

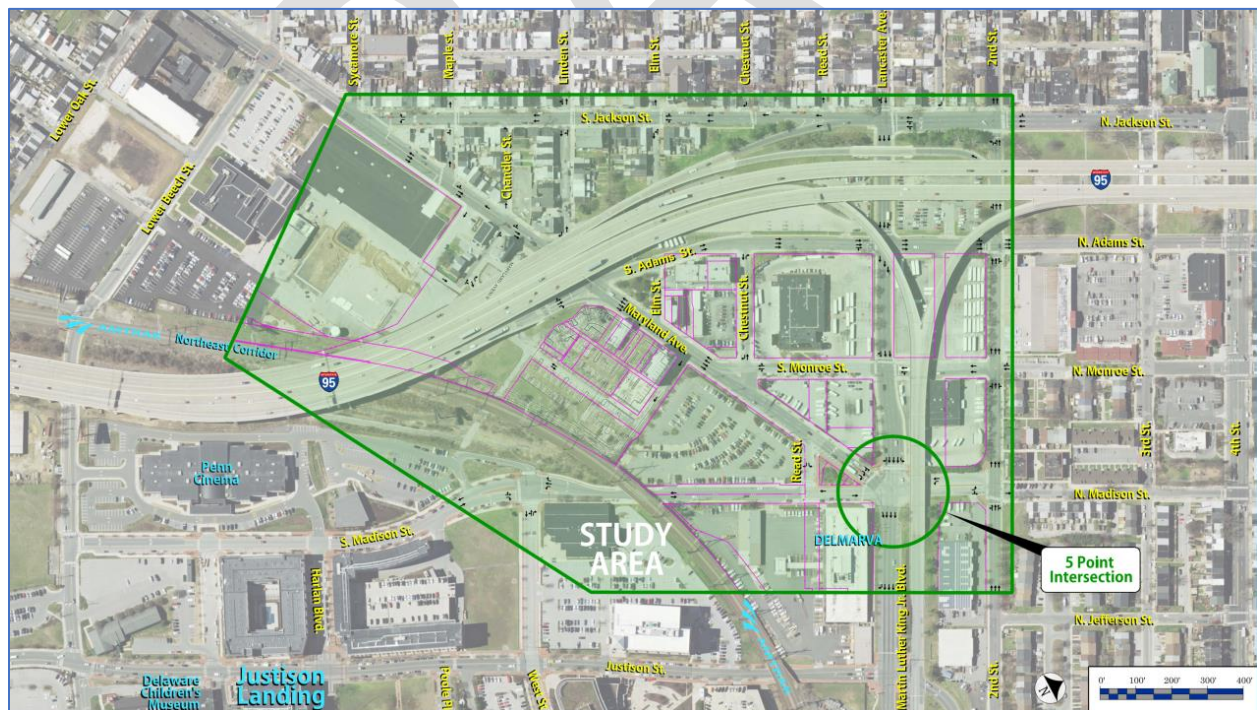
5-Point Intersection Safety & Capacity Improvement Study

EXECUTIVE SUMMARY

Study Overview

The Wilmington Area Planning Council (WILMAPCO), in collaboration with the Wilmington Initiatives Partners, led the 5-Point Intersection Safety & Capacity Improvements Study. Wilmington Initiatives is a multi-agency partnership between the City of Wilmington, Delaware Department of Transportation (DelDOT), Delaware Transit Corporation (DTC, operating as DART First State), and WILMAPCO. RK&K led the planning efforts for the study on behalf of the Partners.

The 5-Point Intersection Safety & Capacity Improvement Study area is located southwest of Wilmington's Central Business District (CBD) at the intersection of Maryland Avenue, Martin Luther King, Jr. Boulevard MLK) and South Madison Street. The 5-Point Intersection and adjoining roads are used by motorists, bicyclists, pedestrians, and buses. Travelers through the 5-Point Intersection experience access and safety challenges. Motorist mobility has been increasingly impeded by congestion, causing delays extending along MLK Boulevard and Maryland Avenue to the I-95 exit ramp and northbound I-95. The 5-Point Intersection also poses considerable challenges for pedestrians and cyclists accessing neighborhoods, businesses, transit connections, and the Riverfront. Issues include wide street crossings, gaps in the sidewalk network (including lack of sidewalks, crosswalks, and ADA facilities), lack of bicycle facilities, inadequate lighting, high volumes of traffic, and motorists traveling at high speeds.



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This study was completed as part of a streamlined project development process in accordance with the Federal Highway Administration's Planning and Environmental Linkages (PEL) guidelines. PEL is a "collaborative and integrated approach to transportation decision-making that considers benefits and impacts of proposed transportation system improvements to the environment, community, and economy during the transportation planning process"¹ (FHWA, accessed 2019). The study informed the environmental review phase of the project in accordance with the National Environmental Policy Act (NEPA) as well as preliminary engineering.

Wilmington Initiatives provided guidance to the Planning Project Team and served as the Project's Management Committee (PMC). As background information and analysis was developed during the Planning process, a Stakeholder's Group was formed to get input on priorities, key opportunities and constraints, and feedback on potential alternatives for transportation improvements.

The City of Wilmington, DelDOT, DTC, WILMAPCO and other members of Wilmington Initiatives have been conducting studies in this area for several years. These studies have included traffic analysis and development of potential roadway solutions to address safety and capacity, pedestrian and bicycle connectivity, congestion impacting I-95, and improvements to DTC and Delmarva Power parking and access. While it was recognized that improvements were needed to address safety and capacity especially at the 5-Point Intersection, consensus was not achieved on what the best solution(s) would be, given the constrained area and the concerns of stakeholders including DTC. However, the previous studies provided good information and input to utilize for this renewed study.

The study started in mid-2018, with the main Stakeholders engagement occurring during 2019. Issues and constraints were identified, and evaluation criteria and alternatives were developed. The main part of the study was put on hold in late 2019 while a separate study was developed in looking at DTC's Monroe Street Maintenance and Operations. The DTC Study was completed in the Summer of 2020, and the stakeholders were re-engaged in November 2020 to present the finding of the DTC Study and finalize the Study Recommendations.

To address the Study's Purpose, transportation needs were identified as part of the early stakeholder involvement and are summarized below:

- Improve Traffic Operations – In the study area traffic volumes are heavy on Maryland Avenue and MLK Boulevard, and on the ramp coming off I-95 NB. This leads to backups, mainly during the peak traffic hours, at locations like the 5-Points Intersection and the ramp, which at times backs up on the I-95 Mainline. The heavy traffic volumes also contribute to crashes, especially along MLK Boulevard, which is currently a corridor identified for safety improvements by the Hazard Elimination Safety (HEP) Program.
 - Improve Multi-Modal access for Pedestrians, Bicyclists, and Transit Users – The study area provides a link between neighborhoods like Browntown and the Wilmington Riverfront, the
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Central Business District (CBD), and transportation centers like the Wilmington Train Station and the recently opened Wilmington Transit Center. In that regard, missing sidewalks and ADA deficiencies cause access deficiencies, and the lack of a bicycle network limits access to other identified bicycle corridors like 2ND Street. The skate park currently under construction next to the Amtrak Northeast Corridor near I-95 will also need access improvements for all modes especially pedestrians and bicyclists.

- Support Economic Development – While the study area has property owners like DTC and Delmarva that have established operations that are not anticipated to change for many years, there are other properties including some that are owned by the Reybold Group that are looking to redevelop. The existing transportation network may limit opportunities for continued economic development.
- Gateway Enhancements – The area is a “gateway” for users from I-95 and Maryland Avenue into the Riverfront and the CBD, but generally the current aesthetics do not promote a gateway feel.

Study Alternatives

Utilizing the alternatives that were first developed in previous studies and based upon the priorities and criteria that were developed with the Stakeholders at a May 20, 2019 Visioning Meeting, the Study Team developed and refined four (4) alternatives that addressed the Purpose and Need of the Study and the criteria that were developed. They were:

- Alternative A: Two-Way Monroe Street
- Alternative B: One-Way Monroe Street with Chestnut Street Extended
- Alternative C: Private Monroe Street/Two-Way Maryland Avenue
- Alternative D: I-95 Split Ramp

All of the alternatives provided changes to the urban street grid and improvements for all modes includes vehicles, pedestrians, bicyclists, and access to transit. But there were some trade-offs with the alternatives related to the priorities and criteria, so a matrix was developed that provided a comparison of the four alternatives.

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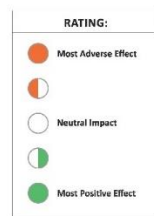
Safety & Capacity Improvement Study for 5-Point Intersection

5-Point
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CRITERIA MATRIX

CRITERIA	TRANSPORTATION						LAND USE	STAKEHOLDER CONCERNS			POTENTIAL STRUCTURED PARKING OPPORTUNITIES		GATEWAY ENHANCEMENT OPPORTUNITIES		ENVIRONMENTAL			COST
Measure	Vehicle Conflicts and Crash Potential	I-95 Ramp Congestion and Queues During Peak Hour(s)	City Streets Congestion and Queues During Peak Hour(s)	Efficient Transportation Grid	Pedestrian Network	Bicycle Network	Opportunities for Economic Development	DTC Operations and Parking	Delmarva Access, Circulation and Customer Parking	Medical Examiner Parking	Parcels Separated by Public Street	Combined Parcels	Wayfinding/ Destination Signage	Aesthetics/ Lighting	Historic	Social/ Environmental Justice	Green Infrastructure Opportunities	Cost Estimate
No Improvements	●	●	●	◐	●	●	◐	◐	◐	◐	No	No	◐	●	○	●	◐	●
Alt. A Two-way Monroe St.	◐	◐	◐	●	◐	◐	●	●*	○	◐	Yes (2 Options)	Yes	◐	◐	○	◐	●	◐
Alt. B One-way Monroe St. with Chestnut St. extended	◐	◐	◐	◐	◐	◐	◐	●*	◐	◐	No	Yes	◐	◐	○	◐	●	◐
Alt. C Private Monroe St. / Two-way Maryland Ave.	◐	◐	◐	◐	◐	◐	◐	●*	◐	◐	No	Yes (2 Options)	◐	◐	○	◐	●	◐
Alt. D I-95 Split Ramp	◐	●	◐	◐	◐	◐	●	●*	○	○	Yes	No	●	◐	○	◐	◐	●

* with Structured Parking



DTC Monroe Maintenance Facility Feasibility Study

A detailed review of DTC's Monroe Maintenance facility was performed after concerns were raised by DTC that potential transportation improvements, especially a two-way Monroe Street, could significantly affect transit operations. The study helped provide a better understanding of what alternatives may be available to address both a replacement of the Monroe Street Maintenance Facility, and parking alternatives for buses and employees for both DTC and Delmarva Power.

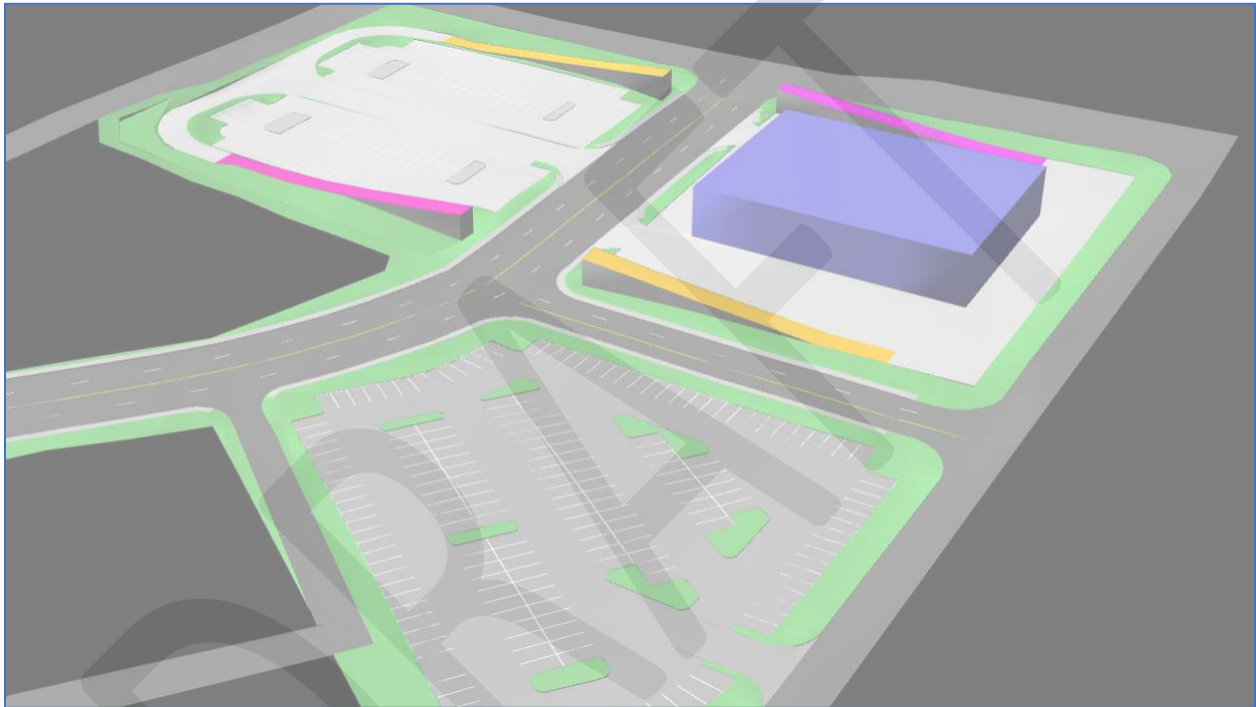
For the study of DTC's Monroe Street Facility and surrounding properties, a site optimization tool SiteOPS was used to analyze existing topography, site features, parking configurations, building locations and order of magnitude site costs. A workshop with DTC staff was held to allow participants to explore site planning "what-if" scenarios and reconfigurations in real time to immediately understand potential impacts. Usually this workshop is held on site and in person; however, the workshop was held as a virtual meeting in GoToMeeting because of the pandemic.

Four site models/layouts were developed in the SiteOPS program for possible site layouts to meet the program requirements. SiteOPS "optioneering" software allowed conceptual design of site layouts in a fraction of the time over traditional drafting methods. Layouts were dynamically

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generated in an interactive session instead of through an iterative process of passing drawings back and forth over weeks or even months.

The SiteOPS process allowed site elements (roads, parking lots, buildings, landscape areas, etc.) to be rapidly moved around the site or between sites to compare the impact of layouts in a matter of minutes. Parking lots with hundreds of spaces were redrawn in a matter of seconds. Grading decisions, like determining suitability for grading out a slope or installing a retaining wall were seen in real time. Sites were visualized in 3D to better understand the context in which the sites exist. All the “what-if” scenarios were rapidly compared to arrive at an optimal site solution that met DTC’s needs all while optimizing cost and evaluating a site’s constraints. An example of a site option developed in SiteOPS is shown below



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The results of the DTC Monroe Maintenance Facility Study are shown below. Cost estimates for a new Maintenance Building, Parking Structure(s), and site construction costs ranged from \$45,960,000 to \$99,725,000.

DTC Monroe Facility						
Cost Estimates						
16-Jun-20						
	Concept 1		Concept 3		Concept 4	Concept 4
	Bus Parking on Top	Bus Parking on Bottom	Bus Parking on Top	Bus Parking on Bottom		w/ Employee Garage
Buildings	\$36,130,890	\$36,130,890	\$36,130,890	\$36,130,890	\$36,130,890	\$36,130,890
Parking Structure	\$30,921,660	\$30,921,660	\$25,821,180	\$25,821,180	\$0	\$17,123,040
80% Solar Panel Cover	\$21,859,200	\$0	\$18,899,100	\$0	\$0	\$0
Other Site Costs	\$10,813,250	\$10,812,450	\$12,008,830	\$12,007,930	\$9,829,110	\$9,831,070
Total Cost Estimate	\$99,725,000	\$77,865,000	\$92,860,000	\$73,960,000	\$45,960,000	\$63,085,000
Bus Parking Spaces	110 +/-	120 +/-	146 +/-	127 +/-	140 +/-	140 +/-
Employee Parking Spaces	520 +/-	380 +/-	460 +/-	400 +/-	159 +/-	300 +/-
*Assumes Solar Panels not needed for Bus Parking on Bottom since buses will be covered, but could be added later for energy reasons						
*If Concept 4 is modified to allow two way access to Lot 1 from Chestnut Street, then Bus Parking Spaces are reduced 5-10 spaces						
*Delmarva needs 225 +/- Employee Parking Spaces						
*DTC needs 100+ Employee Parking Spaces						
*Total Cost Estimate does not include real estate costs						

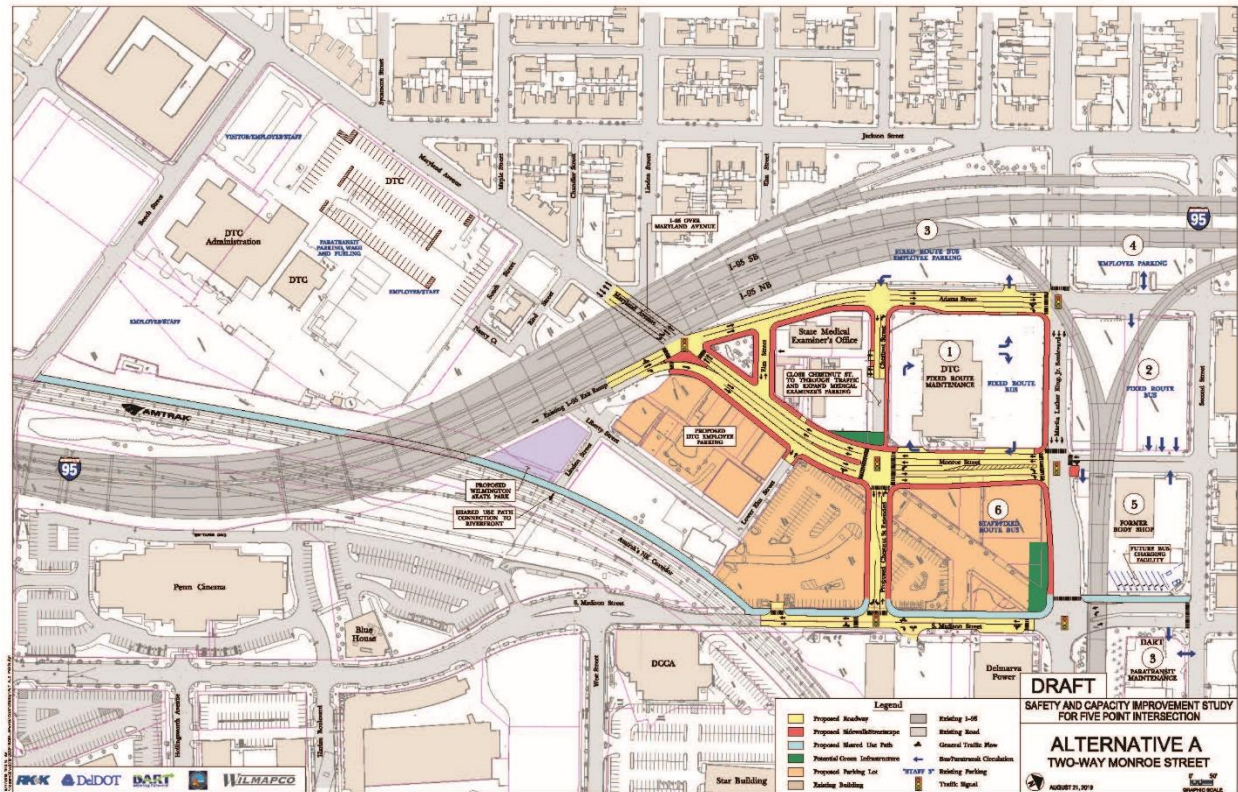
Preferred Alternative

Based upon the input from Wilmington Initiatives, the Stakeholders, and an assessment of Purpose and Need, goals, and objectives, Alternative A has been identified as the Preferred Alternative and is estimated at \$7.6 Million, which does not include right-of-way costs.

Alternative A includes the following:

- Reconstruction of the I-95 Ramp NB Terminus at Maryland Ave, in order for:
 - Maryland Avenue traffic heading towards MLK Boulevard would instead have to make a left onto Adams Street
 - I-95 NB ramp traffic could either have a free-flow right turn onto Maryland Avenue, or stay straight onto Adams Street at the existing traffic signal
- Adding a right turn on Adams Street at the MLK Intersection to accommodate the additional traffic from the diversions from Maryland Avenue
- Reconstruction of Monroe Street between MLK and Maryland to provide two-way traffic separated by a median
- Reconstruction of the MLK Boulevard and Madison Street Intersection to a four-way intersection
- Construction of a new Chestnut Street Extended to connect Monroe Street with South Madison Street, with signals at both intersections.
- Reconstruction of existing Chestnut Street to eliminate access to Monroe Street, with access only being provided to and from Adams Street.
- Reconstruction of South Madison Street from MLK Boulevard to the new intersection with Chestnut Street Extended.

- Shared Use Path along the Amtrak Viaduct and Madison Street, between Beech Street and 2nd Street.
- Sidewalk and ADA Improvements
- Bus Stop Improvements
- Green Stormwater Infrastructure to address stormwater runoff



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Next Steps

The 5-Point Intersection Safety & Capacity Improvement Study has been developed to serve as a conceptual plan and preliminary NEPA analysis. As project components advance into preliminary design, more details and NEPA analysis will be required to obtain NEPA approval. Project improvements could then be advanced into final design and ultimately construction. All of these next steps are based upon availability funding.

However, as indicated in this report, there are issues and other improvements that need to be addressed before significant changes to the street network recommended by Alternative A can be implemented, mainly:

- Replacement of DTC's Monroe Street Maintenance Facility, depending on which concept may be chosen for implementation
- Reconstruction and replacement of parking for buses
- Reconstruction and replacement of parking for DTC and Delmarva employees

The COVID-19 pandemic has also impacted travel patterns and volumes, at least by the writing of this report. Work place disruptions caused by the pandemic may extend for many years, causing additional uncertainty. The summer of 2020 opening of the Margaret Rose Bridge over the Christina River has now connected the Wilmington Riverfront with US 13, which provides traffic another way to access the Riverfront and lessens the need for some traffic needing to use I-95 NB and get off at the Maryland Avenue ramp.

With all these factors, additional monitoring of traffic (yearly or in regular intervals) is recommended to further understand future traffic patterns to better identify the timing of implementation.

Additional critical issues need to be considered as part of the implementation:

- Design of any roadway changes will need to accommodate large vehicles, especially large construction/maintenance vehicles that operate out of Delmarva's site
- Avoidance of the underground Shipley Street Combined Sewer Outfall (CSO) facility that is under the Delmarva Parking lot off South Madison Street and is also under the DTC Maintenance Building Parcel. Any impacts to the CSO will be very expensive to mitigate.
- Staging of parking needs impacted during construction
- Any redevelopment that may have occurred on the Reybold Property since this report was complete