment 2-50)

The "Trout Creek" segment of the Greenway crosses Martin Ave at the intersection with Barbara Ave, crosses Trout Creek on a new bicycle bridge on the north side of the existing roadway bridge, and connects to the existing South Lake Tahoe Community Play Fields Class I trail at the LTCC via a route along Black Bart Ave and Meadowcrest Dr. This segment includes the following features:

- Cross references with Plan sheets I-2.00-01 and I-2.00-02 and L1-2.00-02 through L1-2.00-06.
- 2,439 feet total length, including the following land ownerships: 1,567 feet City (public roadway ROWs and APNs 025-061-026 and 025-061-027), 617 feet Conservancy and 255 feet STPUD (APN 025-061-018).
- 1,820 feet traverses conservation and 619 feet traverse commercial/public service PAS designation areas.
- Approximately 1,015 feet of 10-foot wide asphalt trail on high capability land.
- Approximately 479 feet of 10-foot wide asphalt trail through SEZ constructed on raised permeable fill. Project plans use this detail in SEZ areas where subsurface water conditions are not sufficient to support meadow grass/sedge vegetation and where nearby road conditions do not preclude subsurface flow.
- New bridge over Trout Creek immediately downstream from the Martin Ave Bridge. Due to the narrow dimensions of the existing roadway bridge, a new bridge is necessary to meet AASHTO trail design standards. In approaches to the bridge on both sides, the design requires a 12-foot wide boardwalk with rail, totaling approximately 945 linear feet

Figure 3. Greenway Project Area - Sierra Tract and Trout Creek Area - Segments 2-45 and 2-50

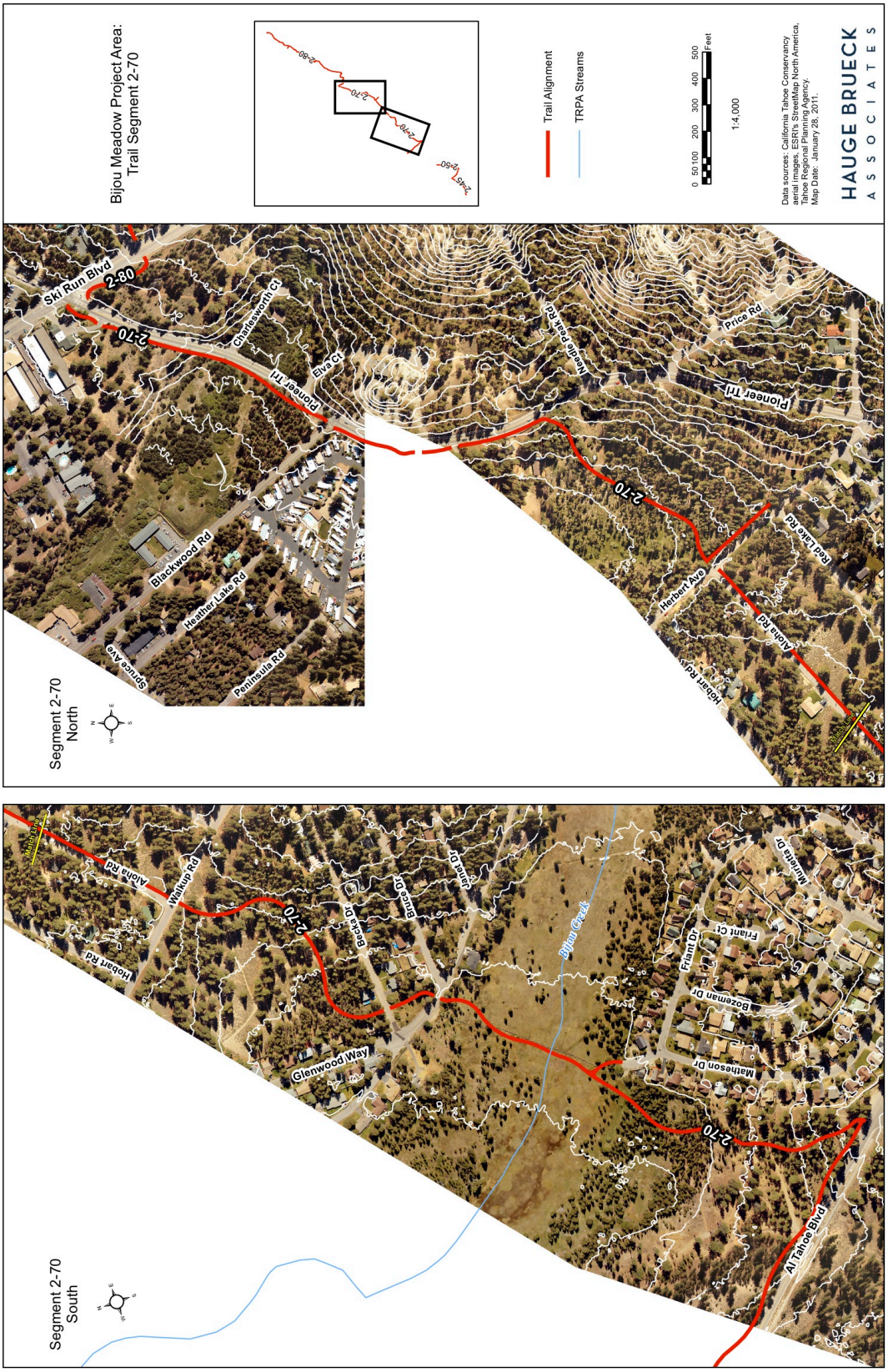
- As the alignment approaches the corner of Black Bart and Meadowcrest Dr, a 3 to 4 -foot high boardwalk (12-foot wide with rail) with a user management fence to direct movement is necessary for approximately 150 feet to meet grade restrictions and protect the Trout Creek stream zone.
- Requires 24,197 square feet of new land coverage and 7,461 square feet of new disturbance associated with trail clear zones. Approximately 19 percent of this segment aligns over existing land coverage (5,534 square feet). Retains and applies BMPs to 873 square feet of existing trails and removes 8,918 square feet of existing land coverage associated with informal trails.
- To construct the Trout Creek segment, removal of 138 total trees occurs, including 14 trees greater than 30-inch dbh, 47 trees less than 30-inch and greater than 14-inch dbh, and 77 trees 14-inch dbh or less. A tree survey and health assessment will confirm this estimate and dictate trail realignment efforts if necessary.

2.6.1.3 Bijou Segment (Segment 2-70)

The Trout Creek Segment described above ends by connecting to an existing bike trail that runs through the South Lake Tahoe Community Play Fields and a portion of the LTCC campus. This existing trail is approximately 2,600 feet long. The Bijou Segment of the Greenway picks up north of the existing trail at Al Tahoe Blvd. This segment establishes a street crossing at Al Tahoe Blvd. at the intersection with the entrance to the South Lake Tahoe Community Play Fields. Across Al Tahoe Blvd, the route follows an existing foot trail across the south end of Bijou Community Park, along the west side of Pioneer Village, and across Bijou Meadow to Glenwood Way near Janet St and Bruce St. The Greenway crosses Becka and passes through LTBMU lots to reach Walk Up and parallels Aloha on the southeast. The alignment crosses Herbert Ave reaching Pioneer Trail north of Needle Peak. Once meeting Pioneer Trail the alignment follows the west side of the roadway within the Pioneer Trail ROW until reaching Ski Run Blvd. This segment includes the following features:

- Cross references with Plan sheets I-2.00-03 through I-2.00-05 and L1-2.00-06 through L1-2.00-16.
- 8,922 feet total length, including the following land ownerships: 2,104 feet City roadway ROWs, 493 feet on other City (Bijou Meadow crossing, APNs 027-323-017 and 025-041-009), 1,291 feet LTBMU (APNs 025-203-001, 025-204-001 and 027-331-003), 792 feet private (APNs 025-021-038, 025-021-077, 025-051-022, 025-282-001, 025-282-018, 025-510-002, 027-323-010 and 027-323-016), and 4243 feet Conservancy.
- 5,034 feet traverses recreation PAS designation, 3,175 feet traverses residential and 711 feet traverse tourist PAS designation areas.
- Approximately 4,979 feet of 10-foot wide asphalt trail on high capability land.
- Approximately 1,021 feet of 12-foot wide boardwalk with no rail just before the short connector to Friant St, which provides access to the Pioneer Village neighborhood. The alignment is boardwalked through this wooded area and into the open meadow to accommodate areas with saturated soil conditions during spring months. Stairs or other means of access allow maintenance of existing perpendicular trails in Bijou Meadow at selected, well-established locations. This access can be relocated or removed if necessary to accommodate future Bijou Meadow restoration plans.
- Intersection improvements include: striped and signed crosswalk with user-activated flashing warning lights at South Lake Tahoe Community Play Fields entrance/Al Tahoe Blvd and Glenwood Way near Bruce; pedestrian phase and striped crosswalk at existing traffic light/signalized intersection crossing at Pioneer Trail/Ski Run Blvd. The existing pedestrian island with utility pole at Ski Run Blvd remains.

Figure 4. Greenway Project Area - Bijou Meadow Area – Segment 2-70



- Aloha becomes a one-way road (traffic direction is towards Walk Up) to accommodate the shared-use trail (Figure 10 depicts the alignment within public parcels along a roadway such as Aloha). A 5-foot offset separates the alignment from the travel lane utilizing a portion of the previously paved area. Relocation of six power poles is necessary. This section of the alignment provides an important trail connection for the Bijou neighborhoods. An existing Class 3 trail is signed along Herbert from this crossing point to Bijou Community School.
- Approximately 1,530 feet of 10-foot wide asphalt trail through SEZ constructed on raised permeable fill. Project plans use this detail in SEZ areas where subsurface water conditions are not sufficient to support meadow grass/sedge vegetation and where nearby road conditions do not preclude subsurface flow. This includes each side of Bijou Meadow adjacent to the existing residential developments.
- Requires 78,410 square feet of new land coverage and 39,433 square feet of new disturbance associated with trail clear zones. Approximately 23 percent of this segment aligns over existing land coverage (17,712 square feet). Retains and applies BMPs to 7,092 square feet of existing foot trails and removes 61,075 square feet of existing land coverage associated with informal trails.
- Maintains and applies BMPs to two existing neighborhood connectors. One connector is a 1,632-foot long, 8-foot wide asphalt trail/sidewalk to the Senior Center on Herbert and the other is 182-foot long, 8-foot wide asphalt trail on permeable fill from the Greenway to the intersection of Walk Up and Red Lake.
- To construct the Bijou segment, removal of 189 total trees occurs, of which 15 are greater than 30-inch dbh, approximately 70 trees are between 30-inch and 14-inch dbh and 104 are less than 14-inch dbh. A tree survey and health assessment will confirm this estimate and dictate trail realignment efforts if necessary.
- Coordinates with the Bijou Park Disc Golf layout and provides a Class 1 trail connection to Bijou Community Park along the north side of Al Tahoe Blvd.

2.6.1.4 Ski Run to Van Sickle Bi-State Park Segment (Segment 2-80)

The "Ski Run to Van Sickle Bi-State Park" segment (Segment 2-80) crosses Ski Run Blvd approximately one block southeast of Pioneer Trail, winds up the facing hillside and follows the former Caltrans ROW through neighborhoods off of Larch Ave and Rocky Point Rd. Once north of Rocky Point neighborhoods, the trail connects to Van Sickle Bi-State Park at the proposed internal circulation trail and ultimately to the existing pathways aligned on both sides of Park Ave from Montreal Ave to US Hwy 50. This segment includes the following features:

- Cross references with Plan sheets I-2.00-05 through I-2.00-08 and L1-2.00-16 through L1-2.00-24.
- 7,428 feet total length, including the following land ownerships: 967 in the City roadway ROW, 105 feet LTBMU (APN 028-090-005), 6,073 feet in the former Caltrans ROW, 36 feet STPUD (APN 028-083-014), 38 feet private (APNs 028-141-037 and 028-141-039) and 209 feet Conservancy.
- Approximately 6,394feet of 10-foot wide asphalt trail on high capability land.
- Approximately 291 feet of 10-foot wide asphalt trail through SEZ constructed on raised permeable fill. As noted above, project plans use this detail in SEZ areas where subsurface water conditions are not sufficient to support meadow grass/sedge vegetation and where nearby road conditions do not preclude subsurface flow.
- Approximately 743 feet of boardwalk.

Figure 5. Greenway Project Area - Ski Run to Van Sickle Bi-State Park – Segment 2-80

- The alignment requires crossing six roadways in this area: Ski Run Blvd (Mid-block crossing with signage), Keller (a mid-block crosswalk with striping and a warning signal); Larch (a primary road crossing at intersection with signage); Shepherds (a secondary road crossing at intersection with signage); and Rocky Point at the loop (two crossings as mid-block crossings with signage).
- Asphalt 8-foot wide neighborhood connector to Chonokis (219 linear feet). The alignment coordinates with existing water quality improvement facilities near the Larch and Lost Sheep and Shepherds and Rocky Point intersections.
- Requires 68,437 square feet of new land coverage and 23,747 square feet of new disturbance associated with trail clear zones. Approximately 22 percent of this segment aligns over existing land coverage (14,918 square feet). Field surveys identify 78,358 square feet of existing land coverage associated with informal trails and abandoned roadways for removal.
- To construct the Ski Run Blvd to Van Sickle Bi-State Park segment, removal of 189 total trees occurs. Four trees are greater than 30-inch dbh and require trail relocation to avoid as described in CM-7. The rest are smaller trees, with 142 trees between 30-inch and 14-inch dbh and 43 less than 14-inch dbh.

2.6.2 Project Design Features and Construction Controls

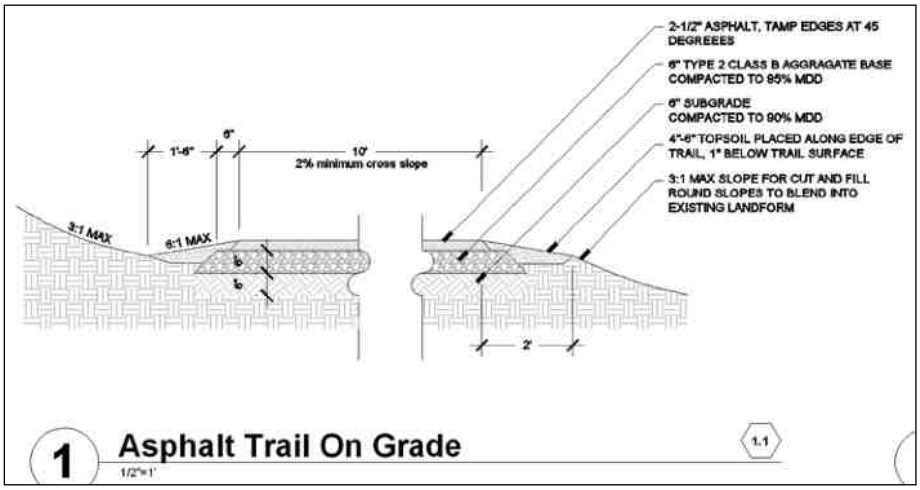
The design features (NEPA lead agency terminology) and construction controls (CEQA lead agency terminology) presented below are incorporated into the project as determined by site-specific characteristics. Section 2.6.5 provides additional detail related to compliance with required permits and regulations for some features. Figures 6 through 12 illustrate design details for trail construction in different settings.

2.6.2.1 Design Objectives

The design objectives of the Greenway shared-use trail include:

- Meeting AASHTO guidelines;
- Meeting ADA standards;
- Maximizing use of former Caltrans ROW lands as consistent with environmental constraints;
- Enhancing public access to recreational facilities
- Coordinating with public improvement projects (e.g. EIP) within project area;
- Considering non-motorized winter uses of the shared-use trail;
- Meeting the goals of adopted Regional Plans;
- Minimizing conflicts between bicycles, pedestrians, and automobiles.
- Considering other public land uses adjacent to the former Caltrans ROW;
- Providing interpretive and education program (environmental and cultural) opportunities;
- Minimizing environmental disturbance, especially in SEZs; and
- Providing environmental restoration opportunity.

Figure 6. 10-Foot Wide Asphalt Trail on Grade



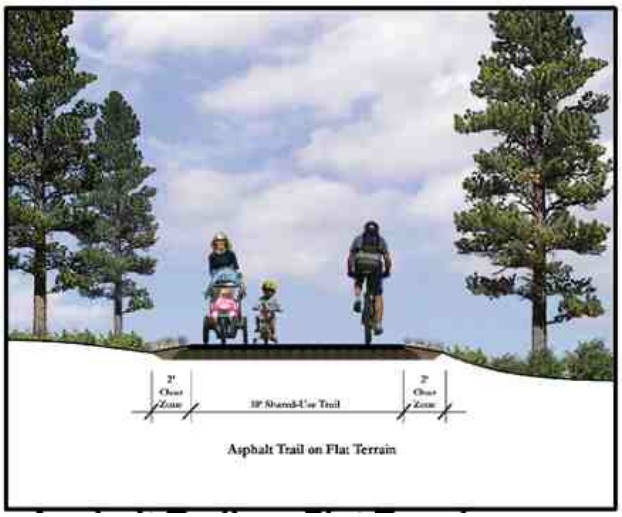


Figure 7. 10-Foot Wide Asphalt Trail on Permeable Fill

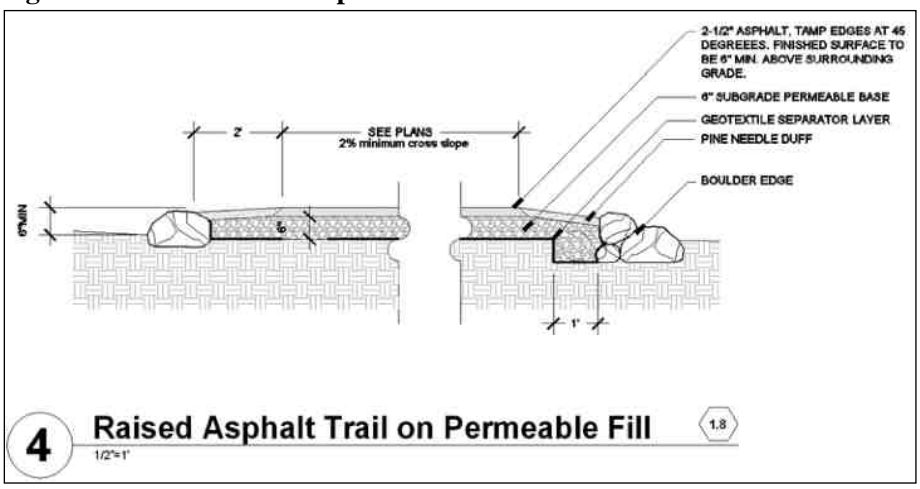


Figure 8. Boardwalk with Railing

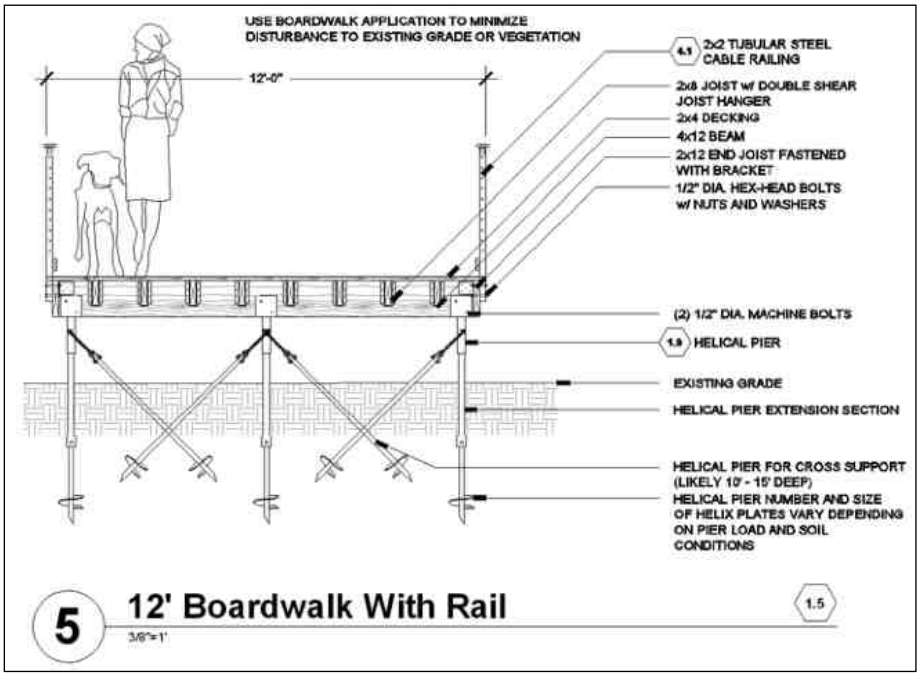


Figure 9. Boardwalk without Railing

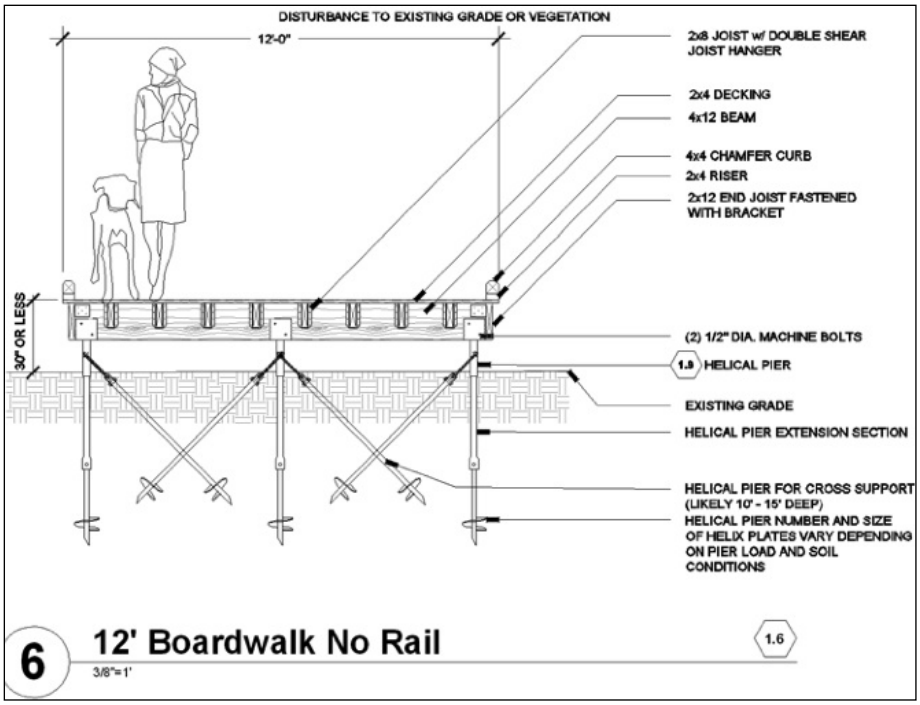
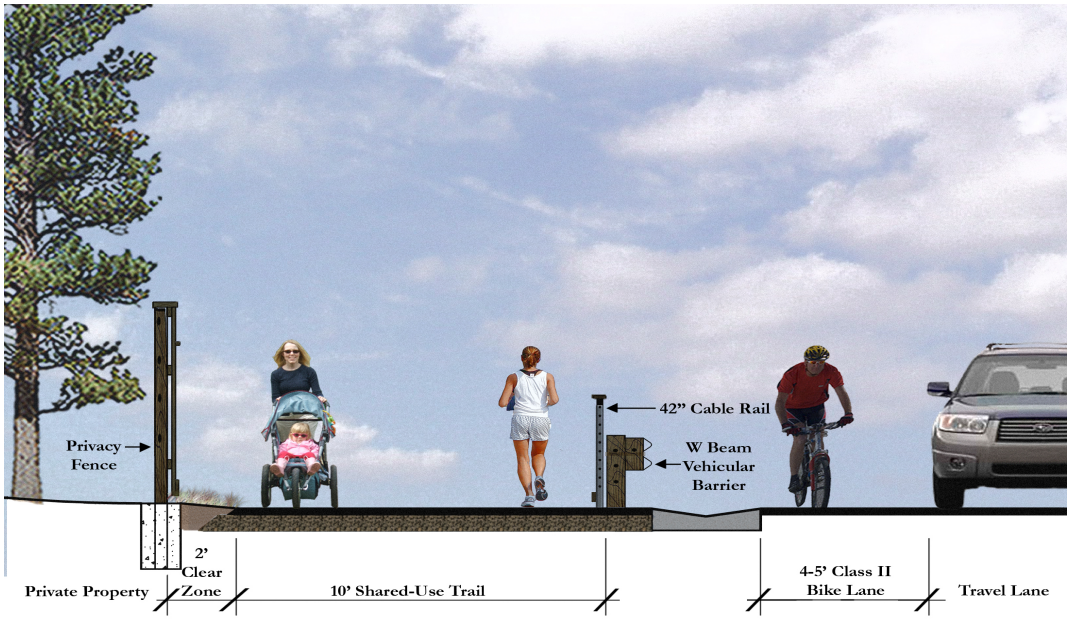


Figure 10. Trail Within Public Parcels Along Roadways (i.e. Public Roadway ROWs)



Constrained Right-of-Way

2.6.2.2 Shared-Use Trail Grades and Slopes Criteria and Standards

The following design features and construction controls serve to meet AASHTO and ADA standards:

- Minimum 10-foot wide asphalt path (Note: Although the recommended shared use path width is 12-feet, the Greenway proposes a 10-foot wide path in most locations to reduce land coverage associated with the proposal. Predicted use in the proposed segments, including the diversity of user groups and the total volume of use, preclude narrowing the trail width beyond the minimum standard of 10-feet.);
- 2-foot wide clear zone on each side of the asphalt path with maximum side slopes of 1:6 or 16%;
- Clear zone free of trees, poles, walls, fences, guardrails, and other lateral and vertical obstructions (can be vegetated with ground cover and low shrubs);
- Minimum 5-foot separation from the edge of path to canals, ditches, or slopes steeper than 1:3 or 33%;
- Grades kept to a minimum and include:
    - Less than 5% preferable to meet accessibility requirements and to keep the trail useable for a wide variety of cyclists;
    - Where grade must exceed 8.33%, incorporate resting areas such as pull-offs or a wider path; and
    - Where grade must exceed 5%, meet the maximum running length for the specified grade distance;

- AASHTO and the Access Board's Regulatory Negotiation Committee on Proposed Accessibility Guidelines for Outdoor Developed Areas grade restrictions include:

- 5-6% for up to 800 feet;
- 7% for up to 400 feet;
- 8% for up to 300 feet;
- 8.33% for up to 200 feet;
- 9% for up to 200 feet;
- 10% for up to 30 feet;
- 12.5 % for up to 10 feet;
- No more than 30% of the trail length shall exceed 1:12 (8.33%); and
- Provide transitions for grade changes;

- Cross-slopes no more than 2-3%; and
- Separate path a minimum of 5 feet from the edge of roadway pavement and in areas where the path is closer than 5 feet from the edge of roadway pavement, maintain a physical barrier.

2.6.2.3 Shared-Use Trail Surface Proposals

The primary shared-use trail surface includes an asphalt trail on grade that is 10-foot wide with 2-foot wide clear zones on each side of the asphalt path, as depicted in Figure 7. Three trail surface designs in SEZ areas correspond to site-specific conditions, as described and illustrated below.

Design Option 1 (Asphalt Trail on Grade). Design Option 1 installs asphalt pavement on grade. Project designs include this option only where the proposed trail lies very close to or partially on existing roadbed fill, making the permeable nature of the base material described below ineffective.

Design Option 2 (Raised Asphalt Trail on Permeable Base Material). Design Option 2 includes asphalt pavement with permeable base where subsurface hydrologic conditions produce long periods of dry surface soils. This design option maintains the trail standards necessary to encourage the widest range of user groups, while avoiding or greatly minimizing impacts to surface and near surface hydrology with the use of permeable base material. Boulder edges built at a 1:1 slope will hold the permeable material in place. For areas with greater than 30 inches of fill above existing grade, a full railing system will be used.

Design Option 3 (Boardwalks). Design Option 3 includes boardwalks to minimize disturbance to existing grades, vegetation and soils in wet SEZ and wetland areas. The following strategies apply to the use of boardwalk:

- Use boardwalk in SEZ areas that exhibit signs of surface water flow or thick meadow grass;
- Do not use boardwalk or permeable fill applications for trail sections directly adjacent to roadways in SEZ due to snow removal and maintenance conflicts and the reduced effectiveness of this very costly technique in these locations;
- Use a curb rail, not a full rail system, for boardwalks 30 inches above grade or less;
- Use full railing system for boardwalks greater than 30 inches above grade;
- Use 12-foot wide boardwalks in these project segments to accommodate predicted use volume without requiring users to step off the boardwalk to avoid collisions;
- Maintain 6-inch clearspace between bottom of structure and finished grade to allow for small animals to pass underneath;
- Use low profile boardwalks without rails whenever possible to allow for large mammals to pass over; and

- Use boardwalks in areas of higher land capability and in SEZ areas that do not show signs of surface flow where necessary to minimize cut and fill in steep terrain.

2.6.2.4 Development Standards for Neighborhood Connections

Neighborhood connections comply with the development standards listed below.

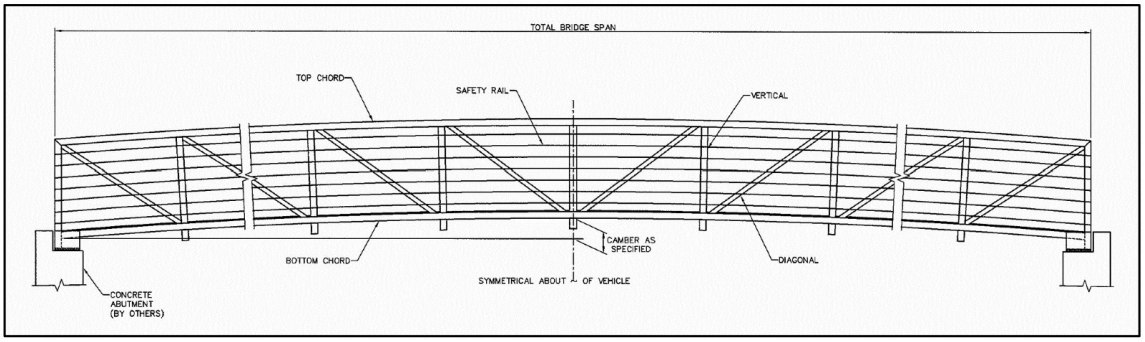
- Neighborhood connections provide easy access to nearby residents.
- Access to neighborhoods can be paved or unpaved, depending on level of use and accessibility needs. Necessary BMP upgrades occur on unpaved trails to reduce impacts on natural resources.
- Accessibility standards follow AASHTO guidelines and the Access Board's recommendations for trails in outdoor recreation areas (see Trail Design Standards above).
- The AASHTO standard (e.g., 10 foot wide path) does not apply to the width of neighborhood trail connections. Neighborhood connector trails are 5 to 8-feet wide because of a smaller number of users at neighborhood access points.

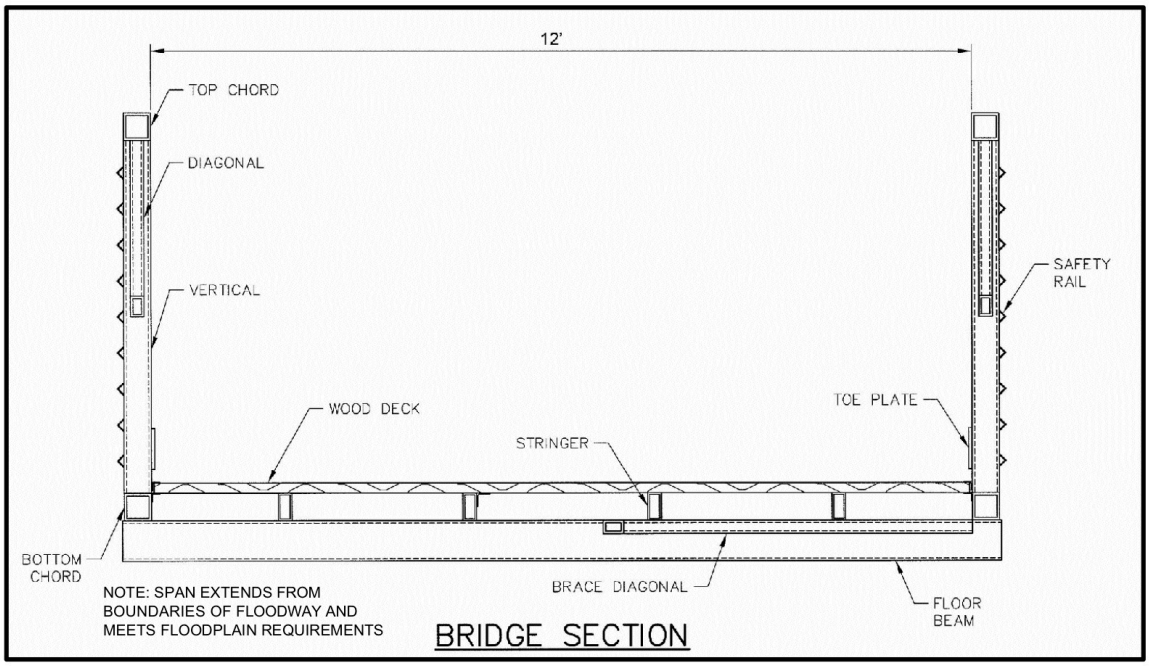
2.6.2.5 Stream Environment Zones and Creek Crossings

Project construction within SEZ adheres to the following list of construction techniques and design features as determined by site-specific conditions (see above for detailed description).

- Minimize length of trail in designated SEZ.
- Maximize use of existing land coverage or disturbance.
- Use raised asphalt trail on permeable fill in areas that exhibit SEZ vegetation types but not near surface groundwater conditions.
- Install boardwalk in SEZs and wetlands that exhibit surface water conditions or thick meadow grass to minimize disturbance and encourage users to stay on the designated trail. Elevated trail sections are designed to accommodate trail maintenance and emergency vehicles.
- Install cantilevered boardwalk with helical pier or diamond pier footings to reduce disturbance along steep slopes or to maintain trail grades without cut/fill within SEZ.
- Install a bridge at Trout Creek parallel to Martin Ave to reduce disturbance to the creek channel and SEZ. Use other short bridging designs in areas ephemeral drainage ways to maintain trail grades without installing culverts or creating cut/fill areas. Figure 11 illustrates the general features of bridge design. At Trout Creek, the shared-use trail bridge will lie directly downstream of Martin Ave and the Martin Ave Bridge. The proposed 12-foot wide bridge contains a 40-foot long overlook area at the channel crossing and is protected with a safety rail. Engineering design of this bridge during construction plan preparation will consider: 1) establishing maximum deck elevation and setting support locations to avoid impeding flood flows; 2) allowing flexibility for future improvements to Martin Ave and the Martin Ave bridge to allow improved flood flow capacity; and 3) bridge support design to minimize SEZ and wetland disturbance. Bridge span between 75 and 100 feet supported by pier or piling footing design is expected to meet this criteria. At either end of the bridge, the proposal transitions to boardwalk with helical pier footing support.

Figure 11. Martin Ave Bridge Span



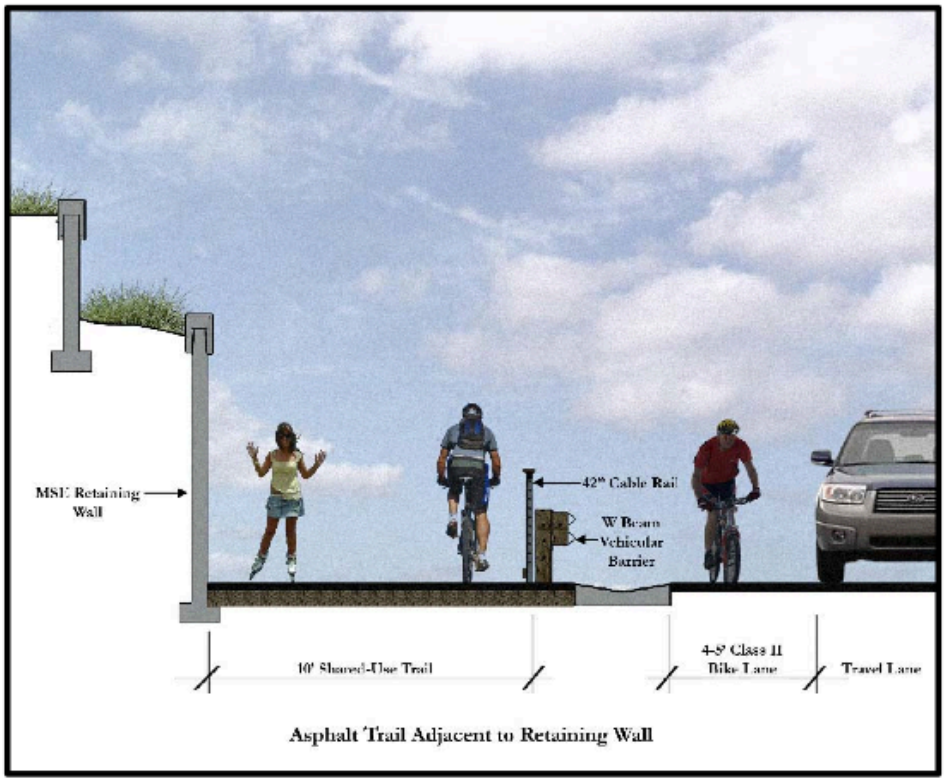


2.6.2.6 Hillside Construction

The construction techniques listed below apply to portions of the trail built on hillsides. Figure 12 illustrates typical hillside construction of a shared-use trail with armored cut and fill slopes and paved trail prism and tiered retaining walls proposed for areas along Segment 2-80 with grades requiring sections of retaining walls in excess of eight feet. City Code Section 36-52 requires that single retaining walls be a maximum of eight feet in height. Final Greenway plans will demonstrate tiered wall construction in compliance with City requirements including height, length and façade materials. Trail construction techniques along hillsides include:

- Focus on fitting the trail to the natural slope alignment;
- Traversing hillsides in order to minimize steep trail grades;
- Minimizing cut and fill slopes as much as possible in order to reduce construction impacts and visual scarring;
- Using retaining walls and boulders in key areas to reduce cut slopes; and
- Utilizing pier construction in order to float above steep slopes to minimize cut and fill requirements and tree removal.

Figure 12. Trail Hillside Construction



2.6.2.7 Street Crossings

Where the Greenway crosses streets, the project employs the following techniques:

- Minimize the number of street crossings;
- Place crossings at established intersections where possible;
- Avoid crossing locations where sight distance is poor (e.g., blind curves and hills);
- Provide bike crossing signage at primary and secondary road crossings at intersections; and
- Install bicyclist-activated flashing warning signal at mid-block crossings where road conditions and traffic levels warrant. The warning signals can be loop activated or button activated.

Figures 13 and 14 detail signed, mid-block crossings for use at Becka and Rocky Point and signed and striped mid-block crosswalk with a warning signal at Al Tahoe Blvd, Glenwood Way, Keller Rd, respectively. Figures 15 and 16 illustrate, respectively, signed, primary road crossings used at Martin Ave, Walk Up, Herbert, Ski Run Blvd and Larch and secondary road crossings at Woodbine, Blackwood and Shepherd, which are intersections that do not warrant signalization. Figure 17 illustrates the Pioneer Trail crossing, a signalized intersection crossing with pedestrian activated phase for intersections with heavy vehicular traffic. The crosswalk illustrated generally in Figure 17 will encompass the existing pedestrian island surrounding the signal pole and meet ADA access standards.

Figure 13. Mid-Block Crossing – Signed

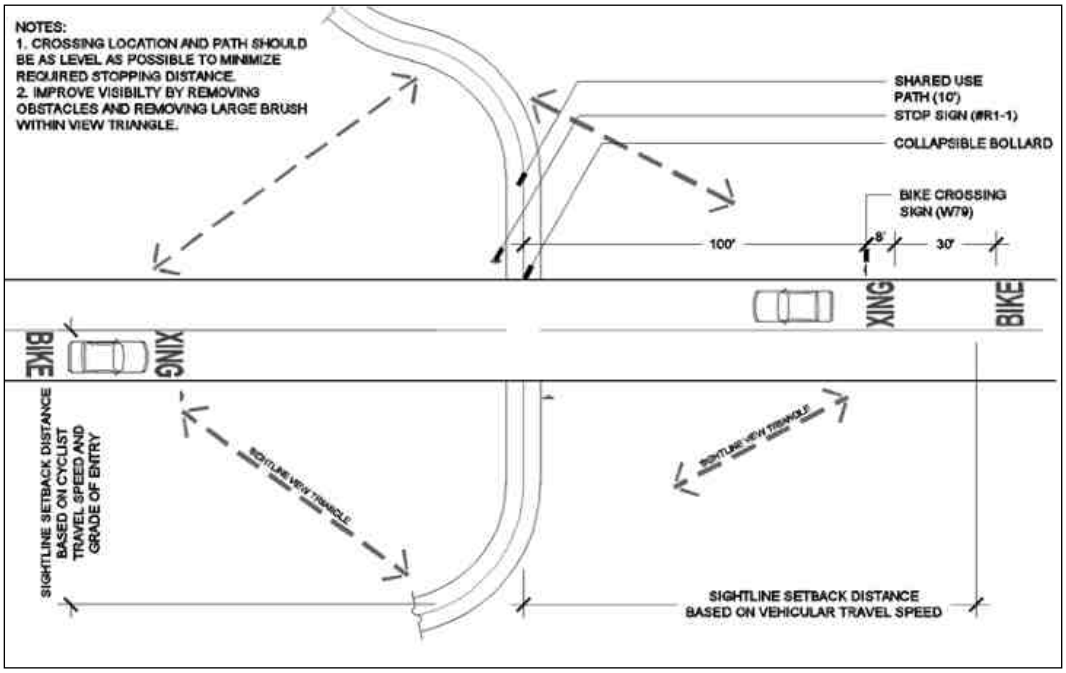
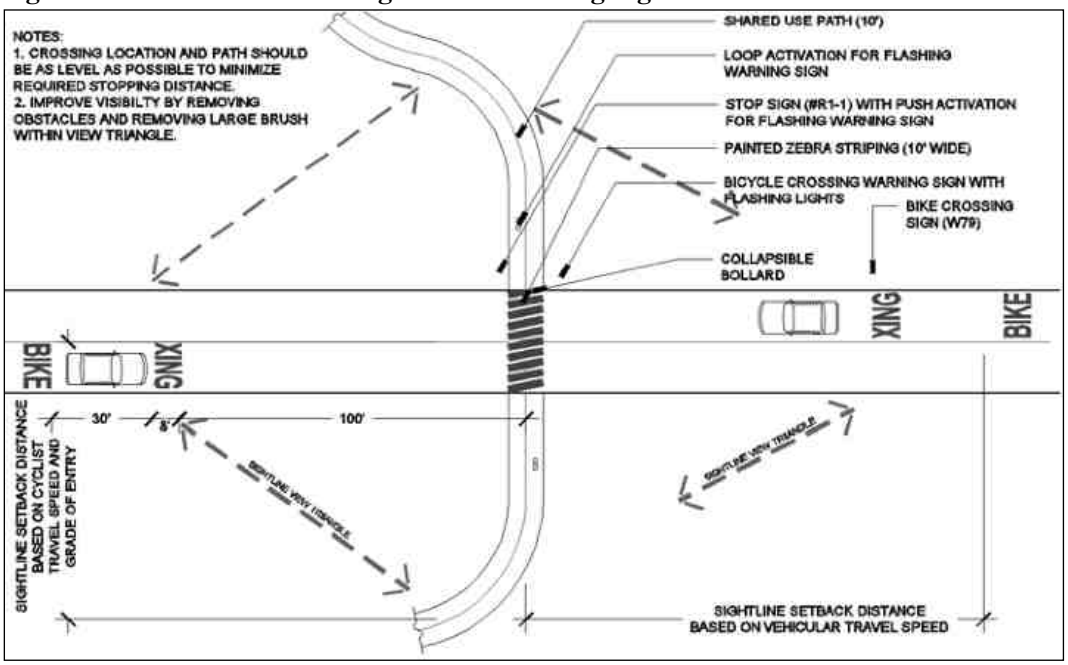



Figure 14. Mid-Block Crossing – With Warning Signal