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HILL COUNTRY CONSERVANCY AUSTIN, TEXAS

PARTNER ORGANIZATIONS for the VIOLET CROWN TRAIL

American Youthworks E-Corps | Austin Parks Foundation | City of Austin
City of Sunset Valley | Hays County | Hill Country Trail Runners
Lady Bird Johnson Wildflower Center | National Parks Service
The Real Estate Council of Austin | Texas Parks and Wildlife
Texas DOT | University of Texas McCombs School of Business
Travis County | Austin Ridge Riders | Greenbelt Guardians

GREENWAYS INC.
planning & design for open space, parks, trails, & alternative tra...
# Table of Contents

1.0 Introduction/Overview  
Map: VCT Overview Map (HCC)  1-2

2.0 History of Violet Crown

3.0 Planning and Design Process  
3.0 Overview  3-1  
3.1 Environmental Protection  3-1  
3.2 Sustainable Development  3-2  
3.3 User Needs  3-3  
3.4 Accommodating User Needs  3-4  
3.5 Relationship to Adjacent Lands  3-4

4.0 Trail Route and Alignment  
4.0 Overview: Maps: Phase 1, 2 and 3  4-1  
4.1 Violet Crown Trail Phases  4-2  
4.2 Environmental Assessment  4-3  
4.3 Phase 1: Zilker Park to Sunset Valley  4-4  
4.2 Phase 2: Sunset Valley to LBJ Wildflower Center  4-6  
4.3 Phase 3: LBJ Wildflower Center to Onion Creek  4-8  
   Upper Bear Creek (WQPL)  4-8  
   Little Bear Creek (WPQL)  4-12  
   Onion Creek Management Unit (WQPL)  4-14

5.0 Trail Design Guidelines  
5.0 Overview  5-1  
5.1 Trail Design  5-3  
5.2 Trail Intersections  5-10  
5.3 Ancillary Trail Features  5-17  
5.4 Signage and Wayfinding  5-22
# 6.0 Trailheads

6.0 Overview .......................... 6-1  
6.1 Dick Nichols Park .................. 6-2  
6.2 Bliss Spillar ........................ 6-3  
6.3 FM967 North ...................... 6-4  
6.4 FM967 South ........................ 6-5  
Map: Location of Trailheads .......... 6-6

# 7.0 Operations and Management

7.0 Introduction ........................ 7-1  
7.1 Overview of O&M Plan ............. 7-1  
7.2 Objectives of O&M Plan .......... 7-1  
7.3 Coordination of Partners ......... 7-2  
7.4 Trail Maintenance ................. 7-2  
7.5 Trail Safety and Security ....... 7-6  
7.6 Education and Stewardship ...... 7-7  
7.7 Roles and Responsibilities ...... 7-7  
   Governance Structure ............. 7-9  
7.8 Trail User Rules and Regulations 7-11  
7.9 Crime Prevention .................. 7-13  
7.10 Risk Management ................. 7-15  
7.11 Additional Information and Material 7-15  
7.12 Frequency of Maintenance Tasks 7-20
1.0 INTRODUCTION/OVERVIEW

Violet Crown Trail (VCT) is the name for an approximately 30-mile, multi-jurisdictional trail that will ultimately extend from Barton Springs/Zilker Park, in Austin, Texas, along City-owned parkland, through portions of the City of Sunset Valley, to the Onion Creek Preserve Management Unit, south of Austin, in Hays County. The vision for VCT includes using existing and new trail alignments planned, designed and built to state-of-the-art standards. One primary goal of those working to bring this vision to reality is to provide continuous public access from existing parkland to sensitive water quality lands owned by the City of Austin, while at the same time protecting the extraordinary natural treasures in the Barton Springs/Edwards Aquifer Recharge Zone. Protecting water quantity and quality; accommodating public access; utilizing public-private partnerships and proven models to fund maintenance; and creating and promoting a strong public education and land stewardship program are some key aspects of VCT that will benefit Central Texas. This master plan report defines a preferred route and alignment for the trail, location of major trailheads, guidelines for building the trail, strategies for operating and maintaining the trail.

Simply put, the proposed Violet Crown Trail corridor offers outdoor enthusiasts access to some of the most beautiful, native landscapes of the Texas Hill Country. The preserved Water Quality Protection Lands not only protect a significant portion of the rural community’s drinking water, they also preserve in perpetuity iconic and irreplaceable landscapes for residents to enjoy for decades to come.
Central Texans place a high value on their parks, preserves and other natural areas. They understand that these sensitive and beautiful lands are an important part of the high quality of life they so greatly enjoy. As early as 1970, a small group of forward thinking conservationists and parks advocates begin planning how to set aside in perpetuity some of the beautiful green spaces in the Greater Austin area. The ultimate result was that the City of Austin purchased more than 20,000 acres of parks, preserves and water-quality protection lands in the Barton Springs Aquifer region from 1990 to 2010 using voter-approved bond funds. The City of Sunset Valley, a few miles south of downtown Austin, also created a trail system connecting its preserve lands and neighborhoods during this same time period.

One of the primary goals of green space advocates and community leaders has always been connecting some of the area’s parks, preserves and water-quality
lands by creating a network of public trails that would provide recreation and educational opportunities. In order to accomplish this goal, a small group of trail advocates proposed connecting Austin’s existing trail system to the “WQPL” owned by the City of Austin. Their vision included planning and constructing a new regional trail system that would connect parks, preserves and private lands (using trail easements) from Zilker Park southward through the City of Sunset Valley to the LBJ Wildflower Center. This proposal was known as the Southwest Greenway Project.

Beginning in 1999, Hill Country Conservancy and other citizen led groups and volunteers began working with the City of Austin to plan in earnest how to create public access opportunities to the “WQPL,” and how to connect them to other parks, preserves and neighborhoods. This public-private effort was known as the Land Management Planning Group whose goal was to develop a management plan to balance the protection of water quality and quantity, species preservation, and outdoor recreation. The group made recommendations for land usage and stewardship based on public input and scientific studies and then developed a recommended implementation plan referred to as the “WQPL Management Plan.”

From 2005 to 2007, the Southwest Greenway Project and the WQPL Management Plan evolved into a more far reaching proposal to create a regional trail system now known as the Violet Crown Trail. This regional trail system will ultimately provide approximately 30 miles of trails connecting downtown urban Austin to the water-quality protection lands and rural countryside in Hays County.

In 2008, the City of Austin and the Hill Country Conservancy agreed to pursue the preparation of a detailed environmental assessment and trail corridor plan for the Violet Crown Trail project. The City commissioned the LBJ Wildflower Center to undertake a detailed environmental analysis and assessment of the “WQPL,” and to work with the nationally recognized trail planning firm Greenways, Inc. to define an acceptable corridor for trail development.

In 2009 and 2010, the Cities of Austin and Sunset Valley executed formal agreements with Hill Country Conservancy that provide the framework for planning, building, operating and maintaining the Violet Crown Trail. Also in 2010, the Violet Crown Trail Master Plan was adopted by Resolution by the City of Austin.
3.0 OVERVIEW

The planning and design process for this master plan has included an extensive on-site analysis and evaluation of the entire approximately 30-mile route of the proposed Violet Crown Trail corridor. Greenways Incorporated has utilized the findings and recommendations of the LBJ Wildflower Center’s environmental assessment of the WQPL to define a route and alignment for the trail. This route was subsequently ground-truthed by the LBJ Wildflower Center during the summer of 2009 through extensive fieldwork. Greenways Incorporated has also worked with the City’s Parks and Recreation Department, met with Sara Hensley, Director, and completed an evaluation of parklands that would be utilized for VCT.

The planning and design process has also included extensive public involvement. Greenways, Inc. has worked with the City of Austin, City of Sunset Valley, the LBJ Wildflower Center and the Hill Country Conservancy to co-host several public open house meetings to collect citizen input regarding the route and alignment of the trail.

Planning and design for the Violet Crown Trail is guided by several principles, including to:

- Protect existing parkland, the Water Quality Protection Lands and their function to provide clean water within the Edwards Aquifer recharge zone,
- Construct and operate a trails system that is sustainable and minimizes impact to the surrounding parkland and WQPL,
- Meet the needs of diverse users, but at the same time recognize that the trail cannot be all things to all users, and
- Consider the impact that increased public access and trail use can have on adjacent private properties and landowners and mitigate this impact.

3.1. ENVIRONMENTAL PROTECTION AND STEWARDSHIP

The most important goal of this project is to protect the environment that allows for clean water to flow into the Edwards Aquifer. To accomplish this goal in both the existing parkland and WQPL, trail facility development must be completed in a manner that limits the amount of physical disturbance to the landscape, and results in a trail surface that is firm, stable and can support the desired trail use.
The WQPL is literally full of open karst features and great care has been taken by the entire planning and design team to identify where these karst features are located in order to shift trail alignment away from the most important and sensitive features.

WQPL is also an intensively managed landscape. The City of Austin Wildland Conservation Division actively manages the WQPL for invasive species, wildlife and water quality. This management program includes the use of prescribed fire, where entire sections of the WQPL are burned. These stewardship practices affect both trail design and public access and use.

For City-owned parkland and other lands outside of the WQPL, environmental protection and stewardship is of equal concern, however, land development adjacent to the proposed trail corridor has already disturbed the native landscape and impacted the environment. The goal for trail development is to minimize impact and restore disturbed landscapes wherever possible.

### 3.2. SUSTAINABLE DEVELOPMENT

The Violet Crown Trail and associated facilities will be developed as low impact and sustainable landscape features. The trailtread, the actual surface area that users walk and bicycle on, is the most critical element of this project. It will be developed and managed to absorb defined and intended uses. If the trail tread is not developed properly, it could quickly degrade and become a problem for management and environmental stewardship. Under the worst-case scenario, the trail surface could become a primary contributor to pollution within designated parkland and WQPL, and that is not an acceptable outcome of this project.

Natural surface trail treads seem to offer the best solution for sustainable trail development. However, it is documented that natural surface trails require a higher level of management and stewardship than hardened trail treads. Natural surface trail treads are highly influenced by weather, native soil type, vegetation management and amount of use. Natural surface trail treads are generally regarded as easier to build and also generally have less impact on the trail corridor landscape because they don’t employ large, heavy construction equipment. Many natural surface trails can and are built with hand labor, rather than machine labor.

Hardened trail treads, conversely, normally involve the use of machinery and include the use of binder materials, such as asphalt cement or portland cement, in trail development. Hardened trail construction will have an immediate detrimental impact to the native Texas Hill Country landscape. This impact can be mitigated through landscape restoration.

The Violet Crown Trail will feature both natural surface trails and hardened surface trails, strategically developed to minimize environmental impact, maximize user experience and provide for a network that links residents and visitors to destinations along the proposed approximately 30-mile route.

In addition to trail construction, trailheads are another major feature of the Violet Crown Trail project. Trailheads typically include parking areas for automobiles, signage systems, information kiosks, restrooms, trash receptacles and seating areas. The footprint of a typical trailhead will vary in size depending on how many
automobile parking spaces are to be accommodated. The Violet Crown Trail will feature four new trailheads. Each of these should be designed and constructed using low impact development techniques as these will be some of the most highly impacted landscapes of the project.

### 3.3. ACCOMMODATING USER NEEDS

More trails are needed in the City of Austin, Travis County and Hays County to meet increasing demand from residents and visitors. Violet Crown Trail will provide a major north-south spine route from Central Austin through South Austin and into Hays County. VCT will also provide links to existing trails in South Austin and Travis County.

Violet Crown Trail will provide support for hiking, walking, strolling, mountain bicycling, off-road and on-road cycling (in the form of bicycle lanes or signed bicycle routes) for transportation, and other passive recreation activities, including interpretation and environmental education. It is recommended that Violet Crown Trail prohibit users with dogs, in Water Quality Protection Lands, to minimize impact on water quality. Designated segments of the trail will accommodate users with disabilities and comply with the Americans with Disabilities Act, providing an accessible path of travel.

The “Violet Crown Trail” will accommodate a number of users whose interests and speeds vary.
3.4 ACCOMODATING USER NEEDS

The Water Quality Protection Lands Stakeholder Steering Committee recommends, by consensus, that the Violet Crown Trail Master Plan consider education, hiking, biking, and equestrian uses for each proposed trail segment with the Water Quality Protection Lands; and that these uses or related facilities be evaluated as part of site specific planning for each trail segment. If a proposed use creates a perception of risk to land or resource sustainability, then site specific plans for each segment must include planning, design, construction and management components that mitigate such risks.

3.5. RELATIONSHIP TO ADJACENT PRIVATE LANDS

The Violet Crown Trail project can and should be accomplished with minimal impact to surrounding and adjacent private property owners. Steps will be taken to ensure that proper vegetative screening and fencing is installed to physically and visually separate trail users from adjacent private properties. Local governments and non-profit partners will work with adjacent property owners to both understand and resolve issues related to the development of the adjacent public use trail.
4.0 OVERVIEW

Violet Crown Trail will be developed in a series of phases over the next ten years. There are three major phases of development, phase one from Zilker Park to Sunset Valley, phase 2 from Sunset Valley to the LBJ Wildflower Center, and phase 3 from LBJ Wildflower Center to Onion Creek Management Unit of the Water Quality Protection Lands.
4.1. VIOLET CROWN TRAIL PHASES

Phase I – Urban Wildlands
This six-mile segment passes through the urban wilderness of the Barton Creek watershed, which is known for its outstanding recreational areas. It is also a recharge zone for the Edwards Aquifer and home to endangered species, including the Golden Cheeked Warbler and the Barton Springs Salamander. The trail begins in Zilker Park near the Barton Springs Pool and follows an existing natural surface along the Barton Creek Greenbelt for 5 miles to the intersection of Gaines Creek where a new trail will begin. The trail will proceed through the creek valley up to a plateau near the City of Sunset Valley.

Phase II – Urban Villages and Neighborhoods
This seven-mile segment begins just north of Sunset Valley and passes through or near seven neighborhoods, three major retail centers, a public library, three major parks, and finally to the destination of the nationally-known Lady Bird Johnson Wildflower Center. The trail will traverse multiple public open spaces, including the Williamson Creek Greenbelt, Dick Nichols Park, the Deer Park at Maple Run Preserve, and the Circle C at Slaughter Creek Park. This part of the trail system has high potential as an alternative transportation way through this highly populated area that is often congested with vehicular traffic. This segment will provide an opportunity to walk or bike to work, to parks, to shop, to visit other communities and enjoy the benefits of green spaces. It will provide connectivity to both nature and urban life.

Phase III – Texas Hill Country Heritage
Beginning near the Lady Bird Johnson Wildflower Center and running into Hays County, this longest trail segment of 17 miles traverses the City of Austin’s Water Quality Lands. These 23,500 acres of land are set aside to protect the water quality of the Barton Springs segment of the Edwards Aquifer. The goal of the trail in this area is to create public access to the land without compromising water quality. The trail will be used as an opportunity to educate the public on the unique qualities of the karst topography that allows water to flow into the underground aquifer. The trail will cross three management units reflective of the creek-based systems of each area – Phase 3a: Upper Bear Creek, Phase 3b: Little Bear Creek, and Phase 3c: Onion Creek. Separate design and management strategies will be designed for each unit in order to correspond to the trail into each unique setting.

Summary Table 1:
Violet Crown Trail Mileage by Phase

<table>
<thead>
<tr>
<th>Phase</th>
<th>Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
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</tr>
<tr>
<td>Phase 2</td>
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</tr>
<tr>
<td>Phase 3a</td>
<td>5 miles</td>
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<tr>
<td>Phase 3b</td>
<td>5 miles</td>
</tr>
<tr>
<td>Phase 3c</td>
<td>7 miles</td>
</tr>
<tr>
<td>Total Miles</td>
<td>30 miles</td>
</tr>
</tbody>
</table>
4.2. LBJ WILDFLOWER CENTER ENVIRONMENTAL ASSESSMENT

The Lady Bird Johnson Wildflower Center was hired by the City of Austin to help identify a route through the WQPL that would minimize impacts to water quality and quantity and to land management activities.

The Wildflower Center’s work consisted of four components:

- Preliminary environmental assessment
- Public involvement (in conjunction with Greenways Inc.)
- On the ground survey of proposed trail route
- Recommendations for trail impact mitigation

The preliminary environmental assessment was a desktop exercise which divided the WQPL into zones according to suitability for trail development. Ecological and land management factors were considered. The results of this analysis were presented in a series of GIS (Geographic Information Systems) maps which were then used to aid in decision making during the preliminary trail routing process. The preliminary alignment and environmental assessment were then presented in a series of public meetings. The goal of the initial meetings was to educate the public about the special needs of the WQPL, to present the goals of the Violet Crown Trail Project and to gather public input on both. Subsequent workshops were held to gain further public input on the Violet Crown Trail project in general and on the potential uses and routing of the trail. Greenways Incorporated used data gathered during public meetings along with the preliminary environmental assessment to modify the trail alignment and to suggest potential use types for different portions of the trail. The Wildflower Center then evaluated the new trail alignment and then surveyed this route for previously unknown karst features. The information gathered during this survey and subsequent examination of potential karst features by a team of hydrogeologists was used to generate the final trail route through the WQPL. The Wildflower Center then identified remaining areas of concern and suggested possible mitigation strategies.
4.3. PHASE 1: URBAN WILDLANDS - ZILKER PARK TO SUNSET VALLEY

The first phase of Violet Crown Trail will extend from Zilker Park south along Barton Creek and within the Barton Creek Greenbelt to Highway 290 and Brodie Lane. The Phase 1 trail also offers connections to the Zilker Nature Preserve, Barton Creek Greenbelt, Barton Creek Wilderness Park, Gaines Creek Park and Lady Bird Lake.

Because of its proximity to large concentrations of population and the popularity of Barton Springs, Zilker Park, the Barton Creek Greenbelt and shopping areas in Sunset Valley, Greenways Incorporated recommends that the Phase 1 trail be designed and constructed to support hiking and mountain bike use. The trail tread for this section will reflect a variety of uses with the tread width varying from 3 to 10 feet depending on the location and type of uses. The tread surface should be either a natural surface or hardened surface, such as compacted decomposed granite screenings, as appropriate for setting and use.

Trailheads for the Phase 1 trail already exist at Zilker Park and Highway 360. Any improvements or changes to these trailheads would be completed by the City of Austin as it deems necessary.

(Numbers on the photos correspond with location on facing map)
4.3. PHASE 2: URBAN VILLAGES AND NEIGHBORHOODS - SUNSET VALLEY TO LBJ WILDFLOWER CENTER

The second phase of Violet Crown Trail begins at the Highway 290 service road in the City of Sunset Valley and continues as an on-road trail along Brodie Lane. At the intersection of Brodie Lane and Home Depot Boulevard the Violet Crown Trail crosses Brodie Lane, follows Home Depot Boulevard, meanders through Williamson Creek West Greenbelt and then parallels MoPac Expressway to William Cannon Drive. The Phase 2 trail crosses MoPac on William Cannon Drive and makes use of existing trails on the perimeter of an existing shopping center. South of the shopping center, the Phase 2 trail follows Convict Hill Road and continues south and west to Dick Nichols District Park, where it connects to an existing trail system and the Latta Branch Greenway. From Dick Nichols Park the trail follows the eastern side of MoPac Expressway to Davis Lane and into Deer Park at Maple Run Preserve. The Phase 2 trail continues south from Deer Park, on the eastern side of the MoPac Expressway to the Circle C Ranch Metro Park, the Veloway and the LBJ Wildflower Center.

Again, due to the proximity to many South Austin and Travis County residential neighborhoods, and all of the popular destinations along the Phase 2 route, Greenways Incorporated recommends that the Phase 2 trail be designed and constructed to support hiking, bicycling and other compatible non-motorized trail uses. The trail tread for this section should be a minimum of 10 feet wide to support two-way use and multiple users. The tread surface should either be a hardened surface or a compacted decomposed granite surface.

A trailhead for the Phase 2 trail would be located at Dick Nichols Park.

(Numbers on the photos correspond with location on facing map)
VIOLET CROWN TRAIL: PHASE 2 MAP
4.4. PHASE 3: TEXAS HILL COUNTRY HERITAGE - LBJ WILDFLOWER CENTER TO ONION CREEK MANAGEMENT UNIT

Phase 3 of the Violet Crown Trail is divided into three subsections: Phase 3a: Upper Bear Creek, Phase 3b: Little Bear Creek and Phase 3c: the Onion Creek Preserve Management Unit. All of these sections are located within the Water Quality Protection Lands (WQPL) purchased and owned by the City of Austin, and managed by the Wildland Conservation Division.

3A: Upper Bear Creek (WQPL)

The Phase 3 Violet Crown Trail section within Upper Bear Creek begins at the Wyldwood Road and traverses a route that has been selected to minimize environmental impact on the native geology, soils and vegetation. One potential area of route and alignment conflict would be with regard to the proposed TX Highway 45 alignment. The trail also crosses a tributary of Bear Creek and terminates at a proposed trailhead at the end of Bliss Spillar Road. The rocky soils conditions support the development of a 4 to 6 foot wide natural surface trail tread, or an improved trail tread that is constructed out of decomposed granite or native crushed rock.

Area of Conflict and Recommended Solution:

Beginning at the proposed location of a new trail head at the end of Bliss Spillar Road the Violet Crown Trail encounters an area of conflict and concern to the City of Austin Wildland Conservation Division. A narrow corridor of land, sometimes referred to as a “spite strip”, and approximately 100 feet in width (see photo below) links the Upper Bear Creek watershed with the Little Bear Creek Watershed. The spite strip serves a functional purpose enabling the City to drive maintenance vehicles from one management area to the other. It is envisioned that the Violet Crown Trail would also make use of this same 100-foot corridor to link trail users between the two watersheds.
There are two possible trail development options for consideration and implementation. The first option would be to have trail users share the existing road so that no further disturbance of the landscape occurs as a result of trail tread construction. This is problematic for the City of Austin Wildlands Conservation Division because their maintenance and operation vehicles use the existing roadway frequently and they are concerned about conflict between these management vehicles and trail users. The LBJ Wildflower Center has recommended that the roadway be hardened in order to limit erosion. If this is accomplished, it may be possible to harden a wider shared vehicle and trail travelway that would accommodate both users (see sketch below).

**Hardened Roadway Solution**

A second solution would be to separate the trail from the road and build a stand alone trail tread. This would involve establishing a setback from the roadway and routing the trail along the south side of the existing maintenance road. Since the spite strip is 100 feet wide, the setback will most likely be minimal and the trail will be seen from the maintenance road. The LBJ Wildflower Center recommends that the stand alone trail tread be constructed as a hardened surface to minimize erosion in this area. In addition to the hardening there are two areas of the trail that will need to be constructed using a boardwalk system to bridge over environmentally sensitive features. The boardwalk systems need to be open in order to allow sunlight and rainwater to pass through. They also need to be able to withstand prescribed fire, a management practice used by the Wildland Conservation Division.
The final issue of concern within the spite strip is the slope of the land on the western end of the strip. The existing maintenance road traverses a steeply sloped area (seen in the prior photograph). Due to the narrow width of the spite strip, it will not be possible to install switchbacks for trail users. So regardless of whether the trail shares the existing maintenance road or is a stand alone tread, the steep slope will be an element of the Violet Crown Trail in this area. It may be possible for the City or Hill Country Conservancy to work with adjacent property owners to acquire additional land, next to the spite strip to support future trail development.

The drawback to a stand alone trail tread within the spite strip is the additional impact to plants, native rocky soil and terrain. An additional travelway exposes more land to possible erosion and denudes a wider zone of the spite strip. Greenways Incorporated recommends that consideration be given to using permeable pavement to widen and harden the maintenance road so that it can support simultaneous trail use through the spite strip. Where deemed necessary by the LBJ Wildflower Center, boardwalk or bridging should be installed to minimize impact to sensitive landscape features. The installation of these boardwalks or bridges would be determined in the field.

A trailhead is needed somewhere in the vicinity of the LBJ Wildflower Center. An effort should be made to plan for the installation of a trailhead between Dick Nichols Park and the proposed trailhead off Bliss Spillar Road.
**3B: Little Bear Creek (WPQL)**
The second sub-phase of Phase 3 VCT extends through the Little Bear Creek section of the WQPL. The trail extends along a ridgeline between two drainageways of Little Bear Creek and heads south, meandering to avoid the most sensitive landscape features. This section of trail terminates at the North FM 967 trailhead. The rocky soil conditions support the development of a 4 to 6 foot wide natural surface trail tread or an improved trail tread that is constructed of decomposed granite.

**Areas of Conflict and Recommended Solutions:**
There are three areas of environmental conflict in this section of WQPL lands, and all can be resolved by realigning the originally recommended route of the VCT to avoid or minimize impact on the natural resources. The first conflict area involves traversing a steeply sloped area that is south and west of the spite strip. The second involves routing the trail away from a bird nesting area. The third involves installing a boardwalk over a drainage feature.

(Numbers on the photos correspond with location on facing map)
VIOLET CROWN TRAIL: PHASE 3B MAP
**3C: Onion Creek Management Unit (WQPL)**

The third section of the Phase 3 VCT extends into the Onion Creek Management Unit. Beginning at a trailhead on South FM 967, the trail proceeds along a narrow strip of land into the Unit. At this point, the trail proceeds through a large grassland, meadow landscape, forming a loop trail that is approximately 8 miles in length. Again, the route and alignment of the trail has been planned to minimize impact to the sensitive landscape features of the WQPL. The 4 to 6 foot wide trail would be constructed using a combination of native soils and decomposed granite.

**Areas of Conflict and Recommended Solutions:**

There is one area of conflict in this section of WQPL lands. The narrow strip of land that is used by the Wildland Conservation Division to enter the Unit is also the route for the proposed VCT. As with the spite strip, this narrow corridor of land accommodates the Division maintenance road, so the same conflict and solution recommended for the spite strip is possible for this area. A separate trail tread is possible in this area, but might be difficult to establish in this narrow strip of land.
VIOLET CROWN TRAIL: PHASE 3C MAP
The trail route, alignment, and design was a result of fieldwork and environmental analysis, steering committee guidance, and input from the public. The above images are from the August 2009 public workshop.
5.0 OVERVIEW

The following text and graphics define the full complement of trail facilities that comprise the Violet Crown Trail project. The approximately 30-mile network will be comprised of hiking trails, off-road bicycling trails (often referred to as mountain bike trails), and multiuse trails. The specific design criteria for each of these are defined in the following text. This chapter provides guidelines to both public and private entities for the future development of various types of trails in Austin. The guidelines noted herein are based on the best practices in use throughout the United States, as well as accepted national standards for greenway facilities.

Guidelines for Best Management Practices

The guidelines should be used with the understanding that each trail project is unique and that design adjustments will be necessary in certain situations in order to achieve the best results. Each segment should be evaluated on a case-by-case basis, in consultation with local or state bicycle and pedestrian coordinators, a qualified engineer and a landscape architect. Should these national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions.

Facility design is a broad topic that covers many issues. This section provides guidelines for typical greenway facilities and is not a substitute for more thorough design and engineering work. For more in-depth information and design development standards, the following publications should be consulted:

- **Trails for the Twenty-First Century**, Island Press, 2nd ed. 2001. Authors: Charles A. Flink, Robert Searns, Kristine Olka
Other useful web sites for information include:
- Rails-to-Trails Conservancy - www.railtrails.org (Note: the Trails and Greenways Clearinghouse is now a part of this website)
- National Park Service - www.nps.org
- U.S. Department of Transportation - www.walkinginfo.org and www.bicyclinginfo.org
- Pedestrian and Bicycle Information Center - www.pedbikeinfo.org
- International Mountain Bike Association - www.imba.com

**ADA Requirements**
The Americans with Disabilities Act requires that portions of Austin trails be accessible to persons with varying motor skills and abilities. Perhaps the best way to comprehend the importance of ADA is to understand that most of us, at some time in our life, will experience a temporary disability which will affect the way in which we make use of outdoor resources. ADA benefits all Americans by making the outdoor environment more accessible.

**Sustainable Design**
The consultant recommends the use of recycled materials and products in the construction of trails and trail facilities. Recycled materials offer design versatility, often have a long life span, and require less long-term maintenance than similar products constructed from natural materials. Recycled plastic lumber and or concrete can be used for the construction of posts and poles, and recycled aluminum can be used for signs. Whenever possible, local materials should be used for construction.

**Trail Details & Standards**
The graphics on the following pages depict greenway trail details, on-road guidelines, and typical trail amenities. They are provided as examples only, and are not intended as substitutes for professional, site-specific design and engineering work.
5.1 TRAIL DESIGN

**Hiking Trails**

Hiking trails within the Violet Crown Trail network would consist of 4-foot to 6-foot-wide trail treads. The treads can be constructed of native soil, or be constructed with decomposed granite or other fine granular stone. Maximum longitudinal or running slopes for hiking trails should be 10%, maximum side slopes for the trail tread should be 4%.
Mountain Biking Trails
The off-road bicycling trails should be built to International Mountain Bike Association (IMBA) standards. The one exception to these standards could be the width of the trail. Typical single track IMBA trails tend to be narrow, from 18 inches to 2 feet in width. For the Violet Crown Trail, the trail tread width may increase to facilitate two-way travel. To remain a low impact and sustainable trail, the tread should follow natural contours to the greatest extent possible. The running slope should be no greater than 10% and side slopes should not exceed 5%.
Multi-Use Trails
Multi-use trails will be constructed in the more urbanized portions of the Violet Crown Trail corridor. These trails will be built to accommodate heavier traffic loads (more users) and multiple users simultaneously. As such, federal standards for shared use pathway standards are recommended. These trails should be no less than 10 feet wide. The recommended running slope for these trails is 5% and the side slopes should not exceed 2%. Multiuse trails also will need to have 2 foot cleared shoulders on each side of the tread. Trail surfacing will vary from asphalt to concrete or stabilized decomposed granite.
CONCRETE MULTI-USE TRAIL
D.G. MULTIPLE USE TRAIL

4" thick decomposed granite

compacted crushed granite granules

90% compacted subgrade

metal edging

10-14" wide

2% cross slope
5.1A TRAIL SURFACE COMPARISON

The table on the opposite page provides a summary of information regarding trail surface type, estimate cost of construction, advantages and disadvantages of a particular surface. The objective in providing this information is to allow the Violet Crown Trail project partners to determine the most suitable surface for a given section of the trail. The consultant, Greenways Incorporated, has made trail surfacing and trail width recommendations for each Phase of the VCT project, which are meant to guide the decision making process. The unit cost estimates are national averages and actual costs will vary depending on local economic factors. Please use the following prices for the purpose of budgeting only.
## Violet Crown Trail: Surface Types

Source: Greenways Incorporated September 2010

<table>
<thead>
<tr>
<th>Trail Type/Cost</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Native Soil</strong> ($50,000-$75,000 per mile) ($10 to $12 per linear foot) (Assume 4 to 6 foot width)</td>
<td>Native material, lowest cost, easiest for volunteers to build and maintain. Somewhat permeable.</td>
<td>Dusty when used, ruts when wet, not all weather, surface will be uneven, not accessible, produces sediment that harms streams, high maintenance</td>
</tr>
<tr>
<td><strong>Wood fiber</strong> ($65,000-$80,000 per mile) ($12 to $15 per linear foot) (Assume 6 to 8 foot width)</td>
<td>Soft, spongy, good for walking, moderate to low cost, permeable.</td>
<td>Decomposes under exposure to sunlight, moisture and high temperatures, limited accessibility, not appropriate for floodprone areas, high maintenance</td>
</tr>
<tr>
<td><strong>Soil Cement</strong> ($75,000-$100,000 per mile) ($15 to $20 per linear foot) (Assume 8 to 10 foot width)</td>
<td>Makes use of natural materials, binders vary, produces smooth surface, accommodates multiple users, moderate cost.</td>
<td>Surface wears unevenly, not stable in all weather, erodes, difficult to achieve uniform surface. Can be high maintenance if not installed correctly.</td>
</tr>
<tr>
<td><strong>Granular Stone</strong> ($100,000-$200,000 per mile) ($20 to $40 per linear foot) (Assume 10 foot width)</td>
<td>Soft surface can be compacted to firm, natural material, moderate cost to high cost. Accessible.</td>
<td>Surface can rut and erode with heavy rainfall, medium maintenance depending on installation, not for use on steep slopes or in floodplains</td>
</tr>
<tr>
<td><strong>Asphalt</strong> ($300,000-$500,000 per mile) ($55 to $95 per linear foot) (Assume 10 foot width)</td>
<td>Hard, flexible pavement, supports most users, accessible, low maintenance.</td>
<td>High installation cost, costly to repair, not a natural surface, uncomfortable for walking and running, not permeable. Hot during summer use.</td>
</tr>
<tr>
<td><strong>Concrete</strong> ($400,000-$1 million per mile) ($75 to $190 per linear foot) (Assume 10 foot width)</td>
<td>Hard, nonflexible pavement, best in areas of extreme environment, such as floodplain, can be formed, colored, supports multiple uses, accessible, resists freeze thaw best. Low maintenance.</td>
<td>High installation cost, very urban appearance, not permeable, hot during summer use.</td>
</tr>
<tr>
<td><strong>Boardwalk</strong> ($1.5-$2 million per mile) ($280 to $380 per linear foot) (Assume 10 foot width)</td>
<td>Necessary in wet or ecologically sensitive landscapes, natural looking, medium maintenance, can be built by volunteers.</td>
<td>Slippery when wet, easily damaged by use and vandalism, high cost to install, high cost to maintain if damaged.</td>
</tr>
</tbody>
</table>
5.2 TRAIL INTERSECTIONS

In order to maintain continuity and safety along trails, intersections with roadways, utilities, and water features should be carefully designed and maintained. There are three types of trail intersections found in greenway design and planning:

- At-Grade Roadway Crossings
- Trail Underpass (Below-grade crossings)
- Trail Overpass (Above-grade crossings)
- Natural Feature Crossing

At-Grade Roadway Crossings
Roadway intersections represent one of the primary collision points for trail users. Generally, the larger the intersection, the more difficult it is to cross. On-coming vehicles from multiple directions and increased turning movements sometimes may make it difficult for motorists to see non-motorized travelers. Modern design techniques such as permit safer crossing conditions for both the user and the motorist.

4-Way Intersection Crossing with Multi-Use Path
This is also a depiction of a ‘sidepath’ intersecting a roadway. Trail users would navigate this crossing like a common pedestrian.

Mid-Block Intersection with Multi-Use Path and Sidewalks
The diagram below illustrates the relationship between the roadway, the intersecting multi-use path, and sidewalks along the roadway. Warn motorists of the upcoming trail crossing and trail users of the upcoming intersections; motorists and trail users can be warned with signage (including trail stop signs), changes in pavement texture, flashing beacons, raised crossings, and/or striping.
Mid-Block Crossing with Multi-Use Path, Sidewalks, and Medians
Site the crossing area at a logical and visible location. The crossing should be a safe enough distance from neighboring intersections to not interfere (or be interfered) with traffic flow. Crossing at an area with flat topography is desirable to increase motorist visibility of the path crossing. The crossing should occur as close to perpendicular (90 degrees) to the roadway as possible.
Median Refuge
If the intersection is more than 75-feet from curb to curb, it is preferable to provide a center median refuge area. A refuge is needed in conditions exhibiting high volumes/speeds and where the primary user group crossing the roadway requires additional time, such as school children and the elderly.

Hike and Bike Trail Underpass
Trail underpasses typically utilize existing overhead roadway bridges adjacent to steams or culverts under the roadway that are large enough to accommodate trail users.

- Vertical clearance of the underpass should be at least 10-feet.
- Width of the underpass must be at least 12-feet
- Proper drainage must be established to avoid pooling of stormwater.
- Lighting is recommended for safety.
**Hike and Bike Bridge Overpass**

Bridges are used for above-grade crossings and should be designed with specific structural engineering and safety considerations. If crossing an interstate highway, specific and stringent standards will apply.

- Safety should be the primary consideration in bridge/overpass design.
- Specific design and construction specifications will vary for each bridge and can be determined only after all site-specific criteria are known.
- Always consult a structural engineer before completing bridge design plans, before making alterations or additions to an existing bridge, and prior to installing a new bridge.
- A ‘signature’ bridge should be considered in areas of high visibility, such as over major roadways. While often more expensive, a more artistic overpass will draw more attention to the trail system in general, and could serve as a regional landmark.
- For shared-use facilities, a minimum width of 14-feet is recommended.
- Trail overpasses are prohibitively expensive and should only be placed in areas of substantial need.
Natural Feature Crossing: Bridges
The function of a water feature crossing in an off-road, multi-use trail situation is to provide access to the user over certain natural (i.e. streams, rivers, creeks) features with the span of a bridge.

- If a corridor already contains a bridge such as an abandoned rail bridge, an engineer should be consulted to assess the structural integrity before deciding to remove or reuse it.
- A trail bridge should support 6.25 tons so that a fully loaded ambulance can use if necessary.
- Information about the load bearing capacity of bridges can be found in the American Association of State Highways and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges.
- There are many options in terms of high quality, prefabricated pedestrian bridges available.
Natural Feature Crossing: Boardwalks
Natural features can also be spanned with boardwalks. Boardwalks can vary in terms of height off the ground, materials used in construction and type of construction. Illustrated below and on the following page are different types of boardwalks that might be used in the Violet Crown Trail project. The boardwalks below are made of wood, which is the most common type of constructed boardwalk trail.
Boardwalks can also be built of metal, such as the one below at the Morris Arboretum in Philadelphia. Metal boardwalks allow sunlight and water to penetrate to the native soil.
5.3 ANCILLARY TRAIL FEATURES

Drinking Fountains

Purpose
Drinking fountains provide a more enjoyable greenway experience and to protect the health of two and four-legged trail users.

Guidelines/Considerations
- Locate drinking fountains at least 5’ from trail edge.
- Locate drinking fountains near restrooms, at trailheads, parks and other public gathering places along the greenway trail.
- Standard, accessible and dog-height bowls should be installed to accommodate all trail users.
- Drinking fountains should be placed on a well-drained surface (i.e. 2% sloped concrete slab)
- Include hose bib connections for maintenance purposes.

Benches

Seating areas along trails provide a place to rest, congregate, or contemplate for the user. There are a wide variety of options to choose from in terms of style and materials. Selections should be based on the desired trail theme as well as cost.

- Locate seating a minimum of 3-feet from the edge of the trail.
- Locate benches in areas that provide interesting views, shade or shelter from seasonal winds, as well as those that are close to educational or cultural elements.
- Drainage should slope away from the trail.
- Benches should be securely anchored to the ground, and located at appropriate intervals along the trail.
- Seating depth should be 18-20-inches and the length should vary between 60-90-inches.
- Provide benches with back rests and arm rests on either side.
Picnic Tables

Purpose
Picnic tables provide places for trail users to congregate for meals or to just sit and relax.

Guidelines/Considerations
- Locate picnic tables far enough back from the trail to avoid interfering with circulation along the trail (min. 3’)
- Wheelchair access should be possible at some picnic tables.
- Wheelchair-accessible tables should be connected to the trail by a firm surface path such as asphalt or concrete.
- Locate picnic tables in areas that provide interesting views, are close to an educational or historical trail element, shade or shelter from seasonal winds.
- Install (1) trash/recycle receptacle for every (1) picnic table.

Example of 8’ universal accessible picnic table manufactured by Pilot Rock.

Example of 8’ side accessible picnic table manufactured by Pilot Rock.

Waste and Recycling Receptacles
Providing trash, pet waste, and recycling receptacles along the trail results in the reduction of litter, improves the overall appearance of the greenway, and preserves the natural environment for all trail users.

- Locate receptacles at each trail access point and each seating area (1 waste/recycling unit per picnic table, 1 unit per every 2 benches) at the minimum.
- Locate pet waste receptacles at trail heads and occasional along trail.
- Receptacles should be selected using the following criteria:
  - Expected trash amount
  - Maintenance program requirements
  - Durability
- Receptacles should be set back a minimum of 3-feet from the edge of the trail.
- Consider selecting trash receptacles that are made of recycled materials and that are appropriate for flood prone areas.
**Bicycle Racks/Bicycle Parking**

Provide bicycle parking at trail heads or trail access points for commuters using the greenway for alternative transportation or for those using the trail for reasons besides bicycling.

- Recommended secure bicycle parking methods are locking the bike to a rack, or providing enclosed storage areas.
- Custom bicycle racks or conventional options are available, depending on greenway theming and budget.
- Provide bicycle parking that supports the bicycle upright by its frame.
- Allow for multiple bicycles to be parked at once.

**Restrooms**

Restrooms provide public sanitary facilities.

**Guidelines/Considerations**
- Local ordinance codes for health issues and accessibility.
- Locate restrooms at strategic sites.
- Restroom structures should be located adjacent to vehicular access points for security, maintenance, and access to utility hookups.
- Restrooms should also make use of natural light and ventilation as much as possible.

Composting restroom facilities are an option where connecting to utilities is difficult. (Photo courtesy of BioSun).
Lighting
Lighting allows certain parts of the trail to be used at nighttime and provides safety for trail users. In general, lighting is not appropriate for off-road trails where there is little to no development. A licensed or qualified lighting expert should be consulted before making any lighting design decisions. Doing so can reduce up-front fixed costs as well as long-term energy costs.

- Only use lighting along a trail if:
  - Nighttime usage is desired or permitted
  - It is acceptable to residents living along or near the trail
  - The area is not a wildlife area
- Locate lighting at the following locations at a minimum:
  - Entrances and exits of bridges
  - Public gathering areas along the greenway
  - Trail access points
  - Along street-based trails
- There are a wide variety of lighting options to choose from in terms of style and material selection as well as energy efficiency.
- Consider using solar-powered or energy-efficient lighting whenever possible.
Emergency Phones

Purpose
Emergency phones provide a means of contacting emergency personnel while using trail facilities and for convenience of trail users.

Guidelines/Considerations
- Locate emergency phones at all trail heads, major intersections, areas of potential conflict along the trail.
- Locate at strategic sites along the trail.
- When installing the emergency phones, provide reference information on the location, such as mile markers so that a caller can be located via georeferenced address.
- Emergency phones have options for cellular and arrangements may be possible with local cell phone providers for reduced service fees.
- Emergency phones also have options for power. If phones are located in a remote area, it may be feasible to use solar power to avoid electric wiring installation and service costs.

Bollards (Removable and Permanent)
Bollards increase trail safety by providing separation between motorized vehicles and trail users. Installing removable bollards allows emergency and maintenance vehicles to access the trail.

Guidelines/Considerations
- Coordinate bollard locations with street crossing and trail access points.
- Bollards are available in a variety of shapes, sizes and colors and come with a variety of features.
- Bollards are typically constructed of painted steel or aluminum. Some have halogen or metal halide lights in weather tight casings for pedestrian lighting.
- Bollards should be chosen according to the specific needs of the site and should be similar in style to the surrounding site furniture.
- Lighted bollards are intended to provide trail users with minimum levels of safety and security along the trails that are open after dark.
5.4 SIGNAGE & WAYFINDING

A comprehensive system of signage ensures that information is provided regarding the safe and appropriate use of all trails, both on-road and off-road. The greenway network should be signed seamlessly with other alternative transportation routes, such as bicycle routes from neighboring jurisdictions, trails, historic and/or cultural walking tours, and wherever possible, local transit systems.

Signage is divided into several categories:
- Network signs
- Directional/wayfinding signs
- Regulatory signs and warning signs
- Educational/Interpretive signs


Kiosks

Kiosks provide visitors with information to orient themselves, learn of site opportunities, read the rules and regulations of the site, find the hours of operation and read about local events such as activities programmed for the greenway or seasonal festivals.

Guidelines/Considerations
- Install kiosks at each trailhead
- Kiosk design should be coordinated with the character of the entire greenway trail sign system.
- Keep the style of the kiosk simple and readily identifiable by trail users as an information contact station.
- Bulletin boards, regional trail maps, rules and regulations and accessibility advisories should be designed as part of the kiosk.
6.0 OVERVIEW

The Violet Crown Trail will feature four (4) new recommended trailheads located strategically along the approximately 30-mile route. Each trailhead will provide parking for automobiles, signage systems. Optional elements include restrooms and site furniture.

An example of a model trailhead is the Lost Dog Wash Trailhead in Scottsdale, Arizona, designed by Weddle Gilmore Architects, Tempe, AZ. This trailhead is designed to be low impact, blend into the surrounding environment, and to meet LEED and sustainable construction standards. The Violet Crown trailheads should be modeled after the approach and results of the Lost Dog Wash Trailhead.
The following trailhead illustrations are provided to depict possible design solutions for each of the four trailheads defined in the master plan. The actual design of each trailhead, including parking and facilities, will be determined at a later time by the Violet Crown Trail partners.

6.1 DICK NICHOLS PARK

A trailhead will be installed at Dick Nichols Park, utilizing existing parking facilities in the park.
6.2 BLISS SPILLAR ROAD

A new mid-sized trailhead should be designed and installed along Bliss Spillar Road. At this location a mid-sized and full service trailhead could be developed. This might also become one location for an equipment and storage building for the purpose of servicing the WQPL trails. This trailhead will serve the northern portion of the Little Bear Creek Preserve Unit.
A new mid-sized trailhead should be developed on the north side of FM 967. The trailhead should include parking for 20 automobiles. Also, restrooms, signage and connector trails should be developed. This trailhead will serve the southern portion of the Little Bear Creek Preserve Unit.
6.4 FM 967 OR RANCH ROAD 967 SOUTH

A new large trailhead should be developed on the south side of the FM 967. The largest of all the trailheads, this facility should be built to accommodate up to 20 cars, with a full service trailhead that features restrooms, potable water, air station, signage, connector trails, landscaping and a maintenance building. This trailhead will serve the Onion Creek Preserve Management Unit.
7.0 INTRODUCTION

The Violet Crown Trail (VCT) is a planned approximately 30-mile regional trail system that will run from Zilker Park in central Austin to near Onion Creek in Hays County. The trail will be built in three phases using existing and new trail alignments planned, designed and built to state of the art standards. Phase I includes 5 miles of the existing Barton Creek Greenbelt Trail and 1 mile of new trail along Gaines Creek and within city-owned parkland. Phase II begins in Sunset Valley and passes through neighborhoods and city-owned parks for 7 miles before ending at the Veloway near the Lady Bird Johnson Wildflower Center. Phase III, the longest segment of the trail, begins here and extends for 17 miles to the City of Austin Onion Creek Preserve Management Unit in Hays County. Key aspects of the VCT vision are protecting water quality and sensitive habitat, accommodating public access, utilizing public-private partnerships and proven models to support maintenance, and creating and promoting a strong public education and land stewardship program.

7.1 OVERVIEW OF THE PLAN

This document presents a plan for addressing the ongoing, long-term operations and maintenance needs of the VCT. It identifies a toolbox of resources that can be utilized by Hill Country Conservancy (HCC), Austin Parks Foundation (APF) and Friends of the Trail in collaboration with the City of Austin and City of Sunset Valley to ensure a safe, attractive and enjoyable trail. HCC, APF, and Friends are collectively known as the Trail Partners. This plan is informed by research on successful models from across the country. It is the result of extensive public involvement and on-site analysis and evaluation of the proposed trail corridor.

7.2 OBJECTIVES OF THE PLAN

Through this plan, the Trail Partners seek to address three primary areas of trail operations and maintenance discussed in depth in the VCT Master Plan. These areas of need include: 1) trail maintenance, 2) trail safety and security, and 3) education and stewardship. The programs and resources presented in this document are organized below based on the needs addressed:
1. **Trail Maintenance**
   - American Youthworks Barton Creek Trail Corps Program
   - Volunteer Work Days
   - Friends of the Trail
   - Adopt-A-Trail Program, in particular the Trail Steward and Volunteer Trail Patrol components

2. **Trail Safety and Security**
   - Safety and Security Task Force Program
   - Austin Ridge Riders Mountain Bike Patrol
   - American Youthworks Barton Creek Trail Corps Program
   - Friends of the Trail
   - Adopt-A-Trail Program

3. **Education and Stewardship**
   - Austin Ridge Riders Mountain Bike Patrol
   - Friends of the Trail
   - Adopt-A-Trail Program, in particular Trail Docents and Master Naturalists components
   - Education Program
   - Monitoring and Observation

### 7.3 COORDINATION

Execution of the plan and the associated work of the Trail Partners will be undertaken in close coordination with appropriate City of Austin and City of Sunset Valley staff, focusing only on lands associated with trail development and maintenance. To effectively coordinate these activities, the Trail Partners recommend the creation of a **Trail Stewardship Council** to serve as the entity accountable to the City of Austin and the City of Sunset Valley for the construction, operation and maintenance of the trail. The Stewardship Council will operate under the direction of the respective land management units of the public agencies.

Modeled on the Slaughter Creek Management Unit Trail Administration Subcommittee, the council would provide a forum to communicate issues related to the management of trail building, maintenance and use policies. The council should meet quarterly and include, but not be limited to, representatives of the City of Austin (COA) Parks and Recreation Department (PARD), COA Austin Water Utility, City of Sunset Valley, Hill Country Conservancy, Austin Parks Foundation and the Friends of the Trail group. The parties may invite other sponsors to the Stewardship Council on the approval of all existing members. A chairperson should be designated to lead the council, call additional meetings when necessary, and serve as a point of contact for the council.

### 7.4 TRAIL MAINTENANCE

**“Tool Box” of Resources to Address Operations & Maintenance Needs**

The Trail Partners will use a variety of resources to assist with the operation and maintenance of the trail system. This “tool box” of resources is explained in the following section. Note that some of these resources will be utilized in different categories. For example, Friends of the Trail will conduct trail maintenance but will also serve as “eyes and ears” on the trail to report any safety or security concerns
to the proper land manager or authority.

**American Youthworks Barton Creek Trail Corps Program**

Austin Parks Foundation (APF) will contract with the American Youthworks Environmental Corps to staff a Barton Creek Trail Corps (BCTC). This program will pilot a public/private approach that could be expanded to the entire the Violet Crown Trail.

American Youthworks has a successful track record of training and running crews of young people between the ages of 18 and 28 from diverse backgrounds to implement improvements in parks and trails throughout Texas. The BCTC will consist of four members and a crew leader with experience in trail construction, rock work and invasive species removal in parks and public lands. In addition to improving the quality of the trail and surrounding natural habitat, the program participants will receive valuable skills to prepare them for possible conservation and park careers.

The BCTC will supplement the current maintenance work by the City of Austin along the Barton Creek Greenbelt by conducting trail repairs, habitat restoration, and erosion control. Trail Corps crew members will spend weekdays walking or riding the trail and wearing clearly-visible uniforms. Specific activities will include:

- **Trail Maintenance** – Light maintenance will be performed on a daily basis, including clearing trail hazards, repairing trail problems, and removing litter. More substantial maintenance will be performed after storm events that result in trail damage. Periodically, grass and brush clearing will be conducted along the trail.

- **Trail Security and Emergencies** – Crew members will be equipped with radios to notify the proper authority of any security or safety issues.

- **Trail Stewardship** – Crew members will be educated about the environmental qualities and sensitivities of the trail corridor. They will assist with the monitoring and observation of natural resources.

- **Trail Volunteers** – Crew members will act as coordinators and team leaders for volunteer events. They will also work in concert with volunteers to foster understanding and appreciation of the trail environment.

The first year of this program will be funded by a $105,000 grant from IMPACT Austin and matching grants from both APF and HCC. During this first year of the program the BCTC will:

- Repair eight miles of trail to provide a sustainable surface for walking, running and biking,
- Restore the ecological balance to 300 targeted acres of the park through invasive species removal and erosion and flood damage repair,
- Host three large volunteer events,
- Catalog major improvement needs in the park,
- Create an ongoing maintenance plan to guide the work of future trail corps crews,
- Distribute maps and information on parks stewardship to park visitors, and
• Assist with monitoring and observation as well as restoration within the new trail section along Gaines Creek.

Based on the success of this pilot program and modified as necessary, APF will partner with HCC to secure long-term funding for this program and to oversee the work of the BCTC crew. This work will be done in coordination with the City of Austin, the Austin Ridge Riders Bike Patrol and other trail programs.

**Volunteer Work Days**

The Trail Partners will sponsor two to three major volunteer work days each year and additional smaller volunteer work projects to conduct trail maintenance. Austin Parks Foundation and Hill Country Conservancy will organize these events, and the Barton Creek Trail Corps will serve as coordinators and team leaders.

These workdays will focus on proper instruction of trail building skills, erosion control, maintenance, invasive species removal, and drainage repair. Participants will not only enhance their own skills, but learn methods for building sustainable trails throughout the region. They will gain a sense of ownership and investment in the trail, which will ultimately lead to more volunteer efforts and protection of the environment.

Major work days will likely take place on National Trails Day in June, National Public Lands Day in September and Austin Community College’s Build a Park Day in November. These events typically engage hundreds of volunteers, yielding thousands of volunteer hours per year.

**Friends of the Trail & Adopt-A-Trail Program**

The Trail Partners will establish a “Friends of the Trail” group dedicated to the creation, preservation, promotion and enhancement of the Violet Crown Trail regional trail system. Friends will include trail users, community members, neighborhood associations, nonprofit organizations and businesses with a long-term interest in supporting the trail. These individuals and organizations will conduct fundraising activities, provide volunteer services, assist with trail stewardship and maintenance, and educate the public about important trail issues.

A key component of the Friends of the Trail program will be the Adopt-A-Trail Program. Through this program, interested parties will adopt a segment of the Violet Crown Trail and ensure that section of trail is clean and in good repair. They will serve as the “eyes and ears” on the trail to promote a safe and secure environment. The Adopt-A-Trail program will be part of the COA Adopt-A-Park program and will be administered in conjunction with the Parks and Recreation Department and Austin Parks Foundation. A group or organization will sign a written agreement to adopt a trail segment for a period of time, in which all parties agree to certain terms, conditions and expectations. An example of a current “Friend” is the Greenbelt Guardians, which is a group of Barton Hills neighbors and community outdoor enthusiasts who work together to preserve and protect Barton Creek and the surrounding Greenbelt by organizing quarterly volunteer workdays to build and repair trails, remove invasive plant species and pick up trash.

The agreement will also designate a **Trail Steward**, who is a trained volunteer leader responsible for supporting operations and maintenance on a particular trail segment. They will serve as a group representative, and will coordinate volunteer
activities and implementation of trail improvement plans. To facilitate this effort, an online system for volunteer management and trail activities will be operated and maintained by Austin Parks Foundation. Stewards will also assist with marketing, promotion and event programming and work closely with City of Austin staff. They will be required to provide reports and participate in Trail Stewardship Council meetings.

In addition to the Trail Steward, each Adopt-A-Trail segment will participate in the Volunteer Trail Patrol and Volunteer Trail Docent programs. These programs will provide dedicated volunteers with the opportunity to become caretakers for a particular segment of the trail. An ideal Volunteer Trail Patroller or Trail Docent would be a hiker, trail runner, rock climber, birdwatcher, mountain biker or other trail user, a Master Naturalist or a resident of an adjacent neighborhood that is interested in outdoor recreation and protecting natural resources.

The Trail Patrollers will focus on ensuring a well-maintained, safe and enjoyable experience for trail user. Patrollers will be required to attend an orientation and training session on trail etiquette and safety procedures, minor trail maintenance, location of the trail and its sensitive features, and wildlife and habitat identification basics. More specifically, they will:

- Assist with light trail maintenance, including clearing trail hazards and picking up litter, and report major maintenance needs or potential hazards,
- Help with scheduled and emergency clean-up days throughout the year, and
- Monitor the trails for inappropriate or illegal activities and notifying proper authorities if necessary.

The Trail Docents will educate trail users by conducting periodic seminars about trail rules and etiquette, and help them avoid sensitive areas for wildlife and water. Docents will be required to attend a short training to learn about the trail and its sensitive features and wildlife and habitat identification basics. In addition, they will have the option of participating in natural resource monitoring and observation activities and may also lead educational tours along the trail.

Hill Country Conservancy and Austin Parks Foundation in collaboration with Austin Ridge Riders will promote and coordinate the formation of the Friends group and its associated programs and will work with dedicated volunteers to ensure its long-term viability. Initial efforts will focus on involving existing known stakeholders and users, such as the Greenbelt Guardians, within Phase I of the VCT trail and will be undertaken as part of an Adopt-A-Park agreement between the APF and COA PARD. This Phase 1-focused effort will pilot a public/private approach that can later be expanded to involve interested parties along the entire length of the trail. This large network of Friends will support the work of COA, the Bike Patrol Program, the Barton Creek Trail Corps and other Trail Partner programs.
7.5 TRAIL SAFETY AND SECURITY

Safety and Security Task Force
The Trail Partners are currently working with COA and its appointed Safety and Security Task Force to implement a safety and security program to protect all parties within the Violet Crown Trail corridor and provide effective patrol and emergency response. The goal of this group is to develop a coordinated task force to respond to emergencies and security needs along the trail regardless of jurisdictional location. The resulting Safety and Security Program will include a GPS-based map system to aid in quickly locating persons in need of assistance. The task force currently includes representatives of COA and City of Sunset Valley police departments, including the COA Police Chief of Staff, and the Travis and Hays County sheriff’s departments.

This program is modeled on the successful Lake Travis Task Force, which is comprised of public safety agencies that have jurisdiction on or adjacent to Lake Travis. These agencies share the mission of serving cooperatively to ensure public safety and an enjoyable lake experience as well as to provide a coordinated response to public safety matters on and around Lake Travis.

The Trail Partners’ will continue to work with the Task Force to create a safety and security program. The Master Plan recommends that this program consist of well-defined safety and security policies; identification of trail management, law enforcement, emergency and fire protection policies; and a system that offers timely response to safety and security problems regardless of jurisdictional location. As part of this program, rules and regulations must be implemented and displayed in brochures and on signs. In addition to creating a safety and security plan, the Master Plan also recommends reducing exposure to liability by ensuring trails are well-maintained, recognizing and removing potentially hazardous situations in a timely manner; and designing and constructing new facilities to adequately accommodate the volume of use.

Austin Ridge Riders Mountain Bike Patrol
The Austin Ridge Riders (ARR) Mountain Bike Patrol program provides assistance with trail safety and observation on trails throughout the City of Austin and Central Texas. Patrols are comprised of volunteer mountain bikers who have completed a patroller certification exam, and are able to inform, assist and educate fellow mountain bikers and other trail users. Patrollers promote responsible mountain biking through the International Mountain Bicycling Association’s philosophy of environmentally sound and socially responsible riding.

To this end, the patrollers:
• Offer “peer to peer” education for other bike riders on the importance of responsible and environmentally sound trail use and discourage unauthorized trail-building activities and riding on closed trails,
• Report unsafe trail conditions, and
• Provide assistance to bike riders and other trail users by providing general information about the trail.

In order to assist with the maintenance and operational needs identified in this plan, the ARR will partner with HCC to increase volunteer participation and secure
additional resources for this program. This program will be expanded as appropriate throughout the trail system.

7.6 EDUCATION AND STEWARDSHIP

Natural Resources Monitoring & Observation
Proper stewardship of the trail and associated natural resources is a critical component of trail operations and maintenance. Given the potential heavy use of the trail and the sensitivity of its features, special efforts must be taken to ensure public access does not threaten species of concern or cause degradation of soil, vegetation or water resources. In addition to proper design, construction and maintenance, erosion and other adverse impacts can be avoided through natural resources monitoring and observation as well as public education.

The Trail Partners will work in collaboration with COA Parks and Recreation Department and the Balcones Canyonlands Preserve (BCP) manager to establish a research program for the monitoring and observation of natural resources associated with newly constructed trails within the Violet Crown Trail system. This program will identify any environmental degradation caused by trail-related activities and make necessary corrections to avoid further harm. For example, the proposed one-mile section of new trail along Gaines Creek passes through Golden Cheeked Warbler habitat and will require a scientifically-defined monitoring program of impacts of mountain bike use on this species and its habitat. This program will include an experimental program to monitor bicycle use.

HCC will contribute funding and work with COA and BCP staff to establish and implement this program. To support this work, monitoring and observation activities will be conducted as part of the activities of the Barton Creek Trail Corps and Friends of the Trail programs. In addition, Trail Partners will also request the assistance of the Capital Area Master Naturalists.

Education Programs
Building upon COA’s existing programs, user education will be provided by the Trail Partners through interpretative programming and information along the trail. Special education projects and programs by the Trail Corps and Friends of the Trail volunteers will be encouraged and sponsored by the coordinating entity. Furthermore, as described in the Master Plan, trail heads with kiosks will detail trail rules and regulations, allowed and prohibited uses and trail etiquette information. Educational materials will also be available at these kiosks and from Trail Corps member and volunteers that explain the sensitive nature of the lands through which the trail passes. In addition, HCC will also create and maintain a website with educational information about the trail.

7.7 ROLES & RESPONSIBILITIES OF THE TRAIL PARTNERS

The stewardship of this linear trail requires a long-term commitment by dedicated community members and nonprofit organizations working together with local government jurisdictions, including the City of Austin and City of Sunset Valley. This plan reflects the strong commitment of Hill Country Conservancy (HCC),
Austin Parks Foundation (APF) and Friends of the Violet Crown Trail to sustain and enhance the trail’s ecological features and environmental and public benefits.

To this end, the Trail Partners will work in coordination with local government jurisdictions to provide for the operation and management of the Violet Crown trail system.

Hill Country Conservancy will:
• Provide construction contracting and management of the project, including continued employment of an experienced project manager to supervise all aspects of trail development,
• Ensure that resources are available to support long-term operation and management and to fulfill the stewardship tasks as defined by the attached chart,
• Contribute funding to establish a research program for monitoring and observation of the natural resources associated with newly constructed trails and work with city officials to facilitate this program,
• Contribute funding for research studies on the potential impacts of recreational access, including mountain biking, on the Golden Cheek Warbler,
• Sponsor a minimum of two major volunteer workdays every year in conjunction with APF,
• Partner with ARR to secure additional funding for the Bike Patrol and increase volunteer participation,
• Secure funding and help manage the Barton Creek Trail Corps in partnership with APF,
• Work with the City of Austin and its appointed Safety and Security Task Force to plan for emergency needs,
• Establish the Friends of the Trail program and work with volunteers to ensure its long-term viability,
• Create and maintain a Violet Crown Trail website,
• Provide a representative on the Trail Stewardship Council, and
• Supply trail maintenance equipment for workdays.

Austin Parks Foundation will:
• Secure funding and help manage the American Youthworks Barton Creek Trail Corps,
• Conduct an analysis of existing maintenance needs and create a matrix of needs as part of the Trail Corps program,
• Sponsor a minimum of two major volunteer workdays every year in conjunction with HCC in addition to organizing smaller work projects,
• Operate and maintain an online system to coordinate volunteer management and trail activities,
• Serve as the fiduciary agent for an operations and management fund,
• Provide a representative on the Trail Stewardship Council, and
• Supply trail maintenance equipment for workdays.
VIOLET CROWN TRAIL GOVERNANCE STRUCTURE

VCT Stewardship Council

Local Government Partners
- Hays County
- Travis County
- City of Sunset Valley
- City of Austin

Non-Profit Partners
- Austin Parks Foundation
- Hill Country Conservancy
- Friends of the VCT
VIOLET CROWN TRAIL O&M RESPONSIBILITIES

Non-Profit Partners
- Volunteer Work Days
- Mountain Bike Patrol
- Friends of the VCT
- Design & Construction Management
- Barton Creek Trail Corps
- Adopt a Trail Program
  - Volunteer Trail Patrol
  - Trail Stewards
  - Trail Docents

Local Government Partners
- Natural Resource Monitoring
- Safety & Security
7.8 TRAIL USER RULES AND REGULATIONS

The following rules and regulations are based on a national model for trails that are similar in operation to the proposed Violet Crown Trail. The consultant recommends reviewing these recommended trail rules and regulations and creating an appropriate set of rules and regulations for VCT. Applicable rules should be displayed in brochures and on information signs along VCT.

1) Be Courteous: All trail users, including bicyclists, joggers, walkers should be respectful of other users regardless of their mode of travel, speed or level of skill. Respect the privacy of adjacent landowners.

2) Keep Right: Always stay to the right as you use the path or stay in the lane that has been designated for your user group. The exception to this rule occurs when you need to pass another user.

4) Pass on the Left: Pass others going in your direction on their left. Look ahead and behind to make sure that your lane is clear before you pull out and around the other user. Pass with ample separation. Do not move back to the right until you have safely gained distance and speed on the other user.

5) Give Audible Signal When Passing: All users should give a clear warning signal before passing. This signal may be produced by voice, bell or soft horn. Voice signals might include “Passing on the Left!” or “Cyclist on the left!” Always be courteous when providing the audible signal — profanity is unwarranted and unappreciated.

6) Be Predictable: Travel in a consistent and predictable manner. Always look behind before changing position on the trail regardless of your mode of travel.

7) Control Your Bicycle: Inattention, even for a second, can cause disaster — always stay alert! Maintain a safe and legal speed at all times.

8) Don’t Block the Trail: When in a group, including your pets, use no more than half the pathway so as not to block the flow of other users. If users approach your group from both directions, form a single line or stop and move to the far right edge of the path to allow safe passage by these users.

9) Yield When entering or Crossing Trails: When entering or crossing a path at uncontrolled intersections, yield to traffic already using the other path.

10) The Use of Lights: When using the trail during periods of low visibility each cyclist should be equipped with proper lights. Cyclists should have a white light that is visible from 500 feet to the front, and a red or amber light that is visible from 500 feet to the rear. Other path users should use white lights (bright flashlights) visible 250 feet to the front, and wear light or reflective clothing.

11) Don’t Use this Path Under the Influence of Alcohol or Drugs: It is illegal to use this path if you have consumed alcohol in excess of the statutory limits, or if you have consumed illegal drugs. Persons who use a prescribed medication should check with their doctor or pharmacist to ensure that it will not impair
their ability to safely operate a bicycle.

12) Clean Up Your Litter: Please keep this path clean and neat for other users to enjoy. Do not leave glass, paper, cans or other debris on or near the path. Please clean up after your pets. Pack out what you bring in — and remember always to recycle your trash.

13) Keep Pets on Leashes: All pets must be kept on a secure and tethered leash. Failure to do so will result in fines and possible detention of the pet.

14) Use the Buddy System: Always use the path system with a friend!

15) Vegetation Removal: It is illegal to remove vegetation of any type, size, or species from the pathway. Please contact the City of Austin should you have concerns about noxious weeds, poisonous vegetation, dying or dead vegetation or other concerns about vegetation growth in the pathway.

17) Share the Path! Always exercise due care and caution when using the pathway!

Additionally, specifically for Mountain Bike Trail users, the International Mountain Bike Association provides its own, suggested, Rules of the Trail, which are worth consideration and distribution for the off-road biking portions of the Violet Crown Trail project.

7.9.1 Rules of the Trail
These guidelines for trail behavior are recognized around the world. IMBA developed the “Rules of the Trail” to promote responsible and courteous conduct on shared-use trails. Keep in mind that conventions for yielding and passing may vary, depending on traffic conditions and the intended use of the trail.

1. Ride On Open Trails Only
Respect trail and road closures — ask a land manager for clarification if you are uncertain about the status of a trail. Do not trespass on private land. Obtain permits or other authorization as may be required. Be aware that bicycles are not permitted in areas protected as state or federal Wilderness.

2. Leave No Trace
Be sensitive to the dirt beneath you. Wet and muddy trails are more vulnerable to damage than dry ones. When the trail is soft, consider other riding options. This also means staying on existing trails and not creating new ones. Don’t cut switchbacks. Be sure to pack out at least as much as you pack in.

3. Control Your Bicycle
Inattention for even a moment could put yourself and others at risk. Obey all bicycle speed regulations and recommendations, and ride within your limits.

4. Yield to Others
Do your utmost to let your fellow trail users know you’re coming — a friendly greeting or bell ring are good methods. Try to anticipate other trail users as you ride around corners. Bicyclists should yield to all other trail users, unless the trail is clearly signed for bike-only travel. Bicyclists traveling downhill should yield to ones headed uphill, unless the trail is clearly signed for one-way or downhill-only traffic.
Strive to make each pass a safe and courteous one.

5. Never Scare Animals
Animals are easily startled by an unannounced approach, a sudden movement or a loud noise. Give animals enough room and time to adjust to you. When passing horses, use special care and follow directions from the horseback riders (ask if uncertain). Running cattle and disturbing wildlife are serious offenses.

6. Plan Ahead
Know your equipment, your ability and the area in which you are riding -- and prepare accordingly. Strive to be self-sufficient: keep your equipment in good repair and carry necessary supplies for changes in weather or other conditions. Always wear a helmet and appropriate safety gear.

### 7.9 CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

"CPTED is the proper design and effective use of the built environment which may lead to a reduction in the fear and incidence of crime, and an improvement of the quality of life." - National Crime Prevention Institute

Crime Prevention Through Environmental Design (CPTED) theories contend that law enforcement officers, architects, city planners, landscape designers and resident volunteers can create a climate of safety in a community, right from the start. CPTED’s goal is to prevent crime through designing a physical environment that positively influences human behavior. For trails, people who use the Violet Crown Trail regularly will need to perceive the trail as safe, and would-be criminals should view the trail as a highly risky place to commit a crime. Crime prevention through environmental design (CPTED) is a multi-disciplinary approach to deterring criminal behavior through environmental design. CPTED strategies rely upon the ability to influence offender decisions that precede criminal acts.

CPTED is based on four principles; natural access control, natural surveillance, territorial reinforcement, and target hardening.

#### 7.10.1 Natural Surveillance
Natural surveillance increases the threat of apprehension by taking steps to increase the perception that people can be seen. Natural surveillance occurs by designing the placement of physical features, activities and people in such a way as to maximize visibility and foster positive social interaction among legitimate users of public space. Potential offenders feel increased scrutiny and limitations on their escape routes.

- Use adjacent roadways and the passing vehicular traffic as a surveillance asset.
- Create landscape designs that provide surveillance, especially in proximity to designated points of entry and opportunistic points of entry.
- Use the shortest, least sight-limiting fence appropriate for the situation.
- When creating lighting design, avoid poorly placed lights that create blind-spots for potential observers and miss critical areas. Ensure potential problem areas are well-lit: pathways, stairs, entrances/exits, parking areas, children’s play areas, recreation areas, storage areas, dumpster and recycling areas, etc.
• Avoid too-bright security lighting that creates blinding glare and/or deep shadows, hindering the view for potential observers. Eyes adapt to night lighting and have trouble adjusting to severe lighting disparities. Using lower intensity lights often requires more fixtures.

• Place lighting along pathways and other pedestrian-use areas at proper heights for lighting the faces of the people in the space (and to identify the faces of potential attackers).

• Natural surveillance measures can be complemented by mechanical and organizational measures. For example, closed-circuit television (CCTV) cameras can and should be utilized.

7.10.2 Natural Access Control
Natural access control limits the opportunity for crime by taking steps to clearly differentiate between public space and private space. By selectively placing entrances and exits, fencing, lighting and landscape to limit access or control flow, natural access control occurs.

• Use a single, clearly identifiable, point of entry
• Use low, thorny bushes to keep people out of sensitive areas.
• Use waist-level, picket-type fencing to control access and encourage surveillance.
• Natural access control is used to complement mechanical and operational access control measures, such as target hardening.

7.10.3 Natural Territorial Reinforcement
Territorial reinforcement promotes social control through increased definition of space and improved proprietary concern. An environment designed to clearly delineate private space does two things. First, it creates a sense of ownership. Owners have a vested interest and are more likely to challenge intruders or report them to the police. Second, the sense of owned space creates an environment where “strangers” or “intruders” stand out and are more easily identified. By using buildings, fences, pavement, signs, lighting and landscape to express ownership and define public, semi-public and private space, natural territorial reinforcement occurs. Additionally, these objectives can be achieved by assignment of space to designated users in previously unassigned locations.

• Maintained premises and landscaping such that it communicates an alert and active presence occupying the space.
• Provide trees in residential areas. Research results indicate that, contrary to traditional views within the law enforcement community, outdoor residential spaces with more trees are seen as significantly more attractive, more safe, and more likely to be used than similar spaces without trees.
• Restrict private activities to defined private areas.
• Display security system signage at access points.
• Avoid cyclone fencing and razor-wire fence topping, as it communicates the absence of a physical presence and a reduced risk of being detected.
• Placing amenities such as seating or refreshments in common areas in a commercial or institutional setting helps to attract larger numbers of desired users.
• Scheduling activities in common areas increases proper use, attracts more people and increases the perception that these areas are controlled.
• Territorial reinforcement measures make the normal user feel safe and make
the potential offender aware of a substantial risk of apprehension or scrutiny. There are four primary obstacles to the adoption of CPTED.

First is a lack of knowledge of CPTED by environmental designers, land managers, and individual community members. For this reason, allocating substantial resources to community educational programs are often required.

The second major obstacle is resistance to change. Many specifically resist the type of cooperative planning that is required to use CPTED. Beyond that, skeptics reject the research and historic precedents that support the validity of CPTED concepts.

The third obstacle is the perception that CPTED claims to be a panacea for crime that will be used to displace other more traditional approaches rather than a small, but important, complementary tool in deterring offender behavior.

The fourth obstacle is that many existing built areas were not designed with CPTED in mind, and modification would be expensive, politically difficult, or require significant changes in some areas of the existing built environment.

**7.10 RISK MANAGEMENT AND LIABILITY**
The design, development, management and operation of the Violet Crown Trail will need to be carefully and accurately implemented in order to provide a resource that protects the health, welfare, and safety of the public.

Liability most often occurs when a facility has been under-designed for the intended volume of use; when management of the facility is poor; or when unexpected accidents occur because the trail manager failed to recognize the possibilities of a potentially hazardous situation. To reduce the exposure to liability, project partners should have in place the following measures prior to opening the first phase of the trail:

1) A complete maintenance program that provides the appropriate duty or level of care to greenway users,
2) A risk management plan that appropriately covers all aspects of the trail
3) A comprehensive working knowledge of public use laws and recent case history applicable in Texas.

Public use of the Violet Crown Trail should be covered under existing city, county and State of Texas policies for the use of parkland and public spaces.

**7.11 ADDITIONAL INFORMATION AND MATERIAL**

**7.12.1 Studies of Trail Liability**
A study by the Rails to Trails Conservancy (RTC) provides a primer on trail-related liability issues and risk management techniques. The report was co-authored by RTC in cooperation with the National Park Service: Rivers, Trails, and Conservation Assistance Program.

**7.12.1.1 Concerns and Solutions**
There are two primary categories of people who might be concerned about liability issues presented by a trail: the trail managing and owning entity (typically a public entity) and private landowners. Private landowners can be divided into two categories, those who have provided an easement for a trail over their land and those who own land adjacent to a trail corridor.

Similarly, there may be a pre-existing corridor traversing or lying adjacent to their property such as a former rail corridor that has been converted to a trail. In either situation, private landowners may have some concerns about the liability should a trail user stray onto their land and become injured. In the first instance, where an easement is granted, the concern may be over injuries on both the granted right-of-way as well as injuries that may occur on land under their control that is adjacent to the trail. Under the latter condition, where the landowner has no ownership interest in the trail, the landowner will only be concerned with injury to trail users wandering onto their property and getting hurt or perhaps a tree from their property falling onto the trail.

In general, people owning land adjacent to a trail -- whether the trail is an easement granted by them or is held by separate title -- foresee that people using the trail may be endangered by a condition on their land. Potential hazards such as a pond, a ditch, or a dead tree may cause the landowner to worry about liability for a resulting injury. The landowners may reduce their liability by taking the following actions.

- Work with trail designers to have the trail located away from hazards that cannot be corrected,
- Make it clear that trail users are not invited onto the adjoining land. This can be aided by having the trail designer develop signs, vegetative screening, or fencing,
- If a hazardous condition does exist near the trail, signs should be developed to warn trail users of the hazard if it cannot be mitigated.

Of particular concern to adjacent landowners are attractions to children that may be dangerous, such as a pond. Many states recognize that children may trespass to explore an attractive nuisance. These states require a legal responsibility to children, even as trespassers, that is greater than the duty of care owed to adults.

If a landowner provides an easement for a public-use-trail, the easement contract should specify that the managing agency will carry liability insurance, will design the trail to recognized standards and will develop and carry out a maintenance plan. The landowner may also request that an indemnification agreement be created in their favor.

Abutting property owners frequently express concerns about their liability to trail users. In general, their liability, if any, is limited and is defined by their own actions in relation to the trail. If an abutting property owner possesses no interest in the trail, then he or she does not have any right or obligation to warn trail users about defects in the trail unless the landowner creates a dangerous condition on the trail by his own act or omission. In that event, the abutting landowner would be responsible for his own acts or omissions that caused the injury to a third party.
using the trail, just as the operator of one car is responsible to the operator of another for an accident he caused on a city street.

7.12.1.2 Forms of Protection
There are three legal precepts, either alone or in combination, that define and in many cases limit liability for injury resulting from trail use. The first is the concept of duty of care, which speaks to the responsibility that a landowner (private or public) has to anyone on his or her land. Second is the Recreational Use Statute (RUS), which is available in all 50 states and provides protection to private landowners and some public landowners who allow public free access to land for recreational purposes. For those public entities not covered by a RUS, states tend to have a tort claims act, which defines and limits governmental liability. Third, for all private and public parties, liability insurance provides the final line of defense. Trail owners can also find much protection through risk management.

7.12.1.3 Duty of Care
Tort law, with regard to finding fault for an incident that occurs in a particular location is concerned with the “class” of person who incurs the injury, and the legal duty of care that a landowner owes a member of the general public varies from state to state but is generally divided into four categories. In most states, a landowner’s responsibility for injuries depends on the status of the injured person. A landowner owes increasingly greater duties of care (i.e.; is more at risk) if the injured person is a “trespasser”, a “licensee”, an “invitee”, or a “child”.

Trespasser -- a person on land without the landowner’s permission, whether intentionally or by mistaken belief that they are on public land. Trespassers are due the least duty of care and therefore pose the lowest level of liability risk. The landowner is generally not responsible for unsafe conditions. The landowner can only be held liable for deliberate or reckless misconduct, such as putting up a trip wire. Adjacent landowners are unlikely to be held liable for injuries sustained by trespassers on their property.

Licensee -- a person on land with the owner’s permission but only for the visitor’s benefit. This situation creates a slightly higher liability for the landowner. For example, a person who is permitted to hunt on a farm without paying a fee, if there were no RUS, would be classified as a licensee. If the landowner charged a fee, the hunter would probably be classified as an invitee. Again, the landowner is not responsible for discovering unsafe conditions; however, the landowner must provide warning of the known unsafe conditions.

Invitee -- a person on the owner’s land with the owner’s permission, expressly or implied, for the owner’s benefit, such as a paying customer. This is the highest level of responsibility and therefore carries the highest level of liability. The owner is responsible for unknown dangers that should have been discovered. Put in a different way, the landowner has a duty to:

1) Inspect the property and facilities to discover hidden dangers;
2) Remove the hidden dangers or warn the user of their presence;
3) Keep the property and facilities in reasonably safe repair; and
4) Anticipate foreseeable activities by users and take precautions to protect users from foreseeable dangers.
The landowner does not insure the invitee’s safety, but must exercise reasonable care to prevent injury. Generally, the landowner is not liable for injuries caused by known, open, or obvious dangers where there has been an appropriate warning. For example, customers using an ice rink open to the public for a fee would be invitees.

Children -- even if trespassing, some states accord children a higher level of protection. The concept of “attractive nuisance” is particularly relevant to children. Landforms such as ponds can be attractive to children who, unaware of potential danger, may be injured if they explore such items.

Prior to the widespread adoption of RUS’ by the states, this classification system defined the liability of adjacent landowners. Even now, trail managers or private landowners who charge a fee are at greater risk of liability because they owe the payee a greater responsibility to provide a safe experience.

Thus, where no RUS exists or is unavailable, trail users would be of the licensee class, provided the trail manager does not charge an access fee. If a trail manager charges a fee, the facility provider tends to owe a greater duty of care to the user and thus has a greater risk of liability if a trail user is injured due to a condition of the trail.

7.12.1.4 Recreational Use Statutes (RUS)
The Council of State Governments produced a model recreational use statute (RUS) in 1965 in an effort to encourage private landowners to open their land for public recreational use by limiting the landowner’s liability for recreational injuries when access was provided without charge.

Recreational use statutes are now on the books in all 50 states. These state laws provide protection to landowners who allow the public to use their land for recreational purposes. The theory behind these statutes is that if landowners are protected from liability they would be more likely to open up their land for public recreational use and that, in turn, would reduce state expenditures to provide such areas. To recover damages, an injured person must prove “willful and wanton misconduct” on the part of the landowner, essentially the same duty of care owned to a trespasser. However, if the landowner is charging a fee for access to the property, the protection offered by the recreational use statute is lost in most states.

The preamble of the model RUS is clear that it was designed for private landowners but the actual language of the model legislation does not differentiate between private and public landowners. The result is that while some states have followed the intent of the model statute and limited the immunity to private landowners, other states have extended the immunity either to cover public landowners legislatively or judicially.

Under the Federal Tort Claims Act, the federal government is liable for negligence like a private landowner under the law of the state. As a result, RUS’s intended for private individuals have been held applicable to the federal government where it has opened land up for public recreation.

Under lease arrangements between a public agency and a private landowner, land can be provided for public recreation while the public agency agrees to defend and
VIOLET CROWN TRAIL FINAL MASTER PLAN

7.1.9 Operations and Management

protect the private landowner. The private landowner may still be sued but the public agency holds the landowner harmless, taking responsibilities for the cost of defending a lawsuit and any resulting judgments.

While state RUS’s and the court interpretations of these laws vary somewhat, a few common themes can be found. The statues were created to encourage landowners to make their land available for public recreation purposes by limiting their liability provided they do not charge a fee. The RUS limits the duty of care a landowner would otherwise owe to a recreational licensee to keep his or her premises safe for use. It also limits a landowner’s duty to warn of dangerous conditions provided such failure to warn is not considered grossly negligent, willful, wanton, or reckless. The result of many of these statues is to limit landowner liability for injuries experienced by people partaking in recreational activities on their land. The existence of a RUS may also have the effect of reducing insurance premiums for landowners whose lands are used for recreation.

These laws do not prevent somebody from suing a trail manager/owner or a private property owner who has made his or her land available to the public for recreational use, it only means the suit will not advance in court if certain conditions hold true. Thus, the trail manager/owner may incur costs to defend himself or herself. Such costs are the principal reason for purchasing liability insurance.

7.12.1.5 Risk Management

All of the above-mentioned forms of protection aside, perhaps the best defense a trail manager has are sound policy and practice for trail maintenance and usage. Developing a comprehensive technique is the best defense against an injury-related lawsuit.

Trails that are properly designed and maintained go a long way to ward off any potential liability. There are some general design guidelines (AASHTO and MUTCD) that, if adhered to, can provide protection by showing that conventional standards were used in designing and building the trail. Trails that are designed in accordance with recognized standards or “best practices” may be able to take advantage of any design immunities under state law. Within the spectrum of public facilities, trails are quite safe, often less risky than roads, swimming pools and playgrounds.

The managing agency should also develop a comprehensive maintenance plan that provides for regular maintenance and inspection. These procedures should be spelled out in detail in a trail management handbook and a record should be kept of each inspection including what was discovered and any corrective action taken. The trail manager should attempt to ward off or eliminate any hazardous situations before an injury occurs. Private landowners that provide public easements for a trail should ensure that such management plans are in place and used to reduce their own liability. Key points include:

During trail design and development:

- Develop an inventory of potential hazards along the corridor;
- Create a list of users that will be permitted on the trail and the risks associated with each;
- Identify all applicable laws;
• Design and locate the trail such that obvious dangers are avoided. Warnings of potential hazards should be provided, and mitigated to the extent possible;
• Trail design and construction should be completed by persons who are knowledgeable about design guidelines, such as those listed in AASHTO and MUTCD documents;
• Trail regulations should be posted and enforced.

Once the trail is open for use:

• Regular inspections of the trail by a qualified person who has the expertise to identify hazardous conditions and maintenance problems.
• Maintenance problems should be corrected quickly and documented. Where a problem cannot be promptly corrected, warnings to trail users should be erected.
• Procedures for handling medical emergencies should be developed. The procedures should be documented as well as any occurrence of medical emergencies.
• Records should be maintained of all inspections, what was found, and what was done about it. Photographs of found hazardous conditions can be useful.

These risk management techniques will not only help to ensure that hazardous conditions are identified and corrected in a timely manner, thereby averting injury to trail users, but will also serve to protect the trail owner and managing agency from liability. Showing that the agency had been acting in a responsible manner can serve as an excellent defense in the event that a lawsuit develops.

7.12.1.6 Use of Volunteers for Trail Work
Trail managers often use volunteers for routine trail maintenance or even for trail construction. What happens if the volunteer is injured while performing trail-related work? What happens if an action taken by a volunteer leads to an injury of a trail user? First, make sure your insurance covers volunteer workers. Second, the trail manager should be protected from any user injury created by an act of a volunteer provided the act is not one of willful or reckless misconduct. The Federal Volunteer Protection Act of 1997 protects the volunteer worker. This act protects volunteers of nonprofit organizations or governmental entities. The Act states that such volunteers are not liable for harm caused by their acts of commission or omission provided the acts are in good faith.

7.12 FREQUENCY OF MAINTENANCE TASKS

The consultant offers the following as a national model for how trails, similar to Violet Crown Trail, are managed by work task. The Violet Crown Trail project partners will want and need to develop a set of maintenance tasks that address common and unique trail management and operation tasks. Partners will also need to define the frequency in which these tasks are performed, and the specific group, organization or agency assigned to each task. It is recommended that the Austin Parks and Recreation Department and the Austin Water Utility Department meet to further discuss and determine the appropriate maintenance and operation tasks for VCT. Please use the following chart as a guide for these discussions.
<table>
<thead>
<tr>
<th>Trail Maintenance Task</th>
<th>Frequency of Task Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patrol of Trail</td>
<td>365 x/year</td>
</tr>
<tr>
<td>Removing debris from trails</td>
<td>26 x/year</td>
</tr>
<tr>
<td>Pick-up and removal of trash from trail/trailheads</td>
<td>52 x/year</td>
</tr>
<tr>
<td>Weed control and vegetation management within trail tread</td>
<td>10 x/year</td>
</tr>
<tr>
<td>Mowing of 3-ft grass safe zone along trail (Parkland &amp; WQPL)</td>
<td>26 x/year</td>
</tr>
<tr>
<td>Drainage and storm channel maintenance</td>
<td>4 x/year</td>
</tr>
<tr>
<td>Re-Surfacing of Unpaved Trail Tread</td>
<td>1 x/year</td>
</tr>
<tr>
<td>Prescribed Fire on WQPL Lands</td>
<td>Per COA</td>
</tr>
</tbody>
</table>