CHESTERFIELD COUNTY
BIKEWAYS AND TRAILS PLAN

Draft February 2015
Chesterfield County Planning Department
Overview

Encouraging a safe and accessible bicycle and pedestrian friendly community is an important part of keeping Chesterfield County an attractive, desirable and healthy place to live, work, shop and recreate. Communities across Virginia and the nation are realizing that biking and walking amenities have a bigger impact than improving the safety of cyclists, walkers and motorists; they are economic development tools that attract new business, provide tourism destinations for visitors and aid in the physical and mental health of their residents. This plan sets the stage to develop a core network of countywide bikeways and trails that address both transportation and recreational needs. Implementation of this plan will provide a safe and comfortable network to walk and bike as viable alternative transportation choices and connect residential areas to destinations such as shopping, services, parks, libraries, jobs and schools.

The purpose of this plan is to identify the core network of bikeways and trails, establish design guidelines for the various facility types and recommend policies and ordinances that will develop and enhance this network. This plan supports many of the goals of the Comprehensive Plan including providing a high quality of life for residents and attracting visitors and businesses to our unique environmental, historical and cultural resources.

HOW TO USE THIS CHAPTER

This plan provides guidelines and recommendations that should be implemented when considering development proposals or public infrastructure projects. The general location of the core network has been identified in this plan, and new rezoning, development plans, and public facility and infrastructure projects should align with this plan by providing facilities to accommodate and enhance the bikeways and trails network. Over time residential areas, commercial developments and public facilities should build additional bikeways or trails to link to the core network. Additional, and more specific, bicycle and pedestrian facilities may be recommended through Special Area Plans and revitalization efforts, and should enhance or provide further guidance to the overall network.

This plan does not recommend exact alignments for the facilities found on the network map. Also, this plan does not recommend a specific type of bicycle and/or pedestrian facility for any segment of the network. Exact alignments and facility types should be determined on a project-by-project basis. Sidewalks are not specifically addressed, but this plan does acknowledge the importance of sidewalks in the community. While not preferred, sidewalks can also provide important and safe connections for cyclists in certain situations.

PLANNING EFFORTS

Chesterfield County has been exploring the concept of bikeways, trails, greenways and linear parks for many years. The first Bikeways Plan was adopted by the Chesterfield County Board of Supervisors in 1989 with a focus towards on-road facilities. The Parks and Recreation Department has also written several plans including the Greenway Master Plan in 1993, updated as the Greenways and Trails Strategic Plan in 2003. The most significant effort exploring these issues was the Committee on the Future’s 2005 Green Infrastructure Report. This report envisioned a high quality of life for Chesterfield County’s residents by incorporating natural areas into urban, suburban and rural development. The protection of natural areas, or green infrastructure, was recommended for multiple benefits including wildlife habitat, environmental protection as well as community health and recreation. Additionally,
Chesterfield County’s strategic plan, Blueprint Chesterfield, sets five goals to serve as priorities for county decision making. While all of the goals relate to this plan, several goals, including Healthy Living and Well Being and Thriving Communities and Environmental Stewardship are directly linked to this plan.

There are numerous state and regional efforts in which Chesterfield County is an active participant regarding bikeways and trails. The Virginia Department of Conservation and Recreation produces the Virginia Outdoors Plan, an important component of which is the Virginia Outdoors Demand Survey that analyzes recreational trends for the state and region. In 2011, trails for hiking and walking were identified as the most needed recreational facility (66 percent), and trails for bicycling the third most needed facility (57 percent) according to respondents in the Richmond Region. The Virginia Outdoors Plan supports local projects and seeks to coordinate regional and state projects. The Richmond Regional Planning District Commission adopted the Richmond Regional Bicycle and Pedestrian Plan in 2004. It is anticipated that the next update of this plan will be a part of the 2040 Long Range Transportation Plan/Congestion Management Process which is due in July 2016. The Crater Regional Planning District Commission is currently updating the Tri-Cities Metropolitan Planning Organization (MPO) Bicycle and Pedestrian Plan for the Tri-Cities area, including southern Chesterfield County, and anticipates completion by the summer of 2015.

Chesterfield County coordinated with surrounding locality efforts, especially along jurisdictional boundaries, in developing this plan. The network recommended by this plan considered, and aligns with, the City of Richmond Bike Master Plan (anticipated adoption 2015), the Colonial Heights Comprehensive Plan (adopted 2014), the Dinwiddie County Comprehensive Plan (adopted 2006), the Petersburg Comprehensive Plan (adopted 2011) and the Route 711 Corridor Study of Powhatan and Chesterfield Counties that calls for bike lanes and sidewalks (2006).

COMMUNITY INPUT

In the summer of 2014, a series of district workshops and an online survey were conducted to gauge the interest and support for bikeways and trails in Chesterfield County. Workshops and meetings were attended by over 300 people and the survey was taken by over 1,000 people. In addition, approximately 700 people were reached by staff attending community events such as the Capital to Capital Trail Ride, Bike Virginia and National Night Out.

The public outreach showed that there is an interest in bicycling and walking in Chesterfield County, with 93 percent of the online survey respondents wanting to bike more and 88 percent wanting to walk more than they do now. The community identified that the strongest barrier to biking and walking in Chesterfield County was not feeling safe on roads and not having enough dedicated facilities for biking and walking, including pedestrian actuated signals, crosswalks and connected sidewalks. The survey asked respondents to rank different types of bicycle and walking facilities. By far the most popular facility type was a shared use path, followed by a protected bike lane, buffered bike lane, traditional bike lane and finally a bike boulevard. Most people identified themselves as “interested, but concerned” bicycle riders - people who

**Barriers to Biking and Walking**

- Don't feel safe on roads
- Destinations too far
- Not enough places to walk
- Lack of signalized crosswalks
- Difficult to carry belongings
- Need to transport kids
are looking for safe, dedicated infrastructure for bicycling. Analysis of all public input led to this plan’s recommendation of a shared use path network and supporting on-road bike facilities.

**BENEFITS OF A BICYCLE AND PEDESTRIAN FRIENDLY COMMUNITY**

Bicycle and pedestrian infrastructure provides more to a community than safe places for people to bike and walk. The presence of this infrastructure has been shown to increase economic development competitiveness, promote personal health and wellness, and aid in environmental protection. A few of these benefits that will enhance the quality of life for Chesterfield County are described below.

**Affordability**

Bicycling and walking are two of the most affordable means of transportation and recreation available to Chesterfield County residents. Replacing vehicle trips with walking or biking trips (to the extent possible) offers immediate financial benefits for households and can be accomplished through the development of a network of bikeways and trails that connect key destinations.

**Convenience**

According to the 2009 National Household Travel Survey, 41 percent of trips Americans make each day are less than three miles, a distance which could be traversed in 18 minutes by bicycle. Not only are these trips short to make, but they incorporate exercise which can be difficult to fit into a busy day.

**Economic**

There are many ways to consider the economic benefits of increased rates of walking and biking. Bicyclists and pedestrians tend to make more frequent visits than those who drive, and end up spending more money over the course of a month. Major employers – and their employees – also seek communities with opportunities for active lifestyles and attractive amenities. In addition, these facilities themselves may attract visitors from outside of the county, increasing tourism dollars for county businesses.

**Environment**

Trails can follow and encourage the protection of environmental features such as streams, rivers and wetlands. While these areas have physical development limitations, they can provide recreational and educational benefits for the community. Tree canopies mitigate air pollution, regulate temperature, protect water quality and provide wildlife habitat. These benefits are multiplied when environmental features are connected, such as by linear parks and trails.

**Health**

Physical activity is effective in the primary and secondary prevention of many chronic health problems including cardiovascular disease, diabetes and cancer. Creating a safe and accessible pedestrian and bicycle network appropriate for all ages and abilities will support efforts to promote healthy lifestyles.
CHAPTER X : BIKEWAYS AND TRAILS PLAN

Mobility Choice
According to the Census Bureau’s 2012 American Community Survey 1-Year Estimates, nearly three percent of Chesterfield County households do not have access to a motor vehicle whatsoever, and 25 percent of households have access to only one motor vehicle. Providing walking and bicycling infrastructure in the parts of Chesterfield County with low car ownership and limited transportation options will improve the safety of those who are walking and biking now and increase the number of people able to walk and bike for daily transportation needs.

Property Values
The presence of trails and other pedestrian and bicycle infrastructure has been shown to have a positive impact on the desirability of commercial and residential real estate. A 2014 Urban Land Institute study showed that 63 percent of all investors ranked improved pedestrian infrastructure as one of the very top priorities for real estate investments, and 46 percent of all investors ranked improved bicycle infrastructure as one of the very top priorities for investments.

COMPLETE STREETS POLICY
Transportation systems have traditionally been designed primarily around vehicles. However, increasingly people are viewing and using roads for non-vehicular means. Streets are used by a variety of people to get exercise, interact with their neighbors and bike or walk to nearby destinations. The need for making our streets more accessible and safe for all modes of transportation is significant, not only to reduce death and injury from collisions, but to address broader health, environmental and economic concerns. This concept of a street for all users is increasingly being referred to as a “Complete Street” and many communities across the nation are adopting Complete Street policies to ensure the entire street right-of-way is being designed for all users regardless of age, ability or mode of transportation.

Complete Streets should be context-sensitive, reflecting the character and needs of the community. For example, on rural county roads with lower automobile volumes, a paved shared use path along the roadway might meet the definition of a complete street. While in denser, more developed settings, a physically protected bike lane and sidewalks might be the most appropriate facility. Finally, in our special plan areas, complete streets may have well-marked crosswalks and sidewalks lining the roads, designed in keeping with the unique identity of that area.

Adoption of a countywide Complete Streets Policy demonstrates Chesterfield County’s commitment to implementation of the Bikeways and Trails Plan and further acknowledges the need to create a transportation network that accommodates bicycling and walking as safe alternatives for people of all ages and abilities.
Current Bicycle & Pedestrian Facilities

ON-ROAD BICYCLE FACILITIES

Several roads in Chesterfield County are constructed with bike facilities. These facilities are typically five foot on-road bike lanes adjacent to traffic. Most of the bike lanes have VDOT signs and/or pavement markings, although a few of the facilities are not marked. Several other roads accommodate bicyclists with paved shoulders or wide outside lanes. The following table notes existing on-road bike facilities in the county. The locations of these on-road facilities can also be viewed on the map found on page 6.

<table>
<thead>
<tr>
<th>Road Name</th>
<th>Location (from/to)</th>
<th>Facility Type</th>
<th>One Side (miles)</th>
<th>Both Sides (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bailey Bridge Rd</td>
<td>Cameron Bay Dr-Claypoint Rd</td>
<td>Bike Lane</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Charter Colony Parkway</td>
<td>Rt 60-Centerpointe Pky</td>
<td>Bike Lane</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>Charter Colony Parkway</td>
<td>Centerpointe Pky-Waterford Lake Dr</td>
<td>Bike Lane</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Courthouse Rd</td>
<td>Busy St-Belmont Rd</td>
<td>Bike Lane</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>Genito Rd</td>
<td>Rt 360-Courthouse Rd</td>
<td>Bike Lane</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Genito Rd</td>
<td>Clintwood Rd-Charter Colony Pky</td>
<td>Wide Outside Lane</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Huguenot Rd</td>
<td>Polo Pky-Forest Hill Ave</td>
<td>Paved Shoulder</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>Iron Bridge Rd (Rt 10)</td>
<td>Ridgedale Pky-Frith Ln</td>
<td>Bike Lane</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Meadowville Technology Pky</td>
<td>Meadowville Rd-N. Enon Church Rd</td>
<td>Bike Lane</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Robious Rd</td>
<td>Robious Forest Wy-James River Rd</td>
<td>Bike Lane</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Robious Rd</td>
<td>James River Rd-Salisbury Rd</td>
<td>Bike Lane</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Robious Rd</td>
<td>Salisbury Rd-Wiesinger Ln</td>
<td>Bike Lane</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Robious Rd</td>
<td>Woodmont Dr-Old Bon Air Rd</td>
<td>Bike Lane</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Spring Run Rd</td>
<td>McEnnally Rd-Swift Creek Baptist Church</td>
<td>Bike Lane</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Woolridge Rd</td>
<td>Walton Park Rd-Coalfield Rd</td>
<td>Wide Outside Lane</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Woolridge Rd</td>
<td>Coalfield Rd-Charter Park Dr</td>
<td>Bike Lane</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>4.1</strong></td>
<td><strong>25.1</strong></td>
</tr>
</tbody>
</table>

PEDESTRIAN ACTUATED SIGNALS

There are 192 signalized intersections in Chesterfield County. Ten signals are outfitted with pedestrian actuated signals, or additional signals and light timing to allow pedestrians to cross the street.
TRAILS WITHIN CHESTERFIELD COUNTY PARKS

Chesterfield County parks currently provide both paved and unpaved trails. These are primarily circuit trails within the park boundary, with some spur connections to adjacent neighborhoods. Some parks have land configuration and site features that are conducive for county connector routes in the Bikeways and Trails Plan network. They are often situated along stream and river corridors or other linear features such as abandoned railroads. With minimal improvement, portions of these existing trails within parks could be utilized for segments of the Bikeway and Trail Plan network. These portions are listed below.

<table>
<thead>
<tr>
<th>Park Name</th>
<th>Trail Type</th>
<th>Trail Length (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chester Linear Park</td>
<td>Soft Surface</td>
<td>0.7</td>
</tr>
<tr>
<td>Daniel Park</td>
<td>Soft Surface</td>
<td>0.2</td>
</tr>
<tr>
<td>Dodd Park</td>
<td>Soft Surface</td>
<td>0.3</td>
</tr>
<tr>
<td>Huguenot Park</td>
<td>Soft and Paved Surface</td>
<td>0.4</td>
</tr>
<tr>
<td>Matoaca Park</td>
<td>Paved Surface</td>
<td>0.3</td>
</tr>
<tr>
<td>Mid-Lothian Mines Park</td>
<td>Soft Surface</td>
<td>0.1</td>
</tr>
<tr>
<td>Radcliffe Conservation Area</td>
<td>Soft Surface</td>
<td>1.3</td>
</tr>
<tr>
<td>Rockwood Park</td>
<td>Paved Surface</td>
<td>1.0</td>
</tr>
<tr>
<td>Robious Landing</td>
<td>Soft Surface</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4.8</strong></td>
</tr>
</tbody>
</table>
U. S. Bike Route 1

U.S. Bike Route 1 (USBR 1) is a touring bicycle route designated by the American Association State Highway and Transportation Officials (AASHTO) in 1982. Approximately 274 miles of this route are in Virginia, with 20 miles passing through Chesterfield County. Any changes to this route must be presented to AASHTO through VDOT. The route is signed and a map of the route is available online. This is a popular route for both local and visiting cyclists.

Other Public Trails

In addition to the trails offered in Chesterfield County Parks, other public trails can be found at state and federal parks. Pocahontas State Park has more than 80 miles of trails available for horseback riding, hiking and mountain biking. At the writing of this plan, construction for an additional 20 miles of mountain biking trails has begun in the northern section of the park in preparation of becoming part of the Richmond Regional Ride Center, a mountain biking destination officially certified by the International Mountain Biking Association (IMBA). The Richmond Regional Ride Center will also include trails in the James River Park System located in the City of Richmond. Federal park sites include the Presquile Wildlife Refuge (visitation by appointment only) and two areas within the Richmond National Battlefield Park System, Parker’s Battery and Drewry’s Bluff. Several miles of trails at these sites offer interpretation of the natural environment as well as the history of the Civil War.

Private Trails

Many neighborhoods offer a trail system as an amenity to residents. While these trails are not open to the general public, they serve as an important biking and walking network for residents in their neighborhoods as well as potential future connections to the overall county bikeways and trails network.

Regional Trail Efforts

There are several regional trail efforts that are planned to pass through Chesterfield County, including the East Coast Greenway and the James River Heritage Trail. The vision of the East Coast Greenway is to develop a 2,900 mile trail system from Maine to Florida for people of all ages and abilities. This effort is spearheaded by the East Coast Greenway Alliance (ECGA). The East Coast Greenway route passes through Chesterfield County and plays an integral role in the proposed bikeways and trails network. The East Coast Greenway also is planned to connect the two sites of the Richmond Ride Center - Pocahontas State Park and the James River Park System in the City of Richmond. The James River Heritage Trail is a proposed statewide trail following the James River from the Allegheny Mountains to the mouth of the Chesapeake Bay. This trail system is envisioned not only for bicyclists and hikers, but also for paddlers and fisherman to enjoy the water. Chesterfield County borders 35 miles of the James River and can play a role in this statewide trail. To the north and east of Chesterfield County, the Virginia Capital Trail is planned to be a 52 mile paved trail that follows the Scenic Route 5 corridor and will connect Richmond to Jamestown (anticipated completion fall 2015). Just across the county’s southern border, the Friends of the Lower Appomattox (FOLAR) is planning a 22.8 mile trail system along the south side of the Appomattox River from the George F. Brasfield Dam to the confluence of the Appomattox River with the James River, with several portions of the trail completed to date. While this trail is not located in Chesterfield County, there is potential to connect to this trail system via a bicycle/pedestrian bridge.
Bikeways & Trails Plan Recommended Network

**Bikeways and Trails Plan Goal:**
Create and maintain a comprehensive bikeway and trail network that will provide alternatives to vehicular transportation, safely link people to destinations within and outside the county and encourage and support an active lifestyle for all ages and abilities.

The Bikeways and Trails Plan network consists of routes that provide the community with viable transportation options as well as recreational opportunities. The network will allow people to walk or bike to places within the county and to neighboring localities. There are two types of routes identified on the network map: off-road and on/along road routes. The principal facility of the network will be a paved shared use path that accommodates both bicycle and pedestrian users. Shared use paths provide accessible, safe and convenient use for both bicyclists and pedestrians. Generally, where off-road shared use facilities cannot be constructed, bicyclists and pedestrians will be accommodated by shared use paths along the road (within rights-of-way). If this is not feasible, bicyclists should be accommodated by an on-road bicycle facility such as a protected, buffered, or standard bike lane or neighborhood byway (low-speed, low-volume shared street) while pedestrians should be accommodated by a standard sidewalk. It is the intent of the plan to provide both bicyclists and pedestrians with travel options along all identified routes. General route locations are shown on the map; however the exact alignments of these routes will be determined at the design level. On/along road facility selections will be determined based on numerous factors including, but not limited to, vehicle volumes, speed and land use. Facility design will be in accordance to design guidelines in this plan as well land availability and feasibility. Some roadways already have existing bike lanes and may serve as a connection between route segments. Due to the high speed and volumes on some routes with existing infrastructure, bike lanes should be redesigned with collaboration from VDOT to provide users with a greater level of protection from motor vehicle traffic.

The core network is divided into three categories according to principle use.

- **The Cross County Routes** form the backbone of the network. Cross County Routes run generally north/south and east/west through the county to adjacent localities. 143 miles of cross county routes are recommended.
- **County Connectors** link the Cross County Routes together and tie in destinations like schools, libraries, parks and commercial areas. 138 miles of County Connectors are recommended.
- **Scenic Routes** are located along the James and Appomattox Rivers and are designed primarily for recreational riding and exercise and do not necessarily connect to key destinations. 67 miles of Scenic Routes are recommended.

The following network map is not reflective of current conditions and does not imply that a road is conducive for bicyclists and pedestrians to use at this time, but is the ultimate planned network sought by this plan from a countywide perspective. The distinction between the off-road and on/along road sections on the map is for general planning purposes and may change at the design level.
NEIGHBORHOOD CONNECTOR STUDY

In order to meet the Bikeways and Trails Plan goal of providing a comprehensive bikeway and trail network, a finer scale of planning must be conducted to safely connect existing neighborhoods to the proposed core network. This is addressed through the Neighborhood Connector Study, currently being piloted in the Midlothian District, with the intention of studying each magisterial district in subsequent years. This study will address the bicycle and pedestrian connections of existing neighborhoods and establish bicycle and pedestrian routes on low volume roads. Examples of recommendations from this plan may include:

- Short shared use paths for pedestrians and bicyclists between existing neighborhoods, at cul-de-sacs, stub roads or across environmental features like a stream
- Bridges or culverts to safely cross streams or roads
- Pedestrian actuated signals at strategic intersections
- Signed bicycle and pedestrian routes along low volume and low speed roads
- Neighborhood Byways, or roads with low volume and low speeds and other features to give bicyclists priority

FUNDING AND MAINTENANCE (this section is under development)

It is estimated that construction build-out of this 348 mile network would cost $X (this figure is under review). This figure represents capital costs only. Other costs such as design, right-of-way and/or easement acquisition, utility relocation and maintenance are not included in this estimate and will impact the cost of both on-road and off-road projects. Potential sources of funding to implement this plan include:

- Capital Improvement Program
- Grants
- Bond Referendums
- Public-/Private Partnerships
- Fundraising Events
- VDOT Revenue Sharing
- Congestion Mitigation Air Quality (CMAQ – Federal)
- Transportation Alternative Projects (Federal)

Maintenance of the Bikeways and Trails network will depend upon the location of the facility. Any facility in the Virginia Department of Transportation (VDOT) right-of-way will be maintained by VDOT. Facilities built by Parks and Recreation will be maintained by that department. Annual maintenance is estimated to cost $X/mile (this figure is under review).

PRIORITY AREAS

To best implement this plan and ensure coordination with other county projects, priority for Bikeway and Trail plan projects should be based on several factors. Major factors include coordination with revitalization areas and partnership opportunities. Other considerations should also be factored into project selection including accident data, population densities, destinations and car ownership rates. Projects may also be built during the development process.
BIKEWAYS AND TRAILS COORDINATOR

To ensure execution of this plan, a Bikeways and Trails Coordinator is recommended to be a single point of contact for all bicycle and pedestrian issues. This coordinator would comment on the impact of development proposals regarding the proposed network, apply for and manage grant funding and work closely with partner departments and organizations to implement the plan and individual projects. In addition, this position would be responsible for database management and reporting as well as producing educational and promotional material for the network. It is recommended that this position be housed in the Planning Department.
Bikeways & Trails Network Design Standards

**FACILITY GUIDELINES**

The Bikeway and Trails Plan proposes a countywide network designed to maximize the safety and comfort of bikeway and trail users of all ages and abilities. While the shared use path is the preferred facility type in all situations, implementation of a shared use path may not be feasible in every context due to right of way constraints, excess cost or environmental concerns, among other factors. When a shared use path is not feasible, an on-street facility type paired with a sidewalk is the preferred alternative.

This section illustrates and defines each facility type, and describes considerations about when and where to place each facility type. The following cross-sections illustrate the proposed dimensions along a segment of the roadway. Accessible intersections with signaled and marked crossings will be equally important to the overall safety and comfort of users of the network. Most all of the roads in the county are managed and maintained by the VDOT. Therefore proposed access as well as road and intersection improvements must adhere to VDOT standards and specifications. A VDOT maintenance agreement will be required for any private improvements within rights of way.
**Off-Road Facility Typical Section**

**Shared Use Path**
Paths that are shared by pedestrians, joggers, wheelchair users, skaters, bicyclists and other non-motorized transportation mechanisms. The surface of the path could be paved or firmly packed aggregate to appeal to a variety of user groups and ages.

Considerations for facility placement: Shared use paths can be located in proximity to natural features such as stream and river corridors or manmade features such as rail or utility lines. In addition to providing an alternative mode of transportation and a place for recreation, these paths can also raise awareness of the natural and cultural environment with interpretation signs and exhibits. Paths and bridges should be designed and constructed for emergency vehicle access.
On/Along Road Facility Typical Sections

All typical sections depicted in the following illustrations are based on a four-lane divided roadway (excluding the paved shoulder typical section which is based upon a two-lane roadway). Right-of-way widths would need to be increased to accommodate any additional road facilities.

Shared Use Path
A paved path shared by pedestrians, joggers, wheelchair users, skaters, bicyclists and other non-motorized transportation mechanisms. These paved paths are separated from motor vehicle traffic by a barrier or open space.

Considerations for facility placement: Shared use paths work well on rail trails, park and recreation areas and alongside major roadways (separated by a buffer). A network of shared use paths can connect residential communities with commercial areas, parks, schools and other destinations.
**Protected Bike Lanes**

An on-road bike lane that is physically separated from motor vehicle traffic lanes and sidewalks by a curb, on-street parking, raised concrete median, landscaped buffer or other various methods. Protected bike lanes can be one-directional on both sides of a street or two-directional on one or both sides of a street.

Considerations for facility placement: Protected bike lanes give bicyclists a higher level of comfort on fast, multi-lane, higher volume streets as well as on slower-traffic streets with high pedestrian traffic in urban-like settings.
Buffered Bike Lanes
An on-road bike lane that provides bicyclists with a lane exclusively for bike travel and an additional striped buffer zone separating the lane from motor vehicle traffic.

Considerations for facility placement: Buffered bike lanes are suggested for roads with speed limits ranging from 35 to 45 miles per hour, and adequate width to implement the buffered lanes (usually eight to 11 feet).
Bike Lanes
A portion of roadway marked by pavement markings (such as lines, arrows and bicycle symbols) and signage (where appropriate), intended preferentially or exclusively for one-way bike travel. Bike lanes are usually adjacent to the traffic lane intended for the same direction of travel, unless the lane is a contra-flow lane, where the bike lane would be adjacent to the traffic lane intended for the opposite direction of travel.

Considerations for facility placement: Bike lanes are one of the most prevalent bike-travel facility types because they can be used on a variety of roadway types, but are not appropriate on high-speed, high-volume roads without a protective buffer separating bicyclists and motor vehicle traffic.
Paved Shoulder
A paved shoulder is located outside of the motor vehicle travel lane and can be used by bicyclists to travel comfortably and conveniently.

Considerations for facility placement: Paved shoulders should be at least four feet wide and work best on rural highways that connect town centers or other areas of attraction.
Wide Outside Lane
The width of the outside lane of traffic is increased in order to give cars and bicyclists more space to comfortably travel in the same space, especially in areas where variance between vehicle and bicycle speeds increases.

Considerations for facility placement: Wide outside lanes work best on roads where bike lanes cannot be added due to space or other limitations, but lane width can be increased by two to four feet and speeds range from 25 to 35 miles per hour and vehicle volumes are not great.
Sharrow (or Shared Roadway)
A roadway that is shared by vehicle and bicycle traffic with a shared-lane marking symbol indicating the appropriate bicycle position on the road. While all roadways allow for motor vehicle and bicycle travel, these roadways provide drivers with a visual reminder that bicyclists are sharing the road, and provide bicyclists with the best positioning to ensure the safety of everyone on the street.

Considerations for facility placement: While other facilities such as bicycle lanes should be considered on streets with moderate traffic when feasible, sharrows are useful on small, low traffic residential collector streets and on streets where room for a retro-fitted bicycle lane is not available.
**Neighborhood Byways**

A neighborhood byway is a local street with low traffic volume and speeds and has management measures in place to discourage through trips by motor vehicles to create safe, convenient bicycle routes. Other measures such as signage and pavement marking are incorporated into the design of the facility.

*Considerations for facility placement:* Neighborhood byways work best on low traffic volume and low speed roads. These routes may also be used to aid in providing safe crossing of busy streets and provide improved access to commercial areas. They may also incorporate environmental features to manage stormwater and other concerns.
**Facility Signage Guidelines**

Any successful multi-modal facility must have clear signage that is easy to see, read and understand. Ideally, signs are cohesive in their placement and design so that facility users understand which signs pertain to them and are able to follow the route of their choice. Signs are also important for the overall safety of the user and should be closely designed, located and maintained with the Chesterfield Fire and EMS and Police Departments. Three basic sign categories exist for bicycle and pedestrian facilities: regulatory, warning and wayfinding. These categories are described and illustrated below.

**Regulatory signage** advises the user on required behaviors such as stopping and crossing locations, where bikes may use full lanes and when to yield to pedestrians.

*Considerations for Regulatory Signage:*
- Often legally required and enforceable
- Standardized sizes and designs
- Locations set by national, state or local codes
- Most signage found in the Manual on Uniform Traffic Control Devices (MUTCD) prepared by the American Association of State and Highway Transportation Officials (AAHSTO)

**Warning signage** highlights potential dangers such as sharp curves, steep slopes and railroad tracks ahead.

*Considerations for Warning Signage:*
- Can be legally required
- Standardized sizes and designs (although localities can add their own warning signage)
- Locations often set by national, state or local codes; should be placed in advance of the hazard
- Most signage found in the MUTCD
Wayfinding signs direct users along the proper route, identify current locations and other potential destinations and mark mileage, parking and other amenities.

Considerations for Wayfinding Signage:
- Non-mandatory signage intended to aid users
- Some standard sizes and designs, but can vary by location and include creative design
- Designs should be uniform throughout the facility
- Off-road facility signs may include mile markers, trailblazers, entrance signs and rule signs
General Bikeways & Trails Guidelines

The General Bikeways & Trails Guidelines assist in planning, coordinating and implementing the bicycle and trails network for the county, and assist in creating recommendations for specific development proposals.

Major considerations in the development of these guidelines include:

- A safe, accessible, connected and convenient bicycle and trails network for people of all ages and abilities.
- A county bikeway network that is equitable.
- Coordination between various agencies responsible for constructing and maintaining the network.
- Providing a range of mobility choices to the community.
- Ensuring extension and enhancement of the network through appropriate recommendations in development proposals.
- Providing opportunities to enhance the general health, desirability and quality of life of Chesterfield County.
- Protecting and enhancing environmental features through the sensitive design of bikeways and trails.

The following General Bikeways & Trails Guidelines should be used when addressing specific development proposals as well as making bikeway and trail infrastructure decisions.

- **Complete Streets Policy.** Adopt and follow a complete streets policy to ensure road corridors are designed, built, operated and maintained to address all modes of community transportation.

- **VDOT Coordination.** Coordinate with VDOT to improve bicycle and pedestrian safety on existing roads through efforts such as installing pedestrian actuated signals, bicycle loop detection at signals, annual repaving projects, standardizing signage and pavement marking for bicycle lanes and regular maintenance and debris removal.

- **Bikeways and Trails Coordinator.** Identify a single point of contact to coordinate the implementation of this plan and other bicycle and pedestrian initiatives including the planning, acquisition, funding and management of the network.

- **Setback and Buffer Relief.** Consider a policy that would provide setback and buffer relief to developers if bikeways or trails are provided during development.

- **Funding.** Consider various sources of funding to construct and maintain the bikeways and trails network, including, but not limited to Capital Improvement Fund, VDOT Revenue Sharing, Grants, Bonds, Public/Private Partnerships and Fundraising Events.
CHAPTER X: BIKEWAYS AND TRAILS PLAN

- **Cash Proffers.** Consider reviewing the cash proffers policy for bicycle and pedestrian improvements independent of road projects.

- **Connect Neighborhoods.** New subdivision development should provide bicycle and pedestrian connections to existing or planned adjacent subdivisions.

- **Public Project Coordination.** All new county infrastructure, public facility construction and improvements including, but not limited to, water and waste lines, stream restoration and other stormwater projects, schools, parks, libraries and buildings with public access, should address bicycle or pedestrian amenities and network connections in the project design and construction.

- **Special Area Plans and Revitalization Areas.** The Special Area Plan and Revitalization Area processes should include the identification of local bicycle and pedestrian networks that provide connection to the countywide Bikeways and Trails Plan network.

- **Proactive Acquisition.** Proactively acquire right-of-way or land for bikeways and trails identified on the network map.

- **Regional Coordination and Partnerships.** Continue to communicate and partner with the Richmond and Crater Planning District Commissions, participating localities, Pocahontas State Park, other state and federal agencies as well as national, regional and local nonprofit organizations to build, maintain and promote the network while to ensuring regional continuity.

- **Bikeways and Trails Design Standards.** All bikeways and trails should be constructed to consistent design guidelines established in this plan, including signage and amenities.

- **Bicycle Parking and Storage.** Bicycle racks should be installed at public and private destinations for safe, short term bicycle storage. Large employers and multifamily developments should consider long term storage, such as bike rooms.

- **End of Trip Facilities.** Support the provision of end of trip facilities, such as showers and locker rooms, at key mixed use development projects in support of bicycle and pedestrian infrastructure.

- **Bicycle and Pedestrian Advisory Committee.** Establish a board-appointed citizen advisory committee to serve as a link between the community and the government on various bicycling and pedestrian issues.

- **Volunteer Program.** Establish a volunteer program for trail building, maintenance and programming.

- **Public Information.** Provide bikeways and trails route information in various formats to promote safe and enjoyable use of the network.

- **Education and Skills Course.** Work with partners to educate the public regarding bicycle and pedestrian rules and regulations. Consider establishing a location for a permanent bicycle skill course for hands-on learning.
CHAPTER X: BIKEWAYS AND TRAILS PLAN

- **Law Enforcement and Public Safety.** Incorporate crime reduction measures and strategies into trail design and support the expansion of Police Department efforts to patrol trails and other areas on bicycles for increased public safety.

- **Tourism.** Partner with Richmond Regional Tourism and other organizations to construct, maintain and promote both long distance cycling opportunities such as the East Coast Greenway and U S Bike Route 1, and special bicycle destinations such as the RVA Ride Center at Pocahontas State Park. Market network facilities for cycling/running events.

- **Bicycle and Pedestrian Count.** Continue to partner with Sports Backers and other organizations to hold an annual fall bicycle and pedestrian count at strategic locations countywide.
### Chapter X: Bikeways and Trails Plan

**Note:** This section will amend Chapter 15: Implementation of *Moving Forward – The Comprehensive Plan for Chesterfield County* upon adoption of the Bikeways and Trails Plan.

#### IMPLEMENTATION

<table>
<thead>
<tr>
<th>Category</th>
<th>General Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLANS</strong></td>
<td><strong>NEIGHBORHOOD CONNECTOR STUDY.</strong> Continue to develop neighborhood connector path studies countywide.</td>
</tr>
<tr>
<td></td>
<td><strong>THOROUGHFARE PLAN.</strong> Update the Thoroughfare Plan to reflect new right of way needs identified in this plan.</td>
</tr>
<tr>
<td><strong>ORDINANCES</strong></td>
<td><strong>BICYCLE PARKING STANDARDS.</strong> Adopt new ordinances to provide both short term customer and long term employee bicycle parking.</td>
</tr>
<tr>
<td></td>
<td><strong>END OF TRIP FACILITIES.</strong> Adopt new ordinances to provide end of trip facilities, such as lockers and showers, at key mixed use development projects.</td>
</tr>
<tr>
<td><strong>POLICIES</strong></td>
<td><strong>COMPLETE STREETS POLICY.</strong> Adopt a Complete Streets Policy.</td>
</tr>
<tr>
<td></td>
<td><strong>TRAIL CONNECTION POLICY.</strong> Adopt a policy requiring trail connection within certain distances of existing or proposed trails.</td>
</tr>
<tr>
<td></td>
<td><strong>RESIDENTIAL SIDEWALK AND RESIDENTIAL SUBDIVISION CONNECTIVITY POLICIES.</strong> When revising the existing Residential Sidewalk Policy and Residential Subdivision Connectivity Policy, consider connections to the Bikeways and Trails Plan.</td>
</tr>
<tr>
<td></td>
<td><strong>PUBLIC FACILITY DESIGN.</strong> Ensure that bicycle and pedestrian connectivity are designed and constructed at appropriate public facilities such as libraries, schools and any building with general public access.</td>
</tr>
<tr>
<td></td>
<td><strong>CASH PROFFERS.</strong> Consider the reduction of cash proffers for bicycle and pedestrian projects independent of road projects.</td>
</tr>
<tr>
<td></td>
<td><strong>FUNDING.</strong> Consider various sources of funding to construct and maintain the bikeways network, including but not limited to, Capital Improvement Fund, Revenue Sharing, Grants, Bonds, Public Private Partnerships and Fundraising Events.</td>
</tr>
</tbody>
</table>
## IMPLEMENTATION

<table>
<thead>
<tr>
<th>Category</th>
<th>General Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INFRASTRUCTURE</strong></td>
<td><strong>PEDESTRIAN ACTUATED SIGNALS.</strong> Work with VDOT to enhance pedestrian crossings at signalized intersections.</td>
</tr>
<tr>
<td></td>
<td><strong>LOOP DETECTION.</strong> Work with VDOT to enhance traffic signals on the bike plan.</td>
</tr>
<tr>
<td></td>
<td><strong>BICYCLE AND PEDESTRIAN COUNTERS.</strong> Purchase and install bicycle and pedestrian counting units for on- and off-road facilities to inventory the number and pattern of users.</td>
</tr>
<tr>
<td></td>
<td><strong>BIKEWAYS AND TRAILS SIGNAGE.</strong> Establish standardized signage and location protocols for the network in coordination with the Police and Fire and EMS Departments for emergency response purposes.</td>
</tr>
<tr>
<td></td>
<td><strong>STANDARDIZE ON-ROAD BIKEWAYS.</strong> Work with VDOT to make all signs and pavement markings on bike lanes uniform.</td>
</tr>
<tr>
<td></td>
<td><strong>ANNUAL REPAVING SCHEDULE.</strong> Work with VDOT to identify roads on the annual repaving schedule that could receive alternative striping to accommodate bicyclists.</td>
</tr>
<tr>
<td></td>
<td><strong>PROACTIVE ACQUISITION.</strong> Proactively acquire right-of-way or land for bikeways and trails identified on the network map.</td>
</tr>
<tr>
<td><strong>OTHER</strong></td>
<td><strong>BIKEWAYS AND TRAILS COORDINATOR.</strong> Identify a single point of contact to coordinate the implementation of this plan and other bicycle and pedestrian issues.</td>
</tr>
<tr>
<td></td>
<td><strong>BIKEWAYS AND TRAILS MAINTENANCE.</strong> Work with partners, volunteers and state agencies to maintain the network, both on- and off-road.</td>
</tr>
<tr>
<td></td>
<td><strong>BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE.</strong> Establish a board-appointed citizen advisory committee to serve as a link between the community and the government on various bicycling and pedestrian issues.</td>
</tr>
<tr>
<td></td>
<td><strong>VOLUNTEER PROGRAM.</strong> Establish a volunteer program for trail building, maintenance and programming.</td>
</tr>
<tr>
<td></td>
<td><strong>PARTNERSHIPS.</strong> Continue to establish partnerships with federal and state agencies as well as national, regional and local nonprofit organizations to build, maintain and promote the bikeways network.</td>
</tr>
<tr>
<td>Category</td>
<td>General Steps</td>
</tr>
<tr>
<td>----------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>REGIONAL COORDINATION.</strong></td>
<td>Continue to communicate and partner with the Richmond and Crater Planning District Commissions and participating localities to ensure regional continuity of bikeways.</td>
</tr>
<tr>
<td><strong>BIKE ROUTE 1.</strong></td>
<td>Participate in the regional Bike Route 1 monitoring committee.</td>
</tr>
<tr>
<td><strong>EAST COAST GREENWAY.</strong></td>
<td>Continue to partner with the East Coast Greenway Alliance to propose new route alignments, and to construct and use appropriate signage on the East Coast Greenway.</td>
</tr>
<tr>
<td><strong>UTILITIES.</strong></td>
<td>Partner with appropriate agencies to use linear utility facilities as trails.</td>
</tr>
<tr>
<td><strong>STREAM RESTORATION.</strong></td>
<td>Partner with the Chesterfield County Environmental Engineering Department to provide public access and install trails as part of stream restoration projects.</td>
</tr>
<tr>
<td><strong>STORMWATER PROJECTS.</strong></td>
<td>Partner with the Chesterfield County Environmental Engineering Department to provide public access and install trails as part of stormwater projects such as green streets.</td>
</tr>
<tr>
<td><strong>GIS PROJECT.</strong></td>
<td>Continue to create a bicycle and pedestrian geodatabase to capture the location and condition of infrastructure such as public and private trails, on-road facilities, pedestrian actuated signals, bike racks and signage.</td>
</tr>
<tr>
<td><strong>BIKEWAYS AND TRAIL APPLICATION.</strong></td>
<td>Develop an online bikeways and trails mapping tool for the public to use on mobile devices in coordination with regional partners.</td>
</tr>
<tr>
<td><strong>BICYCLE AND PEDESTRIAN COUNT.</strong></td>
<td>Continue to partner with Sports Backers to hold an annual fall bicycle and pedestrian count at strategic locations countywide.</td>
</tr>
<tr>
<td><strong>SKILLS COURSE.</strong></td>
<td>Partner with local groups to locate a bicycle skills course.</td>
</tr>
<tr>
<td><strong>LAW ENFORCEMENT.</strong></td>
<td>Incorporate crime reduction measures and strategies into trail design and support the expansion of Police Department efforts to patrol trails and other areas on bicycle for increased public safety.</td>
</tr>
<tr>
<td><strong>ANNUAL BIKEWAYS AND TRAILS PLAN REPORT.</strong></td>
<td>Establish an annual report to track the progress of the Bikeways and Trails Plan efforts, including infrastructure built, usage and safety.</td>
</tr>
</tbody>
</table>