

03

Planning and Design Concepts

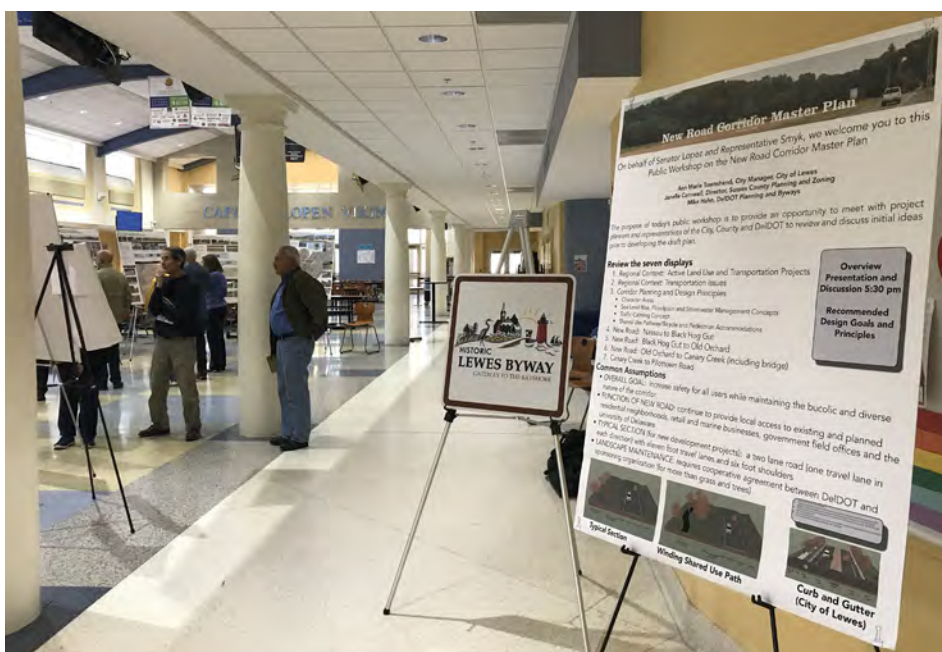
CORRIDOR DESIGN GOALS

The original 2015 Historic Lewes Byway CMP called for maintaining the rural character and character-defining features of the New Road corridor. However, due to changes in land use and transportation throughout the corridor, emphasis of the Corridor Master Plan has shifted towards working cooperatively with developers, land use authorities and DelDOT to achieve context sensitive design solutions that retain some of the character-defining features, while accepting that additional change is likely to happen. Preservation of the remaining farms and riparian forests continues to be a strong priority for the Historic Lewes Byway Committee and as evidenced by many comments during the public meetings for this project.

Similar to the nearby Kings Highway Corridor Master Plan, the Master Plan can be implemented through a combination of development review and guidance, developer contributions, capital improvement program projects, grant funding, HOA coordination, and volunteer support from the Historic Lewes Byway Committee.

The following Corridor Design Goals help to organize the project's implementation into five distinct emphasis areas:

1. **Character Areas:** Define and manage each of the distinct character zones throughout the corridor (see page 22)
2. **Conservation and Development:** Retain a diverse array of open spaces using setbacks, floodplain management, community open space and greenway corridors (see page 24)
3. **Transportation:** Use context sensitive design to accommodate changing travel demands throughout the corridor (see page 26)
4. **Bicycling and Walking:** Expand bicycle and pedestrian trail network along the entire length of New Road and connecting to the Georgetown to Lewes Rail-Trail (see page 33)
5. **Corridor Landscape Concepts:** Establish a coordinated landscape treatment along frontage areas by working with willing developers and private property owners on a voluntary basis (see page 36)



Goal:

Define and manage each of the distinct character zones throughout the corridor



Figure 17 New Road Gateway



Figure 18 Black Hog Gut to Old Orchard



Figure 19 Old Orchard to Canary Creek



Figure 20 Canary Creek to Pilottown Road

CHARACTER AREAS

The first goal and one that underlies all of the planning and design concept recommendations in this master plan is based upon the often-quoted notion that “one size does not fit all.” When considering recommendations for preserving, maintaining and enhancing the character-defining features of the New Road Byway corridor, different treatments will be needed for four distinct character areas with the following character-defining features.

- **New Road Gateway:** Best reflected in the views that frame New Road, the gateway includes the adjoining Knapp family farm (Nassau Orchards) to the west, and the former barn, grain storage and refrigeration building to the east. In addition, trees along Black Hog Gut form an important backdrop to foreground farm and farm structure views.

Changes under consideration that could potentially affect the character-defining features of this area include

- SR1/Minos Conaway Grade Separated Intersection (roundabouts)
- Black Hog Village (Duke property)

During DelDOT’s next public outreach effort for the SR 1 Minos Conaway Grade Separated Intersection Project (anticipated for summer/fall 2019), there will be opportunity to minimize encroachment on the adjoining Knapp Family farm and the commercially used former farm and rail buildings at the Nassau and New Road intersection. While recognizing a need for safety and



Figure 21 Map of Character Areas

mobility, complete avoidance may not be achievable. This analysis has yet to be completed.

- **Black Hog Gut to Old Orchard:** Crossing Black Hog Gut through the heavily vegetated riparian corridor, New Road opens to a view of farm fields with hedgerows to the west. On the east is an open grassy median area associated with Sand Dunes Village and a large man-made pond for stormwater management.

Changes under consideration include:

- SR1/Minos Conaway Grade Separated Intersection
- DelDOT's FY 20-25 CTP (New Road To Old Orchard added)
- Vehicular turning movements added at Old Orchard intersection from the realignment of Old Orchard & Wescoats Corner and from development of Orchard Plaza and Tranquility at Breakwater

Opportunities include:

- Expand pedestrian and bicycle facilities as part of Old Orchard intersection
- Potential to enhance appearance of adjacent residential and corridor sections
- Address drainage or flooding
- Connect developing properties with the Georgetown to Lewes Rail-Trail

- **Old Orchard to Canary Creek:** Crossing the unnamed Black Hog Gut tributary, New Road passes through the former Black Hog Farmstead on the EB side, and the views open up to the fields of the Groome Church (Tower Hill) property on the WB side (now the site of the approved Tower Hill Development, Figure 13 on page 13) leading to three small subdivisions at on the south bank of Canary Creek. The subdivision Tradewinds Estates is setback from the EB side of New Road and primarily screened with hedges and other residential landscaping. Individual large-lot residences, a manufactured home subdivision and two pre-existing commercial lots continue on the EB side leading to the Brittingham Farm (now called the Lewes Waterfront Preserve).

Changes under consideration include:

- Development and vehicular changes for Groome Church (Tower Hill) and Brittingham properties
- Elevation/resiliency of Canary Creek Bridge and approaches

Opportunities include:

- Accommodate shared-use trail with links to larger network
- Address stormwater management and poor drainage
- Preserve healthy roadside and riparian trees as deemed appropriate
- Address future floodplain management needs
- Preserve archeological resources
- Preserve scenic views such as Canary Creek
- Address local access and safety issues with a roundabout at Lynn Road coordinated with development project

- **Canary Creek to Pilottown Road:** Crossing Canary Creek, some of the best views in the Lewes area are found from the Canary Creek bridge. Reserves at Pilottown is the primary neighborhood on the EB side, separated by a ditch line and fences and hedges on the east. On the WB side are deeper setbacks associated with residential lots (not part of an HOA), a church and the Ice House, a local feature associated with

Goal:

Retain a diverse array of open spaces using setbacks, floodplain management and community open space.

Lewes' marine heritage. The right-of-way narrows east of 4th street and houses are closer to the street.

Changes under consideration include:

- Reconstruction of Canary Creek Bridge to address flooding
- Anticipated sea level rise on flood-prone areas

Opportunities include:

- Reconstruction of New Road Bridge over Canary Creek can also provide recreational access (fishing, crabbing, kayaking) and accommodate share use pathway
- Redesign intersection with Park Road to better direct vehicles with boat trailer traffic away from New Road/Pilottown Road intersection and towards public boat ramp
- Address poor drainage, flooding and emergency needs
- Add pedestrian and bicycle facilities where feasible

CONSERVATION

Three overall planning concepts are recommended:

1. Preserve and restore riparian areas, wetlands and floodplains
2. Preserve remaining farms
3. Preserve and restore hedgerows
4. Retain the tree canopy

Preserve and Restore Riparian Corridors

The Historic Lewes Byway CMP (2015) recommended that the Byway's conservation

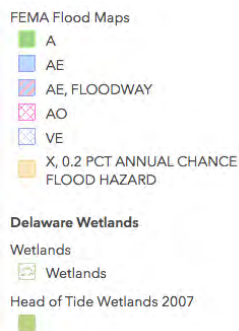


Figure 22 Map of Riparian Corridors associated with streams, floodplains, and wetlands

goals be linked with land use, infrastructure and emergency services planning including sea level rise. The Byway's open spaces play a crucial role in providing infrastructure services by reducing infrastructure demand and contributing ecosystem services (especially for flood mitigation) to the overall quality of life.

Given that New Road serves as a local evacuation route for the northern end of Lewes (although not officially designated), the major activity areas (University of Delaware, DNREC facility, existing marine commercial uses and existing residential neighborhoods) are potentially isolated by Canary Creek and its tributaries. As sea levels rise flooding increases because surface water has no where else to go, more space is needed to reduce the flood risks and damage. The current 100-year floodplain serves this purpose today. However, the current 500 year floodplain is anticipated to become the future 100-year floodplain (Figure 16 on page 17).

Recommendation: Preserve wetlands and floodplains (both current and anticipated future 100-year flooding due to SLR) as open space through voluntary acquisition in fee simple, use of conservation easements, and/or development regulations.

Preserve Remaining Farms

The Historic Lewes Byway CMP identified areas that contribute to the experience of traveling along the Byway that are most vulnerable to change, including adjacent farms, pastures, and woodlands, such as the open farm fields along New Road, as a conservation priority. Currently, there are no farms or forest lands enrolled in the Delaware Agricultural Land Preservation Foundation (DALPF) along New Road.

Delaware's farmland preservation program has two major components – Agricultural Preservation Districts and Agricultural Conservation Easements. Preservation Districts are voluntary agreements where landowners agree to continue to only use their land only for agriculture for at least ten years. Agricultural easements are purchases of development rights from willing property owners on a voluntary basis by the Delaware Agriculture Land Preservation Foundation (DALPF), placing a permanent agricultural conservation easement on the property. Landowners must enroll their farm into a Preservation District before they can sell an easement.

Recommendation: During the time of this Master Plan effort, the owners of the Knapp Family Farm (Nassau Orchards) have indicated that they wish to continue its agricultural use. It is currently cultivated as a flower farm, but owners have stated that they plan to restore the Orchard business. The 1937 aerial photograph above, overlain with the current parcel map, shows the longevity of this farm—extensively planted with orchards and other crops since the farm's origins that date back to the

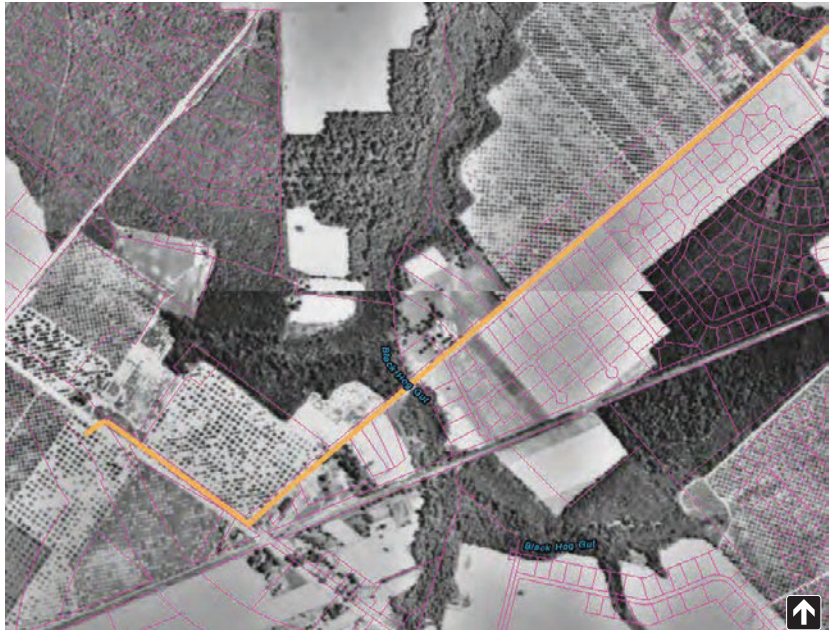


Figure 23 1937 aerial imagery of the Knapp Family farm and vicinity showing extent of orchards that exemplify the agricultural heritage of the corridor. The orchard lands continue to be retained in agricultural use.



Figure 24 Riparian vegetation along Black Hog Gut

Goal

Use context sensitive approaches to accommodate changing travel demands throughout the corridor.

1800s. To every extent possible, all New Road related transportation projects should be designed to best avoid or further minimize encroachment impacts to this important byway farm and community resource. Retention of Black Hog Farmstead for small scale or community agriculture is also recommended, but the property was put up for sale in late 2018. It is not known whether the new owners will continue its use as a Bed and Breakfast and small farmstead.

Preserve and Restore Hedgerows

Many of the remaining hedgerows along New Road are deteriorating and have been taken over by invasive species or removed for development projects. Hedgerows play an important part in providing connectivity for wildlife and pollinators and absorb some water runoff.

Recommendation: Inventory the types of species, their health, and remove the invasive species as deemed necessary. Replant with new appropriate vegetation to achieve desired hedgerow function and appearance. For road & travel safety, plant selection for hedgerows along the roadway should avoid trees and shrubs that are attractive to deer. Restoration or replanting should be included as part of any development and /or transportation project throughout the corridor. (See Chapter 4 for examples of how the concept can be applied).

TRANSPORTATION

New Road is a major collector that serves the needs of travelers that live in adjoining neighborhoods, work at the University of Delaware, Beebe Hospital or other nearby businesses, or enjoy access to public lands and shorelines. The route must address both the mobility of those trying to reach a destination from Coastal Highway and local access for those that must use New Road for daily travel needs.

New Road is located within both the City of Lewes and in Sussex County with four adjoining Traffic Analysis Zones (TAZ), serving a population estimated to be 4,105 (2015)⁴. Population within the four TAZs is projected to be 7,302 by 2050.

⁴ Population, Household and Employment projections by Traffic Analysis Zone (TAZ) for all three counties in Delaware. Data Source: https://firstmap.delaware.gov/arcgis/rest/services/Transportation/DE_TAZ/MapServer/0

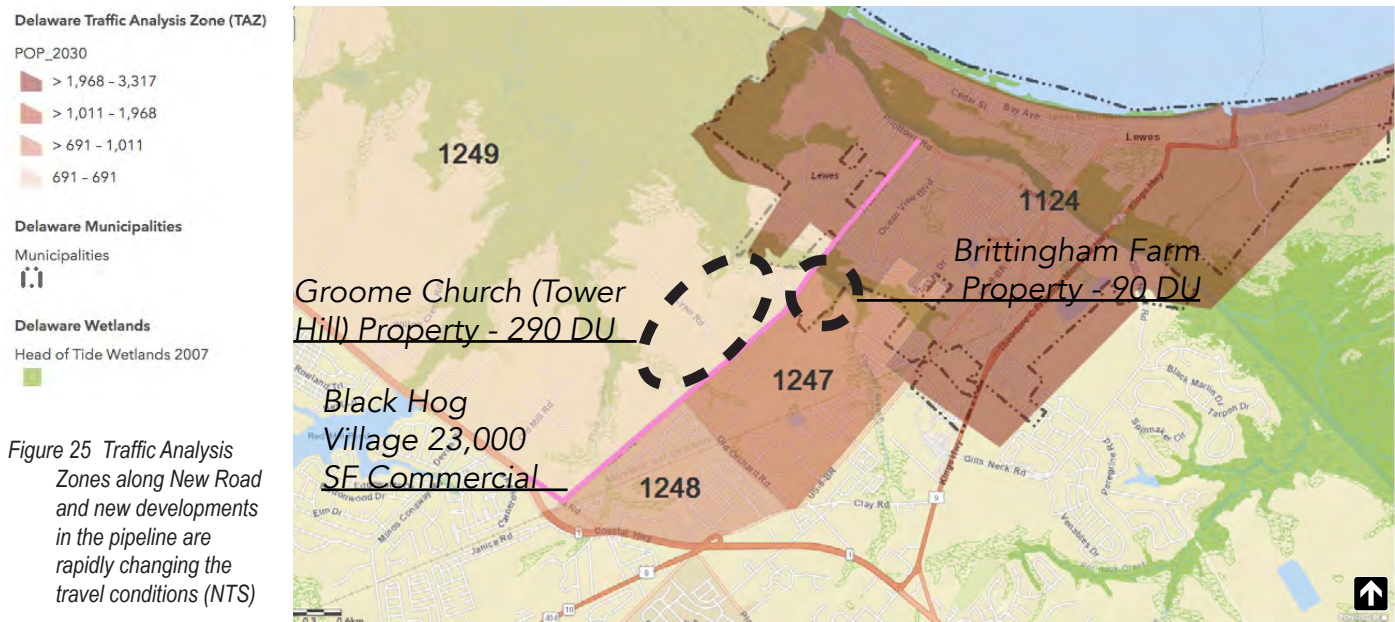


Figure 25 Traffic Analysis Zones along New Road and new developments in the pipeline are rapidly changing the travel conditions (NTS)

New Road can no longer be treated as a rural area from a transportation perspective. Free flowing traffic at 40 mph operating speeds can no longer be sustained. The urbanized area surrounding Lewes along New Road will be extending out to Old Orchard Road. A traffic study is being prepared by DelDOT at the request of the City of Lewes to comprehensively evaluate the changing travel patterns that arise out of projected land use changes and transportation projects.

New Road stakeholders identified higher operating speeds as one of their biggest concerns with regard to the safety of travel along the route, along with limited bicycle and pedestrian facilities. Traffic calming concepts are needed to allow vehicular traffic to slow from the higher operating speeds of the Coastal Highway and transition to the slower operating speeds associated with a rapidly urbanizing travel corridor—one of three entrances to the City of Lewes and an integral part of state designated Historic Lewes Byway.

Traffic Calming Concepts

Traffic calming measures are needed to more closely match the physical design of the road with the desired operating speeds. As New Road becomes more urban, travel patterns will shift away from current levels of relatively high mobility towards meeting future needs for more local access from neighborhood streets. Driver expectations of a high speed through route from Coastal Highway to the Pilottown Road destinations, or as a way to avoid congestion on Coastal Highway, Savannah Road or Kings Highway, need to be managed to avoid the wide range of operating speeds found on New Road today. Residents noted that it is impossible to travel on New Road at the posted speed. Additional speed studies are recommended to confirm the observations recorded in the field.

Three primary traffic calming concepts are recommended to help change driver expectations:

- **Establish New Speed Zones** - initiate required speed studies and DelDOT engineering evaluations to determine appropriate speed zones, addressing actual changes in rural to urban land use patterns (approved development projects), the recent City of Lewes annexation of the Brittingham Farm and the overall community goals for speed management and safety on New Road. The Master Plan recommends considering changes to posted speed limits from 40 mph to 35 mph (between Coastal Highway and Lynn Road) and to 25 mph from Lynn Road to the existing City Limits where the existing speed limit changes to 25 (just east of Canary Creek). After the recent annexation, the new City Limit is at approximately Schaffer Lane, a

Historic Lewes Byway Corridor Management Plan Transportation Recommendations

The Historic Lewes Byway CMP outlined specific strategies to address traffic issues. The following have been adapted to New Road specifically and are advancing towards implementation. These include (with status noted):

1. Manage Development Traffic
 - Improved Coordination among the City, County and Developers
 - Establish a Traffic Improvement District UNDER DISCUSSION
2. Develop a Traffic Management Plan
 - Dynamic Message Signing, Smart Phone App, WTCM Radio, Information Kiosks
 - Coordinate Special Events: Stagger Times/Days, Develop Parking and Routing Plans, Remote Parking
 - Manage Beach Parking: Variable Rates, Season Passes (underway)
 - Manage Visitation to Cape Henlopen State Park: Reservation System, E-Z pass, Express Lanes
3. Improve Transit and Establish a Jitney Service
 - A detailed feasibility study needs to evaluate the number of routes, frequency and time span of service and stop locations as well as whether the service should be provided by DART, partner with DRBA or a private Jitney
4. Reduce Vehicular Demand
 - Build the Trails! (underway)
5. Improve Wayfinding and Visitor Information Services
 - Visitor Center at Proposed Park and Ride at Five Points (underway)
 - Smart Phone App tying the Byway to traffic conditions and event information (DelDOT App serves some of this function)
 - On-street wayfinding system for autos and bikes (underway)
 - Use Traffic Calming to Manage Travel Speed



Figure 26 Transverse markings used to induce slower operating speeds (Source: FHWA)



Figure 27 Multiple studies have shown that radar activated speed limit signs with changeable message reflecting actual speed are effective means of slowing operating speeds of between 3-8 mph (Source: FHWA)

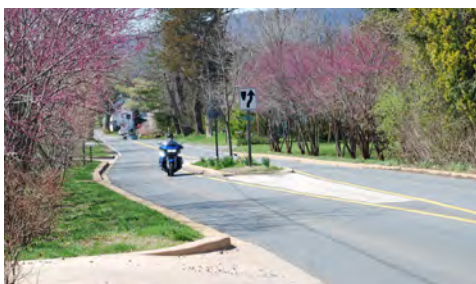


Figure 28 A splitter island combined with landscape roadside plantings effectively reduce operating speeds



Figure 29 Combined splitter island and gateway approaching Centreville, DE on the Brandywine Valley Scenic Byway slows traffic while increasing visual appeal, as noted in the visual preference survey.

distance of approximately 2000' to the intersection of Lynn Road, the access point for 292 planned and approved single family lots.

- **Reinforce desired operating speeds with roadway and roadside design** - Insert traffic calming measures suitable for use on a major collector at a distance apart of between 1200 and 1800 feet (every 25-35 seconds of travel time).
- Treat future **access management** needs consistently with the roadway's function as an urban major collector rather than a rural high speed roadway.

Reinforce Desired Operating Speeds

There are no magic solutions that can be applied to every byway community in the same way. Instead, applying a context sensitive design process and approach, as described in the Historic Lewes Byway CMP, to speed reduction and safety related projects along the Byway can help to increase the safety of the travel experience while at the same time maintaining character-defining features.

Traditional traffic calming solutions (sometimes referred to as "humps and bumps") to achieve speed reduction are typically not appropriate for major collector roads. Instead, a number of tools can be considered to change driver perception as they approach the desired slow down points. These include the following (noted here from a range of less aggressive to more aggressive measures):

- **Low cost transverse markings** painted along the edge line (with spacing that gets closer and closer together) in advance of the slow point warns drivers that they need to slow down (Figure 26);
- **Radar activated speed limit warning signs** work to slow drivers in advance of the desired slow point (Figure 27);
- **Textured pavement strips** (Figure 32 on page 30) placed in advance of the slow point at more closely spaced intervals to induce speed reduction (more permanent and visually appealing than the transverse markings noted above);
- **Horizontal alignment shift** using a splitter island in combination with narrowed travel lanes to break up excessively long sight lines and force drivers to slow down to navigate around the splitter island (Figure 28);
- **Roadside treatments increasing the visual friction** along roadside areas induce speed reduction through the use of landscape clusters, tinted shoulders, entry signs, or gateways (Figure 29); and
- **Roundabouts** are becoming the preferred approach for intersections when both roundabouts and a traffic signal are each warranted. A roundabout has to work from a capacity standpoint. They have the added benefit of requiring slower operating speeds and for eliminating vehicular acceleration to "beat the light".

- **A consistent surface treatment** for crosswalks, sidewalks, gore areas of medians, and turn lanes reinforce driver's perception that they are entering an area frequented by pedestrians and should slow down. Tinted and/or stamped concrete or thermoplastic patterns with a brick appearance, among other techniques, can be utilized to establish a consistent appearance throughout (Figure 29 on page 28 and Figure 34 on page 32).

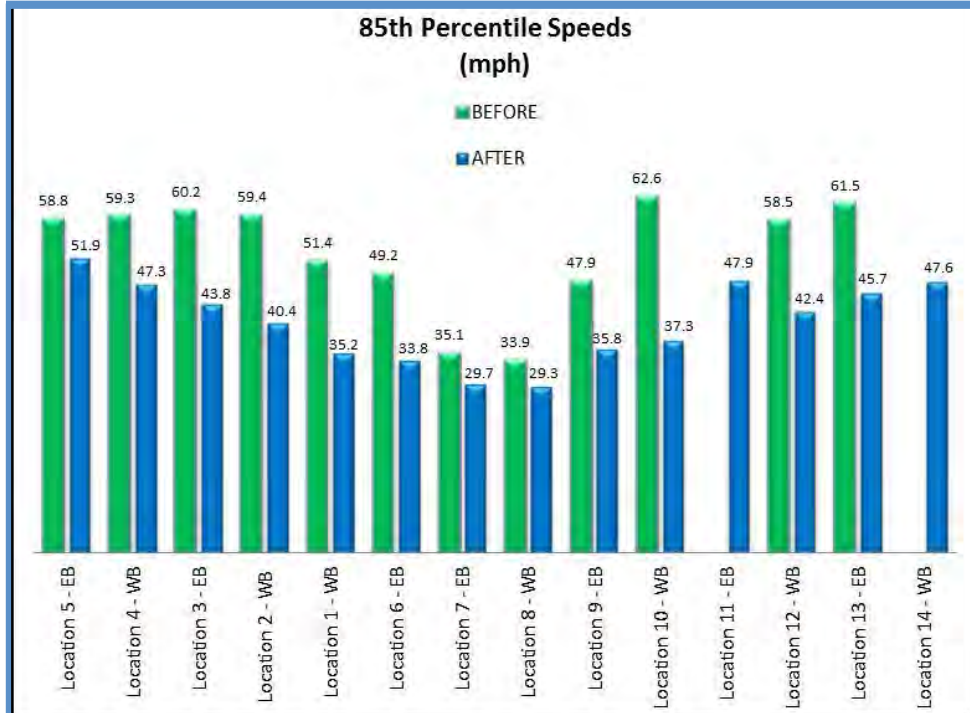


Figure 30 Route 50 Traffic Calming post occupancy research results of before and after speed studies of installed calming measures in Upperville, Virginia, 2007-2009. The graph depicts locations starting with the outskirts of town (west to east) where speed limits transition from 45 mph (locations 3-5 and 11-14) to 35 mph (1-2 and 9-10) to 25 mph (locations 7-8)

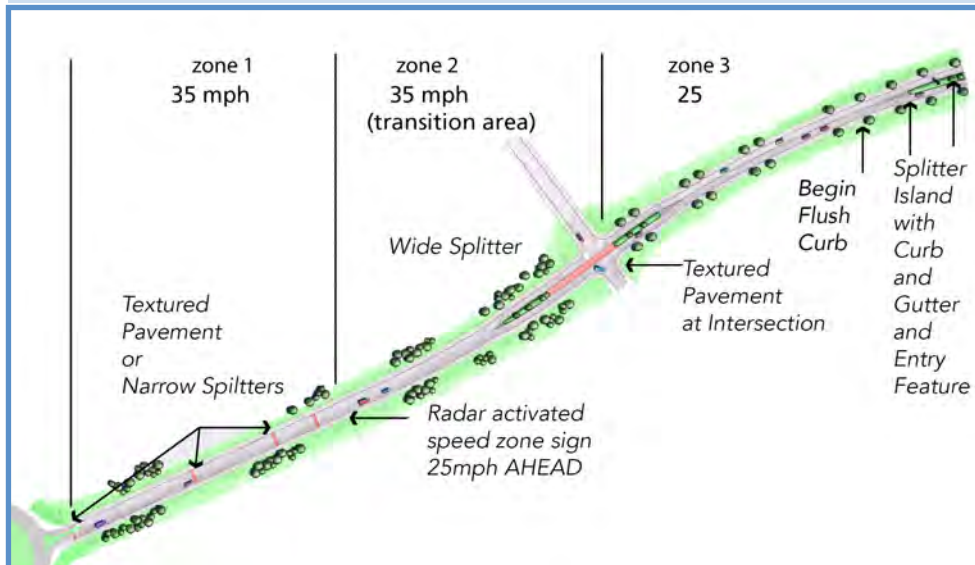


Figure 31 Diagram illustrating traffic calming as a coordinated system using measures at intervals appropriate to the desired speed of the road starting with initial cues (zone 1) as the driver transitions from the 35 mph to 25 mph speed zone (zone 2), and then establishing a clear point of entry for the 25 mph speed zone (zone 3) in advance of the developed town, neighborhood or village (adapted from Route 50 Traffic Calming Program Design Memorandum)

Route 50 Traffic Calming National Demonstration Project

A fifteen year national demonstration project for context sensitive traffic calming was conducted between 2001 and 2016 along US Route 50 in the towns of Upperville, Middleburg, and Aldie, Virginia 50 miles west of the District of Columbia.

Traffic calming measures were inserted at regular intervals approaching each of the three towns. The first project was built in Upperville and completed in 2008. Measures included flush curbs and textured warning strips outside of town, splitter islands reinforced by landscape approaching town, and narrower splitter islands with texture pavements at intersections within town.

Speed studies were conducted before and after construction to test the effects of the measures. Speed reductions between 12 and 25 mph were achieved at the outskirts and transition areas into town where the highest operating speeds were observed prior to the installation.

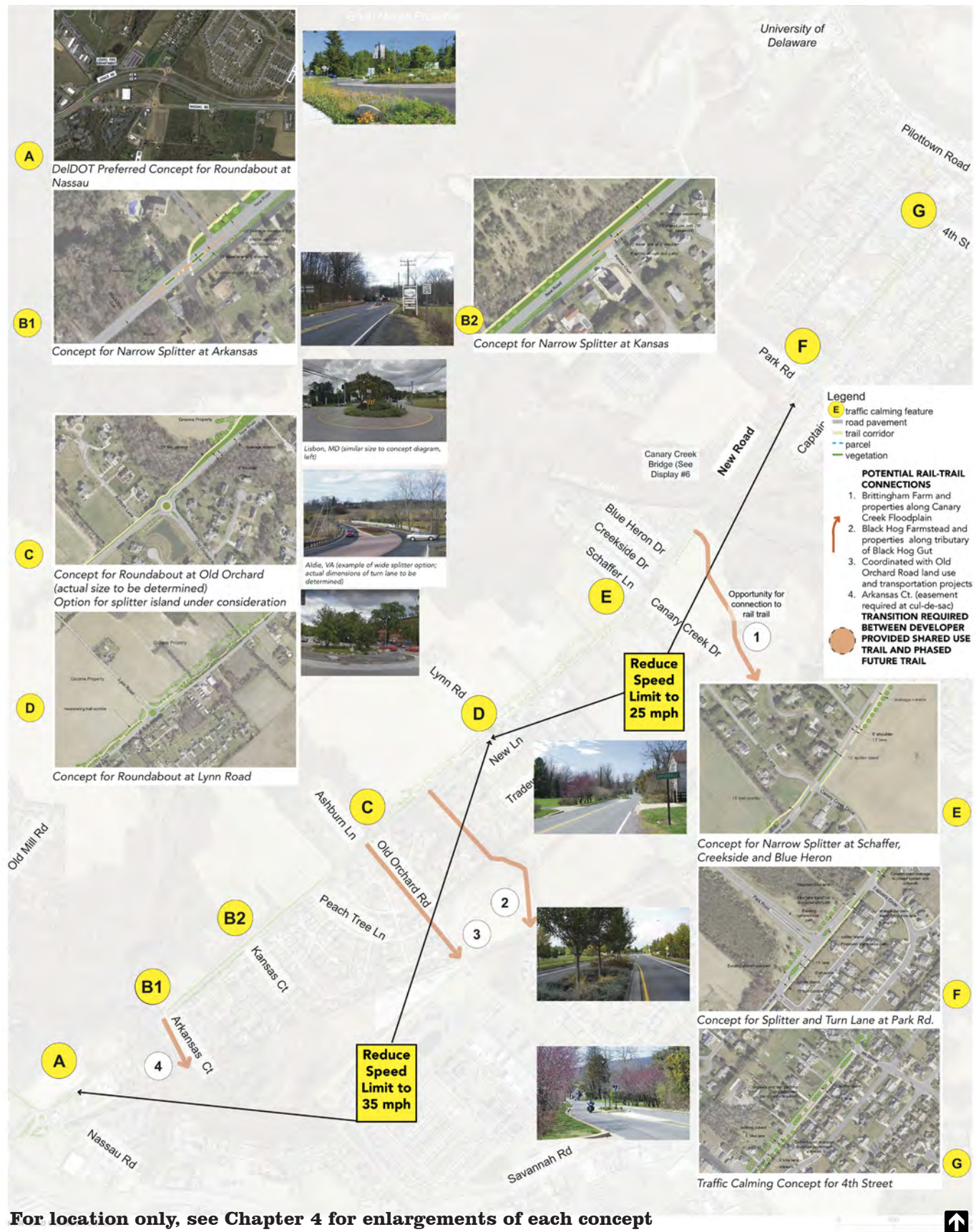


Figure 32 Overall Corridor Transportation Concepts for New Road

Traffic Calming Measures

Figure 31 on page 29 illustrates the general concept for using traffic calming measures to reinforce desired operating speeds through placement of traffic calming measures. For New Road, recommended traffic calming measures primarily include speed activated radar signs, edge treatment, narrow splitter islands, wide splitter islands and other horizontal alignment shifts, coupled with roundabouts. Locations for recommended measures are shown in Figure 32 on page 30:

- A. **Nassau** - landscaped roundabout constructed as part of the Minos Conaway Project (DelDOT Capital Improvement Project)
- B1. **Arkansas Court** - narrow, landscaped splitter island with trail crossing (future capital project)
- B2. **Kansas Court** - narrow landscaped splitter island coupled coordinated with Sand Dunes Village HOA in existing grass island (future Capital Project)
- C. **Old Orchard** - options under consideration include both a roundabout (if both a roundabout and traffic signal are warranted) or wide splitter island (future capital project and/or developer contributions)
- D. **Lynn Road** - landscaped roundabout plus roadside landscape plantings (developer has agreed to landscape)
- E. **Brittingham Farm** - multiple narrow splitter islands with flush median turn lane (sized as required for development access) and coordinated with existing private roads (Schaeffer, Creekside and Blue Heron), related landscape planting (developer funded)
- F. **Park Road** - a splitter island with left turn lane and alignment shift is needed to improve safety and slow traffic continuing eastward on New Road prior to entering more urban, city neighborhood (future capital project)
- G. **4th Street** - landscaped narrow splitter islands approaching 4th Street (future capital project)

Each of the recommended measures and context sensitive design approaches for those measures are discussed in more detail in Chapter 4.

Consistency in Materials

The recommended materials and details for the traffic calming measures should be consistent throughout to provide for better recognition of traffic calming measures. Textured or colored materials can be used that might include brick or various concrete pavers and other materials for outlining and accenting features. Materials will be selected that are ADA compliant and consistent with the Lewes area's character-defining features.

In-Between Areas

Landscape design and/or pavement markings should be used between traffic calming measures to establish a rhythm that gets closer together as the traveler approaches the slow point. Figure 34 illustrates methods for achieving this kind of visual friction to provide clues to drivers that they are entering a different driving condition and to increase driver perception of operating speed.

Access Management

Traffic calming measures are proposed for specific locations throughout the corridor to reinforce the desired operating speeds utilizing horizontal alignment shifts and



Figure 33 Brick and cobble details (top, Greenville, DE), shoulder treatment using euro-cobble (middle) or less expensive painted transverse road markings (bottom, FHWA) are all used to increase visual friction as drivers transition to an intersection or reduces speed limit

roadside landscape treatments. Most locations are tied to existing intersections. As more property is developed over time, requests will be made for access to the state controlled highway. Some access points may be between the traffic calming measures. For larger projects, the development review process provides an opportunity for DelDOT to coordinate access with the traffic calming system. The following corridor planning principles can be utilized to ensure that future access is well coordinated and reinforces the overall goals of the Master Plan:

- **Development Access Reviews:** The Master Plan must be considered at the PLUS review stage of the land development process, at the scoping meeting and all subsequent meetings regarding the traffic impact studies and under agreements

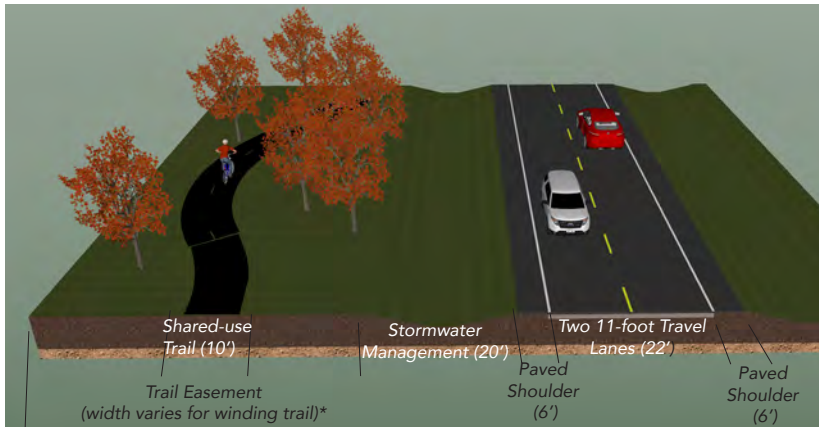


Figure 34 Typical section for segments of New Road where open drainage will remain (west of Canary Creek). Dimensions shown are for typical conditions but specific constraints such as wetlands, impact to adjoining properties, preservation of existing drainage or stormwater facilities, or other natural and cultural resource preservation may require narrower pavement widths, alternative drainage practices, or a narrower trail section. Meandering trail as shown requires cooperation with developer. Shallower curves are applicable where constraints limit trail corridor.

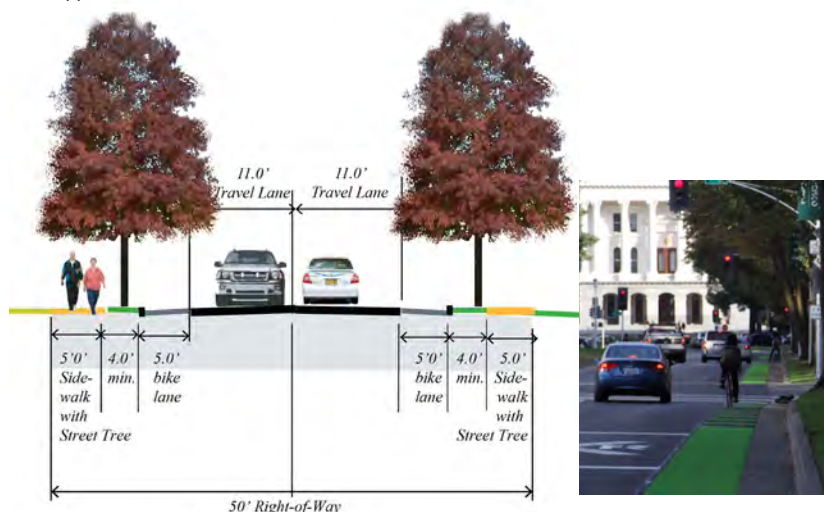


Figure 35 City of Lewes section applies to any newly constructed, closed drainage section (curb and gutter) only; section does not apply to existing open drainage. The recommended section reflects the availability of a 50' right-of-way. Where that R/W narrows to 40' east of 4th Street, and utilities or stormwater compete for available space, pedestrian facilities and street trees will need to be removed from one side of the street.



Figure 36 Bike lanes within the City of Lewes should be tinted to reduce the perception of wide pavement widths and provide more clarity for cyclists and drivers

of any development proposal. As a matter of policy, deviations from the Master Plan should only be considered a waiver by DelDOT provided that proper justification and outreach is provided.

- **Intersections:** Future developments with internal street networks should be coordinated in such a manner as to distribute turning movements to multiple locations or existing roads so as to create a network of neighborhood streets connected together. The south/east side of New Road has greater potential for establishing connectivity in the future. The north/west side land bays are limited by inlets from the Great Marsh, Canary Creek and Black Hog Gut. All tie in points to New Road should be coordinated with existing street intersections. Should future development warrant a traffic signal, multiple access points and a grid or parallel road network (considered as part of the extension of the Lewes street grid) should be utilized to spread out access so that signals or roundabouts are not warranted at one concentrated location.

- **Bypass Lanes:** A bypass lane is a paved shoulder that permits through traffic to bypass a left-turning vehicle which is stopped on the travel lane. They are intended to reduce delay, rear end collisions, and continue the movement of through traffic at T-intersections. While bypass lanes exist on New Road, alternatives should be considered in the future.

- **Roadway Widths:** DelDOT has recommended that all future changes to New Road, whether constructed as part of a Capital Improvement Project, or as part of transportation improvements associated with a development project utilize the cross section as shown in Figure 34. Within the City of Lewes, a closed section is recommended (Figure 35). Preliminary design and engineering undertaken for future Capital Projects will determine actual right of way needs. The application of clear zone requirements, utility impacts and relocations, and drainage and stormwater management design will all play a role in determining if and where pedestrian and bicycle facilities, trees, or open buffer space can be accommodated.

Bicycling and Walking Goal:
Expand bicycle and pedestrian trail network along the entire length of New Road and connecting to the Georgetown to Lewes Rail-Trail.

BICYCLING AND WALKING

The following bicycle and pedestrian facilities are recommended along New Road to meet the intent of the State of Delaware Complete Streets Policy and the Historic Lewes Byway Corridor Management Plan goal of providing for recreational trail facilities along the New Road corridor.

The evolving trail system along New Road serves both the needs of adjoining residents and is part of the region's evolving recreational trail network (Figure 37).

Bicycle and pedestrian facilities will be built out over time utilizing the following four implementation mechanisms:

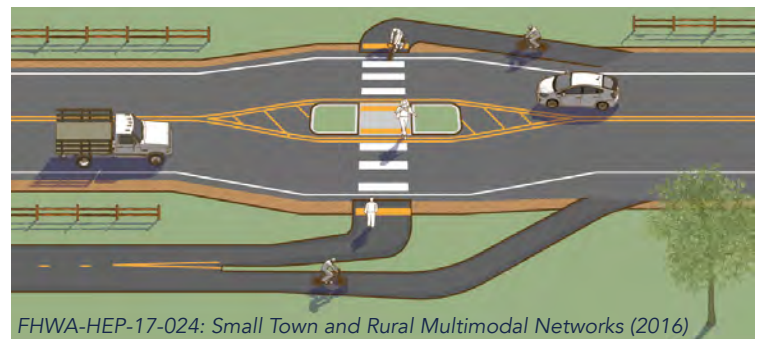
- **Developer Coordination (pipeline):** Portions of the trail system, crossings, and the typical roadway cross section will be undertaken by developers as part of development projects.
- **Capital Improvement (funding in current CTP):** Portions of the trail system will be built as part of transportation projects already funded in the CTP (Minos Conaway Project and the proposed Bridge over Canary Creek).
- **Capital Improvement Program (long range):** Several projects are slated for future capital improvements but they are not yet funded, such as anticipated safety and capacity improvements between Old Orchard and Nassau.
- **Urban Bike-Ped Facilities Coordinated Capital Improvement (long range):** The urban sections of the trail will need to be funded as part of other capital improvement projects not yet identified (coordinated with flood risk reduction, stormwater management, or flood mitigation projects, for example).

Given that the different segments will be built out over a considerable period of time, each specific segment that terminates prior to construction of the next segment will need to provide a transition between the off-road shared-use trail facility and on-road facility (either share the road or bicycle lanes). An example of one way to accomplish this (of many options) is shown in Figure 38.



Figure 37 New Road (magenta) in relation to existing off-road shared-use trail system

Figure 38 Diagram illustrating prototypical transition from off-road facility and on-road facility (FHWA)



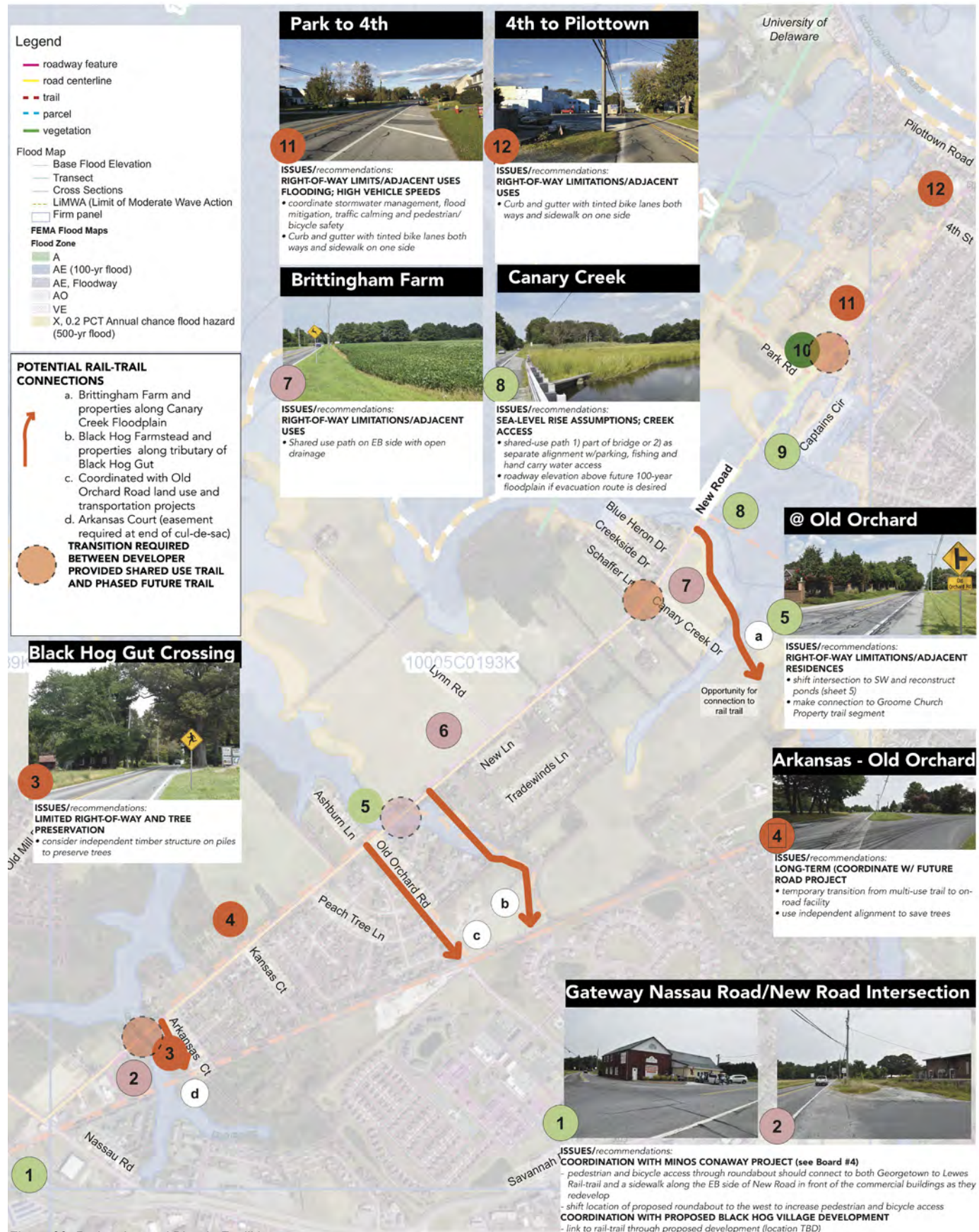


Figure 39 Pedestrian and Bicycle Facilities



Trail Alignment

Figure 39 and the table below provide a segment by segment breakdown of the trail system. The table serves as the guidepost for coordination with both development projects and transportation-related capital improvements. The shared-use trail would start on the EB side of New Road at Nassau, linking directly with the Georgetown to Lewes Rail-Trail at the proposed Black Hog Village. The trail would either stay on the rail-trail to Old Orchard if farmland is preserved on the WB side of New Road, or cross at Arkansas and stay on the WB side through Old Orchard to Shaeffer Lane, where it switches to the EB side, coordinated with new development at Brittingham Farm. At Park Road, the off-road shared-use facility would convert to a combination of bicycle lanes/sidewalk (s) configuration to Pilottown Road.

Type of Project					
	Existing Trail				
	Developer Coordination (pipeline)				
	Capital Improvement (in CIP)				
	Capital Improvement (long range)				
	Urban Bike-Ped Facilities Capital Improvement (long range)				

#	Side	DIST (MI)	From	To	Implementation
1.	EB	0.0	Minos Conaway Project		Bicycle and Pedestrian connections to Rail-Trail and sidewalk connections to business
2.	EB	.16	Connection to Rail-Trail	Black Hog Gut	Developer provided connection to Rail-Trail extending to Black Hog Cut
3.	EB	.07	Black Hog Gut Crossing	Arkansas	Consider separate trail bridge over Black Hog Gut on EB side to preserve trees
4.	WB	.52	Arkansas Court	Old Orchard	Capital improvement (no development pending)
5.	WB	.11	Old Orchard Intersection	Connection to Groome Church (Tower Hill)	Capital Improvement (part of future intersection modifications)
6.	WB	.70	Groome Church (Tower Hill) Property	Shaffer Lane	Developer provided trail on independent alignment with landscape screening (approved by Sussex County)
7.	EB	.14	Brittingham Farm Property	Canary Creek	Crossing to EB side at Shaffer Lane; Developer provided trail constructed to work with traffic calming or provided as Capital Project tied to future traffic calming
8.	EB	.00	Canary Creek Bridge		Construct trail on EB side of a single road with trail structure over Canary Creek as part of Capital Improvement Project including considerations for incorporating fishing access, soft landing and small parking area (location/design TBD, possibly coordinated with development or sewer line)
9.	EB	.38	Canary Creek Bridge	West of Park Road	Part of capital improvement project for bridge – extend trail to crossing west of Park Road
10.	WB	.12	West of Park Road	East of Park Road	Existing trail and crosswalk
11.	TBD	.37	East of Park Road	4 th Street	50' right-of-way: use bike lanes and sidewalk on both sides (or sidewalk on one side if bio-swale implemented)
12.	TBD	.15	4 th Street	Pilottown Road	40' R/W – same options as above but use bike lanes on both sides and sidewalk only on one side
		2.72			



Figure 40 Diagram illustrating potential location of Canary Creek linkage trail to the Georgetown to Lewes Rail-Trail



Figure 41 Diagram illustrating potential linkages to the Georgetown to Lewes Rail-Trail at Black Hog Gut (tributary), Old Orchard, and Black Hog Gut (main stem)



Figure 42 Elevated boardwalk may be needed to cross wetland areas associated with Canary Creek and Black Hog Gut

Linkages to Georgetown to Lewes Rail-Trail

Providing direct trail connections to the Georgetown to Lewes Rail-Trail from New Road neighborhoods would provide recreational and health benefits to residents, as well as increase travel choices between downtown Lewes and the Coastal Highway. Four connection opportunities should be considered further and monitored (letters correspond to Figure 40 on page 36):

- Brittingham Farm along Canary Creek:** An easement is under consideration as part of the development plans for Brittingham Farm for a future trail connection (in addition to the New Road bicycle and pedestrian facilities along the frontage). The connection can continue along Canary Creek across two privately owned parcels as shown in Figure 40. Easements would be required from the property owners on a willing seller basis.
- Black Hog Gut Tributary:** Along a tributary to Black Hog Gut would require easements from two privately owned parcels including the farmstead property that, at the time of this Master Plan, is for sale. Development is under consideration for the 2nd parcel (Old Orchard Ventures, see Figure 13 on page 13). Work with county development review process to secure easements.
- Old Orchard Road:** Could serve as a linkage constructed as part of future capital improvement projects that may be needed to address roadway safety and capacity issues, or coordinated through ongoing development activities
- Black Hog Gut:** A linkage to the rail-trail is secure and should be as part of development plans for Black Hog Village. A sidewalk along the EB side of New Road in front of the commercial buildings is under consideration as they redevelop.

Linkage along Canary Creek and Black Hog Gut may be more suitable as footpaths or require boardwalk construction crossing or parallel to wetland areas to support shared-use trails.

CORRIDOR LANDSCAPE CONCEPTS

In addition to preserving wetlands and floodplains and maintaining and/or enhancing existing riparian areas and tree canopy, new plantings are needed to expand riparian corridors and establish new roadside woodlands and landscapes in developing areas. The following is intended to support the work of the Historic Lewes Byway Committee who has a Design Guidelines team working on corridor landscape concepts for all Byway roads, including New Road.

New landscape installations should be selected and designed to replicate the function of the existing landscape structure,

as shown on Figure 43 on page 38. The landscape structure should also reflect features associated with the identified character areas (Figure 21 on page 22). It should be noted that in areas where no landscaping exists today, the goal of the Byway is to landscape these areas as well.

All landscape agreements made through the development project approval process must later be incorporated into HOA agreements. The City or County must require as a condition of approval, that the developer will provide legal documentation that the approved landscape agreements will carry forward to the HOA. HOA documents are often drawn up after the final site plan approval and not at the time of City or County development approval.

Goal:

Work with homeowners associations and developers to establish a coordinated landscape treatment along frontage areas.

The following corridor-wide landscape concepts are recommended.

Expand Riparian Areas

According to DNREC's publication "Green Infrastructure Fact Sheet: Riparian Buffers," riparian buffers are vegetated areas adjacent to waterways that help filter rainfall and runoff, absorb and retain high stream flows, and provide important wildlife habitat. Buffers link terrestrial uplands to stream, river, or wetland ecosystems. Buffers include a variety of planted, restored, or enhanced natural habitats, hosting different types of vegetation."⁵

Riparian buffers serve as a type of "green infrastructure" with functions that often replace more costly "grey infrastructure" in developing areas. According to the study, "The Economic Value of Riparian Buffers in the Delaware River Basin", prepared by ECONorthwest for the Delaware Riverkeeper Network, riparian buffers provide monetized economic value to the communities and regions that preserve them in the areas of water quality, carbon storage, air quality, flood prevention, property values, wildlife habitat, and outdoor recreation.

The report links the known environmental values of riparian buffers (referred to as ecosystem services) to economic values (related to the costs of replacing the same function if the buffers are converted to urban or agricultural land cover). The report estimates the value of riparian buffers at "over \$10,000 per acre per year in monetized benefits, with additional non-monetized benefits expected to increase this total."⁶

Of particular importance to the rapidly urbanizing area along New Road are the functions that address the following:

- Reduce damage from flooding by providing increased flood storage capacity and slowing the velocity of floodwaters, allowing for more water to infiltrate through soil, more particulate matter in runoff to settle out, more opportunity for plants to take up water and nutrients, and less erosion.
- Filter stormwater pollutants through the ability of vegetation to effectively remove contaminants from runoff through nutrient uptake and soil filtration.
- Shade surface water to help maintain a safe water temperature range for aquatic life.
- Stabilize banks using the deep root systems of trees and shrubs
- Provide wildlife habitat (food, shelter, and close proximity to water) associated with

⁵ DNREC, *Green Infrastructure Fact Sheet: Riparian Buffers*. http://www.dnrec.delaware.gov/GI/Documents/Green%20Infrastructure/Riparian%20FS_04-1.pdf accessed on 4/14/19

⁶ ECONorthwest, *The Economic Value of Riparian Buffers in the Delaware River Basin*, August 2018.

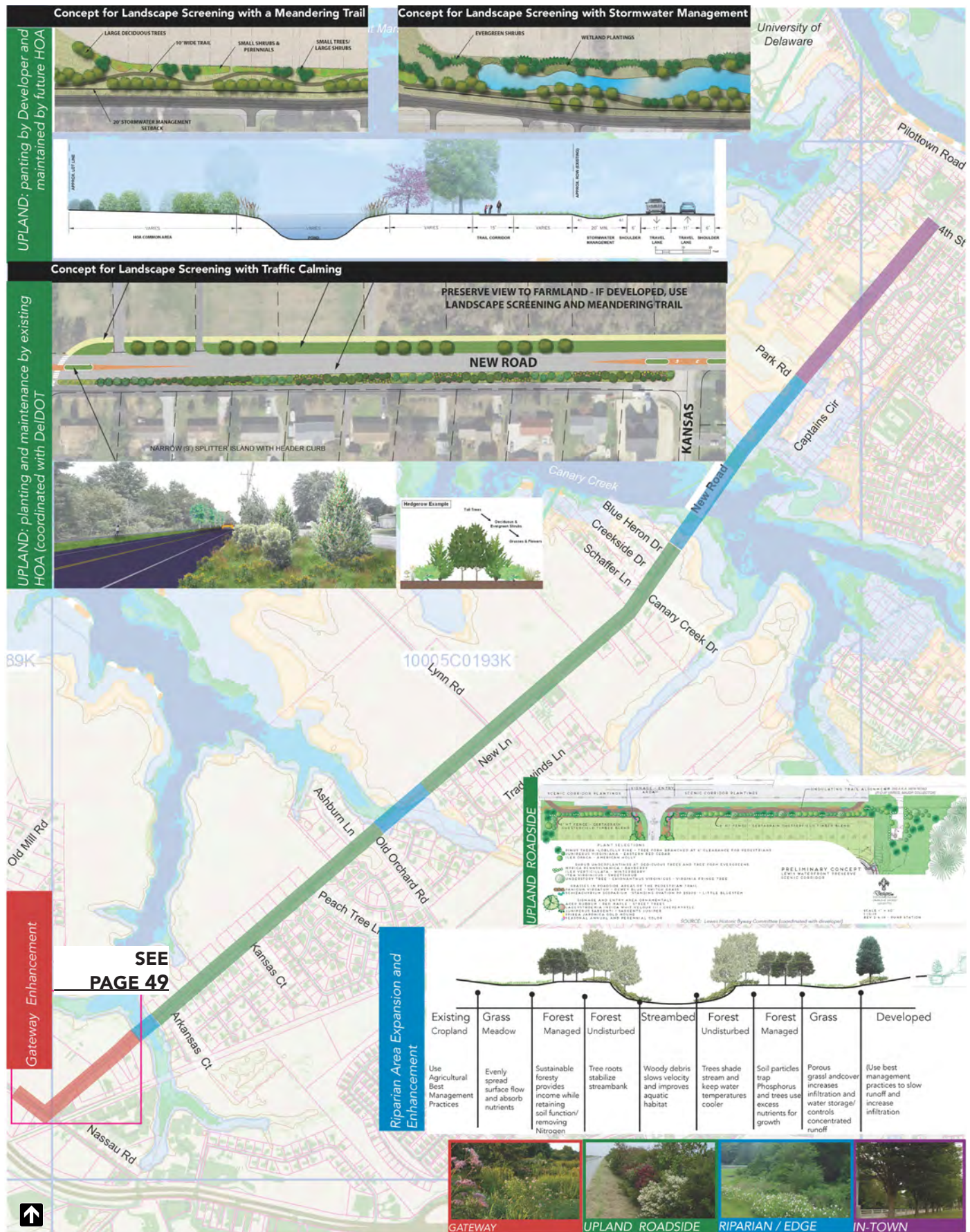


Figure 43 Corridor Landscape Concepts

riparian buffers as well as provide organic matter for the aquatic food chain

- Connect habitat along the stream corridors that link diverse habitat types, allowing animals to move along them and utilize much larger habitats
- Provide recreational opportunities through the role played as part of New Road’s scenic qualities and as noted on page 35, they provide opportunities for access to natural areas utilizing environmentally sensitive trail designs



Riparian buffer widths vary by function desired. Incentives are needed to encourage private landowners to preserve lands within the riparian corridor within today’s 500-year floodplain (the equivalent of the future 100-year floodplain under a moderate risk scenario (see “Sea Level Rise Projections” on page 16). Incentives could include technical and financial assistance funded through floodplain and watershed management programs (Figure 22 on page 24).

Figure 44 Planting along the edge of a riparian area can incorporate native grasses and perennials planted in mass to create an attractive view for adjoining residences

When factored into development site plans, riparian buffers can help to meet stormwater management requirements (for both water quality and quantity). Preserving existing riparian vegetation provides the most values for stormwater management. Establishing new forested buffers along riparian corridors can reduce stormwater management costs and provide enhanced value for those lots that are adjacent to the buffer with permanently protected views of natural areas.

Figure 45 illustrates the various landscape types within a typical riparian corridor. New planting, including installation of vegetated filter strips for stormwater management, would be located in the managed forest areas at the edge of existing undisturbed forest. Suitable plant types are included in Appendix B.

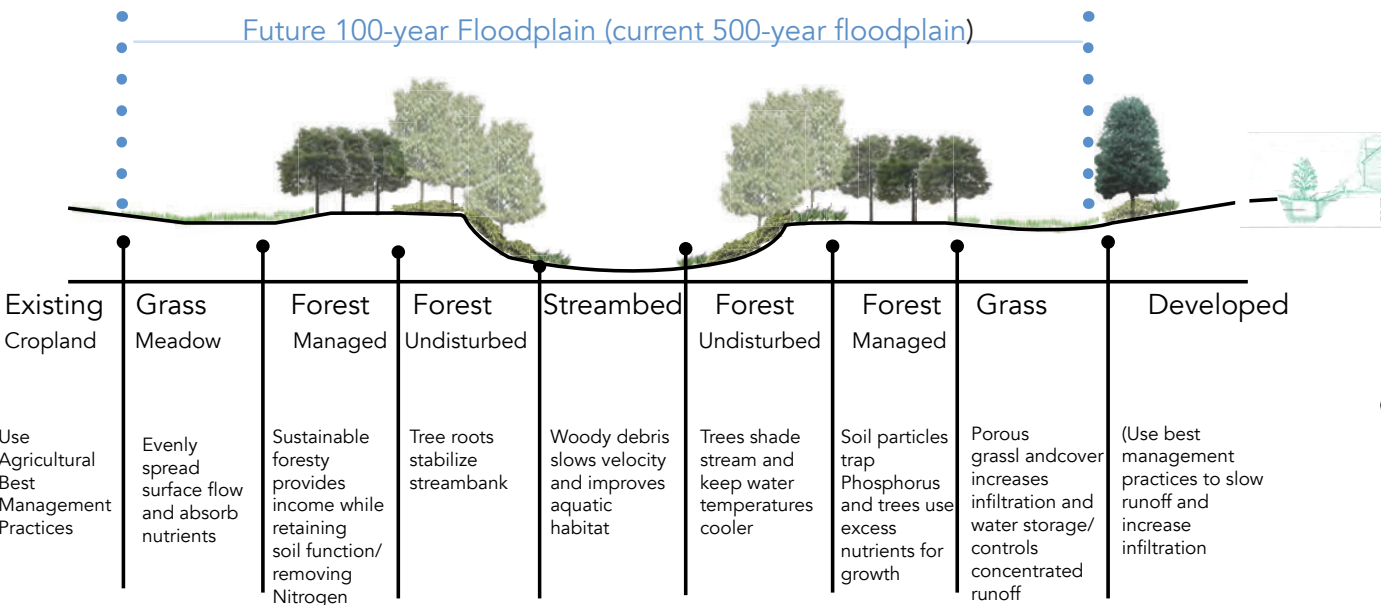


Figure 45 Conceptual diagram illustrating riparian corridor management concepts.

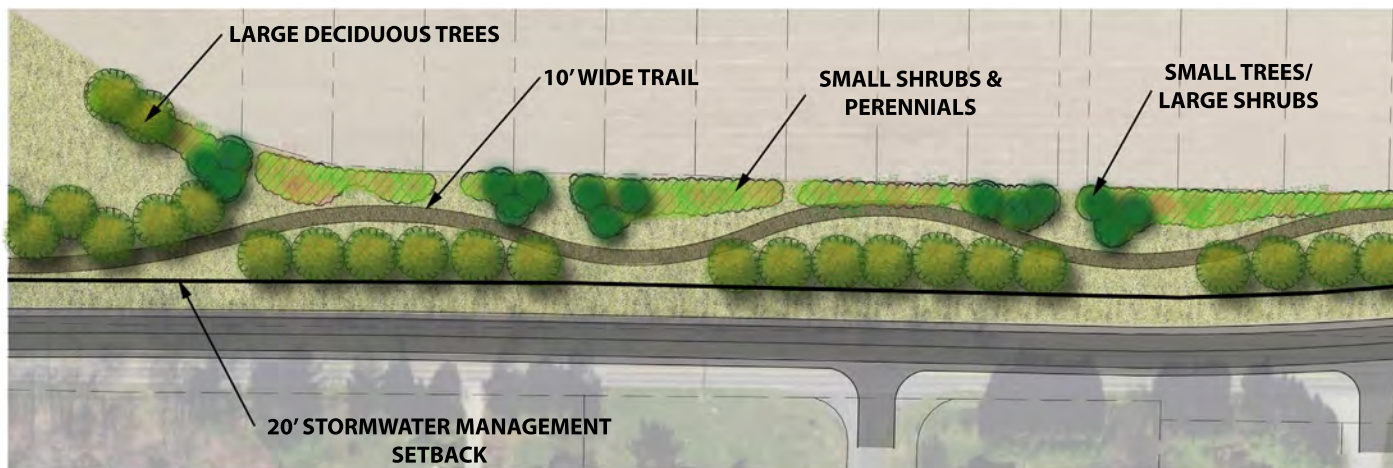


Figure 46 Concept for
Landscape Screening
with a Meandering Trail

Roadside Landscape Treatment

As the New Road corridor develops over time, the importance of coordinating the design and function of the roadside areas increases exponentially. Coordination would provide the following benefits relative to achieving the desired vision for the New Road corridor:

- Can be designed to **reinforce traffic calming goals** by establishing rhythmic spacing of planting between small groupings of trees
- Can **restore function of hedgerows for both screening and wildlife** by maintaining at least a 20' width, planting at least two species that are native to Delaware, and selecting species to provide food, nesting cover, and/or protective cover for the desired wildlife species
- Can provide a **more attractive shared-use pathway experience** by using planting design to reinforce trail alignment, frame positive views, screen contrasting views and provide shade for trail users
- Can **support pollinators** by selecting multiple plant species with different flower colors and blooming periods from early spring through early fall

Prototypes

The concepts presented within this Master Plan are based upon and developed cooperatively with the developer of Groome Church/Tower Hill. The resulting concepts serve as a model for future roadside landscape treatment on a similar cooperative approach. Future developers or other property owners may wish to voluntarily apply the concepts to other locations. Concepts presented in the Master Plan require more detailed preliminary engineering and design work that is developed at the same time as roadside landscape concepts so that drainage/stormwater management, utility work, roadway clear areas, sight distance triangles, and other factors can be incorporated into the design in a comprehensive and holistic manner.

The concepts on these pages reflect a desire to integrate the design of the trail, stormwater management and landscape in a cohesive manner. Existing utility lines must be factored into the equation and the design developed in such a way that the overall contrast of the (often straight line) clearing requirements are blended more carefully into the overall landscape composition. Underground utilities may also have a similar effect due to surface maintenance requirements and they too can be blended into the overall composition.

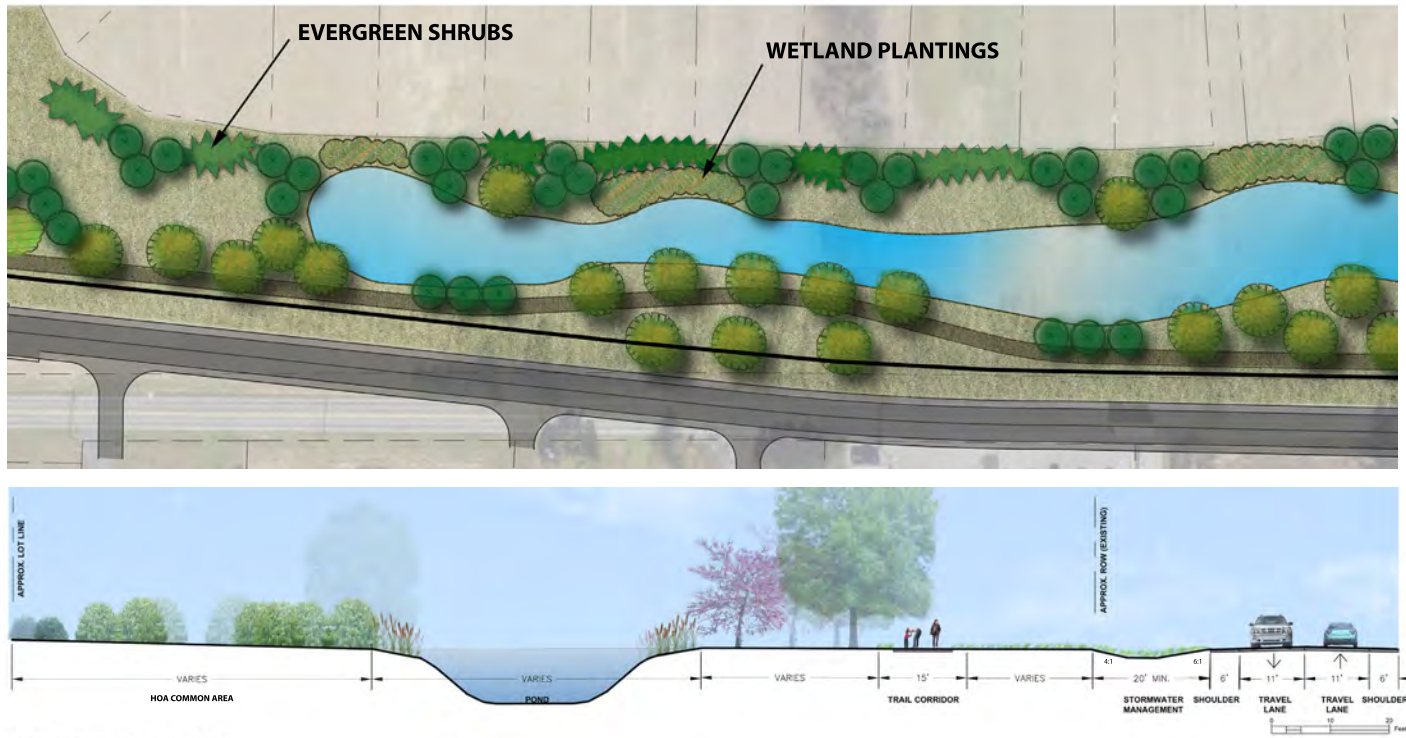


Figure 47 Concept for landscape screening with stormwater management and meandering trail

As a general set of planting design principles:

- Use massing of similar plants and groupings as smaller groupings or individual specimens will get lost in the background and not be effective screening
- Use native plants in all areas where practical at entry area. Well adapted and appropriate flowering trees can be selected to achieve the desired effect
- Specify a mix of plant sizes and types to promote healthy plant groupings
- To establish meadows, assure an adequate establishment period for initial maintenance (3 year establishment period). Once established, they will require little maintenance except pulling out bird dropped plant seedlings
- For wet areas, similarly, assure an adequate establishment period (3 years) and use a mix of plugs and pots to achieve the desired effect. Once established they will require limited maintenance
- For species selection consult, "Enhancing Delaware Highways," a DelDOT publication produced by the University of Delaware, the Delaware Center for Horticulture and Rick Darke. Appendix B of this report includes a planting design matrix with recommendations by landscape type based upon the document.



Figure 48 Example of meandering trail mixed with groves of trees along curving portion of pathway

Meandering Trail with Landscape Screening and Traffic Calming

Effective landscape screening can be combined with an independent and meandering trail alignment (where possible) to create an attractive frontage area serving multiple functions:

- The trail alignment should incorporate long curves with short tangents, where possible, resulting in an enjoyable trail experience (avoid short and sharp curves which may be both dangerous and unattractive).
- Use a planting design concept that accommodates the curving pathway, using the geometry of the curves and a rhythmic planting spacing that gets closer

together approaching the desired slow point or intersection.

- Alternate groupings of mass plantings between the roadway side and the property owners side so that there is a continuous attractive screening for the drivers looking toward the development, and privacy for the adjacent owners, while allowing for framed long views of the wet ponds as an amenity.



Figure 49 Example of a stormwater management facility designed to reinforced the natural character of local wetlands through the use of native wetland plant species

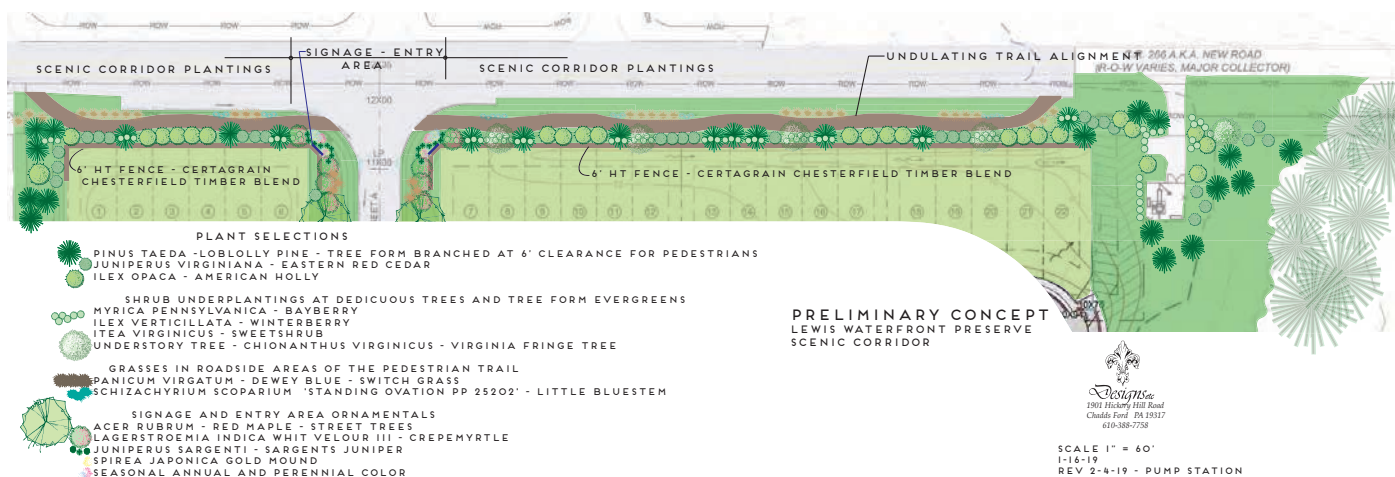
Meandering Trail with Stormwater Management Pond and Screening

Most developments require stormwater management facilities to treat both the quantity and quality of runoff generated by the site, meeting or exceeding pre-development conditions. Stormwater management is often proposed as wet ponds, creating an amenity for the development, or as wetlands that can also serve as an amenity if appropriately located and designed.

Figure 47 on page 41 illustrates how a wet pond can be shaped and designed in such a way as to achieve effective screening while also incorporating a meandering trail along the frontage. The wet pond creates a series of concave and convex shapes which provide specific planting environments:

- For the concave shapes (typically associated with the stormwater outfalls feeding into the pond) use wetland plants (such as cattails) grouped as a large mass along the shoreline and coupled with wet tolerant shrubs and small trees.
- Consider aesthetic treatment for outfalls, since these will be visible (stone facing or use form liner that will create a grain similar to horizontal wood planking).
- For convex shorelines associated with what would be drier more upland portions of the stormwater pond, use a combination of a dense but mixed evergreen and deciduous screen along the back coupled with a mix of small and large trees to break up the "green wall" effect that typical evergreen screen plantings create.
- For the sunnier shoreline areas use planted meadows with native grasses grouped as a large mass planting (meadow should be designed for four season interest).
- Between the trail and New Road, the convex shorelines should be planted as dense woodland thickets with a mix of large canopy trees, smaller trees and shrubs and some evergreen understory. These should line up opposite the concave shaped spaces across the pond to increase effective screening.
- Areas between pond and path should be lined with large canopy shade trees.

Figure 50 Planting concept developed for the Brittingham Farm property with coordination from the Historic Lewes Byway Committee



Meandering Trail with Narrower Widths for Landscape Screening

Where less space is available, some screening and a more undulating trail design can still be achieved using carefully chosen plants and by modulating the plant types in association with the curves in the trail. The spacing can also be utilized to establish a rhythm to the planting for traffic calming benefits.

Working with HOA's to Enhance Existing Roadside Open Spaces

There are a limited number of Homeowners Associations (HOAs) that own and maintain property and riparian buffers along New Road. These include:

- Reserves of Nassau
- New Road Estates
- Orchard Homeowners Association
- Nassau Station HOA
- Pilottown Reserve HOA

Sand Dunes Village residents mow the grassy median between Arkansas and Kansas. New developments will have common areas that are likely to become part of an HOA.

For the grassy median in front of Sand Dunes Village, residents attending meetings expressed an interest in planting trees and shrubs to provide additional privacy and to reduce maintenance.

This area represents an excellent opportunity to adapt the hedgerow concept to provide both screening and roadside planting that support pollinators.

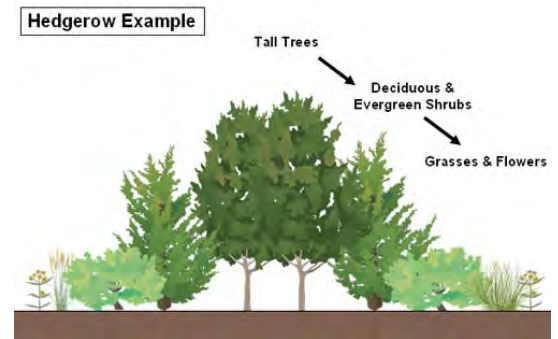


Figure 51 Hedgerow planting concept
(Source: Maryland DNR)

Frontage Areas for Commercial Properties

Except for the former Nassau Station buildings at the corner of Nassau and New Road,



Figure 52 Plan (above) and rendering (left) illustrating design concept for planting in grassy median at Sand Dunes Village



Figure 53 Narrower roadside hedge (Enhancing Delaware's Highways)



Figure 54 Example of narrow planted median in Greenville, DE that could also be used to help screen parking areas while preserving views of the buildings

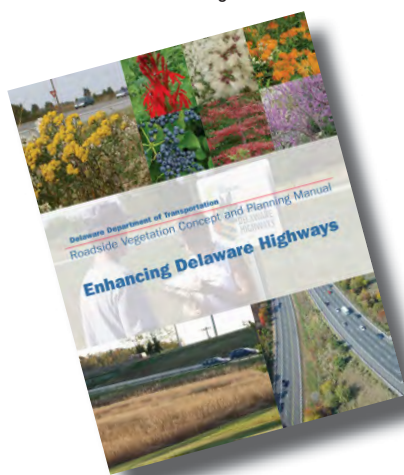


Figure 55 DelDOT's Enhancing Delaware Highways: Roadside Vegetation Concept and Planning Manual:

there are only a few individual lots used for commercial purposes. As with HOAs the Lewes Historic Byway Committee can work with owners on a cooperative basis to develop ideas for screening utilitarian areas while preserving open views to business signage, entrances, and other ways in which businesses wish to maintain visibility with the traveling public along New Road. The following general guidance should be considered by any property owner or business owner wishing to install screening:

- Use planting design to frame desirable views
- When sufficient space exists (minimum of 20'), use the hedgerow concept for effective screening (see "Preserve and Restore Hedgerows" on page 26)
- With less available space, consider a combination of a more tightly spaced hedge with a semi-transparent fence
- Avoid using opaque fences for screening

Use of Native Plants

The Master Plan recommends utilizing the concepts and plant lists offered in DelDOT's "Enhancing Delaware Highways: Roadside Vegetation Concept and Planning Manual" (<https://www.deldot.gov/Programs/edh/index.shtml>). The native trees, shrubs, groundcovers and grasses are not only more consistent with the desired character as expressed through the public outreach conducted for this Master Plan, but also contribute to good habitat for animals and birds, reduce maintenance requirements, and are generally more sustainable and disease resistant.

Appendix B includes a matrix showing representative types of native plants for use as appropriate for the conditions found in the New Road corridor.

Maintenance

A critical factor in the long term sustainability for the corridor is the importance of factoring maintenance into the landscape design concepts as they are applied to the corridor. For state maintained roadways:

- DelDOT is responsible for mowing within the right-of-way. According to the DelDOT mowing policy, residential quality turf is mowed to a height of 3 inches routinely while utility turf (medians and roadsides) is mowed to a height of 6 inches. Planting beds should be designed with long curves and short tangents so that a mower can easily navigate around the beds.
- Unless other arrangements are first determined, DelDOT must maintain the stormwater management facilities that are installed as part of its transportation facilities. Normally they are not outlined or complemented with any other landscaping components – i.e. trees, shrubs, bushes, pollinators. While the function of the stormwater maintenance continues to be DelDOT, opportunities may evolve, pending agreements, for landscaping enhancements by others.
- Planting areas within the right-of-way or stormwater facilities will need to be sponsored to ensure that they receive the appropriate maintenance. A sample agreement is contained in the appendix.
- Outside of the public right-of-way, developers are initially responsible for maintenance of landscaped areas including stormwater management facilities, eventually turning those over to the Homeowners Association (HOA).

Application of the planning and design concepts follow in Chapter 4, based upon stakeholder input from public meetings (visual preferences) and relationship to other goals such as screening and traffic calming.

Lighting

Currently, roadway lighting along New Road is limited to the section of New Road between 4th Street (one light extends west of intersection) and Pilottown Road. Pedestrian lights were installed along the short section of shared use pathway on the WB side of New Road at the Park Road intersection.

Street lighting may be required along New Road where necessary at major intersections, where there are security problems or poor vertical and horizontal alignments or when traffic accident data or traffic volumes warrant street light installation.

Street lighting may be required along New Road where necessary at major intersections, where there are security problems or poor vertical and horizontal alignments or when traffic accident data or traffic volumes warrant street light installation. Street lighting where installed along New Road should minimize glare and light pollution. Light standards should be compatible with the character of the area being served and be scaled to serve project goals, whether for pedestrian or vehicular use. The following general guidance should be considered when designing roadway and pedestrian lighting along New Road:

- Illumination should be concealed and mounted on poles that are color galvanized with a brown or black finish.
- For roundabouts, under consideration at the intersections of New Road and Nassau, New Road and Old Orchard and New Road and Lynn, best practices for roundabout lighting should be considered, an example of which is shown below. Ecoluminance is an approach to roundabout lighting that uses lower light mounting heights, retroreflective elements and light reflected from plants to illuminate a roundabout while reducing power consumption.
- Pole heights should be proportional to roadway width, but more fixtures at lower heights are preferred over fewer fixtures at higher heights.
- Where heavy pedestrian use is anticipated, street lighting should be combined with sidewalks to enhance safety

Signage

The 2015 CMP recommendations for signage and wayfinding should continue to provide guidance for signage in the corridor. Directional signage and wayfinding should be



Figure 56 Existing roadway lighting on New Road is limited to the section between 4th Street and Pilottown Road (including approach to 4th Street shown above)



Figure 57 Existing trail lighting at Park Road intersection with partial cut-off fixture that hides the light source and a pole with duplex finish (color applied)



Figure 58 Pedestrian-scaled street lighting similar to that used at Port Penn along the Delaware Bayshore Byway may be appropriate for the section of New Road east of 4th Street as part of a future enhancement project



Figure 59 Example of "ecoluminance" approach to roundabout lighting (MNDOT)



Figure 60 Excessive signage, such as the multiple sign panels on Delaware's Bayshore Byway at Port Penn should be avoided by coordinating directional signage and wayfinding, as well as keeping regulatory and advisory warnings to the minimum required



Figure 61 Where bicycle lanes are added on New Road to meet the requirements of Delaware's Complete Street Policy, green painted lane markings should be added to differentiate between the travel lane and bicycle lane especially approaching the more urban sections with many intersections and driveways

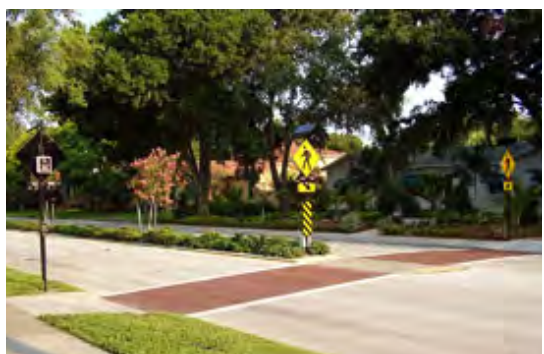


Figure 62 Example of a flash beacon installed with a pedestrian refuge median (FHWA)

coordinated as spelled out in the 2015 CMP document. As projects advance through the design process and more detailed planning and engineering recommendations emerge, the following guidance should be considered in addition to the guidance provided by the 2015 CMP:

- The Signage within the DelDOT right-of-way must be compliant with the Manual of Uniform Traffic Control Devices (MUTCD) and DelDOT policies.
- Development entry signage is regulated by DelDOT and is limited to approved signage.
- Private signage (outside the right-of-way) is regulated by City and County zoning regulations.
- In general, signs along the roadway should be limited to the minimum practical or required under MUTCD guidance.

Pedestrian and Bicycle Signs and Route Markings

Two trail crossings included in the Master Plan (at Shaeffer Lane and at either Old Orchard or Arkansas) may require (if warranted) advance warning and crosswalk signs in accordance with MUTCD. A HAWK beacon (high-intensity activated crosswalk) is used in many places for mid-block or non-signalized intersections with minor streets and driveways (where a warrant can be demonstrated through MUTCD guidance). A smaller, post-mounted "Rectangular Rapid Flashing Beacon (RRFB)" may be more appropriate than the HAWK beacon for New Road crossings, especially if incorporated into the splitter islands, which can also act as a pedestrian refuge.

Bicycle lanes are under consideration throughout the corridor as noted in the project assumptions and shown in Figure 34 and Figure 35 on page 32. Use of green tinting on lanes also helps to call attention to intersecting cross streets and entrances, improving the overall safety for both bicyclists and drivers.

The 2015 CMP calls for a single Gateway Sign that should be kept simple and that excessive signage should be avoided. With the advancement of the Minos Conaway project, the gateway sign can be placed either in the roundabout or on the face of the west side of the bridge modified as part of the Minos Conaway Project (see page 50 for considerations).