Deep Run Bike and Pedestrian Trail

Prepared for the representatives and stakeholders of Spotsylvania County

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community design assistance center
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Spotsylvania County is located in northeast Virginia. The project area is located at the northern edge of the county, just south of Fredericksburg, Virginia. Fredericksburg is a city with significant history dating back to the Civil War. The Battle of Fredericksburg was the site of the largest engagement of the Civil War, involving almost 200,000 soldiers. Fought between December 11 and December 15, 1862, the battle resulted in a key Confederate victory but came at the cost of some 18,000 total casualties. Today, two significant pieces of the battlefield are protected: Slaughter Pen Farm, overseen by the Civil War Trust; and the Fredericksburg and Spotsylvania National Park, managed by the National Park Service. These two battlefield sites remain major cultural icons and tourist attractions to the Fredericksburg area.

The Community Design Assistance Center (CDAC), approached by Spotsylvania County and the Spotsylvania Greenway Initiative (SGI), was tasked to lead a collection of regional stakeholders in a project to highlight the cultural heritage of the area and re-engage the local community through opportunities for recreation and alternative transportation. The purpose of this project was to create a conceptual layout for a trail system that would connect Fredericksburg to these cultural and historic assets related to its involvement in the Civil War. This trail would also provide opportunities to connect to existing trail networks, as well as, a number of developing economic resources and outdoor recreational opportunities. The details of these design considerations will be discussed in more detail in the following pages.

Throughout the design process, the CDAC team and community stakeholders worked collaboratively to develop design goals and strategies for achieving those goals. After presenting a preliminary concept to a number of Spotsylvania County representatives at a community meeting, suggestions received were used to develop the concept and create final route options. The final concept, as presented in this document, is meant to provide a number of route choices. While some routes are presented as more ideal than others, the flexibility of the final proposal will aid in its adaptive implementation. With this in mind, the success of this project relies not only on presenting a desirable trail routing concept, but ensuring that the final concept is firmly rooted in community interest and practical understandings of the limits of the project.
The project began with an initial site visit to Spotsylvania County in June 2012. The CDAC team and Spotsylvania County stakeholders toured a number of sites including the Bowman Center, Slaughter Pen Farm, Lee Drive, and multiple locations along Tidewater Trail and Benchmark Drive. By touring the area of Spotsylvania County in which the proposed trail network was to be placed, the CDAC team was able to establish a first-hand understanding of the range of site conditions, including both opportunities and constraints (pg. 9-13).

The site visit resulted in a number of goals and objectives (pg. 8) developed by the CDAC team and Spotsylvania County Planning representatives. With these goals and objectives in mind, the CDAC team explored the opportunities and constraints that the sites provided. This analysis was provided to Spotsylvania County representatives for feedback and expansion before any conceptual trail alignments were made.

After reaching an understanding of the opportunities and constraints existing on the various sites in question, the CDAC team created a number of trail route alternatives. These alternatives were evaluated based on multiple criteria and a conceptual plan (pg. 14-15) was created and proposed to the Spotsylvania County public at a community meeting. Along with the creation of a route map, character sketches of key locations along the route were created to help community members and participants visualize the pros and cons of each of the potential trail routes.
Project Goals

After visiting important sites under consideration for a trail system in Spotsylvania County, goals and objectives were developed by the stakeholder committee and the CDAC team to guide the design process forward.

Goals:

1. Support local business and compliment economic development and revitalization efforts at the Bowman Center;

2. Provide connectivity between the Rappahannock River, historic sites, community facilities, visitor services and regional trail networks;

3. Provide a venue for healthy, family friendly outdoor recreation that connects youth to nature;

4. Provide an opportunity for learning about Civil War history by connecting sites for interpretation that were significant during the Battle of Fredericksburg.

In order to achieve the above goals a number of key locations were identified as attractive opportunities for connections.

1. The Bowman Center and Franklin’s Crossing

2. Slaughter Pen Farm

3. Lee Drive

4. Proposed Virginia Railway Express (VRE) Station

5. East Coast Greenway and U.S. Bike Route 1
Once an agreed upon list of goals was reached, the CDAC team began an inventory of existing conditions. This inventory was based largely on property ownership, topography, road alignments and possible railroad crossings. These items became the foundation for analysis exercises that would lead to a conceptual understanding of possible routing options for the trail system.

The opportunities inherent in the project area are largely represented by the connection hubs identified in the project goals. These key locations became the basis for a loop trail that would include: The Bowman Center, Slaughter Pen Farm, Lee Drive, and the Proposed VRE Station. Another opportunity that would help facilitate these connections was the existence of the East Coast Greenway and U.S. Bike Route 1.

Important limitations discovered during the inventory process were the heavy traffic along Tidewater Trail and Benchmark Drive as well as the limited opportunities for crossing the CSX rail line that divides much of the site. These hurdles, in combination with steep topography along sections of the Rappahannock River would severely limit the number of possible trail routing options that would still satisfy the goals of the project.

After gathering the necessary inventory information, the CDAC team created analysis maps that would aid in selecting the most desirable routes for the trail. The first map created was a slope analysis map. This map used GIS data to catalog all of the slopes in the project area and identify them based on their feasibility for accommodating a trail. After analyzing the topography, a synthesized analysis map was created that compiled slope data with private property information and desired points of interest. This map was able to identify the most desirable trail locations and a gradient leading down to the least desirable.

Maps illustrating the opportunities, constraints, slope analysis and synthesized analysis are presented on the following pages. The latter depicts the most desirable trail locations in green and the least desirable in red.

Heavy, fast-moving traffic along a congested stretch of Tidewater Trail is one of the primary constraints of this project area.
An existing utility corridor north of the Bowman Center along Dry Run provides a potential solution to the issue of extreme topography in this area along the river.

Empty lots in a residential neighborhood along Tidewater Trail provide a potential access point to the river. This would potentially allow for a trail loop that includes the Bowman Center.

Lee Drive is already part of a larger regional bike network. It also has the ability to allow for a loop due to its connections near the Bowman Center and Benchmark Drive.

Slaughter Pen Farm is an established tourist location which already includes some of the signage to be proposed in other parts of this project. The farm also provides an access point for connecting the Lee Drive area to Tidewater Trail and on to the Bowman Center.

Prospect Hill at the end of Lee Drive connects an existing regional trail to Benchmark Drive while also serving as an established draw for Civil War tourists. The overlook in this location provides some orientation to the entire region.

Slaughter Pen Farm is an established tourist location which already includes some of the signage to be proposed in other parts of this project. The farm also provides an access point for connecting the Lee Drive area to Tidewater Trail and on to the Bowman Center.

Lee Drive is already part of a larger regional bike network. It also has the ability to allow for a loop due to its connections near the Bowman Center and Benchmark Drive.

Opportunities to cross the railroad tracks are limited but two positive locations exist. An at grade crossing at Mine Road, a small bridge that Dry Run flows under and two culverts further south provide the only viable options for creating a regional trail that has the ability to connect necessary points of interest.
Heavy traffic along Tidewater Trail combined with a high speed limit makes this area unsafe for pedestrians and cyclists. Any trail aligned through this area will need to include a barrier protecting the trail from the vehicle traffic along the road.

The CSX Railroad is the most substantial barrier to creating a regional trail in this area. Due to a limited number of allowable crossings, the routing of any trail will be mostly determined by the ability to cross the railroad tracks.

Steep topography along the northeast edge of the Bowman Center is a limitation for two reasons. Firstly, it makes running a trail along the river difficult in this location. Secondly, bridging the difference in elevation to connect the Bowman Center to the river will require a boardwalk or series of stairs, which will increase project costs and limit access.

In this area of Benchmark Drive, the corridor between the road and the railroad tracks is extremely narrow (15-30 feet). Because of this, extra buffers would be needed to safely route a trail through this segment.
After completion of the inventory and analysis phase, the CDAC team began developing preliminary route options for the Spotsylvania County regional trail system. Route options were based primarily on the analysis regarding private property, topography, and confluence with busy roads. The Preliminary Route Options map included routes that were eventually dismissed by the CDAC team due to conflicts with private property or topography. These segments remain in the preliminary map in order to illustrate all of the considered options but were avoided in later iterations of the route options concept. The preliminary route options (including dismissed segments) were provided to Spotsylvania County Planning representatives to allow for revisions ahead of the public presentation of the concepts at the community meeting. In addition to the map, character sketches were used to aid in the public's visualization of key areas along the trail. A map illustrating the preliminary route options and the character sketches that help illustrate that route are presented on the following pages.
1. Bowman Center
2. Deep Run
3. Deep Run Overpass
4. Franklin’s Crossing
5. Tidewater Trail
6. Slaughter Pen Farm
7. Slaughter Pen Farm Lowlands
8. Mine Road At-Grade Crossing
9. Lester Development
10. Benchmark Road
11. Culvert Railroad Crossing
Community Presentation

Trail route alternatives were presented to Spotsylvania County community members on October 2nd, 2012. These routes options were the culmination of four months of analysis, synthesis, and design. Feedback and suggestions from the community were gathered at the meeting and through the Spotsylvania County website. Community input helped to further determine ideal routing options for the trail system as well as identify new opportunities that were previously unknown to the CDAC team. After presenting the initial design concept for trail routing options to the Spotsylvania County community at the community meeting on October 2, 2012 the CDAC team amended the route options to reflect the comments received.

The final route options and a number of key focus areas within the trail network are described in detail on the following pages.
Final Route Options

Similar to the initial concept, the final concept includes a range of routing options that range from ideal (green) to last resorts (red) and the approximate length of each designated trail segment. Also included are maps that specifically illustrate the most desirable loop trail, and the most desirable one-way trail within the larger concept including the project phasing that may be necessary. The motivation behind this strategy was to provide Spotsylvania County representatives with a range of options. This would allow for flexibility when implementing the plan.

In addition to the route plan, the CDAC team developed a number of key focus sketches to help visualize specific areas along the route plan. These focus areas included: Franklin’s Crossing, the Bowman Center, Deep Run Trail Spur, Tidewater Trail, and the narrow section of Benchmark Drive. Each of these focus area sketches is represented with before and after imagery to help illustrate the character of the proposed trail in these particular areas.

The pages that following include maps of final route options and illustrations of the focus areas.
Final Route Options Map

Highlighting Ideal Loop Trail

- Ideal Loop Route
- Ideal Route Options
- At-Grade RR Crossing
- Railroad Crossing
- Point of Interest
- U.S. Bike Route 1 & East Coast Greenway
- Massaponax Creek Trail Corridor (Proposed)
- Exclusive Loop Trail
- On-Road option for Cyclists
- Massaponax Creek Trail Corridor (Proposed)

*Total Loop Length (not including hiking only sections): 13.1 miles
1. Franklin’s Crossing

The Rappahannock River section that runs in proximity to the Bowman Center is a definite resource to the creation of a Spotsylvania County regional trail.

Specifically at Franklin’s Crossing, this part of the river allows trail users to access a significant historical point as well as avoid higher traffic areas within the Bowman Center and along Tidewater Trail.

A trail running along the bank of the Rappahannock River at Franklin’s Crossing provides the opportunity for an informative overlook and places for picnic tables. This section of trail could prove to be one of the most desirable areas within the whole network.
1a. Franklin’s Crossing Trailhead

This section of trail also provides the opportunity for a trailhead established at the access point to the Rappahannock River behind the Bowman Center.

The trailhead would provide picnic areas, restroom facilities, and a boat ramp with access directly from the Bowman Center to the river. In this way, the trailhead becomes a draw for school groups, families, and others with interests in using canoes on the river. The Bowman Center may gain visitor traffic with the introduction of this trailhead.
Franklin’s Crossing Trailhead

Locating a trailhead on the northeast side of the Bowman Center along the Rappahannock River allows for the introduction of a number of amenities that may not be possible along other stretches of the trail.

1. Boat Launch: This site would allow for small boat access to the Rappahannock River. This area of the trailhead would also include interpretive overlooks (pg.20) and picnic areas.

2. Trailhead Facilities: Off of Bourbon Street would be a small parking lot and restroom facilities that re-use an existing cinderblock building. Due to the proximity of the wastewater disposal area, a visual barrier will be needed to screen the trailhead and parking lot where natural vegetation does not already exist.
2. Bowman Center

An abandoned rail line that runs along Main Street within the Bowman Center provides an opportunity for a centrally located trail corridor that connects the Bowman Center to the rest of the Spotsylvania County region.

A pedestrian/bike trail that is offset from vehicular traffic is ideal because substantial eighteen-wheeler truck traffic moving throughout the Bowman Center could prove a safety risk for users of the trail. Likewise, a separate trail allows for the Bowman Center to continue to function with as little interruption from trail users as possible.

The Bowman Center was identified as a crucial point of interest for the Spotsylvania Trail system and the alignment illustrated here makes the most of that connection.

Existing view of Main Street looking south along abandoned rail.

Proposed trail on Main Street along abandoned rail bed.
To safely cross Tidewater Trail bicycle users should use designated crossings. Two crosswalks are needed. One crosses Tidewater Trail and the other Joseph Mills Drive. Due to the volume of traffic in this area, vegetated buffers or some sort of barrier may be necessary at the corners of the intersection. These “barriers” would serve as visual cues for bikers and pedestrians to continue on the path toward the crosswalks rather than moving onto the street to turn with vehicular traffic.
3. Deep Run Trail Spur

A spur trail along the Deep Run corridor the opportunity to use as little of Tidewater Trail as possible. Also, this section of trail puts users into a uniquely native environment given the generally urban context very nearby.

Placing a small overlook along Deep Run creates a resting place for trail users and allows for an appreciation for the surrounding environment.

Existing view of Deep Run southwest of Tidewater Trail.

Proposed overlook along the Deep Run trail spur.
4. Tidewater Trail

The public right-of-way along Tidewater Trail allows for the creation of a bike/pedestrian trail that is separated from the flow of vehicular traffic on this heavily travelled road. This separation of conflicting uses increases the safety of both trail users and drivers on Tidewater Trail.

In addition to separating the trail from vehicular traffic, it is recommended that a guard rail be inserted in especially high traffic areas. The addition of site amenities like shrubs and small trees will help to shield users from the road aesthetically as well as from properties along the route.

Existing view looking southeast along Tidewater Trail.

Proposed trail along Tidewater Trail including a guard rail and additional site amenities.
A stretch of important potential trail corridor that runs along Benchmark Drive where it intersects with Mine Road proves to be a problem area. At this point the trail needs to run parallel to Benchmark between the street and train tracks. The issue here is that in one area the distance between street and tracks is as little as 40 feet which is a tight space when a train is passing by.

In order to connect Slaughter Pen Farm to Lee drive, Lester Development and the future VRE station, this problem area can’t be avoided. A solution should be devised to allow safe passage through this corridor while avoiding the creation of an unesthetic path.

**Possible Solutions**

This example shows the use of low barriers and small vegetative buffers to divide the street, bike trail, and train tracks. The trail is temporarily narrowed to a single lane for a short distance while it runs between the road and rail corridors.

This example shows the bike path placed adjacent to the street and shifted as far away from the train tracks as possible. A chain link fence separates the trail from the train tracks creating a safe yet unesthetic corridor.

In close proximity to train tracks, this example uses an aesthetic fence as a barrier between the bike trail and tracks instead of chain link. Vegetation and another fence to the left separate the trail from the road.
5. Benchmark Drive

Sections of Benchmark Drive prove to be a particular challenge due to the extremely narrow corridor between the road and the railroad tracks. Even so, this section of Benchmark Drive was identified as a critical section to the success of the trail network as a whole.

Formally providing a 3’ buffer between the fence along the railroad and a 4’ buffer between the trail and the road provides visual and physical separation to address safety. Both sides of the proposed trail are addressed through the use of fencing/guard rails and plant material. The fence/guard rail provides the physical separation, while the plant material creates an enclosed space along the trail, and a barrier for unwanted sight lines.
Conclusion

From the very beginning, the CDAC team has been confident that this area of Spotsylvania County holds immense potential for a successful bike and pedestrian trail system. These potentials can provide powerful opportunities to bring the community and tourists outdoors and connect them with the Civil War heritage that is so important to this area of Virginia. Community input was essential to the design process. The community meeting allowed the CDAC team to develop a trail concept that was in line with how local people envisioned using the trail.

The Deep Run trail system highlights under-utilized historic resources in Spotsylvania County, expands upon heritage tourism and economic development, and increases opportunities for recreation and alternative transportation for residents and visitors of Fredericksburg. By connecting to the East Coast Greenway and Bike Route 1, this project has the potential to connect to a much larger and move diverse user group and bring people to this area that would otherwise pass through without notice. Preserved battlefield sites along Lee Drive and within Slaughter Pen Farm as well as redevelopment projects like the Bowman Center stand to benefit greatly from this more expanded pedestrian and bike traffic. In short, this trail project will not only serve as a resource for those already in the local community, but as a possible resource for expanding the community as well.
Appendices

Appendix A - Bike/Pedestrian Trail Case Studies

Appendix B - Bike Trail/Railroad Line Case Studies
Appendix A: Bike/Pedestrian Trail Case Studies

The following links provide information on similar bicycle and pedestrian trail projects, either under construction or completed in various metropolitan areas throughout the United States.

1. Minneapolis, MN: Bicycle Facility Design Guidelines

2. Portland, OR: Bike MasterPlan
http://www.portlandoregon.gov/transportation/44597


4. Seattle, WA: Bicycle MasterPlan
http://www.seattle.gov/transportation/docs/bmp/final/BikeMasterPlanCOMPLETE.pdf

5. Tucson, AZ: Bike Boulevard
Appendix B: Bike Trail/Railroad Line Case Studies

The following images were used to conceptually address the narrow corridor along Benchmark Drive where the proposed trail would come into close proximity to the existing CSX rail line.

Rails to Trails Conservancy: Rails with Trails