

Delaware Department of Transportation

Context Sensitive Solutions for Delaware Byways





Context Sensitive Solutions for Delaware Byways

PREPARED FOR
DELAWARE DEPARTMENT OF TRANSPORTATION
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I. INTRODUCTION

Delaware is rich in scenic, historic, natural, recreational, cultural and archaeological resources. The first state to ratify the U.S. Constitution, Delaware's landscapes and vital communities are reminders of its rich past.

Delaware's diverse resources and history are easily accessible to travelers and residents along specially designated Delaware Byways. In 2000 the General Assembly created a Scenic and Historic Highway Program allowing residents and community representatives the opportunity to officially recognize unique Delaware corridors. In 2010, the General Assembly amended the legislation changing the name to the Delaware Byways Program (17 Del.C. c. 1 §101).

1.1 Purpose of the Manual

This manual integrates Context Sensitive Solutions (CSS) with the Delaware Department of Transportation's (DelDOT) Project Development Process, providing guidance for projects within designated byway corridors. Byways are corridors significant to Delaware's heritage, recreational activities or scenic beauty. Each action taken over the course of a byway's lifetime impacts the traveler's experience. The results of road maintenance, safety improvements, bicycle and pedestrian facilities, landscape enhancements and new signs can individually appear insignificant; however, their cumulative effect can positively or negatively impact the appearance and quality of the byway. Adherence to the following guidelines will ensure future DelDOT projects on Delaware Byways provide solutions to preserve maintain and enhance byways' intrinsic qualities. Intrinsic qualities are defined by the National Scenic Byways Program as the scenic, historic, recreational, cultural, archeological, or natural features that are considered representative, unique, irreplaceable, or distinctly characteristic of an area. Efforts to carefully consider the appropriate measures and design solutions will advance successful projects and operational decisions supported by the local community, byway sponsors and DelDOT.

1.2 When to Use this Manual

This manual is developed to provide guidance to DelDOT designers and consultants during the planning, design, construction, and operation and maintenance of projects on Delaware Byways. Before any project along a byway begins, large or small, whether



Figure 1.1 Cape Henlopen at Lewes Byway, DE

In 2000 the General Assembly created a Scenic and Historic Highway Program allowing residents and community representatives the opportunity to officially recognize unique Delaware corridors.

In 2010, the General Assembly amended the legislation changing the name to the Delaware Byways Program (17 Del.C. c. 1 §101).

A Delaware Byway is a corridor that highlights a combination of six special intrinsic qualities:

- Scenic
- Historic
- Natural
- Cultural
- Recreational
- Archaeological

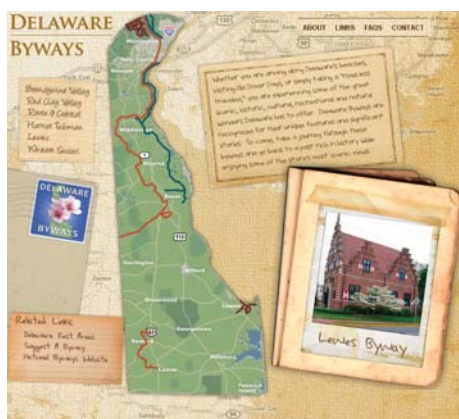


Figure 1.3-1 Delaware Byways Homepage

A CMP is a written document describing the goals, strategies, and responsibilities for conserving and enhancing a road corridor and its intrinsic qualities.

new construction or maintenance, landscape or utility work, it is vital that all participants become familiar with and acquire a broad understanding of the byway. This includes byway's associated intrinsic qualities and any pertinent documents, including but not limited to the Corridor Management Plans prepared for individual byways and the context sensitive solutions discussed therein. Designers and other entities engaged in activities along a byway must involve the Byway Sponsors continuously throughout the course of the project to ensure the project's success.

1.3 Delaware Byways

The Delaware Byways Program is a collaborative effort among Delaware's citizens and local, state and federal governments. During the 2000 legislative session, the General Assembly passed Senate Bill 320 authorizing DeIDOT to develop and manage the Delaware Byways Program. The Program's purpose is to recognize Delaware roads possessing the desired intrinsic qualities which enhance the traveler's experience.

Delaware Byways are first nominated through a sponsoring group, then designated by the Secretary of Transportation and administered under the guidance of the Delaware Byways Advisory Board. The Board includes representatives of public and private parties, including not-for-profit organizations.

A Delaware Byway is a corridor that highlights a combination of Delaware's heritage, recreational activities and scenic beauty. It is managed in order to protect six special intrinsic qualities: scenic, historic, natural, cultural, and recreational or archaeological. It encourages an appreciation of its surroundings and the development of tourism and recreational resources.

A Nomination Application is submitted by the Byway Sponsor, who is responsible for the successful completion of a Nomination Application and Corridor Management Plan (CMP). A CMP is a written document describing the goals, strategies, and responsibilities for conserving and enhancing a road corridor and its intrinsic qualities. It includes the Byway's Vision Statement and Action Plan that covers the implementation of the CMP. It is vital to become familiar with a Byway's Nomination Application and CMP prior to the start of any project within a byway corridor.



Figure 1.3-2 Winterthur Estate, Wilmington, Brandywine Valley National Scenic Byway, DE

Scenic Quality is the heightened visual experience derived from the view of natural and manmade elements or the visual environment of the byway corridor. The characteristics of the landscape are strikingly distinct and offer a pleasing and memorable visual experience. All elements of the landscape—landform, water, vegetation, and manmade development contribute to the quality of the corridor’s visual environment. Everything present is in harmony and shares in the intrinsic qualities.



Figure 1.3-3 Historic House, New Castle, Route 9 Coastal Heritage Byway, DE

Historic Quality encompasses legacies of the past that are distinctly associated with physical elements of the landscape, whether natural or manmade, that are of such historic significance that they educate the viewer and stir an appreciation for the past. The historic elements reflect the actions of people and may include buildings, settlement patterns, and other examples of human activity. Historic features can be inventoried, mapped, and interpreted. They possess integrity of location, design, setting, material, workmanship, feeling, and association.



Figure 1.3-4 Woodland Beach, Route 9 Coastal Heritage Byway, DE

Natural Quality applies to those features in the visual environment that are in a relatively undisturbed state. These features predate the arrival of human populations and may include geological formations, fossils, landform, water bodies, vegetation, and wildlife. There may be evidence of human activity, but the natural features reveal minimal disturbances.



Figure 1.3-5 Delaware Tribe of Indians Pow Wow

Cultural Quality is evidence and expressions of the customs or traditions of a distinct group of people. Examples of cultural features may include, crafts, music, dance, rituals, festivals, speech, food, special events, and vernacular architecture. The cultural qualities of the corridor highlight one or more significant community and/or ethnic traditions.



Figure 1.3-6 Flemings Landing, Route 9 Coastal Heritage Byway, DE

Recreational Quality involves outdoor recreational activities directly associated with and dependent upon the natural and cultural elements of the corridor's landscape. The recreational activities provide opportunities for active and passive recreational experiences. They may include, rafting, boating, fishing, and hiking. Driving the road itself may qualify as a pleasurable recreational experience. The recreational activities may be seasonal, but the quality and importance of the recreational activities as seasonal operations must be well recognized.



Figure 1.3-7 Archaeological Site, Boyds Corner, Middletown, DE.

Archaeological Quality involves those characteristics of the scenic byway corridor that are physical evidence of historic or prehistoric human life or activities that are visible and capable of being inventoried and interpreted. The scenic byway corridor's archaeological interest, as identified through ruins, artifacts, structural remains, and other physical evidence have scientific significance that educate the viewer and stir an appreciation for the past.

Appendix A lists the description of each Delaware Byway and its key intrinsic qualities. An inventory of Delaware Byways, their key documents, supplemental information, and contact information can be found on the Delaware Byway page of the Delaware Department of Transportation’s website: www.byways.deldot.gov.

1.4 Overview of the Manual

In the following chapters the core principles of Context Sensitive Solutions as applied to Delaware Byways will be introduced. The three principles of CSS are provided to ensure all proposed projects preserve and enhance a byway’s character-defining features. A flexible design approach is encouraged, and is crucial to a successful project. This flexibility should be explored with several factors in mind: regulatory issues, design constraints, safety, cost factors, and design standards. This manual was developed to fit within the new *DelDOT Project Development Manual*, which references byways and focuses on process. Furthermore, this manual explores many design treatments applicable to various Delaware Byways and encourages design flexibility and out-of-the-box thinking. Finally, case studies of successfully completed Delaware projects are documented as current best practices.



Figure 1.4-1 South Woodland Beach, Route 9 Coastal Heritage Byway, DE



Figure 1.4-2 Historic District, Lewes Byway, DE



Figure 1.4-3 Camden, Harriet Tubman Underground Railroad Byway, DE



Figure 1.4-4 Brandywine Valley National Scenic Byway, DE

II. CONTEXT SENSITIVE SOLUTIONS

The CSS process is a collaborative, interdisciplinary, holistic approach to the development of transportation projects. It is both process and product, characterized by a number of attributes. It involves all stakeholders, including community members, elected officials, interest groups, and affected local, state, and federal agencies. It puts project needs and both agency and community values on a level playing field and considers all tradeoffs in decision making.

-- Federal Highway Administration

Context Sensitive Solutions require increased awareness, sensitivity, and consideration of human environmental impact. CSS should play a vital role in planning, design, construction, and maintenance along DelDOT roadways, but are especially important in activities conducted within a Delaware Byway corridor. Designated for a combination of scenic, historic, natural, cultural, recreational, or archeological intrinsic qualities, Delaware Byways require careful decision-making to preserve and enhance their special character-defining features.

The Federal Highway Administration (FHWA) defines Context Sensitive Solutions as a:

(C)ollaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist. CSS principles include the employment of early, continuous, and meaningful involvement of the public and all stakeholders throughout the project development process.

Three CSS principles have been identified for this manual, demonstrating design sensitivity and flexibility. They provide a framework to understand byways as a valued resource and to ensure appropriate design solutions are proposed. This CSS approach was developed to guide planning, design, and construction on Delaware Byways. As work is conducted along designated byways, it is important to reference the byway's Corridor Management Plan for additional design guidance.

2.1 Principles of Context Sensitive Solutions for Byways

Principle 1: Identify Byway Character-Defining Features

Identifying and appreciating a project's context is the first step when conducting work within a Delaware Byway. Although each byway identifies overall primary and secondary intrinsic qualities, these qualities and their importance within the byway may vary within specific portions of the corridor. It is vital to recognize not only the character-defining features of the entire byway, but those of the specific project site as well. Character defining features encompass not only physical location but the byway's perceived and tangible characteristics.

Perceived Features: Features such as a peaceful rural landscape or a historic town can be anticipated and appreciated by byway travelers, but may be less likely to be specifically identified in project documents or in field evaluation. Often multiple elements contribute to these features.

Tangible Features: Characteristics such as a historic building or state park can be easily identified and are often inventoried and categorized by agencies, organizations, or byway sponsors.

The process of understanding perceived value is an important and often difficult component of Context Sensitive Solutions. Each byway is a combination of character-defining features and intrinsic qualities that, viewed as a whole, create a unique experience for the traveler.

It is important to understand the character-defining features of a byway and to recognize these critical qualities that, if lost or altered by a transportation project or other action, would change the byway's character and value. If a byway loses the qualities for which it is designated, byway designation could be removed and future funding opportunities would no longer be available. Character-defining features are not solitary elements and may occur as unique features at specific locations of the byway. These characteristics may vary along the byway and would not necessarily populate the entire length of the project site. Identifying intrinsic qualities and evaluating the visual and functional character of a byway corridor will provide additional guidance in understanding the byway's character defining features.

If a byway loses the qualities for which it is designated, byway designation could be removed and future funding opportunities would no longer be available.



Figure 2.1-1 Rural Landscape, Route 9 Coastal Heritage Byway, DE



Figure 2.1-2 Historic Building - Gibraltar Mansion at Brandywine Valley National Scenic Byway, DE



Figure 2.1-3 Visual Character - Round Barn at Route 9 Coastal Heritage Byway, DE



Figure 2.1-4 Functional Character - Wooddale Bridge, Red Clay Valley Scenic Byway, DE

DeIDOT staff and consultants should conduct open and early communication with byway stakeholders and clearly define a transportation project's Purpose and Need.

Visual character is most evident and defined by land use type, landscape character, quality of the view shed, vegetation, and travel experience. The land use type is the physical character of the corridor which ranges from urban to suburban to rural. The landscape character and surrounding views reflect the manmade or natural setting characterized in scenic and historic significance. Trees and other vegetation along a byway play a vital role in defining the overall environmental quality and traveler experience. Quantifiable elements such as mature trees can be more apparent than other less-tangible perceived features, such as important view sheds. For instance, it may not be evident that a scenic view of an agricultural field may depict a historic or cultural landscape critical to the byway story.

Functional character is described by the user type and roadway type. A fundamental expectation of all roadways is that they function safely while serving a variety of users. These various byway users can influence a roadway's visual and functional character. For instance, byways that include a high number of parks or natural features may experience a high volume of cyclists and pedestrians, which is directly related to the byway's functional character.

Principle 2: Provide Stakeholder and Public Involvement

Public involvement is a vital component of all DeIDOT projects and CSS work. As stated in the CSS definition, public involvement should play a critical role in all projects and be provided at multiple design milestones. From inception, a byway's success relies heavily upon active public involvement. Each byway is nominated by a Byway Sponsor comprised of public entities and private organizations. DeIDOT staff and consultants should conduct open and early communication with byway stakeholders and clearly define a transportation project's Purpose and Need. The design team should ensure a proactive public involvement effort, with design solutions and approaches developed in conjunction with byway stakeholders.

Successful public involvement should include:

- Open and early communication
- An understanding of the landscape, community, and valued resources

- A clearly developed project scope, purpose, and need
- Consensus on scope amongst sponsors and design team prior to design work
- A process tailored to meet all needs and expectations
- Project alternatives that address project purpose and need

Successful public involvement can:

- Identify character-defined features of the project site from community's perspective
- Identify characteristics the community values or desires to modify
- Identify situations with special design and access needs

Well-conducted stakeholder involvement and public outreach are essential components of successful byway projects. This interaction should be a collaborative relationship focused on flexibility, yielding a safe and functional product satisfactory to everyone involved.

A successful Delaware example is demonstrated in the Memorandum of Understanding (MOU) between the Delaware Department of Transportation and the Red Clay Valley Scenic Byway (RCVSB) committee (Appendix B). This MOU identifies a process of public communication and coordination for transportation projects within the RCVSB and strives to protect the character-defining features of the byway.

Principle 3: Explore Flexible and Creative Alternatives

Once opportunities, concerns, and issues are identified, designers can take measures to preserve resources, enhance byway features, and ensure a successful end product.

DelDOT designers and consultants must tailor design alternatives to a specific context that preserves, maintains, and enhances the byway's character-defining features. Flexibility begins with using minimum standards to create viable alternatives that augment the byway's intrinsic qualities, reflect community values, and meet engineering requirements for safety and mobility. The final design should meet transportation goals as well as stakeholder expectations. A clear and comprehensive understanding of site issues and context will help designers identify design alternatives that broadly fall within three categories: preservation, conservation, and enhancement.



Figure 2.1-5 US 113 Public Workshop, Millsboro, DE

Flexibility varies with respect to guidelines used by designers; including AASHTO's *Green Book* and the 2009 *MUTCD*.



Figure 2.1-6 Historic Structure, Brandywine Valley National Scenic Byway.



Figure 2.1-7 The Lewes Historical Society Visitors Center, Lewes, DE

Preservation: The act or process of applying measures necessary to sustain the existing form of identified character-defining byway features.

Often preservation will apply to features and view-sheds determined to be historically, aesthetically, or environmentally significant. Where a historic feature or scenic view is identified, work will generally focus on the ongoing maintenance, repair and/or retention of historic materials, natural resources, and landforms, rather than extensive replacement, new construction, or additional planting.

Conservation: The act of design that creates a stable condition or a gradual process of appropriate development that prevents a relapse of a desired byway quality or character-defining feature.

Conserving a byway's character is an important design approach, comprised of many elements:

- The road and right-of-way's intrinsic qualities, attributes, and characteristics
- Intrinsic qualities found within the view from the road and adjacent to the right-of-way
- Physical attributes such as vertical and horizontal road alignments
- The road's contribution and relationship to scenic views

Conserving the character-defining features of Delaware Byways should be considered in everything from planning, design, and construction to permitting and maintenance activities. See **Appendix B**, the MOU between the Delaware Department of Transportation and the Red Clay Valley Scenic Byway, to review the successful maintenance agreement that recognizes the importance of character-defining features.

Enhancement: To augment existing byway intrinsic qualities by increasing or magnifying their beauty, effectiveness, or perceived value or improving the environmental context of them.

This manual encourages two forms of enhancement for Delaware Byways:

- Alternatives that complement the character-defining features of the byway
- Alternatives that add value to the traveler's experience

Consideration should always be given to how each proposed project can support the byway's identified character-defining features and enhance the visual and physical quality of the byway.

2.2 Application of DelDOT's Project Development Process on Byways

Most DelDOT capital projects, as well as roadway improvements undertaken by developers in Delaware, go through DelDOT's *Project Development Process*. The steps in this process are available at DelDOT's online Design Resource Center at www.deldot.gov/information/business/drc/pd_files/plan_development/plan_development_process.pdf. To ensure that transportation projects along byways meet both transportation and community goals, project designers should consider the following steps in the *Project Development Process*.

- During **project scoping**, verify that the project being undertaken is within the limits of a Delaware Byway. For DelDOT engineers this information is available in Primavera; private developers should be notified through the Planners Land Use Service (PLUS) process. Ensure DelDOT staff from the byway program attend the preliminary scoping meeting to discuss byway issues. Obtain and become familiar with the byway's Corridor Management Plan where available. Work with Public Relations to include byway stakeholders in the public involvement plan, including an early meeting to discuss transportation goals and intrinsic qualities of the byway. If there is a project working group, include the byway sponsor as a member. Perhaps the most critical factor in successfully working with a byway sponsor on a transportation project is continuous involvement throughout the project development process.
- When **developing and evaluating alternatives** take the byway qualities seriously, viewing them as opportunities and/or constraints. Although some byway character-defining features may not have standing as formal natural or cultural resources under the National Environmental Policy Act (NEPA), it may be useful to the designer to think of them as protected elements that can guide the design. In this step the designer's familiarity with the flexibility inherent in the AASHTO *Green Book, Roadside Design Guide*, and other publications is most important. Many landmark transportation projects along byways have been designed within that flexibility, without the need for design exceptions. Within the project context, regularly consider the application of "minimum" design criteria before criteria indicated as "desirable." Include an evaluation of how the alternatives meet byway goals as one way of identifying a recommended alternative. Also, throughout the development of alternatives, communicate frequently with the byway sponsor.

DelDOT's Project Development Process:

- Project Scoping
- Purpose and Need
- Develop and Evaluate Alternatives
- Recommended Alternative
 - Concept Plan
 - Survey Plans
 - Pre-Preliminary Plans
- Preliminary Construction Plans
 - Semi-Final R-O-W Plans
 - Semi-Final Construction Plans
 - Final R-O-W Plans
 - Final Construction Plans
 - PS&E Submission
 - Advertisement

DelDOT's *Project Development Process* can be found at: www.deldot.gov/information/business/drc/pd_files/plan_development/plan_development_process.pdf.



Figure 2.2-1 Meeting with Stakeholders



Figure 2.2-2 Public Workshop

- As the **concept plan** is prepared, ensure that the initial cost estimate includes sufficient construction cost items or contingencies to allow flexibility in final design. For example, if the need for guardrail is anticipated, allow sufficient funds for other guardrail types (such as weathering steel or steel-backed timber which may be context-appropriate) rather than assuming conventional galvanized guardrail. Document design exceptions as required.
- A public workshop is typically held after the **preliminary plan** submittal for both DelDOT and developer projects. Depending upon size and complexity of the project, the design team should conduct a focused byway stakeholder meeting early in preliminary plan development to confirm agreement on design assumptions. Where there has been frequent communication between designers and the Byway Sponsor, from scoping through concept development, a meeting should merely confirm design elements. Identification of existing issues and design goals through stakeholder interaction will help achieve a commonly identified goal and ensure schedule conformance.
- Through **semi-final** and **final plan** development, continue coordination with the Byway Sponsor and/or stakeholders on material choices, final design applications, and phasing, again striving to meet both transportation and byway goals.

It is important to note that the application of DelDOT's Project Development Process and the three Principles of Context Sensitive Solutions outlined in this document apply to all work conducted within a Delaware Byway, regardless of size, budget or scope. Practices typically associated with routine roadway maintenance can have an encompassing effect on a perceived byway aesthetic, and should be approached after thoughtful deliberation.

III. APPROPRIATE TREATMENTS

This section highlights appropriate CSS treatments for both maintenance and new construction elements of a road corridor. The following palette of possible design alternatives is intended to guide designers and planners when working on a project located along designated byways. These suggested treatments do not possibly include all potential solutions for the multitude of future projects designed and constructed along Delaware Byways. They are presented as options that can be used for improvements or providing enhancement. These suggested treatments provide guidance by exploring design solutions that are context-sensitive and consider stakeholder interest. Appropriate treatments for each project should result from a process where cost, regulatory considerations, design guidelines, and safety are taken into account.

Roadside elements can dramatically affect a byway's character. When working within byways, mobility, and safety are the primary transportation concerns, while context, visual quality, and traveler experience are equally important to stakeholders. Designers should become acquainted with best practices in transportation to help identify the "right" solutions and consider flexibility when developing an appropriate solution for the task at hand.

Flexibility:

- Assume the maximums in flexibility, when appropriate
- Utilize the minimums in standards, when appropriate
- Consider options beyond the physical elements in addition to considering the function of the road
- Go beyond the functional classification and examine road type, character, and byway intrinsic qualities
- Recognize that design exceptions may be an outcome of a public outreach process after all other design alternatives and improvement options are considered

Determining the appropriate CSS design elements for work on a Delaware Byway can be as easy as reviewing and understanding the Vision and Management Strategies in the byway's CMP. Many CMPs include a section that summarizes the desired palette of design materials and practices consistent with the byway's character. These design elements have been identified as desirable by the corridor's stakeholders, and their continued use in future projects is encouraged. Undesirable design elements are also identified, which can help

Roadside elements can dramatically affect a byway's character. When working within byways, mobility, and safety are the primary transportation concerns, while context, visual quality, and traveler experience are equally important to stakeholders.



Figure 3-1 Design Flexibility: Narrow Lanes to Provide Median, SR 7 Bear, DE

Design elements to consider include:

- road alignment
- roadside structures
 - sidewalks
- shared-use paths
- landscaped medians
 - street trees
 - traffic signs
- utility facilities
- site furniture
- bridge design

eliminate potential design solutions that do not support the desired aesthetic of the byway.

A photographic inventory of each Delaware Byway is also included in its corresponding CMP. Reviewing these roadside characteristics, amenities, design features, and images of scenic character can provide examples of acceptable design solutions for a particular byway. Appendix 5 of the Red Clay Valley Scenic Byway CMP, for example, provides a potential palette of design elements preferred by their sponsoring byway group.

Design elements to consider include road alignment, roadside structures, sidewalks, shared-use paths, landscaped medians and street trees, traffic signs, utility facilities, site furniture, and bridge design. Road work can range from multi-million dollar projects such as a major transportation improvement or modification of an existing alignment to small-scale maintenance activities such as mowing and tree trimming. All should follow the CSS principles.

The following treatments are preferred alternative design solutions for projects commonly encountered on Delaware Byways. Prior to choosing a design solution each project should be evaluated in the context of land use and road and user type.

3.1 Road Alignment and Design Speed

The horizontal and vertical alignment of a byway greatly affects the traveler's experience and contributes to the scenic features of the corridor. Many Delaware Byways are characterized by the road's curving nature as it follows the topography of the natural landscape. In some circumstances, where vehicles move faster than the roadway's ability to safely accommodate them, these undulating roadways may have a higher number of crashes.

In addition to safety concerns, roads historically evolve in response to an increase of use. Alignments are straightened for improved visibility, shoulders are paved, and roadways are widened to accommodate turning or passing lanes. While these changes are made to improve mobility and safety, they can impact the original visual appeal of the roadway and detract from the traveler's experience.

While evaluating the safety and mobility considerations associated with road realignment in a byway is vital, maintaining character-defined features is equally important. Because many current Delaware Byways are in rural areas where traffic volumes do not approach the capacity of the roadway, safety is the driving force behind most alignment decisions along those byways.

When safety is an issue there are two basic ways for designers to consider the relationship between operating speed and road design:

- A traditional engineering approach: The road's existing horizontal alignment, vertical alignment, and/or typical section are inadequate to safely convey traffic at anticipated volumes and speeds. For this reason, the road should be straightened and/ or widened to enhance safety, which may impact the valued character-defining features of the byway.
- An alternate approach: Traffic is traveling too fast to safely negotiate the roadway's alignment and width. For this reason, operating speeds should be reduced to enhance safety as well as preserve byway character-defining features.

The key to both approaches is the selection of an appropriate design speed. Design speed is arguably the most important design control used in selecting standards for the design of a roadway segment. Roadway design should lead the driver to adopt a driving behavior appropriate to local conditions. The appropriate target speed should be based on land use conditions, building densities, environmental context and the needs of users. Designers should seek consistency among all aspects of the roadway, its context, and the chosen design speed.

[An appropriate] "design philosophy takes into account functional classification, existing or intended land use, and the context of the project, and then uses an appropriately selected design speed as the basis for all of the design elements. If there are no physical or environmental impediments to alter the geometry of a roadway, the designer may consider introducing design elements that reinforce and encourage the intended operating speed, which should be based on the needs of all road users." (New Jersey Department of Transportation, Roadway Design Manual)



Figure 3.1-1 Road Alignment: Traditional Alignment, Old Baltimore Pike Christiana, DE



Figure 3.1-2 Road Alignment

The road was designed to blend with the surrounding topography and preserve trees. The alignment created a scenic quality along the corridor and enhanced the visitor's experience.

Top: Rt. 100, DE. Bottom: Rattlesnake Point, Milton, Ontario, Canada

DelDOT's Road Design Manual indicates that four objectives should be met in establishing design speed and other design controls:

- Level of service
- Safety
- Economics
- Context

The core principle is that the design speed should not be lower than the anticipated operating speed. However, selection of the anticipated operating speed is critical. It need not (and, in fact, should not) be based solely on current speed limit or existing measured speed. Future operating speed, for example, can be safely influenced by the design of the roadway. In certain contexts, narrower lanes (within Green Book guidelines) and continuous lines of trees (see Section 3.6) have been shown to have some success in reducing driver speeds in a safe manner.

Along local streets, the designer may also include traffic calming measures, as described in more detail in Section 3.11 of this document. Traffic calming measures tend to be more appropriate along urban or small-town portions of byways, and their aesthetic effects on the surrounding landscape should be considered. In contrast with passive techniques such as lane widths and tree canopy, traffic calming measures actively reduce the speed of vehicles through horizontal and vertical deflection.

The best designs along Delaware Byways will incorporate some of the approaches noted in this chapter as appropriate to the context of the individual project. Selection of a lower design speed within the parameters of terrain, land use, and functional classification may reduce the need for adjustments to horizontal alignment, vertical alignment and typical section. This can reduce impacts and project costs while still ensuring appropriate roadway safety and capacity while preserving the character-defining features of the byway.

3.2 Roadside Barriers

A wide variety of traffic barriers is available for installation along highways and streets, including both longitudinal barriers and crash cushions. Design of traffic barriers is an important detail that contributes to the overall look of the byway; therefore, in addition to safety, the selection of an appropriate barrier design should include aesthetic considerations. All traffic barriers must meet crash-test guidelines. Because aesthetic considerations are usually a factor, many barriers are designed to add to the visual quality while meeting criteria for facilities with truck traffic. Given these options, designers must balance decisions based on safety, cost, and aesthetics.

Given these options, designers must balance decisions based on safety, cost, and aesthetics.



Figure 3.2-1 Guardrail: Steel-Backed Timber

Steel-Backed Timber Guardrail

This system consists of a wood rail backed with a steel plate, and supported on timber posts. The steel plate provides the needed tensile strength, while the wood members provide a more rustic appearance than the steel and concrete normally used in barriers. The primary limitation of this type of guardrail is the lack of crashworthy end treatments. The leading end of the guardrail must be either tapered horizontally out of the clear zone or buried in a suitable slope.

Appropriate for: Roadways located in rural areas or scenic and natural environments.



Figure 3.2-2 Guardrail: Weathering Steel

Weathering Steel Guardrails

Use of a dark color or rusting steel can produce less visual contrast than standard galvanized steel more commonly used. This system provides required strength with additional aesthetic appeal.

Appropriate for: Roadways located in rural areas or scenic and natural environments.



Figure 3.2-3 Guardwall: Stone-Faced, Bridge 1 over Brandywine Creek, Wilmington, DE



Figure 3.2-4 Guardrail: Cable



Figure 3.2-5 Guardrail: Precast Simulated Stone Guardwall

Stone-Faced Guardwall with Concrete Core

The stone of this guardwall can easily complement the surrounding environment. The correct selection of stone can reflect the location while enhancing safety.

Appropriate for: Scenic, historic, and natural settings. Suggest using local material to fit into the surroundings.

Cable Guardrail

Cable guardrail is an alternative to traditional concrete and metal-beam barriers, and often less time-consuming to install. Cable guardrail can be a cost-effective safety measure when compared to other barriers. It is unobtrusive in the rural setting.

Appropriate for: Wide medians, or located an appropriate distance off the road in natural or rural settings. It is not appropriate for drop-off areas.

Precast Simulated Stone Guardwall

Simulated stone precast panels can be fabricated off-site and installed in conjunction with a reinforced concrete core. This option meets safety criteria while providing a multitude of cost-effective color and pattern options.

Appropriate for: Customization allows applications in rural or urban locations, historic or natural.

3.3 Bridges, Walls, and Other Small Structures

Bridges and small structures can contribute to or detract from a byway's character and quality. If an existing bridge or small structure is considered a character-defining feature of the byway, it should be preserved through maintenance, rehabilitation, and repair if possible. When a bridge must be replaced, compatibility can be achieved by replacing the structure in-kind or by reconstructing a bridge with similar detail. If, however, the bridge detracts from the byway's character, a replacement bridge can enhance the byway if a design more compatible with the character of the byway and its users is selected.

Any structural design should take into account the context of the landscape and reflect its historic, rural, or urban character. As viewed in its context, form is most affected by the geometry and the type of bridge structure chosen. Choose materials and colors that are complementary to the landscape. Color and texture can be utilized to reduce or enhance the visual contrast depending upon design goals and can be applied to multiple stages of design.



Figure 3.3-1 Bridge: Stone at D&R Canal State Park, NJ

Bridges and small structures can contribute or detract from a byway's character and quality.

If, however, the bridge detracts from the byway's character, a replacement bridge can enhance the byway if a design that is more compatible with the character of the byway and its users is selected.

Stone Bridge

This single arch stone bridge provides visual interest for a bike and hiking path. The material and texture is aesthetically pleasing and complements the context.

If the bridge is considered a visual and historic treasure, carefully consider repair and restoration before new construction.

Appropriate for: Historic area, park, and rural area. Can be applied to larger vehicular bridges where appropriate and economically feasible.



Figure 3.3-2 Bridge: Van Buren Street, Wilmington, DE



Figure 3.3-3 Bridge: Covered Smith's Bridge, New Castle County, DE



Figure 3.3-4 Bridge: Simulated Stone-faced Concrete, Dulaney Valley Road, MD

Aesthetic Concrete Bridge

This reinforced concrete bridge in Delaware is a closed-span arch bridge over Brandywine Creek. The design of the bridge paid extra attention to detail, blending aesthetically with its surroundings.

Appropriate for: Urban and suburban locations and parkways.

Covered Bridge

This covered bridge was rebuilt in the spirit of the original. The bridge was constructed with new steel beams, a wooden deck and roof and other aesthetic treatments. The piers and abutments were repaired and the curved approaches "smoothed" allowing a better view of traffic approaching from both sides.

The bridge is a local example of flexibility in design standards.

Appropriate for: Historic sites, rural areas, scenic locations, and natural areas.

Simulated Stone-Faced Concrete Bridge

Through the development of a form liner and wall staining system, this design created a unique way to provide a simulated and realistic stone finish to structural concrete walls, providing beauty and economy.

Appropriate for: Structures viewed from a distance or at high speeds.

3.4 Bicycle Facilities

Bicycles are a viable mode of transportation in the United States, both for commuting and recreation. Accommodating bicycles on byways often presents challenges which can result in widening of roadways, potentially altering character-defining features. For example, an important feature of many byways is the narrow two-lane cross-section through rural areas that separate cities and towns. Projects along byways that have scenic intrinsic qualities should strive to preserve this narrow pavement and more intimate and pastoral scale while accommodating bicyclists.

Accommodating bicycles and pedestrians on all Delaware roadways is now the law. Governor Jack Markell's *Executive Order Number Six*, signed April 24, 2009, requires all new and rehabilitated roadways in Delaware to be Complete Streets, properly accommodating pedestrians, bicyclists, and transit users as well as motor vehicles. DeIDOT's Policy Implement O-6 ensures that "system modifications are routinely planned, designed, constructed, operated, and maintained in a way that enables safe and efficient access for all users. The result should be a system for all users that is comprehensive, integrated, connected, safe, and efficient allowing users to choose among different transportation modes, both motorized and non-motorized." This policy applies to all Delaware roadways, including designated byways.

Planning and design of bicycle facilities is rapidly evolving. Designers should be familiar with the most current standards and guidance for bicycles and incorporate them into their projects. This can be particularly important in byway projects, where creative design is needed to allocate limited roadway and/or right-of-way for all modes of travel. AASHTO's 1999 *Guide to the Development of Bicycle Facilities* provides the most accepted national guidelines; however some sections of the Guide are obsolete and the document is scheduled for replacement in 2011. Another document that provides insight into the tradeoffs among all modes of travel is ITE's 2010 document, *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*. This document is especially valuable in understanding what options exist in terms of widths for motor vehicle lanes, bike lanes, shared lanes, shared-use paths, and sidewalks. *The Manual on Uniform Traffic Control Devices (2009)* lists comprehensive traffic control devices for bicycle facilities that help guide traffic and ensure safety.



Figure 3.4-1 Bicycle Facilities, Airport Road, New Castle, DE



Figure 3.4-2 Bicycle Facilities, New York, NY

Accommodating bicycles and pedestrians on all Delaware roadways is now the law. Governor Jack Markell's *Executive Order Number Six*, signed April 24, 2009, requires all new and rehabilitated roadways in Delaware to be Complete Streets, properly accommodating pedestrians, bicyclists, and transit users as well as motor vehicles.

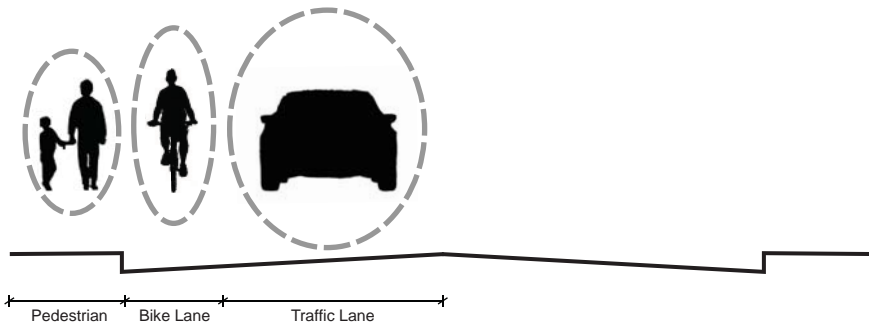


Figure 3.4-3 Separation for All Users

Separate Accommodation for All Users:

Provide maximum separation for different users. Appropriate for roadways with moderate to high motor vehicle speeds or areas with moderate to high levels of pedestrian and bicycle activity.

Advantage: High level of safety and comfort for all users.

Disadvantage: Wide right-of-way required. May not be feasible in environmentally sensitive, historic, or scenic areas.



Traffic Lane – Bike Lane – Buffer – Pedestrian Zone

Appropriate for: Many urban and suburban areas where right-of-way is available, or in rural areas with moderate to high levels of pedestrian and bicycle activity.

Figure 3.4-4 Separation for All Users



Traffic Lane – Parking – Bike Lane – Planting Buffer – Pedestrian Zone

Appropriate for: Residential areas; suburban or city streets with moderate vehicle speeds.

Figure 3.4-5 Separation for All Users with Parking

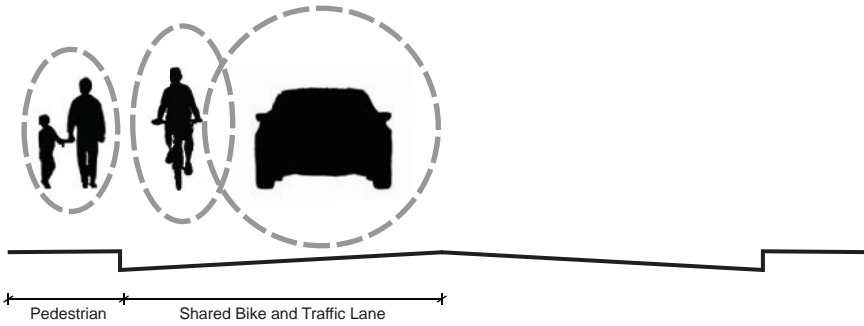


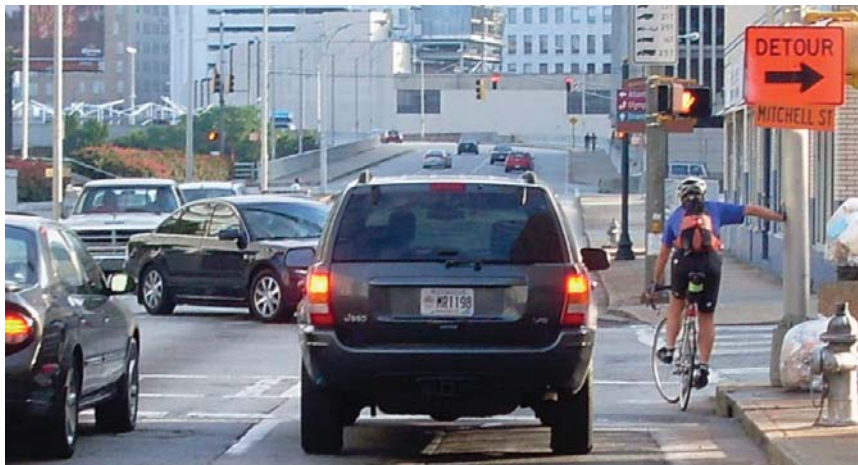
Figure 3.4-6 Partial Sharing for Bicycles and Motor Vehicles

Partial Sharing for Bicycles and Motor Vehicles

In this option there is some overlap between the space provided for bicycles and that provided for motor vehicle travel. However, dedicated pedestrian accommodation is maintained. It is most likely found in urban areas or residential streets where there is limited right-of-way and low traffic speeds and volumes.

Advantage: Pedestrians are provided with a separate path.

Disadvantage: Bicyclists and drivers share the roadway, potentially creating conflicts between cyclists and drivers.



Traffic/Bike Lane - Pedestrian Zone

Appropriate for: Roadways where traffic speeds are low and volumes are not overwhelming, such as residential and rural areas or streets with limited right-of-way; urban historic centers, downtowns or environmentally sensitive areas.



Figure 3.4-7 Partial Sharing for Bicycles and Motor Vehicles

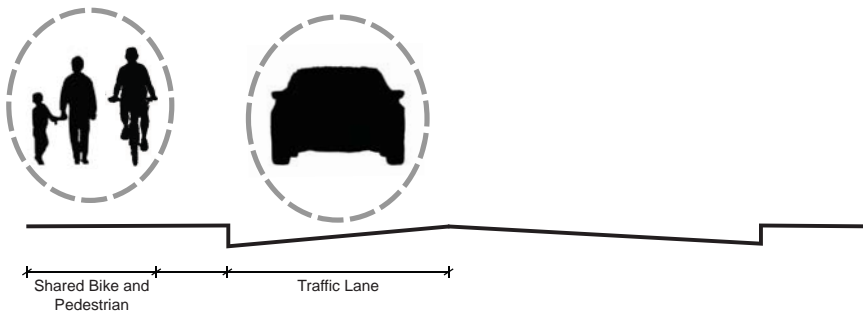


Figure 3.4-8 Shared Bicycle/Pedestrian Zone with Buffer to Vehicular

Sharing for Bicycle and Pedestrians

Pedestrians and cyclists are grouped together in an area separated from motor vehicle traffic, either within the roadway or in a separate area. Shared-use paths are a particularly useful tool for scenic byways because non-motorized users can still be accommodated on narrow roadway alignments. These offset shared-use paths can widen when right-of-way is available while allowing the scenic qualities of the roadway to remain in place.

Advantage: Modes operating at lower speeds are grouped together, reducing the potential for crashes involving motor vehicles.

Disadvantages: Potential for conflicts between fast bicyclists and pedestrians. Many pedestrians feel most comfortable on a dedicated facility like a sidewalk, where bicycle travel is infrequent.



Figure 3.4-9 Shared Bicycle/Pedestrian Zone with Buffer to Vehicular Zone

Traffic Lane - Planting Buffer - Shared-Use Path

Appropriate for: Areas with high motor vehicle traffic speeds and/or volumes that make a shoulder or bike lane uncomfortable for bicyclists, along with low to moderate pedestrian volumes. Also, in areas where there is flexibility in locating a shared-use path. This treatment is less desirable in areas with high concentrations of commercial driveways due to potential for conflict between turning traffic and path users.



Figure 3.4-10 Bicycle and Pedestrian Shared Shoulder

Traffic Lane - Shared Shoulder

Appropriate for: Rural areas with very infrequent pedestrian activity. Often such shoulders are not marked for walking, although pedestrians are allowed to use them.

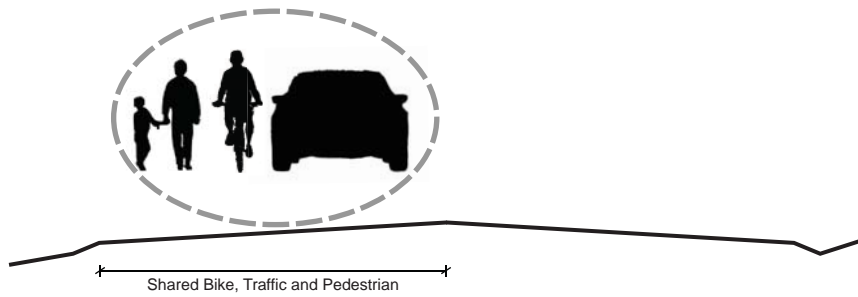


Figure 3.4-11 Shared for All Users



Figure 3.4-12 Shared for All Users

Shared Accommodations for All Users

All users, pedestrian, cyclists, and vehicular, share the roadway.

Advantage: Generally used where right-of-way is very limited.

Disadvantage: Potential conflicts among pedestrians, bicyclists, and motor vehicles.

Appropriate for: Areas of low vehicle speeds and few cyclists and pedestrians. This treatment is frequently found in rural Delaware, but often in circumstances where vehicle speeds are higher than those considered comfortable by cyclists and pedestrians. It should be considered as a potential solution for low-volume, low-speed, local streets in residential, rural and/or historic/natural areas.

3.5 Pedestrian Environment

In keeping with the state's Complete Streets Policy mentioned in Section 3.4, the needs of pedestrians must be considered along all state roadways where they are not specifically prohibited. Sidewalks, where provided, are not just pedestrian thoroughfares; they are social places in communities serving adjacent land uses. Sidewalks should accommodate pedestrians of all ages and abilities, with attention given to locating pedestrian amenities that logically direct people to desired destinations in a safe and attractive environment. Sidewalk design and maintenance should respond to the context and address the full variety of functions the sidewalk will serve. Generally speaking, sidewalks in urban areas should provide opportunities for café seating, planting buffers, bus stops, outdoor signs, street trees, and places for people to congregate. These users will require access to adjacent shops and services as well as on-street parking and public transit. In rural/suburban areas, sidewalks usually serve children traveling to school and recreational activities such as visiting neighbors, dog-walking, jogging, and biking.

In FHWA's, *Designing Sidewalks and Trails for Access* (2001), sidewalks in urban areas are commonly divided into four zones based on their function, prioritizing the needs of pedestrians. From the roadway out they include:

- Curb zone
- Planter/furniture zone
- Pedestrian zone, and
- Frontage zone.

In suburban and rural areas where land uses are not located near the back of the sidewalk, it is more common to simply find a pedestrian zone separated from the roadway by a grass strip.

Understanding sidewalk characteristics help designers determine the width of sidewalk needed, not only enhancing the pedestrian experience but improving the value of adjacent land. Designers should consider the following factors when designing sidewalks:

- Types of pedestrians who use the sidewalk: Ranges of age, mobility, and ability.
- How long pedestrians use the sidewalk: Long-term (gathering spaces, outdoor café), short-term (mass transit stops), or transition (walking through).

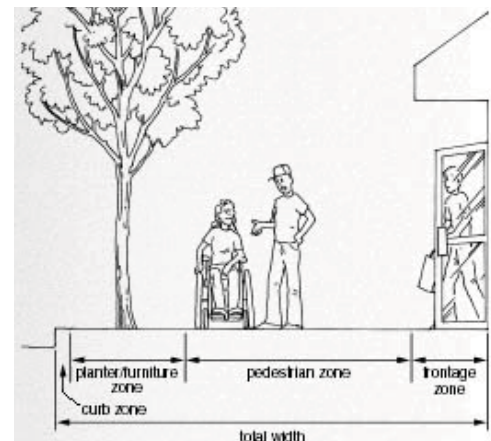


Figure 3.5-1 Sidewalk Zones, FHWA(2001)

- The surrounding context, particularly important in byway projects: The sidewalk's physical condition (right-of-way, existing grade, access points, cross slope, width, materials, etc.) and location (a historic town, urban downtown, residential area, nature preserve, etc.).



Sidewalk Corridor Accommodating Multiple Activities and Functions:

- Clearly defined curb zone.
- Planting/furniture zone (enhances user experience by using trees, low plantings, and appropriate style of site furniture and materials).
- Clearly defined pedestrian zones.
- Frontage zone (separated by planters and outdoor seating, which improves comfort and perceived safety).

Appropriate for: Urban downtown, commercial area, tourist attraction, etc.



Figure 3.5-2 Sidewalk Corridor Accommodating Multiple Activities and Functions



Sidewalk Corridors as Transition Spaces:

- Clearly defined curb zones
- Limited planting/furniture zone with street trees as buffer
- Clearly defined pedestrian zones
- Frontage zone replaced by residential front yard

Appropriate for: Residential area (suburban and urban) and areas between destinations.



Figure 3.5-3 Sidewalk Corridor as Transition Space

When sidewalks are provided along a byway, the designer may choose to specify paving materials that enhance the byway's character-defining features. These sidewalks should consider the following:

- In historic/cultural areas, paving materials should respond to surrounding architectural materials, which could include brick or stone.
- In natural and environmentally sensitive areas, paving materials can play a role in stormwater management and reducing the heat island effect. For example, permeable pavers and pervious concrete infiltrate stormwater and reduce runoff.

Sidewalk materials to consider include:



Figure 3.5-4 Sidewalk Aesthetic Treatment

Aesthetic Treatment:

Sidewalks in a historic area can reflect the local character and historic features through the use of selected paving materials. Material selection and installation methods must be carefully considered to ensure accessibility and reduce tripping hazards.

- Brick/ Concrete Pavers
- Stone
- Decorative concrete



Figure 3.5-5 Sidewalk Alternative Treatments

Alternative Treatments:

Environmentally friendly. Can create smaller tree pits with less root intrusion and sidewalk upheaval. Easy to install, repair and replace.

- Recycled Rubber Pavers



Figure 3.5-6 Sidewalk Permeable Treatments

Permeable Treatments:

Environmentally friendly. May require additional maintenance.

- Pervious Paver
- Pervious Concrete

3.6 Landscape

Trees and other vegetation play a vital role in defining the spatial relationship of a corridor. They often represent an indigenous or designed landscape and enhance the aesthetic quality of the byway. A rolling open field or a canopy-covered street can contribute to a memorable travel experience while the aesthetics of changing seasons often attract visitors year round.

However, the treatment of trees along a byway may pose safety and aesthetic conflict between designers and stakeholders, especially for trees identified as vital character-defining features requiring protection and preservation. Conversely, run-off-the-road crashes account for 40% of Delaware's highway fatalities and have been identified as the primary focus of the Strategic Highway Safety Plan. In addition, AASHTO's 2006 *Roadside Design Guide* views mature trees greater than four inches in diameter inside the clear zone as fixed objects that require removal.

Context Sensitive Solutions encourage designers to explore flexible alternatives that augment the byway's intrinsic qualities, reflect community values, and meet engineering requirements for safety and mobility. Along byways where trees are identified as important features, traffic characteristics and safety concerns should be addressed through the use of design criteria minimums, lower design speeds, and minimum clear zone widths. Application of alternate techniques such as a modified road alignment, adding curb, protective barriers, roadway lighting, edgelines, warning signs, or shoulder rumble strips where feasible is also encouraged. As an added benefit, trees and vegetation along a corridor can help define the roadway edge and may play a role in calming traffic.

Byways where trees are identified as important features, traffic characteristics and safety concerns should be addressed through the use of design criteria minimums, lower design speeds, and minimum clear zone widths.



Tree allees as character-identified features, which help define roadway edge, calm traffic and create aesthetic view shed.

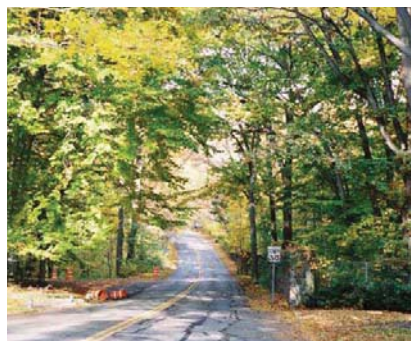
Figure 3.6-1 Tree Allee and Shrub Rows Help Define Road Edge



Significant trees which become part of community history are icons and should be preserved.

Figure 3.6-2 Significant Trees Become Part of Historic Feature.

Left: White Oak, located at St. Anne’s Episcopal Church, New Castle County, DE
 Right: The Historic Brandywine Presbyterian Church and Cemetery, DE



Natural landscapes with indigenous plant species represent a byway’s intrinsic quality.

Figure 3.6-3 Natural Delaware Landscape with Indigenous Planting Species.

It is crucial when identifying byway character-defining features to complete a vegetation inventory. The inventory should take into account the health and contribution to scenic, historic, and natural qualities the vegetation provides.

- Be aware of areas where vegetation impedes sight distance
- Identify opportunities where the health or variety of plant communities may be improved
- Look for places where vistas can be created, opening views to historic landscapes and byway qualities through selective thinning

Despite their importance, trees and vegetation are often threatened by development, road construction, utility excavation and installation, and maintenance and operational decisions. As a result, protecting trees and managing vegetation are vital to preservation and enhancement of a byway. Designers should strive to:

- Preserve character-defining trees and vegetation
- Create appropriate planting design concepts to enhance byway features and visitor experience
- Select appropriate species for new planting to enrich biodiversity, reflect local landscape, and withstand salt if located near the road
- Remove non-native and invasive plants when possible
- Use landscaping to create view-sheds or screen undesired views
- Use trees and vegetation to define a roadway edge, calm traffic, and reduce noise where appropriate
- Increase driver and pedestrian safety through appropriate planting choices and locations

An equally important element of landscape application and preservation is maintenance. Trees, plantings, and naturally occurring hedgerows along a byway require specific maintenance crucial to the preservation of character-defining features of the corridor.

- Tree removal and pruning should be selective and sensitive to the byway's aesthetic
- Appropriate clear zones and sight distances should be considered and maintained
- Often maintenance of open views is just as vital to the character of a byway in the preservation of a defining landscape

An equally important element of landscape application and preservation is maintenance. Trees, plantings, and naturally occurring hedgerows along a byway require specific maintenance crucial to the preservation of character-defining features of the corridor.

3.7 Site Furniture

Site furniture, such as benches, trash receptacles, and lighting, make an urban or small-town street more comfortable and attractive for its users. Generally speaking, site furniture should accommodate all ages and abilities, with attention to appropriate placement and style that not only fulfills the intended function but also complements the surroundings. When working on byway projects, designers should select appropriate site furniture which respects the corridor's character-defining features and enhances the visitor's experience.

The following elements should be considered when selecting and locating lighting fixtures and site furniture along Delaware Byways:

- **Appearance:** The style, material and color of site furniture should respond to the surrounding context. For example, when conducting work along a byway in a historic neighborhood, designers should choose site furniture that coordinates with the style and period of the area's characteristics.
- **Location:** The location of site furniture should accommodate pedestrian activities, movements, and needs. Often site furniture, such as benches and trash receptacles, is underutilized due to lack of comfort, or poor visibility. For example, benches are more frequently used on shopping corridors or near bus stops than places where there is little pedestrian activity, and trash receptacles are seldom used unless placed in a highly visible location.
- **Size and Spacing:** The size and spacing of site furniture should fulfill the requirements of comfort, safety, demand, and maintenance. For example, areas with more pedestrian activities may have increased seating requirements, and require additional trash receptacles and brighter street lighting. Conversely, it is vital to consider pedestrian traffic flow volume before adding excessive obstacles.
- **Regulatory requirements:** Refer to all local, regional and state guidelines for standard site amenities and consider additional options that may better represent the project site. For lighting standards refer to DelDOT's *Lighting Design Guidelines*. The stakeholder or project sponsor may incur increased cost for installation, operations, and maintenance if a non-standard lighting fixture not compliant with Delmarva Power or other utility company standard and local ordinance requirements is selected.

Site furniture should accommodate all ages and abilities, with attention to appropriate placement and style that not only fulfills the intended function but also complements the surroundings.

- **Installation:** Environmental factors such as rain, wind, and snow as well as human factors such as inappropriate or heavy use can cause damage and potential safety issues. Designers should consider these factors and choose appropriate installation to extend the usage of site furniture.



Figure 3.7-1 Site Furniture: Appearance



Appearance: Site furniture should respond to its surrounding context.

Examples: Natural materials in a natural, rural location. Historic-styled lamps in a colonial district or downtown.



Figure 3.7-2 Site Furniture: Location



Location: Site furniture should accommodate the users' movements, activities, and needs. Site amenities should not impede pedestrian flow.

Examples: Benches should be located places of comfort where people naturally rest, such as near a bus stop or plaza.



Figure 3.7-3 Site Furniture: Size and Spacing



Size and Spacing: Site furniture should be comfortable, safe, adequate and easy to maintain. Site furniture should provide areas of respite, but discourage vagrancy and vandalism.

Examples: Provide adequate seating space and trash receptacles for area where people like to stay.

3.8 Utilities

Utility poles can have a significant affect on the safety and aesthetics of a roadway. It is important to consider the accommodation of utilities early in the design process.

Options to relocate, screen, or minimize the visual impact of overhead utilities should be explored when utility work is undertaken within a byway. Although the expense involved with relocating or undergrounding utilities can be prohibitive, communities can gain numerous long-term, sustainable benefits. Benefits such as improved aesthetics can contribute to reduced maintenance, improved safety and community health, and provide potential opportunities for economic development.

There are several techniques to reduce the visual impact of utilities along byways:

- Reduction of utility wires: Consolidate lines along one side of the roadway on a single pole and wrap them to create the appearance of only one cable.
- Screening by tree lines: Selection of appropriately sized and located, tall, upright trees along, but never under, overhead lines, or trees with a mature height of less than 20 feet. (In common practice, oversized trees under utility lines will be pruned into odd shapes.)
- Relocation of wires: Move utilities to alleys or behind buildings.
- Undergrounding wires: The most comprehensive and effective method of reducing the visual impact of utility wires, but also the most expensive and often cost prohibitive.

Through a franchise agreement between DelDOT and the utility companies, most utility companies enjoy the right to locate their utilities within the public right-of-way, with the provision that they must relocate those utilities at their expense if that right-of-way is needed for transportation purposes. However, this relocation is typically undertaken without a change in the character of the utility. In other words, if an electric utility provides distribution lines along a single pole line on one side of a roadway, the utility companies relocation responsibility consists of providing a new single pole line set farther back from the roadway. Relocation that materially changes the character of the utility, such as burying overhead lines or relocating them to the backs of buildings, constitutes a “betterment” that must be paid for by the project, not the utility company.

Although the expense involved with relocating or undergrounding utilities can be prohibitive, communities can gain numerous long-term sustainable benefits, such as improved aesthetics, that can contribute to reduced maintenance, improved safety and community health, and provide potential opportunities for economic development.



Figure 3.8-1 Utilities: Relocation of Wires Before and After, Downtown Laurel, MD

Relocation of wires: Move utilities to available alley or space behind buildings. Benefits include:

- Creation of a wider, more pedestrian-friendly sidewalk and the potential restoration of street-side aesthetics
- The revitalization of a successful Main Street
- Improved visibility of store signs and frontage.

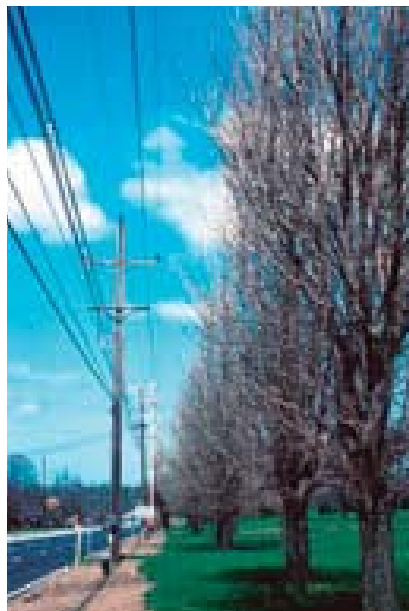


Figure 3.8-2 Utilities: Appropriate Tree Size and Locations

Screening with trees: Select appropriately sized trees for under or adjacent utilities and locate to screen while maintaining appropriate set-backs.

- For trees close to utility lines always select varieties with a mature height of less than 20 feet.
- For trees intended to screen adjacent utilities, select tall, upright varieties. Locate at an appropriate distance from overhead lines. Never place trees with an anticipated height of 20' or more under a utility line.

3.9 Signs and Traffic Control Devices

Signs and traffic control devices provide direction and information within byway corridors. These signs and safety devices, while providing a needed service, may also impact a byway's visual appearance and aesthetic features. Thoughtful, consistent, and well placed signs can complement the valued character of the byway, while over-sized and ill-placed signs may confuse visitors and obscure the byway's scenic quality.

Once a byway is designated, the construction of new outdoor advertising signs (billboards) is no longer permitted. Outdoor advertising signs are signs advertising a product or information not located at the site of the sign. Often, their placement on adjacent property is restricted if the sign is visible from a byway.

“Byway...designation affects permits for new off-site/off-premises signs (outdoor advertising signs placed on one property, but advertising goods or services available on another property) on any roads controlled by the Highway Beautification Act of 1965. New off-premise outdoor advertising signs are not permitted along state Scenic and Historic Highways. This rule does not affect existing outdoor advertising signs.” (Delaware Historic and Scenic Highways Program Guide, 2001)

This does not apply to traffic control devices, way finding, directional and/or business signs, which are permitted within a designated byway. Every sign in a road's right-of-way is subject to the 2009 edition of *the Manual on Uniform Traffic Control Devices*. All signs within the byway, regardless of intended purpose, require careful consideration in regard to their design and location within the byway.

When adding or altering signs along a byway, consider the following:

- When possible combine multiple signs, avoiding cluttered streets and roadsides (evaluate MUTCD co-posting constraints).
- Scale down especially tall or large signs obstructing the visual effectiveness of nearby signs. Signs must still meet minimum height requirements cited in the MUTCD.
- Ensure signs are posted at appropriate heights, maintaining readability and required clearance.
- Minimize information to avoid confusion.
- Secure signs properly to prevent theft and vandalism.

Every sign in a road's right-of-way is, however, subject to the 2009 edition of *the Manual on Uniform Traffic Control Devices*. All signs within the byway, regardless of intended purpose, require careful consideration in regard to their design and location within the byway.



Combine multiple signs into one where feasible, avoid a cluttered streetscape.

Figure 3.9-1 Signs: Combine Similar Uses and Styles



Left: inappropriate size and location of sign which obstructs views and decreases the aesthetic quality of the roadway.

Right: more appropriate size of sign and location. Provides sufficient information and does not distract from the visitor's experience.

Figure 3.9-2 Signs: Consider Size and Location

3.10 Curbs

Curbs and gutter pans define the roadway edge and help direct stormwater to drains. Raised curbs are intended to discourage lower speed vehicles from leaving the roadway while providing an important sense of security to adjacent pedestrians. Generally, curb and/or gutter pans are recommended along byway segments when specifically needed in regard to public safety, stormwater management, drainage, or a combination of these. Curbing can subtly affect the aesthetic appearance of the street. When proposing new or updating existing curb, designers should determine the appropriate height and material that enhances surrounding byway features.

- **Granite curb:** Very durable, expensive, and provides an aesthetic solution complementing features in certain areas. Granite, while very aesthetically pleasing, can be cost prohibitive, especially since it is not a common natural resource in Delaware, and should be considered only when required by local ordinance or economically feasible.
- **Colored concrete curb:** Common in public rights-of-way. May minimize visual disturbance by blending colors with the surrounding environment while complementing area features; however, inconsistencies of color in repairs and maintenance is of primary concern. Reproducing existing color is difficult and repairs tend to appear inconsistent and ‘patchy’. After extensive alternate evaluation small applications may be appropriate.
- **Painted concrete curb:** Easy to install and cost effective. When appropriately sited, it may be a potential economic aesthetic solution.
- **Rolled bituminous curb:** This curb option is no longer an acceptable option in the State of Delaware. Due to the difficulties in production, a limited life-span, and on-going maintenance issues within DelDOT, bituminous curb is not an acceptable curb alternative.



Figure 3.10-1 Granite Curb

3.11 Traffic Calming

“Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users.” (Institute of Transportation Engineers, *Traffic Calming: State of the Practice*.)

Communities along byways want travelers to enjoy the intrinsic qualities of a byway, encouraging visitors to stop at key points of interest. This may present conflicts between lower-speed travelers such as bicyclists and pedestrians, and higher-speed travelers such as commuters and truck drivers. Some interest points are located along lower-speed local roadways where traffic calming is appropriate. If traffic volumes and community context allow, designers should reference the DelDOT *Traffic Calming Design Manual*. Traffic calming measures can improve safety for all travelers, enhance community livability, and preserve the byway’s character-defining features. Guidelines for the contexts in which traffic calming measures may be considered along Delaware roadways, including byways, are found in Table III-4 of the *Traffic Calming Design Manual*.

Traffic calming techniques may include:

- Crossing islands / landscape medians
- Widening sidewalks / narrowing streets
- Curb extensions / neckdowns
- Mini roundabouts
- Use of paving stones or cobblestones
- Entrance/gateway features



Figure 3.11-1 Crossing Islands / Landscape Medians

Guidelines for the context in which traffic calming measures may be considered along Delaware roadways, including byways, are found in Table III-4 of the *Traffic Calming Design Manual*.

Crossing Islands / Landscape Medians

- Help reduce vehicle speed,
- Provide refuge space for pedestrians,
- Provide ideal locations for trees, flowers, sculpture, and other community amenities.

Appropriate for: Areas with wider streets, high pedestrian traffic area, or school zones.



Figure 3.11-2 Curb Extensions/ Neckdowns

Curb Extensions/ Neckdowns

- Provide a haven for pedestrians to cross street
- Define parking bays
- Provide space for amenities and enhancements

Appropriate for: Areas with wider streets or an urban downtown.



Figure 3.11-3 Small Traffic Circles

Mini roundabouts

- Provide visual and auidial cues to alert drivers of areas that require special care
- Reduce conflict points
- Reduce traffic signals
- Provide opportunities for low landscaping that will not interfere with the view of drivers, pedestrians, or bicyclists.

Appropriate for: Residential or urban areas.



Figure 3.11-4 Use of Paving Stones or Cobblestones

Use of Paving Stones or Cobblestones

- Provide visual and auditory cues to alert drivers of areas that require special care
- Slow traffic speed
- Enhance aesthetics

Appropriate for: Residential, commercial areas, and urban areas. Prior to use evaluate potential noise issues.

These traffic-calming tools can be effective in a variety of ways however, each has a specific application with limitations. It is important that designers help identify the appropriate application and material that preserves the area's character-defining features while enhancing the visitor's experience.

3.12 Grading and Drainage

When projects along a byway corridor require modification to the existing grade, such as roadway widening, additional shoulders, or improved drainage, there can be a negative impact on the byway's aesthetic. Identifying a byway's character-defining features can reveal the importance of the roadway's existing grading. Proper grading can not only improve the safety of a roadway but also enhance the byway's appearance. Designers can apply design flexibility, creating viable alternates that can increase site interest, screen views, and blend new design with the surrounding landscape.

Designers should consider the following factors when proposing grading and drainage along a byway:

- User types
- Design speeds
- Capacity needs
- Existing landscape and terrain
- Character-defining features of the byway
- Environmental benefit and sustainability

Efforts to utilize non-traditional solutions for soil stabilization and stormwater management should be explored in the context of each project along a byway.

The following is a short list of potential techniques applicable to sensitive byway situations:

- Soil bio-engineering: A cost-effective solution using plant material to stabilize the slope and blend the new slope with the existing landscape
- Small-scale retaining walls: A less-visual intrusion; can incorporate native plantings to enhance the aesthetic
- Appropriate materials: Replace white rip-rap stabilizing a steep slope with indigenous rock that blends with the surrounding byway character. Gabion baskets are cost-effective, but may alter the visual experience of the traveler
- Small-scale stormwater facilities: Choose facilities both visually and functionally appropriate for the surrounding environment. Consider bioswale, bio-retention, rain planter, etc.

Designers can apply design flexibility, creating viable alternates that can increase site interest, screen views, and blend new design with the surrounding landscape.

- Evaluate the “Lesser of Two Evils”: Consider utilizing a well-planted, stabilized slope or a retaining wall with required barrier, instead of a shoulder with a gentle slope that often requires a larger clear zone and impacts the surrounding landscape. (Maximum slopes are required to adhere to Chapter 4 of the DelDOT Road Design Manual)



Figure 3.12-1 Rain Planter



Rain Planter

Placed near impervious surfaces such as paved areas or buildings.

- Capture, cleanse and infiltrate storm water runoff
- Use native plantings
- Adhere to low maintenance standards
- Enhance the streetscape

Appropriate for: Residential and urban areas. Plantings can be simple native masses, installed relatively quickly and inexpensively, or intricate gardens requiring significant time, maintenance, and cost.



Figure 3.12-2 Bioswale



Bioswale:

Bioswales are vegetated drainage ways that convey runoff.

- Slow stormwater, filter sediment and cool runoff
- Reduce erosion and flooding
- Use native plantings
- Adhere to low maintenance standards
- Enhance the roadway aesthetic

Appropriate for: Areas treating a critical mass of runoff. Areas of application include rural areas, country-side, naturalized areas, and large development parcels.

IV. DELAWARE CASE STUDIES

4.1 Brackenville Road Improvements: Red Clay Valley Scenic Byway

Location

Brackenville Road improvements; beginning at Old Wilmington Road and ending at Barley Mill Road on the Red Clay Valley Scenic Byway.

Project Objective

Identify suitable solutions to address on-going drainage and safety concerns along the roadway.

Context

Brackenville Road is located in an area adjacent to the Delaware Nature Society and Red Clay Reservation as an environmentally sensitive wooded riparian corridor. It is bordered by trees, steep slopes, and the Indian Rill Stream, a tributary of the Red Clay Creek and associated floodplain. Drainage, surface runoff, and erosion to the nearby stream were primary concerns.

CSS/CSD Objectives

Improve roadway safety and drainage. Reduce the potential of roadway collapse and stream erosion. Minimize disturbance and preserve the sensitive environments. Enhance the scenic and visual quality along the corridor.

CSS/CSD Application

DelDOT worked with stakeholders, Delaware Nature Society, and Steering Committee members, to fully understand all project issues and concerns including road width, guardrail, curb, tree removal/replacement, stormwater management, and stream restoration. A site walk of Brackenville Road was

Stakeholders:

- Delaware Nature Society
- Residents
- Red Clay Valley Scenic Byway Alliance
- Delaware Department of Transportation

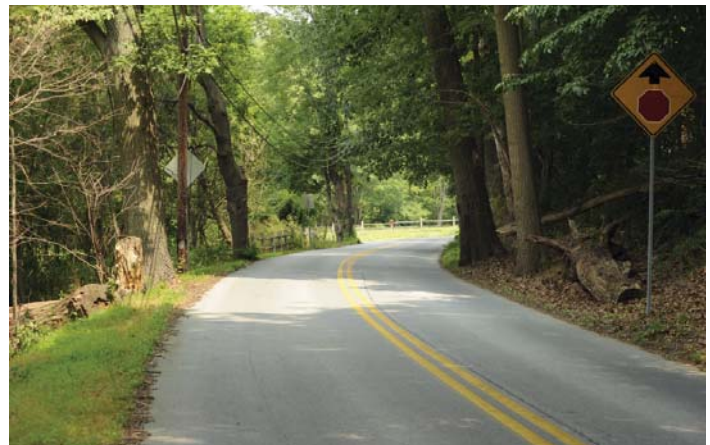
Timeline: Spring 2005 – Spring 2007

Size: 2.42 miles



held with members of the Steering Committee to review the proposed plan and discuss the CSS design issues raised by the Committee. During a public workshop, the Committee agreed upon a collaborative design approach. Public feedback was positive, particularly in relationship to the CSS proposed. The proposed approach balanced transportation, community, and environmental needs as well as enhanced the scenic quality of the corridor. It included:

- Road Width – 11' travel lane with no shoulder
- Guardrail – guardrail was essential for safety reasons. Reinforced wooden guardrail could not be used due to slope and end treatment options. Powder coated steel guardrail was agreed upon
- Curbing – an 8" curb was required to prevent impacts to southern slopes. Dyed concrete was agreed upon.
- Tree removal/replacement – An inventory of existing roadside vegetation was completed. Trees for preservation and removal were identified – removal was considered tree by tree rather than bulk clearing – a draft list of native species for mitigation was proposed
- Stormwater management – limited changes were made to stormwater management structures, with the possible exception of the use of swales at outfalls
- Stream restoration – DelDOT utilized the expertise of DNREC staff regarding the stream restoration project



Project Outcome/Lessons Learned

Design challenges were addressed through negotiations and explorations to determine a compromise that protected natural resources while providing for safe travel. Although not all of the community's suggested alternatives were approved,

those that were will enhance the appearance with the use of colored concrete, reducing the need to widen the road, and preserving significant trees and using native species for tree replacement.

DelDOT's flexibility began with the inclusion of local stakeholders and the CMP Steering Committee

throughout the planning and design process, leading to changes in the project's original design while meeting safety concerns. Stream restoration was developed in partnership with the Delaware Department of Natural Resources and Environmental Control. DelDOT entered into a memorandum of understanding (MOU) with the Delaware Nature Society, which provided ongoing coordination and collaboration for managing byway roads and ensuring public participation for the Red Clay Valley Scenic Byway.

The project set a precedent for future road improvement efforts along the Red Clay Valley Scenic Byway. The project was initiated in the early CMP planning process and negotiations with DelDOT regarding context sensitive solutions framed many of its goals, objectives, and strategies. It also fostered a desire to enter into a MOU with DelDOT.

Due to lack of funding, construction is uncertain so the ultimate outcome of the Brackenville Road project remains to be seen.

4.2 Access to Applecross Development: Brandywine Valley National Scenic Byway

Location

The Applecross development is located on SR 100 near Buck and Kirk Roads at the southern end of the Wilmington Country Club. It is on the Brandywine Valley National Scenic Byway that includes SR 52 and SR 100 extending from Rodney Square in downtown Wilmington north to the Pennsylvania state line for 12.2 miles.

Project Objective

To protect and maintain the existing vegetation and aesthetic qualities along the byway where access improvements on SR 100 were required to accommodate the entrance of a residential development.

Context

SR 100 is a winding project for a rural road bounded by wooded residential lots and open land. Its scenic beauty largely derives from its character as a narrow, two lane rural country road, following the original cart paths of the hilly piedmont terrain.

CSS/CSD Objectives

Design roadway improvements to minimize any negative impact to roadside vegetation and mature trees while assuring safety is maintained

CSS/CSD Application

Sensitively designed roadway improvements that minimized the proposed clear zone and pavement width were a direct result of a collaborative approach where design solutions were discussed among the Byway Advisory Committee, the private developer of the property, Delmarva Power and DeIDOT.

Stakeholders:

- Brandywine Valley Scenic Byway Advisory Committee
- Delaware Greenways, Inc.

Size: 12.2 Miles



Design changes involved grading shoulders and moving utility poles to minimize the area where large deciduous trees and other vegetation had to be removed or disturbed.

Changes included:

- Reduction in the width of the travel lanes to 10'
- Elimination of right turn lane on SR 100.

Working with Delmarva Power, the design team determined that the utility poles could be moved back from the road with the wires cantilevered to protect as many trees as possible. Planting of trees to replace any mature trees that were removed during construction was an added benefit of the project.

Project Outcome/Lessons Learned

This section of the roadway maintains an appearance that is attractive and complementary to the scenic qualities of the byway while allowing safe travel and access to the Applecross community. The traveler will have a seamless experience that highlights the byway's scenic and historic features.

More importantly, conducting an open dialogue with all stakeholders, and the willingness of the utility company to consider alternative solutions resulted in a more place-sensitive design. Going beyond the functional classification guidance proved to meet both safety and environmental goals.

4.3 Wooddale Covered Bridge - Foxhill Lane Over Red Clay Creek: Red Clay Valley Scenic Byway

Location

The Wooddale Covered Bridge (1-137) is located on Foxhill Lane, N263A, over the Red Clay Creek at the entrance of Wooddale, west of Wilmington in New Castle County.

Project Objective

Rebuild the bridge which was destroyed in a storm.

Context

Wooddale Bridge was a single-span Town Lattice Truss timber covered bridge with stone abutments built in 1850. Portions of the bridge were updated in 1969 and 1981, including the addition of steel girders for strength, but it remained a single-lane structure.

In September of 2003, the remnants of Tropical Storm Henri caused the streams and rivers of New Castle County to swell to 100-year storm levels, demolishing stream banks, trees, and historic resources along the way. The Wooddale Covered Bridge was washed off its abutments and deposited downstream along the banks of the Red Clay Creek. As the only access to the small residential community of Wooddale, the Wooddale Covered Bridge served an important role not only in the historical heritage of the state, but also as a vital transportation link for the Wooddale residents.

The surrounding community felt strongly about retaining the historic and aesthetic quality of the original bridge design, and maintaining an environmental responsibility for it.

Stakeholders:

- State Historic Preservation Office
- Red Clay Valley Scenic Byway Alliance
- Mount Cuba Observatory
- Delaware Nature Society
- Residents of Wooddale Community
- Wilmington Western Railroad Riders

Size: 1-lane, 50' Span, Timber Covered Bridge

Cost: Bid \$3.4 million

Timeline: 2001-2009 (Project initiation through construction)



CSS/CSD Objectives

Restore wooden covered bridge which is historically significant. Enhance the scenic quality of the corridor.

CSS/CSD Application

This one-lane covered bridge required a rare exception from American Association of State Highway and Transportation Officials (AASHTO) design guidelines. Designers met the request for an all timber bridge by raising the roadway alignment by 5 feet, allowing the high flood waters of the Red Clay Creek to pass below the bridge. As a result, the adjacent Rolling Mill Road had to be raised, requiring an aesthetic post-and-panel retaining wall to be constructed along the roadway approach to the Foxhill Lane intersection. Additionally, timber guardrails were used (instead of standard steel beam guardrails), and stone from the previous stone abutments was used to create the stone veneer on the new concrete abutments.

Extensive public involvement and workshops produced a design option acceptable to both the community and DelDOT engineers. The agreed-upon option was a single-lane, all timber covered bridge, 16 feet wide, accommodating standard highway loads and clearances.

Project Outcome/Lessons Learned

The project involved reconstructing the Wooddale Covered Bridge to its historic dimensions with limited modifications, ensuring longevity and protection from future storm events. These modifications included:

- A raised roadway profile to allow floodwater to pass beneath the bridge
- A larger portal opening to accommodate emergency and garbage trucks
- Timber protection against vandalism and decay



- Roadway alignment improvements to allow for safer passage.
- Construction of a retaining wall along Rolling Mill Road to stabilize the eroding roadside
- Roadway alignment improvements to ensure road safety.

A successful public involvement process resulted in a design that satisfied all stakeholders. Not only are DelDOT engineers proud of their work, but they have also gained the respect of the local community.

4.4 CVS Pharmacy: Brandywine Valley National Scenic Byway

Location

Route 52 (Delaware Avenue) on the Brandywine Valley National Scenic Byway in the City of Wilmington.

Project Objective

Design the proposed building and site to enhance the street view, and allow for convenient multi-modal connections.

Context

Route 52 at this location is a seven-lane road at the edge of the downtown and is a gateway into the City as well as a transition to the more rural sections of the byway. This location is dominated by commercial land use. The building was located with the entrance toward Route 52.

CSS/CSD Objectives

Enhance the aesthetic qualities along the byway by minimizing visual impact of the proposed CVS Pharmacy and encouraging its design to complement the historic and scenic qualities of the area.

CSS/CSD Application

The building was located close to the street with the entrance toward Route 52. The orientation of the building provides a street edge more typical of the urban orientation of the City. Parking is located to the side of the building. Sidewalks, street tree planting, and lighting are amenities that support the byway goals at this location.

The access drive between the street and building could have been eliminated to further improve the

Stakeholders:

Brandywine Valley Scenic Byway Advisory Committee

Delaware Greenways, Inc.

Size: 1.6 acres

Timeline: 2009



pedestrian access and establish a place-making element on the street. Brick was used for the building to reinforce the historic elements of the byway.

Project Outcome/Lessons Learned

The massing, materials, and arrangement of windows of the RT 52 CVS Pharmacy building was designed to respond to nearby historic apartment buildings. Although the building interior is a typical one-story retail space, the massing appears to travelers as two conventional stories. One building access is a corner entrance adjacent to Delaware Avenue, simplifying pedestrian access. Mature trees along Delaware Avenue were retained and protected during construction. These design decisions helped relate this new building to the surrounding context and byway.

The design of the overall site, however, is a less successful fit in the urban context. Unlike nearly all of the adjacent buildings, the CVS Pharmacy is located in the middle of the block surrounded by parking and access drives. This siting is aesthetically inconsistent with surrounding land uses and poses challenges for pedestrians accessing the store from well-used adjacent sidewalks. The building's inclusion of a drive-through pharmacy window is also inconsistent with the downtown location.

To achieve greater context sensitivity, the building would have been better located directly behind the sidewalk, maintaining a consistent building edge with commercial buildings to the east, across Jackson Street. Additionally, the drive-through should have been eliminated and parking requirements reduced. These changes would have provided a stronger relationship between the development and the byway's intrinsic qualities, and allowed greater development potential.

Perhaps the most important lesson learned is the necessary collaboration between developers, byway stakeholders, and regulatory agencies. Integrating development with byway characteristics should be encouraged along all of Delaware's byways. All future development should be accomplished in a manner that meets the developer's economic needs and complements the byway's intrinsic qualities. Careful attention should be given early in the process to site design and building form.



4.5 Additional Bridge Case Studies

Bridge 9 on Smiths Bridge Road: Brandywine Valley National Scenic Byway

Context

Smiths Bridge was a single-span timber bridge with stone abutments built in 1839 and recorded by the Historic American Building Survey in a Works Project Administration project in 1936. Portions of the bridge were updated in 1950 and 1962 after a fire, but it remained a single-lane structure. The surrounding community felt strongly about the historic quality, traffic calming capabilities, environmental responsibility, and general aesthetic of the bridge.

CSS/CSD Objectives

This one-lane, covered bridge required a rare exception from AASHTO design guidelines. Designers limited the realignment to improve sight distances and used original as-built drawings from 1956 to develop the new design.

Extensive public involvement and workshops produced a design option acceptable to both the community and DelDOT engineers. The working group agreed upon a single-lane covered bridge 15feet wide.

Stakeholders:

- 15-member working group
- Adjacent property owners

Size: 1-lane, 3-span steel beam covered bridge

Cost: \$1.2 million

Timeline: 1998-2003



Ashland Bridge: Red Clay Valley Scenic Byway

Context

Ashland Bridge (State Bridge #118) was known as “thunder bridge” due to the noise made when crossing the wooden planks. It is located on a narrow rural road and is a contributing intrinsic quality of the Red Clay Valley Scenic Byway. Any change to this historic structure required sensitivity in preserving the historic context of the bridge and the natural resources nearby.

CSS/CSD Objectives

Design a new bridge that reflected the historic design, materials, and techniques of the original bridge and protect the natural vegetation of the adjacent landscape.

CSS/CSD Application

DelDOT worked with the Delaware Nature Society and others to sensitively design a bridge replacement that preserved its historic features. Effort was made to minimize any disturbance to the environmental setting and landscape. A landscape plan guided new plantings to enhance the areas where vegetation was affected by the construction.

Through a collaborative dialogue with byway stakeholders and DelDOT, a number of design changes were made to accommodate the goal of preserving the bridge and its site context. DelDOT worked to assure the community that the CMP goals were not compromised by this project.

Stakeholders:

- Delaware Nature Society
- Local Residents

Size: Covered Bridge & Surrounding Landscape

Cost: \$ 435,000 USD

Timeline: Oct 2004 – Jun 2008



V. OUT-OF-STATE CASE STUDIES

5.1 Skyline Trail – Middlefield Road, Peru, Massachusetts

Location

Skyline Trail is a 18.52 mile “Rural Minor Collector” running southeasterly through the towns of Hinsdale, Peru, Middlefield, Chester, and Huntington, Massachusetts. This particular 5-mile study area includes a portion of Skyline Trail within the Town of Peru, beginning southeast of Bennett Brook, to the Middlefield/ Peru town Line.

Project Objective

The project focuses on improved safety and drivability for all persons traveling along the Skyline Trail while preserving the corridor’s rural characteristics – vegetation, winding curves, and scenic beauty.

Context

Skyline Trail, also known as Middlefield Road, is mostly forested and abuts the Peru and Middlefield State Forest and the Peru Wildlife Management Area. Along the corridor are several old growth trees, some over 40 inches in diameter.

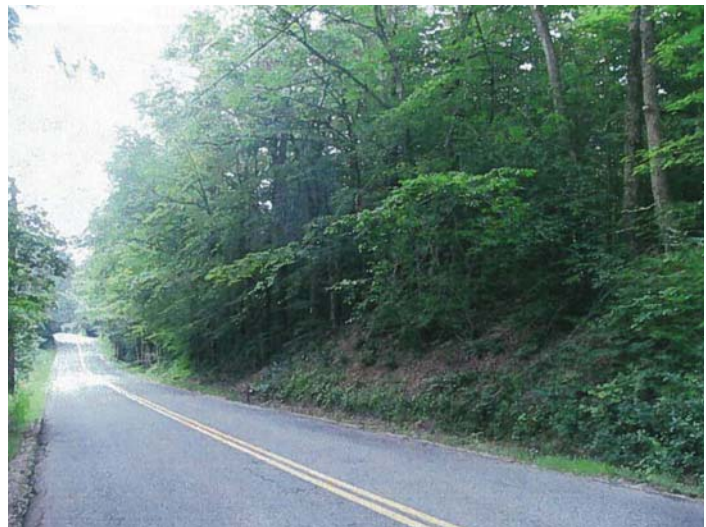
The primary roadway users are local residents in addition to school buses and trucks. The two-lane road through Peru varies from 21 feet to 24.5 feet wide with no distinguishable shoulders and inconsistent lane demarcation. Prevalent along the corridor are numerous drainage deficiencies creating safety hazards as well as intersections with insufficient sight distances.

Stakeholders: Peru Town Residents

Timeline: Study initiated in 2009

Size: 5 miles

Cost: \$5.4 million



CSS/CSD Objectives

Primary design objectives include preserving the rural character and aesthetics of Skyline Trail, and minimizing widening to maintain mature trees along the corridor through the application of design exceptions for shoulder widening.

CSS/CSD Application

The design intent is to create a safe, uniform corridor, maintaining driver comfort and familiarity. In order to find a preferred solution, it was important to understand current design standards that require substantial alterations to the roadway. These include multiple large retaining walls, the removal of over 380 trees, and altering the rural, natural appearance of the corridor.

Additionally, residents of Peru expressed a strong desire to maintain Skyline Trail's current character during public meetings. The design team, recognizing the wishes of residents, proposed a context-sensitive design limiting widening of the travel lanes and shoulders, requiring a design exception from MassHighway's 2006 Project Development and Design Guide. In this proposal, the amount of excavation and maximum height of retaining-walls were reduced.

The proposed improvements include:

- **Design Speed:** The proposed design speed of 40 MPH, maintained the existing posted speed as well as provided conformance to the 2006 Project Development and Design Guide.
- **Lane and Shoulder Width:** The existing road will be widened approximately 3 ft., creating two uniform 11 ft. paved travel lanes along with two 1.32 ft. paved shoulders. There will be 2.46 ft. of dense-graded crushed stone along the paved shoulders.
- **Drainage:** Replace and repair existing deteriorated cross drains, propose new swales to correct drainage deficiencies, and add drainage



structures to rectify water problems while retaining existing drainage patterns and outlets.

- Guardrail: Replace existing guardrail and add guardrail at locations that currently do not meet design standards.
- Tree Removal: Limit widening and shoulder extensions to preserve over 300 existing trees



Project Outcome/Lessons Learned

This design project proposes multiple functional and safety improvements to Skyline Trail in order to maintain the critical rural character identified by residents. Proposed improvements include:

- Increased pavement width. Although this is true, it is less than current standards and is a minimal width to retain existing character.
- Additional pavement markings to delineate the two lanes and shoulders.
- Improved drainage and sight distance

Increased pavement width in conjunction with proposed pavement markings will provide pedestrians and cyclists with a defined shoulder.

Improvements to drainage and side ditches will not only facilitate water and snow removal but improve sight distance throughout the corridor.

The proposed improvements to the Peru section of Skyline Trail will provide a safe roadway while preserving the rural characteristics and beauty present today. Through public collaboration, the project's context-sensitive approach balances project needs and environmental sensitivity. Users, including cyclists, will benefit from the consistent and uniform road section while embracing the opportunity to enjoy the natural features of the Peru corridor. Notice to Proceed for this project was granted in November of 2010 and construction is slated to finish summer of 2012.

5.2 Route 215 Road Improvement, Ozark, National Forest, Arkansas

Location

A 15-mile length of Route 215 beginning at the junction with Route 23 near Cass, Arkansas, to Ozark in the Ozark National Forest (also designated as U.S. Forest Highway 65). The route is north of I-40 in Franklin and Johnson Counties.

Project Objective

Improve the existing gravel road to accommodate anticipated traffic, enhance scenic roadway features, and improve the area's water quality.

Context

The existing route was not adequate for current or anticipated traffic. Travel lanes were too narrow, the surface was rough, and an unnecessary amount of dust and silt was produced, detracting from the visitor's experience and impacting the water quality of the area. Route 215 provides access to the Mulberry River Valley and adjacent campgrounds, hiking trails, and popular outdoor activities such as canoeing and hunting. The reconstructed roadway was designed to reduce dust and silt, thereby enhancing the personal experience and improving the water quality of the area.

CSS/CSD Objectives

Key project concerns included respecting the roadway's location within a national forest and its proximity to the Mulberry river. It was also vital to preserve and enhance scenic quality as well as improve water quality. The proposed design followed the terrain and disturbed as little alignment as possible while using natural materials to the largest extent possible. The new roadway provided improved access for forest activities and improved views from the roadway while protecting

Stakeholders:

- National Park Service
- U.S. Forest Service
- Arkansas State Highway and Transportation Department
- Arkansas Natural Heritage Commission
- Arkansas Department of Environmental Quality

Timeline: 1994-2003

Size: 15 miles

Cost: Approximately 17 million



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the viewshed from the river below.

CSS/CSD Application

Erosion and sediment control were carefully applied during and after construction to protect the sensitive environment. The viewshed from Mulberry River and the vistas overlooking the river were maintained and enhanced by creating as little disturbance as possible to the alignment.

Improvement measures include:

- Replanting of cut and fill slopes with native vegetation
- Location of borrow and waste areas so as to not be visible or impact the river
- Use of native stone to the largest extent possible for retaining walls, gabion walls, riprap, and ditch lining

Because of the potential instability of the mountain, cuts were kept to a minimum. An additional requirement was to maintain existing stone retaining walls at culverts, and at a rock culvert with large stone slabs that had been covered and extended. The roadway alignment closely tracked the existing land contours to minimize both cuts and fills.

- Design Speed: A 20 mph design speed was used to minimize changes to the existing alignment and 40 mph used elsewhere, when possible.
- Right-of-Way: There were no recorded existing right-of-way limits. The roadway project was mandated to be on the existing alignment with minimal changes to the existing landscape.
- Clear Zones: Various combinations of the following were used; barrier walls, curb and gutter, and guardrail
- Number of Lanes: Two lanes with discontinuous 2' paved shoulders
- Lane Width: 10' paved travel lanes



Project Outcome/Lessons Learned

The preliminary design for the first segment underwent significant revision as designers began to appreciate the full extent of the project's requirements. To preserve and protect the natural environment and create a built roadway that was aesthetically pleasing, the design speed, roadway geometry and natural materials were considered together. Simple built features were made possible by using geotechnical design methods and special materials that are not visible to the user.

Design speeds were selected to accommodate as much as possible of the existing gravel road alignment, and retaining structures were used

adjacent to cut and fill in lieu of slope flattening. Native stone was used extensively for veneer on crash walls, gabion retaining walls, rip-rap and ditch lining. Controlling erosion and sediment, during and after construction, was addressed in an environmentally sound solution. Ultimately the design maintained the visual quality of the Mulberry River viewshed and minimized runoff to the River, while providing scenic overlooks of the forest and river for the traveler and river user.

5.3 Route 50, Loudoun & Fauquier County, Virginia

Location

This project follows Route 50 from US 17 near Paris to SR 600 in Lenah, Virginia. Beginning in the village of Paris, the corridor runs through the three towns of Middleburg, Aldie, and Upperville.

Project Objective

The purpose of the project was to employ traffic calming measures addressing aggressive driving, speeding, and safety along the corridor. Efforts to promote local businesses, scenic beauty, and the historic nature of the area were also of prime concern.

Context

Route 50 is a rural highway, serving as a through-route and main street for farm vehicles, tourists, local businesses and residents in several small towns. The area's economy is dependent upon both tourism and agriculture.

Key roadway issues include excessive speed of motor vehicle traffic, aggressive driving along the corridor, poor and unsafe conditions for pedestrians and cyclists, damage to historic buildings, and disruptive noise due to high vehicle speeds.

CSS/CSD Objectives

Preserve and enhance views from the roadway that provide residents and travelers a connection to the vast farmlands and preserved environmental and historic areas along the Route 50 corridor. Minimally develop the roadway in a manner that improves safety and accommodates multiple uses and users and avoids adverse impacts on both historic and natural resources, while preserving the natural topography of the land.

Stakeholders:

- Virginia Department of Transportation
- Local communities and residents

Timeline: 1994-2004 (start construction)

Size: 24 miles



CSS/CSD Application

A goal of preserving and maintaining the scenic, historic, and economic setting was raised by members of adjacent communities and incorporated into a vision statement to include “scenic, unique, rural community in an historic, agricultural, quiet, and natural setting.”

Traffic calming elements were selected to address safety problems. Because right-of-way acquisition was limited, stabilized turf shoulders were utilized throughout the project. Other noteworthy design elements include:

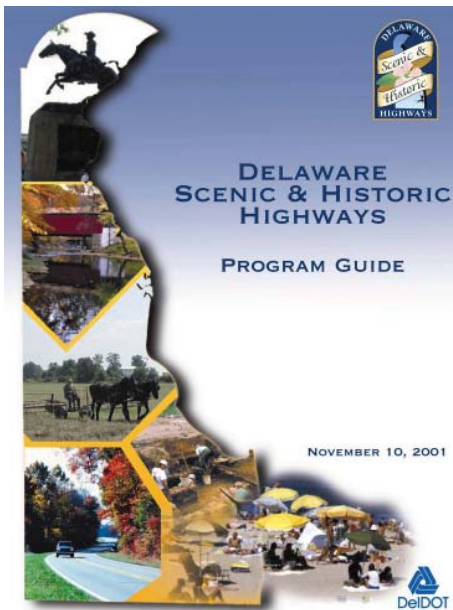
- Roundabouts at high accident intersections in place of signalization
- Rural splitter islands announcing intersection locations and allowing space for turning cars
- Overall integration of landscape materials throughout the concept development phase and final design
- Design exceptions for lane widths, (travel lanes changed to 10ft wide). Additional sidewalks to accommodate residential and tourist foot traffic.

Project Outcome/Lessons Learned

Public input played a critical role in this project, from the selection of the consulting team, to participation in public meetings, to involvement in the community Task Force; their insight actively guided the Project Team’s work. The Project Team was extremely responsive and creative through collaborative thinking, an important element of context sensitive design. The project’s CSS approach was illustrated through the willingness



of engineers to design beyond a “template” mentality. Instead, the design team was particularly sensitive to project needs and examined a variety of design elements in the context of existing resources. The traffic calming experts, traffic engineers, landscape architects, planners, and architectural historians collaborated on design goals and principles – most of which related to transforming a rural highway to a village street – and then adapted the agreed-upon principles to the unique conditions of each town.



APPENDIX A: DELAWARE BYWAYS

A.1 The Delaware Byway Program

The Delaware Byways Program is a collaborative effort of Delaware's citizens, and local, state and federal governments. During the 2000 legislative session, the General Assembly passed Senate Bill 320 authorizing the Delaware Department of Transportation to develop and manage the Delaware Byways Program. Its purpose is to provide recognition to Delaware roads possessing certain intrinsic qualities that create a special visual experience to people traveling the road. The Secretary of Transportation designates Delaware Byways.

The Program is administered under the guidance of the Delaware Byways Advisory Board that includes representatives of other state agencies, historic preservation and environmental advocacy groups, county government, and the real estate industry. The Program has broad public participation and support.

A Delaware Byway is a corridor that offers an alternative travel route, telling a story of Delaware's heritage, recreational activities, and scenic beauty. It is managed in order to protect its special intrinsic qualities: scenic, historic, natural, cultural, and recreational or archaeological. It is also managed to encourage appreciation and development of tourism and recreational resources.

Designation of a route as a Delaware Byway allows the Byway Sponsor to be eligible for Federal Highway Administration (FHWA) grant funds to assist with the completion of a Corridor Management Plan. These grant applications are submitted through DelDOT to FHWA. Designation also allows sponsors to seek funding from other sources.

New off-premise outdoor advertising signs are not permitted along Delaware Byways. Designation as a Delaware Byway affects the permitting of new off-site/off-premises signs (outdoor advertising signs that are placed on one property, but advertise goods or services available on another property) on any road controlled by the Highway Beautification Act of 1965. This rule does not affect existing outdoor advertising signs.

A.2 Nomination and Designation Process

Designating a road corridor as a Delaware Byway is a two-step process including the Nomination Application and Corridor Management Plan:

Step 1: Nomination Application

The successful completion, review, evaluation, and approval of a Nomination Application result in the designation of a road corridor by Delaware's Secretary of Transportation as a Delaware Byway. The application can be submitted by anyone interested in seeking a Byway designation. The application is reviewed by DeIDOT and the Delaware Byways Advisory Board, focusing on an evaluation of the identified intrinsic qualities and the input from a public involvement process carried out as part of the Nomination Application preparation.

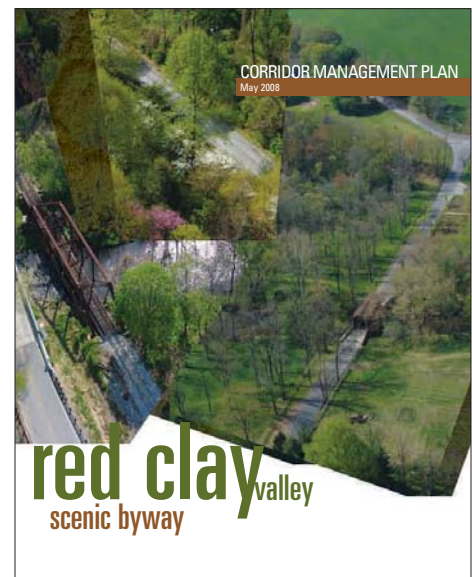
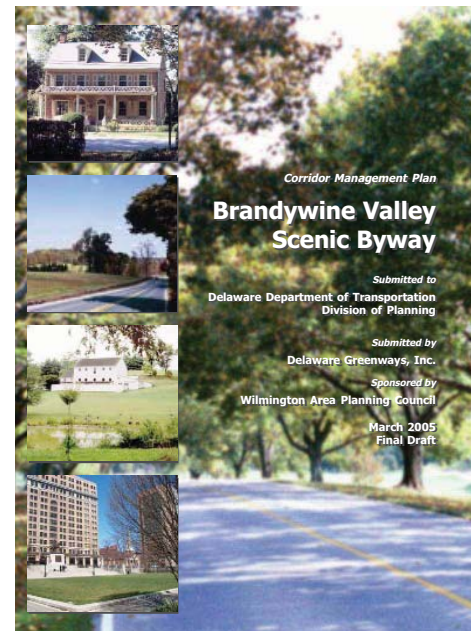
Step 2 – Corridor Management Plan Application

The successful completion, review, and approval of a Corridor Management Plan (CMP) Application by Delaware's Secretary of Transportation results in the installation of specially designed Delaware Byway signs, identification of the Byway on state maps, and promotion through the Delaware Tourism Office.

A CMP is a written document in which the sponsor describes the goals, strategies, and responsibilities for conserving and enhancing a road corridor and its valuable qualities. It is developed collaboratively with those who have an interest in the corridor and surrounding area. It includes a Vision for what the Byway may become over time and an Action Plan that covers the implementation of the CMP.

A.3 Role of Sponsor

Any interested party can nominate a road corridor including individuals, local government, other state agencies, non-profit organizations or a Corridor Advocacy Group formed of citizens and/or representatives from organizations and government agencies. The party submitting a Nomination Application is the Byway Sponsor and is responsible for the successful completion of a Nomination Application and Corridor Management Plan. It is also responsible for the ongoing implementation of the CMP, although the structure of the sponsor may change over time in order to successfully provide the management oversight of the designated Delaware Byway.



A.4 Role of Delaware Department of Transportation

DelDOT's Byway Coordinator provides guidance and assistance to Byway Sponsors and reviews the Nomination Application. The Nomination Application is also reviewed by representatives from the State Historic Preservation Office, Department of Natural Resources and Environmental Control, Delaware Tourism Office, and the Department of Agriculture. This evaluation Committee jointly makes a recommendation to DelDOT's Director of Planning.

If the Evaluation Committee's review recommends that the nomination is not complete or should not be approved, DelDOT's Director of Planning will return the Nomination Application to the Sponsor with a letter that specifies reasons for the disapproval and includes recommendations for how the application could be resubmitted, if appropriate. If the Evaluation Committee's joint recommendation to the Director of Planning is favorable, the Director of Planning reviews the application and submits it with the Evaluation Committee's recommendation with his or her recommendation to the Delaware Byways Advisory Board for review. If the Advisory Board recommends approval, the application is submitted to the Secretary of Transportation for review and a final decision of designation.

DelDOT is also responsible for ongoing coordination with Byway Sponsors and Administration of the State Program. An important element of this ongoing coordination is the administration of funding through the National Scenic Byways Program. DelDOT's coordinator provides information on the activities eligible for Federal Highway Administration (FHWA) Grants, reviews grant applications, forwards them to FHWA for approval, and manages successful grant recipients.

Delaware Designated Scenic Byways (2011)

- Brandywine Valley National Scenic Byway
- Route 9 Coastal Heritage Byway
- Lewes Byway
- Red Clay Valley Scenic Byway
- Harriet Tubman Underground Railroad Byway
- Western Sussex Byway

A.5 Key Documents

Byway Nomination Application

All Delaware Byways are required to produce a Corridor Management Plan; however it can take multiple years to produce this all-encompassing document. During this period, and to supplement information found in the CMP, it is important to reference the Nomination Application of the byway in which work is proposed. The following information about the byway can be found in the Nomination Application:

- A physical description of the route;
- Representative photographs of the byway corridor;
- A map(s) indicating the boundaries of the route that locates the intrinsic qualities along the corridor, and indicating land uses in the corridor
- An intrinsic quality resource inventory
- A written statement that summarizes and evaluates the significance of the primary intrinsic quality for which the byway merits designation and that also describes the significance of any secondary intrinsic qualities present along the route
- A written description of what a traveler will see when traversing the corridor, and
- A description of public involvement conducted to date and the comments and input that have resulted from this process.

Corridor Management Plan (CMP)

A Corridor Management Plan is a written document prepared by the Byway Sponsor identifying the vision, goals, and responsibilities for conserving and enhancing the corridor's most valuable qualities. It describes how these efforts will benefit economic development through tourism and recreational opportunities. The CMP presents a balanced strategy preserving the Byway's intrinsic qualities while providing the visitor an opportunity to experience them. It also explains how byway stakeholders and participants are involved in, and responsible for, implementing the CMP.

The Byway Sponsor is responsible for preparing or contracting a consultant to produce a CMP. It is the Sponsor's responsibility to raise funds needed to complete the Corridor Management Plan, which

may be partially funded through the FHWA National Scenic Byway Discretionary Grant Program.

A Corridor Management Plan must include the following:

- A Vision and Goals Statement with objectives for achieving the goals.
- Documentation of public involvement efforts to illustrate the support of the byway designation has received from the public
- Stewardship of the intrinsic qualities through resource preservation, enhancing existing conditions, and accommodating new development in a complementary manner
- Tourism Development including an explanation of the byway's tourism potential and how the visitor's experience will be enhanced
- A Marketing and Promotion Strategy that includes a sign plan supportive of the visitor experience
- Interpretation of the byway's intrinsic qualities that includes recommended locations for distributing information, and
- Ongoing support and Implementation of the Corridor Plan including its connection to local government comprehensive plans.

Additional Sources

An inventory of Delaware Byways, their key documents, supplemental information, and contact information can be found on the Delaware Byway page of the Delaware Department of Transportation's website: www.byways.deldot.gov.

A.6 Delaware Byways

A brief outline of each Delaware byway is provided in the following section. They include only those byways officially adopted as of June, 2011. As the Delaware Byway Program is an ongoing effort to promote and preserve Delaware roadways, it is the responsibility of the design team to identify those byways adopted after this printing in which a project may be located.

Brandywine Valley National Scenic Byway

Boundary

The Brandywine Valley Scenic Byway is approximately 12.25 miles of the Kennett Pike and Montchanin Road. The byway includes the RT. 52 and 100 roadways from the City of Wilmington to the Delaware-Pennsylvania State Line.

Profile

The Brandywine Valley Scenic Byway is two historic roads, divided into three major sections: City of Wilmington, Kennett Pike, and Montchanin Road. Within these three major sections are fifteen smaller, character-defining segments or “visual rooms”. Defined by their distinct attributes, the segments range from urban Wilmington to the rural countryside of Montchanin Road. The byway includes four distinct commercial areas, multiple residential neighborhoods, and several rural villages.

The roadways of the Brandywine Valley Scenic Byway are considered to be some of the most beautiful and historically significant in the state of Delaware. Encompassing three centuries of American industrial history, these historic roads hold an important place in the area’s industrial past. This byway clearly depicts “the relationships between transportation, road building, regional economy, and culture.” A byway traveler today can experience these unique communities and historic elements of the Brandywine Valley. The byway is a unique resource relaying the Brandywine story of America’s transformation from an agrarian to an industrial society with expanding opportunities, increasing diversity, and the many conflicting issues associated with growth and change. History and horticulture, artwork and antiques, rolling hills and open meadows are beautifully intertwined along the Brandywine Valley Scenic Byway, creating an unforgettable travel experience.



Year of designation: June 25, 2002

Primary Intrinsic Quality

- Historic

Secondary Intrinsic Quality

- Cultural

Contact

Mark Chura
Delaware Greenways
100 W 10th St
PO Box 2095
P: 302.655.7275
F: 302.655.7274



Rodney Square, named after Caesar Rodney, in the center of Wilmington as a civic center.



This 933-acre Brandywine Creek State Park is divided by grey stone walls built of local stone in the late 1800's.



Delaware History Museum. Wilmington, DE

Red Clay Valley Scenic Byway

Boundary

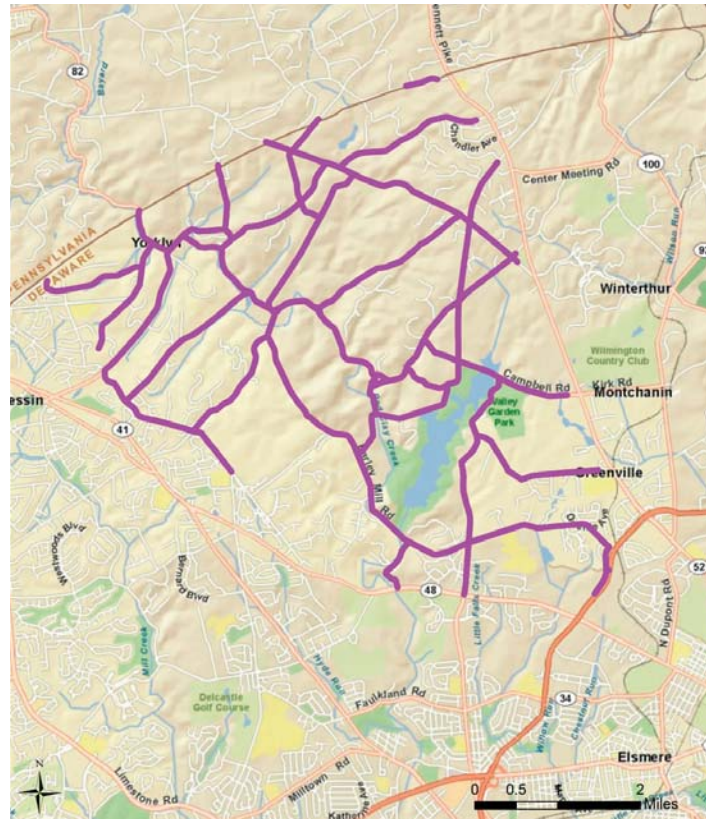
The Red Clay Valley Scenic Byway, approximately 27 miles in length, includes twenty-eight secondary roads in northern New Castle County and is closely linked to the Red Clay Creek and its watershed area.

Profile

The roads of the Red Clay Valley comprise a complex network that conforms to the contours of the land and the Red Clay Creek. While each road has unto itself a corridor boundary, the watershed boundary of the Red Clay Valley has intrinsic value that is an integral component of each road's character.

The roads of the Red Clay Valley date from early European settlements in the beginning of the eighteenth century. Three hundred years of human influence on the land have created a network of roads, mill dams and bridges, homes and barns, rolling meadow, and fence rows. Remarkably, however, such influences often spared the natural resources that contribute immensely to the character of the Valley. All provide a pastoral tranquility. Not urban, nor suburban, the Red Clay Valley provides a unique natural beauty that is unsurpassed in Delaware. Today, the roads of the Valley are exceptionally scenic and help tell the history of the Valley in the context of human interaction with nature. In this context the use of the land, both historically and in the present, speaks to the stewardship that has impacted those who live and work in the Valley.

Travelers who take the time to absorb the history and natural beauty of Delaware's Red Clay Valley are impressed by what it offers. The remnants of a nineteenth century grist, snuff, and paper milling industry can be seen at Yorklyn, historically known



Year of designation: April 05, 2005

Primary Intrinsic Quality

- Scenic

Secondary Intrinsic Quality

- Natural

Contact

Ginger North
Delaware Nature Society
PO Box 700
Hockessin DE 19707
302.239.2334

as Auburn or Auburn Mills. Steam train enthusiasts ride on the Historic Red Clay, Inc (Wilmington and Western) railway from Greenbank to Hockessin. The mature forest and steep slopes of the Red Clay Ravine Natural Area are partially visible from Route 82 and accessible to Delaware Nature Society program participants. Roads originally traveled by horse and buggy, following the topography of the land, inextricably link these scenic vistas.



Mt. Cuba Center is a horticultural institution on almost 600 acres. It is dedicated to the study, conservation, and appreciation of plants native to the Appalachian Piedmont Region.



Historic Wilmington & Western Railroad



Auburn Heights Preserve features a furnished 1897 Victorian country estate surrounded by 200+ acres of preserved open space.

Route 9 Coastal Heritage Byway

Boundary

The 52-mile, Route 9 Coastal Heritage Scenic Byway begins at the County Courthouse in the city of New Castle, traveling south on Route 9 to the John Dickinson Plantation, at the intersection of Routes 9 and 113.

Profile

Paralleling the Delaware River and Bay, Route 9 Coastal Heritage Scenic Byway covers fifty miles of unique Delaware landscape. This two-lane route travels past industrial sites, hardwood forests, tidal and non-tidal marshlands, areas of significant natural resources and wildlife habitat, historic towns and quaint villages, and working farms.

Located within the Atlantic Flyway, this area attracts hundreds of thousands of migrating shorebirds each spring, feeding and resting in the marshes and refuges while gaining strength before continuing to their northern breeding grounds. Protective legislature has helped preserve the bay-shore which has one of the world's largest concentrations of spawning crabs and is one of two critical East Coast stops for migrating shorebirds. Fall brings thousands of waterfowl migrating south for the winter, to the area.

Route 9 Scenic Byway offers a glimpse of a past with healthy ecosystems, rich biodiversity, and pioneering spirit. The Delaware Bay and Estuary is a state treasure providing a reason to slow down and appreciate the state's pastoral scenery.



Year of designation: March 05, 2007

Primary Intrinsic Quality

- Natural

Secondary Intrinsic Quality

- Historic

Contact

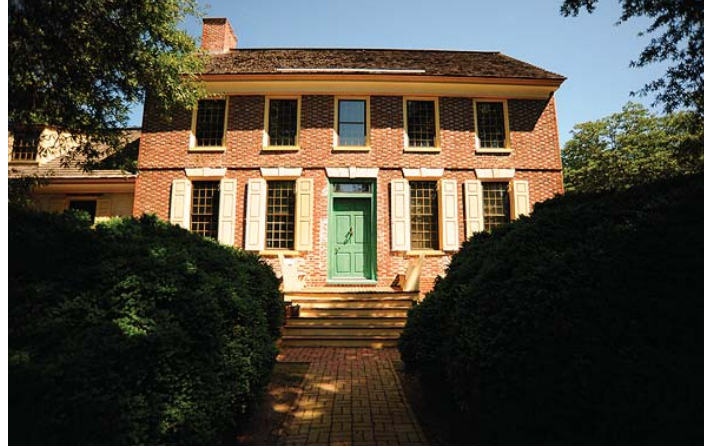
Mark Chura

Delaware Greenways
100 W 10th St
PO Box 2095
Wilmington, DE 19801
P: 302.655.7275
F: 302.655.7274

Cindy Small
Kent County Convention & Visitors Bureau
435 N DuPont Highway
Dover, DE 19901
302.734.1736



Fleming's Landing marks the boundary between Delaware's New Castle County and Kent County. This quaint fishing village and landing is an integral part of Delaware's vibrant seafood industry.



John Dickinson Plantation - This restored colonial plantation at the very end of the byway was the home of John Dickinson, a farmer and signer of the United States Constitution.



Woodland Beach Wildlife Area - Once a thriving resort town with a boardwalk, concession stands, and a dance hall, Woodland beach is now an area with much ecological importance.



Historic City of New Castle - Founded in 1651 as an outpost for the then Dutch colony.

Lewes Byway

Boundary

Approximately 12.5 miles in total, three roads of the Lewes Byway run north-south and three run east-west. These ‘gateway’ roads include, Kings Highway, Savannah Road, New Road, Pilottown Road, Gills Neck Road, and Cape Henlopen Drive.

Profile

The Lewes Scenic and Historic Byway is divided between two gateway types that embrace the local history and regional beauty of “The First Town in the First State.” “Gateways from the Land” are east-west corridors providing access from the state’s interior to marine docks, granting shipping access for farm goods such as grains and livestock. They are also historic coastal routes inland for sea harvests such as fish, crabs, and mussels. Routes parallel to the coast are considered “Gateways from the Sea,” by providing north-south connections between shore towns and docks. These north-south routes highlight the beauty of the coastline while embracing the Lewes-Rehoboth Canal, popular beaches, and natural salt marshes. The byway recapitulates the 378-year cultural history of land and sea, from “native settlements and early European towns, to agricultural and maritime industries, to present day resorts and recreational facilities.”



Year of designation: June 6, 2009

Primary Intrinsic Quality

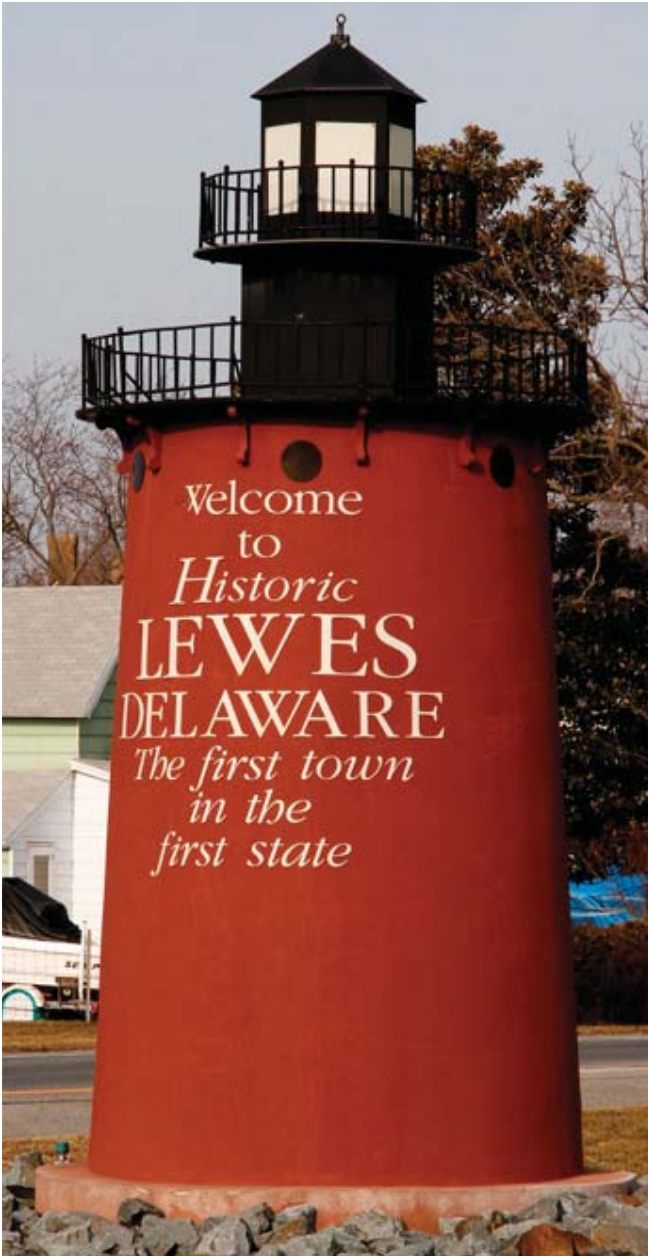
- Historic

Secondary Intrinsic Quality

- Natural
- Recreational
- Scenic
- Archaeological

Contact

Mark Chura
 Delaware Greenways
 100 W 10th St
 PO Box 2095
 Wilmington, DE 19801
 P: 302.655.7275
 F: 302.655.7274



Lighthouse on Kings Highway, Lewes, DE



The Kings Highway Historic District features many homes that date back to the 17th Century.



Scenic views of Canary Creek can be found on New Road. Canary Creek and the Great Marsh account for over 2,000 acres of preserved salt marshes and a gateway to the nationally recognized Prime Hook Wildlife Refuge.

Harriet Tubman Underground Railroad Byway

Boundary

This is a 105 mile byway of interconnected historic sites beginning at the Maryland Harriet Tubman Underground Railroad Byway and ending at Willow Grove Road, Kent County. It detours in Wilmington and then follows Kennett Pike to the Delaware Pennsylvania State Line.

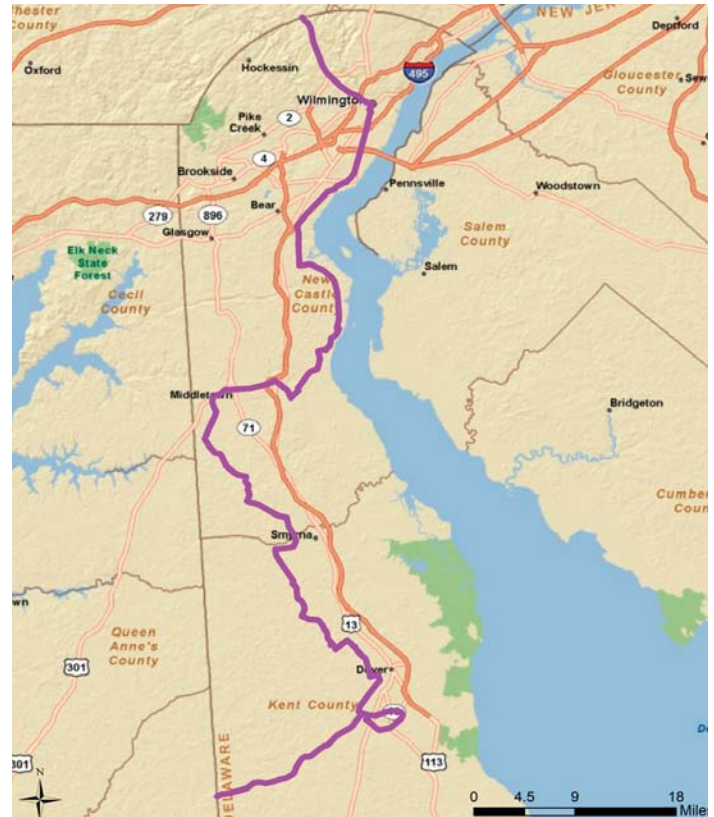
Profile

The Harriet Tubman Underground Railroad Byway is divided into five segments, each illustrating an important step in the journey to freedom. The byway creates a general north-south travel route guiding visitors to locations where history happened.

Harriet Tubman is among the most recognized conductors of the Underground Railroad, struggling against remarkable obstacles to achieve freedom for herself, her family, and numerous others. Her legendary efforts have inspired Americans of all races and backgrounds for generations. Working with the famed, white, abolitionist Quaker, Thomas Garrett, Tubman guided freedom-seekers from Maryland north to Delaware. The Delaware Underground Network was well organized with the cities of Camden and Wilmington playing pivotal roles. Together, Tubman and Garrett purportedly helped more than 2,700 freedom seekers travel through the state.

The Underground Railroad was a network of hiding places connected by secret routes including trails, roads, streams, and rivers. The byway's five segments include:

Segment 1: The Gauntlet: Sandtown to Camden. It was the most dangerous part of the journey due to local pro-slavery sentiment and roving slave hunters.



Year of designation: June 6, 2009

Primary Intrinsic Quality

- Historic

Secondary Intrinsic Quality

- Scenic
- Cultural

Contact

Debbie Martin
Underground Railroad Coalition of Delaware
P: 302-576-3107

Segment 2: Making Choices: Dover to Odessa. Continue north by land, to Wilmington or travel east, seven miles to the Delaware River, find a boat to New Jersey.

Segment 3: The Bold Move: Odessa to Wilmington. A straight shot to Wilmington along the King’s Highway or a journey over to the coast, and possibly find passage north in Port Penn, Delaware City, or New Castle.

Segment 4: Gateway to Freedom: Wilmington. Called “The Gateway to Freedom,” it was here that the famous Thomas Garrett arranged travel to Pennsylvania.

Segment 5: On to Pennsylvania: The final segment follows SR 52/Kennett Pike to the Pennsylvania border.



This area is reflective of the 19th century agricultural landscape. Although much of the landscape along the Byway has been altered since the antebellum era, many areas along the route continue to evoke the experience of the fugitive slave.



Camden Friends Meeting House, built in 1804, is important as the regional hub of Quaker worship and because it served local Quakers who were active in the Underground Railroad.



The forest environment of Blackbird State Forest was part of the freedom seeker’s experience.



The Village of Centreville emphasizes the village road context. It possessed a strong story involving a large group of slaves from Dorchester County, Maryland, conducted by William Brinkley.

Western Sussex Byway

Boundary

Western Sussex Byway, approximately 35 miles in length, begins at RT. 20 following several roads in western Sussex County, and ending at SR 24, Trap Pond State Park.

Profile

Although the landscape of western Sussex County may seem to be a quiet, subdued, rural area with small towns, it encompasses many of Delaware's historic treasures and important natural features. Visually, the route alternates between farmland, wooded areas, and small towns, providing varying views and a diversity of landscape types.

The quaint towns and important sites along the route relate to the region's historic past. Seaford, Bethel, and Laurel, situated along major water routes, made were important centers for trade and shipbuilding from the Colonial period through the nineteenth century. Bethel and Seaford, especially, were known for their shipbuilding trade. After the introduction of the railroad in 1856, Seaford and Laurel, both stops along the line, gained access to large northern markets for agricultural and maritime products, such as oysters, fruit, and baskets. Due to their past industrial prosperity, these three towns provide many examples of vernacular architecture. The homes built by wealthy residents are perfect examples of the evolution of industry and culture in rural Delaware.

The route also includes reminders of a darker chapter in Delaware's history: its status as a slave state through the Civil War. The route contains echoes of both the evils of the slave institution and the struggle for freedom. The byway passes the only known residence for enslaved people still standing in Delaware and connects to the history of notorious kidnapper Patty Cannon. The area was



Year of designation: December, 2009

Primary Intrinsic Quality

- Historic

Secondary Intrinsic Quality

- Scenic

Contact

Dan Parsons
Historic Preservation Planner
Sussex County Government
P: 302-856-6138

a known stop for many African-American freedom seekers escaping enslavement elsewhere on the Delmarva Peninsula.

The primary intrinsic quality of Western Sussex Byway is historic. The route passes through a landscape illustrating many aspects of the area's agricultural and transportation history. Scenic, Natural, Cultural, and Recreational are intrinsic qualities that play supportive roles creating a unique experience through this byway.



Cannon Hall, built in 1820, is the most prominent building on Woodland Village part of the byway.



The Woodland Ferry was first opened in the 1760s. The ferry crossing provides some of the most striking scenic views of the segment, with its broad vistas of the Nanticoke River.



Broad Creek



Downtown Seaford. A number of commercial buildings in Seaford are on the National Register of Historic Places.

APPENDIX B: MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING
 between
 The **DELAWARE DEPARTMENT OF TRANSPORTATION**
 and
 The **RED CLAY VALLEY SCENIC BYWAY STEERING COMMITTEE**
 through the **DELAWARE NATURE SOCIETY**
 for
 The **IMPLEMENTATION OF THE RED CLAY VALLEY SCENIC BYWAY**
CORRIDOR MANAGEMENT PLAN

This Memorandum of Agreement (MOU) is hereby made and entered into by and between the Delaware Department of Transportation (DelDOT) and the Delaware Nature Society (DNS), the coordinating agency for the Red Clay Valley Scenic Byway (BYWAY).

A. BACKGROUND:

On March 31, 2005, through the initiative of DNS, DelDOT designated a network of 28 roads within the Red Clay Valley area as State Scenic and Historic Highways. The designation was made through DelDOT's Scenic and Historic Highway (SSHH) Program which aims to identify, promote, preserve and enhance roadways in Delaware with outstanding visual quality. On May 21, 2008, DelDOT approved the required Corridor Management Plan that was developed by the Red Clay Valley Steering Committee under the leadership of DNS. A copy of the Plan is attached as an integral part of this MOU.

B. PURPOSE:

The purpose of this MOU is to develop and expand a framework of cooperation between DELDOT and DNS to implement the CMP and particularly to strive to:

- develop and implement a process for communicating and coordinating transportation projects within the BYWAY; and
- pursue mutually beneficial programs, projects and activities that will preserve, promote and enhance the character-defining features of the BYWAY without compromising safety.

C. STATEMENT OF MUTUAL BENEFITS AND INTERESTS:

The mutual benefit for both parties is to provide a public service to protect the intrinsic qualities of the BYWAY to fulfill the mission of the SSHH Program to "showcase the natural beauty and unique features of the state and foster the preservation of natural, cultural and historic resources" (Delaware State Scenic and Historic Highways Program Vision) and "protect and/or enhance State Scenic and Historic Highways and their resources through a coordinated management program while ensuring safe operation of these routes" (Program Goal 2).

D. IN ACCORDANCE WITH THIS MOU, DELDOT and DNS shall:

1. Work closely together to identify opportunities for transportation improvements, context sensitive design solutions, education and assistance, etc. and jointly pursue such projects as appropriate to manage the resources and roadways of the BYWAY.
2. Develop an early notification process to inform the BYWAY Steering Committee/Management Entity of major capital road improvements, and construction activities within the BYWAY, including the scheduling thereof, opportunities for public input, etc.
3. Disseminate information and coordinate projects along the BYWAY through the Byway Steering Committee/Management Entity.
4. Strive to involve the BYWAY Steering Committee/Management Entity technical expertise in developing transportation programs and solutions that are sensitive to BYWAY resources.
5. Create procedural guidelines for engineers, designers and planners who work on projects that impact the BYWAY.
6. Coordinate the creation of the context sensitive design guidelines for Delaware Byways so that the context sensitive design materials compiled for and germane to the BYWAY are appropriately referenced.
7. Work with groups such as the Delaware Greenways, the Delaware Bicycle Council and other local bicycle and trails organizations as appropriate to coordinate safety and public access issues within the BYWAY. It is understood that the BYWAY does not anticipate expanded tourism or recreation, does not encourage bicycle usage on roads other than those designated by DELDOT as having average or above average cycling conditions, and recognizes that pedestrian access will remain limited to public institutions given the predominance of private land.
8. Consider improving signage within the BYWAY (consolidate, remove or add), with the understanding that the same will be in accordance to existing standards and subject to the availability of funds.
9. Strive to promote the BYWAY at public workshops intended for transportation projects within the area.
10. Assess the viability of delisting Route 82 as a state highway.
11. Review this agreement regularly and modify as necessary to further implement the Plan.


F. IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

1. MODIFICATION. Modifications within the scope of the instrument shall be made by mutual consent of the parties, by the issuance of a written modification, signed and dated by all parties, prior to any changes being performed.

2. PARTICIPATION IN SIMILAR ACTIVITIES. This instrument in no way restricts either party from participating in similar activities with other public or private agencies, organizations, and individuals.
3. TERMINATION. Either party may terminate, in writing, the instrument in whole, or in part, at any time before the date of expiration.
4. NON-FUND OBLIGATING DOCUMENT. This instrument is neither a fiscal nor a funds obligation document. Any endeavor or transfer of anything of value involving reimbursement or contribution of funds between the parties to this instrument will be handled in accordance with applicable laws, regulations, and procedures including those for State procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. This instrument does not provide such authority. Specifically, this instrument does not establish authority for a noncompetitive award to the cooperators of any contract or other agreement. Any contract or agreement for services must fully comply with all applicable requirements for competition.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the last written date below and agree to actively abide by its terms.

APPROVED AS TO FORM FOR DELDOT:

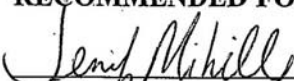


Frederick Schranck
Deputy Attorney General

10/3/08

Date

RECOMMENDED FOR APPROVAL FOR DNS:



Jennifer Mihills
Associate Director
Natural Resources Conservation

10/8/08

Date

APPROVAL FOR DNS:

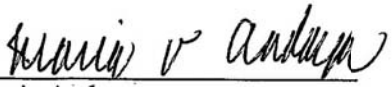


Mike Riska, Executive Director

1/5/09

Date

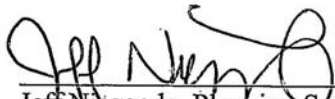
RECOMMENDED FOR APPROVAL FOR DELDOT:



Maria Andaya
State Coordinator, Delaware Byways Program

10/3/08

Date



Jeff Niezgoda, Planning Supervisor
State & Regional Planning

10-3-08

Date



Ralph Reeb, Director
Division of Planning

11/3/08

Date

APPROVAL FOR DELDOT:



Carolann Wicks, Secretary

11/5/08

Date

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