RFQ 683937 - Attachment 2

Date of Meeting: July 19, 2022

6

BOARD OF SUPERVISORS
BUSINESS MEETING
ACTION ITEM

SUBJECT:	**Village of Waterford Preserving the Landmark Infrastructure Improvements Master Plan Study**
ELECTION DISTRICT(S):	Catoctin
CRITICAL ACTION DATE:	At the pleasure of the Board
STAFF CONTACT(S):	Corinna Sigsbury, Transportation and Capital Infrastructure Nancy Boyd, Transportation and Capital Infrastructure

PURPOSE: Present the findings and recommendations from the Village of Waterford Preserving the Landmark Infrastructure Improvements Master Plan Study (the 2022 Study, provided as Attachment 1).

RECOMMENDATION(S): **Staff** recommends that the Board of Supervisors (Board) endorse the long-term improvement recommendations that are described in this item for future planning and implementation. Staff further recommends that the Board forward the request to fund the Village of Waterford improvements to the Capital Improvement Program FY 2024 budget process for consideration and prioritization.

BACKGROUND: The Village of Waterford (Waterford) was established in 1733 and is currently an unincorporated area of Loudoun County within the Catoctin District, approximately five miles northwest of the Town of Leesburg. Waterford with its surrounding countryside— a total of 1,420 acres — was granted the National Historic Landmark (NHL) status in 1970. This NHL is one of only a few that encompasses an entire village. Following this NHL recognition, local citizens, county and state officials, and friends of Waterford from across the nation continued the work in preserving the landmark in the 1970s, 80s, and 90s.

In 1999, through the endeavors of many people, Waterford citizens arrived at a consensus for improving traffic safety and restoring the historic character of the village. Based on this consensus, the Waterford community worked with Loudoun County to obtain a Transportation Equity Act for the 21st Century (TEA-21) grant, with which the County completed a preliminary engineering study entitled *Bury the Wires and Tame the Traffic* (2003 Study). The study was administered by the County's Department of General Services (DGS), in coordination with the Virginia Department of Transportation (VDOT) and completed in 2003.

Since 2003 multiple studies have been undertaken and presented to the Board. Below is a summary of the timeline of events.

At the January 15, 2008 Board Business Meeting, the Board approved (9-0) a conceptual traffic calming plan (Plan) for Waterford and requested that VDOT implement Phase 1 of the Plan. The development of this Plan resulted from increased regional development that created steady growth of traffic volume and increases in traffic speed through Waterford's roadways that threatened its historic landscape.

In July 2015, Waterford Citizens' Association (WCA) approached the Catoctin District Supervisor with concerns regarding excessive vehicular speeding and volume traversing the Village of Waterford. Following this, at the June 23, 2016 Board Business Meeting, the Board approved (9-0) the expenditure for the cut-through traffic study.

At the January 21, 2020 Board Business Meeting, DTCI recommended that the Board authorize the installation of Pole Mounted Speed Display signs on Loyalty Road, Clarkes Gap Road, and First Street as interim traffic calming measures in the Village with the signs to be maintained by DGS, and amend the Fiscal Year 2020 Capital Improvement Program (CIP) by authorizing the transfer of $100,000 from the Traffic Calming Contingency account in the Capital Fund to the Traffic Calming Signs Project in the Capital Projects Fund for the installation of proposed signs, and direct staff to review the viability of other traffic calming measures such as a bypass, chicanes, and chokers at the three entry points of the Village, and report back at a future business meeting, which the Board approved (9-0).

In 2020, in partnership with the Waterford Foundation, Inc. (WFI), the WCA launched a visioning and community planning effort called "Waterford 2033." Their aim is to develop a unifying community plan for Waterford based on shared vision of what they want the Village to be in the future, along with the strategy and resources to implement this community plan. WCA's goal is to implement this community plan by or before 2033, when the village will be 300 years old. In developing a strategy for the potential infrastructure improvements within the village, WFI and WCA turned to the 2003 Study and its master plan of traffic calming, utility relocations, and overall infrastructure improvements intended to preserve the heritage of the Village of Waterford and protect its NHL status.

In 2021, the members of WCA and WFI approached Loudoun County for its support in updating the concept designs in the 2003 Study, with a view to implement these designs before 2033, including integrating the results of the recent Loudoun Water Historic Waterford Water Feasibility Study, the traffic calming analyses recently conducted by Loudoun County and VDOT, and current best management practices for stormwater management, as well as reuse of stormwater and other sustainability practices. In January 2022, Loudoun County DTCI issued a task order to Kimley-Horn for this study, which culminated in the completion of a report titled *Preserving the Landmark* (2022 Study) which is an update to the 2003 Study, incorporates recommendations from more recent studies, and results in comprehensive recommendations and updated high-level cost estimates for a program of infrastructure improvements. The intent is to address the on-going

challenges associated with a growing number of overhead wires and cables, aging stormwater pipes and culverts, growing traffic volumes, and high traffic speeds. A comprehensive, holistic strategy is needed for Waterford to restore historic viewsheds, reduce and calm traffic, improve existing infrastructure, and add new utilities, all in the context of the village's status as a NHL.

The focus area of the 2022 Study are the streets within the Village of Waterford, including the sidewalks, vehicle travel lanes and parking areas, storm drainage, ditches, outfalls, and wet and dry utilities. Adaptive reuse; environmental and cultural resources, including wetland and streams; historic architectural resources; as well as preservation easements were considered in this study. Community input informed the study and report from ongoing coordination with the WFI and WCA via an August 2021 Village survey, March 2022 Community Open House (in-person), and April 2022 Community Meeting (in-person).

Traffic Calming

Reducing vehicle speeds and vehicle volumes remains a priority for Waterford as it impacts the safety of its residents. While the posted speed limit throughout Waterford is 20 miles per hour (mph), speeds measured in the 2003 Study and in recent studies indicate that a vast majority of drivers exceed the 20-mph speed limit. Also, with ongoing development in areas of the County north and west of Waterford, such as "by right" residential developments allowed by current Loudoun County zoning rules, the amount of traffic passing through Waterford to destinations south and east of Waterford has grown significantly in the past 20 years. These vehicle trips use the village streets as their path of least resistance for regional travel, aided today by smart phone apps like Waze and Google Maps. While the recommendations of the 2022 Study focus on traffic calming and infrastructure solutions for the Village of Waterford, it is understood that the residents of Waterford and Loudoun County will continue to advocate for regional transportation solutions to address the systemic challenges of traffic congestion within and around the village.

Traffic calming measures in towns and cities throughout the United States today range from very subtle measures, such as narrower travel lanes and roadside landscaping, to more intrusive measures such as roundabouts and major roadway modifications. A full range of measures could be considered for Waterford, but proposed measures need to be context sensitive so they do not adversely impact Waterford's NHL status and preserve the historic character of the village. Thus, traffic calming alternatives include:

- Minor modifications to the roadways, including edge and centerline pavers (forming splitter islands, chokers, and chicanes), corner radii reduction, narrow lanes, signs, pavement markings, etc.
- More major geometric projects: road lowering, speed tables, speed bumps, dips, curbs, gutters, traffic circles, roundabouts, etc.

These measures, when considered in combination with each other, should result in overall speed reductions of 3 to 5 mph and much more for "rogue" speeders, according to traffic calming references published by the Federal Highway Administration (FHWA) and the Institute of Transportation Engineers (ITE). The materials used for traffic calming measures in Waterford

should resemble historic materials, consistent with the character and "feel" of the village and its NHL status.

Roads, Sidewalks, and Pavement

The roads in and around Waterford are two-lane undivided facilities paved with asphalt or gravel. The cross sections of the roads vary in slope, width, and locations of on-street parking. Vehicle parking needs are currently addressed by on-street parking and a few driveways. The shortage of adequate on-street and off-street parking is a challenge for residents, visitors, and tourists; however, several areas within the village are candidates for informal or infrequent parking areas.

Sidewalks throughout the village are discontinuous, and portions of sidewalk are in need of repair, requiring pedestrians to travel along the street with moving vehicles. Improving the walkability network in Waterford is another top priority; providing safe continuous walking paths, adding connections to existing trails, and separating motorists and pedestrians will enhance the safety of residents and its visitors. This will ultimately provide a network of walkways to knit the village together, including providing access to trails in open space areas, such as the Phillips Farm interpretive trail. The location of the Phillips Farm is shown in Attachment 1.

The reconstruction of pavements will be necessary as Waterford moves forward with a comprehensive infrastructure project to bury wires, tame traffic, fix drainage, and install water lines and utility duct banks. During the detailed design phase, the streets may be rebuilt with asphalt or concrete pavement. If concrete is chosen, this pavement could have a more historic look and feel, similar to facilities owned by the National Park Service.

Stormwater Management

Stormwater in Waterford currently drains primarily via sheet flow around and under existing houses and buildings into small roadside swales or ditches, and then through small storm sewer systems or culverts into seven outfalls. Several problem areas exist with the storm drainage system in Waterford primarily due to the age of the existing stormwater system. With respect to water quality, there are currently no stormwater best management practices (BMPs) evident within Waterford, and stormwater runoff flows directly into South Fork Catoctin Creek without any practical BMP measures. The goal of a BMP is to reduce or eliminate the amount of pollutants that enter streams, waterways, and eventually the Chesapeake Bay.

To address the drainage problems in Waterford, the historic nature of the village should be recognized to minimize adverse impacts to its NHL status, while upgrading the storm drainage system within appropriate areas of the village to current county and Virginia standards. In combination with traffic calming measures, such efforts could include repair of curbs and inlets, extension of curbs, addition of gutters and inlets, regrading and improving ditches, replacing existing pipe culverts, adding new culverts, cleaning out and upgrading existing outfalls, and rerouting drainage away from historic structures.

In the spirit of Waterford 2033 and its moniker of "300 years of preservation and conversation through innovation," there are potential innovations that may apply for the village to assist with

flood mitigation and to address water quality and quantity, including stream and outfall channel restoration, upstream retention basins, constructed wetlands, bioretention, and manufactured BMP systems.

Electric and Telecommunication Services

Waterford exists with a complete overhead power distribution plant owned and operated by Dominion Energy. Similarly, overhead fiber optic telecommunication lines owned and operated by Verizon and Comcast provide telephone, cable, and internet services to residents in the village. The installation of new underground power and telecommunication distribution systems will need to be accomplished prior to removing any overhead services to ensure service to the individual residences continues uninterrupted. It is anticipated that the distribution of power and telecommunications would be accomplished with the installation of a consolidated duct bank within each street segment where the installation of electric and telecommunication services would be phased on a street-by-street basis to allow a controlled conversion from overhead to underground service. Specific phasing would be determined during its design stage. To minimize the disruption to the historic viewsheds, the transformers may be screened on three sides and placed out of immediate view to make them as inconspicuous as possible.

While some lighting upgrades have recently been made by Dominion Energy, street and public area lighting minimally exists in the village. The aesthetic design of any new lighting fixtures should be based on older, decorative fixtures that are historically inherent to Waterford, with options for lighting heights.

Water and Wastewater

Currently no potable water services exist within Waterford. Homes and other businesses rely on wells. However, wastewater (or sanitary sewer) services do exist. A sanitary sewer system was installed in 1975, and homes and other businesses are serviced by a system that feeds into the Waterford Treatment Plant along Old Wheatland Road (Route 698), just west of Catoctin Creek. The *Historic Waterford Water Feasibility Study* recently conducted by Loudoun Water and the Department of General Services (DGS) presents a preliminary early planning-stage study that includes an option for a community water system owned and operated by Loudoun Water through the use of new community wells, a new water treatment facility, and a water distribution system. Further refinement and analysis will be needed to identify the preferred option and final cost.

Conclusions of Design Alternatives

The various alternatives developed through the engineering analyses can result in preferred concepts for taming the traffic, burying the wires, realigning/upgrading the roadways, fixing the drainage, managing stormwater, lighting the village, and providing a potable water system. All of these concepts can be integrated into a holistic, comprehensive program of infrastructure improvements and can be designed and constructed in close coordination with review and approving authorities (Loudoun County, Loudoun Water, VDOT, and other Virginia agencies). It is understood that the citizens of Waterford desire that such a program be implemented in the next few years to meet the goals of Waterford 2033. Further, it was concluded that the alternatives for traffic calming, drainage improvements, utility relocations, and lighting would likely have “no

adverse impact" on the characteristics that qualify Waterford as an NHL, if designed to be consistent with the character of a rural historic village. The alternatives proposed are considered to be relatively benign and, in fact, would enhance the NHL status of the village. The proposed alternatives would also further the Waterford 2033 goals with respect to sustainability and adaptive reuse.

Recommendations: Streets and Sidewalks

To tame the traffic in Waterford, recommendations include modifications and enhancements to the streets, street corners, sidewalks, drainage systems, utilities, and roadside trees and landscaping. With the installation of the traffic calming measures, the condition of streets and sidewalks also will be improved. Taking a holistic approach for the entire village and considering feedback from citizens, the following types of traffic calming measures and street and sidewalk improvements are recommended for various locations throughout the village:

- Pavers (stone, brick, and/or concrete resembling stone or cobbles) that are one (1) foot wide, consistent with native materials and flush with the roadway surface, to define edges of pavement and/or travel way at specific locations and/ or narrow the travel lanes.
- Pavers, one (1) to four (4) feet wide, flush with the roadway surface, to define the roadway centerline at specific locations to horizontally displace traffic and narrow travel lanes (via traffic "splitters" and "chokers").
- Concrete valley gutters, two (2) feet wide (nonstandard), at the edges of roadways to define the travel lanes and improve drainage.
- Reduced radius at corners of intersections to slow traffic and/or discourage rolling stops with treatments at the corners such as pavers or cobble stones to allow emergency vehicles and moving trucks to navigate the streets of Waterford.
- "Bulb-outs" along the roadway and at intersections, with stone or concrete curbing, to add trees and landscaping, define parking areas, and add sidewalk area at corners.
- Series of alternative "bulb-outs" with trees to provide a "chicane" effect on traffic.
- "Speed tables" or raised sections of roadway to vertically displace traffic and allow easier pedestrian access, e.g., serve as specific pedestrian crossings (perhaps with additional safety signage but not with pavement markings, which are not contextual).
- Pavers and/or stamped concrete used at intersections to provide a variation in pavement surface, highlighting the intersection and presence of pedestrians, flush with approaching roadways, or as part of a speed table.
- "Humpback bridge" in place of the wooden bridge over Tannery Creek to vertically displace traffic.
- Lowering of roadway segments in some locations to allow for bulb-outs, speed tables, and humpback bridges (as well as safer pedestrian access and improved drainage).
- Addition and extension of sidewalks and walking paths along the streets, separated by landscaping and/or pavers to narrow and/or define the edge of the travel lane.
- Connections from the sidewalks and walking paths to existing and planned trails or shared use paths within the NHL.
- Addition/modification of trees and landscaping along the roadways and at intersections (often in concert with other measures).

- Minimum signage at specific locations in the village to meet safety and regulatory requirements and to enhance traffic calming throughout the village.
- Varying types of final pavement surfaces as traffic calming measures and other infrastructure improvements are completed, e.g., asphalt or concrete pavement for streets and bricks, concrete pavers, brushed or stamped concrete, or crushed stone for sidewalks.

The recommended traffic calming measures should result in a reduction in the average speed of vehicles within the village and a significant reduction in the speed of "rogue" drivers who grossly exceed reasonable speeds. Pedestrians and pets in the village will benefit. The measures are "traffic neutral," that is, concepts do not result in increased capacity in response to growing traffic volumes in the region, nor should they create additional congestion on the streets in Waterford. The capacity of the streets in Waterford will remain constant. Motorists should be able to progress through town at slow but reasonable speeds.

Recommendations: Drainage and Stormwater
To support the recommended traffic calming measures, improvements to stormwater drainage also should be implemented. The recommended concepts will correct the drainage problems along Second Street and along Main Street, from the Tin Shop to the existing wooden bridge.

Each of the streets in Waterford has specific recommended drainage improvements, as shown on the concept plans, and generally include repairing curbs and inlets, regrading ditches, replacing and adding pipe culverts, cleaning out pipes and outfalls, rerouting drainage from historic structures.

Drainage improvements should also include the installation of BMP measures to address quality and quantity of stormwater flowing from Waterford to Catoctin Creek including BMP landscaping, infiltration practices, bio-retention measures, grass swales, and manufactured BMP systems. During detailed design, this project should convert improved roadside ditches and any improved outfall ditches to BMP vegetated swales while keeping existing parking needs in mind. The project should also consider manufactured BMP systems within storm sewer inlets and seek opportunities to restore the Tannery Creek outfall south of Main Street, as well as other outfalls. Any details developed during design of the infrastructure improvements should be coordinated with Loudoun County, VDOT, and the Virginia Department of Environmental Quality (DEQ) as well as members of WCA and WFI.

Complementary with stormwater management is the need to fully understand the broader Catoctin watershed area in the context of managing the stormwater for the entire Waterford Historic District. The design for fixing the drainage and managing stormwater should take a holistic approach to consider how the wetlands and streams within the landmark can be physically restored, including the wetlands on the Phillips Farm. These actions would lead to habitat restoration and would help protect the overall watershed by facilitating biodiversity, wildlife protection, and absorption of carbon, excess nutrients, and other pollutants. The Phillips Farm has an ongoing open space management plan based on an assessment developed with national and state conservation officials. Future complementary programs (such as seeking more proactive wetlands

restoration, creek-bank remediation, and carbon credits) could be undertaken, with potential financial benefits, through the US Department of Agriculture's National Resource Conservation Service programs and with other public and private partners.

Recommendations: Electric and Telecommunication Utilities

The recommended extent of burying the electric and communication lines extends from just west of the First Street bridge over Catoctin Creek and just north of First Street on Clover Hill Road to north of the Loyalty Road/Browns Lane intersection and approximately 1/4 mile south of the Clarks Gap Road/Factory Street/High Street intersection. These recommendations for relocating overhead wires to underground services include:

- Underground electric service generally following the streets in Waterford, either under the pavement or sidewalk, or adjacent to the road.
- Underground communications following the same general path as the underground electric service.
- Conduits for power and communications in a duct bank in a single trench, with conduits separated by an appropriate distance to be determined during design.
- Spare conduits in this same duct bank for additional electric service and additional communications, including cable TV and high-speed internet services.
- Aboveground transformers in appropriate locations, screened or otherwise hidden from view of pedestrians and motorists, if possible, through strategic placement, addition of shrubs or other vegetation, construction of screen walls, etc.
- Detailed design that considers the supply of power to potential electronic vehicle charging stations (to be owned by residents and building owners) and the supply of power and communications to Waterford Foundation properties that are slated for renovations to accomplish adaptive reuse objectives.

Based on feedback from Waterford representatives, historically correct lighting is recommended consisting of the following:

- A fixture similar to an existing coach-lantern type with a decorative pole, consistent with the character of the village, conforming to "dark sky" standards, and minimizing light trespass onto private properties.
- Pedestrian level lighting at 8 to 12 feet above roadway or sidewalk elevations.
- Placement of lights in appropriate locations to address safety concerns for pedestrians and motorists.
- Metering at key points along the new underground distribution grid to feed the new public lighting. One possible placement is near transformers or tap switches to utilize those landscape and fencing provisions to aid in screening meters.

It is further recommended that during the final design phase, a point-to-point photometric study be performed in the village. This computation should be performed incorporating individual fixtures and clusters of fixtures. The computation should include any major obstructions of the proposed fixtures within the project area.

Recommendations: Potable Water

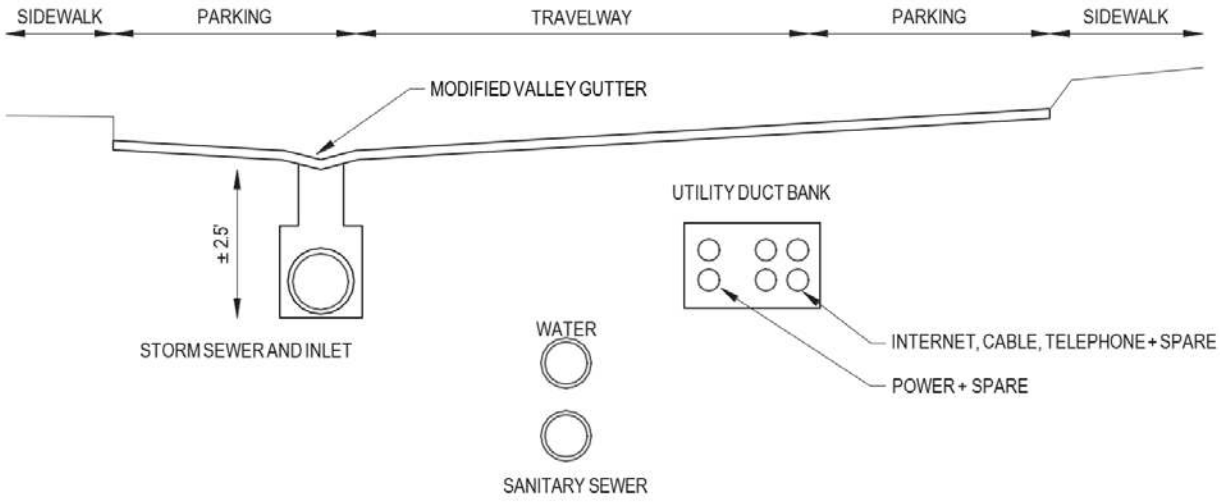
The comprehensive set of street and sidewalk improvements, with traffic calming measures, drainage fixes, and underground utility duct banks, also should include the installation of water lines for distribution and supply of potable water to the homes and other buildings in the village. It is important to note that these buildings include those owned by WFI, which are slated for adaptive reuse that is dependent upon a supply of water for drinking, for restrooms, and for fire suppression systems.

The system of water pipes should be installed in accordance with Option 3 of the draft report of the *Historic Waterford Water Feasibility Study*, completed in April 2022, by Loudoun Water and the DGS. Option 3 is entitled "Community Water System Owned and Operated by Loudoun Water (Using New Community Wells)" which will require a new communal well system and a new water treatment facility, along with the water distribution system that can be installed with other infrastructure in the streets. The overarching objective would be to install the water lines when each of the streets is under construction for utility duct banks, drainage pipe and inlets, and traffic calming devices—to reconstruct the streets of Waterford just once.

Recommendations: General

The recommendations for comprehensive infrastructure improvements to the streets of Waterford are summarized in the typical street cross section shown in Figure 1.

Figure 1: Typical Cross Section of Village Street



All of the measures recommended in this study were reviewed by the study team members specializing in environmental regulations and historic preservation. It is anticipated that none of the recommendations would have an adverse impact on the village's NHL status given that many of them are proposed with the purpose of restoring the historic aesthetic of the village. As the planning and design of infrastructure improvements moves forward, it is anticipated that the project team will be able to coordinate with the State Historic Preservation Office and the National

Park Service NHL Committee to address possible concerns with the design and to minimize or mitigate any potential impacts. It is also anticipated that the project would qualify as a Categorical Exclusion under the National Environmental Policy Act. FHWA implementing regulations could require Section 106 documentation and potentially a programmatic Section 4(f) document (in accordance with the National Historic Preservation Act and U.S. Department of Transportation Act).

ISSUES: Staff has identified two issues to elevate to the Board's attention.

Constructability: Over the last few years, DTCI has conducted multiple planning studies to help identify the specific transportation and safety needs along particular corridors, within specific neighborhoods and streets, or at individual intersections. These studies often include public presentation and encourage public feedback. Upon completion, the planning study recommendations and reports often include graphic renderings of proposed improvements. Although these renderings are based on basic engineering principles, they are only concept plans and not engineered designs. They are very helpful in refining a project's scope, but still require engineering design before a concept can be advanced to construction. The engineering design process takes the concepts and translates them into specific drawings and specifications that a contractor utilizes to construct the improvements. Although a concept drawing can show the proposed alignment of a transportation project, it does not include the vertical profile of the improvements, the location and type of drainage structures, structural details for retaining walls, culverts, or bridges, and many other details. The process to conduct the engineering design is complex, requires multiple steps, and must integrate elements such as right-of-way acquisition, and utility relocation. DTCI has encountered confusion among the public who think the planning study concept plans are engineered plans and assume a project is ready for construction after completion of a study. Except for the simplest projects, multiple years are required to go from planning study completion to design completion.

In order to progress the project to implementation, funding must be secured, the design must be finalized, environmental studies and permitting needs need to be evaluated, and additional public involvement performed.

Maintenance: The recommended improvements are anticipated to calm traffic, relocate utilities, and improve overall infrastructure while preserving the heritage of the Village of Waterford and protecting its NHL status. The use of pavers and similar non-standard materials is intended to be contextual and consistent with Waterford's NHL status. Maintenance responsibility for non-standard materials has not been determined.

FISCAL IMPACT: The estimated project costs for design and installation of all improvements for the Village of Waterford is $58,000,000. Table 1 provides a cost estimate.

Table 1: *Village of Waterford Preliminary Cost Estimate*

	Present Day Value Cost Estimate
Preliminary Engineering Phase	
Preliminary Engineering	$4,200,000
Additional Engineering (Plats, Permits, Etc.)	$3,150,000
Total Preliminary Engineering Costs	**$7,350,000**
Construction Phase	
Construction Costs	$21,000,000
Mobilization (17%)	$3,570,000
Maintenance of Traffic	$3,150,000
Electrical Service Connections	$1,700,000
Village Water System	$9,698,000
Contingency on construction costs (40%)	$8,400,000
Construction Engineering and Inspection	$3,150,000
Total Construction Costs	**$50,670,000**
Total Engineering and Construction Costs (rounded)	**$58,000,000**

Should the Board endorse the improvements, staff will forward a request to fund the improvements to the Capital Improvement Program FY 2024 budget process for consideration and prioritization.

ALTERNATIVES:

1. The Board may choose to endorse all of the recommended improvements for future planning and implementation.
2. The Board may choose to select specific Village of Waterford improvements for future planning and implementation.
3. The Board may choose to take no action at this time.

DRAFT MOTIONS:

1. I move that the Board of Supervisors endorse all recommended Village of Waterford improvements for future planning and implementation.

   I further move that the Board of Supervisors forward the request to fund the Village of Waterford improvements to the Capital Improvement Program FY 2024 budget process for consideration and prioritization.

OR

2. I move an alternate motion.

ATTACHMENT(S):

1. Waterford Preserving the Landmark Report dated June 2022

Waterford

Preserving the Landmark

June 2022

DRAFT

Prepared for:

Loudoun County
VIRGINIA

Prepared by:

Kimley»Horn

Attachment 1

Preserving the Landmark

Infrastructure Improvements Master Plan for the Village of Waterford, Virginia

Update to:
Bury the Wires and Tame the Traffic
Preliminary Engineering Study
and Concept Plans (2003)

DRAFT—June 2022

Prepared for:

Loudoun County
VIRGINIA

Department of Transportation
and Capital Infrastructure

In Coordination With:
Waterford Foundation, Inc.
Waterford Citizens Association

Prepared by:

Kimley»Horn

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Appendices

Executive Summary

The historic Village of Waterford is currently experiencing the challenges associated with a growing number of overhead wires and cables, aging stormwater pipes and culverts, growing traffic volumes, and high traffic speeds. A comprehensive, holistic strategy is needed for the village to restore historic viewsheds, reduce and calm traffic, improve existing infrastructure, and add new utilities, all in the context of the village's status as a National Historic Landmark (NHL). This *Preserving the Landmark* report articulates a strategy of implementing a program of integrated infrastructure improvements. Largely based on the 2003 *Bury the Wires and Tame the Traffic* planning and conceptual design effort by Loudoun County, this 2022 report incorporates more recent input from the citizens of Waterford as well as recommendations from recent infrastructure studies completed by Loudoun County.

Waterford's Heritage

The early American rural Village of Waterford was founded in 1733 in Virginia's Blue Ridge foothills. In the early 1800s, Waterford grew with the new nation into a bustling commercial center for the surrounding farmland. Following the Civil War, the Industrial Revolution passed the village by. Businesses gradually closed and moved, but the community remained.

This sign greets visitors to the Village of Waterford who travel from the west

During the 1930s, Waterford began attracting notice from preservationists for its character as an unspoiled, 19th-century rural village. Local citizens, recognizing their treasure of historic landscape and regional vernacular architecture, founded the Waterford Foundation, Inc. (WFI) in 1943 to ensure the protection of this rich heritage. The Waterford Citizens Association (WCA) was established in 1954 to support the citizens in the preservation of Waterford's historic heritage and to promote citizen involvement in the Waterford community.

Corner Store, circa 1915

Pink House, 1937

Tin Shop, 1919

Through the vision of these citizens and other preservationists, the Village of Waterford with its surrounding countryside—a total of 1,420 acres—was granted NHL status in 1970. This NHL is one of only a few that encompasses an entire village.

Following this NHL recognition, local citizens, county and state officials, and friends of Waterford from across the nation continued the work in Preserving the Landmark in the 1970s, 80s, and 90s. In 1999, through the endeavors of many people, Waterford citizens arrived at a consensus for improving traffic safety and restoring the historic character of the village. Based on this consensus, the Waterford community worked with Loudoun County to obtain a Transportation Equity Act for the 21st Century (TEA-21) grant, with which Loudoun County completed a preliminary engineering study entitled "*Bury the Wires and Tame the Traffic*." The study was administered by the Loudoun County Department of General Services, in coordination with VDOT, and completed in 2003.

The report from the 2003 study was a planning tool for the village, the County, and VDOT to take to the next steps—to obtain funding and implement design and construction of enhancements that would reflect the village's historical significance and help ensure Waterford remains unique in the national context. While WFI and WCA representatives were prepared to move forward with the plan, the Phillips Farm, located within the NHL District's 1,420 acres, was purchased in 2003 by a private investor for land development purposes. Fearing the loss of the historic viewshed and Waterford's NHL status, a significant fundraising campaign ensued to purchase the land from the investor. On December 18, 2003, the Waterford Foundation successfully acquired 144 acres of the Phillips Farm and subsequently placed the land into a conservation easement. The local momentum from the 2003 *Bury the Wires and Tame the Traffic* effort was thus diverted, and over the next nearly 20 years, various other studies were completed by Loudoun County and VDOT to calm traffic, upgrade existing infrastructure, and add a potable water system in the village.

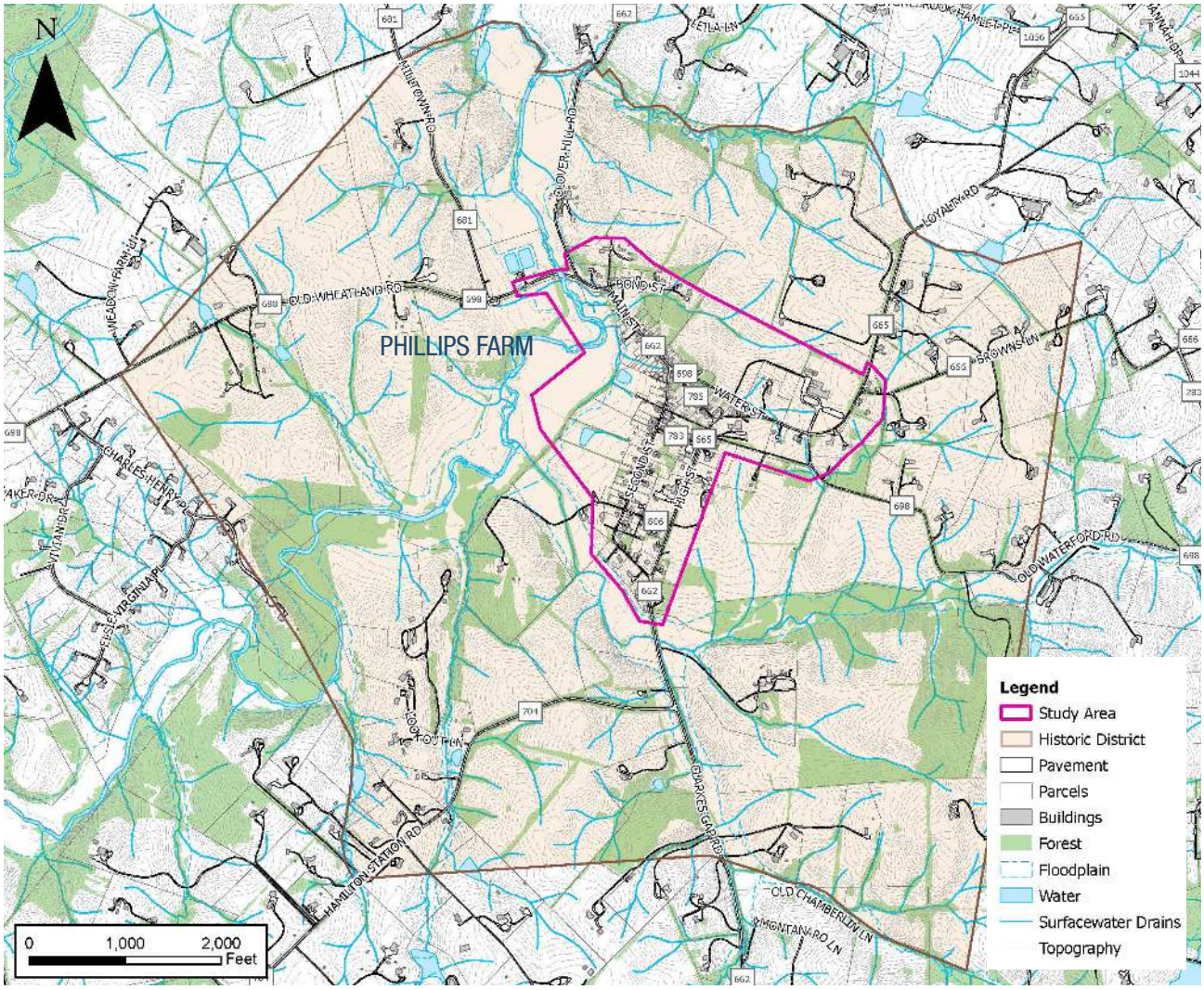
Preserving the Landmark

In 2020, in partnership with WFI, WCA launched a visioning and community planning effort called "Waterford 2033." Their aim is to develop a unifying community plan for the village based on shared vision of what they want the village to be in the future, along with the strategy and resources to implement this community plan. Waterford's goal is to implement this community plan by or before 2033, when the village will be 300 years old.

In developing a strategy for the potential infrastructure improvements within the community, WFI and WCA turned to the 2003 *Bury the Wires and Tame the Traffic* study and its master plan of traffic calming, utility relocations, and overall infrastructure improvements intended to preserve the heritage of the Village of Waterford and protect its NHL status. In late 2021, the members of WCA and WFI approached Loudoun County for their support in updating the concept designs in the 2003 plan, with a view to implementing them before 2033—including integrating the results of the recent Loudoun Water Historic Waterford Water Feasibility Study, the traffic calming analyses recently conducted by Loudoun County and VDOT, and current best management practices for stormwater management, as well as reuse of stormwater and other sustainability practices.

To create a report that updates the 2003 plan, Loudoun County issued a task order to Kimley-Horn under a current contract with the Department of Transportation and Capital Infrastructure (DTCI). Work began on this task order in January 2022 and culminated with the completion of this report. Entitled *Preserving the*

Figure ES-1 – Study Area within Waterford National Historic Landmark



Landmark, this 2022 report is written to be an update of the 2003 *Bury the Wires and Tame the Traffic* report, incorporating recommendations from more recent studies, and resulting in comprehensive recommendations and updated high-level cost estimates for a program of infrastructure improvements that can be implemented over the next several years.

The geographic area considered for this report is shown in *Figure ES-1*. This area includes the NHL District that encompasses the entire Village of Waterford, which is an unincorporated area of Loudoun County within the Catoctin District, approximately 5 miles northwest of Leesburg. The focus areas of this report are the streets within the village shown in the Figure, including the sidewalks, vehicle travel lanes and parking areas, drainage pipes, ditches, outfalls, and wet and dry utilities.

Sustainability

WCA and WFI have formed a Waterford 2033 Joint Leadership Committee, and its stated goal is to ensure that historic Waterford builds a bridge to an environmentally sustainable future by focusing on conservation-focused adaptive reuse of Waterford's built and open

spaces, which in turn will support the economic sustainability of the Waterford Foundation. The Committee desires to maximize the infrastructure improvements contained within this 2022 report and encourages sustainable practices throughout the entire Waterford National Historic Landmark, including stormwater management, open space conservation, sourcing alternative energy, adaptive reuse programs, carbon footprint reduction practices, and the creation of village walkways, paths, trails, and amenities.

Adaptive Reuse

As a capstone project that commemorates the 300-year anniversary of Waterford's founding, Waterford 2033 envisions the restoration of the Old Waterford Mill in a way to make it sustainable and accessible into the future, in support the foundation's preservation and educational efforts and revitalization of heritage tourism in the village. In addition, the committee is studying how best to restore other buildings currently owned by the Waterford Foundation to house cultural and educational tenants.

Environmental and Cultural Resources

Contributing to Waterford's NHL status and its rich heritage are environmental resources, including wetlands and streams, and historic architectural resources, including properties owned by the Waterford Foundation. The recommended infrastructure improvements for the village, especially stormwater management upgrades, could include the restoration of streams and wetlands, which could in turn provide an opportunity to restore historic waterways through creative best management practices (BMPs) for stormwater management. The restoration of these waterways would support the Waterford 2033 goals for sustainability and adaptive reuse, including WFI's restoration of the Old Mill. The recommended infrastructure improvements, including upgraded power and communications for historic buildings, as well as the introduction of potable water to these buildings, would support the adaptive reuse of these buildings.

Preservation Easements

Through the work of the Waterford Foundation and other interested parties, preservation easements have been accumulated in the village. Since the inception of the preservation easement campaign in Waterford in 1972, private property owners as well as WFI have donated easements on approximately 95 properties. As documented in the 2022 nomination for recertification by the National Park Service (NPS) of Waterford as a National Historic Landmark, today the employment of preservation easements in Waterford is likely one of the most extensive and successful examples in the United States due to the sheer number of easements and the extent of their protective coverage. *Waterford's NHL district is the best and densest concentration of easements in any historic district in the Commonwealth of Virginia*, according to the nomination.

Recent Community Input

As the Waterford 2033 effort has gained momentum, community input has been documented to supplement the input received during the 2003 planning effort and through more recent studies. This recent community input includes:

- Input from weekly meetings supporting the Waterford 2033 Visioning and Community Planning efforts since 2020
- Specific input from the citizens of Waterford through
  - August 2021 Village Survey
  - March 26, 2022 Community Open House
  - April 27, 2022 Community Meeting

This recent community input has informed this 2022 report.

March 2022 Community Open House

April 2022 Community Meeting

Engineering Studies and Design Alternatives

Traffic Calming

Reducing vehicle speeds and vehicle volumes remains a priority for the village. Walkability also is a top priority, i.e., making streets safer for pedestrians, improving existing sidewalks, and adding new sidewalks and walking paths, as well as adding connections to existing trails. Vehicle speeds in the village continue to be a major concern for the safety of village residents. While the speed limit throughout the Village of Waterford is 20 miles per hour (mph), speeds measured in 2003 and in recent studies indicate that a vast majority of drivers exceed the 20 mph speed limit in the village.

Also, with ongoing development in areas of the county north and west of Waterford, such as "by right" residential developments allowed by current Loudoun County zoning rules, the amount of traffic passing through Waterford to destinations south and east of Waterford has grown significantly in the past 20 years. These vehicle trips use the village streets as their path of least resistance for regional travel, aided today by smart phone apps like Waze and Google Maps. While the recommendations of this report focus on traffic calming and infrastructure solutions for the Village of Waterford, it is understood that the residents of Waterford and Loudoun County, will continue to advocate for regional transportation solutions to address the systemic challenges of traffic congestion within the village.

Traffic calming measures in towns and cities throughout the U.S. today range from very subtle measures, such as narrower travel lanes and roadside landscaping, to more intrusive measures such as roundabouts and major roadway modifications. A full range of measures could be considered for the Village of Waterford, but measures need to be acceptable, given the desire of Waterford citizens to preserve the character of the village, and the requirement for no adverse impact to the NHL status. Thus, traffic calming alternatives include:

- Minor modifications to the roadways, including edge and centerline pavers (forming splitter islands, chokers, and chicanes), corner radii reduction, narrow lanes, signs, pavement markings, etc.

Main Street

Concrete Pavement and Pavers — Example from Historic Jamestowne, Virginia

- More major geometric projects: road lowering, speed tables, speed bumps, dips, curbs, gutters, traffic circles, roundabouts, etc.

These measures, when considered in combination with each other, should result in overall speed reductions of 3 to 5 mph and much more for "rogue" speeders, according to traffic calming references published by the Federal Highway Administration and the Institute of Transportation Engineers.. The materials used for traffic calming measures should resemble historic materials, consistent with the character of the village and its NHL status.

Roads, Sidewalks, and Pavements

The streets in and around Waterford are two-lane undivided facilities paved with asphalt or gravel. Sidewalks throughout the village are not continuous, and the portions of sidewalks in need of repair encourage pedestrians to travel in the street. With respect to walkways, paths, trails, and related amenities throughout the village, the citizens of Waterford desire to have a network of walkways to knit the village together, including providing access to trails in open space areas, such as the Phillips Farm interpretive trail.

The reconstruction of pavements will be necessary as the Village of Waterford moves forward with a comprehensive infrastructure project to bury wires, tame traffic, fix drainage, and install water lines and utility duct banks. During the detailed design phase, the village may choose to rebuild the streets with asphalt or concrete pavement. If concrete is chosen, this pavement could have a more historic look and feel, similar to facilities owned by the National Park Service.

Vehicle parking needs are currently addressed by on-street parking and a few driveways. The shortage of adequate on-street and off-street parking is a challenge for residents, visitors, and tourists; however, several areas within the village are candidates for informal or infrequent parking areas.

Stormwater Management

Stormwater in the Village of Waterford drains primarily via sheet flow around and under existing houses and buildings into small roadside swales or ditches and then through small storm sewer systems or culverts into seven outfalls. A number of problem areas exist with the storm drainage system in Waterford primarily due to the age of the existing stormwater system. With respect to water quality, there are currently no BMPs evident within Waterford, and stormwater runoff flows directly into South Fork Catoctin Creek without any practical BMP measures.

Existing concrete-lined channel along Water Street

To fix the drainage in Waterford, the historic nature of the village should be recognized to minimize any potential negative impacts, while upgrading the storm drainage system within appropriate areas of the village to current county and Virginia standards. In combination with traffic calming measures, such efforts could include repair of curbs and inlets, extension of curbs, addition of gutters and inlets, regrading and improving ditches, replacing existing pipe culverts, adding new culverts, cleaning out and upgrading existing outfalls, rerouting drainage away from historic structures.

In the spirit of Waterford 2033 and its moniker of "300 years of preservation and conversation through innovation," there are potential innovations that may apply for the village to assist with flood mitigation and to address water quality and quantity, including stream and outfall channel restoration, upstream retention basins, constructed wetlands, bioretention, and manufactured BMP systems.

Power and Communication Lines

Waterford exists with a complete overhead power distribution plant owned and operated by Dominion Energy. Similarly, overhead fiber optic communication lines owned by Verizon and Comcast provide telephone, cable, and internet service to residents in the village. The installation of new underground power and communications distribution system will need to be accomplished prior to removing any overhead services to ensure service to the individual residences continues uninterrupted. It is anticipated that the distribution of power and communication would be accomplished with the installation of a consolidated duct bank within each street and that installation of electric and communications services would be phased on a street-by-street basis to allow a controlled conversion from overhead to underground service. Specific phasing would be determined during final design. To minimize the disruption to the historic viewsheds, the transformers may be screened on three sides and placed out of immediate view to make them as inconspicuous as possible.

Lighting

While some lighting upgrades have recently been made by Dominion Energy, street and public area lighting minimally exists in the village. Any lighting designed for the village would need to have historically replicated or compatible poles and fixtures. The aesthetic design of any new lighting fixtures should be based on older, decorative fixtures that are historically inherent to Waterford, with options for lighting heights.

Water and Wastewater

Currently no potable water services exist within Waterford. Homes and other businesses rely on wells. Wastewater (or sanitary sewer) services do exist. A sanitary sewer system was installed for the village in 1975, and homes and other businesses are serviced by a system that feeds into the Waterford Treatment Plant along Old Wheatland Road, just west of Catoctin Creek. The *Historic Waterford Water Feasibility Study* recently conducted by Loudoun Water and Loudoun County Department of General Services includes an option for a community water system owned and operated by Loudoun Water through the use of new community wells, a new water treatment facility, and a water distribution system.

Conclusions on Design Alternatives

The various alternatives developed through the engineering analyses can result in preferred concepts for taming the traffic, burying the wires, realigning/upgrading the roadways, fixing the drainage, managing stormwater, lighting the village, and providing a potable water system. All of these concepts can be integrated into a holistic, comprehensive program of infrastructure improvements and can be designed and constructed in close coordination with review and approving authorities (Loudoun County, Loudoun Water, VDOT, and other Virginia agencies). It is understood that the citizens of Waterford desire that such a program be implemented in the next few years to meet the goals of Waterford 2033.

Further, it was concluded that the alternatives for traffic calming, drainage improvements, utility relocations, and lighting would likely have "no adverse impact" on the characteristics that qualify Waterford as an NHL, if designed to be consistent with the character of a rural historic village. The alternatives proposed are considered to be relatively benign, and in fact, would enhance the NHL status of the village. The proposed alternatives would also further the Waterford 2033 goals with respect to sustainability and adaptive reuse.

Recommendations

This 2022 *Preserve the Heritage* report contains a comprehensive set of recommendations for a master plan of infrastructure improvements for the Village of Waterford. These recommendations build upon the 2003 *Bury the Wires and Tame the Traffic* report, as well as recent reports developed by Loudoun County, Loudoun Water, and other entities. The recommendations are intended to help the Waterford Citizens Association and the Waterford Foundation, Inc. achieve their 2033 Waterford vision. The recommendations are accompanied by a set of concept plans for the village streets and sidewalks that are intended to lay the foundation for the next steps in implementing the infrastructure improvements—all in the context of Waterford's National Historic Landmark (NHL) status.

Tame the Traffic/Fix Streets and Sidewalks

To tame the traffic in Waterford, recommendations include modifications and enhancements to the streets, street corners, sidewalks, drainage systems, utilities, and roadside trees and landscaping. With the installation of the traffic calming measures, the condition of streets and sidewalks also will be improved. Taking a holistic approach for the entire village and considering feedback from citizens, the following types of traffic calming measures and street and sidewalk improvements are recommended for various locations throughout the village:

- Pavers (stone, brick, and/or concrete resembling stone or cobbles) that are 1 foot wide, consistent with native materials and flush with the roadway surface, to define edges of pavement and/or travelway at specific locations and/ or narrow the travel lanes
- Pavers, 1 to 4 feet wide, flush with the roadway surface, to define the roadway centerline at specific locations to horizontally displace traffic and narrow travel lanes (via traffic "splitters" and "chokers")
- Concrete valley gutters, 2 feet wide (nonstandard), at the edges of roadways to define the travel lanes and improve drainage
- Reduced radius at corners of intersections to slow traffic and/or discourage rolling stops with treatments at the corners such as pavers or cobble stones to allow emergency vehicles and moving trucks to navigate the streets of Waterford
- "Bulb-outs" along the roadway and at intersections, with stone or concrete curbing, to add trees and landscaping, define parking areas, and add sidewalk area at corners

- Series of alternative "bulb-outs" with trees to provide a "chicane" effect on traffic
- "Speed tables" or raised sections of roadway to vertically displace traffic and allow easier pedestrian access, e.g., serve as specific pedestrian crossings (perhaps with additional safety signage but not with pavement markings, which are not contextual)
- Pavers and/or stamped concrete used at intersections to provide a variation in pavement surface, highlighting the intersection and presence of pedestrians, flush with approaching roadways, or as part of a speed table
- "Humpback bridge" in place of the wooden bridge over Tannery Creek to vertically displace traffic
- Lowering of roadway segments in some locations to allow for bulb-outs, speed tables, and humpback bridges (as well as safer pedestrian access and improved drainage)
- Addition and extension of sidewalks and walking paths along the streets, separated by landscaping and/or pavers to narrow and/or define the edge of the travel lane
- Connections from the sidewalks and walking paths to existing and planned trails or shared use paths within the National Historic Landmark (NHL)
- Addition/modification of trees and landscaping along the roadways and at intersections (often in concert with other measures)
- Minimum signage at specific locations in the village to meet safety and regulatory requirements and to enhance traffic calming throughout the village
- Varying types of final pavement surfaces as traffic calming measures and other infrastructure improvements are completed, e.g., asphalt or concrete pavement for streets and bricks, concrete pavers, brushed or stamped concrete, or crushed stone for sidewalks.

The recommended traffic calming measures should result in a reduction in the average speed of vehicles within the village and a significant reduction in the speed of "rogue" drivers who grossly exceed reasonable speeds. Pedestrians and pets in the village will benefit. The measures are "traffic neutral," that is, concepts do not result in increased capacity in response to growing traffic volumes in the region, nor should they create additional congestion on the streets in Waterford. The capacity of the streets in Waterford will remain constant. Motorists should be able to progress through town at slow but reasonable speeds.

Fix the Drainage

To support the recommended traffic calming measures, improvements to stormwater drainage also should be implemented. The recommended concepts will correct the drainage problems along Second Street and along Main Street, from the Tin Shop to the existing wooden bridge.

Proposed traffic calming measures in the context of Waterford's NHL status.

Each of the streets in Waterford has specific recommended drainage improvements, as shown on the concept plans, and generally include repairing curbs and inlets, regrading ditches, replacing and adding pipe culverts, cleaning out pipes and outfalls, rerouting drainage from historic structures.

Manage the Stormwater

Drainage improvements should also include the installation of BMP measures to address quality and quantity of stormwater flowing from Waterford to Catoctin Creek including BMP landscaping, infiltration practices, bio-retention measures, grass swales, and manufactured BMP systems. During detailed design, this project should convert improved roadside ditches and any improved outfall ditches to BMP vegetated swales while keeping existing parking needs in mind. The project should also consider manufactured BMP systems within storm sewer inlets and seek opportunities to restore the Tannery Creek outfall south of Main Street, as well as other outfalls. Any details developed during design of the infrastructure improvements should be coordinated with Loudoun County, VDOT, and DEQ as well as members of WCA and WFI.

Complementary with stormwater management is the need to fully understand the broader Catoctin watershed area in the context of managing the stormwater for the entire Waterford Historic District. The design for fixing the drainage and managing stormwater should take a holistic approach to consider how the wetlands and streams within the landmark can be physically restored, including the wetlands on the Phillips Farm. These actions would lead to habitat restoration and which would help protect the overall watershed by facilitating biodiversity, wildlife protection, and absorption of carbon, excess nutrients, and other pollutants. The Phillips Farm has an ongoing open space management plan based on an assessment developed with national and state conservation officials. Future complementary

Phillips Farm, February 2022 site walk

programs (such as seeking more proactive wetlands restoration, creek-bank remediation, and carbon credits) could be undertaken, with potential financial benefits, through the US Department of Agriculture's National Resource Conservation Service programs and with other public and private partners.

Bury the Wires

The recommended extent of burying the electric and communication lines extends from just west of the First Street bridge over Catoctin Creek and just north of First Street on Clover Hill Road to north of the Loyalty Road/Browns Lane intersection and approximately 1/4 mile south of the Clarks Gap Road/Factory Street/High Street intersection. These recommendations for relocating overhead wires to underground services include:

- Underground electric service generally following the streets in Waterford, either under the pavement or sidewalk, or adjacent to the road.
- Underground communications following the same general path as the underground electric service.
- Conduits for power and communications in a duct bank in a single trench, with conduits separated by an appropriate distance to be determined during design.
- Spare conduits in this same duct bank for additional electric service and additional communications, including cable TV and high-speed internet services.

Transformer Placed out of View

- Aboveground transformers in appropriate locations, screened or otherwise hidden from view of pedestrians and motorists, if possible, through strategic placement, addition of shrubs or other vegetation, construction of screen walls, etc.
- Detailed design, that considers the supply of power to potential electronic vehicle charging stations (to be owned by residents and building owners) and the supply of power and communications to Waterford Foundation properties that are slated for renovations to accomplish adaptive reuse objectives.

Light the Village

Based on feedback from Waterford representatives, historically correct lighting is recommended consisting of the following:

- A fixture similar to an existing coach-lantern type (shown in photo) with a decorative pole, consistent with the character of the village, conforming to "dark sky" standards, and minimizing light trespass onto private properties.
- Pedestrian level lighting at 8 to 12 feet above roadway or sidewalk elevations.
- Placement of lights in appropriate locations to address safety concerns for pedestrians and motorists.
- Metering at key points along the new underground distribution grid to feed the new public lighting. One possible placement is near transformers or tap switches to utilize those landscape and fencing provisions to aid in screening meters.

It is further recommended that during the final design phase, a point-to-point photometric study be performed in the village. This computation should be performed incorporating individual fixtures and clusters of fixtures. The computation should include any major obstructions of the proposed fixtures within the project area.

Provide Potable Water

The comprehensive set of street and sidewalk improvements, with traffic calming measures, drainage fixes, and underground utility duct banks, also should include the installation of water lines for distribution and supply of potable water to the homes and other buildings in the village. It is important to note that these buildings include those owned by WFI, which are slated for adaptive reuse that is dependent upon a supply of water for drinking, for restrooms, and for fire suppression systems.

Pedestrian level light fixture and pole

The system of water pipes should be installed in accordance with Option 3 of the draft report of the Historic Waterford Water Feasibility Study, completed in April 2022, by Loudoun Water and Loudoun County. Option 3 is entitled "Community Water System Owned and Operated by Loudoun Water (Using New Community Wells)" which will require a new communal well system and a new water treatment facility, along with the water distribution system that can be installed with other infrastructure in the streets. The overarching objective would be to install the water lines when each of the streets is under construction for utility duct banks, drainage pipe and inlets, and traffic calming devices—to reconstruct the streets of Waterford just once.

Cross Section

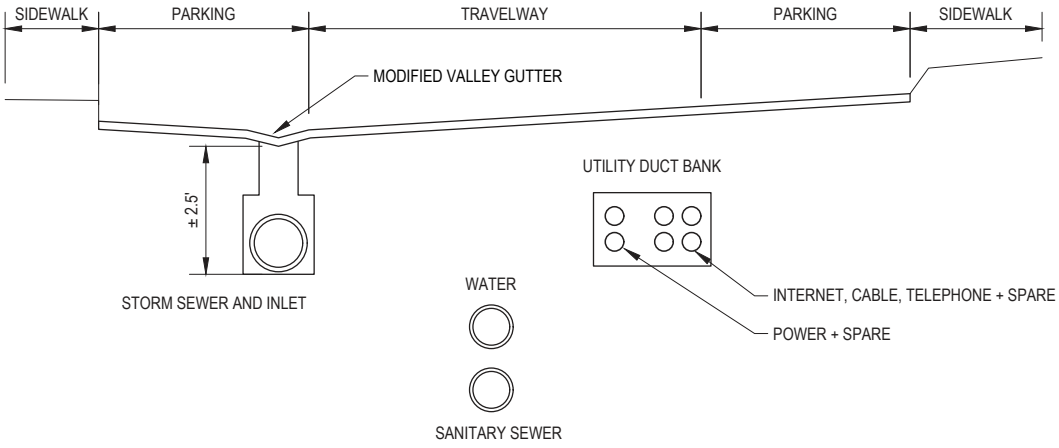
The recommendations for comprehensive infrastructure improvements to the streets of Waterford are summarized in the typical street cross section shown in *Figure ES-2*.

Preserve the Landmark

All of the measures recommended in this study were reviewed by the study team members specializing in environmental regulations and historic preservation. It is anticipated that none of the recommendations would have an adverse impact on the village's NHL status given that many of them are proposed with the purpose of restoring the historic aesthetic of the village. As the planning and design of infrastructure improvements moves forward, it is anticipated that the project team will be able to coordinate with the State Historic Preservation Office and the National Park Service (NPS) NHL Committee to address possible concerns with the design and to minimize or mitigate any potential impacts. It is also anticipated that the project would qualify as a Categorical Exclusion under the National Environmental Policy Act (NEPA). FHWA implementing regulations could require Section 106 documentation and potentially a programmatic Section 4(f) document (in accordance with the National Historic Preservation Act and U.S. Department of Transportation Act).

To build upon the momentum of the Waterford 2033 planning efforts, and to "kick start" the environmental permitting process, it is recommended that the county take a near-term next step and coordinate with FHWA to reconfirm that the class of NEPA action for *Preserving the Landmark* would be a Categorical Exclusion. Note that this concurrence would only apply to projects led by FHWA. A different NEPA concurrence would be required if another federal agency, such as NPS, were to be the lead federal agency.

Figure ES-2: Possible typical cross section of village street after implementation of infrastructure improvements



BEFORE

PROPOSED AFTER

Main Street / Second Street / Water Street

Concept Plans

This 2022 update includes a series of concept plans developed for the streets of Waterford to include traffic calming, roadway and drainage improvement, dry utility relocations, lighting, and water distribution system installation that is consistent with the historic character of the village. These concept plans cover the streets within the entire Village of Waterford study area and all within the NHL district. The concept plans graphically convey the recommendations, and they were used to complete a high-level estimate of quantities for the updated rough-order-of-magnitude cost estimate.

Implementation

This 2022 report of concept plans, cost estimates, and recommendations is intended to be a first step in the implementation of a comprehensive, holistic strategy for the Village of Waterford to calm traffic and to improve infrastructure in context of the Waterford National Historic Landmark. This strategy also will help achieve Waterford 2033 goals related to sustainability practices and adaptive reuse programs for Waterford's built and open spaces. Ultimately, this strategy will result in a program of infrastructure projects to be designed, constructed, and maintained, along with supporting programs to be initiated and sustained by WCA and WFI.

It is understood that the responsible parties for *design and construction* of the infrastructure projects are Loudoun County and the Virginia Department of Transportation (VDOT) with the assistance of design and construction industry partners and WCA, WFI, and likely agencies such as the National Park Service (NPS). The responsible party for *maintenance* of the streets, sidewalks, and other infrastructure improvements will be the subject of future discussions and potential agreements between Loudoun County, VDOT, other agencies, and any governance entity established by WCA and WFI. WCA and WFI will continue to lead strategic programs such as Waterford 2033 and its many objectives.

Implementation Process

The comprehensive set of infrastructure projects described in this *Preserving the Landmark* report must follow a deliberate implementation process for Waterford to get to the construction phase and to culminate with ribbon-cutting ceremonies for safer, walkable streets with underground utilities and stormwater management features. This implementation process is shown in *Figure ES-3*.

Near-Term Steps for Waterford's *Preserving the Landmark* Program of Projects

Given the implementation process shown in *Figure ES-3* for the program of projects recommended in this 2022 report on *Preserving the Landmark*, Waterford's infrastructure projects are in the project initiation (pre-scoping) phase with some project scoping being accomplished with the current planning efforts. The logical next steps for Loudoun County, WCA, and WFI are as follows:

- Request and secure funding to conduct further analyses, to initiate design of the infrastructure improvements, and to coordinate with utility providers and stakeholder agencies
- Develop a comprehensive multiyear budget and seek to understand potential funding sources with the goal of including the program of Waterford infrastructure improvements in Loudoun County's CIP and VDOT's Six-Year Improvement Program
- Begin scoping and NEPA analyses associated with the recommended improvements including:
  - Develop further conceptual design
  - Update traffic analyses
  - Conduct a thorough topographic survey with detailed utility designation
  - Conduct a geotechnical investigation
  - Conduct historic and architectural investigations and environmental investigations such as wetland and stream delineation
  - Obtain concurrence from FHWA (or other federal agency) on the type of NEPA document that will be needed
  - Begin preparing the required NEPA document (assumed to be a Categorical Exclusion)

Figure ES-3

Project Implementation Process

Project Initiation: Identification, Prioritization, and Funding

Project Development:

- Project scoping: concepts, feasibility, traffic
- Preliminary design, field work, environmental, public involvement > "30% plans"
- Design Approval, NEPA Document and Project Delivery Decision Point
- Intermediate design, start utility relocations, ROW acquisition > "60% plans"
- Final design, bidding, owner permitting > "90%/100% plans" "Construction Docs"

Project Delivery: Permitting, construction, environmental monitoring

Project Turnover

Operations & Maintenance

Following these steps, Loudoun County, VDOT, or a public-private partnership could execute the design and construction of a program of projects to make the *Preserving the Landmark* concept plans a reality.

Preliminary Estimate of Project Cost

Based on the concept plans developed for this 2022 *Preserving the Landmark* master plan, planning-level project budget estimates have been prepared by the study team to assist in implementing the next steps in the planning process. To develop the estimated costs, planning level unit costs were applied to aspects of the concept designs for burying the wires, taming the traffic, fixing the drainage, lighting the village, adding the network of pipe for potable water supply, and repaving the streets and sidewalks.

The result of this effort is a preliminary cost estimate for construction, engineering design, construction administration, mobilization, maintenance of traffic, easements, permits, and contingencies. These planning-level estimates of project costs are summarized in *Table ES-1*.

Table ES-1

Preliminary Engineering Phase	
Preliminary Engineering	$4,200,000
Additional Engineering (Plats, Permits, Etc.)	$3,150,000
Total Preliminary Engineering Costs	$7,350,000
Construction Phase	
Construction Costs	$21,000,000
Mobilization (17%)	$3,570,000
Maintenance of Traffic	$3,150,000
Electrical Service Connections	$1,700,000
Village Water System	$9,698,000
Contingency on construction costs (40%)	$8,400,000
Construction Engineering & Inspection (15%)	$3,150,000
Total Construction Costs	**$50,670,000**
Total Estimated Project Budget - 2022 Dollars (rounded)	**$58,000,000**
Total Estimated Project Budget - 2024 Dollars (rounded)	**$63,900,000**
Total Estimated Project Budget - 2027 Dollars (rounded)	**$74,000,000**

Notes:

1. *Costs are preliminary in nature and based on concept designs developed by consultant team in close coordination with representatives from the Village of Waterford.*
2. *Escalation factors used to project 2024 and 2027 cost estimates: 5.00% Annually.*
3. *Costs include construction, engineering design and construction administration, mobilization, maintenance of traffic, easements, permits, and contingencies.*
4. *Costs assume that all items will be constructed as part of a total, phased project.*

Design and Construction Considerations

Future planning and design teams should consider the following design intent:

- Detailed design of traffic calming, pavements, sidewalk, stormwater, utilities, and lighting improvements needs to be done concurrently in an integrated fashion to remain consistent with the historic character of Waterford.
- Native and historically correct materials should be used.
- Traffic calming measures should be subtle, but effective.
- Pedestrian access should be a priority.
- Above-ground transformers should be placed strategically to minimize the intrusion on the historic viewsheds and to limit impacts to archaeological resources.
- The community's motto of "less is more" should be followed.
- The reconstruction of each street should take place once—and include a logical sequencing of street reconstruction, local maintenance of traffic, a regional transportation management and public relations campaign for routing traffic around Waterford during construction phases.
- Designs should be analyzed with respect to constructability.
- Noise and vibration from construction equipment will also need to be managed
- Construction phasing will need to be planned in a logical sequence that minimizes disruption to the citizens of Waterford.
- Traffic calming designs should be analyzed with respect to safety.
- The future integrated design will need to mitigate potential conflicts between drainage pipes, inlets, sanitary sewer, the ducts for power, communications, and any other service.
- Water service will be an integrated element of the project and the installation of the distribution system will need to be designed with considering the existing sanitary sewer lines, updated drainage pipes and inlets, and new dry utility duct banks.
- While current standards of design will need to be followed, VDOT design exceptions will need to be processed.
- Traffic calming and other improvements need to be checked for maintainability.
- Future maintenance of public area lighting for the village may require agreements with Dominion Energy.

Future Infrastructure Maintenance and Repair

The use of pavers and similar non-standard materials is intended to be contextual and consistent with Waterford's NHL status. The maintenance of the pavers and other non-standard pavement materials for streets and sidewalks in the Village of Waterford will likely need to be accomplished by Loudoun County, VDOT, other entity or through a maintenance agreement(s) with a to be determined governance established by WCA and WFI. It is understood that governance is a topic of discussion with WCA and WFI as the Waterford 2033 planning continues.

Closing

As requested by Loudoun County Department of Transportation and Capital Infrastructure (DTCI), Kimley-Horn has updated the preliminary engineering study conducted in 2003, building upon the *Bury the Wires and Tame the Traffic* report and recent reports developed by Loudoun County, Loudoun Water, and other entities, resulting in this 2022 *Preserving the Landmark* report. The recommendations in this report also have been built upon input from citizens of Waterford, including recent outreach efforts by WCA and WFI in support of Waterford 2033.

The concept plans within this 2022 report represent a master plan or program of infrastructure improvements for the Village of Waterford to tame the traffic, bury the wires, fix the drainage, manage the stormwater, light the village, add potable water, and preserve the NHL. The preliminary engineering efforts should provide a basis for final design and be sufficient to support future marketing and fundraising activities.

The recommendations are intended to help WCA and WFI achieve their Waterford 2033 goals related to sustainability and adaptive reuse, with the anticipated result of no adverse effect on the NHL and its contributing properties. This report is intended to lay the foundation for the next steps in implementing a comprehensive, integrated program of infrastructure improvements in the context of preserving Waterford's heritage.

"The campaign to restore, designate, and protect the historic village of Waterford is nationally significant as an important example of a sustained and innovative private preservation effort to secure and conserve a comprehensive village landscape. Waterford's remarkably intact village architecture and expansive agricultural setting survives with such high integrity due to this multipronged and intensive campaign that employed emerging preservation approaches and a diverse set of preservation tools. Spearheaded by private citizens and the community non-profit Waterford Foundation, this decades-long collaborative effort represents a laboratory for experimental preservation strategies and has resulted in the conservation of a living landscape where the majority of properties, unlike in a museum restoration, have remained in private ownership."

-2022 National Park Service Updated
Waterford National Historic Landmark Study

Waterford

Preserving the Landmark

DRAFT

1. Introduction

"The shady streets and modest buildings of Waterford speak eloquently of the simple lives of the men and women who settled in this quiet corner of Loudoun County and helped build the nation - and of the determination of preservationists who have worked hard to keep this fragile piece of our heritage intact and alive."

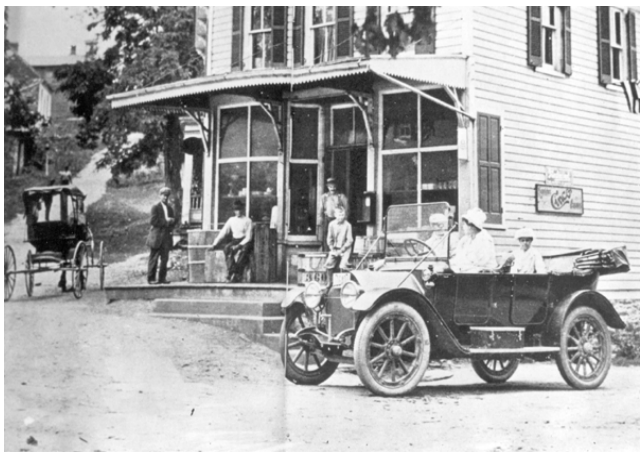
—Richard Moe, The National Trust for Historic Preservation

Through the vision and leadership of Waterford citizens, Loudoun County officials, and historic preservationists, the early American rural Village of Waterford is indeed intact and alive today. Established in 1733, the Village of Waterford was designated a National Historic Landmark (NHL) District in 1970 by the U.S. Department of Interior. The village also is a Virginia Landmark Historic District and a Loudoun County Historic District.

Even with these designations, the village is currently experiencing the challenges associated with a growing number of overhead wires and cables, aging stormwater pipes and culverts, growing traffic volumes, and high traffic speeds throughout the village. A comprehensive, holistic strategy is needed for the Village of Waterford to restore historic viewsheds, reduce and calm traffic, and improve infrastructure in the context of its NHL status.

This report articulates this strategy of integrated infrastructure improvements. Largely based on the 2003 *Bury the Wires and Tame the Traffic* planning effort by Loudoun County, this 2022 *Preserving the Landmark* report incorporates more recent input from the citizens of Waterford as well as recommendations from more recent infrastructure studies completed by Loudoun County in support of Waterford.

1.1 Waterford's History of Preservation



Corner Store, circa 1915

When a pioneer named Amos Janney founded the Village of Waterford in 1733, Virginia's Blue Ridge foothills formed the frontier of a colonial America that had yet to push past the Appalachian Mountains. In the early 1800s, Waterford grew with the new nation into a bustling commercial center for the surrounding farmland. Following the Civil War, the Industrial Revolution passed the village by. Businesses gradually closed and moved, but the community remained.

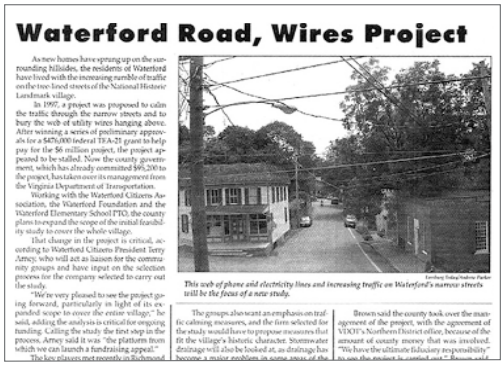
During the 1930s, Waterford began attracting notice from preservationists for its character as an unspoiled, 19th-century rural village. In 1937, the Historic American Buildings Survey carried out a program of photo documentation of Waterford's architectural gems. Local citizens, recognizing their treasure of historic landscape and regional vernacular architecture, founded the Waterford Foundation, Inc. (WFI) in 1943 to ensure the protection of this rich heritage. The Waterford Citizens Association (WCA) was established in 1954 to support the citizens in the preservation of Waterford's historic heritage and to promote citizen involvement in the Waterford community. Through the vision of these citizens and other preservationists, the Village of Waterford with its surrounding countryside—a total of 1,420 acres—was granted NHL status in 1970. This NHL status is one of only a few that encompasses an entire village.

Following this NHL recognition, local citizens, county and state officials, and friends of Waterford from across the nation continued the work in Preserving the Landmark in the 1970s, 80s, and 90s. In 1999, through the endeavors of many people, Waterford citizens arrived at a consensus for improving traffic safety and restoring the historic character of the village. In a Village-wide meeting with Virginia Department of Transportation (VDOT) and Loudoun County in June 1999, the citizens agreed to the following statement:

> *The Village of Waterford is supportive of burying the wires and taming the traffic. We want the village to look much like it does today. We'd like to keep our sidewalks as they exist today; we'd like our trees to exist as they do today; and we'd like the drainage problems to be corrected. We'd like to see historically correct streetlights in the village, and we'd like to see traffic tamed. Our motto: "Less is more."*

To move forward with implementing enhancements that would reflect the village's historical significance and help ensure Waterford remains unique in the national context, WFI led the application process in 1999 and again in 2001 for a Transportation Equity Act for the 21st Century (TEA-21) grant to "*Bury the Wires and Tame the Traffic*." Local citizens and school children participated in the process. The result was a grant for a preliminary engineering study. Combined with matching funds, approved by the Loudoun County Board of Supervisors, the study was funded and then administered by the Loudoun County Department of General Services, in coordination with VDOT.

TEA-21 Grant Application



Waterford Road, Wires Project

As new homes have sprung up on the surrounding hillsides, the residents of Waterford have lived with the increasing rumble of traffic on the tree-lined streets of the National Historic Landmark village.

In 1997, a project was proposed to calm the traffic through the narrow streets and to bury the web of utility wires hanging above. After winning a series of preliminary approvals for a $476,000 federal TEA-21 grant to help pay for the $6 million project, the project appeared to be stalled. Now the county government, which has already committed $95,200 to the project, has taken over its management from the Virginia Department of Transportation.

Working with the Waterford Citizens Association, the Waterford Foundation and the Waterford Elementary School PTO, the county plans to expand the scope of the initial feasibility study to cover the whole village.

That change in the project is critical, according to Waterford Citizens President Terry Arney, who will act as liaison for the community groups and have input on the selection process for the company selected to carry out the study.

"We're very pleased to see the project going forward, particularly in light of its expanded scope to cover the entire village," he said, adding the analysis is critical for ongoing funding. Calling the study the first step in the process, Arney said it was "the platform from which we can launch a fundraising appeal."

The key players met recently in Richmond

This web of phone and electricity lines and increasing traffic on Waterford's narrow streets will be the focus of a new study.

The groups also want an emphasis on traffic calming measures, and the firm selected for the study would have to propose measures that fit the village's historic character. Stormwater drainage will also be looked at, as drainage has become a major problem in some areas of the

Brown said the county took over the management of the project, with the agreement of VDOT's Northern District office, because of the amount of county money that was involved. "We have the ultimate fiduciary responsibility"

Leesburg Today *Article, September 13, 2002*

The stated challenge of the *Bury the Wires and Tame the Traffic* study was to balance traffic calming measures, utility relocations, stormwater management, and roadway alignments with the historic nature of the village. To meet this challenge, the County's consultant team took a holistic planning and conceptual design approach that resulted in recommendations for integrated solutions throughout the entire village. Creating these solutions required the involvement of Loudoun County and VDOT staff, Waterford representatives and citizens, and the consultant team.

The study involved significant input from citizens of Waterford, and the resulting final report of consensus-based findings and recommendations was completed in October 2003. The report document, including concept plans, recommendations, and appendices) is listed in *Appendix A, References*, and incorporated by reference into this *Preserving the Landmark* report.

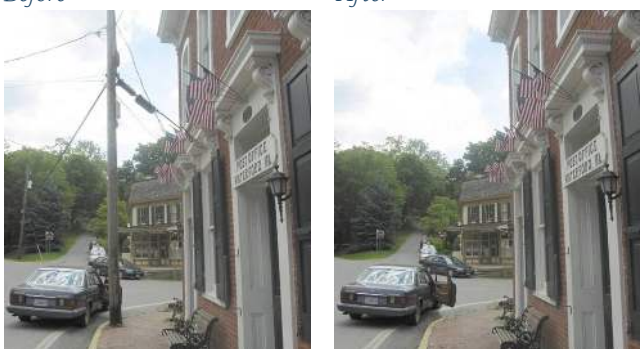
In the 2003 report, concepts were laid out that would lead to detailed design and construction projects that would accomplish the following throughout the village:

- Traffic calming
- Improvements to roads, sidewalks, and pavements
- Stormwater management
- Relocation of electric and communication lines from overhead to underground
- Installation of street and sidewalk lighting
- Support to environmental and historic resources restoration

The design intent of the plan documented in the 2003 report was that traffic calming measures and improvements to lighting, utilities, and drainage would all be constructed in a phased program of projects based on an integrated, coordinated design that would be consistent with the NHL status of the village, i.e., the infrastructure improvements would also help to preserve the NHL. The 2003 plan was created to be timeless to allow the County and the village to implement the improvements when funding became available. An example graphic from the 2003 plan is shown below.

Example Bury the Wires Graphic:

Before *After*



Post Office and Corner Store—Remove pole, bury wires

The 2003 report was a planning tool for the village, the County, and VDOT to take to the next steps—to obtain funding and implement design and construction—and WFI and WCA representatives were prepared to move forward with the plan. However, in 2003, the Phillips Farm, located within the NHL District's 1,420 acres, was purchased by a private investor for land development purposes. Fearing the loss of the historic viewshed and Waterford's NHL status, a significant fundraising campaign began to purchase the land from the investor. On December 18, 2003, WFI successfully acquired 144 acres of the Phillips Farm and subsequently placed the land into a conservation easement.

Phillips Farm, February 2022 site walk

The momentum from the 2003 *Bury the Wires and Tame the Traffic* effort was thus diverted, and over the next nearly 20 years, various other studies were completed by Loudoun County and VDOT to calm traffic and upgrade infrastructure in the village, including the following:

- 2006 – Waterford Elementary School Groundwater Supply Report by Loudoun County Public Schools
- 2008 – Conceptual Traffic Calming Plan completed by VDOT
- 2017 – Envision Waterford by WCA
- 2018 – Cut Through Traffic Study by Loudoun County Department of Transportation and Capital Infrastructure (DTCI)
- 2021 – "Village of Waterford Traffic Calming and Byway Assessment" by Loudoun County DTCI
- 2022 – "Historic Waterford Water Feasibility Study" by Loudoun County Department of General Services (DGS) and Loudoun water.

These additional studies are cited in *Appendix A*. A timeline of traffic calming efforts for the village of Waterford since 2003 is included in *Appendix B*.

1.2 Waterford 2033

In 2020, in partnership with WFI, WCA launched a visioning and community planning effort called "Waterford 2033." Their aim is to develop a unifying community plan for the village based on shared vision of what they want the village to be in the future, along with the strategy and resources to implement this community plan. With the logo and tagline shown in *Figure 1-1* on the following page, WCA and WFI have articulated the following benefits for the community in implementing this plan:

"Together, we will develop a consolidated, unified community plan that will help address anticipated key issues the Village will face over the next 20 years."

"We will have a plan to help interact with each level of elected officials (county, state, and federal), state agencies (e.g., VDOT), and utilities (e.g., Dominion Energy, Verizon, Comcast, Loudoun Water)."

"We will develop more clearly defined roles and responsibilities—and areas for support, synergy and collaboration—between the Waterford Citizens Association and the Waterford Foundation."

"We will better utilize strategic policy tools for the historic preservation and open space protection of this unique Village."

Waterford's goal is to implement this community plan by or before 2033, when the village will be 300 years old.

Figure 1-1: Logo and Tagline for Waterford 2033 Visioning and Community Planning Effort

Waterford 2033

300 Years of Preservation & Conservation Through Innovation

In developing a strategy for the potential infrastructure improvements within the DCTI community, WFI and WCA turned to the 2003 *Bury the Wires and Tame the Traffic* study and its master plan of traffic calming, utility relocations, and overall infrastructure improvements intended to preserve the heritage of the Village of Waterford and protect its NHL status.

In late 2021, the members of WCA and WFI approached Loudoun County for their support in moving forward with updating the concept designs in the 2003 plan, with a view to implementing them before 2033. WCA and WFI would like to do so by integrating the results of the recent Loudoun Water Waterford Feasibility Study, traffic calming analyses conducted by Loudoun County and VDOT, and current best management practices for stormwater management, as well as reuse of stormwater and other sustainability practices. They also expressed a desire for the 2003 plan to be updated to include research conducted by WCA and WFI members to incorporate renewable energy, electric lines to support electric vehicle charging stations, fiber optic lines to support high-speed internet, stormwater harvesting, nutrient banking, and adaptive reuse of historic buildings.

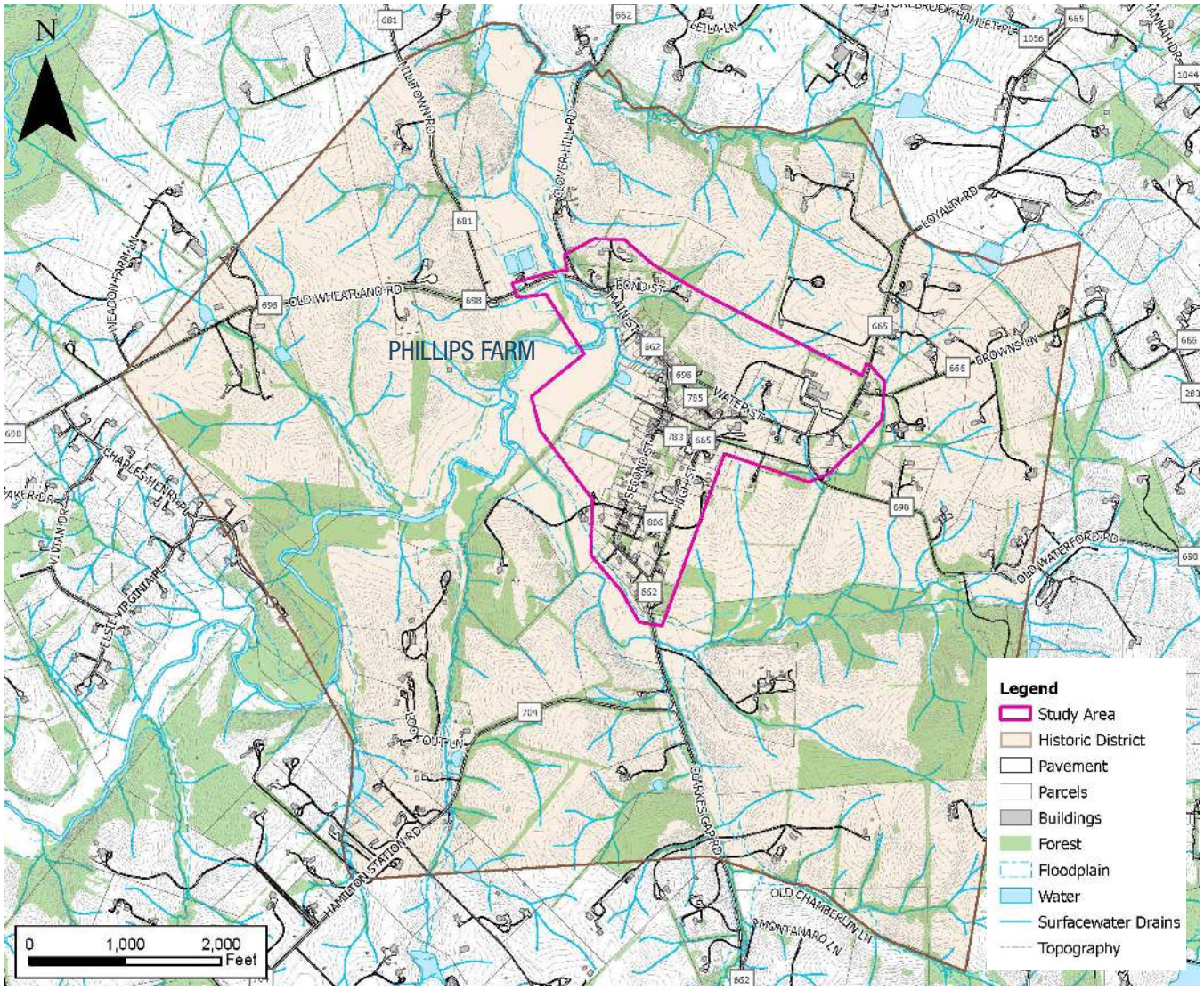
To create a report that updates the 2003 plan, Loudoun County issued a task order to Kimley-Horn under a current contract with the Department of Transportation and Capital Infrastructure (DTCI). Work began on this task order in January 2022 and culminated with the development of this report and its updated concept plans, costs, and recommendations.

1.3 Preserving the Landmark

Entitled *Preserving the Landmark*, this 2022 report is written to be an update of the 2003 *Bury the Wires and Tame the Traffic* report, incorporating recommendations from more recent studies, and resulting in comprehensive recommendations and updated high-level cost estimates for a program of infrastructure improvements that can be implemented by Loudoun County over the next several years.

The geographic area considered for this report is shown in *Figure 1-2*, on the following page. This area includes the NHL District that encompasses the entire Village of Waterford, which is an unincorporated area of Loudoun County, approximately 5 miles northwest of Leesburg. The focus areas of this report are the streets within the village, including the sidewalks, vehicle travel lanes and parking areas, drainage pipes, ditches, outfalls, and wet and dry utilities.

Figure 1-2: Study Area within Waterford National Historic Landmark District



1.3.1 Sustainability

WCA and WFI have formed a Waterford 2033 Joint Leadership Committee, and its stated goal is to ensure that historic Waterford builds a bridge to an environmentally sustainable future by focusing on conservation-focused adaptive reuse of Waterford's built and open spaces, which in turn will support the economic sustainability of the Waterford Foundation. The Committee has and will continue to develop plans to maximize the infrastructure improvements contained within this 2022 report as the committee leads the creation of sustainable practices throughout the entire Waterford National Historic Landmark. These practices include stormwater drainage, retention, and management; open space conservation and restoration; sourcing alternative energy; adaptive reuse programs; carbon footprint reduction practices; and the creation of village walkways, paths, trails, and amenities.

1.3.2 Adaptive Reuse

As a capstone "anchor" project that commemorates the 300-year anniversary of Waterford's founding, Waterford 2033 envisions the restoration of the Old Waterford Mill in a way to make it sustainable and accessible into the future. The committee anticipates that the National Trust would welcome the opportunity to assist in the inauguration of Waterford's next century through adaptive reuse of the Mill, in support the Waterford Foundation's preservation and educational efforts and revitalization of heritage tourism in the village, consistent with the objectives of the National Trust's Main Street America programs. In addition, the committee is studying how best to restore buildings currently owned by the Waterford Foundation. The intent of this effort is to create new spaces to house cultural and educational tenants, which will create both economic stability for the Waterford Foundation and a new attraction for visitors.

1.4 Data Collection

1.4.1 Documentation

As part of this current planning effort, the study team gathered and reviewed documentation, including previous planning reports, agency information, historic records, and publications on the history of Waterford. A list of the key documents is included in *Appendix A*.

1.4.2 Base Mapping

The base mapping used for developing the concept plans included in this 2022 report was developed from Loudoun County's recent geographic information system (GIS) data. The County's GIS contains comprehensive data on base mapping features as well as environmental, historic, archaeological, and existing conditions information that was used to update Figures, tables, and concept plans in this report.

Village of Waterford, 2021

1.4.3 Field Data

In 2003, the consultant team members collected a large volume of existing conditions information within the Village of Waterford. This data included daily and peak hour traffic volumes, traffic speeds, existing signs, and roadway geometry, as well as crash data. Cores of the asphalt pavement on Main and Second Streets were obtained to determine thickness of existing pavement. The existing storm drainage system was documented. Other data collection efforts included determining health of existing trees in the village, conducting a wetlands survey, documenting parcels of property that contributed to the NHL status, and determining archaeological potential of areas within the village. The configuration of the existing power and telephone utilities was documented, and a survey of the lighting levels was performed. Specific findings from this existing conditions data were discussed in the 2003 report.

For the updates to traffic and other information discussed in this report, the County's GIS data was useful, as were the several recent traffic and other infrastructure studies conducted for the village. It should be noted that in moving forward with detailed design and environmental permitting for implementing future infrastructure improvements, new field data will need to be obtained and new analyses will need to be performed for specific activities, such as the development of an approval document in accordance with the National Environmental Policy Act.

1.5 Agency Coordination

For this 2022 report, several agencies and utility companies were contacted for confirming current processes, building upon the study efforts in 2003, during which Loudoun County staff and the consultant team coordinated and met with numerous government agencies and utility companies that were involved in the study and that would have potential involvement in the subsequent implementation of recommended infrastructure projects. It should be noted that coordination and collaboration with the following stakeholder organizations will be essential for successfully moving forward with future infrastructure improvements in support of Waterford 2033:

- Loudoun County DTCI
- Other Loudoun County Departments: General Services, Planning and Zoning, Health
- Loudoun County Sheriff's Department and Emergency Services
- Loudoun County Public Schools
- Loudoun Water
- VDOT:
  - Northern Virginia District Office
  - Leesburg Residency
  - Central Office Organizations
- Virginia Department of Historical Resources

Second Street, 2022

Tin Shop, 2022

Main Street, 2022

- Virginia Department of Environmental Quality
- The National Trust for Historic Preservation
- Federal Highway Administration
- U.S. Army Corps of Engineers
- National Park Service
- Dominion Energy
- Verizon
- Comcast
- WCA
- WFI
- Waterford Elementary School Parent Teachers Organization Rioriaes sundam sunt

2. Waterford's Heritage

What most distinguishes Waterford isn't its connection to major events. Nor is this a grand place, like Mount Vernon or Monticello. Rather, the modest village homes, and their rural surrounds, preserve the templates of ordinary 18th century American lives.

—-Tony Horwitz, National Best-selling Author and former Waterford Resident

2.1 Heritage and Preservation Efforts

In the America of the 21st century, Waterford's significance is evident. Established in the 18th century, the village grew to pre-Civil War prominence. Today, three quarters of the buildings erected before 1834 are still standing. The visual demarcation is evident in the "hard edge" between the 19th-century rural village and the surrounding countryside of fields and farmsteads. The topographic features of the landscape influenced the settlement pattern, which is visible in millworks, houses, roads, hedgerows, fences, and agricultural lands. Waterford's architecturally distinctive buildings were derived from Virginia and Pennsylvania vernacular traditions.

During the 1930s, the Village of Waterford began attracting notice from preservationists for its character as an unspoiled rural village.

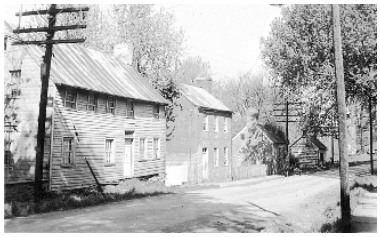
The newly formed Historic American Building Survey conducted a photo inventory of the village buildings. Local citizens founded the Waterford Foundation, Inc. (WFI) in 1943. In 1970, Waterford was granted National Historic Landmark (NHL) status, the nation's highest designation of historic properties, and officially recognized because the village possesses exceptional value in illustrating and interpreting the heritage of the United States. Waterford is currently one of less than 2,600 such landmarks, and it is one of only a handful in which the entire village is an NHL District.

The integrity of the village is embodied in the preservation of historic settlement patterns, the absence of visually modern structures (especially on the periphery), and the use of traditional building materials, for old and new structures, roadways, and sidewalks. In short, Waterford's past is Waterford's present, as demonstrated with the photos in *Figure 2-1*.

Figure 2-1: Waterford's Past is Waterford's Present

Loudoun Hotel, 1937

Second Street, 1950's



Main Street, 1937

1937

2021

Pink House, 1937

Pink House, 1950

Pink House, 2022

Main Street, 1930's

Main Street, 1930's

Main Street, 2022

Second Street, 1905

Second Street, 2022

Tin Shop, 1919

Tin Shop, 2022

2.1.1 Historic Preservation in Waterford

The citizens of Waterford have maintained the integrity of the village through years of preservation efforts, which can be summarized with the following milestones:

1937 – Historic American Building Survey

1943 – WFI established

1954 – Waterford Citizens' Association (WCA) established

1966 – Waterford Water and Sewer Facility Design/Cost Study by Loudoun County

1969 – Virginia Landmarks Register Application by Virginia Department of Historic Resources (VDHR)

1970 – NHL status for 1,420 acres, including entire village

1972 – A Plan for Conservation of Waterford by WFI

1980 – The Waterford Challenge by WFI

1987 – Waterford Area Management Plan by Loudoun County

1988 – National Trust List of 11 Most Endangered Historic Places

1992 – Landscape Conservation Strategy by WFI

1999 – Community Consensus Statement

2001 – Transportation Equity Act for the 21st Century (TEA-21) Grant Applications (1999, 2001)

2003 – *Bury the Wires and Tame the Traffic* Preliminary Engineering Study and Concept Plans by Loudoun County Department of General Services

2004 – Waterford Foundation acquires 144-acre Phillips Farm, bringing total land owned and managed to 13 properties on 195 acres

2006 – Waterford Elementary School Groundwater Supply Report by Loudoun County Public Schools

2008 – Conceptual Traffic Calming Plan completed by Virginia Department of Transportation (VDOT)

2017 – Envision Waterford by WCA

2018 – Cut Through Traffic Study by Loudoun County Department of Transportation and Capital Infrastructure (DTCI)

2020 – Waterford 2033 Visioning and Community Planning initiated and led by WCA and WFI

2020 – Pole-mounted speed display signs to slow traffic entering the village, installed by Loudoun County DGS

2021 – "Village of Waterford Traffic Calming and Byway Assessment" by Loudoun County DTCI

2022 – "Historic Waterford Water Feasibility Study" by Loudoun County DTCI and Loudoun Water

2022 – NHL Update by National Park Service

2022 – *Preserving the Landmark* report by Loudoun County DTCI in coordination with WCA and WFI

The reports and other documentation supporting these efforts are listed in *Appendix A, References*. In addition, during the development of the 2003 *Bury the Wires and Tame the Traffic* study, several written histories of Waterford were collected, including essays on the heritage and significance of Waterford's architecture and two other pieces written by Waterford citizens. These histories are included in *Appendix C, Essays on Waterford's History,* at the end of this 2022 report.

2.1.2 Need for Preserving the Landmark

A major factor in Waterford's character is the unspoiled open rolling landscape which surrounds the village and enhances its integrity.

-1969 nomination of Waterford as a National Historic Landmark

Today, the national cultural legacy that is the Village of Waterford and its NHL status is threatened by growing vehicular traffic and an infrastructure in need of repair. This report builds on the work of many people in Waterford, Loudoun County, and the Commonwealth of Virginia to recommend concepts that can be taken to the next steps in implementing a comprehensive program of projects.

These projects will help alleviate the pressures of traffic volumes and speeds on the historic resources in the village as well as ensure Waterford remains unique in the national context. These projects also will improve infrastructure to support Waterford 2033 goals related to sustainability and adaptive reuse, all with the anticipated result of no adverse effect on the NHL and its contributing properties.

2.2 Environmental and Cultural Resources

Contributing to Waterford's NHL status and its rich heritage are environmental and cultural resources, which were documented in the 2003 *Bury the Wires and Tame the Traffic* report. Updates are provided for this 2022 report, as discussed below.

2.2.1 Wetlands and Streams

In 2003, the County's study team conducted a detailed wetland and water resources investigation in the Village of Waterford for areas subject to jurisdiction by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. The approximate 137-acre historic Village of Waterford, within the larger 1,420-acre NHL, is located within the South Fork of the Catoctin Creek drainage basin in Loudoun County, Virginia. The village is situated approximately 5 miles northwest of Leesburg, and properties within the village can be accessed primarily by Main Street, Water Street, High Street, and Second Street.

The village has moderately sloping terrain, along with cleared and forested land. A tributary of South Fork Catoctin Creek is located adjacent to the eastern and southern village limits, while the South Fork of Catoctin Creek is located just within the northwestern village limits. The current National Wetlands Inventory (NWI) map depicts Catoctin Creek which crosses Old Wheatland Road in the northwestern portion of the village, as well as a palustrine emergent

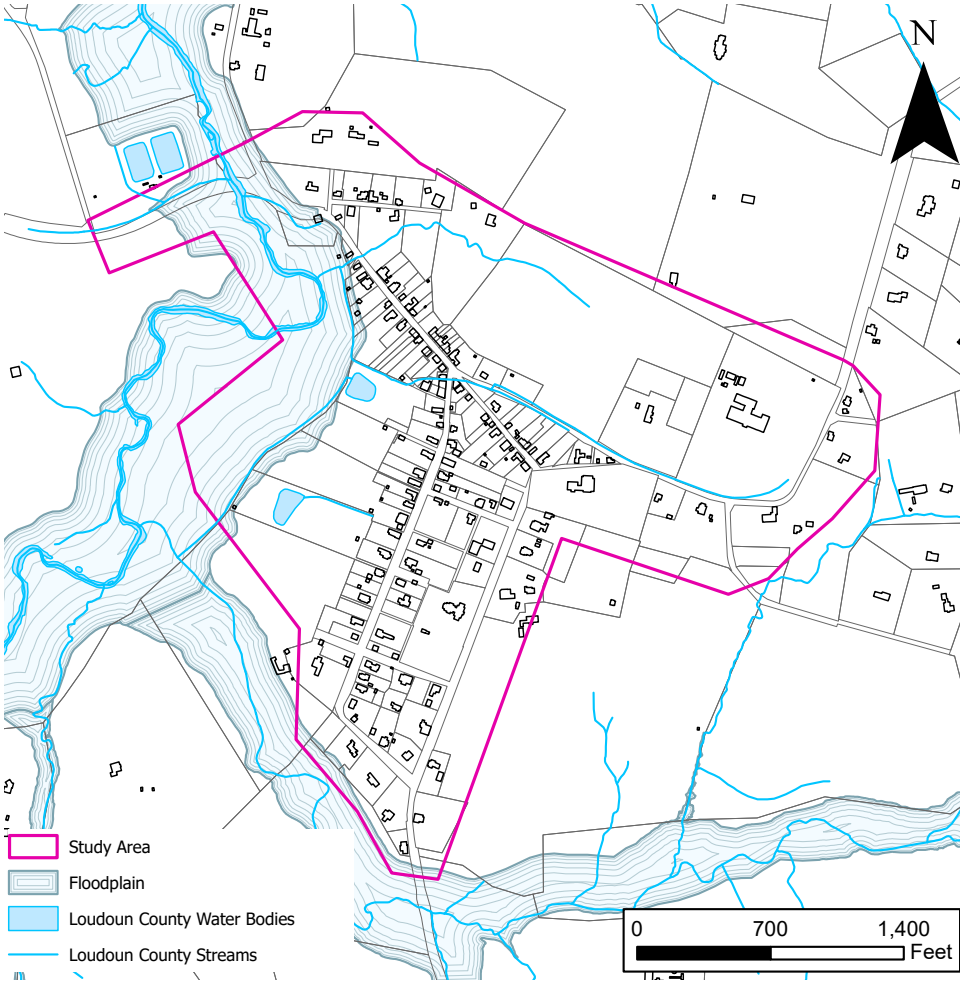
Tannery Creek

wetland adjacent to the creek. Several small ponds are also mapped within the village limits on the NWI mapping. Only a small portion of soil in the western portion of the village is classified by the Natural Resources Conservation Service as hydric. Therefore, the majority of the village does not have hydric soils which indicates the potential lack of wetland conditions. Field work conducted during 2003 included delineation of wetlands to provide an onsite record of the location of wetlands and other water features. After coordination with USACE, a jurisdictional determination was made, which was valid for 5 years. This delineation found a very small amount of wetlands within the village, which may be classified as emergent. The transition from wetlands to uplands was generally identified by a vegetation community change. As the 2003 delineation and USACE approval has expired, a new wetland delineation and USACE confirmation will need to be completed prior to development.

Figure 2-1 indicates the location of water resources within the study area and is based on Loudoun County's 2022 geographic information system data. Of note:

- The South Fork of Catoctin Creek is located at the northwestern village limits and is the only perennial stream within the village. This creek progresses through the Phillips Farm and is linked to the farm's rich history.

Figure 2-1: Streams and Floodplains



- Intermittent streams that may seasonally become dry also exist within the village.
  - The most prominent of these intermittent streams is the swale that begins at the top of Water Street, flows down the roadside drainage ditch, through a pipe under Water Street, through a viaduct, and under the building (the Corner Store) on the corner of Main Street and Second Street. Exiting via an old culvert, the intermittent stream flows under Second Street, beneath a building (the Tin Shop), and emerges at the rear of the building, flowing through a yard and animal lot before it enters a farm pond and leaves the area of study.
  - A second intermittent stream (Tannery Creek) begins between Main Street and the new school complex, approximately halfway up the hill toward the school, and flows under Main Street and into Catoctin Creek.
  - The channel that historically served as the sluice for the Old Mill exists from the location of the waterwheel to Catoctin Creek. It contains water that is primarily backwash from Catoctin Creek and can be considered an intermittent channel.
  - The channel that used to serve as the raceway for water entering the Old Mill sluice and powering the waterwheel is located along the east edge of the Phillips Farm, along the backs of properties that front Second Street and Main Street.

With respect to implementing infrastructure improvements in support of Waterford 2033, it should be noted that while water resources are protected by laws and regulations, there are likely no critical environmental elements present that would hamper the application for or acquisition of a permit to cross or, in a minor way, impact the resources. The replacement of bridges, culverts, or pipes should be able to be addressed through the permitting processes of the USACE and the Virginia Department of Environmental Quality (DEQ).

In addition, the infrastructure improvements recommended in this report and shown on the concept plans in *Chapter 4* can provide an opportunity to restore historic waterways through enhanced drainage design and creative best management practices (BMPs) for stormwater management. The restoration of the waterways could support the Waterford 2033 goals of WFI and WCA, including adaptive reuse of the Old Mill.

2.2.2 Trees

In 2003, the county's team also conducted a survey of 288 trees along the roads and areas of potential construction. The tree survey found that the majority of trees in the village were in good health. With respect to implementing infrastructure improvements, an updated tree survey should be performed to determine potential impacts on today's trees due to construction. Detailed design should include strategies to mitigate impacts to existing trees or replacement of trees in the context of the historic landscape.

Trees on Second Street

2.2.3 Contributing Parcels and Archaeological Potential

In 2003, the county's study team verified that recommended concepts could meet the requirements of the National Historic Preservation Act of 1966, as amended; the Archaeological and Historic Preservation Act of 1974; Executive Order 11593, and Title 36 of the Code of Federal Regulations Parts 660-66 and 800 (as revised, 1999); and other applicable federal cultural resource laws and regulations.

Because the history of the Village of Waterford has already been extensively documented, the study team conducted background research to assess the potential for archaeological resources and historic architectural resources that could be affected by utility burial or traffic calming measures. Relevant repositories of records for research were accessed, including records with the Virginia Division of Historic Resources, the Waterford Foundation, the Library of Virginia, the Virginia Historical Society, Loudoun County libraries and historical societies, and other governmental records. A visual inspection of the architectural and historical resources also was conducted in 2003. This research was instrumental in developing traffic calming, street lighting, and utility relocation concepts that were consistent with the character of the village. This 2022 update builds upon this research and the previous concepts.

Jail and Stone Wall, circa 1836

The Mill, circa 1829

Wisteria Cottage, Main Street, Early 1800's

2.2.4 Preservation Easements

The preservation of the village cannot be left to chance ... Only through the dedicated efforts of its people will Waterford retain its beauty and historical integrity.

-Philip R. Ehrenkranz, Waterford Foundation, 1972

During the 2003 study, of 133 land parcels investigated, 42 historic preservation easements existed at that time. Through the work of the Waterford Foundation and other interested parties, additional easements have been added over the past two decades. *Figure 2-2* shows a current map of the NHL District and its easements or historic district parcels, including the 144-acre Phillips Farm. Since the inception of the preservation easement campaign in

Trees along Second Street

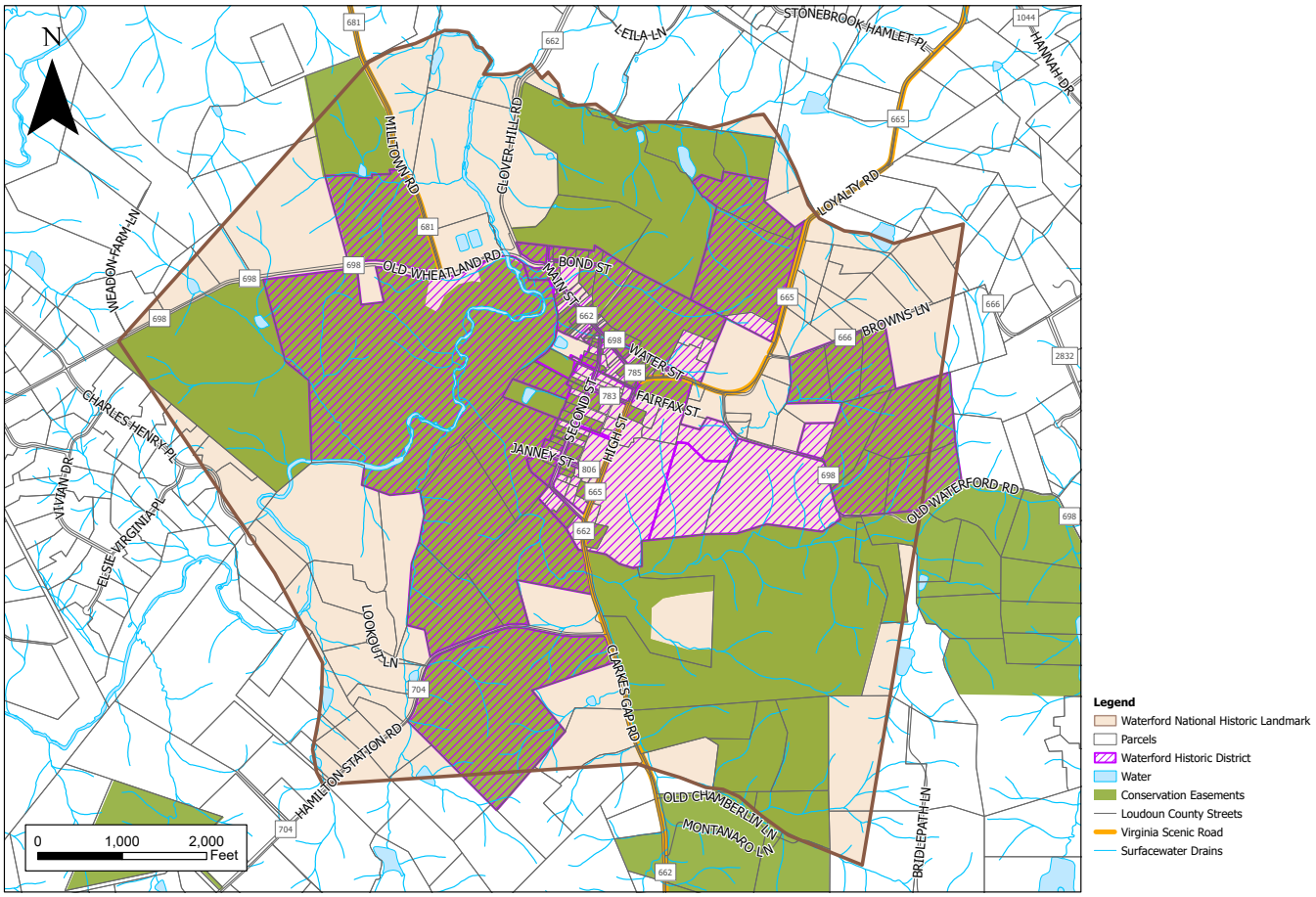
Waterford in 1972, private property owners as well as the WFI have donated easements on approximately 95 properties.

In the early 1970s, the WFI did indeed embark on an ambitious program that encouraged private property preservation through the purchase and donation of easements. As documented in the 2022 nomination for recertification of Waterford as a National Historic Landmark, today the employment of preservation easements in Waterford is likely one of the most extensive and successful in the United States due to the sheer number of easements and the extent of their protective coverage. Waterford's NHL district is the best and densest concentration of easements in any historic district in the Commonwealth of Virginia, according to the nomination.

With respect to its integrity as an NHL, as stated in the 2022 nomination:

> *Waterford's natural features—including hedgerows, tree lines, waterways, and viewsheds—have been sensitively conserved and continue to represent an authentic rural agricultural service village set within farmlands. The intact views and vistas add greatly to the authentic feel of a rural village as it might have appeared during the nineteenth century, featuring only houses, a few small businesses in the village core, and historic farms and meadows enveloping the village core.*

Figure 2-2: Village of Waterford Preservation Easements



It should be noted that the WFI owns and maintains properties within the village, as shown in *Table 2-1*. All but one of the properties have easements on them from VDHR and other agencies (as shown), and each of these properties has been examined by WFI for adaptive reuse following the introduction of potable water service and the completion of other infrastructure improvements recommended in this report, such as new electrical and communications connections.

2.2.5 Conclusions on Environmental and Cultural Resources

From the preliminary engineering studies conducted in 2003, and with this 2022 update, the consultant team has concluded the following:

- Alternatives for traffic calming, drainage improvements, utility relocations, water supply system installation, and lighting would likely have "no adverse impact" on the NHL status.
- Alternatives proposed were found to be relatively benign with respect to potential impact and would enhance the NHL status of the village.
- New delineations of wetlands and streams will need to be completed by Loudoun County and confirmed by USACE.
- Permits from USACE and/or Virginia DEQ will likely be required if any impacts to wetlands and/or streams are proposed as a result of proposed infrastructure improvements.
- Opportunities exist with infrastructure improvements to restore environmental resources such as streams and wetlands and to adapt historic properties to new uses.

The recertification of Waterford as a National Historic Landmark was approved on May 11, 2022 by the National Historic Landmarks Advisory Board of the National Park Service. The next step is approval by the U.S. Department of the Interior.

Table 2-1: Waterford Foundation Properties Data

Name	Acres	Date	Easement	Zoning	Electric	Heat	Water	Parking
Bond St Barn, Ice House, Meadow Bond/Liggett Streets	1.52	1720s (barn)	None	CR2	Yes	No	No	Some
Chair Factory, 15502 Second Street	0.15	1888-1890	VDHR	CR2	Yes	Yes	No	Some
Corner Store, 40183 Main Street	0.04	c. 1900	VDHR	RC	Yes	Yes	Shared	Some
Forge, 15484 Second Street	0.03	??	VDHR	CR2	Yes	No	No	No
John Wesley Church, 40125 Bond Street	0.20	1891	VDHR*	CR2	Yes	Yes	Yes	Yes
Mill, 40105 Main Street	0.87	c. 1817	National Trust	CR2	Yes	No	Yes	Some
Old School, 40222 Fairfax Street	4.50	1910	VDHR	CR2	Yes	Yes	Yes	Yes
Red Barn, 15483 Second Street	0.40	1921	VDHR	RC	Yes	No	No	Some
Schooley Mill Barn & Meadow, Second Street	20.02	c. 1803 Purch 1970	VDHR+new**	AR1	Yes	No	No	Yes
Second Street School, 15611 Second Street	0.25	c. 1867	National Trust	CR2	Yes	Yes	No	Some
North Meadow, Loyalty Road	2.27	Purch 1999	Loudoun County	AR1***	NA	NA	Yes	Some
Phillips Farm, Old Wheatland Road	144	Purch 2003	VOF	AR1***	NA	NA	No?	Some
Water Street Meadow, Water Street	18.79	Purch 1970	VDHR	CR1	NA	NA	Yes	Yes

Notes:

VDHR = Virginia Department of Historic Resources
VOF = Virginia Outdoors Foundation
NA = Not applicable
* special agreement regarding any sale with families of previous congregation who have right to use.
** new easement in 2019?
** listed as CR1 in WF inventory report, but shown on the zoning map as AR1

Zoned commercial

Zoned residential

Open space properties with reusable structures

Open space properties with no reusable structures

LoCo Zoning Codes:

CR (1 and 2) – Countryside Residential
1 unit per 40,000 square feet (0.9 acre) with well and septic, 1 unit per 20,000 (0.45 acre) if served by sewer (differences in 1 and 2 not fully clear but have to do with whether water is public, does not change the number of units)
AR (1 and 2) – Agriculture Rural
Rural business and agriculture uses, 1 unit per 20 acres (per 5 clustered), 40 and 15 for AR2
RC – Rural Commercial
Rural commercial uses in rural villages, uses compatible with scale and character of village, minimum lot size 10,000 sq ft (0.25 acre), parking in rear or on street

Source: Waterford Foundation, Inc, Properties Inventory Draft Report, 2018.

2.3 Community Input – 2003

The 2003 preliminary engineering study to *Bury the Wires and Tame the Traffic* was the result of the efforts of many citizens to obtain consensus on the needs of the village. This consensus, which remains relevant in 2022, is documented in the summary of the meeting on June 10, 1999, between citizens, Loudoun County, and VDOT. A copy of this summary is included in *Appendix D* of this 2022 report.

To confirm this consensus, and to obtain specific input, the study team met with citizens and neighbors of Waterford in 2003. At the meeting, the consultant team introduced the study and presented success stories from similar efforts around the U.S. The citizens participated in breakout groups where they marked up maps of the village with their issues and ideas. The citizens also provided input on what they value most about Waterford as well as their vision for Waterford in 20 years and the issues that this study should address. One final exercise was voting on those issues to help the study team better understand the citizens' priorities.

The results of these discussions are shown in the lists below and *Table 2-2* and included in *Appendix E.*. The input from the citizens at this meeting became the benchmark against which to measure the feasibility of various alternatives for taming traffic, burying wires, fixing drainage, lighting the village, and repairing roads and sidewalks.

Table 2-2: Waterford's Core Values

Historic	Bucolic	Pedestrian friendly
Beautiful old buildings	Quiet	Consideration
Preservation	Peaceful	Tolerance
Respect for history and heritage	Rural character	Intrinsic beauty
Historic ambiance	Rural village setting	Tranquil
Integrity of architecture	Charm	Peaceful
Spirit of community	Quaint	Clean
Neighbors	Original	Welcoming
Family	Green	Friendly
Safety and security	Healthy trees	Home

Source: Village of Waterford 2003 Citizen Meeting.




2003 Community Meeting

It should be noted that some of the issues raised by the citizens, such as the desire for a bypass around Waterford and for water service in the village, were outside the scope of the 2003 study. While a bypass or "byway" around the village remains a topic of discussion, it is not considered for this 2022 report.

However, Loudoun County and Loudoun Water recently completed a study of water service in the village. The recommendations from that study are indeed incorporated into the engineering studies discussion of the next chapter and into the concept plans and overall cost estimate.

20-Year Vision for the Village of Waterford from its Citizens

- A town where a dog can sleep on Main Street in front of the post office.
- Protected, tranquil, green, family-filled lots of outdoor life and activity, fresh air and water, well maintained, visually pleasing
- SAME-less traffic/better behaved traffic and parking. Healthy trees, well preserved buildings
- U.S. model of a well-preserved rural historic village
- A community that has maintained the relationship of the land surrounding the village to the townscape with traffic alleviated to a degree
- The flavor/character much the same but subtly enhanced to allow better strolling through all of town, more respectful traffic (cars more aware of pedestrians/bicyclists) and improved historic feel
- The streets will return to slow car traffic where the drivers would feel comfortable stopping and chatting with passersby or looking at the historic names. A place where children are safe to play, bike, and walk along the streets. NO power or phone lines visible.
- A place where all Americans can come and see a pre-industrial village and its surrounding rural environment, and where they can participate in a living community to recreate a sense of their past
- My grandchildren will be able to come to Waterford and see what it was like in the 1800s in a village in Virginia
- Essentially the same; safer streets; safer for the historic structures; safer for residents and visitors; history preserved
- Remain as it is now with its current historical look. That visitors will still feel that they are transferred back in time when here

Source: Village of Waterford 2003 Citizen Meeting.

Top Ten Issues to Address

Issue and Number of "Votes" by Participants

- Tree canopy (30)
- Maintain/preserve character (28)
- Traffic speed (22)
- Bury wires (19)
- Hidden and expandable utility system (18)
- Traffic diversion (the "bypass") (17)*
- Traffic volume (16)
- Safe walkways / Safe walk to school (14)
- Drainage (12)
- Water (9)*

**Issue outside of study scope*
Source: Village of Waterford 2003 Citizen Meeting.

2.4 Community Input – 2020-2022

With the initiation of the Waterford 2033 Visioning and Community Planning efforts, WCA and WFI have hosted weekly meetings since 2020. The purpose these frequent meetings has been to coordinate efforts of the various Waterford 2033 subcommittees and to talk with neighbors, members of the Loudoun County Board of Supervisors, and numerous agencies. A chronological compendium of these meetings is included with *Appendix F*.

In addition to these weekly meetings, WCA and WFI have offered opportunities for the community to provide specific input from the citizens of Waterford through the following activities:

- August 2021 Village Survey
- March 26, 2022 Community Open House
- April 27, 2022 Community Meeting

2.4.1 Village Survey – August 2021

As part of the Waterford 2033 planning process, the citizens of Waterford were asked to fill out a "Waterford Vision 2033 Questionnaire" in August 2021. The questionnaire was not a vote or request for approval of any particular objective but a simple means of identifying themes and initiatives that are important to the community. A summary of the feedback received from the 41 residents who responded to this survey is included in the lists below. In November 2021, WCA and WFI briefed the results of this survey to the Loudoun County Board of Supervisors. A copy of the briefing is included with *Appendix F*.

Summer 2021 Village Thematic Survey

Core Values

- 100% agree with preserving Waterford's unique history and NHL designation is a core value
- 92% agree with conserving Waterford's natural resources should be a goal
- 78% agree on building and maintaining a sense of community should be a goal

Input on Priorities

- 100% of respondents agree that effective traffic management is a priority
- Second quartile agree that walkability in the Village, burying electric and other wires, adequate potable water supply, environmental sustainability, preservation of historic community resources and natural resources, public access lands, and best use of historic structures are priorities
- Third quartile agree that utilities, adequate parking, context appropriate economic development, community activities, and renewable energy are priorities

Villagers' Input on Challenges

- Volume of traffic, noise, and damage it brings to the Village
- Lack of potable water for all
- Maintaining financially stable Waterford Foundation and preserving NHL designation
- Absence of town government that can represent Village's interests
- Modification/repair of inadequate drainage systems
- Burying wires to maintain a historic feel
- Not maintaining/making best use of historic structures
- Need appropriate businesses and tourism focused on education
- Lack of sufficient parking for residents and visitors
- Need enhanced education and interpretation of historic resources
- Need funding to support any possible solutions

Notes: NHL = National Historic Landmark.
Source: August 2021 Village Survey.

What Villagers Love about Waterford

"The wonderful feeling of history come alive and being able to contribute to the preservation of this unique place."

"The connection to the land."

"Raising a child here was an amazing experience; it is comforting to live among people who care and watch out for one another."

"We were quickly made to feel a part of the community."

"The historic and natural environment."

"The feeling, the architecture, the hills and open spaces, the sense of community."

"The communication among neighbors of all ages, interests, talents, and backgrounds."

"In the evenings, the Village shows a glimmer of what it was—quiet, self-contained, peaceful, and content."

"A community of neighbors working together for a common good."

Source: March 26, 2022 Community Open House.

2.4.2 Community Open House – March 2022

As part of a series of community input sessions for the ongoing planning for Waterford 2033, WCA and WFI held an open house on Saturday, March 26, 2022, at the John Wesley Church on Bond Street (note that the John Wesley Church is a former church building that is now owned by the Waterford Foundation). The open house took place from 12 noon to 5 p.m. and was successful in soliciting input from the Waterford community through informal interactions and through three panel discussions. A brief summary of the panel discussions is shown in the list below. A report on the Waterford 2033 Open House is included with *Appendix F*.

Summary of Panel Discussions at Waterford 2033 Open House

(March 26, 2022, Historic John Wesley Church)

Panel 1: Origins of Waterford 2033

- Visioning and community planning effort by WCA and WFI, in concert with 300th anniversary of the founding of the Village of Waterford
- Outcomes of this effort being considered:
  - Governance of the village for property/ street maintenance, enforcement of traffic laws, and other community needs
  - Sustainability and Adaptive Reuse Plan—blending efforts from the update to the 2003 *Bury the Wires and Tame the Traffic* study, from recent traffic studies and conservation activities, and 2022 "Historic Waterford Water Feasibility Study"

Panel 2: Water and Traffic — Effective Long-Term Solutions

- For fundraising, Waterford is moving from its annual Waterford Fair to a diversified plan that makes use of Foundation properties
  - Potable water and fire protection required for adaptive reuse

Community Open House, March 2022

- Zoning and parking are other issues that need to be solved for using Foundation properties for income-producing purposes

- Desire to leverage stormwater for sustainability and reuse, as well as treatment for putting the appropriate amount of clean water into outfalls and Catoctin Creek
- Opportunities exist to support/enhance wetlands, restore mill race, and restore historic mill
- Multiple property owners—including VDOT and Loudoun County—will need to engage on solutions that benefit the community as a whole
- Traffic calming needed more than ever for village streets like Second Street; sidewalks needed, too; preservation of trees is critical
- Recent traffic data indicates many vehicles travel well in excess of the posted 20 or 25 miles per hour speed limits—vehicle speeds and volumes remain huge concerns

Panel 3: Sustainability and Adaptive Reuse

- Water is the critical priority
- Need to find balance between privacy/quiet village and visitors to Waterford due to more events/increased commerce
- "We don't want to become Williamsburg."
- Bring in businesses that are appropriate to maintain community where people want to live for next 100 years

2.4.3 Community Meeting – April 2022

Following the open house, WCA and WFI hosted a community meeting on Wednesday evening, April 27, 2022. The more formal name of the meeting was called "Village Briefing – Progress and Process for the 2003 – 2022 Waterford Infrastructure and Sustainability Plan." During this meeting, presentation boards developed by Loudoun County and the consultant team were displayed for Waterford citizens to review and discuss. An open forum portion of the meeting was followed by presentations from representatives of WCA, WFI, Kimley-Horn, and Loudoun County. The presentations were then followed by an hour-long question and answer session, during with these representatives provided responses to questions. A summary of the meeting, including photos taken and questions posed, is included in *Appendix F*. Responses to the questions are incorporated in this report and its concept plans and recommendations.

Community Meeting, April 2022

3. Engineering Studies and Design Alternatives

With consideration of Waterford's heritage and resources, as well as input from Waterford citizens and recent traffic calming and other Loudoun County studies, this chapter provides an update to the discussion of engineering studies and design alternatives in the 2003 *Bury the Wires and Tame the Traffic* report. Of note is the addition of alternatives for a potable water supply system in the village, as discussed in the April 2022 draft of the *Historic Waterford Water Feasibility Study* by Loudoun County and Loudoun Water. Also of note is the opportunity with the design alternatives to help further the Waterford 2033 goals related to sustainability practices within the village and adaptive reuse of historic properties.

Thus, this chapter covers the following elements within an overall strategy to preserve the landmark that is the Village of Waterford:

- Traffic calming (mitigating traffic speeds, while advocating for solutions to reduce traffic volumes)
- Improvements to roads, sidewalks, and pavements
- Stormwater management
- Electrical and communication lines (dry utilities)
- Lighting
- Water and wastewater (wet utilities)

3.1 Traffic Calming

Reducing vehicle speeds and vehicle volumes remains a priority for the village. Walkability also is a top priority, i.e., making streets safer for pedestrians, improving existing sidewalks, and adding new sidewalks and walking paths, as well as adding connections to existing trails. Design alternatives to encourage slower speeds in the village and enhance walkability, as well as actions outside of the village that would result in reduced traffic volumes, are dependent upon existing land uses and the transportation network, current traffic data, and context sensitive measures that would be acceptable for the village and its National Historic Landmark (NHL) status.

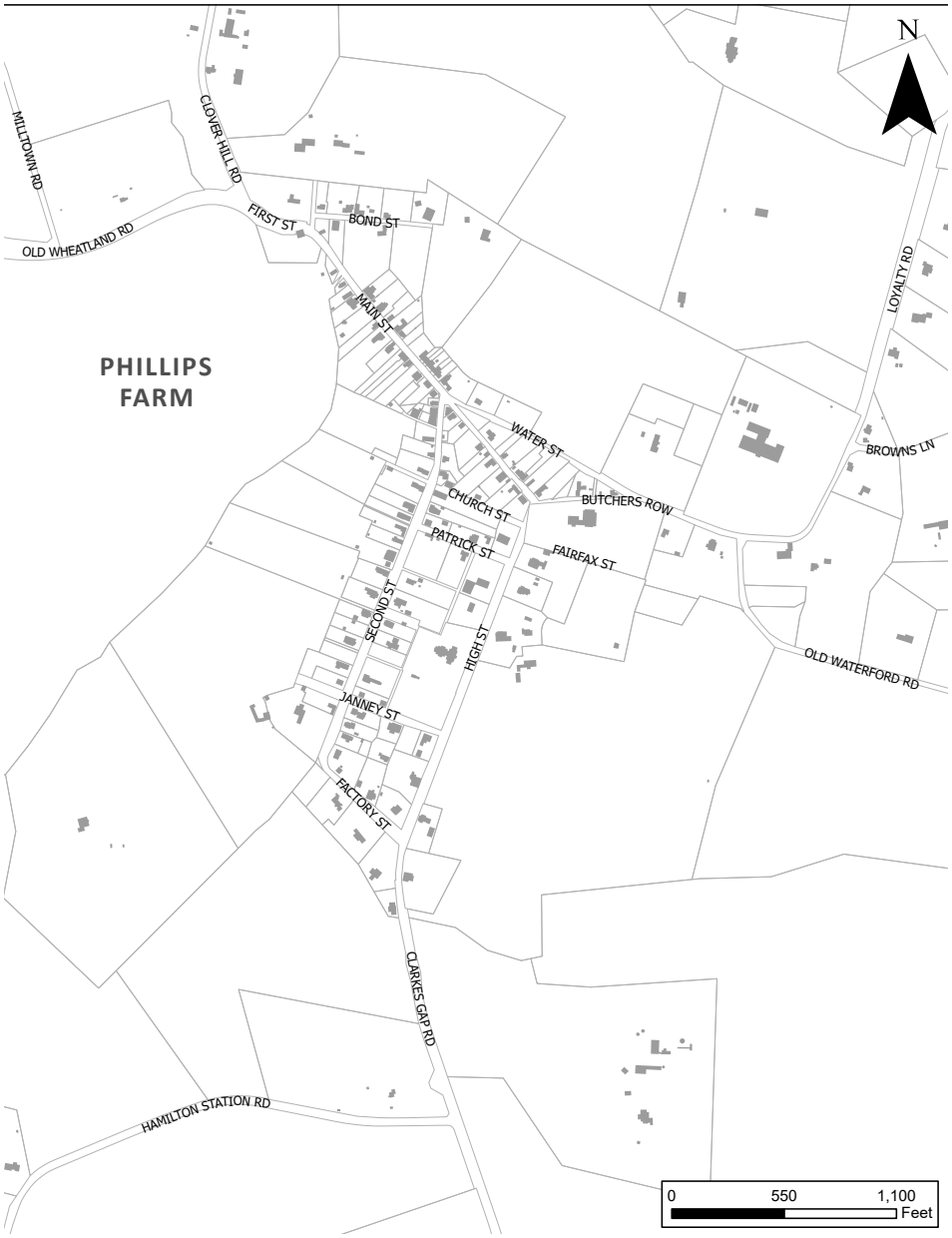
Main Street

3.1.1. Land Use and Transportation Network

According to the Loudoun County Comprehensive Plan, the Village of Waterford is identified as a Rural Village. Located in the Rural Policy Area of the county, the village is comprised of farming and rural residential land uses. The Rural Policy Area contains large and small farms, as well as numerous villages, and is located predominately in the western part of Loudoun County. Residential subdivision development has the potential to diminish the rural character and historical relevance of the area. Predictions of a tremendous population growth within the Rural Policy Area has been the cause for developing guidelines and growth restrictions included in the Comprehensive Plan.

Traffic generated by the population growth in western Loudoun continues to be a concern of the citizens of Waterford, even with the

Figure 3-1: Existing Streets within the Village of Waterford



growth restrictions. The roadways in and around the Village of Waterford are of historical importance and match the rural character of the village. These roads are shown in *Figure 3-1*. The Comprehensive Plan has established transportation and roadway polices to ensure that these roads keep their historical relevance. In addition, in 1987, Loudoun County adopted the Waterford Area Management Plan to help manage growth and change in the Waterford area and conserve the historic and architectural character of the NHL District. The recommendations made in this 2022 report are consistent with both the current Loudoun County Comprehensive Plan and the Waterford Area Management Plan.

3.1.2 Vehicle Speeds

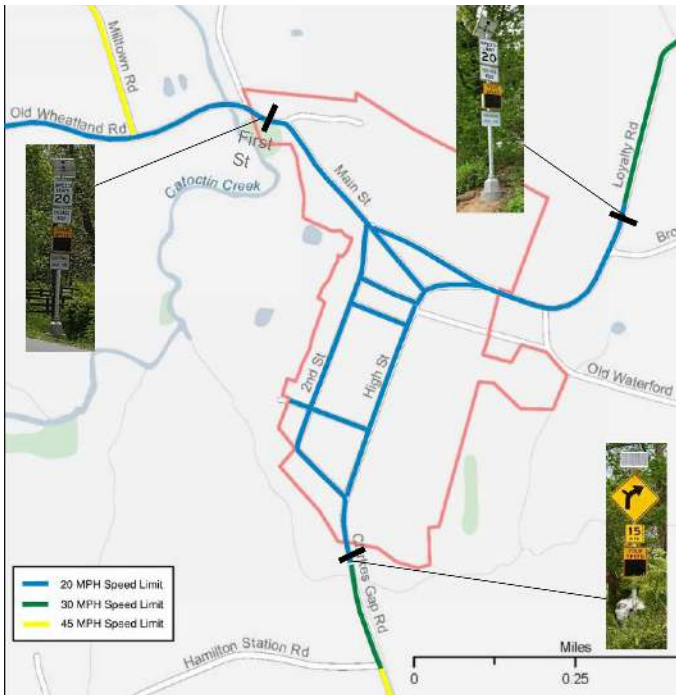
Vehicle speeds in the village continue to be a major concern for the safety of village residents. While the speed limit through the Village of Waterford is 20 miles per hour (mph), speeds measured in 2003 and in recent studies indicate that a vast majority of drivers exceed the 20 mph speed limits in the village. A standard measure of vehicle speed is the 85th percentile speed, which is the speed that 85% of drivers are traveling. Vehicle speed data collected in the field in 2003 and for recent studies show that the 85th percentile speed at all collection locations exceed 20 mph as shown in *Table 3-1*. Clarke's Gap Road was shown to have the highest speeds. Data in 2003 indicated that in addition to motorists speeding while entering and leaving the village, there also are many vehicles exceeding the speed limit within the village limits. Recent observations corroborate these previous findings.

Table 3-1: 85th Percentile Vehicle Speeds

Location	2003*	2019**	2021***
Clarkes Gap Road	37	42	41
First Street	31	31	31
Loyalty Road	33	34	37

Sources:
** Bury the Wire and Tame the Traffic Engineering Study, Loudoun County, 2003*
*** Loudoun County Speed Studies, October 2019*
**** Vehicle Data collected by Loudoun County, October 2021*

Figure 3-2: Speed Limits and Pole Mounted Speed Display (PMSD) signs (from Presentation Board #9)



To help mitigate vehicle speeds, in 2008, Virginia Department of Transportation (VDOT) installed stop signs at several intersections within the village. These signs serve to slow traffic at those intersections; however, drivers have been observed to roll through the signs and to speed up between intersections.

In 2020, Loudoun County installed pole-mounted speed display (PMSD) signs at the three entrances to the village as interim traffic calming measures. These signs and their locations are shown in *Figure 3-2*. Recent data collected from these PMSD signs indicate that some vehicles do slow down but that other vehicles do not. Longer term solutions are needed to address traffic speeds, as discussed in this report.

3.1.3 Traffic Volumes

With ongoing development in areas of the county north and west of Waterford, such as "by right" residential development allowed by current Loudoun County zoning rules along Old Wheatland Road, Milltown Road, and near Lovettsville, the amount of traffic passing through Waterford to destinations south and east of Waterford has grown significantly in the past 20 years. Commuters regularly travel the rural village streets on their way to and from employment centers in Leesburg, the Dulles area, and the Washington, DC metropolitan region. These vehicle trips use the village streets as their path of least resistance for regional travel, aided today by smart phone apps like Waze and Google Maps.

From traffic counts taken in 2003, daily traffic volumes along the three entrances to the village Waterford ranged from 1,400 vehicles per day (vpd) to just over 3,000 vpd. From counts taken in 2019 and later, daily traffic volumes in these locations range from more than 3,000 vpd to more than 8,000 vpd. Table 3-2 shows a comparison between the average daily traffic (ADT) volumes measured in 2003 and volumes documented in a recent Loudoun County study.

Table 3-2: Comparison of Average Daily Traffic Volumes

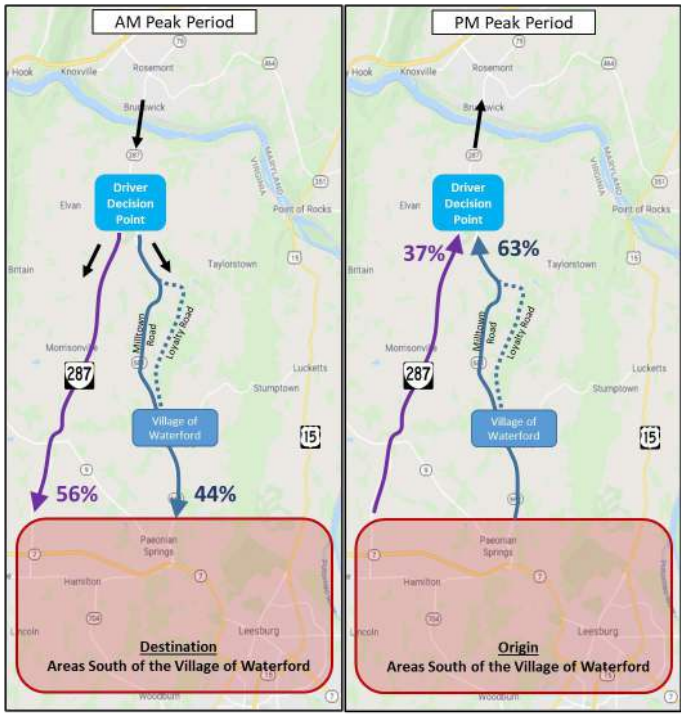
Location	2003 ADT*	2019 ADT**
Clarkes Gap Road	3,067	7,919
First Street	1,662	4,440
Loyalty Road	1,427	3,129

Notes: ADT = Average daily traffic.
Sources:
** Bury the Wire and Tame the Traffic Engineering Study, Loudoun County, 2003*
*** Loudoun County Speed Study, October 2019*

During the morning and late afternoon peak periods of travel, traffic can be observed steadily streaming through the village, especially along High Street, Second and Factory Streets, and Main Street, creating safety concerns for pedestrians and environmental concerns for the village due to the noise and exhaust from the vehicles, especially the frequent trucks and construction vehicles. Given the existing condition of some sidewalks, as well as a lack of sidewalks along some streets in Waterford, walking safely in the village during peak traffic periods is challenging. This situation not only is unpleasant and exacerbating for residents, but it also threatens the village's NHL status.

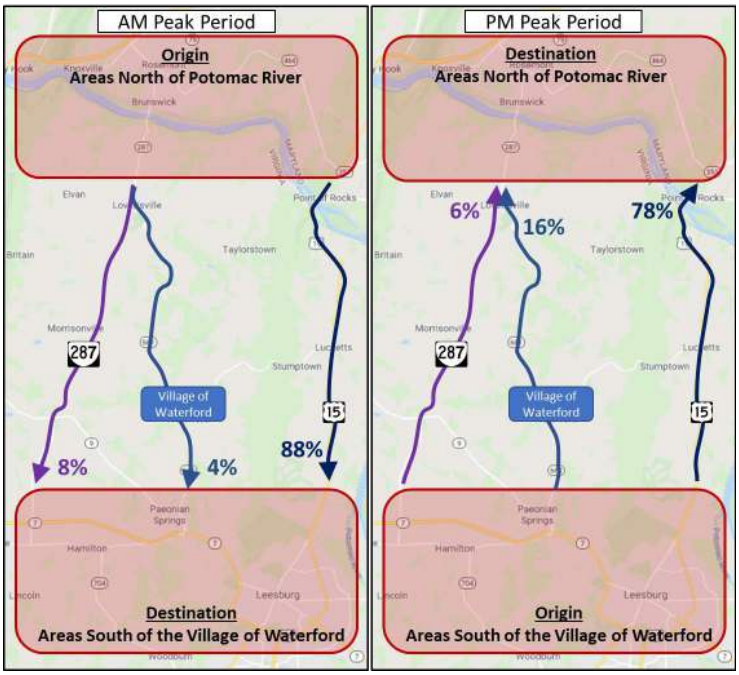
In 2021, a study entitled *Village of Waterford Traffic Calming and Byway Assessment* was completed by Loudoun County with a consultant team led by Michael Baker International. This study quantified trips of regional travel patterns, as shown in *Figure 3-3* and *Figure 3-4*. For AM peak period trips originating in north Loudoun County, 44 percent of those trips travel through Waterford during their commute. For PM peak period community trips originating from the south, 63% of those trips travel through Waterford. For regional trips outside of the county, only 4% of the total trips in the AM peak period travel through Waterford, while in the PM peak period, 16% of trips travel through the village in the northbound direction.

Figure 3-3: North Loudoun Origin and Destination Route Choices (2019)



Source: Village of Waterford Traffic Calming and Byway Assessment by Loudoun County, March 2021

Figure 3-4: Regional Origin and Destination Route Choices (2019)



Source: Village of Waterford Traffic Calming and Byway Assessment by Loudoun County, March 2021

Regarding vehicle volumes, due to the historic nature of the village and the limited right-of-way, capacity improvements in the village are not practical nor desired. Regional solutions are needed; however, regional solutions (or a byway around Waterford) are not the subject of this report.

While the recommendations of this report focus on traffic calming and infrastructure solutions for the Village of Waterford, it is understood that representatives from the Waterford Citizens' Association (WCA) and the Waterford Foundation, Inc. (WFI), along with residents of Waterford and Loudoun County, will continue to advocate for regional transportation solutions to address the systemic challenges of traffic congestion within the village.

This advocacy has begun within Loudoun County, given several regional transportation projects that are currently being planned that would decrease travel times along regional routes and ultimately decrease traffic volumes (congestion) in the village of Waterford. These projects are shown in *Figure 3-5* (from Loudoun County's Traffic Calming and Byway Assessment Study) and include:

Route 9/Route 287 Roundabout

This project includes the construction of a two-lane roundabout and approaches on Route 9 (Charles Town Pike) and Route 287 (Berlin Turnpike). This improvement will potentially reroute traffic away from the Village of Waterford by reducing vehicle delays at this intersection.

Route 7 Improvements

Loudoun County is planning capacity improvements for Route 7 west of Leesburg and for its interchange with Route 287 through a series of phased projects. These interchange improvements and widening of Route 7 will potentially reroute traffic away from the Village of Waterford by improving vehicular operations and decreasing travel times at the interchange and along Route 7.

Route 15 Improvements from Battlefield Parkway to Montresor Road

Project elements for these improvements include widening Route 15 from Battlefield Parkway in the Town of Leesburg to Montresor Road (Route 661), as well as several intersection improvements. These improvements will potentially reroute traffic away from Waterford by improving operations and decreasing vehicular travel times along this roadway segment.

Route 15 Improvements, Montresor Road to Point of Rocks Bridge

This project includes the widening of Route 15 segments to four lanes with a median, the construction of a bypass around the Village of Lucketts, and several intersection improvements. These improvements will potentially reroute traffic away from Waterford by improving roadway operations and decreasing vehicular travel times along this roadway segment.

One result of these regional transportation improvements should include navigation apps such as Waze and Google Maps telling drivers that traveling through Waterford is not the quickest option on their daily commutes.

3.1.3 Traffic Operations and Control Measures

Even with the growth in vehicle volumes, measures to slow this traffic within the Village of Waterford are viable. Such measures will allow a steady progression of traffic through the village at reasonable speeds. Taken as a whole, the traffic calming measures recommended in this report are "traffic neutral," that is, despite growth in traffic volumes in the county, the streets in the Village of Waterford have a fixed capacity and will remain in their current configuration.

Many of the intersections within the village are stop-controlled. As shown in *Figure 3-2*, the speed limit within the village is 20 mph. A school zone exists near the Waterford Elementary School, reducing speed limit to 20 mph along Loyalty Road during AM and PM periods on school days. Since 1999, the regulatory speed limit signs have been equipped with additional placards warning speeding vehicles of a $200 fine. Also, in 1999, Route 662 (Clarkes Gap Road) was closed to through trucks.

Information regarding vehicle crashes and speeding citations within the village was included in the 2003 *Bury the Wires and Tame the Traffic* report, and the recent Traffic Calming and Byway Assessment report contains very recent crash data, which shows that the predominant crash types include "fixed object-off road" and "angle" crashes, which are typical for narrower roadways and intersections with less than standard sight distance. Lack of compliance with speed limits and stop signs often contributes to these crashes.

3.1.4 Conclusions on Traffic Calming

Based on field observations and data collected in previous studies, speeding is a concern on all streets within the village. During recent field visits, numerous vehicles were observed traveling much greater than the speed limit. These observations have been corroborated by speed studies conducted in the village by Loudoun County and VDOT over the past 10 years.

While the widths of streets within the village tend to be narrow, traffic volumes recorded in previous studies can be accommodated by widths of 20 to 22 feet, per American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, as well as VDOT's Context Sensitive Solutions guidelines (IIM-LD-235.4). Considering the historic significance of Waterford's structures

and the limited right-of-way, the current roadway widths are generally satisfactory for the volume of traffic they currently serve and appropriate for the level of traffic ultimately desired in the village.

Based on the traffic and speed data collected, as well as observations made in the field, it was evident that traffic calming measures are necessary in the village and that a *wide range of solutions is possible.* Speeds measured indicated that a majority of drivers exceed the 20 speed limit in the village. The 85th percentile speeds were more than 10 mph over the speed limit, and it was evident that "rogue" speeders also are a concern. Reducing the speed of these drivers is a priority of traffic calming.

From field observations, pedestrians frequently use the sidewalks and streets for access to and from buildings and for leisurely walks. Making the streets safer for citizens and visitors also is a priority. More and better sidewalks are necessary.

3.1.5 Traffic Calming Measures Considered

Traffic calming measures in towns and cities throughout the U.S. today range from very subtle measures, such as narrower travel lanes and roadside landscaping, to more intrusive measures such as roundabouts and major roadway modifications. A full range of measures could be considered for the Village of Waterford with respect to the existing traffic and physical conditions of the roadways, intersections, and sidewalks in the village, but measures reviewed and discussed within the consultant team and with Loudoun County, VDOT, and Waterford representatives resulted in recommended measures that would be considered acceptable, given the desire of the citizens to preserve the character of the village, and the requirement for no adverse impact to the NHL status.

Butchers Row and Main Street—define intersection

First Street at the Mill—use as pinch point, protect Mill

Second Street and Patrick Street—discourage shortcut

Main Street—define edge, add trees

Traffic calming alternatives considered included:

- Minor modifications to the roadways, including edge and centerline pavers (forming splitter islands, chokers, and chicanes), corner radii reduction, narrow lanes, signs, pavement markings, etc.
- More major geometric projects: road lowering, speed tables, speed bumps, dips, curbs, gutters, traffic circles, roundabouts, etc.

According to traffic calming references published by the Federal Highway Administration and the Institute of Transportation Engineers, these measures, when considered in combination with each other, should result in overall speed reductions of 3 to 5 mph and much more for the rogue speeders.

3.1.6 Materials

It is important to note that any materials used for traffic calming measures should resemble historic materials, consistent with the character of the village and its NHL status. For example, pavers to define the road edges or centers could be stone or brick, or concrete resembling those materials. A humpback bridge over Tannery Creek could be finished with a veneer of stone. Examples abound of durable materials that can be used in this application and meet the historic character criteria for Waterford. Such examples can be found in Loudoun County along Route 50 in the villages of Aldie and Upperville, completed approximately 15 years ago, as well as along Route 9 in the Town of Hillsboro, completed in the past few years.

Another example that may be applicable for the streets and/or sidewalks in the Village of Waterford is a type of concrete pavement with pavers typically seen on National Park Service properties such as the Historic Jamestown Settlement in Virginia, as shown in the photos below. The concrete is finished with exposed aggregate, resulting in a pavement that hints at cobblestones and looks contextual with historic buildings.

Concrete Pavement and Pavers — Example from Historic Jamestowne, Virginia

Examples of materials

It should be noted that these materials may be more expensive than industry standard asphalt pavements with concrete curb and gutter. In addition, VDOT Instructional and Information Manual IIM-LD-218.4 states that VDOT will not be responsible for maintaining pavers, i.e., VDOT will not repair or replace damaged paver units or other non-standard pavement materials within the right-of-way of VDOT-maintained roadways (see discussion in *Section 3.4* regarding ownership and maintenance of the streets within the Village of Waterford).

3.2 Roads, Sidewalks, and Pavements

In 2003, the study of the roads, sidewalks, and pavements in the Village of Waterford included a review of available mapping, roadway plans, and historic photos; field visits to take measurements and make observations; obtaining cores of the asphalt pavement to determine existing thicknesses; investigating right-of-way issues; and developing findings and drawing conclusions as to alternatives to enhance traffic calming measures. Findings from the 2003 study remain applicable today, as noted in this 2022 update.

Main Street

3.2.1. Existing Roadway Conditions

The streets in and around Waterford are two-lane undivided facilities paved with asphalt or gravel. Residents access these streets via driveways or on-street parking. From field measurements, current pavement widths range from 14 to 22 feet on the streets in the village. These widths, as well as the horizontal and vertical curves (with poor sight distance in some instances), are not within today's standards for neighborhood streets; however, the widths and curves are features that contribute to the NHL status.

Referring to *Figure 3-1*, starting in the northwest part of the village, First Street is a two-lane undivided roadway, intersecting with Main Street at the historic Mill. Also at this location, John Brown's Lane and Bond Street provide access to historic homes and the John Wesley Church. First Street intersects with Clover Hill Road and Route 698 (Old Wheatland Road), which along with Route 681 (Milltown Road) west of Catoctin Creek provides access to the village from the northwest.

Main Street allows parking along both sides of the roadway. When parked cars are present, capacity of the roadway is reduced to little more than one lane and requires opposing traffic to pull over to pass one another—a traffic calming measure in itself. Curbs and sidewalks exist on either side of Main Street in various states of repair. The distance between the curbs is consistently 30 feet, and the pavement is generally centered between the curbs. Trees and utility poles encroach toward the pavement. The paved ditch on the south side of this road gets wider and steeper as it progresses toward Tannery Creek, creating a safety concern for pedestrians and vehicles.

Upper Main Street

The *upper part of Main Street* (the Big Hill) is a steeply graded, one-lane, one-way paved street that runs westbound from High Street to the intersection of Second Street, Water Street, and (lower) Main Street. Parallel parking is permitted along both sides of the street. Water Street, a narrow, paved, 2-way road, completes the roadway network, connecting the intersections of Butchers Row/Loyalty Road and Second Street/Main Street.

Clarkes Gap Road (Route 662) is a two-lane undivided, paved roadway that runs generally north-south and has narrow shoulders. It serves as access to and from the south, where it connects to Virginia Route 9, a major two-lane undivided roadway, which provides access to Route 7, a major four-lane divided facility that runs east-west.

Within the Village of Waterford, Route 662 has multiple names in addition to Clarkes Gap Road, including Factory Street, Second Street, Main Street, and First Street, which are all paved. Route 662 continues to the north beyond the village as Clover Hill Road, which is unpaved. Factory Street is a narrow road with a roadside ditch and sidewalk along the south side, and parallel parking along the north side of the roadway to serve local residents. Parallel parking was observed along each side of Second Street, which is a narrow, tree-lined residential street with roadside ditches along much of both sides.

Route 665 is a two-lane, undivided, paved roadway serving as the primary north-south route through the village. Route 665 extends from the Clarkes Gap Road/Factory Street intersection at High Street, changing to Butchers Row between the Main Street and Water Street intersections, and changing to Loyalty Road east of Water Street, where it proceeds to the northeast.

Janney Street is a narrow street connecting Second and High Streets and is paved for the majority of its length. Patrick Street also connects Second and High Streets as a narrow, paved road. Church Street is an unpaved roadway between Second and High Streets; its east end is largely obscured by vegetation.

With the exception of the north end of Second Street and the length of Main Street between Second Street and the wooden bridge, the streets throughout the village do not have curb and gutter. Most streets have little or no shoulder. The streets within the village are narrow, with an average width of 18 feet, which is 6 feet less than the VDOT standard. These roads were once unpaved wider streets, intended for horse-drawn carriage traffic. The streets have not undergone any geometric improvements to their original alignments. Streets within the village are free of pavement markings, which is consistent with its rural historic character. Without centerline stripes, vehicles tend to travel in the center of the roadway.

The streets throughout the village are very close to existing buildings, utility poles, and trees, which has been a cause for safety concerns. Specific examples of these safety concerns are:

- The eastbound approach on Main Street comes within inches of the Mill, creating a potential for crashes and damage to the historic structure.
- At the intersection of Factory Street and Clarkes Gap Road, northbound traffic traverses a horizontal curve combined with an upward slope. This geometry, combined with excessive speeds, creates a location for potential crashes.
- Similarly, sight distance issues abound along the east side of the village, from the Loyalty Road/Butchers Row/Water Street intersection, and along the length of Butchers Row and High Street. Excessive vehicle speeds observed along this route reinforce the need for taming the traffic.

3.2.2 Pedestrian Facilities

The existing sidewalks in the Village of Waterford are primarily located along Second Street and Main Street. The sidewalk locations relative to the roadways are generally inconsistent. In some places the sidewalks are lower than the roadway and the transition between roadway and sidewalk is steep. Throughout the village there are discontinuities in the sidewalks, and the portions of sidewalks in need of repair encourage pedestrians to travel in the street.

Sidewalk on Second Street

Most of the pedestrians observed in the village were walking along Main Street and Second Street, but during any visit to the village, pedestrians can be observed on all of the streets. Main Street is the hub of activity in the village, with the post office generating the majority of pedestrian (and vehicle) trips. The post office and Corner Store, located at the intersection of Main Street and Second Street, were observed to operate as school bus stops. Children were observed walking in the street to reach the bus stops.

When discussing sidewalks, the citizens has generally stated that the variety of the sidewalk pavements (concrete, stone, brick, gravel, etc.) is what they want to see continued. They have expressed that they relish the inconsistency of the sidewalks, the variety of widths and materials, and their "clumsy" look. However, the citizens also have expressed a desire to connect existing sidewalks together and to add walking paths or sidewalks that connect to the Waterford Elementary School off of Loyalty Road, as well as specific locations for crossing Waterford's streets.

With respect to walkways, paths, trails, and related amenities throughout the Village of Waterford, the citizens of Waterford also desire to have a network of walkways to knit the village together, including providing access to trails in the open space areas, such as the Phillips Farm interpretive trail. Such a system of pathways and trails, with interpretation markers and classroom areas (as found on the Phillips Farm trail), not only would improve walkability throughout the village, but also could support culturally appropriate educational and recreational activities organized by members of WCA and WFI or the community at large.

3.2.3 Pavements

Through the research conducted during the 2003 study, including discussions with VDOT and Loudoun County Service Authority (now Loudoun Water) and a review of historic photos, it was evident that the general geometry of the roads and sidewalks today exists as it did more than 80 years ago. Prior to the 1930s, roads in Waterford were unpaved. When Waterford was a chartered town for 100 years (1836 to 1936), the village maintained its own roads.

From historic photos, it is evident that the elevations of some of the roads in the village were generally lower than they are today, especially near the wooden bridge, which was originally a ford and then a small stone arch bridge (which sets precedence for a new "humpback" bridge). In 1937 era photographs,

the crown of the road along Main Street and the ditch on the west side appeared to have a significant elevation difference (see photos below).

Waterford citizens have expressed concerns over the elevation of the pavements along Main Street and in the vicinity of the Main Street/ Second Street intersection, compared with the sidewalk elevation. Pedestrian access and parking can be difficult in places, and drainage is poor.

Through field observations, the pavements within the village were observed to be in generally good condition. In 2003, the study team obtained cores of the asphalt pavement to determine its existing thicknesses. The majority of the cores were taken outside of the line of sanitary sewer lines. The thickness of the pavement cores ranged from 4-1/2 inches to 7-3/4 inches. See photo of cores below. It was determined that the asphalt pavement along the streets in Waterford were not unusually thick, but that the original crown of the road was generally followed.

According to representatives from the Leesburg Residency of VDOT, when the sanitary sewer system was installed in the mid 1970s (as-builts are dated 1975), the pavement along the roadways was removed and VDOT resurfaced the streets with “a couple of inches” of asphalt. Over the last 50 years, additional asphalt lifts have been placed periodically (perhaps with

Pavement Cores, April 2003

or without milling off the top layer). In addition, the gravel ditches in front of the Tin Shop and proceeding along lower Main Street also were paved due to erosion from stormwater. It is apparent from field observations that as successive layers have been placed, and when the gravel ditch was paved, curbs and gutters have lost some effectiveness, drainage problems were exacerbated, and pedestrian access and parking became more difficult in some locations.

As the Village of Waterford moves forward with infrastructure improvement projects to bury wires, tame traffic, fix drainage, and install water lines and utility duct banks, the reconstruction of the pavements will likely be necessary. During the detailed design phase, the village may choose to rebuild the streets with asphalt or concrete pavement. If concrete is chosen, this pavement can have a more historic look and feel, as discussed in *Section 3.1.6* above.

Lower pavement

Lower pavement, fix drainage, protect trees

Lower pavement, improve sidewalks

Lower pavement, fix drainage

3.2.4 Right-of-Way

The public right-of-way in the Village of Waterford has a storied past. Following the Civil War, and just after Virginia was readmitted to the Union, incorporated towns in the Commonwealth had to pass legislation or "ordinances" laying out rules for the towns. Waterford passed its Ordinance on July 3, 1875. It contained 15 "Town Ordinances," including two involving the streets. Ordinance No. 11, Section 1 stated:

> *Be it ordained that by the Council of Water-ford: That in laying out streets, twenty feet shall be laid out on each side of the centre, of which five feet on each edge shall be for sidewalks.*

Thus, the streets in Waterford were laid out to be 30 feet wide, with 5-foot sidewalks on either side. Houses, shops, porches, and other structures have encroached on this space over the year. (The other street-related ordinance called for a fine of "not less than fifty cents nor more than three dollars" for each offense of riding or driving at an "unusual rate of speed through the streets.") *Figure 3-6* shows these streets in a map created in 1875 by James Odin.

Figure 3-6: 1875 James Odin Map

Further, the streets in Waterford are not on prescriptive easements maintained by the Virginia Highway Department starting with the Byrd Act of 1932, similar to other roads in Loudoun County, but instead the streets are on public right-of-way. Following the loss of its charter in 1936, ownership of this right-of-way and thus maintenance responsibility of the roads reverted from the Village of Waterford to Loudoun County, according to records confirmed through recent property surveys and deed research.

3.2.5 Conclusions and Recommendations on Roads, Sidewalks, and Pavements in Waterford

From the findings, several conclusions can be drawn:

- The pattern of development in the Village of Waterford over 290 years is not only evident in the residences and other structures, but also in the streets themselves.
- The streets throughout the village are used by commuters in Loudoun County as arterial roads, but these roads act like and resemble rural, neighborhood streets.
- Lowering some portions of the roads will enhance traffic calming measures, improve walkability and drainage, and restore historic elevations.
- Realigning roads horizontally will also enhance traffic calming measures—and protect historic structures like the Mill.
- With the many instances of pedestrians sharing the road with motorists, additional sidewalks and pathways are needed, especially for school children.
- Improving, connecting, and extending the network of sidewalks and walking paths will enhance pedestrian safety, as well as access to the elementary school.

- Vehicle parking needs are currently addressed by on-street parking and a few driveways. The shortage of adequate on-street and off-street parking is a challenge for residents, visitors, and tourists; however, several areas within the village are candidates for informal or infrequent parking areas.

In support of traffic calming measures, roadway alignment, pavements, and sidewalk solutions should include:

- Minor horizontal realigning of roads away from historic structures, such as the Mill
- Vertical realignment, including lowering the surface of Main Street between Second and the Mill, and lowering the surface of the Corner Store intersection
- Repair of roadways, curbs, gutters, and sidewalks
- Extension of existing sidewalks to provide better pedestrian access throughout the village
- Identification of areas that could be used for temporary or permanent parking in support of Waterford events and businesses
- Installation of underground utility duct banks and a potable water distribution system—while the roads are being reconstructed to tame traffic and fix drainage.
- Reconstruction of each street once, with all the infrastructure needed to further the goals of Waterford 2033

3.3 Stormwater Management

In 2003, Loudoun County's study team assessed conditions and developed alternatives for fixing the existing drainage problems, such as the lack of curbs, gutters, and appropriate drainage inlets with respect to the existing asphalt pavement. This 2022 update refines these alternatives, considering the significant revisions to stormwater management regulations in the past 20 years and considering the use of streams and wetlands of the Phillips Farm.

3.3.1 Existing Drainage System

Stormwater in the Village of Waterford drains primarily via sheet flow around existing houses and buildings into small roadside swales/ditches. From the roadside swales/ditches, runoff flows either through small storm sewer systems or culverts into the seven outfall locations described in *Table 3-3* and shown in *Figure 3-7*. Of note is the existing drainage channel that runs down Water Street, under Main Street and Second Street, and under the historic structures of the Corner Store and the old Tin Shop, as shown in the photos below.

Re-route drainage away from Corner Store

Re-route drainage

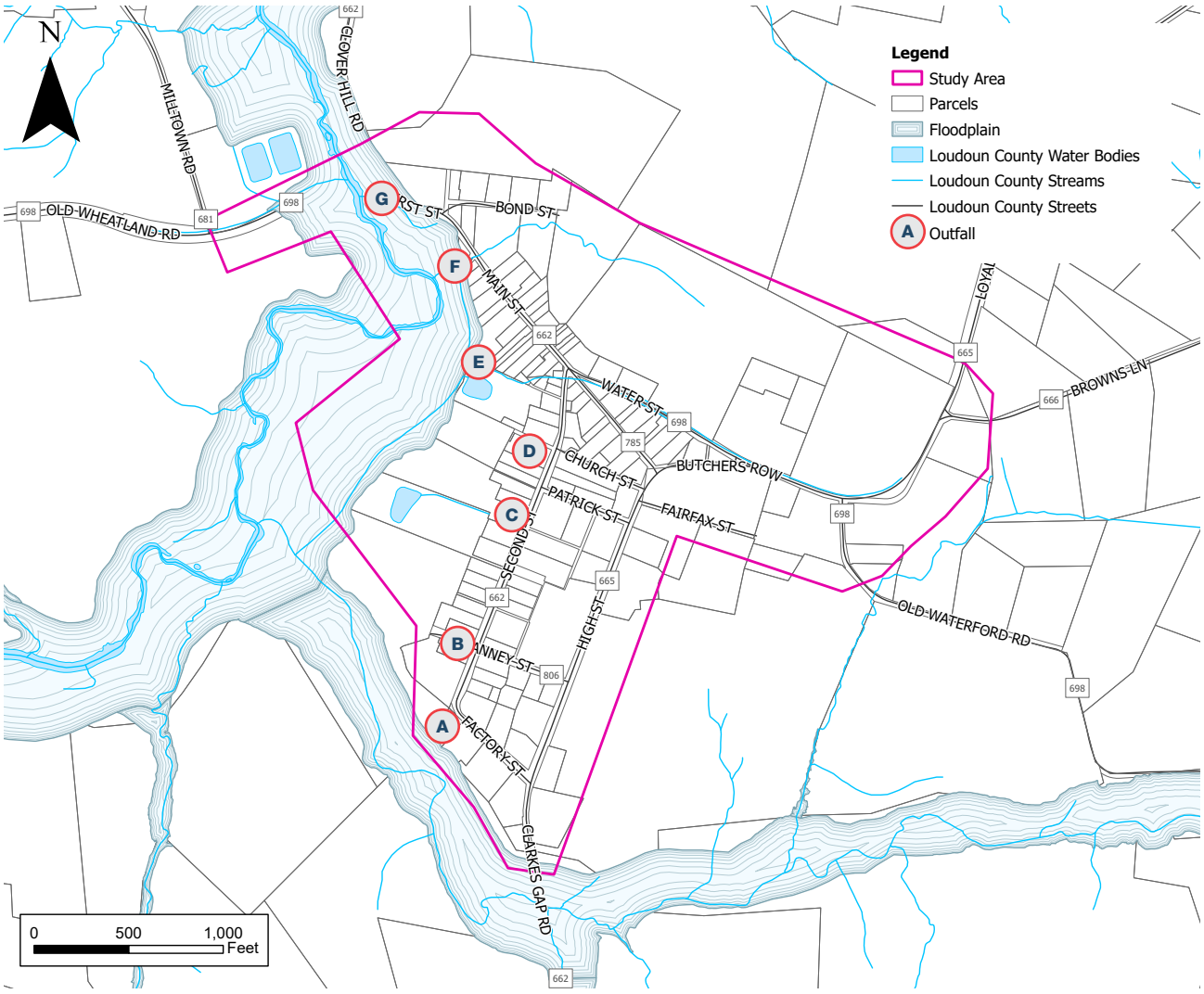
Re-route drainage from under Tin Shop

Keep historic culvert

Table 3-3: Existing Drainage Outfall

Outfall and Location	Existing Condition
Outfall A	
Located in the vicinity of the intersection of Factory Street and High Street	Stormwater runoff in this area sheet flows towards Factory Street. Small roadside ditches carry water down Factory Street in the direction of Second Street. A portion of the runoff flows from the northeast side to the southwest side of Factory Street via a culvert under Factory Street in front of the property located at 15668 Factory Street. A roadside ditch on the southeast side of the street conveys runoff towards the intersection with Second Street. A pair of culverts in the vicinity of the intersection conveys runoff from the east side of the intersection to the west side. Runoff is discharged to an existing swale along the fence line adjacent to the property located at 15653 Factory Street and outfalls into an open field area.
Outfall B	
Located between High Street and Second Street to the north and south of Janney Street	Runoff in this area sheet flows northwest towards Second Street. Water flows either over Second Street or under Second Street via several small culverts. On the northwest side of Second Street, runoff is discharged down a gravel driveway ditch and into an open field area. Several of the culverts under driveways along both sides of Second Street, as well as culverts under Second Street itself are ineffective at conveying any substantial amount of stormwater runoff due to crushing, clogging, and burying of culvert inlet and outlets. This has created ponding areas at culvert inlets and outlets.
Outfall C	
Located between High Street and Second Street	Runoff in this area sheet flows northwest toward Second Street. Runoff then sheet flows over Second Street and flows through some small swales around houses and buildings on the northwest side of Second Street. Runoff is discharged into an open field area. Roadside ditches along Second Street are not graded effectively enough to allow for adequate flow. As a result, stormwater runoff ponds in these ditches.
Outfall D	
Encompasses the area between High Street and Second Street north to Main Street; includes an area east of High Street	Runoff from the area east of High Street sheet flows northwest and passes through a culvert under High Street at the intersection with Church Street. Runoff flows in roadside ditches along Church Street and Patrick Street towards Second Street. Along Second Street, runoff sheet flows over the road or is conveyed through a culvert under Second Street between the properties located at 15511 and 15505 Second Street. This culvert outfalls at the back of the two lots into an open field area. Roadside ditches along Second Street are not graded effectively enough to allow for adequate flow. As a result, stormwater runoff ponds in these ditches.
Outfall E	
Encompasses an area north of Water Street extending east to Loyalty Road	Stormwater runoff sheet flows southwest towards Water Street. A stream channel collects this runoff and flows northwest along the northeast side of Water Street. The stream channel then flows from the northeast side to the southwest side of Water Street via a culvert under Water Street. A man-made channel conveys flow northwest along the southwest side of Water Street to the intersection with Main Street. A storm system conveys the flow under the intersection and outfalls into an open channel under an existing building on the west side of the intersection.
Outfall F	
Includes roadside ditches along the east and west side of Main Street	The roadside ditches convey runoff into a natural drainage channel into the floodplain of South Fork Catoctin Creek.
Outfall G	
Bridge crossing Main Street	Existing bridge crossing of Main Street over South Fork Catoctin Creek.

Figure 3-7 – Streams and Outfalls in Waterford



A number of problem areas exist with the storm drainage system in Waterford:

- Many roadside ditches have been eliminated over the years to allow for additional parking.
- A majority of culverts along the roads have been either crushed or are clogged with silt and debris.
- Existing roadside ditches and/or storm sewers do not adequately handle the storm runoff based on current stormwater regulations.
- Gutters and inlets to pick up the stormwater runoff along the roadways are inadequate.
- The outfalls are generally inadequate to handle the storm events, resulting in localized flooding.

With respect to water quality, there are currently no best management practices (BMPs) evident within Waterford based upon site visits and a review of the aerial topographic data. The stormwater runoff typically flows directly into South Fork Catoctin Creek without any practical BMP measures.

3.3.2 Stormwater Management Review

The review of the conceptual stormwater management alternatives considered the following:

- Investigating upgrades to the existing storm drainage system along the roadways, in conjunction with specific traffic calming improvements
- Identifying needed improvements to drainage outfalls, in concert with upgrades to the drainage system components of the traffic calming measures
- Identifying possible BMP measures that may be incorporated into selected storm drainage upgrades where appropriate and/or cost effective

3.3.3 Conclusions on Stormwater Management Alternatives

Based upon the review, it was concluded that the best approach to "fix the drainage" in Waterford was to recognize the historic nature of the village and minimize any potential negative impacts of storm drainage improvements, while upgrading the storm drainage system within appropriate areas of the village to current county and Virginia standards. In combination with traffic calming measures, such efforts could include the following improvements:

- Repair curbs and inlets
- Extend curbs
- Add gutters and inlets
- Regrade and improve ditches
- Replace existing pipe culverts and add new culverts
- Clean out and upgrade existing outfalls
- Reroute drainage away from historic structures

Drainage channel along Water Street

Culvert under Corner Store and Second St.

Drainage swale under Tin Shop

Based on the historical character of Waterford and given the linear nature of future projects, no BMP or stormwater management facilities should be required by Loudoun County. If the need for BMPs becomes a concern during final design, two approaches can be considered:

- Request a waiver for stormwater management and/or BMP based on the historic nature of Waterford and given the linear improvements being proposed, or
- Install structural and/or non-structural stormwater management and BMP facilities in specific areas

If structural and/or non-structural measures are ultimately required, different methodologies that could be employed throughout Waterford are:

- Retention/detention basins
- Sediment forebays
- Landscaping to promote BMPs
- Constructed stormwater wetlands
- Infiltration practices
- Bioretention
- Grassed/vegetated swales
- Manufactured BMP systems

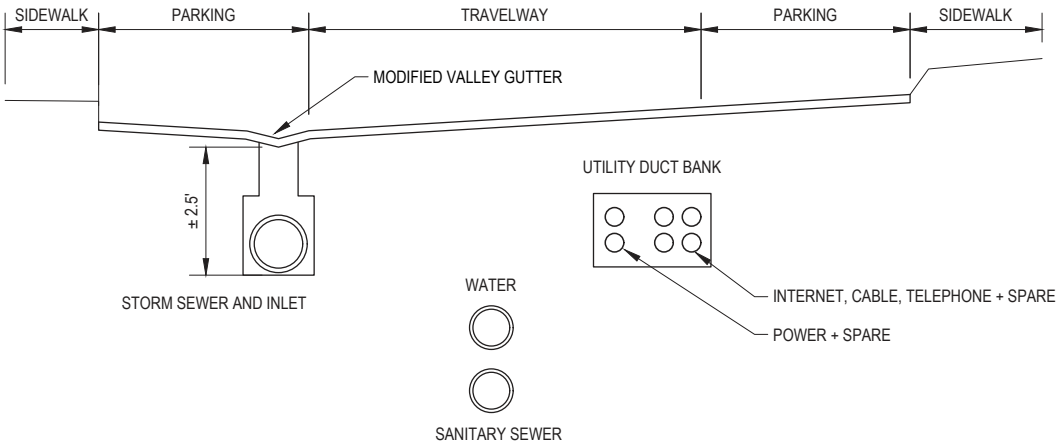
These different methodologies will have varying impacts to the character of Waterford. Retention/detention basins and sediment forebays (to a lesser degree) will result in significant impacts to the project area and are considered impractical. Less obtrusive BMP methods include landscaping to promote BMPs, infiltration practices, bioretention, grassed/vegetated swales, and manufactured BMP systems. Upon review of the possible traffic calming areas and the study area soil, infiltration practices also may be impractical.

With regards to stormwater drainage alternatives, design should follow current VDOT standards or obtain waivers for nontraditional storm drainage design. There are a number of standard VDOT structures such as DI-2, DI-12 and others that can be used within Waterford. Potential waivers of Loudoun County/VDOT standards that might be required are structure depths, minimum pipe or gutter sizes, type of pipe material, or adding bioretention or manufactured BMP systems to VDOT's storm sewer system.

Of note would be the use of a narrow valley gutter as shown in *Figure 3-8*, Typical Section. VDOT standard width for such a gutter is 4 feet. If a gutter of only 2 feet is used in the final design, as was done recently for the U.S. Route 50 project in Middleburg, Virginia, the valley gutter would need to go through VDOT's design exception process (IIM-LD-227.1), assuming the drainage system would be owned and maintained by VDOT.

Note also in *Figure 3-8* the location and configuration of the utility duct bank. The

Figure 3-8: Possible typical cross section of village street after implementation of infrastructure improvements



possible placement of conduits for electrical and communication services is described in the next section of this report. Note also the approximate location of the water line and sanitary sewer. The future construction of stormwater drainage and installation of utility duct banks will need to avoid other utilities such as new water lines and valves and existing sanitary sewer pipes and manholes.

Overall, the existing stormwater system in the Village of Waterford does not adequately handle significant storm events. Water from storms should be rerouted away from historic structures and made to flow away from streets and sidewalks to enhance safety and the historic character of the village.

3.3.4 Potential Innovations in Stormwater Management Facilities for Waterford

In the spirit of Waterford 2033 and its moniker of "300 years of preservation and conversation through innovation," the study team investigated potential innovations that may apply for the Village of Waterford to assist with flood mitigation and water quality.

Stream and Outfall Channel Restoration:
At stream channels or large open channel stormwater conveyance systems within the Village, stream/stormwater outfall channel restoration could be used to correct natural flow paths, restore degraded stormwater conveyance systems, enhance greenspace, modify flood limits, and assist with flood control. These projects also can be paired with trails to create opportunities for communities to interact with the environment.

Channel restoration techniques use a series of aquatic pools, stone riffle weir grade controls, native vegetation, and stone substrate beds to treat, detain, and convey storm flow. These techniques can be used in places where grades make traditional stormwater practices difficult to implement. Restoration projects are designed to convey flows associated with floods in a non-erosive manner.

Potential locations to be used in the village:

- At the Mill channel (Mill Race)
- At the proposed culvert crossing near the intersection of Ligget Street and Main Street next to the Marshall Claggett House
- At the proposed discharge pipe at Factory Street and Second Street (could potentially be a wet swale)

Examples are shown in *Figures 3-9* and *3-10*.

Figure 3-9: Example outfall channel restoration (post construction).

Figure 3-10: Example outfall channel restoration (post construction).

Flood Mitigation Practices in Urban Areas — Source Control Through Upstream Basin Implementation: Flooding source control can be done through the implementation of upstream basins (bioretention and rain barrels at the smallest-scale level, stormwater management ponds and regional ponds at the higher levels). In urban areas where space is limited and infrastructure restoration of entire piped stormwater systems is not economically viable, implementation of strategic stormwater peak flow shaving basins throughout the entire drainage area can help detain and slowly release flows to undersized systems, which help assist with storm system capacity issues in high-intensity/high-flow volume storm events.

Potential locations to be used in the village (these measures could be used throughout the village in the upland areas of contributing watersheds):

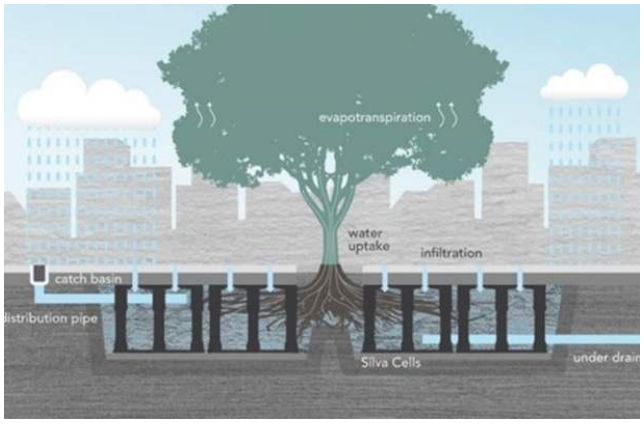
Parallel Pipe Systems and Vaults to Provide In-Ground/Underground Detention: Although not innovative, implementation of parallel pipe systems or large-scale vaults that have low and high flow weir control can be used in urban areas underneath existing sidewalks and streets. This option allows for in-ground detention within the pipe systems up to a certain capacity. Traditionally these systems have to have enough volume to fully detain the flows for a 10-year, 5-minute storm intensity without causing surcharging of the system. Usually this requirement causes these systems to be large and expensive to construct in nature but provides significant urban flood control.

Potential locations to be utilized in the Village (at Second street and Patrick Street):

Silva Cells: The Silva Cell is a modular suspended pavement system that uses soil volumes to support large tree growth and provide on-site stormwater management through absorption, evapotranspiration, and flow interception.

Silva Cell projects come in all shapes and sizes. The common ground between all of them is the advantages that having enough planting soil does for the long-term health and survival of street trees. In combination, the trees and soil also act as a powerful form of green infrastructure, helping to reduce the amount of stormwater runoff that enters nearby sewers, stormwater conveyance facilities, and creeks, thereby protecting properties, infrastructure, water quality, and creek health. A detail is shown in *Figure 3-11* below:

Figure 3-11. Silva Cell cross-sectional detail (typical).



3.4 Power and Communication Lines

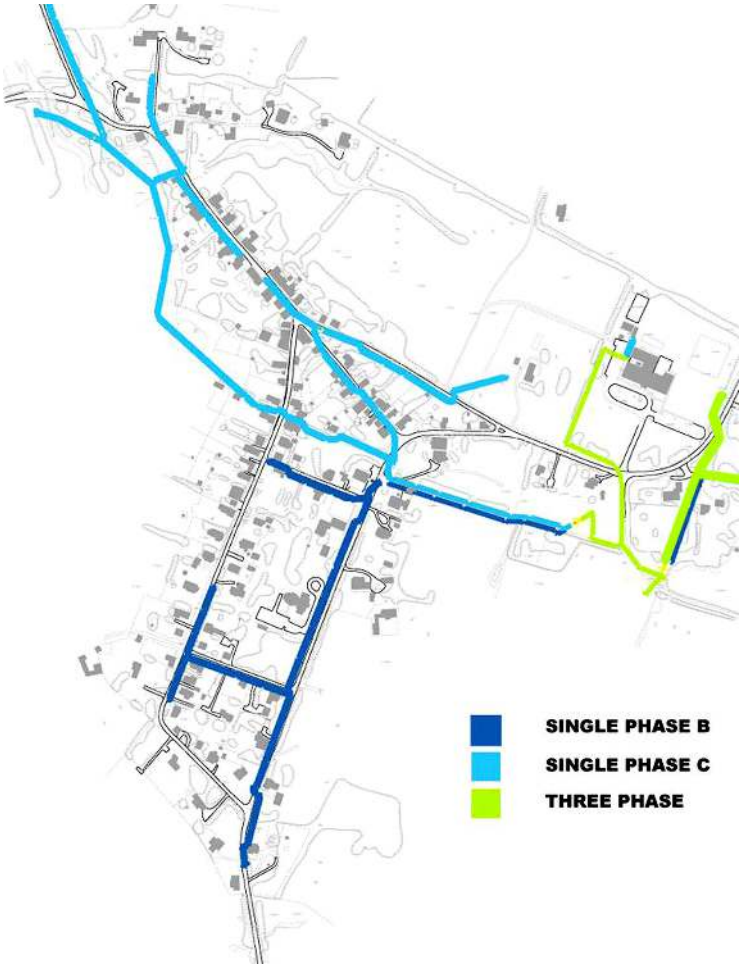
In 2003, the study team conducted an engineering study to analyze and develop possible alternatives for electrical and telephone utility relocations, in concert with the development of traffic calming, drainage, and roadway alternatives. A field inventory and condition assessment of existing electrical and telephone services was coordinated with Loudoun County electrical inspectors, Dominion Virginia Power (DVP), and Verizon Telephone, as well as discussions with Adelphia Cable. For this 2022 update, the county's study team reached back to the utility providers, including Dominion Energy, Verizon, and Comcast (the current provider of cable and high-speed internet service in the village). These contacts were intended to simply confirm existing conditions; many more meetings and coordination with the utility providers will be necessary for implementing the infrastructure improvements recommended in this 2022 report.

3.4.1 Existing Conditions

Electrical: Waterford exists with a complete overhead power distribution plant. Waterford electrification began in the early 1920s, and the current infrastructure includes conventional wooden utility poles, medium- and high-voltage class distribution cables, pole-mounted transformers, and various secondary "T" taps. The entire electrical distribution system is owned and maintained by Dominion Energy's Leesburg District Office.

As shown in *Figure 3-12* and in the photos in this section of the report, Waterford has primarily a single-phase system. There is one minor segment of three-phase power on the southeast perimeter of the village that serves the Waterford Elementary School. A three-phase to single-phase switching facility exists on Fairfax Street adjacent to the Old Waterford School. At this facility, two single-phase services are derived (phases B and C).

Figure 3-12: Existing Electrical Service



Phases B and C run parallel along Fairfax Street to the intersection of Fairfax and High Streets.

- At High Street, Phase B runs west to southeast along High Street with branches extending north to Second Street. Phase B follows Second Street east, and then turns north at the intersection of Second and Church Streets to open land. Phase B then runs east behind Main Street on open land to the vicinity of the Mill. Behind the Mill, Phase B meets Old Wheatland Road and runs north of town.

- Phase C routes east to southeast along High Street and turns north at Main Street. Phase C runs down Main Street. It is split in several locations to serve structures on Main and Water Streets. Phase C continues on Main Street, past the Mill, and then out of the village.

Telephone: As shown in the photos, Waterford is served by overhead fiber optic lines for telephone service. Telephone service has existed in Waterford since approximately 1895, and since 2003, this service has evolved from copper wires to fiber optic technology. It is understood that service is currently provided by both Verizon and Comcast. The existing overhead fiber lines share the wooden poles with Dominion Energy's electrical distribution system.

Cable Service: Cable television and high-speed internet service was introduced to Waterford after 2003, and Comcast is currently the provider.

3.4.2 Conclusions on Burying the Wires

New Underground Power Distribution: To minimize electrical service disruption, the installation of new underground power distribution will need to be accomplished prior to removing any overhead service to ensure electrical service to the individual residences continues uninterrupted. It is anticipated such an installation would be phased on a street-by-street basis to allow a gradual and controlled conversion from overhead to underground service. Specific phasing would be determined during final design.

As shown in *Figure 3-13*, the most practical location to bury power lines is within the public right-of-way under the streets of the village or adjacent to the edges of pavement. Typically, the minimum burial depth would be 36 inches below grade. As shown previously in Figure 3-7, Typical Section, electric and fiber optic lines can be buried in a single duct bank. Such a duct bank also can include spare conduits for future services. Each service would require separate junction boxes or manholes for access to the various lines and cables.

It is anticipated that Dominion Energy will require between 20 and 30 pad-mounted transformers throughout the village. These transformers will be distribution-level transformers changing voltage from medium/high (7.2 to 34.5 kilovolts) to residential user voltage at 240 volts, single phase. Each transformer will likely sit on a concrete pad, approximate 5' X 8' in size. The actual dimensions will need to be determined during final design based on Dominion Energy's assessment of individual transformer kilovolt-amp (kVA) sizing.

Transformer Placed out of View

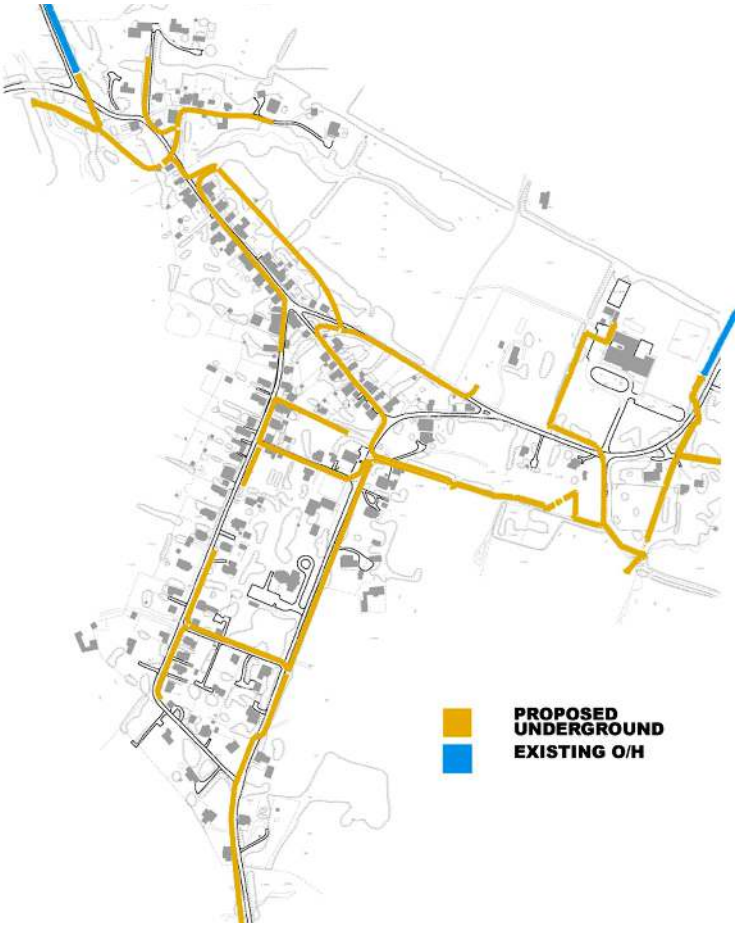
The alternative to burying the transformers was investigated. Assuming underground transformers are possible from Dominion Energy's perspective, constructing large vaults with grates or other covering would not be consistent with the character of the village. Underground vaults also would likely significantly increase the cost of burying the wires.

To minimize the disruption to the historic viewsheds (i.e., make the transformers as inconspicuous as possible), the transformers may be screened on three sides. Each screening scenario will require a 3-foot clearance around the 3 sides for access by Dominion Energy. The front side (access door) must have a minimum clearance of 10 feet for maintenance and safety needs.

In addition, each transformer will likely require an easement for private property location and access. Additionally, there may need to be up to six pad-mounted switches used as circuit tapping devices to "tee" distribution power based on the routing needs generated by the final design. This equipment will be of similar size to the transformers and will also likely require easements on private property. Also similar to the transformers, these devices may be buried, screened, or otherwise enclosed on three sides.

The in-street distribution system will require the installation of buried manhole structures. These structures should be precast with traffic-rated access covers flush with the finished roadway surface. The structures are necessary to facilitate pulling cable and limit cable pulling stress. In some cases, the structures allow a suitable, controlled space to "tap" underground cables. These structures may be spaced 500 to 700 feet apart. The actual spacing and placement will be determined during the design for the construction phase of the project. No systems other than electrical power distribution may share these manholes according to electrical code.

Figure 3-13



New Metered Services for Power: As the underground electrical distribution system is installed over a given phase, it is anticipated that underground laterals can simultaneously be installed to individual buildings. The service laterals can typically be underground type cable placed by direct burial within trenches. Where the secondary service cables cross under pavement, roadway, or structure, the cable should be routed within schedule 40 PVC conduit. There are various issues associated with routing services to individual buildings. Through the final design process, each building will require a review to design a lateral to fit each unique condition.

Potential Service to Electrical Vehicle Charging Stations: The conversion of electrical service in the village from overhead to underground,

including new metered services, needs to consider future requirements for electrical vehicle (EV) charging stations for individual residences (in driveways or with on street parking), as well as for properties owned by the Waterford Foundation and being considered for adaptive reuse. EV technology is evolving, and requirements at the time of final design will need to be considered.

New Underground Fiber: Burying the fiber optic cables to support telephone services, cable TV, and high-speed internet will require close coordination with Verizon and Comcast in a phased, street-by-street implementation approach similar to burying the electrical distribution system. Cable would be routed down the streets to splice cabinets centrally located to facilitate distribution to residences. Verizon or Comcast, at their discretion, may elect to use direct burial type cable where service does not lie below pavement or a structure.

The distribution of fiber optic cable should include below-grade junction boxes or manhole structures. There should be a separate network of structures from those installed for electrical power distribution. The manholes for fiber would be used both to facilitate cable pulling and to splice or tap cables. Final spacing and placement would be a collaborative effort between Verizon, Comcast, and design engineers during preparation of construction documents for a future project.

New Underground Services: Individual services for telephone, cable, and high-speed intersection should be routed from Verizon or Comcast distribution manholes to each residence or building needing service. The underground service would likely enter each building at the same point as the existing overhead service.

As shown in *Figure 3-8* (typical section), a program to “bury the wires” in the Village of Waterford should include spare conduits for the future services by Verizon, Comcast, or a provider to be a named later.

3.4.3 Potential Challenges with Burying the Wires

Overall, based on research of existing records and information, it was determined that burying the wires is feasible, especially if performed in conjunction with construction of traffic calming and roadway and drainage improvements. Burial of lines can occur within the right-of-way of the streets, and underground telephone/cable/internet service would follow the same general path of the underground electric service. A trench with conduits for power and fiber optic cables, separated by a distance to be determined during design, would be feasible. This duct bank could include spare conduits for future services by existing or new providers.

The future design and construction of an underground electric, telephone, and cable system would need to overcome several challenges. As shown in *Figure 3-11*, some of the conditions that may conflict with underground routing of electric and fiber optic cabling, or create additional challenges, include:

- Conflicts with water wells
- Conflicts with sewer mains and laterals
- Conflicts with fuel oil and other types of piping installations
- Conversion of existing power service entries into homes that also need to be upgrades to meet current codes
- Excessive building repairs due to existing routing of overhead service attached to roofs, overhangs, siding, shutters, etc.
- Conflicts with public sidewalks and masonry step structures, retaining walls, and paved areas of private properties such as patios and driveways

Multiple buildings exist in the village that are already served by underground secondary service laterals. These services are routed down utility line poles, underground, and then up to a utility company meter typically mounted on the exterior sidewall. During the "bury the wires" phase of a future construction project, these existing service laterals should require little or no modification.

Additionally, as shown in the photo, there are buildings with overhead masts routed down through roofs and overhang structures. These buildings will require structure roofing and flashing (weatherproofing) repairs upon dismantling of the overhead service.

Subject to individual review by Loudoun County permitting officials, existing services may be required to have an additional service-rated disconnect installation at the service entry point into the building. This requirement would be due to an existing condition where the metered service cable distance to the actual home or building panel board is interpreted to not comply with distance limitations and service over-current parameters indicated in the National Electric Code. There also may be a requirement to place service-rated disconnects at service entry point(s) where high-fault current conditions exist. At the time of final design, Dominion Energy should provide actual fault currents available at each transformer to the design team. Where available fault currents exceed ratings of existing equipment, current limiting disconnect (fusing) may be installed to limit the potential fault energy.

Once the underground power and communications systems are in place along a particular street, the task would then be to connect these underground systems to individual services along the street. After the individual services for both power and communications are in place and operational, the overhead conductor and cables and pole structures can then be removed.

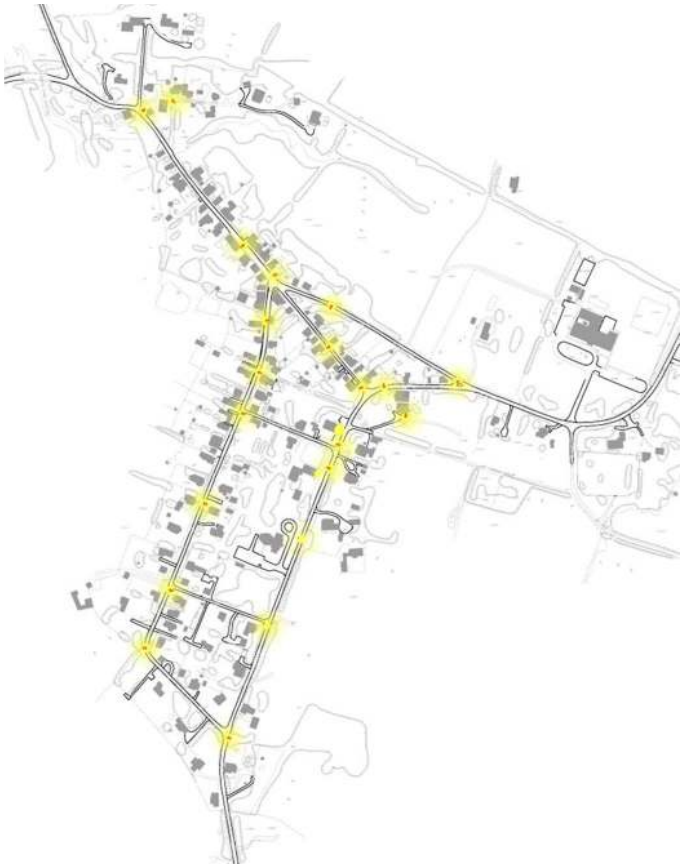
3.5 Lighting

In 2003, the study investigated the existing lighting within Waterford. Through coordination with Loudoun County and Waterford representatives and citizens, alternatives were developed for lighting the village, consistent with its historic character and NHL status. This 2022 update considers these same alternatives, and with ever-evolving lighting technology, these alternatives would need to be refined during detailed design of infrastructure improvements.

3.5.1 Existing Lighting

As shown in *Figure 3-14*, minimal street and public area lighting existed throughout the village. It is understood that minimal lighting upgrades have taken place since 2003, when Waterford was equipped with 21 mercury vapor-based streetlamps mounted directly to utility poles (see examples in the photos below). The existing lamps were outdated reflector and cobra-head type units, estimated to be approximately 250 watts. The lamps appeared to be well past their useful life. The foot candle readings taken in 2003 during a lighting survey of the village at 4 a.m. indicated low levels of lighting from the center of the fixtures to approximately 40 feet from center. The readings indicated an average of less than 1-foot candle

Figure 3-14



at every fixture. Beyond a line 40 feet away, this level quickly dropped to zero footcandles. It is understood that no major upgrades to lighting have occurred since 2003, although Dominion Energy has an active program to proactively replace older light fixtures with light-emitting diode (LED) technology.

3.5.2 Conclusions on Lighting the Village

There are numerous options possible for public area street and pedestrian lighting within the village. Various design options that are possible include:

- No public street lighting
- Extensive public street lighting on each major street in the village
- Partial lighting, such as lighting Main Street only in combination one or two lights at corners of other streets and with increased lighting in pedestrian areas

Historically correct pedestrian level light fixture and pole

Pedestrian level light fixture and pole

Based on discussions with Loudoun County and Waterford representatives and citizens, any lighting designed for the village would need to have, at a minimum, the following features:

- Historically replicated or compatible poles
- Historically replicated or compatible head and globe assemblies
- Color-corrected lamps such as metal halide to ensure quality light and economical life cycle
- Fixtures confirming to “dark sky” parameters with respect to vertical light pollution
- Fixtures that minimize light trespass

The aesthetic design of any new lighting fixtures should be based on older, decorative fixtures that are historically inherent to Waterford. Such fixtures could be a classical coach-lantern type E or globe types associated with older, period gas lamp-type street lighting. Poles would contain an appropriate amount and style of ornamental design. Due to its orange/yellow hue, high- or low-pressure sodium lamps should not be considered for the village; rather, LED fixtures would likely be the preferred technology. Pole placement and spacing will depend on final wattages and specific distribution patterns of fixtures selected during the construction document phase of a future infrastructure project.

Several options for lighting heights are possible, including lighting each major street or lighting selected areas with higher roadway lighting (30+ feet), pedestrian level lighting (8 to 12 feet), or low-level lighting (3 to 5 feet), such as bollards for pathways. Another option to be explored during final design could be lighting the facades of selected buildings along Waterford's streets, in coordination with building owners.

Also during final design of the lighting system, the county and the village should decide (1) if poles and fixtures should be provided and maintained by Dominion Energy; or (2) if poles and fixtures should be provided from industry sources (not included in the standard Dominion Energy streetscape fixture offerings) and maintained by the county or a company hired by WCA or WFI. The second option would require WCA or WFI or other entity to procure and utilize the service of a contractor or vendor to maintain the fixtures. The village also would have to arrange for metered power from Dominion Energy and separately pay for energy costs. For any option, it will be important to consider the architectural appeal and relevance to historic compatibility with Waterford.

3.6 Water and Wastewater (Wet Utilities)

Currently no water services exist within Waterford. Homes and other businesses rely on wells. Wastewater (or sanitary sewer) services do exist. A sewer system was installed for the village in 1975, and homes and other businesses are serviced by a system that feeds into the Waterford Treatment Plant along Old Wheatland Road, just west of Catoctin Creek.

3.6.1 Potential Water Service

Many of the community members in Waterford use individual wells as their primary source of water with a good supply. However, some community members have been experiencing issues with well yield, which led them to reach out to Loudoun County and Loudoun Water to study these issues. With the support of WCA and WFI, the Historic Waterford Water Feasibility Study was conducted by Dewberry for Loudoun Water and Loudoun County Department of General Services, and a draft of this study was released in April 2022 (and incorporated herein by reference in).

The analyses conducted during this water study culminated with 5 options to provide improved water services to residents and businesses in the village. The option that is currently emerging as preferred by the village and Loudoun County is Option 3: Community Water System Owned and Operated by Loudoun Water (Using New Community Wells), which is a feasible alternative requiring a new communal well system and a new water treatment facility and water distribution system. The April 2022 draft report states that wells and the treatment facility could be located in or around the existing Waterford community, pending further groundwater hydrology studies.

Figure 3-15 shows proposed the water distribution system within the streets of Waterford.

Figure 3-15

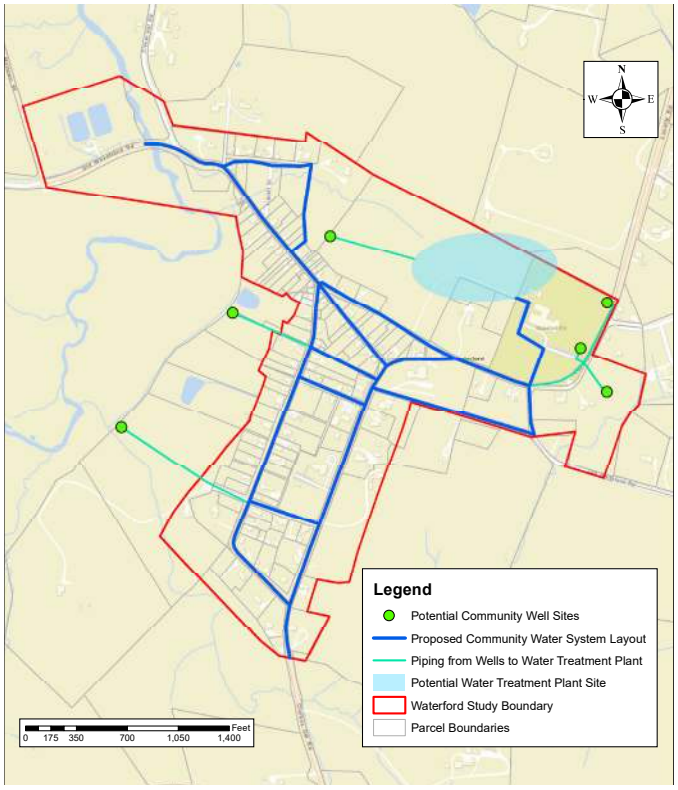
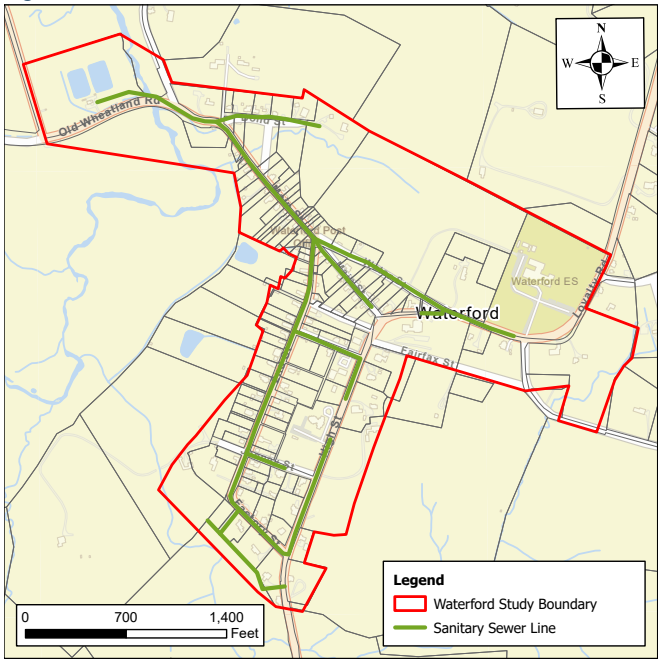


Figure 3-16



3.6.2 Existing Sanitary Sewer System

The existing wastewater system is shown in *Figure 3-16*. It is anticipated that for a comprehensive infrastructure improvements project, the existing sewer facilities (pipe, manholes, and other items) will remain in place. The potential traffic calming measures and other street and drainage improvements, as well as other underground facilities (water lines and valves, drainage pipe and inverts, and electrical and communications lines and duct banks) would all be designed to avoid conflicts with the existing sanitary sewer system. Should Loudoun Water wish to upgrade all or portions of the existing sanitary sewer system in Waterford, these upgrades could be incorporated into the design and construction of the comprehensive project.

3.7 Conclusions on Design Studies and Alternatives

The various alternatives developed through the engineering analyses can result in preferred concepts for taming the traffic, burying the wires, realigning/upgrading the roadways, fixing the drainage, managing stormwater, lighting the village, and providing a potable water system. All of these concepts can be integrated into a holistic, comprehensive program of infrastructure improvements and can be designed and constructed in close coordination with review and approving authorities (Loudoun County, Loudoun Water, VDOT, and other Virginia agencies). It is understood that the citizens of Waterford desire that such a program be implemented in the coming years to meet the goals of Waterford 2033.

3.7.1 Environmental and Historic Resources Review

For this 2022 update, the study team's environmental and historic resources specialists reviewed the engineering studies and possible alternatives described in this chapter for potential impacts to wetlands, trees, historic properties, and the overall NHL status of the village. As with the 2003 study, it was concluded that the alternatives for traffic calming, drainage improvements, utility relocations, and lighting would likely have "no adverse impact" on the characteristics that qualify Waterford as an NHL. The alternatives proposed are considered to be relatively benign, and in fact, would enhance the NHL status of the village. The proposed alternatives would also further the Waterford 2033 goals with respect to sustainability and adaptive reuse.

3.7.2 Preferred Infrastructure Improvement and Traffic Calming Concepts

Concepts that emerged as preferred by Waterford representatives in 2003 and confirmed through recent surveys and discussions with Waterford representatives were those that would be most consistent with the character of a rural historic village. The use of native materials (stone, pavers, brick, gravel, etc.) was encouraged. The inclusion of above-ground transformers was accepted. Also, the representatives decided on a period lighting fixture for use in pedestrian level lighting applications (8 to 12 feet from the roadway or sidewalk), eliminating the DVP fixture options, and the roadway, low-level, and building facade lighting options. It is understood that today's Waterford's representatives also prefer these concepts.

"Taming the traffic" alternatives have continued to garner the most attention during the 2022 community meetings in Waterford and from WCA and WFI representatives. Through a presentation of the alternatives on April 27, 2022, followed by a group discussion about the roads and intersections of the village, specific traffic calming measures were accepted, while others were rejected. Subtle uses of native materials to highlight edges of pavement and intersections was confirmed as a preferred approach. The community does not want the intrusiveness of traffic circles or roundabouts or other out-of-context measures.

Table 3-4 represents a summary of the traffic calming measures considered, in context with burying wires, fixing drainage, and installing water service.

Table 3-4: Traffic Calming Measures Considered and Recommended and Not Recommended

TRAFFIC CALMING MEASURES CONSIDERED	BENEFITS	CONCERNS	PUBLIC SUPPORT?	STATUS
EDUCATION AND ENFORCEMENT				
Radar speed trailer	Driver awareness of speed	Urban look is out of character	no	Rejected for village streets
In-person law enforcement	Enforce $200 fine for speeding to alter driver behavior	Speeding problem returns in between enforcement	yes	Recommended
Law enforcement with technology	Speed cameras and radar	Technology exists, but needs approval by the Virginia General Assembly for uses other than school and hospital zones	yes	Recommended when allowed by law
Areawide education	Sends message to most motorists that speeding in village is unacceptable	"Rogue" drivers ignore message	yes	Recommended
LESS RESTRICTIVE MEASURES				
Traffic calming signs and striping	Reinforces area education efforts and narrows lanes	Sign and paint pollution	no	Not recommended
STOP signs	A traffic control device that is effective when obeyed	Signs routinely disobeyed; vehicles speed in-between signs	yes	No additional stop signs are recommended
Pavers along roadway edge lines (stone, brick, and/or concrete resembling native materials), 1 foot wide and flush with surface	Encourages motorists to avoid driving on them due to rumble effect. Motorists slow down when lane width is narrowed	May not slow "rogue" speeders	yes	Recommended; anticipate 3 - 5 mile per hour reduction when used with median pavers
Pavers in roadway "median," 1 to 4 feet wide	Encourages motorists to avoid driving on them due to rumble effect. Motorists slow down when lane width is narrowed.	Snow plows may chip pavers if raised high off-road surface	yes	Recommended; anticipate 3 - 5 miles per hour reduction when used with edge pavers
Valley gutters 2 feet wide (design exception to VDOT standard)	Defines edge of road/ travel lane, improves drainage	Non-standard width requires design exception process	yes	Recommended along Main Street and other appropriate locations
Raised center "splitter" island to narrow street	Forces slowing effect with horizontal deflection in the path of vehicles	Out of character for village streets	no	Not recommended
Bulb-out with tree(s) and landscaping to narrow street width	Forces slowing effect with horizontal deflection in the path of vehicles	Good sight distance in both directions is key	yes	Recommended
Trees in place of utility poles	Can force slowing effect if adjacent to roadway	Needs to be done on a case-by-case basis	yes	Recommended in appropriate locations

Table 3-4: Traffic Calming Measures Considered and Recommended and Not Recommended (Continued)"

TRAFFIC CALMING MEASURES CONSIDERED	BENEFITS	CONCERNS	PUBLIC SUPPORT?	STATUS
Stone walls and steps adjacent to road	Reduces field-of-vision for motorist that will affect slowing	Potential safety hazard – should be off road edge; may restrict pedestrians	yes	Further consideration recommended for specific sites
Reduced radii of curves on intersection corners	Forces slower right-turn movements	Occasional oversized vehicle may need full width of road to turn	yes	Recommended
MORE RESTRICTIVE MEASURES				
Speed activated traffic signals	Detects speed of oncoming vehicles and goes red if speed limit exceeded	Urban effect	no	Not recommended
Intersection traffic circles	Forces slowing effect with horizontal deflection in the path of vehicles	All intersections but the corner store intersection are too small	no	Not recommended
Roundabouts	Related to historic pole in center of intersection at Corner Store	Out of character	no	Not recommended
Speed bumps and dips	Forces slowing effect with vertical deflection in the path of vehicles	Jarring effect; out of character	no	Not recommended
Speed tables	Forces slowing effect with gradual vertical deflection in the path of vehicles	Some jarring effect	yes	Recommended in two locations—Corner Store intersection and Water Street mid-block
Hump-back bridge	Forces slowing effect with gradual vertical deflection in the path of vehicles	Some jarring effect; design needs to conform to village character	yes	Recommended in one location—replace wooden bridge over Tannery Creek
Lower roadway	Enhances opportunities for vertical deflection with speed tables or humpback bridge	Temporary interruptions during construction	yes	Recommended for Corner Store intersection and Lower Main Street

4. Recommendations

This chapter discusses a comprehensive set of recommendations for a master plan or program of infrastructure improvements for the Village of Waterford. These recommendations build upon the 2003 *Bury the Wires and Tame the Traffic* report and recent reports developed by Loudoun County, Loudoun Water, and other entities. The recommendations are intended to help the Waterford Citizens Association (WCA) and the Waterford Foundation, Inc. (WFI) achieve their 2033 Waterford vision. These recommendations are accompanied by a set of concept plans for the village streets and sidewalks that are intended to lay the foundation for the next steps in implementing the infrastructure improvements —all in the context of Waterford's National Historic Landmark (NHL) status, while striving to meet Americans with Disabilities Act (ADA) standards.

4.1 Tame the Traffic/Fix Streets and Sidewalks

To tame the traffic in Waterford, recommendations include modifications and enhancements to the streets, street corners, sidewalks, drainage systems, utilities, and roadside trees and landscaping. With the installation of the traffic calming measures, the condition of streets and sidewalks also will be improved. Taking a holistic approach for the entire village and considering feedback from citizens, the following types of traffic calming measures and street and sidewalk improvements are recommended for various locations throughout the village:

- Pavers (stone, brick, and/or concrete resembling stone or cobbles) that are 1 foot wide, consistent with native materials and flush with the roadway surface, to define edges of pavement at specific locations and/or narrow the travel lanes
- Pavers, 1 to 4 feet wide, flush with the roadway surface, to define the roadway centerline at specific locations to horizontally displace traffic and narrow travel lanes (via traffic "splitters" and "chokers")
- Concrete valley gutters, 2 feet wide (nonstandard), at the edges of roadways to define the travel lanes and improve drainage
- Reduced radius at corners of intersections to slow traffic and/or discourage rolling stops with treatments at the corners such as pavers or cobble stones to allow emergency vehicles and moving trucks to navigate the streets of Waterford
- "Bulb-outs" along the roadway and at intersections, with stone or concrete curbing, to add trees and landscaping, define parking areas, and add sidewalk area at corners
- Series of alternative "bulb-outs" with trees to provide a "chicane" effect on traffic
- "Speed tables" or raised sections of roadway to vertically displace traffic and allow easier pedestrian access, e.g., serve as specific pedestrian crossings (perhaps with additional safety signage but not with pavement markings, which are not contextual)

Traffic calming measures in the context of Waterford's NHL status.

- Pavers and/or stamped concrete used at intersections to provide a variation in pavement surface, highlighting the intersection and presence of pedestrians, flush with approaching roadways, or as part of a speed table
- "Humpback bridge" in place of the wooden bridge over Tannery Creek to vertically displace traffic
- Lowering of roadway segments in some locations to allow for bulb-outs, speed tables, and humpback bridges (as well as safer pedestrian access and improved drainage)
- Addition and extension of sidewalks and walking paths along the streets, separated by landscaping and/or pavers to narrow and/or define the edge of the travel lane
- Connections from the sidewalks and walking paths to existing and planned trails or shared use paths within the National Historic Landmark (NHL), such as the Phillips Farm interpretive trail
- Addition/modification of trees and landscaping along the roadways and at intersections (often in concert with other measures)
- Minimum signage at specific locations in the village to meet safety and regulatory requirements and to enhance traffic calming throughout the village
- Varying types of final pavement surfaces as traffic calming measures and other infrastructure improvements are completed, e.g., asphalt or concrete pavement for streets and bricks, concrete pavers, brushed or stamped concrete, or crushed stone for sidewalks

The recommended traffic calming measures should result in a slight reduction in the average speed of vehicles within the village and a significant reduction in the speed of "rogue" drivers who grossly exceed reasonable speeds. Pedestrians and pets in the village will benefit. The measures are "traffic neutral," that is, concepts do not result in increased capacity in response to growing traffic volumes in the region, nor should they create additional congestion on the streets in Waterford. The capacity of the streets in Waterford will remain constant. Motorists should be able to progress through town at slow but reasonable speeds.

These recommended measures are further discussed in this chapter and shown graphically in the concept plans.

4.2 Fix the Drainage

To support the recommended traffic calming measures, improvements to stormwater drainage also should be implemented. The concepts recommended will correct the drainage problems along Second Street and Main Street, from the Tin Shop to the existing wooden bridge.

Specifically, recommended drainage improvements include:

- Clarkes Gap Road/High Street/Factory Street Intersection:
  - Regrade the roadside ditches along High Street, Clarkes Gap Road, and Factory Street. These ditches could potentially be utilized as linear stormwater management devices.
  - Install standard Virginia Department of Transportation (VDOT) DI-5, DI-7, or DI-12 inlets along the east and west sides of High Street. The inlets should collect flow from the improved ditches along High Street and convey the runoff into an existing ditch along the west side of High Street.

- Factory Street from Second Street to High Street:
  - Regrade the roadside ditches along both sides of Factory Street.
  - Install two standard VDOT DI-5, DI-7, or DI-12 inlets to collect flow from the improved ditches. The storm system should convey flow down the property lines of the adjoining lots into the open field to the south of Factory Street. The outfalls of the system will need to be improved to handle concentrated runoff.
- High Street from Factory Street to Upper Main Street:
  - Regrade the roadside ditches along High Street.
  - Replace driveway culverts along High Street.
  - Replace the existing culvert under High Street near Church Street with a larger diameter pipe to increase capacity.
  - Consider best management practices (BMPs) related to stormwater management measures down the hill along the former alignment of Church Street, with details to be developed during design in coordination with Loudoun County, VDOT, and Virginia Department of Environmental Quality (DEQ) as well as WCA and WFI (as will be the case with any proposed BMP).
- Janney Street:
  - Regrade the roadside ditches along both sides of Janney Street.
  - Install standard VDOT DI-5, DI-7, or DI-12 inlets to collect flow from the improved ditches. The storm sewer would extend toward and connect with the system along Second Street.
- Patrick Street:
  - Replace the curb and gutter along Patrick Street.
  - Install standard VDOT DI-2 inlets along Patrick Street extending towards and connecting with the system along Second Street.
- High Street/Butchers Row/Upper Main Intersection:
  - Regrade the roadside ditches along High Street, Butchers Row, and Upper Main.
  - Replace the culvert under upper Main Street, which will discharge into the regraded roadside ditch of High Street and to the channel along Church Street.
- Second Street from Factory Street to Church Street:
  - Regrade the roadside ditches along Second Street from Factory Street to approximately 200 feet beyond Church Street.
  - Install standard VDOT DI-5, DI-7, or DI-12 inlets near the intersection of Second Street and Janney Street. The storm sewer in this area will collect runoff from the inlets along Second Street with additional runoff coming from the storm sewer along Janney Street. This storm sewer will outfall into a ditch along the existing gravel drive from Janney Street, which will need to be regraded to accept the additional runoff.
  - A second storm sewer component is proposed near the intersection of Church Street. This component would collect runoff from the inlets along Patrick Street and Church Street. The storm sewer discharges to the back of lots across from Church Street to the existing field pond west of Second Street. This pond may be converted into a BMP retention basin (if required).

- Corner Store Intersection:
  - Replace the existing storm sewer within the intersection. The existing system outfalls under a building. The proposed system would collect runoff from an existing structural channel and convey it to the west side of the intersection to a new outfall, which will discharge to an existing channel. This existing channel may be redirected into the converted BMP pond to enhance water quality for the project (if required).
  - An additional storm sewer component would be connected to the system described above, which would collect runoff from the west side of Second Street, just past Church Street.
  - One of the proposed traffic calming measures proposes to install a small green space along the west side of Second Street. This green space may provide an opportunity to construct a bioretention area if BMP measures are required.
- Upper Main Street from High Street to Corner Store:
  - Loudoun County Department of General Services, with VDOT's support, completed a small drainage improvement project in 2018 near the old jail.
  - No additional major drainage improvements are proposed for this street.
- Lower Main Street from Second Street to First Street:
  - Install a valley gutter along the southwest side of Lower Main Street.
  - Install modified VDOT DI-1 or DI-7 inlets to collect runoff from the valley gutter
  - The storm sewer would outfall into Tannery Creek, a tributary to South Fork Catoctin Creek; consider BMP stormwater management measures as well as stream restoration in this area of Waterford.
- Main Street/First Street/Liggett Street Intersection:
  - Regrade the roadside ditches to promote positive flow.
  - Replace culverts as needed to provide positive flow.
- First Street from Catoctin Creek to Old Mill:
  - Regrade the existing roadside ditches.
  - Install/replace storm sewer culverts where necessary to provide positive flow.
- Water Street from Main Street to Loyalty Road:
  - Regrade the roadside ditches to the south of Water Street to collect runoff generated by the adjoining properties.
  - These ditches could potentially be utilized as linear BMP stormwater management devices.
  - Install a storm sewer component on the north side of Water Street underneath the proposed trail from Lower Main Street to the school. This storm sewer would collect flow by standard VDOT DI-1 or DI-7 inlets adjacent to the trail and will outfall into the existing stream channel on the south side of Water Street.
  - Consider BMP stormwater management measures in the context of the village green area.
- Butchers Row/Water Street/Loyalty Road Intersection:
  - A storm sewer component is proposed to collect flow from improved ditches along Butchers Row and High Street.
  - This storm sewer will outfall into the improved ditch along the north side of Water Street and then to the storm sewer system along Water Street.
- Loyalty Road from Butchers Row to north of Browns Lane:
  - Regrade the roadside ditches.
  - Replace the culvert under the school entrance and install any other culverts as warranted to provide positive flow.

4.3 Manage the Stormwater

Based upon the summary of proposed drainage improvements, recommendations for additional BMP stormwater management measures, in addition to those specifically noted above (and as ultimately required), include:

- Convert all improved roadside ditches and any improved outfall ditches to BMP vegetated swales.
- Install manufactured BMP systems at storm sewer inlets.
- Seek opportunities to restore the Tannery Creek outfall south of Main Street.
- Seek opportunities to restore other outfalls.

These recommended drainage improvements and potential BMP areas are shown graphically in the concept plans for this study included in this chapter. Again, details will be developed during design of the infrastructure improvements in coordination with Loudoun County, VDOT, and DEQ as well as WCA and WFI.

Complementary with stormwater management is the need to fully understand the broader Catoctin watershed area in the context of managing the stormwater for the Waterford National Historic Landmark. As part of the comprehensive set of recommendations in this 2022 report, representatives of WCA and WFI would like to actively establish, revitalize, and relaunch adjacent historic wetlands and habitat areas within the National Historic Landmark boundaries.

The design for fixing the drainage and managing stormwater should take a holistic approach to consider how the wetlands and streams within the landmark can be physically restored, which would lead to habitat restoration, which would help protect the overall watershed by facilitating biodiversity, wildlife protection, and absorption of carbon, excess nutrients, and other pollutants. Phillips Farm has an ongoing open space management plan based on an assessment developed with national and state conservation officials. Future complementary programs (such as seeking more proactive wetlands restoration, creek-bank remediation, and carbon credits) could be undertaken, with potential financial benefits, through the US Department of Agriculture's National Resource Conservation Service programs and with other public and private partners.

4.4 Bury the Wires

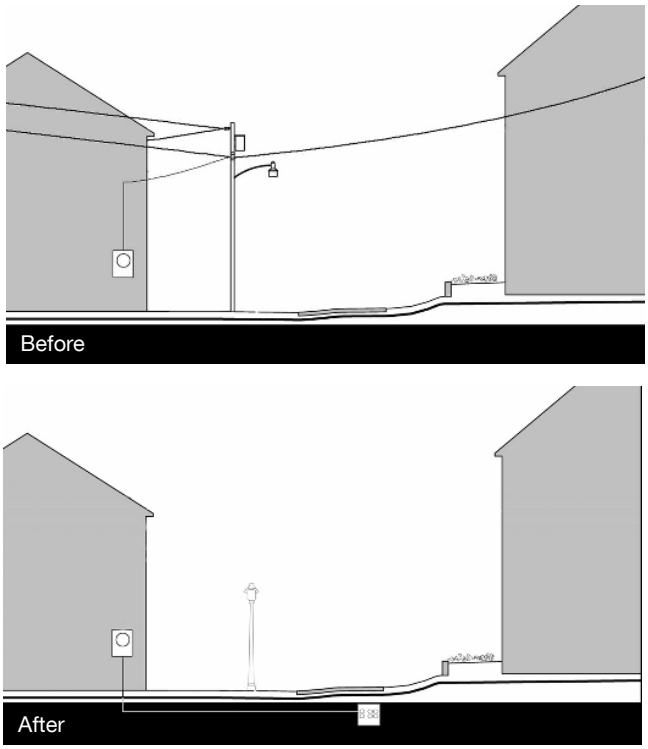
The recommended extent of burying the electric and communication lines extends from just west of the First Street bridge over Catoctin Creek and just north of First Street on Clover Hill Road to north of the Loyalty Road/Browns Lane intersection and approximately 1/4 mile south of the Clarks Gap Road/Factory Street/High Street intersection.

The recommendations for relocating overhead wires to underground services include:

- Underground electric service generally following the streets in Waterford, either under the pavement or sidewalk, or adjacent to the road.
- Underground communications following the same general path as the underground electric service.
- Conduits for power and communications in a duct bank in a single trench, with conduits separated by an appropriate distance to be determined during design.
- Spare conduits in this same duct bank for additional electric service and additional communications, including cable TV and high-speed internet services.
- Aboveground transformers in appropriate locations, screened or otherwise hidden from view of pedestrians and motorists, if possible, through strategic placement, addition of shrubs or other vegetation, construction of screen walls, etc.
- During detailed design, consider the supply of power to potential electronic vehicle charging stations (to be owned by residents or by WFI) and the supply of power and communications to Waterford Foundation properties that are slated for renovations to accomplish adaptive reuse objectives.

Before *After*

Post Office and Corner Store —Remove pole, bury wires



Conversion of overhead electric to underground service.

4.5 Light the Village

Based on feedback from Waterford representatives, historically correct lighting is recommended consisting of the following:

- A fixture similar to an existing coach-lantern type (shown in photo) with a decorative pole, consistent with the character of the village, conforming to “dark sky” standards, and minimizing light trespass onto private properties.
- Pedestrian level lighting at 8 to 12 feet above roadway or sidewalk elevations.
- Placement of lights in appropriate locations to address safety concerns for pedestrians and motorists.
- Metering at key points along the new underground distribution grid to feed the new public lighting. One possible placement is near transformers or tap switches to utilize those landscape and fencing provisions to aid in screening meters.

It is further recommended that during the final design phase, a point-to-point photometric study be performed in the village. This computation should be performed incorporating individual fixtures and clusters of fixtures. The computation should include any major obstructions of the proposed fixtures within the project area.

4.6 Provide Potable Water

The comprehensive set of street and sidewalk improvements, with traffic calming measures, drainage fixes, and underground utility duct banks, also should include the installation of water lines for distribution and supply of potable water to the homes and other buildings. It is important to note that these buildings include those owned by WFI, which are slated for adaptive reuse that is dependent upon a supply of water for drinking, for restrooms, and for fire suppression systems. The system of water pipes should be installed in accordance with the draft report of the Historic Waterford Water Feasibility Study, completed in April 2022, by Loudoun Water and Loudoun County. It is understood that the preferred option of the study report is "Option 3: Community Water System Owned and Operated by Loudoun Water (Using New Community Wells)," which will require a new communal well system and a new water treatment facility, along with the water distribution system that can be installed with other infrastructure in the streets. The overarching objective would be to install the water lines when each of the streets is under construction for utility duct banks, drainage pipe and inlets, and traffic calming devices—to reconstruct the streets of Waterford just once.

4.7 Preserve the Heritage

All of the measures recommended in this study were reviewed by the study team members specializing in environmental regulations and historic preservation. It is anticipated that none of the recommendations discussed in this chapter of this 2022 report would have an adverse impact on the village's NHL status given that many of them are proposed with the purpose of restoring the historic aesthetic of the village. As the planning and design of infrastructure improvements moves forward, it is anticipated that the project team will be able to coordinate with the State Historic Preservation Office and the National Park Service (NPS) NHL Committee to address possible concerns with the design and to minimize or mitigate any potential impacts.

As part of the initial study in 2003, the Federal Highway Administration (FHWA) confirmed on July 28, 2003, that the project would qualify as a Categorical Exclusion under the National Environmental Policy Act (NEPA) and that FHWA implementing regulations could require Section 106 documentation and potentially a programmatic Section 4(f) document (in accordance with the National Historic Preservation Act and U.S. Department of Transportation Act). A copy of this NEPA concurrence from 2003 is included in *Appendix G* of this report. Some NEPA implementing regulations and policies have changed since 2003, including what projects can be considered as Categorical Exclusions.

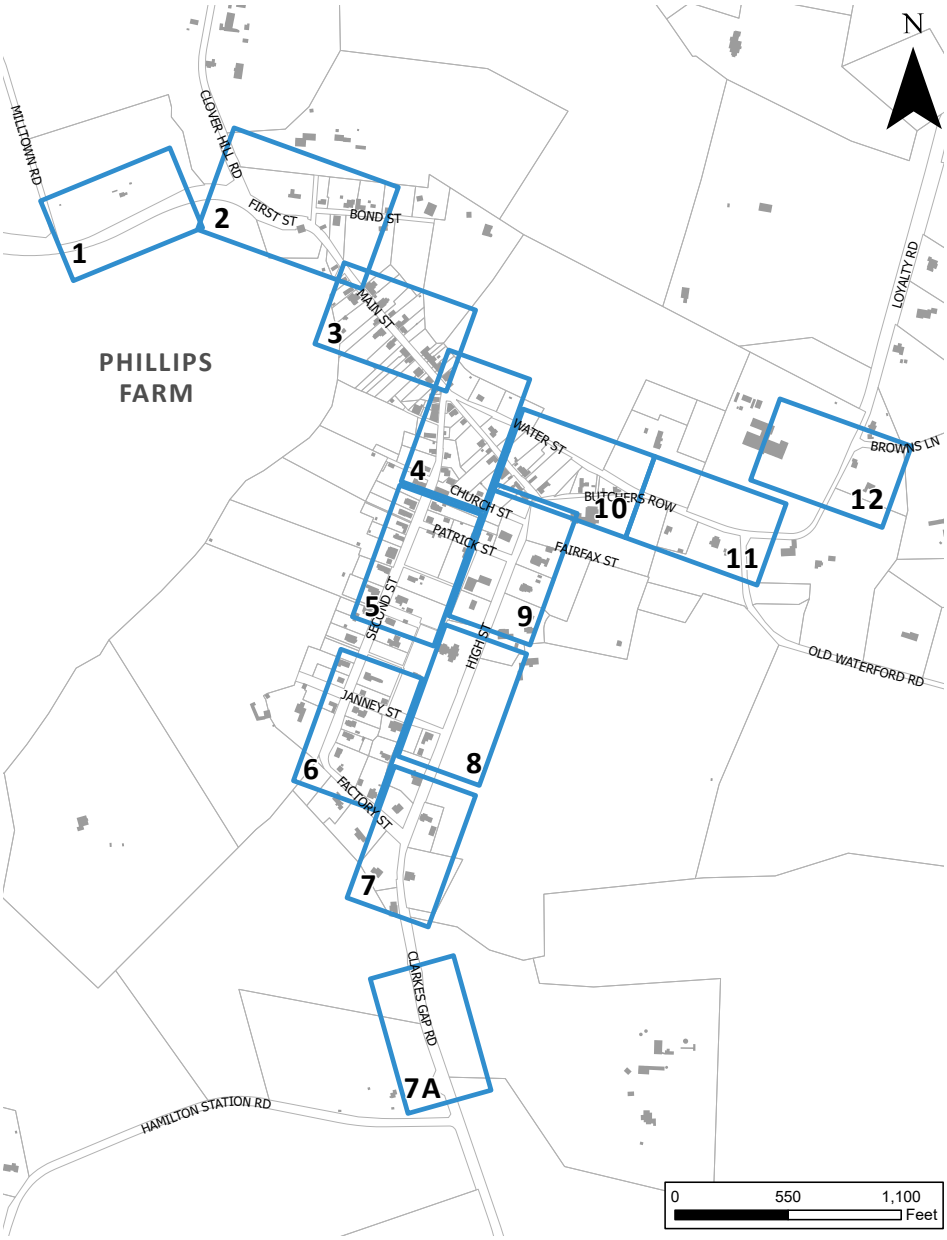
While it is anticipated a Categorical Exclusion will still be applicable, it is recommended that the county take a near-term next step and coordinate with FHWA to reconfirm that the class of NEPA action for *Preserving the Landmark* would be a Categorical Exclusion. Note that this concurrence would only apply to projects led by FHWA. A different NEPA concurrence would be required if another federal agency, such as NPS, were to be the lead federal agency.

4.8 Concept Plans

To implement a program of infrastructure improvement projects with the overarching goal of preserving the landmark that is the Village of Waterford, this 2022 update to the 2003 study recommends modifications and enhancements to the electric and communications services and to the village streets, street corners, sidewalks, drainage systems, and roadside trees and landscaping, as well as the installation of water lines for a potable water distribution pipe network. In close coordination with Loudoun County and representatives from VDOT, WCA, and WFI, the Kimley-Horn team has developed a series of concept plans for traffic calming, roadway and drainage improvement, dry utility relocations, lighting, and water distribution system installation that is consistent with the historic character of the village. As shown in Figure 4-1, these concept plans cover the streets within the entire Village of Waterford study area and all within the NHL district.

Each concept plan is described as follows. The concept plans are included at the end of this chapter.

Figure 4.1 Concept Plan Key Map



4.8.1 CONCEPT PLAN 1 – OLD WHEATLAND ROAD

Description: Old Wheatland Road is a two-lane rural road that has become a commuting route for people who live in the northern part of Loudoun County and commute to their jobs to the south and east by traveling through Waterford. Giving these drivers a precursor to the traffic calming measures in the village would be appropriate.

Recommendations: Install a splitter island using pavers (or stamped concrete to be determined during final design), flush with the roadway surface, along with edge pavers on the outside edges of pavement in this location. The splitter would be installed as shown, in accordance with the recommendations of Loudoun County's 2021 Traffic Calming and Byway Assessment study.

Anticipated Results: This set of traffic calming measures would introduce traffic calming west Waterford, encouraging slower speeds prior to entering the village.

4.8.2 CONCEPT PLAN 2 – FIRST STREET AND MAIN STREET

Description: Visitors entering Waterford from the northwest first notice the unique character of the village upon sight of the Old Mill. The traveler is on rural roads before crossing Catoctin Creek on a concrete bridge, which is on a horizontal curve that is super-elevated, giving the motorist an opportunity to comfortably speed up as they enter Waterford. The bridge provides 15-foot-wide lanes for each direction of travel. There is a 400-foot-long stretch of First Street between the bridge and the Mill. There is no roadway striping on First Street or on the bridge over Catoctin Creek. Today, travelers are greeted with a 20 miles per hour (mph) sign with a pole-mounted speed display sign, encouraging drivers to slow down.

Clover Hill Road intersects First Street as a skewed "T" intersection on the east side of the Catoctin Creek bridge. The only traffic control at the intersection is a stop sign on Clover Hill Road. The sharp horizontal curve at the intersection of Main Street, First Street, John Brown Road, and Bond Street creates an existing traffic calming measure.

The infrequent motorist misjudges the inside of the roadway curve and sometimes collides with

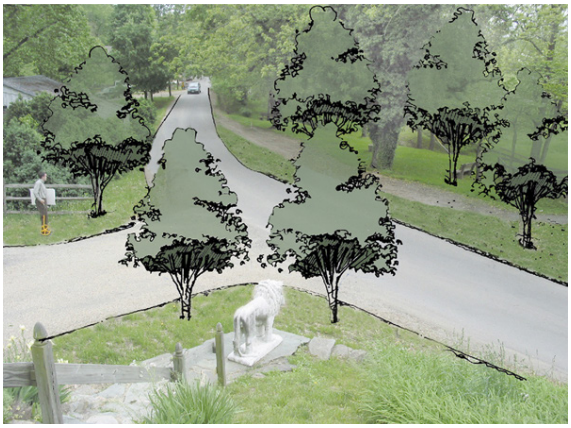
BEFORE

AFTER

First Street and Clover Hill Road

BEFORE

AFTER



Main Street and John Brown Road

the edge of the Old Mill building. These mishaps are evidenced by the chipped bricks on the corner of the building a few feet above ground level. The roadway is 22 feet wide through the curve and on the approaches along both First and Main Streets.

Recommendations: It is important to preserve the historic relationship of rural transition to the village by maintaining the Old Mill as the first hint of entering a populated area. In no other place is it critical to follow the community's mantra "less is more." The following traffic calming measures and other modifications are proposed for this area of the village:

- Reduce the speed of vehicles entering the village by painting a double-yellow centerline stripe on the bridge over Catoctin Creek.
- For a length of 15 feet, place concrete pavers 1 foot in width that resemble stone or cobbles in the median of First Street beginning at the east end of the bridge over Catoctin Creek. Do not paint a centerline stripe on the cobbles or asphalt, only on the bridge surface.
- Reduce corner radii of the Clover Hill Road intersection by realigning to more closely resemble a "T."
- Plant vegetation on both sides of Clover Hill Road close to the intersection with First Street to enclose the visual field-of-view for motorists crossing the Catoctin Creek bridge on their way into the village.
- To reduce the frequency of vehicles crashing into the northeast corner of the Old Mill building, rebuild First Street to its present width of 19 feet of pavement by moving the street a few feet to the north.
- Remove the utility pole that sits a few feet off of the north side of First Street and pave from the site of the old pole back to the existing pavement on First Street.
- Remove a few feet of existing asphalt on the south side near the Mill building and replace it with a combination of edge treatment and historic-looking walking path surface treatment. The recommended edge treatment would be 1 foot wide with exposed aggregate stone and/or crushed red brick material to match the facade of the Mill. The walking path would provide a surface that complements the historic structure, and its design would strive to meet ADA requirements, especially if this path links to a future parking area to the west of the mill.
- Plant vegetation on both sides of John Brown Road close to the intersection with First Street to enclose the visual field-of-view for approaching motorists. The narrowed field-of-vision will naturally cause motorists to

slow down.

- Avoid roadway encroachment on the workshop building that sits near the southeast corner of the intersection of First Street, Main Street, Bond Street, and John Brown Road.

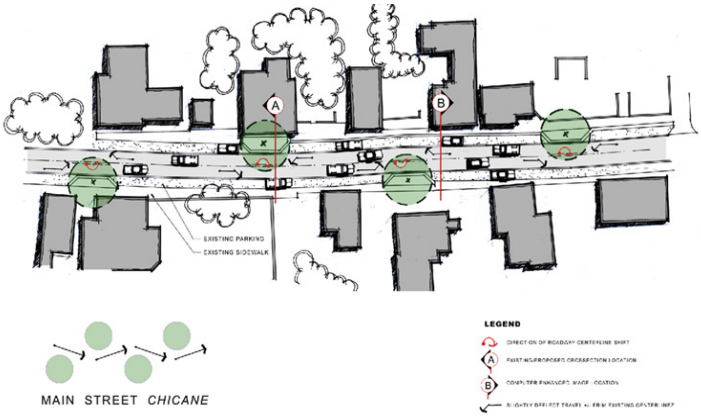
Anticipated Results: The behavior of "rogue" drivers who grossly exceed the speed limit of 20 mph should be altered with these measures. The spacing of about 400 feet between the existing traffic calming measure (sharp curve) at the Old Mill and the recommended calming measure at the Catoctin Creek bridge is appropriate for encouraging slower speeds.

The combination of measures at the Catoctin Creek bridge location will encourage motorists traveling eastbound to "hug" the curve rather than encroach into the median, thereby reducing vehicle speeds through the curve. The narrowed field-of-vision caused by additional trees and landscaping will naturally cause motorists to slow down.

It may be possible to sharpen the already tight horizontal curve where lower Main Street turns around the Mill and becomes First Street. A sharper curve will promote even slower speeds in the immediate vicinity. The recommended lateral shift in the alignment of First Street will reduce the frequency of collisions with the Mill building, improve the safety and security of pedestrians passing near the Mill, and slightly increase the sight distance for Main Street traffic of oncoming vehicles.

4.8.3 CONCEPT PLAN 3: MAIN STREET

Description: Main Street in Waterford is lined with the majority of the 19th-century structures in the village. Consistent with the 19th-century design, this narrow road is just wide enough to allow two cars to pass each other if one pulls over to allow the other to pass. Cars are allowed to park on either side of the road, and some trees exist at the edge of pavement, creating additional obstacles.



MAIN STREET *CHICANE*

BEFORE

AFTER

Main Street at Bridge over Tannery Creek

Main Street, Looking North

The pavement width varies along this corridor. The total width between curbs/sidewalks is generally 30 feet. For 750 feet, from the Post Office to the wooden bridge, vehicles must navigate through the obstacles of parked cars, trees, and on-coming traffic. However, when the road is clear, motorists have been observed to travel at speeds greater than the 20 mph speed limit. West of the wooden bridge, the asphalt is narrow (approximately 18 feet in width), and drivers must slow as they approach the corner of the Old Mill building at the First Street/Bond Street intersection.

On either side of the wooden bridge, it is apparent that the roadway elevation is higher than its historic elevations. The sidewalk to the east of the bridge and the areas to the west of the bridge are approximately 2 feet lower than the roadway.

On the south side of Main Street, east of the bridge, the asphalt slopes sharply down to the old curb. The asphalt slope actually begins at the top of the crest near the Post Office and continues to a culvert just before the wooden bridge, growing wider and deeper. According to VDOT, this sloped pavement was the result of paving an eroding roadside ditch. Drainage along Lower Main Street consists of the paved ditch but is otherwise undefined. Citizens

BEFORE

AFTER

Main Street, Looking North

have expressed concerns over the height of the roadway and the presence of the sloping asphalt. Pedestrian and vehicle safety is an issue.

The sidewalks along Main Street are made of a variety of materials, including brick, stone, gravel, and sand. Trees and utility poles sometimes interrupt the sidewalk as well as the parking areas along the roadway. Citizens have indicated that the presence of the trees along the roadway as well as the parked cars is preferred. Both the trees and the cars provide traffic calming.

Recommendations: The following traffic calming measures and other modifications are proposed for lower Main Street:

- Lower the elevation of the roadway along the length from the Corner Store intersection to the wooden bridge.

Main Street, Looking North

- Lower the elevation of the roadway just west of the wooden bridge and match elevation of the First Street/Bond Street intersection.
- Replace the wooden bridge with a concrete "hump-back bridge," with a stone veneer resembling native materials. Lowered roadway on either side of bridge will provide the needed change in elevation.
- Add concrete pavers, 1 foot in width, resembling stone or cobbles, along the north edge of the roadway asphalt.
  Add valley gutter (2 feet wide) along south edge of roadway.
- On either side of the roadway, improve the remaining 6 feet of parking areas to the curb line.
- Repair existing sidewalks and curbs with native materials, consistent with existing materials in place (i.e., brick, stone, etc.).
- Install bulb-out to protect existing trees and provide traffic calming measure.
- In appropriate locations, plant additional trees and install bulb-outs.
- Install inlets in valley gutter to convey drainage toward creek at new hump-back bridge. Add pipe culvert and install new outfall at creek.

BEFORE

AFTER

Main Street, Looking Southeast

- Improve ditches west of the new hump-back bridge and install inlet and pipe culvert to convey drainage from north of the road to the south and on to the creek.
- Consider in-line treatment of stormwater or modification to creek downstream of bridge to treat/retain stormwater with pond or state-of-the-practice in-line treatment system.
- Plant trees at appropriate locations.
- Add pedestrian level light poles and fixtures at appropriate locations.

Anticipated Results: Lowering the roadway from 1 to 2 feet will return Main Street to its historic elevations and allow a hump-back bridge to provide an aesthetic crossing and a traffic calming measure. Defining the edges of

roadway along the length of lower Main Street will appear to narrow the travel way, and it will better designate parking areas. While speeds are not a major concern along this segment, the "rumbling" effect of the pavers will cause drivers to slow and remain in the lane. The resulting series of bulb-outs (with trees) and parking areas should provide a "chicane" effect for traffic, creating the need for opposing traffic to alternate through parked cars and trees.

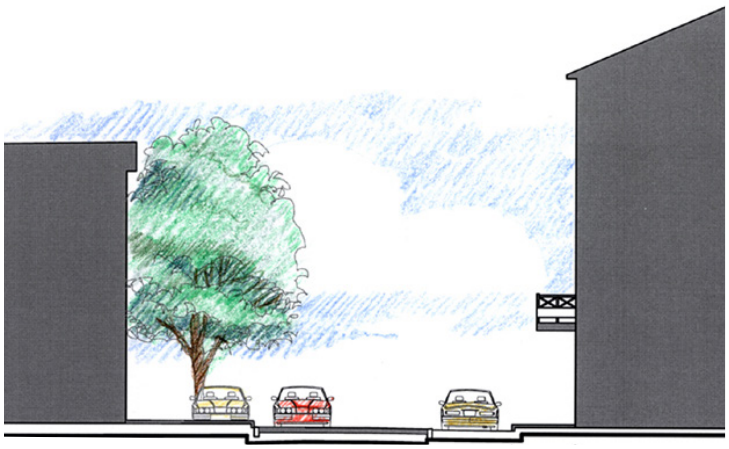
Drainage improvements will complete the project and allow a better flow of drainage from the Corner Store intersection and along Main Street. The resulting width of asphalt roadway should about 15-16 feet, and it should slope toward the valley gutter. Each parking area also should slope to valley gutter. Additional trees will improve aesthetics. Additional lighting will provide a measure of safety for motorists and pedestrians.

4.8.4 CONCEPT PLAN 4: MAIN STREET, SECOND STREET, AND WATER STREET

Description: The intersection of Main Street, Second Street, and Water Street is the historic center of Waterford. The Corner Store is one of the most recognizable structures in historic photos of Waterford. Other prominent buildings at this intersection include the Pink House, Post Office, Insurance Building (Map Maker's Shop), and the Tin Shop. This intersection handles a large number of vehicles per day, while accommodating the many pedestrians who frequent the Post Office, Corner Store, and the convenience store just south of this intersection. Also, many vehicles park along the edges of this intersection. The approaches of Second Street, Main Street, upper Main Street (coming down the hill), and Water Street are all controlled with stop signs.

At this intersection, the pavement is generally at a higher level than the adjacent sidewalks, especially along the west side of the intersection, along curve from lower Main Street to Second Street. Concerns were also voiced by the citizens about the lack of safe pedestrian access at this location, i.e., having to step up a steep slope from the sidewalk to cross the road.

In addition, concerns were voiced about poor drainage in this location, especially at the sidewalk linking the Post Office and the Tin



Main Street, Looking North

Shop. Some curbs and gutters exist in this location, but the asphalt is typically at the top of the curb. The historic structures are often exposed to stormwater at the bases of the buildings along the sidewalk, creating the potential for damage to these buildings.

A unique drainage system exists through this intersection. An old concrete channel along Water Street leads to a pipe culvert that conveys drainage from the corner of Water Street and Upper Main Street to under the Corner Store, under Second Street, and under the Tin Shop. The outfall of this system, downstream of the Tin Shop, is in need of maintenance.

Recommendations: The following traffic calming measures and other modifications are proposed:

- Lower the elevation of the roadway at this

intersection to match the elevation of the adjacent sidewalks, considering slope of the intersection pavement for drainage purposes.

- Lower the approaching roadways of Second Street, lower Main Street, and Water Street to 6 inches lower than the finished elevation of the intersection to provide a speed table at this intersection.
- Replace asphalt pavement at the intersection with concrete pavers resembling stone or similar native material. Pavers or a similar material would be used for the extent of the speed table.
- Add concrete pavers, 1 foot in width, resembling stone or cobbles, along the edges of pavement for all approaches to the intersection and at all corners.
- At the corner of lower Main Street and Second Street, expand the brick sidewalk and provide a landscaped bulb-out, reducing the radius of the corner and reducing width of each roadway crossing for pedestrians.
- At the corner of Second Street and upper Main Street, convert the gravel area in front of the corner store to a brick sidewalk, and reduce the radius. Allow parking in this location, if desired by the citizens.
- At the corner of upper Main Street and Water Street, add section of brick sidewalk and reduce corner radius.
- Along the north side of the intersection, connecting Water Street and lower Main Street, repair the existing brick sidewalk and extend the sidewalk to the east, adding brick pavers to connect the sidewalk with the gravel path extending down the hill on Water Street (see discussion for Water Street improvements). Provide gravel parking area between brick sidewalk and intersection.
- Repair and modify the drainage system in this location. Replace the existing system under the historic structures by picking up flow from an improved drainage system on the north side of Water Street. Add inlets and pipe culvert under Water Street at this intersection, connecting to improved inlet at the corner of upper Main and Water Streets. Add pipe culvert under the intersection, away from the Corner Store, to the area between the Insurance Building and the Post Office. Add inlet at this location and provide pipe culvert to new outfall beyond the two building
- Remove the existing pipe culvert under Second Street between the Corner Store and the Tin Shop. This culvert would no longer be necessary and its removal will facilitate lowering the roadway in this location.
- Mill and overlay the asphalt of all the approaches to the intersection prior to the start of the speed table.

BEFORE

AFTER

Main Street / Second Street / Water Street

- Repair all sidewalks at the intersection.
- Plant trees at appropriate locations.
- Add pedestrian level light poles and fixtures at appropriate locations.

Anticipated Results: Creating a speed table while still lowering the elevation of the approaches to the intersection as well as the intersection itself should provide a traffic calming measure consistent with the nature of this intersection. Pedestrian access will be improved. Vehicles will slow prior to the intersection due to the speed table and its vertical displacement as well as the appearance of a pedestrian plaza-type environment.

Bulb-outs at the corners and a reduction in the corner radii will further slow vehicles and enhance pedestrian safety, reducing the distance that pedestrians will need to cross the streets. Edge pavers will better define the intersection, parking areas, and sidewalks as well as act to hold the concrete pavers and the brick sidewalks in place.

Drainage improvements will remove the threat of stormwater from under the Corner Store and the Tin Shop, protecting the historic structures. New inlets and sidewalk improvements as well as lowering the roadway will correct the drainage problems on the sidewalks and further protect the historic structures. Additional trees will improve aesthetics. Additional lighting will provide a measure of safety for motorists and pedestrians.

BEFORE

AFTER

Second Street / Main Street

4.8.5 CONCEPT PLAN 5: SECOND STREET AND PATRICK STREET

Description: Unlike High Street's rural through-street appearance, Second Street clearly has a residential look. While relatively narrow (approximately 18 feet wide), its long straight length tempts drivers to exceed the 20 mph speed limit. Edges of the asphalt pavement are extended by narrow gravel shoulders, which appear to be used often. Dozens of vehicles park along this street, and driveways serve the many houses. Stop signs now exist at the Second Street/Patrick Street intersection with stop bars (pavement markings).

Roadside ditches and several culverts convey stormwater away from Second Street and toward Catoctin Creek, but many of the ditches are in need of repair. Standing water was observed along the roadsides well after storms. Drainage inlets appeared clogged and overgrown.

Patrick Street serves as unwanted shortcut for traffic traveling through Waterford to and from points northwest of the village. The street is a narrow roadway (approximately 14 feet) paved from Second Street to High Street. Parallel to the street is a concrete curb and brick sidewalk in various states of repair. Traffic on this street is relatively light, with approximately 300 vehicles per day, and pedestrians were observed to use this street frequently. The approach to Second Street is controlled by a stop sign.

Recommendations: The following traffic calming measures and other modifications are proposed:

- At Patrick Street, reduce the radius of each corner to 20 feet, and add concrete pavers along the corners. Connect curb and gutter drainage system to Second Street drainage system.
- At Church Street, define parking area with concrete pavers along edges of intersection. Also install a planter box or tree well and tree, with concrete or granite curbing, at the northeast corner of the intersection.
- At the approximate midway point between Janney and Patrick Streets, add trees and provide concrete or stone curbing and speed table along Second Street to protect the trees and provide a narrowing effect for traffic.
- Regrade, repair, and reseed roadside ditches along Second Street to better convey stormwater, eliminate ponding, and fix erosion. Repair and/or replace intersection and driveway culverts.

BEFORE

AFTER

Second Street at Church Street

BEFORE

AFTER

Second Street at Patrick Street

- Improve ditch along the east side of Second Street to the south of Patrick Street. Repair/ modify storm sewer system to collect flows from inlets at Patrick Street and Church Street.
- Mill and overlay the asphalt along the length of Second Street.
- Repair sidewalks along Second Street and add new sidewalks/walking paths to connect the existing sidewalks.
- Repair brick sidewalk along the entire length of Patrick Street.

BEFORE

AFTER

Second Street Mid-Block

- Add curb and gutter between brick sidewalk and roadway, with intermittent inlets collecting runoff from entire width of roadway and conveying runoff towards Second Street, joining the drainage system at that location.
- Plant trees at appropriate locations.
- Add pedestrian-level light poles and fixtures at intersections and driveways and other appropriate locations.

Anticipated Results: Defining the edges of roadway along portions of Second Street will appear to narrow the travel way and minimize

the use of what is now the extra width due to the narrow gravel shoulders. The "rumbling" effect of the pavers will cause drivers to slow and remain in their travel lanes. This measure should reduce speeds by 3 to 5 mph.

The addition of a speed table at the approximate midway point between Janney and Patrick Streets will provide a mid-block traffic calming measure to minimize the speeding between the intersections.

The reduction in the corner radii of the intersections with Patrick Street will minimize slow and roll traffic at the stop signs, reducing speeds on the side streets and discouraging shortcuts. Turning left off of southbound Second Street also will be more difficult with the smaller radius and will discourage shortcuts on Patrick Street. An improved brick sidewalk will enhance the walking experience of residents and visitors.

Additional trees and lighting will enhance safety and provide a pedestrian feel to the roadway, further calming traffic.

4.8.6 CONCEPT PLAN 6: SECOND STREET, JANNEY STREET, AND FACTORY STREET

Description: As discussed for Concept Plan 5, Second Street's long and narrow look tempts drivers to exceed the 20 mph speed limit. The stop signs at the Janney Street intersection and the sharp curve connecting Factory Street (10 mph cautionary speed limit) slow southbound traffic. Opposing vehicles also slow traffic.

Janney Street is a narrow roadway (approximately 14 feet) paved only from Second Street for approximately 200 feet and again just before High Street. The approaches to both Second Street and High Street are controlled by stop signs.

Factory Street links Second Street to Clarkes Gap Road and High Street in a straight path. Motorists were observed increasing speed along this roadway, especially heading toward Clarks Gap Road. The stop sign at High Street/ Clarkes Gap Road causes travelers to slow on Factory Street. Traveling westbound on Factory Street, drivers slow as they approach the sharp curve (15 mph cautionary speed limit) to Second Street.

Recommendations: The following traffic calming measures and other modifications are proposed:

- At Janney Street, widen Second Street approaches by 4 feet and add centerline pavers for 50 feet on either side of intersection, tapering from 1 foot to 4 feet at the intersection.
- Reduce the radius of each corner of Janney Street to 20 feet and add concrete pavers along the corners to 50 feet east of the intersection.
- Regrade, repair, and reseed roadside ditches along Second Street to better convey stormwater, eliminate ponding, and fix erosion. Repair and/or replace intersection and driveway culverts.
- Repair and/or replace the culvert at the intersection of Second Street and Factory Street. Repair outfall.
- Repair/replace storm sewer system that is near the intersection of Second Street and Janney Street. Inlets along the east and west side of Second Street collect runoff, and additional flow is collected from the storm sewer running along Janney Street. Repair outfall and regrade ditch along existing gravel drive.
- Add trees at the midway point on Factory Street between Second Street and High Street (replacing existing utility pole).
- Protect above trees with a bulb-out of concrete pavers or granite curbing along the

BEFORE

AFTER

Factory Street

edge of the roadway, connecting with the existing sidewalk.

- Improve the drainage ditch at the above location on either side of Factory Street. This improvement should include regarded/repair ditches along Factory Street, conveying flow down the existing swale along property lines between the nearby lots to improved outfalls along the back of the lots into the open field.
- Option: Add concrete pavers, 1 foot in width, along both edges of pavement along the length of Factory Street and around the corner transitioning to Second Street.

BEFORE

AFTER

Second Street at Janney Street

- Mill and overlay the asphalt.
- Repair and add sidewalks and walking paths
- Regrade and repair gravel portion of Janney Street.
- Regrade and repair of roadsides ditches along both sides of Janney Street, connecting to storm sewers along Second Street.
- Plant trees at appropriate locations throughout.
- Add pedestrian-level light poles and fixtures at appropriate locations.

Anticipated Results: Defining the edges of roadway on Second Street (including as an option the curve to Factory Street) will appear to narrow the travel way and minimize the use of what is now the extra width due to the narrow gravel shoulders. The "rumbling" effect of the pavers will cause drivers to slow and remain in their travel lanes. This measure should reduce speeds by 3 to 5 miles per hour.

The slight widening of Second Street at Janney Street, and the addition of centerline pavers will horizontally displace traffic, further reducing speeds. The reduction in the corner radii of the intersections with Janney Street will minimize slow-and-roll traffic at the stop signs, reducing speeds on the side streets and discouraging shortcuts. Turning left off of southbound Second Street also will be more difficult with the smaller radius.

The addition of trees and curb at the midway point along Factory Street will provide a pinching effect resulting in slower speeds in this location. Lighting will enhance vehicle and pedestrian safety. Drainage improvements will better convey stormwater along Factory Street and to drainage outfalls away from the street, improving safety during storms. The reduction in the corner radii of the intersections with Second and Janney Streets will minimize slow-and-roll traffic, thereby reducing the speeds and discouraging shortcuts on Janney Street.

Janney Street

4.8.7 CONCEPT PLAN 7: CLARKS GAP ROAD, HIGH STREET, AND FACTORY STREET

Description: At this location, traffic from the south proceeds from Clarks Gap Road, greeted by a pole-mounted speed display (PMSD) sign and rounds a sharp curve (with 15 mph cautionary speed limit), and enters the village at this intersection. Speeds in the vicinity of this intersection were measured well in excess of the 20 mph speed limit. The centerline double yellow striping of Clarks Gap Road ends at this intersection and does not exist on any of the roads in the village.

The Factory Street approach is controlled by a stop sign, but the angle of the intersection and the large corner radius was observed to lead many motorists to roll through the stop from Factory Street to southbound Clarks Gap Road. Vehicles proceeding both north and south on High Street are slowed by the existing horizontal and vertical curves, but pavement is wide enough to lead some motorists to travel through the intersection and on to points south and north at speeds greater than 20 mph.

Recommendations: The following traffic calming measures and other modifications are proposed:

- Add concrete pavers, 1 foot in width, resembling stone or cobbles, along edges of pavement 300 feet south of the intersection, and 150 feet north and west of the intersection.

Clarks Gap Road, high Street, Factory Street Intersection

- Add concrete pavers at the centerline of Clarks Gaps Road and High Street, 100 feet north and south of the intersection, tapering from 1 foot at the points furthest from the intersection to 4 feet at the intersection, with a gap across the intersection.
- Widen Clarks Gap Road and High Street at the intersection by 4 feet to accommodate the above centerline treatment.
- Reduce the radius on southwest corner from over 40 feet to 25 feet.
- Mill and overlay the asphalt throughout the intersection.
- Add a valley gutter along the east side of High Street (in place of pavers) with inlets at appropriate locations to collect flow from improved ditches.
- Add pipe culvert to convey flow from east side of intersection to west side, then to the existing ditch, and then to the existing stream channel.
- Regrade and seed all roadside ditches to improve stormwater flow.
- Plant trees at appropriate locations.
- Add pedestrian-level light poles and fixtures (light fixture 8-12 feet above roadway) at the intersection.

BEFORE

AFTER

Clarks Gap Road at Factory Street

Anticipated Results: Defining the edges of roadway in advance of the intersection will appear to narrow the travel way and alert the motorist of the upcoming intersection. The centerline pavers will further define the travel lane and slightly displace vehicles horizontally as they proceed through the intersection. The "rumbling" effect of the pavers will cause drivers to slow and remain in their travel lanes. These measures combined should reduce speeds by 3 to 5 miles per hour.

The reduction in the southwest corner radius will make rolling through the stop sign more difficult for the typical motorist, reducing the number of vehicles that slow and go, and thus reducing the speed on Factory Street. Drainage improvements will better convey stormwater through and away from this intersection. Additional trees and lighting will enhance the appearance of the intersection and provide a measure of safety.

4.8.8 CONCEPT PLAN 7A: CLARKES GAP ROAD

Description: Clarkes Gap Road is a two-lane rural road that has become a major commuting route for people who live in the northern part of Loudoun County and commute to their jobs to the south and east by traveling through Waterford. Giving northbound drivers a precursor to the traffic calming measures in the village would be appropriate.

Recommendations: Install a choker using pavers (or stamped concrete to be determined during final design), flush with the roadway surface, along the edges of pavement in this location. The choker would be installed as shown on Concept Plan 7A, in accordance with the recommendations of Loudoun County's 2021 Traffic Calming and Byway Assessment study, but with pavers instead of raised concrete islands.

Anticipated Results: This traffic calming measure would introduce a measure south of Waterford, encouraging slower speeds prior to entering the village.

4.8.9 CONCEPT PLAN 8: HIGH STREET AND JANNEY STREET

CONCEPT PLAN 9: HIGH STREET AND PATRICK STREET

Description: High Street is a relatively narrow roadway (approximately 18 feet in pavement width), with worn edges of pavement, very narrow gravel shoulders in some locations, and roadway ditches exhibiting erosion and overgrowth of vegetation (especially on the east side) and ponding (on the west side). This section of High Street is not marked with a centerline.

Stop signs on High Street slow traffic at the Patrick Street intersection, but no other traffic control devices exist along this section of roadway except for the 20 mph speed limit sign that includes a sign indicating an additional fine. The narrow road and the crest at the approximate midway point of this segment does serve to slow some traffic, especially when vehicles are approaching each other.

Recommendations: The following traffic calming measures and other modifications are proposed:

- At Janney Street, reduce the radius of each corner to 20 feet, and add concrete pavers along the corners to 50 feet west of the intersection.
- At Patrick Street, reduce the radius of each corner to 20 feet, and add concrete pavers along the corners.
- Enhance the existing stone and concrete staircases on the east side of High Street with additional pavers, additional stone walls, and landscaping.
- Regrade, repair, and reseed roadside ditches along High Street to better convey stormwater, eliminate ponding, and fix erosion. Repair and/or replace intersection and driveway culverts.
- On the crest of the High Street hill between Janney and Patrick Streets, add centerline and edge pavers to High Street.
- Mill and overlay the asphalt along the length of High Street.
- Plant trees at appropriate locations.

- Add pedestrian-level light poles and fixtures at intersections, driveways, and other appropriate locations.
- Option: Add sidewalk/walking path along west side of High Street, linking Patrick and Janney Streets.

Anticipated Results

Defining the edges of roadway at the intersections will appear to narrow the travel way and minimize the use of what is now the extra width due to the narrow gravel shoulder. The centerline pavers will separate on-coming traffic and narrow the travel lanes. The "rumbling" effect of the pavers will cause drivers to slow down and remain in their travel lanes. These measures should reduce speeds by 3 to 5 mph.

Additional trees and the enhancement of the staircases just off the roadway will provide a narrowing effect, further calming traffic. The reduction in the corner radii of the intersections with Janney Street and Patrick Street will minimize slow-and-roll traffic, thereby reducing the speeds and discouraging shortcuts on those streets.

4.8.10 CONCEPT PLAN 10: BUTCHERS ROW, MAIN STREET, AND WATER STREET

Description: High Street and Butchers Row meet at the intersection with the top of Main Street in a horizontal and vertical curve that results in short sight distances. Plenty of trees provide a canopy that make this a quaint intersection, but they contribute to the lack of sight distance. Edges of pavement are undefined and the large radius at each corner of Main Street and the gravel shoulders gives motorists the appearance of a wide through street. The driveway to the Old Waterford School near this intersection contributes to the concerns of speeding traffic and short sight distances. Both Patrick Street and Main Street provide pedestrians access to functions at the Old School; however, no formal pedestrian crossing exists in this area.

There are no traffic control devices such as stop signs along these street segments, except for stop signs for the Water Street approach. This section of High Street/Butchers Row is not marked with a centerline. Main Street is signed as a one-way street away from the intersection and down a steep hill toward the Corner Store. Residences line each side of this narrow street (14 feet wide). Cars park on either side of the street.

BEFORE

AFTER

Second Street at Janney Street

BEFORE

BEFORE

AFTER

AFTER

High Street Mid-Block

Water Street is a narrow 14-foot-wide street connecting the northeastern entryway into Waterford with Main Street. The 900-foot segment from Main Street to Loyalty Road is characterized by a dense tree canopy and few buildings. An historic hedgerow exists on the north side of the street. Near Main Street, an open U-shaped concrete channel provides a nostalgic element.

An important observation is the direct link that Water Street provides between the Waterford Elementary School and Main Street – the community center of Waterford. The narrow pavement on Water Street, combined with no suitable shoulder to walk on, creates a challenge for pedestrians. Water Street is not safe for young pedestrians, despite a desire for children and adults to be able to walk between the school and Main Street.

The northeastern access into Waterford on Loyalty Road splits at this intersection with relatively high-speed turns to Water Street and to Butchers Row. The “T” intersection is characterized by a change in elevation and a center circular island with a utility pole placed inside the island.

Recommendations: The following traffic calming measures and other modifications are proposed:

- Replace the asphalt roadway surface at the Main Street/High Street/Butchers Row intersection with wide concrete paving blocks, textured to resemble small cobble stones, approximately 50 feet north, south, and west of the intersection.
- Add concrete pavers, 1 foot in width, resembling stone or cobbles, along the edges of High Street and Butchers Row, as well as along Main Street for approximately 50 feet, and along Fairfax Street for approximately 50 feet.
- Reduce the radius of each corner with Main Street to 25 feet.
- Reduce the radius of each corner with Fairfax Street to 25 feet.
- Regrade and repair of ditches. Repair or replace the culverts.
- Add pedestrian-level light poles and fixtures at appropriate locations at this intersection and at the adjacent driveways.
- Define the edges of pavement and parking areas along Main Street by adding concrete pavers.
- Match the elevation of the roadway of Main Street at the bottom of the hill with the elevation of the speed table. An additional change in elevation (i.e., a rise to the speed table) is not necessary at this location.
- Plant trees at appropriate locations.
- Build a speed table on Water Street.
- Build a walkway on the north side of Water Street to connect the Waterford Elementary School with Main Street. The surface material should be weather-proof and should be designed to meet the requirements of the Americans with Disabilities Act.
- At the intersection of Butchers Row, Loyalty Road, and Water Street, modify the center island. Reduce the radius of the curve on the northern edge of Loyalty Road connecting to Water Street to slow traffic as motorists' transition to Water Street. Replace the asphalt with planted materials including trees that can be limbed-up to provide sight distance under the tree canopy for motorists at the intersection.
- Plant street trees at appropriate locations along the north side of Loyalty Road.
- Add concrete pavers, 1 foot in width, resembling stone or cobbles, along the edges of pavement.
- Repair and/or replace the culvert under Water Street running along the north side of Butchers Row.
- Avoid encroachment on the stone wall at the west side of the intersection.

High Street at Church Parking Lot

Anticipated Results: Defining the edges of the roadway, including the smaller corners of the intersection with Main Street, will appear to narrow the travel way and minimize the use of what is now the extra width due to the gravel shoulder and large corners. The "rumbling" effect of the pavers also will cause drivers to slow and remain in their travel lanes. The further measure of concrete pavement with small cobbles provides a change in roadway surface. The cobbling is intended to provide a different feel to the driver, but it is meant to be much less noisy to the residents than larger cobble stones. These combined measures should reduce speeds by up to 5 mph at this intersection.

BEFORE

AFTER

High Street/Butchers Row at Main Street

Additional trees and the lighting will enhance the narrowing effect, further calming traffic and providing a measure of safety.

Defining the edges of roadway along the length of Main Street (the Big Hill) will better designate parking areas. While speeds are not a major concern along this segment, the “rumbling” effect of the pavers will cause drivers to slow and remain in the lane.

Drainage improvements will complete the project and allow a better flow of drainage to the improvements at the Corner Store intersection. Additional trees will improve aesthetics.

BEFORE

AFTER

Water Street

Additional lighting will provide a measure of safety for motorists and pedestrians.

While the proportion of vehicles that speed along Water Street is comparable to other Waterford study streets, the volume of 300 vehicles per day is considerably lower. While an adjacent walkway may not seem to be a priority, it is nevertheless recommended by the study team as a considerable community amenity that will enhance the safety and security of not only schoolchildren, but all pedestrians who use it. The recommended speed table to correspond with an improved pipe culvert is another

amenity that will reinforce the importance of the conveyance of water along Water Street.

Making Water Street more of a "T" with Butchers Row and Loyalty Road, turning vehicles will slow, and when other vehicles are trailing, this will have the effect of slowing all vehicles as the lead vehicle turns onto Water Street.

Defining the edges of roadway along the length of Loyalty Road and Butchers Row, including the curves, will appear to narrow the travel way. The narrowing of the intersection should reduce vehicular speeds on the transition from Loyalty Road to Water Street significantly in that the recommendation is for a 20 mph design speed.

4.7.11 CONCEPT PLAN 11: LOYALTY ROAD AT SCHOOL ENTRANCE

CONCEPT PLAN 12: LOYALTY ROAD AT BROWNS LANE

Description: The northeastern access into Waterford is on Loyalty Road. The roadway is 19 feet wide with grass drainage ditches on both sides. The entry is marked with traffic signs posted for 20 mph, school flashing signal, School Bus Stop Ahead, and curve ahead. The intersection of Loyalty Road and Browns Lane is a "T" intersection near the study area limits. Browns Lane has a steep uphill approach to the intersection with Loyalty Road with a stop sign for traffic approaching on Browns Lane.

The intersection of Loyalty Road and the Waterford Elementary School is controlled by STOP signs on the side streets; that is, Loyalty Road traffic does not stop. While traffic counts at the intersection are not available, it is not likely there is enough traffic to warrant a traffic signal. The subject of signalized intersections was discussed with citizens and the stakeholder group during this study and strongly rejected by local citizens as too urban in design.

Recommendations: The following traffic calming measures and other modifications are proposed:

- Reduce the radius of the curves on the northeastern and southeastern corners of the intersection of Loyalty Road and Browns Lane to slow traffic as motorists turn on and off of Loyalty Road. Replace the asphalt with planted materials including trees that can be limbed-up to provide sight distance under the tree canopy for motorists at the intersection.
- Add concrete pavers, 1 foot in width, resembling stone or cobbles, along the edges of pavement from Browns Lane to Butchers Row.
- Reduce the radius of the curves on the southeastern and southwestern corners of the intersection of Loyalty Road/Waterford Elementary School/Old Waterford Road to slow traffic as motorists turn on and off of Loyalty Road. Replace the asphalt with planted materials including trees that can be limbed-up to provide sight distance under the tree canopy for motorists at the intersection.

- Install a splitter island within each concept plan, as shown, using pavers (or stamped concrete to be determined during final design), flush with the roadway surface, along with edge pavers on the outside edges of pavement in this location. The splitters would be installed in accordance with the recommendations of Loudoun County's 2021 Traffic Calming and Byway Assessment study.

Anticipated Results: The recommended measures along Loyalty Road should reduce vehicular speeds by 3 to 5 mph and reduce the number of rogue speeders.

BEFORE

AFTER

Loyalty Street at Brown's Lane

BEFORE

AFTER

Loyalty Street at Elementary School Entrance

CONCEPT PLAN 1 – OLD WHEATLAND ROAD

MILLTOWN ROAD

SHED

WATERFORD TREATMENT PLANT

EXISTING SANITARY SEWER LINE

PROP. 6' SPLITTER ISLAND

PROP. EDGE TREATMENT PAVERS

OLD WHEATLAND ROAD

PROP. GRASS SHOULDER

PROPOSED TRAFFIC CALMING MEASURE: 6' SPLITTER ISLAND

POTENTIAL AREA FOR VEHICLE PARKING

PHILLIPS FARM

PHILLIPS FARM

MATCH LINE - SEE SHEET 2

DRAFT

THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

- EDGE OF PAVEMENT
- PROP. CONCRETE (SIDEWALK/ MED)
- PROP. BRICK (SIDEWALK/ MED)
- PROP. PAVERS
- CENTERLINE
- PROPERTY LINE (GIS)
- 4 FT CONTOURS
- PROP. UNDERGROUND UTILITIES
- EXISTING FOREST
- EXISTING STREAM
- VALLEY CURB/GUTTER
- PROP. WATER LINE
- PROP. TREE
- EXISTING DRAIN LINE
- PROP. STORM DRAIN
- PROP. DRAINAGE STRUCTURE
- PROP. STORMWATER BMP
- EXISTING SANITARY LINE
- EXISTING SAN. STRUCTURE
- LIMITS OF LOWERING
- PROP. GRASS SHOULDER
- PROP. PAVEMENT REMOVAL
- PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
OLD WHEATLAND ROAD

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

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FIGURE 1

CONCEPT PLAN 2 – FIRST STREET AND MAIN STREET

CLOVER HILL ROAD
EXISTING OVERHEAD WIRES
LIMIT OF UNDERGROUND WIRES
IMPROVED PIPE CULVERT
EXTEND UNDERGROUND UTILITIES TO WEST SIDE OF CREEK
PAVERS AT EDGES AND CENTERLINE
REDUCED CORNER RADIUS WITH HARD SHOULDER
NEW TREES
PAVERS AT EDGES AND CENTERLINE
PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK
FIRST STREET
NEW WALKING PATH
PEDESTRIAN LEVEL LIGHT (TYP.)
MILL END
JOHN BROWN'S ROAD
PAVEMENT FOR ADJUSTED ROAD ALIGNMENT
HILLSIDE
SAMUEL MEANS HOUSE
JANNEY-PHILLIPS HOUSE
BOND STREET
JOHN WESLEY CHURCH
NEW TREES
MILL WEIGH STATION
LIGGETT STREET
THE MILL
ADJUSTED ROAD ALIGNMENT (NEW PAVEMENT)
MAIN STREET
PHILLIPS FARM
POTENTIAL STREAM CHANNEL RESTORATION OPPORTUNITY
POTENTIAL WETLANDS RESTORATION IN COMBINATION WITH INFRASTRUCTURE IMPROVEMENTS
CATOCTIN CREEK
LOWER PAVEMENT FOR IMPROVED WALKABILITY AND DRAINAGE
HUMP BACK BRIDGE WITH WALKING PATH
MARSHALL CLAGETT HOUSE
POTENTIAL SWM OR BMP WATER QUALITY AND QUANTITY IMPROVEMENT
PHILLIPS FARM
WISTERIA COTTAGE
MATCH LINE - SEE SHEET 1
MATCH LINE - SEE SHEET 3

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
CLOVER HILL ROAD, FIRST STREET, JOHN BROWN'S ROAD, MAIN STREET, BOND STREET, AND LIGGETT STREET

NORTH
GRAPHIC SCALE IN FEET
0 12.5 25 50

LOUDOUN COUNTY, VIRGINIA 1757

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FIGURE 2

CONCEPT PLAN 3—MAIN STREET

HUMP BACK BRIDGE WITH WALKING PATH
LOWERED PAVEMENT FOR IMPROVED WALKABILITY AND DRAINAGE
PIERPOINT HOUSE
VALLEY GUTTER AND INLET
DRAINAGE PIPE BELOW VALLEY GUTTER - AWAY FROM TREES
WISTERIA COTTAGE
BULB-OUT AND NEW TREE
HOLLINGSWORTH
ISAAC STEER HOUGH HOUSE
PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK
GRIFFITH/GOVER HOUSE
40148 MAIN
KITTY LEGGETT HOUSE
JOSEPH JANNEY HOUSE
CONCRETE PAVERS THROUGHOUT INTERSECTION FLUSH WITH SIDEWALK
PEDESTRIAN LEVEL LIGHT (TYP.)
CAMELOT SCHOOL
EDGE PAVERS
BULB-OUT AND NEW TREE
PARALLEL PARKING AREA
IMPROVED SIDEWALKS AND CURBS CONSISTENT WITH VILLAGE CHARACTER
MAIN STREET
BANK HOUSE
WILLIAM IRISH SHOP
GOODWIN-SAPPINGTON HOUSE
ARCH HOUSE ROW
SUGAR SHACK
IRON STORE HOUSE
PINK HOUSE
SALLY NETTLE HOUSE
GRAHAM HOUSE
LOWERED PAVEMENT FOR IMPROVED WALKABILITY AND DRAINAGE
VALLEY GUTTER
MATCH LINE- SEE SHEET 2
MATCH LINE- SEE SHEET 4

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
MAIN STREET

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

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FIGURE 3

CONCEPT PLAN 4—MAIN STREET, SECOND STREET, AND WATER STREET

MATCH LINE - SEE SHEET 5

MATCH LINE- SEE SHEET 3

POST OFFICE
OLD INSURANCE BUILDING
TIN SHOP
LIVERY STABLE
PINK HOUSE
WALKER-PHILLIPS HOUSE
WILLIAM HITE HOUGH HOUSE
PEDESTRIAN LEVEL LIGHT (TYP.)
WATERFORD MARKET
WILLIAM NETTLE HOUSE
IMPROVED SIDEWALK
PROPOSED CURB
CORNER STONE
THE FORGE
WILLIAM JAMES HOUSE
SECOND STREET
CONCRETE PAVERS THROUGHOUT INTERSECTION FLUSH WITH SIDEWALK
LOWERED PAVEMENT FOR IMPROVED WALKABILITY AND DRAINAGE
REDUCED CORNER RADIUS WITH HARD SHOULDER
PEDESTRIAN LEVEL LIGHT (TYP.)
PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK
JAMES HOUSE
HARDWARE STORE
JOHN MCGEATH HOUSE
BRADEN HOUSE
GARAGE
CHURCH STREET
WEAVER'S COTTAGE
MAIN STREET
WATER STREET
ASA MOORE HOUSE
JAMES MOORE HOUSE
ABNER MOORE HOUSE
WALKING PATH
POTENTIAL BMP TREATMENT AREA
SHED
SPEED TABLE
EDGE PAVERS
JAMES MOORE HOUSE
SHED
EDWARD DORSEY HOUSE

MATCH LINE- SEE SHEET 9

MATCH LINE- SEE SHEET 10

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
W PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
S EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
MAIN STREET, WATER STREET, AND SECOND STREET

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

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FIGURE 4

CONCEPT PLAN 5: SECOND STREET AND PATRICK STREET

FLAVIUS BEANS HOUSE
ASHBURY JOHNSON HOUSE
MAHLON SCHOOLEY HOUSE
GARAGE
PARKER-BENNET HOUSE
MERCHANT HOUSE
CATOCTIN HOUSE
SAMUEL HOUGH HOUSE
DOCTORS HOUSE
SPEED TABLE
EDGE PAVERS
IMPROVED PIPE CULVERT
EXISTING SANITARY SEWER LINE
NEW TREES
SECOND STREET
PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK
PEDESTRIAN LEVEL LIGHT (TYP.)
SAMUEL STEER HOUSE
SUNNYSIDE
TROUBLE ENOUGH INDEED
ISRAEL GRIFFITH ICEHOUSE AND STABLE
PATRICK STREET
TALBOTT HOUSE
LEMUEL SMITH HOUSE
STABLE
NEW TREE
GARAGE
MONROE HOUGH HOUSE
MATCH LINE - SEE SHEET 6
MATCH LINE - SEE SHEET 4
MATCH LINE- SEE SHEET 8
MATCH LINE- SEE SHEET 9

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
SECOND STREET AND PATRICK STREET

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY VIRGINIA 1757

Kimley»Horn

FIGURE
5

CONCEPT PLAN 6: SECOND STREET, JANNEY STREET, AND FACTORY STREET

PAVERS AT EDGE AND CENTERLINE
PEDESTRIAN LEVEL LIGHT (TYPICAL)
IMPROVED PIPE CULVERT
SHAWEN HOUSE
SECOND STREET SCHOOL
ODD FELLOWS HALL
ROAD ALIGNMENT SHIFT
ELTON JAMES HOUSE
NEW SIDEWALK
SECOND STREET
IMPROVED PIPE CULVERT
PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK
IMPROVED PIPE CULVERT
REDUCED CORNER RADIUS WITH HARD SHOULDER
BULB-OUT AND NEW TREE
IMPROVED SIDEWALK
OLD ACRE
MAGNOLIA HOUSE
15634 SECOND STREET
JACOB MENDENHALL HOUSE
WILLIAMS STORE-HOUSE
WILLIAMS HOUSE
IMPROVED PIPE CULVERT
FACTORY STREET
EXISTING SANITARY SEWER LINE
15633 FACTORY STREET
IMPROVED PIPE CULVERT
IMPROVED PIPE CULVERT
JANNEY STREET
PROPOSED WATER LINE
IMPROVED PIPE CULVERT
BULB-OUT AND NEW TREES
LANESLEA
HIDDEN HOUSE
MADISON HOUSE
MATCH LINE- SEE SHEET 7
MATCH LINE- SEE SHEET 8
MATCH LINE - SEE SHEET 5

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
W PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
S EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
SECOND STREET, JANNEY STREET, AND FACTORY STREET

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

Kimley»Horn

FIGURE 6

CONCEPT PLAN 7: CLARKES GAP ROAD, HIGH STREET, AND FACTORY STREET

MATCH LINE - SEE SHEET 7A

MILL RUN

IMPROVED SIDEWALK

FACTORY STREET

MATCH LINE- SEE SHEET 6

PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK

IMPROVED PIPE CULVERT

BOXWOOD WALK

LESLIE MYERS HOUSE

STEER-DEVINE HOUSE

EXISTING SANITARY SEWER LINE

REDUCED TURNING RADIUS

IMPROVED PIPE CULVERT

PEDESTRIAN LEVEL LIGHT (TYPICAL)

NEW TREES

CLARKES GAP ROAD

HIGH STREET

PAVERS AT EDGES AND CENTERLINE

IMPROVED PIPE CULVERT

IMPROVED PIPE CULVERT

MINOR ROAD RE-ALIGNMENT TO ACCOMMODATE CALMING MEASURE

15676 HIGH STREET

COALE'S BLACKSMITH SHOP

EPHRALM SCHOOLEY HOUSE

PROPOSED WATER LINE

IMPROVED PIPE CULVERT

REUBEN SCHOOLEY HOUSE

MATCH LINE - SEE SHEET 8

DRAFT

THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE

PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
PROP. WATER LINE

PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE

LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
CLARKES GAP ROAD, HIGH STREET, AND FACTORY STREET

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

Kimley»Horn

FIGURE 7

CONCEPT PLAN 7A: CLARKES GAP ROAD

DRIVEWAY TO 15861 CLARKES GAP ROAD

PROPOSED TRAFFIC CALMING MEASURE: CHOKER

PROP. GRASS SHOULDER

CLARKES GAP ROAD (ROUTE 662)

PROP. PAVERS

SOUTH FORK CATOCTIN CREEK

DRIVEWAY TO 15758 CLARKES GAP ROAD

MATCH LINE - SEE SHEET 7

DRAFT

THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

- EDGE OF PAVEMENT
- PROP. CONCRETE (SIDEWALK/ MED)
- PROP. BRICK (SIDEWALK/ MED)
- PROP. PAVERS
- CENTERLINE
- PROPERTY LINE (GIS)
- 4 FT CONTOURS
- PROP. UNDERGROUND UTILITIES
- EXISTING FOREST
- EXISTING STREAM
- VALLEY CURB/GUTTER
- W PROP. WATER LINE
- PROP. TREE
- EXISTING DRAIN LINE
- PROP. STORM DRAIN
- PROP. DRAINAGE STRUCTURE
- PROP. STORMWATER BMP
- EXISTING SANITARY LINE
- S EXISTING SAN. STRUCTURE
- LIMITS OF LOWERING
- PROP. GRASS SHOULDER
- PROP. PAVEMENT REMOVAL
- PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
CLARKES GAP ROAD

GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

Kimley»Horn

FIGURE 7A

CONCEPT PLAN 8: HIGH STREET AND JANNEY STREET

MATCH LINE- SEE SHEET 6

MATCH LINE- SEE SHEET 5

IMPROVED PIPE CULVERT

JANNEY STREET

SIMMS HOUSE

40171 JANNEY ST

LOUDOUN MUTUAL INSURANCE COMPANY

PEDESTRIAN LEVEL LIGHT (TYPICAL)

LOW ROCK WALL WITH LANDSCAPING

NEW TREES

EXISTING SANITARY SEWER LINE

IMPROVED PIPE CULVERT

PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK

HIGH STREET

IMPROVED PIPE CULVERT

PROPOSED WATER LINE

PAVERS AT EDGES AND CENTERLINE

REDUCED CORNER RADIUS WITH HARD SHOULDER

MATCH LINE - SEE SHEET 7

MATCH LINE - SEE SHEET 9

DRAFT

THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

- EDGE OF PAVEMENT
- PROP. CONCRETE (SIDEWALK/ MED)
- PROP. BRICK (SIDEWALK/ MED)
- PROP. PAVERS
- CENTERLINE
- PROPERTY LINE (GIS)
- 4 FT CONTOURS
- PROP. UNDERGROUND UTILITIES
- EXISTING FOREST
- EXISTING STREAM
- VALLEY CURB/GUTTER
- W PROP. WATER LINE
- PROP. TREE
- EXISTING DRAIN LINE
- PROP. STORM DRAIN
- PROP. DRAINAGE STRUCTURE
- PROP. STORMWATER BMP
- EXISTING SANITARY LINE
- S EXISTING SAN. STRUCTURE
- LIMITS OF LOWERING
- PROP. GRASS SHOULDER
- PROP. PAVEMENT REMOVAL
- PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
HIGH STREET AND JANNEY STREET

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY VIRGINIA 1757

Kimley»Horn

FIGURE 8

CONCEPT PLAN 9: HIGH STREET AND PATRICK STREET

MATCH LINE- SEE SHEET 5

MATCH LINE - SEE SHEET 8

MONROE HOUGH HOUSE

THE CAPTAIN'S HOUSE

MATCH LINE- SEE SHEET 4

IMPROVED SIDEWALK

EXISTING SANITARY SEWER LINE

CATOCTIN PRESBYTERIAN CHURCH

SHED

PATRICK STREET

PRESBYTERIAN MANSE

CHURCH PARKING LOT

CURB AND INLETS WITH PIPE BELOW

POTENTIAL BMP TREATMENT AREA

WATERFORD BAPTIST CHURCH

PEDESTRIAN LEVEL LIGHT (TYPICAL)

PAVERS AT EDGE AND CENTERLINE

REDUCED CORNER RADIUS WITH HARD SHOULDER

METHODIST CHURCH

PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK

RAIN GARDEN

NEW TREES

REDUCED CORNER RADIUS WITH HARD SHOULDER

HIGH STREET

IMPROVED PIPE CULVERT

PROPOSED WATER LINE

IMPROVED PIPE CULVERT

ENHANCED LOW WALL

EDGE TREATMENT

FAIRFAX STREET

CONCRETE PAVERS THROUGHOUT INTERSECTION FLUSH WITH SIDEWALK

HUNTLEY FARM

EDITH WALKER HOUSE

40231 FAIRFAX STREET

CARRIAGE HOUSE

CARRIAGE HOUSE AND GARAGE

MATCH LINE - SEE SHEET 10

DRAFT

THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE

PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
W PROP. WATER LINE

PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE

LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
HIGH STREET AND PATRICK STREET

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

Kimley»Horn

FIGURE 9

CONCEPT PLAN 10: BUTCHERS ROW, MAIN STREET, AND WATER STREET

EXISTING OVERHEAD WIRES
LIMITS OF UNDERGROUND UTILITIES
PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK
NEW WALKING PATH
PEDESTRIAN LEVEL LIGHT (TYP.)
IMPROVED PIPE CULVERT
ALTERNATE WALKING PATH
LIMITS OF UNDERGROUND WIRES
WATER STREET
PEDESTRIAN LEVEL LIGHT (TYP.)
IMPROVED PIPE CULVERT
MATCH LINE - SEE SHEET 4
AMERICA HOUGH TOWNER HOUSE
LIMIT OF UNDERGROUND WIRES
REDUCED CORNER RADIUS WITH HARD SHOULDER
JAMES LEWIS HOUSE
GARAGE
MAHLON MYERS HOUSE
IMPROVED PIPE CULVERT
PEDESTRIAN LEVEL LIGHT (TYP.)
CHARLES AND GEORGE SCHOOLEY HOUSE
MODIFIED ISLAND WITH EDGE PAVERS AND LANDSCAPING
MAIN STREET
BUTCHERS ROW
LLOYD CURTIS HOUSE
PAVERS AT EDGE AND CENTERLINE
HOUGH HOUSE
IMPROVED PIPE CULVERT
MARKET HILL
OLD SCHOOL
MYERS-HAIHES HOUSE
NEW TREES
CONCRETE PAVERS THROUGHOUT INTERSECTION (NOT A SPEED TABLE)
PEDESTRIAN LEVEL LIGHT (TYP.)
METHODIST CHURCH
REDUCED CORNER RADIUS WITH HARD SHOULDER
IMPROVED PIPE CULVERT
MATCH LINE- SEE SHEET 9
MATCH LINE - SEE SHEET 11

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
WATER STREET, MAIN STREET, AND BUTCHERS ROW

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY VIRGINIA 1757

Kimley»Horn

FIGURE
10

CONCEPT PLAN 11: LOYALTY ROAD AT SCHOOL ENTRANCE

MATCH LINE - SEE SHEET 10

MATCH LINE- SEE SHEET 12

PEDESTRIAN LEVEL LIGHT (TYP.)
EDGE PAVERS
NEW TREES
UNDERGROUND POWER AND COMMUNICATION IN DUCT BANK
PROPOSED NEW PAVEMENT
PAVERS AT EDGE AND CENTERLINE
ALTERNATE WALKING PATH
PEDESTRIAN LEVEL LIGHT (TYP.)
IMPROVED PIPE CULVERT
EDGE TREATMENT PAVERS
SCHOOL DRIVEWAY
LOYALTY ROAD
IMPROVED PIPE CULVERT
5' SPLITTER ISLAND
PROPOSED TRAFFIC CALMING MEASURE: SPLITTER ISLAND
IMPROVED PIPE CULVERT
REDUCED CORNER RADIUS WITH HARD SHOULDER
OLD WATERFORD ROAD
PEDESTRIAN LEVEL LIGHT (TYP.)
15520 LOYALTY ROAD
ECHO HILL
GARAGE
EXISTING OVERHEAD WIRES
LIMITS OF UNDERGROUND WIRES

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
LOYALTY ROAD AND OLD WATERFORD ROAD

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

Kimley»Horn

FIGURE
11

CONCEPT PLAN 12: LOYALTY ROAD AT BROWNS LANE

LIMIT OF UNDERGROUND WIRES
EXISTING OVERHEAD WIRES
15484 LOYALTY ROAD
REDUCED CORNER RADIUS WITH HARD SHOULDER
PEDESTRIAN LEVEL LIGHT (TYP.)
BROWNS LANE
EDGE PAVERS
MODIFIED ISLAND WITH EDGE PAVERS AND LANDSCAPING
PEDESTRIAN LEVEL LIGHT (TYP.)
155498 LOYALTY ROAD
LOYALTY ROAD
WATERFORD ELEMENTARY SCHOOL
PAVERS AT EDGE AND CENTERLINE
PROPOSED TRAFFIC CALMING MEASURE: SPLITTER ISLAND
PROPOSED NEW PAVEMENT
5' SPLITTER ISLAND
PROPOSED UNDERGROUND POWER AND COMMUNICATION DUCT BANK
PARKING
MATCH LINE- SEE SHEET 11

DRAFT
THIS CONCEPT PLAN WAS PRODUCED FOR PLANNING PURPOSES ONLY.

EDGE OF PAVEMENT
PROP. CONCRETE (SIDEWALK/ MED)
PROP. BRICK (SIDEWALK/ MED)
PROP. PAVERS
CENTERLINE
PROPERTY LINE (GIS)
4 FT CONTOURS
PROP. UNDERGROUND UTILITIES
EXISTING FOREST
EXISTING STREAM
VALLEY CURB/GUTTER
PROP. WATER LINE
PROP. TREE
EXISTING DRAIN LINE
PROP. STORM DRAIN
PROP. DRAINAGE STRUCTURE
PROP. STORMWATER BMP
EXISTING SANITARY LINE
EXISTING SAN. STRUCTURE
LIMITS OF LOWERING
PROP. GRASS SHOULDER
PROP. PAVEMENT REMOVAL
PROP. NEW PAVEMENT

VILLAGE OF WATERFORD
LOYALTY ROAD AND BROWNS LANE

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

LOUDOUN COUNTY, VIRGINIA 1757

Kimley»Horn

FIGURE 12

5. Implementation

This 2022 report of concept plans, cost estimates, and recommendations is intended to be a first step in the implementation of a comprehensive, holistic strategy for the Village of Waterford to calm traffic and to improve infrastructure in context of the Waterford National Historic Landmark. This strategy also will help achieve Waterford 2033 goals related to sustainability practices and adaptive reuse programs for Waterford's built and open spaces. Ultimately, this strategy will result in a program of infrastructure projects to be designed, constructed, and maintained, along with supporting programs to be initiated and sustained.

It is understood that the responsible parties to design and construct infrastructure projects for the Village of Waterford are Loudoun County and the Virginia Department of Transportation (VDOT) with the assistance of design and construction industry partners and the Waterford Citizens' Association (WCA), the Waterford Foundation, Inc. (WFI), and likely agencies such as the National Park Service (NPS). Maintenance of the streets, sidewalks, and other infrastructure improvements will be the subject of future discussions and potential agreements between Loudoun County, VDOT, other agencies, and any governance entity established by WCA and WFI. WCA and WFI will continue to lead strategic programs such as Waterford 2033 and its many objectives.

5.1 Implementation Process

The comprehensive set of infrastructure projects described in this *Preserving the Landmark* report should follow a deliberate implementation process for Waterford to get to the construction phase and to culminate with ribbon-cutting ceremonies for safer, walkable streets with underground utilities and stormwater management features. This implementation process is shown in *Figure 5-1*. For Waterford's infrastructure projects, the process includes the following steps:

Figure 5-1

Project Implementation Process

Project Initiation: Identification, Prioritization, and Funding

Project Development:

- Project scoping: concepts, feasibility, traffic
- Preliminary design, field work, environmental, public involvement > "30% plans"
- Design Approval, NEPA Document and Project Delivery Decision Point
- Intermediate design, start utility relocations, ROW acquisition > "60% plans"
- Final design, bidding, owner permitting > "90%/100% plans" "Construction Docs"

Project Delivery: Permitting, construction, environmental monitoring

Project Turnover

Operations & Maintenance

5.1.1 Project Initiation

This first step involves the identification of projects, development of concept plans and cost estimates, and establishment of a program of projects (likely with a multi-year budget) through incorporation into programming documents (e.g., Loudoun County Capital Improvement Program (CIP) and VDOT Six-Year Improvement Program). This *Preserving the Landmark* report is a tool for completing the project initiation phase, as well as jump-starting the project development phase.

5.1.2 Project Development

This phase includes:

- *Project Scoping:* Traffic analyses, concept development, initial public and stakeholder input, and determination of feasibility, as well as establishment of a project budget, schedule, delivery method, agency lead, and final scope.
- *Preliminary Design:*
  - Topographic survey and mapping, utility designation, initial utility coordination with utility providers
  - Updated wetland delineation and jurisdictional determination
  - Geotechnical investigation and report
  - Environmental report(s), including a draft document in accordance with the National Environmental Policy Act (NEPA)
  - 30% to 50% engineering plans: roadway, drainage, structures, traffic, utilities, etc.
  - Value Engineering (VE) and constructability review (as appropriate)
  - Public Hearing on proposed design
- *Design Approval:* A major milestone in a multifaceted project, design approval can lead to a final decision point on project delivery, i.e., design-bid-build (DBB) or design-build (DB), as well as progressive design-build (PDB) or delivery through a public private partnership (P3) or a master developer.
- *Intermediate Design:* Consistent with the chosen delivery method, this step includes:
  - Detail design, 60% to 80% plans for all project elements
  - Initiation of environmental permitting for impacts to wetlands and/or streams
  - Final design of utilities, including test pits, Utility Field Inspection (UFI), cost sharing agreements
  - Acquisition of right-of-way for streets and sidewalks and easements for utilities
- *Final Design:* Consistent with the chosen delivery method, this step includes:
  - Final design to 100% plans for all project elements
  - Final easements for utilities and initiation of relocations
  - Final acquisition of right-of-way and easements
  - Construction documents for advertisement
  - Agency permitting

5.1.3 Project Delivery

There are many options for project delivery (and as many schools of thought as to the best method for a given situation), and Loudoun County and VDOT, with support from other agencies and from WCA and WFI, will need to decide which delivery method or series of methods works best for this *Preserving the Landmark* program of projects. For all delivery methods, implementation steps will include:

- Construction approval by County, VDOT, and/or a 3rd party
- Project management plan to guide the lead agency and inform stakeholders
- Monitoring of project budget and expenditures and project schedule and controls by County, VDOT, or 3rd party
- Owner Quality Assurance (QA) reviews/inspections

See also discussion below regarding design and construction considerations

5.1.4 Project Close-Out

A final step in the implementation process is closing out the project, which includes financial close and turnover of the project to VDOT or Loudoun County, and operations and maintenance of the streets, sidewalks, and related infrastructure.

5.2 Near-Term Steps for Waterford's *Preserving the Landmark* Program of Projects

Given the implementation process outlined above for the program of projects recommended in this 2022 report on *Preserving the Landmark*, Waterford's proposed infrastructure improvement are in the project initiation (pre-scoping) phase with some project scoping being accomplished with the current planning efforts. The logical next steps for Loudoun County, WCA, and WFI are as follows:

- Request and secure funding to conduct further analyses, to initiate design of the infrastructure improvements, and to coordinate with utility providers and stakeholder agencies
- Develop a comprehensive multiyear budget and seek to understand potential funding sources with the goal of including the program of Waterford infrastructure improvements in Loudoun County's CIP and VDOT's Six-Year Improvement Program
- Begin NEPA analyses associated with the recommended improvements including:
  - Develop further conceptual design
  - Update traffic analyses
  - Conduct a thorough topographic survey with detailed utility designation
  - Conduct a geotechnical investigation
  - Conduct historic and architectural investigations and environmental investigations such as wetland and stream delineation
  - Obtain concurrence from FHWA (or other federal agency) on the type of NEPA document that will be needed
  - Begin preparing the required NEPA document

Following these steps, Loudoun County, VDOT, or a public-private partnership could execute the design and construction of a program of projects to make the *Preserving the Landmark* concept plans a reality.

Regarding NEPA, the level of environmental documentation required for this endeavor will depend on multiple factors including the source of the funding, the lead federal agency, and the scope or phasing of the overall work. Each federal agency, like the Federal Highway Administration (FHWA) or NPS, have their own NEPA implementing regulations which determine their procedures for completing a NEPA document and what can be considered a Categorical Exclusion, the most streamlined of the three types of environmental documents (with an Environmental Assessment (EA) and an Environmental Impact Statement (EIS) being the other two types).

Regardless of the document type, the NEPA process will require more in-depth studies and documentation of the existing conditions; definition of a project purpose and need, study area, and alternatives to be considered; coordination with agencies to determine the anticipated impacts to resources due to the project; and finally, identification of potential strategies to avoid, minimize, or mitigate these impacts. NEPA considers impacts to both the natural environment (streams, wetlands, and threatened or endangered species) and the built environment (cultural resources, community resources) as well as noise impacts.

As noted in Chapter 3, based on the scope of the proposed improvements and the purpose of the project, it is anticipated that impacts will be able to be minimized to a point at which the agencies will be in support of the project, namely, to maintain the historic integrity of the Village of Waterford. Once a distinct project (or series of projects) is identified, and funding is secured, the discussion can begin regarding which agency will lead the NEPA study and what the appropriate document may be. If federal funding is not obtained, NEPA would only apply if a major federal action is required. If NEPA is not triggered by either of the above cases, state environmental review or local environmental review policies may apply.

5.3 Preliminary Estimates of Project Cost

Based on the concept plans developed for this 2022 *Preserving the Landmark* master plan, planning-level project budget estimates have been prepared by the study team to assist in implementing the next steps in the planning process. To develop the estimated costs, planning level unit costs were applied to aspects of the concept designs for burying the wires, taming the traffic, fixing the drainage, lighting the village, adding the network of pipe for potable water supply, and repaving the streets and sidewalks.

The result of this effort is a preliminary cost estimate for construction, engineering design and construction administration, mobilization, maintenance of traffic, easements, permits, and contingencies. These planning-level estimates of project costs are summarized in *Table 5-1*. The more detailed estimates are included in *Appendix G.*

Table 5-1

Preliminary Engineering Phase	
Preliminary Engineering	$4,200,000
Additional Engineering (Plats, Permits, Etc.)	$3,150,000
Total Preliminary Engineering Costs	$7,350,000
Construction Phase	
Construction Costs	$21,000,000
Mobilization (17%)	$3,570,000
Maintenance of Traffic	$3,150,000
Electrical Service Connections	$1,700,000
Village Water System	$9,698,000
Contingency on construction costs (40%)	$8,400,000
Construction Engineering & Inspection (15%)	$3,150,000
Total Construction Costs	**$50,670,000**
Total Estimated Project Budget - 2022 Dollars (rounded)	**$58,000,000**
Total Estimated Project Budget - 2024 Dollars (rounded)	**$63,900,000**
Total Estimated Project Budget - 2027 Dollars (rounded)	**$74,000,000**

Notes:

1. *Costs are preliminary in nature and based on concept designs developed by consultant team in close coordination with representatives from the Village of Waterford.*
2. *Escalation factors used to project 2024 and 2027 cost estimates: 5.00% Annually.*
3. *Costs include construction, engineering design and construction administration, mobilization, maintenance of traffic, easements, permits, and contingencies.*
4. *Costs assume that all items will be constructed as part of a total, phased project.*

5.4 Design and Construction Considerations

During the development of the concept plans shown in this report, the study team consistently verified the feasibility of the solutions with respect to the ability to design and construct such improvements in the future, within the constraints of the physical layout of the village and the nature of the historic properties.

Given this initial analysis by the study team, future planning and design teams should consider the following design intent:

- Detailed design of traffic calming, pavements, sidewalk, stormwater, utilities, and lighting improvements needs to be done concurrently in an integrated fashion to remain consistent with the historic character of Waterford.
- Native and historically correct materials should be used.
- Traffic calming measures should be subtle, but effective.
- Pedestrian access should be a priority.
- Above-ground transformers should be placed strategically to minimize the intrusion on the historic viewsheds and to limit impacts to archaeological resources.
- The community's motto of "less is more" should be followed.
- The reconstruction of each street should take place *once*—and include:
  - Logical sequencing of street reconstruction considering erosion and sediment control, stormwater management, and the ultimate drainage system
  - Local maintenance of traffic (for lane and road closures within the village)
  - A comprehensive transportation management plan to address regional traffic, including a likely detour plan and public relations campaign for routing traffic around Waterford during construction phases (similar to the approach taken recently by the Town of Hillsboro)
  - Demolition of pavements and excavation of soils to the desired top of roadway subgrade
  - Installation of stormwater drainage pipes, culverts, and structures; water lines; and utility duct banks—all while avoiding the existing sanitary sewer system
  - Reconstruction of pavements and/or milling and overlay of existing pavements, depending on the location
  - Final activities such as installation of signs, pavement markings, and landscaping
  - Ribbon-cutting ceremony(ies)

With respect to the final design and construction, the following considerations should be made:

- Designs should be analyzed with respect to constructability. Given the concept plan for lower Main Street, for instance, temporary parking will be required to lower the pavement and construct the new roadway. Traffic will need to be managed along Main Street and in other construction areas. Long term lane closures and temporary traffic signals may be necessary to safely construct the projects.
- Noise and vibration from construction equipment will also need to be managed, given the historic structures and the close vicinity of the residences. In general, construction phasing will need to be planned in a logical sequence that minimizes disruption to the citizens of Waterford.
- Traffic calming designs should be analyzed with respect to safety. Blunt ends of any bridge parapet walls will not be allowed. The constraints of "clear zones" at the edges of the roadways (the areas that should be free

of obstructions) need to be considered when designing and installing measures such as trees and stone walls. Given the 20 mph speed limit, and the roadside trees that exist today, such constraints may be minimized.

- Placing utilities underground is typically challenging in narrow streets like those of the Village of Waterford. The future design will need to manage potential conflicts with drainage pipes, inlets, sanitary sewer, the ducts for power, communications, and any other service. Water service will be an integrated element of the project and the installation of the distribution system will need to be designed with considering the existing sanitary sewer lines, updated drainage pipes and inlets, and new dry utility duct banks.
- Current standards of design will need to be followed. If VDOT is the design approving authority, some measures may need to go through a design exception process, similar to the process that the U.S. Route 50 project (in Aldie, Middleburg, and Upperville) successfully went through many years ago and what the Town of Hillsboro experienced more recently.
- Traffic calming and other improvements need to be checked for maintainability: Edge and centerline pavers require a quality design and sound construction to not become maintenance headaches. Also, snow removal was a major consideration in the decision to not have narrow lanes through raised chokers or to not have splitters with raised medians and/or curbs. Pavers that are flush with the roadway surface will allow snow plows to more efficiently work the streets.
- Placement of transformers and switching equipment on private property will require coordination with property owners, the utility companies, and other parties. Ultimately, Dominion Energy will require easements on those properties for transformers and any underground electrical lines.
- Coordination of new underground secondary service and metering on existing properties with inherent obstacles such as pavement, wall structures, panelboard locations, etc. will be necessary. Of note will be the new electrical service (along with new potable water service) to Waterford Foundation properties for their adaptive reuse.
- Older residential panelboards may have potential problems and high fault-current values, present when utility company sets new, pad mounted transformers. Where new fault current values exceed ratings of older equipment, an additional expense of current-limiting fuses installed in service switches may be incurred. These potential challenges will have to be studied in detail during final design.
- Public area lighting for the village may require a maintenance contract with an appropriate independent vendor. The power cost may have to be paid for by the community. Should the Village of Waterford elect to use standard Dominion Energy street lighting fixtures, Dominion will handle maintenance and the cost will be based on a standard fee for this service.

5.5 Future Infrastructure Maintenance and Repair

As referenced in *Chapter 3*, the use of pavers and similar materials is intended to be contextual and consistent with Waterford's National Historic Landmark (NHL) status. However, in accordance with VDOT Instructional and Information Manual IIM-LD-218.4, VDOT will not be responsible for maintaining pavers, i.e., VDOT will not repair or replace damaged paver units or other non-standard pavement materials within the right-of-way of VDOT-maintained roadways.

Thus, maintenance of the pavers and other non-standard pavement materials for streets

and sidewalks in the Village of Waterford will need to be accomplished by Loudoun County, VDOT, or other entity or through a maintenance agreements with some type of governance established by WCA and WFI, such as an entity like a homeowners' association (which can establish agreement with VDOT to maintain landscaping or patch holes in roads). It is understood that governance is a topic of discussion with WCA and WFI as the Waterford 2033 planning continues.

5.6 Closing

As requested by Loudoun County Department of Transportation and Capital Infrastructure (DTCI), Kimley-Horn has updated the preliminary engineering study conducted in 2003, building upon the *Bury the Wires and Tame the Traffic* report and recent reports developed by Loudoun County, Loudoun Water, and other entities, resulting in this 2022 *Preserving the Landmark* report. The recommendations in this report have also been built upon input from citizens of Waterford, including recent outreach efforts by WCA and WFI in support of Waterford 2033.

The concept plans within this report represent a master plan or program of infrastructure improvements for the Village of Waterford to tame the traffic, bury the wires, fix the drainage, manage the stormwater, light the village, add potable water, and preserve this NHL. The preliminary engineering efforts should provide a basis for final design and be sufficient to support future marketing and fundraising activities. The recommendations are intended to help WCA and WFI achieve their Waterford 2033 goals related to sustainability and adaptive reuse, with the anticipated result of no adverse effect on the NHL and its contributing properties. This report is intended to lay the foundation for the next steps in implementing a comprehensive, integrated program of infrastructure improvements in the context of preserving Waterford's heritage.

The recommended program of projects will help alleviate the pressures of traffic volumes and speeds on the historic resources in the village as well as ensure Waterford remains unique in the national context. These projects also will improve infrastructure to support Waterford 2033 goals related to sustainability and adaptive reuse, all with the anticipated result of no adverse effect on the NHL and its contributing properties.

"The campaign to restore, designate, and protect the historic village of Waterford is nationally significant as an important example of a sustained and innovative private preservation effort to secure and conserve a comprehensive village landscape. Waterford's remarkably intact village architecture and expansive agricultural setting survives with such high integrity due to this multipronged and intensive campaign that employed emerging preservation approaches and a diverse set of preservation tools. Spearheaded by private citizens and the community non-profit Waterford Foundation, this decades-long collaborative effort represents a laboratory for experimental preservation strategies and has resulted in the conservation of a living landscape where the majority of properties, unlike in a museum restoration, have remained in private ownership."

—2022 National Park Service Updated Waterford National Historic Landmark Study

Appendices

Appendix A: Reference Documents

"Preserving the Landmark"
Infrastructure Improvements Master Plan
Village of Waterford, VA

APPENDIX A

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Appendix B: Timeline of Waterford Traffic Calming Efforts Since 2003

"Preserving the Landmark"
Infrastructure Improvements Master Plan
Village of Waterford, VA

APPENDIX B

TIMELINE OF WATERFORD TRAFFIC CALMING EFFORTS SINCE 2003

January 15, 2008 – The Waterford Citizens' Association ("WCA") prepared a conceptual traffic calming plan that was reviewed by the Loudoun County Office of Transportation Service and the Virginia Department of Transportation (VDOT). One conclusion: Increased regional development has created a steady growth of traffic volume and increase in traffic speed through the Village roadways that threaten the historic landscape. More than 75 percent of the total occupied households within the Waterford area signed a petition requesting authorization from Loudoun County and VDOT to implement the plan, including Phase I improvements. VDOT agreed to assist the WCA by implementing Phase I of the plan using discretionary funds from VDOT's Secondary Road Fund for Loudoun County.

July 13, 2015 – WCA approached Catoctin District Supervisor with concerns including: The volume of traffic commuting through Waterford twice a day is jeopardizing historic preservation efforts, and that the Village's quiet character has become a noisy, unsafe and busy commuter's thoroughfare during the morning and afternoon rush hours.

July 17, 2015 – Preliminary traffic counts taken on a Friday in July show that rush hour traffic numbers passing non-stop through the main village intersection were recorded on average as 210 vehicles per hour in the AM and 335 vehicles per hour in the PM. Peak volume in the afternoon was 366 vehicles per hour.

August 12, 2015 – WCA requested assistance from VDOT and the County to address vehicular speeding and cut-through traffic in the Village. Determined the best approach to do so would be through VDOT's Residential Cut-Through program.

December 2, 2015 - Vice Chairman Buona moved that the Board of Supervisors direct staff to identify cost and funding sources for the completion of a traffic study in the Village.

June 23, 2016 - Vice Chairman Buona moved that the Board of Supervisors direct staff to proceed with the completion of the traffic study within the Village of Waterford. Vice Chairman Buona further moved that the Board of Supervisors authorize staff to execute a budget adjustment to transfer $82,500 from the Project Management Consulting Services account in the Capital Fund to a project specific account for this project. County was required to submit a formal resolution and supporting data (recommended traffic study) to be included with the County's request for consideration under VDOT's Residential Cut-Through program.

May 2018 – Village of Waterford Cut Through Traffic Study

This document investigated the required information set forth by VDOT's cut-through policy to initiate a study for the Village of Waterford and explored vehicle speeds within the Village. The information for VDOT review included a primary use area, roadway classifications of all roadways in the associated

primary use area, a community petition, minimum vehicular volume of cut-through vehicles, and potential alternative routes for cut-through traffic. This study presented this information, except for an official community petition, which at the time of the document, the County was working with the community to complete the petition.

The threshold of 150 cut-through vehicles and 40% cut-through traffic was met for one hour through the Village of Waterford in the northbound direction. Several alternative improvements, including new alignments, were identified. These alternatives include signing and enforcement on local streets, time-based roadway restrictions and enforcement, cul-de-sac Factory Street, and a new road alignment (bypass). Additionally, Loudoun County identified funds for the design of a roundabout at the intersection of Route 9 and Route 287 in the County's Capital Improvement Program (CIP). The roundabout could significantly reduce delays and improve travel times on Route 287 and Route 9, thereby eliminating the need for motorists to divert through the Village. Following completion of the roundabout, cut-through traffic volumes through the Village could be reassessed.

A vehicle speed analysis was conducted using 24-hour speed count in November 2016 to determine vehicle speed issues in the Village. Through the speed count, it was concluded that the 85th percentile speeds may qualify High Street, Loyalty Road, Water Street, and Clarkes Gap Road for additional traffic calming measures. No additional traffic calming measures were recommended.

May 30, 2018 – Meeting held by Loudoun County Department of Transportation and Capital Infrastructure (DTCI) to discuss the results of the study and remediation measures including short, medium, and long-term solutions.

April 4, 2019 – WCA sent the Waterford Traffic Reduction Counterproposal to representatives of the County and VDOT.

July 2019 – DTCI held meeting with WCA and VDOT to gain context on the matters highlighted in the counterproposal. Since traffic data had been collected in 2016, participants agreed new traffic data was needed to better assess current speed/volume conditions.

October 10, 2019 – DTCI collected traffic and speed data at seven locations in and around the Village. The locations on Clarkes Gap Road, Loyalty Road, and First Street, met the criteria for the installation of traffic calming measures.

October 25, 2019 – DTCI met with VDOT to discuss the proposed installation of three pole-mounted speed display (PMSD) signs on Loyalty Road, Clarkes Gap Road, and First Street, and received VDOT's concurrence.

October 30, 2019 – DTCI held a meeting with WCA and VDOT to discuss the speed study results and the proposed installation of PMSD signs. WCA expressed support of its installation as an interim solution and further investigation of other traffic calming options.

January 21, 2020 – Board of Supervisors Business Meeting – DTCI recommended that the Board of Supervisors authorize the installation of PMSD signs on Loyalty Road, Clarkes Gap Road, and First Street as an interim calming measure in the Village. Staff was also directed to review the viability of other traffic calming measures such as a bypass, chicanes, and chokers at the three entry points of the Village.

April 2020 - A notice to proceed was issued to Loudoun County's consultant to complete the viability review through a study entitled Village of Waterford Traffic Calming and Byway Assessment.

May 18, 2020 (Interim Traffic Management Measure) – Through coordination between VDOT, Loudoun County DTCI, and WCA, three PMSD signs capable of storing speed data were installed along the village's entry points. Signs indicating a $200 fine were also installed in May 2020.

July 15, 2020 – DTCI met with VDOT to review and obtain their feedback on draft conceptual drawings depicting the various potential traffic calming measures for mid- and long-term solutions.

August 6, 2020 – VDOT and DTCI presented conceptual drawings to Catoctin District Supervisor's Office and Loudoun County Sherriff's Office.

December 2, 2020 – DTCI received additional comments from VDOT on concept drawings.

January 14, 2021 – Study team briefed Catoctin District Supervisor's Office on study findings and viability of other traffic calming measures, including a byway option

January 28, 2021 – WCA sent letter to VDOT requesting their assistance to address vehicular speeding and reduce cut-through traffic in the village and proposed various innovative solutions for their consideration.

March 17, 2021 – Village of Waterford Traffic Calming and Byway Assessment (Draft Report)

Three potential mid-term traffic calming treatments were investigated for each of the roadways leading into the village (Loyalty Road, Clarkes Gap Road, and First Street): chicanes, chokers, and splitter islands. Five locations for potential treatments were identified that would minimize impacts to residential ROW and impacts to the environmental and historic constraints. The results concluded that none of the concepts are expected to reduce traffic volumes; however, FHWA data from 2014 suggests that chicanes may reduce vehicle operating speeds by approximately 3 to 9 MPH and chokers may reduce vehicle operating speeds by approximately 1 to 4 MPH. FHWA data also shows that splitter islands commonly reduce vehicle speeds by approximately 2 to 3 MPH; however, data from ITE suggests that there is no significant impact of vehicles speeds beyond the island.

Four areas were also reviewed for a potential byway around the Village as directed by Loudoun County Board of Supervisors: two options west of the Village, and two options east of the Village. The options inside the National Historic Landmark District have the lowest costs and the least impacts to environmental constraints in the area. The byway options outside of the National Historic District would offer more travel time savings versus traveling through the village as it was assumed that vehicles would travel at higher speeds along a potential byway than along the roadways within and leading to the village. For the potential byway areas outside of the National Historic District, there are more acres of environmental constraints as these options would require the byway to span a greater distance and would require more right-of-way. At the time this report was written, a potential byway around the village was not included in the Loudoun Countywide Transportation Plan or the Loudoun County Comprehensive Plan.

April 15, 2021 – Village of Waterford Presentation

Loudoun County DTCI reviewed the viability of traffic calming measures such as chicanes and chokers at the three entry points of the village and the viability of a bypass (or byway). The presentation discussed existing signage and traffic calming measures present within the village which included a reduction in speed limit to 20 MPH throughout the village, installation of all-way stop signs, installation of "Speeding – Additional $200 Fine" signs, and pole-mounted speed display signs installed at three entry points to the Village. There are several budgeted projects that may relieve cut-through traffic within the village including a new roundabout at the intersection of Route 287 and Route 9, Route 7 roadway widening with interchange improvements, and Route 15 widening with intersection improvements.

May 2021 – Village of Waterford Traffic Calming and Byway Assessment – Final report submitted to DTCI.

June 7, 2021 - VDOT acknowledged receipt of the January 28, 2021 letter and deferred to the Village of Waterford Traffic Calming and Byway Assessment study developed by County.

June 9, 2021 – WCA met with DTCI staff, VDOT, and a Commonwealth Transportation Board (CTB) member to discuss status of response to January 28, 2021 letter. WCA requested that chokers be installed at each of the three village entryways, that additional signs be installed, and that the County complete a walkability study for the village.

July 20, 2021 – Board of Supervisors Meeting

Supervisor Kershner moved that the Board of Supervisors direct staff to forward a project of three mid-term traffic calming measures to include Clarkes Gap Road, Old Wheatland Road, and Loyalty Road for the FY 2023 CIP deliberations. He also moved that the Board of Supervisors direct staff to continue work with VDOT to consider additional interim solutions, such as those recommended by the WCA and other public comments received during the study. The Board directed staff to move forward with a pilot implementation project on Clarkes Gap Road for a full choker traffic calming device to the FY 2023 CIP deliberations and request that DTCI monitor speed, traffic volume, and crash data at the vicinity of the pilot project before and after installation and report back to the board with findings. The Board also directed staff to periodically monitor vehicular movements while planned regional transportation improvements, which can be expected to reduce cut-through traffic in the Village, are being constructed and reassess traffic conditions after these improvement projects are completed.

Appendix C: Essays on Waterford's History

HISTORIC WATERFORD, VIRGINIA
An Overview

by
Phillip E. Pendleton, Architectural Historian
The Louis Berger Group, Inc.
March 2003

The Early Years

The remarkably well preserved rural village of Waterford received its first settlers in about 1733. The initial homesteaders were Quakers of English background from Bucks County, Pennsylvania. Waterford is situated between a relatively steep bluff slope and the South Fork of the Catoctin Creek, its houses and other buildings hugging the sides of the bluff and of a broad gully that dissects the village area. This topography provided a good run of quickly descending water and so presented a suitable site for a grain mill and a sawmill, which were soon established by the Janney family, the first settlers, in the vicinity of the extant circa 1820 mill building. The land around Waterford was well adapted for the growing of wheat, which could be made into flour at Janney's mill. Wheat was a crop for which the colonial Pennsylvanians already well understood the methods of cultivation, harvesting and storage, while wheat flour was the commodity that formed the agricultural engine of the Mid-Atlantic region's great rural prosperity in the eighteenth and early nineteenth centuries. By 1741, as other Quakers from the Delaware Valley region moved in next to the Janneys, settling the larger area surrounding the Waterford site, there was a need for a Friends meetinghouse, and one was constructed of log in that year. The log meetinghouse was replaced with a two-story one built of stone masonry in 1761 (Waterford Foundation 2001; Land Ethics and Dodson Associates 1992:20-24).

Growth of the Village

The hamlet that would become Waterford evidently began to coalesce around the middle of the eighteenth century, as the holders of large tracts made deals on a gradual, piecemeal basis to create small properties for craftsmen and others who were drawn by the presence of the mill and the meetinghouse. This was a common pattern for the initial development of backcountry urban places in early America. If Waterford were typical, one of the first to purchase a village plot was an inn- or tavernkeeper, thereby realizing the classic triumvirate of mill, tavern and house of worship. The first subdivision of a tract to provide a group of lots, made to facilitate the growth of the village, was undertaken in 1792. As additional lot divisions took place in 1800 and 1812, Waterford practically attained its present spatial configuration within a few decades of the beginning of its development as an urban place. Thus the village today represents an instance of the preservation of an early-nineteenth-century community that, at least in this aspect of geographical extent, is rather extraordinary for this country. Waterford's inhabitants obtained a charter via legislative action of the Virginia Assembly in 1801, and in 1811 Waterford was incorporated as a town, complete with a governing council (Waterford Foundation 2001; Land Ethics and Dodson Associates 1992:25, 33; Lewis 1980:1).

In the 1810s, Waterford was also entering its halcyon age, becoming a local center of some importance for retail commerce and the artisanal crafts such as blacksmithing and coopering that were essential to the rural economy. The relationship between the inhabitants of the village and their neighbors in the surrounding countryside was necessarily a close one; in fact, some village dwellers cultivated land and raised livestock on farmsteads that they owned nearby. The Federal Census of 1810 recorded 43 households dwelling in the village. Waterford was described in 1834 as a village inhabited by approximately 400 people living in about seventy dwellings. There was a tannery, a chairmaking shop and a workshop manufacturing boots and shoes. Waterford's surviving assemblage of historic architecture includes approximately 57 major buildings dating before 1834, about 51 of these having been dwellings during the early period. This high proportion of surviving houses, about 73%, shows just how truly intact the village is, with reference to its architectural character as it completed its formative stage of the early nineteenth century (Waterford Foundation 2001; Virginia Historic Landmarks Commission 1969; Land Ethics and Dodson Associates 1992:33).

As the village grew in the final years of the eighteenth century and the early decades of the next century, more Quaker families came from Pennsylvania, along with Ulster Scots and people of German cultural heritage who adhered to the Presbyterian and Lutheran churches respectively. Baptists and Methodists also came, from eastern Virginia and elsewhere. An interesting aspect of local life was the presence by the late eighteenth century of a substantial proportion of free African-Americans among the local population, as well as slaves. In 1830, free black people, who were frequently craftsmen in early-nineteenth-century Virginia, made up a full quarter of the village's heads of household. Such a large proportion of free blacks was unusual among the state's communities, especially in a rural setting (Waterford Foundation 2001; Virginia Historic Landmarks Commission 1969).

From the time of initial settlement onward, due to the Pennsylvania influence among Waterford's inhabitants, the vernacular architectural landscape was characterized by a mingling of building forms associated with the Delaware Valley and Chesapeake regions. Brick masonry construction, with the principal or front façade of a building typically laid up in the more expensive Flemish bond during the eighteenth and early nineteenth centuries, was known in the Delaware Valley in that era but was more common in Virginia. Waterford's early brick buildings frequently present well expressed Federal-style detail including jack arches over the window openings and molded cornices and entry architraves. The Pennsylvania architectural tradition can be seen in the corner-notched log and fully developed stone masonry construction techniques. For each of these methods, there are a half-dozen or so specimens that survive from the settlement's early decades (Waterford Foundation 2001).

The Pennsylvania vernacular influence in Waterford can also be detected in the embankment siting that is represented by many examples due to the sloping topography. Especially common in early southeastern and south-central Pennsylvania, the practice of building on an embanked site enabled a house design incorporating two primary entries, each providing access to a discrete section of the house. The entry on the cellar or basement level led into the part of the house where the kitchen and the food storage area were commonly located, a

place of heavy work in that era. In a commercial and service village such as Waterford, this would generally also be the location of the store or workshop space. The first-story entry, which might be located on a different elevation (i.e., face of the building) than the basement entry, or might be situated above the basement entry with access via a porch, led into the house's formal space and typically boasted a more decorative design for its woodwork (Waterford Foundation 2001).

In 1860, on the eve of the Civil War, Waterford enjoyed the status of Loudoun County's second largest town, serving as the commercial and service center for the northern quarter of the county. The censustaker in that year found the village to be home to seven merchants as well as blacksmiths, tailors, shoemakers, cabinetmakers, saddlers, a confectioner, a tinsmith, and an ambrotypist (the ambrotype being an early variant of the photographic process), and several proprietors of hotels and taverns (Land Ethics and Dodson Associates 1992:34).

The War Years

The war, which ran 1861-1865, had a major impact on Waterford, cutting short the village's continued development as a business center and exacting a heavy material and emotional toll on local families and their properties. Many would never recover. The local inhabitants descended from Pennsylvania families tended to the Unionist side in their convictions, although many of these, as staunch Quakers, were pacifists. There were also many pro-Confederate inhabitants in and around the village. Some of the local Unionists went northward, while others, led by miller Samuel Means, formed a partisan military organization, the Loudoun Rangers. Mustered in as a regular Union Army unit consisting of two companies in June 1862, the Loudoun Rangers operated as an independent command, frequently fighting against Confederate partisans native to northern Virginia, including the battalion led by the noted cavalryman John Singleton Mosby. An extended gunfight between the Loudoun Rangers and Confederate troopers commanded by Elijah White took place in and around the Waterford Baptist Church in August 1862, and several other small but sharp incursions were made on Waterford Unionists by the Confederate partisans. Situated amidst a larger area that endured three or more devastating years as a sort of "no man's land," Waterford apparently enjoyed an intermittent status as a Unionist enclave. Three young women of the village, Sarah Ann Steer and sisters Lida and Lizzie Dutton, ran a pro-Union newspaper, the *Waterford News* (Waterford Foundation 2001; Land Ethics and Dodson Associates 1992:34).

Local families on both sides of the political divide suffered severely from exactions made on livestock and supplies by military commissaries and passing army units, and from the depredations of individual marauders. In November 1864, war's heavy hand fell on many Loudoun Valley farmsteads and mills as Union Army authorities determined on laying the area waste to deprive Mosby and his men of subsistence. The Northern troops seized livestock, destroyed crops, and burned some 230 barns and 8 mills in the valley, many of these properties located in and around Waterford. Perhaps apologies were expressed in the many instances in which the troops knowingly put Unionist property to the torch (Waterford Foundation 2001; Land Ethics and Dodson Associates 1992:34).

War's Aftermath: Waterford's "Rip Van Winkle" Period

In the years following the war, although community life continued, Waterford was not able to regain its earlier vitality. Many former neighborhood families had spent the war years in Northern states. Some returned but others, pausing to consider the unpromising economic outlook in Virginia and the potential for rancor with the ex-Confederates in the Waterford vicinity, departed for the Midwest or remained where they were in the North. On the other hand, an element in Waterford's population that made a definite effort to persevere on their home ground consisted of the African-American residents. The village's surviving buildings dating to the period between 1865 and 1900 include three that were constructed for institutions created by local black people to enhance and reinforce their community life. These properties include the Second Street School, which had 38 pupils when it opened in 1869, the John Wesley Church, built for the African Methodists in 1891, and the Odd Fellows Hall, constructed for a black fraternal organization in 1893. There are also at least three surviving historic dwellings that are known to have been built for African-Americans during this period, as well as other older houses that were owned by black families at that time. The 1910 Federal Census counted six African-Americans who owned their own farmsteads in and around Waterford (Waterford Foundation 2001; Land Ethics and Dodson Associates 1992:26).

Waterford's return to prosperity was hampered considerably in the 1870s when railroad developers passed the village by. As the late nineteenth century and the opening years of the twentieth proceeded, the rising surge of factory-made goods that characterized the national scene made it increasingly difficult for the small-scale artisan to continue to operate. This was the sort of workshop producer that had made up much of Waterford's population. The trend toward mass production resulted in the gradual closing down of businesses and moving away of families in Waterford, as it did in villages and small towns elsewhere in the eastern United States. For decades, local country people continued to patronize Waterford businesses, although they were also strongly drawn to do business in villages served by the railroads, where goods were more readily available. Purcellville, which received the rail line, in a sense took over the economic and geographic role that Waterford had once filled. The decline in the village's volume of business as a commercial and service center took place at a rate that was very slow, but certain (Waterford Foundation 2001; Land Ethics and Dodson Associates 1992:34-36).

For Waterford, the Great Depression years of the 1930s seem to have represented a cloud with a silver lining. The village had already touched bottom in terms of population level and economic wherewithal, a situation that received belated recognition in 1936, when the community lost its incorporation as a town because it was unable to meet the expenses of town government. A perhaps somewhat ironic aspect of the community's decades of decline and neglect was that the surviving building stock was in an impressive state of preservation in the sense that properties had escaped modification. The people with adequate funds had largely been absent, and so for the most part houses had not been altered and updated to conform with changing patterns in lifeways, or torn down to make way for new houses. The proportion of construction surviving in Waterford that dates to the period between 1865 and

1930, numbering about 35 of the approximately 108 major buildings of historic age[1] in town, or 32%, is probably much lower than is typical for the older communities of the eastern United States. In addition to a number of typically plain examples of the regional vernacular from that period, Waterford's buildings from those years include some interesting, relatively small-scale specimens of Victorian commercial vernacular architecture, and a handful of buildings that nicely express the influence of the Queen Anne and the Colonial Revival styles (Waterford Foundation 2001).

The Preservation Renaissance

When the newly formed Historic American Buildings Survey carried out a program of photodocumentation for Waterford's architectural treasures in 1937, the agency was endorsing a recognition the place was already receiving as an extraordinarily intact rural village of an earlier era. The national movement for historic preservation had enjoyed a new burst of vigor in the 1920s, and there had been a related resurgence of the American upper-middle-class family's impulse to "return to the land." In the1930s, as a local expression of these trends, new people from Washington and its environs had begun trickling into the Waterford neighborhood in hopes of enjoying the fresh country air and a slower-paced life. Many of these families chose to renovate existed houses in the village. The roads in Waterford were paved for the first time in 1936, perhaps as a result of the renewed attention (Waterford Foundation 2001; Land Ethics and Dodson Associates 1992:34).

By the later years of the 1930s, several local families were increasingly devoting their time and resources to the protection and promotion of Waterford's historic physical character. These efforts attained a concrete organizational form with the establishment of the Waterford Foundation in 1943. The foundation's mission was to "revive and stimulate a community interest in recreating the town of Waterford as it existed in previous times with its varying crafts and activities." An arts and craft exhibition was organized for October 1944—the Waterford Fair has been an autumn tradition ever since. In 1970, the village became a National Historic Landmark, in effect a member of the elite upper tier of National Register resources. The NHL boundary extends to encompass the farmstead properties immediately surrounding the village (Waterford Foundation 2001).

The last third of a century has seen ever mounting developmental pressure on the vicinity of the village as the northern Virginia suburban region has continued to experience a high rate of growth in housing and commercial properties. In 1974, the Waterford Foundation responded to this threat to the village's historic integrity with a program of easements designed to protect historic properties from inappropriate change. As of 2001, there were 68 such easements in place within the village's National Historic Landmark area (Waterford Foundation 2001).

[1] "Historic age" refers to the National Park Service age criterion for National Register eligibility, which directs that an eligible property be more than 50 years of age, unless it demonstrates exceptional historic or architectural significance.

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Waterford's Significance

Phillip E. Pendleton, Architectural Historian
The Louis Berger Group, Inc.
June 2003

In the America of the early 21st century, Waterford clearly represents a place apart. A National Historic Landmark since 1970, Waterford began attracting special notice from preservationists for its character as an unspoiled rural village during the 1930s. A fairly comprehensive photographic study was compiled by the Historic American Buildings Survey, the Federal agency charged with the documentation of architectural resources of outstanding historic value, in 1937. Local citizens, recognizing their community's nature as a treasure piece of historic landscape and regional vernacular architecture, founded the Waterford Foundation in 1943 to ensure the protection of this rich heritage. There are approximately 2,200 National Historic Landmarks in the United States, places that have been officially recognized as bearing exceptional significance in regard to the physical representation of American history.

Waterford today is almost unique in the eastern United States. It is so significant to our national cultural legacy as to merit the elevated status of National Historic Landmark, for the thoroughness with which the visual demarcation between the 19th–century village as an urban place and the surrounding countryside of farmsteads, pastures, and fields has persisted. There may be automobiles in the village, there may be power lines, there may be some modern dwellings (well designed to blend in with the old architecture for the most part), because Waterford is a lived-in, modern community—but, due to the absence of quick-stop stores and other elements of today's standard small town's periphery, the nature of the place as a village that evolved during the early 1800s is readily visible to the resident or visitor. In this sense, Waterford may present the opportunity for greater insight, or certainly a different sort of insight, into the look and feel of an historic community than that offered by a museum village such as Colonial Williamsburg or Old Sturbridge Village, where the visual character of the landscape is in some measure contrived. Walk a piece along one of the three "gateway" roads that lead into and out from the village, and you can gather an impression of the closely intertwined social and economic connections between village and surrounding countryside that must have characterized the past life of the community.

In addition to the historic spatial pattern of the settlement, with Waterford's configuration of constituent lots practically the same as it was in 1812, the historic architecture itself is impressively intact—about three quarters of the houses that stood in 1834 are still standing. Only a few of America's communities that old could make such a claim. Waterford's body of early architecture represents a fairly broad spectrum of the design forms, construction techniques, and decorative elements seen in the vicinity during the early 1800s, and exhibit the intriguing, and very American, mingling of Pennsylvania and Virginia vernacular architectural traditions that occurred during that time in this part of northern Virginia. Waterford's buildings dating to the late 19th and early 20th centuries, which bear testimony to the effort to regain the town's vitality following the Civil War, are also of interest as examples of a variety of styles and forms from that period. Especially noteworthy are the

village's many institutional and commercial buildings that date to the full span of Waterford's history and that so well embody and express the historic life of the community, including churches, schools, mills, stores and workshops.

In the case of Waterford, the "historic life of the community" has apparently been one of considerable texture and variation. As the historian or archaeologist studies the small communities of America's past, and considers them within the context of the larger cultural region or group of inhabitants, he or she not infrequently has to remark upon the exceptionality of a given place or neighborhood, a community whose history does not fit right into the general pattern of the broader area around it. This departure from the predominant regional pattern demands recognition as a prominent phenomenon in American history, with Waterford as a striking example. Waterford's exceptionality was there from the commencement, when Friends or Quakers from southeastern Pennsylvania initiated the local settlement in 1733, and continued as the town evolved during the early to mid 1800s.

A preservationist writing in 1992 described how the village's integrity, i.e., its retention of the physical characteristics that make it historically significant, enable Waterford to exemplify its historic development as a rural community based on grain milling and other services and institutional functions that the village inhabitants provided for the surrounding farming neighborhood. The topography of the landscape, which facilitated the waterpower necessary to run mills and which was also located amidst a larger area that was well suited to the cultivation of grains including wheat, is expressed as well in the placement of roads and buildings, and in the pattern of agricultural land use. This pattern on the land is there to be traced, seen also in archaeological resources and ruins, and in fences, hedgerows, plantings and other landscape elements. But, as the writer put it, "Waterford is a unique, non-renewable resource—once changed, it will be lost forever." The exurban residential development, currently tending toward a transformation of the rural landscape in much of the village's larger vicinity, poses an ongoing, omnipresent threat.

FARM, MILL, AND MARKET
An Introduction to the Transportation History of Waterford, Virginia

Memo for FHWA by John Souder, Waterford Resident
February 2003

For a variety of reasons, federal, state, and local government agencies have all deemed the Waterford National Historic Landmark District an important resource worth preserving. This overview summarizes aspects of the district relating to transportation history.

In brief, the district encompasses an early road network that was put in place in the 18th century primarily to transport cereal grains from surrounding farms to a water-powered mill and to ship the resulting flour to distant markets. Since then, the only change to that network has been a small grid of streets that was laid out shortly after 1800 to serve the village that grew up around the mill. What exists today is an intact, documentable example of a colonial-era transportation system radiating from a mill that, in turn, attracted a variety of other support services typical of a self-sufficient early American farming community. Because there have been so few modern intrusions into this landscape, the early history is readily apparent to visitors.

The essential details of that history are as follows:

In 1733 and 1740 two Quaker brothers-in-law from Bucks County, Pennsylvania, purchased from colonial land speculators two adjacent parcels in the Loudoun Valley of Virginia totaling 703 acres. Those empty acres would became the core of the Waterford Historic Landmark District.

Except for a handful of German settlers who had preceded the two Quakers by just a few years, the valley was essentially unpopulated. The native Americans had been pushed west of the Blue Ridge Mountains by the Treaty of Albany, concluded in 1722. There was no village and no roads other than rough trails.

The first of these Quakers to arrive, Amos Janney, was a farmer, surveyor, and entrepreneur. Recognizing the power potential of Catoctin Creek and Balls Run, which flowed through his land, Janney promptly built a small mill to process his grain and that of other Quaker farmers who arrived in increasing numbers through the 1760s.

At about the same time, in 1748, the colonial government in Williamsburg enacted legislation providing that "the several county courts of this dominion have, and shall have power, by their order, from time to time, to direct the alteration of public roads already made,

> "The German, Scotch-Irish, and Quaker immigrants from Pennsylvania were accustomed to growing grain . . . their settling of Upper Loudoun 1735-1775 coincided with a renewed interest in the growing of wheat to meet the increased demands of the British market."
>
> *Helen Hirst Marsh, "Early Loudoun Water Mills," reprinted in Loudoun Historical Society Bulletin, 1997.*

or hereafter to be made . . . in such places as to them shall seem convenient, for passing to, and from . . . the court house of every county, the parish churches, and all public mills, and ferries."[1]

Amos Janney died in 1747, but his son Mahlon Janney by the early 1760s expanded and modernized his father's mill. His mill dam, millrace, and mill building still exist.

> "Stores and other accouterments of town life often evolved where a mill or church had been established during the colonial era. For example, towns emerged around the establishment of mills at Aldie and Waterford."
>
> Charles P. Poland, Jr., *From Frontier to Suburbia*, Walsworth Publishing Company, Marceline, Missouri, 1976, p. 69.

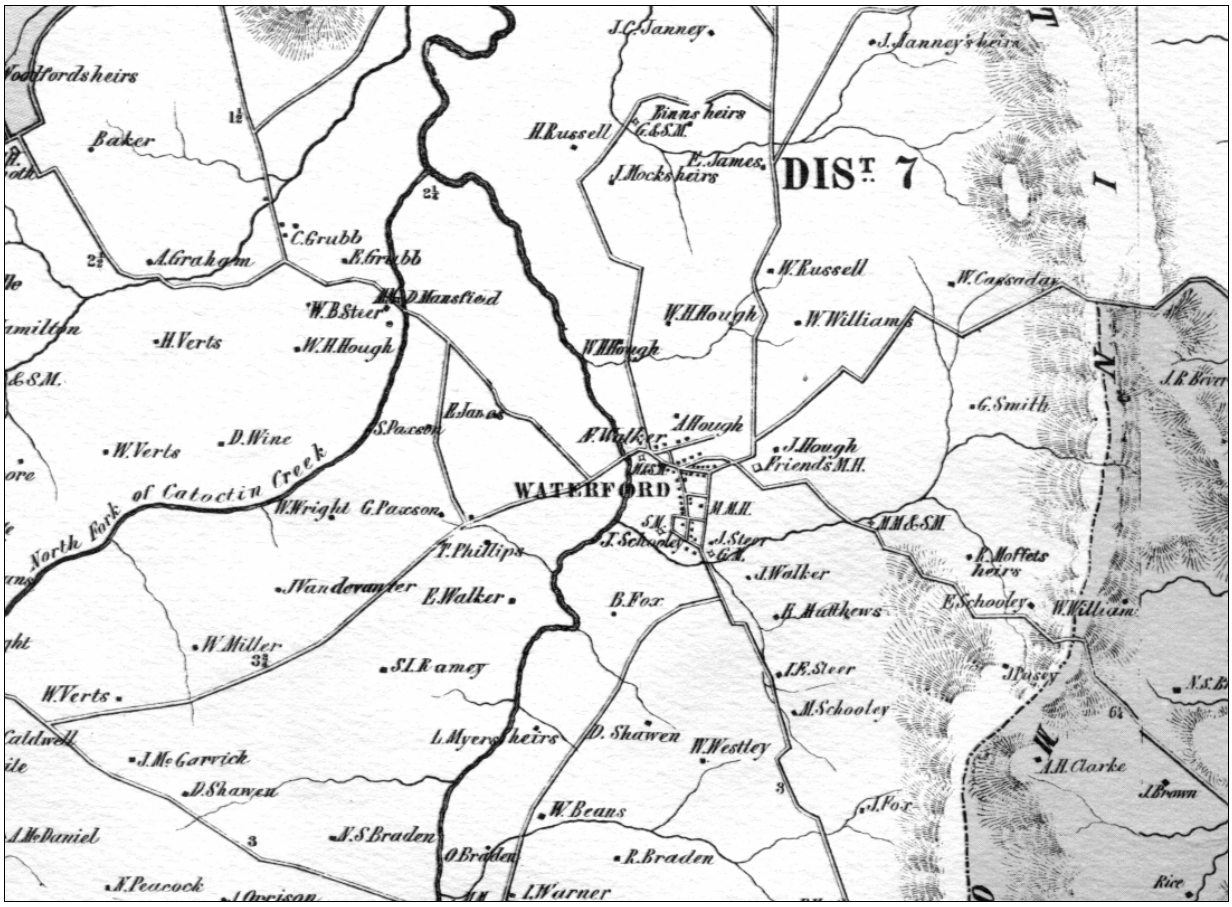
From the beginning, the mill was the commercial center of a farming area several miles in radius. It is clear from early deed records that roads developed quickly as spokes of a wheel with the mill as the hub. The settlement that grew up around that hub was called simply "Janney's Mill." It appears as such in early road petitions. In 1762, for example, the county court appointed four men "to site a new Road from Jenny's [Janney's] Mill into the main Road leading from Leesburgh to Clapham's & Noland's Ferries" on the Potomac River.[2] These ferries offered access to the port of Baltimore, an early and important market for Loudoun Valley farmers.

A few years later petitioners were seeking better access *to* the mill.

> To the Worshipfull court of Loudoun
> Gentlemen
> We your petitioners Humbly sheweth that we labour under Great difficulty for want of a Road leading to Mahlon Janneys Mill through our settlement. We therefore Pray your Worships to order a Road to be laid out & Opened through our Settlement the most convenient & Beste way to said Mill.
>
> *Loudoun County Road Case #46, March 1774*

The village was finally renamed "Waterford" around 1790. By then the Loudoun Valley and adjacent areas across the Potomac River in Maryland had become famous as the "breadbasket of the Revolution."[3] In those years large quantities of grain flowed through Waterford to be ground into flour and shipped to markets along the eastern seaboard and beyond to Europe and the Caribbean. The principal routes ran north to the river (Rts. 662, 665 and 681) and south (Rt. 662) through the county seat of Leesburg and thence to Georgetown and Alexandria.

[1] William W. Henning, ed., *Statutes at Large, Being a Collection of All the Laws of Virginia*, Samuel Pleasants, Richmond, 1819-23, Vol. VI, p. 64.
[2] Loudoun County Court Order Book A, p. 622.
[3] Asa Moore Janney, Loudoun County historian, videotaped interview, 2000.



In the early 1817 Robert Braden purchased the Waterford mill. The following year he and another Waterford businessman, Asa Moore, were co-directors of a company formed to "turnpike" the road to the nearest ports.[4]

The mill business continued to drive local road improvements. One priority was the bridging of Catoctin Creek just a block from the mill. In poor weather, the lack of a bridge blocked passage to and from the northern part of the county. In the 1830s the mill owner at that time, Thomas Phillips, headed a successful petition drive for such a bridge. The resulting covered bridge served for more than 50 years until it was swept away at the time of the Great Johnstown Flood. (The present bridge is the fourth on the site. The design of the original wooden bridge as well as photographs of a later steel truss bridge survive.)

Notice.

PROPOSALS for turnpiking the road from Leesburg to Alexandria & George Town as authorised by law will be received, addressed to either of the subscribers, until Tuesday the 24th day of June next Persons desirous of undertaking any part of the road, will be shewn the ground, and the location of said road by applying to Samuel Carr or John Littlejohn, in Leesburg.

JOHN LITTLEJOHN, *Pres't.*
ASA MOORE,
ROBT. BRADEN,
—— SMITH,
A. MAINS,
Directors.
SAMUEL CARR, *Secretary.*

May 20.—[3w.

[4] *Genius of Liberty*, Leesburg, Virginia, May 20, 1818.

Thomas Phillips also spearheaded other transportation initiatives, not all of them as successful, to improve access to and from his mill. In the 1830s he received state approval to construct a railroad from the mouth of Catoctin Creek on the Potomac south through the Loudoun Valley to the town of Upperville in neighboring Fauquier County.[5] There was also talk of a canal linking Waterford to the Potomac. Neither project got off the ground.

The Waterford area *c.*1850. An extensive road network radiates from the mill village, serving the surrounding Loudoun Valley, including the farmers whose names appear. The Potomac River lies a few miles to the north and east of Waterford. All of the roads were in place before 1800.

At the outbreak of the Civil War in 1861, the Waterford mill remained one of the most important in the county, and its owner, Samuel Means, was one of the county's wealthier citizens. He maintained several teams of horses and wagons to ship flour and other goods up to and across the Potomac at Point of Rocks, Maryland, where he owned warehouses and where the mill's output was transferred to the B&O Railroad or C&O Canal for delivery to Baltimore and Washington.

The Waterford Mill and its race, 1905

Six-horse team and wagon at the mill, early 1900s

[5] *Ibid.*, January 17 & 24, 1835.

Miller Means, incidentally, figured prominently in Waterford's Civil War history. When he refused to throw in with the Confederacy, the rebels sacked his mill and confiscated his horses. In response, Means raised a Union cavalry battalion from among his north Loudoun neighbors. He had a direct commission from Secretary of War Stanton. His Independent Loudoun Virginia Rangers were one of the only organized units in what is now Virginia to fight for the North. Unfortunately, Means's commercial losses from the war and his poisoned relations with pro-Confederate farmers left him ruined after the war.

Ironically, modern transportation eventually doomed Waterford's mill-based economy. The railroad that finally came to the Loudoun Valley in the 1870s bypassed the village. Farmers and other local producers and consumers increasingly looked elsewhere for milling services, and the great grain-producing areas of the Midwest undercut the market for locally-produced flour. Loudoun farmers shifted the basis of their economy to dairy operations.

But Waterford's stagnation and decline had a silver lining. Because the mill and other commercial and residential buildings were no longer worth expanding—or even demolishing for new enterprises, the village's past was almost perfectly preserved. That unique state of preservation was the basis of Waterford's designation as a National Historic Landmark District.

All parties to that designation agree that preservation of the agricultural setting of the village—not just its buildings—is critical to its continued historic significance. That significance, as this memorandum has argued, includes an unaltered transportation network centered on the mill.

One farm, in particular, dominates the western portion of the Landmark. That property is now on the market and slated for the maximum of residential housing that county zoning permits. This property adjoins the mill and encompasses the mill dam and pond on Catoctin Creek and much of the mile-long millrace. For many of the years between 1740 and the present, the owner of the mill has also owned much, if not all, of the farm. These men include Amos and Mahlon Janney and Thomas Phillips. The farm, in fact, remained in the Phillips family until the 1950s.

Loss of the farm to development—with inevitable "improvements" to adjacent Virginia Scenic Byways—would destroy for visitors and the traveling public the 250-year-old visual connection between the mill, the village, and the transportation network that grew up around them.

Endangered Waterford National Historic Landmark
Written by Tony Horwitz, 2003

The 1969 nomination of Waterford, Virginia, as a National Historic Landmark stated: "A major factor in Waterford's character is the unspoiled open rolling landscape which surrounds the village and enhances its integrity." Now that landscape is under threat. The 144-acre farm that enfolds Waterford and defines its rural heritage has been sold to a real estate company. If the company proceeds with its plans to build fourteen homes on the property—ten percent of the entire acreage within the Historic Landmark—Waterford could lose its national heritage status.

The threatened acreage, Phillips Farm, frames the village with a pastoral expanse of field, stream, floodplain and ridgeline. This isn't simply Waterford's backyard; it's America's. When a pioneer named Amos Janney founded the village in the Blue Ridge foothills in 1733, Virginia's piedmont formed the frontier of a colonial America that had yet to push past the Appalachians. In the early 1800s, Waterford grew with the new nation into a bustling commercial center for the surrounding farmland, and became a distinctive corner of the South: a largely Quaker town that welcomed free blacks, a quarter of Waterford's population.

The Civil War marked a watershed in the town's history, as it did in the nation's. Split between anti-slavery Quakers and farmers who supported the Confederacy, Waterford was the rare community where brother really did fight against brother. Quakers, though anti-war, raised two cavalry companies, the only organized Federal force from Virginia. Many of their neighbors and kinsmen joined the local Confederate battalion. A skirmish between the two forces erupted in a Waterford cornfield in 1862; the Baptist Church on Waterford's High Street still bears the scars of battle. After the Union men surrendered, one of the rebels recognized his brother among the prisoners and tried to kill him. Two other skirmishes were fought in fields adjoining Phillips Farm, one of them involving Mosby's Raiders. The graves of Union and Confederate soldiers lie side by side in Waterford's historic cemetery. Nearby are graves of African-Americans who went north and joined the famed 54th Massachusetts, celebrated in the movie "Glory."

Waterford's location, near the Potomac and within a county bounded by Maryland and West Virginia, also placed it near the heart of the broader conflict. Union and Confederate Armies marched through Waterford on their way to and from Gettysburg. Waterford lies midway between Manassas and Antietam; residents could hear the latter battle, twenty miles away. The village is fifteen miles from Monocacy and Harper's Ferry, and just five miles from Ball's Bluff. Visitors to all of these prominent National Park Service sites often stop in Waterford.

But what most distinguishes Waterford isn't its connection to major events. Nor is this a grand place, like Mount Vernon or Monticello. Rather, the modest village homes, and their rural surrounds, preserve the templates of ordinary 18th and 19th century American lives. The threatened property is crucial to this history. If you take a few steps beyond Williamsburg's colonial center, you enter the neon 21st century. But walk behind the log

cabins and brick homes along Waterford's Main Street and you'll find yourself in farmland and meadow that sustained this community for centuries, and sustains it still. While so much of America's agricultural land has been lost, these acres are still a working cattle farm. Catoctin Creek, which powered Waterford's grist mill and provided the reason for the village's founding, winds through Phillips Farm. The floodplain on either side of the creek is a rich natural habitat for blue heron and other migratory birds. The ridgeline offers the best spot from which to view the layout of Waterford's village, which hasn't changed in 150 years.

This farmland also forms the backdrop to Waterford's annual fair, during which Civil War reenactors fight beside the creek and children ride on agricultural equipment through the fields. Villagers whose land adjoins Phillips Farm open their historic homes and yards to the fair's 30,000 visitors—the largest tourist gathering in Loudoun County—so everyone can share the modest scale and rural feel of earlier America. Villagers will endeavor to do the same with Phillips Farm, if it is preserved under the auspices of the non-profit Waterford Foundation. Interpreted nature and historical trails would provide public access to a patch of traditional farmland at a time when so much of the greater Washington area is becoming suburbanized. This would also complement the many public and educational activities already available in Waterford, including living history programs for elementary school students at the one-room schoolhouse on Second Street, which was created by the Freedmen's Bureau two years after the Civil War and served African-American students until 1957.

If the farmland surrounding Waterford is developed, the village will become a very different place: a collection of quaint houses hemmed in by sprawl and shorn of its rural context. Future generations will have lost the opportunity to know America as it once was. The fine, frail thread that binds here and now to there and then will have been cut. That is why the proposed development of land within the National Historic Landmark threatens not only Waterford's heritage, but America's.

Sources:

Loudoun County and the Civil War by John Devine.

The Civil War Day by Day, by E.B. and Barbara Long.

The Civil War Sourcebook, by Chuck Lawless.

The New York Times, August 9, 1995

To Talk Is Treason: Quakers of Waterford, Virginia, on Life, Love, Death & War in the Southern Confederacy, by John Devine and Bronwyn and John Souders.

Waterford National Historic Landmark: Its Significance and Protection, the Waterford Foundation

Appendix D: Summary from the June 10, 1999 Village Meeting

SUMMARY FROM THE JUNE 10, 1999 VILLAGE MEETING ON THE WATERFORD BURY THE WIRES AND TAME THE TRAFFIC TEA-21 INITIATIVE

Lighting

In the grant, provisions were made for historically appropriate streetlights. We have brought an original Waterford streetlight for your review and would like your input as to type and placement of street lamps.

Consensus: The residents were in favor of historically appropriate streetlights.
The Chair of the task force has found an example of an old Waterford street light. The Village has concerns as to placement and safety.

Village Chairperson: Robert Thompson, 882-4104

Trees (see next section for consensus items)

In the grant, provisions were made for protection and maintenance of streetside landscape and street trees. You should know that VDOT has already made copies of the Waterford tree survey and is very aware of the need to keep the trees intact.

Village Chairperson: Kitty Rose , 882-3696

Sidewalks/Paths

In the grant, provisions were made for historically appropriate sidewalks/paths. We would like your input as to the type and placement of sidewalks/paths.

Village Chairperson/s: Skip Couser, 882-4459, Beth Erickson, 882-4758

Items of Significance with regard to both Trees and Sidewalks/Paths:

- A vote was taken to ascertain if anyone wanted the entire Village to have paved concrete sidewalks. The result of the vote was, 40+ people opposed, 2 in favor.

- During the discussion, it was determined that the residents do not want wide scale sidewalk expansion; however, they do want to make sure that safety concerns are addressed.

- The residents are concerned with speeding as it relates to safety. The residents were happy to learn that VDOT is in the process of printing the $200 fine for exceeding the speed limit signs that were approved by the Board of Supervisors in March of 1999.

Consensus for Both Trees and Sidewalks/Paths:

- Residents were in favor of keeping things as they are in the Village to the greatest extent possible; however, the residents are concerned about safety.

- The residents and the Waterford Elementary School Parent Teacher Organization (PTO) are concerned about the safety of the children in the Village. The PTO would like to see a path from the school into the Village (possibly through the Foundation's Water Street Meadow). The residents are also concerned about safety within the Village itself.

Road Surface/Drainage/Traffic Taming

In the grant, provisions were made for burying the wires and taming the traffic. This provision impacts the road surface, drainage, and traffic taming.

Village Chairperson/s: Tom Edmonds, 882-4471, John White, 882-4090

Item of Significance:

The residents would like the Village character to remain as it is today.

Consensus – Road Surface/Traffic Taming:

The residents would like some type of traffic taming device to slow traffic. The Road Surface/Traffic Taming Committee would like to work with VDOT to develop solutions.

Consensus – Drainage:

The residents would like the drainage problems in the Village corrected.

Transformers

In the grant, provisions were made for burying the wires (which would include: Virginia Power, Bell Atlantic, and Cable). When the wires are buried, the poles will be eliminated; however, transformers will need to be installed.

Village Chairperson: Dave Godfrey, 882-3280

Consensus: The residents would like the transformers buried if possible. In addition, they are also interested in learning about the size and placement of transformers.

Homeowner Costs

In the grant, provisions were included which would allow for the cost of residential hook-up to be defrayed by the grant. When the wires are buried, there will be fees involved in connecting to the new service. Attached please find a document, which may answer some of your concerns.

Village Chairperson: Ed Good, 882-3592

Item of Significance: The residents appreciated learning about the many different aspects of this project. Concern was expressed with regard to cost.

Final Comment from the Village Meeting held on June 10, 1999

"The Village of Waterford is supportive of burying the wires and taming the traffic. We want the village to look much like it does today. We'd like to keep our sidewalks as they exist today, we'd like our trees to exist as they do today and we'd like the drainage problems to be corrected. We'd like to see historically correct streetlights in the village and we'd like to see traffic tamed."

Our motto is: "Less is more."

Appendix E: 2003 Project Meeting for Waterford Citizens

VILLAGE OF WATERFORD
Loudoun County, Virginia

"Bury the Wires and Tame the Traffic"
Preliminary Engineering Services Project

PROJECT MEETING FOR WATERFORD CITIZENS

Waterford Citizens' Association (WCA)
Waterford School Parent Teacher Organization (PTO)
Waterford Foundation, Inc. (WFI)

Thursday, March 6, 2003, 7 PM
Old Waterford School

AGENDA

7:00 PM	WELCOMING REMARKS	Eric Breitkreutz, Waterford Foundation
7:10	INTRODUCTION OF PROJECT	John Martin, Kimley-Horn and Associates
7:15	"VISION AND VALUES" GROUP ACTIVITY	Dan Burden, Facilitator
7:30	PRESENTATION: "SUCCESS STORIES"	Dan Burden
8:00	"SHOW US" ACTIVITY	Group activity
8:45	SUMMARY: "VISION AND VALUES"	Dan Burden / Kimley-Horn Team
8:55	NEXT STEPS	John Martin / Eric Breitkreutz
9:00	ADJOURN	

"Bury the Wires and Tame the Traffic"
Waterford, Virginia

Project Meeting for Waterford Citizens
March 6, 2003

CORE VALUES

During the Project Meeting for Waterford Citizens, the participants were asked to write down words or phrases on individual post-it notes that describe what they value most about the village. Listed below are these "core values" from the citizens. The numbers shown in parentheses indicate the number post-it notes turned in showing that value.

- Ability to enable others to appreciate value of history Waterford offers
- Accessible
- Agricultural oriented
- Appreciation
- Architectural character
- Architectural integrity
- Attractive
- Authentic (2)
- Beautification consistent with historically accurate landscapes
- Beautiful
- Beautiful old buildings
- Beauty (5)
- Beauty of the scenery
- Bigger school
- Boxwood gardens
- Buildings and houses
- Bucolic
- Caring
- Character
- Charm (2)
- Clean (2)
- Cleanliness
- Comfortable
- Cared for
- Close knit feel
- Closeness of neighbors
- Community (2)
- Community involvement
- Community based school
- Community spirit
- Consideration
- Dedicated (2)
- Diverse (2)
- Family
- Friendliness (2)
- Friendly (7)
- Friendship
- Glimpse of the past/history
- Good landscaping
- Green (2)
- Healthy trees
- Historic (10)
- Historic ambiance
- Historic feeling
- Historic character
- Historic preservation (2)
- Historical (2)
- History (6)
- Home
- Hominess
- Horse friendly/rural character
- Integrity
- Integrity of the architecture
- Intrinsic beauty
- Learning environment about our past
- Low traffic
- Maintained
- Natural
- Natural beauty
- Natural protected environment
- Neighbors
- Neighborhood
- Old
- Old time ambience
- Open
- Open
- Original
- Parking (2)
- Patience
- Peaceful (5)
- Peacefulness
- Pedestrian
- Pedestrian friendly (2)
- Plain
- Preservation minded
- Preservation of Waterford as National Historical Landmark
- Preserved (4)
- Preserving the past
- Pub
- Quaint
- Quiet (11)
- Quiet beauty of the views
- Quietness
- Quietude
- Re-incorporation
- Relaxed
- Respect for our history & heritage
- Restored
- Reverence
- Rural
- Rural character
- Rural unchanged from today
- Rural village setting/green
- Safe (4)
- Safety
- Security
- Sense of community (2)
- Sense of peace
- Serene
- Serenity
- Simple
- Slow
- Small
- Small town people interaction
- Special
- Stillness
- Spirit of community
- Standard setting
- Stimulation
- Strong community spirit
- Strong sense of family/community
- The peaceful environment
- Thriving
- Tolerance
- Tranquil (2)
- Tranquility (3)
- Trees
- Unchanged from today
- Unique (3)
- Uniqueness
- View
- Views
- Walker friendly
- Warm/friendly
- Well maintained
- Welcoming
- Wireless

"Bury the Wires and Tame the Traffic"
Waterford, Virginia

Project Meeting for Waterford Citizens
March 6, 2003

20-YEAR VISIONS

During the Project Meeting for Waterford Citizens, the participants were asked to write down their visions for what the village will be in 20 years. Listed below are these 20-year visions from the citizens.

A town where a dog can sleep on Main St in front of the post office – walkable, bike able, equestrian friendly

Comfortable retreat from parking lot called Rt. 7

Visually much the same, less high speed traffic, safer for pedestrians, pets and kids. Less noise, less speed, less traffic

Protected, tranquil, green, family-filled, lots of outdoor life and activity, fresh air and water, well maintained, visually pleasing

SAME – less traffic/better behaved traffic and parking. Healthy trees, well preserved buildings

Physically unchanged, less traffic, more water

US model of a well-preserved rural historic village

No wires

Calmer traffic-wise and have a by-pass

A quieter country village with less traffic and noise

A community that has maintained the relationship of the land surrounding the town to the townscape with traffic alleviated to a degree

Protected from the encroachment of development with its associated traffic, density and hecticness

The location of my home in a sound, viable house as opposed to a non-viable house

Cobblestone streets, gas lights, people who haven't fixed up their homes to do so

To look and feel like it did in the 1700's, similar to Harper's Ferry. Traffic diverted

No wires. Little traffic. Sidewalks, street lights. All else the same.

The flavor/character much the same but subtly enhanced to allow better strolling through all of town, more respectful traffic (cars more aware of pedestrians/bicyclists) and improved historic feel

Look essentially the same and will remain a National Historic Landmark and a good community with less traffic

The streets will return to slow car traffic where the drivers would feel comfortable stopping and chatting with passersby or looking at the historic names. A place where children are safe to play, bike and walk along the streets. NO power or phone lines visible.

Closer to it's appearance in 1900 (but in better repair and more liveable.) Fewer cars, no wires, still a rural feel. Not a plastic, overdone restoration.

A living, evolving village that does not change much. Enhancing without sterilizing the community. Without pass-through traffic. I don't want to wait 20 years.

Rural village, safely accessible by foot (not just by car and SUV). An oasis. Equestrian friendly.

The same as today, but with no lines

Will not look much different than today except the wires will be buried, old looking street lights will line the streets, traffic will be slowed and limited

Much the same, no overhead wires would be nice. A well-maintained community with active members

Minimal traffic (no thru roads) – accessible to residents and visitors –no overhead wires – no paved sidewalks –plantings that visually slow down cars – off street lighting

The same as today with no wires

Maintain sense of community; maintain its historic feel; safe place to live

Same with no power lines

A bucolic village with brick and stone walkways and closed to thru traffic

Speed limit 15MPH. All wires buried. No new construction. Cobblestone streets

Same but with no overhead wires and poles, fewer autos parked, and street level at town center back to where it was in 1937 (water runs into my office)

A place where all Americans can come and see a pre-industrial village and its surrounding rural environment, and where they can participate in a living community to recreate a sense of their past

My grandchildren will be able to come to Waterford and see what it was like in the 1800's in a village in Virginia

Essentially the same; safer streets; safer for the historic structures; safer for residents and visitors; history preserved

Remain as it is now with its current historical look. That visitors will still feel that they are transferred back in time when here

Historically appropriate as possible. Buried utilities including: Electric, Communication conduit, gas lines, gas lights. Restored sidewalks. Bypasses built

Maintain rural historic character with slower traffic that allows enjoyment for citizens and visitor pedestrians alike

Well-maintained homes and landscaping with much less thru traffic

A beautiful, walkable landscaped village with drivers primarily consisting of village residents. Not a drive-thru village but a drive-around village

"Bury the Wires and Tame the Traffic"
Waterford, Virginia

Project Meeting for Waterford Citizens
March 6, 2003

INPUT FROM BREAK-OUT GROUPS

During the Project Meeting for Waterford Citizens, the participants separated into three groups and wrote ideas on maps that showed the roads and buildings within and adjacent to the village. These break-out groups were asked to capture their specific issues, concerns, and ideas on the maps. Listed below are the notes from each of these groups.

Group 1 – Issues, Concerns, Ideas

- Serious Ped Drop offs
- Every time the road is paved, the drainage problem gets worse
- Replace town horse
- High St. and Second St are treated by drivers as straight-aways, badly needs traffic calming
- Can't see oncoming traffic from south
- Keep Waterford unique so Dan can say we are like no other in country.
- Whole town—don't build suburb sidewalks! Sidewalks could be old sidewalks or bricks or flagstones or oyster shell paths
- Whole town-when putting in lights watch light in windows of houses. Love the old gaslights in Chuck's garden & in front of Chamberlin's and Thompson house
- Don't turn us into Williamsburg or a suburb looking town
- Entire town have historic looking or "low-key" signage. VDOT [signs] are too shiny and ugly
- Pavement 2' higher than initial 1937 paving. Water spills into buildings on W. side of Second St.
- Sidewalk impossible to walk on 2nd St
- Unchecked speeding where people cross from P.O.
- Cars too fast – some hit gully
- Dangerous blind spots for all traffic
- Road shoulders are too steep
- Street should drain down the middle
- Congested parking
- Traffic speed
- Unsafe for pedestrians
- Trucks gun up for hill and ride over yellow line
- Any car stopped at pt "A" is not visible to car at pt "B" (increasing occurrence)
- Unsafe pedestrian corridor-traffic too fast
- Throughout village – ankle-turning road edge dropoffs
- Traffic speed
- Ditch too deep
- Street trees need to be replaced as they die
- Bypass
- Pedestrian pinch either trespass or spill onto road at blind hill
- Spotty, intermittent variable substances (8 types in 2 blocks)
- Great place for tree canopy
- Unsafe walking/riding-significant ditch drop-off
- Unsightly curve signs (VDOT)
- Stop folks from having to honk at corner
- Path problem-traffic pinch point-dangerous!

Group 2 – Issues, Concerns, Ideas

- Slow down signage
- Bigger circle to slow down
- Possible walks to school
- Lower pavement-curbs are covered over
- Speeding
- Improve for walking/biking
- Floods at culvert
- 3-way stop (design solution)
- Horse watering trough
- High speed drainage
- Insufficient parking
- Very congested
- Make bridge 1 car at a time
- Too many parked cars
- Drainage problem
- People traveling uphill should have right-of-way vs. people traveling downhill
- Slow speed over bridge
- No parking space for events
- Mill at risk of damage and poor sightline
- Lower bridge and road
- Drainage
- Needs trees
- Cut down road
- Traffic circle
- Water runs down Church St. across 2nd St
- High hump in road
- Traffic speed and noise
- 90-degree culvert backs up
- Speeding
- Unfunctional culvert
- Speed
- By-pass idea – move [traffic]
- Would need to be designed as a country road since 662 needs to be slowed, too

Group 3 – Issues, Concerns, Ideas

- "Hidden" by-pass, trees, high bank to 662
- No walkways needed from school
- Safe walkways to/from school
- Rumble strips to entrances of village
- Invisible stop signs
- Less lights
- Blind hill
- Speedway (High St, Clarkes Gap, Janney St, Patrick St)
- Speedway (High St, 2nd St)
- No sidewalks anywhere
- Street light too bright
- Blind curve
- Too fast (Main St)
- Speed increase (2nd St)
- Sidewalks
- Dangerous speeds
- Ugly light
- Circle
- Ugly light
- Ugly utility pole
- Poor drainage
- Elevated road surface
- No sidewalks anywhere
- One-way traffic
- No streetlights
- Drainage a problem in entire village
- Main St is a speedway
- Drive too fast around the mill
- Bridge is too wide-cars speed
- Stone bridge (bypass)

"Bury the Wires and Tame the Traffic"
Waterford, Virginia

Project Meeting for Waterford Citizens
March 6, 2003

CITIZEN ISSUES AND COMMUNITY VOTE

As a concluding exercise during the Project Meeting for Waterford Citizens, the group was asked to provide major issues or concerns for the village that needed to be addressed by the study to "bury the wires and tame the traffic." These issues were voiced and then recorded on poster-sized paper. Subsequently, the participants were asked to "vote" on the issues by placing a dot (red sticker) next to the issues they believed were most important. Each participant was allowed seven votes and could place all of the dots on one issue or spread their votes among multiple issues.

Listed below are the issues and concerns voiced by the citizens during this exercise, preceded by the number of votes each issues or concern received.

28 Maintain/preserve character
22 Traffic speed
21 Tree Canopy
19 Bury wires
18 Hidden and expandable utility system
17 Traffic diversion (the "bypass")
16 Traffic volume
12 Drainage
9 (Re)placement of trees/maintain existing trees
9 Water
9 Less lighting
7 Make historic-looking streets authentic
7 Safe walk to school
7 Better lighting for evening stroll
7 Authentic looking streets
6 Lower pavement level
6 Eliminate commuter traffic
6 Bicycle-friendly Waterford (including approach roads)
5 Less asphalt (thickness)
5 Visitor friendly Waterford
4 Safe walkways
3 Parking
3 Safe walkways
2 Restore street function
2 Broadband cable access
2 Bicycle un-friendly
1 Sign friendly (proper, tasteful)
0 Construction vehicles
0 Adequate parking at post office
0 Allow construction/farm vehicles
0 Eliminate dangerous corners

VILLAGE OF WATERFORD
Loudoun County, Virginia

"Bury the Wires and Tame the Traffic"
Preliminary Engineering Services Project

PUBLIC MEETING FOR WATERFORD CITIZENS
Thursday, March 6, 2003

FEEDBACK FORM

1. What is your vision for the Village of Waterford, 20 years from now?

2. What do you value most about the Village of Waterford?

3. In your opinion, what are the main issues in the Village that the "Bury the Wires and Tame the Traffic" project needs to address?

4. Other comments?

Your information: ☐ Resident of Waterford ☐ Neighbor ☐ Other: _____

Name(s): _____

Address: _____

Phone: _____

Email: _____

Please fill out form and leave with Kimley-Horn team member at the March 6 meeting.

You may also **mail** form to:
John Martin / Scott Mingonet
Kimley-Horn and Associates, Inc.
13755 Sunrise Valley Drive, Suite 450
Herndon, VA 20171

You may also **email** your comments to:

Waterford@kimley-horn.com

Please succinctly categorize your comment in the subject box so the team clearly understands your issue/comment.

Please send in all comments by March 28, 2003

Appendix F: 2020-2022 Community Input

Waterford 2033
Chronological Compendium (as of April 2022)

Milestones Dates

Weekly	**Tuesday Noon Zoom Briefings**
8/16/20	Origin: WCA Motion for a WCA Governance Review, and vote to Proceed with, an Ad Hoc WCA Governance Analysis Committee Creation of an Ad Hoc WCA Governance Committee approved. Chaired by Cate Magennis Wyatt, Co-Chaired by Mary Sheehan and Mike Stup
9/24/20	**WCA Membership Meeting Action Item: Motion to constitute the Ad Hoc Governance Committee passed** Committee Decision Points presented to the WCA Board with the first step to create a joint Leadership council with the Waterford Foundation Board.
12/2/20	**WCA Board Action Item: Governance** Approved As Hoc Governance Committee report and 4 Action Steps
3/25/21	Outreach: Neighbors, WCA Annual Meeting As requested by the WCA Executive Committee, Cate Magennis Wyatt, with Mike Stup, presented a proposed plan to gather data for the creation of a Waterford Village-Citizen driven, "Waterford 2033" comprehensive plan. This was approved.
8/23/21	Outreach: Neighbors Villager Questionnaire sent to all Villagers to seek guidance on values, culture and vision for our Village
8/24/21	Outreach: County Supervisors Briefing and lunch with **Supervisor Caleb Kushner** staff member Stacy Carey
9/01/21	**Outreach: WCA/WFI Joint 2033 Leadership Council** Briefing and approval to proceed
9/10/21	**Outreach: Partners** Briefing and lunch with the **Chairs of the: Loudoun County Preservation and Conservation Coalition and the Loudoun Historic Village Alliance.** They gave W2033 their organizations unconditional support
9/15/21	Outreach: County Supervisors Briefing and lunch for **Supervisor Mike Turner** at CMW home, with Sharyn Franck, Chair of the Waterford Traffic Committee, Mike Stup, Co-Chair of the Waterford Water Committee, Margaret Good, leader of the Western Loudoun Historic Villages Alliance.
9/15/21	Outreach: County Supervisors A personal Thank You from the WFI & WCA to the County **Board of Supervisors,** with 2 tickets to the Fair and invitation to an Open house from 10am-5pm on 12/02/21 at the home of Cate Magennis Wyatt were hand delivered to the County BOS Offices.
9/16/21	**Outreach: Partners** Zoom briefing **Julie Langan, VA SHPO and ExDirector of the VA Department of Historic Resources.** 100% supportive
9/17/21	**Outreach: Partners** Spoke with **Lynn Tadlock, Claude Moore Charitable Foundation**

9/17/21	**Outreach: Commonwealth Transportation Board** Briefed **Scott Kasprowicz, CTB** At Large Representative: He will attend the 9/28/21 Briefing and Lunch.
9/17/21	**Outreach: Commonwealth Transportation Board** Sent email to our **Virginia CTB representative Mary Hines** with a brief backgrounder, the 2003 plan and invite to join briefing and lunch on 9/28/21 invite.
9/17/21	**Outreach: Congress** **Call with Congresswoman Wexton:** Briefed her on 2033, requested working together to create an earmark, requested her interest in the NPS NHL update approval, invited her to the Fair and will set up Briefing early November
9/17/21	**Outreach: DTCI** (Loudoun Dept. Transportation and Capital Improvements) Called Joe Kroboth DTCI to invite to the 9/28/21 Briefing
9/19/21	**Sustainability** Committee: Chair Mary Sheehan held meeting, minutes and will conduct meeting every 2 weeks
9/21/21	**Outreach Partner: Visit Loudoun** Spoke with Beth Erickson, Ex. Director of **Visit Loudoun** to brief her on activities, solicit her insight into the impact of different types of visitor attractions as economically viable and culturally acceptable adaptive reuse alternatives are researched.
9/21/21	Outreach National Park Service: Called and briefed Kathryn G. Smith National Historic Landmarks & National Register Coordinator, National Park Service Editor of Waterford's NHL Register update Sustainability and Technical Preservation Services ~ https://www.nps.gov/tps/standards/rehabilitation/sustainability-guidelines.pdf
9/21/21	Outreach: County Supervisors Board of Supervisors presented the Waterford Foundation a Resolution of Appreciation for the 77th Waterford Fair during the Public Hearing.
9/22/21	Outreach: County Supervisors Call with Stacy Carey, Supervisor Kershner's Office ~ which lead to participation in 4pm meeting with Sup. Caleb Kershner, Stacy Carey, Tim Hemstreet and Joe Kroboth
9/22/21	Outreach: County Supervisors Briefing: Caleb Kershner, Stacy Carey, CMW for Tim Hemstreet and Joe Kroboth re: Waterford 2033. Request for allocation of $40K towards the on-call contract with Kimley-Horn will be considered.
9/23/21	Outreach: Village Briefing WCA Membership Meeting briefing
9/28/21	Outreach VDOT: VDOT Briefing, Walk About and Lunch: Farid Bigdeli, VDOT
9/30/21	Outreach: Congress Call with Tami Davis: Tami.Davis@mail.house.gov Congresswoman Wexton's W2033 Point Person. Update and Earmark planning
10/02/21	Outreach: County Supervisors Supervisor's and staff members, including the County Administrator and DTCI

	were sent Thank you notes with tickets to the Fair and October 2nd Open House (at Cate's Home): Attendees: • Chair Phyllis Randall and Elizabeth Bennis • Supervisor Caleb Kershner, his wife and 4 boys • Supervisor Kristen Umstattd • Chair, Planning Commission, Forest Hayes Many thanks to Sharyn Franck, Chris Gleckner, Mary Sheehan, Mike Stup, Stephanie Thompson and whomever I've currently forgotten :)
10/02/21	Business Plan: Increase Volunteers W2033 Under 40 Advisory Board: Discussed establishing a committee of Waterfordians, who grew up here or live here now, and would like to contribute their expertise, including: • August Erickson: Virtual/Social Media Communications • Ken Dunn: AI Technology • Tucker Denicore • Ford Wyatt: Sustainability Technology • Catherine Wyatt: Sustainability Federal Legislation and Agency Policy
10/02/21	Funding: Federal Infrastructure Bill Stacy Carey, ExAsst for Supervisor Kurshner briefed the Loudoun County Federal Lobbyist on Friday, 10/1/21 regarding our W2033, indicating it is a high priority.
	Funding: Loudoun County Chair Randall suggested we request full $45m in the CIP DTCI has received the BMI to include $2.3m in 2022 CIP for entry way engineering. (See Traffic Committee 10/3/21 Report) We need to Request Supervisor Kershner increase the $40K immediate funds to $80K to include dusting off 2003 Plan and to hire Charette Coordinators/leaders
10/3/21	Traffic Committee: Meeting held with County DTCI and VDOT Sharyn Franck and Mike Stup attended
10/5/21	Outreach: NPS Kathryn Smith, Associate Keeper of the Records: National Park Service Update on out 3022 Sustainability and Adaptive Reuse studies
10/5/21	Outreach: NPS Advisory Committee Called old friends and Committee Members and LVM John Nau Ethan Carr, Ph.D., FASLA, Professor, Department of Landscape Architecture and Regional

	Planning, University of Massachusetts Amherst; Amherst, Massachusetts Alexandra "Lexi" Lord ~ Former NPS DC Branch Chief alexandra_lord@nps.gov Richard Guy Wilson, UVA Architectural Historian ~ 2011 JTHG Annual Meeting tour 2014??
10/8/21	Outreach: Department of Interior, National Parks Service, Keeper of the Records:
10/8/21	Outreach: NPS Advisory Committee Briefed: John Nau Call Kathryn Smith ~ NPS NHL agenda Sherry_Frear@nps.gov 202.913.3763 Head of NHL Joy Beasley, NPS Directorate
10/11/21	**WCA/WFI Joint 2033 Leadership Council** Briefing and approval to proceed Set Village wide/ WFI Board Member Briefing and Input for November 3rd
10/15/21	Outreach Neighbors: Traffic concerns rec'd by Ruchi with her desire to join the W2033 Traffic Committee. Sent her immediate response to ensure she knew all neighbors have a seat in this discussion, and sent her the 2003 Plan for her review.
10/18/21	Sustainability Committee Meeting at Noon via Zoom
10/22/21	Outreach: County Supervisors, NVTA, Commonwealth Transportation Board W2033 Briefing, Walk About and Lunch with Chair Randall and Elizabeth Bennis and CTB At Large Member Scott Kasprowicz, NVTA CEO Monica Backmon
11/03/21	Outreach: Neighbors Village wide Zoom meeting to share Questionnaire Insight, findings gathered todate as an Organizing Committee on Water, Traffic, Sustainability, Funding and to solicit insight/ thoughts/ concerns/ recommendations/ volunteers/ for Waterford 2033 Organizing Committee
11/08/21 2:30-6pm	Outreach: DTCI / VDOT Waterford Walk About and Briefing at Mike Stup's
11/16/21	Outreach: Congress: Call with Tami Davis, Congresswoman Wexton's Office Update and set date for site tour and briefing
11/16/21	Outreach: County Supervisors Laura TeKrony: Chair Randall's Office Wrote BMI Request for $95K from the Fund Balance for December 7th Meeting ~ which is the soonest available funding source and to ensure it will be on the December Finance Committee's Agenda. Will include 1. Updating the 2003 Plan with current traffic study and water study
12/2/21	Outreach Villagers: WCA Board Meeting Briefing
12/9/21	Outreach Villagers: WCA 4th Quarter Member Meeting Briefing: Reported on the Supervisor's Approved funding to update the 2003 Kimley Horn plan to "Tame the Traffic and Bury the Wires" with the current Traffic

	Studies, Water Studies, stormwater management best management practices, sustainability and adaptive reuse. Thanked Beth Erickson for the assistance of Visit Loudoun as we consider appropriate adaptive reuse opportunities that will sustain the WFI while only enhancing the culture of the village. Once again, all villagers were encouraged to participate in the "guilt-free" Waterford 2033 Visioning Committee, which meets each Tuesday at noon, via Zoom.
12/13/21	Outreach: Congress Briefing Congresswoman Wexton and her Team in Waterford with a walk-about.
2022	
01/03/22	Outreach: DTCI: Monthly update call, determined that the $55K will be on the BOS Agenda tomorrow and that once approved, can be increased to cover OnPoint Contract if and when needed.
1/04/22	FUNDING: BOS Approved $55K to be awarded to Kimley Horn to update our 2003 Bury the Wires and Tame the Traffic Plan
1/14/22	Planning: Meeting to outline 2022 Goals: Zoom Meeting to outline draft W2033 targeted dates and action steps for 1st and 2nd Quarter, to solicit input from all neighbors and Waterford 2033 Committee Members and to capture consensus on the means to convey all efforts in a shared format. Agreement on the format was achieved and shared with all.
1/19/22	Planning: Kimley Horn Document Transfer: All studies done from 2003 to present were given to KH, in addition to preliminary "place-holder" ideas for Adaptive Reuse and Sustainability
1/24/22	**Outreach: Partners** **Julie Langan, VA SHPO and ExDirector of the VA Department of Historic Resources.** Update re: Funding to update 2003 Plan
1/26/22	Outreach: Department of Interior, National Park Service Associate Director of Cultural Resources, Partnerships, and Science: Joy Beasley Call
	Discussed her coming to Waterford for a Site Visit with Julie Langan/ Heidi/ W2033 Team. She would very much like to and has never been to Waterford CMW submitted a formal email invite, to run by the ethics office. Who/ what/ when/ where why.
1/27/22	Brad McDonald, VDHR's archeologist visited Waterford to document the Mill Race and the Damn. Stephanie Thompson, Ron Benschoter and Mike Stup joined him
1/31/22	Business Plan Updates: The $55k DTCI Task Order with Kimley Horn Signed by DTCI ~ to update 0ur 2003 Plan
2/07/21	Business Plan Updates DTCI/ VDOT/ W2033 Monthly call: KH to initiate Phase 1 of the Task Order. The Update should be complete by June.
2/7/22	**WCA/WFI Joint 2033 Leadership Council** Briefing and approval to proceed

	Set village-wide Open House for March 26, 2022
2/11/21	Funding: Meeting with the Virginia Dept of Health Mike Stup and Sharyn Franck met with Anthony Hess, Project Manager for VDA-Office of Drinking Water's, Financial and Construction Assistance Program. Learned there 2 opportunities to apply for grants: April 8th for the Bipartisan Infrastructure Law (BIL) funding May 6th can also apply for both the BIL and Drinking Water State Revolving Fund (DWSRF) pots of money: https://www.vdh.virginia.gov/drinking-water/fcap/drinking-water-funding-program/ ***Anthony Hess, MBA*** Project Manager Financial and Construction Assistance Program VDH - Office of Drinking Water 131 Walker St. Lexington, VA 24450 Phone: (540) 463-0419
2/17/21	FUNDING: County Supervisors: Attend CIP Budget Public Work Session Ron Benschoter, Matt Donnelly, Sharyn Franck, Christy Hertel, Patti Psaris, Cate Magennis Wyatt
2/17/22	Engineering: Kimley Horn Team with DTCI tour Waterford and met at the at the Mill for review of millrace and then to Cate's for conversation
2/24/22	FUNDING: County Supervisors: Speak at CIP Budget Public Hearing Annie Good, Chris Gleckner, Ruchi Parekh, Mike Stup: to reinstate $3.5m
3/1/22	FUNDING: Cabell Foundation Grant Application Submitted: Stephanie Kenyon, Cate Magennis Wyatt
3/2/22	FUNDING: County Supervisors: Attend CIP Budget Public Work Session
3/3/22	Outreach: County Supervisors W2033 Waterford Walk-About and Briefing with Supervisor Kristen Umstattd at Cate's. Discussed funding sources for FY23
3/7/22	Business Plan Updates DTCI/VDOT/W2033: W2033 attended 3 CIP Budget workshops ~ only citizens there, how could the fund NOT be in the budget?
3/7/22	**WCA/WFI Joint 2033 Leadership Council** Briefing and approval to proceed: Pursue County Engineering funding FY'23; Issue weekly invitation from the Leadership Council to villagers to attend the March 26th Open House at Jon Wesley Church; Use visuals for alternative uses of WFI properties during village-wide Open House March 26th
3/12/22	Outreach: Villagers emailed the 2033 Update
3/15/22	FUNDING: County Supervisors: Personally invited to the 3/26/22 Open House
3/16/22	Business Plan Updates: Moody Graham Landscape Architecture visit and walkabout
3/23/22	Outreach: Village Briefing: WCA Membership Meeting briefing at the Old School

3/27/22	Outreach: Villagers Open House and Panel Discussions: John Wellesley Church 12-5pm
3/29/22	**Outreach: Partners Loudoun County Preservation and Conservation Coalition** Brief monthly meeting.
4/4/22:	Business Plan Updates DTCI/VDOT/W2033: KH Updating studies and will send to DTCI by 4/18 and to W2033 by 4/19 to review together before the 4/27 Village gathering/KH Update. J. Zeller suggested to specifically ID the need and name tied to NHL
4/4/22	**WCA/WFI Joint 2033 Leadership Council**: Briefing and approval to proceed Update 4/27 Village Gathering with KH Summary Documents; Survey Villagers on Sustainability efforts; Share Water Study with all villagers; reach out to our Planning Commissioners and update BOS
4/7/22	Outreach: Partner National Park Service: Kathryn G. Smith released and sent the final draft of the Waterford NHL study update
4/13/22	Outreach: Congress Wexton Team: Briefing and federal funding discussion and plan.
4/18/22	Outreach: Congress Wexton Team: federal funding plan refining.
4/19/22	Outreach: Partner Solarize VA Katie Van Langan, CMW and Ron B met to discuss their program and potential of working together with our Sustainability Committee.
4/19/22	Outreach: WFI Annual Meeting: President and the Executive Director reported out on the W2033 efforts to date.
4/24/22	Outreach: Senator Kaine's Office: Briefing and discussion on earmarks. Rachel Reibach will attend a Waterford Walk About and Briefing on 4/27
4/25/22	Outreach: Congress Wexton Team: federal funding plan refining.
4/26/22	Business Plan Update DTCI Call: Review presentation materials with Nancy Boyd, Corinna Sigsbury, John Martin, CMW and Mike Stup
4/27/22	Outreach Villagers Reception and Discussion with Kimley Horn: Old School Auditorium.
5/11-12/22	National Park Service National Historic Landmark Advisory Committee meeting to review the Waterford Updated NHL Study/Analysis

WATERFORD 2033

300 YEARS OF PRESERVATION, EDUCATION, AND COMMUNITY

A JOINT PROJECT

Waterford FOUNDATION, INC.

Waterford Citizens Association

Update and Discussion

November 3, 2021

Hosted By

Waterford Citizen's Association – Ray Daffner, President

&

Waterford Foundation – Chris Gleckner, Chair

- ***We are working collectively to give back to our Village's National Historic Landmark and our Villager's quality of Life.***
- **Building on the June 2021 WCA and WFI Briefings**
- **Meeting Format**

Waterford 2033 Mission Statement and Goal

Approved by WCA Members and the WFI Board

The WCA and the WFI, each stewards of the Waterford National Historic Landmark, are working collaboratively to protect the NHL and to direct future cultural, infrastructure, and community improvements.

Goal:

Create a Waterford 2033 Visioning Plan by June 2022 for implementation beginning in 2022

THE ORGANIZING COMMITTEE TO DATE

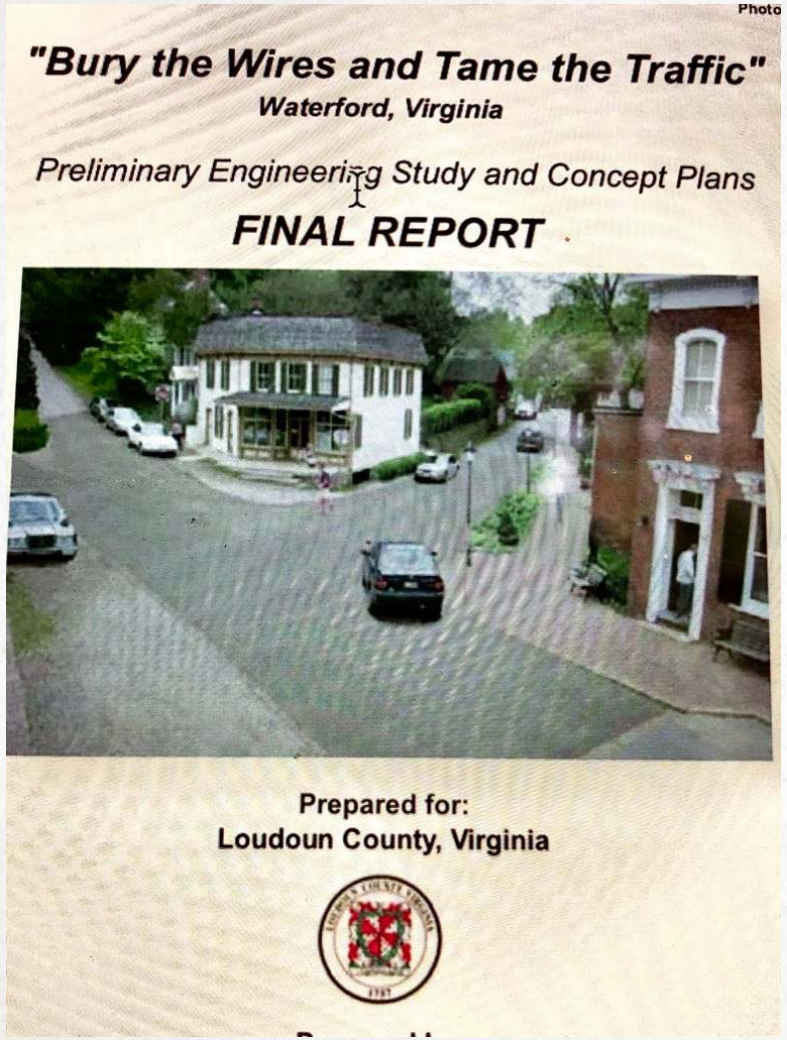
Ron Benschoter
Bo Cutter
Ray Daffner
Jonathan Daniel
Matt Donnelly
Michelle Dunne
Sharyn Franck
Christine Gleckner
Ann Goode
Forest Hayes
Dave Hunt
Emily Houston
Meredith Imwalle
Corinne Jacques
Stephanie Kenyon
Sue Manch
Ruchi Parekh
Patti Psaris
Richard Rogers
Mary Sheehan
Mike Stup
Peter Thomas
Julia Thompson
Stephanie Thompson
Cate Magennis Wyatt

And we welcome all to join!

COMMITTEES

- WCA Traffic Committee
- Water Committee
- Communications Committee
- Sustainability and Adaptive Reuse Committee
- Outreach
- Funding

Jointly Approved Use of the 2003 Plan as Base Document for the Waterford 2033 Visioning Plan



This 2003 Plan was Approved by the WCA (and further advanced by) WFI and the County of Loudoun.

In 2003, this plan cost $500,000

Kimley-Horn, the lead Engineering firm, has offered pro-bono work and a below-market rate to "dust off" and update the plan.

THERE ARE POSITIVES ALREADY

SEPTEMBER 21ST BOARD OF SUPERVISOR'S RESOLUTION OF COMMENDATION TO ACKNOWLEDGE THE WATERFORD FOUNDATION'S 77TH WATERFORD FAIR

LOUDOUN COUNTY, VIRGINIA

RESOLUTION

Recognizing October 1, 2021, as the 77th Anniversary of the Waterford Fair

WHEREAS The first Waterford Fair, known originally as the Waterford Crafts Exhibit, was held 77 years ago in October 1944; and

WHEREAS The Waterford Fair has since won the Loudoun County Event of the Year award four separate times and has grown to become the mid-Atlantic's quintessential fall festival, hosting contemporary artisans, living historians, a juried art show, historic home and garden tours, and entertainment for all ages; and

WHEREAS The Waterford Fair provides fundraising opportunities for local scouting troops, school booster clubs and PTOs, local churches, and other community organizations, and proceeds from the Fair support the preservation and education efforts of the nonprofit Waterford Foundation; and

WHEREAS Each year, over three days, more than 400 volunteers freely give their time to help put on the Waterford Fair, which attracts over 120 artisans and fine craftspeople, 10,000 fairgoers, and 12 nonprofit partners, for an estimated local economic impact of $4.5 million; and

WHEREAS Following the first Virtual Waterford Fair during the COVID-19 pandemic in 2020, the 77th Waterford Fair this year is once again bringing the community together in person to welcome artisans, volunteers, vendors, and visitors to the Waterford National Historic Landmark on October 1-3, 2021.

NOW THEREFORE BE IT RESOLVED that the Loudoun County Board of Supervisors recognizes October 1, 2021, as the 77th Anniversary of the Waterford Fair.

Joint *Thank You* Note to the Supervisors and County Staff
With
Tickets to the Fair and Invitation to an Open House

More Progress . . .

- Board of Supervisor members will request funding on **12/7/21** to dust off 2003 Plan and pay for Village-wide Charettes.
- The **Loudoun Department of Transportation and Capital Improvements,** at the direction of the Board of Supervisors, will be coming to tour Waterford.
- The three-year **Water Feasibility Stud**y will be wrapping up later this year.
- We have engaged the Churches and Loudoun Mutual Insurance Company.

High Level Overview Vision and Timeline Since June 24, 2021 Briefings

Waterford 2040

Building a community plan for our village

* Original document from 6/24/21, adjusted from 2040 to 2033 July 2021

Our objective is to develop a unifying Waterford community plan based on a shared vision of what we want the village to be in the future, along with the strategy and resources to execute on that plan. We aspire to a fully inclusive process, with input from all key stakeholders

Benefits for the community

- The opportunity to discuss and determine a collective vision for what Waterford will be in 2040, resulting in a shared view held by Waterford's residents and two key organizations, the WCA and the Waterford Foundation. Based on the vision agreed upon, the plan could include issues such as walkability, traffic calming, burying the wires, business operations in the village, building preservation, tourism, parks / public spaces, municipal status, and more
- A consolidated, unified community plan that increases likelihood of securing public and private/philanthropic funding
- Definition of roles and responsibilities for interaction with each level of elected officials (County, State and Federal), multiple divisions within State agencies (e.g., VDOT, DTCI), and privately-run utilities (e.g., Dominion Energy, Verizon, Comcast, Loudoun Water)
- A more clearly defined set of roles and responsibilities – and areas for creative support, synergy and collaboration – between the WCA and the Waterford Foundation
- The ability to more fully maximize use of available strategic policy tools for historic patrimony and open space protection, such as Section 106, the National Heritage Area designation, the State Scenic Byway programs, and others

Our ask for you

We would like your support to move forward with this plan, facilitated by a leading outside expert, if we can raise the necessary funds to do so. Moreover, we would appreciate your participation and input throughout the process!

Waterford 2033

High-level timeline for visioning and community plan development

- Green items completed
- Blue item next focus

	Phase I *Vision**	**Phase II** *High-level design*	**Phase III** *Detailed design*
Timeline	4 months July – October 2021	3 months October – December 2021	6 months January – June 2022
Objectives	Gather input from village: **Village Wide Thematic Survey Completed** **Analyze all previous studies and determine why they failed** Determine operating model: **Built WCA/ WFI Joint Committee; Organizing Committee, Sub-Committees on Traffic, Water, Communications; Sustainability; Funding**	**Align on overall vision through facilitated workshops** Align on high-level design for each line of effort Understand stakeholder landscape	Develop detailed design Engage key stakeholders Draft community plan and implementation strategy
Deliverables	Vision for Waterford 2033 **WCA and WFI Board approval of the 2003 Tame the Traffic and Bury the Wires Plan** Overall design principles Scope of effort: **Kimley Horn**	Vision statement for each line of effort High-level design for each area Stakeholder map and engagement strategy	Detailed design for each line of effort Waterford 2040 Community Plan Implementation strategy and timeline
Participants	**Village residents** Representatives of Waterford Foundation Outside experts and facilitator	Village residents Representatives from Waterford Foundation Outside experts and facilitator Key public sector entities (e.g., VDOT, DCTI)	Village residents Representatives from Waterford Foundation Outside expert facilitator Key public sector entities (e.g., VDOT, DCTI)

NEW TOOLS

- The Loudoun County Comprehensive Plan now allows for **Village Small Area Management Plans**
- **New Federal** and **Northern Virginia Transportation Authority Funding sources**
  - USDA, LC CIP, State & Federal funds & grants (avail as well)
- A year spent building a **joint WCA/WFI the Infrastructure** means to implement the ultimate plan.

THE VILLAGE THEMATIC SURVEY RESULTS

SUMMER 2021

Discussion Points

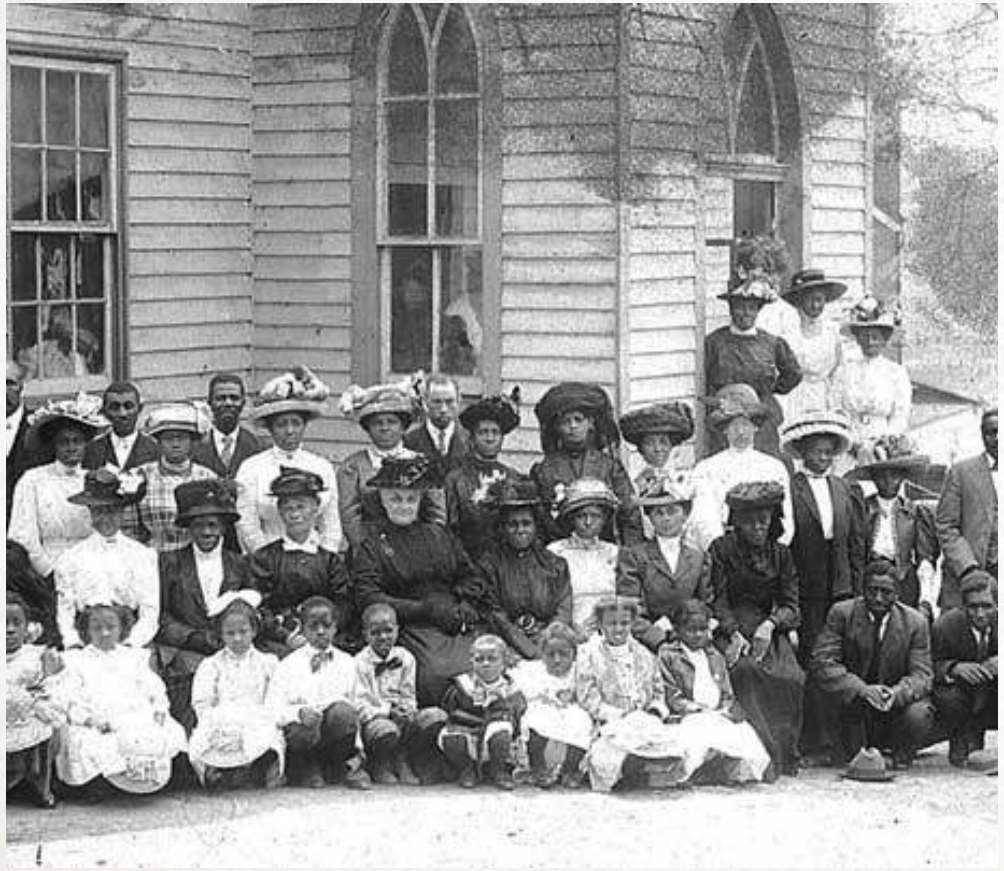
- Overview of the Core Values of the 2033 Project
- Review of the Village Thematic Survey Results
- Q & A
- Discussion of next steps

PARTICIPANTS

41 respondents

All Village residents

INPUT ON CORE VALUES



- 100% agree preserving Waterford's unique history and NHL designation is a core value
- 92% agree conserving Waterford's natural resources should be a goal
- 78% agree building and maintaining a sense of community should be a goal

INPUT ON PRIORITIES

- 100% of respondents agree that effective traffic management is a priority
- Second quartile agree that walkability in the Village, burying electric and other wires, adequate potable water supply, environmental sustainability, preservation of historic community resources and natural resources and public access lands and best use of historic structures are priorities
- Third quartile agree that utilities, adequate parking, context appropriate economic development, community activities, and renewable energy are priorities

VILLAGERS' INPUT ON MEDIUM TERM CHALLENGES

- Volume of traffic, noise and damage it brings to the Village
- Lack of potable water for all
- Maintaining financially stable Waterford Foundation and preserving NHL designation
- Absence of town government that can represent Village's interests
- Modification/repair of inadequate drainage systems
- Burying wires to maintain a historic feel
- Not maintaining/making best use of historic structures
- Need appropriate businesses and tourism focused on education
- Lack of sufficient parking for residents and visitors
- Need enhanced education and interpretation of historic resources
- Need to get funding to support any possible solutions

WHAT WE VILLAGERS LOVE ABOUT WATERFORD

- *"The wonderful feeling of history come alive and being able to contribute to the preservation of this unique place."*
- *"The connection to the land."*
- *"Raising a child here was an amazing experience; it is comforting to live among people who care and watch out for one another."*
- *"We were quickly made to feel a part of the community."*
- *"The historic and natural environment."*
- *"The feeling, the architecture, the hills and open spaces, the sense of community."*
- *"The communication among neighbors of all ages, interests, talents, and backgrounds."*
- *"In the evenings, the Village shows a glimmer of what it was – quiet, self-contained, peaceful, and content."*
- *"A community of neighbors working together for a common good."*

Outreach/ Data Gathering initiatives

Community Partners

- Loudoun Preservation and Conservation Coalition
- Loudoun Historic Village Alliance

Loudoun County Board of Supervisors

County Planning Commission

State and Regional Officials

- VDOT
- Northern Virginia Transportation Authority
- Commonwealth Transportation Board
- Virginia Department of Historic Resources

Outreach Research initiatives

National Park Service

National Park Service Review Board

"Waterford is a jewel of Loudoun County" was stated by a Supervisor during a gathering we hosted ~ and the information gathered from these briefings, has demonstrated that this sentiment is embraced by our Regional, Statewide and National leaders.

NEXT STEPS, WHICH WILL BE ANNOTATED FOLLOWING DISCUSSION

Village Wide Conversation with with Hillsboro Mayor and Vice Mayor to discuss the holistic approach they took, after 20+ years of planning, for the installation of water, safety, traffic calming, and the sustainability of their community historic and cultural assets

Show up for the 6:30pm December 7th Meeting with the Board Of Supervisors ~ As "Witnesses" and join afterwards at Tuskies

Village-Wide discussions and town halls to develop combined 2003/2033 study

Work with the County to allocate the $2.3m DTCI funding and secure additional CIP Funding for 2022

ALL are invited to be part of the Waterford 2033 Organizing Committee's Efforts ~ Please, join us!

Report on the Waterford 2033 Open House – March 26, 2022

Visitor Log = 63

Juli Briskman, BOS	Debbie Zungoli	Corrine Jacques
Sylvia Glass, BOS	George Rambo	Christy Hertel
Michelle McIntyre, Chief of Staff	Sharyn Franck	Tom Hertel
Maura Walsh Copeland, Zoning Ordinance Committee	Cate Magennis Wyatt	Skip Couser
Madeline Skinner, RVA	Ron Benschoter	Mary Dudley
Lee Spangler	Stephanie Thompson	Nick Ratliffe
Jonathan Daniel	Stephanie Kenyon	Kathie Ratliffe
Sue Manch	Matt Donnelly	Phil Paschall
Bill Manch	Dave Hunt	Bill Mayer
Sue Eberhart	Jeff Bean	Matt Rasnake
Jack Eberhart	Peter Thomas	Kay Chewning
Mike Stup	Judy Jackson	Bob Jackson
Jeff Browning	Mark Sutton	Lynne Anderson
Debbie Robison	Isaac Johnson	Jeff Darrah
Charles Schneider	Nancy Doane	Connie Moore
Ruchi Parech	Mark Denicore	John Malone
Olivia Taylor	Annie Good	Annie Good's Parents (2)
Britton Baine	David Douthett	Molly Douthett
Melissa Sutton	Kris Tiscione	Lindsay Frandsen
Grey Frandsen	Laura Shaw	Paige Cox
Roger Smith		Charles (missing last name)

Highlighted names = Village Residents/Committee Members

See Addendum 1 for Recorded Comments and Reactions to Storyboards

Panel Discussion Notes

Panel 1:Origins of Waterford 2033

Christy Hertel, President, Waterford Citizens Association (WCA)
Stephanie Thompson, Executive Director, Waterford Foundation
Cate Magennis Wyatt, Chair, Waterford 2033 Ad Hoc Committee

Stephanie Thompson, Executive Director Waterford Foundation

By way of background, the Waterford Foundation was created in 1943, by Citizens of Waterford, and was one of the first conservation and preservation organizations in the country. It is largely due to the decades of dedicated work by the members of the Foundation that the village and the surrounding 1,420 acres

were designated in 1970, by the Secretary of the Interior, as the first National Historic Landmark in the country that included an entire Village and surrounding landscape.

Mind you, the designation was, and remains, honorific, which means there is no regulatory authority conveyed with it to protect any of what the "Sectary of Interior" has designated as "Critically Important to sharing our American Story"

~ which is to say, while all of this was deemed "Critically important to telling our shared American Story", it fell upon the Waterford Foundation, namely the Citizens of Waterford, to find the funds to purchase all of the public buildings ~

Including all abandoned places of worship which have meant so much to our Community's Culture:

The abandoned Methodist Church, which we (the WFI) purchased after it was de-consecrated.

We then sold to, Jackson Walters, a gentleman who had just stepped down as President of the National Trust for Historic Preservation, who restored the church for Adaptive Reuse as his private office.

The abandoned John Wesley Church

The African American 1-Room School House,

The Mill Across the Street, Bond Street Meadow and Bond surrounding us.

Phillips Farm and Water Street Meadow, the Forge, the Corner Store, the Old School.

The Red Barn behind the Tin Shop and the Schooley Mill Barn.

The Foundation has not only purchased and protected these and other properties but maintains them year in and year out. Yet, many are used only once a year during the Waterford Fair.

Over the last 70 years the income from the Annual Waterford Fair has been the principal source of funding for the Foundation and, as we have witnessed, due to weather or the pandemic, we must diversify our income stream.

Hence, we look forward to exploring how we can secure year-round income from these structures and open spaces in a means that meets the mission of the Foundation through furthering preservation and education, while meeting the needs of the citizens of Waterford, is very exciting.

Christy Hertel, President WCA

Waterford was one of the first settlements in Loudoun County when it was founded in 1743. It was incorporated as a town until the depression, but because the railroad passed it by and several of the Mills became shuttered it could no longer pay to keep up the streets. So Waterford became unincorporated.

At that time, the Waterford Foundation was created and since then has done a magnificent job ~ Chris has been modest ~ in innovating means to raise the funds to protect and preserve Waterford.

The Waterford Citizens Association's principal mission was to beautify our village and to organize community gatherings, like:

The 4th of July fireworks, potluck and Fireworks

Halloween in the Village

Santa's visits to the Village

However, over the last 20 years, the WCA has slowly assumed more of the responsibilities of a municipality as the citizens of Waterford absorb more and more of the impacts from regional growth and the negative impacts of changes to the infrastructure that we have not been consulted on before roads are raised or telecommunication systems installed, or 100-year old trees sheared by utility companies.

What we saw was that outside entities did not feel responsible to ask permission to make substantial changes within this National Historic Landmark, because there was not one central authorized entity to ask permission from.

As a result, in August 2020, the WCA Board initiated a study of the WCA's current Bylaws and current responsibilities.

Waterford Village 'Public Good' Services – Currently Provided or Possibly Needed

With Service Mandates, Current WCA Governance Structure, Relevant Partnerships, and Possible Policy Tools

Village Service*	**Organizations with Service Mandates**	***Current WCA Structure* Partnerships**	**Policy Tools**
Transport infrastructure: • Street maintenance • Traffic management • *Drainage* • *Parking* • *Sidewalks* • *Safety*	• VDOT • Loudoun County DTCI	*WCA Traffic Committee* • Waterford Foundation • Local private residents • Nearby private residents • Commuters • Local farmers, businesses other road users	• 1987 Waterford Area Management Plan • 2004 Bury the Wires study • 2016 JMT Cut-Through Traffic Study • BOS-approved Waterford Traffic Management Plan (2019) • Section 106 consultation (WF jointly with WCA?) • VDOT Historic Roads policy • Loudoun Historic Roads overlay (2019) • NHL Revision (2020)
Water and sewerage infrastructure:	• Loudoun Water	*WCA Water Ad Hoc Committee*	

• Sewerage network and treatment • Piped water network and treatment		• Waterford Foundation • Local private residents	• 1987 Waterford Area Management Plan • 2004 Bury the Wires study • County water feasibility study (to begin 2020?) • Relationship with Loudoun Water on sewerage service • NHL revision (2020)
Electricity and telecommunications infrastructure: • Electricity service • *Public lighting* • Burying electric wires • *Phone and cable* • *Burying telecoms cables*	• Dominion (electricity, street lighting) • VDOT (street lighting) • Verizon (phone/cable) • Others?	*WCA Electricity Ad Hoc 'Effort'* • Waterford Foundation • Local private residents	• 1987 Waterford Area Management Plan • 2004 Bury the Wires study • Renewed bury the wires (electric and telecom) ad hoc 'effort' (2020) • Wire burying easement policy (?) • Dominion historic village policy (?) • Relationship with Verizon as village 'resident' • NHL revision (2020) •
Other services: • Cemetery maintenance • Beautification • Preservation • *Trash collection* • *Recycling collection* • *'Parks and grounds'*	• Private organizations	*Cemetery Committee* *Beautification Committee* *Preservation Committee* • Waterford Foundation • Local private residents	• 1987 Waterford Area Management Plan • WF invitation to WCA to assist maintaining Phillips Farm • NHL revision (2020)

*Service being provided with WCA involvement if no italics; *italics signifies service provided without WCA involvement or service currently not provided.*

On **September 24, 2020**, the full membership of the WCA voted to constitute an Ad Hoc Governance Committee to increase Board hygiene and map out a means to work collaboratively with the Waterford Foundation to build a "quasi-municipal" organizational structure moving forward.

On **October 1, 2020** the Scope of the Committee's assignment was:

Governance Committee Scope of Task

1. Review the current Waterford Citizens' Association (WCA) Governance Hygiene to assess options for enhanced effectiveness and transparency of the WCA organizational structure. Report findings and recommendations to the WCA Executive Committee.

2. Review the issues, frustrations, needs, and opportunities the WCA has and will face as a community non-profit, operating in the vacuum of a "municipal" governing body. Report findings and recommendations to the WCA Executive Committee.

3. Analysis of potential governing structures, i.e.; HOA, Municipal, Alignment with other Western Villages/ Loudoun Historic Village Associations to provide a framework for determining the best governance structure for the WCA. Report findings and recommendations to the WCA Executive Committee.

4. **Once the WCA governing structure is selected, recommend to the Executive Committee the tools to "formalize" relationships and communications with the WFI, County, State, Federal partners; public, private utilities and other service providers; other local and regional non-profit organizations.**

The committee then worked with both the WCA and the Waterford Foundation to draft a joint Mission Statement, which was passed by both Boards:

WATERFORD 2033 MISSION STATEMENT AND GOAL
APPROVED BY WCA MEMBERS AND THE WFI BOARD

The WCA and the WFI, each stewards of the Waterford National Historic Landmark, are working collaboratively to protect the NHL and to direct future cultural, infrastructure, and community improvements.

Goal:

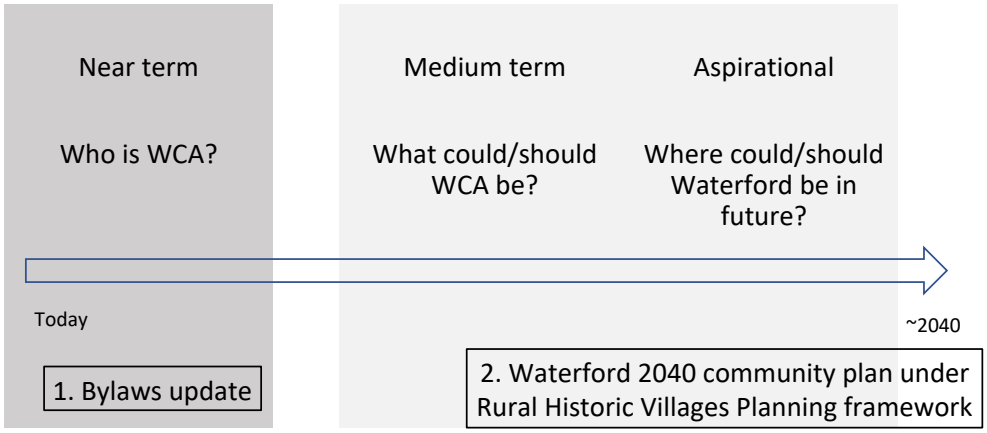
Create a Waterford 2033 Visioning Plan by June 2022 for implementation beginning in 2022

COMMITTEES

- WCA Traffic Committee
- Water Committee
- Communications Committee
- Sustainability and Adaptive Reuse Committee
- Outreach
- Funding

February 25 2021 Ad Hoc Committee Presentation to the WCA

Ad Hoc Governance Committee Review:
questions & main recommendations



Who is WCA? Bylaws hygiene review

- Geographic boundaries
  - "Waterford area" vs "project area"
- Membership types, voting, dues
  - Clarify Regular and Associate
- Elections, Officers and Board
  - Set terms, clarify Nom Com
  - Better define Board
- Committees
  - Resolve inconsistencies (table)
  - Chair appointments
  - Policies: decisions, succession planning, counterparts, missions
- [Context: Who is WF?]

Bylaws	Website	Missions (website)	Chair
1.Audit	NA	NA	NA
2.Beautification	1.Beautification/ Environmental	Organizes village cleanups, tree and bulb planting, etc.	Nick Ratcliffe
3.Cemetery	2.Cemetery	Helps maintain the Waterford cemeteries	Paul Rose
4.Cooperative	NA	NA	NA
5.Environmental	NA	Looks at issues involving our water and sewage	NA
6.Fund Raising	NA	Raises funds to support all of our other efforts	NA
7.Membership	3.Membership	Recruits new members and membership activities	Ed Lehmann
8.Preservation	4.Preservation	Ensures the preservation of our historic community	Mary Sheehan
NA	5.Social	NA	Jill Kadish
9.Special Events	6.Special Events	NA	Ann Belland
10.Streets	7.Traffic	Organizes traffic management strategy and plans	Meredith Imwalle
NA	8.Ad Hoc Water	Helps ensure dissemination to WCA member on water topics	Mark Sullivan
NA	9.Ad Hoc Governance	NA	NA

Recommendation 1: Bylaws update
How to get there?

- Hygiene review has raised issues
- Multiple options for "fixing"
- Dialogue, consultation
  - Identify additional solutions
  - Build buy-in
- Bylaws (Art. 6.2) require presentation of amendments in Q before vote

Recommend --> Update WCA Bylaws:

- Governance hygiene report on website
- Delegate redlining of Bylaws
- Redlined Bylaws on website
- Open review period (online and other ways)
- Propose revised Bylaws draft Q2
- Vote revised Bylaws Q3

What could/should WCA be? Options review

1. Town incorporation
   - Greater autonomy, but obstacles to achieving
2. Public and private partnerships or sponsorships
   - Funding, preservation support but little impact on autonomy
3. HOAs
   - Not likely to offer major benefits
4. Devolved planning through Rural Historic Villages framework
   - Enhanced autonomy with little downside, available to us now
   - Provides vehicle to answer question 3 on aspirational future goal

Loudoun 2019 Comprehensive Plan Rural Historic Villages framework

Goal: "development and land use in [County's 12] Rural Historic Villages must be compatible with the historic development pattern, community character, visual identity, intensity, and scale of the individual villages…"

Means: "work with Rural Historic Villages to develop ***community plans*** that support appropriate land use, zoning, community facilities, water and transport."

Aldie (2019 Small Area Plan, village) and Hillsboro (Comp Plan, incorporated town) provide examples

Recommendation 2: Community plan
How to get there?

- Community plan most promising, though study of other options may be useful
- Waterford has wealth of pre-existing planning studies
- Update to Waterford Area Management Plan 1987
- Rural Historic Village community plan framework not yet formed
  - Waterford may be test case
  - Must be participatory, link to other LHVA villages

Recommend --> Embark on Waterford community plan:

- Post governance options report on website
- Plan for interactive, participatory process
- Continue outreach to County and LHVA
- Outline steps for vision and community plan development
- Formalize joint effort WCA-WF on Waterford 2040 vision sessions
- Identify consultant, funding
- Waterford 2040 Vision sessions Q2
- Aim for draft outline of plan by Q4

In this process, and in collaboration with the Waterford Foundation Board, we authorized the Waterford 2033 Visioning Planning to begin, led by Cate Magennis Wyatt, Mike Stup and Mary Sheehan.

Cate Magennis Wyatt, Chair Waterford 2033 Committee

50 years of studies, culminating in the 2003 "Bury the Wires and Tame the Traffic" Report, funded by the WFI and Loudoun County highlighted recommendations you can view downstairs that include:

- Traffic taming mechanisms at the village entrances
- Burying the wires
- Stormwater management
- Lowering the streets
- Adding lighting

- Increasing walkability

The recommendations in that study were agreed upon by citizens of the Village, the WFI, the WCA, and Loudoun County

In 2021 with the help of Supervisor Kershner and Chair Randall we received funding from the County to Update the study to reflect:

Updated Traffic Plans

New Stormwater Management Planning

New Potable Water Studies

Adaptive Reuse and Sustainability Planning

We conducted Community outreach to engage villagers:

Conducted a thematic survey in summer 2021 and reported on results in a community meeting.

Hold monthly briefings of Waterford 2033 progress with the WFI and WCA leadership teams.

Include updates on Waterford 2033 at every WCA community meeting.

Include updates in the Waterford Foundation Newsletters.

We conducted outreach to local, state, and federal agencies:

Loudoun County Board of Supervisors

Virginia State authorities

Virginia Congresswoman Wexler

National Park Service

Department of Historic Resources

Department of the Interior

Rural Villages Alliance

Loudoun County Water Authority

Virginia Department of Transportation

Dominion Electric

After the Panel presentations, the floor was opened for questions and answers and discussion.

Q: What is the origin of the name Waterford 2033? (Nancy Doane)

Wyatt succinctly recapped the founding of Waterford in 1733 by Quakers from Bucks County, PA, and the upcoming celebration of its rich 300-year history. She further reflected on Waterford's early innovative contributions to the economy of Loudoun County, its significance during the Civil War, the retribution by a post-Civil War Virginia and Loudoun County government sympathetic to the Confederate cause, for the pro-Union and anti-secession sentiments of the Waterford community, and the subsequent demise of its thriving local economy, which ultimately led to the town's de-incorporation in the 1930's.

Thompson further described the groundbreaking preservation efforts dating back to the 1930's of the Chamberlain family to restore a number of the homes and many of the historic structures in Waterford. This led to the formation in 1943 of the Waterford Foundation, formalizing efforts to preserve and protect the historic structures and open spaces of the village, 20 years prior to passage of the National Preservation Act of 1966. In 1970, the Department of Interior designated Waterford and its surrounding 1,420 acres as a National Historic Landmark, the first such designation for a living community area.

In recent years, the Foundation has been working with the Department of the Interior to update its National Register documentation. The draft report is currently available for public comment. The professional staff from the Department have concluded in their review that Waterford is **THE BEST** example of historic preservation in the entire country, a phenomenal accomplishment.

Q: Is a summary of the various studies of the needs of Waterford (to ensure its continued viability as a village and its integrity as a National Historic Landmark), which were reviewed by the Waterford 2033 Leadership Team, available on-line to the general public? (Jeff Bean)

Wyatt and Hertel ensured the audience that the summary of the many reports would be posted on both the Foundation and the WCA websites.

Supervisor Sylvia Glass (Broad Run) of the Loudoun County Board of Supervisors briefly addressed the audience. She expressed her regret that other commitments required her to leave but thanked everyone for the informative presentations and discussions and applauded the efforts of the community to bring these issues and the significance of Waterford to the forefront. She further offered her support for our Waterford 2033 plans as they move forward.

A lengthy discussion of regulations and zoning restrictions that constrain efforts to improve adaptive re-use of village buildings and sustain a vibrant community followed. Maura Walsh-Copeland, consultant and member of the Loudoun County Zoning Ordinance Working Group, and Madeline Skinner, Chair of the Loudoun Historic Village Alliance, briefed those present on the status and related issues of the current County review and revision of its Zoning Ordinance. Of particular note was the exclusion of any effort to specifically address the needs of unincorporated villages at this time. Draft revisions to the Ordinance will be released to the public in April, and there will be a 90-day comment period. Chapters 3,4 &5 are of particular interest for the village overlay districts. If issues pertaining to villages are not addressed during the current review, small area plans will otherwise be addressed at a later date.

Q: How are comments received on the drafts? (Bean)

Comments may be made relatively easily on-line. E-mails and in-person comments from new faces are very important to alert the working group, Planning Commission and County staff of village issues and concerns.

Q: Is there an issue paper or outline identifying key issues for villages and the position(s) of the Loudoun County Preservation and Conservation Coalition/Rural Village Alliance to inform the public and focus efforts of those who wish to comment? (Wyatt)

Skinner announced that there will be a work session on the Small Area Plans, but in the meantime, Walsh directed attention to the Coalition's website (LoudounCoalition.org, "Our Work"/Zoning FAQ's) which contains all the comments that the Coalition has made on the Zoning Ordinance drafts.

Q: Who is the current Planning Commissioner for the Catoctin District? (Doane)

Mark Miller has been appointed by Supervisor Kershner to represent the Catoctin District. In addition, the At-Large member of the Planning Commission is Forest Hayes, who resides outside of the Village and is a member of the Waterford Foundation Board of Directors and is currently serving as Chair. The proposed revisions to the Zoning Ordinance are currently on track to be before the Planning Commission sometime during July and then before the Board of Supervisors by the end of the year. There will be public comment periods and hearings before both bodies.

Panel 2: Water and Traffic – Effective Long-Term Solutions

Sharyn Franck, Chair – Traffic,
Mike Stup, WCA Vice President

Traffic Overview

Three traffic flashing lights at entrances to the village measure speed. We get the data. Found out that 67% of license plates are MD and WVA going through Waterford to avoid driving on 15. We don't have data about people leaving the village; would need more traffic monitoring systems to capture that data.

If the traffic speed lights aren't flashing, that means they are broken and need repairs. Report them to Sharon. Need to make our voices known. There's only so much traffic the village can handle.

Before Covid, almost 9,000 cars came thru the village on weekday. The last robust traffic study was in 2019. As a result, we now have the signs collecting speed data. Approx. 3-4,000 cars on weekends. The average weekly volume is now about 5,000 vehicles per day. Can be as much as 1,000 cars per hour. The situation is going to get worse before it gets better. Especially when we fix it. That will tie up the roads in the village. The Sherriff's cars are sometimes parked and monitoring traffic on High Street. Pointing down on Patrick Street. They pull people over and ticket them.

The 2033 committee is looking for more volunteers to be on the traffic committee. Connie Moore pointed out extremely loud traffic on High Street by the Presbyterian Church on Sunday mornings. Disruptive. May be motorcycles or race cars. Could we put a decibel limit on vehicles going through the village? The minister, Rev. David Douthett, concurred.

The WCA has the money to put traffic cameras on private buildings. Mike knows about installing them. Could put them up if people volunteer to use their property. (Note: the Presbyterian Church is very interested in doing that.) There was a survey of village residents last fall. Traffic was raised by 100% of the participants as an issue.

Waterford 2033

All the info about the 2033 project is on the WCA website. All the reports are there. Everything from the downstairs panel on March 26th meetings are also on the website. Anyone is welcome to attend the Tues meetings at noon. Look on the WCA site for all the Waterford 2033 documentation and updates. Mike is happy to sit with anyone to brief them on any aspects of the Waterford 2033 initiative.

WCA 2033 site:

https://www.waterfordcitizens.org/activities/waterford-2033-visioning-and-community-planning/

Water:

https://www.waterfordcitizens.org/activities/water-needs/water-study-timeline/

Plan from 2003(bury the wires, tame the traffic, with storm water and walkability)

https://www.waterfordcitizens.org/activities/waterford-traffic/traffic-calming-and-bury-the-wires-studies-in-2003/

Water Overview

Mike will do briefings on water to anyone who wishes him to address a meeting or talk one-on-one. Mike has been documenting the water issue for a long time. This starts with what was done in 2003 study, the 2006 WES Water Study, the 1966 Study etc. The 2003 study addressed: paving, traffic, and storm water. Mike and Sharon want to hear from us—the entire community. The 2033 committee wants to get everyone up to date and then generate new ideas for going forward.

Waterford is moving from a once a year big Fair to support the Foundation to diversified plan to utilize the buildings and spaces for the WFI mission and community needs. This is a new way of thinking that the Waterford Foundation has and it requires water for the buildings that lack it.

The 2003 Study

The panels downstairs on the March 26th event are taken from the 2003 proposal. In 2003, the village lost sight of the report. Didn't have money to move forward. More importantly, the Phillips Farm crisis took all the energy away from the traffic report. At the time it would have cost $13M to bury the wires and tame the traffic. Now the 2003 study is being updated. The updated study will be available by the end of April. That will then be the most current proposal. The full 2003 report for calming and buying the wires is 117 pages. Mike can walk us thru any component of the study – the summaries are on the big boards. Mike Sullivan is the WCA committee chair for water.

Question from the audience:

Wastewater management: are most solutions looking at diverting water into the creek?

Answer:

Two definitions: stormwater 1) what is it? and 2) how to leverage it?

Want to leverage water for sustainability/reuse/filtering/stages, including using native plants and best practices to manage stormwater. In 2003, there weren't a lot of best practices for gray water, or for using native plants in stages before run-off occurs. Since then, the EPA(and many others) have done a lot of work on it managing stormwater using new techniques. By June 2022, we will have these new approaches incorporated into the plan. Opportunities for improvement are almost everywhere you look. The problem statement for stormwater management is now much bigger than it was 20 years ago. Engineering and design phase—look at historic elements, putting clean water into the creek, water collection.

Is it possible to collect water and maybe connect to Mill Race to turn the wheel?

We need to get water out of people's basements from heavy rain events and into the right place and with the right quality.

Some real problem areas in the town include: the intersection at the corner store. We are getting significantly more flash storms now than in 2003 and climate experts say that will continue and possibly worsen. We keep seeing things happening to the village that are water run-off problems. There is diverse ownership: The county owns the ditches near the jail. VDOT has responsibility for its right of way but they don't do drainage design. The entity that does manage drainage and water is not connected to VDOT –they didn't know each other even though working in the same building. We introduced them to each other. There have been many good intentions over the years. The pavement is as high as 10-18 inches higher than the old road by in some areas. This problem with stormwater run-off and the solutions involves all of us—WCA, WF.

The WCA members take votes and make decisions. The Waterford Foundation decisions are governed by board of directors. We need to recreate and anticipate the next set of problems. We are currently doing an engineering study concept plan(update to the 2003 plan). We must figure out how to transition from what we currently have, to where we are going. The current plan being created is an idea study. After that, the next study is a feasibility study. Don't want people to miss the planning period. We have already been awarded money to do engineering studies. We have visited other areas and have incorporated some design elements from Aldie, Middleburg, and Upperville, Millwood. Mike encourages people to visit those towns and see what they have done to calm traffic and improve storm water management.

Mike sees Second Street currently as a runway for speeding traffic. Look at the 2003 boards that shows elements to slow traffic by visually squeezing the road and add rumble and/or humps and/or speed tables(with cross walks). Other villages are putting in strips or speed tables for cross walks. Let's look at those other towns and see what they've done. In Aldie, the strips are spaced closer and closer as you get closer to town, and it helps people think about slowing down. Mentally calms drivers down when they come into the town.

What are we doing to do about the trees when we put in sidewalks? The WCA currently spends $2-3K per year updating trees. Preserving the trees is critical. Creating elevated patches over

tree roots is one idea. Want as much as possible to avoid hurting the integrity of the trees However, when we install all the structures we need into the ground, will have disrupt some tree roots. Items to go in the ground would be storm water pipes, utilities (power, internet) & potable water pipe(very small ~4") . Also, need to install internet/cable fiber to future proof the village. It may be possible to swing around the trees to avoid damaging them.

Stephanie Kenyon's created a historical report on Waterford's water usage/issues since the 1950s. It is on the WCA site. We will never stop collecting ideas. We will always a need to incorporate new changes. Stephanie's project is focused on doing many things at once. It is on the WCA site under the 2033 Community Vision section.

Currently, we get traffic data monthly. On the Clarke's Gap entryway, the average speed is 31 mph. 85% of the traffic is 41 mph, and the outliers are 50-60 mph. Speeding at the point, the video is shocking.

Want and need to put up more cameras. WCA has funding. Foundation is also looking into funding them. Nancy Doane: Would love to see a camera by Factory Street and High Street.

1966 studies on water - Hand dug wells and surface level water were not good for quality of life. Problems with leaching of heavy metals from roofs, insects, pollutants. Shifted the villager's focus on installing drilled wells instead. Waterford started shifting, and also installed the sewer system.

Water in the village.

The trend for water discussions and analysis, need, changes have been ongoing in Waterford. We have seen discussions of water needs early in the history. Of note an example is a 3 acre zoned lot would normally have 1 well for one family. In Waterford there are as many as 55 wells in a 3 acre zone in a village. There are over 110 active wells in the village currently. The very high ratio of wells per acre in Waterford puts incredible pressure on well interference and recharge rates. This example highlights one of the factors in play in our village.

The incredible amount of land that is in easement now adjacent to the Village and/or the NHL has increased over time. The threat of dense developments, once a heightened fear in the 70s, 80s through the 90's into early the 21st Century, has dropped precipitously with the down zoning of WFI managed properties, use of Easements, use of Tax structure with Easements (ie, Browns farm 800 acres in 2021) over the last 50 years. The threat of a super-sized development or dense development has waned and currently is not the threat to the Village, as it once was. We need to stay diligent on development and helping preserve the surrounding land, no question. Moving towards a water solution for part or the entire village can be done without increasing development concerns and to help save and preserve the Village and the NHL. Using tools like legal Easement terms on a water solution would keep the water for the intended use of fixing water scarcity for village parcels only.

The shift from hand dug wells, which were prevalent in Waterford, in the 60's and beyond to machined drilled wells into the granite bedrock continues mainly as a response to health concerns for water quality. The VDH and LCDH (health departments) shifted regulations to

reduce impact from contaminated waters from sewer, bacteria, agricultural runoff, heavy metals from roof to name a few. The focus was to get much cleaner water and tap into water below the bedrock layer. It has been a requirement to drill into the bedrock before a new well can be certified. The increase in the drilled wells into bedrocks has increased the interference for recharging wells in an area like Waterford that has a dense well to acre ratio. This is evident in the graph that was shown from the 2006 Water Study for the Elementary School on the chart for how water can recharge in our village. The highlighted areas in yellow, orange and red zones where water yields are much lower than the surrounding areas shown in green and blue.

The Waterford Foundation is shifting focus for structures from one-time events to instead focus to more of an adaptive reuse strategy for preservation. This shift has been going on for decades and part of the longer term vision for use of WFI properties. The history of preservation is the journey to adaptive reuse that support the NHL & Village Preservation goals. Foundation's properties; without water the foundation can't rent or use the properties on a regular basis. The properties also have zoning issues, parking issues, and water availability is a big issue. Some of the historic properties owned by the foundation lack water.

The Waterford Water Feasibility Study will be out in April 2022. The intention of the study is to define the water problems and provide solution options.

The intention of any water solution for the village would include the following: Parcel owners who want to keep their wells can. The Village through the 2033 Committee, WCA & WFI would find funding for the capital improvements (sources identified in 2033 meeting minutes). The home owner or parcel owner would be able to keep well and new source if they elected to as long as they were separated systems. The service area would need 50% of the parcel owners to connect in the first year and the rest could connect or not over time. A solution for clean, affordable, and plentiful potable water that helps preserve the Village and NHL that has a clear service area(think legal easement) are part of the success criteria

Water for emergency and fire suppression is a topic to review and coordinate with any solution that is being discussed.

Phyllis Randall (Chair of Board of Supervisors) put water as a county initiative in her first term. Sorting out water issues for rural and small communities without running water, such as St. Louis, was a desire for the leaders in Loudoun. St. Louis is doing a design now. There is money for community water systems. Paeonian Springs did a study 4 years ago and they are now commencing with a sewer system and a water solution design is next. Paeonian Springs was able to have $13m in the capital budget allocated to pay for their sewer system through Loudoun County. Hillsboro was able to solve their water issues with funds through USDA and Loudoun County.

Our study will be finished and released any time soon. Maybe in another week. According to the county, it will be exceptional and lengthy, including geological research. There will be a video explaining the Water Feasibility Study released by LCGS &LW through the WCA. The timing of the video is targeted to be a few weeks after the study is released.

Final question from the audience:

How fast can a well recharge?

The Waterford 2033 committee has a map with a visual representation of well recharge rates. Red, Orange and Yellow location are indicators of lower well recharge yields. When you couple the Red, Orange and Yellow locations with a high density of wells & houses per acre the recharge rates become more of a problem. Pockets of blue zones on Loyalty Road around and beyond the school indicate a rate of 20+ gallons per minute recharge. In the red zones, wells only get ounces/minute to recharge.

Please see Sharyn Frank, Mike Stup or Mark Sullivan for any questions on Water. Their contact information is on the WCA site under Water.

Panel 3:Sustainability and Adaptive Reuse

Ron Benschoter
Dave Hunt, Chair – WF Finance Committee
Annie Good, Chair – WF Preservation Committee
Mike Stup, WCA Vice President

Presentation:

- Overview of the Committee's approach to and definition of sustainability
- Discussion of the matrix
- Discussion of the intersection with the Kimley Horn Report and Recommendations based on changes in the past 19 years
- Overview of the Phillips Farm Plan
- Review of the 13 properties owned by the WF
- Discussion of zoning and water issues
- Discussion of restrictions of easements, historic designations, and NHL and Land Trust rules

Audience Comments/Questions:

- It looks as though water is the most critical priority if we are going to gain any value from the buildings and land.
- The quasi-municipal structure is going to increase transparency going forward as decisions are made about the use of or sale of properties.
- There are so many more opportunities for education in the village. It seems as though we are focused on raising funds than educating people about the history of the village. We need to do a lot more to interpret the village for visitors.
- Have to find a balance between the competing interests of keeping things as they are and funding the care of the buildings/properties. Would villagers prefer to pay the WF for the care and upkeep of the properties rather than have the WF try to make money from them?
- We need to balance the desire for privacy and a quiet village vs. lots of visitors coming because of events or commerce.
- We should be more forceful about asking volunteers to do building upkeep like painting.
- If the buildings are used more often, we can add educational information on each property to increase the educational value.
- There is funding available, but we need to define our priorities, have a project outline, and define a budget in order to go after grants.
- We don't want to become Williamsburg. My biggest worry is that, in the future, no one will live in the village. We need to look at bringing in businesses that are appropriate and educational like a potter, not businesses that will bring in droves of people. We have to consider how the community will look in 100 years.

Addendum 1 Recorded Comments and Reactions to Storyboards

Villagers and 2033 Committee members were given an opportunity to comment with sticky notes and/or to post stickers that reflect their reactions to ideas. Green means they like the idea, Yellow means they have questions about the idea, and Red means they do not like the idea.

Recorded Comments and Reactions to Storyboards					
Subject	**Color Reaction**			**Comments**	**Response**
Lowering Roads	Green 25	Yellow 1	Red 0	Add speed tables to Second St (2) Add speed tables to Main Street (2) Narrow the streets if possible What is the purpose of reducing the corner radius?	
Burying Wires	Green 33	Yellow 1	Red 2	Add stamped concrete to all intersections (2) There is a historic quarry near the intersection of Clover Hill Road and First Street near where some trees are proposed Center Island takes away from the original village landscape. There is already a stop sign there. I don't understand the divider.	
Adding Sidewalks	Green 16	Yellow 1	Red 2	Why not sidewalks on Patrick Street? A sidewalk on Water Street is likely to increase the speed on the road as pedestrians are deconflicted. A sidewalk/path to the elementary school from the village would eliminate the silly busing requirement for village students. (2)	
Lighting the Village	Green 2	Yellow 0	Red 1	No lighting near Quaker Meeting House	

		Disagree with all the lighting. The rural darkness is beautiful, especially outside the village center. I would be against lighting. I know it can be dark, but it's valued. Don't increase light pollution. Maybe a few lights near the center of town.	
Adapt Entrances to Tame Traffic	Green 32 Yellow 1 Red 0	Does the reduction of the corner radius at Old Waterford Road and Loyalty impact the Meeting House stone on the corner? Install a dead end somewhere on Second Street. That will return traffic to a level appropriate for a small residential neighborhood instead of continuing to be the quickest path for people from WV or MD to get to Leesburg/East. Check out Woonerf – it's a Danish "living street" concept for city planning that focuses on bikes and pedestrians, with cars being the lowest priority. Contact Google Maps/Waze exec's to see how they can help with traffic flow.	
Humpback Bridge	Green 16 Yellow 0 Red 1	Early deeds note that there was a "little bridge" over Tanyard Run. Constructing a humpback bridge would alter the cultural landscape and it is not historically appropriate per the Secretary of the Interior Standards for Rehabilitation of Cultural Landscapes because the humpback bridge is a historical style that would be introduced into the Waterford	

		cultural landscape, which would create a false sense of history. Waterford has already gone through one period of historical fakery (the Colonial Revival Period when Williamsburg-y elements were introduced). In 1792, the bridge was described in a deed as "a Little bridge." People already have a false sense of what Waterford looked like; let's not add to the issue. Additionally, I don't think a humpback bridge is going to do anything to discourage traffic through the village. What it will do is cause more noise when people hit the gas after crossing the bridge. Narrow the street.	
Stormwater Management	Green 18 Yellow 0 Red 0	Ensure stormwater installation doesn't disturb any boundary stones	
Solar Panels	Green 7 Yellow 0 Red 0	Where would they be allowed on roofs in Waterford? Go for it!	
Mill and Millrace Restoration	Green 2 Yellow 0 Red 1	The period of significance that the Waterford Foundation selected for restoring the mill is the period when the hurst frame was used, not the roller mill period. The addition and Mill Pond by the Mill are from the roller mill period; therefore, they are incompatible with the period of significance. The mill dam would pond water at the mill. If there is a breach in the dam, the historic mill would be at risk. Someone would need to open a spillway gate every time there is a heavy rain. I am not aware of any way to restore a millrace that retains the historic integrity of the mill race. Digging out a millrace to make it deeper would not be an	

		appropriate treatment. We want to make sure we don't end up with a stormwater swale where the millrace used to be.	
Phillips Farm Plan	Green 6 Yellow 1 Red 0	When stabilizing the streambank, don't destroy the part of the stream where the original run from Hamilton Station Road entered Catoctin Creek When clearing the millrace, recommend following cultural landscape treatment plans that typically suggest cutting down trees along the race at ground level	
Adaptive Reuse	Green 7 Yellow 0 Red 0	Think big; keep flexible for future use Definitely restore flows and eradicate invasive species in Open space Activate Foundation Buildings for Co-working space for monthly income Yoga classes Fitness Classes May we please add another trail on the other side of the Phillips Farm? Too much commercial activity may make people not want to live here in their homes A trail on the far side of the Farm with interpretive places More trails (2) A little concerned about updating all the buildings with restrooms, HVAC, sprinklers, etc. Have to retain the character	

				Update building leases to market rates to help defray the cost of upkeep Install a kiln (where safe) and rent space for local potters	
Individual Reuse Idea Reactions	**Green**	**Yellow**	**Red**	**Comments**	**Response**
Movies in Meadow	4	0	1		
Flower Shop	3	0	0		
Museum	2	0	0		
Community Garden	3	0	0	Not sure how many people would use a community garden; needs to be a discussion of habitat, carbon sinks, and ecological communities	
Space for Artists	2	0	0		
Farmers Market	7	0	0		
Space for Crafters	1	0	0		
Art Gallery	1	0	0		
Climate Controlled Archive	1	0	0		
Add Hiking Trails	1	0	0		
Sheep Trials/ Equestrian Events	1	0	0		

Village Briefing

Progress and Process for the 2003 – 2022 Waterford Infrastructure and Sustainability Plan

Waterford 2033

300 Years of Preservation & Conservation Through Innovation

Opening and Closing the Meeting

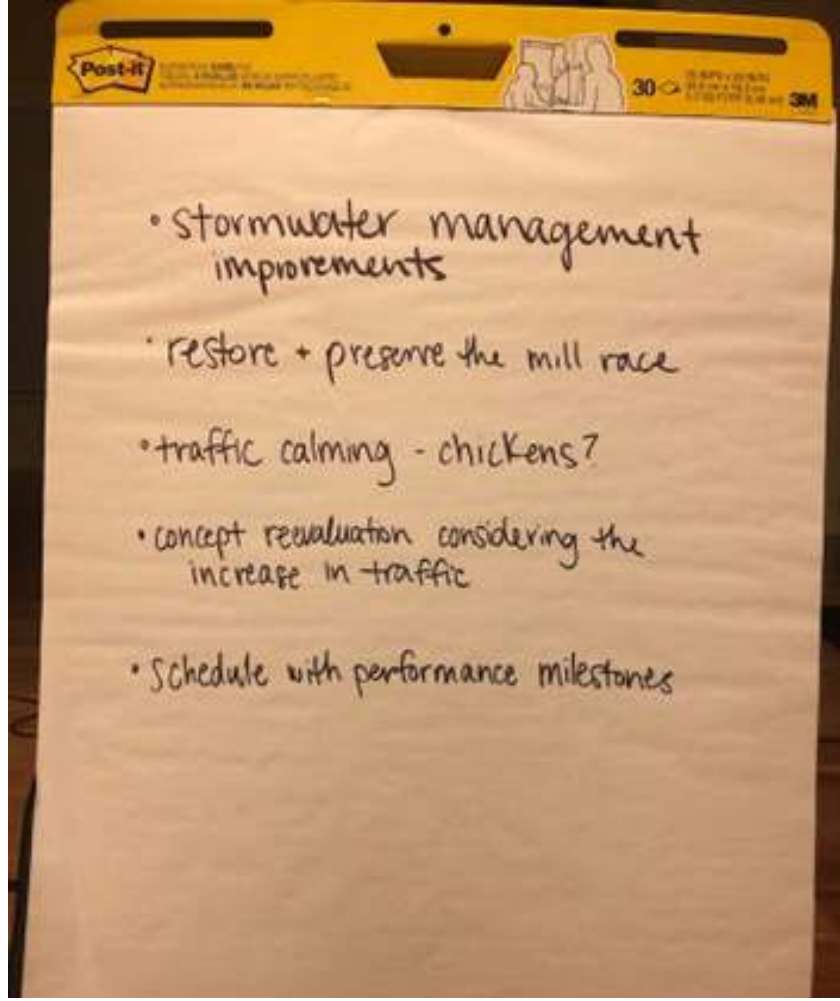
Waterford Citizens Association
President, Christy Hertel

Waterford Foundation Board
President, Susan Manch

Update on the Work of the Waterford 2033 Committee under the direction of the Joint Leadership Council of the WFI Board and WCA

WATERFORD 2033 CHAIR, CATE MAGENNIS WYATT

John Martin, P.E. and lead engineer from Kimley-Horn provides citizens with an update of Waterford's Infrastructure and Sustainability Plan



Villagers Engage and Share Questions and Ideas

The Kimley-Horn and Loudoun County DTCI team members

From left to right: Devon Arnold, Mark Phillips, Nancy Boyd, Bob Brown, Kate Noel

Former WCA President and Current WCA President welcomed Rachel Reibach, Regional Director for US Senator Tim Kaine of Virginia

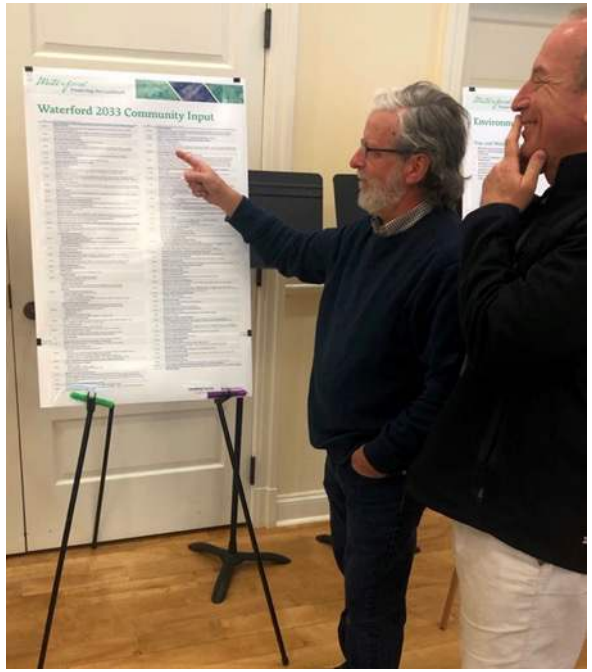
Waterford 2033 Vice Chair, Mike Stup speaks with Corinna Sigsbury (DTCI), Bob Brown (DTCI) John Martin (Kimley-Horn) Peggy and Dave Bednarik (Village Residents)

Nancy Boyd, P.E., Deputy Director of the Loudoun County Department of Transportation and Capital Infrastructure speaks to Context Sensitive Design

Villagers Learn More About the Project

MARK PHILLIPS, KIMLEY-HORN AND NICK RATCLIFFE

ROY CHAUDET AND RAY DAFFNER



Villagers Hear About and Examine the 2033 Plan

Waterford Citizens' Questions and Comments
Collected for Historical Reference and Records

Traffic Questions and Comments

- Do you know where the limits of ownership under the roads are, AND where the limits of VDOT role in relation to the design maps?
- Will brick pavers along the road really calm traffic when those who are cutting through are focused on passing through the village as quickly as possible?
- Do any proposed treatments reduce traffic counts?
- Waterford is historically significant in part due to its development patten using a street grid plan. Would changing the street corner radii be of such high valve to offset the impact of modifying the grid?
- Is there a prioritization of projects to be tackled? Traffic calming before other initiatives, for example.
- For traffic calming, are there ways we can enforce existing laws (i.e., weight restrictions on heavy trucks)
- Could we use technology to cheat the system. For example, WAZE app which many rely on for fastest route, could discourage traffic through Waterford.
- Has there ever been consideration of a toll for thorough traffic (non-local cars)? EZ Pass and plate readers are much improved over the past five years. It could be only in effect during rush hour, exempt local residents, etc. Toll has a big effect on driving decisions, especially when routes are of comparable length. Traffic volume is the most escalating issue and requires the most radical out of the box solution.

Traffic Questions and Comments

- Wondering why there are no speed bumps in the plan.
- We should ask VDOT to restrict committee commuter cut-through traffic during rush-hour—this is a way to get Waterford off the traffic apps which is very important.
- What is the timeline of construction?
- Is there a timeline of Key mill stones?
- What happens to traffic coming through Waterford once Route 15 is being revamped?
- Average transit speed monitoring could enforce compliance. Are they permitted in Loudon County?
- Are there any caveats for speed cameras?
- These concepts are all good and work together. In past studies a variety of solutions were proposed a long various streets within the village and the entrances. When it was time to present it to the Board of Supervisors little or nothing from the study ends up being recommended. What is the process to keep the updated 2003 proposals togethers as a whole? Doing this piecemeal won't solve the issue.
- Too many streetlights only increase speed.
- How are cars kept from driving over grass?
- Toll for non-local traffic could be a very cheap option.

Restoration Questions and Comments

- Regarding Mill Race restoration:
  - What construction will be done to restore the millrace?
  - How will the construction retain the historic integrity of the race? Wouldn't construction just turn the historic race into a new stormwater swale?
  - What areas upstream are causing Catoctin creek to channel?
  - Can anything be done upstream to mitigate stormwater channeling?
  - Please describe the construction needed to restore the creek.
  - Will construction include bulldozing the streambank?
  - If so, to what extend on each side?
  - Will riprap be placed on each side?
- Will Tannery Run be restored? If so, how are historic tanning vats preserved

Wires and Roads Questions and Comments

- For several years Dominion Energy has had authorization from the state utility commission to put all electric and other “wires” underground for homes/buildings in its service territory. Has Dominion been contacted about doing this for the homes/buildings of Waterford? Has anyone talked to the state commission about authorizing/encouraging putting all village wires underground?
- Will street elevations be addressed and corrected (too much sameness of appearance in road edging throughout village?
- How will the suggested improvements help the Waterford Foundation?
- Does reconstruction work include Bond and Liggett streets, the gravel streets around JW church. Right now, the citizens who live there pay for any work done.
- Can electric and cables be in the same conduit?
- How does the rerouting under the intersection avoid the drainage under the road?

Appendix G: NEPA concurrence from 2003

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

RECEIVED
AUG 2 1 2003
KHA-NOVA
Environmental Consultants

LETTER OF TRANSMITTAL

Attn: John Martin

Date: August 11, 2003

To: Kimley-Horn
13755 Sunrise Valley Drive
Suite 450
Herndon VA 20171

Project #: 1725

Reference: Waterford

From: Loretta Cummings
Senior Regulatory Specialist

cc: Dick Pezzullo

WE ARE SENDING YOU:

- ☐ Plans
- ☐ Prints
- ☐ Copies
- ☐ Contracts
- ☐ Literature
- ☐ Report
- ☐ Samples
- ☒ Letters
- ☐ Other:

REASON:

- ☐ As per your request
- ☐ For your signature
- ☐ For your review/comments
- ☒ For your use/files
- ☐ Other:

SENT BY:

- ☒ Mail
- ☐ Overnight Carrier:
- ☐ Courier:
- ☐ Other:

COPIES	DATED	DESCRIPTION
1	7-28-03	NEPA Concurrence

Notes:

Attached is the NEPA concurrence letter from the Federal Highway Administration. This is the first step of the document process. Please keep it in your files.

Loretta Cummings

L:\1700s\1725-Waterford\Correspondence\Concurrence transmittal.doc

To: Mr. Jerry Combs
From:
Loretta B. Cummings
Senior Regulatory Specialist
Williamsburg Environmental Group, Inc.
46030 Manekin Plaza, Suite 160
Sterling, Virginia 20166

Date: 7/22/03

NEPA DOCUMENTATION
CONCURRENCE FORM

Project: Waterford Historic District – National Landmark
#EN98-053-137, PE101
Location: Limits of the Historic District
Federal Project Number: Federally Funded; T-21 Grant
City/County: Loudoun County
PPMS ID #:
Loudoun County RFP: QQ-00963

Description: This grant in known as the "Hide the Wires, Tame the Traffic" project. Its purpose is to improve the intrinsic historic nature of this National Historic Landmark by eliminating the overhead utility lines and poles and reducing traffic speeds. The utilities will be buried under the road pavement. Traffic taming measures that do not detract from the historic nature of the area will be employed to slow traffic and create a safer pedestrian area.

This goal of this project is to work with the Department of Historic Resources and the Waterford Foundation and Waterford Citizens Group to create a project that achieves a "no impact" or "no adverse impact" to the National Historic Landmark village.

Attachments:

Map XX
SERP PEI
Other XX DHR, DCR, USACOE Correspondence

Suggested Level of NEPA Document:

CE X with Section 106 documentation and potentially a Programmatic Section 4(f)
EA
EIS

Comments: Extensive coordination has already occurred and will continue to occur between the Waterford Foundation, the Waterford Citizens Group, the Parent/Teachers Association, Loudoun County and the Department of Historic Resources. Architectural historians and Section 106 compliance specialists have been involved with the preliminary planning and will be intricately

involved in project development and compliance review. The primary environmental concern is the historic nature of the project area.

Several intermittent and one perennial stream exist within the project area. State Program General Permits may be required if bridge alterations on the intermittent streams are included in the traffic calming measures.

There are no threatened or endangered species in the area. Traffic volumes do not warrant an air or noise study. Properties under protective easements do exist around the historic district but are not anticipated to be impacted.

We concur with the suggested level of NEPA document.

FHWA Approval

07/28/2003
Date

TOTAL P.02

Appendix H: Preliminary Cost Estimates

Preserving the Landmark
Infrastructure Improvements Master Plan
Village of Waterford, Virginia

Update to 2003 "Bury the Wires and Tame the Traffic" Preliminary Engineering Study

PRELIMINARY ESTIMATE OF PROJECT COST

SUMMARY

Preliminary Engineering Phase		
Preliminary Engineering	$	4,200,000
Additional Engineering (Plats, Permits, Etc.)	$	3,150,000
Total Preliminary Engineering Costs	$	7,350,000
Construction Phase		
Construction Costs	$	21,000,000
Mobilization (17%)	$	3,570,000
Maintenance of Traffic	$	3,150,000
Electrical Service Connections	$	1,700,000
Village Water System	$	9,698,000
Contingency on construction costs (40%)	$	8,400,000
Construction Engineering & Inspection (15%)	$	3,150,000
Total Construction Costs	$	50,670,000
Total Estimated Project Budget - 2022 Dollars (rounded)	$	58,000,000
Total Estimated Project Budget - 2024 Dollars (rounded)	**$**	**63,900,000**
Total Estimated Project Budget - 2027 Dollars (rounded)	**$**	**74,000,000**

Notes:
1. Costs are preliminary in nature and based on concept designs developed by consultant team in close coordination with representatives from the Village of Waterford.
2. Escalation factors used to project 2024 and 2027 cost estimates: 5.00% Annually.
3. Costs include construction, engineering design and construction administration, mobilization, maintenance of traffic, easements, permits, and contingencies.
4. Costs assume that all items will be constructed as part of a total, phased project.

Preserving the Landmark
Infrastructure Improvements Master Plan
Village of Waterford, Virginia

Update to 2003 "Bury the Wires and Tame the Traffic" Preliminary Engineering Study

PRELIMINARY ESTIMATE OF PROGRAM COSTS

SUMMARY

STREET SEGMENT	ESTIMATED COST
CLARKES GAP ROAD - Clarkes Gap Road/High Street/Factory Street Intersection	$ 3,435,000
FACTORY STREET - Second Street to High Street	$ 1,187,000
HIGH STREET - Factory Street to Upper Main Street	$ 3,775,000
JANNEY STREET - Second Street to High Street	$ 1,132,000
PATRICK STREET - Second Street to High Street	$ 2,277,000
HIGH STREET - High Street/Butchers Row/Upper Main Intersection	$ 833,000
SECOND STREET - Factory Street to Church Street	$ 7,618,000
CORNER STORE INTERSECTION - Water Street/2nd Street/Main Street Intersection	$ 4,620,000
MAIN STREET HILL - High Street to Corner Store Intersection	$ 1,481,000
LOWER MAIN STREET - Second Street to First Street	$ 3,672,000
FIRST STREET - Main Street/First Street/Liggett Intersection	$ 4,171,000
FIRST STREET - Old Wheatland Road to Old Waterford Mill	$ 4,034,000
WATER STREET - Main Street to Loyalty Road	$ 2,188,000
BUTCHERS ROW - Butchers Row/Water Street/Loyalty Road Intersection	$ 1,880,000
LOYALTY ROAD - Butchers Row to North of Brown's Lane	$ 4,327,000
VILLAGE WATER SYSTEM	$ 9,698,100
SERVICE CONNECTIONS	$ 1,700,000
TOTAL - 2022 DOLLARS (rounded)	**$ 58,000,000**
2024 DOLLARS	**$ 63,900,000**
2027 DOLLARS	**$ 74,000,000**

Notes:

1. Costs are preliminary in nature and based on concept designs developed by consultant team in close coordination with representatives from the Village of Waterford.
2. Escalation factors used to project 2024 and 2027 cost estimates: 5.00% Annually.
3. Costs include construction, engineering design and construction administration, mobilization, maintenance of traffic, easements, permits, and contingencies.
4. Costs assume that all items will be constructed as part of a total, phased project.

CLARKES GAP ROAD - Clarkes Gap Road/High Street/Factory Street Intersection

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	25	CY	$ 55.00	$ 1,375
2	Embankment	20	CY	$ 50.00	$ 1,000
3	Sawcut Asphalt Pavement	75	LF	$ 12.00	$ 900
4	Remove Asphalt Pavement	57	SY	$ 20.00	$ 1,140
5	Mill Existing Pavement	1260	SY	$ 45.00	$ 56,700
6	8" Aggregate Base	296	SY	$ 55.00	$ 16,280
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	1260	SY	$ 65.00	$ 81,900
9	2" Asphalt Stabilized Open-Graded Gravel	296	SY	$ 50.00	$ 14,800
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	296	SY	$ 585.00	$ 173,160
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	550	SY	$ 15.00	$ 8,250
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	2	EA	$ 1,500.00	$ 3,000
23	Water Line		LF	$ 350.00	$ -
24	Undergrounding Utilities	410	LF	$ 600.00	$ 246,000
25	Storm Sewer Inlet	2	EA	$ 8,000.00	$ 16,000
26	18" Concrete Pipe	365	LF	$ 200.00	$ 73,000
27	Light Poles	1	EA	$ 8,000.00	$ 8,000
28	Lighting Conduit	47	LF	$ 75.00	$ 3,525
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	5	EA	$ 1,500.00	$ 7,500
32	Traffic Calming Measure - Choker	1	EA	$ 750,000.00	$ 750,000
				TOTAL	**$ 1,480,530**
			Mobilization	17%	$ 251,690
			CEI	15%	$ 222,080
			Maintenance of Traffic	25%	$ 370,133
			Engineering	20%	$ 296,106
			Bonds & Permits	15%	$ 222,080
			Contingency	40%	$ 592,212
				TOTAL	**$ 3,434,830**
				ROUNDED TOTAL	**$ 3,435,000**

FACTORY STREET - Second Street to High Street

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	0	CY	$ 55.00	$ -
2	Embankment	0	CY	$ 50.00	$ -
3	Sawcut Asphalt Pavement	226	LF	$ 12.00	$ 2,712
4	Remove Asphalt Pavement	22	SY	$ 20.00	$ 440
5	Mill Existing Pavement	0	SY	$ 45.00	$ -
6	8" Aggregate Base	22	SY	$ 55.00	$ 1,210
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	0	SY	$ 65.00	$ -
9	2" Asphalt Stabilized Open-Graded Gravel	22	SY	$ 50.00	$ 1,100
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	22	SY	$ 585.00	$ 12,870
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	44	SY	$ 15.00	$ 660
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	3	EA	$ 1,500.00	$ 4,500
23	Water Line		LF	$ 350.00	$ -
24	Undergrounding Utilities	485	LF	$ 600.00	$ 291,000
25	Storm Sewer Inlet	3	EA	$ 8,000.00	$ 24,000
26	18" Concrete Pipe	390	LF	$ 200.00	$ 78,000
27	Light Poles	2	EA	$ 8,000.00	$ 16,000
28	Lighting Conduit	555	LF	$ 75.00	$ 41,625
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	13	EA	$ 1,500.00	$ 19,500
				TOTAL	**$ 511,617**
			Mobilization	17%	$ 86,975
			CEI	15%	$ 76,743
			Maintenance of Traffic	25%	$ 127,904
			Engineering	20%	$ 102,323
			Bonds & Permits	15%	$ 76,743
			Contingency	40%	$ 204,647
				TOTAL	**$ 1,186,951**
				ROUNDED TOTAL	**$ 1,187,000**

HIGH STREET - Factory Street to Upper Main Street

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	180	CY	$ 55.00	$ 9,900
2	Embankment	30	CY	$ 50.00	$ 1,500
3	Sawcut Asphalt Pavement	178	LF	$ 12.00	$ 2,136
4	Remove Asphalt Pavement	14	SY	$ 20.00	$ 280
5	Mill Existing Pavement	0	SY	$ 45.00	$ -
6	8" Aggregate Base	350	SY	$ 55.00	$ 19,250
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	0	SY	$ 65.00	$ -
9	2" Asphalt Stabilized Open-Graded Gravel	350	SY	$ 50.00	$ 17,500
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	350	SY	$ 585.00	$ 204,750
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	890	SY	$ 15.00	$ 13,350
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	200	LF	$ 250.00	$ 50,000
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	5	EA	$ 1,500.00	$ 7,500
23	Water Line		LF	$ 350.00	$ -
24	Undergrounding Utilities	1718	LF	$ 600.00	$ 1,030,800
25	Storm Sewer Inlet	0	EA	$ 8,000.00	$ -
26	18" Concrete Pipe	176	LF	$ 200.00	$ 35,200
27	Light Poles	7	EA	$ 8,000.00	$ 56,000
28	Lighting Conduit	1754	LF	$ 75.00	$ 131,550
29	Stormwater Management Facilities	84	SF	$ 60.00	$ 5,040
30	Storm Sewer End Section	16	EA	$ 1,500.00	$ 24,000
				TOTAL	**$ 1,626,756**
			Mobilization	17%	$ 276,549
			CEI	15%	$ 244,013
			Maintenance of Traffic	25%	$ 406,689
			Engineering	20%	$ 325,351
			Bonds & Permits	15%	$ 244,013
			Contingency	40%	$ 650,702
				TOTAL	**$ 3,774,074**
				ROUNDED TOTAL	**$ 3,775,000**

JANNEY STREET - Second Street to High Street

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	90	CY	$ 55.00	$ 4,950
2	Embankment	60	CY	$ 50.00	$ 3,000
3	Sawcut Asphalt Pavement	81	LF	$ 12.00	$ 972
4	Remove Asphalt Pavement	0	SY	$ 20.00	$ -
5	Mill Existing Pavement	0	SY	$ 45.00	$ -
6	8" Aggregate Base	172	SY	$ 55.00	$ 9,460
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	0	SY	$ 65.00	$ -
9	2" Asphalt Stabilized Open-Graded Gravel	172	SY	$ 50.00	$ 8,600
10	Granite Curb	770	LF	$ 85.00	$ 65,450
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	0	SY	$ 585.00	$ -
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	345	SY	$ 15.00	$ 5,175
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	0	EA	$ 1,500.00	$ -
23	Water Line		LF	$ 350.00	$ -
24	Undergrounding Utilities	492	LF	$ 600.00	$ 295,200
25	Storm Sewer Inlet	2	EA	$ 8,000.00	$ 16,000
26	18" Concrete Pipe	305	LF	$ 200.00	$ 61,000
27	Light Poles	0	EA	$ 8,000.00	$ -
28	Lighting Conduit	0	LF	$ 75.00	$ -
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	5	EA	$ 1,500.00	$ 7,500
				TOTAL	**$ 487,807**
			Mobilization	17%	$ 82,927
			CEI	15%	$ 73,171
			Maintenance of Traffic	25%	$ 121,952
			Engineering	20%	$ 97,561
			Bonds & Permits	15%	$ 73,171
			Contingency	40%	$ 195,123
				TOTAL	**$ 1,131,712**
				ROUNDED TOTAL	**$ 1,132,000**

PATRICK STREET - Second Street to High Street

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	85	CY	$ 55.00	$ 4,675
2	Embankment	10	CY	$ 50.00	$ 500
3	Sawcut Asphalt Pavement	419	LF	$ 12.00	$ 5,028
4	Remove Asphalt Pavement	520	SY	$ 20.00	$ 10,400
5	Mill Existing Pavement	125	SY	$ 45.00	$ 5,625
6	8" Aggregate Base	520	SY	$ 55.00	$ 28,600
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	125	SY	$ 65.00	$ 8,125
9	2" Asphalt Stabilized Open-Graded Gravel	520	SY	$ 50.00	$ 26,000
10	Granite Curb	350	LF	$ 85.00	$ 29,750
11	Brick Pavers	4500	SF	$ 65.00	$ 292,500
12	Concrete Pavers	80	SY	$ 585.00	$ 46,800
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	1400	SF	$ 55.00	$ 77,000
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	235	SY	$ 15.00	$ 3,525
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	1	EA	$ 1,500.00	$ 1,500
23	Remove Curb, Sidewalks	115	SY	$ 5.00	$ 575
24	Water Line		LF	$350.00	$ -
25	Undergrounding Utilities	494	LF	$600.00	$ 296,400
26	Storm Sewer Inlet	5	EA	$8,000.00	$ 40,000
27	18" Concrete Pipe	417	LF	$200.00	$ 83,400
28	Light Poles	0	EA	$8,000.00	$ -
29	Lighting Conduit	0	LF	$75.00	$ -
30	Stormwater Management Facilities	0	SF	$60.00	$ -
31	Storm Sewer End Section	2	EA	$1,500.00	$ 3,000
				TOTAL	**$ 981,403**
			Mobilization	17%	$ 166,839
			CEI	15%	$ 147,210
			Maintenance of Traffic	25%	$ 245,351
			Engineering	20%	$ 196,281
			Bonds & Permits	15%	$ 147,210
			Contingency	40%	$ 392,561
				TOTAL	**$ 2,276,855**
				ROUNDED TOTAL	**$ 2,277,000**

HIGH STREET - High Street/Butchers Row/Upper Main Intersection

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	50	CY	$ 55.00	$ 2,750
2	Embankment	10	CY	$ 50.00	$ 500
3	Sawcut Asphalt Pavement	0	LF	$ 12.00	$ -
4	Remove Asphalt Pavement	408	SY	$ 20.00	$ 8,160
5	Mill Existing Pavement	0	SY	$ 45.00	$ -
6	8" Aggregate Base	585	SY	$ 55.00	$ 32,175
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	0	SY	$ 65.00	$ -
9	2" Asphalt Stabilized Open-Graded Gravel	585	SY	$ 50.00	$ 29,250
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	355	SF	$ 65.00	$ 23,075
12	Concrete Pavers	230	SY	$ 585.00	$ 134,550
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	53	SY	$ 15.00	$ 795
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	0	EA	$ 1,500.00	$ -
23	Water Line		LF	$ 350.00	$ -
24	Undergrounding Utilities	118	LF	$ 600.00	$ 70,800
25	Storm Sewer Inlet	0	EA	$ 8,000.00	$ -
26	18" Concrete Pipe	44	LF	$ 200.00	$ 8,800
27	Light Poles	2	EA	$ 8,000.00	$ 16,000
28	Lighting Conduit	147	LF	$ 75.00	$ 11,025
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	2	EA	$ 1,500.00	$ 3,000
				TOTAL	**$ 358,880**
			Mobilization	17%	$ 61,010
			CEI	15%	$ 53,832
			Maintenance of Traffic	25%	$ 89,720
			Engineering	20%	$ 71,776
			Bonds & Permits	15%	$ 53,832
			Contingency	40%	$ 143,552
				TOTAL	**$ 832,602**
				ROUNDED TOTAL	**$ 833,000**

SECOND STREET - Factory Street to Church Street

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	230	CY	$ 55.00	$ 12,650
2	Embankment	30	CY	$ 50.00	$ 1,500
3	Sawcut Asphalt Pavement	541	LF	$ 12.00	$ 6,492
4	Remove Asphalt Pavement	350	SY	$ 20.00	$ 7,000
5	Mill Existing Pavement	1215	SY	$ 45.00	$ 54,675
6	8" Aggregate Base	470	SY	$ 55.00	$ 25,850
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	1215	SY	$ 65.00	$ 78,975
9	2" Asphalt Stabilized Open-Graded Gravel	470	SY	$ 50.00	$ 23,500
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	230	SY	$ 585.00	$ 134,550
13	4' Concrete Sidewalk	1490	LF	$ 120.00	$ 178,800
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	970	SY	$ 15.00	$ 14,550
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	50	LF	$ 250.00	$ 12,500
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	6	EA	$ 1,500.00	$ 9,000
23	Water Line		LF	$ 350.00	$ -
24	Undergrounding Utilities	1503	LF	$ 600.00	$ 901,800
25	Storm Sewer Inlet	13	EA	$ 8,000.00	$ 104,000
26	18" Concrete Pipe	953	LF	$ 200.00	$ 190,600
27	Light Poles	9	EA	$ 8,000.00	$ 72,000
28	Lighting Conduit	1640	LF	$ 75.00	$ 123,000
29	Stormwater Management Facilities	21048	SF	$ 60.00	$ 1,262,880
30	Storm Sewer End Section	34	EA	$ 1,500.00	$ 51,000
				TOTAL	**$ 3,283,322**
			Mobilization	17%	$ 558,165
			CEI	15%	$ 492,498
			Maintenance of Traffic	25%	$ 820,831
			Engineering	20%	$ 656,664
			Bonds & Permits	15%	$ 492,498
			Contingency	40%	$ 1,313,329
				TOTAL	**$ 7,617,307**
				ROUNDED TOTAL	**$ 7,618,000**

CORNER STORE INTERSECTION - Water Street/2nd Street/Main Street Intersection

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	1050	CY	$ 55.00	$ 57,750
2	Embankment	22	CY	$ 50.00	$ 1,100
3	Sawcut Asphalt Pavement	73	LF	$ 12.00	$ 876
4	Remove Asphalt Pavement	765	SY	$ 20.00	$ 15,300
5	Mill Existing Pavement	0	SY	$ 45.00	$ -
6	8" Aggregate Base	1130	SY	$ 55.00	$ 62,150
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	0	SY	$ 65.00	$ -
9	2" Asphalt Stabilized Open-Graded Gravel	1130	SY	$ 50.00	$ 56,500
10	Granite Curb	280	LF	$ 85.00	$ 23,800
11	Brick Pavers	6872	SF	$ 65.00	$ 446,680
12	Concrete Pavers	0	SY	$ 585.00	$ -
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	1420	SF	$ 55.00	$ 78,100
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	20	SY	$ 50.00	$ 1,000
17	Seed and Mulch	3525	SY	$ 15.00	$ 52,875
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	40	LF	$ 250.00	$ 10,000
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	1	LS	$ 40,000.00	$ 40,000
22	Adjust Sanitary Sewer Manhole Elevation	2	EA	$ 1,500.00	$ 3,000
23	Water Line		LF	$ 350.00	$ -
24	Undergrounding Utilities	456	LF	$ 600.00	$ 273,600
25	Storm Sewer Inlet	3	EA	$ 8,000.00	$ 24,000
26	18" Concrete Pipe	76	LF	$ 200.00	$ 15,200
27	Light Poles	2	EA	$ 8,000.00	$ 16,000
28	Lighting Conduit	280	LF	$ 75.00	$ 21,000
29	Stormwater Management Facilities	12876	SF	$ 60.00	$ 772,560
30	Storm Sewer End Section	1	EA	$ 1,500.00	$ 1,500
				TOTAL	**$ 1,990,991**
			Mobilization	17%	$ 338,468
			CEI	15%	$ 298,649
			Maintenance of Traffic	25%	$ 497,748
			Engineering	20%	$ 398,198
			Bonds & Permits	15%	$ 298,649
			Contingency	40%	$ 796,396
				TOTAL	**$ 4,619,099**
				ROUNDED TOTAL	**$ 4,620,000**

MAIN STREET HILL - High Street to Corner Store Intersection

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	45	CY	$ 55.00	$ 2,475
2	Embankment	15	CY	$ 50.00	$ 750
3	Sawcut Asphalt Pavement	0	LF	$ 12.00	$ -
4	Remove Asphalt Pavement	0	SY	$ 20.00	$ -
5	Mill Existing Pavement	1,140	SY	$ 45.00	$ 51,300
6	8" Aggregate Base	1,140	SY	$ 55.00	$ 62,700
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	0	SY	$ 65.00	$ -
9	2" Asphalt Stabilized Open-Graded Gravel	0	SY	$ 50.00	$ -
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	0	SY	$ 585.00	$ -
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	2,400	SF	$ 55.00	$ 132,000
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	535	SY	$ 15.00	$ 8,025
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	0	EA	$ 1,500.00	$ -
23	Water Line	0	LF	$ 350.00	$ -
24	Undergrounding Utilities	555	LF	$ 600.00	$ 333,000
25	Storm Sewer Inlet	0	EA	$ 8,000.00	$ -
26	18" Concrete Pipe	0	LF	$ 200.00	$ -
27	Light Poles	2	EA	$ 8,000.00	$ 16,000
28	Lighting Conduit	185	LF	$ 75.00	$ 13,875
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	0	EA	$ 1,500.00	$ -
				TOTAL	**$ 638,125**
			Mobilization	17%	$ 108,481
			CEI	15%	$ 95,719
			Maintenance of Traffic	25%	$ 159,531
			Engineering	20%	$ 127,625
			Bonds & Permits	15%	$ 95,719
			Contingency	40%	$ 255,250
				TOTAL	**$ 1,480,450**
				ROUNDED TOTAL	**$ 1,481,000**

LOWER MAIN STREET - Second Street to First Street

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	515	CY	$ 55.00	$ 28,325
2	Embankment	60	CY	$ 50.00	$ 3,000
3	Sawcut Asphalt Pavement	0	LF	$ 12.00	$ -
4	Remove Asphalt Pavement	500	SY	$ 20.00	$ 10,000
5	Mill Existing Pavement	1530	SY	$ 45.00	$ 68,850
6	8" Aggregate Base	490	SY	$ 55.00	$ 26,950
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	1,530	SY	$ 65.00	$ 99,450
9	2" Asphalt Stabilized Open-Graded Gravel	490	SY	$ 50.00	$ 24,500
10	Granite Curb	1,500	LF	$ 85.00	$ 127,500
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	490	SY	$ 585.00	$ 286,650
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	3,600	SF	$ 55.00	$ 198,000
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	180	SY	$ 15.00	$ 2,700
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	1	LS	$ 150,000.00	$ 150,000
21	Temporary Traffic Signal	1	LS	$ 40,000.00	$ 40,000
22	Adjust Sanitary Sewer Manhole Elevation	4	EA	$ 1,500.00	$ 6,000
23	Water Line	0	LF	$ 350.00	$ -
24	Undergrounding Utilities	345	LF	$ 600.00	$ 207,000
25	Storm Sewer Inlet	3	EA	$ 8,000.00	$ 24,000
26	18" Concrete Pipe	662	LF	$ 200.00	$ 132,400
27	Light Poles	3	EA	$ 8,000.00	$ 24,000
28	Lighting Conduit	245	LF	$ 75.00	$ 18,375
29	Stormwater Management Facilities	1445	SF	$ 60.00	$ 86,700
30	Storm Sewer End Section	0	EA	$ 1,500.00	$ -
				TOTAL	**$ 1,582,400**
			Mobilization	17%	$ 269,008
			CEI	15%	$ 237,360
			Maintenance of Traffic	25%	$ 395,600
			Engineering	20%	$ 316,480
			Bonds & Permits	15%	$ 237,360
			Contingency	40%	$ 632,960
				TOTAL	**$ 3,671,168**
				ROUNDED TOTAL	**$ 3,672,000**

FIRST STREET - Main Street/First Street/Liggett Intersection

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	100	CY	$ 55.00	$ 5,500
2	Embankment	20	CY	$ 50.00	$ 1,000
3	Sawcut Asphalt Pavement	785	LF	$ 12.00	$ 9,420
4	Remove Asphalt Pavement	46	SY	$ 20.00	$ 920
5	Mill Existing Pavement	860	SY	$ 45.00	$ 38,700
6	8" Aggregate Base	145	SY	$ 55.00	$ 7,975
7	4" Asphalt Base Course	65	SY	$ 30.00	$ 1,950
8	2" Asphalt Pavement	925	SY	$ 65.00	$ 60,125
9	2" Asphalt Stabilized Open-Graded Gravel	80	SY	$ 50.00	$ 4,000
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	80	SY	$ 585.00	$ 46,800
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	50	SY	$ 50.00	$ 2,500
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	180	SY	$ 15.00	$ 2,700
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	2	EA	$ 1,500.00	$ 3,000
23	Water Line	0	LF	$ 350.00	$ -
24	Undergrounding Utilities	1760	LF	$ 600.00	$ 1,056,000
25	Storm Sewer Inlet	3	EA	$ 8,000.00	$ 24,000
26	18" Concrete Pipe	792	LF	$ 200.00	$ 158,400
27	Light Poles	6	EA	$ 8,000.00	$ 48,000
28	Lighting Conduit	1090	LF	$ 75.00	$ 81,750
29	Stormwater Management Facilities	1330	SF	$ 60.00	$ 79,800
30	Storm Sewer End Section	3	EA	$ 1,500.00	$ 4,500
				TOTAL	**$ 1,655,040**
			Mobilization	17%	$ 281,357
			CEI	15%	$ 248,256
			Maintenance of Traffic	25%	$ 413,760
			Engineering	20%	$ 331,008
			Bonds & Permits	15%	$ 248,256
			Contingency	60%	$ 993,024
				TOTAL	**$ 4,170,701**
				ROUNDED TOTAL	**$ 4,171,000**

FIRST STREET - Old Wheatland Road to Old Waterford Mill

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	45	CY	$ 55.00	$ 2,475
2	Embankment	10	CY	$ 50.00	$ 500
3	Sawcut Asphalt Pavement	185	LF	$ 12.00	$ 2,220
4	Remove Asphalt Pavement	330	SY	$ 20.00	$ 6,600
5	Mill Existing Pavement	555	SY	$ 45.00	$ 24,975
6	8" Aggregate Base	325	SY	$ 55.00	$ 17,875
7	4" Asphalt Base Course	170	SY	$ 30.00	$ 5,100
8	2" Asphalt Pavement	725	SY	$ 65.00	$ 47,125
9	2" Asphalt Stabilized Open-Graded Gravel	180	SY	$ 50.00	$ 9,000
10	Granite Curb	0	LF	$ 85.00	$ -
11	Pavement Markings	100	LF	$ 8.00	$ 800
12	Concrete Pavers	180	SY	$ 585.00	$ 105,300
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	0	SY	$ 50.00	$ -
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	160	SY	$ 15.00	$ 2,400
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	0	EA	$ 1,500.00	$ -
23	Water Line	0	LF	$ 350.00	$ -
24	Undergrounding Utilities	1140	LF	$ 600.00	$ 684,000
25	Storm Sewer Inlet	0	EA	$ 8,000.00	$ -
26	18" Concrete Pipe	0	LF	$ 200.00	$ -
27	Light Poles	4	EA	$ 8,000.00	$ 32,000
28	Lighting Conduit	400	LF	$ 75.00	$ 30,000
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	0	EA	$ 1,500.00	$ -
31	Traffic Calming Measure - Splitter Island	1	EA	$ 750,000.00	$ 750,000
				TOTAL	**$ 1,738,370**
			Mobilization	17%	$ 295,523
			CEI	15%	$ 260,756
			Maintenance of Traffic	25%	$ 434,593
			Engineering	20%	$ 347,674
			Bonds & Permits	15%	$ 260,756
			Contingency	40%	$ 695,348
				TOTAL	**$ 4,033,018**
				ROUNDED TOTAL	**$ 4,034,000**

WATER STREET - Main Street to Loyalty Road

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	70	CY	$ 55.00	$ 3,850
2	Embankment	10	CY	$ 50.00	$ 500
3	Sawcut Asphalt Pavement	0	LF	$ 12.00	$ -
4	Remove Asphalt Pavement	0	SY	$ 20.00	$ -
5	Mill Existing Pavement	1,320	SY	$ 45.00	$ 59,400
6	8" Aggregate Base	125	SY	$ 55.00	$ 6,875
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	1,320	SY	$ 65.00	$ 85,800
9	2" Asphalt Stabilized Open-Graded Gravel	125	SY	$ 50.00	$ 6,250
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	125	SY	$ 585.00	$ 73,125
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	420	SY	$ 50.00	$ 21,000
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	1,025	SY	$ 15.00	$ 15,375
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	1	LS	$ 150,000.00	$ 150,000
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	3	EA	$ 1,500.00	$ 4,500
23	Water Line	0	LF	$ 350.00	$ -
24	Undergrounding Utilities	623	LF	$ 600.00	$ 373,800
25	Storm Sewer Inlet	3	EA	$ 8,000.00	$ 24,000
26	18" Concrete Pipe	180	LF	$ 200.00	$ 36,000
27	Light Poles	2	EA	$ 8,000.00	$ 16,000
28	Lighting Conduit	625	LF	$ 75.00	$ 46,875
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	1	EA	$ 1,500.00	$ 1,500
				TOTAL	**$ 942,850**
			Mobilization	17%	$ 160,285
			CEI	15%	$ 141,428
			Maintenance of Traffic	25%	$ 235,713
			Engineering	20%	$ 188,570
			Bonds & Permits	15%	$ 141,428
			Contingency	40%	$ 377,140
				TOTAL	**$ 2,187,412**
				ROUNDED TOTAL	**$ 2,188,000**

BUTCHERS ROW - Butchers Row/Water Street/Loyalty Road Intersection

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	85	CY	$ 55.00	$ 4,675
2	Embankment	20	CY	$ 50.00	$ 1,000
3	Sawcut Asphalt Pavement	0	LF	$ 12.00	$ -
4	Remove Asphalt Pavement	0	SY	$ 20.00	$ -
5	Mill Existing Pavement	725	SY	$ 45.00	$ 32,625
6	8" Aggregate Base	170	SY	$ 55.00	$ 9,350
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	725	SY	$ 65.00	$ 47,125
9	2" Asphalt Stabilized Open-Graded Gravel	170	SY	$ 50.00	$ 8,500
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	170	SY	$ 585.00	$ 99,450
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	68	SY	$ 50.00	$ 3,400
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	270	SY	$ 15.00	$ 4,050
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	50	LF	$ 250.00	$ 12,500
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	0	LS	$ 40,000.00	$ -
22	Adjust Sanitary Sewer Manhole Elevation	3	EA	$ 1,500.00	$ 4,500
23	Water Line	0	LF	$ 350.00	$ -
24	Undergrounding Utilities	715	LF	$ 600.00	$ 429,000
25	Storm Sewer Inlet	3	EA	$ 8,000.00	$ 24,000
26	18" Concrete Pipe	180	LF	$ 200.00	$ 36,000
27	Light Poles	3	EA	$ 8,000.00	$ 24,000
28	Lighting Conduit	550	LF	$ 75.00	$ 41,250
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	7	EA	$ 1,500.00	$ 10,500
				TOTAL	**$ 809,925**
			Mobilization	17%	$ 137,687
			CEI	15%	$ 121,489
			Maintenance of Traffic	25%	$ 202,481
			Engineering	20%	$ 161,985
			Bonds & Permits	15%	$ 121,489
			Contingency	40%	$ 323,970
				TOTAL	**$ 1,879,026**
				ROUNDED TOTAL	**$ 1,880,000**

LOYALTY ROAD - Butchers Row to North of Brown's Lane

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Excavation	25	CY	$ 55.00	$ 1,375
2	Embankment	10	CY	$ 50.00	$ 500
3	Sawcut Asphalt Pavement	0	LF	$ 12.00	$ -
4	Remove Asphalt Pavement	0	SY	$ 20.00	$ -
5	Mill Existing Pavement	2,445	SY	$ 45.00	$ 110,025
6	8" Aggregate Base	260	SY	$ 55.00	$ 14,300
7	4" Asphalt Base Course	0	SY	$ 30.00	$ -
8	2" Asphalt Pavement	2,445	SY	$ 65.00	$ 158,925
9	2" Asphalt Stabilized Open-Graded Gravel	260	SY	$ 50.00	$ 13,000
10	Granite Curb	0	LF	$ 85.00	$ -
11	Brick Pavers	0	SF	$ 65.00	$ -
12	Concrete Pavers	260	SY	$ 585.00	$ 152,100
13	4' Concrete Sidewalk	0	LF	$ 120.00	$ -
14	Brick Sidewalk	0	SF	$ 55.00	$ -
15	Gravel Path	300	SY	$ 50.00	$ 15,000
16	Gravel Parking Lot	0	SY	$ 50.00	$ -
17	Seed and Mulch	400	SY	$ 15.00	$ 6,000
18	Landscaping	1	LS	$ 18,000.00	$ 18,000
19	2' Stone Wall	0	LF	$ 250.00	$ -
20	Stone-faced Bridge	0	LS	$ 150,000.00	$ -
21	Temporary Traffic Signal	1	LS	$ 40,000.00	$ 40,000
22	Adjust Sanitary Sewer Manhole Elevation	2	EA	$ 1,500.00	$ 3,000
23	Water Line	0	LF	$ 350.00	$ -
24	Undergrounding Utilities	855	LF	$ 600.00	$ 513,000
25	Storm Sewer Inlet	0	EA	$ 8,000.00	$ -
26	18" Concrete Pipe	56	LF	$ 200.00	$ 11,200
27	Light Poles	3	EA	$ 8,000.00	$ 24,000
28	Lighting Conduit	790	LF	$ 75.00	$ 59,250
29	Stormwater Management Facilities	0	SF	$ 60.00	$ -
30	Storm Sewer End Section	0	EA	$ 1,500.00	$ -
31	Traffic Calming Measure - Spitter Island	1	EA	$ 725,000.00	$ 725,000
				TOTAL	**$ 1,864,675**
			Mobilization	17%	$ 316,995
			CEI	15%	$ 279,701
			Maintenance of Traffic	25%	$ 466,169
			Engineering	20%	$ 372,935
			Bonds & Permits	15%	$ 279,701
			Contingency	40%	$ 745,870
				TOTAL	**$ 4,326,046**
				ROUNDED TOTAL	**$ 4,327,000**

"Bury the Wires and Tame the Traffic"
Waterford, Virginia
PRELIMINARY ENGINEERING STUDY AND CONCEPT PLANS
PRELIMINARY ESTIMATES OF PROJECT COSTS

PRELIMINARY COST ESTIMATE *
ELECTRICAL/TELEPHONE SERVICE CONNECTIONS

Potential Easements (estimate 185 services)		
Utility Company recording cost of each easement x $200 ea.	$	37,000.00
Right of way engineering per easement x $500 ea	$	92,500.00
Utility Company drafting / planning x $500 ea	$	92,500.00
Subtotal - Easements	$	222,000.00
Legal Fees, County Fees, Contingencies, etc. (50%)	$	111,000.00
Total Estimate - Easements	$	333,000.00
Simple Service Connection		
Telephone Connection (Lump Sum)	$	1,000.00
Conductors; Direct Bury Type SE; 100 feet; 200 ampere	$	1,500.00
200 Ampere Meter	$	500.00
Demolition of old service: Lump sum	$	350.00
Minor Siding Repair	$	650.00
Subtotal - Simple Service Connection	$	4,000.00
Engineering, Fees, Contingencies, etc. (50%)	$	2,000.00
Total - One Service Connection	$	6,000.00
Anticipated Typical Service Connection		
Telephone Connection (Lump Sum)	$	1,000.00
Conductors; Direct Bury Type SE; 100 Feet; 200 ampere	$	1,500.00
200 Ampere Meter	$	500.00
Demolition of old service: Lump Sum	$	350.00
Siding and Pavement Repair	$	2,000.00
Subtotal - Typical Service Connection	$	5,350.00
Engineering, Fees, Contingencies, etc. (50%)	$	2,675.00
Total - One Typical Service Connection	$	8,025.00
Complex Service Connection		
Telephone Connection (Lump Sum)	$	1,000.00
Conductors; Direct Bury Type SE; 200 Feet; 200 Ampere	$	2,250.00
200 Ampere Meter	$	500.00
Demolition of old service: Lump sum	$	350.00
Siding and Pavement Repair	$	1,000.00
House mounted pullbox	$	300.00
Subtotal - Complex Service Connection	$	5,400.00
Engineering, Fees, Contingencies, etc. (50%)	$	2,700.00
Total - One Complex Service Connection	$	8,100.00

SUMMARY - ELECTRICAL / TELEPHONE SERVICE CONNECTIONS		
Easements (estimate 185)	$	333,000.00
Simple Service Connections (estimate 60)	$	360,000.00
Typical Service Connections (estimate 85)	$	682,125.00
Complex Service Connections (estimate 40)	$	324,000.00
TOTAL SERVICE CONNECTIONS AND EASEMENTS	$	1,699,125.00
ROUNDED TOTAL	$	1,700,000.00

* This document is not to be construed as a final construction level estimate.
It is a preliminary estimate based on general information known to date.