Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Final Report May

11, 2022

Prepared by:

CENTURY ENGINEERING
A Kleinfelder Company

Contents

Executive Summary 1
Study Area 3
Project Purpose and Need 3
Project Description 4
Existing Conditions 4
Summary of Past Studies 5
Alternatives Studied 7
Extension of Pigeon Point Road 7
Extension of Pigeon Point Road, Option 1 8
Extension of Pigeon Point Road, Option 2 9
Pyles Lane Extended 10
Garasches Lane Reconfiguration 10
Measures of Effectiveness Analysis 12
Traffic Operational Analysis 13
Measures of Effectiveness & Benefits 13
Cost Estimates and Funding Opportunities 19
Alternative Cost Estimates 19
Funding Opportunities 20
Public Outreach 20
Summary and Recommendations 21
Appendix A – Public Workshop Summaries 25
Appendix B – PEL Checklist 26
Appendix C – Detailed Plans for Concepts 34
Appendix D – Detailed Estimates 53

List of Figures

Figure 1 - Study Area 3
Figure 2 - Existing Communities 4
Figure 3 - Truck Restrictions 5
Figure 4 – Alternatives Studies 7
Figure 5 - Pigeon Point Extension - Route 9 Study 8
Figure 6 - Pigeon Point Road Extended - Option 1 9

Figure 7- Pigeon Point Road Extended - Option 2 10
Figure 8 - Pyles Lane Extended 10
Figure 9 - Garasches Lane Reconfiguration 11
Figure 10 - Signing Trucks to Use I-495 12
Figure 9 - Garasches Lane Reconfiguration 11
Figure 10 - Signing Trucks to Use I-495 12

List of Tables

Table 1 - Annual Travel Time & Fuel Consumption Reduction for Weekday AM and PM Peak Hours 14
Table 2: Weekday AM Peak Hour Intersection LOS 14
Table 3: Weekday PM Peak Hour Intersection LOS 16
Table 4: Weekday AM and PM Peak Hours Truck Reduction 17
Table 5: Weekday AM and PM Peak Hours Truck Reduction (Percentage) 18
Table 6: Weekday AM and PM Peak Hours Overall Benefit Scores 19
Table 7: Overall Benefit Scores with Project Costs 22
Table 8: Overall Recommendations 23

Executive Summary

Since the development of the Port of Wilmington in 1923, the residential areas surrounding the Port have been plagued with incompatible land uses. The existing communities of Eden Park Gardens, Hamilton Park, Rose Hill, Simons Gardens, Mayview Manor, and Holloway Terrace have seen the surrounding industrial areas expand over the decades. The regional truck traffic is utilizing I-95, I-295 and I-495 to access the Port and other businesses in the study area. Once the trucks leave the interstate system, they have very few options other than SR9, New Castle Ave, to access their destination. Truck traffic (and any subsequent increases) has been found to conflict with the vision of the corridor established through the SR9 Corridor Master Plan. As a result there is a need to identify alternatives and options that would remove or divert truck traffic from SR9, New Castle Ave while still allowing access the Port and the surrounding area.

This project evaluated several alternatives to determine the benefits of each relative to the purpose and need for the project. Five alternatives we evaluated using the measures of effectiveness to determine the overall benefits that each alternative has on diverting or removing truck tips on New Castle Ave and thereby improving the overall operations of the corridor.

Alternative 1 – Pigeon Point Road Ext. Option 1

Alternative 2 – Pigeon Point Road Ext. Option 2

Alternative 3 – Pyles Lane Extension

Alternative 4 – Garasches Lane Reconfiguration

Alternative 5 – Sign and Reroute All Port I-295 Traffic to I-495.

The overall benefit scores and the costs of each alternative is listed in the following table.

Scenario	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Travel Time Reduction	2.33	2.33	1.00	3.67	5.00
Truck Reduction on New Castle Ave	8.00	8.00	2.00	6.00	8.00
Truck Reduction on Terminal Ave West of I-495 Ramps	1.00	1.00	1.00	0.00	1.00
A.M. Peak Hour LOS Improvement	1.00	1.00	0.00	1.00	1.00
P.M. Peak Hour LOS Improvement	1.00	1.00	0.00	1.00	1.00
Fuel Consumption Reduction	2.92	2.92	1.25	3.54	5.00
Total Benefit Score	16.25	16.25	5.25	15.21	21.00
Estimated Project Cost	$25,200,000	$23,200,000	$2,800,000	$7,925,000	N/A

As discussed more fully in the final report Alternative 5 offers the highest benefit score however there is still some due-diligence work required to determine the feasibility. Alternative 1 and 2 have the highest benefit scores. Alternative 4 provides a good value in an overall high benefit score with less of a capital investment than Alternatives 1 and 2. It is recommended that Alternative 3 be dropped from further study. The following table summarizes the recommendations of the study.

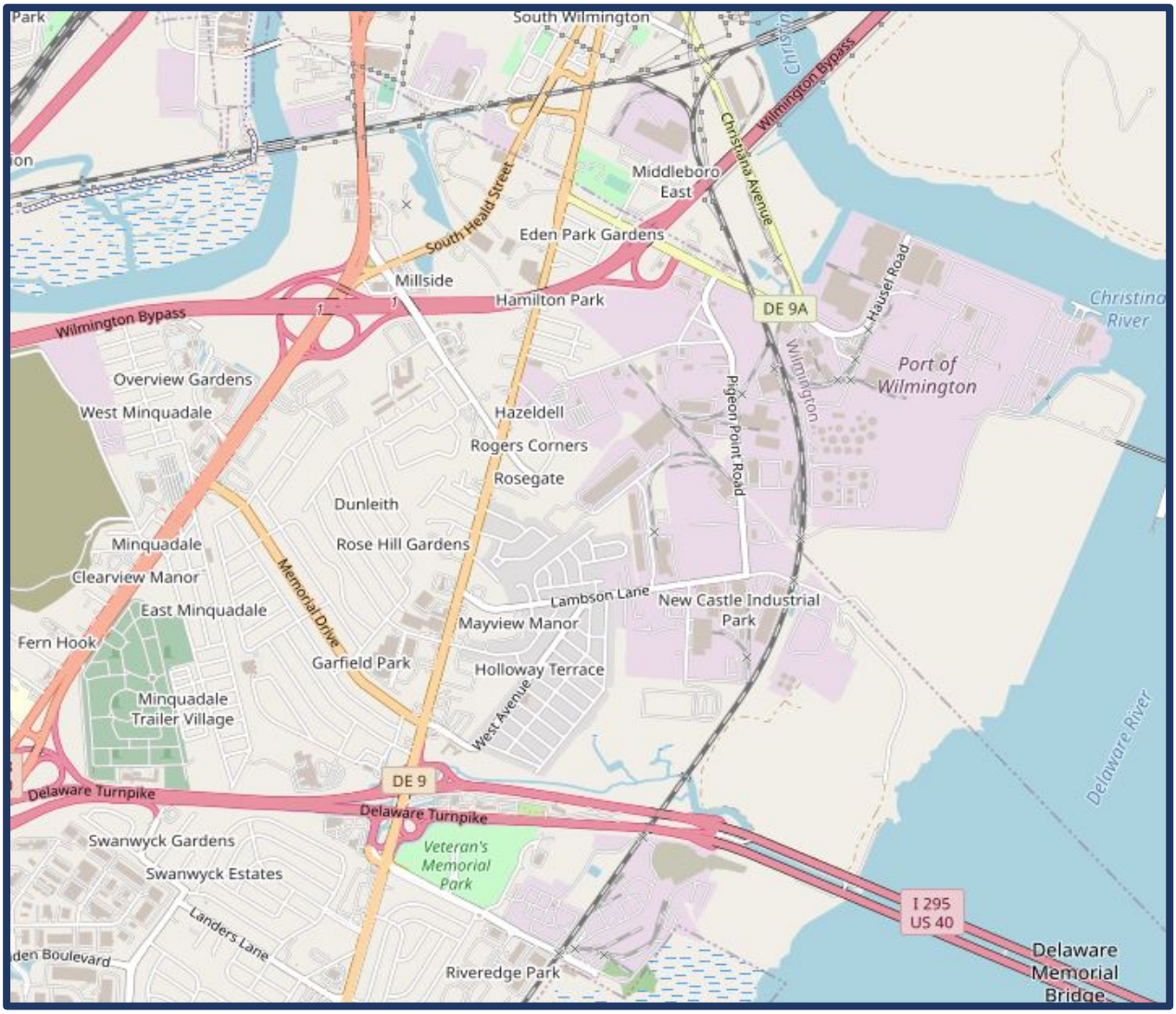
Recommendations		
Alternative	Advance for Further Study	Include in RTP
Alternative 1 -Pigeon Point Extended Option 1	Yes	Yes
Alternative 2 - Pigeon Point Extended Option 2	Yes	Yes
Alternative 3 - Pyles Lane Extension	No	No
Alternative 4 - Garasches Lane Reconfiguration	Yes	Yes
Alternative 5 - Sign and Reroute All Port I-295 Traffic to I-495	Yes	No

The next steps are to move the projects into the Regional Transportation Plan (RTP) and strategize on possible funding opportunities to advance the projects into the Capital Transportation Program (CTP).

Study Area

The study is defined as the geographical area bounded by US13 to the west, the Delaware Bay to the east, Southbridge Community to the north and I-295 to the south. The study area includes all the communities along SR9, New Castle Ave, and from south of I-295 to the Southbridge Community. Figure 1 illustrates the general study area.

Figure 1 - Study Area



Project Purpose and Need

The area in and around the Port of Wilmington has experienced increased truck traffic as the Port and other commercial businesses have continued to grow and expand over the years. The truck traffic has an adverse impact on the local neighborhoods and neighborhood streets. The regional truck traffic is utilizing I-95, I-295 and I-495 to access the Port and other businesses in the study

area. Once the trucks leave the interstate system, they have very few options other than SR9, New Castle Ave, to access their destination. Truck traffic (and any subsequent increases) has been found to conflict with the vision of the corridor established through the SR9 Corridor Master Plan.

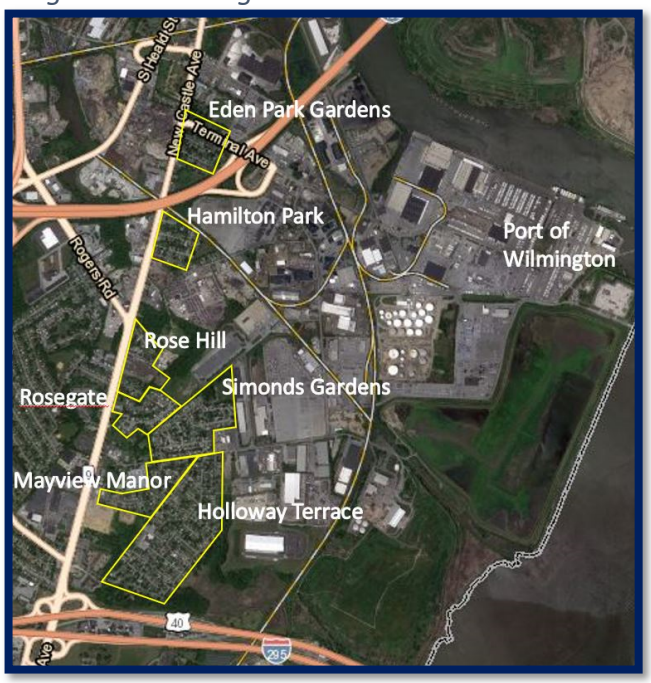
As a result, there is a need to identify alternatives and options that would remove or divert truck traffic from SR9, New Castle Ave while still allowing access the Port and the surrounding area.

Project Description

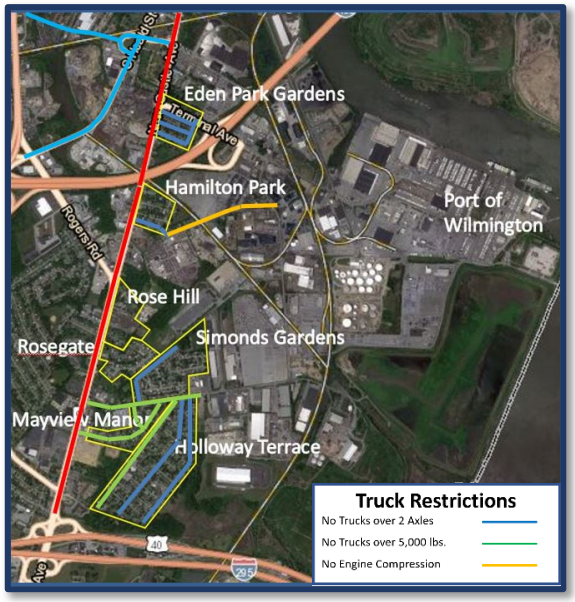
This study evaluated and recommended a series of possible improvements in and around the Port of Wilmington area in an effort to improve truck circulation. The recent completion of the SR9 Corridor Master Plan, several expansion proposals for the Port of Wilmington and other studies such as the 2008 Southbridge Circulation Study and the 2028 Wilmington Comp Plan have generated several proposed improvements which were further evaluated. This study looked at these possible improvements, as well as others through a technical benefits analysis using a measures of effectiveness model to assess the benefits of each possible improvement against the defined purpose and need.

Existing Conditions

Figure 2 - Existing Communities



Since the development of the Port of Wilmington in 1923, the residential areas surrounding the Port have been plagued with incompatible land uses. The existing communities of Eden Park Gardens, Hamilton Park, Rose Hill, Simons Gardens, Mayview Manor, and Holloway Terrace have seen the surrounding industrial areas expand over the decades. Figure 2 shows the existing communities within the study area. With the expansion of those industrial areas has come increased truck traffic, as well as, noise and air quality concerns. This has significantly impacted the quality of life of the residents in those communities. Balanced with that concern is the need for continued viability of the Port and surrounding industrial areas. For these businesses to thrive and contribute to the Delaware economy there must be adequate and efficient access, and the ability to move goods and services in and out of the area.

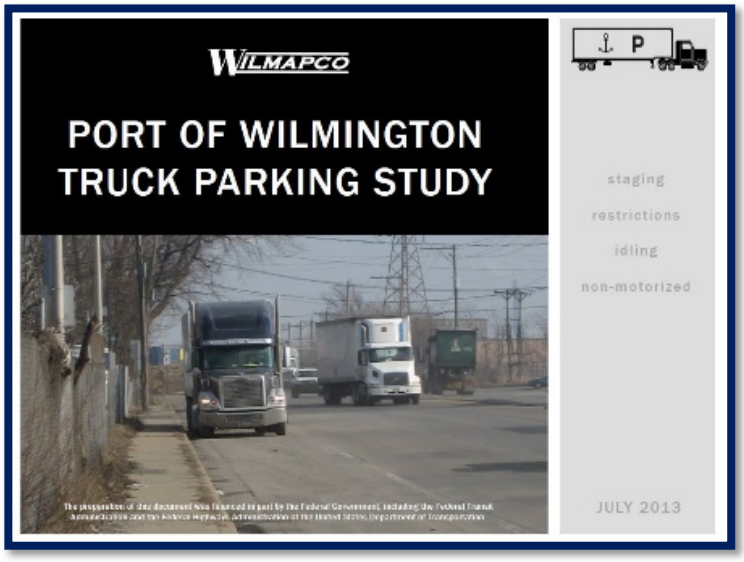


In an effort to keep truck traffic off of the neighborhood streets several truck restrictions have been implemented over the years. This has had some positive impacts but there are still instances where trucks violate the posted restrictions. There are truck restrictions for vehicles over 2 axles in Holloway Terrace, Simonds Gardens, Hamilton Park and Eden Park Gardens. Trucks over 5000 lbs. are prohibited on Lambsons Lane, West Ave, within Holloway Terrace and Hillview Ave. within Mayview Manor.

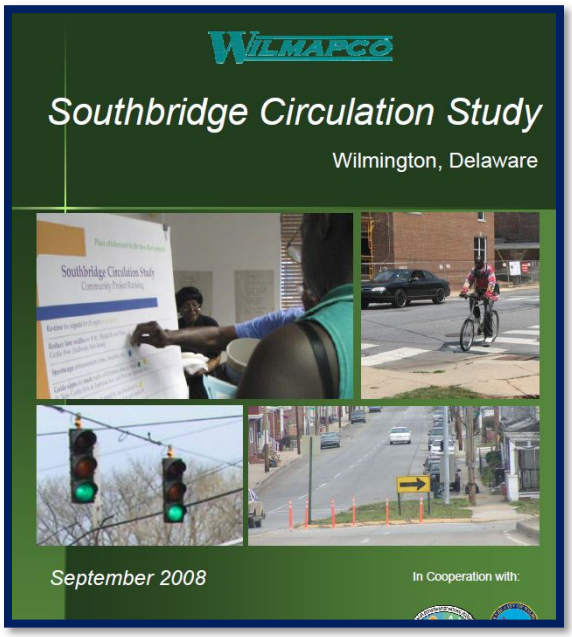
Figure 3 - Truck Restrictions

Summary of Past Studies

Over the years WILMAPCO, DelDOT, New Castle County and the City of Wilmington have studied the area with the goal of providing improved quality of life for those communities impacted by the Port of Wilmington and the surrounding industrial areas. This study will help inform this effort of assessing the impacts and benefits of the possible improvements needed to improve truck access around the Port of Wilmington. Based on the results of this study the Project Team will make recommendations for actual capital projects to be added into the Regional Transportation Plan (RTP) and the Capital Transportation Plan (CTP). The studies that will form the foundation of this effort are summarized below.



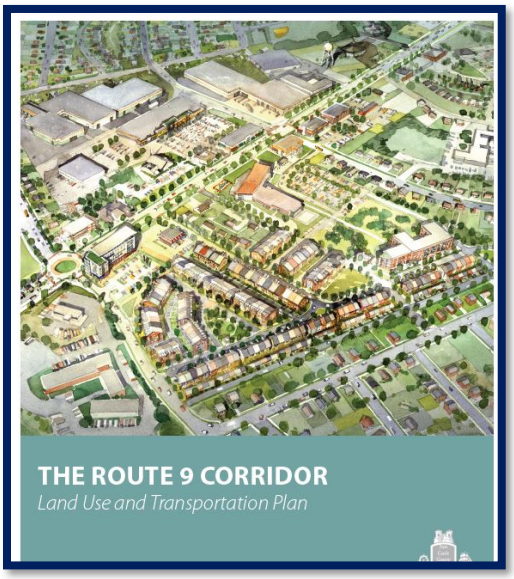
The *Port of Wilmington Parking Study* sought to identify possible locations for off-site truck parking near the Port of Wilmington and address the issues of trucks using residential roadways. Several of the recommendations from this study have been implemented including improvements to the nonmotorized access to the Port, however, there has been little movement on finding an alternative route to access Pigeon Point Road other than Terminal Avenue, which bisects the residential community of Hamilton Park.



The *Southbridge Circulation Study* identified several recommendations to address the goal of minimizing truck traffic through the residential area, specifically the side streets. The initial recommendation was to implement turning restrictions and to provide better signing from the Port and surrounding areas to minimize trucks traveling through Southbridge. The study contemplated a bypass; however, it was not pursued as part of the study.

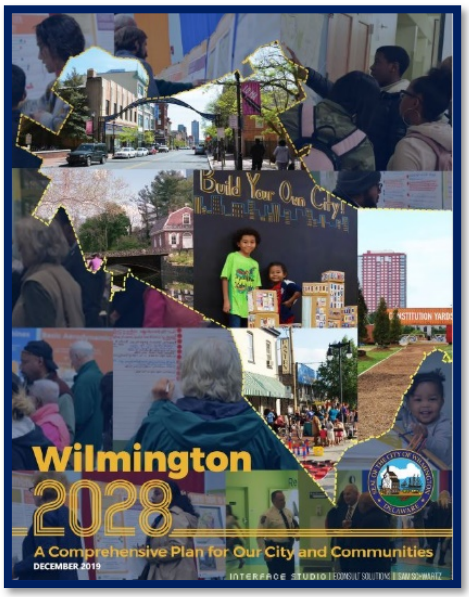
The Route 9 Corridor Land Use and Transportation Plan also provided some recommendations for the area concerning truck traffic in the industrial areas. These may become the foundation for the possible improvements that will be identified in Task 1.

- It was contemplated that the Industrial lands adjacent to Route 9 will be appropriately separated from residential neighborhoods.
- It was also suggested that the northern tip of the corridor – north of I-495 be rezoned to industrial or open space. We will consider this as a possible long-term goal as potential improvements are considered during this study.
- Potential new truck routes (Pigeon Point Road Extension and Garasches Lane Extension) could work to keep trucks out of existing and future neighborhoods and simultaneously improve freight movement efficiency, freeing industries and the Port to comfortably expand west and south.



Wilmington's latest comprehensive plan, *Wilmington 2028 A Comprehensive Plan for Our City and Communities*, outlines several initiatives concerning truck traffic in the City, these include:

- Limit the amount of truck traffic traveling through Wilmington's neighborhoods. Limiting truck traffic in neighborhoods will reduce wear and tear on roads and decrease air and noise pollution. Wilmington should better enforce truck restricted streets, as well as



truck signage, with a special emphasis in South Wilmington and the Eastside and make necessary changes to ensure trucks are clearly directed towards the appropriate routes.

- Coordinate with WILMAPCO's *Route 9 Corridor Land Use and Transportation Plan*

This study picked up where these studies left off to determine which efforts or proposed improvements are still viable or amenable to the stakeholders, but also address any new concerns and look for new solutions. These recommendations will be assessed using the identified measures of effectiveness to determine feasibility, impact to the efficiency of the transportation system, overall project costs, their ability to confine truck traffic to the industrial areas and major roadways, and consistency with the goals and objectives of the previous planning efforts.

Alternatives Studied

The study looked at 5 alternatives to assess their effectiveness in meeting the purpose and need of the project. The alternatives were assembled from previous studies, current DelDOT and New Castle County initiatives, and from input from the community during the initial public workshop.

Alternative 1 – Pigeon Point Road Ext. Option 1

Alternative 2 – Pigeon Point Road Ext. Option 2

Alternative 3 – Pyles Lane Extension

Alternative 4 – Garasches Lane Reconfiguration

Alternative 5 – Sign and Reroute All Port I-295 Traffic to I-495.

Figure 4 – Alternatives Studies

Extension of Pigeon Point Road

This Alternative came from the *Route 9 Corridor Land Use and Transportation Plan*. The initial idea is illustrated in Figure 5 and shows existing Pigeon Point Road being extended from its current terminus with Lambsons Lane along the abandoned rail corridor and extending south parallel to the Norfolk Southern, New Castle County Secondary (Regan to Porter) rail line. The

initial idea was to create an interchange with I-295 with the new Pigeon Point Road that would provide direct access from the industrial areas east of SR9 to and from I-295. Detailed discussions with the Delaware River and Bay Authority (DRBA) were undertaken to determine the feasibility of creating an interchange with the I-295 between the Delaware Memorial Bridge and the existing toll lanes. Based on the conversations it was determined that an interchange at this location would negatively impact their operations and the physical improvements could not be implemented without significant cost to the bridge and tolling operations. There was also a concern with maintenance access for their existing operations.

DRBA was agreeable to extending pigeon point road parallel to the existing Norfolk Southern underpass. This would require improvements to the substructure and superstructure of the I-295 bridges that cross the Norfolk Southern rail line. They were also agreeable to the utilization of their right-of-way for the option 1.

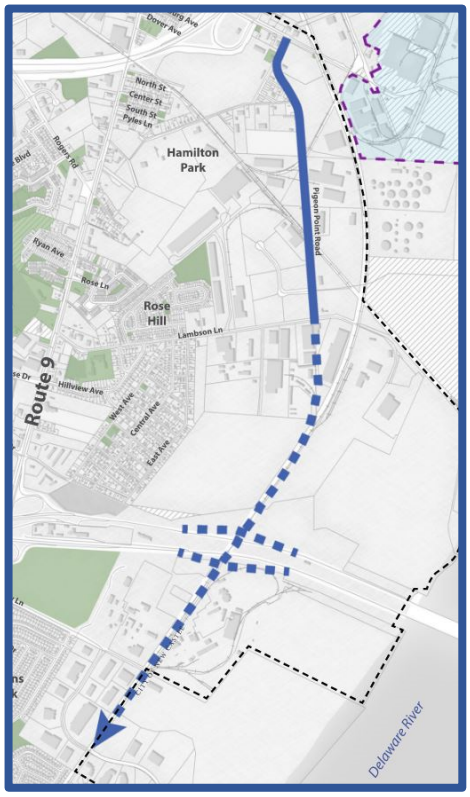


Figure 5 - Pigeon Point Extension - Route 9 Study

Two alternatives were developed considering DRBA coordination, existing utilities, existing wetlands, and property concerns. The major differences between the two alternatives are the connections to Lambsons Lane and the connections to Cherry Lane. The two options have similar impacts to the existing utilities and wetlands.

Extension of Pigeon Point Road, Option 1 - This option extends Pigeon Point Road through the existing rail corridor. The alignment is to the west of the existing sewer line and west of the power transmission lines. The existing Fed-Ex Facility ties into the new roadway to provide direct access to the new truck corridor. South of the Fed-Ex Facility there is a significant wetland that will have to be spanned to minimize the environmental impact. Option 1 proposes a low-profile structure to span the entirety of the wetlands. As the alignment continues south there is a horizontal shift as it approaches I-295 to minimize the impacts to the I-295 structures over Norfolk Southern. Once on the south side of I-295 the alignment runs along the toe of fill for the I-295 embankment. The alignment then ties into Uniqema Blvd. adjacent to the Veterans Memorial Park. This option will need to include screening and buffering of Cherry Lane from Collins Park. This will have to be coordinated during the final design. Figure 6 illustrates Option 1 of the Pigeon Point Road Extension and more detailed plans can be found in Appendix C.

Truck Travel Patterns for Option 1. Trucks leaving the Port Area destined for points north or south on I-295 will utilize the new Pigeon Point Extended to Cherry Lane. Trucks will then use Cherry Lane to Access the I-295 interchange. Trucks on I-295 destined for the Port and surrounding areas will exit I-295 on New Castle Ave. and turn onto Cherry Lane to Uniqema Blvd. These travel patterns reduce truck trips from New Castle Ave. north of I-295 to the Southbridge Community.

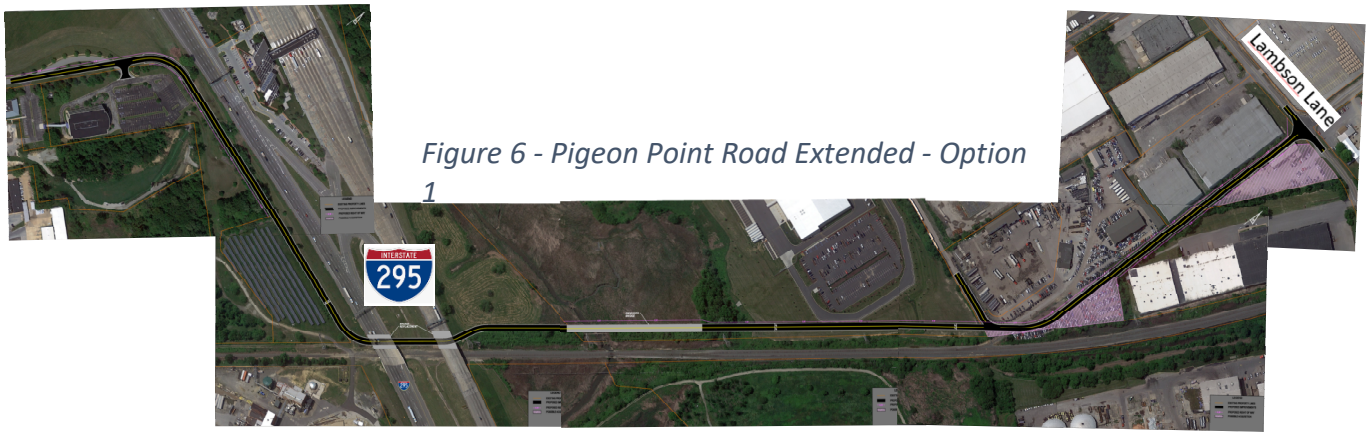


Figure 6 - Pigeon Point Road Extended - Option 1

Extension of Pigeon Point Road, Option 2 – This option utilizes the existing infrastructure of Davidson Lane and the new Fed-Ex driveway to minimize the need for new pavement along the rail corridor. At this point the alignment is the same as option 2 and is west of the existing sewer line and west of the power transmission lines. The existing Fed-Ex Facility ties into the new roadway to provide direct access to the new truck corridor. South of the Fed-Ex Facility there is a significant wetland that will have to be spanned to minimize the environmental impact. Option 1 proposes a low-profile structure to span the entirety of the wetlands. As the alignment continues south there is a horizontal shift as it approaches I-295 to minimize the impacts to the I-295 structures over Norfolk Southern. Once on the south side of I-295 the alignment continues parallel to the Norfolk Southern rail corridor to Cherry Lane. The access points to Fuji Film will need to be reconfigured as shown on the detailed concept drawings. In addition, this option will need to include screening and buffering of Cherry Lane from Collins Park. This will have to be coordinated during the final design. Figure 7 illustrates Option 2 of the Pigeon Point Road Extension and more detailed plans can be found in Appendix C.

Truck Travel Patterns for Option 2. Trucks leaving the Port Area destined for points north or south on I-295 will utilize the new Pigeon Point Extended to Cherry Lane. Trucks will then use Cherry Lane to Access the I-295 interchange. Trucks on I-295 destined for the Port and surrounding area will exit I-295 on New Castel Ave. and turn into the new Pigeon Point Road Extended. These travel patterns reduce truck trips from New Castle Ave. north of I-295 to the Southbridge Community.

Figure 7- Pigeon Point Road Extended - Option 2

Pyles Lane Extended

The extention of Pyles Lane was an option that was derrived from the DelDOT and New Castle County initiative to relocate the residents that currently live along Plyes lane adjacenet to the industial areas on the south side of Pyles Lane. The properties in purple as illustrated in Figure 8 are those residences that were approached for possible relocation. This alternative would have extended pyles lane and created a new intersection with New Castle Ave. The existing Pyles Lane would have a cul-de-sac and be buffered from the industrial areas. Figure 8 illustrates the Pyles Lane Extension alternative, more detailed plans can be found in Appendix C.

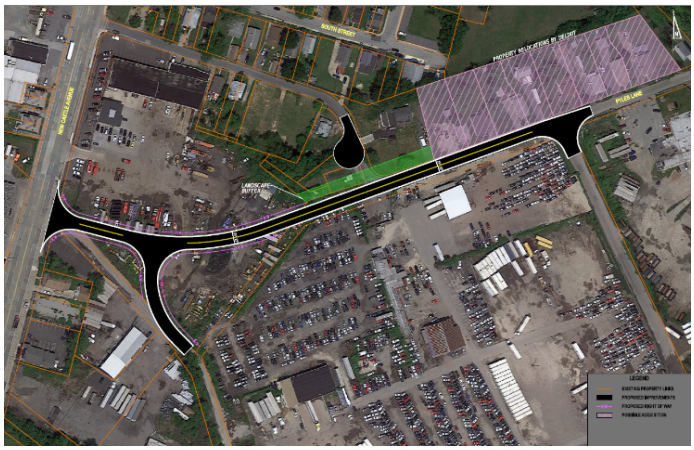


Figure 8 - Pyles Lane Extended

Truck travel patterns for Plyes Lane Extended - This Alternative would allow trucks an alternative access into the Port area and provide some reduction of truck traffic on Terminal Ave. This alternative would also reduce truck trips on New Castle Ave. from about Rodgers Road north to the Southbridge Community. This alternative does not reduce truck trips on New Castle Ave from Rodgers Road to the southern study limits.

Garasches Lane Reconfiguration

This alternative reconfigures the ramp from Heald Street to New Castle Ave. into a two-way roadway creating a connection between Market Street and New Castle Ave. Access to Heald Street would be accomplished by a new ramp connector road between Heald Street and Garasches Lane. This alternative mainly follows the existing roadway alignments however additional right-of-way would be needed from the old Norheat property. This property is needed to convert the existing one-way ramp into a two-way roadway. The new roadway would split and go on either side of the existing bridge pier under Heald Street. This alternative would also include a new rail crossing and improved access to the other industrial areas along Garasches Lane. Figure

9 illustrates the Garasches Lane Reconfiguration alternative, more detailed plans can be found in Appendix C.

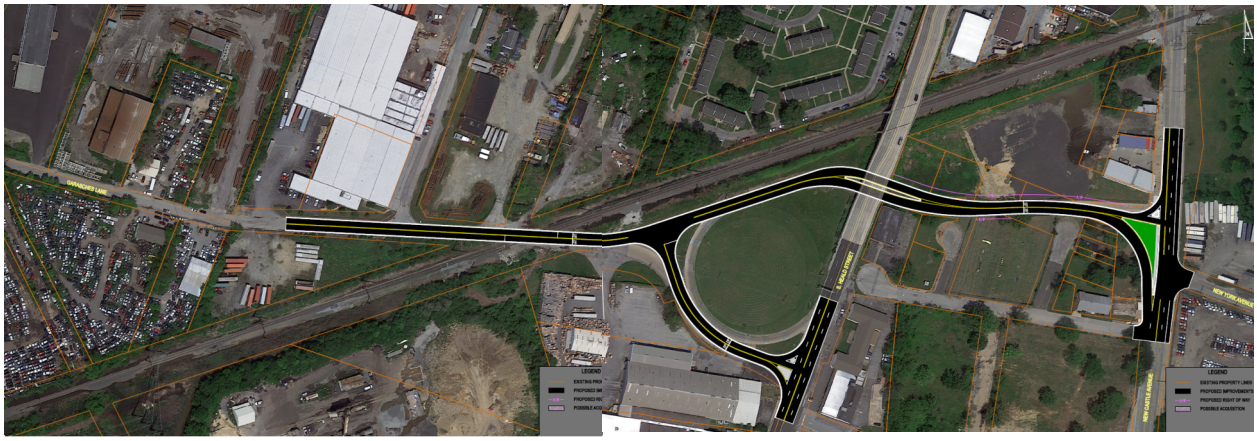


Figure 9 - Garasches Lane Reconfiguration

Truck travel patterns for Garasches Lane Reconfiguration – Trucks leaving the Port destined for US13 would still utilize Terminal Ave however they would only use a short section of New Castle Ave to access the new Garasches Lane and then utilize the new ramps to access Heald Street. Trucks on Heald Sttreet could access the Port utilizing the newly configured Garasches Lane. This alternative does put more traffic on New Castle Ave between Terminal Ave and Garasches Lane but does remove trucks from New Castle Ave south of Terminal Ave. Another benefit of this alternative is that all vehicles wanting to access Heald Street, New Castle Ave and Market Street that are south of the rail crossing do not have to enter into the Southbridge Community. The current use of D and C street could be moved onto the new Garasches Road connector.

Signing Trucks to Use I-495

This alternative would consist of placing signs and restrictions on certain roads to force trucks to access the Port and surrounding area by staying on I-295 / I-495 to the Terminal Ave interchange. This alternative seems easy to implement however there are several factors that need to be studied in further detail:

- SB 89 SA1, signed into law on June 30, 2021, requires all truck restrictions to be published through the Registrar of Regulations.
- SB 159, signed into law on Sept 15, 2021, allows roadways to be identified for the usage of monitoring systems in order to assist in the enforcement of applicable laws. However, the **Department must ensure proper documentation and devices exist before a roadway becomes eligible**.
- National Network regulation 23 CFR § 658.19 **prohibits denying "reasonable access" for food, fuel, repairs, or rest and prohibit denying access within 1 road-mile of the National**

Network using the "most reasonable and practicable route." National Network routes in Delaware include all interstate highways, US-13, US-40, US-113, and US-301.

The most concerning of the factors needing further study is the National Network regulation that prohibits denying "reasonable access" to goods and services along the National Network. This would include access to New Castle Ave. Figure 9 illustrates the Garasches Lane Reconfiguration alternative, more detailed plans can be found in Appendix C.

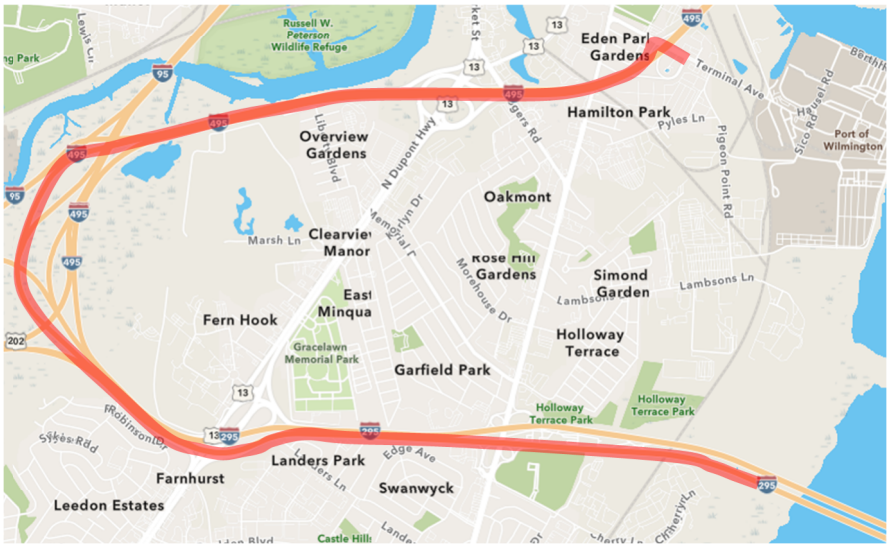


Figure 10 - Signing Trucks to Use I-495

Truck travel patterns for the Signing Truck Restrictions – Trucks would stay on I-295 and I-495 to access the Port and surrounding area. Trucks that would normally use New Castle Ave to access I-295 would have to get onto I-495 at the Terminal Ave. interchange and then access I-295 via I-495. This would remove trucks from the New Castle Ave and the surrounding roadways. Local businesses and services would still accommodate trucks however the number of trucks would be significantly reduced.

Measures of Effectiveness Analysis

Each alternative was assessed through a measures of effectiveness analysis to determine the benefit to New Castle Ave and Terminal Ave. The following information contains the methodology and the summary of results for the analysis.

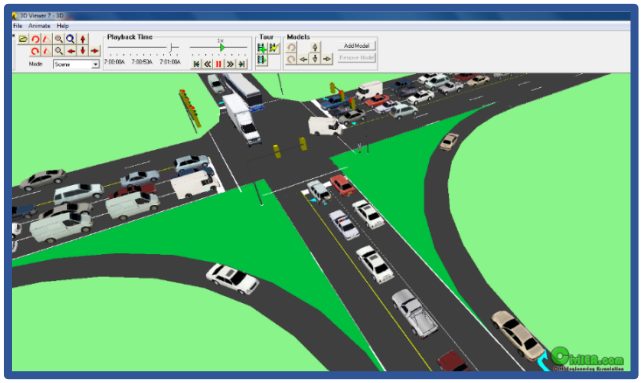
Per the protocols established by DelDOT regarding turning movement counts during the Covid-19 restriction period, the DelDOT Traffic Management Center's (TMC) Extranet was used to locate available pre-covid existing turning movement counts within the study area. A.M. and P.M. Manual turning movement counts were performed at intersection for which no existing turning movement counts were found. The counts were all performed on the weekdays from Tuesday April 13, 2021, through Thursday April 15, 2021.The counts classified vehicles with three axles or above as trucks.

Automatic Traffic Recorders with pneumatic tubes were deployed at appropriated locations during the week of the manual counts to enable corroboration of the manual counts. Data from the following sources were used to adjust traffic volumes where needed:

1. The ATR's deployed the week of the April 2021 manual turning movement counts.
2. Data from Permanent ATR Station 8006 located on New Castle Avenue at the I-495 Overpass obtained from the DelDOT TMC.
3. Data from Wavetronix Devices within the study area obtained from DelDOT TMC.
4. Existing pre-covid era intersection turning movement counts and tube counts obtained from the DelDOT TMC Extranet.

Traffic Operational Analysis

The traffic operational analysis was performed using Synchro 10 traffic analysis software. Six scenarios were analyzed as follows:



1. Existing Conditions to serve as the basis for comparison of the benefits of the alternatives.
2. Alternative 1 – Pigeon Point Extended Option 1.
3. Alternative 2 – Pigeon Point Extended Option 2.
4. Alternative 3 – Pyles Lane Extension.
5. Alternative 4 – Garasches Lane.
6. Alternative 5 – Sign and Reroute All Port I-295 Traffic to I-495.

Measures of Effectiveness & Benefits

The measures of effectiveness (MOE) generated from the analyses are:

1. Bidirectional Travel Time on New Castle Avenue from D Street to Cherry Lane.
2. A.M. and P.M. peak hour Intersection Level of Service (LOS) for all applicable intersections on New Castle Avenue, Terminal Avenue, and Heald Street (US13).
3. Truck Reduction at intersections on New Castle Avenue and on Terminal Avenue west of the I-495 ramps.
4. Fuel consumption reduction on New Castle Avenue from D Street to Cherry Lane.

The MOE obtained for each alternative was compared to the existing conditions MOE to assess the benefits/disbenefits of each. The difference in travel time and fuel consumed between existing conditions and each alternative for the two peak hours analyzed was annualized by multiplying by 260 days (5 weekdays x 52 weeks per year) to obtain the annual benefit/disbenefit.

Regarding LOS and truck reduction, a benefit score of one (1) was allocated to each intersection / location at which benefits are realized. For travel time and fuel reduction, the alternative with the greatest reduction was allocated a benefit score of 5. The benefit scores for the other alternatives were prorated based on their reduction value. The results for each individual MOE are presented in **Table 1** through **Table 4**. An overall benefit score based on the individual total scores is presented in **Table 5**.

The Bidirectional Travel Time on New Castle Avenue from D Street to Cherry Lane and the Fuel consumption reduction on New Castle Avenue from D Street to Cherry Lane are captured in Table 1. The travel time reductions identified in column one represents the travel time reduction for all vehicles. The Annual Fuel Reduction is directly related to the travel time savings for each alternative.

Air Quality impacts are also directly related to annual fuel reduction. Based on this connection between reduced fuel consumption and reduced emissions it can be assumed that there will be reductions in CO, NOx, and VOC.

Table 1 - Annual Travel Time & Fuel Consumption Reduction for Weekday AM and PM Peak Hours

Scenario	Annual Travel Time Reduction on New Castle Avenue (Hours)	Benefit Score (5 Max)	Annual Fuel Reduction for New Castle Avenue Vehicles (Gallons)	Benefit Score (5 Max)
Alternative 1	1,820	2.33	3,640	2.92
Alternative 2	1,820	2.33	3,640	2.92
Alternative 3	780	1.00	1,560	1.25
Alternative 4	2,860	3.67	4,420	3.54
Alternative 5	3,900	5.00	6,240	5.00

The next criteria assessed the benefits each alternative would have on the A.M. and P.M. peak hour Intersection Level of Service (LOS) for all applicable intersections on New Castle Avenue, Terminal Avenue, and Heald Street (US13). Since trucks in this area only represent a small percentage of the overall traffic on the roadways there was generally very little benefit to the individual intersection level of service by removing the trucks off the road. Although there were no measurable improvements to the intersection LOC letter grade there were minor reductions in measured delay at the several of the intersections studied. Table 2 and Table 3 identify the existing network LOS and the change in LOS of the studied intersections with the implementation of each alternative for the AM and PM peak hours. It should be noted that each alternative was studied independent of the others but if two or more alternatives were implemented there would be a compounding benefit that could be realized.

Table 2: Weekday AM Peak Hour Intersection LOS

Intersection	Existing Rd Network	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
New Castle Ave & D St	A	A	A	A	A	A
New Castle Ave & Connector Rd/Garashces Ln Extension	A	A	A	A	A	A
New Castle Ave & Garasches Ln	A	A	A	A	A	A
New Castle Ave & Terminal Ave	C	C	C	C	C	C
New Castle Ave & Pyles Ln	A	A	A	A	A	A
New Castle Ave & Old Ferry Rd/Pyles Ln Extension	A	A	A	A	A	A
New Castle Ave & Rogers Rd	C	C	C	C	C	C
New Castle Ave & Lambson Ln	A	A	A	A	A	A
New Castle Ave & Morehouse Dr	A	A	A	A	A	A
New Castle Ave & Memorial Dr	D	D	D	D	D	D
New Castle Ave & Halcyon Dr	C	B	B	C	B	B
New Castle Ave & Cherry Ln	D	D	D	D	D	D
Terminal Ave & SB I-495	A	A	A	A	A	A
Terminal Ave & NB I-495	A	A	A	A	A	A
Terminal Ave & Pigeon Point Rd	C	C	C	C	C	C
Pigeon Point Rd & Pyles Ln	A	A	A	A	A	A
Pigeon Point Rd & Lambson Ln	A	A	A	A	A	A
S Heald St & Garasches Ln	A	A	A	A	A	A
Garasches Ln & Grashches Ln Extension	N/A	N/A	N/A	N/A	A	N/A
Heald St & Rogers Rd	C	C	C	C	C	C
Dupont Pkwy & Rogers Rd	B	B	B	B	B	B
LOS Improvement?	**N/A**	**YES**	**YES**	**No**	**YES**	**YES**
Benefit Score (21 Maximum)	**N/A**	**1.00**	**1.00**	**0.00**	**1.00**	**1.00**

Table 3: Weekday PM Peak Hour Intersection LOS

Intersection	Existing Rd Network	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
New Castle Ave & D St	A	A	A	A	A	A
New Castle Ave & Connector Rd/Garashces Ln Extension	A	A	A	A	A	A
New Castle Ave & Garasches Ln	A	A	A	A	A	A
New Castle Ave & Terminal Ave	C	C	C	C	C	C
New Castle Ave & Pyles Ln	A	A	A	A	A	A
New Castle Ave & Old Ferry Rd/Pyles Ln Extension	A	A	A	A	A	A
New Castle Ave & Rogers Rd	C	C	C	C	C	C
New Castle Ave & Lambson Ln	B	B	B	B	B	B
New Castle Ave & Morehouse Dr	A	A	A	A	A	A
New Castle Ave & Memorial Dr	D	D	D	D	D	D
New Castle Ave & Halcyon Dr	C	B	B	C	B	B
New Castle Ave & Cherry Ln	C	C	C	C	C	C
Terminal Ave & SB I-495	A	A	A	A	A	A
Terminal Ave & NB I-495	A	A	A	A	A	A
Terminal Ave & Pigeon Point Rd	B	B	B	B	B	B
Pigeon Point Rd & Pyles Ln	A	A	A	A	A	A
Pigeon Point Rd & Lambson Ln	A	A	A	A	A	A
S Heald St & Garasches Ln	A	A	A	A	A	A
Garasches Ln & Grashches Ln Extension	N/A	N/A	N/A	N/A	A	N/A
Heald St & Rogers Rd	C	C	C	C	C	C
Dupont Pkwy & Rogers Rd	B	B	B	B	B	B
LOS Improvement?		**YES**	**YES**	**No**	**YES**	**YES**
Benefit Score (21 Maximum)	**N/A**	**1.00**	**1.00**	**0.00**	**1.00**	**1.00**

The next measure of effectiveness evaluated was the AM and PM peak hour truck reduction at each intersection studied along the New Castle Ave corridor. Table 4 identifies where there was a truck reduction for each of the alternatives studied. Alternative 1, 2 and 5 provide reductions to the greatest number of intersections along the corridor. Alternative 4 (Garasches Lane) provides reductions to intersection south of Terminal Ave, but no reductions on Terminal Ave or at the Garasches Lane connector. Alternative 3 (Pyles Lane) does not provide any significant reduction along the majority of the New Castle Ave Corridor, however it does divert trucks from Terminal Ave. and the intersections north of I-495. The study looked deeper at the data to assess

Table 4: Weekday AM and PM Peak Hours Truck Reduction

Intersection / Location	Truck Reduction?				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
New Castle Ave & D St	NO	NO	NO	NO	NO
New Castle Ave & Connector Rd	NO	NO	NO	NO	NO
New Castle Ave & Garasches Ln	NO	NO	NO	NO	NO
New Castle Ave & Terminal Ave	YES	YES	YES	NO	YES
New Castle Ave & Pyles Ln	YES	YES	YES	YES	YES
New Castle Ave & Old Ferry Rd/Pyles Ln Extension	YES	YES	NO	YES	YES
New Castle Ave & Rogers Rd	YES	YES	NO	YES	YES
New Castle Ave & Lambson Ln	YES	YES	NO	YES	YES
New Castle Ave & Morehouse Dr	YES	YES	NO	YES	YES
New Castle Ave & Memorial Dr	YES	YES	NO	YES	YES
New Castle Ave & Halcyon Dr	YES	YES	NO	YES	YES
New Castle Ave & Cherry Ln	NO	NO	NO	NO	NO
Terminal Avenue West of I-495 Ramps	YES	YES	YES	NO	YES
New Castle Ave Truck Reduction Locations	**9**	**9**	**3**	**7**	**9**
New Castle Ave Benefit Score (12 Maximum)	**8.00**	**8.00**	**2.00**	**6.00**	**8.00**
Terminal Ave Benefit Score (1 Maximum)	**1.00**	**1.00**	**1.00**	**0.00**	**1.00**

the percentage of truck trip reduction at each of the intersections to better identify the benefit of each of the alternatives in removing truck trips from New Castle Ave.

Table 5 provides the percentage of reduction in truck trips for the AM and PM peak hours for each of the alternatives. This data provides a better indication on where the diverted trips end up on the system. Alternatives 1 and 2 (Pigeon Point Road Extended) reduce trucks on the majority of the New Castle Ave Corridor, however those trips end up on Cherry Lane to access the I-295 interchange. Alternative 4 (Garasches Lane) also reduce trucks on the majority of the New Castle Ave Corridor, however those trips end up on the on the section of New Castle Ave between Terminal Ave and the Garasches Lane Connector and we also see increased trucks at Heald Street and Rodgers Road.

Table 5: Weekday AM and PM Peak Hours Truck Reduction (Percentage)

No.	Location	Percent Truck Reduction (-) / Increase									
		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	New Castle Avenue at The Connector (from S Heald St Exit Ramp)	0%	0%	0%	0%	0%	0%	177%	238%	0%	0%
2	New Castle Avenue at New York Avenue	0%	0%	0%	0%	0%	0%	170%	174%	0%	0%
4	S Heald St at Garasches Lane	0%	0%	0%	0%	0%	0%	340%	297%	0%	0%
5	New Castle Avenue at Garasches Lane	0%	0%	0%	0%	0%	0%	263%	276%	0%	0%
6	New Castle Avenue at Terminal Ave (Signal Permit No. N264)	-60%	-50%	-60%	-50%	-60%	-50%	0%	0%	-60%	-50%
7	Terminal Avenue at SB I-495 Ramps	-28%	-32%	-28%	-32%	-28%	-32%	0%	0%	-19%	-14%
8	Terminal Avenue at NB I-495 Ramps	-17%	-28%	-17%	-28%	-17%	-28%	0%	0%	16%	12%
9	Terminal Avenue at Pigeon Point Road (Signal Permit No. N826)	8%	0%	8%	0%	8%	0%	0%	0%	0%	0%
10	S Heald St at Rogers Road (Signal Permit No. N177)	0%	0%	0%	0%	0%	0%	135%	615%	0%	0%
11	New Castle Avenue at Pyles Lane	-55%	-75%	-55%	-75%	-55%	-75%	-55%	-75%	-55%	-75%
12	New Castle Avenue at Rogers Road (Signal Permit No. N175)	-48%	-66%	-48%	-66%	0%	0%	-48%	-66%	-48%	-66%
13	New Castle Avenue at Lambson Lane (Signal Permit No. N174)	-53%	-68%	-53%	-68%	0%	0%	-53%	-68%	-53%	-68%
14	New Castle Avenue at Moorehouse Dr. (Signal Permit No. N384)	-54%	-68%	-54%	-68%	0%	0%	-54%	-68%	-54%	-68%
15	New Castle Avenue at Memorial Drive (Signal Permit No. N173)	-53%	-67%	-53%	-67%	0%	0%	-53%	-67%	-53%	-67%
16	New Castle Avenue at Halcyon Drive	-59%	-78%	-59%	-78%	0%	0%	-59%	-78%	-59%	-78%
17	New Castle Avenue at Cherry Lane (Signal Permit No. N313)	242%	727%	242%	727%	0%	0%	0%	0%	0%	0%
18	Pigeon Point Road at Pyles Lane	34%	41%	34%	41%	34%	41%	-34%	0%	0%	0%
19	New Castle Avenue at Old Ferry Road	-65%	-74%	-65%	-74%	0%	0%	-65%	-74%	-65%	-74%
20	Pigeon Point Road at Lambson	92%	58%	92%	58%	0%	0%	0%	0%	0%	0%
21	US13 at Ramp to Rogers Rd	0%	0%	0%	0%	0%	0%	336%	262%	0%	0%

As shown in Table 6, based solely on the traffic analysis and the specified MOE considered, Alternative 5, Sign and Reroute All Port I-295 Traffic signed to I-495, yielded the highest benefit score of 21. Alternative 1 and 2, are second best with the same benefit score of 16.25. Following closely is Alternative 4, Garasches Lane Relocation with a benefit score of 15.21. Pyles Lane Extension, Alternative 3 had the lowest benefit score of 5.25.

Table 6: Weekday AM and PM Peak Hours Overall Benefit Scores

Scenario	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Travel Time Reduction	2.33	2.33	1.00	3.67	5.00
Truck Reduction on New Castle Ave	8.00	8.00	2.00	6.00	8.00
Truck Reduction on Terminal Ave West of I-495 Ramps	1.00	1.00	1.00	0.00	1.00
A.M. Peak Hour LOS Improvement	1.00	1.00	0.00	1.00	1.00
P.M. Peak Hour LOS Improvement	1.00	1.00	0.00	1.00	1.00
Fuel Consumption Reduction	2.92	2.92	1.25	3.54	5.00
Total Benefit Score	16.25	16.25	5.25	15.21	21.00

Cost Estimates and Funding Opportunities

A detailed cost estimate was prepared for each alternative to determine the overall investment needed to realize the projected benefit. The cost estimates were based on the concept drawings and represent an opinion of cost using current dollar values. A more detailed cost estimate can be found in Appendix D.

Alternative Cost Estimates

	Alternative 1 – Pigeon Point Road Ext. Option 1	Alternative 2 – Pigeon Point Road Ext. Option 2	Alternative 3 – Pyles Lane Extension	Alternative 4 – Garasches Lane Reconfiguration	Alternative 5 – Sign and Reroute All Port I-295 Traffic to I-495.
Preliminary Engineering	$3,500,000	$3,200,000	$300,000	$750,000	N/A*
Right-of-Way	$1,000,000	$800,000	$400,000	$200,000	N/A*
Construction	$20,700,000	$19,200,000	$2,100,000	$7,000,000	N/A*
Total Cost	**$25,200,000**	**$23,200,000**	**$2,800,000**	**$7,925,000**	N/A*

*A Cost estimate was not prepared for this alternative however there are significant soft costs that come with enforcement of the signing and restrictions. As this alternative is further evaluated those costs will have to be assessed.

Funding Opportunities

To realize the benefits attributed to each of the alternatives they must move toward implementation. This section is intended to provide a general overview of the funding opportunities. The detailed next steps are more fully described in the Summary and Recommendations section of this report. With the recent passing of the historic bipartisan bill – Infrastructure Investment and Jobs Act (IIJA) there are opportunities to leverage the increased federal apportionment or apply for the competitive grans that are established in the Bill.

Rebuilding American Infrastructure Sustainably and Equitably (RAISE) grants—a competitive grant program (formerly BUILD and TIGER) which provides funding for road, rail, transit, and other surface transportation of local and/or regional significance. Selection criteria includes safety, sustainability, equity, economic competitiveness, mobility, and community connectivity is an excellent fit for these projects. The is $7.5 billion in this competitive grant program.

Currently, DelDOT is applying for $6.5 million from the 2022 RAISE program to begin designing an ambitious plan in the Route 9 area near New Castle, reducing the through lanes on Route 9 with saved lane space used to improve pedestrian and bicycle and bus facilities and provide extra green space. The project would also include rebuilt intersections including roundabouts, a center-lane multi-use pathway over the I-295 Expressway and a pedestrian/bicycle path system to knit together the now largely disconnected neighborhoods along the corridor. If design funds are granted, DelDOT would apply to RAISE for construction funding in future years, with total cost estimated at $30 million.

The provisions in the IIJA seek to ensure equity and equality which will benefit any grant applications as the entire study area meets the definition of a low-income community (LIC) as defined in IRS Section 45D(e), as well as a newly defined Qualified Opportunity Zone. The study area is also a Qualified Census Tract (QCT).

In addition, the Infrastructure for Rebuilding America (INFRA) Program, which supports freight and highway projects of regional and national significance is very applicable to the new access roads to the Port. This grant funding could be leveraged for the Pigeon Point Road Extended project. There is $8 billion in this competitive grant program.

Public Outreach

The Project kicked off in October 2020, at which time an advisory group was developed to help guide the project through the public process. The Advisory Committee provided representation from key stakeholders in the area. Included in the Advisory Committee were the following:

- Elected Officials
- Local Government
- Community Representatives

- Business and Industry Representees
- WILMAPCO
- DelDOT
- Century Engineering
- Duffield Associates

An Advisory Committee meeting was held on February 15, 2021. During the meeting the project purpose and work plan were discussed as well as a review of the initial alternatives that were to be studied. A strategy for the first public workshop was also discussed during the meeting.

The **first public workshop** was held on March 24, 2021. This workshop was held in a Zoom format with a formal presentation followed by breakout sessions to allow participants to discuss, in a small group setting, the ideas presented. The workshop was advertised on the WILMAPCO website, and the project team worked with many of the Advisory Committee members to help get the word out about the workshop. In addition, the workshop was advertised during the regular standing meetings of the Route 9 Monitoring Committee and the Southbridge Community. The workshop had about 15 attendees that were very engaged in the breakout sessions and question and answer session at the end of the workshop. The detailed summary of Public Workshop #1 can be found in Appendix A.

Information was presented to the WILMAPCO Council at the March 10, 2022 meeting this information was a summary of the benefits analysis that was preformed using the measures of effectiveness. This same presentation was given to the Route 9 Monitoring Committee at their monthly meeting on March 17, 2022.

The **second and final public workshop** was held on March 24, 2022. The meeting was a Zoom format and had 38 attendees. The workshop started with a formal presentation followed by a question-and-answer session. The presentation focused on a detailed assessment of the alternatives studied and how they scored as a result of the overall benefit assessment. The individual alternatives were also discussed in detail including the cost estimates that were developed. The formal presentation was followed by about 40 min of questions and answers from the participants. The detailed summary of Public Workshop #1 can be found in Appendix A.

Summary and Recommendations

The purposed of this study was to evaluate and recommend a series of possible improvements in and around the Port of Wilmington area in an effort to improve truck circulation. This study looked at these possible improvements, as well as others through a technical benefits analysis using a measures of effectiveness model to assess the benefits of each possible improvement against the defined purpose and need.

1. Alternative 1 – Pigeon Point Extended Option 1
2. Alternative 2 – Pigeon Point Extended Option 2
3. Alternative 3 – Pyles Lane Extension

4. Alternative 4 – Garasches Lane
5. Alternative 5 – Sign and Reroute All Port I-295 Traffic to I-495

Based on the Overall Benefit Scores sown in Table 7, Alternative 5 provided the highest benefit score. As discussed earlier this alternative will need further study and coordination with DelDOT Traffic and the Delaware State Police. It is recommended that this Alternative be assessed for feasibility based on the laws and regulations that govern the restrictions of trucks on roadways. If feasible more detailed conversations between DelDOT and the State Police should take place.

Table 7: Overall Benefit Scores with Project Costs

Scenario	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Travel Time Reduction	2.33	2.33	1.00	3.67	5.00
Truck Reduction on New Castle Ave	8.00	8.00	2.00	6.00	8.00
Truck Reduction on Terminal Ave West of I-495 Ramps	1.00	1.00	1.00	0.00	1.00
A.M. Peak Hour LOS Improvement	1.00	1.00	0.00	1.00	1.00
P.M. Peak Hour LOS Improvement	1.00	1.00	0.00	1.00	1.00
Fuel Consumption Reduction	2.92	2.92	1.25	3.54	5.00
Total Benefit Score	16.25	16.25	5.25	15.21	21.00
Estimated Project Cost	$25,200,000	$23,200,000	$2,800,000	$7,925,000	N/A

Alternatives 1 and 2 also had a very high overall benefit score, however this improvement requires a significant capital investment. These alternatives would still provide a significant reduction on New Castle Ave and fully satisfy the purpose and need of the project.

It is recommended that Alternative 3 be dropped from further study based on a relatively low overall benefit score and the alternative only partially satisfied the purpose and need.

Alternative 4 does satisfy the purpose and need for the project and should be considered for further study. It is recommended that this project be included in the next update to the Regional Transportation Plan.

Table 8: Overall Recommendations

Recommendations		
Alternative	Advance for Further Study	Include in RTP
Alternative 1 -Pigeon Point Extended Option 1	Yes	Yes
Alternative 2 - Pigeon Point Extended Option 2	Yes	Yes
Alternative 3 - Pyles Lane Extension	No	No
Alternative 4 - Garasches Lane Reconfiguration	Yes	Yes
Alternative 5 - Sign and Reroute All Port I-295 Traffic to I-495	Yes	No

Before these projects can be placed in DelDOT's Capital Transportation Program (CTP) they must first be included in WILMAPCO Regional Transportation Plan (RTP). The RTP identifies the region's long-term transportation needs and the projects and activities that address them. The RTP 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 RTP, 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, WILMAPCO and the Study Team. 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 community.

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.

As the projects recommended in the study advance through development, consideration should be given to applying for the competitive funding grants identified earlier in this report. The grant funding leveraged against normal federal apportionments and funds form the Transportation Trust Fund could be a means to realize the implementation of the recommendation and the corresponding benefits.

Appendix A – Public Workshop Summaries

Full recordings and presentation materials for the 3/23/21 and 3/24/22 workshops are available on the project page at http://www.wilmapco.org/port_analysis/

Appendix B – PEL Checklist

Appendix B – PEL Checklist

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
1.	Background:		
a.	Who is the sponsor of the PEL study? (state DOT, Local Agency, Other)	Recommendations	WILMAPCO
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	Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area
c.	Who was included on the study team (Name and title of agency representatives, consultants, etc.)?	Title Page	DelDOT, WILMAPCO, New Castle County, Elected Officials, Community Representatives, Business Representatives • Sen. Darius Brown (State Senator) • Rep. Franklin Cooke (State Representative) • Councilperson Jea Street (New Castle County Council) • Phillip Mcbride (New Castle County) • Diana Dixon (Southbridge Civic Association) • Sandra Smithers (NC Prevention Coalition) • Jerry Collins (Holloway Terrace Civic Association) • Sam Latham (Community at large) • Kathryn Bradley(Gulftainer) • Lee Derrickson (DMTA) • Drew Boyce (Century) • Sonia Marichic-Goudy (Century) • Ted Foglietta (Century) • Jeff Bross (Duffield) • James Taylor (Duffield) • Dan Blevins(WILMAPCO)

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
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	This study evaluated and recommended a series of possible improvements in and around the port of Wilmington area in an effort to improve truck circulation. The recent completion of the SR9 Corridor Master Plan, several expansion proposals for the Port of Wilmington and other studies such as the 2008 Southbridge Circulation Study and the 2028 Wilmington Comp Plan have generated several proposed improvements which were further evaluated. This study looked at these possible improvements as well as others through a technical benefits analysis using a measures of effectiveness model to assess the benefits of each possible improvement against the defined purpose and need. The study recommended five alternatives with varying impacts, benefits, and costs. Three of the alternatives are on new alignment and will need extensive environmental resource coordination through the project development phase and early NEPA process. The other two alternatives are generally constructed within disturbed areas with very little impacts on environmental resources.

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
e.	Provide a brief chronology of the planning activities (PEL study) including the year(s) the studies were completed.	Recommendations	This study was kicked off on October 20, 2020 and was finalized in May of 2022. Over the summer
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?		There are several other studies in the Study Area. They include: • *Port of Wilmington Parking Study* • *Southbridge Circulation Study* • *The Route 9 Corridor Land Use and Transportation Plan* • *Wilmington Comp Plan – 2028* Currently there are several capital projects within the study area. These include: • Replacement of BR 1-684 on South Heald Street • Southbridge Streetscape Improvements Phase II • SR9, New Castle Ave, Landers Lane to A Street
2.	Methodology used:		
a.	What was the scope of the PEL study and the reason for completing it?	Purpose & Need	The area in and around the Port of Wilmington has experienced increased truck traffic as the Port and other commercial businesses have continued to grow and expand over the years. The truck traffic has an adverse impact on the local neighborhoods and neighborhood streets. The regional truck traffic is utilizing I-95, I-295 and I-495 to access the Port and

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
			other businesses in the study area. Once the trucks leave the interstate system, they have very few options other than SR9, New Castle Ave, to access their destination. The truck traffic on SR9 in incompatible with the vision of the corridor established through the SR9 Corridor Master Plan. There is a need to identify alternatives and options that would remove or divert truck traffic from SR9, New Castle Ave while still allowing access the Port and the surrounding area.
b.	Did you use NEPA-like language? Why or why not?	Alternatives Studied	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)	Alternatives Studied	Wetlands, Rare, Threatened and Endangered Plant and Animal Species 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?	Alternatives Studied	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	Public Involvement	Throughout the study, representatives from DelDOT, City of Wilmington, New Castle County, WILMAPCO,

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
	decision was made by state DOT and the local agency, with buy-in from FHWA, the USACE, and USFWS and other resource/regulatory agencies.		Business Owners, 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 area businesses, as well as input from the DelDOT, City of Wilmington, New Castle County, WILMAPCO, Business Owners, and the community. The Study was not scoped to have consultation with regulatory and resource agencies.
b.	What transportation agencies (e.g. for adjacent jurisdictions) did you coordinate with or were involved during the PEL study?	Recommendations	DelDOT, City of Wilmington, New Castle County, and WILMAPCO were consulted throughout the Study.
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.

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
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 Wilmington, New Castle County, WILMAPCO, Business Owners, 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?	Alternatives Studied	This study looked at 5 alternatives. Alternative 1 – Pigeon Point Extended Option 1. Alternative 2 – Pigeon Point Extended Option 2. Alternative 3 – Pyles Lane Extension. Alternative 4 – Garasches Lane. Alternative 5 – Sign and Reroute All Port I-295 Traffic to I-495.
b.	How did you select the screening criteria and screening process?	Measures of Effectiveness	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

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
			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	Alternative 3 was recommended to not move forward because of its low benefit score and it only partially satisfied the purpose and need.
d.	Which alternatives should be brought forward into NEPA and why?	Recommendations	As funding becomes available the recommendations in this Study should move forward into project development.
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	There was general consensus for the alternatives presented. Some of the public preferred on option over another however all the alternatives recommended for project development were supported.
7.			
a.	What is the forecast year used in the PEL study?	Measures of Effectiveness	Current year was used top determine the benefit scores
b.	What method was used for forecasting traffic volumes?	Measures of Effectiveness	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?	Cost Estimates and Funding Opportunities	Costs were preparing using 2021 unit costs

Appendix B – PEL Checklist

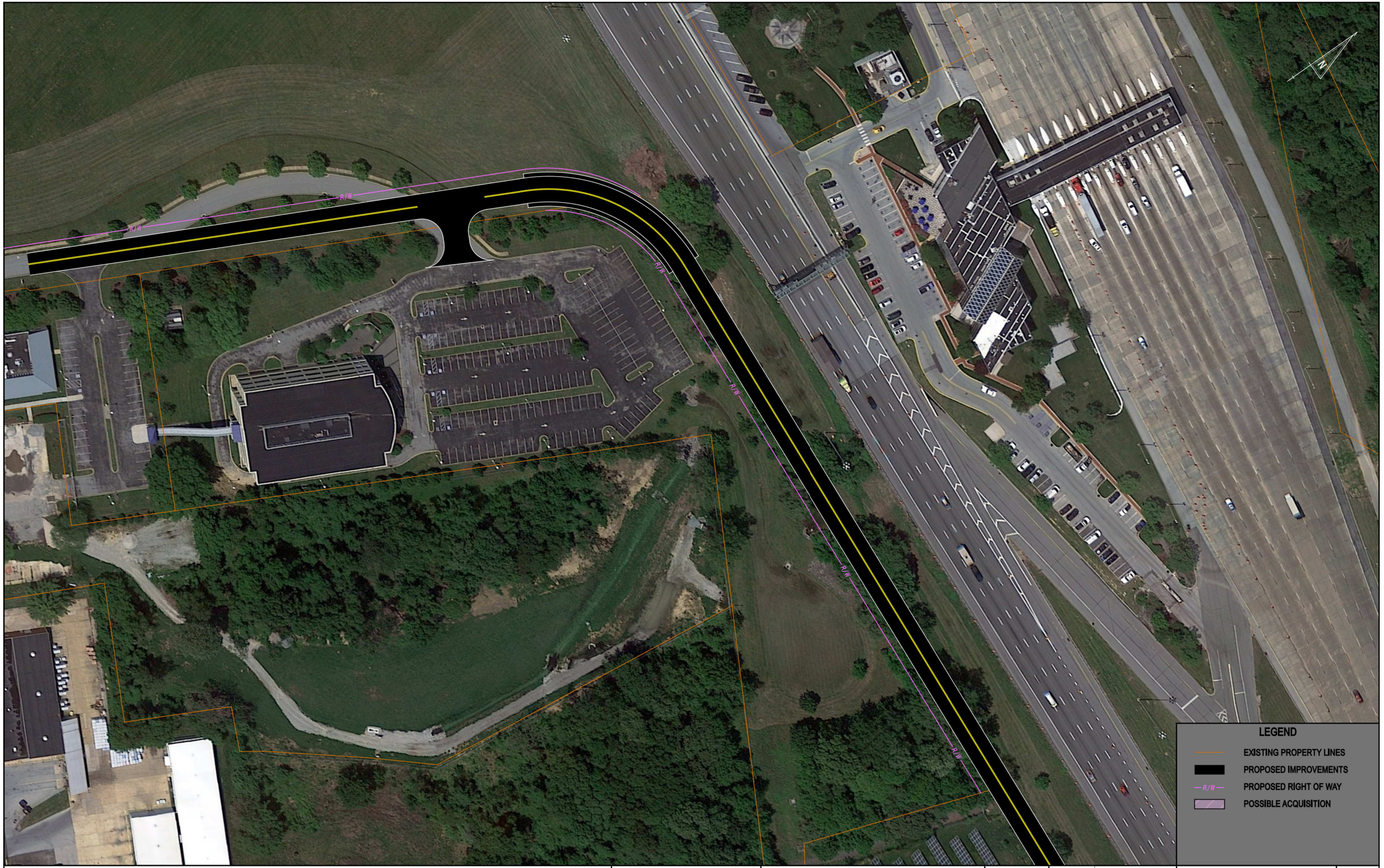
Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx			
	Topic	Section Reference	Comments
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?	Alternatives Studied	Desktop Review and Field Verification
b.	Is this resource present in the area and what is the existing environmental condition for this resource?	Alternatives Studied	It appears from our desktop review there are environmental and potential cultural 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.	Alternatives Studied	None identified
10.	Were cumulative impacts considered in the PEL study? If yes, provide the information or reference where the analysis can be found.	Alternatives Studied	No cumulative impacts were considered
11.	Describe any mitigation strategies discussed at the planning level that should be analyzed during NEPA.	Alternatives Studied	All the alternatives considered that impact wetlands have recommended a full bridge span of the wetland to minimize impacts.
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

Appendix C – Detailed Plans for Concepts

Alternative 1

Pigeon Point Road Extended – Option 1



ADDENDA / REVISIONS	

SCALE
0 50 100 150
FEET

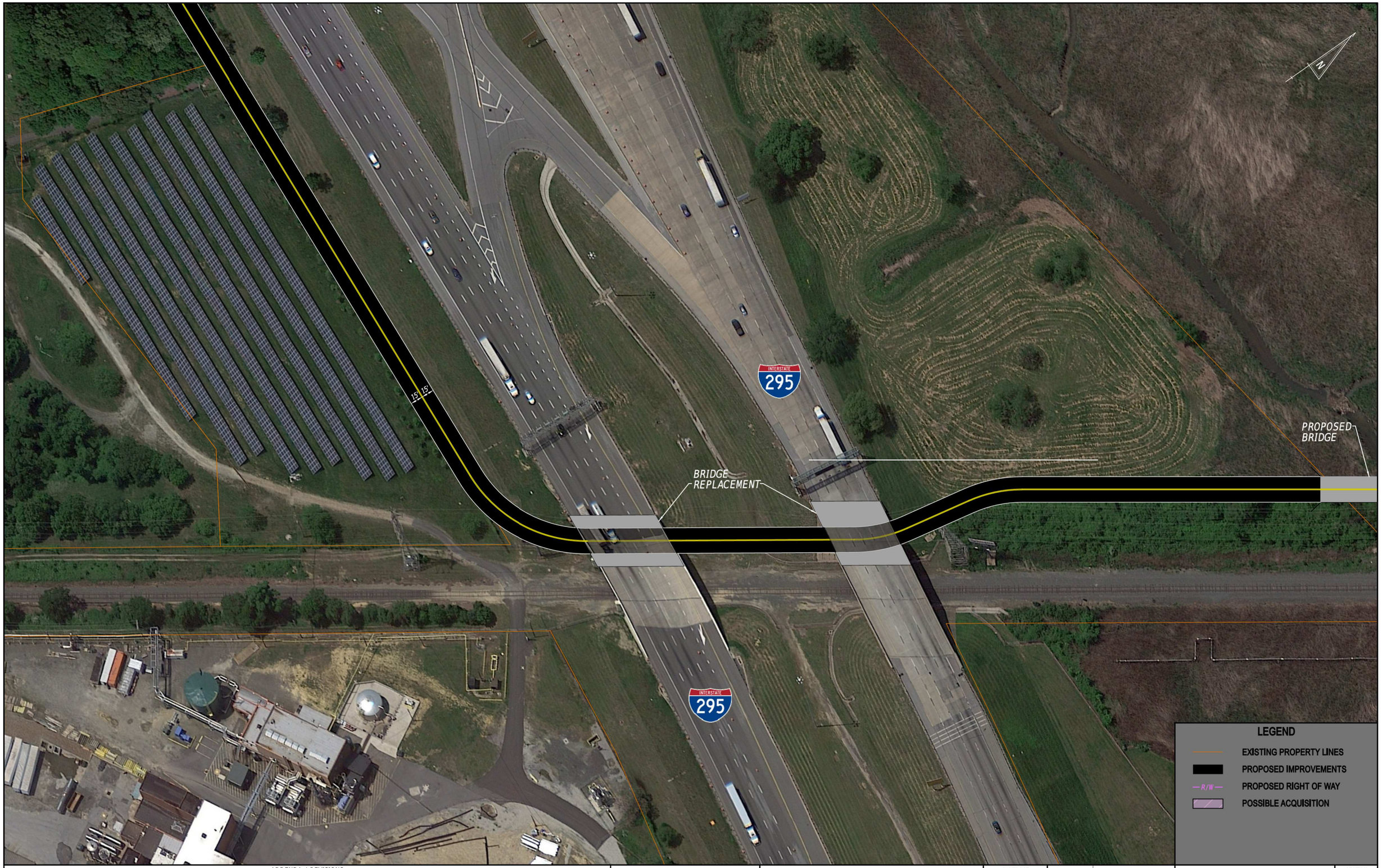
WILMAPCO
PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

CONCEPT PLAN
OPTION 1

SECTION
CEI
SHEET NO.
1

STATES
STATES
STATES



ADDENDA / REVISIONS	

SCALE
0 50 100 150
FEET

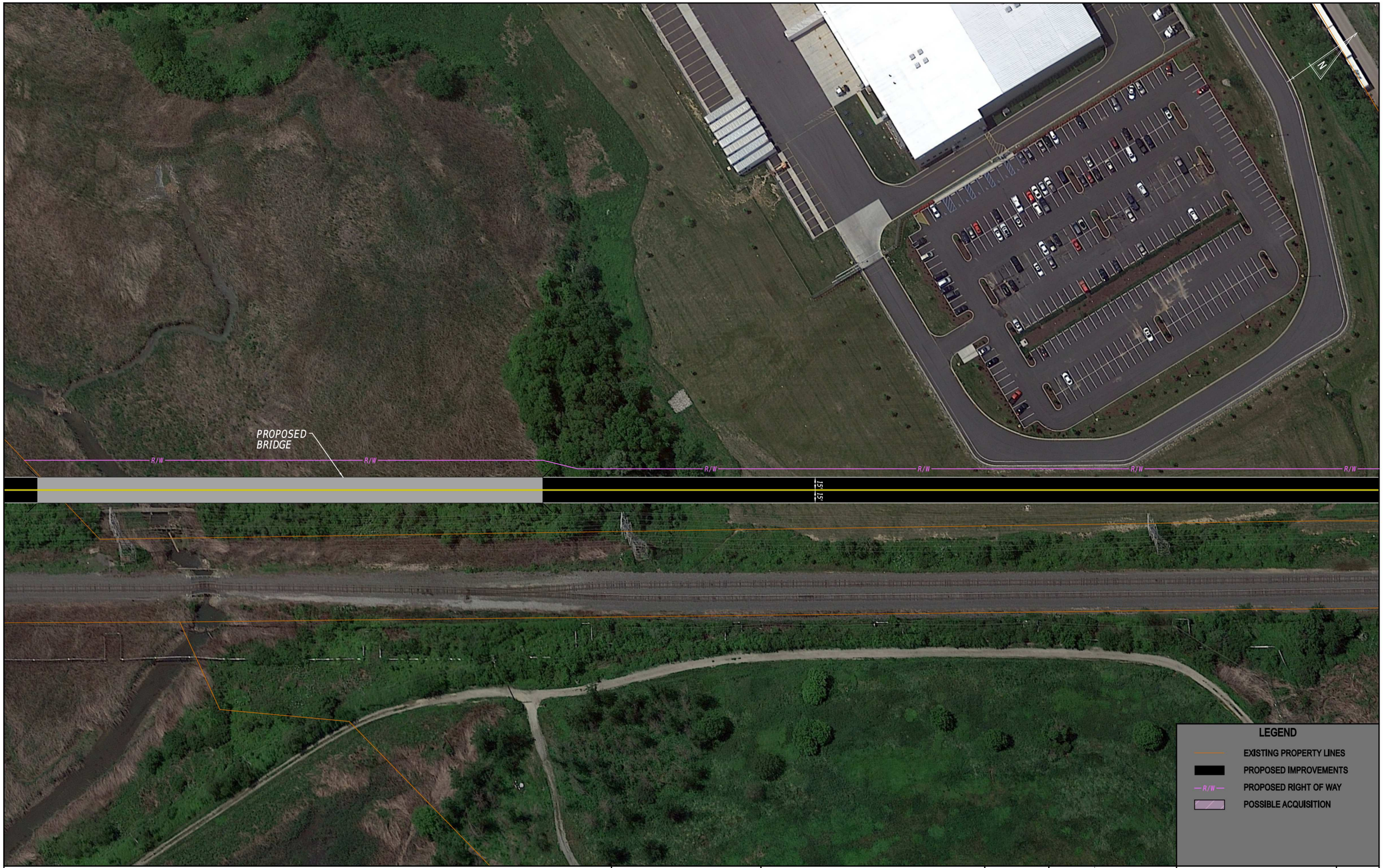
WILMAPCO
PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

CONCEPT PLAN
OPTION 1

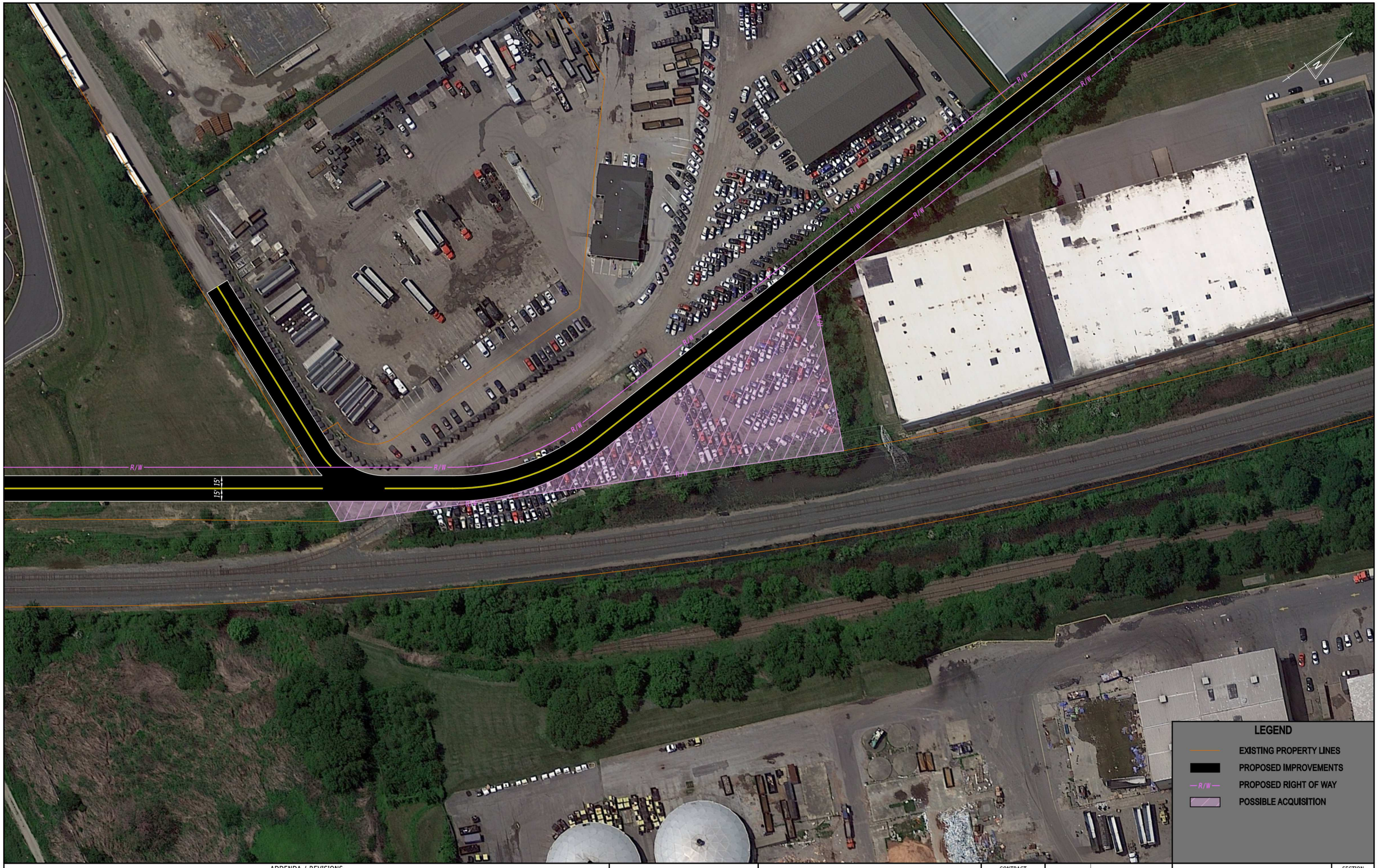
SECTION
CEI
SHEET NO.
2

$DATE$
$TIME$
$FILE$



$DATES
$TIMES
$FILES

ADDENDA / REVISIONS		SCALE	WILMAPCO PORT ACCESS	CONTRACT	BRIDGE NO.	X	CONCEPT PLAN OPTION 1	SECTION
		0 50 100 150		TXXXXXXXXX	DESIGNED BY:			CEI
		FEET		COUNTY				SHEET NO.
				X	CHECKED BY:			3



ADDENDA / REVISIONS	

SCALE
0 50 100 150
FEET

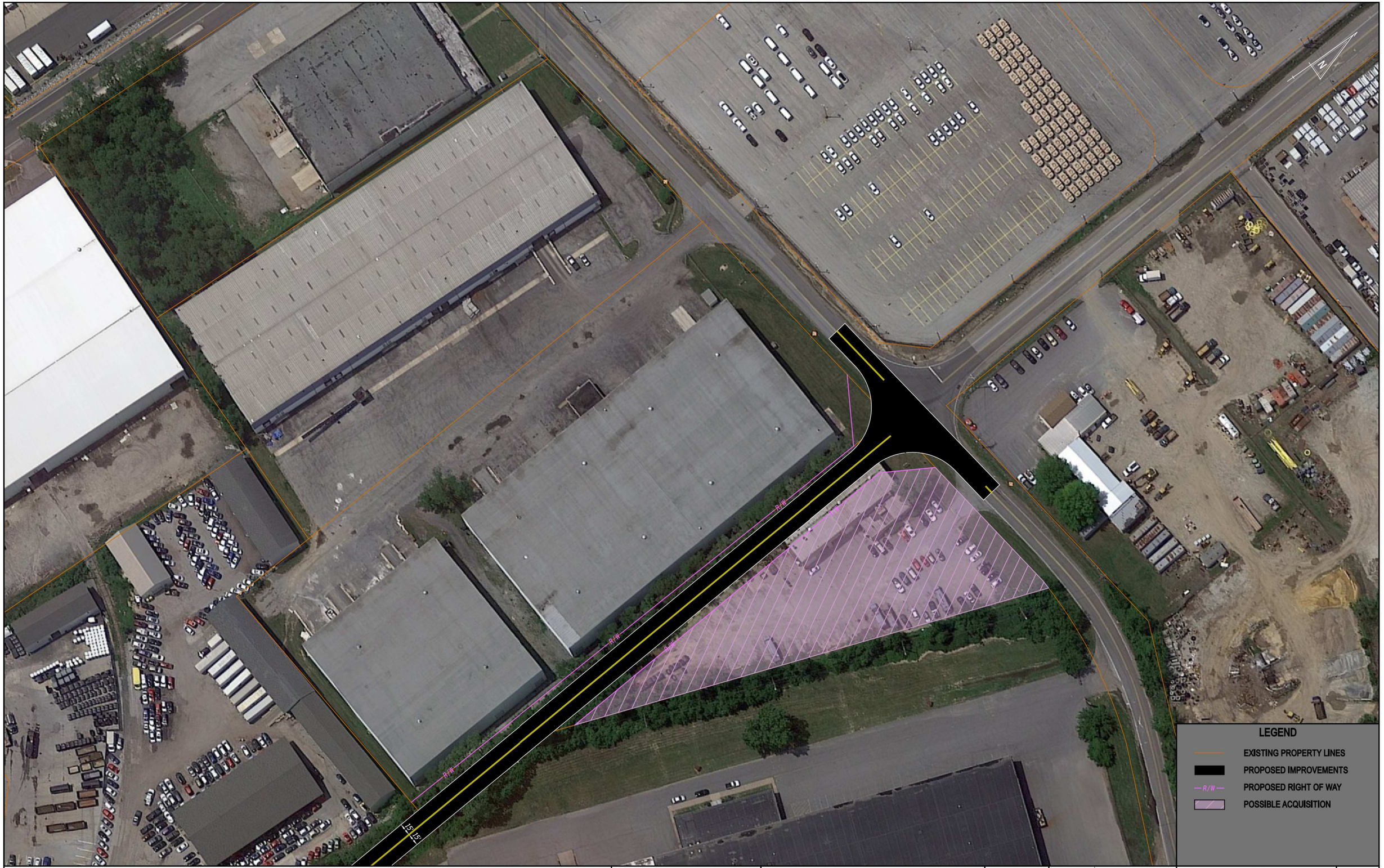
WILMAPCO
PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

CONCEPT PLAN
OPTIION 1

SECTION
CEI
SHEET NO.
4

STATES STREETS STILES



ADDENDA / REVISIONS	

SCALE
0 50 100 150
FEET

WILMAPCO
PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

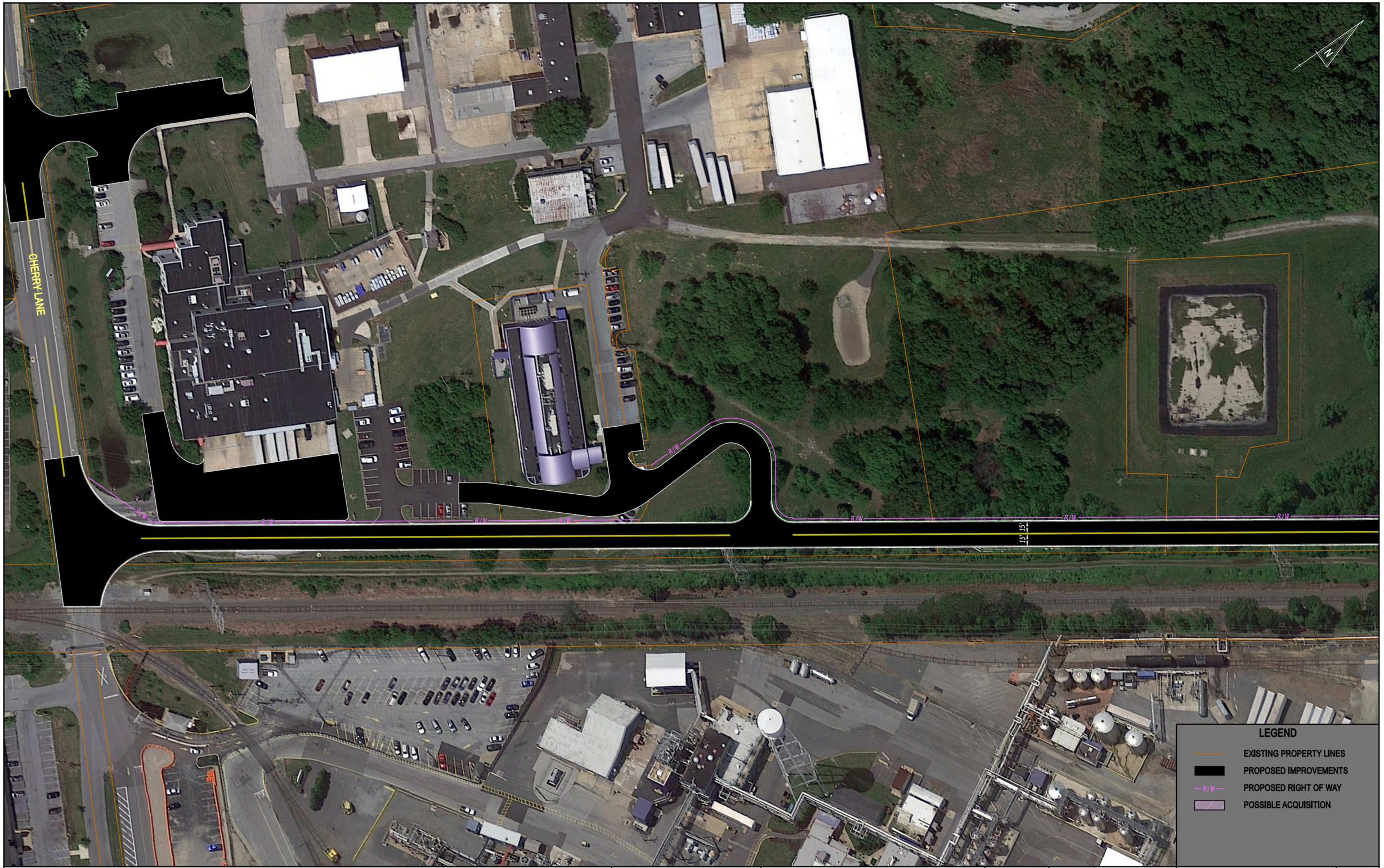
CONCEPT PLAN
OPTION 1

SECTION
CEI
SHEET NO.
5

SDATES
STIMES
SFILES

Alternative 2

Pigeon Point Road Extended – Option 2



ADDENDA / REVISIONS	

SCALE
0 50 100 150
FEET

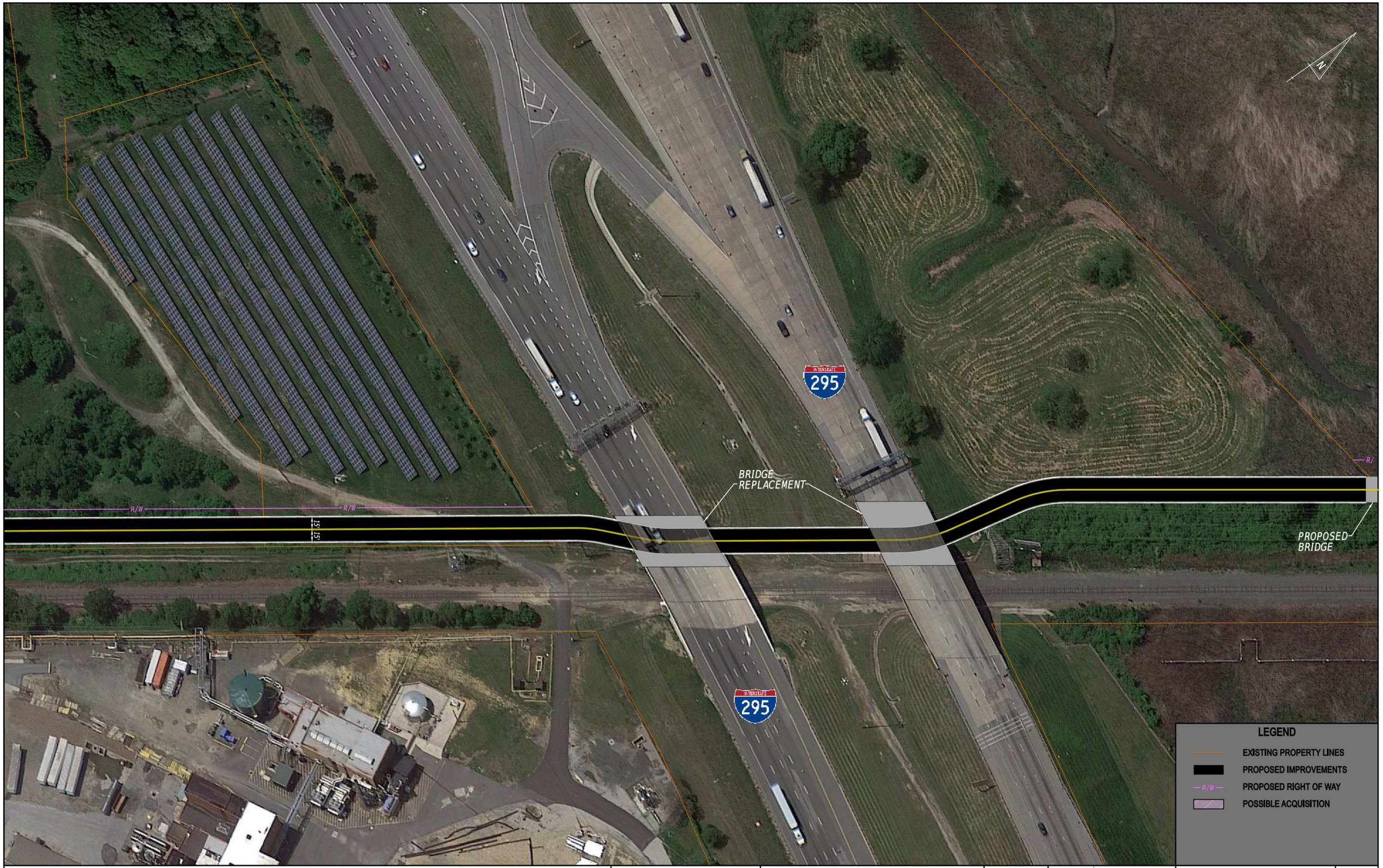
WILMAPCO
PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

CONCEPT PLAN
OPTION 2

SECTION
CEI
SHEET NO.
1

$DATE$
$TIME$
$FILE$



$DATE$
$TIME$
$FILE$

ADDENDA / REVISIONS	

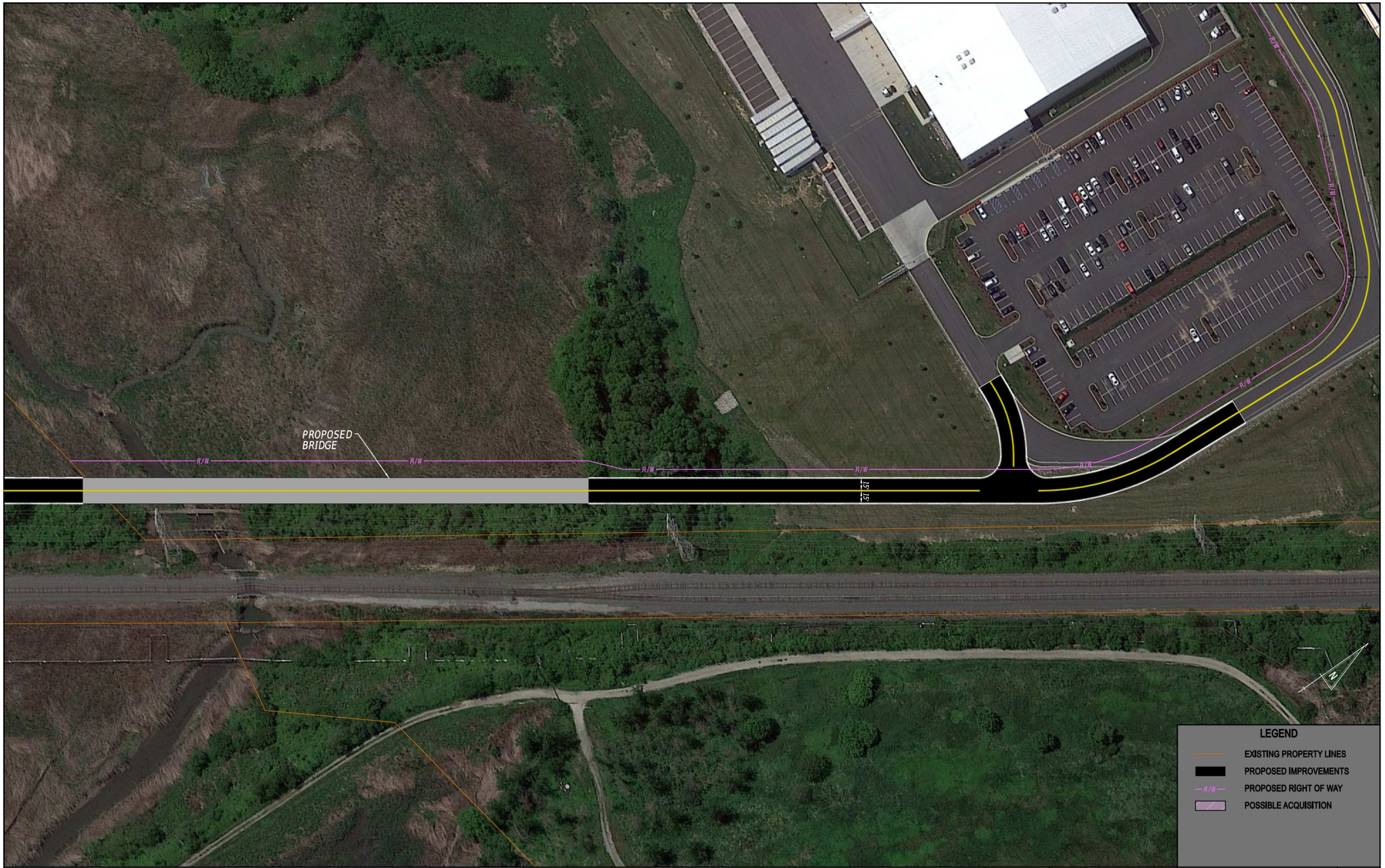
SCALE
0 50 100 150
FEET

WILMAPCO
PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

CONCEPT PLAN
OPTION 2

SECTION
CEI
SHEET NO.
2



$DATE$
$TIME$
$FILE$

ADDENDA / REVISIONS	

SCALE
0 50 100 150
FEET

WILMAPCO PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

CONCEPT PLAN OPTION 2

SECTION
CEI
SHEET NO.
3

ADDENDA / REVISIONS		SCALE 0 50 100 150 FEET	WILMAPCO PORT ACCESS	CONTRACT TXXXXXXXXX	BRIDGE NO. X	CONCEPT PLAN OPTION 2	SECTION CEI
				COUNTY X	DESIGNED BY:		SHEET NO. 4
					CHECKED BY:		

Alternative 3

Pyles Lane Extended

$DATE$
$TIME$
$FILE$

ADDENDA / REVISIONS		SCALE 0 50 100 150 FEET	WILMAPCO PORT ACCESS	CONTRACT TXXXXXXXXX	BRIDGE NO. X	CONCEPT PLAN	SECTION CEI
				COUNTY X	DESIGNED BY:		SHEET NO. 1
					CHECKED BY:		

Alternative 4

Garasches Lane Reconfiguration

$DATE$
$TIME$
$FILE$

ADDENDA / REVISIONS	

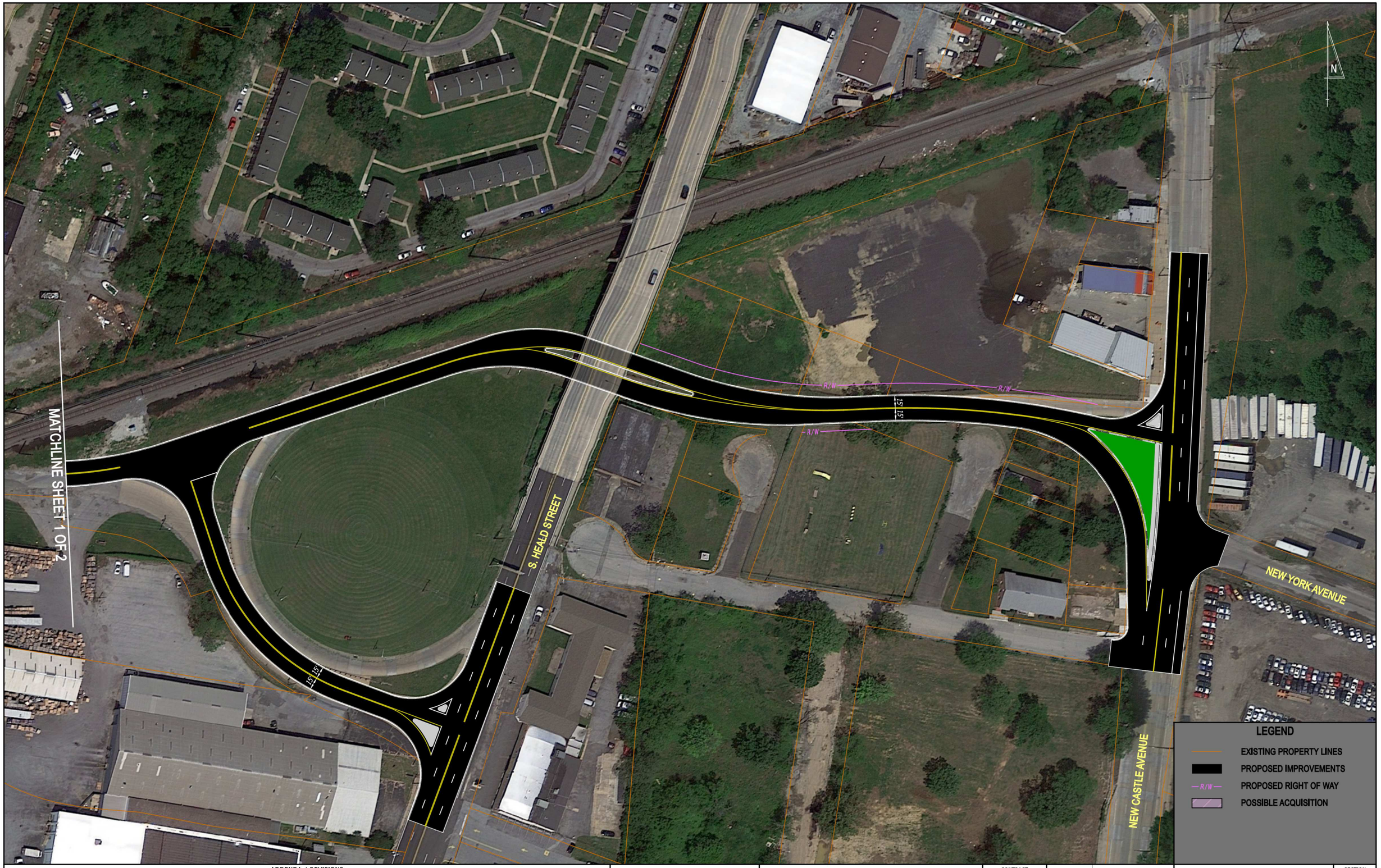
SCALE
0 50 100 150
FEET

WILMAPCO
PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

CONCEPT PLAN

SECTION
CEI
SHEET NO.
1



ADDENDA / REVISIONS	

SCALE
0 50 100 150
FEET

WILMAPCO PORT ACCESS

CONTRACT	BRIDGE NO.	X
TXXXXXXXXX	DESIGNED BY:	
COUNTY	CHECKED BY:	
X		

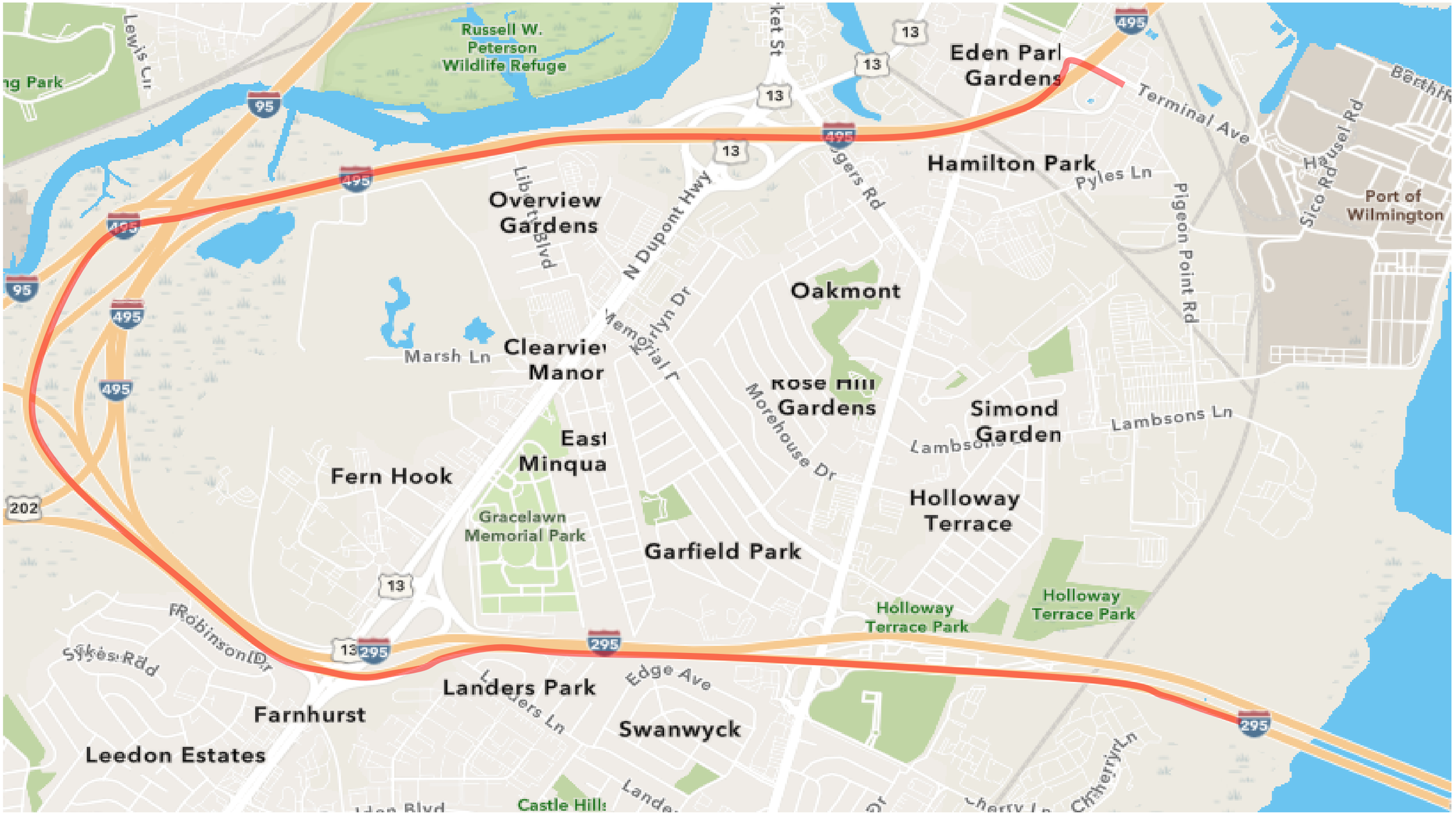
CONCEPT PLAN

SECTION
CEI
SHEET NO.
2

$DATES
$TIMES
$FILES

Alternative 5

Signing Trucks to Use I-495


Russell W.
Peterson
Wildlife Refuge
Eden Park
Gardens
Terminal Ave
Hamilton Park
Pyles Ln
Pigeon Point Rd
Port of
Wilmington
Overview
Gardens
N Dupont Hwy
Oakmont
Marsh Ln
Clearview
Manor
Rose Hill
Gardens
Simond
Garden
Lambsons Ln
East
Minqua
Fern Hook
Morehouse Dr
Holloway
Terrace
Gracelawn
Memorial Park
Garfield Park
Holloway
Terrace Park
Holloway
Terrace Park
Robinson Dr
Sykes Rd
Landers Park
Farnhurst
Swanwyck
Leedon Estates
Edge Ave
Landers Ln
Cherry Ln
Castle Hills
13
95
495
202
295

Appendix D – Detailed Estimates

Impact/Benefit Analysis of Truck Access Improvements in the Port of Wilmington Area

Assessment of Cost

Option	Construction Cost	Righ-of Way Impacts	Design Costs	Total Costs
Garasches Lane Reconfiguration	$7,000,000	$200,000	$725,000	$7,925,000
Pyles Lane Extension	$2,100,000	$400,000	$300,000	$2,800,000
Pigeon Point Road Extended - Option 1	$20,700,000	$1,000,000	$3,500,000	$25,200,000
Pigeon Point Road Extended - Option 2	$19,200,000	$800,000	$3,200,000	$23,200,000

Cost Estimate Summary

Contract No. TBD

WILMAPCO Port Access - Pigeon Point Road, Option 1

	Funded Amount (CTP):	Current Estimate	% Difference
Preliminary Engineering		$3,441,072.19	
Right-of-Way		$1,000,000.00	
Total Construction		$20,658,863.38	

Contractor Items*	$17,205,360.94		* From TrnsPort
Const. Contingency	$1,720,536.09	@	10.00%
CE**	$548,750.00	@	3.19%
Traffic	$100,000.00		
Utilities	$1,000,000.00		
Planting	$20,000.00		
Env. Performance	$0.00		
QA/QC for HMA	$5,820.15		
Asphalt Cost Adj	$58,396.20		
Total Need:	$20,658,863.38		

** CE costs consist of the following:

Advertisement	$1,000.00
Construction inspection services	$300,000.00
Construction engineering services	$100,000.00
E&S Inspection services	$127,750.00
Pipe Video Inspection Services	$0.00
Materials and Research Insp. Services	$20,000.00
Misc. Construction Items	$0.00

Primavera Estimate Data

Preliminary Engineering	$3,441,072.19
Right-of-Way	$1,000,000.00
Construction	$20,658,863.38
Contingency	$1,784,752.44
CE	$548,750.00
Traffic	$100,000.00
Utilities	$1,000,000.00

WILMAPCO Port Access - Pigeon Point Road, Option 1

TBD

Conceptual Cost Estimate 11/4/2021

ITEM #	TITLE	UNIT	ESTIMATE COST	UNIT QUANTITY	TOTAL
201000	CLEARING AND GRUBBING	LS	$200,000.00	1.00	$200,000.00
202000	EXCAVATION AND EMBANKMENT	CY	$40.00	31775.00	$1,271,000.00
202003	UNDERCUT EXCAVATION	CY	$35.00	7396.00	$258,860.00
204000	TEST HOLE	CY	$200.00	11.00	$2,200.00
209001	BORROW, TYPE A	CY	$30.00	2865.00	$85,950.00
209002	BORROW, TYPE B	CY	$35.00	7396.00	$258,860.00
209006	BORROW, TYPE F	CY	$25.00	2865.00	$71,625.00
301001	GABC	CY	$65.00	5738.00	$372,970.00
302002	DELAWARE NO. 3 STONE	TON	$60.00	134.00	$8,040.00
401006	SUPERPAVE TYPE C, PG 70-22 (CARBONATE STONE)	TON	$105.00	2755.00	$289,275.00
401015	SUPERPAVE TYPE B, PG 70-22	TON	$95.00	5592.00	$531,240.00
401021	SUPERPAVE TYPE BCBC, PG 64-22	TON	$90.00	8282.00	$745,380.00
601032	REINFORCED CONCRETE PIPE, 15", CLASS IV	LF	$55.00	3150.00	$173,250.00
601033	REINFORCED CONCRETE PIPE, 18", CLASS IV	LF	$75.00	1800.00	$135,000.00
601035	REINFORCED CONCRETE PIPE, 24", CLASS IV	LF	$95.00	1350.00	$128,250.00
601144	REINFORCED CONCRETE FLARED END SECTION, 24"	EACH	$1,800.00	4.00	$7,200.00
602005	DRAINAGE INLET, 48" X 48"	EACH	$4,500.00	49.00	$220,500.00
701023	I.PCC CURB AND GUTTER, TYPE 3-8	LF	$36.00	7354.00	$264,744.00
705001	PCC SIDEWALK, 4"	SF	$11.00	4082.00	$44,902.00
705002	PCC SIDEWALK, 6"	SF	$15.00	57.00	$855.00
705007	DETECTABLE WARNING SURFACE	SF	$50.00	22.00	$1,100.00
762000	SAW CUTTING, BITUMINOUS CONCRETE	LF	$2.50	679.00	$1,697.50
762001	SAW CUTTING, CONCRETE, FULL DEPTH	LF	$5.00	94.00	$470.00
817002	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC	SF	$15.00	240.00	$3,600.00
817013	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	LF	$0.80	14093.00	$11,274.40
905001	SILT FENCE	LF	$1.50	14448.00	$21,672.00
905004	INLET SEDIMENT CONTROL, DRAINAGE INLET	EACH	$150.00	49.00	$7,350.00
908004	TOPSOIL, 6" DEPTH	SY	$15.00	59854.00	$897,810.00
908014	PERMANENT GRASS SEEDING, DRY GROUND	SY	$1.00	59854.00	$59,854.00
908015	PERMANENT GRASS SEEDING, STORMWATER	SY	$1.50	1890.00	$2,835.00
908017	TEMPORARY GRASS SEEDING	SY	$0.75	190431.00	$142,823.25
908023	STABILIZED CONSTRUCTION ENTRANCE	SY	$45.00	596.00	$26,820.00
908024	STABILIZED CONSTRUCTION ENTRANCE, TOPDRESSING	TON	$78.00	45.00	$3,510.00
N/A	LANDSCAPING LUMP SUM	LS	$75,000.00	1.00	$75,000.00
N/A	BRIDGE CONSTRUCTION	LS	$5,600,000.00	1.00	$5,600,000.00
N/A	DRBA BRIDGE MODIFICATIONS LUMP SUM	LS	$3,500,000.00	1.00	$3,500,000.00
N/A	STORMWATER MANAGEMENT POND LUMP SUM	LS	$300,000.00	1.00	$300,000.00
	Subtotal				**$15,725,917.15**
763000	Initial Expense (5%)	L.S.	$786,295.86	1	$786,295.86
763501	Construction Engineering (2.5%)	L.S.	$393,147.93	1	$393,147.93
	MOT	L.S.	$300,000.00	1	$300,000.00
	TOTAL BASE FOR PROJECT				**$17,205,360.94**
	CONSTRUCTION CONTINGENCY	10%	$1,720,536.09	1	$1,720,536.09
	TRAFFIC (FROM TRAFFIC STATEMENT)	L.S.	$100,000.00	1	$100,000.00
	UTILITY	L.S.	$1,000,000.00	1	$1,000,000.00
	PLANTING	L.S.	$20,000.00	1	$20,000.00
	QA/QC for HMA	L.S.	$5,820.15	1	$5,820.15
	Asphalt Cost Adj	L.S.	$58,396.20	1	$58,396.20
	TOTAL CONSTRUCTION COST				**$20,110,113.38**
	PRELIMINARY ENGINEERING (DESIGN)	L.S.	$3,441,070.00	1	$3,441,070.00
	CONSTRUCTION ENGINEERING - (INSPECTION, CE, ETC)	L.S.	$548,750.00	1	$548,750.00
	ROW COSTS	L.S.	$1,000,000.00	1	$1,000,000.00
	TOTAL BASE CONSTRUCTION COST				**$25,099,933.38**

Cost Estimate Summary

Contract No. TBD

WILMAPCO Port Access - Pigeon Point Road, Option 2

	Funded Amount (CTP):	Current Estimate	% Difference
Preliminary Engineering		$3,175,618.16	
Right-of-Way		$800,000.00	
Total Construction		$19,188,680.12	

Contractor Items*	$15,878,090.79		* From TrnsPort
Const. Contingency	$1,587,809.08	@	10.00%
CE**	$548,750.00	@	3.46%
Traffic	$100,000.00		
Utilities	$1,000,000.00		
Planting	$20,000.00		
Env. Performance	$0.00		
QA/QC for HMA	$4,896.85		
Asphalt Cost Adj	$49,133.40		
Total Need:	$19,188,680.12		

** CE costs consist of the following:

Advertisement	$1,000.00
Construction inspection services	$300,000.00
Construction engineering services	$100,000.00
E&S Inspection services	$127,750.00
Pipe Video Inspection Services	$0.00
Materials and Research Insp. Services	$20,000.00
Misc. Construction Items	$0.00

Primavera Estimate Data

Preliminary Engineering	$3,175,618.16
Right-of-Way	$800,000.00
Construction	$19,188,680.12
Contingency	$1,641,839.33
CE	$548,750.00
Traffic	$100,000.00
Utilities	$1,000,000.00

WILMAPCO Port Access - Pigeon Point Road, Option 2

TBD

Conceptual Cost Estimate 11/4/2021

ITEM #	TITLE	UNIT	ESTIMATE COST	UNIT QUANTITY	TOTAL
201000	CLEARING AND GRUBBING	LS	$200,000.00	1.00	$200,000.00
202000	EXCAVATION AND EMBANKMENT	CY	$40.00	19348.00	$773,920.00
202003	UNDERCUT EXCAVATION	CY	$35.00	5821.00	$203,735.00
204000	TEST HOLE	CY	$200.00	11.00	$2,200.00
209001	BORROW, TYPE A	CY	$30.00	1745.00	$52,350.00
209002	BORROW, TYPE B	CY	$35.00	5821.00	$203,735.00
209006	BORROW, TYPE F	CY	$25.00	1745.00	$43,625.00
301001	GABC	CY	$65.00	4863.00	$316,095.00
302002	DELAWARE NO. 3 STONE	TON	$60.00	80.00	$4,800.00
401006	SUPERPAVE TYPE C, PG 70-22 (CARBONATE STONE)	TON	$105.00	2318.00	$243,390.00
401015	SUPERPAVE TYPE B, PG 70-22	TON	$95.00	4705.00	$446,975.00
401021	SUPERPAVE TYPE BCBC, PG 64-22	TON	$90.00	6968.00	$627,120.00
601032	REINFORCED CONCRETE PIPE, 15", CLASS IV	LF	$55.00	3600.00	$198,000.00
601033	REINFORCED CONCRETE PIPE, 18", CLASS IV	LF	$75.00	1800.00	$135,000.00
601035	REINFORCED CONCRETE PIPE, 24", CLASS IV	LF	$95.00	1650.00	$156,750.00
601144	REINFORCED CONCRETE FLARED END SECTION, 24"	EACH	$1,800.00	4.00	$7,200.00
602005	DRAINAGE INLET, 48" X 48"	EACH	$4,500.00	57.00	$256,500.00
701023	I.PCC CURB AND GUTTER, TYPE 3-8	LF	$36.00	8106.00	$291,816.00
762000	SAW CUTTING, BITUMINOUS CONCRETE	LF	$2.50	745.00	$1,862.50
817002	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC	SF	$15.00	68.00	$1,020.00
817013	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	LF	$1.00	11062.00	$11,062.00
905001	SILT FENCE	LF	$1.50	4759.00	$7,138.50
905004	INLET SEDIMENT CONTROL, DRAINAGE INLET	EACH	$150.00	57.00	$8,550.00
908004	TOPSOIL, 6" DEPTH	SY	$15.00	44220.00	$663,300.00
908014	PERMANENT GRASS SEEDING, DRY GROUND	SY	$0.75	44220.00	$33,165.00
908015	PERMANENT GRASS SEEDING, STORMWATER	SY	$1.50	1890.00	$2,835.00
908017	TEMPORARY GRASS SEEDING	SY	$0.75	141183.00	$105,887.25
908023	STABILIZED CONSTRUCTION ENTRANCE	SY	$45.00	358.00	$16,110.00
908024	STABILIZED CONSTRUCTION ENTRANCE, TOPDRESSING	TON	$78.00	27.00	$2,106.00
N/A	LANDSCAPING LUMP SUM	LS	$75,000.00	1.00	$75,000.00
N/A	BRIDGE CONSTRUCTION	LS	$5,600,000.00	1.00	$5,600,000.00
N/A	DRBA BRIDGE MODIFICATIONS LUMP SUM	LS	$3,500,000.00	1.00	$3,500,000.00
N/A	STORMWATER MANAGEMENT POND LUMP SUM	LS	$300,000.00	1.00	$300,000.00
	Subtotal				**$14,491,247.25**
763000	Initial Expense (5%)	L.S.	$724,562.36	1	$724,562.36
763501	Construction Engineering (2.5%)	L.S.	$362,281.18	1	$362,281.18
	MOT	L.S.	$300,000.00	1	$300,000.00
	TOTAL BASE FOR PROJECT				**$15,878,090.79**
	CONSTRUCTION CONTINGENCY	10%	$1,587,809.08	1	$1,587,809.08
	TRAFFIC (FROM TRAFFIC STATEMENT)	L.S.	$100,000.00	1	$100,000.00
	UTILITY	L.S.	$1,000,000.00	1	$1,000,000.00
	PLANTING	L.S.	$20,000.00	1	$20,000.00
	QA/QC for HMA	L.S.	$4,896.85	1	$4,896.85
	Asphalt Cost Adj	L.S.	$49,133.40	1	$49,133.40
	TOTAL CONSTRUCTION COST				**$18,639,930.12**
	PRELIMINARY ENGINEERING (DESIGN)	L.S.	$3,175,620.00	1	$3,175,620.00
	CONSTRUCTION ENGINEERING - (INSPECTION, CE, ETC)	L.S.	$548,750.00	1	$548,750.00
	ROW COSTS	L.S.	$800,000.00	1	$800,000.00
	TOTAL BASE CONSTRUCTION COST				**$23,164,300.12**

Cost Estimate Summary

Contract No. TBD

WILMAPCO Port Access - Pyles Lane

	Funded Amount (CTP):	Current Estimate	% Difference
Preliminary Engineering		$290,596.98	
Right-of-Way		$400,000.00	
Total Construction		$2,079,686.07	

Contractor Items*	$1,452,984.88		* From TrnsPort
Const. Contingency	$145,298.49	@	10.00%
CE**	$384,000.00	@	26.43%
Traffic	$25,000.00		
Utilities	$50,000.00		
Planting	$5,000.00		
Env. Performance	$0.00		
QA/QC for HMA	$1,577.10		
Asphalt Cost Adj	$15,825.60		
Total Need:	$2,079,686.07		

** CE costs consist of the following:

Advertisement	$1,000.00
Construction inspection services	$200,000.00
Construction engineering services	$100,000.00
E&S Inspection services	$63,000.00
Pipe Video Inspection Services	$0.00
Materials and Research Insp. Services	$20,000.00
Misc. Construction Items	$0.00

Primavera Estimate Data

Preliminary Engineering	$400,000.00
Right-of-Way	$400,000.00
Construction	$2,079,686.07
Contingency	$162,701.19
CE	$384,000.00
Traffic	$25,000.00
Utilities	$50,000.00

WILMAPCO Port Access - Pyles Lane

TBD

Conceptual Cost Estimate 11/4/2021

ITEM #	TITLE	UNIT	ESTIMATE COST	UNIT QUANTITY	TOTAL
201000	CLEARING AND GRUBBING	LS	$15,000.00	1.00	$15,000.00
202000	EXCAVATION AND EMBANKMENT	CY	$40.00	5355.00	$214,200.00
202003	UNDERCUT EXCAVATION	CY	$35.00	563.00	$19,705.00
204000	TEST HOLE	CY	$200.00	6.00	$1,200.00
209001	BORROW, TYPE A	CY	$30.00	483.00	$14,490.00
209002	BORROW, TYPE B	CY	$35.00	563.00	$19,705.00
209006	BORROW, TYPE F	CY	$25.00	483.00	$12,075.00
301001	GABC	CY	$65.00	1603.00	$104,195.00
302002	DELAWARE NO. 3 STONE	TON	$60.00	27.00	$1,620.00
401006	SUPERPAVE TYPE C, PG 70-22 (CARBONATE STONE)	TON	$105.00	747.00	$78,435.00
401015	SUPERPAVE TYPE B, PG 70-22	TON	$95.00	1515.00	$143,925.00
401021	SUPERPAVE TYPE BCBC, PG 64-22	TON	$90.00	2244.00	$201,960.00
601033	REINFORCED CONCRETE PIPE, 18", CLASS IV	LF	$65.00	3663.00	$238,095.00
602005	DRAINAGE INLET, 48" X 48"	EACH	$75.00	14.00	$1,050.00
701023	I.PCC CURB AND GUTTER, TYPE 3-8	LF	$36.00	3363.00	$121,068.00
705002	PCC SIDEWALK, 6"	SF	$15.00	378.00	$5,670.00
705007	DETECTABLE WARNING SURFACE	SF	$50.00	21.00	$1,050.00
762000	SAW CUTTING, BITUMINOUS CONCRETE	LF	$2.50	101.00	$252.50
762001	SAW CUTTING, CONCRETE, FULL DEPTH	LF	$5.00	202.00	$1,010.00
817002	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC	SF	$15.00	631.00	$9,465.00
817013	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	LF	$1.10	1879.00	$2,066.90
905001	SILT FENCE	LF	$1.50	3666.00	$5,499.00
905004	INLET SEDIMENT CONTROL, DRAINAGE INLET	EACH	$150.00	14.00	$2,100.00
908004	TOPSOIL, 6" DEPTH	SY	$15.00	3696.00	$55,440.00
908014	PERMANENT GRASS SEEDING, DRY GROUND	SY	$1.00	3696.00	$3,696.00
908017	TEMPORARY GRASS SEEDING	SY	$0.75	3696.00	$2,772.00
908023	STABILIZED CONSTRUCTION ENTRANCE	SY	$45.00	120.00	$5,400.00
908024	STABILIZED CONSTRUCTION ENTRANCE, TOPDRESSING	TON	$78.00	9.00	$702.00
	Subtotal				**$1,281,846.40**
763000	Initial Expense (5%)	L.S.	$64,092.32	1	$64,092.32
763501	Construction Engineering (2.5%)	L.S.	$32,046.16	1	$32,046.16
	MOT	L.S.	$75,000.00	1	$75,000.00
	TOTAL BASE FOR PROJECT				**$1,452,984.88**
	CONSTRUCTION CONTINGENCY	10%	$145,298.49	1	$145,298.49
	TRAFFIC (FROM TRAFFIC STATEMENT)	L.S.	$25,000.00	1	$25,000.00
	UTILITY	L.S.	$50,000.00	1	$50,000.00
	PLANTING	L.S.	$5,000.00	1	$5,000.00
	QA/QC for HMA	L.S.	$1,577.10	1	$1,577.10
	Asphalt Cost Adj	L.S.	$15,825.60	1	$15,825.60
	TOTAL CONSTRUCTION COST				**$1,695,686.07**
	PRELIMINARY ENGINEERING (DESIGN)	L.S.	$290,600.00	1	$290,600.00
	CONSTRUCTION ENGINEERING - (INSPECTION, CE, ETC)	L.S.	$384,000.00	1	$384,000.00
	ROW COSTS	L.S.	$400,000.00	1	$400,000.00
	TOTAL BASE CONSTRUCTION COST				**$2,770,286.07**

Cost Estimate Summary

Contract No. TBD

WILMAPCO Port Access - Garasches Lane

	Funded Amount (CTP):	Current Estimate	% Difference
Preliminary Engineering		$725,271.17	
Right-of-Way		$200,000.00	
Total Construction		$6,960,737.78	

Contractor Items*	$4,835,141.16		* From TrnsPort
Const. Contingency	$483,514.12	@	10.00%
CE**	$584,000.00	@	12.08%
Traffic	$100,000.00		
Utilities	$900,000.00		
Planting	$20,000.00		
Env. Performance	$0.00		
QA/QC for HMA	$3,451.70		
Asphalt Cost Adj	$34,630.80		
Total Need:	$6,960,737.78		

** CE costs consist of the following:

Advertisement	$1,000.00
Construction inspection services	$400,000.00
Construction engineering services	$100,000.00
E&S Inspection services	$63,000.00
Pipe Video Inspection Services	$0.00
Materials and Research Insp. Services	$20,000.00
Misc. Construction Items	$0.00

Primavera Estimate Data

Preliminary Engineering	$400,000.00
Right-of-Way	$200,000.00
Construction	$6,960,737.78
Contingency	$521,596.62
CE	$584,000.00
Traffic	$100,000.00
Utilities	$900,000.00

WILMAPCO Port Access - Garasches Lane

TBD

Conceptual Cost Estimate 11/4/2021

ITEM #	TITLE	UNIT	ESTIMATE COST	UNIT QUANTITY	TOTAL
201000	CLEARING AND GRUBBING	LS	$10,000.00	1.00	$10,000.00
202000	EXCAVATION AND EMBANKMENT	CY	$40.00	14940.00	$597,600.00
202003	UNDERCUT EXCAVATION	CY	$35.00	1569.00	$54,915.00
204000	TEST HOLE	CY	$200.00	6.00	$1,200.00
209001	BORROW, TYPE A	CY	$30.00	1347.00	$40,410.00
209002	BORROW, TYPE B	CY	$35.00	1569.00	$54,915.00
209006	BORROW, TYPE F	CY	$25.00	1347.00	$33,675.00
301001	GABC	CY	$65.00	3522.00	$228,930.00
302002	DELAWARE NO. 3 STONE	TON	$60.00	54.00	$3,240.00
401006	SUPERPAVE TYPE C, PG 70-22 (CARBONATE STONE)	TON	$105.00	1634.00	$171,570.00
401015	SUPERPAVE TYPE B, PG 70-22	TON	$95.00	3316.00	$315,020.00
401021	SUPERPAVE TYPE BCBC, PG 64-22	TON	$90.00	4912.00	$442,080.00
601033	REINFORCED CONCRETE PIPE, 18", CLASS IV	LF	$75.00	6731.00	$504,825.00
602005	DRAINAGE INLET, 48" X 48"	EACH	$4,500.00	25.00	$112,500.00
701014	PCC CURB, TYPE 2	LF	$30.00	929.00	$27,870.00
701023	I.PCC CURB AND GUTTER, TYPE 3-8	LF	$36.00	5802.00	$208,872.00
705002	PCC SIDEWALK, 6"	SF	$15.00	3089.00	$46,335.00
705007	DETECTABLE WARNING SURFACE	SF	$50.00	116.00	$5,800.00
762000	SAW CUTTING, BITUMINOUS CONCRETE	LF	$2.50	209.00	$522.50
762001	SAW CUTTING, CONCRETE, FULL DEPTH	LF	$5.00	144.00	$720.00
817002	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC	SF	$15.00	1075.00	$16,125.00
817013	PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	LF	$0.80	8012.00	$6,409.60
905001	SILT FENCE	LF	$3.50	6689.00	$23,411.50
905004	INLET SEDIMENT CONTROL, DRAINAGE INLET	EACH	$150.00	25.00	$3,750.00
908004	TOPSOIL, 6" DEPTH	SY	$15.00	7143.00	$107,145.00
908014	PERMANENT GRASS SEEDING, DRY GROUND	SY	$1.00	7143.00	$7,143.00
908015	PERMANENT GRASS SEEDING, STORMWATER	SY	$1.50	1890.00	$2,835.00
908017	TEMPORARY GRASS SEEDING	SY	$0.75	24391.00	$18,293.25
908023	STABILIZED CONSTRUCTION ENTRANCE	SY	$45.00	239.00	$10,755.00
908024	STABILIZED CONSTRUCTION ENTRANCE, TOPDRESSING	TON	$78.00	18.00	$1,404.00
N/A	BRIDGE REPAIRS LUMP SUM	LS	$1,000,000.00	1.00	$1,000,000.00
N/A	STORMWATER MANAGEMENT POND LUMP SUM	LS	$300,000.00	1.00	$300,000.00
	Subtotal				**$4,358,270.85**
763000	Initial Expense (5%)	L.S.	$217,913.54	1	$217,913.54
763501	Construction Engineering (2.5%)	L.S.	$108,956.77	1	$108,956.77
	MOT	L.S.	$150,000.00	1	$150,000.00
	TOTAL BASE FOR PROJECT				**$4,835,141.16**
	CONSTRUCTION CONTINGENCY	10%	$483,514.12	1	$483,514.12
	TRAFFIC (FROM TRAFFIC STATEMENT)	L.S.	$100,000.00	1	$100,000.00
	UTILITY	L.S.	$900,000.00	1	$900,000.00
	PLANTING	L.S.	$20,000.00	1	$20,000.00
	QA/QC for HMA	L.S.	$3,451.70	1	$3,451.70
	Asphalt Cost Adj	L.S.	$34,630.80	1	$34,630.80
	TOTAL CONSTRUCTION COST				**$6,376,737.78**
	PRELIMINARY ENGINEERING (DESIGN)	L.S.	$725,270.00	1	$725,270.00
	CONSTRUCTION ENGINEERING - (INSPECTION, CE, ETC)	L.S.	$584,000.00	1	$584,000.00
	ROW COSTS	L.S.	$200,000.00	1	$200,000.00
	TOTAL BASE CONSTRUCTION COST				**$7,886,007.78**