

04 Application of Design Concepts



Figure 64 Existing view looking eastward toward New Road

The following pages illustrate the application of design concepts for selected areas along the corridor. The areas selected primarily correspond to the recommended locations for traffic calming interventions as shown in Figure 32 on page 30. For those areas not represented by these more detailed design concepts, reference should be made back to the overall concepts for Transportation (Figure 32), Pedestrian and Bicycle Facilities (Figure 39 on page 34) and Corridor Landscape Concepts (Figure 43 on page 38). For example, if a property is redeveloped on the EB side of New Road between Brittingham Farm and Lynn Road at some future date, then the overall concepts and guidance regarding traffic calming, trail connections, and corridor landscape can be applied. Failure to include more detail does not imply that the overall planning and design concepts do not apply.

More immediate attention is being paid to the traffic calming and intersection measures due to the immediate coordination needs of pipeline projects - both land development and transportation.

NEW ROAD GATEWAY (NASSAU TO BLACK HOG GUT)

The intersection of New Road at Nassau serves as the gateway to the New Road segment of the Historic Lewes Byway. The 2015 CMP recognizes that gateways provide an important function of introducing the traveler to the Byway and changing the overall perception of the route upon which they are about embark. This type of transition is important for both new visitors unfamiliar with the area and lifelong residents or employees that may have used the road for many years.

The 2015 CMP also notes that New Road gateway should be low key in reflecting its context. Visual preferences expressed at the November 2018 public meeting reflect a simple landscape oriented treatment as the best approach for the gateway. The coastal/farm context itself is the most important part of this gateway. The following recommendations apply specifically to the gateway:

Gateway Design Concepts

The gateway starts with the new underpass that is being built as part of the Minos-Conaway Project and continues through and includes the roundabout. The farm field and commercial buildings are an important part of this context. The gateway design will be considered as a cohesive whole, not as many different parts, based upon:

- Support efforts to preserve Knapp Family Farm and minimize encroachments onto the property
- Coordinate with adjacent property owners to develop comprehensive planting program (orchard restoration, roadside pollinators)



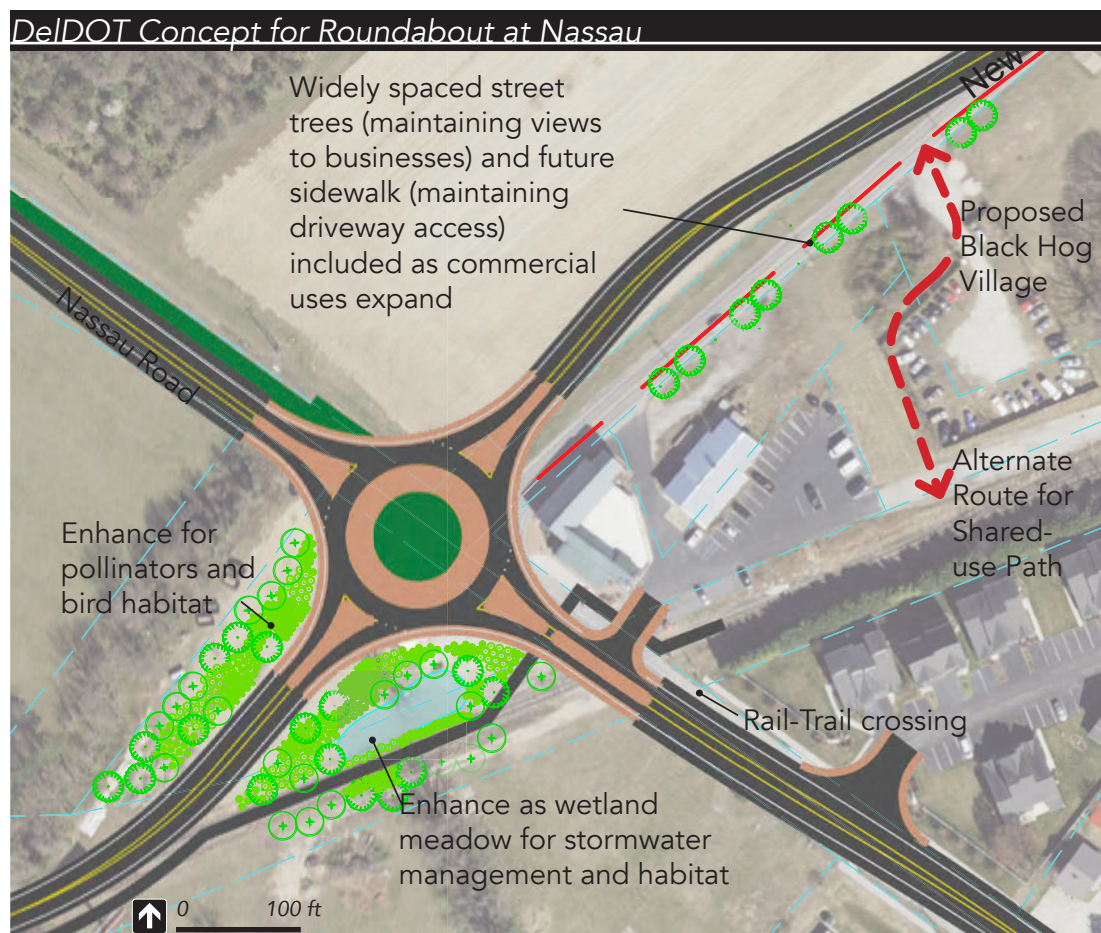
Snohomish, WA



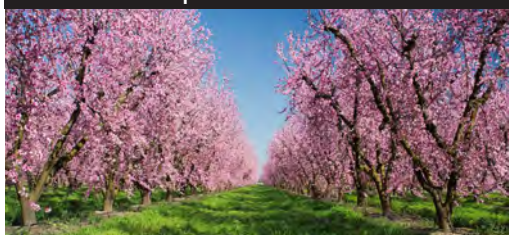
Planavagen, Stockholm, SE

Figure 63 Images of different types of roundabouts were shown to participants at the first public meetings and these two roundabouts exhibit the preferred characteristics of those that participated

Figure 65 DelDOT's preferred concept includes a roundabout at Nassau. Consideration of the separately illustrated landscape concept included with the Master Plan should include pollinator gardens, habitat, and wetland meadow/stormwater management as shown.



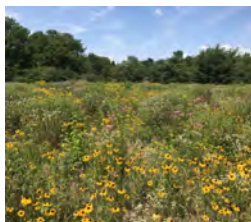
Landscape Treatment Ideas



Pollinator/Butterfly/Bird Habitat



Eutrochium fistulosum
(Hollow-stem Joe-pye-weed)



Asclepias incarnata
(Swamp Milkweed)



Quercus bicolor
(Swamp White Oak)

- Coordinate with DelDOT to ensure that the design for the Minos Conaway Project will contribute/enhance the New Road Corridor Gateway
- Coordinate with DelDOT on stormwater management and look for ways to implement recent advanced practices to enhance stormwater management design to fit the context

Coordinate with Minos Conaway Project

When DelDOT advances the preliminary concept they will consider the following in response to issues raised during the planning process:

- DelDOT will consider design minimization or refinements to reduce impact on the adjoining farm, adjoining commercial buildings and the approach transition speed into the roundabout (45-25 mph transition).
- DelDOT will work with the Byway Committee and the public to incorporate context sensitive gateway design landscape treatments consistent with state and federal design standards to the roundabout and adjoining areas using guidance provided by the Corridor Master Plan. Maintenance agreements will also be discussed and considered in the final level of effort.
- DelDOT will investigate the viability of context sensitive design treatments to any required modifications to the underpass

DelDOT Concept for Minos-Conoway Project Underpass of Route 1

Figure 66 DelDOT's preferred concept utilizes the existing bridge parapet and bridge columns without modification. The rail-trail, relocated to the outside of the existing columns, will require a low retaining wall

(the existing embankment will need a low retaining wall to accommodate the full width of the trail and roadway).

Landscape Design Concept

At a master plan level, the design of the New Road Gateway should reflect the past history of the orchards that once graced this landscape (see Figure 23 on page 25). Should the property owner wish to pursue their interest in restoring the orchard, then the design of the gateway can consider that desire, including ensuring that pollinator plantings are compatible with any envisioned new orchard. The envisioned design concept includes incorporating a wetland design concept to address stormwater needs (SE quadrant) and a pollinator planting on the SW quadrant.

Coastal Highway Underpass

The Minos Conaway Project will require some modifications to the apron on the EB side (outside of the columns, area #3 in Figure 66). The Rail-Trail will need to be relocated to accommodate the roadway as shown. DelDOT should consider utilizing a low brick⁷ or brick pattern wall to retain the earth and wrap that wall around into the adjoining slope to create a planting area behind.

Coordinate with Black Hog Village Project

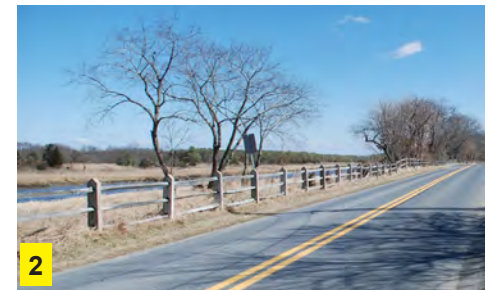
Commercial redevelopment of what will be called Black Hog Village (see Figure 13 on page 13 for location) will provide opportunities for coordination that should be pursued and further discussed. The following design concepts apply to reinforce the gateway concept:

- Incorporate landscape treatment along frontage area to function as a gateway and to meet traffic calming goals.
 - Plant street trees with a sidewalk along frontage area to frame view toward Black Hog Gut and the New Road Gateway.
 - Encourage DelDOT to shift roundabout towards Coastal Highway and use frontage area to create usable greenspace for outdoor use by adjoining businesses.
- Consider option of rail-trail connection through front or back of property to reduce right-of-way requirements on New Road including frontage along Black Hog Gut

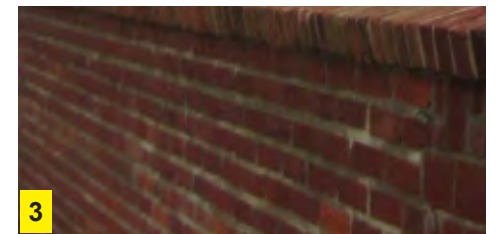
⁷ Brick wall would require a maintenance agreement with DelDOT

Ideas for Bridge Abutments

Use Delaware coastal upland native trees, shrubs and wildflowers on embankments



Use historical post and rail fencing details and maintain open views to adjoining preserved farm



Use simple design and honest materials (real brick preferred if a maintenance agreement can be negotiated with responsible party, otherwise use of form liners or brick veneer patterns will need to be used)



Narrow Splitter Ideas



Figure 67 Narrow median with brick crosswalk



Figure 68 Median w/ trees/shrubs



Figure 69 Splitter w/trees shrubs and grass

Wide Splitter Ideas



Figure 70 Splitter with pavers at intersection

- Use landscape design to frame views of historic buildings while screening views of parking and utilitarian functions.

BLACK HOG GUT TO OLD ORCHARD

Two narrow splitter islands are proposed at Arkansas Court and Kansas Court. The splitter islands would be designed to accommodate a left turn lane within the center median and incorporate vegetation or other measures in the median to break up the long sight line that induces high operating speeds. The splitter at Arkansas Court would also provide an opportunity for the shared-use trail to cross from the WB side to the EB side.



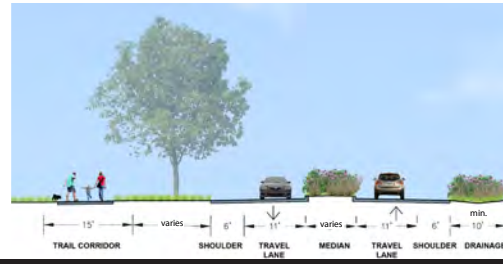
SPLITTER ISLAND AT KANSAS COURT



SPLITTER ISLAND AT ARKANSAS

Figure 71 Splitter at Kansas Court (top) and Arkansas Court (bottom)

Section B - Splitter Island at Arkansas Court



NOTE:
see page
55 for
discussion
of splitter
island
widths

Section B - Roundabout at Old Orchard



Figure 72 Sections illustrating splitter at Arkansas Court (top) and Roundabout at Old Orchard (bottom) - Roundabout dimension shown is minimum, actual dimension TBD

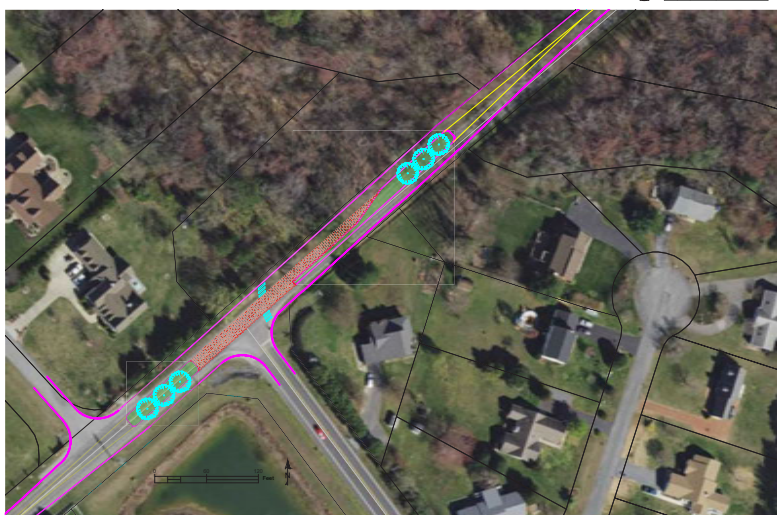


Figure 73 Roundabout Option (top) and Splitter Option (bottom) for Old Orchard

Old Orchard Intersection

Anticipating that additional traffic will be generated from new development on Old Orchard and New Road, along with the proposed modifications under consideration for the Minos Conaway Project, two alternative approaches are possible for increasing the intersections safety and capacity.

- **Roundabout Option:** should traffic studies warrant, an appropriately scaled roundabout could be considered in lieu of a signal.
- **Wide Splitter Option:** with appropriately scaled turn lanes.

The intersection design should consider the following issues, among others:

- Address the anticipated primary turning movements from EB New Road to SB Old Orchard, and NB Old Orchard to WB New Road.
- Minimize property impacts to Ashburn Lane lots to the north and an individual lot to the SE (including replacement of the hedge on the corner).
- The roundabout option shown would require partial reconstruction of the stormwater pond shoreline on the SW corner and additional utility relocations (TBD).
- Incorporate the trail on the EB side of New Road.



Figure 76 Plan and section illustrating winding trail at Groome Church Property



Figure 74 Pond (US 50, Queen Anne Co., MD)



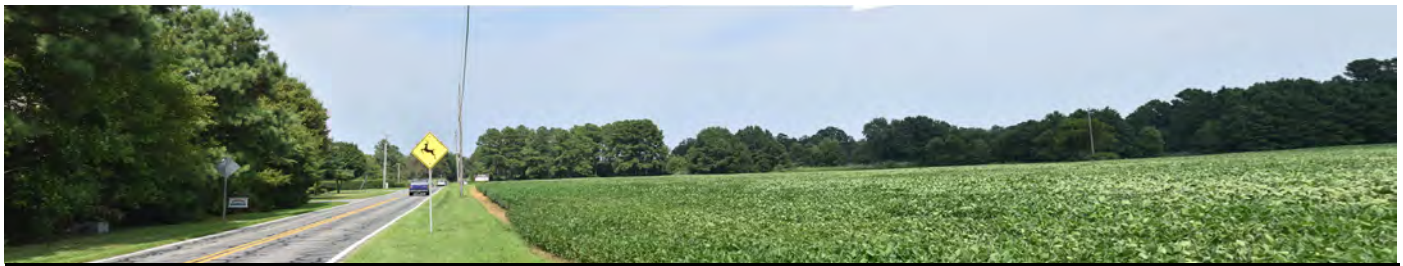
Figure 75 Natural Area (Enhancing Delaware's Highways)

OLD ORCHARD TO CANARY CREEK

The coordinated landscape design for the frontage area of the Groome Church (Tower Hill) Property (integrating the shared-use trail, traffic calming landscape treatment, stormwater management as an amenity), and a developer provided roundabout at Lynn Rd. with the developer's interest in showcasing the property as a high quality place to live resulted in commitments established as part of the Master Plan's approval in Sussex County.

As site improvements move forward through the approval phase, additional coordination will be needed to achieve the desired character.

- DeIDOT will review plans and concur to ensure adequate roadside drainage and safety.
- Landscape agreements will be needed for any plantings in center roundabout.
- Utility relocations and coordination will need to be evaluated and incorporated into the overall design concept
- Stormwater management will need to be coordinated for maintenance responsibilities related to roadway runoff
- Stormwater management for the agreed upon independent trail alignment will need to be confirmed



Brittingham Farm Traffic Calming and Entrances



Figure 77 Concept Plan for New Road splitter islands at Brittingham Farm

BRITTINGHAM FARM

In addition to the landscape recommendations shown on page 42, a series of narrow splitter islands should be installed approaching Canary Creek Drive (EB) in between Canary Creek and Creekside (also the entrance to Brittingham Farm). A third splitter east of Blue Heron Lane should also be installed to slow outbound traffic. Splitter islands are needed to accomplish traffic calming objectives, slowing operating speeds through the rapidly urbanizing area. The design of splitter islands should consider the following:

- The center lane should be incorporate textured pavement to visually distinguish the turn lane from travel lanes.
- A trail crossing is needed between the end of the Groom Church property and the beginning of the Brittingham Farm (at Schaffer Lane/Canary Creek Drive).
- Splitter islands should be wide enough to adequately provide a horizontal alignment shift as a traffic calming measure.
- Splitters should be wide enough to protect left turning traffic in the center lane for the anticipated traffic volume (different at Arkansas or Kansas than at Brittingham Farm, for example).
- Splitters should be wide enough for planting (use of a barrier curb allows for

shrubs and small trees (4" dbh at 25 years), or if constrained by right-of-way, environmental or other considerations, to support grasses and low shrubs.

- Splitters should be long enough and wide enough to allow for planting while maintaining all required sight distance triangles.



Figure 78 Narrow splitter island with crossover



Figure 79 12' splitter island with turn lane

Bridge Over Canary Creek and SLR

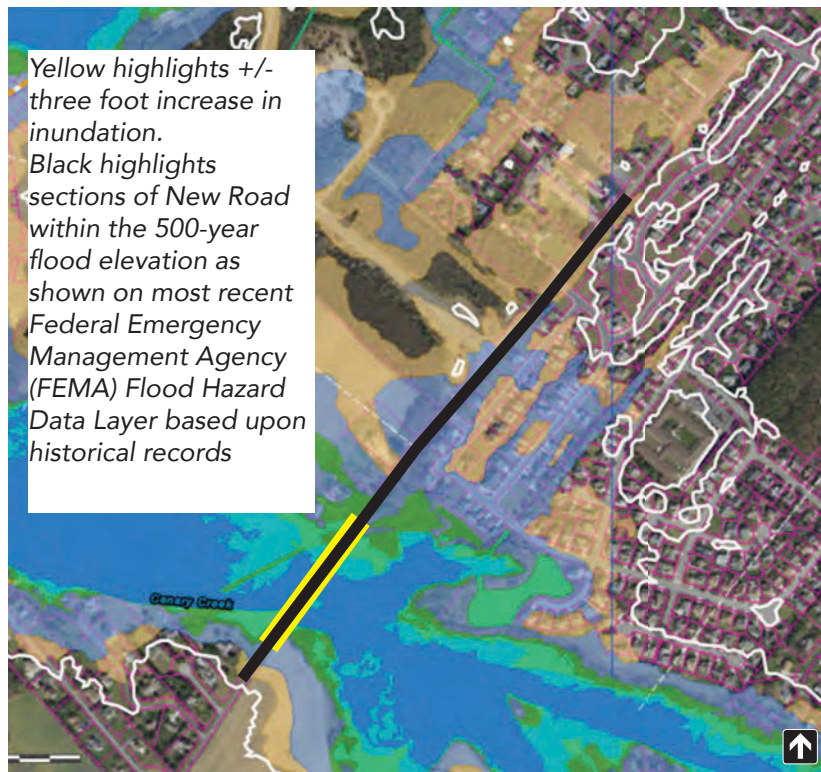


Figure 80 White contour line equals 10' above MSL; tan area shows current 500-yr flood elevation

Bridge Over Canary Creek

Executive Order 41 requires that state projects address the potential impacts of Sea-Level Rise (see page 15).

Application of Executive Order 41 to the bridge over Canary Creek would suggest that transportation improvements for a potential evacuation route (whether designated officially or not) address effects of SLR on the 100-year floodplain based upon a "high confidence" level – meaning that there is a 95% confidence that SLR will not exceed a rise of +/- three feet. Such an increase in SLR would also increase the 100-year floodplain to that roughly equivalent of the current 500 year flood elevation by 2075 (Figure 80). Figure 81 illustrates the relationship of those flood elevations to existing terrain. Other factors, such as cost and property considerations and environmental impact will be factored into the design as it develops.

The State Complete Streets policy also requires that the width of bridge must accommodate bicycle and pedestrian uses or consideration should be given to an independent bridge alignment for bicycles and pedestrians.

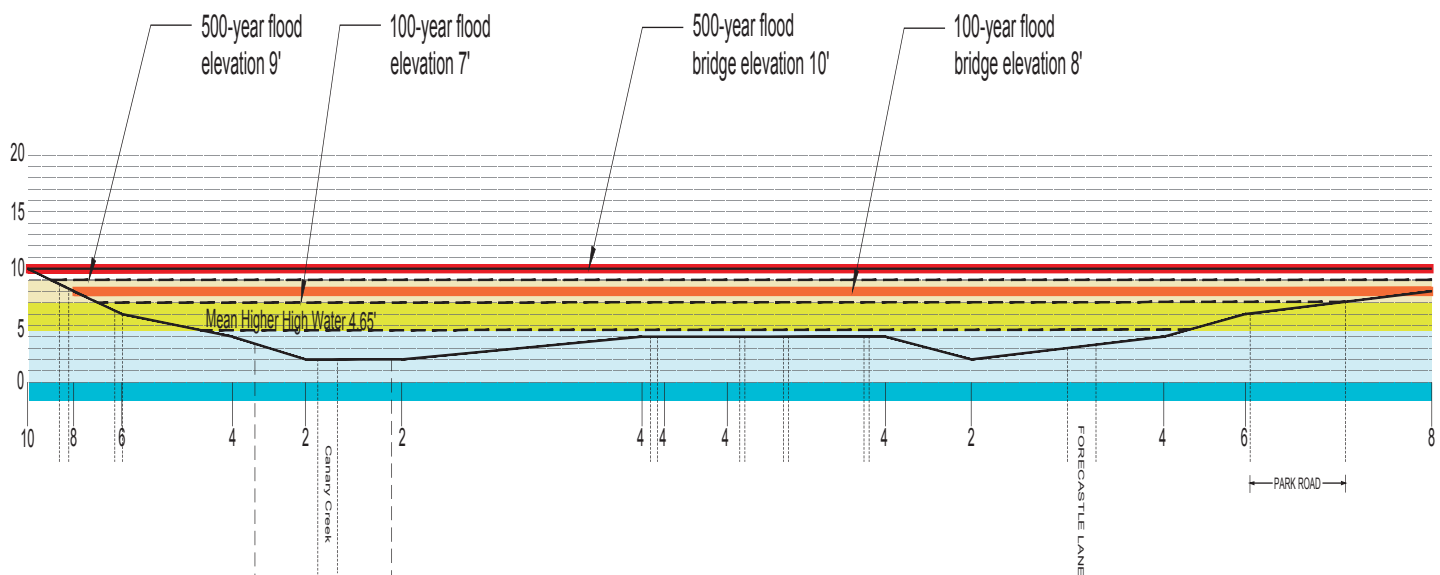


Figure 81 Bridge elevations in relationship to current and projected 100-year flood elevations (elevations shown are one-foot above estimated flood elevation)

Bridge Over Canary Creek: CMP Alignment (2014)



Figure 85 Illustrative concept showing a combined structure used to accommodate both the vehicular travel lanes and the shared use pathway with an overlook to Canary Creek

Bridge Over Canary Creek: suggested profile and details*



Figure 82 Bridges of Nordward (West 8) exemplify the preferred "thin" bridge with sleek profile

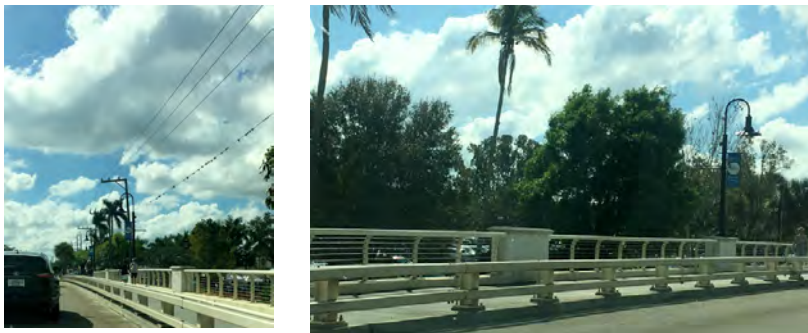


Figure 83 Box beam (inside) and pedestrian railing exemplify the preferred railing type



Figure 84 Example of CalTrans Rail Type 10 (left) and 20 (at bicycle pedestrian height of 54") approved for use at Test Level 4

The 2015 Historic Lewes Byway CMP recommended that a separate alignment be constructed on the EB side. However, that assumed a timeline for bridge construction much farther into the future. With the design and construction now identified as part of DelDOT's bridge replacement capital programming, the general sense of the stakeholders regarding guidance for the design of the new bridge incorporate the bicycle and pedestrian facilities as part of the bridge structure rather than as an independent alignment. DelDOT's preference for initial cost and long-term inspection and maintenance is also single structure.

The following additional Master Plan recommendations apply to the bridge design and trail alignment:

- Preference for "thin" bridge with sleek profile (Figure 82) and transparent railings/parapet (Figure 83 and Figure 84)
- Width of shared use pathway must accommodate all users
- Accommodate fishing/crabbing
- Accommodate soft landing for hand carry boats (e.g. kayak launch) and explore the viability for any on-site or nearby parking for fishing/crabbing and hand carry launch)



courtesy of Marta Namack



Figure 86 4th Street Vicinity Flood Risk (White contour line equals 10' above MSL; tan area shows current 500-yr flood elevation)

PARK ROAD TO PILOTTOWN ROAD

This section of New Road faces a very complex set of issues:

- The area is susceptible to nuisance flooding that will only get exacerbated with sea level rise
- The ditch lines, across a nearly flat landscape, need constant maintenance, but is not widely undertaken
- Motorists travel at a high rate of speed through the neighborhood
- There are no sidewalks and the pavement is narrow, leaving bicyclists and pedestrians to compete for space with the fast moving automobiles

Traffic Calming Concept at Park Road



12' splitter island with turn lane



12' splitter with gore area pavers

Park Road

Park Road represents the first location where horizontal alignment shifts can be introduced to slow EB traffic on New Road. A turn lane is proposed for Park Road coupled with an alignment shift just east of the intersection.

Figure 87 Concept plan or recommended modifications to the Park Road intersection with splitter island examples



Figure 88 Catchment Area for the WB side of New Road feeds to culverts (blue circles)- NTS

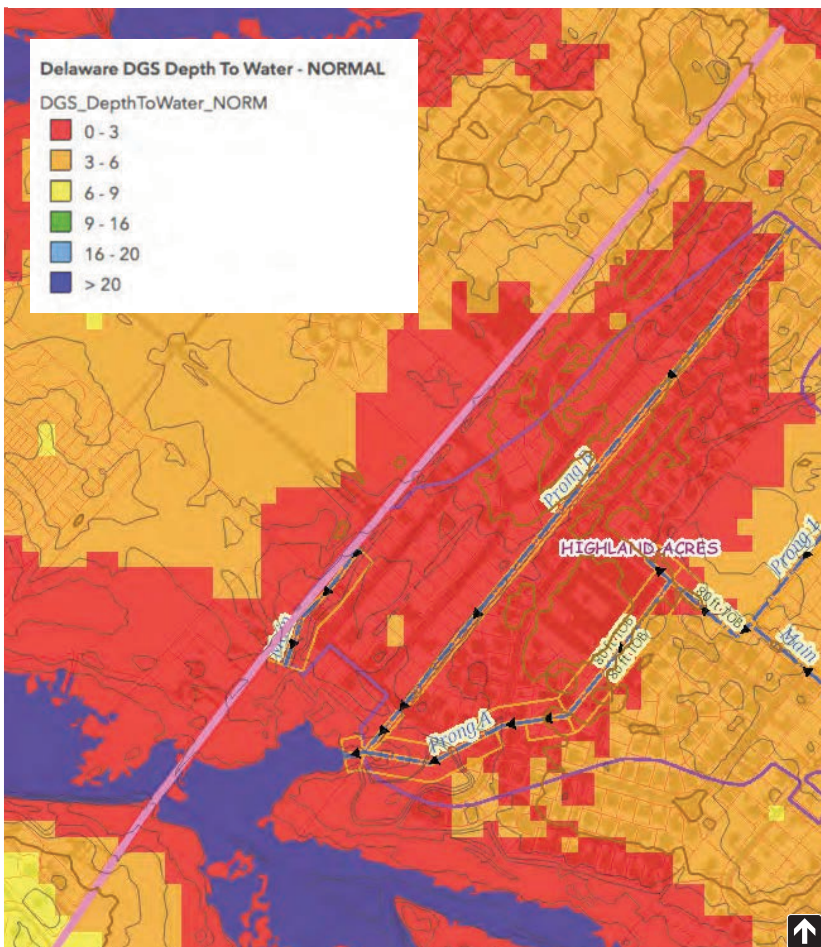


Figure 89 Depth to water table derived by identifying dry, normal, and wet periods from long-term observation well data (DNREC/DGS) - (NTS)



Figure 90 Ditchline on WB side of New Road leading to outlet on EB side (inset)

Existing Conditions

The area between Canary Creek and Pilottown is relatively flat and prone to nuisance flooding as waters flow from the north and west of New Road between houses towards three inlets on the northwest side of the road as shown in Figure 88. The culvert that collects water from the Le Briton subdivision (120-132 New Road) is shown in the inset photo above.

Drainage from the SW side of New Road flows directly into the ditch on the SW (EB lane) side of the road. The Highland Acres tax ditch system collects surface runoff from the catchment area shown in purple in Figure 88, with a portion of the catchment area feeding into the New Road Ditch in the vicinity of Park Road.

During a flood event, water backs up on the WB side of New Road unable to cross through the culvert to the ditch on the EB lane.

A third factor affecting runoff is the depth to water table which is between zero and three feet during normal periods for the area roughly southwest of 4th Street (Figure 89). A ridge just east of 4th Street is the primary divide between waters draining towards Canary Creek and waters draining toward the Delaware Bay.

Neighborhood Stormwater Ideas



Figure 91 Roadside bio-swale



Figure 92 Median bio-swale

After extensive discussion with neighboring residences, a three step approach is recommended with all three requiring more detailed studies that is beyond the scope of a master plan.

- Continue to work on maintaining and restoring the ditch line that carries water on the southeast side of New Road towards Canary Creek, including the potential of expanding the undersized culverts.
- Adjacent property owners on the northwest side (generally between 120 and 132 New Road) expressed a willingness to maintain a roadside bio-swale and/or rain garden to treat the quality of runoff and quantity that enters the ditch system (Figure 91) if constructed as part of any road re-configuration and stormwater management effort. This will have the added benefit of trapping sediments before they enter the ditch system.
- Work with DelDOT, the City, Board of Public Works and the Highland Acres tax ditch representatives to develop an overall "grey-green" infrastructure enhancement plan that would combine a closed drainage system with infiltration swales and/or median swales (to be designed at a future date) to increase the sustainability of the stormwater management system at least through the next 20-30 year period of climate change and sea-level rise. Shallow groundwater depths may limit future infiltration capacity, especially as sea levels rise. This technique could be applied at the upper reach of the catchment area near 4th Street, provided that subsurface testing is completed to determine actual depth to water table. A minimum of 2' separation is required between the bottom of the bio-swale and the water table; more is desirable.

Traffic Calming and Pedestrian Safety

Splitter islands are recommended approaching 4th Street in the area where the asphalt pavement has been widened. The splitter islands are needed to introduce a horizontal shift in the vehicular path and to block the long distance sight lines. Figure 93 illustrates how the splitter islands would work within the available right-of-way and how a median bio-swale could be installed with soil cells to help improve water quality and slow the pace at which water is released into the ditches.

The typical section in this area would shift towards closed drainage for the roadway, bike lanes, and a sidewalk on one side with the rain gardens/bioswales on the northwest side, or if rain gardens are infeasible, then sidewalks on both sides. (See Figure 36 on page 32). Bike lanes should be tinted green to reduce the overall perceived width of the roadway and to discourage drivers from using the bike lanes as a bypass lane.

Traffic Calming Concept Approaching 4th Street (w/infiltration)

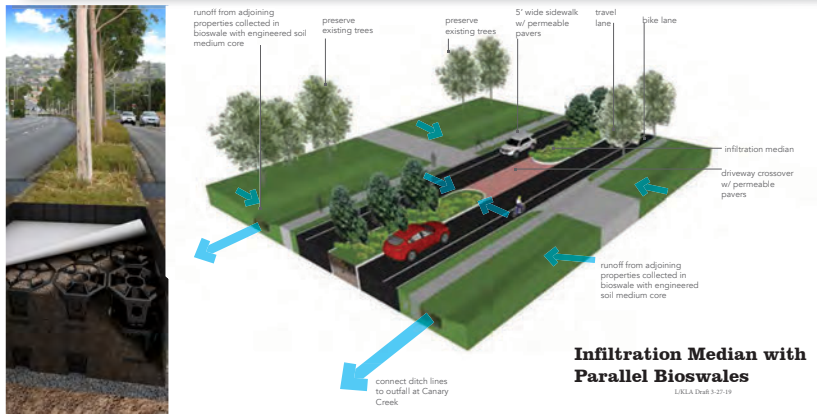


Figure 93 Diagram illustrating grey-green-hybrid system with soil cells in median (right) - actual tree planting must be sized for clear area of median (width TBD). Maximum size of trees likely to be 4" diameter at breast height (dbh) at 25 years.

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