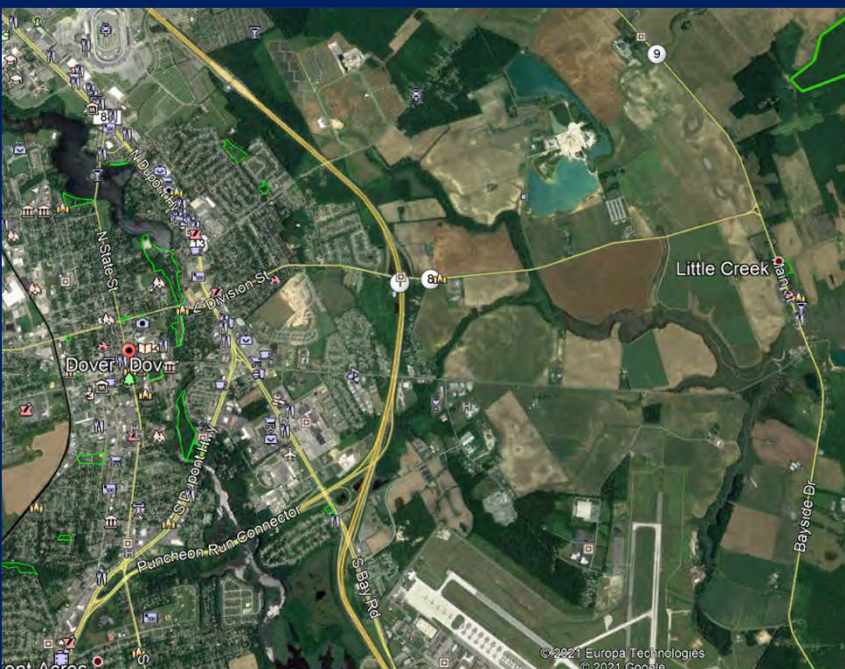
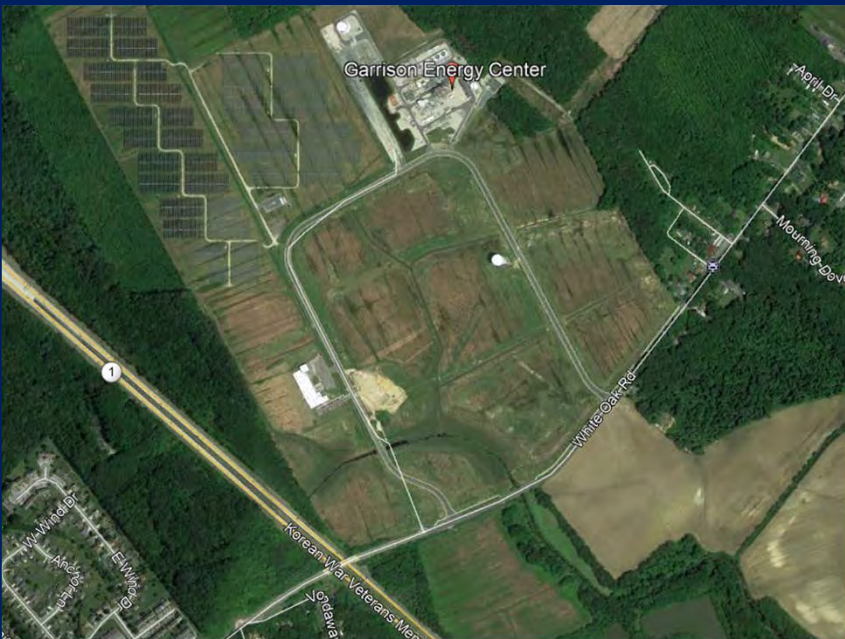




DOVER AIR CARGO  
FREIGHT ACCESS STUDY -  
PLANNING AND  
ENVIRONMENTAL  
LINKAGE (PEL) REPORT



**CENTURY**  
ENGINEERING

July 2021

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## Executive Summary

The Dover Air Cargo Freight Access Study examined possible transportation improvements needed to support economic growth on the east side of SR1 from the DAFB to north of White Oak Road. Over the last decade both the City of Dover and Kent County have made considerable investments on the east side of SR1 to create opportunities for economic growth supporting high quality new jobs. The City of Dover has major investments in the Garrison Oak Business and Technology Center (Garrison Oak) and there have been significant efforts by both the City of Dover and Kent County to realize the full economic potential of the Central Delaware Aviation Complex (CDAC), formally known as the Civil Air Terminal (CAT). The marketing efforts for both these potential employment centers have identified transportation issues and access to SR1 as a major reason for businesses not wanting to locate in this area. This study and the resulting recommendations were an effort to identify the needed transportation improvements and access to SR1 to support the continued growth of both Garrison Oak and the CDAC.

An examination of the existing conditions revealed that the current businesses and any future businesses at Garrison Oak and the CDAC use the local roadway network for their heavy truck shipping and deliveries. These roads were not designed for heavy truck traffic and they limit future growth and expansion opportunities. Many of these local roads have been developed over time with residential development on both sides of the road which is not conducive for heavy truck traffic. Based on an examination of possible alternatives it was determined that a new freight corridor roadway north of South Little Creek Road is needed to support the growth goals of the area. This would essentially extend existing Horsepond Road from its existing terminus north to White Oak Road. To the south of South Little Creek Road upgrades to existing local roads, both Horsepond Road and Lafferty Lane, would support heavy truck traffic. In addition, to support the future growth plans of both the City of Dover and Kent County, Starlifter Avenue should be extended north to South Little Creek Road creating another access point into the CDAC.

The study also looked at the feasibility of creating a more direct connection to SR1 through the creation of a new interchange. This effort concluded that there are no opportunities to create an additional interchange with SR1 that would meet established design standards. The existing interchange on North Little Creek Road will have very close proximity to the new freight corridor and centrally serve all the areas east of SR1.

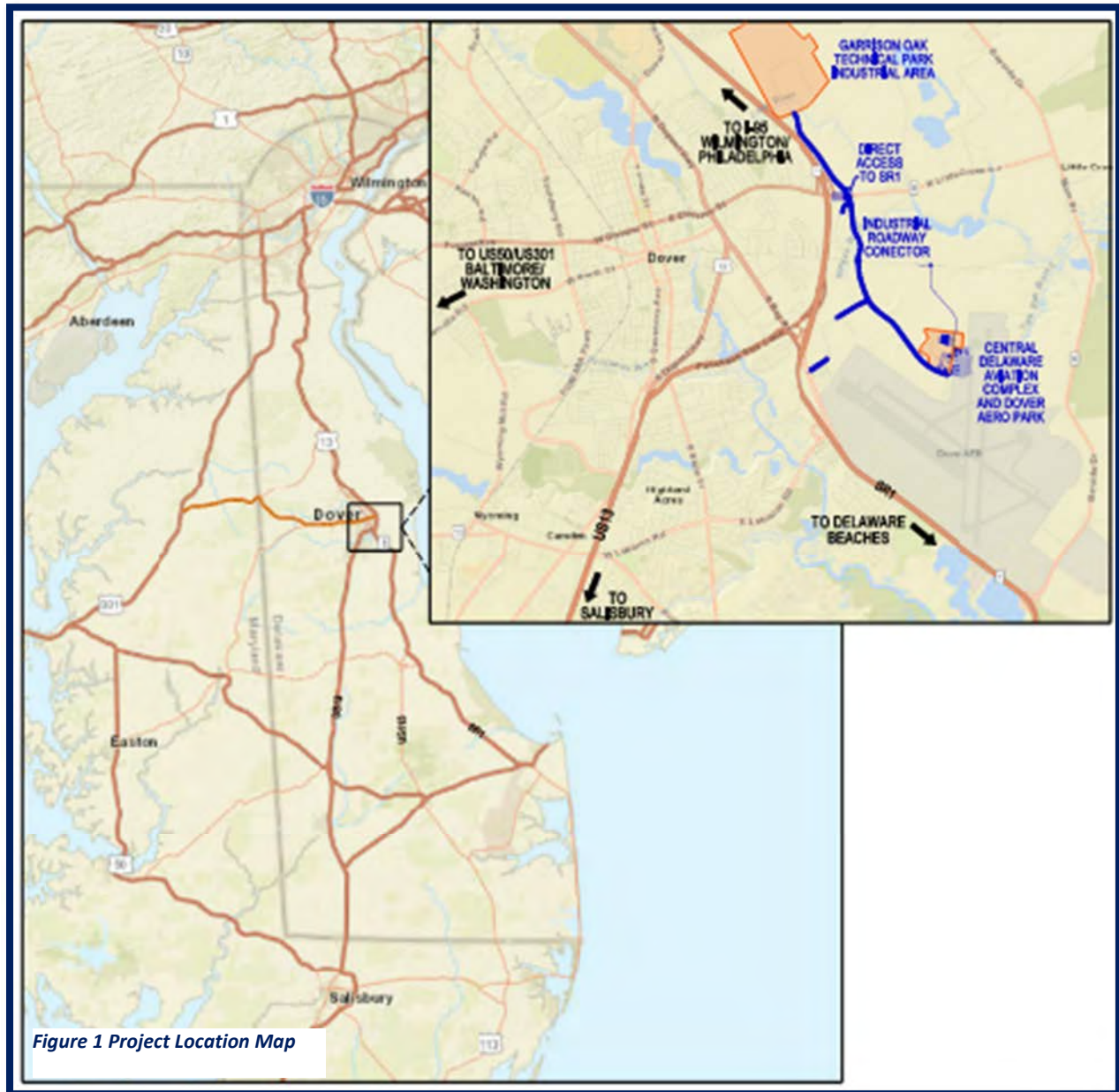
The study included robust stakeholder engagement including an Advisory Committee, 2 public workshops, local business owners survey and a separate business owner meeting to assess the truck and transportation needs of the local businesses in the area. Feedback during the public process confirmed general support for the recommendations included in this study.

The recommended implementation plan calls for the new alignment sections of Horsepond Road to be prioritized first working North to South. Each segment has independent utility and can be implemented in a phased approach. The upgrades to existing Horsepond Road and Lafferty Lane can follow. The Starlifter Avenue extension can be implemented concurrent with future growth and development in that area.



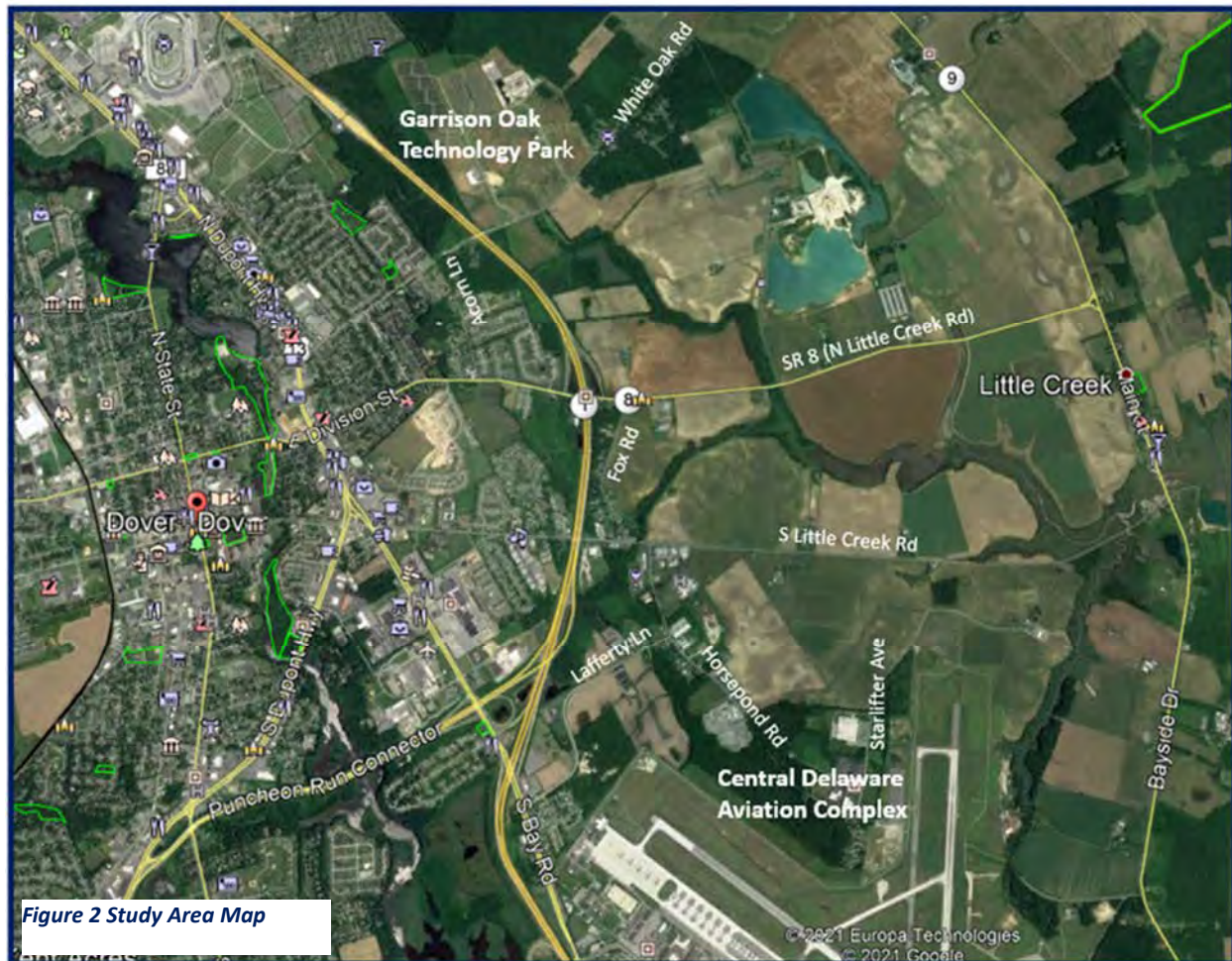
## Study Location

The Dover Air Cargo Freight Access Study is located on the east side of the City of Dover, DE, as shown in **Figure 1**. Portions of the study area include unincorporated sections of Kent County. Some of these unincorporated areas are identified as potential City of Dover future annexation areas.



## Study Area

The Dover Air Cargo Freight Access study area is bound to the south by the Central Delaware Aviation Complex (CDAC), to the north by Garrison Oak Business and Technology Center (Garrison Oak), and to the east and west by SR 9 (Bayside Drive) and US 13 (S. Bay Road) respectively. SR 1 extends in a north/south direction approximately through the center of the study area, and S. Little Creek Road, N. Little Creek Road (SR 8), and White Oak Road are the primary east/west routes in the study area. **Figure 2** provides a Study Area Map.



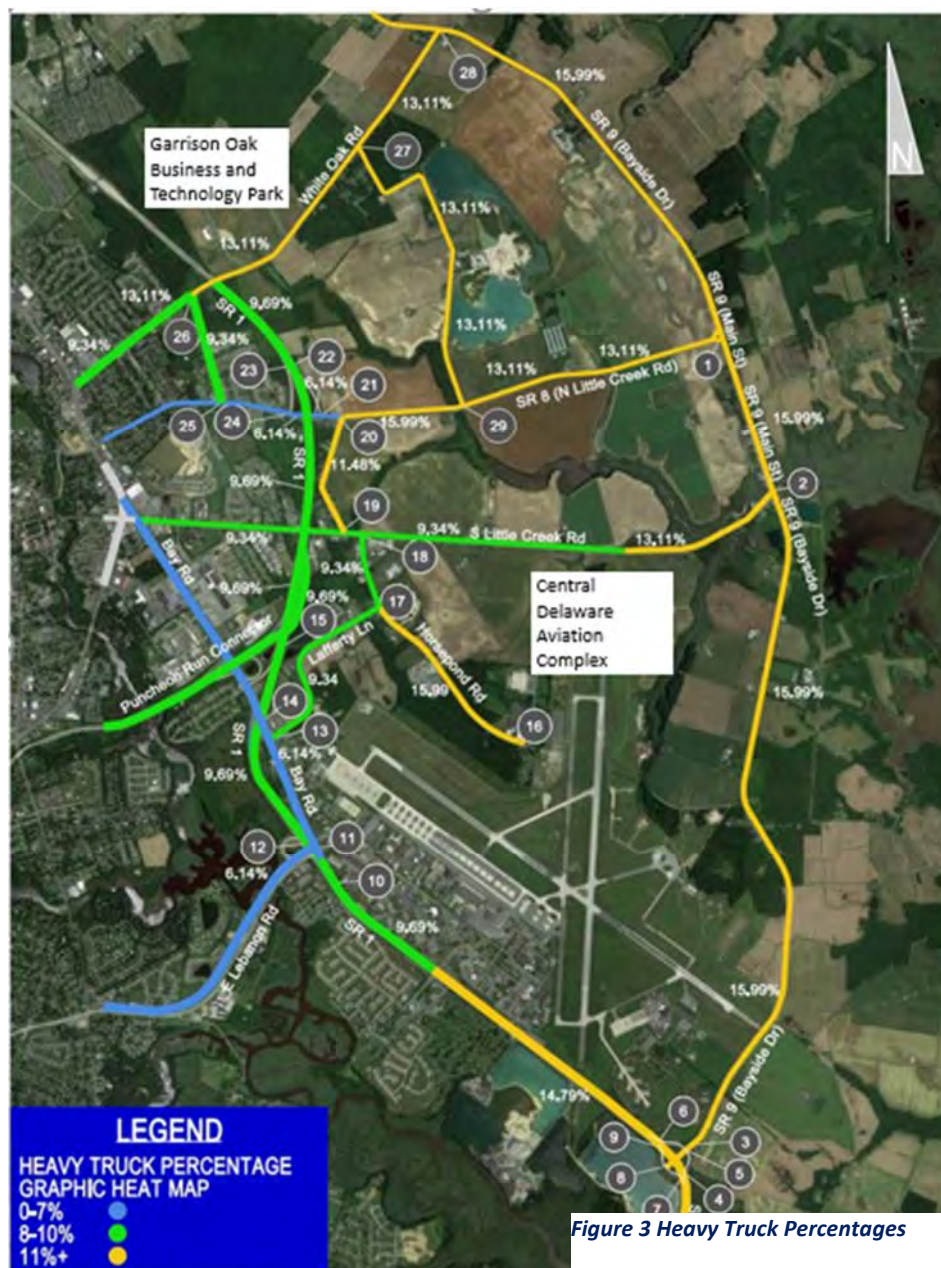
## Purpose & Need

The primary purpose of the Dover Air Cargo Freight Access Study is to identify improvements that would enhance connections and access to the CDAC at the Dover Air Force Base and the Garrison Oak Business and Technology Center (Garrison Oak) to the north from the regional highway network, as well as improve connections between these two facilities. These improved connections could potentially draw in more

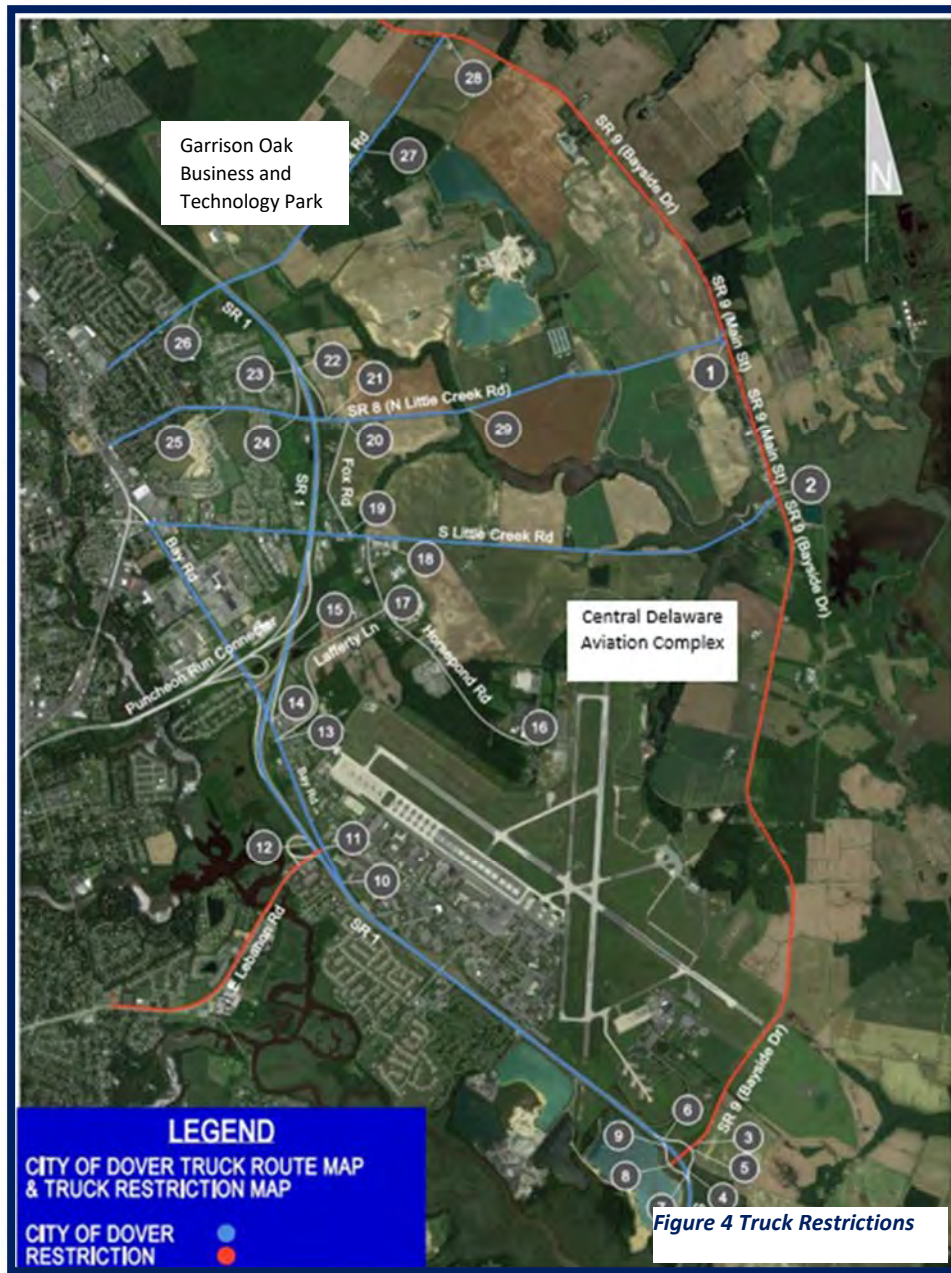
businesses to CDAC and Garrison Oak. An additional benefit would be the reduction of traffic, particularly heavy-truck traffic, on the area's local roadway network.

Currently, trucks traveling to and from both the CDAC and Garrison Oak must use a series of local roads that were not designed for heavy trucks to access the regional highway network. These roads include Fox Road, Acorn Lane, Horsepond Road, and Lafferty Lane. This condition is inefficient for existing truck traffic, and potentially limits future growth of new businesses from locating to these facilities.

**Figure 3** shows several roads with high to moderate truck percentages. These roads include SR 9, White Oak Road, Long Point Road, N. & S. Little Creek Roads, Fox Road, Horsepond Road, Lafferty Lane, and SR 1.



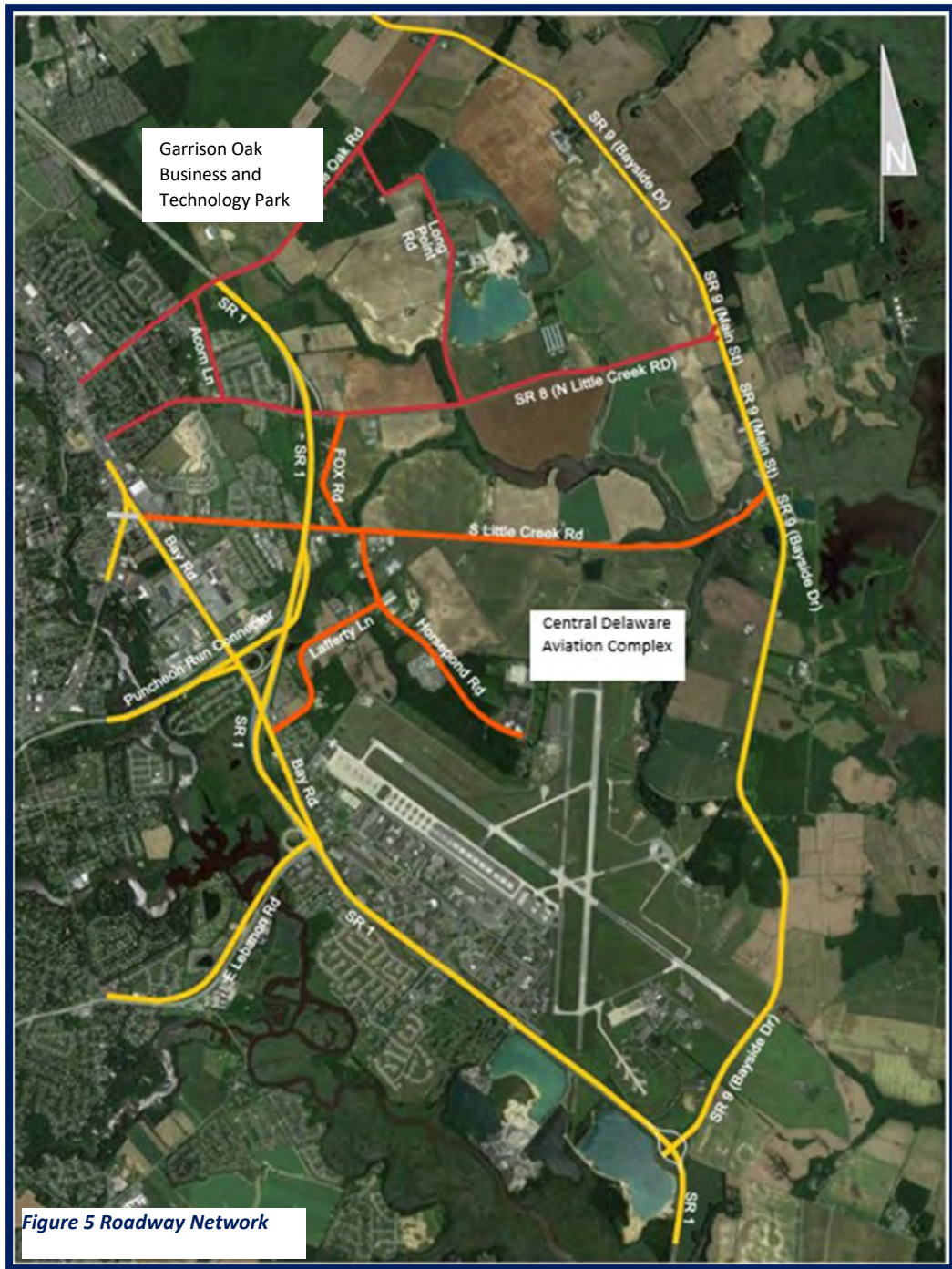
**Figure 4** identifies roads that have been identified for truck use, such as SR 1, White Oak Road, and N. & S. Little Creek Roads, as well as those roads with current truck restrictions, such as SR 9 and E Lebanon Road.



These restrictions prohibit trucks from using these roads other than local deliveries but considering the percentage of truck traffic currently using them, it appears that non-local trucks are using these roads. One of the goals of this study is to remove non-local, heavy truck traffic from these local roads by developing and providing better options for truck traffic.

**Figure 5** provides an overview of the roadway network in the study area. The yellow roads are major roads, which are part of the regional roadway network such as US 13, SR 1, and SR 9. These roads are the

most heavily used by trucks. It should be noted that there is an existing truck restriction on SR 9, but trucks continue to use it as a primary north/south route. The heavy truck usage of SR 9 indicates the need for an additional north/south route as an alternate to SR 1 in this area and would allow SR 9 to function as intended by the existing restrictions, limiting truck travel to local deliveries only.



The roads shown in red in **Figure 5** generally service truck traffic to and from Garrison Oak. These roads include White Oak Road, Acorn Lane, Long Point Road and N. Little Creek Road. Acorn Lane is a small residential street, 22-feet in width with no shoulders, that was not designed to accommodate truck traffic.



Like the roads that currently serve Garrison Oak, many of the roads that serve the CDAC were not designed to accommodate truck traffic. The roads shown in orange in [Figure 5](#) generally service truck traffic to and from the CDAC. These roads include Horsepond Road, Lafferty Lane, S. Little Creek Road, and Fox Road. Fox Road is a small county road, 22-feet in width, with no shoulders, and was not designed to accommodate truck traffic.



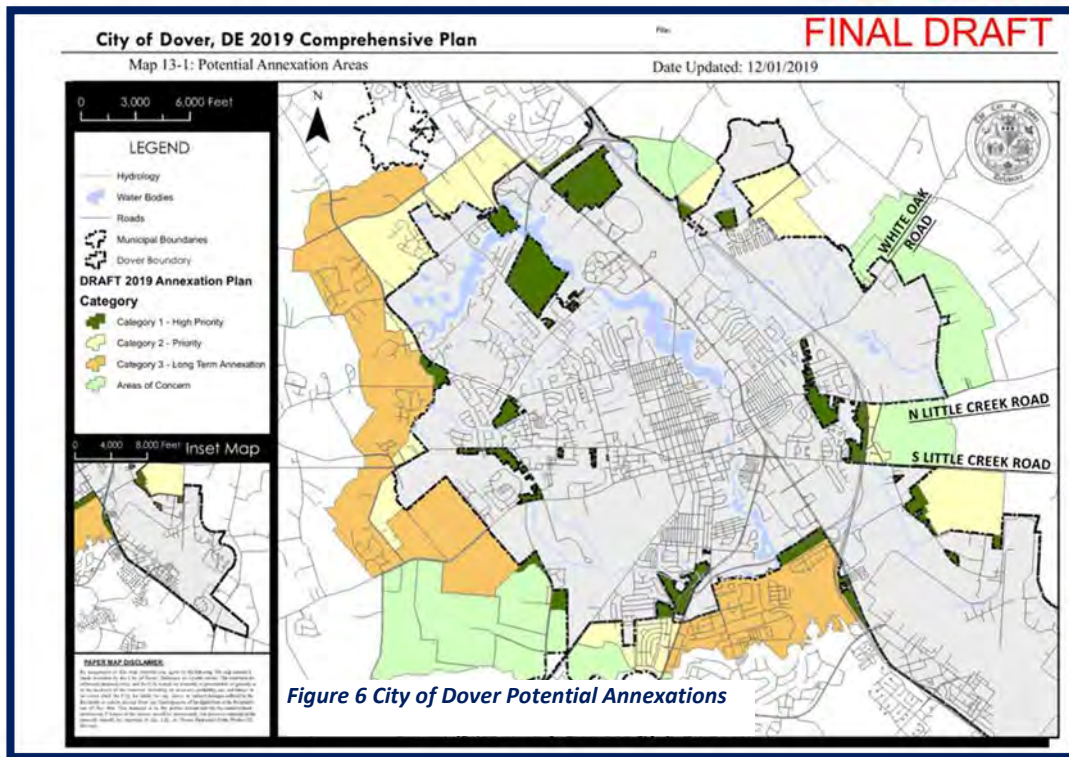
White Oak Road is more capable than Acorn Lane of accommodating truck traffic; however, trucks have a difficult time negotiating the White Oak Road/Acorn Lane intersection. Furthermore, passenger vehicles often come in conflict with trucks at this intersection.



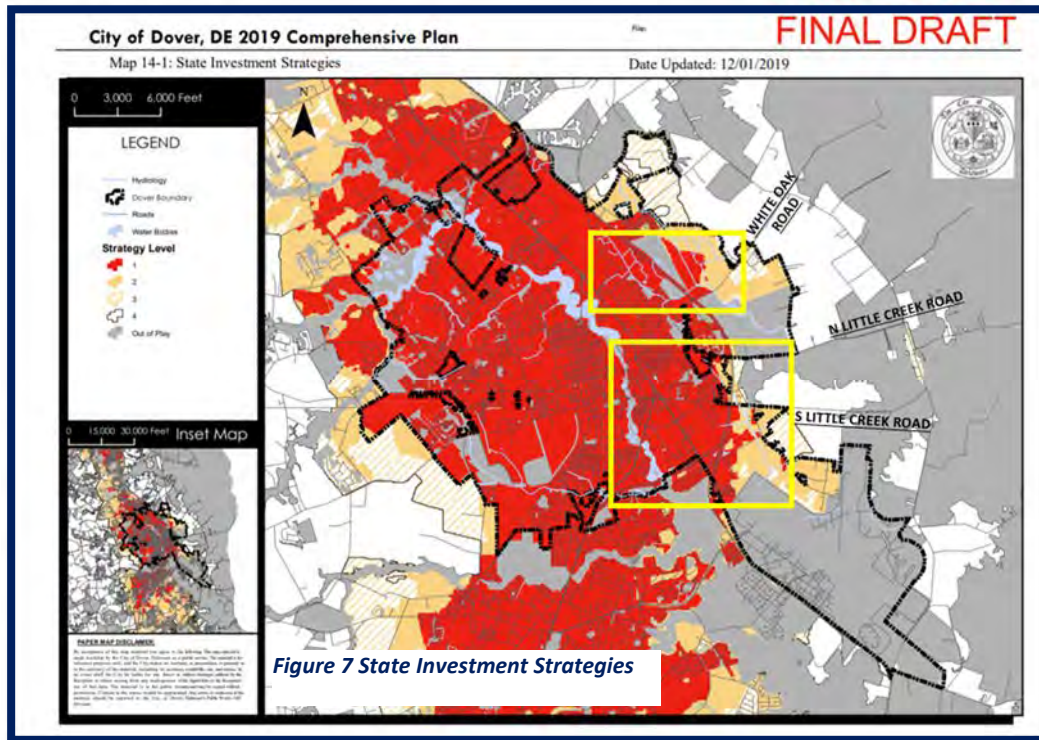
Both N. and S. Little Creek Roads can accommodate truck traffic; however, their intersections with Fox Road are difficult for trucks to negotiate, and passenger vehicles and trucks are often in conflict at these intersections.



These potential improved connections would support and are consistent with the future land use for the area as identified in both the Kent County and City of Dover Comprehensive Plans as shown in **Figure 6**.



As shown in [Figure 7](#), the proposed improvements are also consistent with the State's Strategies for Spending. The majority of the study area, including both the CDAC and Garrison Oak, are comprised of Strategy Level 1 and 2, which are identified as the highest investment areas.

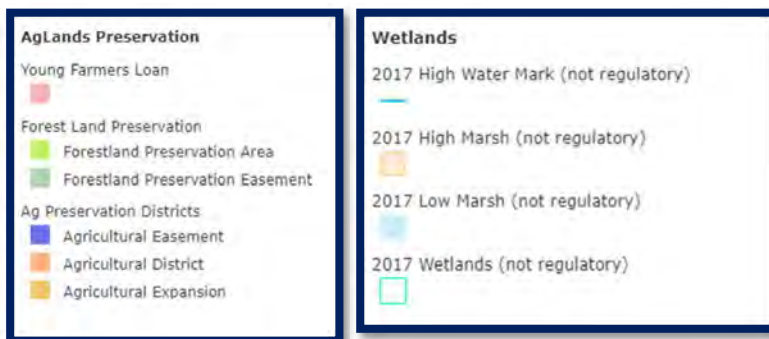
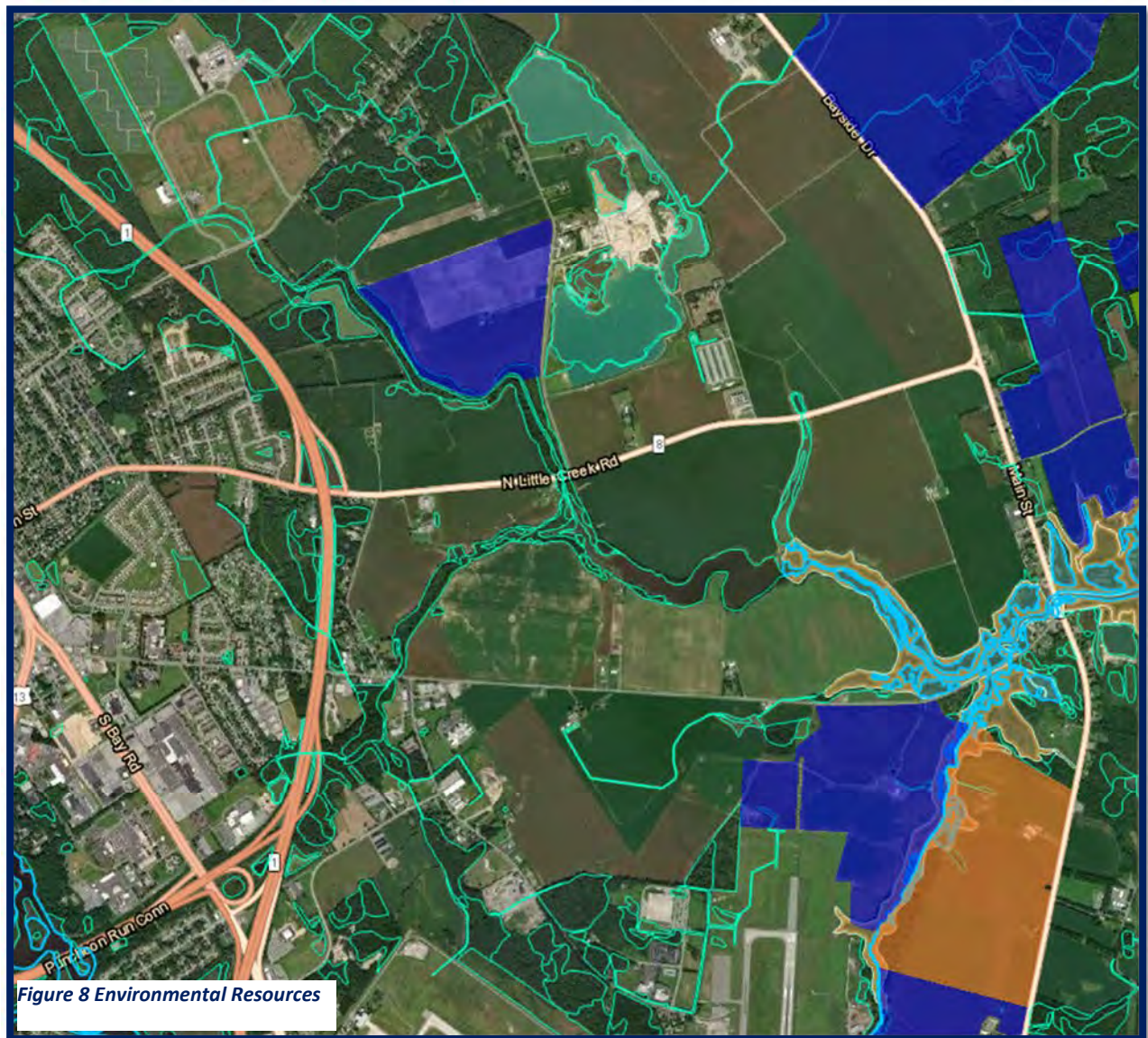


## Existing Conditions, Environmental Resources & Project Description

Existing conditions in the study area are comprised of a variety of land uses including active farmlands, agricultural easements, wooded areas, and wetlands. The study area also contains parcels owned by DelDOT, parcels where DelDOT holds Corridor Capacity Preservation Program (CCPP) development rights, and areas that have been designated as accident prevention zones. The built environment includes residential, commercial, and industrial uses including a portion of the Dover Air Force Base.

Environmental resources in the study area are primarily comprised of farmlands, wetlands, and small waterways. Additionally, some of these resources may include habitat that supports Rare, Threatened and Endangered Plant and Animal Species.

**Figure 8** depicts existing land uses and environmental resources in the study area.



As individual improvement recommendations advance to design projects, if any federal funds are used and/or any federally protected resources are impacted, the requirements of the National Environmental Policy Act of 1969 (NEPA) will need to be satisfied.

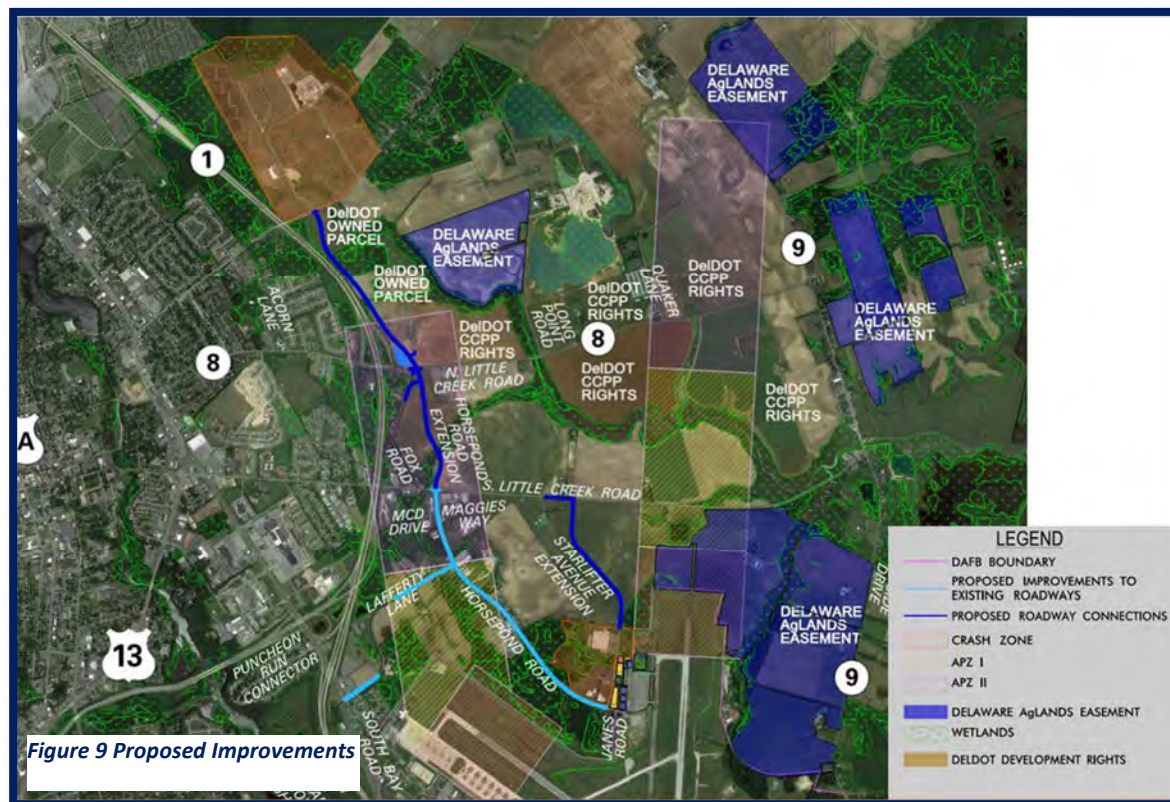
It is therefore recommended that coordination with the following agencies occur at the outset of any future design projects that advance as a result of this study:

- Delaware State Agricultural Lands Preservation Foundation
- Army Corps of Engineers
- DNREC
- USFWS
- FHWA
- DE SHPO
- Kent County

The general description of the project includes the following:

- Improvements to existing Horsepond Road from its existing terminus with Starlifter Avenue to its current terminus with S. Little Creek Road.
- An extension of Horsepond Road from its current terminus with S. Little Creek Road to a new terminus with White Oak Road.
- Improvements to portions of existing Lafferty Lane. These improvements would occur at and near its intersections with Horsepond Road and S. Bay Road.
- An extension of Starlifter Avenue from its current terminus at Galaxy Drive to a new terminus with S. Little Creek Road.

**Figure 9** illustrates the existing land use and proposed transportation improvements in the study area.



## 1. Alternatives

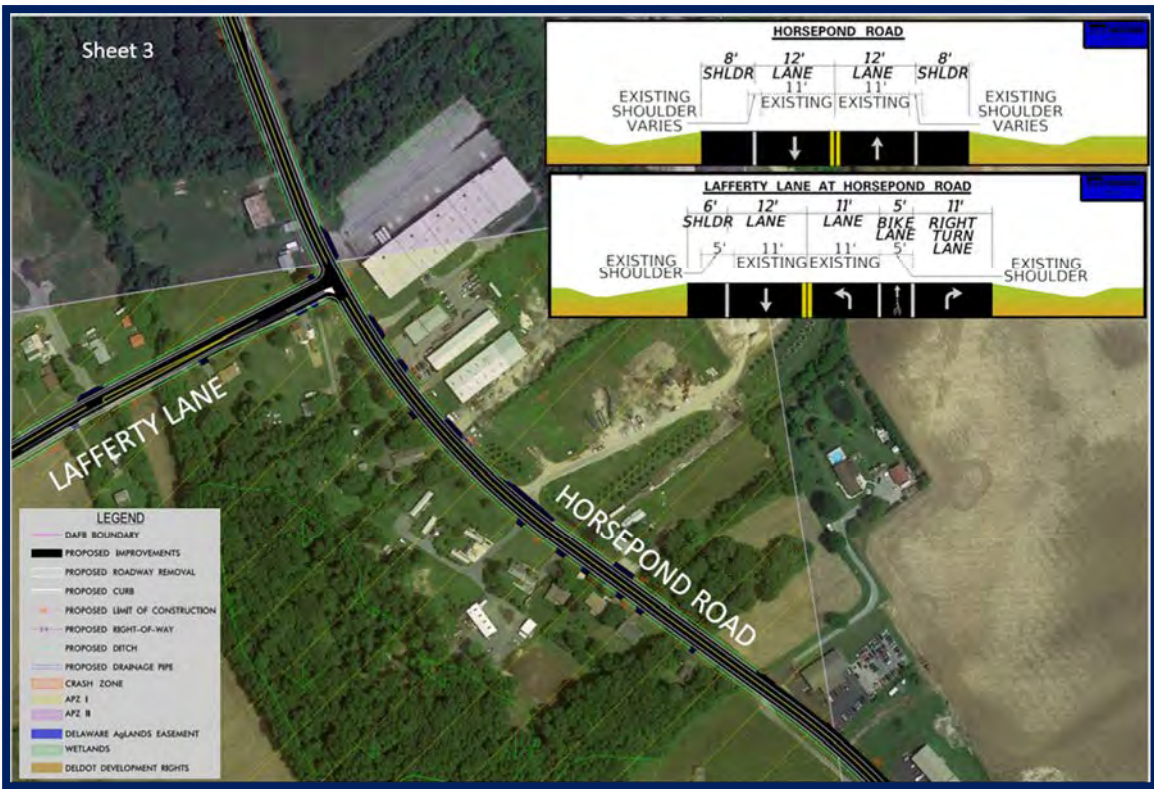
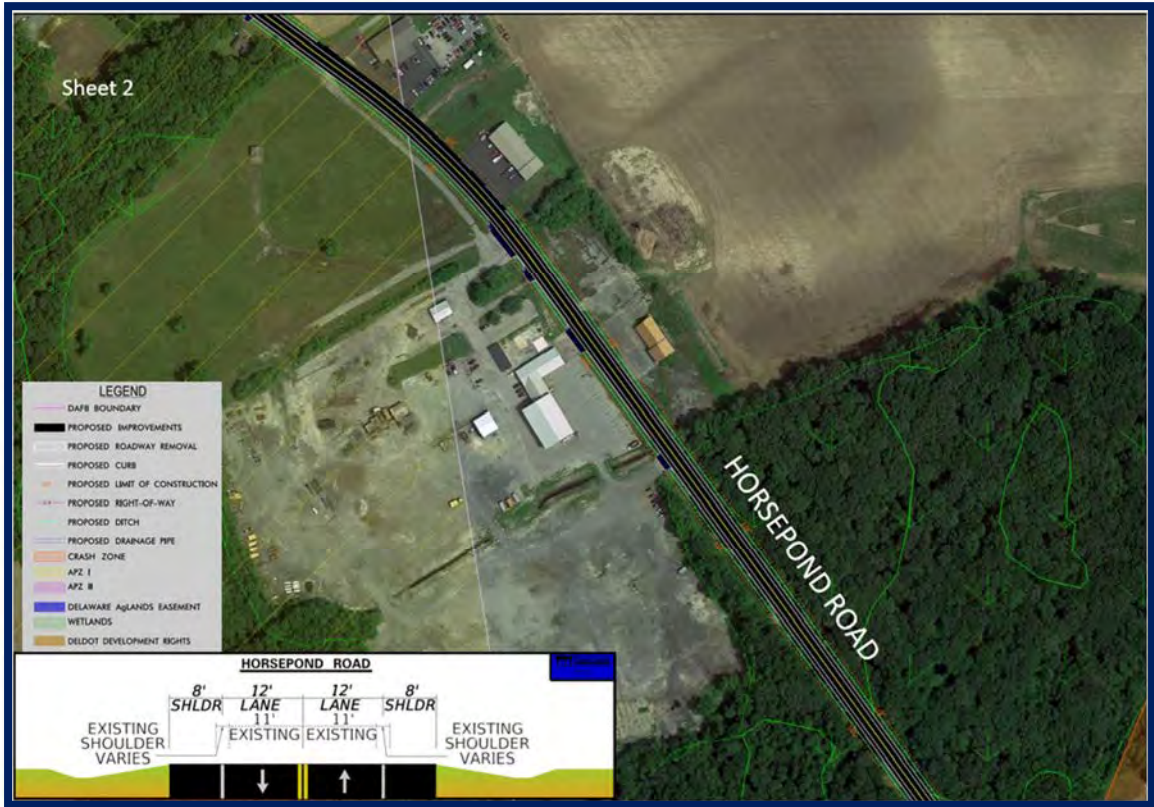
Several Alternatives were evaluated as part of this study including improvements to existing roads, as well as extensions of existing roads on new alignment. Each of the proposed improvements have independent utility and logical termini and therefore can function independently. Likewise, none preclude or exclude the need for any other improvements from being constructed. The following provides a description of each of the proposed improvements developed as part of this Study:

### *Existing Horsepond Road Improvements*

Existing Horsepond Road is comprised of two 11-foot lanes with shoulders that vary in width up to three-feet wide between Starlifter Avenue and S. Little Creek Road. Proposed improvements to existing Horsepond Road would include a consistent typical section of two 12-foot lanes, two 8-foot shoulders, and improvements at the intersections with Lafferty Lane and S. Little Creek Road.

The following series of four graphics illustrates the proposed improvements to existing Horsepond Road. Sheet 1 starts at the intersection of Horsepond Road and Starlifter Avenue and continues through Sheet 4 where Horsepond Road intersects with S. Little Creek Road.





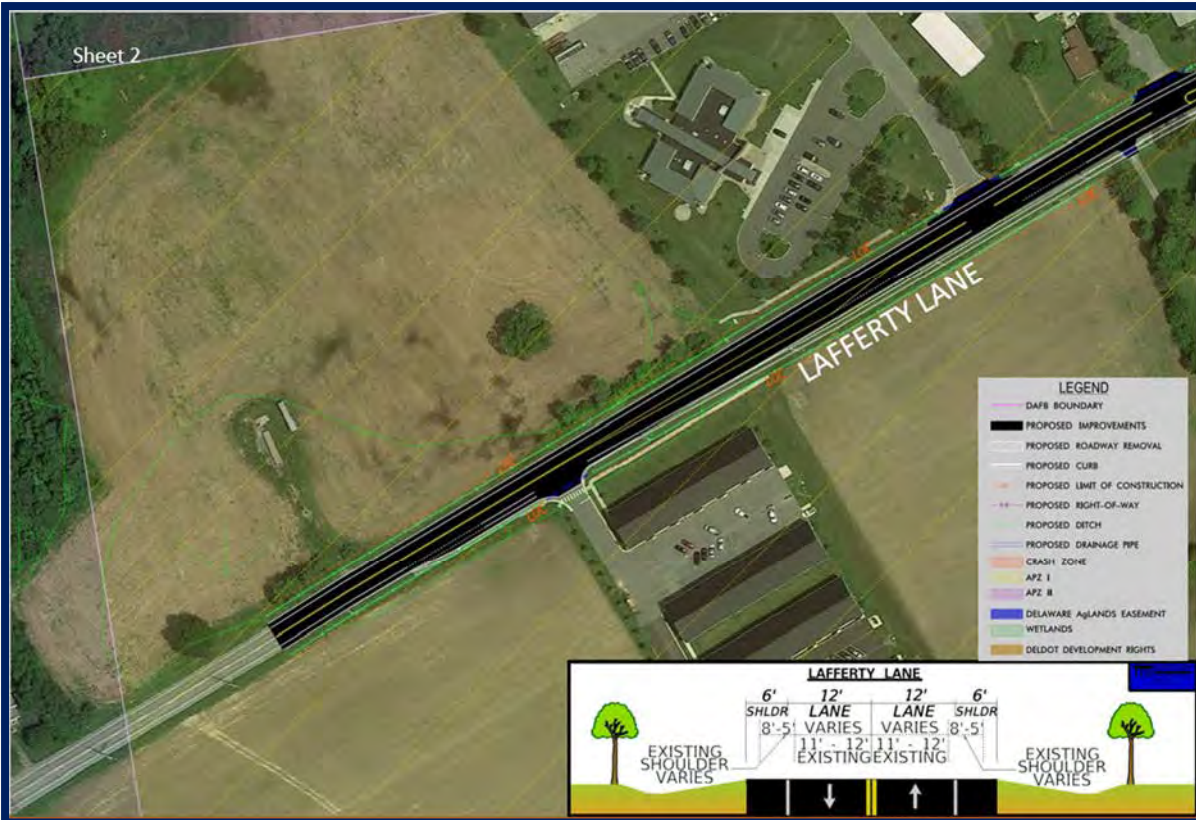
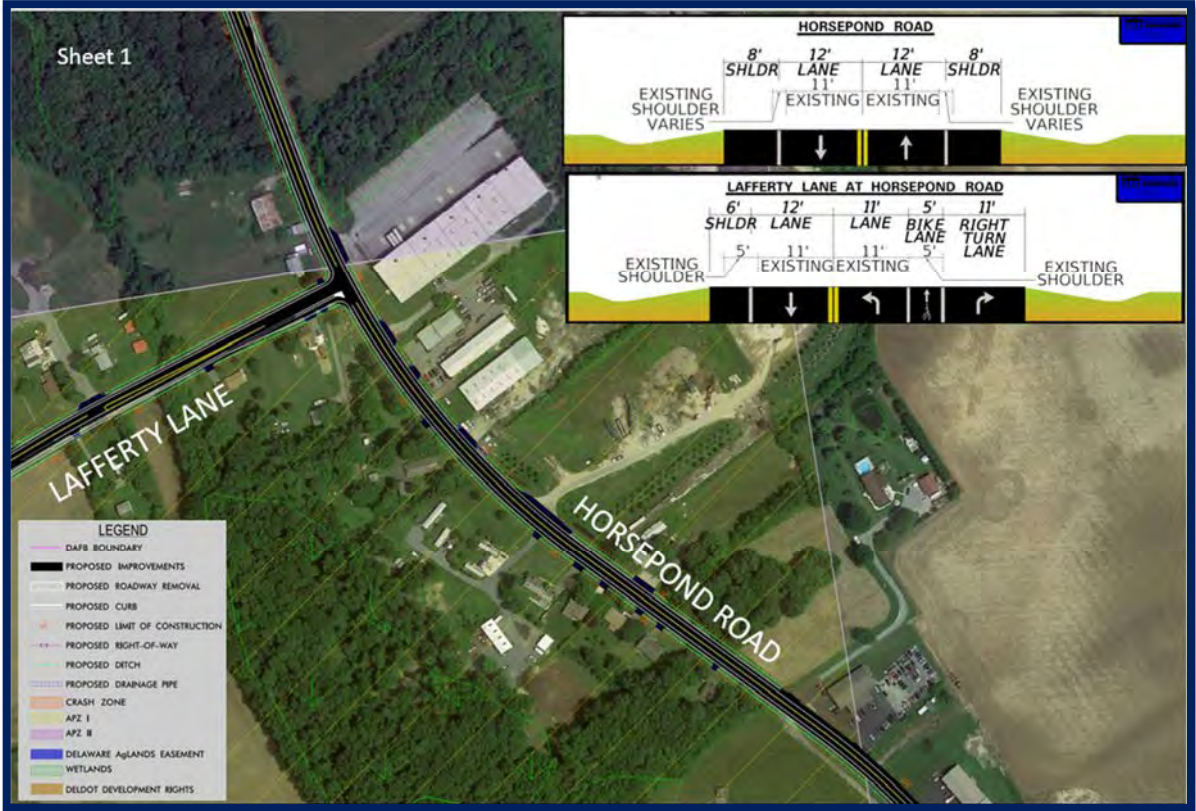


### Existing Lafferty Lane Improvements

Improvements to existing Lafferty Lane are primarily focused on the approaches to the intersections with Horsepond Road and S. Bay Road.

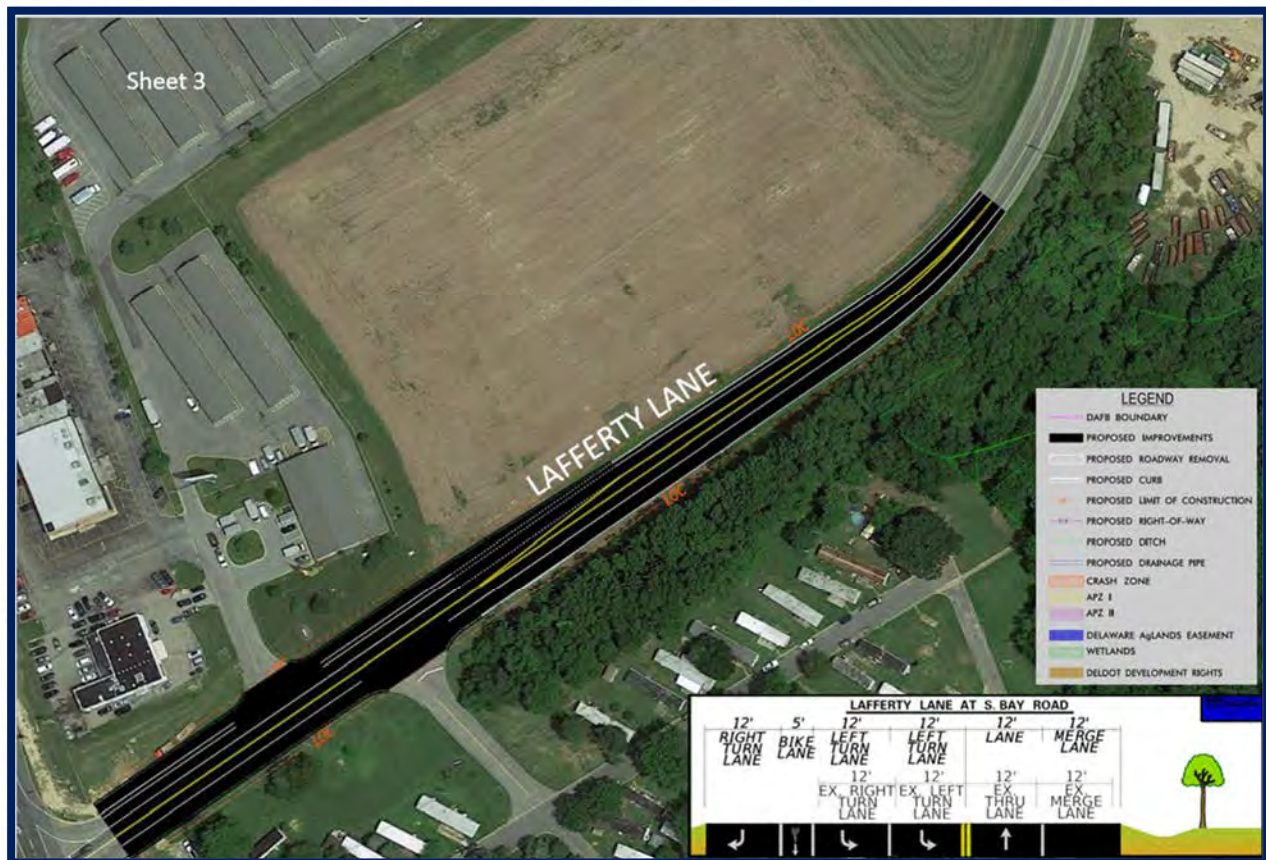
The Lafferty Lane improvements include: a consistent typical section of two 12-foot travel lanes and two 6-foot shoulders. These improvements would total approximately 1,800 feet in length and tie into a similar typical section west of Horsepond Road. At the intersection with Horsepond Road the typical section consists of an 11-foot left turn lane, 5-foot bicycle lane, and an 11-foot right turn lane.





Improvements to Lafferty Lane at the S. Bay Road intersection include, designated left and right turn lanes from Lafferty Lane to S. Bay Road; a 5-foot shared shoulder/bicycle lane; a 12-foot travel lane, and a 12-foot merge lane along Lafferty Lane from S. Bay Road. These improvements are proposed to extend from S. Bay Road for approximately 1,200 along Lafferty Lane.

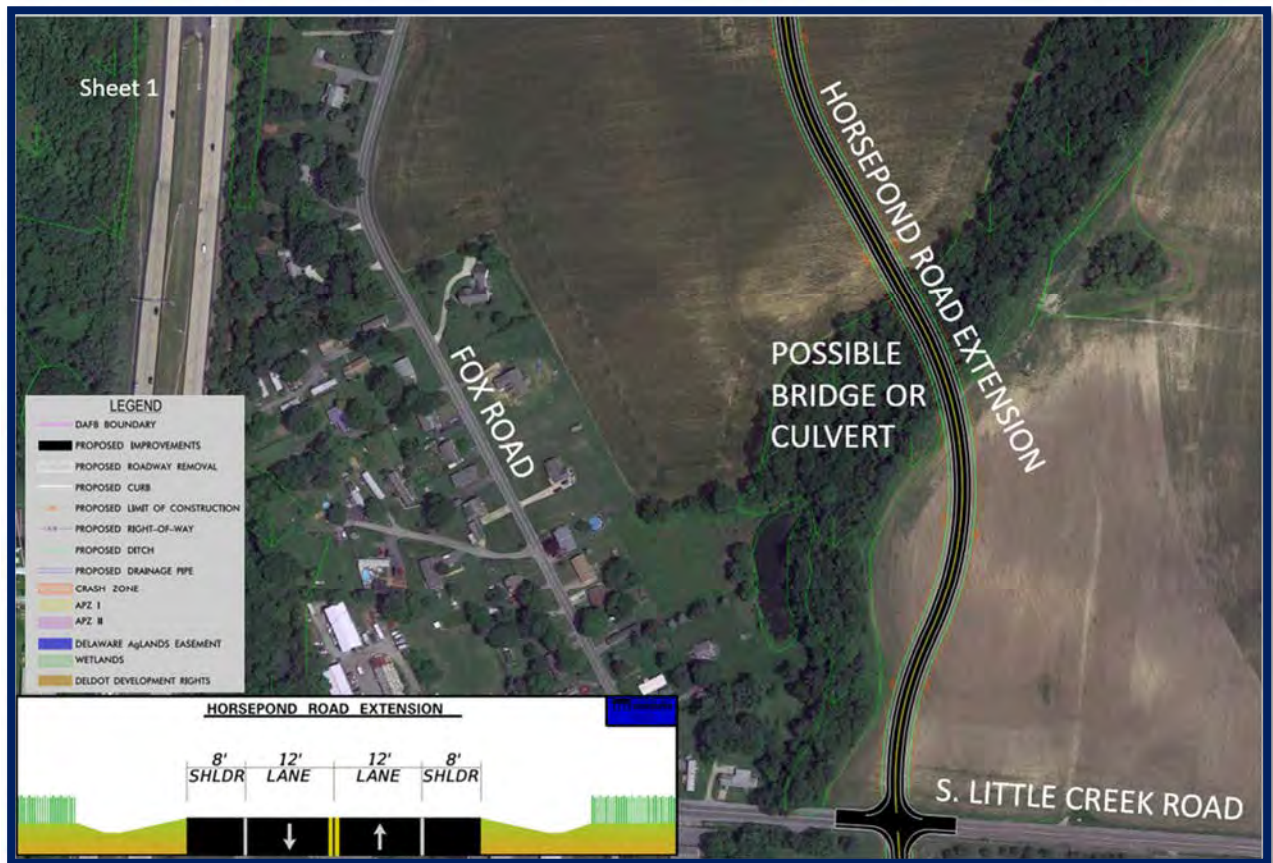
The following graphic illustrates the proposed improvements along Lafferty Lane at the S. Bay Road intersection.



### Horsepond Road Extension

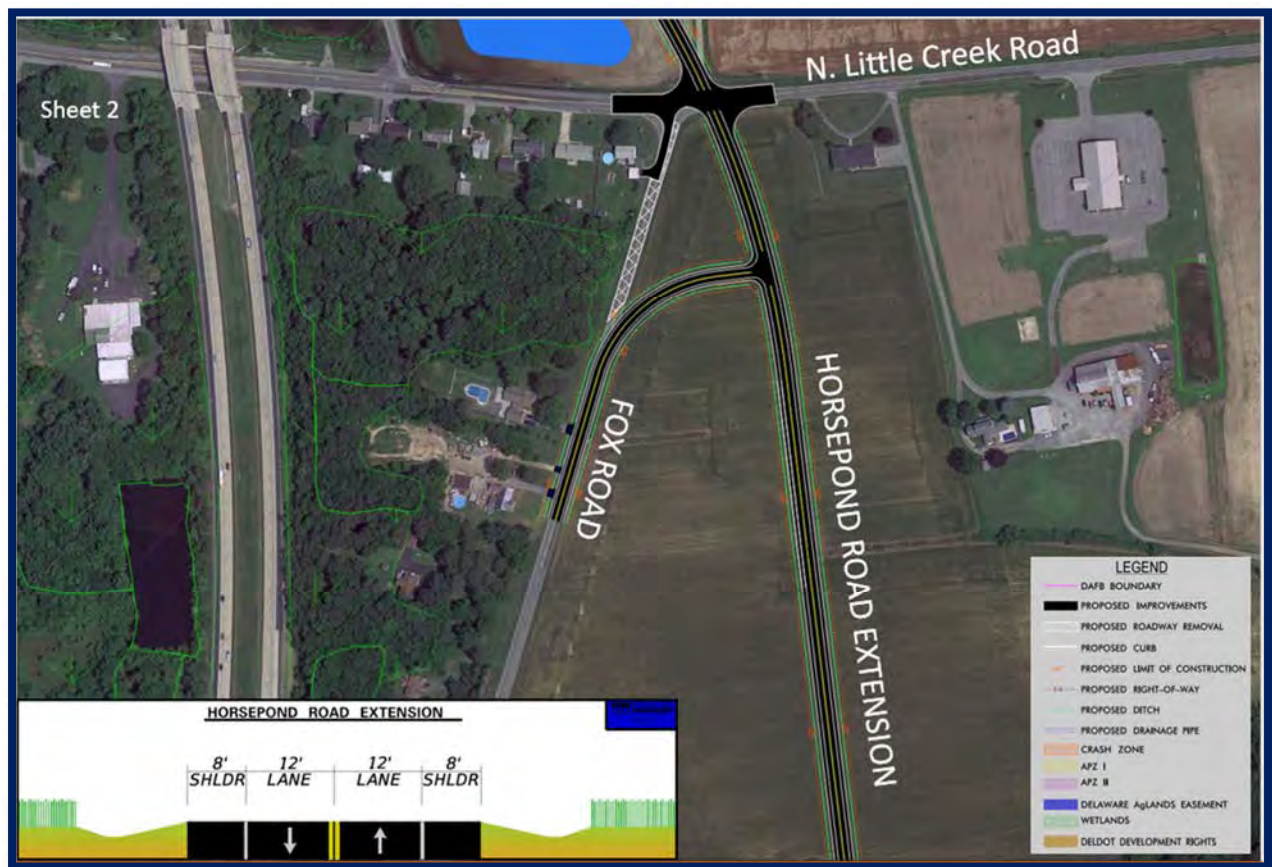
Horsepond Road Extension would begin at S. Little Creek Road and consist of two 12-foot travel lanes and two 8-foot shoulders. It would extend in a northerly direction primarily through agricultural lands, which are interspersed with small, wooded areas, some of which contain wetlands. One of these wooded/wetland areas occurs approximately 1,000 feet north of S. Little Creek Road and could require a structure crossing, possibly a bridge or culvert. Once across the wooded/wetland area, Horsepond Road Extension continues north, through agricultural land, and generally parallels Fox Road.

The graphic below illustrates this section of Horsepond Road Extension.



Continuing north and through agricultural lands, Horsepond Road Extension would eventually create a new intersection with N. Little Creek Road. In this section, Fox Road would tie directly into Horsepond Road Extension and a 450-foot section of Fox Road would be removed. The current Fox Road intersection with N. Little Creek Road would also be removed but access would be maintained to the property at the current intersection of Fox Road and N. Little Creek Road.

The graphic below illustrates this section of Horsepond Road Extension.



Horsepond Road Extension would form a new intersection with N. Little Creek Road approximately 600-feet to the east of the existing northbound entrance ramp to SR 1 and continue north through agricultural lands. Access to N. Little Creek Road from an existing private driveway in this area would be removed, but a new access to Horsepond Road Extension would be made approximately 365 feet north of N. Little Creek Road.

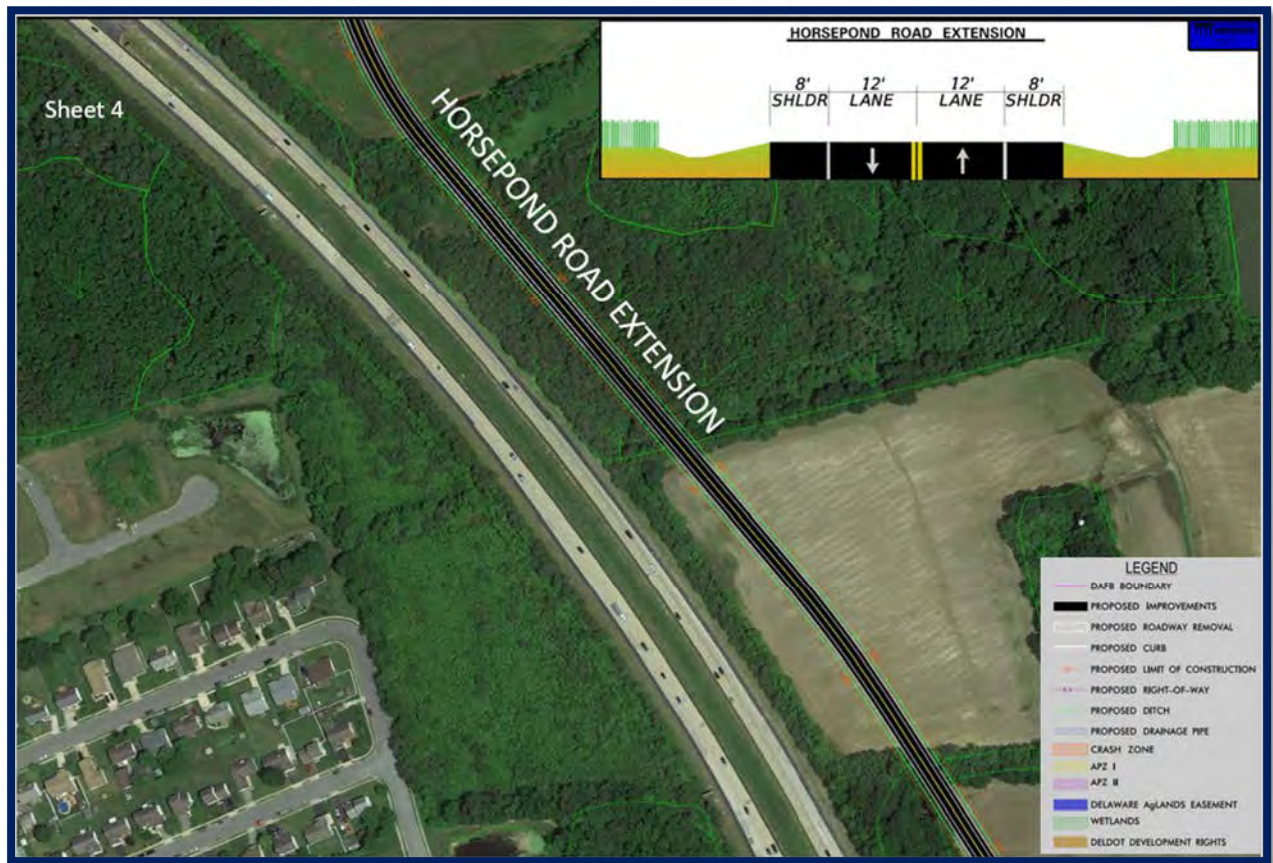
Two stormwater management ponds currently exist between the north and southbound ramps to SR 1. The area between the existing northbound ramp and Horsepond Road Extension is a potential location for a new stormwater management pond for the proposed Extension.

The graphic below illustrates this section of Horsepond Road Extension.



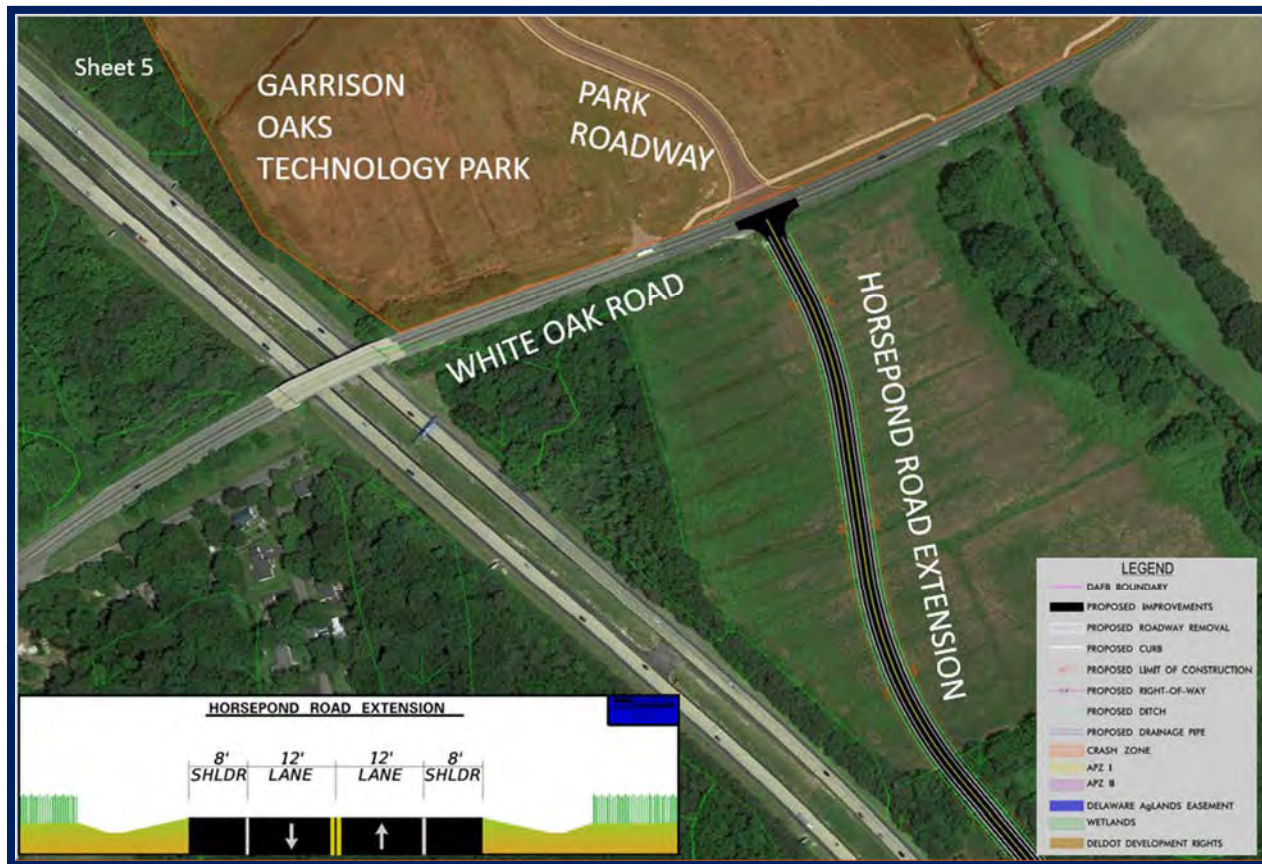
Horsepond Road Extension continues in a northerly direction through agricultural lands and wooded areas, some of which may contain wetlands, and generally parallels SR 1 through this section. A structure may be required through some of these wooded/potential wetland areas depending on the presence and extent of wetlands in those areas.

The graphic below illustrates this section of Horsepond Road Extension.



The most northern section of Horsepond Road Extension extends through an agricultural area, although this area appears to be a fallow farm field, before forming a new intersection with White Oak Road. The proposed location of the new intersection with White Oak Road would be directly adjacent to Park Roadway, the entrance to the Garrison Oak.

The graphic below illustrates this section of Horsepond Road Extension.

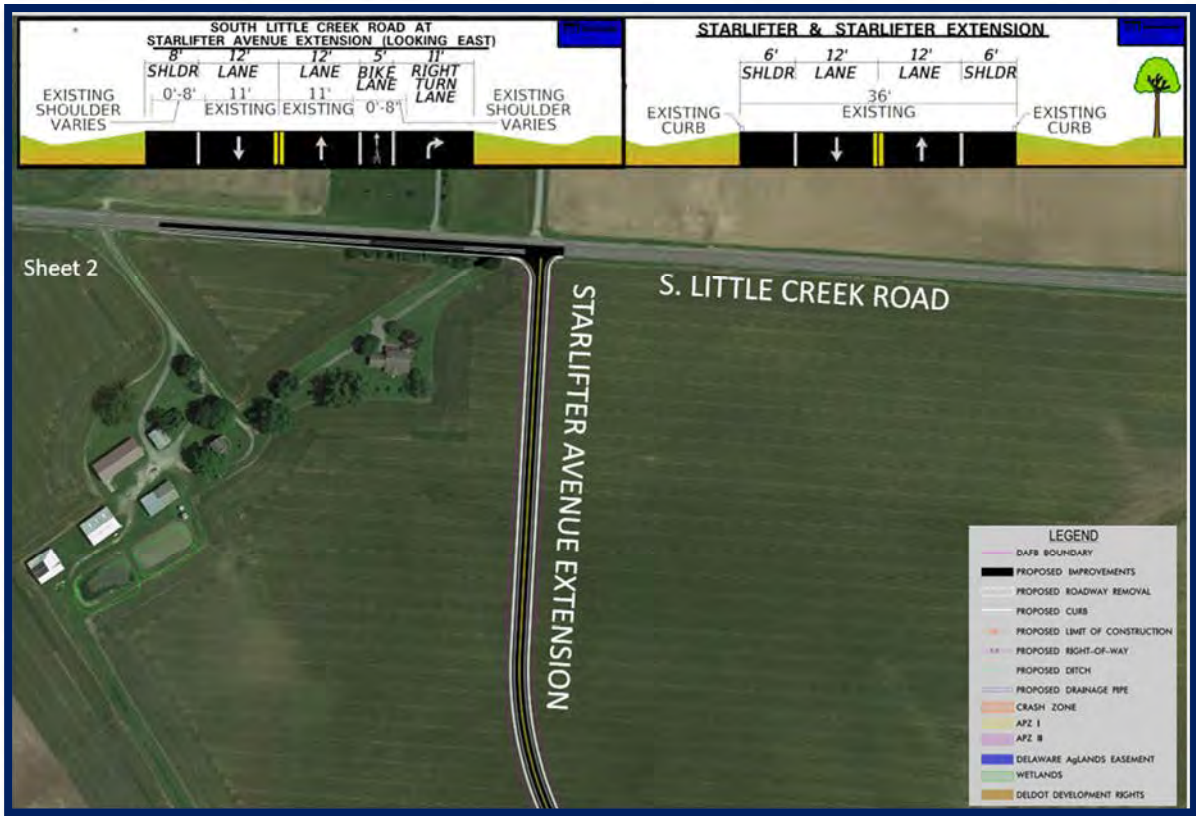
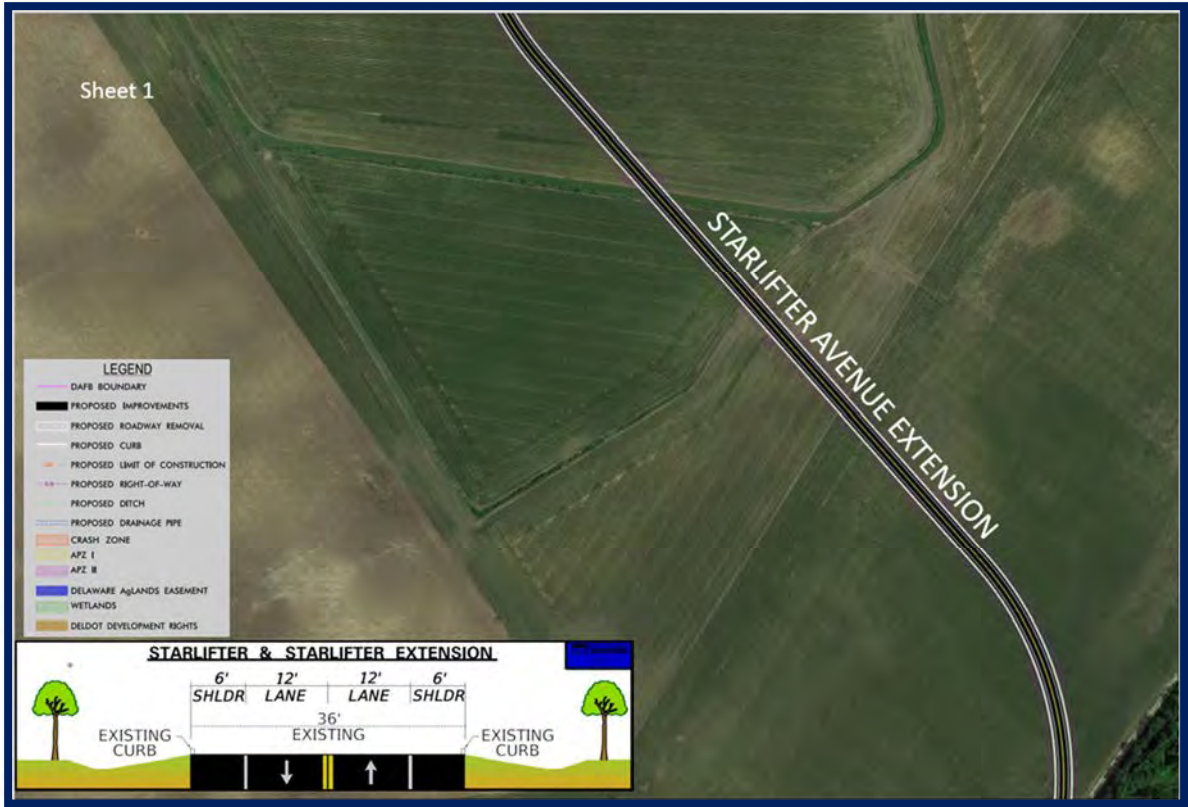


### ***Starlifter Avenue Extension***

Starlifter Avenue Extension would begin at the current northern terminus of existing Starlifter Avenue near Galaxy Drive. It would extend north through a small strip of trees, which do not appear to contain wetlands, before extending north through agricultural fields. Continuing north through agricultural lands, Starlifter Avenue Extension would form a new intersection with S. Little Creek Road.

The proposed typical section of Starlifter Avenue Extension would include two 12-foot lanes and two 6-foot shoulders. The typical section of S. Little Creek Road at the proposed Starlifter Avenue intersection would include two 12-foot lanes, an 8-foot shoulder on the north side, a 5-foot shared shoulder/bicycle lane on the south side, and an 11-foot right turn lane from S. Little Creek Road onto the proposed Starlifter Avenue Extension.

The two graphics below illustrate Starlifter Avenue Extension.



### ***SR 1 Interchange Analysis***

The study evaluated the possibility of creating additional access points with SR 1 to further enhance the truck access east of SR 1. Connections from existing roads and the Horsepond Road Extension alternative were assessed as part of the evaluation.

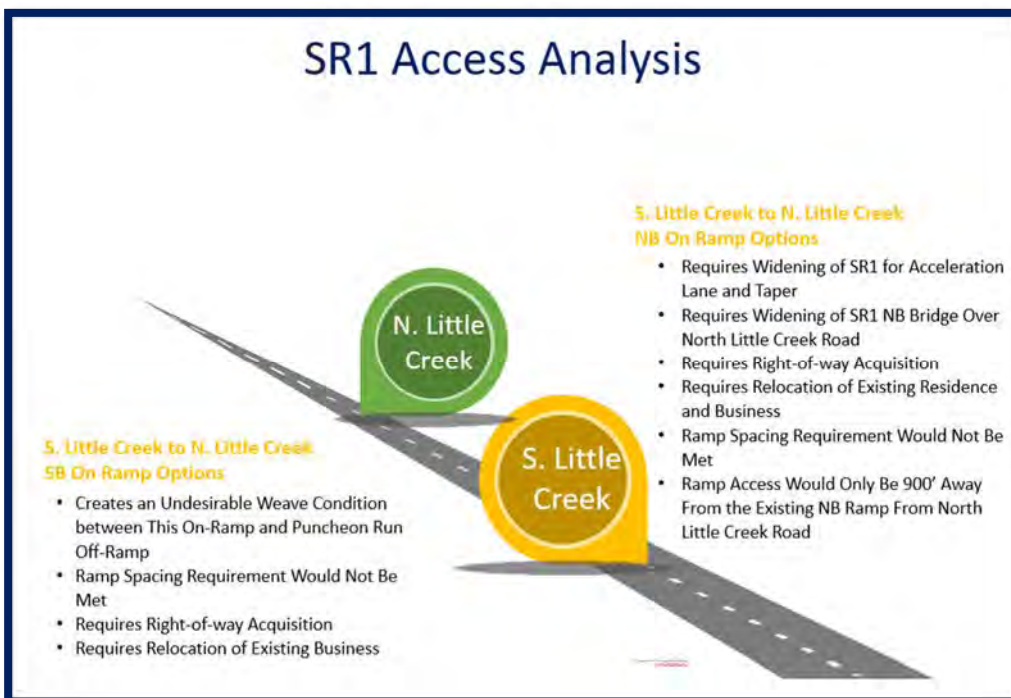
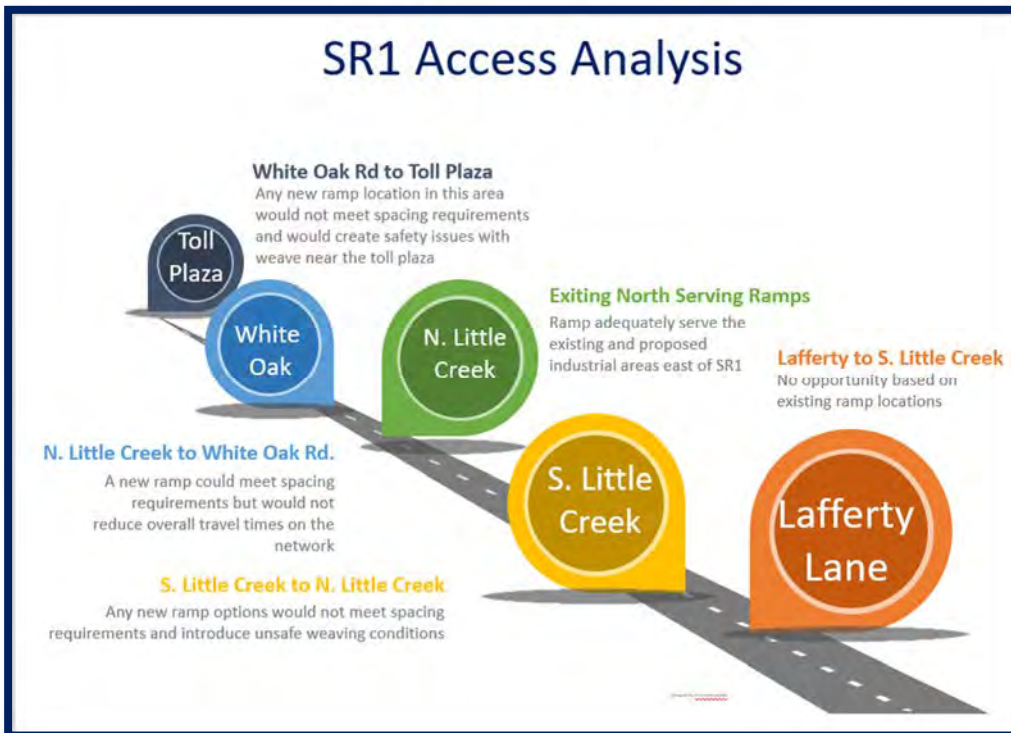
The decision to build a new interchange between an existing pair of interchanges is made by evaluating whether there is sufficient need for traffic to enter and/or exit the freeway at that location. The obvious intent is to reduce the systemwide travel times and delays for all users by providing convenient freeway access and egress.

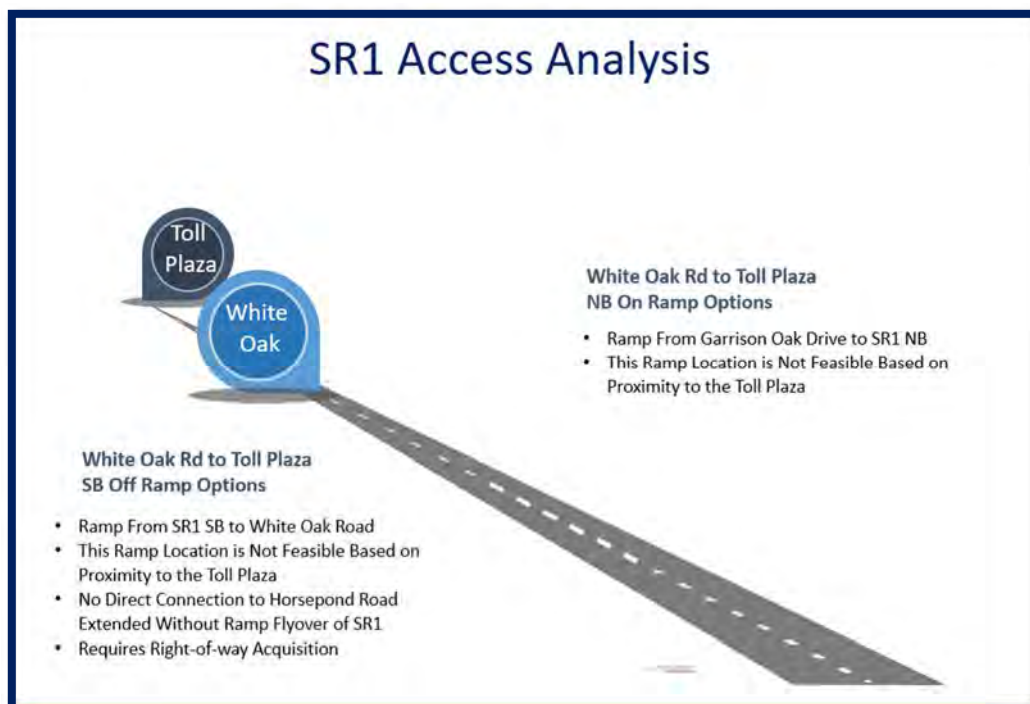
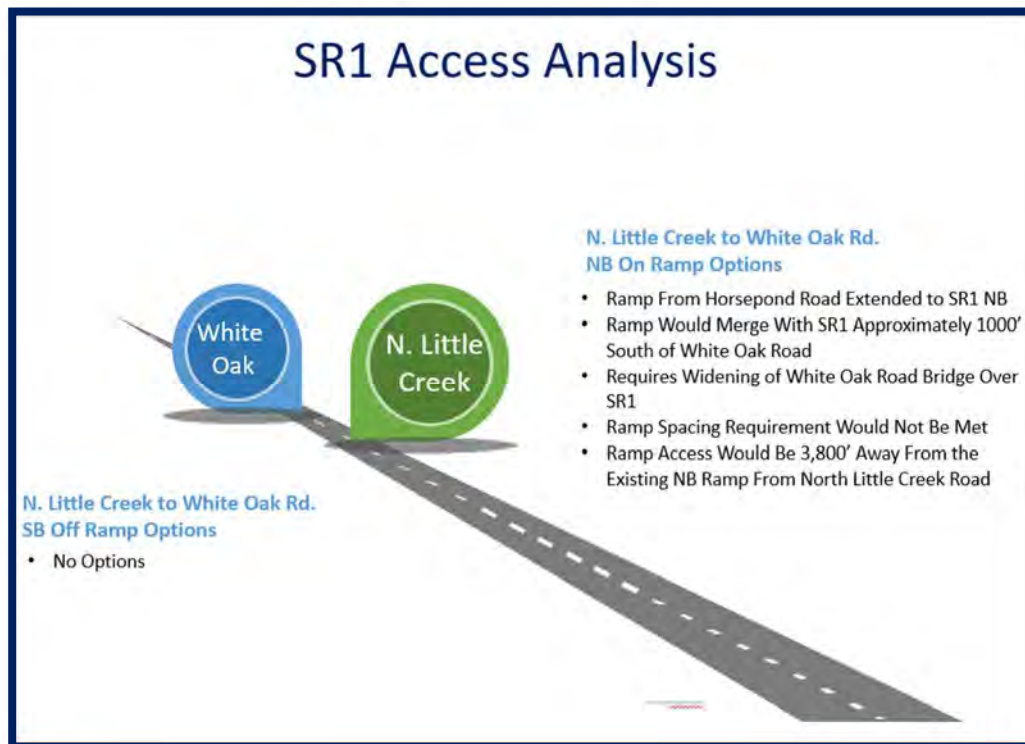
Based on the analysis of geometric constraints there are no feasible options for additional ramp access to SR 1 that would meet the minimum spacing requirements. Even if spacing requirements were waived there are still issues with an undesirable weave condition for any on or off-ramps located north of the Puncheon Run ramps.

In addition to the geometric constraints identified above, the costs and impacts associated with any additional ramp construction on or off SR 1 would not be justified based on the minimal value added to the transportation network.

In the decision to add additional access to SR 1, there needs to also be a reduction in travel times and no detriment to the safety of the system. This cursory analysis demonstrates that the safety and operational conditions would be compromised with the addition of any new access ramps. The enhanced access does not provide any system wide reduction in travel times over the existing ramps located at N. Little Creek Road, which adequately serve the existing and proposed industrial areas east of SR 1.

The following graphics summarize the SR 1 Access Analysis and the issues associated with the addition of a new ramp in this area.





See Appendix A for complete SR 1 Interchange Analysis.

## Recommendations

Throughout the course of this study, alternatives were developed to address the study's Purpose and Need and are based on feedback from the community and area businesses, as well as input from the City of Dover, Kent County, and the Office of State Planning. Four phases of improvements are recommended as part of this study. These recommendations include new alignments as well as improvements to existing roadways.

The following phased recommendations are based on the independent utility of each segment and should be implemented as presented below.

### PHASE 1

#### HORSEPOND ROAD EXTENSION - WHITE OAK ROAD TO N. LITTLE CREEK ROAD

Phase 1 includes the design, engineering, land acquisition and construction of a connector road from Garrison Oak at White Oak Road, running parallel to SR1, to the existing SR 1 interchange at N. Little Creek Road. This connection would make access from Garrison Oak more efficient and competitive for business. Phase I of this project is the City of Dover's Number 1 priority transportation project submitted to the Dover/Kent County MPO.

#### ESTIMATED COST PHASE 1

##### HORSEPOND ROAD EXTENSION - WHITE OAK ROAD TO N. LITTLE CREEK ROAD

|                         |                    |
|-------------------------|--------------------|
| Preliminary Engineering | \$500,000          |
| Right-of-Way            | \$30,000           |
| Construction            | \$4,195,000        |
| <b>Total Cost</b>       | <b>\$4,725,000</b> |

### PHASE 2

#### HORSEPOND ROAD EXTENSION – N. LITTLE CREEK ROAD TO S. LITTLE CREEK ROAD

Phase 2 includes design, engineering, land acquisition and construction of a limited access connector from N. Little Creek Road to S. Little Creek Road. This segment allows access to SR 1 northbound and removes heavy truck traffic from adjacent local streets, thereby improving safety and increasing efficiency for freight and business-related transportation through this area.

#### ESTIMATED COST PHASE 2:

##### HORSEPOND ROAD EXTENSION - N. LITTLE CREEK ROAD TO S. LITTLE CREEK ROAD

|                         |           |
|-------------------------|-----------|
| Preliminary Engineering | \$450,000 |
| Right-of-Way            | \$40,000  |



|                   |                    |
|-------------------|--------------------|
| Construction      | \$4,012,000        |
| <b>Total Cost</b> | <b>\$4,502,000</b> |

### PHASE 3

#### EXISTING HORSEPOND ROAD IMPROVEMENTS – S. LITTLE CREEK ROAD TO STARLIFTER AVENUE & EXISTING LAFFERTY LANE IMPROVEMENTS

Phase 3 includes design, engineering, land acquisition and construction of improvements to existing Horsepond Road from S. Little Creek Road to Starlifter Avenue, as well as improvements to existing Lafferty Lane at, and near, its intersections of Horsepond Road and S. Bay Road. Improvements to existing Horsepond Road will facilitate travel, particularly for large trucks, along Horsepond Road to and from the Central Delaware Aviation Complex (CDAC) and would provide an improved connection to the proposed Horsepond Road Extension. Improvements to existing Lafferty Lane will also improve travel to and from the CDAC for vehicles heading south via S. Bay Road to SR 1 and the Puncheon Run Connector to US 13.

#### ESTIMATED COST PHASE 3:

##### EXISTING HORSEPOND ROAD IMPROVEMENTS - S. LITTLE CREEK ROAD TO STARLIFTER AVENUE & LAFFERTY LANE

|                         |                    |
|-------------------------|--------------------|
| Preliminary Engineering | \$572,055          |
| Right-of-Way            | \$205,000          |
| Construction            | \$5,255,000        |
| <b>Total Cost</b>       | <b>\$6,032,055</b> |

### PHASE 4

#### STARLIFTER AVENUE EXTENSION

Phase 4 includes design, engineering, land acquisition and construction of a limited access connector of Starlifter Avenue from its current northern terminus north of Galaxy Drive to a new intersection with S. Little Creek Road. This extension would facilitate travel for vehicles, particularly large trucks, from businesses at the Dover Aero Park and the Central Delaware Aviation Complex. This Extension would preclude the need for heavy truck traffic from having to “backtrack” to existing Horsepond Road to ultimately head north to S. Little Creek Road and beyond.

#### ESTIMATED COST PHASE 4:

##### STARLIFTER AVENUE EXTENSION

|                         |           |
|-------------------------|-----------|
| Preliminary Engineering | \$292,335 |
| Right-of-Way            | \$85,000  |



|                   |                    |
|-------------------|--------------------|
| Construction      | \$2,100,000        |
| <b>Total Cost</b> | <b>\$2,477,335</b> |

If multiple phases of the connector road were funded at the same time, a savings due to economy of scale, could be realized in preliminary engineering and construction costs. These recommendations will require a full project development process and will most likely be implemented through DelDOT's 6-year Capital Transportation Program (CTP)

Before these projects can be placed in the CTP they must first be included in Dover/Kent County MPO's Metropolitan Transportation Plan (MTP). The MTP identifies the region's long-term transportation needs and the projects and activities that address them. The MTP extends at least two decades and must be financially reasonable (based on anticipated revenues) while meeting air quality standards. The projects in the Plan are divided into two lists, the Constrained List (projects that are funded in the CTP) and the Aspirations List (projects which are not yet funded). Only transportation projects found in the MTP, are eligible for federal funding. It is a living plan, subject to continual revision (at least every four years) and a tool for informed transportation and policy decisions.

This Planning and Environmental Linkage (PEL) Report is a result of the PEL study process conducted by Century Engineering, the Dover/Kent County MPO and the Study Team's Project Management Committee (PMC) which included the City of Dover, Kent County, and the Office of State Planning. The first phase was the data gathering phase where existing conditions were collected and reviewed. The second phase utilized the existing conditions and community feedback gathered in the Visioning Workshop to analyze the opportunities, challenges, concerns, and goals of the project. In the third phase potential recommendations were developed, analyzed, and documented to be discussed with the PMC and the community. Results from these engagements were positive and the recommendations were slightly revised.

Each recommendation that moves forward for design will continue with the NEPA process where this report leaves off. Each agency will be prepared to have a scoping meeting for the recommendation and begin the in-depth investigation into the permitting and coordination necessary for design.



## Public Involvement

Public involvement and community outreach were important components of the Dover Air Cargo Freight Access Study. Residents, the business community, as well as state and local stakeholders were engaged throughout the Study. The following provides a summary of the public involvement and outreach that occurred throughout the study and helped guide the development of improvement alternatives:

### Community Workshop 1 - *Visioning*

October 28, 2020

- Via Zoom
- 13 Registered – 11 Attended
- 5 Polling Questions Asked and Tabulated
- 15 Questioned Asked and Answered
- 6 Post Workshop Survey Questions Asked Tabulated
- See *Appendix C* for Workshop 1 Summary Report

### Business Owners Survey

January 2021

- 97 Business Surveys Distributed
- 11 Questions Asked and Tabulated
- See *Appendix D* for Survey Results

### Office of State Planning Meeting

February 24, 2021

- Consensus with Office of State Planning

### Business Owners Meeting

March 23, 2021

- 10 Businesses Contacted (based on Survey respondents who provided emails and input from PMC)
- 5 Businesses Attended

### Revisions to Conceptual Alternatives

October 2020 – April 2021

- Based on Feedback from Community and Area Businesses
- Input from City, County, and Office of State Planning

### Community Workshop 2 – *Alternatives*

April 21, 2021

- Via Zoom
- Meeting Announcement Flyers Direct Mailed to over 250 Residents/Businesses
- 7 Registered – 7 Attended
- 6 Polling Questions Asked and Tabulated
- 3 Questioned Asked and Answered
- 3 Post Workshop Survey Questions Asked and Tabulated
- See *Appendix E* for Workshop 2 Summary Report



*Appendices*



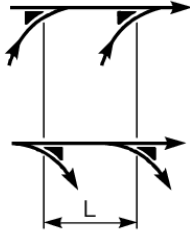
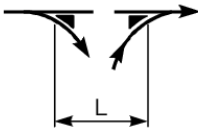
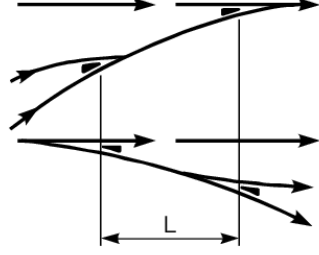
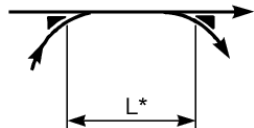
## Appendix A – SR 1 Interchange Analysis

This analysis will assess the feasibility, based on geometric constraints, for an additional direct access ramp connection to and from SR1 between Lafferty Lane and the Dover Toll Plaza.

Interchange and access spacing requirements on SR1 are governed by the SR1 Technical Memorandum, and requirements from the American Association of State Highway and Transportation Officials (AASHTO) publications on interstates and geometric design policies.

Ramps on SR1 will be designed in accordance with AASHTO Case II-B of one lane operation and Case III-B for two lane operation. The minimum length of a typical entrance ramp shall be 1,200' with an additional 300' taper. The minimum length of a typical exit ramp shall be 500' with an additional 300' taper. The recommendations for interchange spacing can be found in the AASHTO publication *A Policy on Geometric Design of Highways and Streets* (known as the "Green Book") and it states that there should be a minimum spacing between interchanges of 1.6 km (1 mi) in urban areas and 3.2 km (2 mi) in rural areas between crossroads. In urban areas the following guidance is provided.

### Minimum Ramp Spacing

| EN-EN or EX-EX                                                                     |                   | EX-EN                                                                               |                   | Turning roadways                                                                   |                     | EN-EX (weaving)                                                                                                                       |                    |                                |                    |
|------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------|--------------------|
|  |                   |  |                   |  |                     | <br><br>*Not Applicable to Cloverleaf Loop Ramps |                    |                                |                    |
| Full Freeway                                                                       | CDR or FDR        | Full Freeway                                                                        | CDR or FDR        | System Interchange                                                                 | Service Interchange | System to Service Interchange                                                                                                         |                    | Service to Service Interchange |                    |
|                                                                                    |                   |                                                                                     |                   |                                                                                    |                     | Full Freeway                                                                                                                          | CDR or FDR         | Full Freeway                   | CDR or FDR         |
| Minimum lengths measured between successive ramp terminals                         |                   |                                                                                     |                   |                                                                                    |                     |                                                                                                                                       |                    |                                |                    |
| 300 m<br>[1000 ft]                                                                 | 240 m<br>[800 ft] | 150 m<br>[500 ft]                                                                   | 120 m<br>[400 ft] | 240 m<br>[800 ft]                                                                  | 180 m<br>[600 ft]   | 600 m<br>[2000 ft]                                                                                                                    | 480 m<br>[1600 ft] | 480 m<br>[1600 ft]             | 300 m<br>[1000 ft] |

NOTES: FDR - Freeway Distributor Road  
CDR - Collector Distributor Road  
EN - Entrance  
EX - Exit

The recommendations are based on operational experience and need for flexibility and adequate signing. They should be checked in accordance with the procedure outlined in the Highway Capacity Manual and the larger of the values is suggested for use. Also a procedure for measuring the length of the weaving section is given in chapter 24 of the 2000 Highway Capacity Manual. The "L" distances noted in the figures above are between like points, not necessarily "physical" gores. A minimum distance of 90 m [270 ft] is recommended between the end of the taper for the first on ramp and the theoretical gore for the succeeding on ramp for the EN-EN (similar for EX-EN).



Current conditions for SR1 Northbound:

On Ramp 1

- Bay Road NB on-ramp provides access to SR1 from Bay Road and Lafferty Lane
- Parallel ramp design
- 1,050' acceleration length from the physical gore area to the end of the taper
- 300' taper

On Ramp 2

- Puncheon Run NB on-ramp provides access to SR1 from US13
- Parallel ramp design
- Ramp is constructed as a 2 lane on-ramp but is currently striped as a single lane on-ramp
- Single lane on-ramp
  - o 1,500' acceleration length from the physical gore area to the end of the taper
  - o 300' taper
- Ultimate 2 lane on-ramp
  - o 2,700' acceleration length from the physical gore area to the end of the taper
  - o 300' taper

On-Ramp 3

- SR8 / N. Little Creek Road NB on-ramp
- Parallel ramp design
- 1,000' acceleration length from the physical gore area to the end of the taper
- 300' taper

Current conditions for SR1 Southbound:

Off-Ramp 1

- SR8 / N. Little Creek Road SB off-ramp
- Parallel ramp design
- 940' deceleration length from beginning of the taper to the physical gore area
- 300' taper

Off Ramp 2

- Puncheon Run SB off-ramp provides access from SR1 to US13
- Parallel ramp design
- Ramp is constructed as a 2 lane off-ramp but is currently striped as a single lane off-ramp
- Single lane off-ramp
  - o 1,780' deceleration length from beginning of the taper to the physical gore area
  - o 300' taper
- Ultimate 2 lane off-ramp
  - o 3,220' deceleration length from beginning of the taper to the physical gore area
  - o 300' taper

Off Ramp 3

- Bay Road SB off-ramp provides access from SR1 to Bay Road and Lafferty Lane
- Parallel ramp design
- 800' deceleration length from beginning of the taper to the physical gore area



- 300' taper

NB Ramp Options:

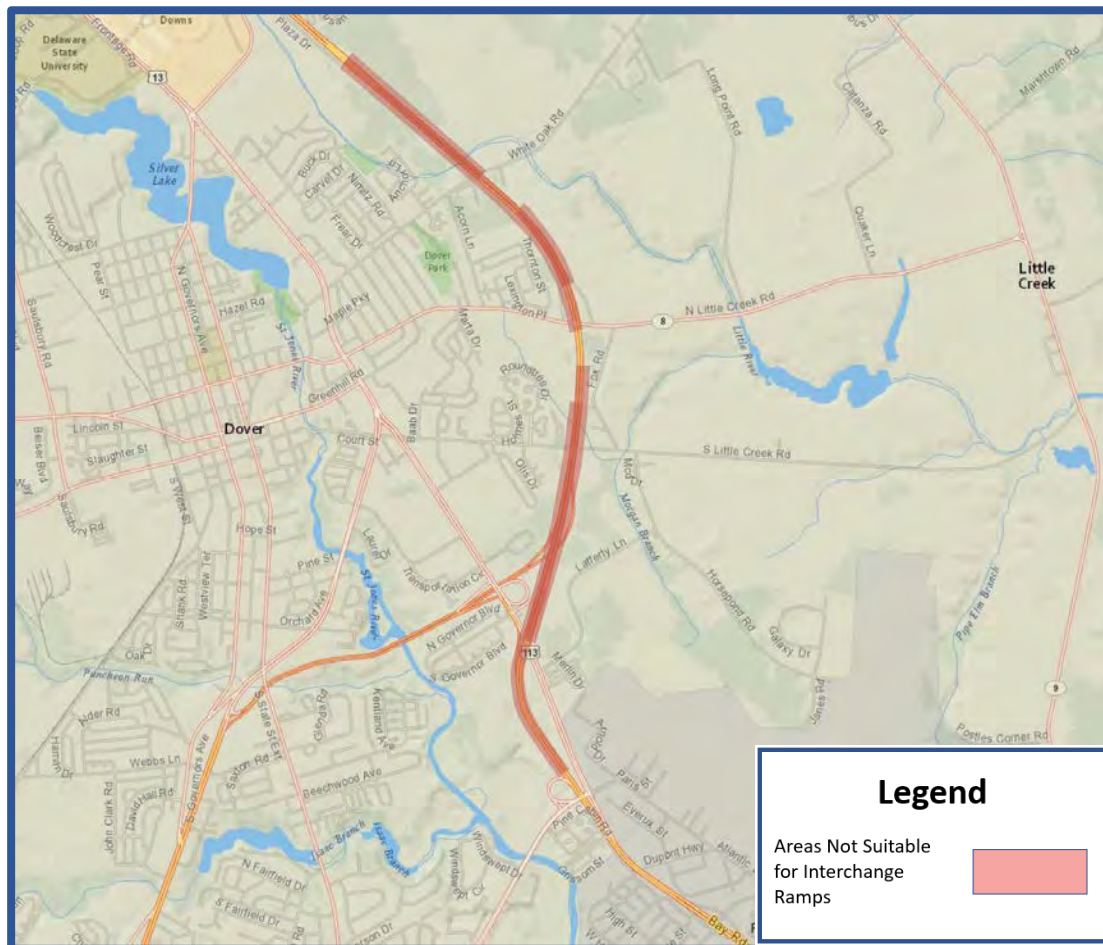
- Direct connection to SR1 between Lafferty Lane and South Little Creek Road
  - There is no physical room for an additional on-ramp between on-ramp 1 and on-ramp 2
- Direct connection to SR1 between South Little Creek Road and North Little Creek Road
  - Ramp from Fox Road/Horsepond Road Extended to SR1 NB
  - Ramp would merge with SR1 approximately 750' south of North Little Creek Road
  - Requires widening of SR1 for acceleration lane and taper
  - Requires widening of SR1 NB Bridge over North Little Creek Road
  - Requires right-of-way acquisition
  - Requires relocation of existing residence and business
  - Ramp spacing requirement would not be met
  - Ramp access would only be 900' away from the existing NB ramp from North Little Creek Road.
- Direct connection to SR1 between North Little Creek Road and White Oak Road
  - Ramp from Horsepond Road Extended to SR1 NB
  - Ramp would merge with SR1 approximately 1000' south of White Oak Road
  - Requires widening of White Oak Road Bridge over SR1
  - Ramp spacing requirement would not be met
  - Ramp access would be 3,800' away from the existing NB ramp from North Little Creek Road.
- Direct connection to SR1 between White Oak Road and SR1 Toll Plaza
  - Ramp from Garrison Oak Drive to SR1 NB
  - This ramp location is not feasible based on proximity to the toll plaza
- NB off-ramp between South Little Creek Road and North Little Creek Road
  - Creates an undesirable weave condition between the Puncheon Run on-ramp and an off-ramp in this location.
  - Ramp spacing requirement would not be met
  - Requires right-of-way acquisition
  - Requires relocation of existing residence and business

SB Ramp Options:

- Off-ramp between White Oak Road and SR1 Toll Plaza
  - Ramp from SR1 SB to White Oak Road
  - This ramp location is not feasible based on proximity to the toll plaza
  - No direct connection to Horsepond Road extended without ramp flyover of SR1
  - Requires right-of-way acquisition
- On-ramp between North Little Creek Road and South Little Creek Road
  - Creates an undesirable weave condition between this on-ramp and Puncheon Run off-ramp
  - Ramp spacing requirement would not be met
  - Requires right-of-way acquisition
  - Requires relocation of existing business



### Areas Not Suitable for Interchange Location



#### Summary:

The decision to build a new interchange between an existing pair of interchanges is made by evaluating whether there is sufficient need for traffic to enter and/or exit the freeway at that location. The obvious intent is to reduce the systemwide travel times and delays for all users by providing convenient freeway access and egress.

Based on the analysis of geometric constraints there are no feasible options for additional ramp access to SR1 that would meet the minimum spacing requirements. Even if spacing requirements were waived there are still issues with an undesirable weave condition for any on or off-ramps located north of the Puncheon Run ramps.

In addition to the geometric constraints identified above, the costs and impacts associated with any additional ramp construction on or off SR1 would not be justified based on the minimal value added to the transportation network.

In the decision to add additional access to SR1 there needs to also be a reduction in travel times and no detriment to the safety of the system. This cursory analysis demonstrates that the safety and operational conditions would be compromised with the addition of any new access ramps. The enhanced access does not provide any system wide reduction in travel times over the existing ramps located at North Little Creek Road which adequately serve the existing and proposed industrial areas east of SR1.



## Appendix B – Alternatives Cost Estimates

### ESTIMATED COST PHASE 1

#### HORSEPOND ROAD EXTENSION - WHITE OAK ROAD TO N. LITTLE CREEK ROAD

|                         |                    |
|-------------------------|--------------------|
| Preliminary Engineering | \$500,000          |
| Right-of-Way            | \$30,000           |
| Construction            | \$4,195,000        |
| <b>Total Cost</b>       | <b>\$4,725,000</b> |

### ESTIMATED COST PHASE 2:

#### HORSEPOND ROAD EXTENSION - N. LITTLE CREEK ROAD TO S. LITTLE CREEK ROAD

|                         |                    |
|-------------------------|--------------------|
| Preliminary Engineering | \$450,000          |
| Right-of-Way            | \$40,000           |
| Construction            | \$4,012,000        |
| <b>Total Cost</b>       | <b>\$4,502,000</b> |

### ESTIMATED COST PHASE 3:

#### EXISTING HORSEPOND ROAD IMPROVEMENTS - S. LITTLE CREEK ROAD TO STARLIFTER AVENUE & LAFFERTY LANE

|                         |                    |
|-------------------------|--------------------|
| Preliminary Engineering | \$572,055          |
| Right-of-Way            | \$205,000          |
| Construction            | \$5,255,000        |
| <b>Total Cost</b>       | <b>\$6,032,055</b> |

### ESTIMATED COST PHASE 4:

#### STARLIFTER AVENUE EXTENSION

|                         |                    |
|-------------------------|--------------------|
| Preliminary Engineering | \$292,335          |
| Right-of-Way            | \$85,000           |
| Construction            | \$2,100,000        |
| <b>Total Cost</b>       | <b>\$2,477,335</b> |



*Appendix C – Workshop 1 Summary Report*

**Dover Air Cargo Freight Access Study  
Community Workshop #1  
October 28, 2020  
Workshop Summary Report**

The first Public Workshop for the Dover Air Cargo Freight Access Study was held on October 28, 2020, via Zoom. The Workshop included a live presentation and was followed by a Question-and-Answer period.

The following provides a summary of the Workshop and corresponding feedback.

The Workshop hosted 10 attendees. The Workshop presentation included a review of the Study's Purpose and Need, a review of Existing Traffic Conditions, presentation of Conceptual Alternatives, and an outline of the Next Steps of the Study. Conceptual Alternatives included improvements to existing Horsepond Road and Lafferty Lane, well as extensions of Horsepond Road to White Oak Road and Starlifter Avenue to S. Little Creek Road.

Eight polling questions were asked throughout the presentation to gather information and to encourage participation from the attendees. The following information was gathered through the polls:

|                                                                                               |                                      |              |
|-----------------------------------------------------------------------------------------------|--------------------------------------|--------------|
| <b>Dover Air Cargo Freight Access Study</b>                                                   |                                      |              |
| <b>Community Workshop #1</b>                                                                  |                                      |              |
| <b>28-Oct-21</b>                                                                              |                                      |              |
|                                                                                               |                                      |              |
|                                                                                               | <b>Answer</b>                        | <b>Tally</b> |
| <b>Question 1: How did you hear about this Workshop?</b>                                      |                                      |              |
|                                                                                               | <b>Dover/Kent County MPO Website</b> | <b>2</b>     |
|                                                                                               | <b>DelDOT Website</b>                | <b>1</b>     |
|                                                                                               | <b>Other</b>                         | <b>4</b>     |
|                                                                                               |                                      |              |
| <b>Question 2: Do you agree with the Purpose and Need of this study?</b>                      |                                      |              |
|                                                                                               | <b>Yes</b>                           | <b>4</b>     |
|                                                                                               | <b>Unsure</b>                        | <b>1</b>     |
|                                                                                               |                                      |              |
| <b>Questions 3: Do you feel like this graphic adequately depicts truck in the Study Area?</b> |                                      |              |
|                                                                                               | <b>Yes</b>                           | <b>2</b>     |
|                                                                                               | <b>No</b>                            | <b>1</b>     |
|                                                                                               | <b>Unsure</b>                        | <b>3</b>     |



|                                                                                  |               |          |
|----------------------------------------------------------------------------------|---------------|----------|
|                                                                                  |               |          |
| <b>Question 4: Do you support removing/reducing truck traffic from Fox Road?</b> |               |          |
|                                                                                  | <b>Yes</b>    | <b>6</b> |
|                                                                                  | <b>Unsure</b> | <b>2</b> |
|                                                                                  |               |          |
| <b>Question 5: Do you support Improvements to Horsepond Road?</b>                |               |          |
|                                                                                  | <b>Yes</b>    | <b>6</b> |
|                                                                                  | <b>Unsure</b> | <b>2</b> |
|                                                                                  |               |          |
| <b>Question 6: Do you support Improvements to Lafferty Lane?</b>                 |               |          |
|                                                                                  | <b>Yes</b>    | <b>5</b> |
|                                                                                  | <b>Unsure</b> | <b>3</b> |
|                                                                                  |               |          |
| <b>Question 7: Do you support the Extension of Starlifter Avenue?</b>            |               |          |
|                                                                                  | <b>Yes</b>    | <b>5</b> |
|                                                                                  | <b>Unsure</b> | <b>3</b> |
|                                                                                  |               |          |
| <b>Question 8: Do you support the Extension of Horsepond Road?</b>               |               |          |
|                                                                                  | <b>Yes</b>    | <b>5</b> |
|                                                                                  | <b>Unsure</b> | <b>3</b> |

Following the presentation, which included the eight poll questions summarized above, a Question-and-Answer Session was held. The following questions were asked:

1. When was the traffic study completed? If it was completed over the last 6 months, wouldn't it be hard to consider that valid or normal traffic data due to COVID shutdowns?
2. On the annexation map - does this mean these areas are not considered part of the City of Dover?
3. Are we looking at expansion of the existing roads? Or are we looking at putting in NEW roads?
4. What is the thinking behind keeping trucks off Rt 9? I would think that would be preferable to having trucks in downtown areas.
5. Are these side roads all being used so trucks can get on and off SR1? Are we thinking of putting in more access points to SR1?
6. Why were no Garrison Oak Technology Park occupants interviewed or included in this study?
7. What is the connection between the two industrial parks? They seem dissimilar in nature.
8. Will the extension of Horsepond Road have north and south access to Rt 1?



9. How do these extensions help? You made it sound like the improvements were minor. Do we really think this is enough to move traffic from the other roads or are there other initiatives?
10. There has been talk about putting an additional access point to SR1 near Dover Downs. Is this still in the process? Would this help/impact this study?
11. Regarding Rt 1 access - However the Rt 1 interchange at Rt 8 does not have full north/south access - will that be improved?

The Q&A Session, as well as the entire presentation, was recorded and the responses to the questions above can be found on that recording which is posted on the Dover/Kent County MPO Website at [doverkentmpo.delaware.gov](http://doverkentmpo.delaware.gov).

At the completion of the Workshop and Q& Session attendees were asked to complete a Post Workshop Survey. The results of that survey are as follows:

1. How would you rate this workshop experience?  
**Scale: 1 Strongly Disagree – 10 Strongly Agree**  
Reply: 10  
Reply: 10  
Reply: 9  
Reply: 5
2. How was the overall video quality?  
**Scale: 1 Strongly Disagree – 10 Strongly Agree**  
Reply: 10  
Reply: 10  
Reply: 9  
Reply: 7
3. How was the overall audio quality?  
**Scale: 1 Strongly Disagree – 10 Strongly Agree**  
Reply: 10  
Reply: 10  
Reply: 9  
Reply: 7
4. The workshop content and project information was clearly presented.  
**Scale: 1 Strongly Disagree – 10 Strongly Agree**  
Reply: 10  
Reply: 10  
Reply: 10  
Reply: 5



5. Do you support the improvements described during tonight's workshop? Please explain why or why not.
  - Yes! Long overdue!
  - Yes, if the intent is to expand businesses in that area it is smart to look at the roads, traffic, and capacity and to expand them with it.
  - Yes
6. Do you have any other concerns that were not addressed in tonight's workshop?
  - I think there should be more northern and southern access points along SR1. Would love to see Rt 9 improved even if you do want to keep the trucks off it.
  - South bound access to Route 1.
7. Do you have any other thoughts you would like to share with the Project Team?
  - Excellent Job!
  - Good presentation. Thank you.



## Appendix D – Business Owners Survey Results

2/3/2021

Microsoft Forms

### Dover Freight Study

8  
Responses

07:33  
Average time to complete

Active  
Status

1. Does your business involve the use of heavy trucks for delivering or receiving goods or materials?

|              |   |
|--------------|---|
| Yes          | 6 |
| No           | 1 |
| Occasionally | 1 |



2. Which best describes your business?

|                                |   |
|--------------------------------|---|
| Ship Goods                     | 0 |
| Receive Goods                  | 1 |
| Both Ship and Receive Goods    | 6 |
| Neither Ship nor Receive Goods | 1 |



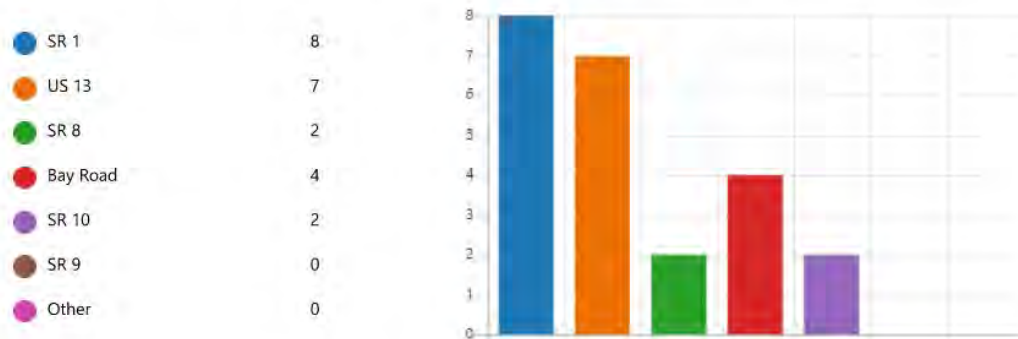
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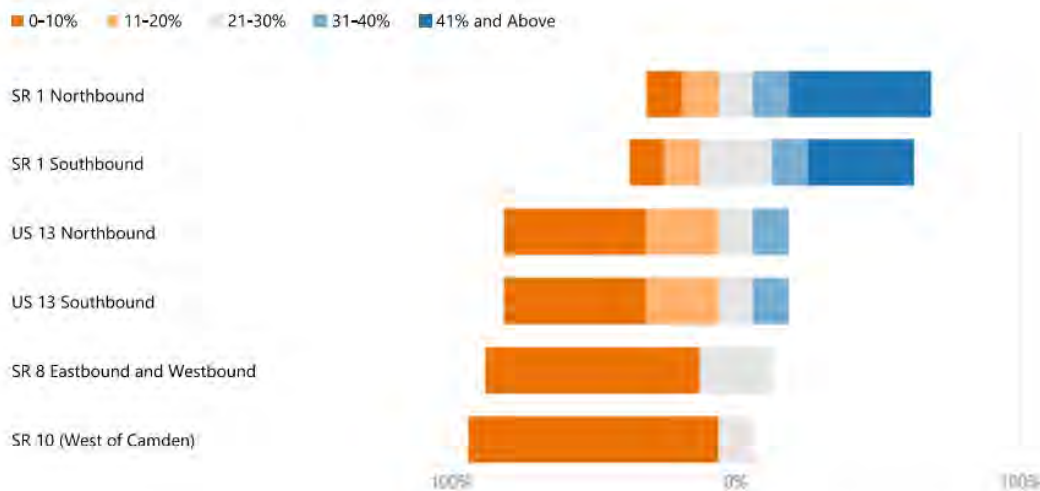
2/3/2021

Microsoft Forms

3. Which regional roads/highways do your trucks typically use? Select **all** that apply



4. Typically, what percentage of heavy trucks coming to and from your business use the following roads?



5. On average, approximately how many heavy trucks make deliveries to your business each week?

8  
Responses

Latest Responses

"3"  
"2"  
"0"

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2/3/2021

Microsoft Forms

6. On average, approximately how many heavy trucks leave your business to make deliveries or provide services each week?

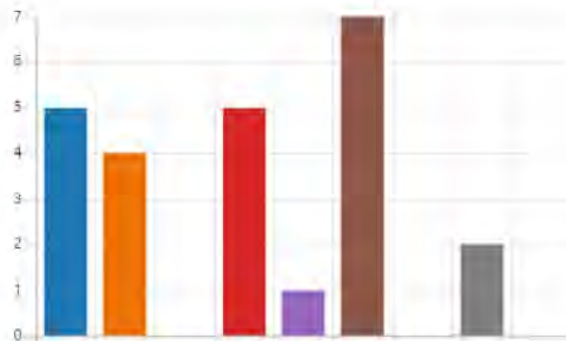
8  
Responses

Latest Responses

"2"  
"2"  
"0"

7. Which local roads do your trucks typically use?

|                       |   |
|-----------------------|---|
| Lafferty Lane         | 5 |
| Horsepond Road        | 4 |
| Starlifter Avenue     | 0 |
| Fox Road              | 5 |
| N Little Creek Road   | 1 |
| S Little Creek Road   | 7 |
| Acorn Lane            | 0 |
| E Lebanon Road (SR10) | 2 |
| Puncheon Run          | 0 |



8. Do you support improvements to Lafferty Lane, such as intersection improvements at Horsepond Road?

|        |   |
|--------|---|
| Yes    | 5 |
| No     | 1 |
| Unsure | 2 |



9. Do you support improvements to Horsepond Road, such as improving shoulder widths, intersections, and constructing a new road that extends Horsepond Road to Garrisons Oak Technology Center?

|        |   |
|--------|---|
| Yes    | 6 |
| No     | 0 |
| Unsure | 2 |



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# DOVER AIR CARGO FREIGHT ACCESS STUDY - PLANNING AND ENVIRONMENTAL LINKAGE (PEL) REPORT

2/3/2021

Microsoft Forms

10. Do you support construction of a new road that extends Starlifter Avenue to S Little Creek Road?

|        |   |
|--------|---|
| Yes    | 5 |
| No     | 0 |
| Unsure | 3 |



11. Do you support removing/reducing truck traffic from Fox Road and Acorn Lane by utilizing an extension of Horsepond Road?

|        |   |
|--------|---|
| Yes    | 4 |
| No     | 1 |
| Unsure | 3 |



12. Additional Comments or recommendations

8

Responses

Latest Responses

"It is good to look at this now since the area is growing."

"An immediate improvement to Fox Road is needed. Our trucks will be..."

"Non applicable "

13. Contact Information (Optional)

5

Responses

Latest Responses

"Jim McLaughlin"

"Steve Manlove - "

14. Contact Information (Optional)

5

Responses

Latest Responses

"500 E. front St. Wilmington DE 19801 (also own building at 679 Horse..."

"1196 S. Little Creek Road - the old "Dover Post" building. "

<https://forms.office.com/Pages/DesignPage.aspx#Analysis=true&FormId=XUAjI3ZS1kW3PuJvDaEgL-CLR7vNDkJLjFwhedkwoq5UMVVZVDhFM0dBS...> 4/5



2/3/2021

Microsoft Forms

15. Contact Information (Optional)

5  
Responses

Latest Responses  
"Jimmcl@uwco.com"  
"SManlove@AvalonIndustries.com"

<https://forms.office.com/Pages/DesignPage.aspx#Analysis=true&FormId=XUAJl3ZS1kW3PuJvDaEgL-CLR7vNDkJLjFwhedkwoq5UMVVZVDhFM0dBS...> 5/5



## Appendix E – Public Workshop 2 Summary Report

### Dover Air Cargo Freight Access Study Community Workshop #2 April 21, 2021 Workshop Summary Report

The second Public Workshop for the Dover Air Cargo Freight Access Study was held on April 21, 2021 via Zoom. The Workshop included a live presentation and was followed by a Question-and-Answer period.

The following provides a summary of the Workshop and corresponding feedback.

The Workshop hosted 7 attendees. The Workshop presentation included a review of the Study Area, Purpose and Need, Status Update, presentation of Revised Conceptual Alternatives, and review of the Next Steps of the study. Specifically, the presentation included conceptual plans and recommendations for improvements to Horsepond Road, Lafferty Lane, and Starlifter Avenue. Typical sections were provided illustrating the anticipated lane and shoulder widths of the conceptual improvements. In addition, information was presented on the SR 1 Access Study that examined the feasibility of another ramp connection to SR 1 directly from the proposed Horsepond Road extension.

Six polling questions were asked throughout the presentation to gather information and to encourage participation from the attendees. The following information was gathered through the polls:

| Dover Air Cargo Freight Access Study                                                                                                                                                                               |         |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|
| Community Workshop #2 April 21, 2021                                                                                                                                                                               |         |       |
| Poll Results                                                                                                                                                                                                       |         |       |
|                                                                                                                                                                                                                    | Answer  | Tally |
| <b>Question 1: Do you live or work in the study area?</b>                                                                                                                                                          |         |       |
|                                                                                                                                                                                                                    | Neither | 2     |
|                                                                                                                                                                                                                    | Work    | 1     |
| <b>Question 2: Do you agree with the purpose and need of this study?</b>                                                                                                                                           |         |       |
|                                                                                                                                                                                                                    | Yes     | 3     |
| <b>Question 3: Do you support removing/reducing truck traffic from Fox Road and Acorn Lane by utilizing an extension of Horsepond Road?</b>                                                                        |         |       |
|                                                                                                                                                                                                                    | Yes     | 2     |
| <b>Question 4: Do you support improvements to Horsepond Road, such as improving shoulder widths, intersections, and construction of a new road that extends Horsepond Road to Garrison Oaks Technology Center?</b> |         |       |
|                                                                                                                                                                                                                    | Yes     | 2     |



|                                                                                                                       |        |   |
|-----------------------------------------------------------------------------------------------------------------------|--------|---|
| <b>Question 5: Do you support construction of a new road that extends Starlifter Avenue to S Little Creek Road?</b>   |        |   |
|                                                                                                                       | Yes    | 1 |
|                                                                                                                       | Unsure | 1 |
| <b>Question 6: Do you support improvements to Lafferty Lane, such as intersection improvements at Horsepond Road?</b> |        |   |
|                                                                                                                       | Yes    | 2 |

Following the presentation, which included the six poll questions summarized above, a question-and-answer session was held. The following questions were asked:

1. Is the proposed Starlifter Avenue Extension in addition to the Horsepond Road Extension or is it one or the other?
2. What are the current and projected traffic counts (or increased percentage) if all proposed improvements are built?
3. Is the previous Workshop available online?

The Q&A Session, as well as the entire presentation, was recorded and the responses to the questions above can be found on that recording which is posted on the Dover/Kent County MPO Website at [doverkentmpo.delaware.gov](http://doverkentmpo.delaware.gov).

At the completion of the Workshop and Q& Session attendees were asked to complete a Post Workshop Survey. The results of that survey are as follows:

1. How strongly do you agree or disagree with the purpose and goals of the study?  
**Scale: 1 Strongly Disagree – 10 Strongly Agree**  
**Reply: 8**  
**Reply: 10**  
**Reply: 10**
2. Are there other improvements you would like evaluated as part of this study? (Please Explain)  
**Reply: It's too early to say**
3. How well do you feel that tonight's Workshop provided you the opportunity to share your ideas, thoughts and concerns related to transportation and traffic circulation in the study?  
**Scale: 1 Poor – 10 Excellent**  
**Reply: 10**  
**Reply: 8**  
**Reply: 8**
4. Are there any other thoughts, or topics, regarding the content or format of tonight's Workshop you would like addressed?  
**No replies**



5. How was the video quality of the Workshop?

**Scale: 1 Poor – 10 Excellent**

**Reply: 10**

**Reply: 9**

**Reply: 10**

6. How was the audio quality of the Workshop?

**Scale: 1 Poor – 10 Excellent**

**Reply: 10**

**Reply: 10**

**Reply: 10**



Dover Air Cargo Freight Access Study

| Federal Highway Administration - Planning and Environmental Linkages Questionnaire                                                                            |                                                                                                                                                                                                                                                                                        |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <a href="https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx">https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx</a> |                                                                                                                                                                                                                                                                                        |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                               | Topic                                                                                                                                                                                                                                                                                  | Section Reference | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1.                                                                                                                                                            | Background:                                                                                                                                                                                                                                                                            |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| a.                                                                                                                                                            | Who is the sponsor of the PEL study? (state DOT, Local Agency, Other)                                                                                                                                                                                                                  | Recommendations   | Dover Kent County MPO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| b.                                                                                                                                                            | What is the name of the PEL study document and other identifying project information (e.g. sub-account or STIP numbers, long-range plan, or transportation improvement program years)?                                                                                                 | Title Page        | Dover Air Cargo Freight Access Study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| c.                                                                                                                                                            | Who was included on the study team (Name and title of agency representatives, consultants, etc.)?                                                                                                                                                                                      | Title Page        | DelDOT, City of Dover, Kent County, Kent Economic Partnership, and the Office of State Planning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| d.                                                                                                                                                            | Provide a description of the existing transportation facility within the corridor, including project limits, modes, functional classification, number of lanes, shoulder width, access control and type of surrounding environment (urban vs. rural, residential vs. commercial, etc.) | Study Area        | Currently, trucks traveling to and from both the CDAC and Garrison Oak must use a series of local roads that were not designed for heavy trucks to access the regional highway network. These roads include Fox Road, Acorn Lane, Horsepond Road, and Lafferty Lane. This condition is inefficient for existing truck traffic, and potentially limits future growth of new businesses from locating to these facilities. Like the roads that currently serve Garrison Oak, many of the roads that serve the CDAC were not designed to accommodate truck traffic. These roads include Horsepond Road, Lafferty Lane, S. Little Creek Road, and Fox Road. Fox Road is a small county road, 22-feet in width, with no shoulders, and was not designed to accommodate truck traffic. White Oak Road is more capable than Acorn Lane of accommodating truck traffic; however, trucks have a difficult time negotiating the White Oak Road/Acorn Lane intersection. Furthermore, passenger vehicles often come in conflict with trucks at this intersection. Both N. and S. Little Creek Roads can accommodate truck traffic; however, their intersections with Fox Road are difficult for trucks to negotiate, and passenger |

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|                                                                                                                                                                                                                                                     |                                                                                                                     |                   | vehicles and trucks are often in conflict at these intersections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| e.                                                                                                                                                                                                                                                  | Provide a brief chronology of the planning activities (PEL study) including the year(s) the studies were completed. | Recommendations   | <p>Before these projects can be placed in the CTP they must first be included in Dover/Kent County MPO's Metropolitan Transportation Plan (MTP). The MTP identifies the region's long-term transportation needs and the projects and activities that address them. The MTP extends at least two decades and must be financially reasonable (based on anticipated revenues) while meeting air quality standards. The projects in the Plan are divided into two lists, the Constrained List (projects that are funded in the CTP) and the Aspirations List (projects which are not yet funded). Only transportation projects found in the MTP, are eligible for federal funding. It is a living plan, subject to continual revision (at least every four years) and a tool for informed transportation and policy decisions.</p> <p>This Planning and Environmental Linkage (PEL) Report is a result of the PEL study process conducted by Century Engineering, the Dover/Kent County MPO and the Study Team's Project Management Committee (PMC) which included DeIDOT, City of Dover, Kent County, Kent Economic Partnership, and the Office of State Planning. The first phase was the data gathering phase where existing conditions were collected and</p> |

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|                                                                                                                                                                                                                                                     |                                                                                                                                                             |                   | <p>reviewed. The second phase utilized the existing conditions and community feedback gathered in the Visioning Workshop to analyze the opportunities, challenges, concerns, and goals of the project. In the third phase potential recommendations were developed, analyzed, and documented to be discussed with the PMC and the community. Results from these engagements were positive and the recommendations were slightly revised.</p> <p>Public involvement and community outreach were important components of the Dover Air Cargo Freight Access Study. Residents, the business community, as well as state and local stakeholders were engaged throughout the Study.</p> |
| f.                                                                                                                                                                                                                                                  | Are there recent, current, or near future planning studies or projects in the vicinity? What is the relationship of this project to those studies/projects? |                   | Civil Air Terminal Strategic Market Assessment<br>2017 Garrison Oak Traffic Study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2.                                                                                                                                                                                                                                                  | Methodology used:                                                                                                                                           |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| a.                                                                                                                                                                                                                                                  | What was the scope of the PEL study and the reason for completing it?                                                                                       | Purpose & Need    | <p>The primary purpose of the Dover Air Cargo Freight Access Study is to identify improvements that would enhance connections and access to the CDAC at the Dover Air Force Base and the Garrison Oak Business and Technology Center (Garrison Oak) to the north from the regional highway network, as well as improve connections between these two facilities. These improved connections could potentially draw in more businesses to CDAC and Garrison Oak. An additional benefit would be the reduction of traffic, particularly heavy-truck traffic, on the area’s local roadway network.</p>                                                                                |

## Dover Air Cargo Freight Access Study

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| b.                                                                                                                                                                                                                                                  | Did you use NEPA-like language? Why or why not?                                                                                                                                                                                                                                                                                                   | Environmental Resources | Yes, because there are potentially state and federally regulated environmental and cultural resources present in the study area.                                                                                                                                                                                                                                                                                                                                                    |
| c.                                                                                                                                                                                                                                                  | What were the actual terms used and how did you define them? (Provide examples or list)                                                                                                                                                                                                                                                           | Environmental Resources | Wetlands, farmland, Rare, Threatened and Endangered Plant and Animal Species<br><br>As individual improvement recommendations advance to design projects, if any federal funds are used and/or any federally protected resources are impacted, the requirements of the National Environmental Policy Act of 1969 (NEPA) will need to be satisfied.                                                                                                                                  |
| d.                                                                                                                                                                                                                                                  | How do you see these terms being used in NEPA documents?                                                                                                                                                                                                                                                                                          | Environmental Resources | These analyses are described in the report for reference in a future NEPA study                                                                                                                                                                                                                                                                                                                                                                                                     |
| e.                                                                                                                                                                                                                                                  | What were the key steps and coordination points in the PEL decision-making process? Who were the decision-makers and who else participated in those key steps? For example, for the corridor vision, the decision was made by state DOT and the local agency, with buy-in from FHWA, the USACE, and USFWS and other resource/regulatory agencies. | Public Involvement      | Throughout the study, representatives from DelDOT, City of Dover, Kent Economic Partnership, Dover Kent County MPO, Office of State Planning, and the community were invited to provide existing conditions information, review the information prepared, comment on the material, and provide feedback which was processed through subsequent revisions. In addition, legislators and local business owners were also invited to review and provide feedback throughout the study. |
| f.                                                                                                                                                                                                                                                  | How should the PEL information be presented in NEPA?                                                                                                                                                                                                                                                                                              |                         | The PEL Study may be attached                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3.                                                                                                                                                                                                                                                  | Agency coordination:                                                                                                                                                                                                                                                                                                                              |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| a.                                                                                                                                                                                                                                                  | Provide a synopsis of coordination with Federal, tribal, state and local environmental, regulatory and resource agencies. Describe their level of participation and how you coordinated with them.                                                                                                                                                | Recommendations         | Throughout the course of this study, alternatives were developed to address the study's Purpose and Need and are based on feedback from the community and                                                                                                                                                                                                                                                                                                                           |

## Dover Air Cargo Freight Access Study

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|                                                                                                                                                                                                                                                     |                                                                                                                               |                    | area businesses, as well as input from the Dover Kent County MPO, DelDOT, City of Dover, Kent County, Kent Economic Partnership, and the Office of State Planning.                                                                                                                                                                                                                                                                                                                  |
| b.                                                                                                                                                                                                                                                  | What transportation agencies (e.g. for adjacent jurisdictions) did you coordinate with or were involved during the PEL study? | Recommendations    | DelDOT, Dover Kent County MPO, City of Dover, Kent County, Office of State Planning, Kent Economic Partnership                                                                                                                                                                                                                                                                                                                                                                      |
| c.                                                                                                                                                                                                                                                  | What steps will need to be taken with each agency during NEPA scoping?                                                        | Recommendations    | Each recommendation that moves forward for design will continue with the NEPA process where this report leaves off. Each agency will be prepared to have a scoping meeting for the recommendation and begin the in-depth investigation into the permitting and coordination necessary for design.                                                                                                                                                                                   |
| 4.                                                                                                                                                                                                                                                  | Public coordination:                                                                                                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1.                                                                                                                                                                                                                                                  | Provide a synopsis of your coordination efforts with the public and stakeholders.                                             | Public Involvement | Throughout the study, representatives from DelDOT, City of Dover, Kent Economic Partnership, Dover Kent County MPO, Office of State Planning, and the community were invited to provide existing conditions information, review the information prepared, comment on the material, and provide feedback which was processed through subsequent revisions. In addition, legislators and local business owners were also invited to review and provide feedback throughout the study. |
| 5.                                                                                                                                                                                                                                                  | Range of alternatives:                                                                                                        |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| a.                                                                                                                                                                                                                                                  | What types of alternatives were looked at?                                                                                    | Recommendations    | Throughout the course of this study, alternatives were developed to address the study's Purpose and Need and are based on feedback from the community and area businesses, as well as input from DelDOT, City of                                                                                                                                                                                                                                                                    |

## Dover Air Cargo Freight Access Study

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|                                                                                                                                                                                                                                                     |                                                                                                                                                                                         |                    | Dover, Kent County, Kent Economic Partnership, and the Office of State Planning. Four phases of improvements are recommended as part of this study. These recommendations include new alignments as well as improvements to existing roadways. The recommendations were placed into four phases.                                                                                                         |
| b.                                                                                                                                                                                                                                                  | How did you select the screening criteria and screening process?                                                                                                                        | Project Need       | Recommendations that were deemed “feasible” were included in the report and will move forward for further study. To be deemed feasible the recommendations must meet the project needs statement, while having the ability to be designed and constructed.                                                                                                                                               |
| c.                                                                                                                                                                                                                                                  | For alternative(s) that were screened out, briefly summarize the reasons for eliminating the alternative(s). (During the initial screenings, this generally will focus on fatal flaws.) | Recommendations    | Fatal flaws on recommendations that did not move forward included recommendations that did not meet the purpose and need statement, recommendations that were too costly or required a large amount of right-of-way versus the benefit that the recommendation provided. Also, if recommendations were not supported by multiple agencies and the community they were not chosen to move forward either. |
| d.                                                                                                                                                                                                                                                  | Which alternatives should be brought forward into NEPA and why?                                                                                                                         | Recommendations    | As funding becomes available all of the recommendations in this Study should move forward for further study.                                                                                                                                                                                                                                                                                             |
| e.                                                                                                                                                                                                                                                  | Did the public, stakeholders, and agencies have an opportunity to comment during this process?                                                                                          | Public Involvement | Yes                                                                                                                                                                                                                                                                                                                                                                                                      |
| f.                                                                                                                                                                                                                                                  | Were there unresolved issues with the public, stakeholders, and/or agencies?                                                                                                            | Public Involvement | The community would like more detailed information as the recommendations move into further study.                                                                                                                                                                                                                                                                                                       |
| 7.                                                                                                                                                                                                                                                  |                                                                                                                                                                                         |                    |                                                                                                                                                                                                                                                                                                                                                                                                          |

## Appendix F – PEL Checklist

### Dover Air Cargo Freight Access Study

| Federal Highway Administration - Planning and Environmental Linkages Questionnaire<br><a href="https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx">https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx</a> |                                                                                                                                                                                                                                          |                     |                                                                                                                                                            |
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|                                                                                                                                                                                                                                                     | Topic                                                                                                                                                                                                                                    | Section Reference   | Comments                                                                                                                                                   |
| a.                                                                                                                                                                                                                                                  | What is the forecast year used in the PEL study?                                                                                                                                                                                         | N/A                 | N/A                                                                                                                                                        |
| b.                                                                                                                                                                                                                                                  | What method was used for forecasting traffic volumes?                                                                                                                                                                                    | N/A                 | N/A                                                                                                                                                        |
| c.                                                                                                                                                                                                                                                  | Are the planning assumptions and the corridor vision/purpose and need statement consistent with each other and with the long-range transportation plan? Are the assumptions still valid?                                                 | Project Need        | Yes and Yes                                                                                                                                                |
| d.                                                                                                                                                                                                                                                  | What were the future year policy and/or data assumptions used in the transportation planning process related to land use, economic development, transportation costs, and network expansion?                                             | Recommendations     | Costs were preparing using 2021 unit costs                                                                                                                 |
| 8.                                                                                                                                                                                                                                                  | Environmental resources (wetlands, cultural, etc.) reviewed.                                                                                                                                                                             |                     |                                                                                                                                                            |
| a.                                                                                                                                                                                                                                                  | In the PEL study, at what level of detail was the resource reviewed and what was the method of review?                                                                                                                                   | Project Need        | Desktop Review and Field Verification                                                                                                                      |
| b.                                                                                                                                                                                                                                                  | Is this resource present in the area and what is the existing environmental condition for this resource?                                                                                                                                 | Existing Conditions | It appears from our desktop review there are environmental, potentially cultural and farmland resources present in the project study areas.                |
| c.                                                                                                                                                                                                                                                  | What are the issues that need to be considered during NEPA, including potential resource impacts and potential mitigation requirements (if known)?                                                                                       | Recommendations     | It appears there could be impacts to the resources with many of the recommendations presented in this report.                                              |
| d.                                                                                                                                                                                                                                                  | How will the planning data provided need to be supplemented during NEPA?                                                                                                                                                                 | Recommendations     | Coordination with appropriate State and Federal resource agencies will be imperative at the start of the next phase of design for each individual project. |
| 9.                                                                                                                                                                                                                                                  | List environmental resources you are aware of that were not reviewed in the PEL study and why. Indicate whether they will need to be reviewed in NEPA and explain why.                                                                   | N/A                 | N/A                                                                                                                                                        |
| 10.                                                                                                                                                                                                                                                 | Were cumulative impacts considered in the PEL study? If yes, provide the information or reference where the analysis can be found.                                                                                                       | N/A                 | N/A                                                                                                                                                        |
| 11.                                                                                                                                                                                                                                                 | Describe any mitigation strategies discussed at the planning level that should be analyzed during NEPA.                                                                                                                                  | N/A                 | N/A                                                                                                                                                        |
| 12.                                                                                                                                                                                                                                                 | What needs to be done during NEPA to make information from the PEL study available to the agencies and the public? Are there PEL study products which can be used or provided to agencies or the public during the NEPA scoping process? |                     | The PEL Study will be available to agencies involved in the planning and design processes.                                                                 |
| 13.                                                                                                                                                                                                                                                 | Are there any other issues a future project team should be aware of?                                                                                                                                                                     | N/A                 | N/A                                                                                                                                                        |