# Appendix J: Indirect and Cumulative Effects Technical Report

for the

# I-95 Access Improvements from Caton Avenue to Fort McHenry Tunnel – Environmental Assessment (EA) Baltimore City, Maryland

Prepared for:

Maryland Transportation Authority

dot DEPARTMENT OF TRANSPORTATION BALTIMORE CITY

and

U.S. Department of Transportation Federal Highway Administration

***March 2018***

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| APE | Area of Potential Effects |
| B&O | Baltimore and Ohio Railroad |
| BMP | Best Management Practices |
| BCRP | Baltimore City Department of Recreation and Parks |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| COMAR | Code of Maryland Regulations |
| CWA | Clean Water Act |
| DOT | Department of Transportation |
| EA | Environmental Assessment |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FIDS | Forest Interior Dwelling Species |
| GIS | Geographic Information System |
| HUC | Hydraulic Unit Code |
| ICE | Indirect and Cumulative Effects |
| LOS | Levels of Service |
| MDE | Maryland Department of the Environment |
| MDNR | Maryland Department of Natural Resources |
| MDP | Maryland Department of Planning |
| MDTA | Maryland Transportation Authority |
| MHT | Maryland Historic Trust |
| MIHP | Maryland Inventory of Historic Properties |
| NEPA | National Environmental Policy Act |
| NPS | National Park Service |
| NRHP | National Register of Historic Places |
| PFA | Priority Funding Areas |
| RTE | Rare, Threatened and Endangered Species |
| SHA | State Highway Administration |
| SSPRA | Sensitive Species Project Review Areas |
| SWM | Stormwater Management |
| TMDL | Total Maximum Daily Load |
| USACE | US Army Corps of Engineers |
| USEPA | US Environmental Protection Agency |
| USFWS | US Fish and Wildlife Service |
| USGS | US Geological Survey |

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# 1 ALTERNATIVES DEVELOPMENT PROCESS

The Maryland Transportation Authority (MDTA) and the Baltimore City Department of Transportation (Baltimore City DOT), in coordination with the Federal Highway Administration (FHWA), studied several alternatives for improvements to Interstate 95 (I-95) ramps and other nearby transportation facilities to support ongoing and planned redevelopment of the Port Covington peninsula in south Baltimore. These improvements are collectively known as the I-95 Access Improvements from Caton Avenue to the Fort McHenry Tunnel (I-95 Access Improvement Project).

The existing road and roadway capacity are not adequate to meet projected traffic demand and there are limited multi-modal connections around and across I-95 in the vicinity of Port Covington. The purpose of the I-95 Access Improvements project is to accommodate forecasted increased transportation demand on I-95 and the surrounding transportation network by minimizing effects on mobility and safety, as well as enhancing multi-modal connections to the Port Covington peninsula.

To simplify a complex project, the improvements under consideration were broken down into seven elements as illustrated in Table 1-1.

**Table 1-1: Project Elements**

| Designation | Element | Locations |
|---|---|---|
| **A** | I-95 Northbound Off Ramps | • I-95 NB to Hanover Street SB<br>• I-95 NB to McComas Street |
| **B** | I-95 Northbound On Ramps | • Key Highway to I-95 NB |
| **C** | I-95 Southbound Off Ramps | • I-95 SB to Key Highway |
| **D** | I-95 Southbound On Ramps | • McComas Street WB to I-95 SB<br>• Hanover Street NB to I-95 SB |
| **E** | Hanover Street | • Between Wells and McComas Streets |
| **F** | McComas Street and Key Highway | • Swann Park to Key Highway<br>• McComas Street to McHenry Row |
| **G** | Pedestrian and Bicycle Connections | • Hanover Street<br>• Key Highway<br>• McComas Street<br>• Shared-Use Path |

Several options were developed for each element. These were combined into four discrete alternatives for analysis purposes – Alternative 1 (the No-Build Alternative) and three Build Alternatives. These four alternatives were analyzed to determine how well they meet the project's stated Purpose and Need and the effects each has on future traffic operations both on I-95 and on surface streets. Key performance measures include travel times, vehicle throughput, queuing, and level of service. Each element's options were also compared against each other to identify the highest performing ones. Based on the key performance measures results, and how well they meet the Purpose and Need, the highest performing options for each element were combined into Alternative 5, the MDTA/Baltimore City Team Recommended Preferred Alternative.

## 1.1 Recommended Preferred Alternative (Alternative 5)

This section describes the Recommended Preferred Alternative, as approved by MDTA and Baltimore City DOT, broken down into the seven elements (A-G).

***Element A: I-95 Northbound Off Ramps***

- New Ramps
  - **Spur from Russell Street Ramp** – The existing auxiliary lane between the Caton Avenue On Ramp and the Russell Street Off Ramp will be widened to two lanes. The Russell Street Off Ramp will also be widened to two lanes until it overpasses MD 295, at which point the two lanes will split. One lane will continue along the existing ramp alignment to Russell Street NB. The second will continue east, over the Middle Branch, as a new ramp spur parallel to the existing ramps adjacent to I-95 NB, and merge with the new spur ramp from I-395 SB, connecting to McComas Street at an at-grade intersection on the western side of Port Covington.
  - **Spur from I-395 SB Ramp** – A new ramp spur, splitting off from the existing I-395 SB Ramp to I-95 NB where it overpasses I-95, is proposed. It will run southeast, merge with the new spur ramp from Russell Street, connecting to McComas Street at an at-grade intersection on the western side of Port Covington.
- **I-95 NB to Hanover Street SB Ramp** – The existing ramp will be removed. Vehicles traveling from I-395 SB to MD 2 SB will be accommodated by the new ramp Spur from I-395 SB.
- **I-95 NB to McComas Street Ramp** – The existing ramp will remain in a similar location, but will be realigned to accommodate the new I-95 NB On-Ramp (Element B), modifications to McComas Street (Element F), and the removal of the existing Hanover Street ramp from I-95 NB. The realigned ramp will extend the existing auxiliary lane that terminates at the Hanover Street exit to a two lane exit gore located approximately 1,600 feet from the existing I-395 SB On Ramp gore. The new two-lane exit ramp will run under I-95 NB, braid through the existing piers, and daylight perpendicular to an at-grade signalized intersection with McComas Street near the existing intersection of McComas and Cromwell Streets.

***Element B: I-95 Northbound On Ramps***

- **Key Highway to I-95 NB Ramp** – No modifications to the existing ramp are proposed.
- **McComas Street to I-95 NB Ramp** – A new ramp is proposed from McComas Street at a location approximately 700 feet east of its intersection with Hanover Street. The new ramp will braid with the realigned I-95 NB to McComas Street Ramp (Element A) and modifications to the realigned one-way section of McComas Street WB (Element F).

***Element C: I-95 Southbound Off Ramp***

- **I-95 SB to Key Highway Ramp** – No modifications to the existing ramp are proposed.
- **I-95 SB to McComas Street WB Ramp** – A new ramp, with a gore located approximately 400 feet west of the Key Highway overpass is proposed. It will provide access to the one-way section of McComas Street WB located directly beneath I-95 SB. The new ramp will braid with the realigned McComas Street WB to I-95 SB Ramp (Element D). The improvements will require the relocation of two CSX storage tracks.

***Element D: I-95 Southbound On Ramps***

- **McComas Street WB to I-95 SB** – The existing ramp will continue to provide access from the one-way section of McComas Street WB to I-95 SB, but will be realigned to minimize construction cost and duration. It will braid with the new ramp from I-95 SB to McComas Street WB (Element C).
- **Hanover Street NB to I-95 SB** – No modifications to the existing ramp are proposed.

***Element E: Hanover Street***

- **From Wells Street to McComas Street –** No modifications to this section of Hanover Street are proposed.

***Element F: McComas Street & Key Highway***

- **McComas Street west of Key Highway** – The existing two-way section of McComas Street and the one-way section of McComas Street EB will be converted to a two-way boulevard from the western side of the Port Covington peninsula to Key Highway. The boulevard will accommodate vehicular and multi-modal connections between South Baltimore, I-95, and the Port Covington development. The median will be designed to accommodate a future light rail spur from Westport anticipated to terminate prior to the existing intersection of McComas and Cromwell Streets. The existing one-way section of McComas Street WB beneath I-95 SB will remain in its current location, but be modified to accommodate the addition of an exclusive right-turn lane at the approach to the Key Highway intersection, the addition of the I-95 SB to McComas Street WB ramp (Element C), and the tie-in to the proposed two-way McComas Street boulevard.
- **Key Highway** – The existing roadway will be widened from a 4-lane section (2 NB & 2 SB) to a 5-lane section (3 NB & 2 SB) between the McHenry Row and McComas Street intersections Additionally, a 450' long southbound right-turn lane will be added at the McComas Street intersection. The CSX bridge over Key Highway, just north of the McComas Street intersection, will be reconstructed to accommodate the new width of Key Highway.

***Element G: Pedestrians and Bicycles***

- **Hanover Street** – The existing sidewalks on Hanover Street will remain unchanged on the bridge over the CSX tracks. South of the bridge over the CSX tracks, a new sidewalk is proposed along the west side of Hanover Street, running south to the McComas Street intersection.
- **Key Highway** – An 11-foot wide shared-use path will be provided on the east side of Key Highway between the intersections of McHenry Row and McComas Street.
- **McComas Street** – Sidewalks will be installed along both sides of the new McComas Street boulevard. Likewise, a shared-use path will be installed along the north side of McComas Street between the Cromwell Street and Key Highway intersections.
- **New Shared-Use Bridge/Path** – A new shared-use path, linking South Baltimore to Port Covington will be constructed. The path will run parallel to the south side of Winder Street, ramping up from the Light Street intersection. A stair case will connect to the path from the Charles Street intersection. At the Charles Street intersection, the ramp will turn south, bridge over the CSX tracks and under I-95, then turn east to connect to the shared-use path proposed along the north side of McComas Street.

## 2 INDIRECT AND CUMULATIVE EFFECTS REGULATIONS AND GUIDANCE

This Indirect and Cumulative Effects (ICE) analysis was conducted in compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1508.25(c)). Additional references included *the Federal Highway Administration Position Paper: Secondary and Cumulative Impact Assessment in the Highway Project Development Process* (April 1992) and *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Consideration in the NEPA Process* (January 2003); as well as the National Research Council, *National Cooperative Highway Research Program Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*[1].

Per CEQ guidance, *direct effects* are defined as,

> "effects caused by the action and occur at the same time and place. Direct effects are typically well understood and predictable, may include residential or business displacements or the removal of a historic structure." (40 CFR 1508.8(a)).

*Indirect effects* are defined as,

> "effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR § 1508.8(b)).

*Cumulative impacts* are defined as,

> "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR § 1508.7).

[1] National Academy Press, Transportation Research Board. (2002).

# 3 INDIRECT AND CUMULATIVE EFFECTS ANALYSIS SCOPING

ICE scoping involved identifying environmental resources within the ICE boundary, further described in Section 3.1. Data availability, geographic boundaries and important time frames were used as the foundation for conducting the ICE analysis. Table 3-1 summarizes resources that were analyzed as part of this ICE analysis.

**Table 3-1: Summary of Potential ICE Resources**

| Resource | Incorporation into ICE | Rationale | Representative Boundary |
|---|---|---|---|
| **Socio-Economic Resources** | | | |
| **Land Use** | Yes | Direct Effects /Possible Indirect and Cumulative Effects | Planning Areas, Census Tracts, Area of Traffic Influence / Traffic Analysis Study Area |
| **Neighborhoods** | Yes | No Direct Effects/Possible Indirect and Cumulative Effects | Planning Areas, Census Tracts, Area of Traffic Influence / Traffic Analysis Study Area |
| **Park and Recreational Facilities** | Yes | Direct Effects/Possible Indirect and Cumulative Effects | Watersheds, Planning Areas |
| **Cultural Resources** | | | |
| **Archaeological** | Yes | No Direct Effects/Possible Indirect and Cumulative Effects | Archaeological Area of Potential Effect |
| **Historic Sites and Structures** | Yes | No Direct Effects/ Possible Indirect and Cumulative Effects | Architectural Area of Potential Effect |
| **Natural Resources** | | | |
| **Surface Water** | Yes | Direct Effects/Possible Indirect and Cumulative Effects | Watersheds |
| **Groundwater** | Yes | Direct Effects/Possible Indirect and Cumulative Effects | Watersheds |
| **Floodplains** | Yes | Direct Effects/Possible Indirect and Cumulative Effects | Watersheds |
| **Wetlands/ Aquatic Habitat** | Yes | Direct Effects/Possible Indirect and Cumulative Effects | Watersheds |
| **Terrestrial Habitat/Forests** | No | None Present | Watersheds |
| **Rare, Threatened or Endangered Species and Habitats** | No | None Present | Watersheds |

## 3.1 ICE Geographic Boundary

In assessing the potential for indirect and cumulative effects associated with the I-95 Access Improvements Project, general development trends were researched, natural and cultural resources were inventoried, and other projects within the general vicinity which may contribute to cumulative effects were evaluated.

The ICE boundary is defined as the 14 census tracts surrounding the project site. This boundary is inclusive of the communities, watersheds, and traffic analysis study areas that would most likely experience the direct, indirect and cumulative effects of this project.

The ICE boundary is illustrated in Figure 3.1 and generally described below:

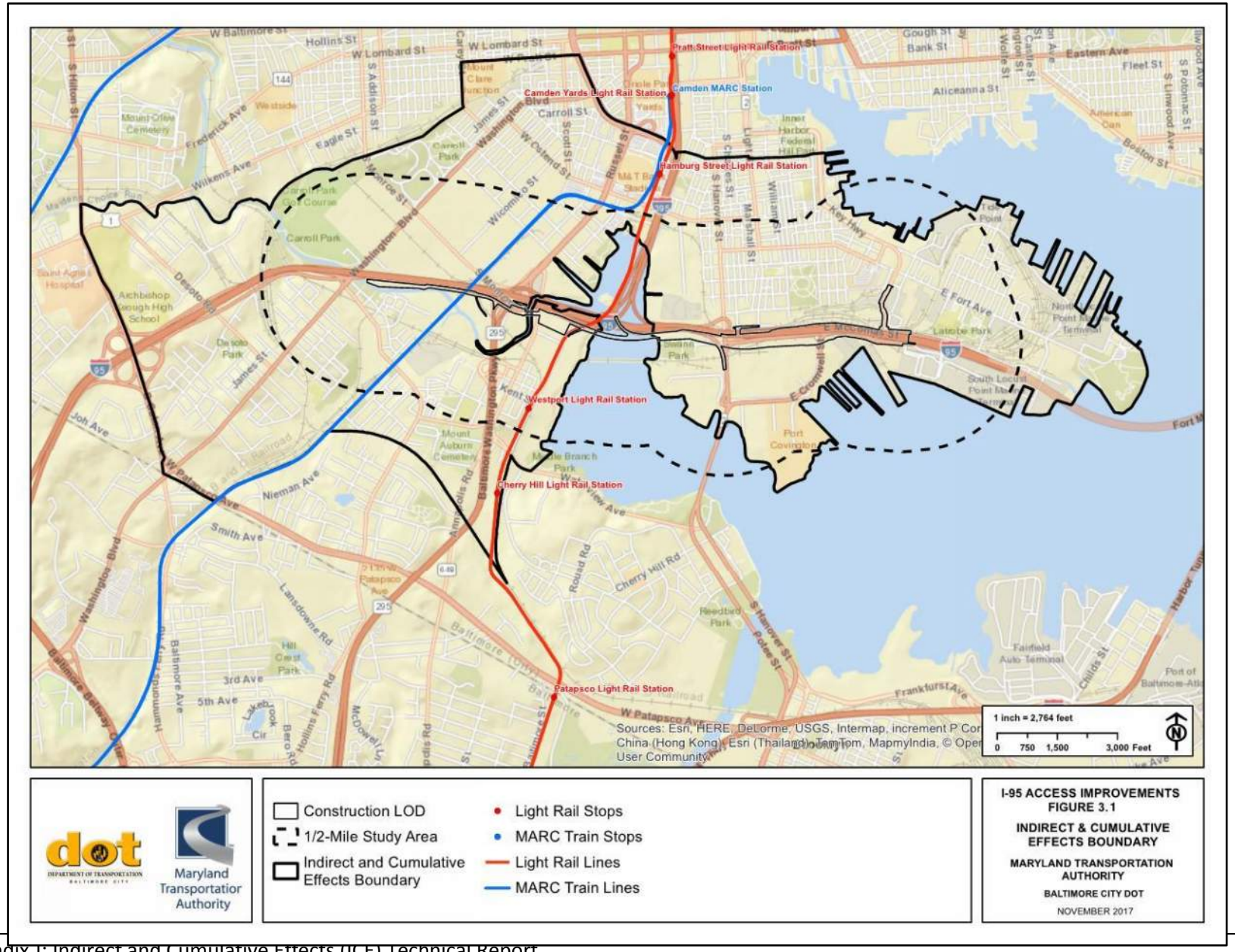
- West Pratt Street (between South Carey Street and Martin Luther King, Jr. Boulevard), to the north;
- MD 295, southeast of Annapolis Road (MD 648), to the south;
- Fort McHenry on the Locust Point Peninsula, to the east; and
- South Caton Avenue (between the City Line near West Patapsco Avenue and Maiden's Choice Run, approximately 800 feet north of Wilkens Avenue, to the west.

Table 3-2 presents a summary of the ICE resources, data availability, data sources, and analysis methodologies.

**Table 3-2: Summary of ICE Resources, Data Availability, and Analysis**

| Resources | Data Availability | Data Source | Analysis |
|---|---|---|---|
| **Socio- Economic Resources** | | | |
| **Land Use** | Census records; Land use maps, Aerial photos; City Mater Plans | US Census, Maryland Department of Planning (MDP), Baltimore City Department of Planning | Access and Mobility Improvements; Land Use Development / Redevelopment |
| **Neighborhoods** | Census records; Land use maps; Community facilities; City Mater Plans | US Census, Maryland Department of Planning (MDP), Baltimore City Department of Planning | Access and Mobility Improvements; Community Cohesion and impact to community facilities |
| **Park and Recreational Facilities** | Online maps, ADC maps | Baltimore City Department of Recreation and Parks (BCRP) | Visual Effects; Increased Use/Capacity |
| **Cultural Resources** | | | |
| **Archaeological** | Archaeology Investigations | MHT's Cultural Resources GIS, State Highway Administration (SHA) Archaeology Survey, Archaeology Investigations | Encroachment on listed/eligible NRHP resources |
| **Historic Sites and Structures** | Topographic and historical maps | National Register of Historic Preservation (NRHP), Maryland Inventory of Historic Places (MIHP), National Park Service (NPS), SHA Archaeology Survey | Encroachment on listed/eligible NRHP resources |
| **Natural Resources** | | | |
| **Surface Water** | Topographic maps; NWI Maps; wetland delineation maps | Maryland Department Natural Resources (MDNR), U.S. Geological Survey (USGS), EPA, MDE, U.S. Army Corp of Engineers (USACE), Straughan Environmental Services | Impervious surfaces, instream flow and discharge water quality |
| **Groundwater** | Well and aquifer data; Land use data; Geological records | Maryland Department of Environment (MDE), MDP, USEPA, Straughan Environmental Services | Impervious surfaces, instream flow and discharge water quality and quantity |
| **Floodplains** | Land use maps, Flood Insurance Rate Maps (FIRM) | Federal Emergency Management (FEMA), MDNR, MDE | Impervious surfaces and water quantity |
| **Wetlands/ Aquatic Habitat** | NWI maps, Land use maps, Wetland delineation maps; and Wetland permit data | US Fish and Wildlife Service (USFWS), MDNR (stream surveys), USEPA, MDP | Impervious surfaces, instream flow, and discharge water quality |

**Figure 3-1: ICE Boundary**



## 3.2 ICE Time-frame

Past and future time frames were established in accordance with CEQ NEPA regulations (40 CFR 1508.25(c)). The time frame for the ICE analysis is defined as 1973 to 2040. This time frame was selected based on the availability of historical land use data, the occurrence of major transportation changes in the city, and the design year for the project. Population trends as well as significant changes in land use and development within the study area were examined. Table 3-3 shows events that justify the starting year of the 1973 for the ICE time frame as well as the end year of 2040.

**Table 3-3: Events Justifying ICE Time Frame**

| Event | Year | Importance |
|---|---|---|
| Maryland Department of Planning land use/land cover GIS data created | 1973 | First GIS-based land use data available for the analysis |
| I-95 Fort McHenry Tunnel opened | 1985 | Tunnel system allowed the continuation of travel across Baltimore's Inner Harbor, without limiting the access to tall sailing ships. Providing more access to the area. |
| Baltimore Sun Facility at Port Covington (Sun Park) built | 1988 | The opening of Sun Park contributed to the re-development of the area |
| Oriole Park at Camden Yard Stadium opened | 1992 | The opening of Oriole Park at Camden Yard contributed to the redevelopment of the area |
| North-South Light Rail Line opened for service connecting Timonium to Glen Burnie | 1992 | The opening of the light rail allowed for better north-south transit connectivity within Baltimore and surrounding counties. |
| M&T Bank Stadium opened | 1998 | The opening of M&T Bank Stadium contributed to the re-development of the area |
| Maryland Department of Planning land use/land cover GIS data created | 2002 | Data available for the analysis |
| Maryland Department of Planning land use/land cover GIS data updated | 2010 | Data available for the analysis |
| Port Covington Master Plan approved | 2016 | The Port Covington Master Plan approved by Baltimore City Planning Commission |
| I-95 Project: Caton Avenue to Fort McHenry Tunnel proposed design year | 2040 | Design year for traffic analysis |

Sources: Maryland Stadium Authority (http://www.mdstad.com/completed-projects);
Open Baltimore Data Portal (https://data.baltimorecity.gov/);
Port Covington Master Plan
(http://planning.baltimorecity.gov/sites/default/files/Draft%20PORT%20COVINGTON%20MASTER%20PLAN.pdf)

Past, present, and projected future trends were analyzed to identify cumulative effects within the ICE boundary. Qualitative and quantitative historic data was collected and reviewed to understand past effects on the socio-economic, cultural and natural environment and the rate at which these effects occurred. The resulting information was used to project future trends and potential effects.

### 3.2.1 Past Trends

The majority of land within the Baltimore City waterfront was historically developed as waterfront industrial and manufacturing uses, including the Port Covington area within the ICE boundary. The second half of the twentieth century saw additional road improvements including interchange improvements to MD 295/Russell Street at Monroe Street. Most notably, I-95 was constructed in Baltimore City, with construction spanning the years 1978 to 1985, when the Fort McHenry Tunnel opened. The highway was constructed on an elevated bridge structure from a point west of the MD 295/Russell Street interchange to the Fort McHenry Tunnel.

On Port Covington, additional land reclamation activities took place along the shoreline between 1959 and 1970 from the Western Maryland Railway to the Hanover Street Bridge providing additional transportation and industrial land. By 1974, Port Covington's last land reclamation project was complete on the south side of Locust Point, west of Fort McHenry, allowing the construction of the South Locust Point Marine Terminal. In the 1970s, once the Western Maryland Railway was absorbed into the Chessie system (which eventually became CSX), the rail yard was no longer needed. The rails and port-associated structures were removed in the 1980s. The former rail terminal has been partially redeveloped as an industrial park, including the Baltimore Sun Headquarters.

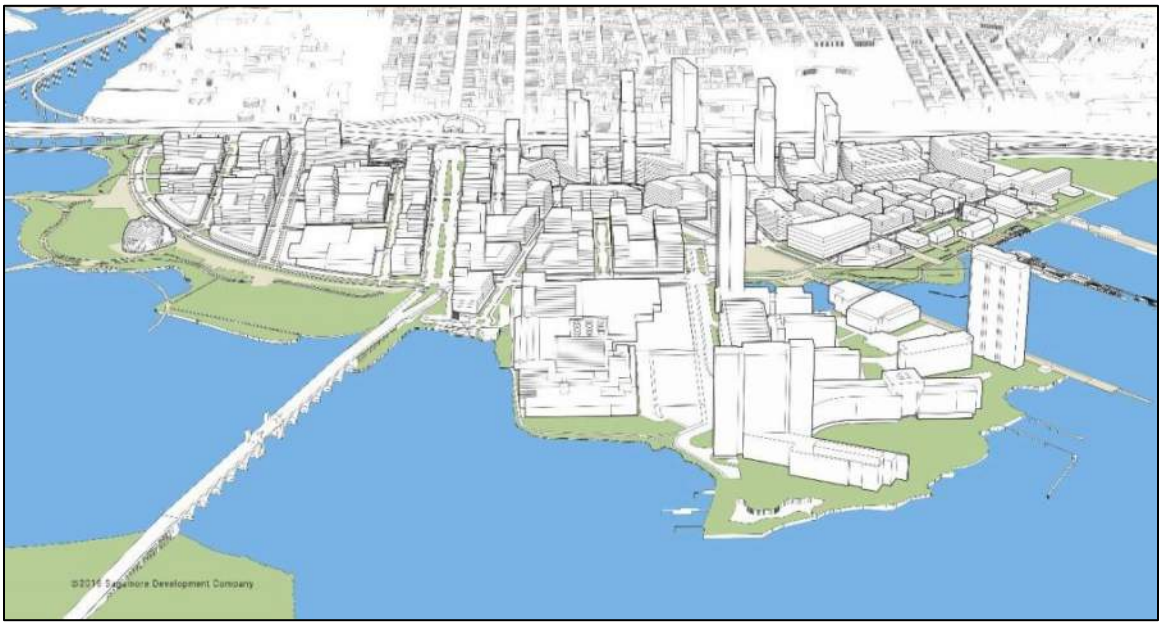
### 3.2.2 Present Trends

With continued outsourcing of manufacturing and industrial services, much of the previously industrial waterfront land remains vacant. Some of the vacant land on the Port Covington peninsula was redeveloped and converted to big box retail, which ultimately closed in 2016. The land within Port Covington is undergoing redevelopment, as further discussed in Section 4.1.1: Land Use. The Port Covington redevelopment will follow the recent trends of conversion vacant industrial lands in other Baltimore City areas including the Inner Harbor, Locust Point, Camden Yards, and Canton.

The Port Covington Master Plan proposes to redevelop approximately 260 acres of under-utilized industrial brownfields. As currently planned, the revitalization of the Port Covington site will increase population density on the peninsula, which will generate an attendant demand for infrastructure improvements. The proposed redevelopment is currently underway and includes the following:

- Relocation of the Under Armour World headquarters (roughly 3 million square feet and 11,000 employees anticipated by 2040);
- Approximately 1.5 million square feet of office space (in addition to the Under Armour World headquarters);
- Approximately 500,000 square feet of industrial/light manufacturing space;
- Approximately 1.5 million square feet of destination, attraction, entertainment and specialty retail establishments;
- Over 7,500 residential units, including rental and for-sale properties;
- 200+ hotel rooms;
- Civic and cultural uses including 40+ acres of public parks and other civic and cultural uses.

**Figure 3-2**: **Port Covington Redevelopment Concept Plan**



Source: Port Covington Master Plan Draft (June 2016)

### 3.2.3 Future Trends

Redevelopment trends are anticipated to continue into the future. Resulting in the further construction of residential and commercial areas replacing former industrial properties. Planned and proposed redevelopment of the Port Covington peninsula may increase demand and induce future development in the vicinity of the project. Two recent master plans that are most applicable to the Recommended Preferred Alternative and the study area are described below:

- **South Baltimore Gateway Master Plan[2] (2015):** The Plan offers a 20-year vision for the South Baltimore Gateway Area, which includes the communities, business areas, and open spaces ringing the Middle Branch of the Patapsco River and provides detailed set of recommendations for short-, medium-, and long-term actions. One of the goals of the South Baltimore Gateway Master Plan is to foster economic growth in more than a dozen neighborhoods in South Baltimore. Baltimore City Planning Commission adopted the Plan on October 29, 2015. The Recommended Preferred Alternative is compatible with the goals of the Plan, including redevelopment of Port Covington.
- **Port Covington Master Plan[3] (2016):** Proposes to redevelop approximately 260 acres of underutilized industrial land into a mixed-use community on the Port Covington peninsula. The Baltimore City Planning Commission approved the Port Covington Master Plan in June 2016. Land use approvals were granted by the Baltimore City Council in December 2016, and the redevelopment of Port Covington is underway.

[2] http://www.southbaltimoregatewaymasterplan.com/

[3] http://planning.baltimorecity.gov/sites/default/files/PORT%20COVINGTON%20MASTER%20PLAN%20061616%20v11%206.22.16.pdf

Other neighborhood plans that have been prepared by the City's Planning Department within portions of the ICE Boundary include:

- Carroll Camden Urban Renewal (2012)
- Middle Branch Transportation Plan (2011)
- Middle Branch Master Plan (2007)
- Cherry Hill Master Plan (2008):
- Westport Mount Winans Lakeland Master Plan (2005)
- Sharp-Leadenhall Master Plan (2004)
- Locust Point Comprehensive Plan (2004)

These plans recommend strategies for economic development and to support revitalization, encourage redevelopment of underutilized industrial properties, increase mobility for residents and visitors, and promote sustainability, environmental protection, and social equity. In addition, the Carroll Camden Urban Renewal, Locust Point Comprehensive Plan, Middle Branch Master Plan and Transportation Plan, and Westport Mount Winans Lakeland Master Plan recommend improving access to Baltimore's waterfront. The Middle Branch Transportation Plan proposes traditional traffic and roadway improvements, as well as solutions that will make the Middle Branch neighborhoods more pedestrian-, bicycle-, and transit-friendly.

# 4 INDIRECT AND CUMULATIVE EFFECTS ANALYSIS

An ICE analysis was prepared for the study in accordance with NEPA and CEQ regulations. The resources evaluated for indirect and cumulative effects include socioeconomic, cultural, and natural resources. Using readily available data from State and local sources, the resources were mapped using GIS and analyzed to determine the nature and extent of the indirect and cumulative effects created by the project. Table 4-1 identifies major transportation projects including this project, that have been completed or are underway from 1985 to present, as well as, relevant projects planned within the ICE boundary.

**Table 4-1: Major Transportation Projects within the ICE Boundary**

| Description | Status |
|---|---|
| **I-95 Fort McHenry Tunnel Project** | |
| Local, state, and federal governments planned, designed and constructed a 1.7-mile, eight-lane tunnel to complete I-95 across the harbor in Baltimore City. | Completed in 1985 |
| **I-95 Fort McHenry Tunnel-Rehabilitation Projects** | |
| Rehabilitate the tunnel deck for all four bores | Completed in 2017 |
| Rehabilitate decks, repair superstructure, replace joints, add drainage troughs and paint fifty-one bridges north and south of the Fort McHenry Tunnel | Completed in 2017 |
| Replace all weathering steel high mast light poles with galvanized steel poles on I-95 in Baltimore City, north and south of the Fort McHenry Tunnel. Also, replace foundations and associated conduits/controls. | Engineering complete;<br>Construction underway |
| Replace the Fort McHenry Tunnel lighting system | Engineering complete;<br>Construction underway |
| Rehabilitate forty-eight ventilation fans in the East and West Ventilation Buildings | Project moved to the D&E Program;<br>Construction is deferred until redesign is complete |
| **I-95 Fort McHenry Tunnel- Moravia Road to Tunnel Improvement Project** | |
| This project will reconfigure I-95 to provide four lanes in each direction from north of the Fort McHenry Toll Plaza to the southern end of the I-95 Express Toll Lane. The project involves restriping; reconstruction of at-grade shoulders; replacement of at-grade median concrete traffic barrier; and reconstruction of portions of existing bridge decks and all concrete bridge parapets. | Phase 1 SB is open to service. Planning is complete and engineering and construction are underway for Phase 1 NB and Phase 2 NB and SB. |
| **Hanover Street Bridge Multimodal Corridor Plan - Connecting Communities Through Investment (April 2014)** | |
| A study to identify feasible methods of rehabilitating or replacing the Hanover Street Bridge, improve multimodal corridor accessibility and freight access and highlight ways to enhance access to economic opportunities and recreational amenities, quality of life, and safety throughout the corridor. | Study underway |
| **I-95 Fort McHenry Tunnel- Port Covington I-95 Access Project** | |
| The project includes a comprehensive evaluation of potential improvements along I-95 required to support major planned development on the Port Covington Peninsula located in Baltimore City. Improvements being evaluated include potential changes to the I-95 mainline and ramps between the I-695 interchange and Fort McHenry Tunnel. | Planning is underway, being funded by a private developer. Construction schedule to be determined, dependent on the FASTLANE Grant application. |
| **CSX Swing Bridge (over Middle Branch)** | |
| As part of the Port Covington redevelopment the existing CSX bridge will be rebuilt and rehabilitated as a bike and pedestrian connection between the Port Covington peninsula and Westport. | Proposed Project |
| **Light Rail Extension** | |
| The proposed extension would add two tracks, two stations, a crossover track and a trail track at the end of the proposed alignment, from Westport into Port Covington. | Proposed Project |

Source: Maryland Transportation Authority, Maryland's FY2017-2022 Consolidated Transportation Program and Maryland Transportation Authority, Maryland's FY2018-2023 Consolidated Transportation Program

## 4.1 Socio-Economic

As shown in Table 4-2, Maryland has experienced 42.4 percent growth in the past thirty-five years (1980-2015) and is expected to grow by 14.7 percent in the next twenty-five years (2015-2040). The population of Baltimore City has experienced a decrease in population of nearly 21 percent during the same thirty-five year period, but is expected to grow by nearly six percent over the next twenty-five years.

**Table 4-2: Regional Population and Growth**

| Area | Statistic | Year | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1980 | 1990 | 2000 | 2010 | 2015 | 2040 |
| **Baltimore City** | **Population** | 786,775 | 736,014 | 649,086 | 621,180 | 621,849 | 659,100 |
| | **Percent Change** | -- | -6.5% | -11.8% | -4.3% | 0.1% | 6.0% |
| **Maryland** | **Population** | 4,216,975 | 4,780,753 | 5,311,034 | 5,788,409 | 6,006,401 | 6,889,690 |
| | **Percent Change** | -- | 13.4% | 11.1% | 9.0% | 3.8% | 14.7% |

Source: Maryland Department of Planning, Planning Data Services

Baltimore City's employment levels steadily regressed from the 1970s through the first decade of the new millennium; however, the number of jobs in the City increased by 5.1 percent between 2010 and 2015 (an average of 0.9 percent per year) and are expected to increase an additional 8.8 percent between 2015 and 2040 (an average of 0.4 percent per year). Comparatively, the number of jobs in Maryland increased by 6.2 percent from 2010 to 2015 (an average of 1 percent per year) and is expected to increase an additional 17.3 percent by 2040 (an average of 0.7 percent per year). Table 4-3 provides the further detail on the number of jobs for the City and State and their growth trends.

**Table 4-3: Regional Employment and Growth**

| Area | Year (number of jobs) | | | | Percentage Change | | |
|---|---|---|---|---|---|---|---|
| | 2000 | 2010 | 2015 | 2040 | 2000-2010 | 2010-2015 | 2015-2040 |
| **Baltimore City** | 446,406 | 381,313 | 400,600 | 435,700 | -14.6% | 5.1% | 8.8% |
| **Maryland** | 3,065,202 | 3,344,652 | 3,552,000 | 4,167,000 | 9.1% | 6.2% | 17.3% |

Source: Projections from 2015 to 2040 prepared by the Maryland Department of Planning, January 2015

Indirect and cumulative effects to the socio-economic resources within the ICE boundary are anticipated as a result of the Recommended Preferred Alternative and planned development projects within the area. Due to the existing highly urbanized development within the project vicinity, most development would occur as redevelopment of industrial land. With the existing Smart Growth laws, land use plans and zoning regulations of Baltimore City in place, adverse indirect and cumulative effects are not anticipated with the I-95 Access Improvements Project's ICE boundary.

The Recommended Preferred Alternative would not itself, induce changes in the land use patterns within the ICE boundary, but would have indirect and cumulative effects on the growth rates of commercial and residential development and redevelopment. Land Use, neighborhoods, and park and recreational facilities located within the ICE boundary were evaluated and described below. Further details are provided in the Appendix C, the Socio-Economic Technical Report for the I-95 Access Improvements Project.

### 4.1.1 Land Use

Transportation projects and planned development within the ICE boundary were assessed to determine their potential indirect and cumulative effects on land use patterns. A land use designation is established through Baltimore City's comprehensive planning and zoning processes. According to Baltimore City GIS data (2014), existing land use/land cover in the ICE boundary includes industrial, residential, transportation and parking, natural areas, parks and recreation, institutional facilities (educational facilities, places of worship), commercial areas (retail, office space), underdeveloped, and cemetery uses (Table 4-4 and Figure 4-1).

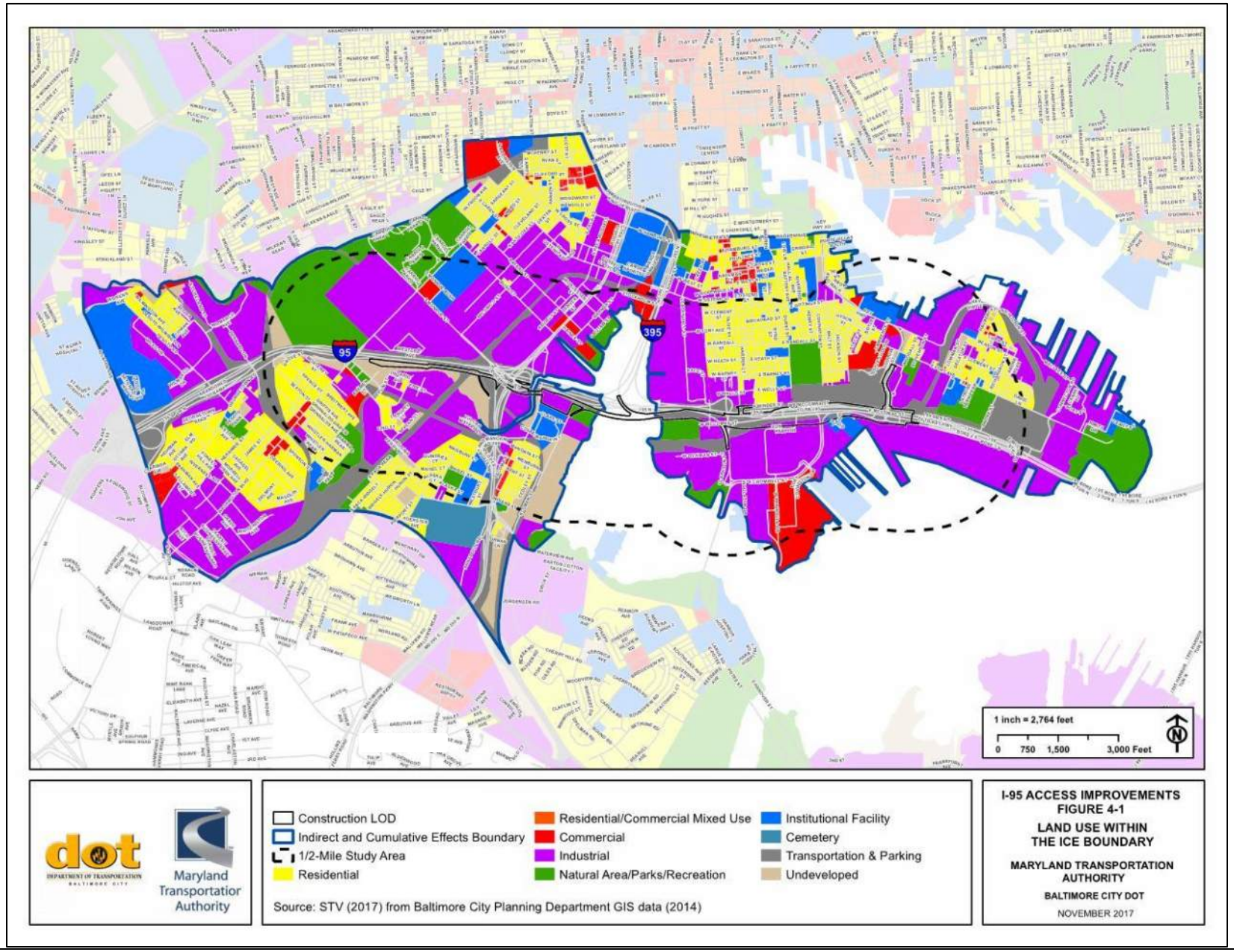
**Table 4-4: Summary of Existing Land Use/Land Cover**

| Land Use/Land Cover Category | Study Area | | ICE Boundary | |
|---|---|---|---|---|
| | Acres | Percent of Total | Acres | Percent of Total |
| Industrial | 822.8 | 41.0% | 1,362.4 | 36.2% |
| Residential | 337.4 | 16.8% | 743.7 | 19.7% |
| Transportation and Parking | 317.6 | 15.8% | 544.1 | 14.4% |
| Natural Areas/Parks/Recreation | 191.5 | 9.5% | 367.9 | 9.8% |
| Institutional Facility | 137.0 | 6.8% | 363.6 | 9.7% |
| Commercial (Retail & Office) | 109.9 | 5.5% | 218.5 | 5.8% |
| Underdeveloped | 89.1 | 4.4% | 129.6 | 3.4% |
| Cemetery | 0.0 | 0.0% | 37.1 | 1.0% |
| **Total** | **2,005.40** | **100.0%** | **3,766.9** | **100.0%** |

Source: Baltimore City, April 2014

The primary land use within the ICE boundary is industrial (36.2 percent). Most industrial uses are immediately adjacent to I-95 and the Middle Branch waterfront. Residential and transportation and parking uses make up 19.7 percent and 14.4 percent, respectively. Together, these three uses account for 70.3 percent of the total study area. The remaining land uses include natural areas/parks/recreation (9.8 percent), institutional (9.7 percent), commercial (5.8 percent), barren land (3.4 percent), and cemetery (1.0 percent).

**Figure 4-1: Land Use within the ICE Boundary**



### A. Direct Effects

Direct effects are anticipated on those properties converted into right-of-way for the project. The areas being acquired for the project would be converted from their existing industrial use to a transportation right-of-way use. The Recommended Preferred Alternative supports planned development and redevelopment in the study area and is consistent with the Port Covington and South Baltimore Gateway Master Plans' recommendations for land use and redevelopment. Development/redevelopment will likely occur regardless of the I-95 Access Improvements Project as they have all been registered with the Baltimore City Department of Planning.

### B. Indirect Effects

Potential indirect effects do not result from the project itself. Acquisition of right-of-way though representing a change in land use, would not in itself, represent a substantial change to the overall land use pattern in the ICE boundary; moreover, the change in land use would be limited to that property and therefore not be expected to affect the uses of neighboring properties. The I-95 Access Improvements would provide additional traffic capacity, which would facilitate opportunities for additional commercial, industrial, and residential redevelopment in the South Baltimore area.

### C. Cumulative Effects

Converting existing land to a transportation use would result in a cumulative effect of precluding the development of that land in the future. Planning recommendations made in existing master plans are not dependent upon the completion of the Recommended Preferred Alternative. Land use patterns are anticipated to remain the same for most of the built out areas within the ICE boundary. Redevelopment areas outside of the Port Covington peninsula could lead to changes in the density of development and composition of land uses. As approved under the Port Covington Master Plan current industrial land uses would be rezoned to accommodate residential, office, business, and mixed use. Based on past trends throughout Baltimore City, underutilized industrial lands may continue to be redeveloped into residential and commercial uses, which could attract new residents and employers, and increase population and employment within the ICE boundary.

### D. Mitigation

Access to the existing land uses via the street network would not be restricted by the I-95 Access Improvements Project. Intersection upgrades, traffic signalization, and other mitigation improvements are proposed under this project to mitigate the design year peak period traffic volumes anticipated in the study area.

The design will minimize the amount of right-of-way needed for the project. All right-of-way acquisitions would be obtained in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 as amended by Title VI of the Surface Transportation Policies Act of 1987. All property owners from whom fee simple and perpetual right-or-way easements are obtained would be compensated according to the Uniform Act and paid fair value for affected property.

Potential indirect effects do not result from the project itself. Cumulative effects on land use changes influenced by other entities fall under the purview of Baltimore City through their comprehensive planning and zoning processes; therefore, no mitigation is required.

### 4.1.2 Neighborhoods and Industrial/Commercial Areas

There are twelve neighborhoods/industrial/commercial areas located within the ICE boundary which include Carroll Park, Carroll-Camden Industrial Area, Locust Point, Locust Point Industrial Area, Morrell Park, Port Covington, Riverside, Saint Paul, South Baltimore, Spring Garden Industrial, Westport/Mount Winans, and Wilhelm Park.

Four of these areas are primarily industrial/commercial areas (Carroll-Camden Industrial Area, Locust Point Industrial Area, Port Covington, and Spring Garden Industrial) that do not contain many (if any) residents. These areas consist mostly of a cruise line terminal, railways, warehouses, and merchandise piers. Neighborhoods within the ICE boundary contain various community facilities (police, fire, and emergency medical services; places of worship, public facilities, and schools), as identified in Table 4-5. While many of the neighborhoods have residential pockets and community facilities, these are outside of the Recommended Preferred Alternative's LOD and would not be impacted.

**Table 4-5: Community Facilities**

| Name | Neighborhood | Address |
|---|---|---|
| **Fire Station** | | |
| BCFD 26 Riverside/Locust Point | Locust Point | 1001 E Fort Avenue |
| Fort McHenry Fire Boat Station | Locust Point Industrial Area | 2609 Leahy Street |
| BCFD 2 Federal Hill/Inner Harbor | Federal Hill | 800 Light Street |
| BCFD 58 Westport | Westport | 2524 Annapolis Road |
| BCFD 47 Morrell Park | Morrell Park | 2608 Washington Boulevard |
| BCFD 55 Carroll Park / Washington Village / Pigtown | Carroll-Camden Industrial Area | 1229 Bush Street |
| **Places of Worship** | | |
| Bethany Baptist Church | Mount Winans | 2616 Ridgely Street |
| Evangelical Bible Church | Morrell Park | 2444 Washington Boulevard |
| Holy Cross Church | Riverside | 110 East West Street |
| Christ United Church Of Christ | Locust Point | 1308 Beason Street |
| Church Of Advent Church Of Federal Hill | South Baltimore | 1301 S Charles Street |
| Saint Mark's United Church Of Christ | Morrell Park | 1805 Wickes Avenue |
| Inner Harbor Church Of God | South Baltimore | 1632 S Hanover Street |
| Grace United Church of Christ | South Baltimore | 1404 S Charles Street |
| Star Of Bethlehem AME Church | Mount Winans | 2525 Ridgely Street |
| Riverside Baptist Church | Riverside | 1602 Johnson Street |
| Mount Winans First Baptist Church | Mount Winans | 2417 Puget Street |
| Church of Redemption | Locust Point | 1401 Towson Street |
| Salem Evangelical Lutheran Church | Riverside | 1530 Battery Avenue |
| St. Mary Star of the Sea | Riverside | 1400 Riverside Avenue |
| Streetlite Christian Fellowship | Riverside | 1121 Riverside Avenue |
| **Schools** | | |
| Francis Scott Key Elementary/Middle | Locust Point | 1425 E Fort Avenue |
| Thomas Johnson Elementary/Middle | Riverside | 100 E Heath Street |
| Morrell Park Elementary/Middle | Morrell Park | 2601 Tolley Street |
| Westport Academy Elementary/Middle | Westport | 2401 Nevada Street |
| Baltimore Montessori School | Locust Point | 1530 E Fort Avenue |
| Kiddie Academy of Locust Point | Locust Point | 1215 E Fort Avenue |
| St. Ignatius Loyola Academy | Riverside | 300 Gittings Street |

### A. Direct Effects

The Recommended Preferred Alternative would not impede community cohesiveness because no residential acquisitions are associated with the I-95 Access Improvements Project and no changes to residential composition of existing neighborhoods are anticipated. The implementation of the project would not adversely affect the interactions among residents and their community facilities and services and would not separate or divide communities. Enhancement of bicycle and pedestrian access associated with the Recommended Preferred Alternative will improve connections between surrounding neighborhoods.

### B. Indirect Effects

Indirect effects resulting from the Recommended Preferred Alternative may be both beneficial and adverse. Indirect effects would be experienced by communities located in close proximity to the I-95 Access Improvement Project. Transportation benefits associated with the Recommended Preferred Alternative include reduced travel time and more efficient mobility within the region. Improved access, mobility, and safety for drivers in the ICE boundary would improve travel to work, shopping, school, and recreational destinations. Businesses would benefit from the improved transportation system's ability to accommodate projected increases in traffic. However, the project may result in an increase in traffic within the neighborhoods requiring additional future improvements to the roadway network.

The Recommended Preferred Alternative would not diminish access to any existing large regional employers or employment centers. Mobility improvements gained from the Recommended Preferred Alternative are anticipated to support neighborhood connectivity and cohesion throughout this corridor.

### C. Cumulative Effects

Cumulative effects to the area would result from direct and indirect effects of the Recommended Preferred Alternative combined with the effects of all planned and future residential, commercial, and transportation projects. Cumulative effects related to new development are facilitated by the project over time. While the Port Covington redevelopment may still occur under the No-Build Alternative, the Recommended Preferred Alternative would support that development which in turn could influence future redevelopment of other parcels in the ICE boundary. The redevelopment of Port Covington, along with the increased traffic capacity and better accessibility resulting from the Recommended Preferred Alternative, could cumulatively increase the demand for residential and commercial land in lower density areas, such as Locust Point Industrial Area, Carroll-Camden Industrial Area, and Westport. This demand may in turn increase future property values, real estate taxes, and housing costs, type, and density in those areas.

Increased development often coincides with increased population and employment. Population size and density will increase, as will traffic congestion, which may facilitate the need for additional future transportation improvements, commercial development, and community facilities and services (police, fire, and emergency medical services; places of worship, public facilities, and schools).

### D. Mitigation

Access to the neighborhoods via the street network would not be restricted due to the I-95 Access Improvements Project. Transit access would be maintained for transit-dependent populations within the ICE boundary.

Temporary changes to traffic patterns are anticipated during construction. Maintenance of Traffic and construction staging would be planned and scheduled to minimize traffic delays and interruptions to the maximum extent practical. Access and parking to residences and businesses would be maintained to the maximum extent practical, and access for fire and emergency vehicles would be maintained at all times. Appropriate signage, the project website, and other notices will be used to notify the public of roadway

and sidewalk closures and detours. Particular attention will be given to maintaining public safety during the construction period. Public access to construction areas will be limited to the greatest extent practical, through the use of temporary fencing, warning signs and other safety precautions.

### 4.1.3 Park and Recreation Facilities

Eighteen parks and recreation facilities are located in the neighborhoods within the ICE boundary, as identified in Table 4-6.

**Table 4-6: Parks and Recreation Facilities**

| Facility Name | Neighborhood |
|---|---|
| Atlantic Avenue Park | Mount Winans |
| Desoto Park | Morrell Park |
| Florence Cummings Park | Westport |
| Gwynns Falls Trail South | Westport |
| Heath Street Park | South Baltimore |
| Hull Street Park | Locust Point |
| Indiana Avenue Park | Westport |
| Latrobe Park | Locust Point |
| Maisel Street Park | Saint Paul |
| Morrell Park | Morrell Park |
| Riverside Park | Riverside |
| Swann Park | South Baltimore |
| Carroll Park | Carroll Park |
| Paca Street Park | Mount Winans |
| Hollins Ferry and B&O Park | Mount Winans |
| Fort McHenry National Monument & Historic Shrine | Locust Point |
| Locust Point Recreation Center | Locust Point |
| South Baltimore Recreation Center | South Baltimore |
| Morrell Park Recreation Center | Morrell Park |

#### A. Direct Effects

The Recommended Preferred Alternative would pass through the northern portion of Swann Park. This would require piers in the northern end of existing Swann Park, potentially prior to the completion of the relocated park. Construction of the realignment of McComas Street and the ramp spur from I-395 SB to McComas Street would require a swath of approximately 200 feet of property throughout the length of the park totaling 3.7 acres, which would adversely impact all of the existing ball fields, access to the park, and the parking lot. During construction, there would be no access to the park. Therefore, the Recommended Preferred Alternative would result in a permanent incorporation use.

### B. Indirect Effects

The I-95 Access Improvements Project itself, is not anticipated to introduce any indirect effects. The project would not diminish or alter the environs of the park and recreational facilities, including the relocated and expanded Swann Park, within the ICE boundary.

### C. Cumulative Effects

Past, present, and reasonably foreseeable future Baltimore City actions include property acquisition for parks, infrastructure and facility improvements, and maintenance programs. Since Swann Park's relocation is proposed further south and away from the project vicinity as part of the No-Build and Recommended Preferred Alternatives, the new location would provide additional acreage compared to the existing condition. Population growth in the ICE boundary is expected to increase demand and capacity pressure on public parks and recreation facilities. These limitations have the potential to result in a long-term shortfall in the ratio of parks and recreation areas to population.

### D. Mitigation

Swann Park will be directly affected by the construction of the I-95 Access Improvements Project; however, according to the Port Covington Master Plan Redevelopment Plan's the park will be relocated in 2027, prior to the removal of the existing Swann Park. It shows that the existing location of Swann Park as a new network of roads, walkways, and pedestrian ways. Relocated Swann Park, or a newly named park, would be approximately 26 acres, extending along the majority of the peninsula's western waterfront.

The project would not result in any indirect effects to parks and would not require mitigation under this project. The potential cumulative effect to a long-term shortfall in the ratio of parks and recreation areas to population will be coordinated between Baltimore City and private entities consistent with the development approval requirements and Adequate Public Facilities Ordinances.

## 4.2 Cultural Resources

The I-95 Access Improvements Project Corridor has been built-out, with few undeveloped areas remaining. Cultural resources within these areas have a greater potential of previously being disturbed. Cultural resources evaluated within the ICE boundary are archaeological resources and historical sites and structures. Further details are provided in Appendix G, the Cultural Resources Assessment of Effects Technical Report for the I-95 Access Improvements Project.

### 4.2.1 Archaeological Sites and Historic Architectural Sites and Structures

No known archaeological sites have been identified in the Area of Potential Effects (APE), but Baltimore Center for Urban Archeology's survey demonstrated that the Port Covington Rail Terminal was constructed on fill, with potential for archeological sites at a subsurface depth of 8-10 feet. The Port Covington archaeological site (18BC72) is south of the APE, but within the ICE Boundary. It contains the remnants of a mid- to late nineteenth-century industrial building that were identified during machine-excavated trenches that were 10-feet wide and up to 12-feet deep. Investigators recommended further survey, finding the Port Covington area in general to have high potential to contain other nineteenth-century industrial sites.

Architectural resources were identified via field survey and GIS parcel research. The Recommended Preferred Alternative's architectural APE and National Register of Historic Places (NRHP)–eligible or listed historic districts and resources were coordinated with Maryland Historical Trust (MHT) to determine if there would be any direct or indirect effects as a result of the implementation of the project. The resources along with the MHT effect determination is provided in Table 4-7.

**Table 4-7: NRHP Listed and Eligible Resources within the APE**

| MIHP Number | Resource Name | NRHP Eligibility | MHT Effects Determination |
|---|---|---|---|
| B-1342 | Westport Historic District | Eligible | No Adverse Effect |
| B-3668 | Spring Garden Bridge | Eligible | No Adverse Effect |
| B-5139 | Riverside Historic District | NRHP Listed | No Adverse Effect |
| B-5309 | Gould Street Generating Station | Eligible[1] | No Adverse Effect |
| B-1055 | Lyon, Conklin, and Company | Eligible[1] | No Adverse Effect |
| [1]NRHP Eligibility Status is pending concurrence from the Maryland Historical Trust. | | | |

### A. Direct Effects

The I-95 Access Improvement Project would require some construction within the three NRHP eligible/listed resources. The project is not anticipated to introduce visual, atmospheric, or audible elements to the sites, thus would not diminish the integrity of significant historic features of the resources. No archaeological, historical sites, or historical structures are anticipated to be effected, therefore MHT determined there to be No Adverse Effects to these resources.

### B. Indirect Effects

There are no indirect effects to Archaeological and Historical Sites and Structures associated with the project. The Recommended Preferred Alternative would not require right-of-way from any of the historically registered sites. The I-95 Access Improvements Project is not expected to increase development rates or densities itself within the ICE boundary.

### C. Cumulative Effects

Cumulative effects are anticipated to be minor due to the previous development within the project vicinity. Any potential cumulative effects to historic sites and structures are expected to be minimal due to established laws and regulations designed to protect cultural resources. City and State regulations for historic sites and structures will be followed to minimize impacts to the extent possible.

### D. Mitigation

Any potential cumulative effects to historic sites and structures are expected to be minimal due to established laws and regulations designed to protect cultural resources, including:

- The National Historic Preservation Act 1966, as amended; 36 CFR Part 800 – Protection of Historic Properties; Executive Order 11593
- The Maryland Historic Trust Act of 1990 (Article 83B, §§5-607,5-617, to 5-619, and 5-623 of the Annotated Code of Maryland)
- Section 4(f) of the Department of Transportation Act of 1966

## 4.3 Natural Resources

The I-95 Access Improvement Project is located within a highly urbanized area where most of the natural resources have been altered due to previous development and industrial use of the area. Despite the many years of disturbance, that has diminished the extent and quality of the natural habitat within the corridor, the corridor contains a number of natural resources that enhance the area. Most of the area within the ICE boundary is already built-out; consequently, indirect and cumulative effects on natural resources are anticipated to be minimal.

Natural resources evaluated within the ICE boundary include, surface water and water quality; groundwater; floodplains; and wetlands and other waters of the US. Terrestrial Habitats and rare, threatened, and endangered species (RTE) were not reviewed within the ICE analysis. In a letter dated

November 23, 2016, the DNR Wildlife and Heritage Service stated that there are no state or federal records for RTE species within the boundaries of the project corridor. In a letter dated August 3, 2016, USFWS also confirmed there are no federal endangered or threatened species within the project corridor. A desktop review for forest interior dwelling species (FIDS) and sensitive species project review areas (SSPRAs) was performed and neither were identified within the ICE boundary. Further details and coordination letters are provided in the Natural Resources Technical Report for the I-95 Access Improvements Project.

### 4.3.1 Surface Water and Water Quality

This section identifies water resources within the proposed project's ICE boundary and the potential indirect and cumulative effects of the Recommended Preferred Alternative. Potential effects to water quality from point and non-point sources were evaluated.

The ICE boundary crosses two surface waters, the Middle Branch portion of the Patapsco River (between Annapolis Road and South Hanover Street in Baltimore City) and Gwynns Falls Stream (East of Hollins Ferry Road). Both have a Designated Use Class II, supporting estuarine and marine aquatic life and shellfish harvesting. The Patapsco River receives impaired drainage from two distinct Maryland 8-digit watersheds within the ICE boundary: Baltimore Harbor Watershed and Gwynns Falls Watershed. Both contributing watersheds are highly urbanized, with mainly residential and commercial areas, especially within Baltimore City. The northern portions of Gwynns Falls Watershed includes forest land and some crop use, which has led to increased amounts of sediment and nutrients. Table 4-8 summarizes the status total maximum daily loads (TMDLs) within the project Watersheds and Streams.

**Table 4-8: Status of TMDLs within the Project Watersheds and Streams**

| Watershed/Stream | Impairment | Status |
|---|---|---|
| Gwynns Falls | E. coli | Approved December 4, 2007 |
| Gwynns Falls | TSS | Approved March 10, 2010 |
| Gwynns Falls | Trash | Approved January 5, 2015 |
| Baltimore Harbor | Nitrogen | Approved December 17, 2007 |
| Baltimore Harbor | Phosphorous | Approved December 17, 2007 |
| Baltimore Harbor | PCBs | Approved October 1, 2012 |
| Patapsco River | Nitrogen | Approved December 29, 2010 |
| Patapsco River | Phosphorous | Approved December 29, 2010 |
| Patapsco River | TSS | Approved December 29, 2010 |
| Middle Branch Portion of the Patapsco River | Trash | Approved January 5, 2015 |

Source: MDE Current Status of Total Maximum Daily Load (TMDL) Development in Maryland

The surface drinking water supply sources for Baltimore City are located outside of the ICE boundary; consequently, the Recommended Preferred Alternative will have no direct, indirect, or cumulative effects on the surface drinking water supply for the population within the ICE boundary. Additionally, the surface water within the ICE boundary is not a drinking water source for others outside of the boundary; consequently, the Recommended Preferred Alternative will have no direct, indirect, or cumulative effects on the surface drinking water supply for the population outside of the ICE boundary.

#### A. Direct Effects

Potential effects to water resources associated with the Recommended Preferred Alternative would result from construction and facility use. Impacts associated with physical disturbances could include accidental spills and reductions in base flow caused by paving and soil compaction and impacts associated with runoff quality and quantity such as chemical contamination, thermal loads from heated surfaces, increased erosive flows and reduced base flows.

Temporary effects during construction, such as sedimentation and chemical spills, could result from land disturbing activities. Fuel and hydraulic spills from construction equipment could also temporarily affect water quality and other aquatic resources, should standard control measures fail. Construction of the bridge piers within wetlands or WUS would have a direct and permanent square footage impact to these resources.

**B. Indirect Effects**

Potential indirect effects to water resources associated with the Recommended Preferred Alternative would result from increased traffic volume and increased impervious surface which would result in a proportional increase in runoff carrying vehicle-generated pollutants (e.g., oil, coolants, brake fluids, and rubber). Over time the increased traffic volume could also result in runoff quality and quantity such as thermal loads from heated surfaces, increased erosive flows, and reduced base flows.

**C. Cumulative Effects**

Cumulative effects to water resources associated with the Recommended Preferred Alternative would result from redevelopment that is supported by the I-95 Access Improvement Project. While the Port Covington redevelopment could still occur under the No-Build Alternative, the Recommended Preferred Alternative would support its redevelopment and could influence future redevelopment of other parcels in the ICE boundary. There is already developed land in the project area that has contributed to degraded water quality. Effects from other future developments in the ICE boundary may include increased pollutant-containing runoff as the quantity of impervious surfaces expands. It could result in a decrease in water quality. An additional cumulative effect includes an increase in the surface water temperatures of streams which may adversely affect various aquatic organisms dependent upon cooler water temperatures.

Even though cumulative effects to aquatic habitat and water quality may occur within the ICE boundary, project-related effects are expected to have a minimal contribution to water degradation compared to existing non-point pollution sources.

**D. Mitigation**

Effects from other future development and proposed highway improvements would be mitigated based on protective regulations related to wetland and waterways, and associated measures to control stormwater, sediment, and erosion.

Under the Clean Water Act (CWA), the U.S. Environmental Protection Agency (USEPA) has implemented pollution control programs and set water quality standards for all contaminants in surface waters. The CWA mandates that the State establish TMDL to bring existing water quality up to minimum established water quality standards in streams that have been categorized as "impaired." A TMDL is an estimate of the maximum amount of a pollutant that a given waterbody can absorb without violating environmental water quality standards. The State of Maryland has established water quality standards for the protection of public health or welfare, simultaneously providing enhancement of water quality and protection of aquatic resources. Best Management Practices and stormwater management practices will be incorporated into the design plans.

### 4.3.2 Groundwater

This section assesses potential indirect and cumulative effects to groundwater resources that may result from the proposed project. The ICE boundary is within the Patuxent aquifer system of the Coastal Plain Physiographic Province. The Patuxent aquifer is 125 to 525 feet and overlain by low permeability clay layers, thus, the likelihood of contamination from the Preferred Alternative is negligible.

The Code of Maryland Regulations (COMAR 26.17.06.02) officially recognizes that the availability of adequate water supplies is essential to health, safety, and economic welfare. Maryland Department of the Environment (MDE) implements regulatory and planning programs to reduce the input of pollutants to groundwater's of the State. Indirect and cumulative effects to groundwater resources within the ICE boundary may occur, but are likely to be minor.

**A. Direct Effects**

There are no direct effects on groundwater resulting from the Recommended Preferred Alternative. No drinking water wells are located within the ICE boundary. Drinking water within the ICE boundary is supplied from the Montebello Filtration Plants, using water from the Loch Raven Reservoir or the Susquehanna River. Both watersheds for these water bodies are outside of the ICE boundary.

**B. Indirect Effects**

Minimal indirect effects are expected from the I-95 Access Improvements Project due to the Recommended Preferred Alternative's relatively small increase in new impervious surface area at or above grade. Potential indirect effects to groundwater would primarily be associated with the relatively small increases in impervious surface associated with I-95 and other projects in the ICE boundary. Small changes in the movements of the shallow groundwater table are likely to occur during grading and construction of the project components. In addition, the existing urbanized project vicinity makes it unlikely that runoff would reach the groundwater table.

**C. Cumulative Effects**

Additional impervious areas added to the watershed over time could reduce infiltration into shallow portions of the aquifer over time. Sustainable aquifers cannot have a recharge rate less than the rate of withdrawal. These effects would be localized and are not expected to change hydrology at the larger sub-watershed or watershed level. In addition, the increase in impervious surface would proportionately increase runoff carrying vehicle-generated pollutants (e.g., oil, coolants, brake fluids, and rubber), which could potentially enter groundwater resources. Contaminated groundwater may ultimately affect the surface waters that feed the Chesapeake Bay where both groundwater and surface waters eventually drain. Stormwater runoff would be managed in accordance with MDE stormwater regulations and stormwater Best Management Practices.

**D. Mitigation**

Any effects to groundwater resources would be closely monitored by MDE for water quality. Any runoff from the project would be treated in accordance with MDE regulations for stormwater management and released to surface waters.

### 4.3.3 Floodplains

This section identifies potential indirect and cumulative effects to floodways and 100-year floodplains resulting from the proposed project. Development in floodplains reduces flood storage capacity and places development in the floodplain and downstream properties at risk.

A large portion of the ICE boundary resides within the 100-year floodplain. The floodplain extends from the main waterbodies within and adjacent to the ICE boundary including the Patapsco River, the Middle Branch of the Patapsco River, and Gwynns Falls.

**A. Direct Effects**

The Preferred Alternative would permanently place up to 35 piers within the 100-year floodplain. During construction, each pier would require drilling, boring, driving a foundation

piling, or other excavation of the floodplain. There could be up to 4,620 square feet of impact due to the permanent installation of the piers. Permanent floodplain impacts would occur throughout the Study Area during construction, including cutting, filling, and grading. Approximately 85,000 cubic yards of fill is anticipated, mainly at the bridge abutments where the elevated structures descend to street level east of the Patapsco River.

**B. Indirect Effects**

Transportation projects and planned development within the ICE boundary were assessed by comparing planned projects with floodplain boundaries to evaluate potential indirect effects. The floodplains within the ICE boundary are within areas are developed or are within protected parkland areas. Fill and permanent piers could have the potential to increase base flood levels, but the level of increase would be provided at a later design phase pending a detailed hydrologic and hydraulic study. Additional effects associated with redirecting surface runoff, altering drainage patterns, and localized changes in shallow groundwater movement could occur.

**C. Cumulative Effects**

Cumulative effects to floodplains, when combined with other planned projects, are associated with disturbance to floodplain vegetation and landscapes which may cause loss of hydraulic function. This loss could cause increased flooding, erosion and sedimentation, thus affecting downstream channel morphology.

**D. Mitigation**

Federal policy requires avoidance of effects associated with the modification of and development in floodplains if a practicable alternative exists. Federal standards also limit increases in base flood levels to less than 1.0 foot above pre-development levels.

The U.S. Department of Transportation (DOT) Order 5650.2, entitled *Floodplain Management and Protection*, prescribes policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse floodplain effects. Floodplains are also regulated at the state level and any construction in the nontidal floodplain will require a Waterway Construction Permit from MDE.

Future development would have minimal effect to 100-year floodplains due to existing regulations and the requirement for approval from the MDE. Permits requiring avoidance, minimization, and mitigation would offset most floodplain disturbances caused by cumulative effects.

### 4.3.4 Wetlands and other Waters of the US

This section identifies indirect and cumulative effects to wetlands and waterways that may result from the proposed project. Four waterways and one wetland were identified within the ICE boundary. All of the delineated systems, ultimately convey flow to the Gwynns Falls watershed, part of the larger Patapsco River Basin (HUC# 021309). At the time of the site visit, all waterways were flowing. All the delineated systems have a significant nexus to a traditional navigable water and, therefore, likely will be regulated. However, the U.S. Army Corps of Engineers (USACE) and MDE will make the final determination concerning the jurisdictional status of delineated features.

Since the project is not expected to increase development rates or densities by itself in the ICE boundary, and waterway protection regulations have been established at the federal, state, and local level in the ICE boundary, minimal indirect effects to wetlands are anticipated to occur as a result of this project. The use of Best Management Practices and stormwater management practices by future developers in the ICE boundary will minimize overall impacts.

### A. Direct Effects

Potential effects of the Recommended Preferred Alternative on wetlands and waterways would result from the construction and insulation of the piers. Impacts are summarized in Table 4-9.

**Table 4-9: Wetland and Waterways Impacts**

| System | Temporary Impacts (sq. ft.) | Temporary Impacts (LF) | Permanent Impacts (sq. ft.) | Permanent Impacts (LF) |
|---|---|---|---|---|
| WL001 (Gwynns Falls) | 11,551 | 117 | 0 | 0 |
| WP003 | 7,335 | N/A | 1,008 | N/A |
| WP003 Buffer | 2,262 | | 230 | |
| WL004 (Patapsco River) | 245,384 | 246 | 15,062 | 484 |

### B. Indirect Effects

Indirect effects to the wetland and waterways as a result of the Recommended Preferred Alternative are projected to be minimal. Potential indirect effects to wetlands may be associated with roadway runoff, sedimentation, and alterations to hydrology. The additional highway lanes and ramps proposed for the Recommended Preferred Alternative would contribute small amounts of pollutants over time to wetlands already receiving chemical inputs from the existing roadways and built lands throughout the affected sub-watersheds.

### C. Cumulative Effects

The potential for cumulative effects to the wetland and waterways, within the ICE boundary would arise from the effects of the I-95 Access Improvements Project together with additional, development within the ICE boundary from the past, present, and future. Wetlands and waters in the ICE boundary are impaired due to urban uses. As redevelopment pressure rises, there may be additional cumulative effects to wetland and waterways that would lead to further impairment.

All of the Waters of the United States in the ICE boundary, including wetlands, have been influenced to some degree by the intense development in the corridor, and the majority of the systems identified have been heavily manipulated through past ditching or filling. Despite the high degree of manipulation, existing wetland and waterways may still provide some limited functions such as wildlife habitat and sediment trapping. This wetland would be expected to provide groundwater discharge/recharge, flood absorption, terrestrial and aquatic wildlife habitat, and water quality benefits such as nutrient uptake and sediment trapping.

### D. Mitigation

Indirect and cumulative effects to the wetland and waterways within the ICE area boundary could be minimized by protective regulations related to wetlands and waterways (Sections 404 and 401), forest conservation, and due to stormwater, sediment, and erosion control measures that would be put into place as conditions of development. Strict zoning and state and federal regulations are in place to protect wetlands, waterways, and designated conservation areas from development through the permitting process. Additionally, limiting cumulative effects to natural resources will require protection of critical resource lands, directing new development to existing developed lands, enhancing control of stormwater quantity and quality, and maximizing the use of smart growth and low impact development approaches. The use of Best Management Practices and stormwater management practices by future developers in the ICE boundary will minimize overall impacts.

# 5 INDIRECT AND CUMULATIVE EFFECTS ANALYSIS CONCLUSIONS

Indirect and cumulative effects associated with socio-economic, cultural and natural resources have been identified and described for the proposed I-95 Access Improvement Project.

## 5.1 Socio-Economic Resources

Indirect effects to socio-economic resources resulting from Recommended Preferred Alternative may be both beneficial and adverse. The indirect effects would be experienced by communities located in close proximity to the I-95 Access Improvement Project. Transportation benefits associated with the Recommended Preferred Alternative include reduced travel time and more efficient mobility within the region. Improved access, mobility, and safety for drivers in the ICE boundary would improve travel to work, shopping, school, and recreational destinations. Businesses would benefit from the improved transportation system's ability to accommodate projected increases in traffic. However, the project may result in an increase in traffic within the neighborhoods requiring additional future improvements to the roadway network.

Due to the existing highly urbanized development within the project vicinity, most development would occur as redevelopment of industrial land. With the existing Smart Growth laws, land use plans and zoning regulations of Baltimore City in place, adverse indirect and cumulative effects are not anticipated from the I-95 Access Improvements Project, itself.

Projected land use changes and planned development are consistent with development trends, population growth, and land conversion patterns in the ICE boundary, and could induce future development/redevelopment. Increased development often coincides with increased population and employment. Population size and density will increase, as will traffic congestion, which may facilitate the need for additional future transportation improvements, commercial development, and community facilities and services (police, fire, and emergency medical services; places of worship, public facilities, and schools).

Population growth in the ICE boundary, resulting from proposed Port Covington redevelopment, is expected to increase demand and capacity pressure on public parks and recreation facilities. The potential cumulative effect to a long-term shortfall in the ratio of parks and recreation areas to population will be coordinated between Baltimore City and private entities consistent with the development approval requirements and Adequate Public Facilities Ordinances.

## 5.2 Cultural Resources

There are no indirect effects to Archaeological and Historical Sites and Structures associated with the project. The Recommended Preferred Alternative would not require right-of-way from any of the historically registered sites. The Recommended Preferred Alternative would not require right-of-way from any historically registered sites and is not expected to increase development rates or densities itself within the ICE boundary. The project is not anticipated to introduce visual, atmospheric, or audible elements to the sites, thus would not diminish the integrity of significant historic features of the sites.

## 5.3 Natural Environment Resources

Minor indirect effects to groundwater, surface water, wetlands may occur as a result roadway runoff, sedimentation, and alterations to hydrology, thereby potentially affecting the extent and quality of available wetland habitat. Construction of the piers and fill for the I-95 Access Improvements Project could potentially increase base flood levels, but to what extent will not be known until a later design pending a detailed hydrologic and hydraulic study.

The I-95 Access Improvements Project Corridor and the ICE boundary have been built-out, with few undeveloped areas remaining. Future planned residential and commercial development independent of the I-95 Access Improvements Project is likely to have cumulative effects of increasing population and

employment within the ICE boundary and the master plan is approved for redevelopment of Port Covington.

Due to the existing urbanized project vicinity it is unlikely that runoff would reach the groundwater table and any runoff would be treated in accordance with MDE regulations for stormwater management and released to surface waters, resulting in minor cumulative effects to these resources, if any. As redevelopment pressure rises, there may be additional cumulative effects to groundwater, surface water, wetlands such as alterations to local hydrology.

Cumulative effects associated with the I-95 Access Improvements Project will be minor because the ICE boundary coincides with Baltimore City's planned redevelopment areas, and the project would support both commercial and residential growth.

## 5.4 Indirect and Cumulative Effects Mitigation

Baltimore City is ultimately responsible for monitoring and applying growth management strategies and mechanisms that result in development at a pace that is consistent with roadways and infrastructure. Avoidance and minimization strategies to reduce direct effects to environmental resources will be incorporated into the I-95 Access Improvement Project planning and future design efforts. Mitigation is required for any direct effects that remain following avoidance and minimization efforts. MDTA will develop conceptual mitigation plans for any unavoidable impacts and coordinate efforts with the appropriate regulatory agencies for the Recommended Preferred Alternative.

Regulatory agencies and responsible parties are obligated to evaluate mitigation for cumulative effects associated with environmental effects. Any future development that occurs in the 2040 time frame will be required to comply with the numerous federal, state, and local ordinances in place to protect resources. Strict zoning and state and federal regulations are in place to protect wetlands, waterways, and designated conservation areas from development through the permitting process. Additionally, limiting cumulative effects to natural resources will require protection of critical resource lands, directing new development to existing developed lands, enhancing control of stormwater quantity and quality, and maximizing the use of smart growth and low impact development approaches. The use of Best Management Practices and stormwater management practices by future developers in the ICE boundary will minimize overall impacts.

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