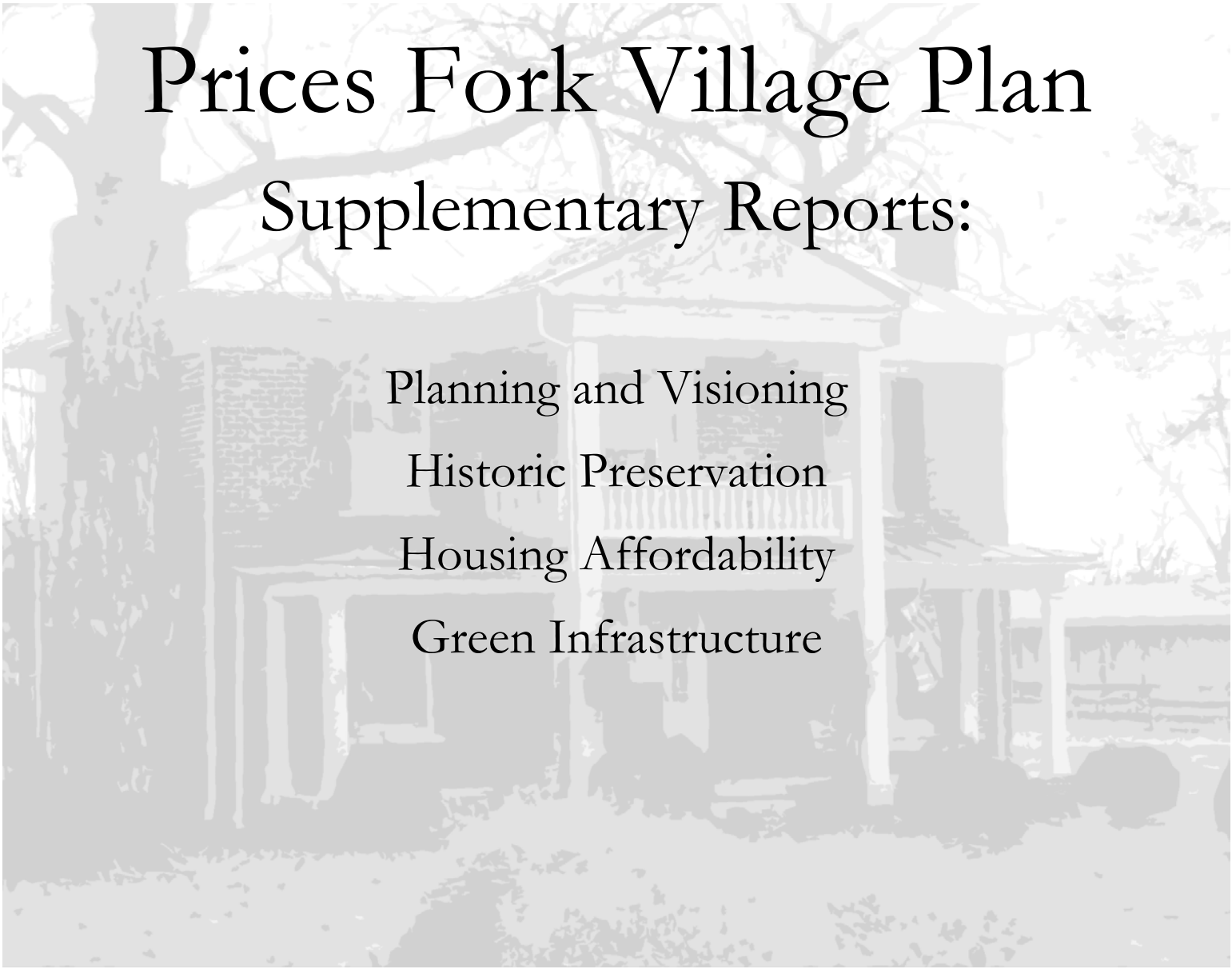

Prices Fork Village Plan

Supplementary Reports:

Planning and Visioning

Historic Preservation

Housing Affordability

Green Infrastructure

Graduate Urban and Regional Planning Studio
Virginia Tech Urban Affairs and Planning

Spring 2005

ACKNOWLEDGEMENTS

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INTRODUCTION

Montgomery County has been growing at a rate of nearly 10,000 people per decade and this trend is expected to continue in the foreseeable future. ***Montgomery County 2025***, which was adopted in October 2004, anticipates that two-thirds of this new growth will be accommodated in the Towns of Christiansburg and Blacksburg. The remaining one-third can primarily be contained in the county's urban expansion areas and villages because public water and sewer facilities are (or will be) available. Only a small percentage of growth would need to take place in the county's rural areas.

The County has initiated a village planning program that addresses this demand for growth and considers the unique character and the needs of each village. Residents work with county staff and consultants in a process that reveals issues and concerns, strengths and opportunities, and that works within the framework for future growth, but defines the goals and process by which each village will absorb change. The first of these village plans was completed for the Elliston-Lafayette area in 2004. A planning process for Prices Fork began in January of 2005.

Led by Milton Herd of Herd Planning and Design and Vladimir Gavrilovic of Paradigm Design, and organized by the Montgomery County Department of Planning and GIS, the work of the community was divided into three public meetings:

March 19	Create the Vision
April 16	Refine the Vision
May 7	Affirm the Vision.

Students in Virginia Tech's graduate urban and regional planning studio, under the direction of Dr. Diane Zahm, assisted with this planning process. Their work included a community survey as well as several studies responding to specific questions raised by Prices Fork residents. This report documents the students' work, and is divided into four sections:

Planning and Visioning includes the results of the community survey.

Historic Preservation Planning inventories the design elements and character of historic resources in Prices Fork and initiates a process for expanding the boundaries of the historic district. This section also includes information on historic preservation zoning and its possible implications for individual owners as well as the Prices Fork community.

Housing Affordability considers evaluates those elements of a development that contribute to the overall cost of housing. Using a standard square footage for a home, the report examines the impact that changes such as narrower roads or reduced lot sizes have on housing affordability.

The last section, **Green Infrastructure**, outlines options for connecting Prices Fork's residents through greenways, trails and open spaces.

PLANNING AND VISIONING

The Village Survey Results:

YOUR view of Prices Fork

What do you like most about Prices Fork Village?

"The way it is"
- Rural, agricultural character
- Pleasant views
- Historic resources
- Prices Fork Elementary school
- Quiet, neighborly atmosphere

Convenience to Blacksburg

Affordability
- Reasonable housing costs
- Low taxes

Resident commitment
- Multiple generations of families
- Average length of residence 16 years
- 70% own their homes
- 50% with children at Prices Fork Elementary, past, present or future

What changes would you like to see in the future?

Road improvements
- Widen Prices Fork Road
- Reduce traffic volumes
- Enforce the speed limit

Improved access to facilities and services
- Water, sewer, and gas
- Trash pickup, snow plowing, fire and emergency services

You also mentioned:
- More businesses (4), more single family homes (3), more families (2), and pizza delivery (6)
- Maintaining affordability (2), keeping taxes low (2)
- Accommodating Virginia Tech and Blacksburg (3), not becoming part of Blacksburg (2), and increasing urbanization (3)

Because you like Prices Fork the way it is, you believe that these changes should not come at the expense of the Village's rural character.

Where do residents live?

Residents of Prices Fork say they live in:
- Prices Fork (50%)
- Montgomery County (28%)
- Greater Blacksburg area (22%)

Who responded to the survey?

Virginia Tech students distributed the Village Survey to 464 households. 93 households completed the survey.

The Village survey was administered by graduate students in Virginia Tech's urban and regional planning studio during February 2005. Results presented March 19, 2005.

A BRIEF OVERVIEW OF PRICES FORK

Prices Fork is a Village of approximately 1,000 residents located on Prices Fork Road just west of Blacksburg. The Village was one of the first settlements in the area. German settlers moved into the region in the mid-1700s and colonized the Horseshoe Bends of the New River (near McCoy) where the Radford Arsenal presently sits. Later, they moved upland to a spot along the crest of the ridge. This is the present site of the village core at the Prices Fork Road and McCoy Road fork.

Today Prices Fork is a well-established community of homes and farms, supported by a few small commercial establishments. Prices Fork Elementary School serves as the heart of the community. The location of the Village, immediately adjacent to Blacksburg, means Prices Fork is under tremendous pressure for development, placing its historic resources at risk.

HISTORIC PRESERVATION AND THE PRICES FORK VILLAGE PLAN

Throughout the Prices Fork village plan process, participants inquired as to the options available for protecting their historic resources. This included expanding the existing historic district boundaries and/or establishing an historic preservation overlay zone and implementing a review process with design guidelines specific to Prices Fork.

Presently the historic district is a contiguous block of eleven structures, situated at the east end of the village core, including the Lutheran church, the James Bane Price home, and Price's store (shown as the dark green shaded area at left in Figure 1, below). All of these structures were built prior to World War II and several

Figure 1: Existing Prices Fork historic district shown in dark green (left); and proposed additions to the historic district, by parcel, in light green (right).

were built in the mid- to late-1800s. Eleven additional structures are now old enough to be included in the historic district (shown at right in Figure 1). These would constitute the extent of the proposed expansion, either as a contiguous district or as individual resources.

The next section of this report summarizes the steps required to expand the Prices Fork historic district.

EXPANDING THE PRICES FORK HISTORIC DISTRICT

Conservation of historic resources is the responsibility of the local, state and federal governments. Local historic preservation and overlay zoning will be discussed in greater detail later in this section. What follows is information on the federal and state programs and the process for registering historic properties.

THE NATIONAL REGISTER OF HISTORIC PLACES AND THE VIRGINIA LANDMARKS REGISTER

Properties with significant historic or architectural character may be eligible for listing on the National Register of Historic Places. The National Register was established in 1966 and is the responsibility of the National Park Service of the U.S. Department of the Interior. The Secretary of the Interior has developed criteria and guidelines for decisions regarding historic status, which involves review and approval by both state and local officials.

The Commonwealth of Virginia also maintains an historic register, The Virginia Landmarks Register, which was created at the same time as the National Register. The Virginia Department of Historic Resources (DHR) is responsible for the Virginia Register, and for reviewing applications for inclusion on the National Register.

Registration is an important step for two reasons: it officially recognizes the historic significance of a property, which can then be marked with a plaque; and it encourages good stewardship of historic resources over time by allowing owners of registered properties to donate historic preservation easements and by offering them state and federal rehabilitation tax credits. Once on the Registers, the property has limited protection from federal or state actions such as eminent domain.

Adding an historic property to one or both of the Registers involves two processes. The first is a **determination of eligibility** for listing, and the second is for the actual **nomination and listing**. A determination of eligibility and/or listing on the state or national registers imposes restrictions on the property owner only when a federal or state license or permit, or state or federal funding, is involved. Restrictions are imposed for state and federal rehabilitation tax credits, or rehabilitation grants from the Virginia Department of Historic Resources.

Determination of Eligibility

1) The applicant completes a Preliminary Information Form (PIF) with information on ownership and current condition, and a list of local government contacts. The PIF is submitted to the regional Department of Historic Resources (DHR) office in Roanoke, which reviews the materials for completeness and then forwards the complete application package to the central office in Richmond:

   Roanoke Regional Preservation Office
   John Kern, Director
   1030 Penmar Avenue, SE
   Roanoke, VA 24013
   Phone: (540) 857-7585
   Fax (540) 857-7588

2) Staff at the Department of Historic Resources provide notice of receipt to the property owner and applicant; and notify local officials regarding consideration of the application at the next Department of Historic Resources National Register Evaluation Committee Meeting.

   The Evaluation Committee reviews the materials and makes a recommendation to the State Review Board, which is composed of experts in the fields of architecture, history, American history, etc. The owner, applicant, sponsor and others involved are notified of the meeting date, time and location. The State Review Board also solicits public comments as part of the review process.

3) The State Review Board considers the PIF and any supplementary information (including public comment) and makes a determination of eligibility based on a simple majority vote. Staff send letters to the applicant and other interested parties regarding the decision. Application and review materials are then archived.

Nomination to and listing on the State and National Registers

1) The applicant submits a draft of the nomination forms and narrative, and any supporting materials, e.g., photographs, site plans, list of property owner(s) and adjacent property owners, for review and comment by the Roanoke DHR office staff. Once the application is determined to be complete, it is forwarded to Richmond.

2) The nomination is placed on the agenda for the next quarterly meeting of the State Review Board and the Virginia Board of Historic Resources. Public notice is required prior to this meeting. [If the property falls under the purview of a Certified Local Government, local officials are afforded a more formal review and

input process that includes the local Architectural Review Board; however Montgomery County is not a Certified Local Government.]

3) DHR staff present the nominations to the Board for a determination, with the following three possible outcomes:

   - The property meets the criteria for listing (shown in the box at right). The State Review Board accepts the nomination and it is listed on the Virginia Landmarks Register. The State Historic Preservation Officer forwards the nomination to the Keeper of the National Register of Historic Places in Washington, D.C.

   - The State Review Board accepts the nomination but it is opposed by a majority of the impacted property owners. The property remains "eligible" for listing but is not placed on either Register.

   - The State Review Board rejects the nomination because it does not meet the criteria for listing. An applicant may appeal this decision.

National Park Service Criteria for Listing a Property

The National Park Service is concerned with both the quality and significance of historic resources. In general, properties that are more than 50 years old qualify, but in the case of an exceptional resource, listing may occur before 50 years. In general, the NPS lists properties:

1) known to be associated with important events or the lives of significant persons in the nation's history
2) exhibiting distinct artistic or architectural design characteristics or methods of construction, or the work of a master designer or craftsperson
3) with information important in prehistory or history.

Other properties may be included if they are an integral part of, and contribute to, an historic district. According to the Secretary of the Interior, a contributing structure is "one which by location, design, setting, materials, workmanship, feeling and association adds to the district's sense of time and place and historical development."

4) The National Park Service reviews the application materials and resolves any issues related to incomplete information. After 45 days the property is listed on the National Register of Historic Places.

The State Historic Preservation Officer (SHPO) should be contacted for further information, questions, or additional forms:

The Virginia State Historic Preservation Office
Ms. Kathleen S. Kilpatrick
State Historic Preservation Officer
Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221
804-367-2323
kkilpatrick@dhr.state.va.us

FEDERAL AND STATE TAX CREDITS FOR HISTORIC REHABILITATION

Properties listed on the National Register or the Virginia Register are eligible to apply for rehabilitation income tax credits. The federal tax incentive is a 20% tax credit and Virginia offers an additional 25%, based on eligible rehabilitation expenses. Each is discussed in greater detail below.

Federal Tax Credits

The Federal Historic Preservation Tax Incentive Program is administered by two agencies: the National Park Service (NPS) of the U.S. Department of the Interior determines that rehabilitation work conforms to the Secretary of the Interior's ***Standards for Rehabilitation***, and the Internal Revenue Service (IRS) assures that taxpayers comply with the tax laws regarding historic structures.

The property owner must establish that the proposed rehabilitation is eligible for the federal tax credit *before* construction can begin.

(1) Properties not already on the National Register of Historic Places as individual nominations or as part of an historic district must proceed through the eligibility and nomination processes outlined previously.

(2) The owner submits an application (and the required fees) to the Virginia Department of Historic Resources. The application includes detailed information on the proposed rehabilitation.

(3) DHR reviews the application and forwards its decision to the Mid-Atlantic Office of the National Park Service (NPS).

(4) NPS makes a determination of conformity and notifies the applicant, DHR and the IRS. An applicant may appeal a negative decision.

(5) The applicant completes the proposed work within the established time frame and receives certification that:

- renovation work meets the Secretary of the Interior's ***Standards for Rehabilitation*** (36 CFR Part 67):

  - historic use and/or historic character are retained and preserved, including any changes made over time that have acquired historic significance in their own right; this includes historic materials, finishes, construction techniques, and craftsmanship
  - project repairs rather than replaces deteriorated historic features
  - rehabilitation avoids treatments or techniques that cause damage to historic materials

- new additions, alterations or new construction is differentiated from the old and protects the historic form and integrity of the resource

- costs are "substantial," i.e., exceeding the basis of the building or $5,000, whichever is greater, including

  - improvements to the structure
  - architectural and engineering fees
  - some construction financing and management costs, and/or
  - reasonable developer fees,
  - BUT NOT acquisition, additions to or enlargements of the building, site planning or landscaping

- future use is "active" -- a commercial use or a residential use that derives rent, or a mix of the two.

(6) The owner must hold the property for at least 5 years following the rehabilitation, or must repay the amount of the tax credit.

Virginia's Tax Program

The Commonwealth of Virginia has modeled its program on the Federal Historic Preservation Tax Incentive program described above, with some important exceptions: the state rehabilitation tax credit is 25% and "passive" uses (owner-occupied dwellings) also qualify. To be eligible, the structure must be on the Virginia Landmarks Register or eligible for listing, or must be a contributing structure in a state-designated historic district. Because DHR participates in reviews for the federal tax credit, the application process is virtually the same.

To receive the tax credit for commercial structures, rehabilitation costs must be at least 50% of the assessed value of the building in the year preceding the rehabilitation. Rehabilitation of owner-occupied properties must cost at least 25% of the assessed value of the building in the year preceding the rehabilitation. Site planning and site preparation are included in eligible costs.

HISTORIC PRESERVATION EASEMENTS

Virginia created the Historic Preservation Easement Program to encourage proper stewardship of historic properties and secure them for future generations. Easements run with the land and therefore protect the structures from incompatible subdivision or commercial development – even from government action – in perpetuity.

An owner voluntarily donates land to the Commonwealth of Virginia and the property is forever protected through language in the deed of the easement. This includes all historic structures and outbuildings, and may encompass archaeological sites, historic landscapes or open space. The land is still in the owner's hands and he or she is free to use it as he or she wishes, so long as the historic character is preserved.

The value of the easement can be claimed as a charitable donation against federal income tax, up to 30% of the owner's gross annual income, and over a period of five years. Virginia now allows owners to claim easements as deductions against their state income taxes. Since the property can no longer be developed the value of the property will drop accordingly, lowering the local property tax burden, and also lowering estate and inheritance taxes.

An easement is also protection from state or federal actions such as eminent domain.

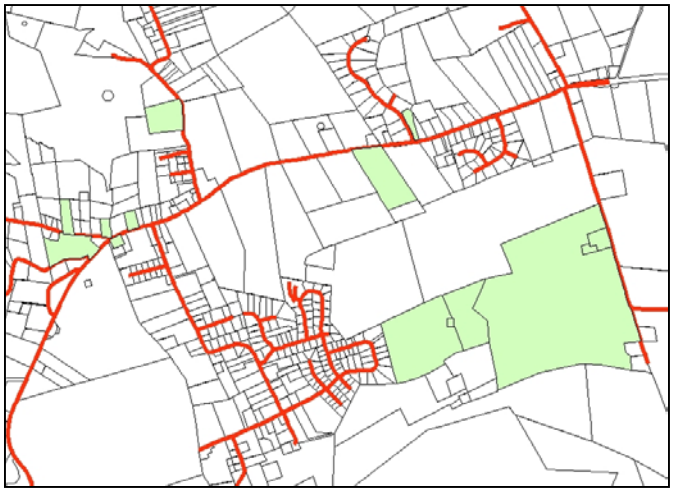
LOCAL HISTORIC DISTRICTS: COMPREHENSIVE PLANNING, HISTORIC OVERLAY ZONING, AND DESIGN REVIEW

Historic preservation at the local level is established in the comprehensive plan and implemented through land development regulations and policies. The comprehensive plan locates historic resources, identifies a need or desire to preserve these resources, and states preservation as part of the community's vision and goals for the future. Historic preservation is specifically addressed in the "Cultural Resources" element of ***Montgomery County 2025*** (also see Appendix A), which has as one of its goals to "develop and revitalize historically significant districts, villages, and corridors." Prices Fork is specifically noted as one of the Villages to be protected.

The Prices Fork village plan process affords an important opportunity to protect the community's historic resources and historic character. Preservation should be identified in the Prices Fork plan as a goal for the village (in addition to the county-wide goal already identified). Implementation of the historic preservation goal means the County planning commission and Board of Supervisors must (1) establish the boundaries for an expanded historic district in Prices Fork; (2) adopt zoning ordinance language for historic preservation; (3) appoint an architectural review committee; and (4) create historic design guidelines to guide the committee's work. These last three tasks – the zoning language, the design guidelines and the review committee – could be accomplished for Prices Fork specifically, or could address historic preservation issues throughout the County.

An Expanded Historic District in Prices Fork

As mentioned previously and shown in the map below, eleven properties in the Prices Fork village are now more than 50 years old and may be eligible for listing on the state and/or federal registers. Two preservation options are possible:



1. expand the boundaries of the existing historic district, creating a continuous area that includes the 11 properties and the parcels between them; OR

2. maintain the existing historic district boundaries and include the 11 additional properties in a non-contiguous "resource district."

The first option protects all of the village's historic resources. It also allows an opportunity to consider the impact that new development might have on the historic character and/or visual quality of the village. The second option only protects the historic resources.

Historic Preservation Overlay Zoning

All development is regulated through the Montgomery County zoning ordinance. The ordinance establishes rules for such issues as minimum lot area, yards, height limits, parking and landscaping requirements and allowable uses. Where special circumstances exist (floodplains, for example) the Board of Supervisors is allowed to adopt additional requirements to address these unique needs. The same holds true for historic districts or individual historic resources. When an historic preservation overlay zone is created, the owner of any property inside the zoning district must first comply with the zoning rules and regulations that apply to all properties in the community, and then meet the additional requirements related to historic preservation.

Historic preservation overlay zoning accomplishes two basic objectives:

(1) it protects older sites and structures – even those not on the state or federal registers – by requiring review and approval before these properties can be demolished, changed or expanded; and

(2) it prevents new development that is incompatible with the historic character of significant properties and their surrounding communities (i.e., anything inside the historic overlay district boundaries).

Decisions regarding historic preservation require education, training and experience in design, architectural history, materials conservation, and construction techniques, among other areas. Because few planning commissioners, supervisors or even planning staff have such credentials, communities frequently rely on the advice of an architectural review committee. Members of the committee are appointed based on their expertise in these important areas.

Proposals for new development, redevelopment, rehabilitation, demolition, etc., for all properties in the historic preservation overlay zone are forwarded to the architectural review committee for review and recommendations. The architectural review committee is charged only with those aspects of the application or proposal that deal with historic preservation. Even so, the committee's decisions must comply with Virginia law, and must be in accordance with the comprehensive plan and zoning ordinance.

To aid the architectural review committee, localities generally develop a set of design guidelines the committee uses in its decision-making. Historic preservation design guidelines consider:

- the history of the community or neighborhood, its major periods of development and its predominant architectural styles and settlement patterns,
- common and/or traditional materials and methods of construction, and
- architectural design elements and ornamentation, e.g., window and door styles, colors, etc.

The design guidelines are applied to all properties in the historic preservation overlay zone, both old and new. Proposals for new development are evaluated for their consistency with historic settlement patterns, design attributes (for example, number of stories, roof pitch, porches), and use of materials and colors, as outlined in the design guidelines. Applications for rehabilitation or reconstruction are examined to be certain they will not result in significant changes to the general character of the structure (exterior). This includes changes to colors or materials as well as additions or other modifications to the structure.

The architectural review committee makes a recommendation to either approve or deny the proposal, but final decisions are left to the planning commission and board of supervisors as outlined in the zoning or subdivision ordinances.

HOUSING AFFORDABILITY

According to the Code of Virginia, local comprehensive plans must include areas for construction and maintenance of affordable housing (15.2-2223). Local governments are authorized to increase densities, waive permits, reduce infrastructure fees, and take other measures to meet this requirement (15.2-2305).

The Prices Fork Village Plan is an area plan, not a comprehensive plan; therefore, it does not have a requirement to include affordable housing in this plan. Housing affordability is a concern of the Prices Fork residents so the issue will be examined here.

The Montgomery County Comprehensive Plan recommends six ways to improve housing affordability.

1. Mixed income developments
2. Development of smaller houses (1000-1500 square feet)
3. Accessory dwelling units (commonly called mother-in-law apartments)
4. Mixed use developments
5. Dispersing eldercare facilities throughout the county
6. Increasing development where infrastructure exists.

The Comprehensive Plan also outlines standards for Village Area Community Design.

- Multi-use structures and a mix of housing types that are compatible in scale and character with existing structures
- Interconnecting network of streets compatible with the character of local roads (pavement, width, building setbacks, etc.)
- Well-defined open spaces
- Comfortable and safe pedestrian access
- On street parking with lots and garages behind buildings

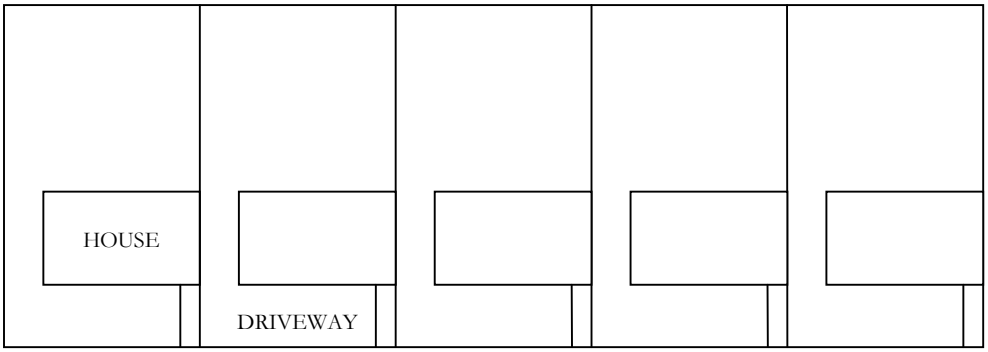
While not all of these standards apply to or are easily incorporated into residential development, they provide a starting point for the design of affordable housing.

LOT CONFIGURATION FOR AFFORDABILITY

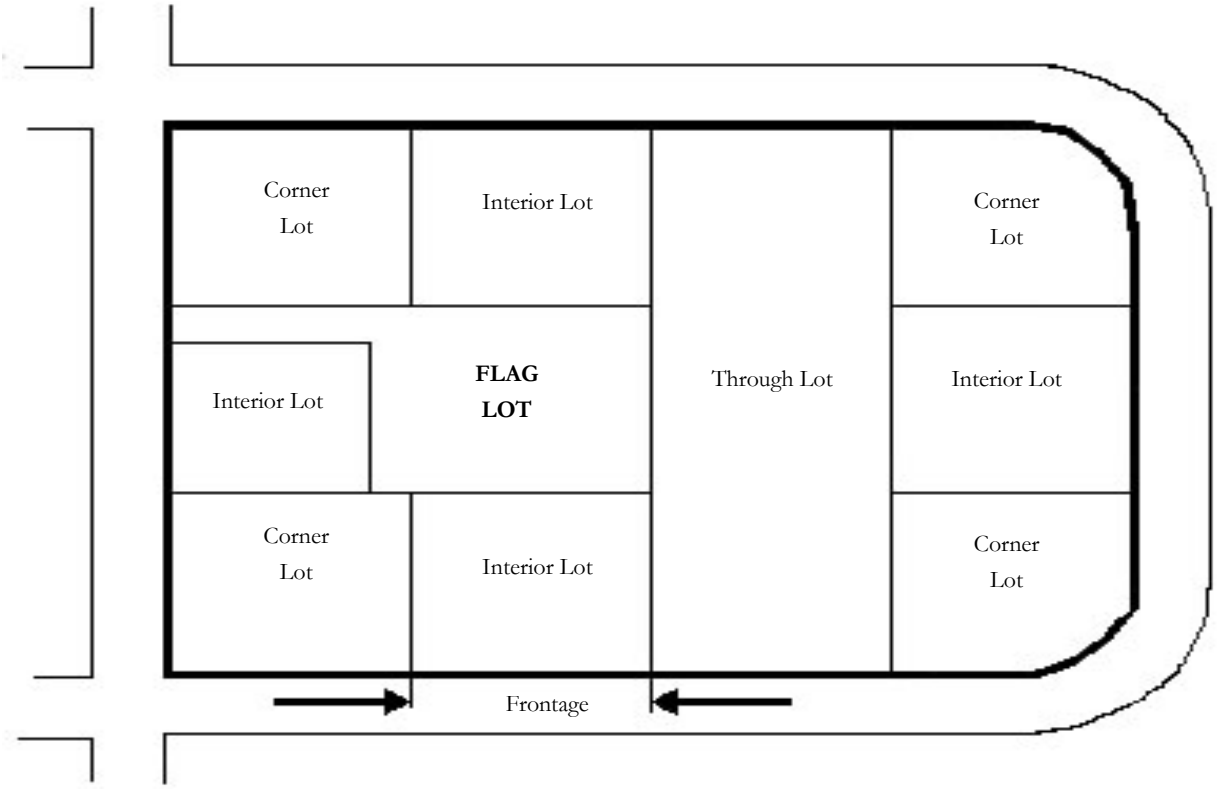
Other localities in Virginia have faced development pressures similar to those in Montgomery County. They have employed multiple strategies for keeping housing development affordable. One approach varies lot

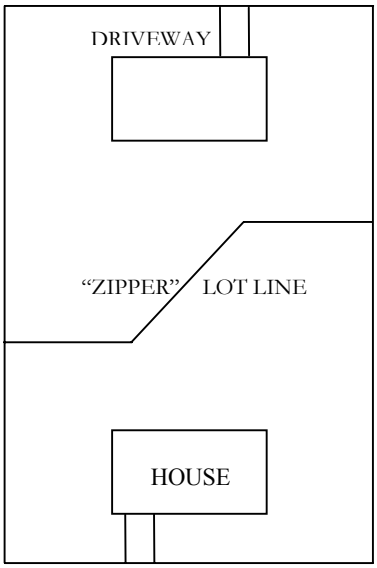
design. Lots are configured in such a way as to reduce overall land area (and therefore reduce cost) while retaining the appearance of larger lots. A few of these are shown in the diagrams below.

Zero lot line development eliminates setback requirements (yards) on one side of the lot, so long as the distance between the houses remains a minimum distance.

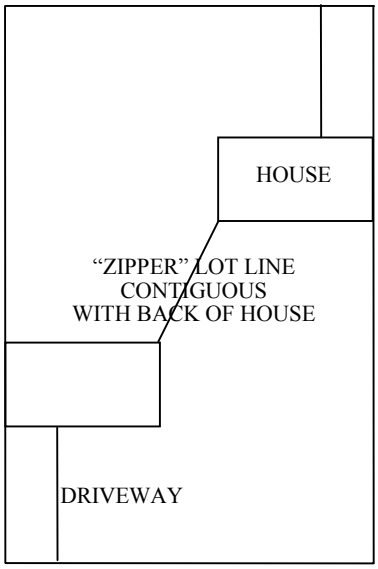


Flag lots allow for development at the interior of a block, with a small "pole" to access the street. This strategy eliminates the need to develop through lots or even to split the block in half because the flag lot takes advantage of interior block land area.





Zipper lots split the back portion of two lots creating more usable space in a vertical yard that is set to one side of the house. They are called zipper lots because the result looks very much like a closed zipper. A zipper lot can be combined with the zero lot line concept as well.



MAKING HOUSING MORE AFFORDABLE BY REDUCING INFRASTRUCTURE COSTS

Roads, sidewalks, curbs, gutters, water, sewer, and storm water are among the most significant costs in new developments. Two sources contribute to the cost: the amount of infrastructure needed to service a community, and regulations which require performance standards for infrastructure.

Reducing the Amount of Infrastructure in New Communities

The amount of road needed to service a community is directly related to street layout and, as well, the width of the lots. Traditional neighborhood design in a grid pattern often requires a larger number of streets than curvilinear designs. RHSD Planning, of Minneapolis, Minnesota, for instance, recommends a street design referred to as "coving." Coving replaces familiar grid pattern neighborhood development designs with streets that curve back and forth. Coving can result in the reduction of street lengths from 20 to 50 percent. The additional area not paved over for streets can be used to create larger lots, more lots of the same size, or open space.

Another way of reducing road length and accompanying infrastructure in a community is clustering development. Clustering development places the housing in one area of a property while keeping the other

area as open space. This also results in reducing the total infrastructure, if clustering is kept near the collector road. The remaining open space can be used for passive recreation, such as biking or hiking, or active recreation on sports fields or playgrounds. Clustering also provides opportunities for establishing green networks.

A final consideration is reducing the cost of infrastructure to each homebuyer by increasing the density of the development. The density can be increased by narrowing the width of the lots, resulting in each housing unit paying less of the total infrastructure costs for the neighborhood. Creative designs such as flag lots can result in multiple sized lots, giving residents the option to purchase larger or smaller properties depending on their ability and preference. Smaller lots also allow for the integration of moderately and higher priced units into a single community, contributing to families being able to live together.

By reducing the length of roads needed to service the community, clustering development, and increasing density, infrastructure costs per house can be lowered.

Regulations and Infrastructure Performance Standards

Other infrastructure requirements and common provisions have a large impact on housing costs. Curbs, gutters, and sidewalks can add over a thousand dollars per unit to each house. Should curbs, gutters, and sidewalks be considered in the Prices Fork Village Plan, flexible application should be allowed. Sidewalks could be added to one side of the road, for instance, or gutters could be replaced with grassy swales. Grassy swales are generally much easier to maintain than traditional storm drainage and also allow for groundwater infiltration, maintaining the water cycle. However, grassy swales are not effective on steep pitches, so their use must be dictated by terrain. To the extent that they can be substituted on level terrain, though, they promise both reduced infrastructure costs and sound environmental development policy.

Sewers generally have width requirements by the county or state. Carefully assessing whether the sewer requirements are excessive for households and reducing the pipe size accordingly can be a significant source of savings for a community. Additionally, sewers have traditionally been laid out in a grid fashion, not unlike streets. By creating curvilinear sewage networks, the total length of the sewage facilities can be reduced, thus lowering linear foot prices. Another method for reducing sewer costs is to build one pipe to service two houses. This can be done by constructing the sewage pipe along property line, rather than building two separate pipes through the middle of each property. One study in 1987 showed that a neighborhood in Kentucky that employed both smaller pipes and reduced sewage system length was able to save over 60,000 dollars in construction costs.

Road width is also an important contributor to infrastructure costs. Virginia Department of Transportation standards are calculated by trip generations, but many believe that the standards can be relaxed slightly and

still meet safety regulations. Reducing road widths from 36 to 28 feet on streets with low to moderate usage, for instance, can save over 17% in total costs for road construction. Wider-than-necessary also roads reduce the amount of land available for housing, resulting in smaller lots, fewer houses, less open space, or all three. Allowing for narrower roads in communities not only results in lower costs for developing these roads, but it also slows traffic and provides for a safer environment for inhabitants of the neighborhood. Finally, wider roads create greater impervious surfaces and therefore increase erosion and sedimentation. Narrower roads can enhance safety, reduce costs for homeowners and improve environmental quality.

Roads that do not meet VDOT standards must be privately maintained by the community. Currently, Montgomery County only permits private roads in single family subdivisions if the subdivisions median lot size is three acres or greater (Montgomery County Code, Section 8.152). This rule should be changed so that roads can be privatized based on service demands for local, collector, and arterial roads.

Finally, engineering standards for neighborhood roads should be reviewed. Often, neighborhood roads meet design standards for much heavier traffic than they accommodate. This results in excessive costs for building the roads in communities. Reduction in engineering standards based on trip generation models per household can save several hundred dollars per unit of housing.

The most efficient neighborhoods will be those that can both reduce the amount of road required to serve homeowners and save on costs that are imposed by unnecessary regulations. To provide an example of how much can be saved in a neighborhood, a comparative calculation was made between two neighborhoods. The first is a 100 unit, traditional subdivision that meets all state and county regulatory standards, has sidewalks, complete curb and gutter drainage, and no clustering. The second neighborhood has 110 units, slight clustering, and infrastructure that would still meet health and safety requirements but do so through slightly narrower streets, reduced sewage size on local streets, limited sidewalks, and grassy swales where slopes are less than 10 percent. For conservative purposes, swales and local streets were assumed to exist in only 30 percent of the neighborhood, and half of all streets still have sidewalks:

Comparison of Standard Development and Modified Development Infrastructure Costs

Infrastructure	Standard Development Cost per Linear Foot	Planned Development Cost per Linear Foot	Guiding Regulation Source
Water	$23.00	$16.00	Virginia Department of Health, Montgomery County, VA
Sewer	$51.88	$41.32	Virginia Department of Health
Drainage	$38.00	$17.60	Montgomery County, Virginia
Sidewalks	$20.00	$16.00	None
Roadways	$63.70	$41.48	Virginia Department of Transporation
Curb and Gutter	$18.00	$18.00	Yes- Part of Drainage System
Swales- LID Drainage		$5.00	None
Total	**$214.58**	**$142.40**	
Total Infrastructure Cost	$2,145,800	$1,281,600	
Houses (Total)	**100**	**110**	
Infrastructure Cost per House	$21,458	$11,651	

SAVINGS PER HOUSE	**$9,807**
SAVINGS (%)	**46%**

Note: costs for planned development are not additive. Please see Appendix A for a detailed breakout of development costs.

Cost Source: Barnes, Grogan, Bower & Taylor Design Group, PC

As can be seen, efficient development of infrastructure can result in cost savings of almost 10,000 dollars per house, or 46% of the original infrastructure price. A detailed break-out of the costs is available in Appendix B. These costs do not include water and sewer tap fees, electricity, permitting, landscaping, or private costs such as front yard sidewalks or driveways. While these options add to home value, the inclusion of high end features such as brick sidewalks should be optional and discouraged for moderately priced housing.

In conclusion, reducing infrastructure length, increasing density, and relaxing engineering standard requirements can all contribute to housing affordability in Prices Fork village without degrading the quality of life. The county and citizens should welcome opportunities to create more affordable housing through efficient and responsible infrastructure development.

HOUSING DESIGN FOR AFFORDABILITY

Changing the way infrastructure is developed is not the only way to make housing more affordable. There are ways to change the design and building methods to reduce costs as well. Two options that are explained in this report are factory built housing and multi-family housing that blends in with single family housing.

In recent years the factory built house (also called modular or manufactured house) has gained popularity. This is largely due to its increasing similarities to site built houses. Because of computer design capabilities, factory built houses are now easier to customize. Owners can alter floor plans and select optional upgrades just as they can when designing a site built house (bathroom fixtures, appliances, vaulted ceilings, fireplaces, bay windows, etc.)

While savings figures vary depending on the source, it is generally concluded that factory built housing is less expensive per square foot than site built housing. Other advantages of factory built housing are consistency in high quality construction and less time required for construction.

Cost Comparison: Two-Story House, 1900 square feet		
	Site Built	Factory Built
Construction Costs	$76,752	$65,239
Land Costs	$35,136	$35,136
Other Expenses	$29,232	$27,517
Finance Costs	$2,880	$1,292
TOTAL COST	$144,000	$129,187
Savings	**$14,813**	**10.3%**
Source: U.S. Dept. of Housing & Urban Development		

The second way to increase housing affordability is by incorporating multi-family homes in single family neighborhoods. Through good design, it may be difficult to distinguish between the two. There are companies who specialize in "disguising" multi-family housing as single family homes. The pictures at right are samples of multi-family housing units designed by Signature Building Systems of Moosic, PA and St. George, SC.

Integrating single family housing and multi-family housing increases housing density while maintaining the neighborly feel of the village of Prices Fork.

MULTI-FAMILY

The Jefferson

The Washington

The Lincoln

The Bayboro

This method adds housing units without creating a large apartment complex in the area.

ACTION STRATEGIES FOR AFFORDABLE HOUSING

There are multiple ways for Prices Fork to encourage housing affordability while maintaining the character of the village.

- Allow developers to integrate multi-family units into single family neighborhoods
- Allow homeowners to choose factory built houses
- Encourage the County to be flexible with zoning requirements
- Encourage the County to amend regulations to allow alternative lot configurations (Z lots and zipper lots) to minimize land and infrastructure costs
- Encourage the County to permit planned use developments
- Encourage developers to explore ways to minimize infrastructure costs while still connecting new homes to County services
- Encourage the County to relax infrastructure requirements so long as health and safety goals can be demonstrably met
- Promote clustering and other methods to reduce road and sewer length in new subdivisions
- Permit higher densities to reduce costs per housing unit.

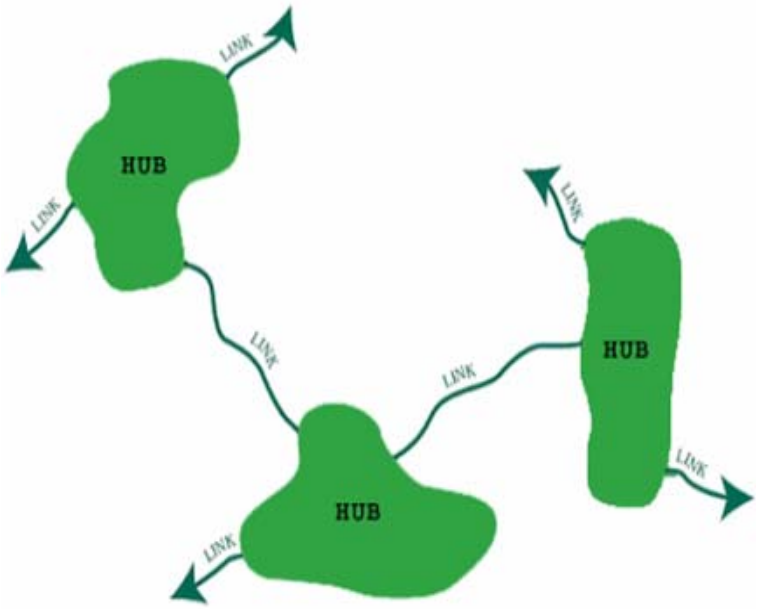
GREEN INFRASTRUCTURE

Green infrastructure is conceptual framework that can be used to plan for open space and connectivity as part of – or even in advance of – new development. Sprawl Watch defines green infrastructure as "an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations."

A green infrastructure plan is just like a transportation plan or a land use plan. Through the plan the community makes a commitment to protect open spaces and views, create recreational opportunities, and facilitate the movement of people by linking important places and spaces. A green infrastructure plan is comprised of a system of hubs and links, as shown in the figure, below.

Hubs are natural places that serve as origin and destination for the movement of both people and wildlife. These areas also support important ecological processes:

- Reserves – large protected areas like national and state parks and wildlife habitats;
- Managed Native Landscapes – large publicly owned lands like national and state forests that are used for natural and recreational values;
- Working Lands – private farms, forests and ranches that are used for production of different commodities and yet remain in an undeveloped state;
- Regional Parks and Preserves – places of regional ecological significance;
- Community Parks and Natural Areas – smaller parks and other open spaces at community level where natural processes or ecological benefits are to be preserved.



Green Infrastructure Concept

From Williamson, *Growing With Green Infrastructure*

Links are the corridors that connect hubs and allow for movement, and include:

- Landscape Linkages – large protected natural areas that serve as corridors for connecting ecosystems and landscapes. They also provide opportunities for protection of historic sites and recreational use;
- Conservation Corridors – linear protected areas that are less extensive like river and stream corridors. They mainly act as conduits for wildlife movement and besides also provide limited recreational use;
- Greenways – protected corridors managed for resource conservation and recreational use;

- Greenbelts – natural lands or working lands that preserve native ecosystems while maintaining their predominantly undeveloped uses like farms and ranchlands;
- Ecobelts – linear buffers acting as refuge between urban and rural land uses while providing ecological and social benefits to both urban areas and rural areas.

PLANNING FOR GREEN INFRASTRUCTURE

Planning for green infrastructure is similar to planning for built, or gray, infrastructure. It involves an inventory of open spaces in the community and a set of policies or strategies for protecting and preserving these places. Many communities focus their green infrastructure planning a theme like recreation, preservation, or economic development. This helps in analyzing who would be using the infrastructure and what features to incorporate to encourage usage. Green infrastructure also needs to be coordinated with gray infrastructure facilities like roads and bike trails. In fact, bike trails are an important feature of green infrastructure as they provide linkages for movement of people.

The stages or steps required for planning and developing green infrastructure for a community are described below.

1. Decide on the approach (theme)
2. Inventory community resources and existing features (land use and ownership, environmental resources, access and transportation, recreation resources, etc.)
3. Formulate goals and objectives for the future
4. Explore alternative scenarios
5. Prepare the final plan, design guidelines and other implementation tools
6. Build the system.

DESIGNING THE SYSTEM: WALKWAYS AND TRAILS

Walkways are important features in a green infrastructure plan because they provide linkages between places. In fact they are features that can be used for more than just providing linkages. They can be places that provide interesting character by sequentially revealing landscape to the people who use it and by providing a sense of being at a particular place or just having passed a particular place. This experience can be enhanced by orientation, use of landscape features and through the overall design of the walkways.

Street furniture incorporated into walkway design
Dave Lamons - http://lamonslandscape.com/walkways2.htm

Walkways should have a distinct pedestrian feel, with consistent materials and details, e.g., the trees and bushes that line the walkway edge. Where walkways intersect roads and/or parking areas, landscape "bumps" with trees and other landscape features can be used to minimize pavement widths. Street furniture – benches, refuse containers, bicycle racks, signage and lighting – should be provided to make them both safe and enjoyable. Some guidelines for designing walkways are:

- Layout of the walkway and walkway design itself should be based on the speed of movement in relation to path width, walking gradient and viewing distance.
- Walkways should be designed according to hierarchy of volume. The major walkways may include a bicycle right-of-way wherever possible.
- Major walkways should be wide enough to accommodate peak volume from origin to destination without any interruption.
- Minor walkways can make use of interesting terrain and other spatial features by being circuitous or looping.
- Pedestrian traffic and vehicular traffic must be separated and at places of conflicts adequate measures should be taken like pedestrian

Using landscape features in walkway design.
CreativeLandscapes, www.creativelandscapes.com/whatwedo.html

crossing, speed humps and special pavement treatments.

- Walkways should be aesthetically pleasing which can be done by using landscaped features and material to provide a memorable experience to the pedestrians.
- Access ramps should be provided for people with restricted mobility.

Trails are one of the most common features of greenway planning. They can be used for active and passive recreation, as well as for alternative transportation. Users are the most important consideration when designing a trail system – walkers, joggers and runners, nature lovers, bicyclists, skaters and skateboarders, horseback riders, and even motorized vehicle drivers. Each of these user groups has slightly different demands that have to be considered during planning and design. Conflicts may crop up between different user groups and it is possible to eliminate at least some of these conflicts through design (though in some cases, such as motorized vehicles or horses, the use can be geographically or temporally restricted or prohibited entirely).

Monona Greenway Carmel

Indiana's Cardinal Greenway

A good guide for trail layout comes from the Pennsylvania Trails Program, which states that trails should be "more than simply the shortest distance between two points." Land ownership and availability of public land sometimes define the layout by restricting the places a trail can be routed through.

As with walkways, safety is an important consideration. Trails should meet minimum construction standards, and signage should be installed to guide and facilitate movement.

Local residential street patterns are influential in shaping the identity of a community and determining people's travel behaviors. Streets provide access to individual residences and to neighborhood destinations such as schools and parks. A poorly connected street network forces use of automobile over other travel modes, creates the need for excessive out-of-direction travel, divides neighborhoods, and limits accessibility to property and neighborhood facilities. A well-connected street network provides travel choices, helps to disperse traffic, and encourages pedestrian and bicycle travel.

The design of local streets also plays an important role in controlling traffic speed. Narrow streets tend to slow traffic and are more conducive to pedestrian travel. They also need less maintenance, encourage more efficient land use, and improve neighborhood character. Narrower streets are an efficient way of providing connectivity without encouraging the use of local streets for cut-through or fast-moving traffic. Thus, local streets should not be excessively wide, but must be wide enough to accommodate emergency vehicles and provide for on-street parking.

Adoption of local street connectivity policies (and related ordinance language) will ensure that existing street connections are maintained and that new developments are consistent with the community's green infrastructure goals. Model connectivity policies are outlined in the table that follows.

Implementation of the policies may require the adoption or new or revised ordinance language. Community input is an important part of this process; residents need to be involved in decisions about the location and design of streets, as well as the walkways and trails.

IMPLEMENTATION OF THE GREEN INFRASTRUCTURE PLAN

Successful implementation means that funding must be available for land acquisition, trail construction, and trail management, maintenance and security. Some properties may be acquired through the dedication of easements, but not all of the necessary land acquisition can be accomplished in that manner.

Public financing options include a general fund allocation or local bond funding. Including green infrastructure in the capital improvements plan provides a mechanism for funding development and is evidence of a long-term commitment by the local government. State and federal grants (for example, the federal Transportation Equity Act for the 21st Century, or TEA21 multi-modal transportation grants) can supplement the local allocation. Grant funds can also be obtained from private and nonprofit foundations or organizations. However, grants should not be considered a long-term solution for greenway development and maintenance.

GOAL	OBJECTIVE	POLICIES
To provide an interconnected local street system that encourages various travel modes and dispersal of traffic.	New development should contribute a local street pattern that provides access to property and connections to collector and arterial streets, neighborhood centers and facilities, and emergency access.	Applicants submitting preliminary development plans shall provide for local street connections to existing streets and neighborhood centers within one-half-mile of the development. Street alignments should be sensitive to natural features, topography, and layout of adjacent development.
		Applicants submitting preliminary development plans shall provide for extension of local streets to adjoining undeveloped properties in order to connect undeveloped properties to the existing street system. Street alignments should be sensitive to natural features, topography, and layout of adjacent development.
		Street connections to existing or planned streets and undeveloped properties shall be provided at no greater than 600-foot intervals unless the adjacent layout or topographical conditions justify greater length.
	Local street systems are designed to meet the needs of pedestrians and encourage walking as a transportation mode.	All development shall include sidewalk and walkway construction. All new roads construction or reconstruction projects shall include sidewalks.
		All development shall not have block-length of more than 600 feet between street centerlines unless adjacent layout or topographical conditions justify greater length.
		The Village may require pedestrian and bicycle accessway to connect to cul-de-sac streets, to pass through long blocks, and to provide for networks of public paths creating nonmotorized access to neighborhood centers or facilities.
	Provide for minimal paved area and dimensional requirements for local streets consistent with efforts to reduce street construction and maintenance costs, and impervious surfaces and to provide for pedestrian-friendly streets.	In order to facilitate pedestrian crossing, through traffic should be discouraged, speed limits should be low and local streets shall not be excessive in width. However, public local streets must have sufficient width to allow for emergency access and provide parking on at least one side.
		Local streets shall be designed to minimize cut-through traffic. Limiting street length, width, and the installation of traffic calming measures may be used to discourage through traffic from using local streets.
		Construction of cul-de-sac streets shall be minimized to the extent practicable. Cul-de-sac streets may be allowed to increase density by accessing the land which otherwise cannot be accessible through a connected street pattern due to topography or other constraints.
		Cul-de-sac streets shall not exceed 800 feet in length. However, no portion of the cul-de-sac street shall be more than 400 feet from an intersecting street or public accessway unless physical constraints make it impracticable.

Private contributions can be obtained from 1) donations and gifts of money from individuals or corporations; 2) wills, estates or trusts; and 3) in-kind donations of labor, materials and supplies. A local private greenway advocacy group or greenway commission can create and administer a trust fund for land acquisition and greenway trail development.

Communities have been successful in garnering financial support from the Chamber of Commerce, tourism and economic development organizations. A good greenway system is one indicator of the community's quality of life and a good selling point for economic developers trying to attract quality businesses to the community or for local businesses trying to attract high income earning employees. Programs aimed at increasing public awareness and involvement in greenways could also serve to facilitate private contributions. In High Point, NC, citizens were encouraged to purchase one linear foot of the trail.

GREEN INFRASTRUCTURE FOR PRICES FORK

In the planning workshops residents expressed their concerns about the potential future loss of green infrastructure in the village. They enjoy the natural beauty of Prices Fork and consider the scenic views of Price and Brush Mountains, historic houses and farmlands, especially along the Prices Fork Road a strength and an opportunity for the community. They want to preserve natural resources such as forests, wetlands and creeks.

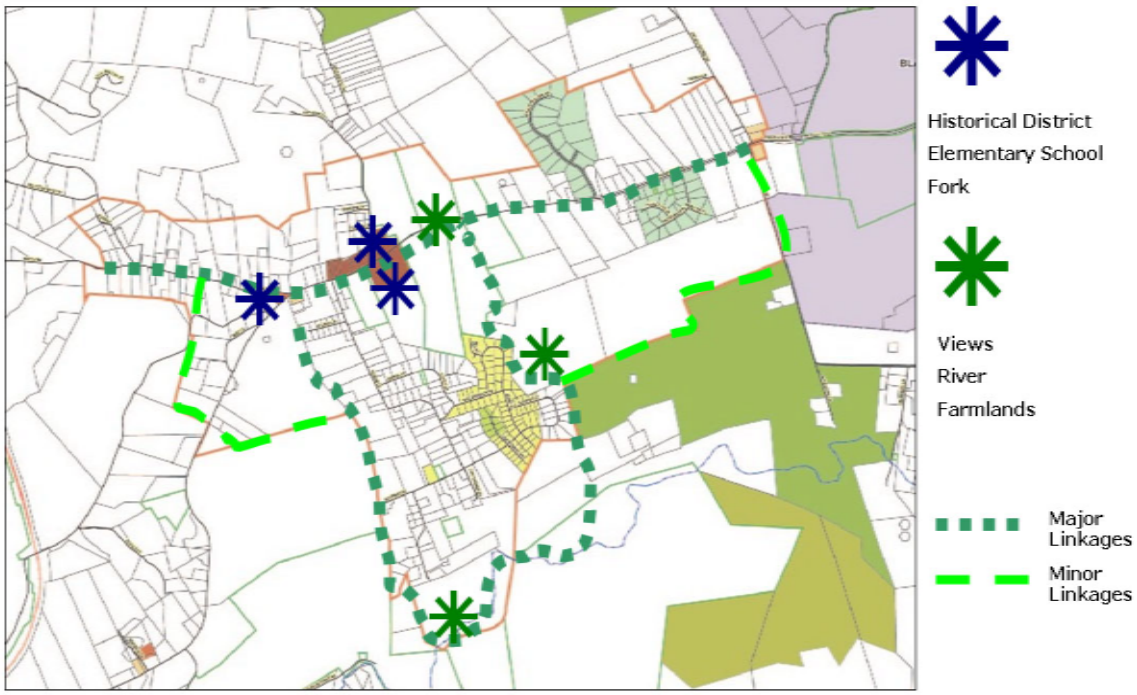
Some expressed a need for a community park where they can hold community gatherings and other social events. They wanted footpaths and trails to improve connectivity in neighborhood, so that children can walk to school and people can walk to the homes of relatives and friends in the neighborhood. Presently it is impossible to walk on village roads due to the lack of sidewalks. Some wanted trails and parks to connect to the Hethwood and Huckleberry Trails.

Based on the concept of Green Infrastructure and residents' desires, some of the themes for planning green infrastructure for Prices Fork are:

1. Maintain open rural landscape in Prices Fork.
2. Link residential centers and natural and cultural features.
3. Provide walkways alongside roads and trails for connectivity.
4. Provide improved connectivity in new subdivisions.

The residents mapped the natural processes and cultural places unique to Prices Fork. These are shown in the map below. The green stars represent natural resources such as scenic views from Prices Fork road, farmlands, and creeks. The blue stars indicate culturally and socially important buildings, e.g., Prices Fork Elementary School and the Fork.

The map shows major and minor linkages, however these linkages are only suggestive and do not consider any constraints imposed by the present land use or property ownership. They only suggest how the places identified as hubs can be linked to have a walkable community.



Hubs and Links in Prices Fork
Source: Montgomery County

*map not to scale

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APPENDIXES

APPENDIX A

HISTORIC PRESERVATION PLANNING IN MONTGOMERY COUNTY FROM ***MONTGOMERY COUNTY 2025***

CULTURAL RESOURCES ELEMENT

CULTURAL RESOURCES: GOALS

CRS 1.0 Historic Preservation Goal: Promote the preservation of the historical and cultural integrity of the built and natural environment, including individual structures, districts, and historically significant landscapes and viewsheds.

CRS 1.1 Historic Villages, Districts, and Corridors: Develop and revitalize historically significant districts, villages (Riner, Prices Fork, Lafayette, Elliston, Shawsville, and Merrimac), and corridors (US 460/Rt 11 and Catawba).

CRS 1.1.1 Certified Local Government Program. Establish a countywide Certified Local Government program, as outlined under the Historic Preservation Act of 1966, including maintaining and updating the inventory of historic structures in Blacksburg, Christiansburg, and Montgomery County. Establishing a countywide Certified Local Government program would require a cooperative effort between Montgomery County, Blacksburg, and Christiansburg, as well as the City of Radford.

CRS 1.1.2 Historic Signage. Establish a systematic program, through the Department of Historic Resources Local Marker program, to provide historic markers, town markers, and appropriate historical signage, as well as an online and printed guide to the local markers, throughout Montgomery County, Blacksburg, and Christiansburg, in order to preserve the history of the area and promote the development of a viable history based tourism industry. (3)

CRS 1.1.3 Historic Villages and Rural Communities. Maintain the viability and historic character of existing villages and rural communities by encouraging preservation of historic structures and preservation of the historic pattern of developed and undeveloped areas that define the villages, rural communities, and their boundaries.(4)

CRS 1.2 Preservation of Individual Properties. Promote the historic preservation of individual structures by providing local technical assistance to local landowners and developers.

CRS 1.2.1 Historic Preservation Easements. Target specific areas of the county for conservation and historic preservation easements, allowed under the Virginia Historic Preservation Easement Program (1996), thereby preserving both historic structures and districts by preserving the context in which they are situated and by affording long-term legal protection.

CRS 1.2.2 Regional Survey of Historic Resources Database and GIS Layers. Provide direct access to information on individual properties, within Montgomery County, to property owners by establishing, maintaining, and updating the County Survey of Historic Resources GIS database.

CRS 1.2.3 Public Information. Provide public information on historic preservation and historic preservation easements to individual landowners and developers, including access to forms and a list of local preservation and easement specialists.

APPENDIX B

CALCULATIONS FOR LINEAR COSTS OF INFRASTRUCTURE

Calculations for Linear Foot Costs as Shown in Table 1

Standard Development		Planned Development		
Water	**$ per linear foot**	**Water**	**$ per linear foot**	**Split Between Infrastructure**
8 inch DI*	$23.00	6 inch PVC*	$16.00	
Total, Water	*$23.00*	*Total, Water*	*$16.00*	
Sewer		**Sewer**		
8 inch & manhole every 200 feet	$51.88	8 inch main, mahhole every 300 feet	$41.92	70%
		6 inch side, manhole every 300 feet	$39.92	30%
Total, Sewer	*$51.88*	*Total, Sewer*	*$41.32*	
Storm Drains		**Storm Drains**		
24 inch average pricing HDPE*	$27.00	18 inch average pricing CMP*	$12.00	70%
		Swales in shallow drain areas	$5.00	30%
DI-3B curb structure for inlet	$11.00	DI-3B where CMP used	$11.00	70%
Total, Storm Drains	*$38.00*	*Total, Storm Drains*	*$17.60*	
Sidewalks		**Sidewalks**		
Five foot sidewalk	$20.00	Four foot sidewalk main street	$16.00	50%
Total, Sidewalks	*$20.00*	*Total, Sidewalks*	*$8.00*	
Roadway**		**Roadway****		
36 foot main road per VDOT	$67.00	28 foot wide main road	$56.00	49%
28 foot wide side streets per VDOT	$56.00	26 foot wide side roads w/sidewalks	$54.00	21%
Concrete Curb & Gutter	$18.00	20 foot wide ditch roads	$27.00	30%
		Concrete Curb & Gutter	$18.00	70%
Total, Roadway	*$81.70*	*Total, Roadway*	*$59.48*	

Total Cost	Standard Practice	Revised Practice	Savings
	$214.58	$142.40	33.6%

*Terms
DI = Ductile Iron piping
PVC = polyvinyl chloride piping
*HDPE = High Density Polyethelyne
CMP = Corrugated Metal Pipe

**In both scenarios, roadways have 8 inch gravel base and 2 inch asphalt surface.
Standard Development assumes 50% of neighborhood has 36 foot wide roadways.