VILLAGE TRANSPORTATION LINKS PLAN: Final Report

Montgomery County, VA

June 25, 2007

June 13, 2007
Approved by the Planning Commission subject to additional study being made of the Belview and Riner demonstration projects prior to seeking grant funding for these projects.

June 25, 2007
Approved by the Board of Supervisors

Prepared By: RENAISSANCE PLANNING GROUP

MONTGOMERY COUNTY VILLAGE TRANSPORTATION LINKS (VITL) PLANS: FINAL VITL

Prepared for:
MONTGOMERY COUNTY, VIRGINIA

PREPARED BY:

June 25, 2007

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Federal Highway Administration or Virginia Department of Transportation acceptance of the report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

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VILLAGE TRANSPORTATION LINKS PLAN
EXECUTIVE SUMMARY

INTRODUCTION

The purpose of the Village Transportation Links (VITL) Plans is to develop a comprehensive Bicycle, Pedestrian, and Greenways Master Plan for each of the villages designated in the 2004 Montgomery County Comprehensive Plan. As an element of the Comprehensive Plan, the Village Transportation Links (VITL) Plans will build a vision for non-motorized transportation access and mobility within and between each of the County's designated villages. VITL Plans will enhance transportation by providing both local and regional links that enable residents to use non-motorized transportation for trips to school, parks, and local businesses, as well as commute to nearby centers such as Blacksburg, Christiansburg, and Radford. Additionally, a non-motorized transportation network will reinforce the sense of community and support more compact land development within each village.

Throughout the planning process, a number of goals have emerged that reinforce the project's stated purpose. These include:

- connecting activities/spaces within Villages
- strengthening a sense of place and sense of community in each village
- improving connections to schools
- tying into regional trails & resources
- tying into intermodal connections
- leveraging public/private funding opportunities

These goals have been affirmed through the public input process and support the overall purpose of developing a comprehensive Village Transportation Links plan.

The plan identifies specific improvements and implementation priorities for an interconnected network of bicycling and walking facilities that complements each Village's and the County's overall transportation system. This includes an overall Connectivity Framework plan that shows linkages between the Villages and connections to the regional trail and bike route network, as well as design standards and appropriate cross-sectional and construction standards for each linkage and trail segment. It is important to note that the VITL emphasizes improvements that can be achieved in the shorter term, such as signing designated routes, but recognizes

that higher-level improvements, such as buffered sidewalks and designated bicycle lanes, are more feasible in conjunction with other significant public or private investments such as road widening or development.

It is intended for this plan to be incorporated into the Montgomery County Comprehensive Plan through the formal County plan amendment process. It is anticipated that the VITL plan will be adopted as a chapter of the Comprehensive Plan and cross-referenced with the Village Plans, and with the Parks and Recreation, and Transportation chapters. Furthermore, the VITL planning effort, along with the work of the appointed Citizen Advisory Committee, will serve as a foundation for future policy and implementation directives that deal with non-motorized transportation in Montgomery County.

SUMMARY OF PLANNING PROCESS

The planning process for this study involved a number of different activities and outreach efforts. The process is briefly outlined below:

1. Field Analysis

An analysis of existing conditions was conducted in the field for all villages and key roadway segments. It included visual inspection of right of way width, pavement conditions, presence of shoulder, posted speed limits and connections to key destinations.

2. Public and Key Stakeholder Input

A considerable effort was undertaken to gather input from residents and key stakeholders from each of the seven villages, neighboring municipalities, the regional metropolitan planning organization and the Virginia Department of Transportation. The public input process was an essential component in affirming goals, and selecting and prioritizing destinations, routes, and facility standards. This process is described in more detail below.

3. Draft and Final Plan and Route Network

The Village Transportation Links Plan was developed in coordination with the Citizen's Advisory Committee, the Montgomery County Planning Commission and Parks and Recreation Commission.

SUMMARY OF COMMUNITY INPUT

The VITL plan relied heavily on the public participation process, including consultation with the Citizen's Advisory Committee (CAC), public workshops, and meetings with key stakeholders.

• A Citizens' Advisory Committee was formed to guide the planning process and ensure that the needs of residents would be addressed by the final plan. The committee was comprised of representatives from various villages, the

County Planning Commission, Parks and Recreation Commission and the County staff. The Committee was closely involved throughout the development of the plan, commenting on the route network and implementation priorities.

• Four public workshops were held at the County's office building from October 2006 to March 2007 to obtain feedback on the goals of the plan, route alignments, facility and crossing standards, and implementation priorities. They were well attended and participants included citizens and members of local bicycling clubs.

• Meetings were held with key stakeholders from many of the local jurisdictions, the Virginia Department of Transportation, as well as the New River Valley Planning District Commission to gather input on the plan.

- Preliminary VITL recommendations for Belview, Plum Creek and Shawsville villages

were discussed as part of the Village Planning Process meetings for each respective village held during March 2007

Participants of the public input process included both residents and non-residents of Montgomery County. Their comments revealed considerable support for the development of the Plan. The following issues were identified as being important for the future of bicycle and pedestrian access in Montgomery County:

• **Safety.** All of the villages have at least one major thoroughfare traversing the village. Workshop participants expressed concern over the safety of users sharing theses high speed and high traffic roadways. Traffic calming and reducing travel speeds within the village boundaries were often cited as critical issues to consider to improve the safety of the roads and provide safe access to schools.

• **Connectivity.** Residents want to be able to have access to key destinations within the villages, particularly schools and other important activity centers, to strengthen sense of place and community, as well as have access to important regional destinations, such as employment centers, recreational facilities, and tourist sites both in the County and nearby Towns.

• **Coordination.** Throughout the public input process, workshop participants emphasized the need to coordinate with neighboring jurisdictions, state/local agencies, and other interested parties as a way to maximize the route network and leverage public/private funding opportunities.

• **Recreation and tourism.** Workshop participants also identified the opportunity to create a regional system of recreational trails and greenways, by connecting to the New River Trail and Roanoke Valley Greenways, to promote the development of an ecotourism industry.

These issues formed the basis for the guiding goals of the planning process:

1. To strengthen sense of place and community within the Villages by connecting activities and spaces;

2. To improve the health and safety of school aged children through enhanced connections to schools;

3. To maximize bicycle and pedestrian infrastructure by tying into intermodal connections;

4. To promote the development of an ecotourism industry by creating a regional system of recreational trails and greenways.

Routes were established and prioritized to support these goals. In addition, workshop participants identified a key "first phase" demonstration project within each Village and Countywide. The demonstration projects are intended to provide a high visibility project to build momentum for the plan and serve as a basis for grant proposals and volunteer efforts.

EXPLANATION OF DOCUMENT FORMAT

This report is organized into four components. The first part introduces the project and planning process. The second part, Design Guidelines, introduces the facility and crossing standards that comprise the VITL Plan. The third part, the VITL plan, establishes an overall connectivity concept for the County, as well as each village, and identifies implementation priorities to achieve the vision set forth in the plan. The final section provides a strategy for implementing the ideas generated by the plan, with appropriate funding sources. This format is designed as a concise, user friendly report that should serve as a tool for use by the Planning Commission and Parks and Recreation Commission in guiding the future location and design of bicycle and pedestrian facilities in Montgomery County. Additional documentation related to existing conditions and trail and crossing standards is provided in Appendix 1.

PART 1. DESIGN GUIDELINES

BICYCLE, PEDESTRIAN, AND TRAIL STANDARDS

Consistent with a recently adopted VDOT policy, all new roadways in Virginia should be planned and designed as multi-modal facilities. This section provides design guidelines for incorporating bicycle and pedestrian facilities into transportation and development projects in Montgomery County.

On-road bicycle facilities typically provide the most direct connections in a multi-modal transportation system, as the roadways themselves provide the framework. On-street systems for cycling are achieved by providing bike lanes, paved shoulders and signed/shared roadways, the choice of which is determined primarily by the available right-of-way width. While bike lanes and paved shoulders are not essential on every street, these exclusive lanes help to mitigate the impacts of heavy traffic volumes, high-speed traffic, or truck traffic.

Off-road bicycle and pedestrian facilities, which may include greenways, multi-use trails, or pedestrian paths, are separated from vehicle lanes and usually serve multiple user groups simultaneously (pedestrians, cyclists, skaters, wheelchairs, etc.). Such facilities may run parallel to the roadway or function as part of a greenway system linking adjacent neighborhoods or land uses.

Sidewalks are an important element of the VITL plan. Sidewalks provide a safe zone for pedestrian traffic and should be wide enough to comfortably serve the volume and type of pedestrian traffic expected in a particular area. Depending on the context, sidewalks may be located directly adjacent to a curbed street or separated from the road by a landscaped buffer. Additional pedestrian-friendly treatments, such as street trees, street furniture (benches, lighting, planters), and a strong relationship between adjacent buildings and the sidewalk are also important considerations for providing a higher quality pedestrian experience.

A successful and comprehensive bicycle and pedestrian system will include all of these facilities in order to accommodate the diverse recreation and transportation needs of the community.

The following sheet of trail standards was developed as part of the VITL planning process and was reviewed and affirmed during the public work sessions.

TRAIL TYPE KEY

A. Constrained Right of Way w/ Bike Lane + Sidewalk

INTENT: Intended for streets in mixed-use core areas to add sidewalks and dedicated bike lanes (in the event that they are to be rebuilt or widened)

TYPICAL APPLICATION: Not proposed for use in any of the VITL Plans

B. Constrained Village Right of Way w/ Shared Lane + Sidewalk

INTENT: Intended for streets in mixed-use core areas to add sidewalks with signed, shared bike use in the travelway (in the event that they are to be rebuilt or widened)

TYPICAL APPLICATION: Typically used in the VITL Plans within the central, walkable core of the Village on older streets with mixed commercial and residential frontages

C. Wide Village Right of Way w/ Bike Lane + Buffered Sidewalk

INTENT: Intended for new streets in Village areas with curb and gutter and adequate right of ways to accommodate a sidewalk, landscaped buffer and a separate bike lane

TYPICAL APPLICATION: Typically used only for new roads, such as in Prices Fork, as a standard for accommodating bikes and pedestrians

D. Wide Village Right of Way w/ Paved Shoulder + Buffered Sidewalk

INTENT: Intended for existing rural section highways in Village areas and between Villages to add a paved shoulder for bikes and a buffered sidewalk for pedestrians (in the event that they are to be rebuilt or widened)

TYPICAL APPLICATION: Typically used on major highways such as Rts 460, and 11, within and at the edges of Village areas to accommodate regional bicycle traffic and local pedestrian traffic

E. Constrained Rural Right of Way w/ Paved Shoulder (No Pedestrian)

INTENT: Intended for rural section highways that will not accommodate pedestrians to add a paved shoulder for bicyclists (in the event that they are to be rebuilt or widened)

TYPICAL APPLICATION: Typically used between Villages on rural highways for regional bicycle traffic

F. Constrained Village Right of Way w/ Shared Lane + Buffered Sidewalk

INTENT: Intended for rural section highways that accommodate local pedestrian and regional bicycle traffic with a buffered sidewalk and shared, signed lane for bicyclists (in the event that they are to be rebuilt or widened)

TYPICAL APPLICATION: Not used in the VITL plans, except for a short segment of Rt. 460 in Lafayette

G. Constrained Rural Right of Way w/ Shared Lane (No Pedestrian)

INTENT: Intended for rural section highways that do not accommodate pedestrians, but will accommodate regional bicycle traffic with a signed shared travelway

TYPICAL APPLICATION: Typically used between Villages on rural highways for regional bicycle traffic

H. Constrained Village Right of Way w/ Shared Bike/Pedestrian

INTENT: Intended for rural streets in Village areas that accommodate local pedestrian and bicycle traffic as part of the current travelway

TYPICAL APPLICATION: Typically used in older, narrow streets in the village areas that have very little automobile traffic

I. Multi- Use Trails - Adjacent to Road

INTENT: Intended for regional trails adjacent to rural highways to accommodate regional bicycle and pedestrian traffic

TYPICAL APPLICATION: Typically used within and between Villages alongside rural highways as regional trail linkages

1. Severe

2. Moderate

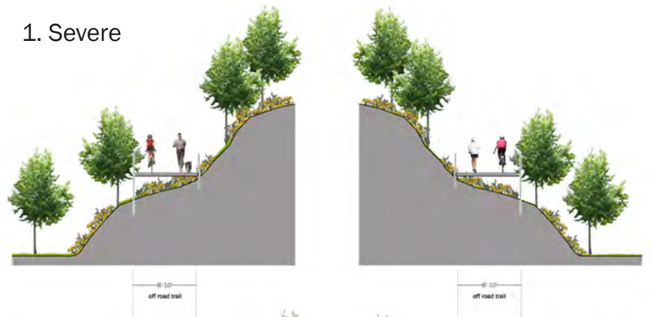
3. Flat

J. Multi-Use Trail - Greenway

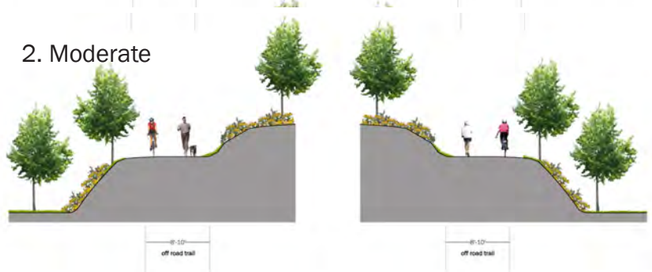
INTENT: Intended for regional cross-country trails remote from roadways to accommodate regional bicycle and pedestrian traffic

TYPICAL APPLICATION: Typically used within and between Villages as regional trail linkages

1. Severe



2. Moderate



CROSSING STANDARDS

Intersections are where the paths of motorists, cyclists and pedestrians converge. Every intersection contains a variety of conflict points where crashes may occur, so good intersection design requires that the paths and roles of all travelers are clear and visible.
Safe, convenient, and highly visible crossings make a multi-modal transportation system safe and usable for pedestrian and bicycle activity.

PEDESTRIAN SUPPORTIVE INTERSECTIONS

A primary type of intersection is Pedestrian Supportive, where pedestrian visibility and safety are improved over existing conditions, but bicycle, pedestrian, and automobile traffic is not sufficient to warrant a major investment. This treatment includes:

- Marked and high visibility crosswalks
- Curb extension
- Pedestrian scale lighting to illuminate waiting pads

MID BLOCK CROSSINGS

Many pedestrian crashes occur when a pedestrian attempts to cross the street at mid-block. Where such crossings are needed, a special crosswalk between intersections may be appropriate. Such crossings should be designed with signage, flashing lights and highly visible pavement markings, because motorists do not expect pedestrians at mid-block. At mid-block crossings with particularly heavy traffic, a signal warrant study may be conducted to determine if a pedestrian activated signal may be installed.

The following sheet of crossing standards was developed as part of the VITL planning process and was reviewed and affirmed during the public work sessions.

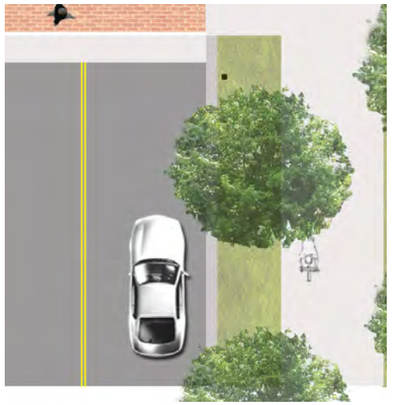
CROSSING TYPE KEY

A. Marked Crosswalk

INTENT: Intended for general crossings of major and minor streets with limted pedestrian traffic

TYPICAL APPLICATION: Typically used in the VITL Plans at street and highway crossings without medians in areas without high pedestrian traffic

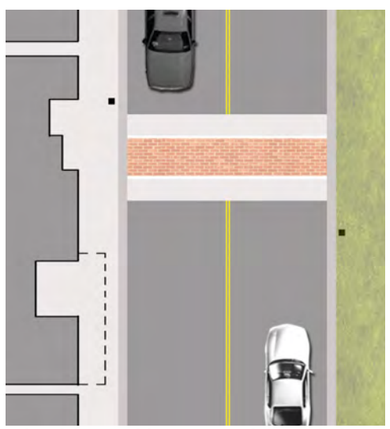
B. High Visibility Crosswalk



INTENT: Intended for higher use crosswalks where limited traffic calming is an objective

TYPICAL APPLICATION: Typically used in the core areas of the Villages on main throughways to calm traffic and safely move pedestrians and bicycles across

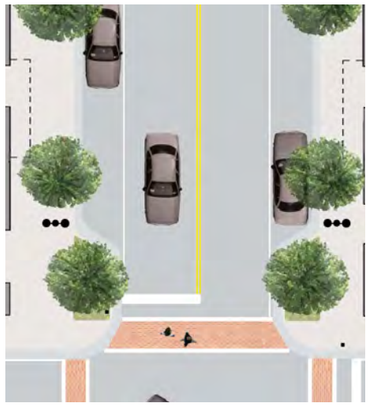
C. Raised Crosswalk



INTENT: Intended for high use crosswalks where traffic calming is a significant objective

TYPICAL APPLICATION: Typically used in the core areas of the Villages on main throughways to calm traffic and safely move pedestrians and bicycles across

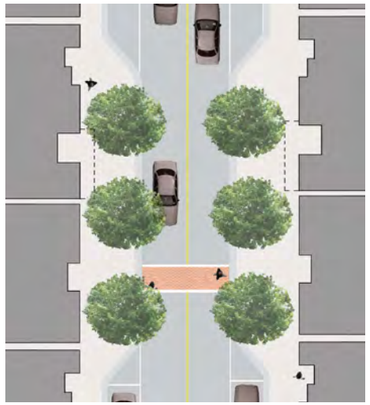
D. Curb Extension



INTENT: Intended for high-use pedestrian crossings at intersections with adjacent on-street parking

TYPICAL APPLICATION: Not proposed for use in any of the VITL Plans

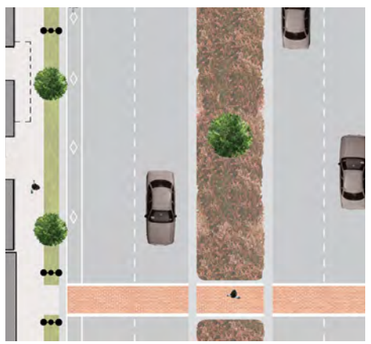
E. Choker



INTENT: Intended for urban streets with high pedestrian activity to slow traffic and make crossings safer

TYPICAL APPLICATION: Not proposed for use in any of the VITL Plans

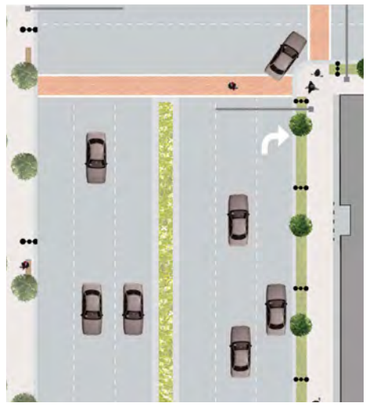
F. Median Refuge



INTENT: Intended for higher use crosswalks between intersections on rural highways where limited traffic calming is an objective

TYPICAL APPLICATION: Typically used in the core areas of the Villages on main throughways to calm traffic and safely move pedestrians and bicycles across

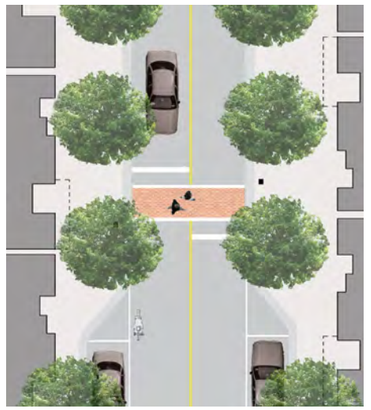
G.. Pedestrian-Activated Signal (at intersection)



INTENT: Intended for higher use crosswalks at intersections that do not have existing traffic signals - especially main highways going through Village core areas

TYPICAL APPLICATION: Typically used in the core areas of the Villages (such as Elliston) on main highways to calm traffic and safely move pedestrians and bicycles across

H. Pedestrian-Activated Signal (mid-block)



INTENT: Intended for higher use crosswalks between intersections - especially high speed highways going through Village core areas

TYPICAL APPLICATION: Typically used in the core areas of the Villages on main highways to calm traffic and safely move pedestrians and bicycles across

I. Pedestrian Underpass

INTENT: Intended for major pedestrian linkages on very high traffic and high-speed roadways, such as freeways

TYPICAL APPLICATION: Not proposed for use in any of the VITL Plans

PART 2. THE VITL PLAN

COUNTY-WIDE PLAN

1. COUNTY PROFILE

Montgomery County is located in the New River Valley in the southwestern part of Virginia, about 35 miles southwest of the City of Roanoke. The County's 393 square miles lie between the Appalachian Plateau and the Blue Ridge Mountains and encompass the Towns of Blacksburg, home to Virginia Tech, and Christiansburg, the County seat. This setting provides an abundance of natural features, recreational resources, cultural and historical facilities, and community points of interest throughout the County that could serve as important focal points for tourism. The population of Montgomery County has been expanding since 1960, reaching about 87,900 in 2005 and the County has witnessed sprawling growth typical of counties of a similar size. Urban growth patterns are replacing farmland and the edges of the town and village boundaries are blurred by residential growth. Much of this development was designed as discrete subdivisions that lack a physical integration into the place in which they were built and contribute to a diminished sense of community and mobility within the County. With only two miles of off-road or multi-use trails, two small sections of paved shoulders, a handful of narrow sidewalks in historic districts, and limited trails in private developments, County residents currently have no other option but to get in their car and drive to their work, school, recreational or shopping needs. A County-wide bike or trail system has the potential to remove a reasonably large share of commuter traffic from the roadway network, promote the health and safety of children through Safe Routes to Schools, and provide economic development opportunities with improved recreational facilities.

2. CONNECTIVITY ISSUES

The following issues were expressed in the community workshops:

- Lots of beginnings, but no connections
- Challenging topography and natural features
- High speed and large traffic volumes on major thoroughfares connecting important destinations
- Poor road conditions for cyclists

3. VITL CONCEPT

The Countywide Connectivity Framework focuses on connecting the villages to nearby population centers and to regional facilities mainly through a network of shared road facilities (see Standard G). Particular attention is paid to improving connections between Christiansburg, Blacksburg and Radford both via on-road and off-road facilities to accommodate the need for both safe and direct access. Along major arterials around the urban and village areas, the plan recommends providing (see Standard E). Along major

arterials within the village areas, the plan recommends paved shoulders and buffered sidewalks where right of way allows. In addition to direct access along high traffic arterials, the plan provides alternatives to major arterials with greenway connections where feasible (see Standard I and J). These greenways are intended to connect local and regional recreational areas to promote tourism and economic development.

4. IMPLEMENTATION

Community members identified the following implementation priorities during the public workshops for the plan:

1. Place "Share the Road/VITL" signs on all routes to improve visibility of cyclists and pedestrians using the system
2. Link Christiansburg to Blacksburg to Radford ("the triad")
3. Connect villages to the "triad"
4. Pave shoulders on Bike Route 76
5. Improve Merrimac/Hightop crossing at the Huckleberry Trail (additional stop sign)

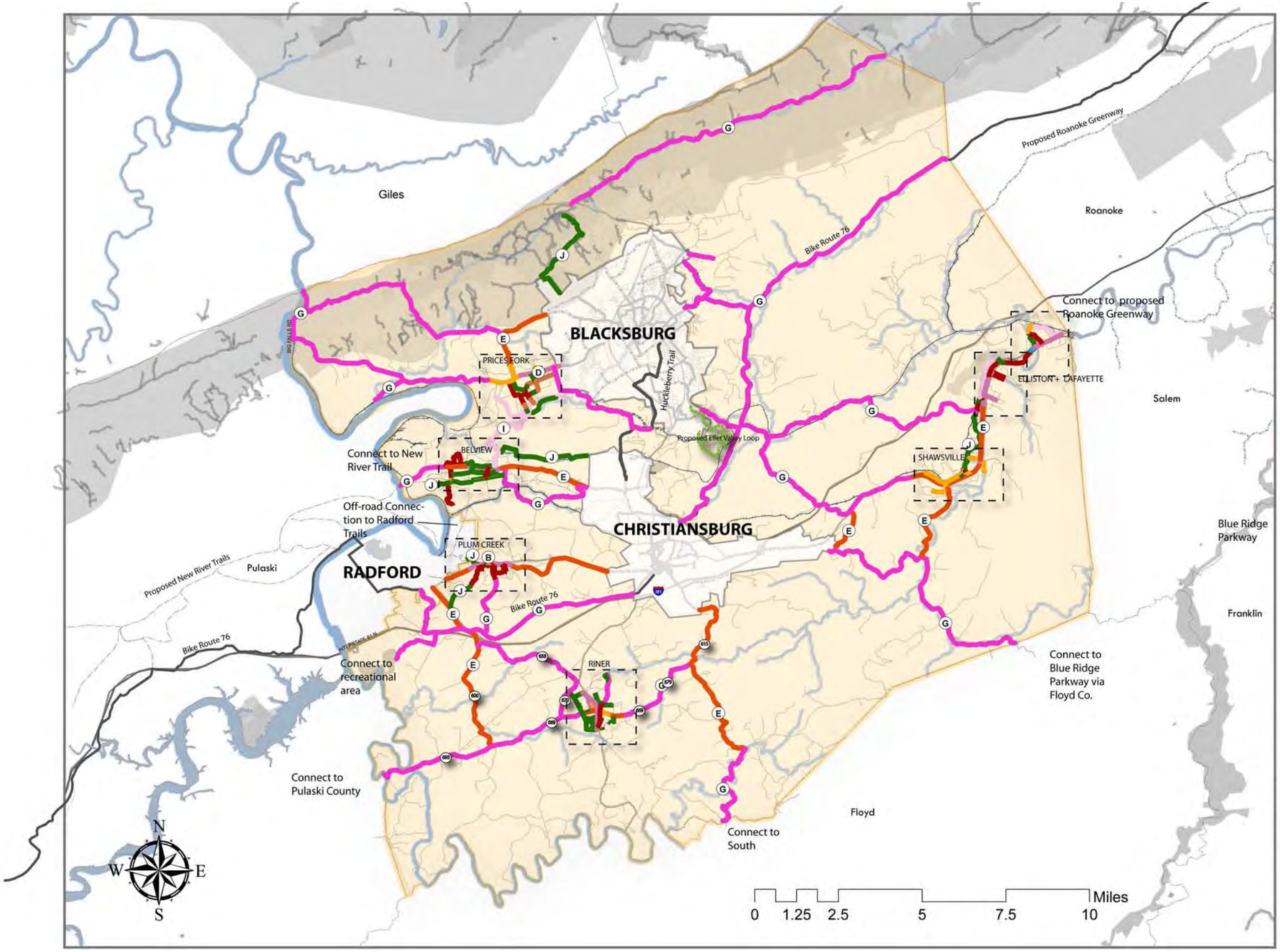
Signing all route alignments is an important first step in increasing awareness of the plan and promoting usage of the system. A comprehensive signage system should be developed to uniquely identify the Montgomery County Village Transportation Links network. Residents and visitors bicycling thought the County should be aware that they are riding on a route that is part of an interconnected system of bikeways and walkways throughout the County. The signs should contain an image specifically designed for the region and should be placed along all designated VITL routes. The system should be designed to indicate key destinations, distances and/or a bikeway route name or number. Below are a number of examples:

As facilities are upgraded, priority should be given to connecting the major population centers to one another and to the Villages where feasible. Future development proposals along the major corridors (Routes 460, 11, 114 and Prices Fork Road) should enhance connectivity between the urban and village centers and should allow for the highest standard identified in the plan. Road widening and other road construction projects should also accommodate the highest standard for bicycle and pedestrian facilities.

Bike 76 is an important national resource and should have paved shoulders throughout its course. Though the plan maintains the shared road designation, it does encourage paved shoulders where topography and right of way permit.

The Virginia Department of Transportation has plans to widen Route 114 in the Town of Christiansburg and will include bicycle and pedestrian facilities along both sides of the road. The County should also monitor the progress of these plans and coordinate future upgrades to complement this planned system. Similarly the County should continue to coordinate with adjacent jurisdictions on projects such as the New River Trail, Roanoke Trail system and The Towns of Blacksburg and Christiansburg and City of Radford trail systems.

MONTGOMERY CO.
VITL FINAL DRAFT
Includes public input from all community workshops



Legend

Trail Typology

- B
- C
- D
- E
- F
- G
- H
- I
- J

- B — Potential Crossing Point*
- Public Facilities or Activity Centers
- Existing Ped/Bike Facilities
- Proposed Ped/Bike Facilities
- Demonstration Plan Location
- Major Rivers or Streams

* Letter denotes crossing type.

Village Transportation Links Plans
Montgomery County, VA

Herd Planning and Design

RENAISSANCE PLANNING GROUP

PROPOSED PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
County	114/Belview boundary to Cburg	E		13031	$1,110,597
County	114/Belview to western county line	G	E	8283	$941
County	460/Shawsville to Elliston	E		8625	$735,085
County	460/Wayside to Shawsville	G	E	11825	$1,344
County	615 leaving Cburg	E		13414	$1,143,239
County	657/Merrimac Connector	G		22263	$2,530
County	669/Dairy to Piney Woods	G	E	12154	$1,381
County	679/669 into Riner	G	E	14762	$1,678
County	Allegheny Springs/Georges Run to Floyd	G		27812	$3,160
County	Allegheny Springs/Georges Run to Kirk Hollow	E		14114	$1,202,898
County	Bike 76	G	E	43971	$4,997
County	Bike 76 Roanoke to Cburg	G	E	81047	$9,210
County	Bishop Road	G		3898	$443
County	Brooksfield to Toms Creek	E		13146	$1,120,398
County	Brush Creek to Floyd County	G		18365	$2,087
County	Childress	E		698	$59,489
County	Craigs Creek Road/Pandapas Pond to Caldwell Field	G	E	58685	$6,669
County	Dairy Road	G		4339	$493
County	Den Hill to 460	G	E	22200	$2,523
County	Den Hill to Blacksburg	G		12367	$1,405
County	Dry Valley/Bains Chapel/Cornbread to Rec Facility	G		9301	$1,057
County	Fairview Church to Childress	G		19235	$2,186
County	Falls Connector	G	E	20547	$2,335
County	Falls to Giles Co.	G		8646	$983
County	Fire Tower Road	G	E	9847	$1,119
County	Follows Existing Biking Facilities	J		19749	$631,183
County	From Prices Fork Boundary to McCoy	G	E	13847	$1,574
County	Gantt to Tyler	J		5269	$168,398
County	Georges Run	G		20630	$2,344
County	Happy Hollow Rd into Blacksburg	G		8249	$937
County	Harding Road into Blacksburg	G		11766	$1,337
County	Meadowcreek to Currin	G		10906	$1,239
County	Meadowcreek/Tyler to Currin	G		6044	$687
County	Mt Zion/Lick Run/Norris Run	G		39856	$4,529
County	Multiuse Trail from Pentacostal Church in Belview	J		3375	$107,866
County	Multiuse Trail from Walton to Archway	J		2369	$75,714
County	North Fork Road/Elliston to Den Hill	G		41066	$4,667
County	Off road trail to Walton to access trail head	J		1128	$36,051
County	Old Route 11 from Plum Creek to Route 11	E		8454	$720,511
County	Pilot Road	E	E	18629	$1,587,699
County	Piney Woods	E		3392	$289,091
County	Prices Fork Rd/Kiesters Branch to the forks	B		2712	$147,927
County	Prices Fork Rd/the forks to Brooksfield	B		2527	$137,836
County	Proposed 460 Connector	I		13462	$430,249

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
County	Proposed New Road connecting Archway to Wisteria	B		1179	$64,309
County	Radford Hwy/Cburg to Old Route 11	E	I	8972	$764,659
County	Seneca Hollow connecting schools	H	B	1245	$566
County	Shawsville Middle School to Seneca Hollow	J		9149	$292,404
County	Slate Branch Connector - Belview to Cburg	J		16549	$528,910
County	Stroubles Creek along road/Slate Branch to PF	I		14342	$458,374
County	Tyler Road	E		9052	$771,477
County	Tyler Road	E		6807	$580,142
County	Tyler Road/I-81 to Radford	E		11047	$941,506
County	VIckers Switch to Cburg	G	E	21171	$2,406
County	Wayside Road	E		7049	$600,767
County	Whitethorne Road Connector	G		5480	$623
County	Wisteria	H		4091	$1,860

RINER

1. VILLAGE PROFILE

The Village of Riner is located along Rt. 8, south of Christiansburg. Though currently one of the smallest Villages in the County in land area, much of the undeveloped land is already platted for subdivision lots that, once built out, will triple the size of the community. With this increased development comes the opportunity to connect current and future residents to centers of activity within the Village. Riner is unique in that it has an elementary, middle and high school in one location that is a "campus." The challenge, however, is connecting residents from the surrounding subdivisions to this important community facility. At present, there are primary residential areas located opposite the schools along Route 8, a heavily trafficked thruway that connects Christiansburg to Floyd County. Some residential development is also currently taking place on the western side of Route 8 in Cloverlea, but no pedestrian or bicycle connections currently exist to the school. The existing Hillcrest subdivision has privately constructed trails, which can serve as a model for future trail development within the Village.

2. CONNECTIVITY ISSUES

The following issues were expressed in the community workshops:

- Develop a safe crossings of Route 8
- Intersection and pedestrian safety improvements at the Rt. 8 / Union Valley/Fairview Church Road intersection
- Connect existing and proposed subdivisions to the Village and the schools
- Improve connections within the school campus
- Develop appropriate standards for incorporating bicycle and pedestrian amenities into new development
- Connect food store and market shops along Route 8
- Connect subdivisions together and across Route 8
- Sidewalks on Route 8 and connect to Historic District

3. VITL CONCEPT

The primary issue addressed was incorporating bicycle and pedestrian linkages along route 8 with a paved shoulder and buffered sidewalk within the village core (see standard D) to connect important community focal points, such as the schools and commercial areas. Additional linkages were provided to connect trail networks in existing and future subdivisions to the schools. These linkages are primarily off-road multi-use trails and incorporate improved crossings across Route 8 where necessary. Because of the high traffic

and high speeds along Route 8, regional networks focus on Union Valley/Fairview Church Road.

4. IMPLEMENTATION

Community members identified the following implementation priorities during the public workshops for the plan:

1. Demonstration project: Develop safe crosswalk improvements at the Union Valley/Route 8 intersection as part of a future roundabout
2. Connect Five Points Road to the schools
3. Construct sidewalk and improve the crossing to connect the market to the schools
4. Construct 'B' standard network from the cul-de-sac in Cloverlea to Auburn Hills and improve crossing (group suggested B standard) at Rt 8
5. Construct facilities, including B standard crossing, to connect Cloverlea at the proposed road connection to the east end of the village.

Traffic calming along Route 8 is an important consideration for implementing the Riner VITL. The Virginia Department of Transportation has identified the need to improve the Union Valley/Route 8 intersection. However, due to lack of funding, the improvement has been tabled for the time-being. This plan recommends constructing a roundabout at the intersection of Union Valley and Route 8 with appropriate bicycle and pedestrian facilities to calm traffic along this high-speed, high-traffic route to improve the overall cycling and pedestrian environment within the Village. By policy, VDOT is required to investigate the feasibility of a roundabout as an alternative to installing a traffic signal. Specific challenges at this intersection include minimizing the impact on surrounding property owners and providing adequate site distance for vehicles approaching the roundabout on Route 8. Both pedestrian and bicycle safety and site distance can both be improved by slowing vehicle traffic on Route 8 through Riner. One possibility is to install gateway treatments such as a narrow median that would slow traffic as it enters Riner north of this intersection and south of the school complex. Medians, chokers, or other traffic calming features could be used between these gateways to reduce traffic speeds along Route 8 through the Village.

Constructing chokers, medians, or other points of traffic calming along Route 8 would also provide ideal locations for pedestrian crossings of Route 8 to better connect residences to the school complex, market, and other shops along Route 8. Because points of traffic

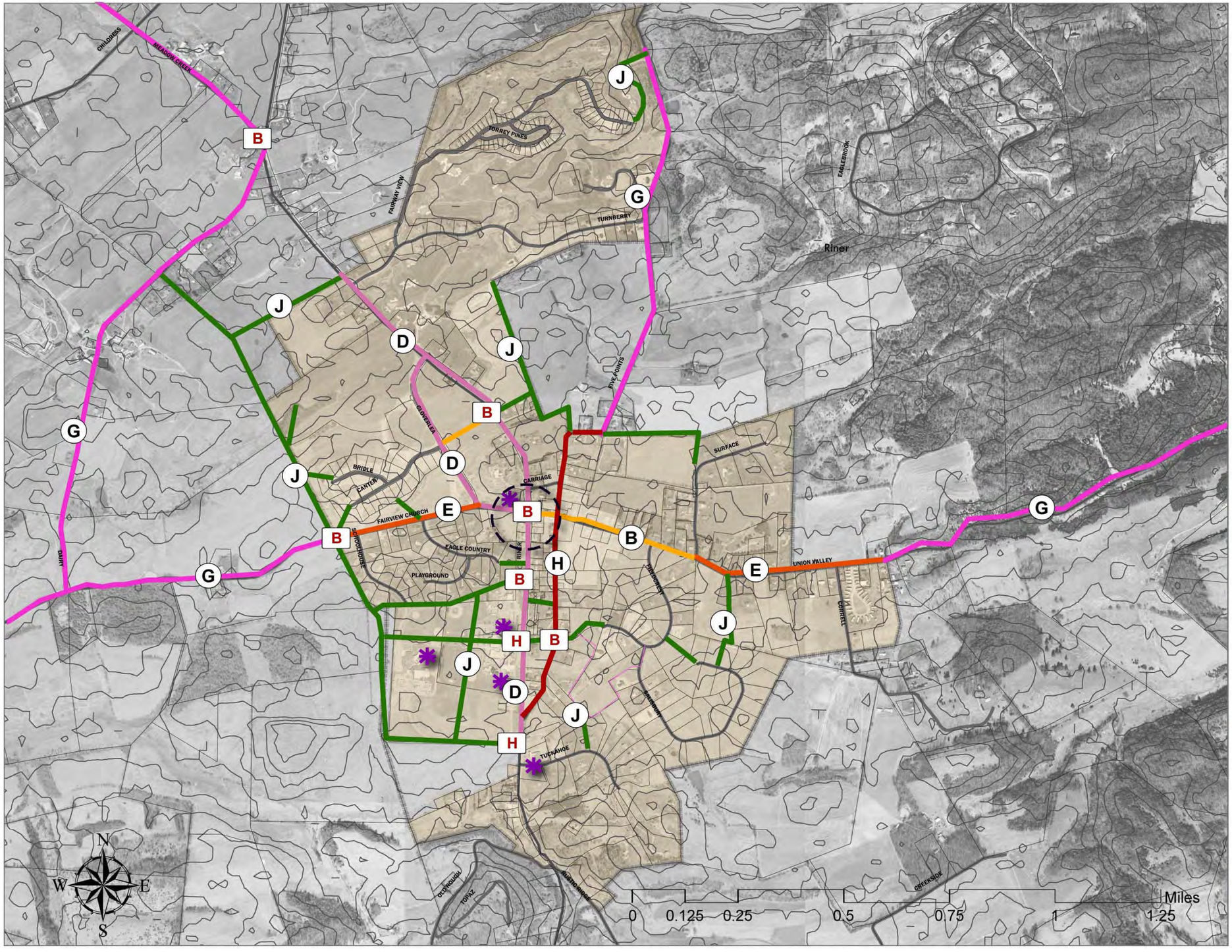
calming reduce speeds and require drivers to be more alert, pedestrians will be safer and more visible at these points.

In addition to the traditional funding sources indicated in the Implementation Section of this report, crossings and sidewalks within two miles of the school complex are eligible for Safe Routes to Schools grants, a new funding source dedicated towards improving walking and biking conditions around elementary and middle schools. Proposals for development in Colverlea or elsewhere in Riner provide opportunities for recommended projects to be constructed by the developer to achieve consistency with the Comprehensive Plan.

RINER

VITL FINAL DRAFT

Includes public input from all community workshops



Legend

Trail Typology

- B
- C
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B — Potential Crossing Point*

Public Facilities or Activity Centers

Demonstration Plan Location

Major Rivers or Streams

* Letter denotes crossing type.

Village Transportation Links Plans
Montgomery County, VA

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5. DEMONSTRATION PROJECT

This plan recommends constructing a roundabout at the intersection of Union Valley and Route 8 with appropriate bicycle and pedestrian facilities to calm traffic along this high-speed, high-traffic route to improve the overall cycling and pedestrian environment within the Village.

Existing view along Route 8 looking north toward Christiansburg

Proposed roundabout at the Route 8/Fairview Church intersection to calm traffic and improve bicycle and pedestrian safety along Route 8.

6. COST ESTIMATES

PROPOSED PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Riner	5 Point Connector	G		5050	$574
Riner	669/Riner to Dairy Road	G		3492	$397
Riner	Connect Five Points to Surface	J		1593	$50,913
Riner	Connect off-road to Rt. 8 near church	J		510	$16,300
Riner	Connect Rt. 8 to Five Points near Campus	J		360	$11,506
Riner	Dairy to Meadowcreek	G		4369	$496
Riner	East/West connection at Five Points	H	B	367	$167
Riner	Fairview Church/Cloverlea to boundary	E		1841	$156,903
Riner	Five Points Historic Core	H	B	3709	$1,686
Riner	Internal East/West connection in school campus	J		1721	$55,004
Riner	Internal North/South connection in school campus	J		1910	$61,044
Riner	New Cloverlea Connection from Rt. 8/Union Valley	D		2752	$384,655
Riner	new Cloverlea Road at Canter	B		753	$41,073
Riner	North Rt 8 to new Cloverlea Rd at Canter	D		2624	$366,764
Riner	Off road/Bridle to western boundary	J		378	$12,081
RIner	Off road/Canter to Eagle Country	J		385	$12,305
Riner	Off road/Canter to Fairview Church	J		452	$14,446
Riner	Off road/Cloverlea to western boundary	J		513	$16,396
Riner	Off road/Eagle Country to Rt. 8	J		374	$11,953
Riner	Off road/existing subdivision tr. to Tuckahoe	J		455	$14,542
Riner	Off road/Fieldcrest to Rt. 8	J		1089	$34,805
Riner	Off road/Rt. 8 North to Western boundary	J		1598	$51,072
Riner	Off road/Salisbury to Fieldcrest	J		479	$15,309
Riner	Off road/Salisbury to Union Valley	J		1284	$41,037
Riner	Offroad connection golf course to Five Points (N)	J		1236	$39,503
Riner	Offroad connection golf course to Five Points (S)	J		2495	$79,741
Riner	Off-road connection on western boundary	J		8324	$266,037
Riner	Off-road on northern edge of school campus	J		1989	$63,569
Riner	Rt. 8 from Central Campus to Tuckahoe	D		1234	$172,480
Riner	Rt. 8 from new Cloverlea Rd to proposed round.	D		1363	$190,510
Riner	Rt. 8 south of roundabout to N. Campus Trail	D		804	$112,377
Riner	Rt. 8 stouth from N. Campus to Central Campus	D		768	$107,345
Riner	Union Valley Rd/village boundary to Surface Rd	E		2378	$202,670
Riner	Union Valley Road east of Five Points	B		2161	$117,873

DEMO PROJECT

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Riner	Roundabout				$500,000
			Total cost		$500,000

CROSSINGS

Village	Description	Crossing Type A	Crossing Type B	COST
Riner	Rt 8 North of Market	H		$50,000
Riner	Rt 8 at School	H		$50,000
Riner	Five Points Road in historic area	B		$3,000
Riner	Fairview Church/Union Vally Intersection	B	F	$28,000
Riner	Rt 8 south of Eagle Country Extd	B		$3,000
Riner	Rt 8 North/Cloverlea and Hillcrest	B		$3,000
Riner	Roundabout at Meadowcreek/Dairy/Rt8	B	F	$28,000

BELVIEW

1. VILLAGE PROFILE

Belview is located west of Christiansburg along Peppers Ferry Road, and lies between Prices Fork to the north and Plum Creek to the south. The main focal point of the community is Belview Elementary School, which is located on the high speed Peppers Ferry Road. Opportunities for bicycle and pedestrian facilities along the major thoroughfares are limited at present due to the high speeds, narrow shoulders, and the dangerous signalized intersection on Peppers Ferry Road. Traffic calming measures in front of the school will be critical for connecting future residential development to the north of Belview Elementary with the school itself. Although opportunities for on-road connections are limited at present, there is significant off-road potential, including a trail system along the gas pipeline that runs east-west just south of the village boundaries. This trail system could also serve as a piece of the proposed trail connecting the New River Trail to the Huckleberry Trail.

2. CONNECTIVITY ISSUES

The following issues were expressed in the community workshops:

- Identify a safe crossing point on Peppers Ferry Road
- Connect Belview Elementary to existing and future residential areas
- Slow traffic on Peppers Ferry Road
- Connections to Prices Fork and Radford through Walton Meadow
- Connect to Huckleberry Trail
- Need secondary access to connect school and neighborhoods
- Look into trail along gas pipeline easement

3. VITL CONCEPT

The concept for Belview focuses on providing safe connections from existing and proposed residential areas to Belview Elementary. Buffered sidewalks along the north side of Peppers Ferry Road connect residential areas to the school with median refuge and improved crossing that provides both traffic calming and safe access for school children. While paved shoulders provide additional room for cyclists within the core. This system transitions to paved shoulders and shared lanes as one travels outside of the village center. Parallel multi-use trail systems (see standard J) to the north and south of Peppers Ferry Road are created to connect the residential areas to avoid accessing the high speed, high traffic Peppers Ferry Road. These local connections feed into the regional trail network, including a connection to the Huckleberry Trail, the Town of Christiansburg and the villages of Plum Creek and Prices Fork.

4. IMPLEMENTATION PRIORITIES

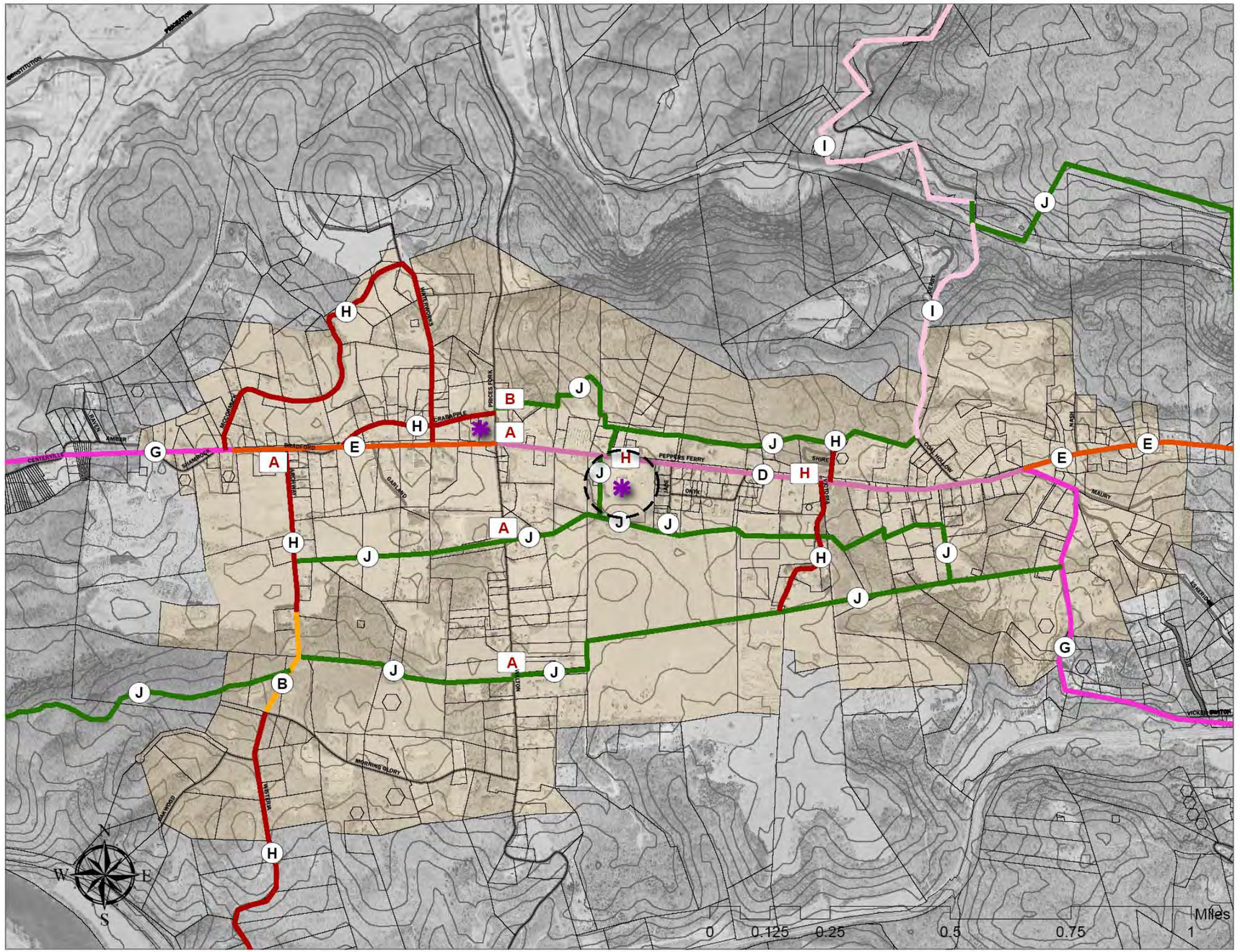
Community members identified the following implementation priorities during the public workshops for the plan:

1. Demonstration project: Improve the crossing in front of Belview Elementary School
2. Construct a sidewalk from Prices Fork Road to Massie's Mobile Home Park (extend D standard to Massie's Mobile Home Park).
3. Construct a trail from Coal Hollow to Prices Mountain
4. Connect the neighborhood behind Belview Elementary from Archway to Victoria
5. Construct facilities in neighborhoods north of Route 114 (i.e. the Shires, proposed Forest Hills) and connect them from Prices Fork Road to Coal Hollow
6. Connect to Radford Trail System

Important considerations for implementation include: availability of Safe Routes to School Funding, potential to coordinate future development proposals, potential to coordinate with the New River Valley Planning District Commission and the City of Radford, and availability of trail use along the utility corridor.

To most effectively improve the safety at the proposed crossing in front of Belview Elementary School, strategies should be pursued to reduce the speed of traffic on Peppers Ferry Road through the Village. One possibility is to install gateway treatments such as a narrow median that would slow traffic as it enters Belview to the east around Coal Hollow Road and west of the traffic signal at the intersection of Peppers Ferry Road and Prices Fork Road. Medians, chokers, or other traffic calming features could be used between these gateways to reduce traffic speeds along Peppers Ferry Road through the Village. An additional consideration as development and redevelopment is proposed along Peppers Ferry Road is to design these developments to emphasize Peppers Ferry Road as the Village's Main Street. By locating buildings close to Peppers Ferry Road and oriented towards a public sidewalk along the road, this pedestrian-oriented design will help to emphasize Peppers Ferry Road as a road that will be used by many different types of users at slower travel speeds for vehicles.

In addition to the traditional funding sources indicated in the Implementation Section of this report, crossings and sidewalks within two miles of Belview Elementary School are eligible for Safe Routes to Schools grants, a new funding source dedicated towards improving walking and biking conditions around elementary and middle schools. Proposals for development along Peppers Ferry Road provide an opportunity for recommended projects to be constructed by the developer to achieve consistency with the Comprehensive Plan.



BELVIEW

VITL FINAL DRAFT

Includes public input from all community workshops

Legend

Trail Typology

- B
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B — Potential Crossing Point*

Public Facilities or Activity Centers

Demonstration Plan Location

* Letter denotes crossing type.

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Montgomery County, VA

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5. DEMONSTRATION PROJECT

The demonstration project for the Village of Belview is a plan to improve the crossing in front of Belview Elementary School. To most effectively improve the safety at the proposed crossing in front of the school, the plan proposes strategies for reducing the speed of traffic on Peppers Ferry Road.

Existing view along Peppers Ferry Road looking east toward Christiansburg

High visibility crossing and landscaped median slows down traffic and provides safe crossing for school children.

6. COST ESTIMATES

PROPOSED PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Belview	114/Belview Village	D		5886	$822,702
Belview	114/Eskeridge to east village boundary	E		924	$78,750
Belview	114/Prices Fork to McCormick	E		2863	$244,006
Belview	Archway Road	H	B	1768	$804
Belview	Coal Hollow to Slate Branch	I	J	2617	$83,640
Belview	Crabapple Trail	H		1778	$808
Belview	Jade extended	J		230	$7,351
Belview	Jade to Belview Elem	J		909	$29,052
Belview	McCormick/Waterworks Loop	H		5713	$2,597
Belview	Multiuse Trail from Walton to Archway	J		2293	$73,285
Belview	Off Road from Peppers Ferry to Regional Trail	J		639	$20,423
Belview	Off Road trail to Belview Elem	J		3276	$104,702
Belview	Regional Off Road	J		5291	$169,102
Belview	Shire Road	H		418	$190
Belview	The Shires Connector	J		3458	$110,518
Belview	Trail from Peppers Ferry to Belview Elem	J		666	$21,286
Belview	Trail Network in Forest Hills	J		2374	$75,874
Belview	Victoria Lane	H		1692	$769
Belview	Walton to Belview Elem	J		959	$30,650

CROSSINGS

Village	Description	Crossing Type A	Crossing Type B	COST
Belview	Southern Crossing at Walton	A		2,000
Belview	Northern Crossing at Walton	A		2,000
Belview	114/VIctoria	H		50,000
Belview	114/Belview Elementary School	H	F	75,000
Belview	114 at Prices Fork	A	A	4,000
Belview	114 at Archway	A	A	4,000
Belview	Prices Fork Road/Crabapple	B		3,000

DEMO PROJECT

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Belview	Crosswalk				$4,000
Belview	Split pedestrian cross-over				$50,000
Belview	Sidewalk (Peppers Ferry Rd to School)			75	$2,000
			Total cost		$56,000

PRICES FORK

1. VILLAGE PROFILE

Prices Fork has a small (population 1,296), in a traditionally agricultural community that is now experiencing residential growth spreading westward from Blacksburg. It is located about three miles west of Blacksburg along Prices Fork Road, a heavily traveled thoroughfare connecting the Town of Blacksburg to the City of Radford. The Village has one church (Prices Fork United Methodist Church), a Grange Hall and an elementary school (grades pre-K through 5th grade). These facilities – particularly the school - serve as the heart of the community and as civic focal points. Recreational facilities are located at Prices Fork School, with additional facilities nearby at Blacksburg Middle School and Kipps Elementary. Several buildings in the community are designated as historical structures, and there is a National Historic District in the heart of the Village.

2. CONNECTIVITY ISSUES

The following issues were expressed in the community workshops:

- Preserve the elementary school as an important unifying feature of the community
- Incorporate traffic calming measures along Prices Fork Road
- Improve connectivity with safe streets, biking trails, and sidewalks
- Determine the feasibility of pedestrian or bike connections along Prices Fork Road and Thomas Lane
- Develop standards for bicycle and pedestrian connectivity new development
- Connect residential areas, such as Montgomery Farms, to both the existing and the potential future school sites in the community.
- Regional connections to schools and to Blacksburg

3. VITL CONCEPT

The overall concept of for Prices Fork is a network of trails that connects residential areas to existing and proposed schools, and provides direct access via multiple routes to the Town of Blacksburg. The basic concept includes:

1. Improving the existing conditions along Prices Fork Road to a village standard that includes sidewalks in the village core and buffered sidewalks and paved shoulders at the village edge
2. Incorporating "share the road" facilities for bicycles and pedestrians (see standard H) in existing residential areas.

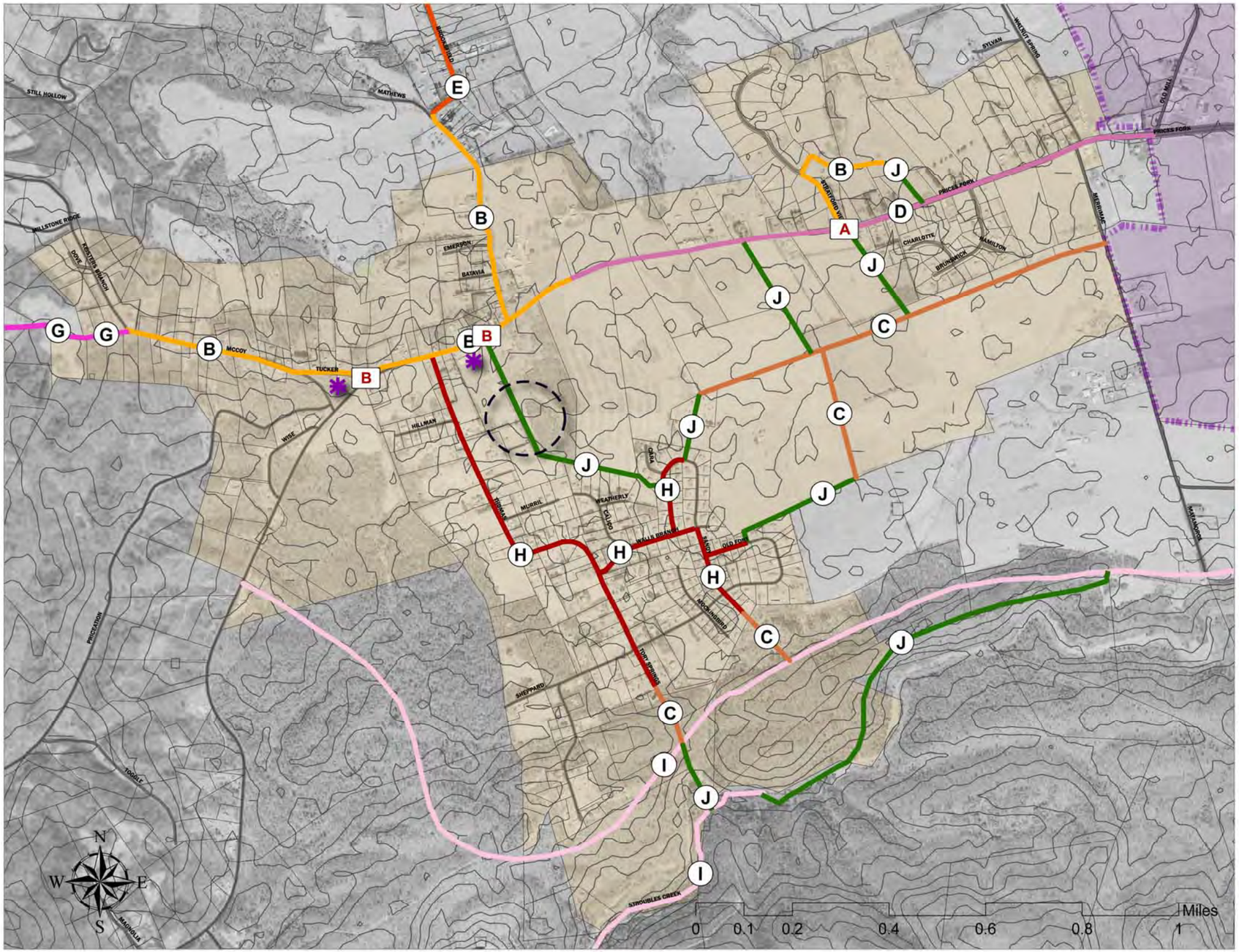
3. Providing a multi-use trail connection from Montgomery Farms to the Prices Fork Elementary and future school
4. Including buffered sidewalks and bicycle lanes in new developments.
5. Incorporating Route 460 Connector as a long range bikeway connection to Virginia Tech and the Town of Blacksburg

4. IMPLEMENTATION PRIORITIES

Community members identified the following implementation priorities during the public workshops for the plan:

1. Demonstration plan: Multi-use trail to connect Montgomery Farms to Prices Fork school
2. Construct facilities (B standard) on Prices Fork Road from the forks to VA Tech property
3. Construct facilities (D standard) on Prices Fork Road from VA Tech property to Stratford View area
4. Connect facilities (D standard) on Prices Fork Road from Stratford View to Blacksburg trails
5. Construct facilities (B standard) on Prices Fork Road from the forks to Keister's Branch Road

Strong community support exists for the Prices Fork VITL. To implement the demonstration plan, the County will need to work with landowners to determine the proper alignment of the trail (avoiding the cemetery located at the intersection of the Johnson, Walls and Simpson properties) and acquire the necessary easements for its use. This project would be eligible for a Safe Routes to Schools grant. The County will also need to examine the availability of right of way along Prices Fork Road to establish the most feasible bicycle and pedestrian standards along that road. Adjustments to the plan may need to be made in the event the right of way is insufficient. In addition, all future development proposals and roadway projects (such as the proposed 460 Connector) should be coordinated with this plan.



PRICES FORK
VITL FINAL DRAFT
Includes public input from all community workshops

Legend

Trail Typology

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- Public Facilities or Activity Centers
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* Letter denotes crossing type.

Village Transportation Links Plans
Montgomery County, VA

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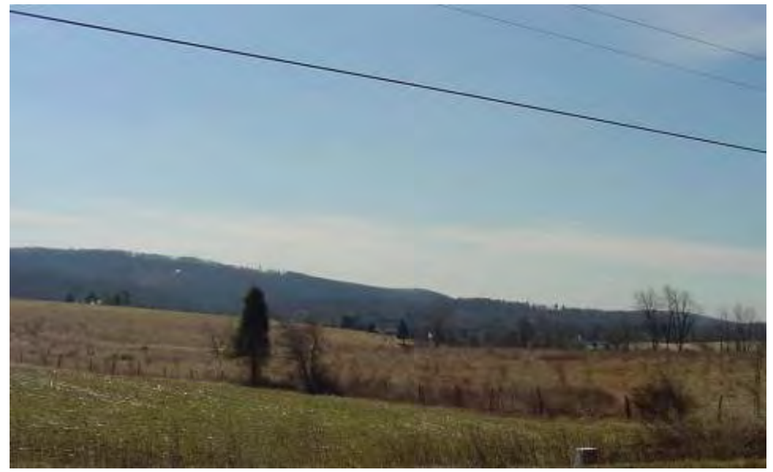
5. DEMONSTRATION PROJECT

The demonstration project for the Village of Prices Fork is a trail that connects Montgomery Farms to Prices Fork Elementary School. The County will need to work with landowners to determine the proper alignment of the trail (avoiding the cemetery located at the intersection of the Johnson, Walls and Simpson properties) and acquire the necessary easements for its use.



View looking away from residences in Montgomery Farms

Proposed greenway trail connecting Montgomery Farms to Prices Fork Elementary.

6. COST ESTIMATES

PROPOSED PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Prices Fork	Brookfield/Prices Fork Rd to Matthews	B		2521	$137,509
Prices Fork	Connect new connector to school	C	F	1457	$263,143
Prices Fork	Connect Old Fort Road to school	J		1499	$47,908
Prices Fork	Connect PF Road to new connector road	J	F	1429	$45,671
Prices Fork	Connect Sandy Rd to new connector	J		744	$23,778
Prices Fork	Demo project/Connect Montgomery Farms to School	J		2839	$90,735
Prices Fork	New Connector from Bburg to School	C	B	4735	$855,170
Prices Fork	New Subdivision Road	B	F	1082	$59,018
Prices Fork	New Subdivision Trail	J		625	$19,975
Prices Fork	New Subdivision Trail South of PF Road	J	F	1143	$36,531
Prices Fork	Old Fort Road	H	B	478	$217
Prices Fork	Prices Fork Rd/village boundary to Kiesters	G		452	$51
Prices Fork	Prices Fork Road/VA Tech property to Bburg	D		6603	$922,919
Prices Fork	Sandy Circle/Walls Branch to Cara Ct	H	B	953	$433
Prices Fork	Sandy Road	H	B	1099	$500
Prices Fork	Sandy Road Extended	C		725	$130,939
Prices Fork	Stratford View	B	F	767	$41,836
Prices Fork	Stroubles Creek	J		5061	$161,751
Prices Fork	Thomas Lane to Tory Springs	H	B	4862	$2,210
Prices Fork	Tory Springs Extended	C		665	$120,103
Prices Fork	Tory Springs/460 to Stroubles Creek	J		813	$25,984
Prices Fork	Walls Branch	H	B	1195	$543

DEMO PROJECT

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Prices Fork	Multi-use trail (Cara Court to School)			3,500	$111,900
			Total cost		$111,900

CROSSINGS

Village	Description	Crossing Type A	Crossing Type B	COST
Prices Fork	Prices Fork Elementary	B		3,000
Prices Fork	Prices Fork Road at future park site	B		3,000
Prices Fork	Prices Fork Road/Stratford View	A		2,000

PLUM CREEK

1. VILLAGE PROFILE

Plum Creek is located to the west of Christiansburg along Radford Road (Route 11), a high speed, high traffic regional thoroughfare connecting Radford and Pulaski County to the population centers of Montgomery County. Unlike the other Villages, Plum Creek does not have a school as a focal point of civic activity within the community. Rather, the main center of activity within Plum Creek is a park located on Hornsby Drive, which is topographically and physically separated from the residential areas of the Village. There are two parks in Plum Creek (Hornsby Drive and Texas Road) although the Texas Road park may ultimately be closed and limited resources redirected to the further development of the Hornsby Drive park because it is located in the center of the Village and has more acreage to accommodate additional facilities.

2. CONNECTIVITY ISSUES

The following issues were expressed in the community workshops:

- Link residential areas to the park to reinforce the sense of community within the Village
- Link to other regional trail opportunities in the area
- Include bike lanes in the large right of way along Radford Road
- Provide an off-road trail connection along the creek bed that parallels Radford Road
- Connect to Bethel area (Bethel school will be redeveloped as a recreational center) and new growth around Carillon
- Connect to Belview and Radford, especially along the river
- Old Route 11 is good opportunity to divert bicycle and pedestrian activity from Radford Road

3. VITL CONCEPT

The overall concept for Plum Creek is to connect residential areas to the park on Hornsby Drive through an internal network of bicycle and pedestrian facilities to reinforce the sense of community within the Village. The basic framework includes:

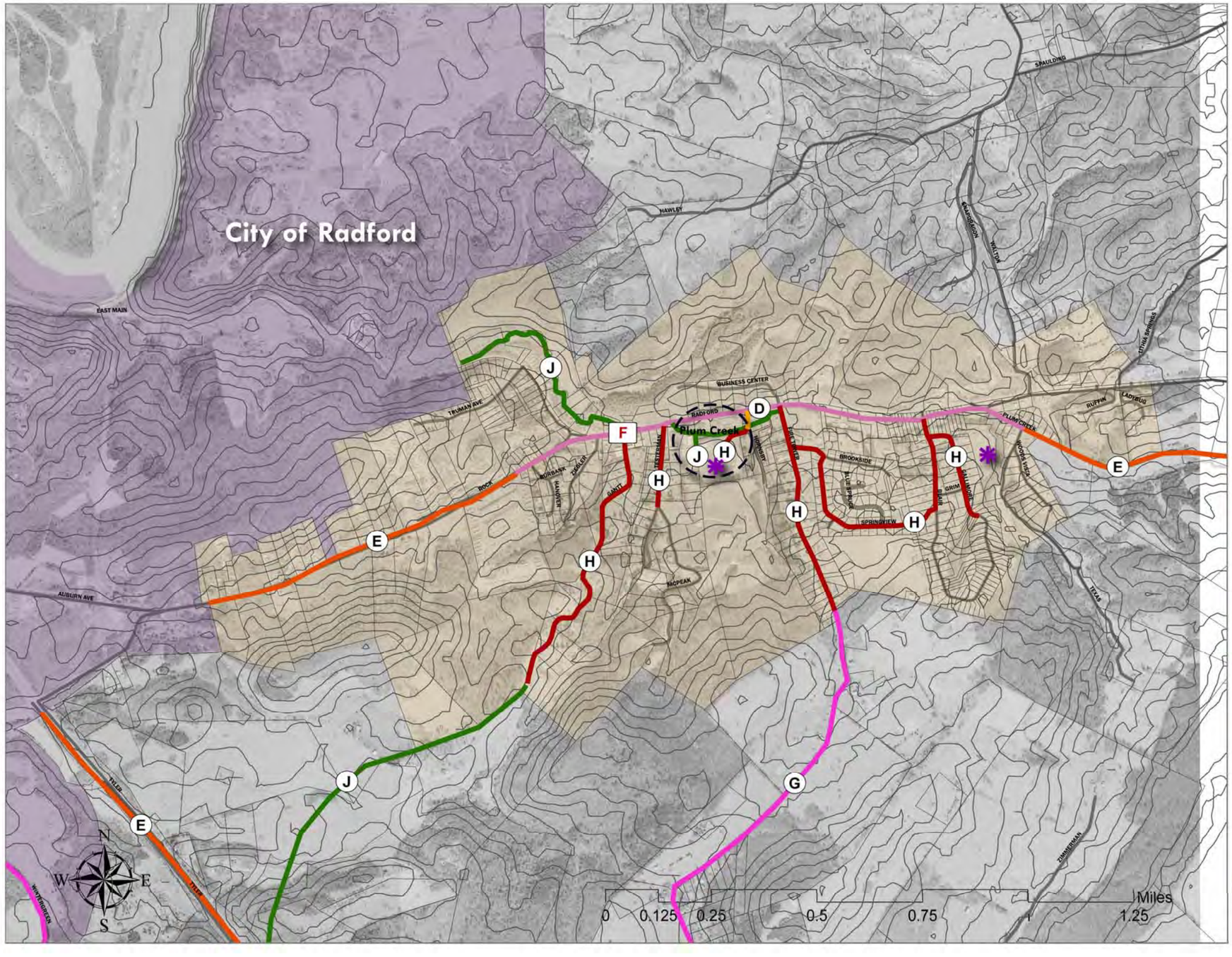
1. Buffered sidewalks and paved shoulders from residential areas along Route 11
2. "Share the road" signs for bicycles and pedestrians on lower volume residential roads
3. Divert bicycle and pedestrian activity from Route 11 where feasible, by using old road alignments and creek beds as basis for route alignments

4. Bethel area/Carrillon Hospital connections with parallel off road and on-road facilities
5. Regional connections served by paved shoulders

4. IMPLEMENTATION

The following demonstration project was identified through the community workshops:
1. Connect residential areas to the Park through an internal network of walkways and bikeways

The physical improvements necessary to implement the demonstration project in Plum Creek are fairly minimal. VITL wayfinding signs and an improved park entrance will significantly enhance the sense of community within this village. It appears that sufficient right of way exists for the proposed facilities along Radford Road/Route 11; however, the exact location of right of way will need to be determined. The proposed multi-use trails connecting Plum Creek to Radford and the recreational facility will also require further investigation. Steep topography and significant natural features may alter the proposed route alignments when the plan goes into design. In all cases, the County will need to work closely with landowners to determine the appropriate location and acquire any necessary easements to facilitate the use.



PLUM CREEK
VITL FINAL DRAFT
Includes public input from all community workshops

Legend

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Public Facilities or Activity Centers

Demonstration Plan Location

Major Rivers or Streams

* Letter denotes crossing type.

Village Transportation Links Plans
Montgomery County, VA

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5. DEMONSTRATION PROJECT

The demonstration project for the Village of Plum Creek is to connect residential areas to the Park through an internal network of walkways and bikeways. Way-finding signs and an improved park entrance are also included in the demonstration plan and will significantly enhance the sense of community within this village.

Existing view along Radford Road looking west toward Radford.

The existing wide right of way accommodates sidewalks and bike lanes, while improved landscaping and park signage enhances the sense of place in Plum Creek.

6. COST ESTIMATES

PROPOSED PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Plum Creek	Blair/Springview	H	B	3808	$1,731
Plum Creek	Demo plan along Plum Creek	J		1486	$47,493
Plum Creek	Fire Tower	H	B	2700	$1,227
Plum Creek	Gallimore	H	B	1365	$620
Plum Creek	Gantt Road in Plum Creek	H	B	3762	$1,710
Plum Creek	Hornsby to Park	B		236	$12,873
Plum Creek	Old Route 11 in Plum Creek	D		515	$71,983
Plum Creek	Park Connector	J		263	$8,406
Plum Creek	Park entrance	H		411	$187
Plum Creek	Radford Road from crossing to Old Rt.11	D		6052	$845,905
Plum Creek	Rock Road	E		4168	$355,227
Plum Creek	Testerman	H		1018	$463
Plum Creek	Trail following water	J		3139	$100,323

DEMO PROJECT

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Plum Creek	Sidewalk (Fire Tower Road to Hornsby Road)			400	$10,900
Plum Creek	Crosswalk				$2,000
Plum Creek	Multi-use trail (Radford Road to Park)			600	$19,200
Plum Creek	Street trees			400	$6,000
Plum Creek	Park sign				$10,000
			Total cost		$48,100

CROSSINGS

Village	Description	Crossing Type A	Crossing Type B	COST
Plum Creek	Radford Rd at Gantt	F		25,000

SHAWSVILLE

1. VILLAGE PROFILE

Shawsville is located about four miles west of Elliston along US 460/Route 11, between Elliston and Christiansburg. The majority of US 460 between the communities is a completely straight stretch of road, known locally as the Elliston Straightaway. Elliot's Creek Road, (VA 675) is the historic road that connected Shawsville to Riner in the lower half of Montgomery County. The focal points within the community are Shawsville Elementary School, Shawsville Middle School and the Meadowbrook Center. The Meadowbrook Center (former nursing home) has recently been renovated to include a branch library, YMCA, youth center, museum and community meeting facilities. There is also an historic area in the center of the Village (Shawsville Historic District) that reflects the historic development patterns.

2. CONNECTIVITY ISSUES

The following issues were expressed in the community workshops:

- Connecting the fairly dispersed pattern of settlements together and to the schools and library
- Connect Elementary/Middle Schools and Library along 460
- Challenges with crossing 460 – explore possibility of underpass at River crossings, pedestrian overpass or traffic light at Library crossing
- Landowner interest in connecting middle/elementary schools
- Concern over increased traffic from the potential site of a regional intermodal facility
- Potential greenway along Roanoke River

3. VITL CONCEPT

The organizing element for the VITL in Shawsville is connecting residential areas to the Meadowbrook Library/YMCA. The basic framework includes:

1. Creating a parallel system to 460 that connects the historic residential areas and the schools to the library through a new multi-use trail and sidewalks along Old Town Road.
2. Adding sidewalks to residential areas not located in the village core
3. Adding paved shoulders to 460 for direct access to regional destinations

4. IMPLEMENTATION

Community members identified the following implementation priorities during the public workshops for the plan:

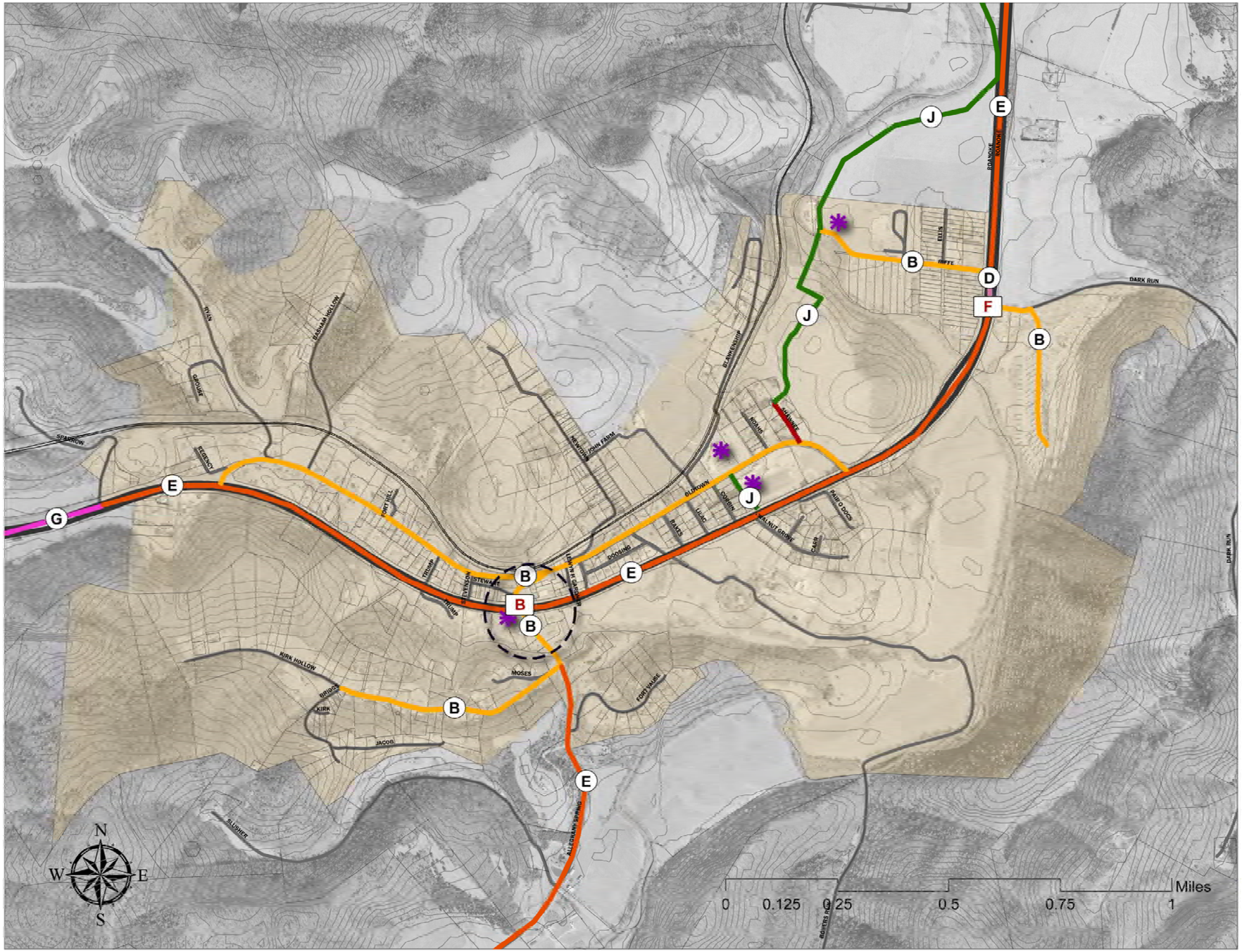
1. Demonstration project: Improve crossing of Route 460 at Meadowbrook library
2. Construct sidewalks along the north side of Old Town Road from the Meadowbrook Library past the middle school
3. Designated shared walkways along Shawnee and connecting off-road past Shawsville Elementary School
4. Improve the crossing at the Route 460/Riffe Road intersection
5. Construct sidewalks along Riffe Street and Dark Run to connect the neighborhood to Shawsville Elementary

Sidewalks currently exist in front of the Meadowbrook Library and will need to be extended south to Kirk Hollow Road and north across Route 460 to successfully connect Shawsville's residential areas. To do so, a traffic signal is proposed at the Route 460 intersection at Allegheny Spring Road to allow pedestrians and cyclists to safely cross with traffic stopped on Route 460. The feasibility and design of this signalized intersection will need to be further investigated with VDOT. In addition, the right of way along Old Town Road will need to be studied to assess how much land is available for the proposed sidewalks along the north side. In the event that adequate right of way does exist, the County should consider constructing sidewalks on both the north and south sides of Old Town Road or providing bike lanes.

SHAWSVILLE

VITL FINAL DRAFT

Includes public input from all community workshops



Legend

Trail Typology

- B
- C
- D
- E
- F
- G
- H
- I
- J

B Potential Crossing Point*

Demonstration Plan Location

Public Facilities or Activity Centers

* Letter denotes crossing type.

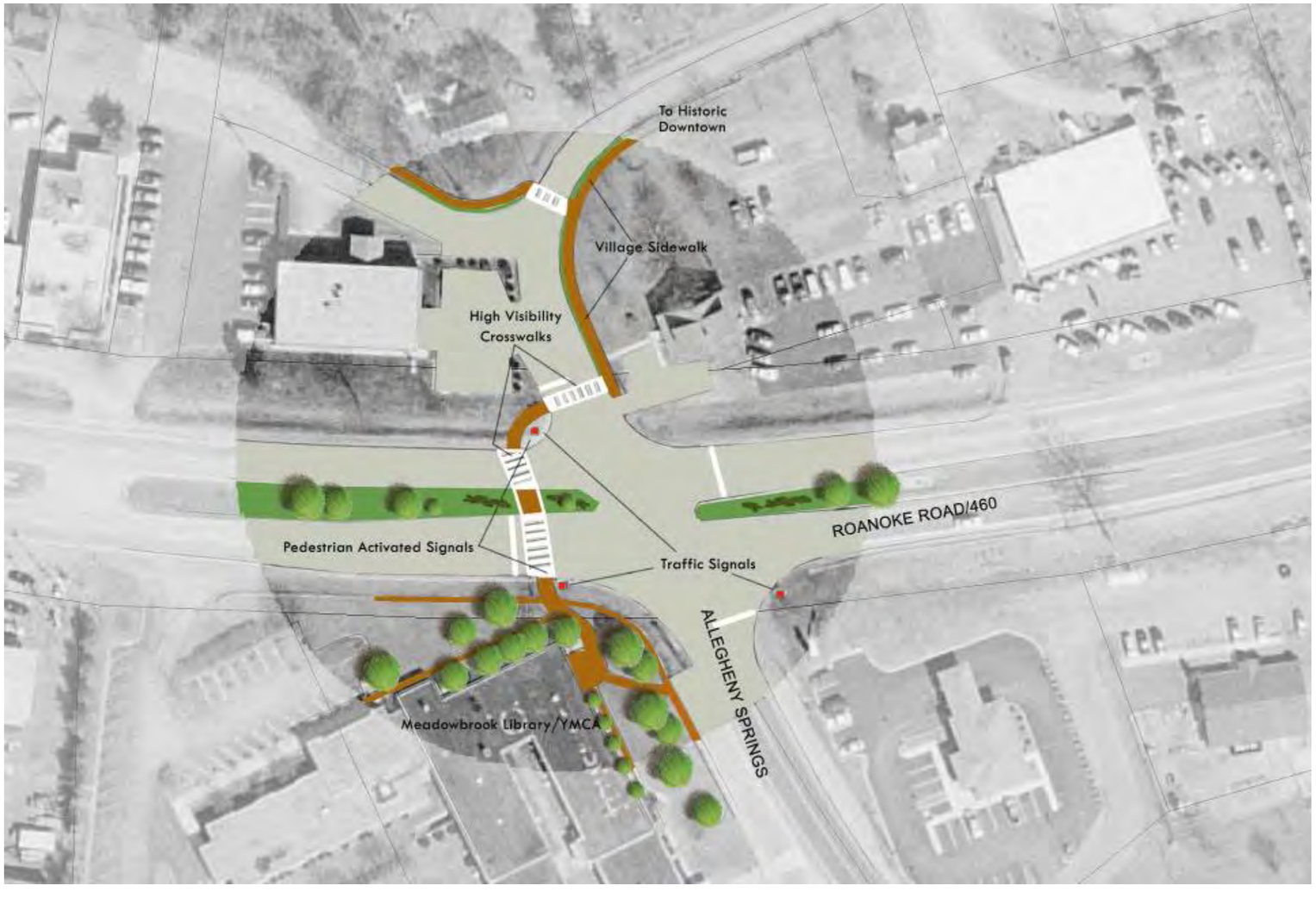
Village Transportation Links Plans
Montgomery County, VA

Herd Planning and Design

RENAISSANCE PLANNING GROUP

5. DEMONSTRATION PROJECTS

The demonstration project for the Village of Shawsville is to improve the crossing of Route 460 at Meadowbrook library. To implement this plan, a traffic signal is proposed at the Route 460 intersection at Allegheny Spring Road to allow pedestrians and cyclists to safely cross with traffic stopped on Route 460 with sidewalks extending north and south to the residential areas. The feasibility and design of this signalized intersection will need to be further investigated with VDOT.



Existing view looking south on Allegheny Springs Road toward Route 460 and the Meadowbrook Library/YMCA.

A proposed traffic signal and high visibility crosswalks allow pedestrians to safely cross Route 460.

6. COST ESTIMATES

PROPOSED PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Shawsville	460 Connector from Riffe to Dark Run	D		407	$56,888
Shawsville	460/Shawsvile to Old Town	E		1364	$116,250
Shawsville	Dark Run to neighborhood	B		2143	$116,891
Shawsville	Historic Village Connector	B		1516	$82,691
Shawsville	Kirk Hollow Connector	B		2841	$154,964
Shawsville	Off Road from Shawnee to Middle School	J		2483	$79,357
Shawsville	Old Town Rd	B		8452	$461,018
Shawsville	Riffe Road	B		2066	$112,691
Shawsville	Route460	E		10882	$927,443
Shawsville	Shawnee	H		579	$263
Shawsville	Shawsville Elementary to Walnut Grove	J		553	$17,674

DEMO PROJECT

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Shawsville	Crosswalk				$4,000
Shawsville	New traffic signal				$260,000
Shawsville	Countdown timer				$8,000
			Total cost		$272,000

CROSSINGS

Village	Description	Crossing Type A	Crossing Type B	COST
Shawsville	460/Dark Run	F		$25,000
Shawsville	460/Walnut Grove	F		$25,000
Shawsville	460/Meadowbrook Library	B	G	$33,000

ELLISTON AND LAFAYETTE

1. VILLAGE PROFILE

Elliston and Lafayette are distinct communities, which share common public facilities. Lafayette is located along the Roanoke River just across the Roanoke County line and is separated from Elliston by the South Fork of the Roanoke River. The center of Elliston, which is the larger community, is about three miles west of Lafayette on Route 460. Both communities are historic, with older sections of small integrated commercial "downtowns" and residential neighborhoods that reflect a self-sufficient and vibrant past. While there are significant historic resources within the Villages, both Elliston and Lafayette are largely defined by environmental features, particularly the South and North Fork of Roanoke River and the Pedlar Hills Natural Area. These areas provide significant opportunities for a river or greenway trail that connects the two Villages and Roanoke County. The population is served by three schools, Elliston-Lafayette Elementary School, Shawsville Middle School, and Eastern Montgomery High School.

2. CONNECTIVITY ISSUES

The following issues were expressed in the community workshops:

- Link the Villages together along the old Route 11/US 460 alignment and the rivers that flow adjacent to the residential areas in each Village.
- Construct a greenway trail between Eastern Montgomery High School and the Roanoke County lines.
- Post Office in Elliston gets foot traffic
- Deli gets foot traffic from Rowe Furniture employees
- High school, Elementary School and Pedlar Hills Preserve are important connections
- Examine a river trail from Old Roanoke to Enterprise Drive

3. VITL CONCEPT

The VITL concept for Elliston and Lafayette harnesses the natural and historic features that make these villages unique. The basic framework includes:

1. Creating a parallel system of historic road alignments and greenway facilities to link the two villages without having to access Route 460
2. Incorporating paved shoulders and buffered sidewalks along Route 460 within specific areas of the villages to provide direct access between key destinations.

3. Signing lower volume residential roads with "share the road" designations to improve visibility of bicyclists and pedestrians

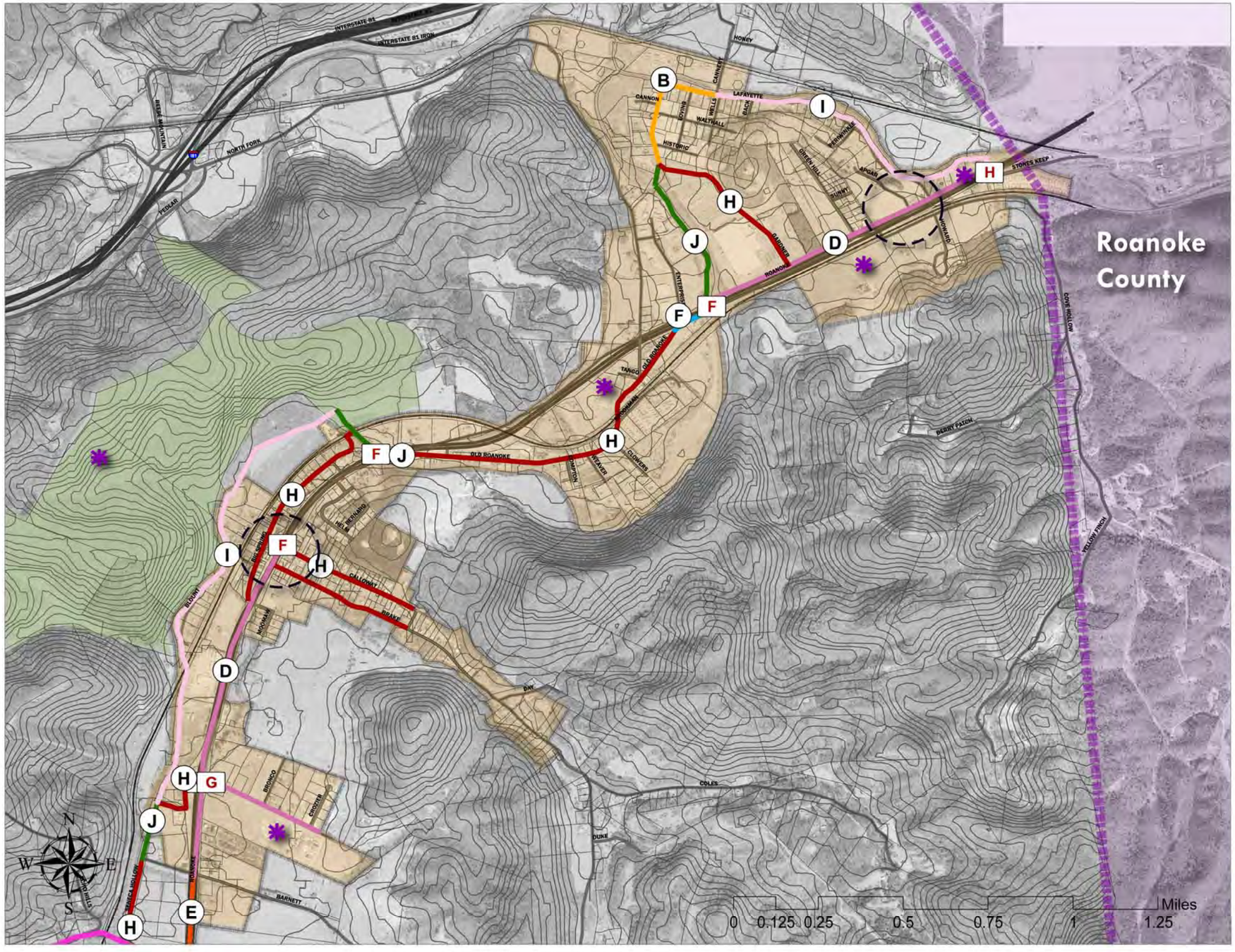
4. IMPLEMENTATION

Community members identified the following implementation priorities during the public workshops for the plan:

1. Elliston demonstration project: changed from improved crossing in front of Eastern Montgomery High School to improve the crossing at Route 460/Big Spring Drive intersection to connect Brake/Calloway neighborhoods to historic village center
1. Lafayette demonstration project: Connect Rowe Furniture to deli along 460
2. Construct facilities on Lafayette village streets to connect neighborhoods to Rowe furniture
3. Construct trails around Pedlar Hills trail to connect village to Eastern Montgomery High School
4. Connect Rowe Furniture/deli trail to Gardner Street
5. Improve pedestrian crossing at Eastern Montgomery high school
6. Connect Shawsville River Trail to Eastern Montgomery High School

A significant barrier to implementation in Elliston and Lafayette is the need to cross both railroads and rivers at multiple locations to complete the system. While river crossings are often costly and railroads frequently prohibit bicycle and pedestrian access, these crossings will become a vital part of the Elliston and Lafayette system if the proposed Intermodal Transportation Facility locates in these villages. Pending approval of the proposed Intermodal Transportation Facility, there may be an opportunity for VDOT to offset the traffic impacts of the Facility by constructing one or more of the recommended pedestrian and bike projects along or connecting to Route 460. Ongoing coordination with VDOT will be required to minimize the impact of this Facility to Elliston and Lafayette and to seek opportunities to include pedestrian and bicycle facilities as a component of the project.

The County will also need to work closely with the railroad to determine the feasibility of additional connections.



ELLISTON + LAFAYETTE
VITL FINAL DRAFT
Includes public input from all community workshops

Legend

Trail Typology

- B
- C
- D
- E
- F
- G
- H
- I
- J

B Potential Crossing Point*

Public Facilities or Activity Centers

Demonstration Plan Location

Major Rivers or Streams

* Letter denotes crossing type

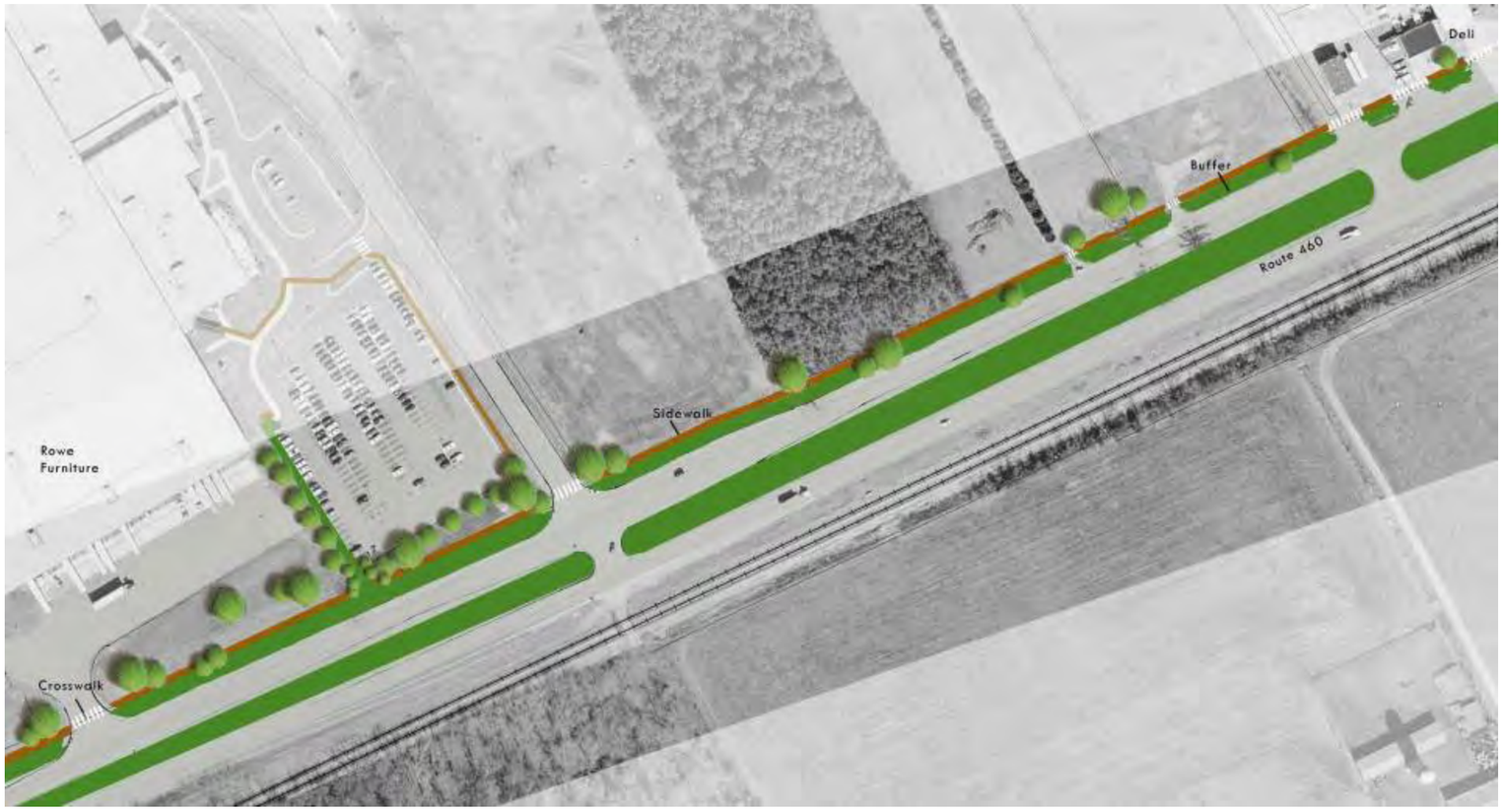
Village Transportation Links Plans
Montgomery County, VA

Herd Planning and Design

RENAISSANCE PLANNING GROUP

5. DEMONSTRATION PROJECT

The demonstration project for Lafayette is to improve pedestrian facilities along Route 460, connecting Rowe Furniture to the deli. The plan consists of buffered sidewalks along the north side of the road and paved shoulders for direct bicycle access.

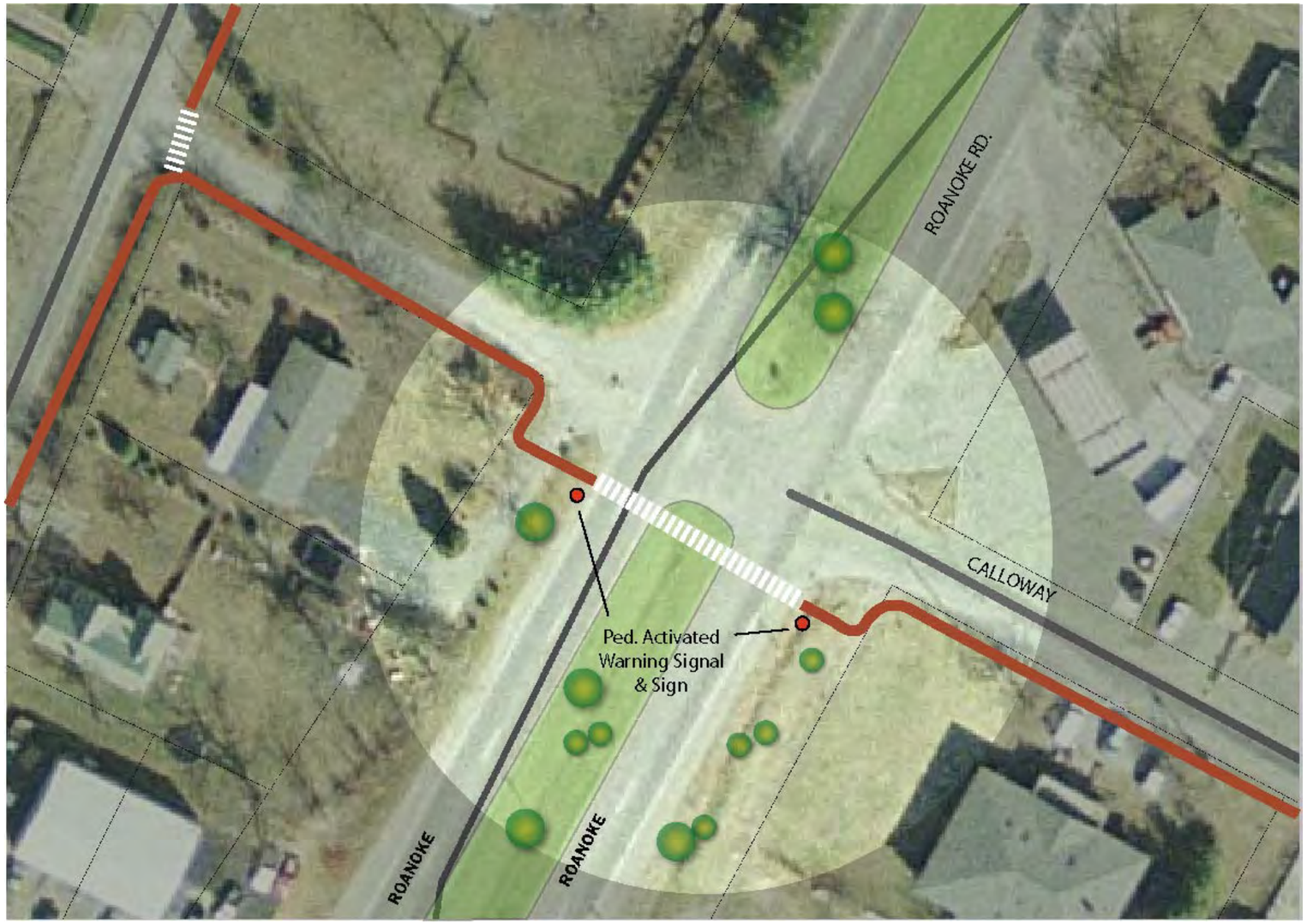


Existing view at the deli in Lafayette looking east towards Elliston.

The existing wide right of way provides an opportunity to install a sidewalk separated from the road allowing Rowe Furniture employees to safely walk to the deli.

5. DEMONSTRATION PROJECT

The demonstration project for Elliston is an improved pedestrian crossing at the Route 460/Calloway intersection. This improved crossing would connect the Brake/Calloway neighborhoods to the historic downtown.



Existing view at the Roanoke Road/Calloway intersection looking north.

An improved crossing allows pedestrians to safely cross 460/Roanoke Road.

6. COST ESTIMATES

PROPOSED PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Elliston	460/Brake to Calloway	D		341	$47,663
Elliston	460/E. Mont HS to Brake	D		3698	$516,880
Elliston	460/EMS to Brake	D		1504	$210,218
Elliston	460/Old Roanoke to river crossing	F		599	$32,673
Elliston	Big Spring in historic district	H	B	3367	$1,530
Elliston	Big Spring to 460	H	B	239	$109
Elliston	Brake Road	H	B	2340	$1,064
Elliston	Calloway	H	B	2291	$1,041
Elliston	Connects Old Roanoke Rd. to 460	J		1527	$48,803
Elliston	Crozier Rd to E Mont HS	D		1990	$278,148
Elliston	off road connection from Seneca Hollow to School	J		941	$30,075
Elliston	Off road trail to west of EMS crossing	H	F	1031	$469
Elliston	Old Roanoke Road	H	B	5203	$2,365
Elliston	Pedlar Hills Connector	I	J	7478	$238,999
Lafayette	460/Rowe to deli	D		4826	$674,543
Lafayette	Ford Crossing	J		338	$10,803
Lafayette	Gardner	H	F	2715	$1,234
Lafayette	Lafayette Road Sidewalks	B		2174	$118,582
Lafayette	Lafayette/Roanoke Connector	I	J	4981	$159,194
Lafayette	Rowe Furniture Trail	J		2185	$69,833

DEMO PROJECTS

Village	Route Description	Short-term Trail Type	Long-term Trail Type	Length (feet)	Cost
Elliston	Crosswalk				$2,000
Elliston	Flashing warning signal				$70,000
Elliston	Median refuge				$25,000
			Total cost		$97,000
Lafayette	Sidewalk (Rowe Furniture to Deli)			1,480	$40,400
Lafayette	Street trees			1,480	$22,200
Lafayette	Crosswalks				$6,000
			Total cost		$68,600

CROSSINGS

Village	Description	Crossing Type A	Crossing Type B	COST
Elliston/Lafayette	460 at Eastern Montgomery High	G		30,000
Elliston/Lafayette	460 at Brake/Calloway	F	G	97,000
Elliston/Lafayette	460/connect to Elliston historic core	F		25,000
Elliston/Lafayette	460/Rowe to Old Roanoke	F		25,000
Elliston/Lafayette	Old bridge xing near school			#N/A
Elliston/Lafayette	Ford Crossing			#N/A
Elliston/Lafayette	Lafayette to Roanoke	H		50,000

PART 3. IMPLEMENTATION PLAN

Improving conditions for bicyclists and pedestrians in Montgomery County will require local and regional coordination, education and encouragement, as well as physical improvements. The following implementation strategy is designed to provide the County with the tools needed to effectively implement the Village Transportation Links Plan. Below is a summary of the recommendations.

COORDINATION

1. Encourage continued participation by the Citizen Advisory Committee to share initiatives to educate, encourage, and enforce safe, effective bicycle and pedestrian transportation.
2. Adopt and use bike and pedestrian design guidelines to support development review.
3. Increase coordination and expand facilities and programs to specifically encourage bicycle tourism.
4. Establish a committee with County staff and school board representatives to promote Safe Routes to School through infrastructure improvements, educational and encouragement programs, and enforcement of laws designed to promote safe pedestrian and cycling conditions.
5. Coordinate planning efforts with the Towns of Blacksburg, Christiansburg, and Radford, as well as surrounding counties, to develop a cohesive regional network of pedestrian and cycling facilities.

EDUCATION + ENCOURAGEMENT

1. Conduct community-wide encouragement programs for bicycling and walking on an on-going basis.
2. Implement a bicycle and pedestrian safety education curricula into elementary and middle schools throughout the region
3. Launch a corridors to campus initiative to support walking and biking to University campuses around the region
4. Develop educational and encouragement materials and events to promote student bicycling to and around local colleges and universities.
5. Coordinate with the region's major employers to distribute share the road and bicycling safety educational materials, and to develop encouragement programs to increase bicycle commuting
6. Utilize local cycling groups as avenues for community based training and advocacy programs

PHYSICAL IMPROVEMENTS

1. Develop a countywide wayfinding signage system, with specific treatments for the village areas, that is easily and quickly understood by cyclists and pedestrians using the village Transportation links system

2. Focus short-term efforts on implementing the demonstration projects identified within each Village.
3. Seek funding to initiate a Safe Routes to School program
4. Plan the installation of bicycle and pedestrian facilities, where feasible, as part of all new road construction, resurfacing, streetscape and traffic calming projects.
5. Negotiate with developers to incorporate recommended projects into site plans or as off-site mitigation.
6. Undertake routine maintenance of the bicycle and pedestrian network facilities, such as sweeping, repainting pavement markings, and repairing infrastructure.
7. Link bicycle and pedestrian facility improvements with the Town of Blacksburg's existing and planned transit services to better connect residential areas in the county with Virginia Tech, downtown Blacksburg, and other destinations within the Town
8. Create a unified pedestrian and bicycle network that provides continuous facilities linking village areas and major activity areas countywide, with the Town of Blacksburg, Town of Christiansburg and City of Radford.
9. Consider implementing "livable street" standards that encourage safe and comfortable walking and biking through improved site design and lower speed limits. A street with a 35 mph speed limit and buildings set close to the street will typically provide a more pleasant pedestrian environment than a street with a 55 mph speed limit and buildings set well back from the street. Changes to street and site design may help encourage walking and biking as much or more then constructing sidewalks and bike lanes.

FEASIBILITY ANALYSIS

In order to implement the recommended projects, a number of questions regarding the feasibility of each project will need to be answered. These include:

Is the project cost-effective and is funding available? The County should identify opportunities to reduce the cost of implementation by including pedestrian and bicycling projects as a component of roadway projects that are planned for construction. There may also be opportunities to negotiate with developers to include pedestrian and bicycling projects into site plans, developer-constructed streets, or as off-site mitigation. For publicly funded projects, the "Potential Funding Sources" section identifies a number of State and Federal programs that provide funding for bicycle and pedestrian process, most often in the form of grants.

Will the project fit within the existing right-of-way, or can the County acquire right-of-way for the project? Projects where right-of-way is already available or where voluntary easements can be acquired will typically be the cheapest and easiest projects to implement. Where right-of-way is constrained or expensive to obtain, the County should investigate alternative alignments that could be used to meet the same

objective, or consider narrowing the proposed project to better fit within the available right-of-way.

Does the project further the development of a cohesive system of pedestrian and cycling facilities? While certain isolated projects can provide benefits by themselves, the County should focus on implementing projects that tie into existing pedestrian and bicycling facilities in order to further the benefit these existing facilities provide.

Additional Considerations

Right-of-way, environmental, historical, and funding constraints, as well as the political climate, must all be considered during the planning process to ensure that implementation of the plan is actually feasible. For example, land acquisition costs and historical and environmental impacts need to be carefully considered to determine the feasibility of a project.

PHASING SCHEDULE AND RESPONSIBLE PARTIES

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
COORDINATION			
Citizen Advisory Committee	County staff coordinates, with volunteer participation from network members	Develop strategic plan, begin regular meetings, report to MPO in July?	Continue regular meetings, outreach efforts, and implementation, annual MPO report in July **Performance measures**: Completion of strategic plan by 2007. Begin implementing key recommendation.
Bike and pedestrian design guidelines for development review	County staff	Adopt VITL plan; establish developer review criteria; begin reviewing proposals	Construction of bicycle and pedestrian facilities in new development **Performance measures**: All new development includes bicycle and pedestrian facilities. Completion of strategic plan by 2007. Begin implementing key recommendation.
Bicycle Tourism	MPO; Local governments Chamber of Commerce; County staff	Prepare a bicycle tourism marketing plan by 2007. Implement key recommendations by 2008.	Distribute information to tourist bureaus, hotels, youth hostels, and regional travel magazines. Identify self-guided bike tours. Feature information on Web sites. **Performance measures**: Distribute bicycle touring and rental information to 50 – 100 locations per year, beginning in 2008. Identify 3 – 5 self-guided bike tours in 2008. Feature information on bicycle touring and rental on 3 – 5 Web sites by 2008.
Safe Routes to Schools Committee	Montgomery County Schools; County staff & MPO	Establish task force of teachers, parents & students; review previous efforts and national resources, create action agenda, and secure funding to launch program at one school.	Continue securing grant funding to provide safe access to all schools in the County **Performance measures**: Grant funding secured for 3 projects.

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Local Governments	MPO, Montgomery County, Town of Blacksburg, Town of Christiansburg, City of Radford, Pulaski County, Roanoke County	Establish regional coalition; agree to regional network of pedestrian + cycling facilities	Continue regular meetings; pursue funding opportunities Performance measures: Semi-annual meetings with the regional coalition.
EDUCATION + ENCOURAGEMENT			
Community-wide encouragement programs	CAC	Develop media outreach plan including development of regional bicycling website. Website could include maps of on-road and off-road facilities, recommended touring routes, resources such as bicycle shops, bike clubs, and a calendar of events	Increase bicycle and pedestrian activities and programs as part of local and nationally sponsored events such as Commuter Choices Week, Walk to School Day, and Bike to Work Day. Performance Measure: Issue 3 – 5 press releases per year, beginning in 2007
School Bike/Pedestrian Safety Coordinator	Montgomery County Schools	Designate and fill half time staff position (existing or new staff)	Staff member initiates and coordinates school-based programs Performance Measure: Incorporate bicycle skills training into appropriate school curricula by 2008.
Classroom & Experiential Education Events & Activities	School Bike/Pedestrian Safety Coordinator	Build and distribute resources to teachers throughout system (Master Plan Teachers Resource Guide provides starting point)	Projects and activities incorporated into regular curricula and events Performance Measures: Train 150 elementary school students per year by 2009, increasing to 500 elementary school students by 2015.
Corridors to Campus Initiative	CAC, University officials. MPO	Discuss approach and desired outcomes of Initiative; secure funding through capital investments and program budgets	Identify, evaluate and prioritize cost effective strategies to support walking and cycling to and from each university; Performance Measures: Implement at least three projects by 2010.

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Commuter Programs	CAC, County staff, Chamber of Commerce, Town of Blacksburg, Town of Christiansburg; City of Radford, Local employers	Develop "Share the Road" and Bicycling safety educational materials for working age adults; Work with local employers to and fitness centers to improve bike lockers, bike parking, and showers for those who commute to work by bike or on foot	Establish an annual Bike to Work day. Distribute publications, provide incentives to participate, and stage workplace education sessions. Survey the participants and workplaces, to determine how to make the event more successful. Track participation to determine air quality benefits. Prepare an annual report with recommendations to improve the program, beginning in 2008; Hold event annually **Performance Measures:** 5000 participants in 2008; increasing to 10,000 by 2010.
Community-based training and advocacy	CAC, NRVBA and other local bike clubs	Promote VITL plan through bike group newsletters and electronic listservs; Assist in the development of route maps	Organize volunteer led commuter cycling courses; Secure funds for educational campaign including publicity & events Conduct campaign Performance Measures: Hold 5 commuter cycling courses by 2012
PHYSICAL IMPROVEMENTS			
Village Transportation Wayfinding Signage & Map Guide	CAC, Planning Department, Parks and Recreation	Develop route map and downtown signage system (use PR firm to assist with guide design & sign logos); program funds for implementation.	Publish & distribute guide, complete signage improvements. Performance Measures: Route guide completed and all routes signed by 2012
Demonstration Projects	Representatives from villages, CAC; County staff; VDOT	Organize task forces within each village to identify funding sources for implementation; conduct any additional study necessary for implementation; secure easements where necessary	Secure funding and begin construction Performance Measures: 3 demonstration projects under construction by 2012

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Bicycle and pedestrian facilities with road construction	County Planning Department, VDOT	Monitor county and state bridge and underpass construction projects to ensure that adequate accommodation for bicyclists and pedestrian is provided; Provide through access whenever building new streets, planned developments, cul-de-sacs, and traffic calming projects; Make new and reconstructed intersections bicycle-friendly wherever possible	Ongoing monitoring and coordination **Performance Measures**: Increase miles of bicycle lanes and sidewalks that are constructed.
Bicycle and pedestrian facilities with new development	County Planning Department	Establish connectivity standards for new development and redevelopment and apply to site plan review process.	Ensure that trails built as a condition of development approval are designed and built to appropriate standards. Ensure that trails are the appropriate width and safely connect to the street network and/or existing trails. **Performance Measures**: Apply trail standards and establish a monitoring process by 2007.
Routine Maintenance	County staff, VDOT	Inspect the bike lane network 3 – 4 times per year, issuing work orders to address maintenance issues. Sweep streets with bike lanes at the same frequency as the sweeping of arterial streets.	Ensure safety through routine maintenance, including regular inspections, replacing worn pavement markings and bike symbols, replacing damaged signs, sweeping away debris, repaving streets, and repairing potholes. **Performance Measures**: Maintenance schedule upheld.

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Link to Transit	County Planning Department; Town of Blacksburg; Town of Christiansburg	Identify priority stations to serve safe, convenient routes; Develop a Bike to Blacksburg Transit signage program	Implement bike lanes that service where appropriate. **Performance Measures:** Establish new or enhanced bikeways to 5 transit stations by 2015 and to an additional 10 transit stations by 2030.
Link activity centers	County Planning Department, Town of Blacksburg, Town of Christiansburg, City of Roanoke, CAC, Safe Routes to Schools Committee, Friends of the Huckleberry Trail	Conduct inventory of bicycle parking at key destinations (schools, parks, libraries, transit stops, community centers, shopping centers, office parks, etc); Sign all routes linking important destinations	Prioritize bikeways/walkways to elementary schools, high schools, colleges, and universities; improve access to the Huckleberry Trail and other popular trails; Connect Blacksburg, Christiansburg and Radford; Provide bicycle parking at key destinations within the County; Continue to identify key local connections that support the VITL plan. Performance Measures: Construct bicycle parking at 5 destinations by 2008, Construct bicycle parking at 5 destinations annually; Increase miles of streets/trails between Christiansburg, Blacksburg and Radford by 2012, Create 5 new access points to the Huckleberry Trail by 2012
Livable Streets	County staff, VDOT	Work with VDOT to establish "livable street" guidelines for major arterials. Potential improvements include, where appropriate, lower speed limits, curb extensions, striping, planted medians, textured crosswalks, and gateway treatments. Building site design should also be considered. All improvements should accommodate emergency, snow removal, and mass transit vehicles.	Implement measures on selected village arterials to reduce speeding and encourage bicycling and walking. **Performance Measure:** Test measures at 3 bikeway locations by 2012.

POTENTIAL FUNDING SOURCES

There are various means through which bicycle and pedestrian recommendations can be funded, including:

- Safe routes to school
- Transportation enhancements
- Safety programs
- Air quality programs
- Road construction
- Private development

A number of the actively funded programs are described below:

Safe Routes to School

Purpose	This program establishes a federally funded grant program providing communities with the opportunity to improve bicycling or walking to school in grades K-8.
Funding	*70% to 90% allocated to Safety Improvement Project Grants* *$500,000 maximum for project grants (per application)* *25,000 maximum for SRTS program grants (per locality or school division)* All grants provide 100 percent federal funding with no local match required.
Eligible Projects	Program Grants are to develop documented SRTS plans and programs at schools or school divisions Project Grants are intended to provide infrastructure improvements within a two-mile radius of targeted schools
Eligible Applicants	Schools, Cities, Counties, Public and non-profit entities working on behalf of schools, Metropolitan Planning Organizations
Contact	Jakob Helmboldt; jakob.helmboldt@vdot.virginia.gov, (804) 225-3269; Safe Routes to School coordinator, VDOT Traffic Engineering Division

Transportation Enhancement Program

Purpose	This program is an initiative to focus on enhancing the travel experience and fostering the quality of life in American communities
Funding	Up to 80% of a project can be financed with federal funds. A local match of at least 20%, from other public or private sources, is required. Local matches may be in-kind contributions including tangible property, professional services and volunteer labor This is a reimbursable program
Eligible projects	Pedestrian and bicycle facilities such as sidewalks, bike lanes and shared use paths Pedestrian and bicycle safety and educational activities such as classroom projects, safety handouts and directional signage for trails Preservation of abandoned railway corridors such as the development of a rails-to-trails facility
Eligible applicants	Any local government, state agency, group or individual may apply to the program. All projects need to be formally endorsed by a local jurisdiction or public agency.
Contact	Transportation Enhancement Program Staff, VDOT Local Assistance Division www.VirginiaDOT.org, "Programs" section

Bicycle and Pedestrian Safety Program

Purpose	This program was developed to implement safety projects addressing bicycle and pedestrian crashes or the potential for such crashes, with evaluations based on risk and applications competing with like projects.
Funding	Up to 90% of a project can be financed with federal funds A project must have a minimum 10% match
Eligible projects	Construction of on-street facilities and shared use paths Development of treatments for intersections Installation of signs and pavement markings
Eligible applicants	State and local agencies may apply to the program
Contact	VDOT Mobility Management Division –HSIProgram@vdot.virginia.gov 804-786-9094

Virginia Recreational Trails Fund Program

Purpose	This grant program was established to provide and maintain recreational trails and trails-related facilities.
Funding	Up to 80% of a project can be financed with federal funds. A project must have a minimum 20% sponsor match This is a reimbursable program
Eligible projects	Build new trails Restore damaged existing trails Develop trailside and trailhead facilities Provide feature to facilitate access and use by people with disabilities
Eligible applicants	Any local government, government entity, or private organization may apply to the program Federal government entities may be eligible if teamed with private trail groups and organizations
Contact	Virginia Recreational Trails Fund Program, Department of Conservation and Recreation 804-786-3218 or 804-786-4379 www.dcr.virginia.gov, "Outdoor Recreation Planning

Rural Transportation Planning Program

Purpose	This program provides funds to planning district commissions to carry out transportation planning for rural areas.
Funding	Federal funds finance 80% of program activities and grants A match of at least 20% from a planning district commission or locality is required
Eligible projects	Bicycle and pedestrian planning, greenway planning
Eligible applicants	Planning district commissions
Contact	Peggy Todd; peggy.todd@vdot.virginia.gov; 804-371-3092 VDOT Transportation and Mobility Planning Division

Highway Construction Program

Purpose	This program provides funding for the preliminary engineering, right of way acquisition, and construction of highway projects.
Funding	No local match is needed for projects on primary and secondary system roads. A 2% local match is required for projects on urban system roads
Eligible projects	Bicycle and pedestrian accommodations can be built as part of highway projects Bicycle and pedestrian accommodations can be built as individual projects, separate from the construction of highways, either on highway or independent right of way
Contact	VDOT district offices – www.VirginiaDOT.org

Recreation Access Program

Purpose	This program provides bicycle access to public recreational facilities or historic sites operated by a state agency, a locality, or a local authority, either with an access road or on a separate bicycle facility.
Funding	This program uses state funds only. Up to $75,000 may be awarded for bicycle access to a facility operated by a state agency. Up to $60,000 may be awarded for bicycle access to a facility operated by a locality or local authority, with a $15,000 match.
Eligible projects	Construction, reconstruction, maintenance, or improvement of bikeways.
Eligible applicants	A governing body of a county, city or town may make an application to this program
Contact	Hugh Adams, 804-786-2744, hugh.adams@vdot.virginia.gov VDOT Local Assistance Division

APPENDICES:

TECHNICAL MEMO 1: EXISTING CONDITIONS

TECHNICAL MEMO 2: TRAIL DESIGN STANDARDS

TECHNICAL MEMO 3: CROSSING DESIGN STANDARDS

MONTGOMERY COUNTY VILLAGE TRANSPORTATION LINKS (VITL) PLANS: TECHNICAL MEMO 1

Prepared for:

MONTGOMERY COUNTY, VIRGINIA

PREPARED BY:

RENAISSANCE PLANNING GROUP

November 7, 2006

Prepared in cooperation with the U.S .Department of Transportation, Federal Highway Administration, and the Virginia Department of Transportation. The contents of this report reflect the views of the author(s) who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration, the Virginia Department of Transportation, or the New River Valley Planning District Commission. This report does not constitute a standard, specification, or regulation.

Federal Highway Administration or Virginia Department of Transportation acceptance of the report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

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INTRODUCTION

In October of 2004, the Montgomery County Board of Supervisors approved a new Comprehensive Plan, which designated seven Village/Village Expansion Areas throughout the County (Belview, Plum Creek, Prices Fork, Riner, Shawsville, Elliston, and Lafayette). These villages are rural communities, where limited mixed use development has historically occurred and public utilities are available, and are intended to accommodate a significant share of the future development in the unincorporated areas of the County. Throughout the comprehensive planning process, County residents identified the need for developing non-motorized transportation networks (bikeways, sidewalks, trails) in an effort to reduce traffic congestion, increase travel options, and enhance daily life for village residents.

The purpose of the Village Transportation Links (VITL) Plans is to develop a comprehensive Bicycle, Pedestrian, and Greenways Master Plan for each of the villages designated in the 2004 Montgomery County Comprehensive Plan. As an element of the Comprehensive Plan, the Village Transportation Links (VITL) Plans will build a vision for non-motorized transportation access and mobility within and between each of the County's designated villages. VITL Plans will enhance transportation by providing both local and regional links that enable residents to use non-motorized transportation for trips to school, parks, and local businesses, as well as commute to nearby centers such as Blacksburg, Christiansburg, and Radford. Additionally, a non-motorized transportation network will reinforce the sense of community and support more compact land development within each village.

Upon completion, the plan will identify specific improvements and implementation priorities for an interconnected network of bicycling and walking facilities that complements each Village's and the County's overall transportation system. This will include an overall Connectivity Framework plan that shows linkages between the Villages and connections to the regional trail and bike route network, as well as design standards and appropriate cross-sectional and construction standards for each linkage and trail segment.

It is intended for this plan to be incorporated into the Comprehensive Plan through the formal plan amendment process. The VITL plan will be adopted as a chapter to the Comprehensive Plan and cross-referenced with the Village Plans, and with the Parks and Recreation, and Transportation chapters. Furthermore, the VITL planning effort, along with the work of the appointed Citizen Advisory Committee, will serve as a foundation for future policy and implementation directives that deal with non-motorized transportation in Montgomery County.

This memo summarizes the data and information compiled during the first task of the Master Plan process. The completion of Task 1 (Project Initiation and Inventory/Analysis) required assembling an inventory of existing and planned bicycle, pedestrian, and greenway

facilities, and reviewing current conditions within the County, as well as documents and initiatives for promoting local and regional connectivity.

COUNTY PROFILE

Montgomery County is located in the New River Valley in the southwestern part of Virginia, about 35 miles southwest of the City of Roanoke. The county is bordered by Craig County to the north, Floyd County to the south, Giles County to the northwest, the City of Radford and Pulaski County to the southwest, and Roanoke County to the northeast. The County's 393 square miles lie between the Appalachian Plateau and the Blue Ridge Mountains and encompass the Towns of Blacksburg, home to Virginia Tech, and Christiansburg, the County seat. In addition, the County is split by the Continental Divide, which creates a topography that varies from narrow valleys with moderately steep ridges to the east to gently rolling hills to the west. This setting provides an abundance of natural beauty, cultural attractions, and historic assets for its residents to enjoy.

The population of Montgomery County has been expanding since 1960, reaching about 87,900 in 2005. Rapid growth took place from 1965 to 1980, coinciding with Virginia Tech's change from an all male military institution to a co-ed university. In the decade between 1980 and 1990, the Center for Public Service considered Montgomery County the fastest growing locality in Southwest Virginia. Since that time, the County has witnessed more steady growth, which may be attributed to stabilizing enrollments at Virginia Tech. The average annual growth rate growth decreased to 1.3 percent from 1990-2000 (down from 4.4 percent from 1960-1970), which mirrors state growth rates for the same decade. In absolute numbers, however, growth in Montgomery County has outpaced all of the surrounding jurisdictions. The population distribution within the County, however, has remained fairly consistent with about two-thirds of the County's total population located in the towns of Blacksburg and Christiansburg, and the remaining one-third located in the unincorporated area of the County. It is expected that the population will continue to grow at slightly more than 1 percent average annual growth until 2030, increasing the population by 25,000 in the County as a whole and adding 6,000 to 8,000 more persons in the unincorporated area.

This growth has significant implications on mobility within the County. Montgomery County has witnessed sprawling growth typical of counties of a similar size. Urban growth patterns are replacing farmland and the edges of the town and village boundaries are blurred by residential growth. From 1988 to 2004, unincorporated areas of Montgomery County lost over 2,800 acres of agriculturally zoned land and 185 acres of conservation zoned lands to a combination of residential, commercial, and industrial uses. Transportation access to the traditional centers of growth in the County is usually via existing major collector roads or minor arterial highways. The result of this growth has meant increased traffic on substandard roads.

In recent years, single family residential development has taken place along road frontage in rural parts of the county. Many of these developments were designed as discrete subdivisions that lack a physical integration into the place in which they were built and

contribute to a diminished sense of community. In an effort accommodate new growth and create a sense of community and interconnectedness, the County has designated Urban Expansion areas adjacent to Blacksburg, Christiansburg, and Radford, and the Villages/Village Expansion Areas of Belview, Elliston, Lafayette, Plum Creek, Prices Fork, Riner, and Shawsville (Figure 1). These Villages/Village Expansion Areas will build upon the traditional street network of the existing villages and will be designed to accommodate pedestrians, as well as vehicles. By encouraging growth in designated areas, and creating villages with civic and commercial focal points, the County has a unique opportunity to ensure that mobility and access can be achieved without having to rely on a vehicle.

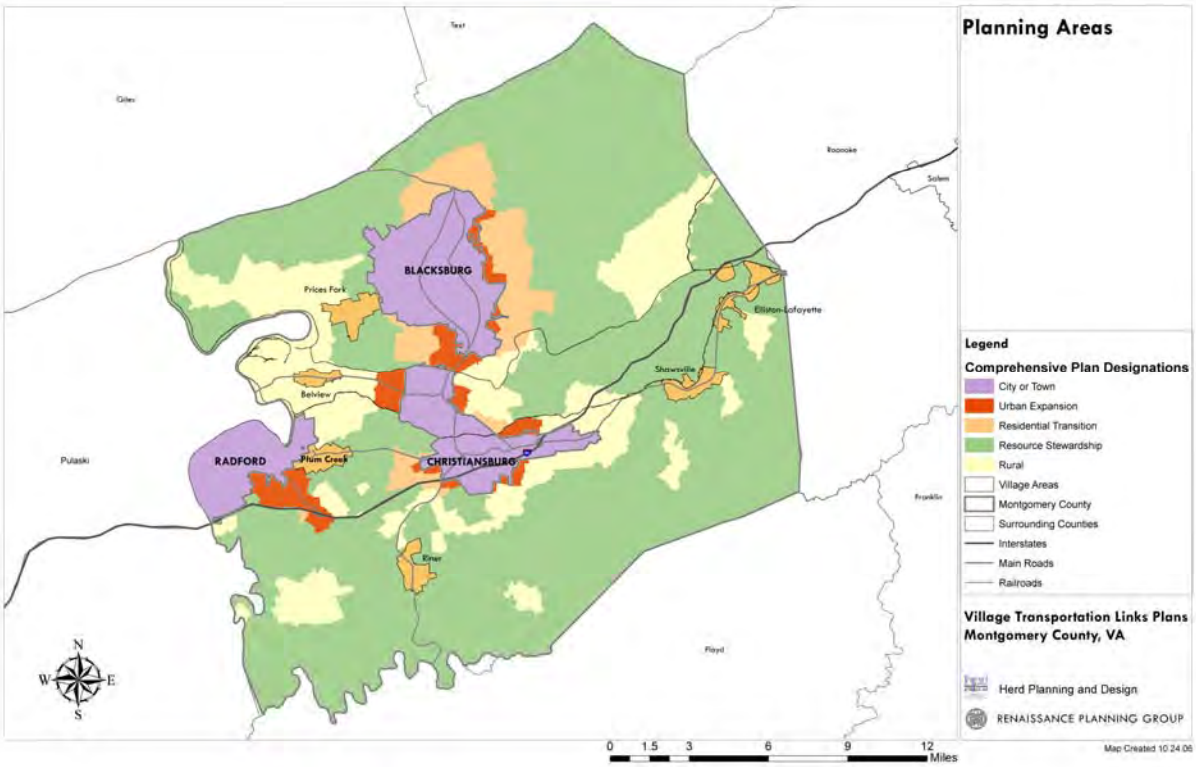


Figure 1 Planning Areas as identified in Montgomery County Comprehensive Plan

Despite the appearance of significant residential development, the County remains primarily rural. Nearly 60 percent of Montgomery County is forested, and about seven percent of this forest land lies in the Jefferson National Forest. There are also significant rural lands under state, religious, and charitable ownership, including the Pedlar Hills Natural Area Preserve and Nature Conservancy Lands. As a result, many of these natural features are preserved from future development, and present opportunities for trail and greenway connections that can provide both recreational and environmental benefits to County residents.

COMMUNITY AND ECONOMIC FOCAL POINTS

The majority of business and industrial areas are located either in or in close proximity to Blacksburg and Christiansburg, or in the 177 Corridor between the city of Radford and Carilion Hospital adjacent to I-81. The notable exceptions are the Elliston/Lafayette Park, located next to US 460/ Rt. 11, at Elliston, and Rowe Furniture, across the South Fork at Lafayette. In addition, small business districts are located in the villages (Riner, Elliston, Shawsville, and Prices Fork) and along specific corridors (Rt. 11 at Plum Creek, Rt. 114 at Belview, and Rt. 460/Rt. 11 at Lafayette). These commercial areas provide important neighborhood services, ranging from convenience stores and small delis to auto body shops. While many of these small business districts do not provide all the services necessary to sustain any one Village, they nevertheless can be accessed without getting in the car and can serve as a community focal point for the VITL plan.

Regional links to nearby population centers (Blacksburg, Christiansburg, Radford, central Pulaski County, Roanoke, and Giles) are also important to consider, as they have the potential to provide a commuting alternative. An example is the off-road Huckleberry Trail currently linking Blacksburg to Christiansburg. According to the Virginia Employment Commission, Montgomery County has 29,589 workers who both live and work in Montgomery County (79.1 percent of County residents). With a high number of workers who live and work in the County, a County-wide bike or trail system has the potential to remove a reasonably large share of commuter traffic from the roadway network. The majority of the remaining workers commute to Pulaski County, the City of Radford, and Roanoke, all of which have plans to expand their existing network of trails to connect to Montgomery County. Connections to Giles and Floyd County are also important, as a high percentage of workers from those counties commute to Montgomery County for employment. Additionally, links to regional facilities, such as the New River Trail, Roanoke Valley Greenways, New River Blueway, Appalachian Trail, Pandapas Pond, and the Bicentennial Bike Route 76 will provide tourism and recreation opportunities.

Historically, Montgomery County has not actively promoted tourism, although results from the comprehensive planning process suggest strong support for an expansion of the industry, especially in terms of agricultural, historical, and eco-tourism. Montgomery County and the New River Valley provide many scenic routes for cycling. The Blacksburg Bikeway and Walkway, the Huckleberry Trail, and the TransAmerica Bike Route are among a few. The Town of Blacksburg has served as both a host site and finishing site for Tour DuPont, America's premier cycling event. In addition, there are a number of natural features, recreational resources, cultural and historical facilities, and community points of interest throughout the County that could serve as important focal points for tourism. Figure 2 identifies several of these facilities, such as historic districts, natural resources, recreational facilities, etc.

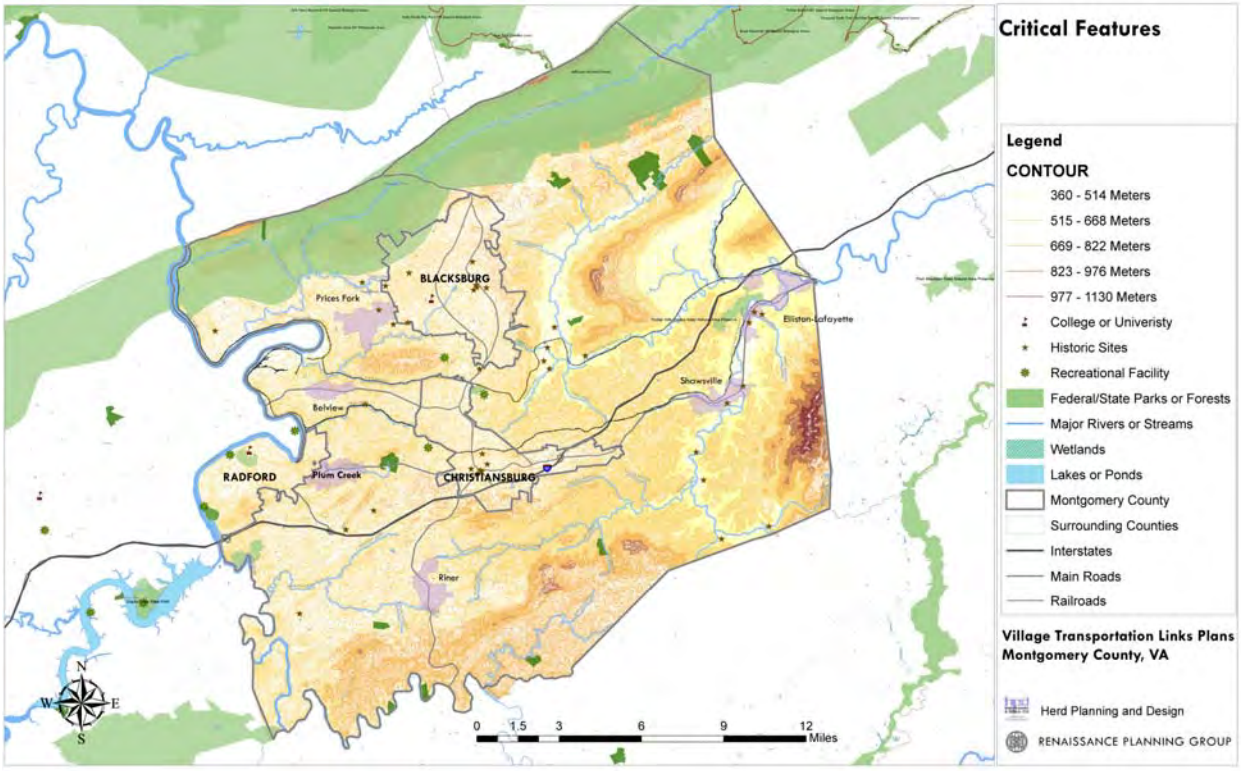


Figure 2. Critical Features

EXISTING BICYCLE AND PEDESTRIAN FACILITIES

Only two miles of off-road or multi-use trails exist in the unincorporated areas of Montgomery County and comprise the County-owned portion of the Huckleberry Trail. While a portion of Bike 76, a transcontinental bike route, passes through the County, only two bike facilities currently exist in the County. These consist of paved shoulders along Route 723 between Lusters Gate and Ellett (part of the Bike 76 route) and Route 685 connecting Blacksburg and Prices Fork. Pedestrian facilities are also limited and exist along the Huckleberry Trail, as well as within some private developments (not shown). A handful of narrow sidewalks can also be found in the historic village cores. Figures 3 and 4 show the existing bicycle and pedestrian facilities within the County.

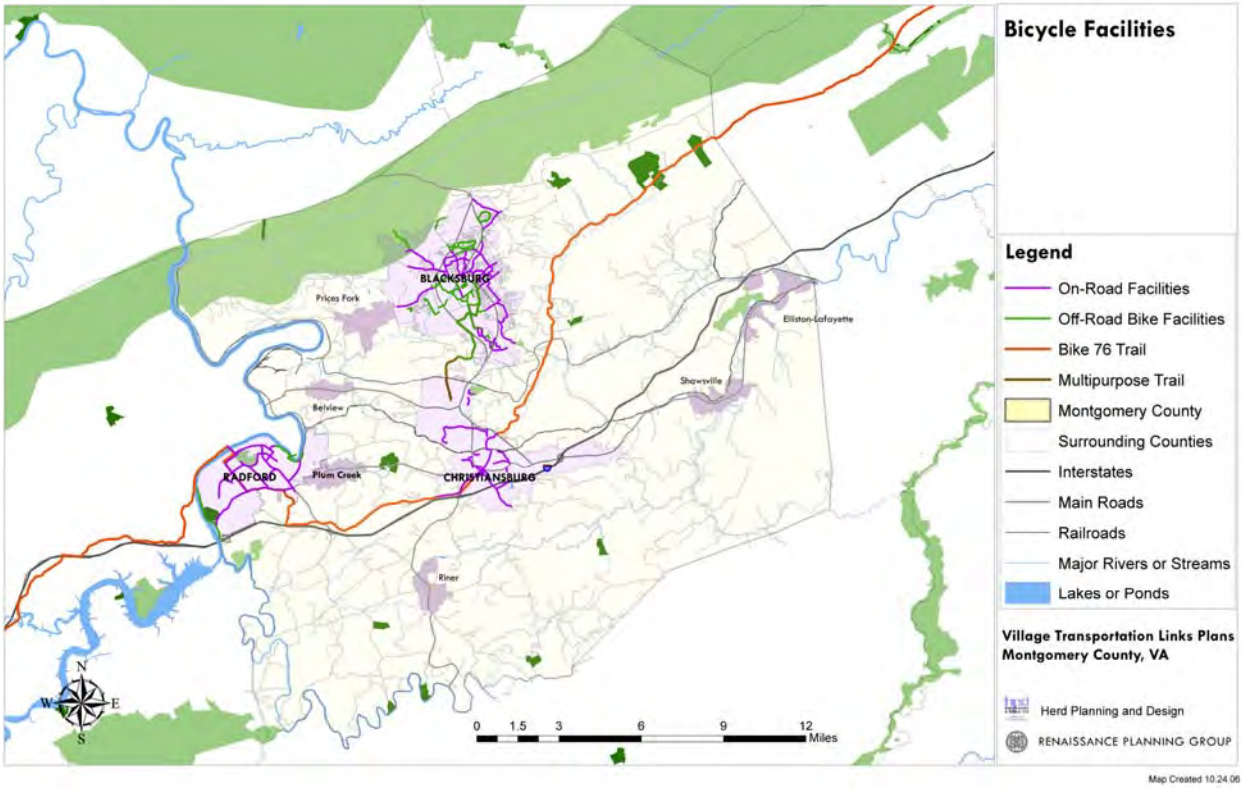


Figure 3: Existing Bicycle Facilities

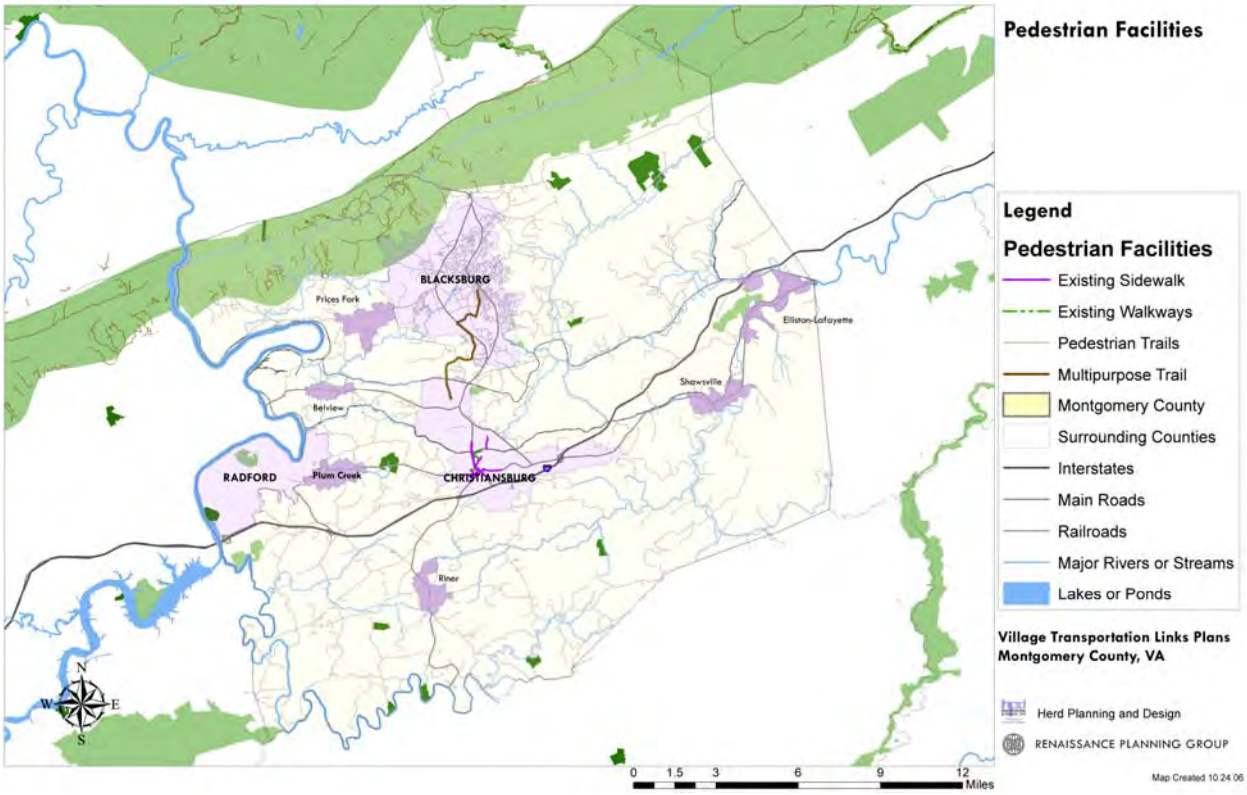


Figure 4. Existing Pedestrian Facilities

The lack of public non-motorized transportation facilities within the County is due in large part to the large number of recreational facilities that exist in the surrounding areas. Trails in Blacksburg, Christiansburg, the Appalachian Trail, Blue Ridge Parkway trail systems provide numerous hiking opportunities within close proximity to Village Areas. In addition. Claytor Lake State Park, Cascades Waterfalls, the Jefferson National Forest, the Nature Conservancy Falls Ridge Preserve and Pandapas Pond also provide significant hiking and recreational facilities for Montgomery County residents. The New River Trail in Pulaski County,Radford's Riverfront Trail and Greenway, and the Roanoke Valley Greenway have existing networks and plans to expand their trail system to connect to Montgomery County and the Huckleberry Trail (see Figure 5).

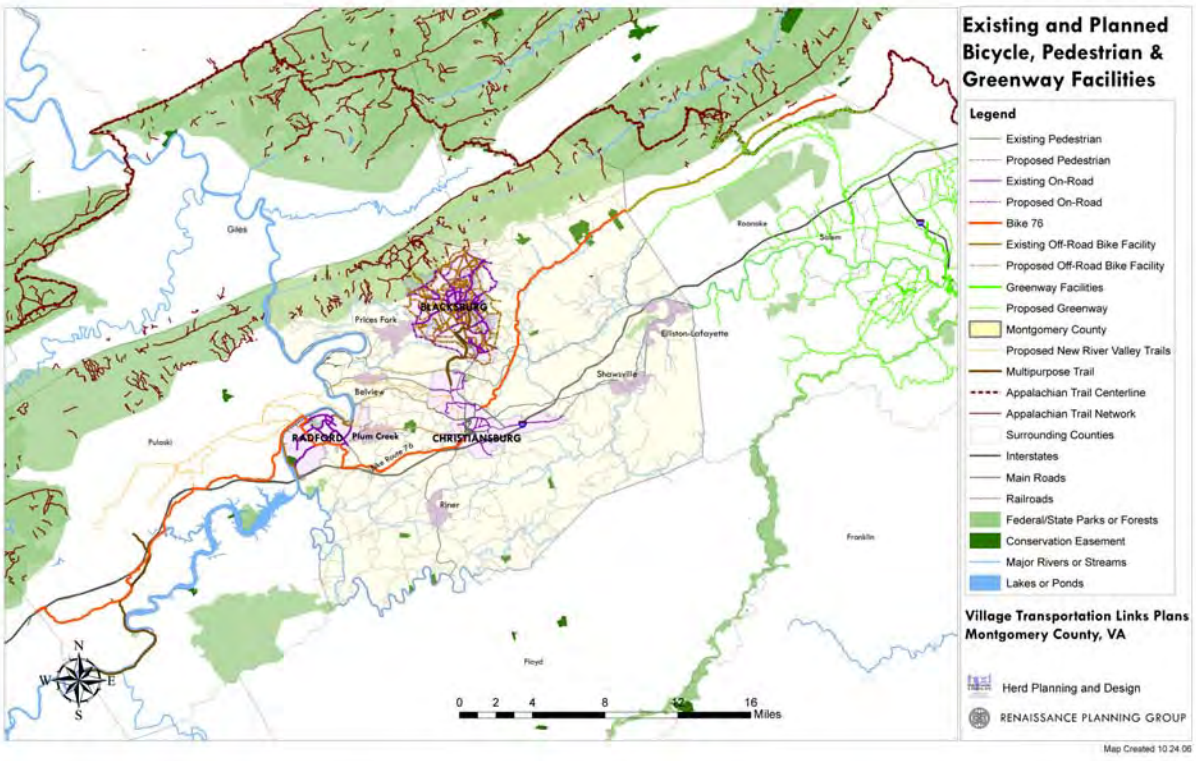


Figure 5. Existing and Planned Bicycle and Pedestrian Facilities

POLICIES AND PROGRAMS

Planning for non-motorized modes of transportation in Montgomery County has always taken place within the context of regional efforts. The first planning efforts began in 1974 as part of a comprehensive bike plan prepared by the New River Valley Planning District Commission. This plan paralleled the Blacksburg Bicycle Trail Study and the 1975 document entitled the Blacksburg Bikeway System. Both of these documents were intended to address the increasing population of student cyclists at Virginia Tech. The regional

interest in bicycle planning was also reflected in the creation of the Bicentennial Bike Route (also known as US Bicycle Route 76), a transcontinental signed bike route that passes through Montgomery County between Yorktown, Virginia and Astoria, Oregon.

Despite the number of planning efforts during this time, it was not until 1990 when the County officially developed and adopted a Bikeway/Walkway Plan to address the transportation needs of its growing population. The plan focused on population centers, commuter links, parks and recommendations from the Blacksburg Plan as the basis for the routes, and carefully considered the costs involved in their route proposals (i.e. designating "shared roads" that were already safe for cyclists, and coordinating additional "lanes" and "trails" with Virginia Department of Transportation's Six Year Road Plan).

The most notable result of the 1990 Bikeway/Walkway Plan was the creation of the Huckleberry Trail, an off-road, multipurpose trail that lies along an abandoned railroad bed, paralleling Rt. 460 between Christiansburg and Blacksburg, and connecting the two population centers. Other accomplishments were the addition of paved shoulders along Rt. 723 between Lusters Gate and Ellett, and along Rt. 685 between Blacksburg and Prices Fork. There are current plans under development to extend the Huckleberry Trail south into Christiansburg and north to the Jefferson National Forest. The New River Valley Planning District Commission is also evaluating the possibility of connecting the New River Trail in Pulaski County through the City of Radford to Plum Creek, Belview, and east to the Huckleberry Trail.

Cycling, pedestrian, and greenway needs continued to be addressed through a combination of local and regional Comprehensive Plans and Bicycle, Pedestrian, and Greenway Plans. A summary of these plans is included below:

One of the primary goals of the current **Montgomery County Comprehensive Plan** is to support the development of non-motorized modes of transportation in an effort to reduce traffic congestion and provide safe routes for non-motorized travel. These non-motorized transportation networks should be linked with other local and regional bikeway/walkway systems, as well as population centers (i.e. City of Radford, Blacksburg, Christiansburg), employment centers (business/industrial parks), major shopping areas, parks, and schools. To accomplish this vision, the Comprehensive Plan includes the following provisions:

- Within Urban Expansion Areas, Village Areas and Village Expansion Areas, new roads and road improvements should be designed to accommodate pedestrians and should include design elements that create comfortable and safe pedestrian access between sites and along sidewalks (PLU 1.6.5c, PLU 1.7.4d); and
- Rezoning proposals must include provisions for pedestrian mobility within the site and safe and convenient connections for pedestrian traffic to adjacent sites, public roadways and trails (PLU 2.1f).

The **New River Valley Bikeway-Walkway-Blueway Plan 2000** encourages a non-motorized and intermodal transportation system for the region (Floyd, Giles, Montgomery, and Pulaski Counties, the City of Radford, and the towns for Blacksburg, Christiansburg, Dublin, Floyd, Glen Lyn, Narrows, Pearisburg, Pembroke, Pulaski and Rich Creek). The plan includes nine policy statements to support their vision for the New River Valley. Among these:

- All road design within the New River Valley should include additional width for non-motorized uses (14 foot outside lanes are suggested);
- New residential, commercial, and industrial development in the New River Valley should propose non-motorized transportation facilities that supplement the proposed Bikeway-Walkway-Blueway system;
- All agencies in the region should promote the New River Valley as a place that is safe and enjoyable for cyclists, canoeists and pedestrians; and
- All County, City and Municipal jurisdictions should be encouraged to endorse the Plan and should be encouraged to adopt a local Bikeway-Walkway-Blueway plan into their respective comprehensive plans.

The **Town of Blacksburg** has a history of commitment to the development of a multi-use trail system. In addition to the bicycle planning efforts initiated in the 1970s, the County developed a Sidewalk and Curb and Gutter Policy to provide guidance in the further development of the sidewalk system. The town has an on-going program of constructing and improving sidewalks, and the Subdivision Ordinance requires installation of sidewalks in all new subdivisions. The Town has also created a **Bikeway/Greenway Master Plan** as part of its 2001 Comprehensive Plan. The greenway system is an outgrowth of community interest in conservation of natural resources, exercise and outdoor recreation, and viable alternatives to motorized transportation. As part of the plan, the Town completed a trail connecting Meadowbrook Drive to Jefferson National Forest and began construction on the North Main Street Trail (Patrick Henry Drive to Wyatt Farms). A number of other routes have been master planned, such as the Central Blacksburg Greenway, Cedar Run Greenway, and the Ellet Loop Trail. The Town has also partnered with Virginia Tech on the Hethwood Trail Extension and a Stadium Trail.

The **Office of Transportation at Virginia Tech** has been awarded funding through federal transportation enhancement grants for three phases of a bicycle pathways project called the "**Hokie Bikeways,** " which includes bike paths, bicycle safety classes, and instructional/safety brochures developed to promote bike use on campus. Phase I added bike lanes on West Campus Drive, connecting the Washington Street Shared Pathway to the Duck Pond Trail. Construction of Phase 2 began in the spring of 2006 (about 75% complete) and once complete with provide a trail connecting the Washington Street Shared Pathway up to the Cranwell International Center and then down to the Southgate Drive Huckleberry Trail Spur. Virginia Tech is in the process of submitting final plans to VDOT for Phase 3 of the project, and has partnered with the Friends of the Huckleberry and the Town of Blacksburg to secure additional funding for the final phase of the project, which

connects the Smithfield Trail to the Huckleberry Trail. In addition to their bicycle planning efforts, Virginia Tech could potentially provide public access on their lands, such as the Fishburn Tract, for additional joint trail planning projects.

The **City of Radford** has focused its bike and pedestrian planning efforts along the waterfront. As recommended in the **Comprehensive Open Space Master Plan** (1990 and 2001 Update), the City of Radford, Pathways for Radford, and Radford University have worked together to "create an interconnecting and cohesive network of open spaces that would create a greenbelt . . . [with] green fingers that extend into its interior." They hope to establish a network of bicycle facilities and walkways connecting schools, businesses, residential areas, and the university, and restore trail access and the popular appeal of Wildwood Park, a 47-acre woodlands located in the center of the city.

The **Roanoke Valley Conceptual Greenway Plan** was developed in 1995 and was adopted by Roanoke City, Roanoke County, Salem, and the Town of Vinton. Following development of the plan, the four jurisdictions, working with the Roanoke Valley Alleghany Regional Commission (RVARC), established the Roanoke Valley Greenway Commission to coordinate implementation of the plan. Since the Greenway Plan was developed, local, regional and state transportation, economic, community, and neighborhood plans have all been updated, incorporating greenway and bikeway components. As such, an update of the Conceptual Plan, 10 years after its completion, is needed. The Roanoke Valley Greenway system currently has 16 miles of completed trails (paved and natural surfaces) in the cities of Roanoke and Salem, Roanoke County, and the Town of Vinton. The 1995 Conceptual Greenway Plan is currently being updated by the Regional Commission and the Greenway Commission, funded, in part by a State Transportation Pilot Planning Grant awarded by VDOT.

VILLAGE PROFILES

The Villages of Montgomery County are unique in that almost every one (excluding Plum Creek) has at least one school as a focal point within the community. This fact, combined with the County's continued reinforcement of the Villages as distinct planning areas, and the generally positive overall sense of community within each Village all establish a good platform for the development of community-based plans in each Village. With a large number of school aged children living within the villages, there appear to be significant opportunities to incorporate bike and pedestrian access for people of all ages and abilities. The following section provides a snapshot overview of the unique characteristics and conditions within each village that will be considered in the VITL planning process. Maps identifying these unique characteristics and conditions can be found in the Appendix of this report.

RINER

The Village of Riner is located along Rt. 8, south of Christiansburg. Though currently one of the smallest Villages in the County in land area, much of the undeveloped land is already platted for subdivision lots that, once built out, will triple the size of the community. With this increased development comes the opportunity to connect current and future residents to centers of activity within the Village. Of primary concern is connecting residents to the Village schools. Riner is unique in that it has an elementary, middle and high school in one location that is a "campus." The challenge, however, is connecting residents from the surrounding subdivisions to this important community facility. At present, there are primary residential areas located opposite the schools along Route 8, a heavily trafficked thruway that connects Christiansburg to Floyd County. Some residential development is also currently taking place on the western side of Route 8 in Cloverlea, but no pedestrian or bicycle connections currently exist to the school. The existing Hillcrest subdivision has privately constructed trails, which can serve as a model for future trail development within the Village. Key connectivity issues for the Village of Riner include developing a safe crossing of Route 8, connecting existing subdivisions to the Village and the schools, improving connections within the school campus, and developing appropriate standards for incorporating bicycle and pedestrian amenities into new development (see Appendix 1).

The County and citizens of Riner recently completed a draft Village Plan (not yet adopted) that includes provisions for bicycle and pedestrian access and connectivity. During the planning process, participants expressed a desire that Riner be a "connected" community and envision sidewalks and trails that connect the schools to surrounding residential areas, which are in turn connected to the commercial and civic uses in the core. To support that vision, the plan includes a number of policies related to bike and pedestrian access as a component of streetscape improvements on major and minor streets within the Route 8 corridor (i.e. walking paths, street trees, crosswalks), as well as design details for the historic village area. The plan also supports the development of a safe and accessible transportation network of trails, by promoting the Safe Routes to Schools Program, and by incorporating pedestrian paths or sidewalks into new and existing street systems and bike lanes into collector and arterial roads.

PRICES FORK

Prices Fork is a small (population 1,296), traditionally agricultural community that is now experiencing residential growth spreading westward from Blacksburg. It is located about three miles west of Blacksburg along Prices Fork Road, a heavily traveled thoroughfare connecting the Town of Blacksburg to the City of Radford. The Village has one churches (Prices Fork United Methodist Church), a Grange Hall and an elementary school (grades pre-K through 5th grade). These facilities – particularly the school - serve as the heart of the community and as civic focal points. Recreational facilities are located at Prices Fork School, with additional facilities nearby at Blacksburg Middle School and Kipps Elementary.

Several buildings in the community are designated as historical structures, and there is a National Historic District in the heart of the Village (see Appendix 2).

The Village of Prices Fork recently completed a Village Plan, which was adopted into Montgomery County's Comprehensive Plan. During the planning process, Prices Fork residents crafted a vision that reflected their interest in preserving the elementary school as an important unifying feature of the community, incorporating traffic calming measures, and improving connectivity with safe streets, biking trails, and sidewalks. The plan includes a number of policies related to bike and pedestrian access and safety that support this vision. Specifically, the plan encourages design features that promote safe and walkable environments, traffic calming measures and street design in residential areas, incorporating bicycle and pedestrian facilities into new and existing street systems, developing a greenway park and trail system that incorporates historic features.

Prices Fork is also anticipated to be the focus of significant new residential development in the years to come. The Village plan shows potential locations for this new development, centered around walkable neighborhoods within a quarter-mile radius. There is also a proposal for two new roads, one linking new and existing neighborhoods and one providing a Southern bypass. It is important that standards be developed for bicycle and pedestrian connectivity for these new roads and in the new neighborhoods.

Key issues for Prices Fork include determining the feasibility of pedestrian or bike connections along Prices Fork Road and Thomas Lane, developing standards for these connections for new development, and connecting residential areas, such as Montgomery Farms, to both the existing and the potential future school sites in the community.

ELLISTON AND LAFAYETTE

Elliston and Lafayette are distinct communities, which share common public facilities. Lafayette is located along the Roanoke River just across the Roanoke County line and is separated from Elliston by the South Fork of the Roanoke River. The center of Elliston, which is the larger community, is about three miles west of Lafayette on US 460. Both communities are historic, with older sections of small integrated commercial "downtowns" and residential neighborhoods that reflect a self-sufficient and vibrant past. Lafayette is listed in the National Register of Historic Places. There is a historic plat for the Village of Lafayette, which was originally laid out in 1828, that shows a traditional grid of narrow streets and small blocks.

While the County recognizes these areas as distinct communities, the U.S. Census Bureau does not. In 2000, the population was 1,241, with children and young adults representing 27.2 percent of the population, the highest percentage in the county. Continued population growth is expected to occur; however, most of this growth will take place in residential areas surrounding Lafayette, as both villages are at or near build out within the village cores.

The population is served by three schools, Elliston-Lafayette Elementary School, Shawsville Middle School, and Eastern Montgomery High School. At present, park and recreational facilities are provided through a shared use agreement with the schools. While there are significant historic resources within the Villages, both Elliston and Lafayette are largely defined by environmental features, particularly the South and North Fork of Roanoke River and the Pedlar Hills Natural Area. The Pedlar Hills Natural Area is a 522 acre preserve that is located just outside of the village boundaries, but rises above the historic core of Elliston and the Roanoke River. These areas provide significant opportunities for a river or greenway trail that connects the two Villages and Roanoke County (see Appendix 3).

The Villages of Elliston and Lafayette recently completed a Village Plan, but it has not been adopted into the Montgomery County Comprehensive Plan. During the planning process, village residents crafted a vision of future development that included pedestrian oriented communities with the two public schools serving as community focal points, historical tourism, and a river greenway. In order to achieve the vision, the Village Plan includes the following action steps:

- Work with the Department of Conservation and Recreation to develop a direct access trailhead to Pedlar Hills Natural Area;
- Work with the Virginia state tourism board to advertise eco-tourism and historic sites, including Pedlar Hills, the Lafayette Historic District, tourism-related businesses;
- Develop a Roanoke River Greenway Park and Trail System;
- Encourage the development of interconnected and intraconnected street, bikeway, and walkway networks in new subdivisions;
- Construct a bikeway/walkway along Brake Road to provide safe pedestrian access along Brake and Calloway Streets; and
- Construct a greenway trail between Eastern Montgomery High School and the Roanoke County lines.

In addition to these Comprehensive Plan items, a key issue for these Villages includes identifying opportunities to link the Villages together along the old Route 11/US 460 alignment and the rivers that flow adjacent to the residential areas in each Village.

SHAWSVILLE

Shawsville is located about four miles west of Elliston along US 460/Route 11, between Elliston and Christiansburg. The majority of US 460 between the communities is a completely straight stretch of road, which is not common in this area of Virginia, known locally as the Elliston Straightaway. Elliot's Creek Road, (VA 675) is the historic road that connected Shawsville to Riner in the lower half of Montgomery County. The focal points within the community are Shawsville Elementary School, Shawsville Middle School, and the Meadowbrook Library, which is within a larger building (former nursing home) being renovated to include a YMCA and community meeting room. There is also an historic area in the center of the Village (Shawsville Historic District) that reflects the historic development patterns.

Key issues and challenges in Shawsville include connecting the fairly dispersed pattern of settlements together and to the schools and library, as well as identifying a safe and appropriate crossing point on US 460 (see Appendix 4).

PLUM CREEK

Plum Creek is located to the west of Christiansburg along Radford Road (Route 11), a major thoroughfare connecting Radford and Pulaski County to the population centers of Montgomery County. Unlike the other Villages, Plum Creek does not have a school as a focal point of civic activity within the community. There is also the added challenge of being located along a high traffic and high speed regional corridor. There are two parks in Plum Creek (Hornsby Drive and Texas Road), although the Texas Road park will ultimately be closed and resources devoted to the further development of the other, larger park, located in the center of the Village on Hornsby Drive. The main center of activity within Plum Creek is this park (Hornsby Drive), which is topographically and physically separated from the residential areas of the Village. Despite some of these challenges, there are opportunities to include bike lanes in the large right of way along Radford Road, as well as providing an off-road trail connection along the creek bed that parallels Radford Road. These connections have the potential to link to bicycle and pedestrian facilities in Radford and beyond to the New River Trail (see Appendix 5).

Key planning issues in Plum Creek, as described, include linking residential areas to the park to reinforce the sense of community within the Village, and to link to other regional trail opportunities in the area.

BELVIEW

Belview is located west of Christiansburg along Peppers Ferry Road, and lies between Prices Fork to the north and Plum Creek to the south. The main focal point of the community is Belview Elementary School, which is located on the high speed Peppers Ferry Road. Opportunities for bicycle and pedestrian facilities along the major thoroughfares are limited at present due to the high speeds, narrow shoulders, and the dangerous signalized intersection on Peppers Ferry Road. Traffic calming measures in front of the school will be critical for connecting future residential development to the north of Belview Elementary with the school itself. Although opportunities for on-road connections are limited at present, there is significant off-road potential, including a trail system along the gas pipeline that runs east-west just south of the village boundaries. This trail system could also serve as a piece of the proposed trail connecting the New River Trail to the Huckleberry Trail (see Appendix 6)l.

Important issues for Belview include identifying a safe crossing point on Peppers Ferry Road, traffic calming along this road, and connecting the school to existing residential areas, as well as potential new residential development on the north side of the road.

NEXT STEPS AND KEY ISSUES

This analysis highlighted several trends that will have an impact on the development of the Master Plan:

- Significant demand for regional automobile travel on US 460, Route 8, Peppers Ferry Road, Radford Road, and Prices Fork Road, combined with heavy traffic volumes and high speeds leads to potentially dangerous conditions for cyclists and pedestrians. Alternative routes or improvements of conditions for all potential users of these routes should be considered.

- Greenway corridors along natural features in the County can serve environmental needs through protection from development, transportation needs by providing additional pedestrian and cycling connections, and developing a local recreation or eco-tourism economy. Depending on the role, careful consideration will need to be made towards locating greenway corridors to maximize their function and ecological suitability.

- Developing implementation and funding strategies will be critical to the success of this Plan. A clear vision, supported by the Montgomery County public, is needed to provide guidance to County officials, private landowners, and developers on the appropriate location and type of pedestrian and cycling facilities needed to support the goals of the County. Funding sources and strategies must be identified, with an emphasis on implementing less-costly but highly visible projects in the near-term.

Over the next several months, Renaissance Planning Group will further analyze the existing conditions to determine appropriate routes and trail types based on previously identified needs, land use patterns, and other factors. Preliminary connectivity plans will be developed, both for each individual Village, and as part of a county-wide network. These will be coordinated with a set of preliminary design and cross-sectional standards for a variety of trail types. A workshop will be held in January with the general public and key stakeholders from each Village to present these preliminary VITL plans and solicit input on pros and cons of each preliminary plan.

MONTGOMERY COUNTY VILLAGE TRANSPORTATION LINKS (VITL) PLANS: TECHNICAL MEMO 2 DESIGN GUIDELINES

PREPARED FOR:

MONTGOMERY COUNTY, VIRGINIA

PREPARED BY:

RENAISSANCE PLANNING GROUP

DRAFT – February 22, 2007

Prepared in cooperation with the U.S .Department of Transportation, Federal Highway Administration, and the Virginia Department of Transportation. The contents of this report reflect the views of the author(s) who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration, the Virginia Department of Transportation, or the New River Valley Planning District Commission. This report does not constitute a standard, specification, or regulation.

Federal Highway Administration or Virginia Department of Transportation acceptance of the report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

TABLE OF CONTENTS

I. INTRODUCTION

This memo summarizes the data and information compiled during the fourth phase of the VITL process (Development of Preliminary Design Standards). Technical Memo 2 includes a series of prototypical cross sections, with appropriate dimensions that are intended to address the full range of on- and off-street bicycle and pedestrian facility needs in each Village and connecting between Villages. In addition, Technical Memo 3 highlights a range of crosswalk, traffic calming, and connection standards for locations where non-motorized facilities intersect with roadways. Together, these standards provide the best combinations of safety, mobility and design for a variety of facility types and vehicular design speeds.

II. BICYCLE AND PEDESTRIAN FACILITY DESIGN GUIDELINES

All new roadways in Virginia should be planned and designed as multi-modal facilities, consistent with the new VDOT policy. This section provides design guidelines for incorporating bicycle and pedestrian facilities into transportation and development projects in Montgomery County.

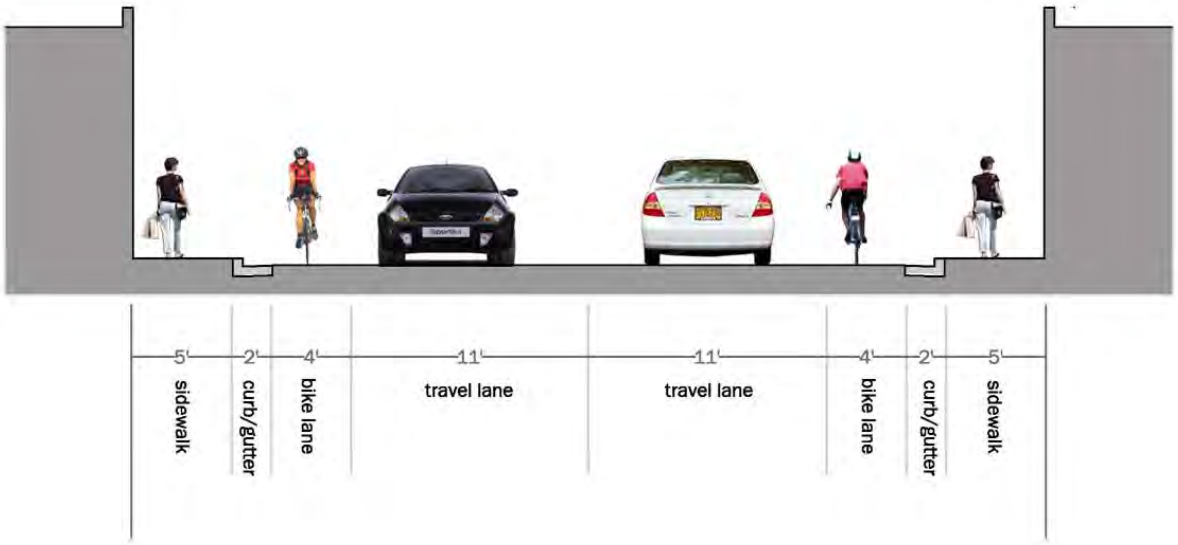
On-road bicycle facilities typically provide the most direct connections in a multi-modal transportation system, as the roadways, themselves provide the framework. On-street systems for cycling are achieved by providing bike lanes, paved shoulders and signed/shared roadways, the choice of which is determined primarily by the available right-of-way width. While bike lanes and paved shoulders are not essential on every street, these exclusive lanes help to mitigate the impacts of heavy traffic volumes, high-speed traffic, or truck traffic.

Off-road bicycle and pedestrian facilities, which may include greenways, multi-use trails, or pedestrian paths, are separated from vehicle lanes and usually serve multiple user groups simultaneously (pedestrians, cyclists, skaters, wheelchairs, etc.). Such facilities may run parallel to the roadway or function as part of a greenway system linking adjacent neighborhoods or land uses.

Sidewalks are an important element of the VITL plan. Sidewalks provide a safe zone for pedestrian traffic and should be wide enough to comfortably serve the volume and type of pedestrian traffic expected in a particular area. Depending on the context, sidewalks may be located directly adjacent to a curbed street or separated from the road by a landscaped buffer. Additional pedestrian-friendly treatments, such as street trees, street furniture (benches, lighting, planters), and a strong relationship between adjacent buildings and the sidewalk are also important considerations for providing a higher quality pedestrian experience.

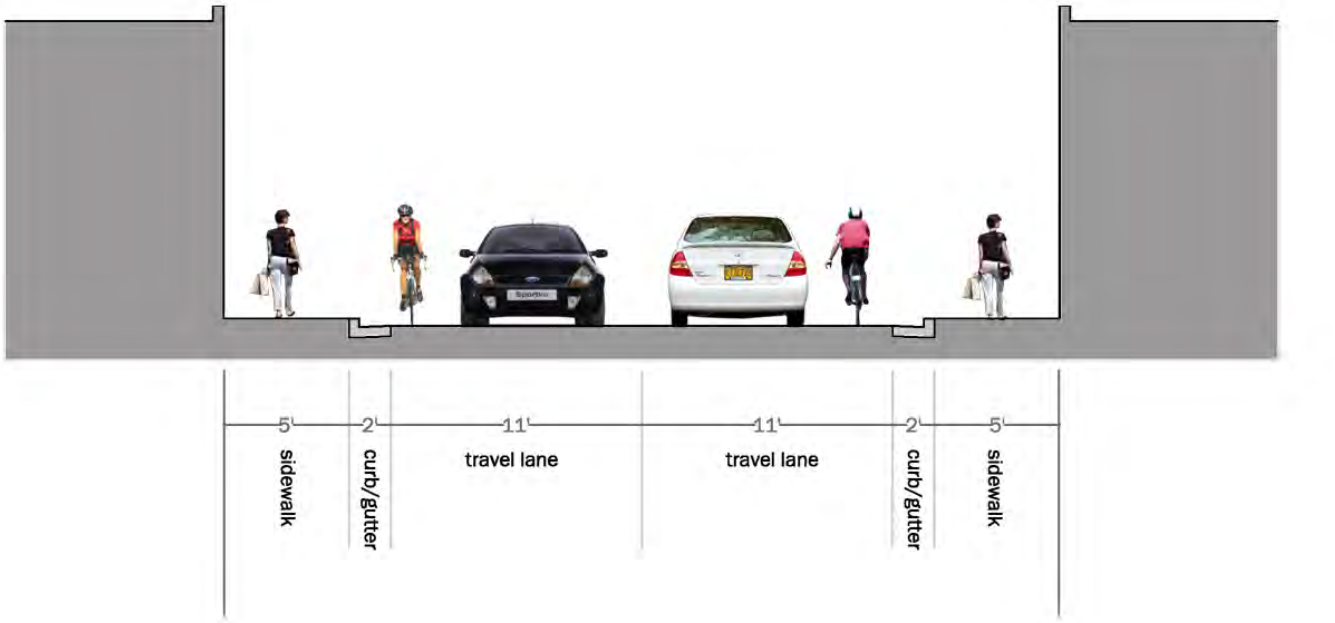
A successful and comprehensive bicycle and pedestrian system will include all of these facilities in order to accommodate the diverse recreation and transportation needs of the community.

A. CONSTRAINED VILLAGE RIGHT OF WAY WITH BIKE LANE + SIDEWALK



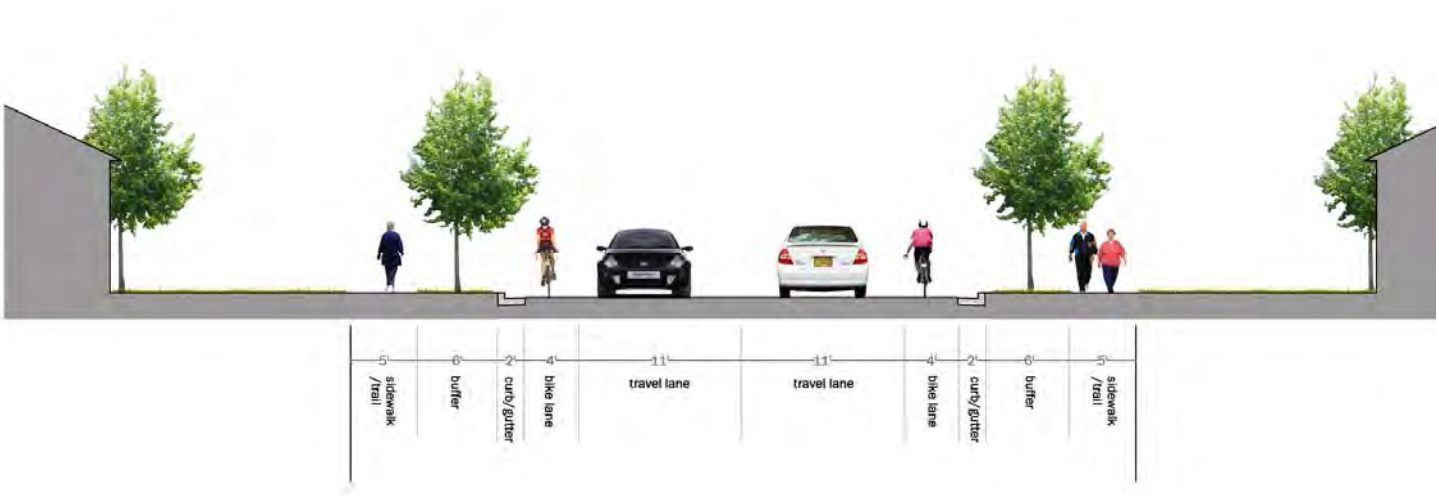
This is an example including pedestrian and cycling facilities in a narrow right-of-way, most typically found along a commercial street where the buildings are located close to the street. The sidewalk should be at least five feet wide if right-of-way allows, and up to ten feet wide if heavy pedestrian traffic is expected. The bike lane should be at least four feet wide, although a wider lane of five feet in width is preferred if on-street parallel parking is present.

B. CONSTRAINED VILLAGE RIGHT OF WAY WITH SHARED LANE + SIDEWALK



In this example, only pedestrian facilities are provided in a narrow right-of way, most typically found along a commercial street where the buildings are located close to the street. The sidewalk should be at least five feet wide if right-of-way allows, and up to ten feet wide if heavy pedestrian traffic is expected. The road can be signed as a shared road to bring greater attention to cyclists.

C. WIDE VILLAGE RIGHT OF WAY WITH BIKE LANE + BUFFERED SIDEWALK

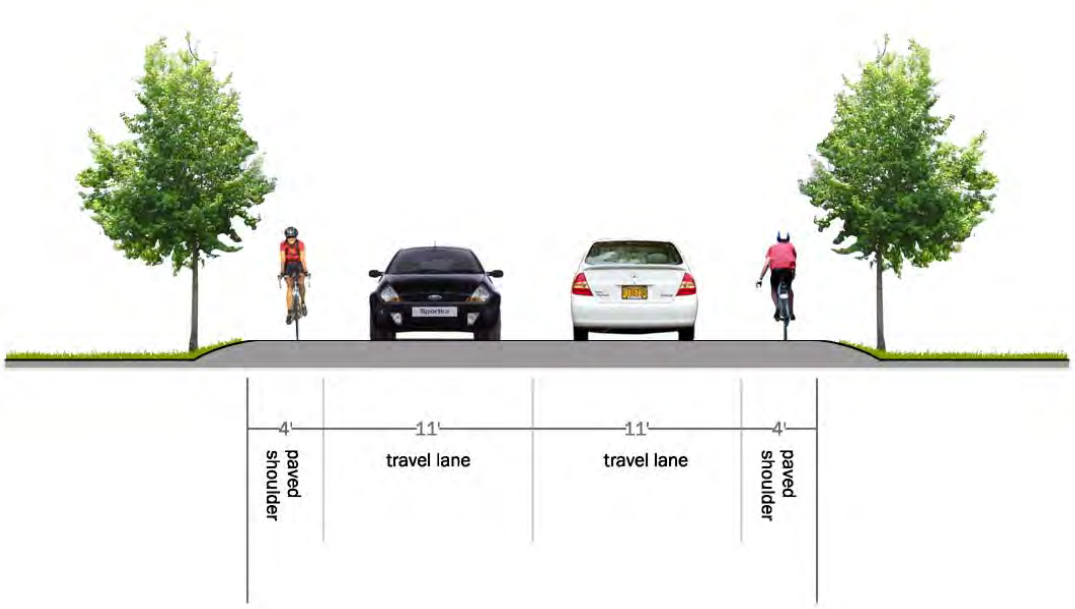


This is an example of including pedestrian and cycling facilities in a wider right-of-way, most typically found along a residential street or anywhere that the buildings are located further from the street. The sidewalk should be at least five feet wide, and up to ten feet wide if heavy pedestrian traffic is expected. A landscaped buffer helps to separate pedestrians from vehicle traffic. The bike lane should be at least four feet wide, although a wider lane of five feet in width is preferred if on-street parallel parking is present.

D. WIDE VILLAGE RIGHT OF WAY WITH PAVED SHOULDER + BUFFERED SIDEWALK

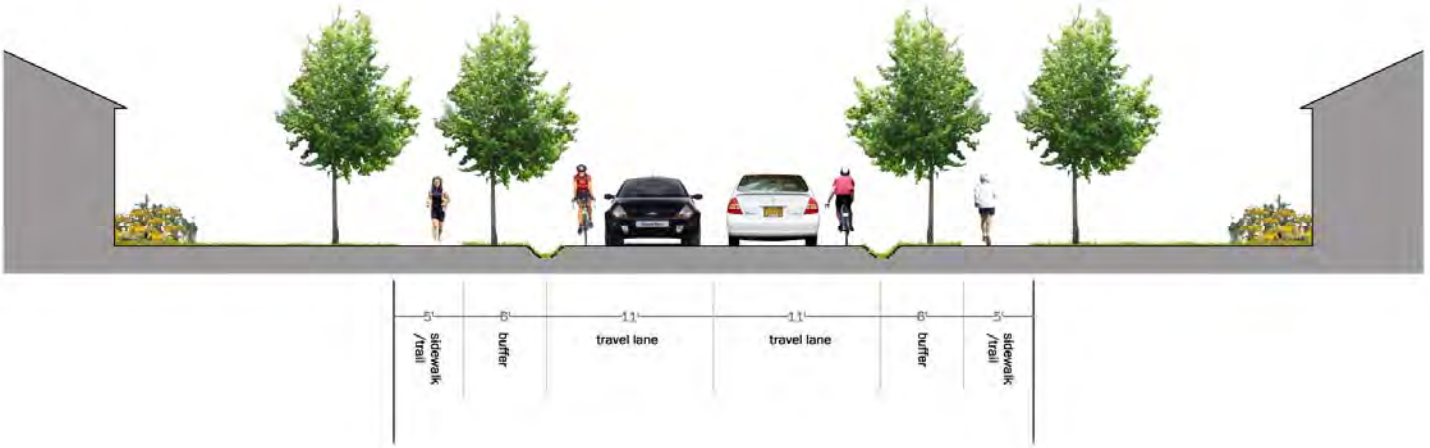
This is an example of including pedestrian and cycling facilities in a narrow right-of-way, most typically found along a residential street or anywhere that the buildings are located closer to the street. The sidewalk should be at least five feet wide, and up to ten feet wide if heavy pedestrian traffic is expected. A landscaped buffer helps to separate pedestrians from vehicle traffic. The paved shoulder has a similar function to a bike lane but is typically used where there is no curb or gutter. The shoulder should be at least four feet wide.

E. CONSTRAINED RURAL RIGHT OF WAY WITH PAVED SHOULDER (NO PEDESTRIAN)



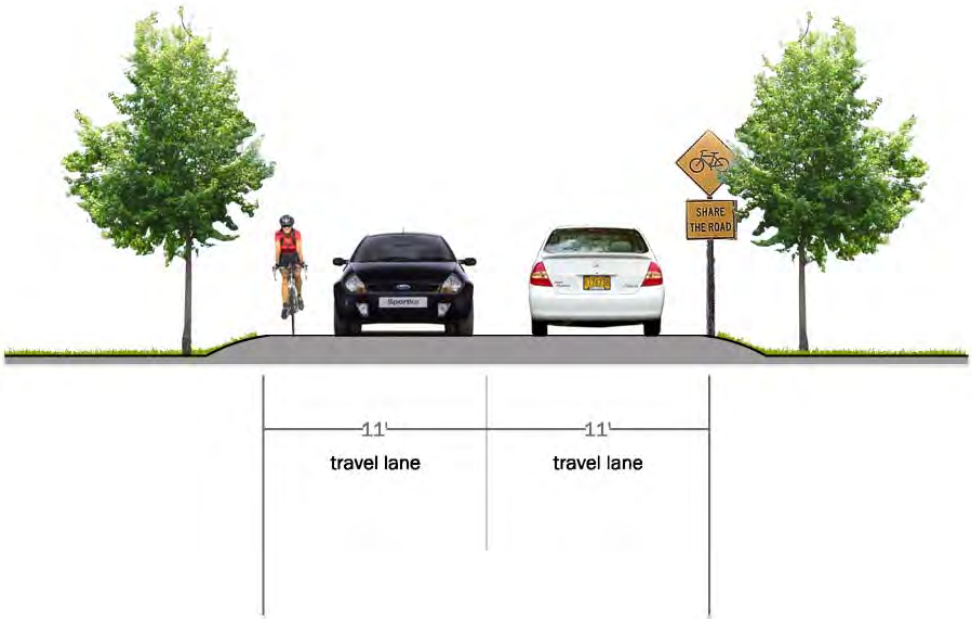
Outside of the villages, there may be locations where pedestrian facilities are unnecessary but a paved shoulder can be provided for cyclists. The paved shoulder has a similar function to a bike lane but is typically used where there is no curb or gutter. The shoulder should be at least four feet wide.

F. CONSTRAINED VILLAGE RIGHT OF WAY WITH SHARED LANE + BUFFERED SIDEWALK



In this example, only pedestrian facilities are provided in a narrow vehicular throughway, although one with a wider right of way. The sidewalk should be at least five feet wide if right-of-way allows, and up to ten feet wide if heavy pedestrian traffic is expected. The road can be signed as a shared road to bring greater attention to cyclists.

G. CONSTRAINED RURAL RIGHT OF WAY WITH SHARED LANE (NO PEDESTRIAN)



Outside of the villages, there may be locations where pedestrian facilities are unnecessary but there is a desire to designate the road as a cycling route. In the event that paved shoulders cannot be provided, the road can be signed as a shared road to bring greater attention to cyclists.

H. CONSTRAINED VILLAGE RIGHT OF WAY WITH SHARED BIKE/PEDESTRIAN

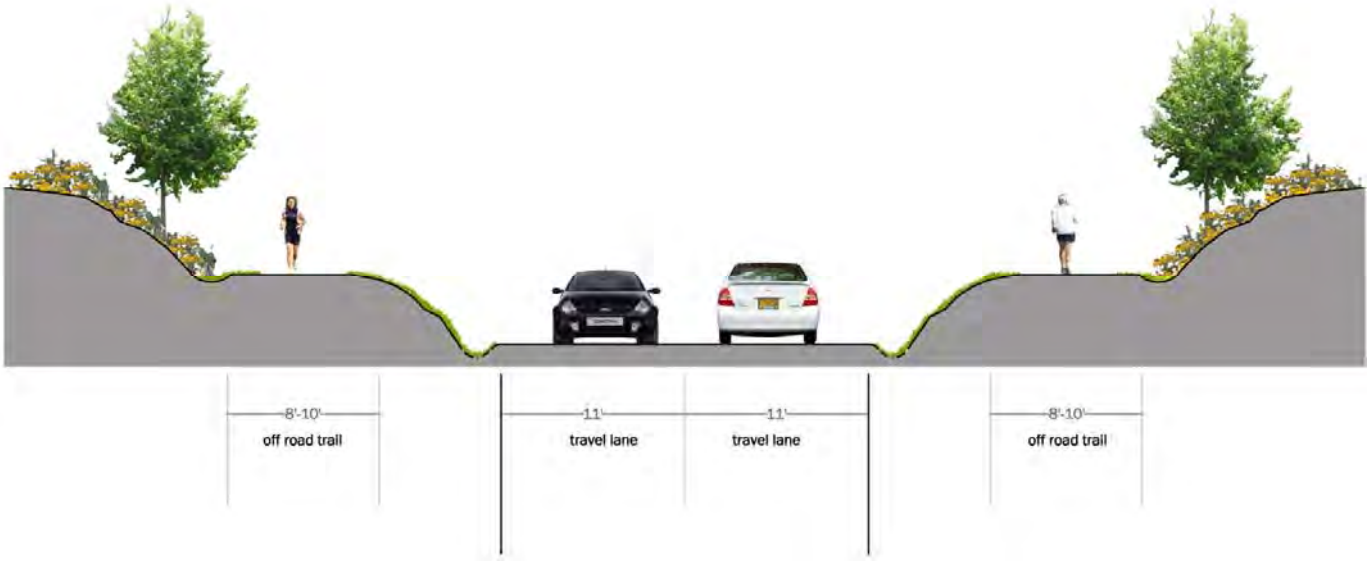
Within the villages, there may be locations where pedestrian and bicycle facilities are unnecessary due to low traffic volume, but there is a desire to designate the road as part of the village trails system. In the event that bicycle or pedestrian facilities cannot be provided, the road can be signed as a shared road to bring greater attention to cyclists and pedestrians. Creatively designing a series of signs for each village can call better attention to all users of a street. Some examples are provided below:

I. MULTI-USE TRAILS – ALONGSIDE ROAD

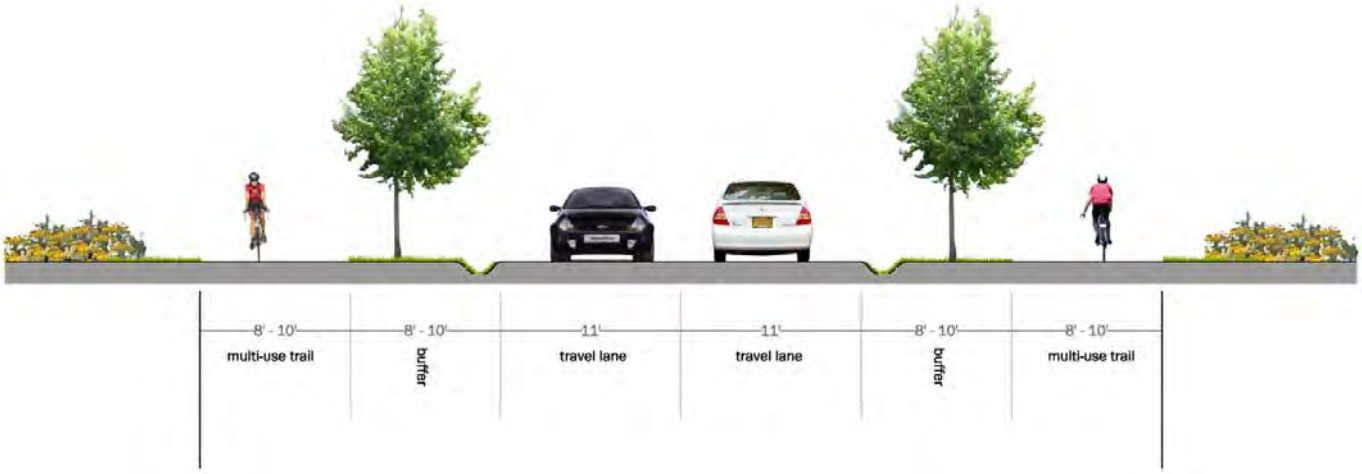
Multi-use trails can be provided alongside roadways within or outside of villages to provide a shared pedestrian and cycling facility. At a minimum, multi-use trails should be eight feet wide, although ten feet in width is preferred to improve comfort and safety for passing. Multi-use trails may be designed at-grade with the roadway, buffered by a grass or landscaped strip of a minimum ten feet in width. Where topographical constraints are present, multi-use trails may be cut into adjacent slopes or elevated above the slope to provide a level surface.

1. SEVERE TOPOGRAPHY

2. MODERATE TOPOGRAPHY



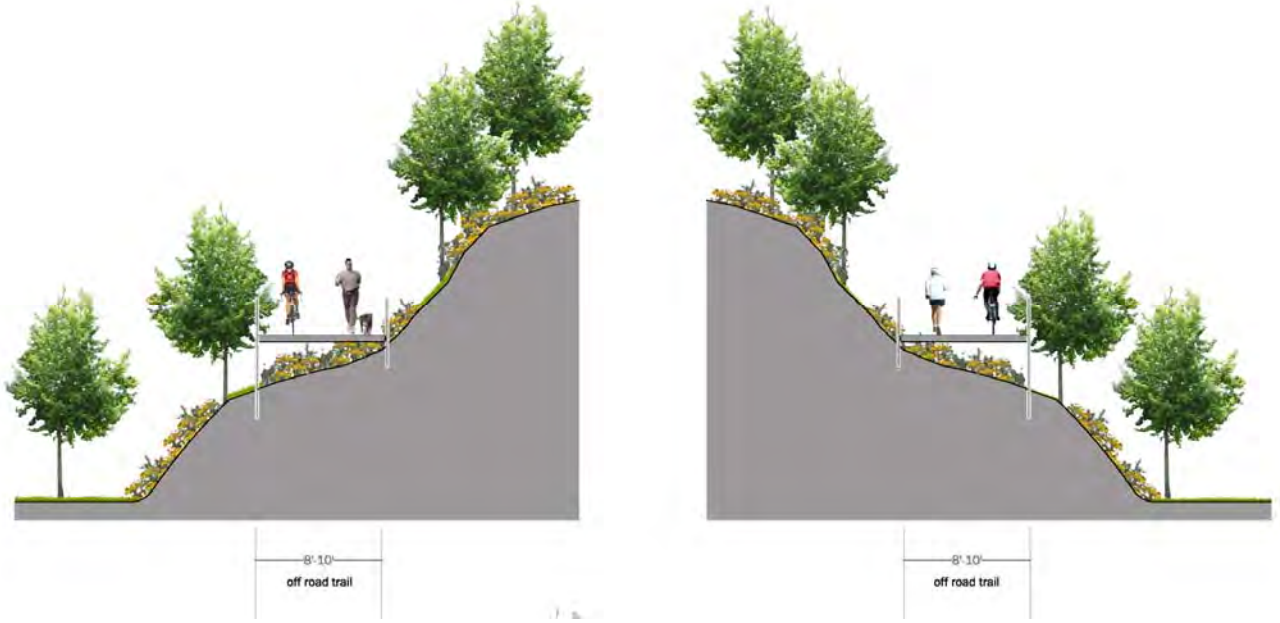
3. FLAT TOPOGRAPHY



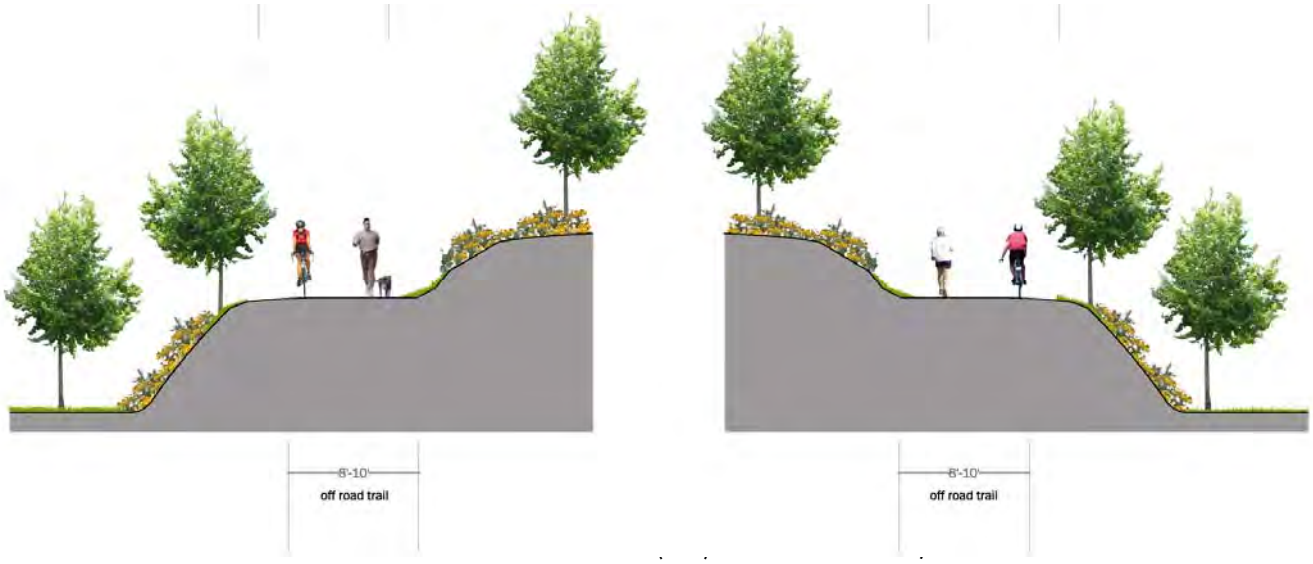
J. MULTI-USE TRAILS – GREENWAY

Multi-use trails can be provided away from roadways within or outside of villages to provide a shared pedestrian and cycling facility. At a minimum, multi-use trails should be eight feet wide, although ten feet in width is preferred to improve comfort and safety for passing.

1. SEVERE TOPOGRAPHY



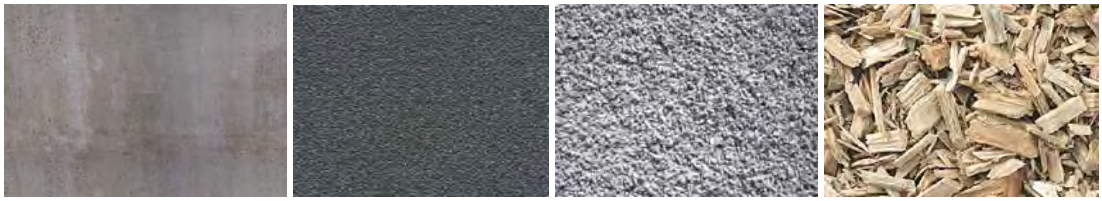
2. MODERATE TOPOGRAPHY



MATERIALS

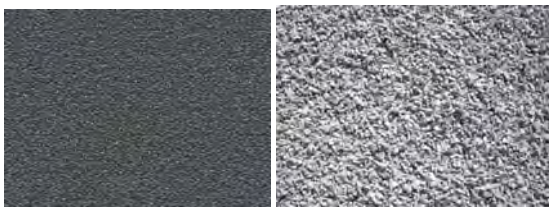
SIDEWALKS:
Sidewalks are typically concrete, although bricks, asphalt, or other pavers may be used.

PEDESTRIAN TRAILS:
Pedestrian Trails may also be constructed with concrete or asphalt, although more pervious surfaces such as crushed stone or wood chips may be preferred in certain circumstances.



BIKE LANES + PAVED SHOULDERS:
Bike lanes and paved shoulders are typically constructed with asphalt as an extension of the roadway surface.

MULTI-USE TRAILS:
Multi-Use are typically constructed with either asphalt or crushed stone.



COSTS

CONCRETE

Concrete is typically the most expensive surface but also the most durable. Concrete construction cost is $4.75/square foot (SF) for regular concrete and $6.00/SF for permeable concrete. Regular concrete will last for 25 years before needing significant maintenance while permeable concrete will last for 15 years.

ASPHALT

Regular asphalt can be constructed at a cost of $2.75/SF and will typically last for about 10 years before needing significant maintenance. Permeable asphalt is more expensive than regular asphalt at a cost of $3.50/SF and has a shorter life at 8 years before needing significant maintenance.

CRUSHED STONE

Crushed Stone paving is permeable and can be constructed at a cost of $4.50/SF, lasting for 15 years before needing significant maintenance. A regular crushed stone surface can be constructed for $2.50/SF but may require significant maintenance every 2-5 years. Filbert shells may also be used at a cost of $2.25/SF and last 7-10 years before needing significant maintenance. All three of these surfaces are permeable but only crushed stone paving meets ADA standards.

WOOD MULCH

Wood mulch or wood planer shavings can be constructed at a cost of $2.50/SF but will require significant maintenance every 1-3 years. Both of these surfaces are permeable but neither meets ADA standards.

MONTGOMERY COUNTY VILLAGE TRANSPORTATION LINKS (VITL) PLANS: TECHNICAL MEMO 3

CROSSING STANDARDS

Prepared for:

MONTGOMERY COUNTY, VIRGINIA

PREPARED BY:

DRAFT – February 22, 2007

Prepared in cooperation with the U.S .Department of Transportation, Federal Highway Administration, and the Virginia Department of Transportation. The contents of this report reflect the views of the author(s) who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration, the Virginia Department of Transportation, or the New River Valley Planning District Commission. This report does not constitute a standard, specification, or regulation.

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I. CROSSING STANDARDS

Intersections are where the paths of motorists, cyclists and pedestrians converge. Every intersection contains a variety of conflict points where crashes may occur, so good intersection design requires that the paths and roles of all travelers are clear and visible.
Safe, convenient, and highly visible crossings make a multi-modal transportation system safe and usable for pedestrian and bicycle activity.

PEDESTRIAN EMPHASIS INTERSECTIONS

The VITL Plan refers to two types of crossing standards that have been developed as blue prints for bicycle and pedestrian improvements at key locations. The Pedestrian Emphasis intersection is a higher level of treatment, including changes to the physical character of the intersection as well as pavement markings and signal improvements. These changes include:

- Marked and high visibility crosswalks
- Raised crosswalks
- Curb extensions
- Chokers
- Median refuge
- Pedestrian activated signals
- Pedestrian underpass

PEDESTRIAN SUPPORTIVE INTERSECTIONS

The second type of intersection is Pedestrian Supportive, where pedestrian visibility and safety are improved over existing conditions, but bicycle, pedestrian, and automobile traffic is not sufficient to warrant a major investment. This treatment includes:

- Marked and high visibility crosswalks
- Curb extension
- Pedestrian scale lighting to illuminate waiting pads

MID BLOCK CROSSINGS

Many pedestrian crashes occur when a pedestrian attempts to cross the street at mid-block. Where such crossings are needed, a special crosswalk between intersections may be appropriate. Such crossings should be designed with signage, flashing lights and highly visible pavement markings, because motorists do not expect pedestrians at mid-block. At mid-block crossings with particularly heavy traffic, a signal warrant study may be conducted to determine if a pedestrian activated signal may be installed.

MARKED CROSSWALK

A marked crosswalk is the cheapest and most basic type of crosswalk. A marked crosswalk should be a minimum of six feet in width and is painted with non-slip, reflective, white paint or tape. (Cost: $100-$300)

Some crosswalks are angled to the right in the median. This is intended to facilitate a pedestrian's view of oncoming traffic before crossing the second half of the street..

Photo above right, by Dan Burden.

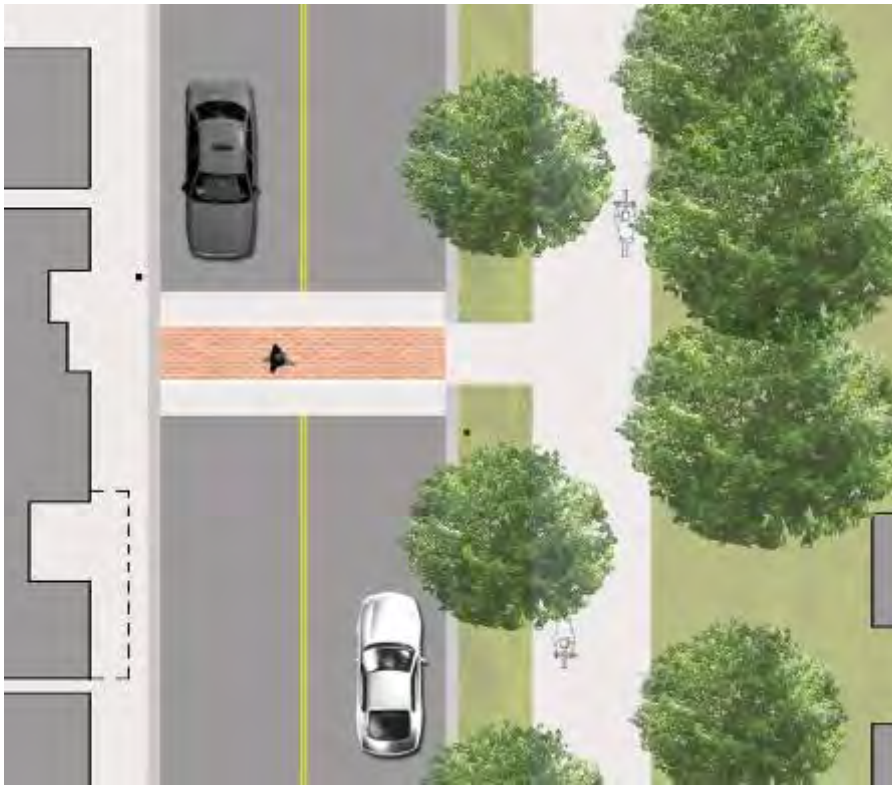
HIGH-VISIBILITY CROSSWALK

Brick, stone, or other high-visibility, textured paving materials may be used to improve the aesthetics and increase the emphasis on the importance of a crosswalk. A high-visibility crosswalk should be a minimum of six feet in width and of a non-slip surface accentuated with reflective, white paint or tape. (Cost: $3,000)

A well-defined crosswalk with brick paving and median refuge provides clear path for pedestrians. Photo above right, by Dan Burden.

RAISED CROSSWALK

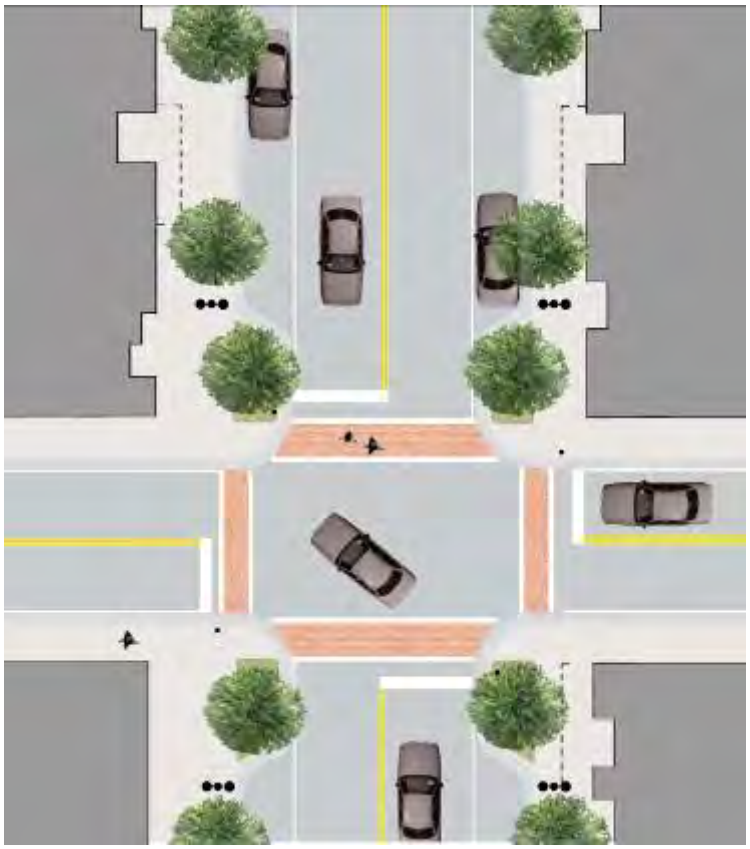
A raised crosswalk elevates either a marked or high-visibility crosswalk to a level above the road that is at-grade with the adjacent sidewalk. This design slows vehicle traffic at the crossing and increases the visibility of the pedestrian. The flat crosswalk surface is typically three-four inches above the street and 10 feet in width. The ramps on either side should be six feet long (a 1:20 slope) which reduces travel speed to about 15-25 mph. (Cost: $2,000-$15,000)



A raised pedestrian crossing provides a continuous route for the pedestrian at the same level as the sidewalk. Pavement markings may be used on the slope to make the crossing visible to motorists. Photo below right, by Dan Burden.

CURB EXTENSION

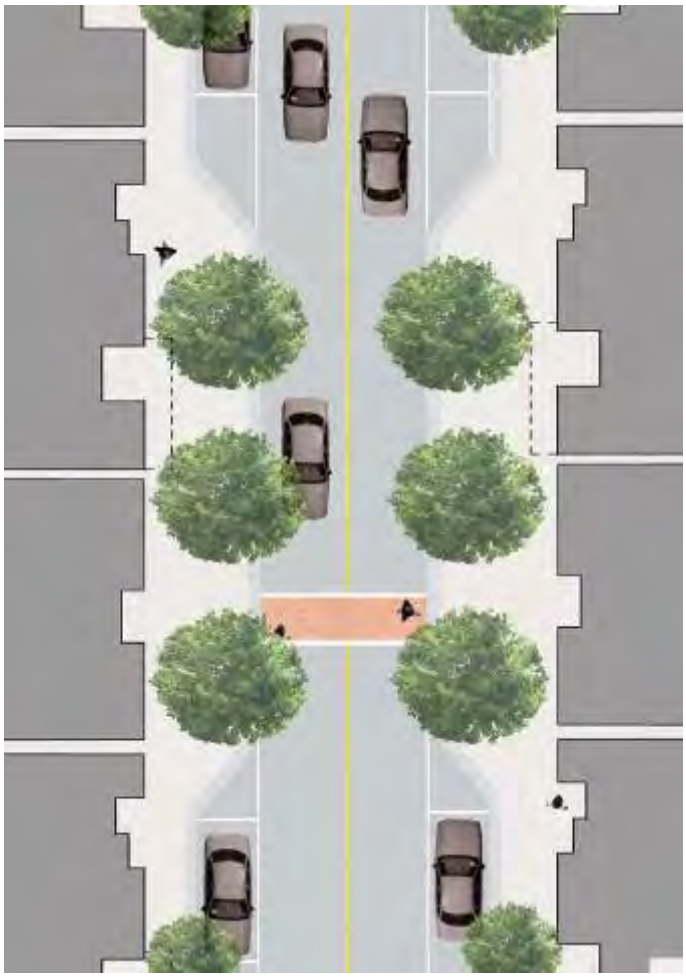
A curb extension is a way of redesigning the corner of an intersection to narrow the travel lane, shorten the pedestrian crossing distance, and decrease the speed of turning vehicles. The curb should be extended so that a 10-11' travel lane remains. (Cost: $2,000-$20,000 per corner)



Curb extensions, or bulb-outs, reduce crossing distance, and special pavement markings help to alert motorists of pedestrian crossing. Photo above right, taken in Anchorage, Alaska. by Michael King.

CHOKER

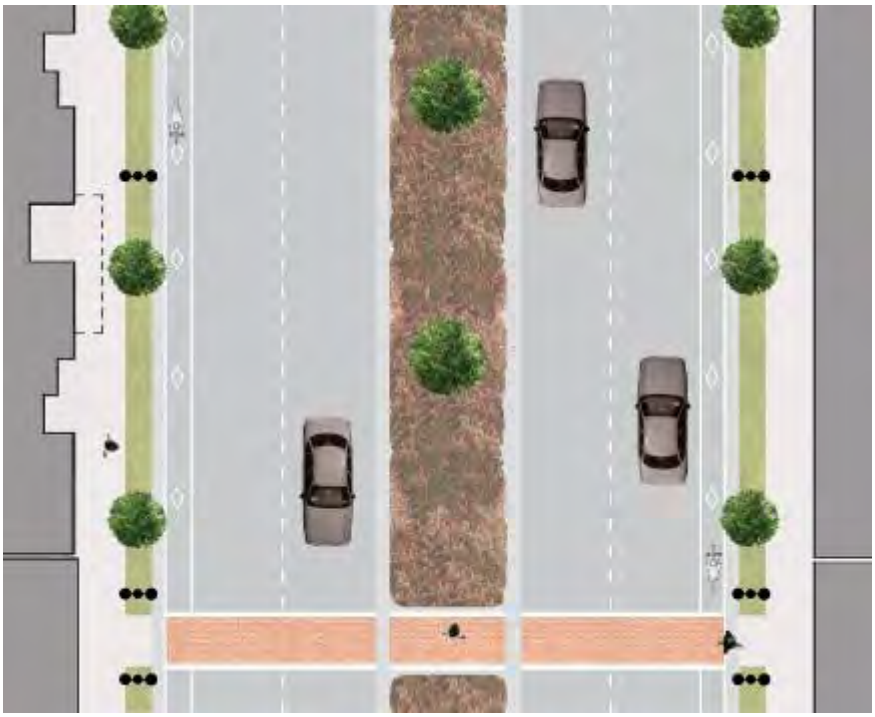
A choker is used mid-block to narrow the travel lane, shorten the pedestrian crossing distance, and decrease the speed of through traffic. The curb should be extended so that a 10-11' travel lane remains. (Cost: $5,000-$20,000)



This choker narrows the street from two lanes to one. Traffic is forced to slow down and, in some cases, wait for an approaching vehicle to pass before proceeding.
Photo below right by Michael King.

MEDIAN REFUGE

A median refuge is used at an intersection or mid-block at a crosswalk to narrow the travel lanes and reduce the need to cross both directions of traffic at one time. Trees, landscaping, bollards, or some other physical barrier should be located at both ends of a median refuge to provide extra protection for a pedestrian waiting in the median. The level of the crossing through the median should be at the same height as the adjacent crosswalk. (Cost: $4,000-$30,000)



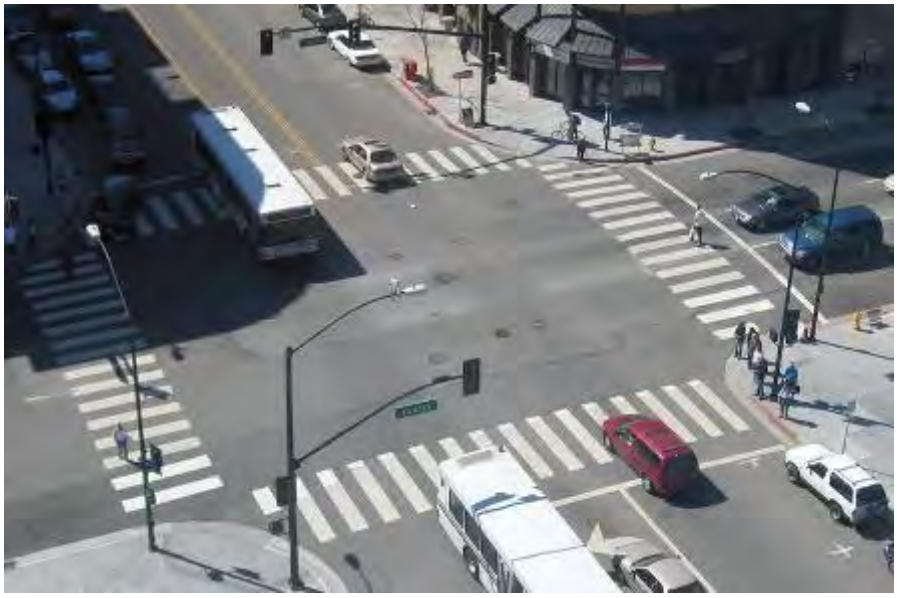
New median refuge and marked crossing provides shorter crossing distance for pedestrian.

Photo by Dan Burden.

PEDESTRIAN-ACTIVATED SIGNAL (AT AN INTERSECTION)

Pedestrian activated signals can be integrated into existing traffic signal systems at intersections. A display that counts down the time left for a pedestrian to safely cross is preferred. (Cost: $20,000-$40,000)

Pedestrians safely cross a busy intersection.



PEDESTRIAN-ACTIVATED SIGNAL MID-BLOCK

Pedestrian activated signals can be added to intersections or mid-block where heavy pedestrian-traffic is expected or where there are safety concerns. This requires standalone poles for the crossing push-button and for the vehicle traffic signals. A display that counts down the time left for a pedestrian to safely cross is preferred. (Cost: $20,000-$40,000)

Mid-block crossing allows bikers and pedestrians to cross a highly trafficked road.

PEDESTRIAN UNDERPASS

A pedestrian underpass completely separates the pedestrian from vehicle traffic but is typically very difficult and expensive to construct. Lighting, drainage, graffiti, and personal security are all issues that must be addressed with pedestrian underpasses. ADA requirements also lead to long entry and exit ramps to meet slope requirements. Studies have shown that many pedestrians will not use pedestrian bridges or underpasses because of their inconvenience and potential security concerns. Typically, pedestrian underpasses are only used as a strategy of last resort.
(Cost: $500,000-$4 million)

Boulder, Colorado.

PART 3. IMPLEMENTATION PLAN

Improving conditions for bicyclists and pedestrians in Montgomery County will require local and regional coordination, education and encouragement, as well as physical improvements. The following implementation strategy is designed to provide the County with the tools needed to effectively implement the Village Transportation Links Plan. Below is a summary of the recommendations.

COORDINATION

1. Encourage continued participation by the Citizen Advisory Committee to share initiatives to educate, encourage, and enforce safe, effective bicycle and pedestrian transportation.
2. Adopt and use bike and pedestrian design guidelines to support development review.
3. Increase coordination and expand facilities and programs to specifically encourage bicycle tourism.
4. Establish a committee with County staff and school board representatives to promote Safe Routes to School through infrastructure improvements, educational and encouragement programs, and enforcement of laws designed to promote safe pedestrian and cycling conditions.
5. Coordinate planning efforts with the Towns of Blacksburg, Christiansburg, and Radford, as well as surrounding counties, to develop a cohesive regional network of pedestrian and cycling facilities.

EDUCATION + ENCOURAGEMENT

1. Conduct community-wide encouragement programs for bicycling and walking on an on-going basis.
2. Implement a bicycle and pedestrian safety education curricula into elementary and middle schools throughout the region
3. Launch a corridors to campus initiative to support walking and biking to University campuses around the region
4. Develop educational and encouragement materials and events to promote student bicycling to and around local colleges and universities.
5. Coordinate with the region's major employers to distribute share the road and bicycling safety educational materials, and to develop encouragement programs to increase bicycle commuting
6. Utilize local cycling groups as avenues for community based training and advocacy programs

PHYSICAL IMPROVEMENTS

1. Develop a countywide wayfinding signage system, with specific treatments for the village areas, that is easily and quickly understood by cyclists and pedestrians using the village Transportation links system

2. Focus short-term efforts on implementing the demonstration projects identified within each Village.
3. Seek funding to initiate a Safe Routes to School program
4. Plan the installation of bicycle and pedestrian facilities, where feasible, as part of all new road construction, resurfacing, streetscape and traffic calming projects.
5. Negotiate with developers to incorporate recommended projects into site plans or as off-site mitigation.
6. Undertake routine maintenance of the bicycle and pedestrian network facilities, such as sweeping, repainting pavement markings, and repairing infrastructure.
7. Link bicycle and pedestrian facility improvements with the Town of Blacksburg's existing and planned transit services to better connect residential areas in the county with Virginia Tech, downtown Blacksburg, and other destinations within the Town
8. Create a unified pedestrian and bicycle network that provides continuous facilities linking village areas and major activity areas countywide, with the Town of Blacksburg, Town of Christiansburg and City of Radford.
9. Consider implementing "livable street" standards that encourage safe and comfortable walking and biking through improved site design and lower speed limits. A street with a 35 mph speed limit and buildings set close to the street will typically provide a more pleasant pedestrian environment than a street with a 55 mph speed limit and buildings set well back from the street. Changes to street and site design may help encourage walking and biking as much or more then constructing sidewalks and bike lanes.

FEASIBILITY ANALYSIS

In order to implement the recommended projects, a number of questions regarding the feasibility of each project will need to be answered. These include:

Is the project cost-effective and is funding available? The County should identify opportunities to reduce the cost of implementation by including pedestrian and bicycling projects as a component of roadway projects that are planned for construction. There may also be opportunities to negotiate with developers to include pedestrian and bicycling projects into site plans, developer-constructed streets, or as off-site mitigation. For publicly funded projects, the "Potential Funding Sources" section identifies a number of State and Federal programs that provide funding for bicycle and pedestrian process, most often in the form of grants.

Will the project fit within the existing right-of-way, or can the County acquire right-of-way for the project? Projects where right-of-way is already available or where voluntary easements can be acquired will typically be the cheapest and easiest projects to implement. Where right-of-way is constrained or expensive to obtain, the County should investigate alternative alignments that could be used to meet the same

objective, or consider narrowing the proposed project to better fit within the available right-of-way.

Does the project further the development of a cohesive system of pedestrian and cycling facilities? While certain isolated projects can provide benefits by themselves, the County should focus on implementing projects that tie into existing pedestrian and bicycling facilities in order to further the benefit these existing facilities provide.

Additional Considerations

Right-of-way, environmental, historical, and funding constraints, as well as the political climate, must all be considered during the planning process to ensure that implementation of the plan is actually feasible. For example, land acquisition costs and historical and environmental impacts need to be carefully considered to determine the feasibility of a project.

PHASING SCHEDULE AND RESPONSIBLE PARTIES

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
COORDINATION			
Citizen Advisory Committee	County staff coordinates, with volunteer participation from network members	Develop strategic plan, begin regular meetings, report to MPO in July?	Continue regular meetings, outreach efforts, and implementation, annual MPO report in July **Performance measures**: Completion of strategic plan by 2007. Begin implementing key recommendation.
Bike and pedestrian design guidelines for development review	County staff	Adopt VITL plan; establish developer review criteria; begin reviewing proposals	Construction of bicycle and pedestrian facilities in new development **Performance measures**: All new development includes bicycle and pedestrian facilities. Completion of strategic plan by 2007. Begin implementing key recommendation.
Bicycle Tourism	MPO; Local governments Chamber of Commerce; County staff	Prepare a bicycle tourism marketing plan by 2007. Implement key recommendations by 2008.	Distribute information to tourist bureaus, hotels, youth hostels, and regional travel magazines. Identify self-guided bike tours. Feature information on Web sites. **Performance measures**: Distribute bicycle touring and rental information to 50 – 100 locations per year, beginning in 2008. Identify 3 – 5 self-guided bike tours in 2008. Feature information on bicycle touring and rental on 3 – 5 Web sites by 2008.
Safe Routes to Schools Committee	Montgomery County Schools; County staff & MPO	Establish task force of teachers, parents & students; review previous efforts and national resources, create action agenda, and secure funding to launch program at one school.	Continue securing grant funding to provide safe access to all schools in the County **Performance measures**: Grant funding secured for 3 projects.

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Local Governments	MPO, Montgomery County, Town of Blacksburg, Town of Christiansburg, City of Radford, Pulaski County, Roanoke County	Establish regional coalition; agree to regional network of pedestrian + cycling facilities	Continue regular meetings; pursue funding opportunities Performance measures: Semi-annual meetings with the regional coalition.
EDUCATION + ENCOURAGEMENT			
Community-wide encouragement programs	CAC	Develop media outreach plan including development of regional bicycling website. Website could include maps of on-road and off-road facilities, recommended touring routes, resources such as bicycle shops, bike clubs, and a calendar of events	Increase bicycle and pedestrian activities and programs as part of local and nationally sponsored events such as Commuter Choices Week, Walk to School Day, and Bike to Work Day. Performance Measure: Issue 3 – 5 press releases per year, beginning in 2007
School Bike/Pedestrian Safety Coordinator	Montgomery County Schools	Designate and fill half time staff position (existing or new staff)	Staff member initiates and coordinates school-based programs Performance Measure: Incorporate bicycle skills training into appropriate school curricula by 2008.
Classroom & Experiential Education Events & Activities	School Bike/Pedestrian Safety Coordinator	Build and distribute resources to teachers throughout system (Master Plan Teachers Resource Guide provides starting point)	Projects and activities incorporated into regular curricula and events Performance Measures: Train 150 elementary school students per year by 2009, increasing to 500 elementary school students by 2015.
Corridors to Campus Initiative	CAC, University officials. MPO	Discuss approach and desired outcomes of Initiative; secure funding through capital investments and program budgets	Identify, evaluate and prioritize cost effective strategies to support walking and cycling to and from each university; Performance Measures: Implement at least three projects by 2010.

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Commuter Programs	CAC, County staff, Chamber of Commerce, Town of Blacksburg, Town of Christiansburg; City of Radford, Local employers	Develop "Share the Road" and Bicycling safety educational materials for working age adults; Work with local employers to and fitness centers to improve bike lockers, bike parking, and showers for those who commute to work by bike or on foot	Establish an annual Bike to Work day. Distribute publications, provide incentives to participate, and stage workplace education sessions. Survey the participants and workplaces, to determine how to make the event more successful. Track participation to determine air quality benefits. Prepare an annual report with recommendations to improve the program, beginning in 2008; Hold event annually **Performance Measures:** 5000 participants in 2008; increasing to 10,000 by 2010.
Community-based training and advocacy	CAC, NRVBA and other local bike clubs	Promote VITL plan through bike group newsletters and electronic listservs; Assist in the development of route maps	Organize volunteer led commuter cycling courses; Secure funds for educational campaign including publicity & events Conduct campaign Performance Measures: Hold 5 commuter cycling courses by 2012
PHYSICAL IMPROVEMENTS			
Village Transportation Wayfinding Signage & Map Guide	CAC, Planning Department, Parks and Recreation	Develop route map and downtown signage system (use PR firm to assist with guide design & sign logos); program funds for implementation.	Publish & distribute guide, complete signage improvements. Performance Measures: Route guide completed and all routes signed by 2012
Demonstration Projects	Representatives from villages, CAC; County staff; VDOT	Organize task forces within each village to identify funding sources for implementation; conduct any additional study necessary for implementation; secure easements where necessary	Secure funding and begin construction Performance Measures: 3 demonstration projects under construction by 2012

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Bicycle and pedestrian facilities with road construction	County Planning Department, VDOT	Monitor county and state bridge and underpass construction projects to ensure that adequate accommodation for bicyclists and pedestrian is provided; Provide through access whenever building new streets, planned developments, cul-de-sacs, and traffic calming projects; Make new and reconstructed intersections bicycle-friendly wherever possible	Ongoing monitoring and coordination **Performance Measures**: Increase miles of bicycle lanes and sidewalks that are constructed.
Bicycle and pedestrian facilities with new development	County Planning Department	Establish connectivity standards for new development and redevelopment and apply to site plan review process.	Ensure that trails built as a condition of development approval are designed and built to appropriate standards. Ensure that trails are the appropriate width and safely connect to the street network and/or existing trails. **Performance Measures**: Apply trail standards and establish a monitoring process by 2007.
Routine Maintenance	County staff, VDOT	Inspect the bike lane network 3 – 4 times per year, issuing work orders to address maintenance issues. Sweep streets with bike lanes at the same frequency as the sweeping of arterial streets.	Ensure safety through routine maintenance, including regular inspections, replacing worn pavement markings and bike symbols, replacing damaged signs, sweeping away debris, repaving streets, and repairing potholes. **Performance Measures**: Maintenance schedule upheld.

END PRODUCT	LEAD AGENCY(IES)	YEAR ONE GOALS/ ACTIVITIES	YEAR 2-5 GOALS/ ACTIVITIES
Link to Transit	County Planning Department; Town of Blacksburg; Town of Christiansburg	Identify priority stations to serve safe, convenient routes; Develop a Bike to Blacksburg Transit signage program	Implement bike lanes that service where appropriate. **Performance Measures:** Establish new or enhanced bikeways to 5 transit stations by 2015 and to an additional 10 transit stations by 2030.
Link activity centers	County Planning Department, Town of Blacksburg, Town of Christiansburg, City of Roanoke, CAC, Safe Routes to Schools Committee, Friends of the Huckleberry Trail	Conduct inventory of bicycle parking at key destinations (schools, parks, libraries, transit stops, community centers, shopping centers, office parks, etc); Sign all routes linking important destinations	Prioritize bikeways/walkways to elementary schools, high schools, colleges, and universities; improve access to the Huckleberry Trail and other popular trails; Connect Blacksburg, Christiansburg and Radford; Provide bicycle parking at key destinations within the County; Continue to identify key local connections that support the VITL plan. Performance Measures: Construct bicycle parking at 5 destinations by 2008, Construct bicycle parking at 5 destinations annually; Increase miles of streets/trails between Christiansburg, Blacksburg and Radford by 2012, Create 5 new access points to the Huckleberry Trail by 2012
Livable Streets	County staff, VDOT	Work with VDOT to establish "livable street" guidelines for major arterials. Potential improvements include, where appropriate, lower speed limits, curb extensions, striping, planted medians, textured crosswalks, and gateway treatments. Building site design should also be considered. All improvements should accommodate emergency, snow removal, and mass transit vehicles.	Implement measures on selected village arterials to reduce speeding and encourage bicycling and walking. **Performance Measure:** Test measures at 3 bikeway locations by 2012.

POTENTIAL FUNDING SOURCES

There are various means through which bicycle and pedestrian recommendations can be funded, including:

- Safe routes to school
- Transportation enhancements
- Safety programs
- Air quality programs
- Road construction
- Private development

A number of the actively funded programs are described below:

Safe Routes to School

Purpose	This program establishes a federally funded grant program providing communities with the opportunity to improve bicycling or walking to school in grades K-8.
Funding	*70% to 90% allocated to Safety Improvement Project Grants* *$500,000 maximum for project grants (per application)* *25,000 maximum for SRTS program grants (per locality or school division)* All grants provide 100 percent federal funding with no local match required.
Eligible Projects	Program Grants are to develop documented SRTS plans and programs at schools or school divisions Project Grants are intended to provide infrastructure improvements within a two-mile radius of targeted schools
Eligible Applicants	Schools, Cities, Counties, Public and non-profit entities working on behalf of schools, Metropolitan Planning Organizations
Contact	Jakob Helmboldt; jakob.helmboldt@vdot.virginia.gov, (804) 225-3269; Safe Routes to School coordinator, VDOT Traffic Engineering Division

Transportation Enhancement Program

Purpose	This program is an initiative to focus on enhancing the travel experience and fostering the quality of life in American communities
Funding	Up to 80% of a project can be financed with federal funds. A local match of at least 20%, from other public or private sources, is required. Local matches may be in-kind contributions including tangible property, professional services and volunteer labor This is a reimbursable program
Eligible projects	Pedestrian and bicycle facilities such as sidewalks, bike lanes and shared use paths Pedestrian and bicycle safety and educational activities such as classroom projects, safety handouts and directional signage for trails Preservation of abandoned railway corridors such as the development of a rails-to-trails facility
Eligible applicants	Any local government, state agency, group or individual may apply to the program. All projects need to be formally endorsed by a local jurisdiction or public agency.
Contact	Transportation Enhancement Program Staff, VDOT Local Assistance Division www.VirginiaDOT.org, "Programs" section

Bicycle and Pedestrian Safety Program

Purpose	This program was developed to implement safety projects addressing bicycle and pedestrian crashes or the potential for such crashes, with evaluations based on risk and applications competing with like projects.
Funding	Up to 90% of a project can be financed with federal funds A project must have a minimum 10% match
Eligible projects	Construction of on-street facilities and shared use paths Development of treatments for intersections Installation of signs and pavement markings
Eligible applicants	State and local agencies may apply to the program
Contact	VDOT Mobility Management Division –HSIProgram@vdot.virginia.gov 804-786-9094

Virginia Recreational Trails Fund Program

Purpose	This grant program was established to provide and maintain recreational trails and trails-related facilities.
Funding	Up to 80% of a project can be financed with federal funds. A project must have a minimum 20% sponsor match This is a reimbursable program
Eligible projects	Build new trails Restore damaged existing trails Develop trailside and trailhead facilities Provide feature to facilitate access and use by people with disabilities
Eligible applicants	Any local government, government entity, or private organization may apply to the program Federal government entities may be eligible if teamed with private trail groups and organizations
Contact	Virginia Recreational Trails Fund Program, Department of Conservation and Recreation 804-786-3218 or 804-786-4379 www.dcr.virginia.gov, "Outdoor Recreation Planning

Rural Transportation Planning Program

Purpose	This program provides funds to planning district commissions to carry out transportation planning for rural areas.
Funding	Federal funds finance 80% of program activities and grants A match of at least 20% from a planning district commission or locality is required
Eligible projects	Bicycle and pedestrian planning, greenway planning
Eligible applicants	Planning district commissions
Contact	Peggy Todd; peggy.todd@vdot.virginia.gov; 804-371-3092 VDOT Transportation and Mobility Planning Division

Highway Construction Program

Purpose	This program provides funding for the preliminary engineering, right of way acquisition, and construction of highway projects.
Funding	No local match is needed for projects on primary and secondary system roads. A 2% local match is required for projects on urban system roads
Eligible projects	Bicycle and pedestrian accommodations can be built as part of highway projects Bicycle and pedestrian accommodations can be built as individual projects, separate from the construction of highways, either on highway or independent right of way
Contact	VDOT district offices – www.VirginiaDOT.org

Recreation Access Program

Purpose	This program provides bicycle access to public recreational facilities or historic sites operated by a state agency, a locality, or a local authority, either with an access road or on a separate bicycle facility.
Funding	This program uses state funds only. Up to $75,000 may be awarded for bicycle access to a facility operated by a state agency. Up to $60,000 may be awarded for bicycle access to a facility operated by a locality or local authority, with a $15,000 match.
Eligible projects	Construction, reconstruction, maintenance, or improvement of bikeways.
Eligible applicants	A governing body of a county, city or town may make an application to this program
Contact	Hugh Adams, 804-786-2744, hugh.adams@vdot.virginia.gov VDOT Local Assistance Division

APPENDICES:

TECHNICAL MEMO 1: EXISTING CONDITIONS

TECHNICAL MEMO 2: TRAIL DESIGN STANDARDS

TECHNICAL MEMO 3: CROSSING DESIGN STANDARDS

MONTGOMERY COUNTY VILLAGE TRANSPORTATION LINKS (VITL) PLANS: TECHNICAL MEMO 1

Prepared for:

MONTGOMERY COUNTY, VIRGINIA

PREPARED BY:

RENAISSANCE PLANNING GROUP

November 7, 2006

Prepared in cooperation with the U.S .Department of Transportation, Federal Highway Administration, and the Virginia Department of Transportation. The contents of this report reflect the views of the author(s) who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration, the Virginia Department of Transportation, or the New River Valley Planning District Commission. This report does not constitute a standard, specification, or regulation.

Federal Highway Administration or Virginia Department of Transportation acceptance of the report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

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INTRODUCTION

In October of 2004, the Montgomery County Board of Supervisors approved a new Comprehensive Plan, which designated seven Village/Village Expansion Areas throughout the County (Belview, Plum Creek, Prices Fork, Riner, Shawsville, Elliston, and Lafayette). These villages are rural communities, where limited mixed use development has historically occurred and public utilities are available, and are intended to accommodate a significant share of the future development in the unincorporated areas of the County. Throughout the comprehensive planning process, County residents identified the need for developing non-motorized transportation networks (bikeways, sidewalks, trails) in an effort to reduce traffic congestion, increase travel options, and enhance daily life for village residents.

The purpose of the Village Transportation Links (VITL) Plans is to develop a comprehensive Bicycle, Pedestrian, and Greenways Master Plan for each of the villages designated in the 2004 Montgomery County Comprehensive Plan. As an element of the Comprehensive Plan, the Village Transportation Links (VITL) Plans will build a vision for non-motorized transportation access and mobility within and between each of the County's designated villages. VITL Plans will enhance transportation by providing both local and regional links that enable residents to use non-motorized transportation for trips to school, parks, and local businesses, as well as commute to nearby centers such as Blacksburg, Christiansburg, and Radford. Additionally, a non-motorized transportation network will reinforce the sense of community and support more compact land development within each village.

Upon completion, the plan will identify specific improvements and implementation priorities for an interconnected network of bicycling and walking facilities that complements each Village's and the County's overall transportation system. This will include an overall Connectivity Framework plan that shows linkages between the Villages and connections to the regional trail and bike route network, as well as design standards and appropriate cross-sectional and construction standards for each linkage and trail segment.

It is intended for this plan to be incorporated into the Comprehensive Plan through the formal plan amendment process. The VITL plan will be adopted as a chapter to the Comprehensive Plan and cross-referenced with the Village Plans, and with the Parks and Recreation, and Transportation chapters. Furthermore, the VITL planning effort, along with the work of the appointed Citizen Advisory Committee, will serve as a foundation for future policy and implementation directives that deal with non-motorized transportation in Montgomery County.

This memo summarizes the data and information compiled during the first task of the Master Plan process. The completion of Task 1 (Project Initiation and Inventory/Analysis) required assembling an inventory of existing and planned bicycle, pedestrian, and greenway

facilities, and reviewing current conditions within the County, as well as documents and initiatives for promoting local and regional connectivity.

COUNTY PROFILE

Montgomery County is located in the New River Valley in the southwestern part of Virginia, about 35 miles southwest of the City of Roanoke. The county is bordered by Craig County to the north, Floyd County to the south, Giles County to the northwest, the City of Radford and Pulaski County to the southwest, and Roanoke County to the northeast. The County's 393 square miles lie between the Appalachian Plateau and the Blue Ridge Mountains and encompass the Towns of Blacksburg, home to Virginia Tech, and Christiansburg, the County seat. In addition, the County is split by the Continental Divide, which creates a topography that varies from narrow valleys with moderately steep ridges to the east to gently rolling hills to the west. This setting provides an abundance of natural beauty, cultural attractions, and historic assets for its residents to enjoy.

The population of Montgomery County has been expanding since 1960, reaching about 87,900 in 2005. Rapid growth took place from 1965 to 1980, coinciding with Virginia Tech's change from an all male military institution to a co-ed university. In the decade between 1980 and 1990, the Center for Public Service considered Montgomery County the fastest growing locality in Southwest Virginia. Since that time, the County has witnessed more steady growth, which may be attributed to stabilizing enrollments at Virginia Tech. The average annual growth rate growth decreased to 1.3 percent from 1990-2000 (down from 4.4 percent from 1960-1970), which mirrors state growth rates for the same decade. In absolute numbers, however, growth in Montgomery County has outpaced all of the surrounding jurisdictions. The population distribution within the County, however, has remained fairly consistent with about two-thirds of the County's total population located in the towns of Blacksburg and Christiansburg, and the remaining one-third located in the unincorporated area of the County. It is expected that the population will continue to grow at slightly more than 1 percent average annual growth until 2030, increasing the population by 25,000 in the County as a whole and adding 6,000 to 8,000 more persons in the unincorporated area.

This growth has significant implications on mobility within the County. Montgomery County has witnessed sprawling growth typical of counties of a similar size. Urban growth patterns are replacing farmland and the edges of the town and village boundaries are blurred by residential growth. From 1988 to 2004, unincorporated areas of Montgomery County lost over 2,800 acres of agriculturally zoned land and 185 acres of conservation zoned lands to a combination of residential, commercial, and industrial uses. Transportation access to the traditional centers of growth in the County is usually via existing major collector roads or minor arterial highways. The result of this growth has meant increased traffic on substandard roads.

In recent years, single family residential development has taken place along road frontage in rural parts of the county. Many of these developments were designed as discrete subdivisions that lack a physical integration into the place in which they were built and

contribute to a diminished sense of community. In an effort accommodate new growth and create a sense of community and interconnectedness, the County has designated Urban Expansion areas adjacent to Blacksburg, Christiansburg, and Radford, and the Villages/Village Expansion Areas of Belview, Elliston, Lafayette, Plum Creek, Prices Fork, Riner, and Shawsville (Figure 1). These Villages/Village Expansion Areas will build upon the traditional street network of the existing villages and will be designed to accommodate pedestrians, as well as vehicles. By encouraging growth in designated areas, and creating villages with civic and commercial focal points, the County has a unique opportunity to ensure that mobility and access can be achieved without having to rely on a vehicle.

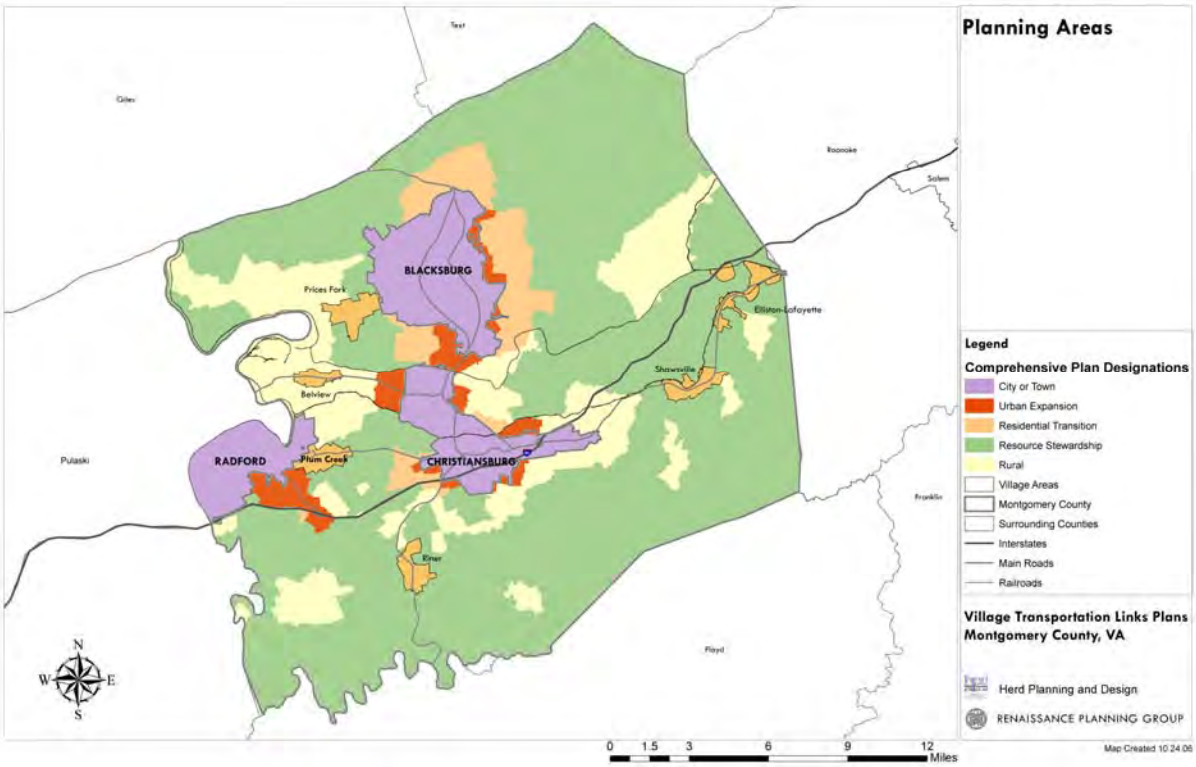


Figure 1 Planning Areas as identified in Montgomery County Comprehensive Plan

Despite the appearance of significant residential development, the County remains primarily rural. Nearly 60 percent of Montgomery County is forested, and about seven percent of this forest land lies in the Jefferson National Forest. There are also significant rural lands under state, religious, and charitable ownership, including the Pedlar Hills Natural Area Preserve and Nature Conservancy Lands. As a result, many of these natural features are preserved from future development, and present opportunities for trail and greenway connections that can provide both recreational and environmental benefits to County residents.

COMMUNITY AND ECONOMIC FOCAL POINTS

The majority of business and industrial areas are located either in or in close proximity to Blacksburg and Christiansburg, or in the 177 Corridor between the city of Radford and Carilion Hospital adjacent to I-81. The notable exceptions are the Elliston/Lafayette Park, located next to US 460/ Rt. 11, at Elliston, and Rowe Furniture, across the South Fork at Lafayette. In addition, small business districts are located in the villages (Riner, Elliston, Shawsville, and Prices Fork) and along specific corridors (Rt. 11 at Plum Creek, Rt. 114 at Belview, and Rt. 460/Rt. 11 at Lafayette). These commercial areas provide important neighborhood services, ranging from convenience stores and small delis to auto body shops. While many of these small business districts do not provide all the services necessary to sustain any one Village, they nevertheless can be accessed without getting in the car and can serve as a community focal point for the VITL plan.

Regional links to nearby population centers (Blacksburg, Christiansburg, Radford, central Pulaski County, Roanoke, and Giles) are also important to consider, as they have the potential to provide a commuting alternative. An example is the off-road Huckleberry Trail currently linking Blacksburg to Christiansburg. According to the Virginia Employment Commission, Montgomery County has 29,589 workers who both live and work in Montgomery County (79.1 percent of County residents). With a high number of workers who live and work in the County, a County-wide bike or trail system has the potential to remove a reasonably large share of commuter traffic from the roadway network. The majority of the remaining workers commute to Pulaski County, the City of Radford, and Roanoke, all of which have plans to expand their existing network of trails to connect to Montgomery County. Connections to Giles and Floyd County are also important, as a high percentage of workers from those counties commute to Montgomery County for employment. Additionally, links to regional facilities, such as the New River Trail, Roanoke Valley Greenways, New River Blueway, Appalachian Trail, Pandapas Pond, and the Bicentennial Bike Route 76 will provide tourism and recreation opportunities.

Historically, Montgomery County has not actively promoted tourism, although results from the comprehensive planning process suggest strong support for an expansion of the industry, especially in terms of agricultural, historical, and eco-tourism. Montgomery County and the New River Valley provide many scenic routes for cycling. The Blacksburg Bikeway and Walkway, the Huckleberry Trail, and the TransAmerica Bike Route are among a few. The Town of Blacksburg has served as both a host site and finishing site for Tour DuPont, America's premier cycling event. In addition, there are a number of natural features, recreational resources, cultural and historical facilities, and community points of interest throughout the County that could serve as important focal points for tourism. Figure 2 identifies several of these facilities, such as historic districts, natural resources, recreational facilities, etc.

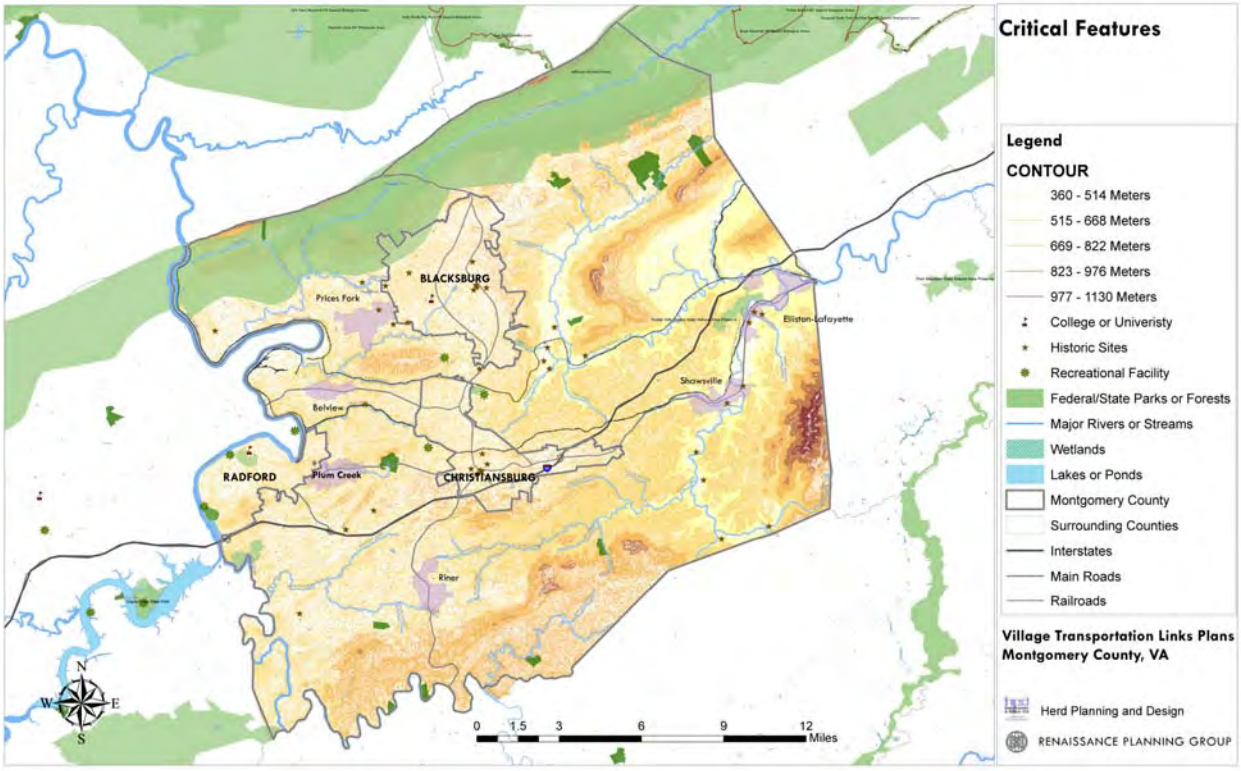


Figure 2. Critical Features

EXISTING BICYCLE AND PEDESTRIAN FACILITIES

Only two miles of off-road or multi-use trails exist in the unincorporated areas of Montgomery County and comprise the County-owned portion of the Huckleberry Trail. While a portion of Bike 76, a transcontinental bike route, passes through the County, only two bike facilities currently exist in the County. These consist of paved shoulders along Route 723 between Lusters Gate and Ellett (part of the Bike 76 route) and Route 685 connecting Blacksburg and Prices Fork. Pedestrian facilities are also limited and exist along the Huckleberry Trail, as well as within some private developments (not shown). A handful of narrow sidewalks can also be found in the historic village cores. Figures 3 and 4 show the existing bicycle and pedestrian facilities within the County.

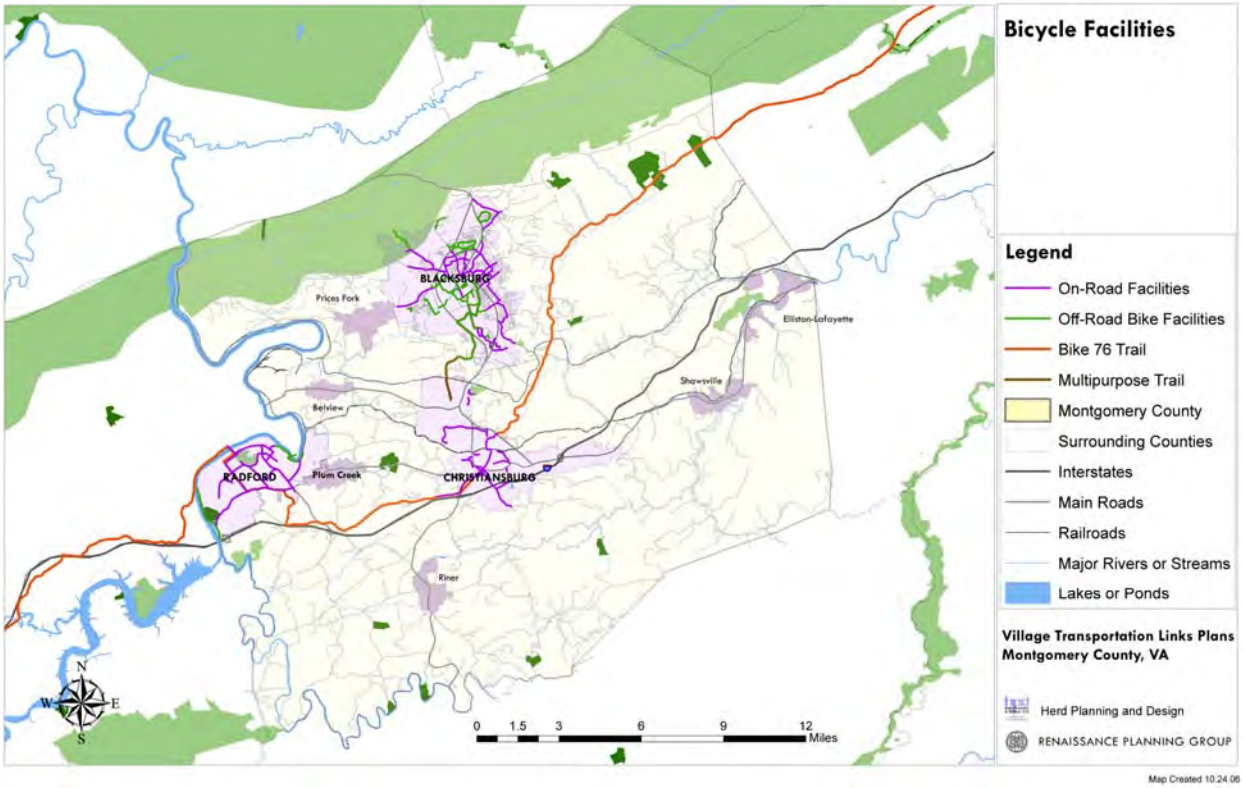


Figure 3: Existing Bicycle Facilities

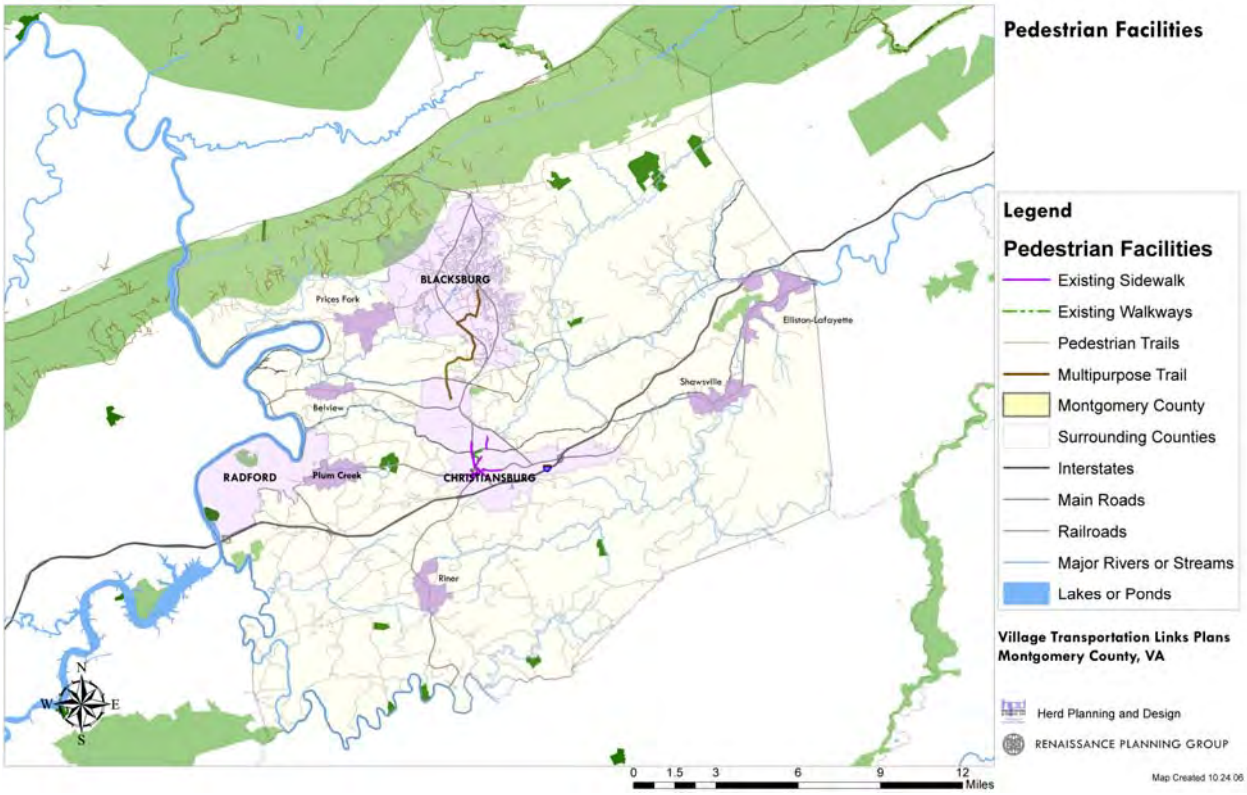


Figure 4. Existing Pedestrian Facilities

The lack of public non-motorized transportation facilities within the County is due in large part to the large number of recreational facilities that exist in the surrounding areas. Trails in Blacksburg, Christiansburg, the Appalachian Trail, Blue Ridge Parkway trail systems provide numerous hiking opportunities within close proximity to Village Areas. In addition. Claytor Lake State Park, Cascades Waterfalls, the Jefferson National Forest, the Nature Conservancy Falls Ridge Preserve and Pandapas Pond also provide significant hiking and recreational facilities for Montgomery County residents. The New River Trail in Pulaski County,Radford's Riverfront Trail and Greenway, and the Roanoke Valley Greenway have existing networks and plans to expand their trail system to connect to Montgomery County and the Huckleberry Trail (see Figure 5).

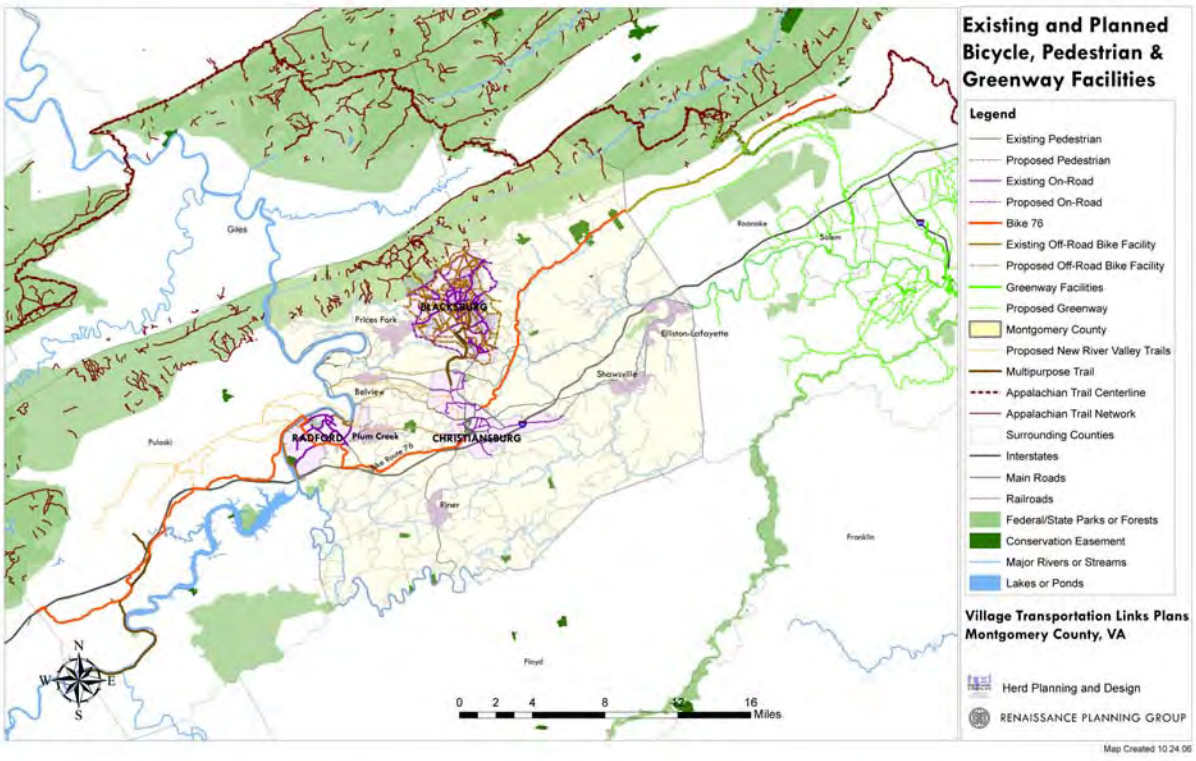


Figure 5. Existing and Planned Bicycle and Pedestrian Facilities

POLICIES AND PROGRAMS

Planning for non-motorized modes of transportation in Montgomery County has always taken place within the context of regional efforts. The first planning efforts began in 1974 as part of a comprehensive bike plan prepared by the New River Valley Planning District Commission. This plan paralleled the Blacksburg Bicycle Trail Study and the 1975 document entitled the Blacksburg Bikeway System. Both of these documents were intended to address the increasing population of student cyclists at Virginia Tech. The regional

interest in bicycle planning was also reflected in the creation of the Bicentennial Bike Route (also known as US Bicycle Route 76), a transcontinental signed bike route that passes through Montgomery County between Yorktown, Virginia and Astoria, Oregon.

Despite the number of planning efforts during this time, it was not until 1990 when the County officially developed and adopted a Bikeway/Walkway Plan to address the transportation needs of its growing population. The plan focused on population centers, commuter links, parks and recommendations from the Blacksburg Plan as the basis for the routes, and carefully considered the costs involved in their route proposals (i.e. designating "shared roads" that were already safe for cyclists, and coordinating additional "lanes" and "trails" with Virginia Department of Transportation's Six Year Road Plan).

The most notable result of the 1990 Bikeway/Walkway Plan was the creation of the Huckleberry Trail, an off-road, multipurpose trail that lies along an abandoned railroad bed, paralleling Rt. 460 between Christiansburg and Blacksburg, and connecting the two population centers. Other accomplishments were the addition of paved shoulders along Rt. 723 between Lusters Gate and Ellett, and along Rt. 685 between Blacksburg and Prices Fork. There are current plans under development to extend the Huckleberry Trail south into Christiansburg and north to the Jefferson National Forest. The New River Valley Planning District Commission is also evaluating the possibility of connecting the New River Trail in Pulaski County through the City of Radford to Plum Creek, Belview, and east to the Huckleberry Trail.

Cycling, pedestrian, and greenway needs continued to be addressed through a combination of local and regional Comprehensive Plans and Bicycle, Pedestrian, and Greenway Plans. A summary of these plans is included below:

One of the primary goals of the current **Montgomery County Comprehensive Plan** is to support the development of non-motorized modes of transportation in an effort to reduce traffic congestion and provide safe routes for non-motorized travel. These non-motorized transportation networks should be linked with other local and regional bikeway/walkway systems, as well as population centers (i.e. City of Radford, Blacksburg, Christiansburg), employment centers (business/industrial parks), major shopping areas, parks, and schools. To accomplish this vision, the Comprehensive Plan includes the following provisions:

- Within Urban Expansion Areas, Village Areas and Village Expansion Areas, new roads and road improvements should be designed to accommodate pedestrians and should include design elements that create comfortable and safe pedestrian access between sites and along sidewalks (PLU 1.6.5c, PLU 1.7.4d); and
- Rezoning proposals must include provisions for pedestrian mobility within the site and safe and convenient connections for pedestrian traffic to adjacent sites, public roadways and trails (PLU 2.1f).

The **New River Valley Bikeway-Walkway-Blueway Plan 2000** encourages a non-motorized and intermodal transportation system for the region (Floyd, Giles, Montgomery, and Pulaski Counties, the City of Radford, and the towns for Blacksburg, Christiansburg, Dublin, Floyd, Glen Lyn, Narrows, Pearisburg, Pembroke, Pulaski and Rich Creek). The plan includes nine policy statements to support their vision for the New River Valley. Among these:

- All road design within the New River Valley should include additional width for non-motorized uses (14 foot outside lanes are suggested);
- New residential, commercial, and industrial development in the New River Valley should propose non-motorized transportation facilities that supplement the proposed Bikeway-Walkway-Blueway system;
- All agencies in the region should promote the New River Valley as a place that is safe and enjoyable for cyclists, canoeists and pedestrians; and
- All County, City and Municipal jurisdictions should be encouraged to endorse the Plan and should be encouraged to adopt a local Bikeway-Walkway-Blueway plan into their respective comprehensive plans.

The **Town of Blacksburg** has a history of commitment to the development of a multi-use trail system. In addition to the bicycle planning efforts initiated in the 1970s, the County developed a Sidewalk and Curb and Gutter Policy to provide guidance in the further development of the sidewalk system. The town has an on-going program of constructing and improving sidewalks, and the Subdivision Ordinance requires installation of sidewalks in all new subdivisions. The Town has also created a **Bikeway/Greenway Master Plan** as part of its 2001 Comprehensive Plan. The greenway system is an outgrowth of community interest in conservation of natural resources, exercise and outdoor recreation, and viable alternatives to motorized transportation. As part of the plan, the Town completed a trail connecting Meadowbrook Drive to Jefferson National Forest and began construction on the North Main Street Trail (Patrick Henry Drive to Wyatt Farms). A number of other routes have been master planned, such as the Central Blacksburg Greenway, Cedar Run Greenway, and the Ellet Loop Trail. The Town has also partnered with Virginia Tech on the Hethwood Trail Extension and a Stadium Trail.

The **Office of Transportation at Virginia Tech** has been awarded funding through federal transportation enhancement grants for three phases of a bicycle pathways project called the "**Hokie Bikeways,** " which includes bike paths, bicycle safety classes, and instructional/safety brochures developed to promote bike use on campus. Phase I added bike lanes on West Campus Drive, connecting the Washington Street Shared Pathway to the Duck Pond Trail. Construction of Phase 2 began in the spring of 2006 (about 75% complete) and once complete with provide a trail connecting the Washington Street Shared Pathway up to the Cranwell International Center and then down to the Southgate Drive Huckleberry Trail Spur. Virginia Tech is in the process of submitting final plans to VDOT for Phase 3 of the project, and has partnered with the Friends of the Huckleberry and the Town of Blacksburg to secure additional funding for the final phase of the project, which

connects the Smithfield Trail to the Huckleberry Trail. In addition to their bicycle planning efforts, Virginia Tech could potentially provide public access on their lands, such as the Fishburn Tract, for additional joint trail planning projects.

The **City of Radford** has focused its bike and pedestrian planning efforts along the waterfront. As recommended in the **Comprehensive Open Space Master Plan** (1990 and 2001 Update), the City of Radford, Pathways for Radford, and Radford University have worked together to "create an interconnecting and cohesive network of open spaces that would create a greenbelt . . . [with] green fingers that extend into its interior." They hope to establish a network of bicycle facilities and walkways connecting schools, businesses, residential areas, and the university, and restore trail access and the popular appeal of Wildwood Park, a 47-acre woodlands located in the center of the city.

The **Roanoke Valley Conceptual Greenway Plan** was developed in 1995 and was adopted by Roanoke City, Roanoke County, Salem, and the Town of Vinton. Following development of the plan, the four jurisdictions, working with the Roanoke Valley Alleghany Regional Commission (RVARC), established the Roanoke Valley Greenway Commission to coordinate implementation of the plan. Since the Greenway Plan was developed, local, regional and state transportation, economic, community, and neighborhood plans have all been updated, incorporating greenway and bikeway components. As such, an update of the Conceptual Plan, 10 years after its completion, is needed. The Roanoke Valley Greenway system currently has 16 miles of completed trails (paved and natural surfaces) in the cities of Roanoke and Salem, Roanoke County, and the Town of Vinton. The 1995 Conceptual Greenway Plan is currently being updated by the Regional Commission and the Greenway Commission, funded, in part by a State Transportation Pilot Planning Grant awarded by VDOT.

VILLAGE PROFILES

The Villages of Montgomery County are unique in that almost every one (excluding Plum Creek) has at least one school as a focal point within the community. This fact, combined with the County's continued reinforcement of the Villages as distinct planning areas, and the generally positive overall sense of community within each Village all establish a good platform for the development of community-based plans in each Village. With a large number of school aged children living within the villages, there appear to be significant opportunities to incorporate bike and pedestrian access for people of all ages and abilities. The following section provides a snapshot overview of the unique characteristics and conditions within each village that will be considered in the VITL planning process. Maps identifying these unique characteristics and conditions can be found in the Appendix of this report.

RINER

The Village of Riner is located along Rt. 8, south of Christiansburg. Though currently one of the smallest Villages in the County in land area, much of the undeveloped land is already platted for subdivision lots that, once built out, will triple the size of the community. With this increased development comes the opportunity to connect current and future residents to centers of activity within the Village. Of primary concern is connecting residents to the Village schools. Riner is unique in that it has an elementary, middle and high school in one location that is a "campus." The challenge, however, is connecting residents from the surrounding subdivisions to this important community facility. At present, there are primary residential areas located opposite the schools along Route 8, a heavily trafficked thruway that connects Christiansburg to Floyd County. Some residential development is also currently taking place on the western side of Route 8 in Cloverlea, but no pedestrian or bicycle connections currently exist to the school. The existing Hillcrest subdivision has privately constructed trails, which can serve as a model for future trail development within the Village. Key connectivity issues for the Village of Riner include developing a safe crossing of Route 8, connecting existing subdivisions to the Village and the schools, improving connections within the school campus, and developing appropriate standards for incorporating bicycle and pedestrian amenities into new development (see Appendix 1).

The County and citizens of Riner recently completed a draft Village Plan (not yet adopted) that includes provisions for bicycle and pedestrian access and connectivity. During the planning process, participants expressed a desire that Riner be a "connected" community and envision sidewalks and trails that connect the schools to surrounding residential areas, which are in turn connected to the commercial and civic uses in the core. To support that vision, the plan includes a number of policies related to bike and pedestrian access as a component of streetscape improvements on major and minor streets within the Route 8 corridor (i.e. walking paths, street trees, crosswalks), as well as design details for the historic village area. The plan also supports the development of a safe and accessible transportation network of trails, by promoting the Safe Routes to Schools Program, and by incorporating pedestrian paths or sidewalks into new and existing street systems and bike lanes into collector and arterial roads.

PRICES FORK

Prices Fork is a small (population 1,296), traditionally agricultural community that is now experiencing residential growth spreading westward from Blacksburg. It is located about three miles west of Blacksburg along Prices Fork Road, a heavily traveled thoroughfare connecting the Town of Blacksburg to the City of Radford. The Village has one churches (Prices Fork United Methodist Church), a Grange Hall and an elementary school (grades pre-K through 5th grade). These facilities – particularly the school - serve as the heart of the community and as civic focal points. Recreational facilities are located at Prices Fork School, with additional facilities nearby at Blacksburg Middle School and Kipps Elementary.

Several buildings in the community are designated as historical structures, and there is a National Historic District in the heart of the Village (see Appendix 2).

The Village of Prices Fork recently completed a Village Plan, which was adopted into Montgomery County's Comprehensive Plan. During the planning process, Prices Fork residents crafted a vision that reflected their interest in preserving the elementary school as an important unifying feature of the community, incorporating traffic calming measures, and improving connectivity with safe streets, biking trails, and sidewalks. The plan includes a number of policies related to bike and pedestrian access and safety that support this vision. Specifically, the plan encourages design features that promote safe and walkable environments, traffic calming measures and street design in residential areas, incorporating bicycle and pedestrian facilities into new and existing street systems, developing a greenway park and trail system that incorporates historic features.

Prices Fork is also anticipated to be the focus of significant new residential development in the years to come. The Village plan shows potential locations for this new development, centered around walkable neighborhoods within a quarter-mile radius. There is also a proposal for two new roads, one linking new and existing neighborhoods and one providing a Southern bypass. It is important that standards be developed for bicycle and pedestrian connectivity for these new roads and in the new neighborhoods.

Key issues for Prices Fork include determining the feasibility of pedestrian or bike connections along Prices Fork Road and Thomas Lane, developing standards for these connections for new development, and connecting residential areas, such as Montgomery Farms, to both the existing and the potential future school sites in the community.

ELLISTON AND LAFAYETTE

Elliston and Lafayette are distinct communities, which share common public facilities. Lafayette is located along the Roanoke River just across the Roanoke County line and is separated from Elliston by the South Fork of the Roanoke River. The center of Elliston, which is the larger community, is about three miles west of Lafayette on US 460. Both communities are historic, with older sections of small integrated commercial "downtowns" and residential neighborhoods that reflect a self-sufficient and vibrant past. Lafayette is listed in the National Register of Historic Places. There is a historic plat for the Village of Lafayette, which was originally laid out in 1828, that shows a traditional grid of narrow streets and small blocks.

While the County recognizes these areas as distinct communities, the U.S. Census Bureau does not. In 2000, the population was 1,241, with children and young adults representing 27.2 percent of the population, the highest percentage in the county. Continued population growth is expected to occur; however, most of this growth will take place in residential areas surrounding Lafayette, as both villages are at or near build out within the village cores.

The population is served by three schools, Elliston-Lafayette Elementary School, Shawsville Middle School, and Eastern Montgomery High School. At present, park and recreational facilities are provided through a shared use agreement with the schools. While there are significant historic resources within the Villages, both Elliston and Lafayette are largely defined by environmental features, particularly the South and North Fork of Roanoke River and the Pedlar Hills Natural Area. The Pedlar Hills Natural Area is a 522 acre preserve that is located just outside of the village boundaries, but rises above the historic core of Elliston and the Roanoke River. These areas provide significant opportunities for a river or greenway trail that connects the two Villages and Roanoke County (see Appendix 3).

The Villages of Elliston and Lafayette recently completed a Village Plan, but it has not been adopted into the Montgomery County Comprehensive Plan. During the planning process, village residents crafted a vision of future development that included pedestrian oriented communities with the two public schools serving as community focal points, historical tourism, and a river greenway. In order to achieve the vision, the Village Plan includes the following action steps:

- Work with the Department of Conservation and Recreation to develop a direct access trailhead to Pedlar Hills Natural Area;
- Work with the Virginia state tourism board to advertise eco-tourism and historic sites, including Pedlar Hills, the Lafayette Historic District, tourism-related businesses;
- Develop a Roanoke River Greenway Park and Trail System;
- Encourage the development of interconnected and intraconnected street, bikeway, and walkway networks in new subdivisions;
- Construct a bikeway/walkway along Brake Road to provide safe pedestrian access along Brake and Calloway Streets; and
- Construct a greenway trail between Eastern Montgomery High School and the Roanoke County lines.

In addition to these Comprehensive Plan items, a key issue for these Villages includes identifying opportunities to link the Villages together along the old Route 11/US 460 alignment and the rivers that flow adjacent to the residential areas in each Village.

SHAWSVILLE

Shawsville is located about four miles west of Elliston along US 460/Route 11, between Elliston and Christiansburg. The majority of US 460 between the communities is a completely straight stretch of road, which is not common in this area of Virginia, known locally as the Elliston Straightaway. Elliot's Creek Road, (VA 675) is the historic road that connected Shawsville to Riner in the lower half of Montgomery County. The focal points within the community are Shawsville Elementary School, Shawsville Middle School, and the Meadowbrook Library, which is within a larger building (former nursing home) being renovated to include a YMCA and community meeting room. There is also an historic area in the center of the Village (Shawsville Historic District) that reflects the historic development patterns.

Key issues and challenges in Shawsville include connecting the fairly dispersed pattern of settlements together and to the schools and library, as well as identifying a safe and appropriate crossing point on US 460 (see Appendix 4).

PLUM CREEK

Plum Creek is located to the west of Christiansburg along Radford Road (Route 11), a major thoroughfare connecting Radford and Pulaski County to the population centers of Montgomery County. Unlike the other Villages, Plum Creek does not have a school as a focal point of civic activity within the community. There is also the added challenge of being located along a high traffic and high speed regional corridor. There are two parks in Plum Creek (Hornsby Drive and Texas Road), although the Texas Road park will ultimately be closed and resources devoted to the further development of the other, larger park, located in the center of the Village on Hornsby Drive. The main center of activity within Plum Creek is this park (Hornsby Drive), which is topographically and physically separated from the residential areas of the Village. Despite some of these challenges, there are opportunities to include bike lanes in the large right of way along Radford Road, as well as providing an off-road trail connection along the creek bed that parallels Radford Road. These connections have the potential to link to bicycle and pedestrian facilities in Radford and beyond to the New River Trail (see Appendix 5).

Key planning issues in Plum Creek, as described, include linking residential areas to the park to reinforce the sense of community within the Village, and to link to other regional trail opportunities in the area.

BELVIEW

Belview is located west of Christiansburg along Peppers Ferry Road, and lies between Prices Fork to the north and Plum Creek to the south. The main focal point of the community is Belview Elementary School, which is located on the high speed Peppers Ferry Road. Opportunities for bicycle and pedestrian facilities along the major thoroughfares are limited at present due to the high speeds, narrow shoulders, and the dangerous signalized intersection on Peppers Ferry Road. Traffic calming measures in front of the school will be critical for connecting future residential development to the north of Belview Elementary with the school itself. Although opportunities for on-road connections are limited at present, there is significant off-road potential, including a trail system along the gas pipeline that runs east-west just south of the village boundaries. This trail system could also serve as a piece of the proposed trail connecting the New River Trail to the Huckleberry Trail (see Appendix 6)l.

Important issues for Belview include identifying a safe crossing point on Peppers Ferry Road, traffic calming along this road, and connecting the school to existing residential areas, as well as potential new residential development on the north side of the road.

NEXT STEPS AND KEY ISSUES

This analysis highlighted several trends that will have an impact on the development of the Master Plan:

- Significant demand for regional automobile travel on US 460, Route 8, Peppers Ferry Road, Radford Road, and Prices Fork Road, combined with heavy traffic volumes and high speeds leads to potentially dangerous conditions for cyclists and pedestrians. Alternative routes or improvements of conditions for all potential users of these routes should be considered.

- Greenway corridors along natural features in the County can serve environmental needs through protection from development, transportation needs by providing additional pedestrian and cycling connections, and developing a local recreation or eco-tourism economy. Depending on the role, careful consideration will need to be made towards locating greenway corridors to maximize their function and ecological suitability.

- Developing implementation and funding strategies will be critical to the success of this Plan. A clear vision, supported by the Montgomery County public, is needed to provide guidance to County officials, private landowners, and developers on the appropriate location and type of pedestrian and cycling facilities needed to support the goals of the County. Funding sources and strategies must be identified, with an emphasis on implementing less-costly but highly visible projects in the near-term.

Over the next several months, Renaissance Planning Group will further analyze the existing conditions to determine appropriate routes and trail types based on previously identified needs, land use patterns, and other factors. Preliminary connectivity plans will be developed, both for each individual Village, and as part of a county-wide network. These will be coordinated with a set of preliminary design and cross-sectional standards for a variety of trail types. A workshop will be held in January with the general public and key stakeholders from each Village to present these preliminary VITL plans and solicit input on pros and cons of each preliminary plan.

MONTGOMERY COUNTY VILLAGE TRANSPORTATION LINKS (VITL) PLANS: TECHNICAL MEMO 2 DESIGN GUIDELINES

PREPARED FOR:

MONTGOMERY COUNTY, VIRGINIA

PREPARED BY:

RENAISSANCE PLANNING GROUP

DRAFT – February 22, 2007

Prepared in cooperation with the U.S .Department of Transportation, Federal Highway Administration, and the Virginia Department of Transportation. The contents of this report reflect the views of the author(s) who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration, the Virginia Department of Transportation, or the New River Valley Planning District Commission. This report does not constitute a standard, specification, or regulation.

Federal Highway Administration or Virginia Department of Transportation acceptance of the report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

TABLE OF CONTENTS

I. INTRODUCTION

This memo summarizes the data and information compiled during the fourth phase of the VITL process (Development of Preliminary Design Standards). Technical Memo 2 includes a series of prototypical cross sections, with appropriate dimensions that are intended to address the full range of on- and off-street bicycle and pedestrian facility needs in each Village and connecting between Villages. In addition, Technical Memo 3 highlights a range of crosswalk, traffic calming, and connection standards for locations where non-motorized facilities intersect with roadways. Together, these standards provide the best combinations of safety, mobility and design for a variety of facility types and vehicular design speeds.

II. BICYCLE AND PEDESTRIAN FACILITY DESIGN GUIDELINES

All new roadways in Virginia should be planned and designed as multi-modal facilities, consistent with the new VDOT policy. This section provides design guidelines for incorporating bicycle and pedestrian facilities into transportation and development projects in Montgomery County.

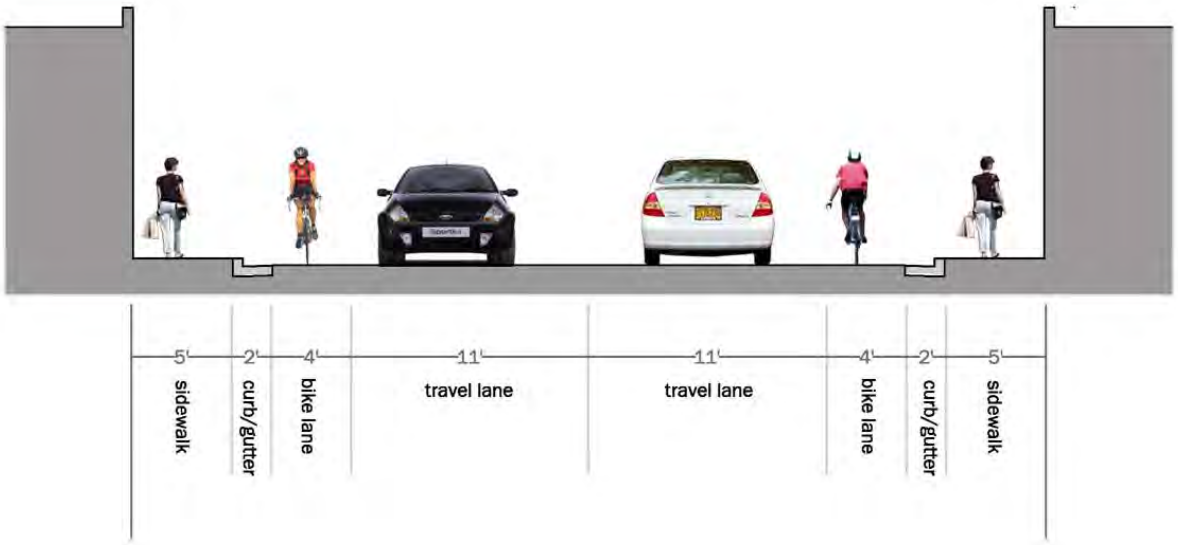
On-road bicycle facilities typically provide the most direct connections in a multi-modal transportation system, as the roadways, themselves provide the framework. On-street systems for cycling are achieved by providing bike lanes, paved shoulders and signed/shared roadways, the choice of which is determined primarily by the available right-of-way width. While bike lanes and paved shoulders are not essential on every street, these exclusive lanes help to mitigate the impacts of heavy traffic volumes, high-speed traffic, or truck traffic.

Off-road bicycle and pedestrian facilities, which may include greenways, multi-use trails, or pedestrian paths, are separated from vehicle lanes and usually serve multiple user groups simultaneously (pedestrians, cyclists, skaters, wheelchairs, etc.). Such facilities may run parallel to the roadway or function as part of a greenway system linking adjacent neighborhoods or land uses.

Sidewalks are an important element of the VITL plan. Sidewalks provide a safe zone for pedestrian traffic and should be wide enough to comfortably serve the volume and type of pedestrian traffic expected in a particular area. Depending on the context, sidewalks may be located directly adjacent to a curbed street or separated from the road by a landscaped buffer. Additional pedestrian-friendly treatments, such as street trees, street furniture (benches, lighting, planters), and a strong relationship between adjacent buildings and the sidewalk are also important considerations for providing a higher quality pedestrian experience.

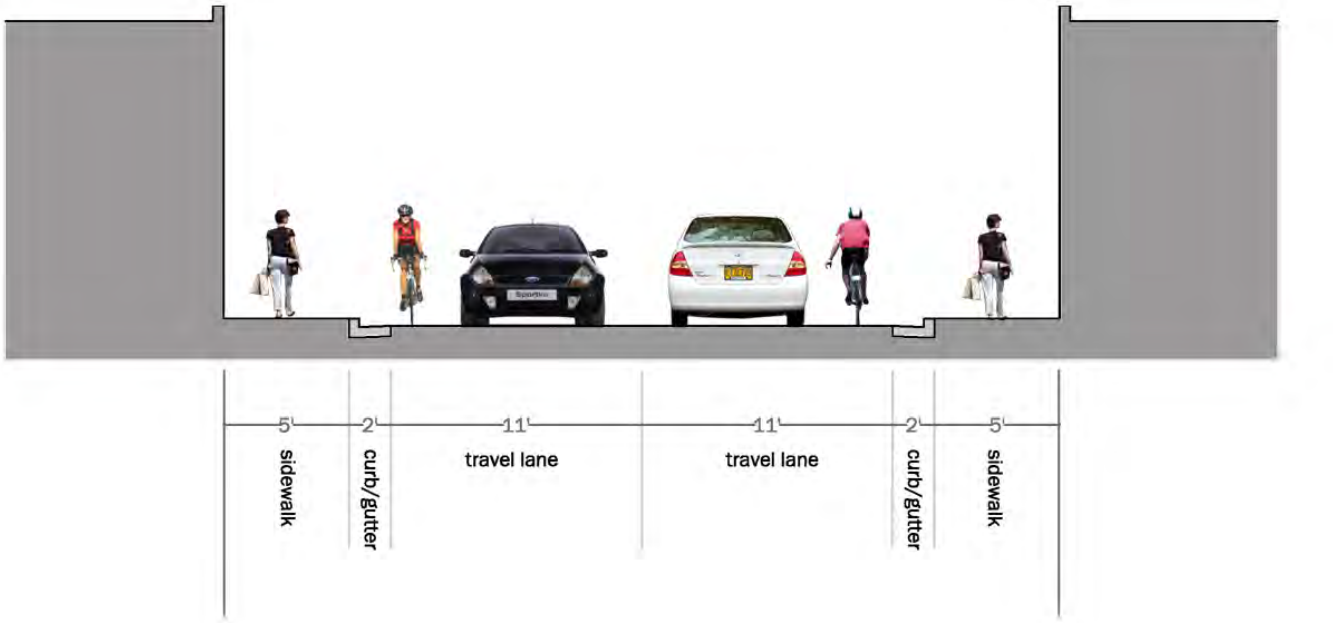
A successful and comprehensive bicycle and pedestrian system will include all of these facilities in order to accommodate the diverse recreation and transportation needs of the community.

A. CONSTRAINED VILLAGE RIGHT OF WAY WITH BIKE LANE + SIDEWALK



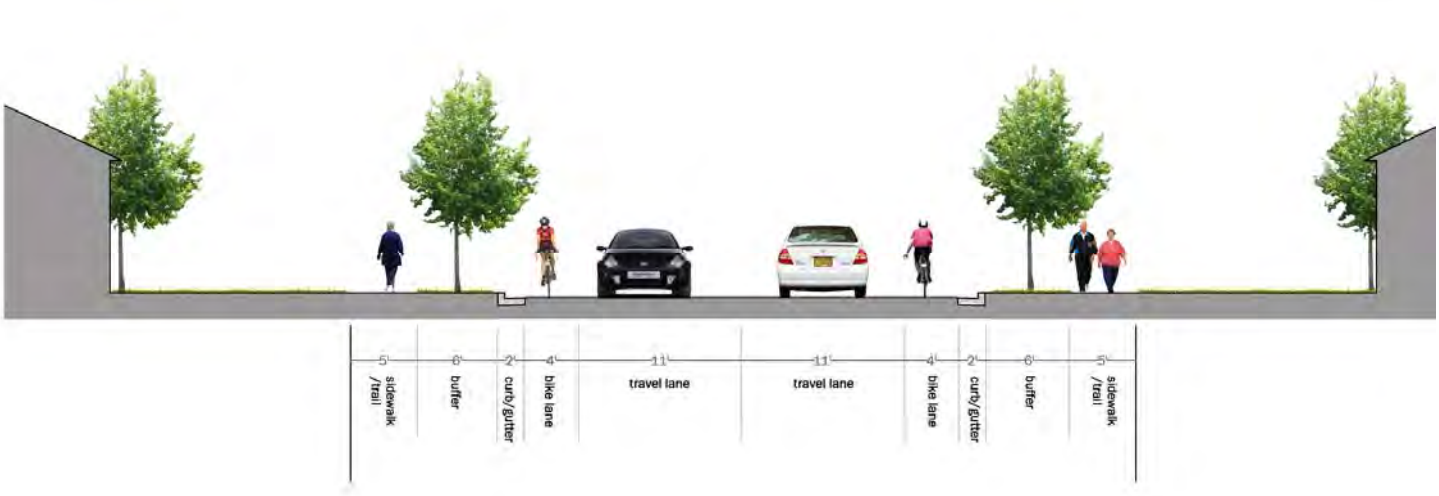
This is an example including pedestrian and cycling facilities in a narrow right-of-way, most typically found along a commercial street where the buildings are located close to the street. The sidewalk should be at least five feet wide if right-of-way allows, and up to ten feet wide if heavy pedestrian traffic is expected. The bike lane should be at least four feet wide, although a wider lane of five feet in width is preferred if on-street parallel parking is present.

B. CONSTRAINED VILLAGE RIGHT OF WAY WITH SHARED LANE + SIDEWALK



In this example, only pedestrian facilities are provided in a narrow right-of way, most typically found along a commercial street where the buildings are located close to the street. The sidewalk should be at least five feet wide if right-of-way allows, and up to ten feet wide if heavy pedestrian traffic is expected. The road can be signed as a shared road to bring greater attention to cyclists.

C. WIDE VILLAGE RIGHT OF WAY WITH BIKE LANE + BUFFERED SIDEWALK

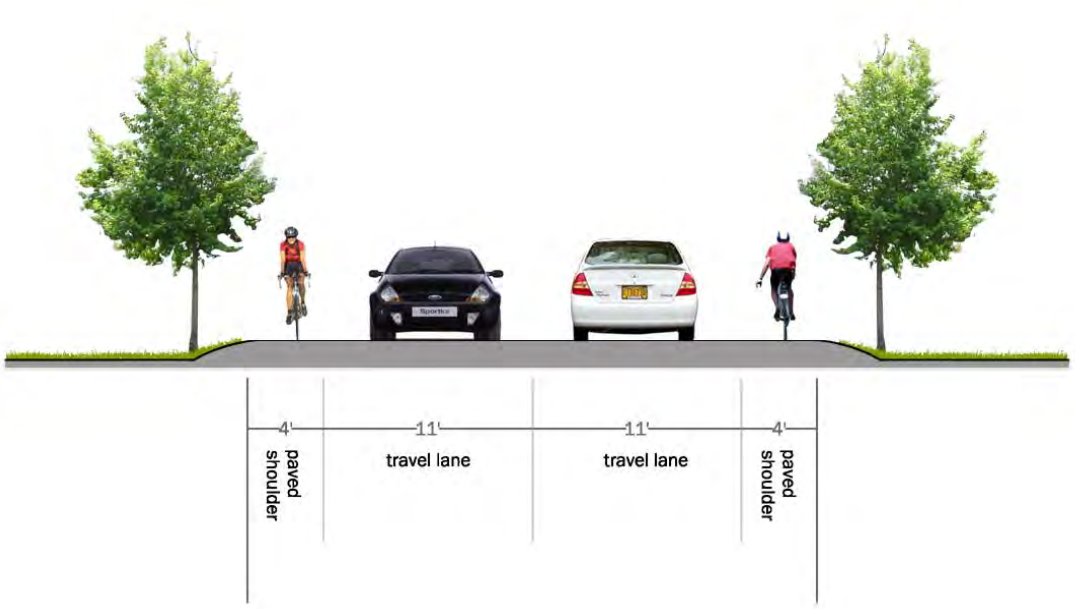


This is an example of including pedestrian and cycling facilities in a wider right-of-way, most typically found along a residential street or anywhere that the buildings are located further from the street. The sidewalk should be at least five feet wide, and up to ten feet wide if heavy pedestrian traffic is expected. A landscaped buffer helps to separate pedestrians from vehicle traffic. The bike lane should be at least four feet wide, although a wider lane of five feet in width is preferred if on-street parallel parking is present.

D. WIDE VILLAGE RIGHT OF WAY WITH PAVED SHOULDER + BUFFERED SIDEWALK

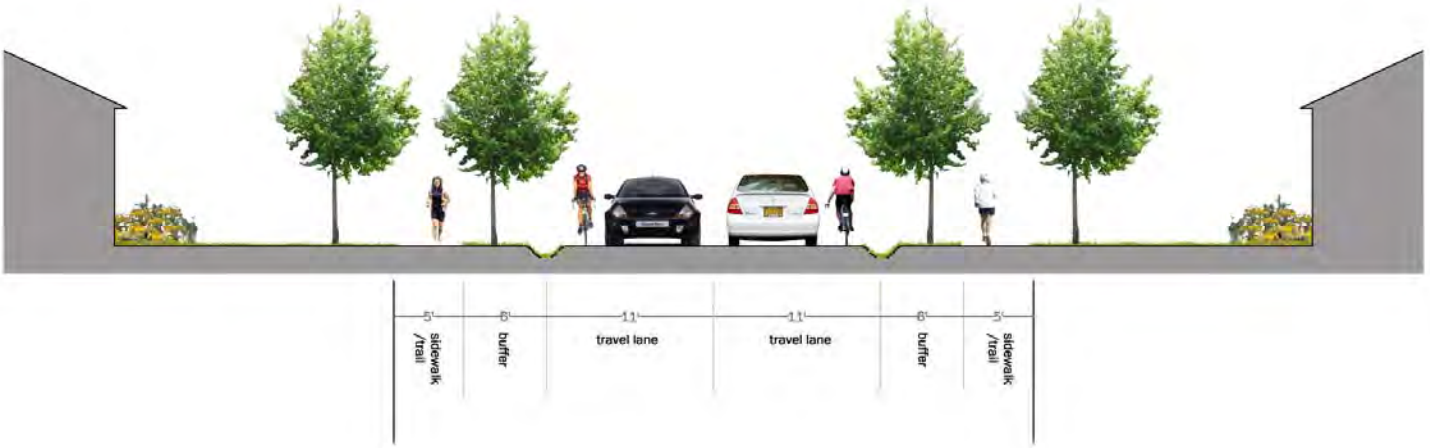
This is an example of including pedestrian and cycling facilities in a narrow right-of-way, most typically found along a residential street or anywhere that the buildings are located closer to the street. The sidewalk should be at least five feet wide, and up to ten feet wide if heavy pedestrian traffic is expected. A landscaped buffer helps to separate pedestrians from vehicle traffic. The paved shoulder has a similar function to a bike lane but is typically used where there is no curb or gutter. The shoulder should be at least four feet wide.

E. CONSTRAINED RURAL RIGHT OF WAY WITH PAVED SHOULDER (NO PEDESTRIAN)



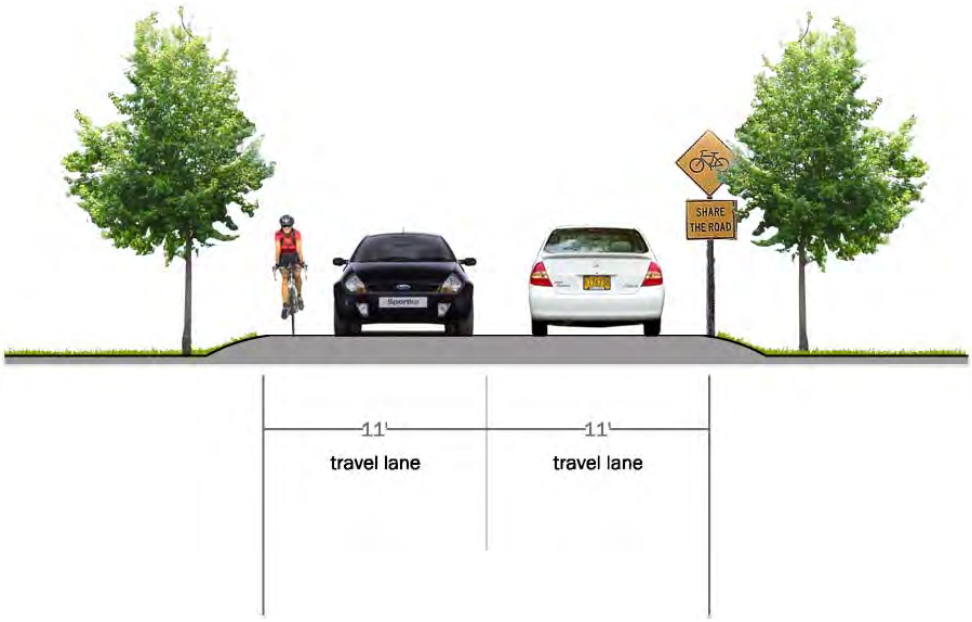
Outside of the villages, there may be locations where pedestrian facilities are unnecessary but a paved shoulder can be provided for cyclists. The paved shoulder has a similar function to a bike lane but is typically used where there is no curb or gutter. The shoulder should be at least four feet wide.

F. CONSTRAINED VILLAGE RIGHT OF WAY WITH SHARED LANE + BUFFERED SIDEWALK



In this example, only pedestrian facilities are provided in a narrow vehicular throughway, although one with a wider right of way. The sidewalk should be at least five feet wide if right-of-way allows, and up to ten feet wide if heavy pedestrian traffic is expected. The road can be signed as a shared road to bring greater attention to cyclists.

G. CONSTRAINED RURAL RIGHT OF WAY WITH SHARED LANE (NO PEDESTRIAN)



Outside of the villages, there may be locations where pedestrian facilities are unnecessary but there is a desire to designate the road as a cycling route. In the event that paved shoulders cannot be provided, the road can be signed as a shared road to bring greater attention to cyclists.

H. CONSTRAINED VILLAGE RIGHT OF WAY WITH SHARED BIKE/PEDESTRIAN

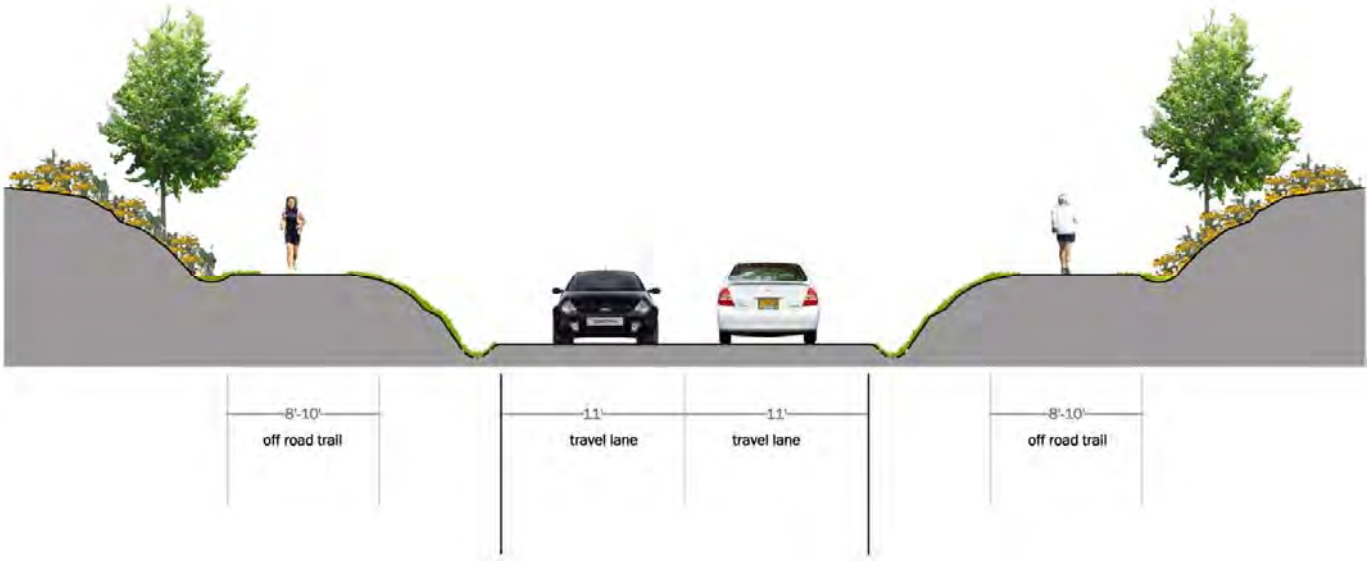
Within the villages, there may be locations where pedestrian and bicycle facilities are unnecessary due to low traffic volume, but there is a desire to designate the road as part of the village trails system. In the event that bicycle or pedestrian facilities cannot be provided, the road can be signed as a shared road to bring greater attention to cyclists and pedestrians. Creatively designing a series of signs for each village can call better attention to all users of a street. Some examples are provided below:

I. MULTI-USE TRAILS – ALONGSIDE ROAD

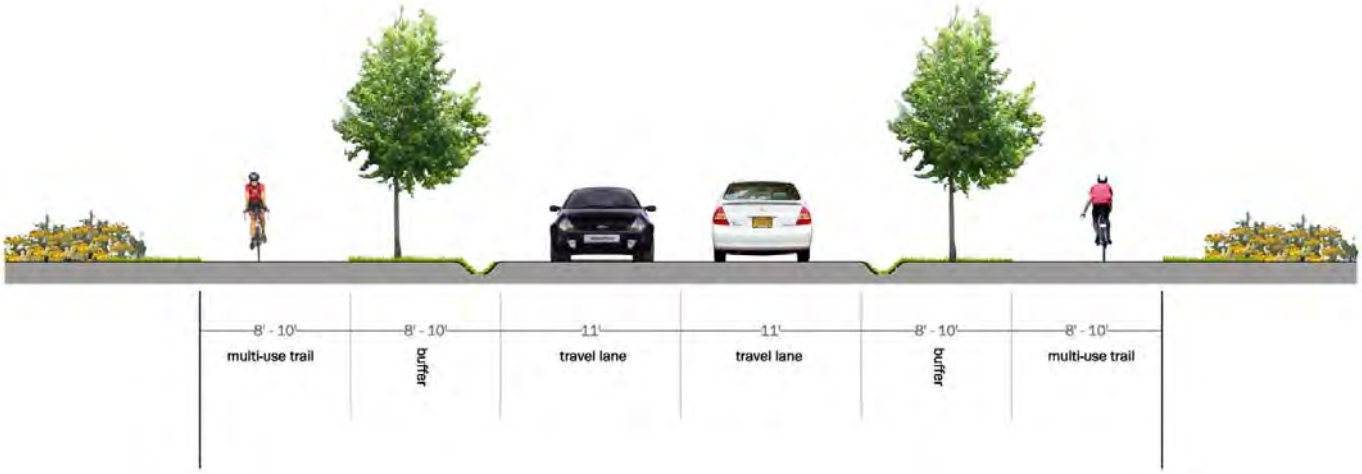
Multi-use trails can be provided alongside roadways within or outside of villages to provide a shared pedestrian and cycling facility. At a minimum, multi-use trails should be eight feet wide, although ten feet in width is preferred to improve comfort and safety for passing. Multi-use trails may be designed at-grade with the roadway, buffered by a grass or landscaped strip of a minimum ten feet in width. Where topographical constraints are present, multi-use trails may be cut into adjacent slopes or elevated above the slope to provide a level surface.

1. SEVERE TOPOGRAPHY

2. MODERATE TOPOGRAPHY



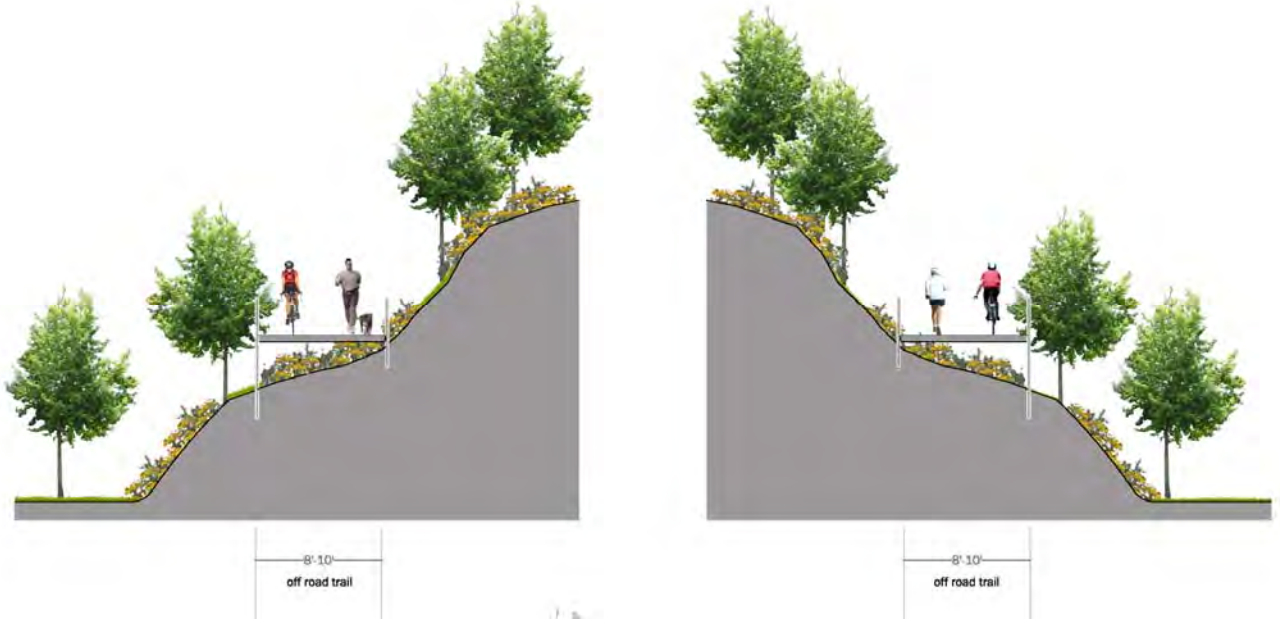
3. FLAT TOPOGRAPHY



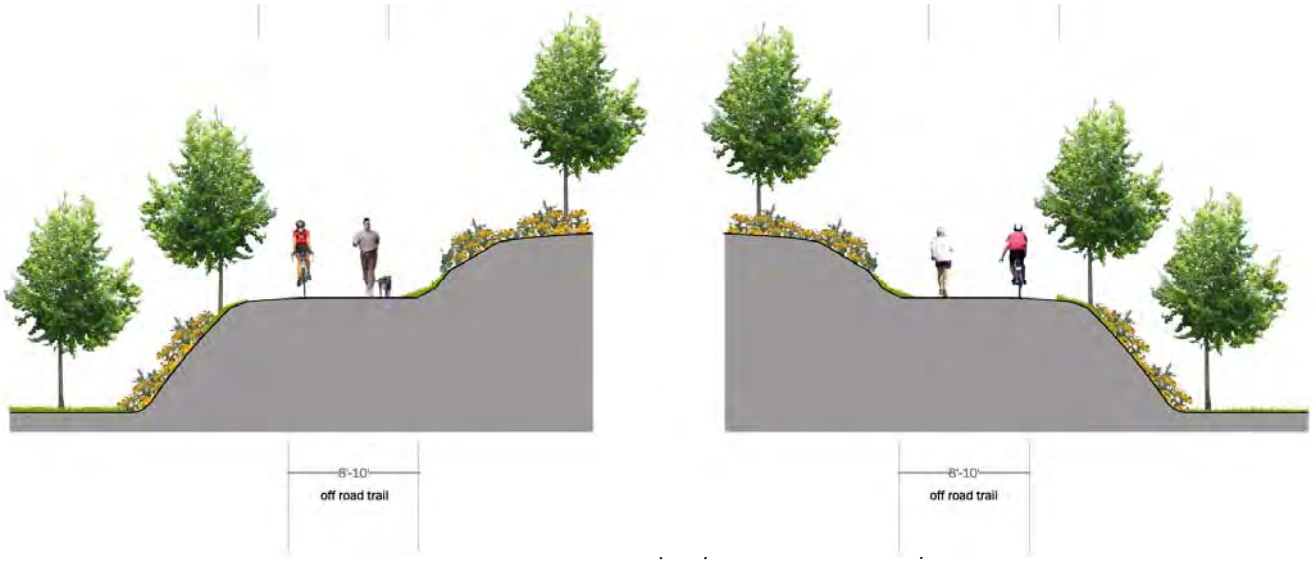
J. MULTI-USE TRAILS – GREENWAY

Multi-use trails can be provided away from roadways within or outside of villages to provide a shared pedestrian and cycling facility. At a minimum, multi-use trails should be eight feet wide, although ten feet in width is preferred to improve comfort and safety for passing.

1. SEVERE TOPOGRAPHY



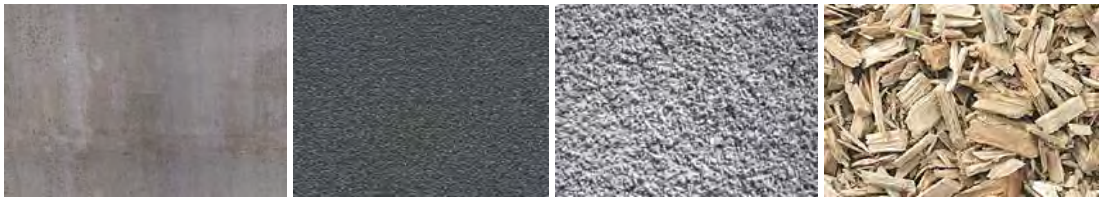
2. MODERATE TOPOGRAPHY



MATERIALS

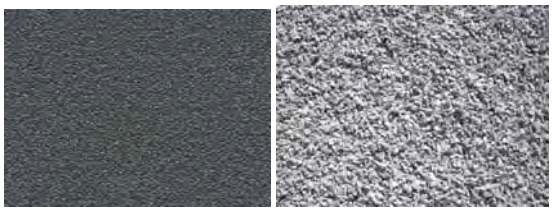
SIDEWALKS:
Sidewalks are typically concrete, although bricks, asphalt, or other pavers may be used.

PEDESTRIAN TRAILS:
Pedestrian Trails may also be constructed with concrete or asphalt, although more pervious surfaces such as crushed stone or wood chips may be preferred in certain circumstances.



BIKE LANES + PAVED SHOULDERS:
Bike lanes and paved shoulders are typically constructed with asphalt as an extension of the roadway surface.

MULTI-USE TRAILS:
Multi-Use are typically constructed with either asphalt or crushed stone.



COSTS

CONCRETE

Concrete is typically the most expensive surface but also the most durable. Concrete construction cost is $4.75/square foot (SF) for regular concrete and $6.00/SF for permeable concrete. Regular concrete will last for 25 years before needing significant maintenance while permeable concrete will last for 15 years.

ASPHALT

Regular asphalt can be constructed at a cost of $2.75/SF and will typically last for about 10 years before needing significant maintenance. Permeable asphalt is more expensive than regular asphalt at a cost of $3.50/SF and has a shorter life at 8 years before needing significant maintenance.

CRUSHED STONE

Crushed Stone paving is permeable and can be constructed at a cost of $4.50/SF, lasting for 15 years before needing significant maintenance. A regular crushed stone surface can be constructed for $2.50/SF but may require significant maintenance every 2-5 years. Filbert shells may also be used at a cost of $2.25/SF and last 7-10 years before needing significant maintenance. All three of these surfaces are permeable but only crushed stone paving meets ADA standards.

WOOD MULCH

Wood mulch or wood planer shavings can be constructed at a cost of $2.50/SF but will require significant maintenance every 1-3 years. Both of these surfaces are permeable but neither meets ADA standards.

MONTGOMERY COUNTY VILLAGE TRANSPORTATION LINKS (VITL) PLANS: TECHNICAL MEMO 3

CROSSING STANDARDS

Prepared for:

MONTGOMERY COUNTY, VIRGINIA

PREPARED BY:

DRAFT – February 22, 2007

Prepared in cooperation with the U.S .Department of Transportation, Federal Highway Administration, and the Virginia Department of Transportation. The contents of this report reflect the views of the author(s) who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration, the Virginia Department of Transportation, or the New River Valley Planning District Commission. This report does not constitute a standard, specification, or regulation.

Federal Highway Administration or Virginia Department of Transportation acceptance of the report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary

I. CROSSING STANDARDS

Intersections are where the paths of motorists, cyclists and pedestrians converge. Every intersection contains a variety of conflict points where crashes may occur, so good intersection design requires that the paths and roles of all travelers are clear and visible.
Safe, convenient, and highly visible crossings make a multi-modal transportation system safe and usable for pedestrian and bicycle activity.

PEDESTRIAN EMPHASIS INTERSECTIONS

The VITL Plan refers to two types of crossing standards that have been developed as blue prints for bicycle and pedestrian improvements at key locations. The Pedestrian Emphasis intersection is a higher level of treatment, including changes to the physical character of the intersection as well as pavement markings and signal improvements. These changes include:

- Marked and high visibility crosswalks
- Raised crosswalks
- Curb extensions
- Chokers
- Median refuge
- Pedestrian activated signals
- Pedestrian underpass

PEDESTRIAN SUPPORTIVE INTERSECTIONS

The second type of intersection is Pedestrian Supportive, where pedestrian visibility and safety are improved over existing conditions, but bicycle, pedestrian, and automobile traffic is not sufficient to warrant a major investment. This treatment includes:

- Marked and high visibility crosswalks
- Curb extension
- Pedestrian scale lighting to illuminate waiting pads

MID BLOCK CROSSINGS

Many pedestrian crashes occur when a pedestrian attempts to cross the street at mid-block. Where such crossings are needed, a special crosswalk between intersections may be appropriate. Such crossings should be designed with signage, flashing lights and highly visible pavement markings, because motorists do not expect pedestrians at mid-block. At mid-block crossings with particularly heavy traffic, a signal warrant study may be conducted to determine if a pedestrian activated signal may be installed.

MARKED CROSSWALK

A marked crosswalk is the cheapest and most basic type of crosswalk. A marked crosswalk should be a minimum of six feet in width and is painted with non-slip, reflective, white paint or tape. (Cost: $100-$300)

Some crosswalks are angled to the right in the median. This is intended to facilitate a pedestrian's view of oncoming traffic before crossing the second half of the street..

Photo above right, by Dan Burden.

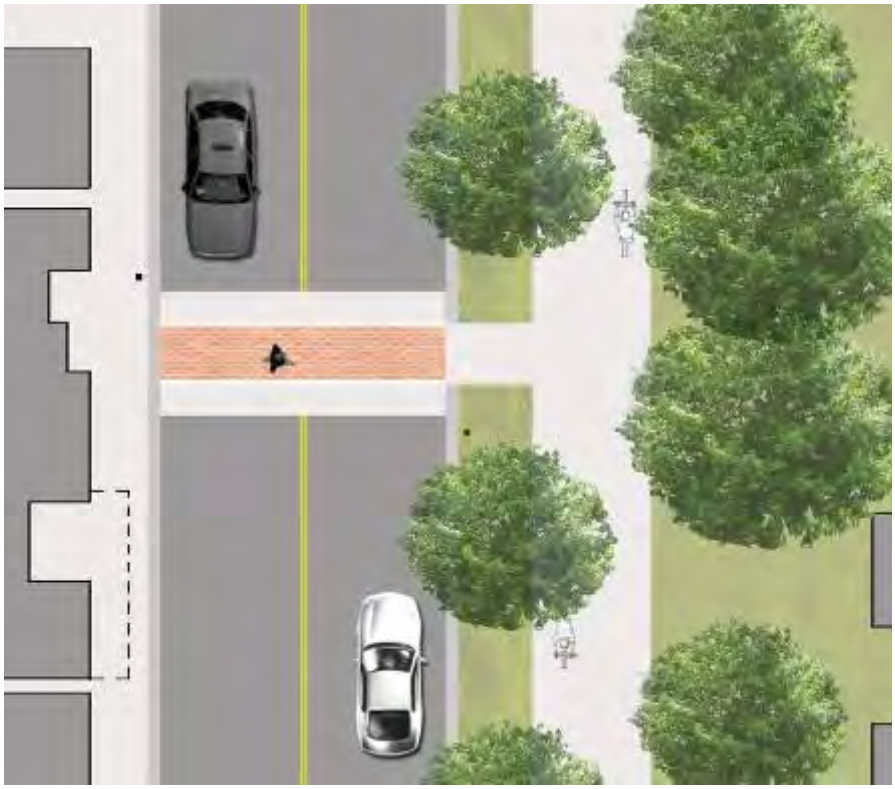
HIGH-VISIBILITY CROSSWALK

Brick, stone, or other high-visibility, textured paving materials may be used to improve the aesthetics and increase the emphasis on the importance of a crosswalk. A high-visibility crosswalk should be a minimum of six feet in width and of a non-slip surface accentuated with reflective, white paint or tape. (Cost: $3,000)

A well-defined crosswalk with brick paving and median refuge provides clear path for pedestrians. Photo above right, by Dan Burden.

RAISED CROSSWALK

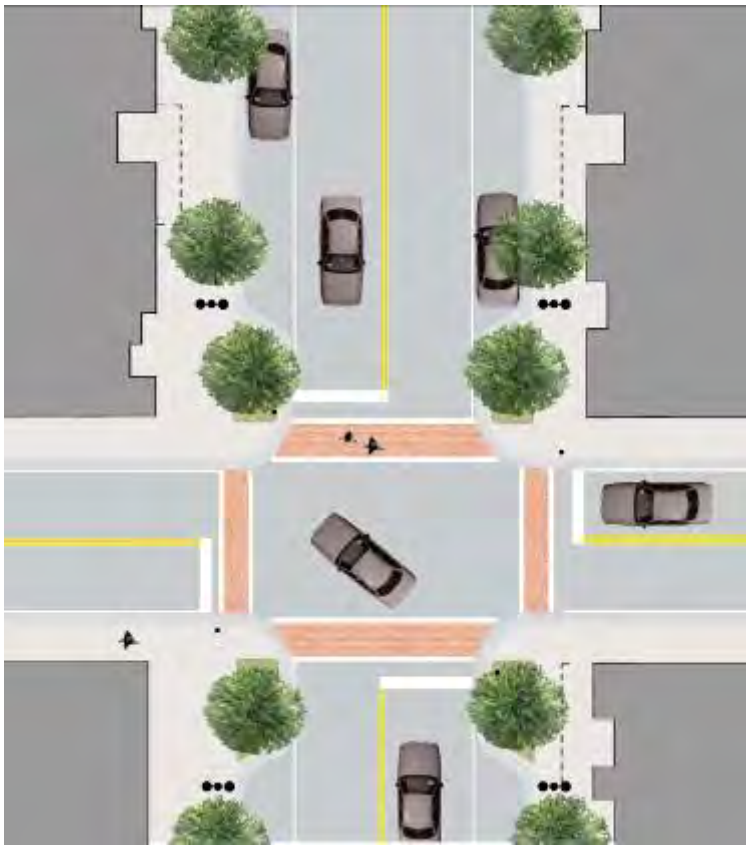
A raised crosswalk elevates either a marked or high-visibility crosswalk to a level above the road that is at-grade with the adjacent sidewalk. This design slows vehicle traffic at the crossing and increases the visibility of the pedestrian. The flat crosswalk surface is typically three-four inches above the street and 10 feet in width. The ramps on either side should be six feet long (a 1:20 slope) which reduces travel speed to about 15-25 mph. (Cost: $2,000-$15,000)



A raised pedestrian crossing provides a continuous route for the pedestrian at the same level as the sidewalk. Pavement markings may be used on the slope to make the crossing visible to motorists. Photo below right, by Dan Burden.

CURB EXTENSION

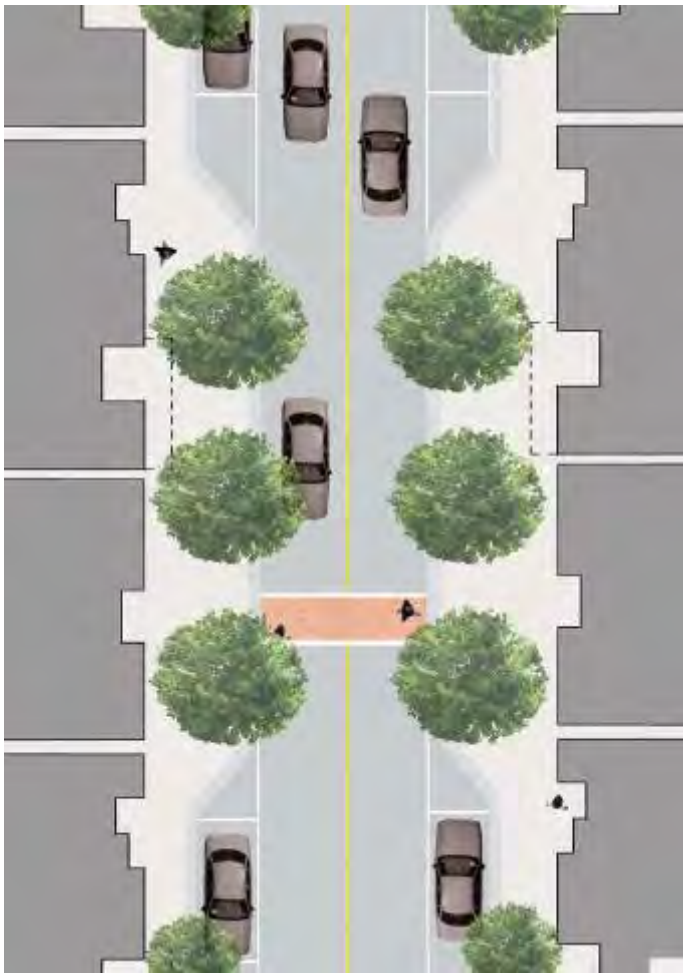
A curb extension is a way of redesigning the corner of an intersection to narrow the travel lane, shorten the pedestrian crossing distance, and decrease the speed of turning vehicles. The curb should be extended so that a 10-11' travel lane remains. (Cost: $2,000-$20,000 per corner)



Curb extensions, or bulb-outs, reduce crossing distance, and special pavement markings help to alert motorists of pedestrian crossing. Photo above right, taken in Anchorage, Alaska. by Michael King.

CHOKER

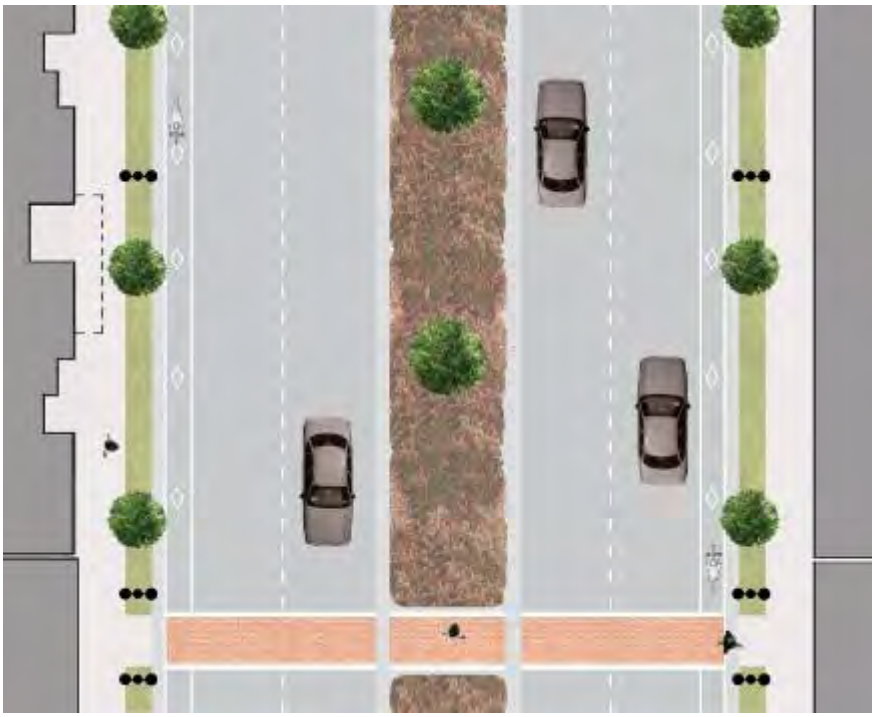
A choker is used mid-block to narrow the travel lane, shorten the pedestrian crossing distance, and decrease the speed of through traffic. The curb should be extended so that a 10-11' travel lane remains. (Cost: $5,000-$20,000)



This choker narrows the street from two lanes to one. Traffic is forced to slow down and, in some cases, wait for an approaching vehicle to pass before proceeding.
Photo below right by Michael King.

MEDIAN REFUGE

A median refuge is used at an intersection or mid-block at a crosswalk to narrow the travel lanes and reduce the need to cross both directions of traffic at one time. Trees, landscaping, bollards, or some other physical barrier should be located at both ends of a median refuge to provide extra protection for a pedestrian waiting in the median. The level of the crossing through the median should be at the same height as the adjacent crosswalk. (Cost: $4,000-$30,000)



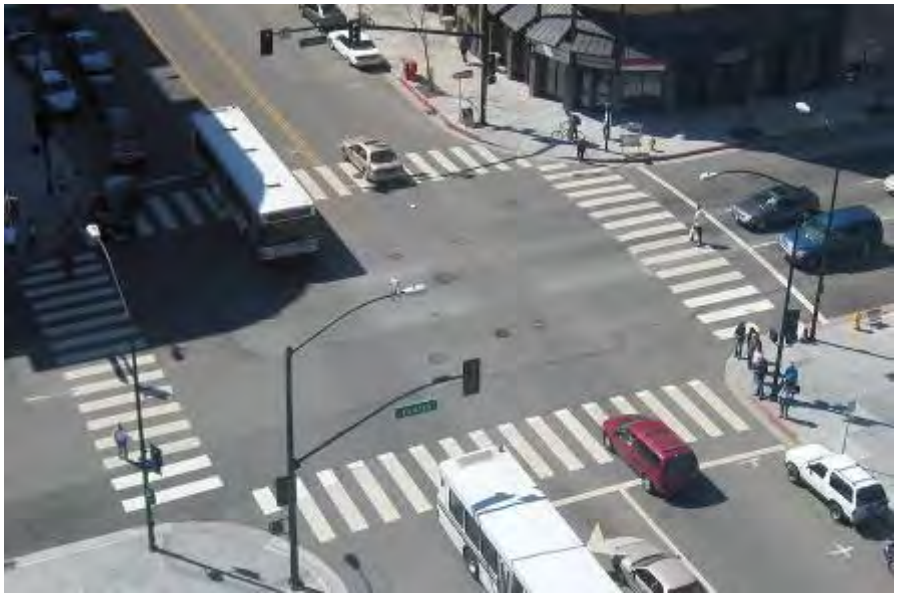
New median refuge and marked crossing provides shorter crossing distance for pedestrian.

Photo by Dan Burden.

PEDESTRIAN-ACTIVATED SIGNAL (AT AN INTERSECTION)

Pedestrian activated signals can be integrated into existing traffic signal systems at intersections. A display that counts down the time left for a pedestrian to safely cross is preferred. (Cost: $20,000-$40,000)

Pedestrians safely cross a busy intersection.



PEDESTRIAN-ACTIVATED SIGNAL MID-BLOCK

Pedestrian activated signals can be added to intersections or mid-block where heavy pedestrian-traffic is expected or where there are safety concerns. This requires standalone poles for the crossing push-button and for the vehicle traffic signals. A display that counts down the time left for a pedestrian to safely cross is preferred. (Cost: $20,000-$40,000)

Mid-block crossing allows bikers and pedestrians to cross a highly trafficked road.

PEDESTRIAN UNDERPASS

A pedestrian underpass completely separates the pedestrian from vehicle traffic but is typically very difficult and expensive to construct. Lighting, drainage, graffiti, and personal security are all issues that must be addressed with pedestrian underpasses. ADA requirements also lead to long entry and exit ramps to meet slope requirements. Studies have shown that many pedestrians will not use pedestrian bridges or underpasses because of their inconvenience and potential security concerns. Typically, pedestrian underpasses are only used as a strategy of last resort.
(Cost: $500,000-$4 million)

Boulder, Colorado.