

Delaware Memorial Bridge - Continuing Projects

Crossings Strategic Capital Improvement Plan

Ranking	Project	2020 \$ Spent (EST.)	2021	External Funding 2021	2022	External Funding 2022	2023	External Funding 2023	2024	External Funding 2024	2025	External Funding 2025
Continuing Projects												
3	Deck UHPC Overlay Program	\$ 5,750,000	\$ 1,200,000	\$ -	\$ 21,667,000	\$ -	\$ 43,333,000	\$ -	\$ -	\$ -	\$ -	\$ -
5	Deck Repairs	\$ 670,000	\$ 1,155,000	\$ -	\$ 1,500,000	\$ -	\$ 1,500,000	\$ -	\$ 1,500,000	\$ -	\$ -	\$ -
7	Roof and Building Envelope Rehabilitation (DMB)	\$ 1,200,000	\$ 320,000	\$ -	\$ 1,000,000	\$ -	\$ 25,000	\$ -	\$ 70,000	\$ -	\$ -	\$ -
11	Admin Building Elevator Retrofits	\$ 575,000	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
15	Ship Collision Protection	\$ 450,000	\$ 7,000,000	\$ 5,500,000	\$ 20,940,000	\$ 16,340,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
28	Catwalk Repairs	\$ 50,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
32	Miscellaneous Roadway Improvements	\$ 1,100,000	\$ 3,900,000	\$ -	\$ 1,000,000	\$ -	\$ 1,000,000	\$ -	\$ 1,000,000	\$ -	\$ 1,000,000	\$ -
34	Toll Booth HVAC Replacement	\$ 50,000	\$ 300,000	\$ -	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
35	Salt Bay Renovation	\$ 57,000	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
41	Police Parking Lot at Julia Building	\$ 26,000	\$ 777,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
42	Gantry Lane Markers	\$ -	\$ 200,000	\$ -	\$ 200,000	\$ -	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ -
45	Replace Chillers in Administration Building Phase 2	\$ 625,000	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
47	Roadway LED Lighting Upgrades	\$ 200,000	\$ 250,000	\$ -	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
56	Facility Utility Survey (DMB)	\$ -	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
60	War Memorial Refurbishment	\$ -	\$ 200,000	\$ -	\$ 1,750,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grand Total		\$ 10,753,000	\$ 16,677,000	\$ 5,500,000	\$ 48,557,000	\$ 16,340,000	\$ 46,058,000	\$ -	\$ 2,570,000	\$ -	\$ 1,000,000	\$ -

3 **Deck UHPC Overlay Program - Asset Preservation**

Both structures exhibit minor deck cracking and delamination as well as potholes due to age and heavy truck volumes. The project aims to demonstrate a proof of concept for Ultra High Performance Concrete (UHPC) overlays on the decks of the Delaware Memorial Bridge. As part of this project, areas will be identified on the bridge where UHPC overlays can be installed and cores taken for testing and evaluation. This project has an estimated DRBA cost of \$1,200,000 in 2021 and \$65,000,000 in the out years. This effort has no anticipated annual operating cost impact.

5 **Deck Repairs - Safety**

Both structures exhibit minor deck cracking and delamination as well as potholes due to age and heavy truck volumes. The project includes large lane-width concrete repairs to the bridge deck to maintain an appropriate level of service until the permanent overlay project is fully implemented. This project has an estimated DRBA cost of \$1,155,000 in 2021 and \$4,500,000 in the out years. This effort has no anticipated annual operating cost impact.

7 **Roof and Building Envelope Rehabilitation (DMB) - Asset Preservation**

The Authority is still in the early stages of a healthy roof management program having over 150 roof systems throughout its facilities. Each year, annual inspections and capital investments are strategically placed to provide a 30-year solution to establish a consistent and manageable replacement plan in the future. This project has an estimated DRBA cost of \$320,000 in 2021 and \$1,095,000 in the out years. This effort has no anticipated annual operating cost impact.

11 **Admin Building Elevator Retrofits - Efficiency and Sustainability**

Elevators in the Delaware Memorial Bridge Administrative Building are reaching the end of their design life and are in need of repair. The project programs the design and rehabilitation of two elevators. This project has an estimated DRBA cost of \$25,000 in 2021. This effort has no anticipated annual operating cost impact.

Delaware Memorial Bridge - Continuing Projects

15 **Ship Collision Protection - Safety**

The existing tower fender system on the twin spans is in poor repair and the design is insufficient for the current vessel traffic. The project programs the provision of protection system meeting current standards and consisting of eight 80 foot diameter dolphin structures, two at the approach of each tower pier. This project has an estimated DRBA cost of \$7,000,000 in 2021 and \$20,940,000 in the out years. The project is partially funded in the amount of approximately \$21,840,000 by the US Department of Transportation. This effort has no anticipated annual operating cost impact.

28 **Catwalk Repairs - Safety**

The steel framework of the catwalks on the Delaware Memorial Bridge are aging and showing signs of severe corrosion and section loss. The project aims to remove and replace deteriorated members of the catwalks and install new members. This project has an estimated DRBA cost of \$500,000 in 2021. This effort has no anticipated annual operating cost impact.

32 **Miscellaneous Roadway Improvements - Asset Preservation**

Large sections of hot mix pavement in the northbound direction are 12 or more years old, showing signs of distress, and have reached the end of their useful life. The project will remove the wearing surface and install a fresh wearing course in sections over a three year period. This project has an estimated DRBA cost of \$3,900,000 in 2021 and \$4,000,000 in the out years. This effort has no anticipated annual operating cost impact.

34 **Toll Booth HVAC Replacement - Asset Preservation**

The HVAC units for the Tolls building are at the end of their service life and operate on obsolete R-22 refrigerant, which is being phased out by the EPA. The project will begin the process of replacement with high efficiency units that operate on modern, environmentally-friendly refrigerant. This project has an estimated DRBA cost of \$300,000 in 2021 and \$250,000 in the out years. This effort has no anticipated annual operating cost impact.

35 **Salt Bay Renovation - Safety**

The salt bay at the Delaware Memorial Bridge complex has developed issues including a cracked foundation, concrete spalling, and cracks in the masonry. The project programs the design and construction of the necessary repairs for the salt bay building envelope. This project has an estimated DRBA cost of \$500,000 in 2021. This effort has no anticipated annual operating cost impact.

41 **Police Parking Lot at Julia Building - Efficiency and Sustainability**

Parking for police vehicles is greatly lacking at the Julia Building adding significant response time for officers when vehicles are parked in the administration building lot. The project programs the design and construction of 50 additional parking spaces at the Julia Building to address this shortage. This project has an estimated DRBA cost of \$777,000 in 2021. This effort has no anticipated annual operating cost impact.

42 **Gantry Lane Markers - Efficiency and Sustainability**

The existing gantry mounted lane status signals on each span are comprised of a series of LED lights. These lights are nearing the end of their anticipated life cycle (10 years). Each lane signal consists of 50 individual LED lights. The project programs the replacement of the 4,000 LED lights over a three year period. This project has an estimated DRBA cost of \$200,000 in 2021 and \$400,000 in the out years. This effort has no anticipated annual operating cost impact.

45 **Replace Chillers in Administration Building Phase 2 - Efficiency and Sustainability**

Several existing HVAC chiller units are at the end of their service life and operate on obsolete R-22 refrigerant, which is being phased out by the EPA. The project will begin the process of replacement with high efficiency units that operate on modern, environmentally-friendly refrigerant. This project has an estimated DRBA cost of \$250,000 in 2021. This effort has no anticipated annual operating cost impact.

Delaware Memorial Bridge - Continuing Projects

47 **Roadway LED Lighting Upgrades - Efficiency and Sustainability**

This is a continuation of an existing program to replace all existing high pressure sodium roadway lights with new, modern, longer lasting, and more efficient LED fixtures. The effort will continue for two more years to complete the Delaware approach roads. This project has an estimated DRBA cost of \$250,000 in 2021 and \$250,000 in the out years. This effort has no anticipated annual operating cost impact.

56 **Facility Utility Survey (DMB) - Efficiency and Sustainability**

Utility records and location services are not provided by the local utility companies for the majority of the Authority's properties and historical records are difficult to track without a common GIS platform. The project programs a field utility survey to include preliminary development of a GIS platform to record this data and track future changes. This project has an estimated DRBA cost of \$100,000 in 2021. This effort has no anticipated annual operating cost impact.

60 **War Memorial Refurbishment - Asset Preservation**

The War Memorial is aging and showing signs of deterioration. The project programs the design and restoration of the existing War Memorial. This project has an estimated DRBA cost of \$200,000 in 2021 and \$1,750,000 in the out years. This effort has no anticipated annual operating cost impact.

Delaware Memorial Bridge - Annual Projects

Crossings Strategic Capital Improvement Plan

Ranking	Project	2021	External Funding 2021	2022	External Funding 2022	2023	External Funding 2023	2024	External Funding 2024	2025	External Funding 2025
	Annual Projects										
1	Annual Bridge Steelwork Repairs	\$ 13,000,000	\$ -	\$ 10,000,000	\$ -	\$ 9,000,000	\$ -	\$ 9,000,000	\$ -	\$ 9,000,000	\$ 1
22	Annual Maintenance Bridge Span Painting	\$ 10,000,000	\$ -	\$ 14,500,000	\$ -	\$ 11,000,000	\$ -	\$ 7,500,000	\$ -	\$ 7,500,000	\$ 1
24A	Annual Minor Capital Maintenance (DMB)	\$ 1,821,000	\$ -	\$ 1,375,000	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ 1
25A	Annual Minor Capital Equipment (DMB)	\$ 917,000	\$ -	\$ 665,000	\$ -	\$ 455,000	\$ -	\$ -	\$ -	\$ -	\$ 1
27A	Annual Automation/Telecom Upgrades (DMB)	\$ 2,780,000	\$ -	\$ 1,540,000	\$ -	\$ 904,000	\$ -	\$ 420,000	\$ -	\$ 1,465,000	\$ 1
	Grand Total	\$ 28,518,000	\$ -	\$ 28,080,000	\$ -	\$ 21,419,000	\$ -	\$ 16,980,000	\$ -	\$ 18,025,000	\$ 5

1 **Annual Bridge Steelwork Repairs - Asset Preservation**

This project programs miscellaneous steelwork repairs found to be necessary as a result of comprehensive annual inspections. These repairs are necessary to preserve the bridge's steelwork while maintaining safety and operational service levels. Work typically includes replacement of worn bearing assemblies, access platforms, maintenance of steel connections, installing new safety features, and other items. This project has an estimated DRBA cost of \$13,000,000 in 2021 and \$37,000,000 in the out years.

22 **Annual Maintenance Bridge Span Painting - Asset Preservation**

The annual bridge report recommends repairs to the coating system of the Delaware Memorial Bridge to protect the structural steel on specific spans. The project programs funds to have deficient areas cleaned to bare metal and recoat with a 4- layer protective overcoat system. This project has an estimated DRBA cost of \$10,000,000 in 2021 and \$40,500,000 in the out years.

24A **Annual Minor Capital Maintenance (DMB) - Asset Preservation**

This project programs annual work activities necessary to accommodate changing regulations and to preserve existing infrastructure. Minor capital maintenance may include, but not be limited to: interior renovations, building upgrades, electrical/lighting improvements, installation of oil/water separators, fencing, guiderail replacement, signage replacement, HVAC upgrades, chiller upgrades, emergency generator improvements, miscellaneous office space improvements, miscellaneous toll booth improvements, as well as utility and general infrastructure improvements. This project has an estimated DRBA cost of \$1,821,000 in 2021 and \$1,555,000 in the out years.

25A **Annual Minor Capital Equipment (DMB) - Efficiency and Sustainability**

This project programs annual capital equipment purchases which may include but are not limited to: vehicles, trucks, specialty equipment, emergency generators, trailers, and other equipment that are utilized to preserve existing infrastructure assets. Purchases are based on established replacement guidelines considering useful life and condition. This project has an estimated DRBA cost of \$917,000 in 2021 and \$1,120,000 in the out years.

Delaware Memorial Bridge - Annual Projects

27A **Annual Automation/Telecom Upgrades (DMB) - Efficiency and Sustainability**

Automation upgrades and equipment enhancements are needed to maintain sustainable and efficient facilities. This yearly project includes but is not limited to: automation master planning, computer hardware replacement purchases, local and wide area network upgrades, software and hardware upgrades, file back-up system maintenance and upgrades, video teleconference system upgrades, document management storage systems, server replacements, business continuity hardware/software, network replacement/upgrades, storage area network upgrades, and various hardware/software installations or upgrades as necessary. This project has an estimated DRBA cost of \$2,780,000 in 2021 and \$4,329,000 in the out years.