HANOVER STREET CORRIDOR STUDY

includes the Vietnam Veterans Memorial Bridge

Public Information Meeting

Tuesday, January 31, 2017

CATHERINE E. PUGH
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HANOVER STREET CORRIDOR STUDY
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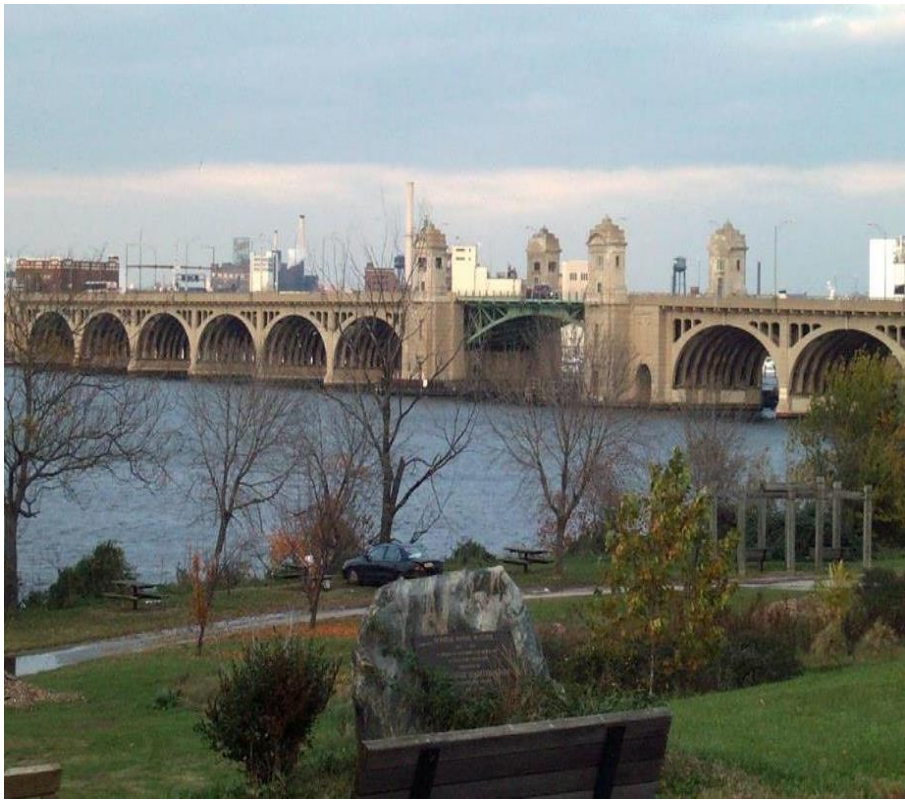
Tonight's Presentation

- Study Overview
- Project Goals
- Process & Schedule
- Work Completed to Date
- What We've Heard
- Economic Study
- Analysis of Existing Conditions
- Next Steps
- Your Input



Study Overview

- **Purpose**: Identify improvements to the Vietnam Veterans Memorial Bridge and Hanover Street corridor to address accessibility, connectivity, and safety for multiple modes:
  - Bicycle
  - Pedestrian
  - Transit
  - Automobiles
  - Freight
- **Funding**: USDOT $1.1 MM TIGER Grant and a $700,000 match from Baltimore City
- **Study Limits**: Wells Street to Reedbird Avenue (a distance of 1.4 miles)

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Project Goals

At the end of this process, the team will produce a PLAN to upgrade and enhance the Hanover Street corridor and Vietnam Veterans Memorial bridge by:

- Providing the surrounding communities with safe and reliable access to key quality of life resources
- Maintaining a critical link between existing and planned bicycle and pedestrian trails
- Improving access for local and regional motorists to and from the Port of Baltimore
- Promoting better connectivity between local bus and light rail services

Process & Schedule

Summer 2016 | Winter 2017 | Summer 2017 | Winter 2018

Assess Existing Conditions & Collect Data

- Review area master plans
- Collect regional and community demographic data
- Assess existing and proposed land uses
- Review current traffic data
- Review bridge inspection reports

Conduct Economic Market Analysis

- Assess current economic climate
- Identify future potential development opportunities and challenges

Study Existing Transportation Network

- Identify potential barriers to multi-modalism
- Review existing pedestrian and bicycle facilities
- Identify transit facilities and assess operations
- Conduct safety assessment

Identify Design Opportunities and Constraints

- Identify growth opportunities
- Identify design opportunities and constraints
- Compare concepts to study area needs
- Evaluate constructability challenges

Develop Corridor Plan and Guiding Principles

- Develop corridor plan
- Create guiding principles
- Outline recommendations in Project Plan
- Determine costs
- Identify key factors needed to advance project

Solicit Public and Agency Feedback

Work Completed to Date

- Conducted Public Outreach
  - Interagency Advisory Group (IAG) – June and July 2016, January 2017
  - Community Advisory Panel (CAP) – June and July 2016, January 2017
  - 1st Public Meeting – September 2016
- Collected Existing Conditions Data
  - Review of available data and previous plans, studies, and inspection reports
  - Field visits to verify existing conditions
- Conducted Economic Market Analysis
  - Review of previous economic and master plans
  - Analysis of demographic, economic, and real estate data
  - Stakeholder interviews
  - Documentation of economic strengths and weaknesses
- Analyzed Existing Transportation Network
  - Investigation of existing demand
  - Review of safety and capacity of existing facilities

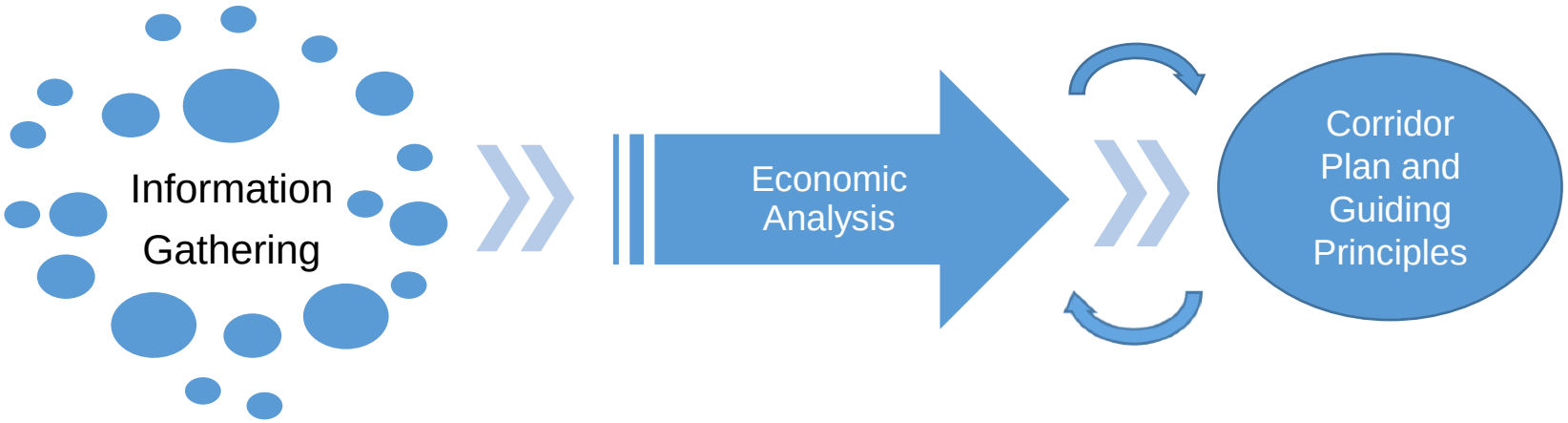
What We've Heard from Stakeholders

Key areas of focus for the project team to consider:

- Safety and comfort for pedestrians and cyclists
- Improving traffic signalization and signage
- Future construction impacts to community
- Neighborhood beautification (landscaping, community signage, etc.)
- Maintaining historic view into Baltimore
- Vehicular riding surface on bridge
- Speeding in corridor
- Poor transit access to downtown (jobs)
- Commercial vehicle travel and impact of tolls
- Consistency with area master plans and ongoing development

Economic Study

Economic Study



- Gathering / analysis of Demographic, Economic, and Real Estate Data
- Site Visit
- Stakeholder Interviews
- Review of Previous Plans

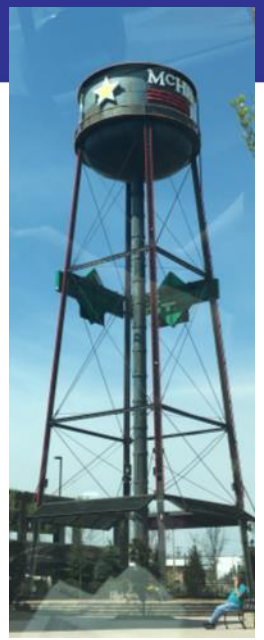
- Strengths and weaknesses identified through analysis
- Potential barriers to investment & strategies to overcome
- Economic importance of bridge and the components that are needed by business / community

- Contribute and respond to principles and recommendations

Real Estate & Business Environment

- Economic Study Area is successful and important to overall Baltimore region
- Previous plans / studies suggest need for bridge improvements, truck route improvements
- Logistics industry is a targeted cluster
- Port of Baltimore uses in particular have wider economic implications than the number of employees on-site
- Vietnam Veterans Memorial Bridge is a critical industrial link
  - Historic asset and emblematic to Baltimore
  - Carries substantial truck traffic
  - Link to Interstate and often used for toll avoidance

Economic Conditions: Jobs



- Residents - particularly south of the bridge - rely on transit for access to jobs
  - Low car ownership
  - Local employment areas not necessarily areas where residents work
- Area has a large working-age population: workforce development and access to jobs is important

Economic Conditions: Retail

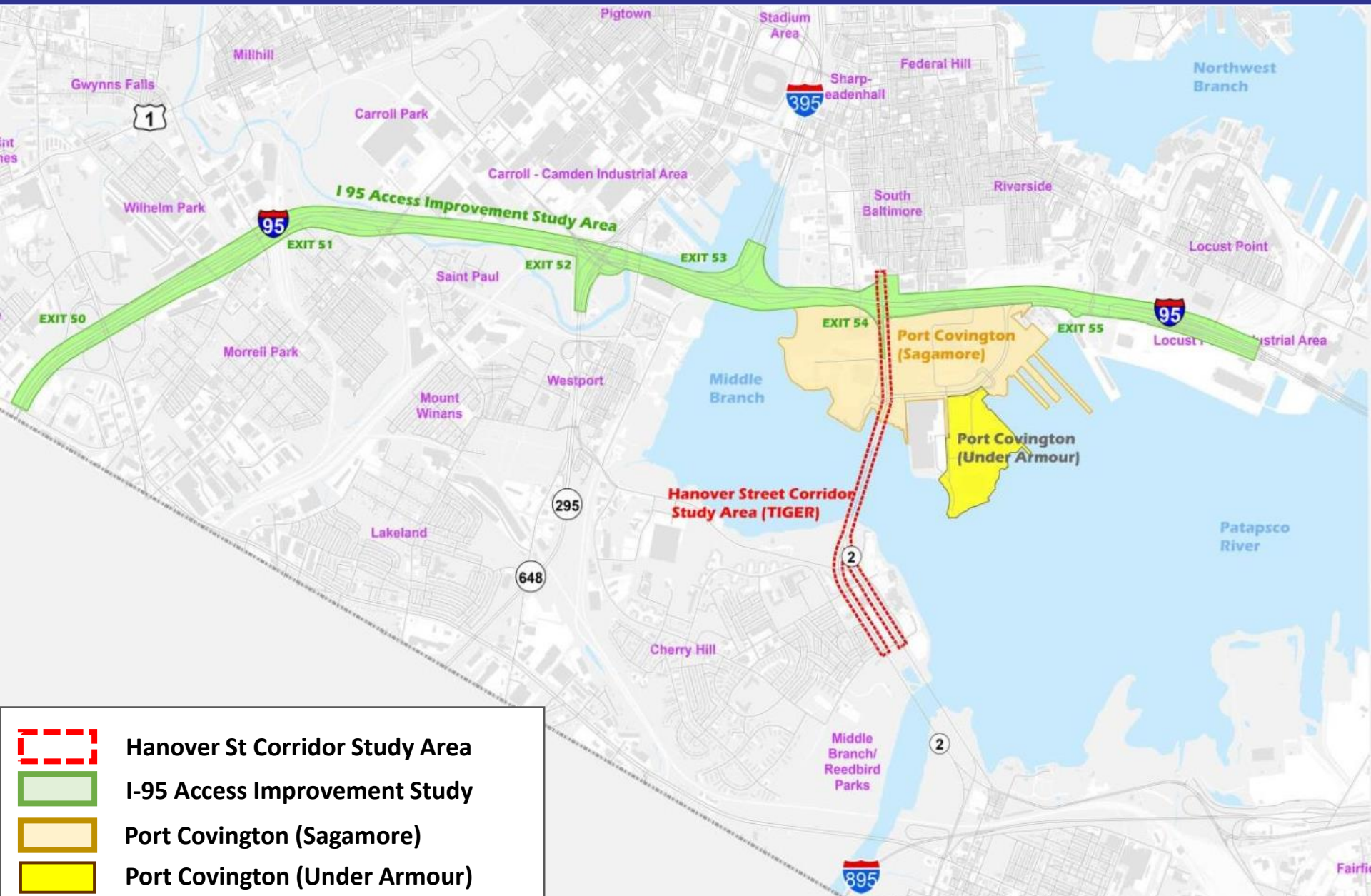
- Little demand for additional large-scale retail in area in short term due to moderate household growth in the next several years
- Investment in infrastructure or economic development could positively impact demand
- Access and connections to transit and alternate modes critical for resident access to larger supermarkets

Analysis of Existing Conditions

Existing Demand

- Total volumes
  - Approximately 37,500 total vehicles / day
  - 2,650 AM peak hour vehicles
  - 3,420 PM peak hour vehicles
- Truck volumes
  - Approximately 2,500 trucks per day
  - 160 AM peak hour trucks
  - 78 PM peak hour trucks
- Pedestrian and bicycle volumes
  - 5 pedestrians between 7-9 AM and 4-6 PM
  - 2 bicycles between 4-6 PM
- Traffic volumes coordinated between overlapping projects:
  - I-95 Access Improvements NEPA / IAPA led by MDTA and Baltimore City DOT
  - Port Covington Development

Adjacent Projects



Existing Level of Service (LOS) Results

- All intersections within the project study area limits operate with an acceptable LOS during the AM and PM peak hours
- Reversible lane required during PM peak hour at intersection of Hanover Street at Cromwell Street
- Traffic volumes will grow significantly with Port Covington development

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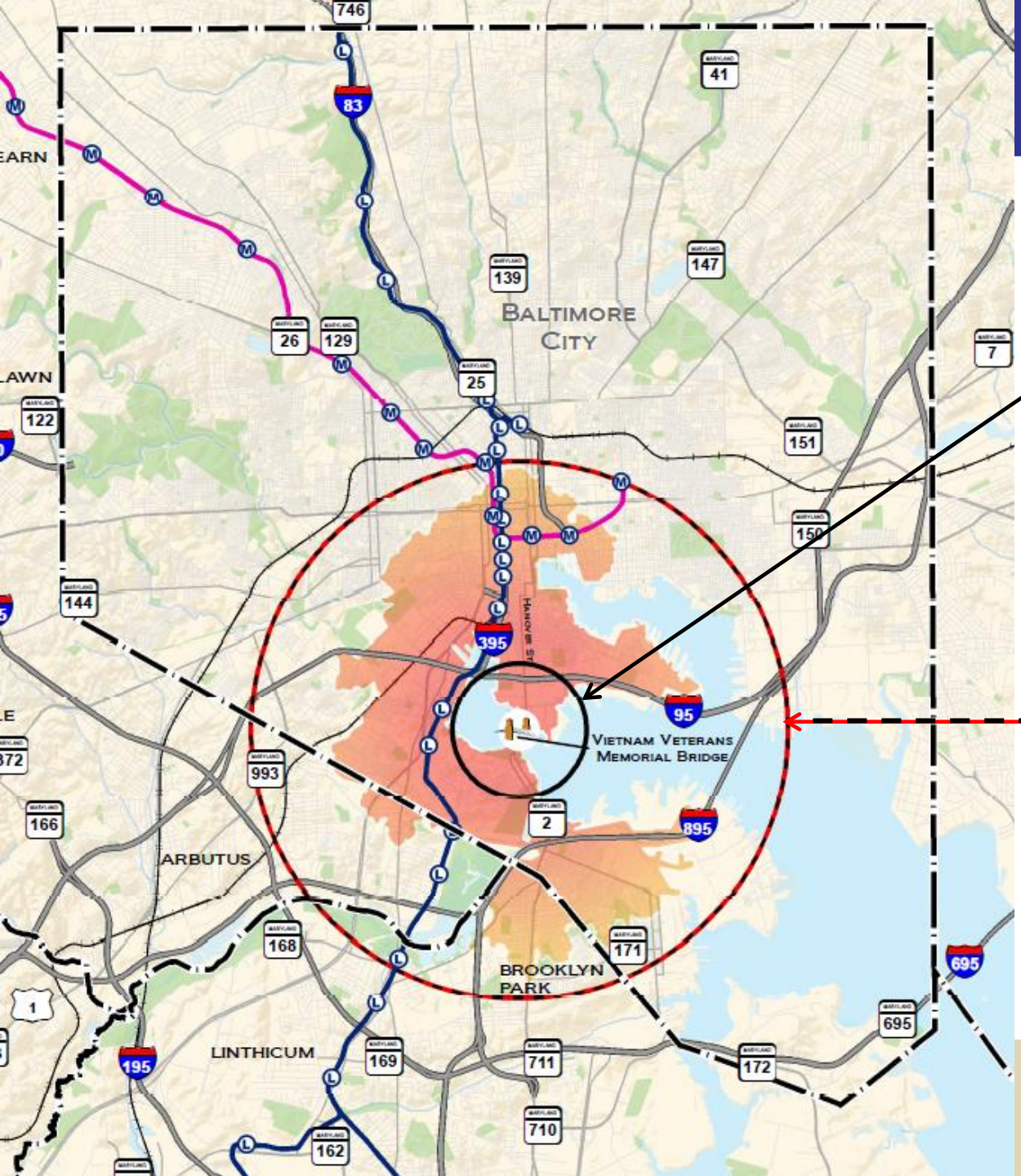
Pedestrian and Bicycle Demand



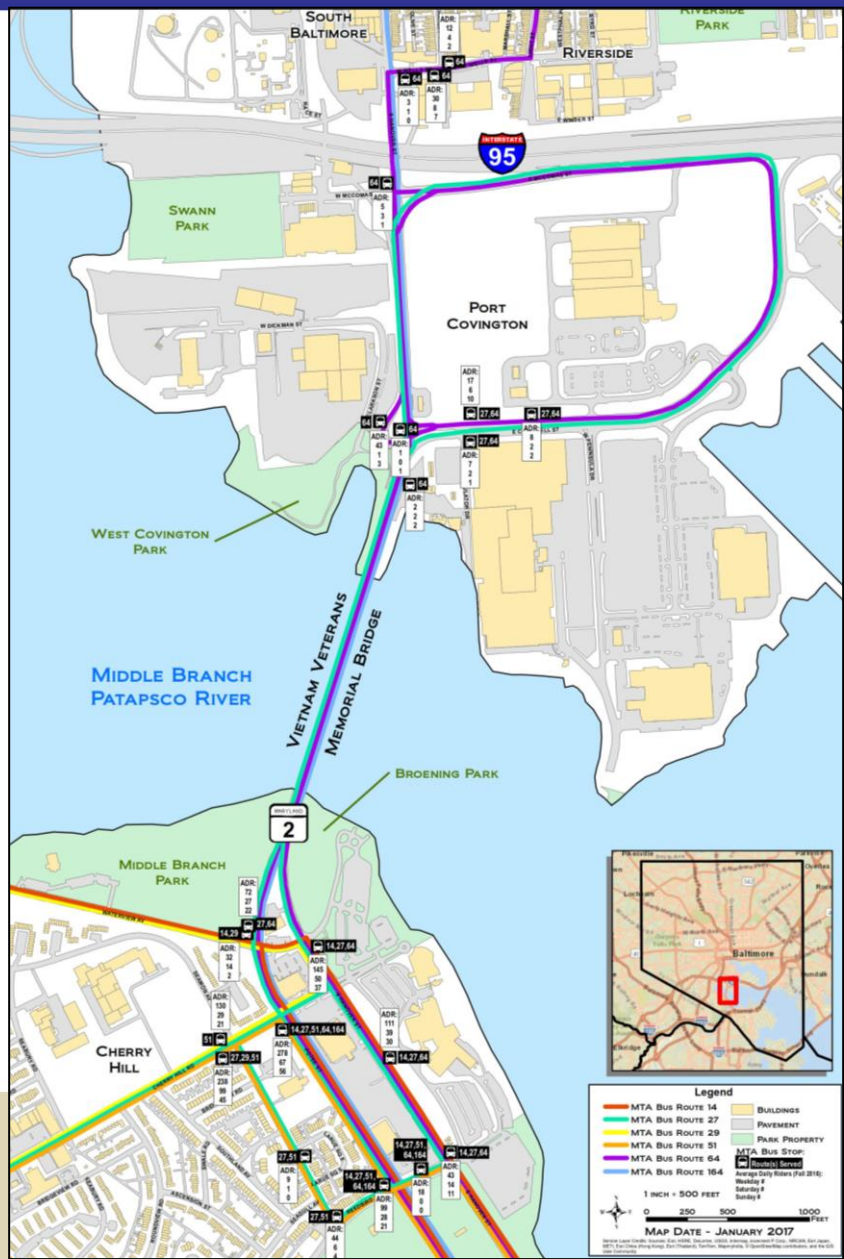
½ Mile Pedestrian Study Area (walkable within 30 minutes)

3 Mile Bikeshed Study Area (bikeable within 10 – 15 minutes)

Hanover Street Corridor Study
includes the Vietnam Veterans Memorial Bridge

Existing Transit Demand

- 22 bus stops in the study area
- Communities in the southern portion of the study area, including Cherry Hill, have a transit-dependent population
- Maryland Transit Administration (MTA) local bus routes 27, 64, and express route 164 cross the bridge
- MTA local bus routes 14, 29, and 51 serve the area south of the bridge



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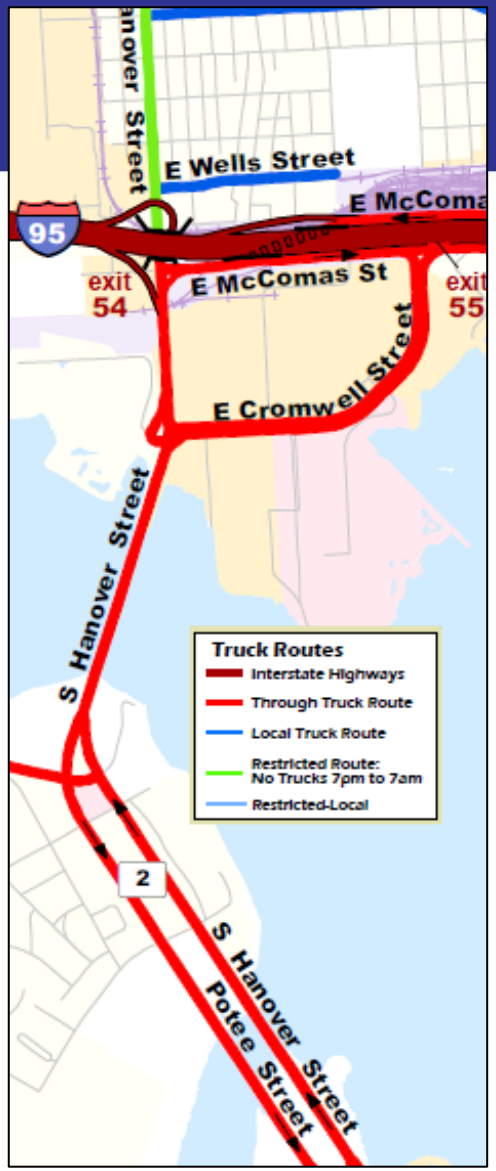
Freight Operations

Truck Route Designations on Hanover Street:

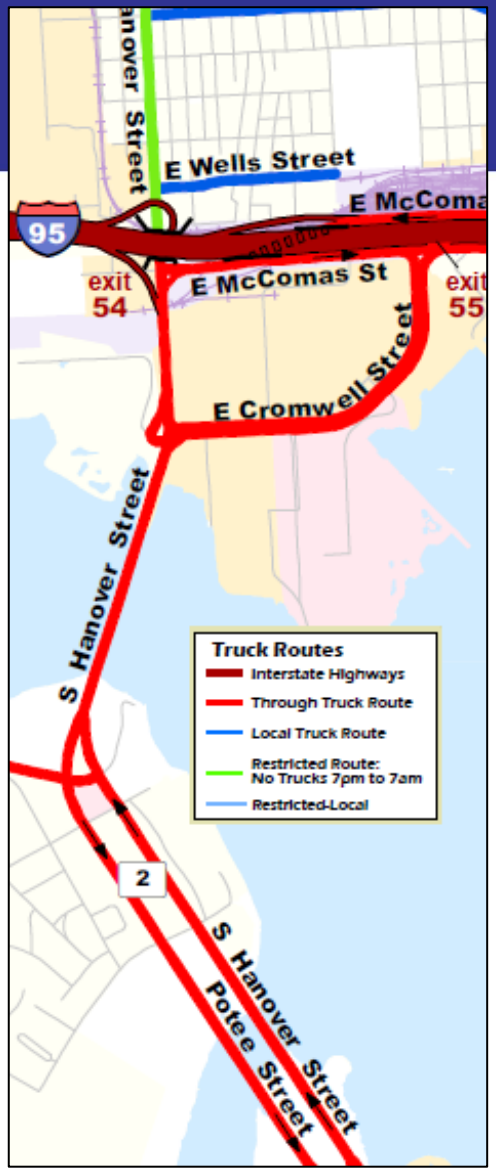
- Wells Street to I-95: restricted route (no trucks from 7:00pm to 7:00am)
- I-95 to Reedbird Avenue and points south: through truck route (unrestricted access 24 hours a day, seven days a week)
- Official truck routes should be designed to handle the geometry, heights, and weights of trucks

Source: Baltimore City Truck Route Map



Freight Operations

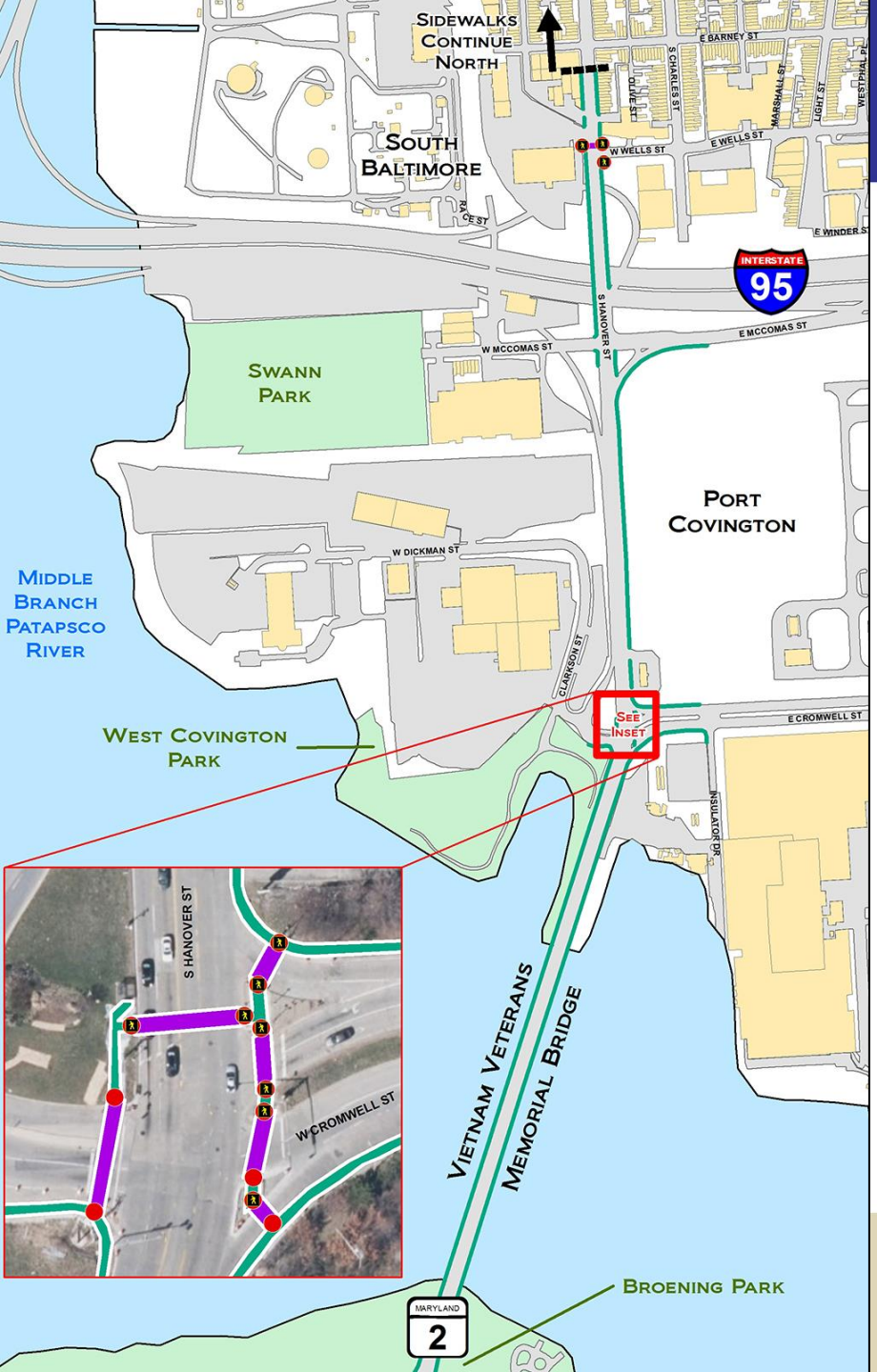
- Most trucks in the corridor carry domestic freight (local deliveries, fuel trucks, etc.) and not international freight traveling to and from the Port of Baltimore
- The Hanover Street corridor is critical for freight if there are any tunnel closures
- Some maritime-related truckers use Baltimore City neighborhood streets to avoid tolls (not Hanover Street as much as other downtown City streets)

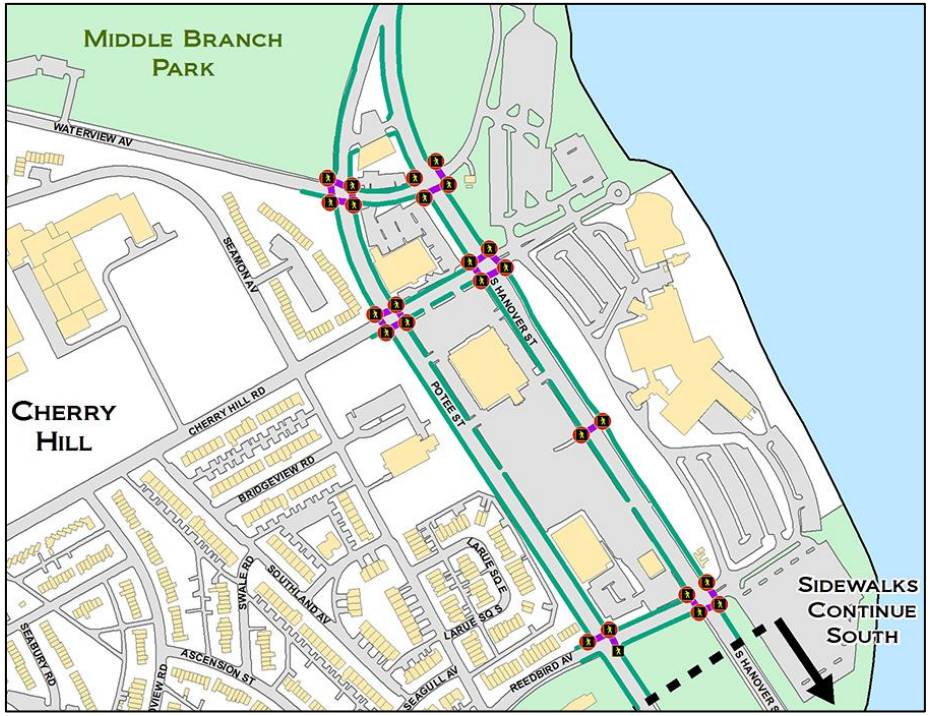


Existing Roadway Facilities

- Corridor designed for vehicular travel
- 12-foot travel lanes
- Vehicular overhead lighting
- Drainage
  - Existing roadways served by closed storm drain system – curb, gutter, and pipe system
  - Outfalls discharge to the Middle Branch of the Patapsco River
- Stormwater management
  - No existing SWM – existing roads constructed prior to water quality regulations
  - Existing median areas may be useful for future bioretention type facilities

Existing Pedestrian Facilities





- Existing Pedestrian Signal
- Existing ADA Ramp
- Existing Sidewalk
- Existing Crosswalk

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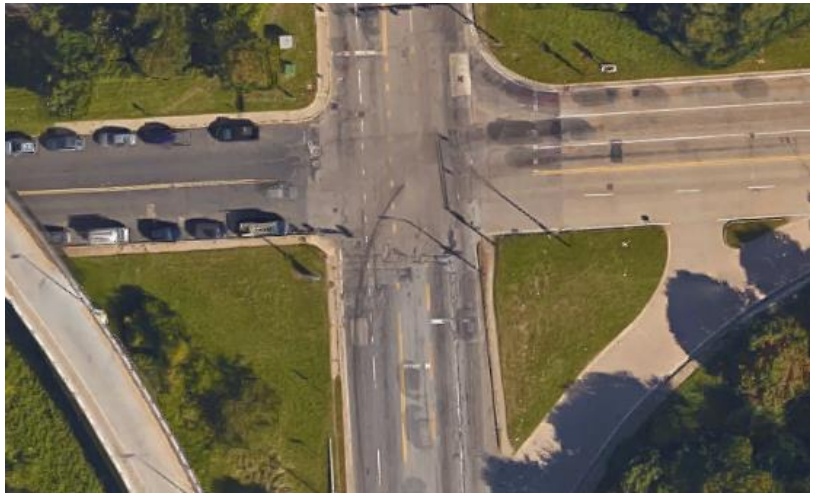
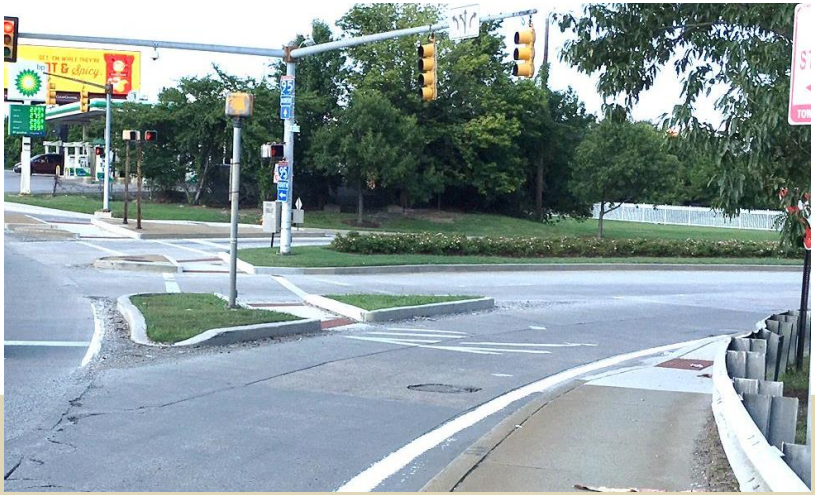
Existing Bicycle Facilities

- Designated bike lanes
  - Northbound Hanover Street from Reedbird Avenue to Cherry Hill Road
  - Eastbound and westbound on Cherry Hill Road from Hanover Street to points west
- Off-road
  - Gywnns Falls Trail

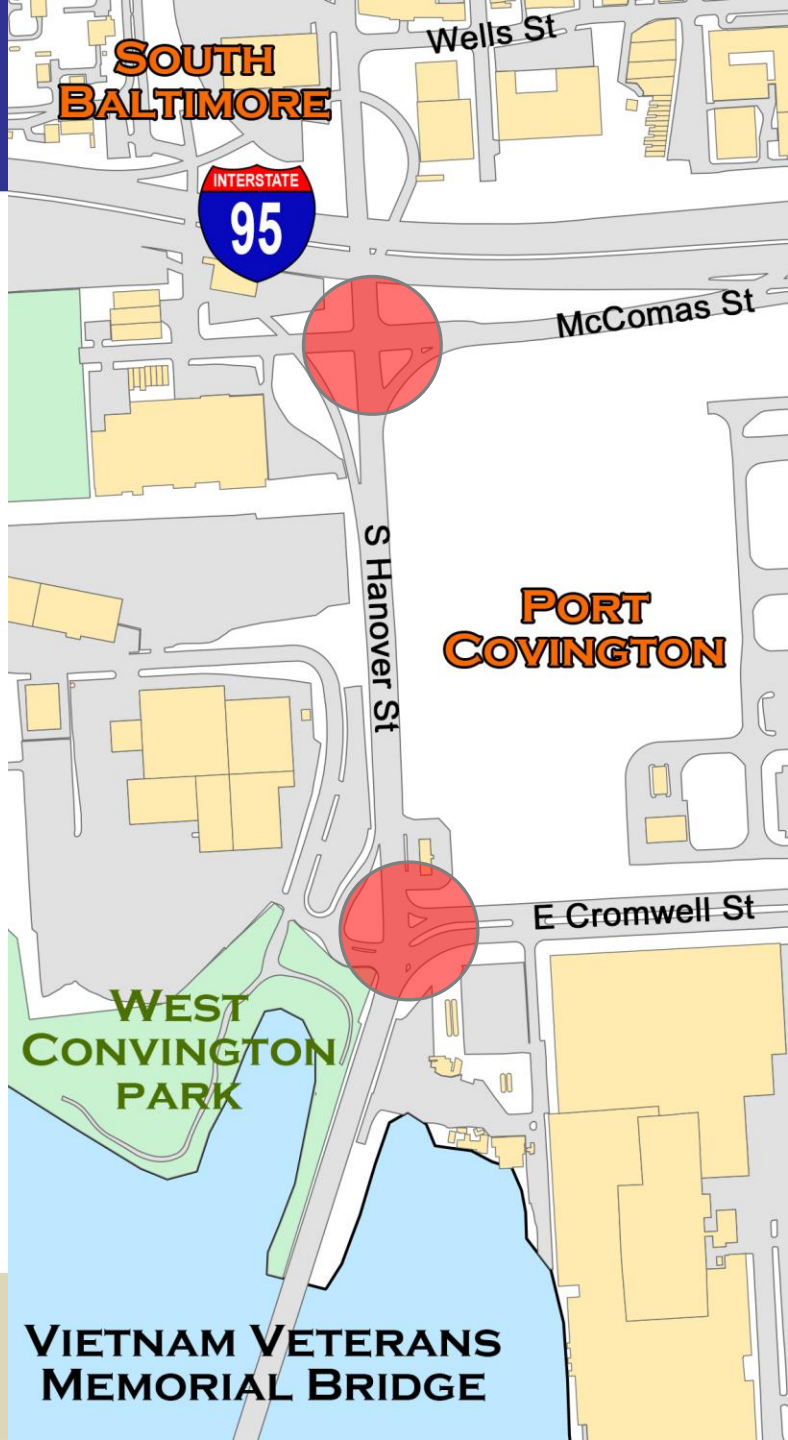
Existing Conditions



- Unmarked pedestrian crossings
- Clearly marked crosswalks with 10’ outer edge width recommended for ADA compliance

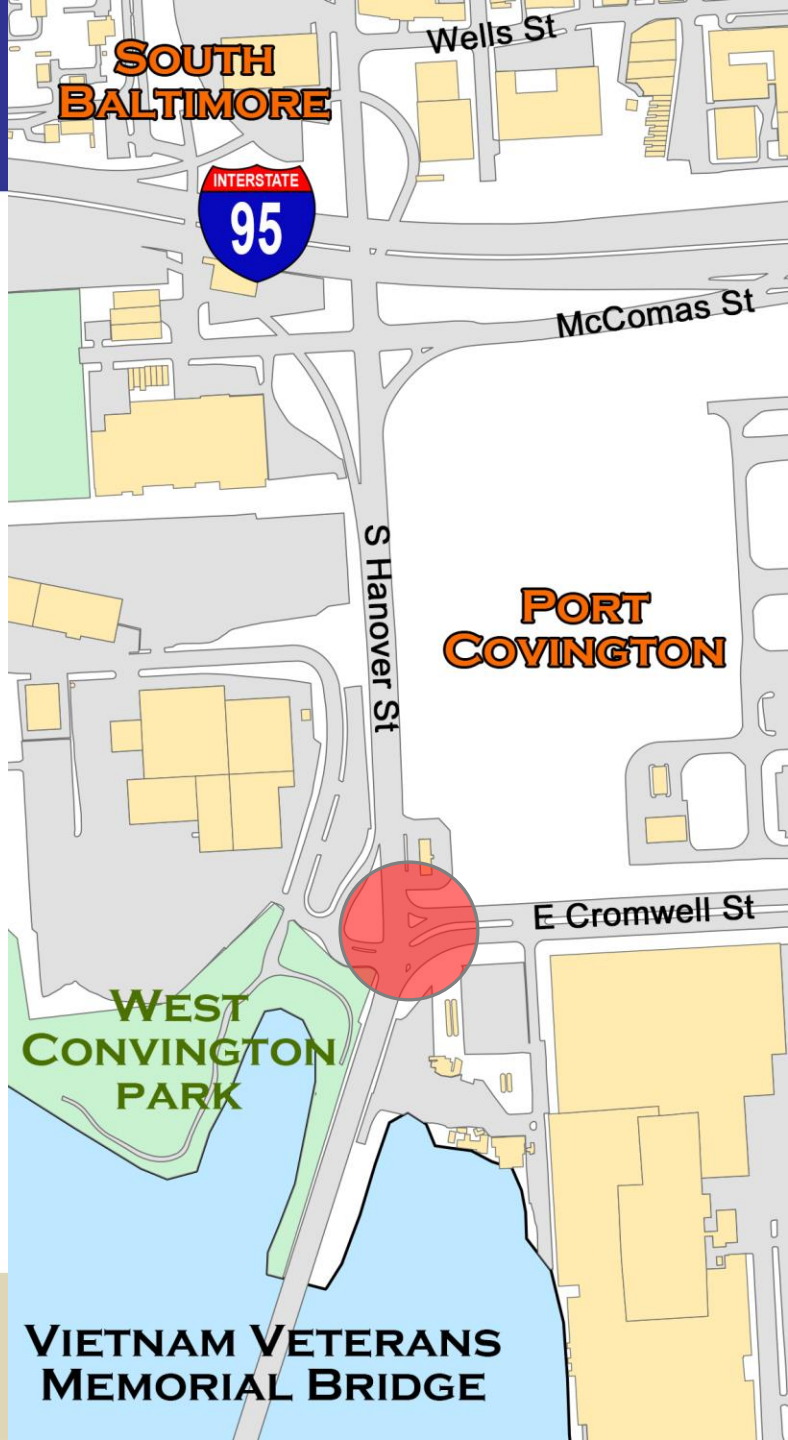


Pedestrian / vehicle conflicts at free right turns



Existing Conditions

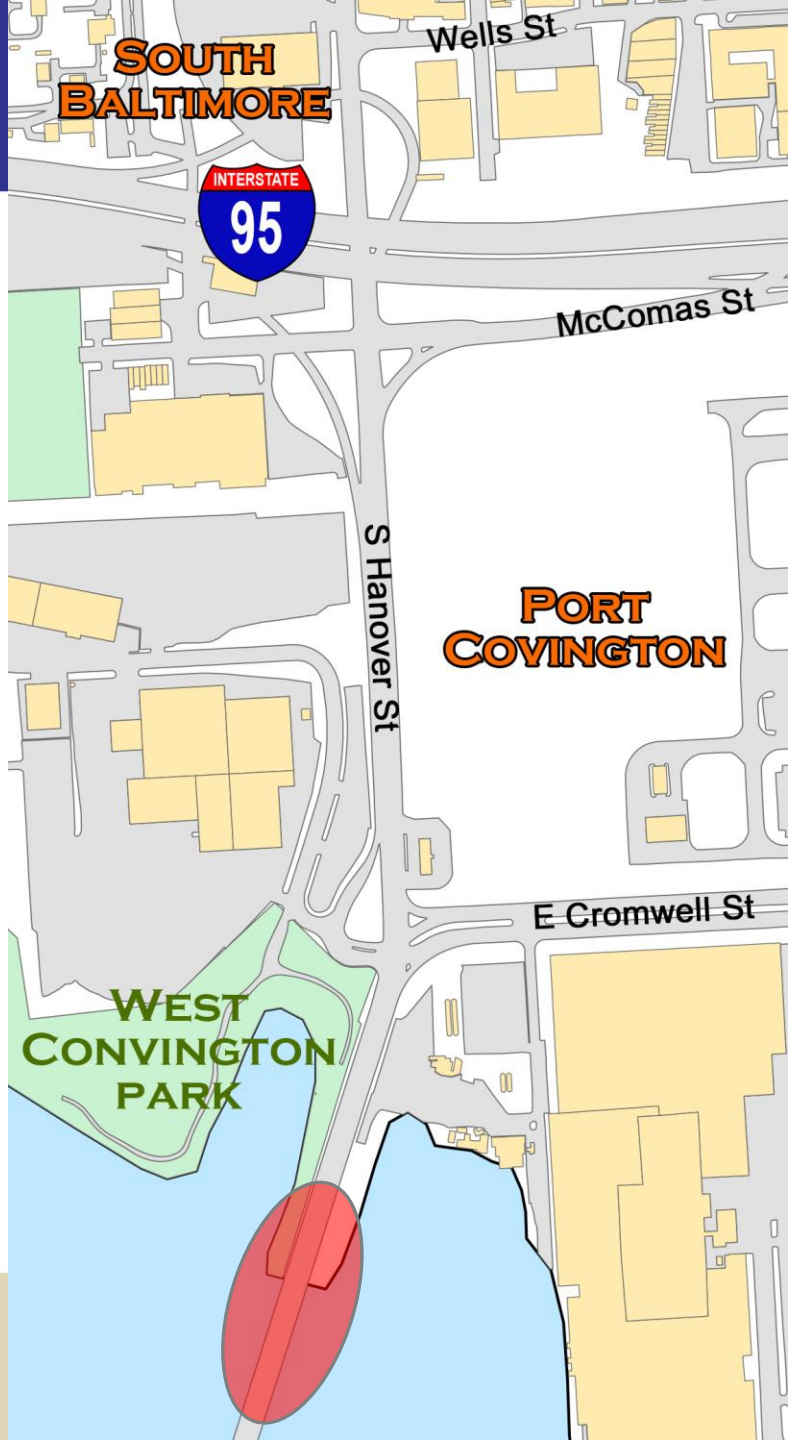
Hanover Street at Cromwell Street intersection geometric configuration is challenging for all users, especially pedestrians and cyclists



Existing Conditions

- No bicycle facilities on bridge
- Narrow sidewalk on bridge without buffer
- Minimum 24” buffer recommended (NACTO Design Guide)

Sidewalk ramps on bridge not ADA compliant



Existing Conditions

Lane signals dim / difficult to read

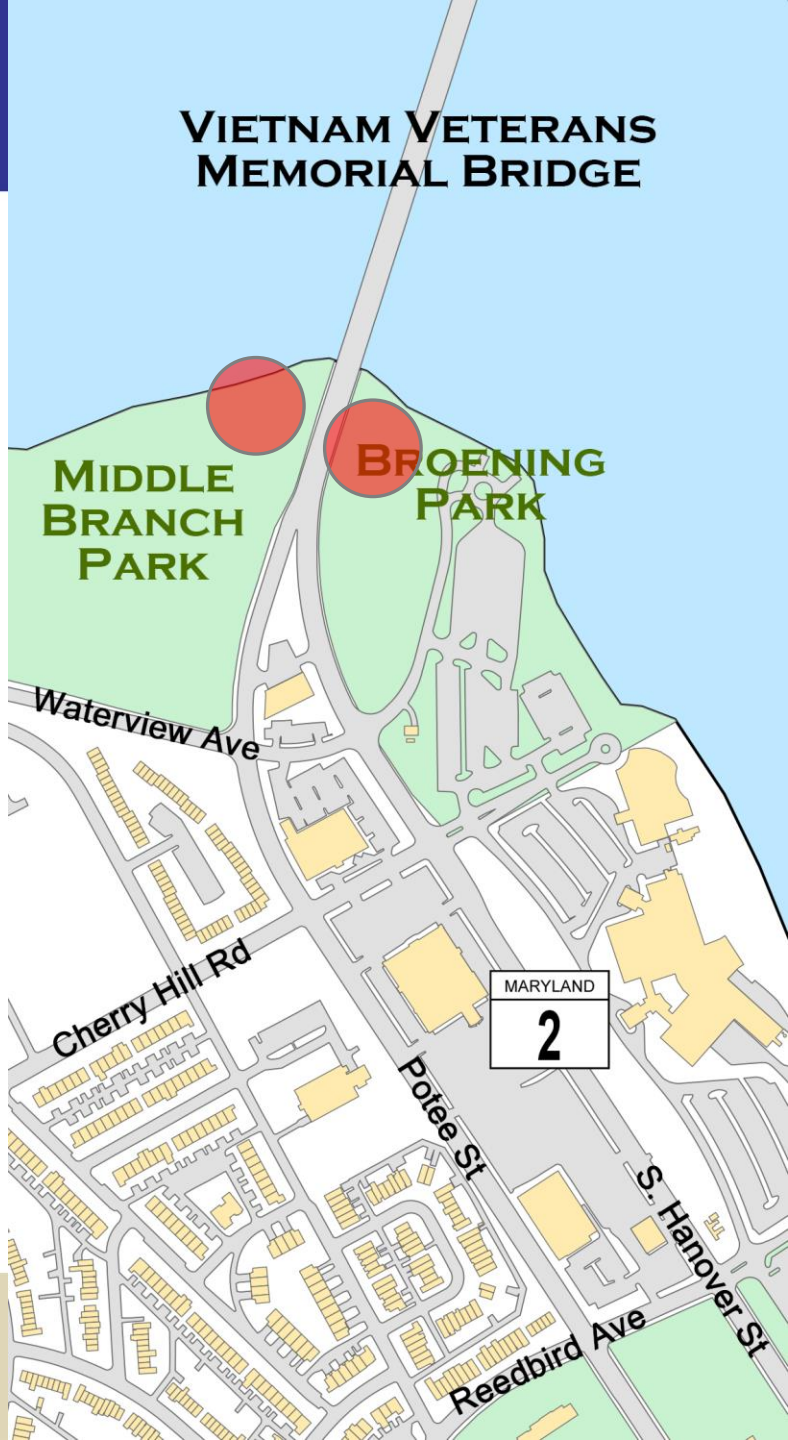
Blocked inlets (flooding and safety concerns)

Poor bridge deck and pavement conditions

Existing Conditions

Overgrown vegetation and limited pedestrian access from bridge to Gwynns Falls Trail and no suitable, accessible bicycle connectivity

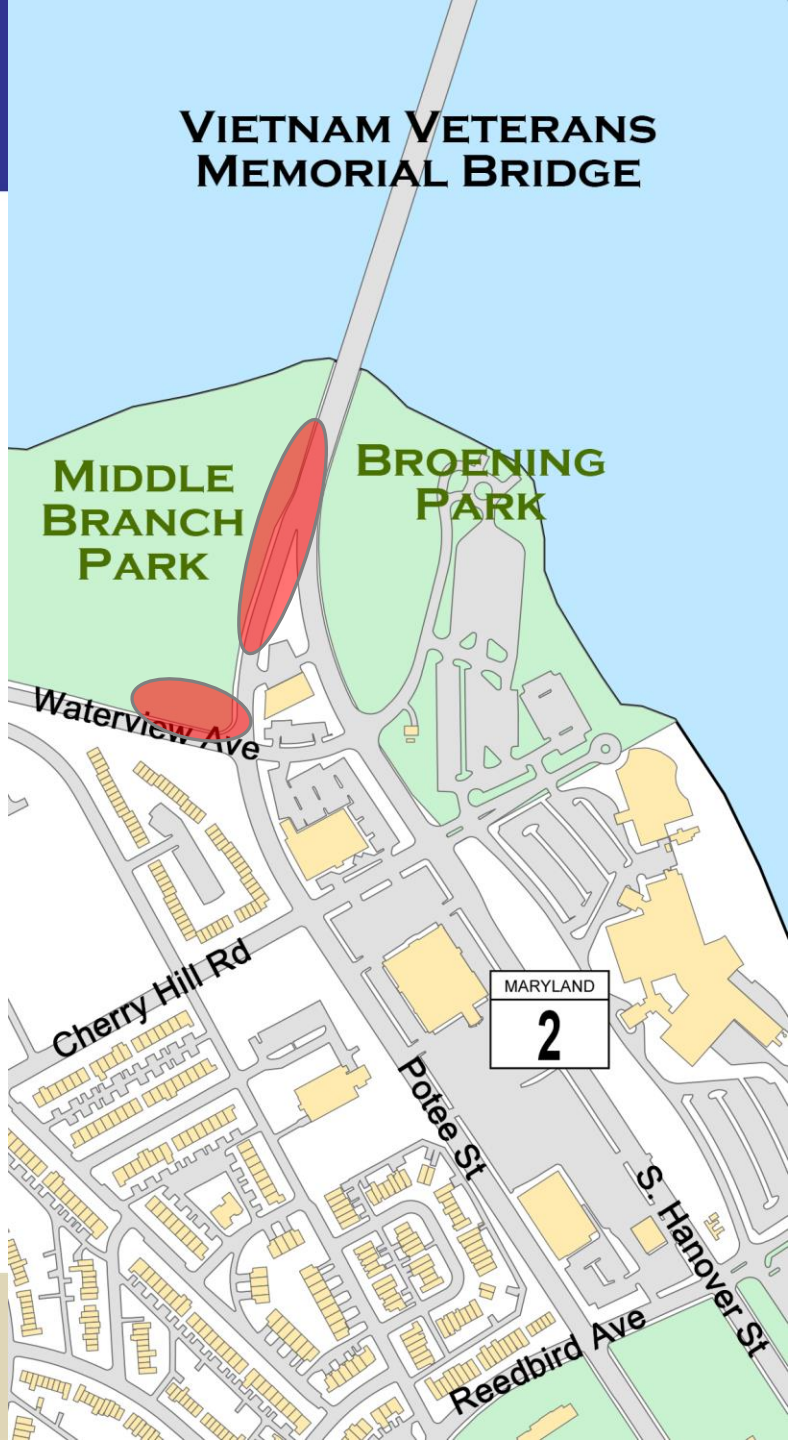
Overgrown vegetation on Gwynns Falls Trail blocks views and contributes to pedestrian safety concerns



Existing Conditions

Overgrown vegetation on sidewalk reduces width along corridor; 60” width recommended for ADA compliance

Missing sidewalk / pedestrian connections to bus stops



Existing Conditions

Lack of low level lighting for pedestrians along corridor

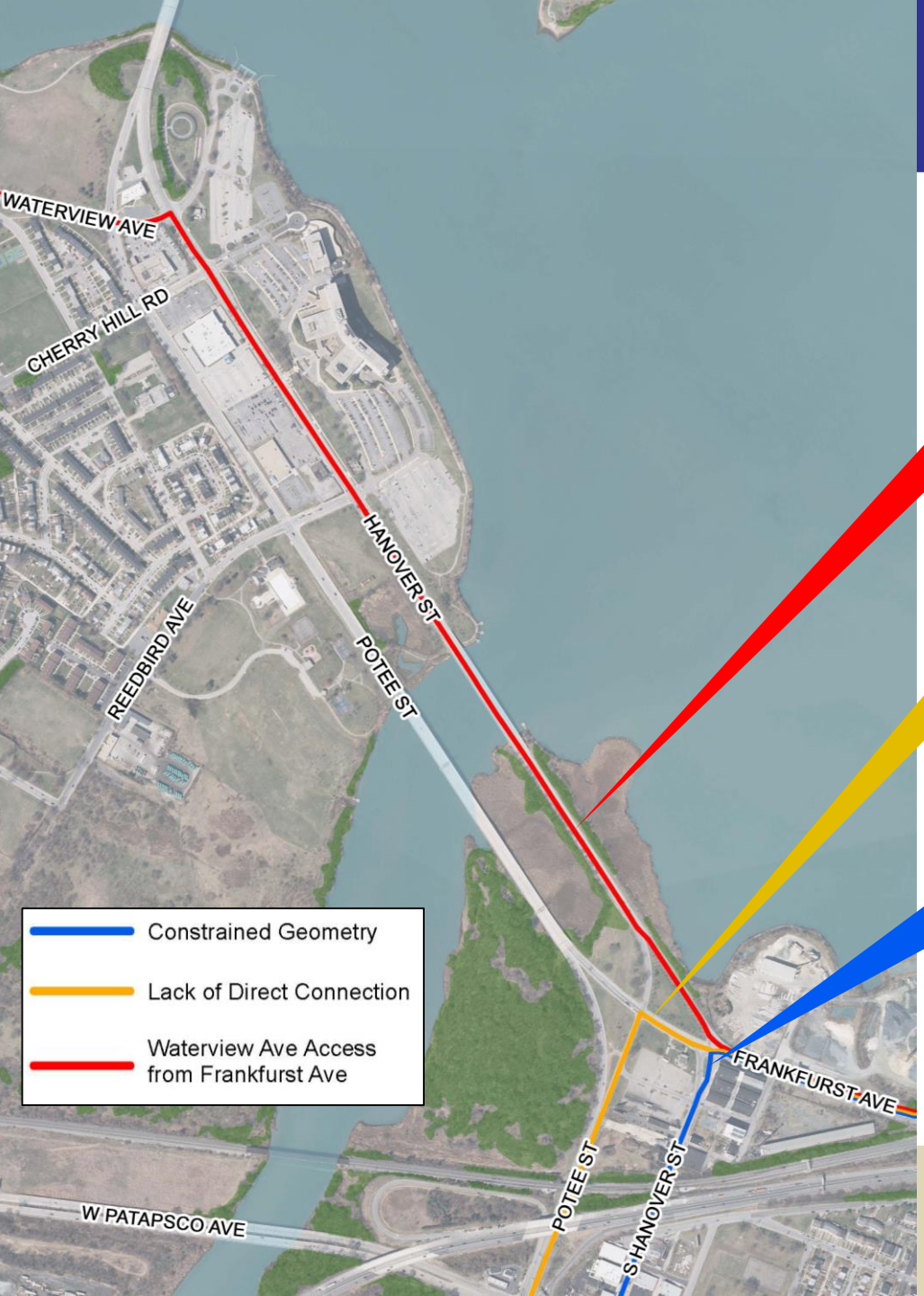
Faded crosswalks

- Sidewalk obstructions decrease width
- 36” min. width for ADA compliance

Existing Conditions

- Bus shelters and benches not present at all stops along the corridor
- Shelters are recommended for stops with average daily ridership of 100 or more
- Seven bus stops have average daily ridership greater than 100, but only three of those stops have shelters

Existing Freight Conditions



Deficiencies cause additional truck traffic to use bridge to access Waterview Avenue

Missing connection from westbound Frankfurst Avenue to Potee Street

Constrained geometry at intersection of Hanover Street at Frankfurst Avenue

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Hanover Street Corridor Structures and Bridges

Minor Maintenance

- Hanover St NB ramp to I-95 SB (BCW552) *
- I-95 NB ramp to SB Hanover St (BCW553) *

Major Rehabilitation/Replacement

- Hanover St over CSX Railroad (BC5209) *
- Hanover St over CSX Railroad (BC5212) *
- Hanover St over Middle Branch – Vietnam Veterans Memorial Bridge (BC5210)

** Overlaps with Port Covington development*

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Vietnam Veterans Memorial Bridge (BC5210)

- Built in 1916 – the major component of this corridor
- Most iconic structure in the inventory of the Baltimore City Department of Transportation
- Age and **two** unique structural configurations make it significant on a **national scale**
  - Rall Mechanical Operating System – Movable Span
  - Concrete Encased Steel Trusses – Arched Approaches

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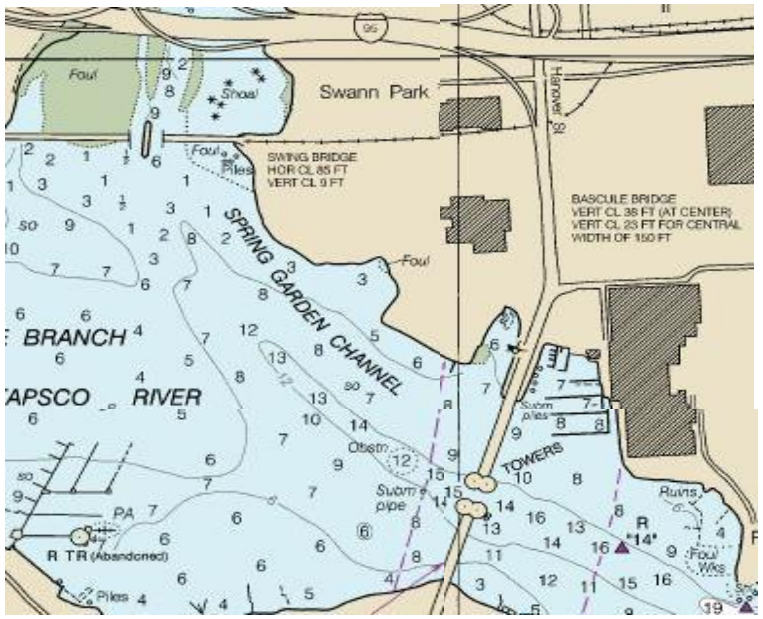
Historic Preservation

- April 2001 – the bridge was determined to be eligible for the National Register of Historic Places (NRHP)
- Improvements to a NRHP site must comply with federal and state laws:
  - Section 106 of the National Historic Preservation Act
  - Maryland Historical Trust Act
- All actions (projects) must take steps to avoid, minimize, or mitigate adverse effects to the site

Marine Navigation

- General reconstruction of movable span electrical and mechanical operating systems required for continued bridge openings
- Major support elements (Rall wheel and track) good for continued use
- Clearance box of movable span in closed position
  - Vertical clearance = 38 feet at center
  - Vertical clearance = 23 feet for entire 150-foot channel width
- Clearance adequate for barge and small tug access
  - Future dredging and marine construction
  - Maintenance access for I-95, I-395, and Light Rail piers



Vietnam Veterans Memorial Bridge

Movable Span			
Element	**Description**	**Potential Repair**	**Additional Study**
Bridge Lighting	None present	N/A	Architectural Evaluation of Period Lighting Standards
Traffic Barriers	Open Steel Barrier	Replacement	Barrier Studies to consider supplemental pedestrian protection and period elements
Deck and Sidewalk	Open Steel Grid	Replacement	N/A
Steel Superstructure	Riveted Steel Truss / Girder	• Clean and Paint Steel • General Retrofits	• Evaluate fatigue life • Detailed Inspection • Metallurgical Study of Structural Steel
Operator's Houses	Masonry and Concrete	Rehabilitation of exterior and interior elements	Architectural and Hazardous Materials Evaluations
Electrical and Mechanical Operating Systems	Rall Mechanical Operating System	General Reconstruction	Detailed Inspection
Bascule Piers	Reinforced Concrete and Masonry	Rehabilitation	• Detailed Inspection • Underwater Inspection • Detailed Structural / Hydraulic Analyses
Concrete Pile Foundations	Reinforced Concrete	Unknown at this time	• In situ Investigation of Existing Piles • Detailed Structural Analysis
Waterway Fenders and Dolphins	Timber	Unknown at this time	Analyze piers in accordance with AASHTO Vessel Collision Criteria

Assessments based upon guidelines established by the current AASHTO publications – *Manual for Bridge Element Inspection* and *Movable Bridge Inspection, Evaluation, and Maintenance Manual*.

Vietnam Veterans Memorial Bridge

Arched North and South Main Approach Spans			
Element	**Description**	**Potential Repair**	**Additional Study**
Bridge Lighting	Standard Roadway	Replace/Augment with "Pedestrian Friendly" Period Lighting Standards	Architectural Evaluation of Period Lighting Standards
Traffic Barriers	Concrete w/ Steel Rail	Replacement	Barrier Studies to consider supplemental pedestrian protection and period elements
Deck and Sidewalk	Reinforced Concrete	Replacement	N/A
Floor System	Reinforced Concrete w/ Steel Encased Members	Replacement	Detailed Inspection
Concrete/Steel "Arched" Superstructure	Composite Steel Truss with Concrete	General Rehabilitation	• Detailed Inspection • Non-linear Structural Analysis - Member Capacities • In-situ metallurgical Study of Steel Members • Evaluate Riveted Connections
Piers	Reinforced Concrete	General Rehabilitation	• Detailed Inspection • Underwater Inspection • Detailed Structural / Hydraulic Analyses
Concrete Pile Foundations	Reinforced Concrete	Unknown at this time	• In situ Investigation of Existing Piles • Detailed Structural Analysis

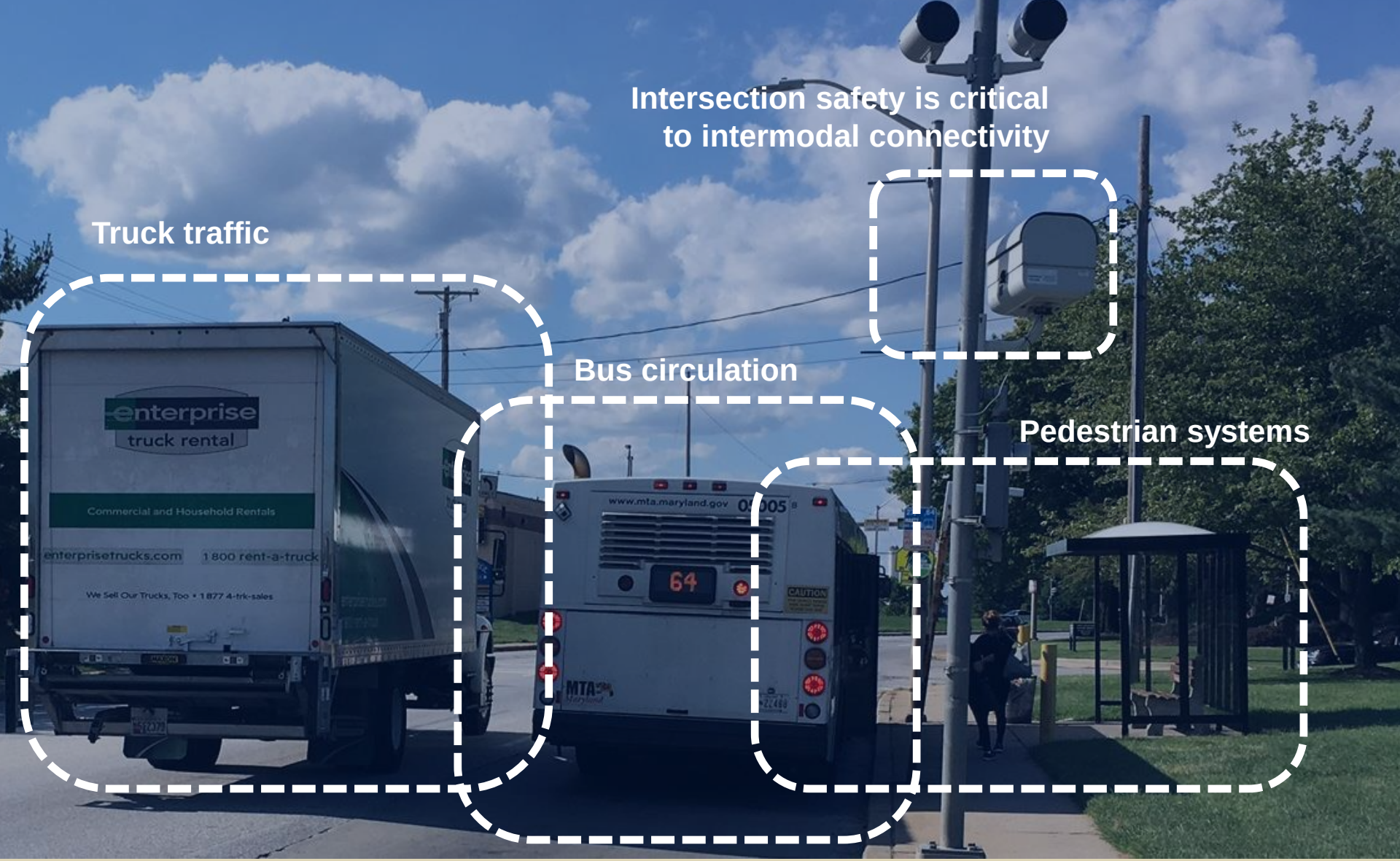
Assessments based upon guidelines established by the current AASHTO publication – *Manual for Bridge Element Inspection*

Vietnam Veterans Memorial Bridge

Arcade North Approach Spans			
Element	**Description**	**Potential Repair**	**Additional Study**
Bridge Lighting	Standard Roadway	Replace/Augment with "Pedestrian Friendly" Period Lighting Standards	Architectural Evaluation of Period Lighting Standards
Traffic Barriers	Concrete w/ Steel Rail	Replacement	Barrier Studies to consider supplemental pedestrian protection and period elements
Deck and Sidewalk	Reinforced Concrete	Replacement	N/A
Concrete Arcades	Reinforced Concrete	General Rehabilitation	• Detailed Inspection • Detailed Structural Analysis
Timber Pile Foundations	Georgia Long-leaf Pine	Unknown at this time	• In situ Investigation of Existing Piles • Detailed Structural / Hydraulic Analyses

Assessments based upon guidelines established by the current AASHTO publications – *Manual for Bridge Element Inspection*

Barriers to Multimodal Safety, Connectivity, and Accessibility



Barriers to Multimodal Safety, Connectivity, and Accessibility

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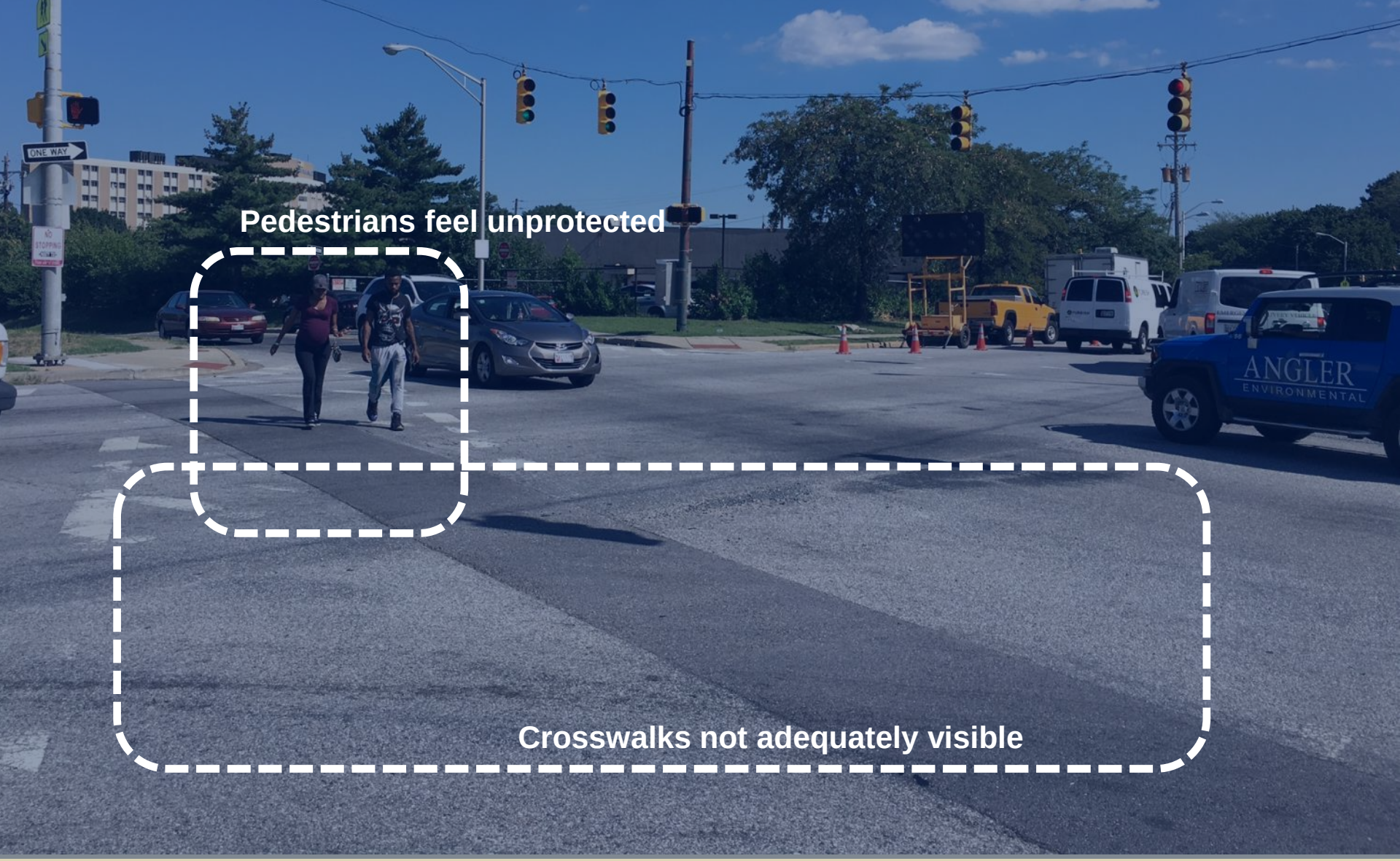

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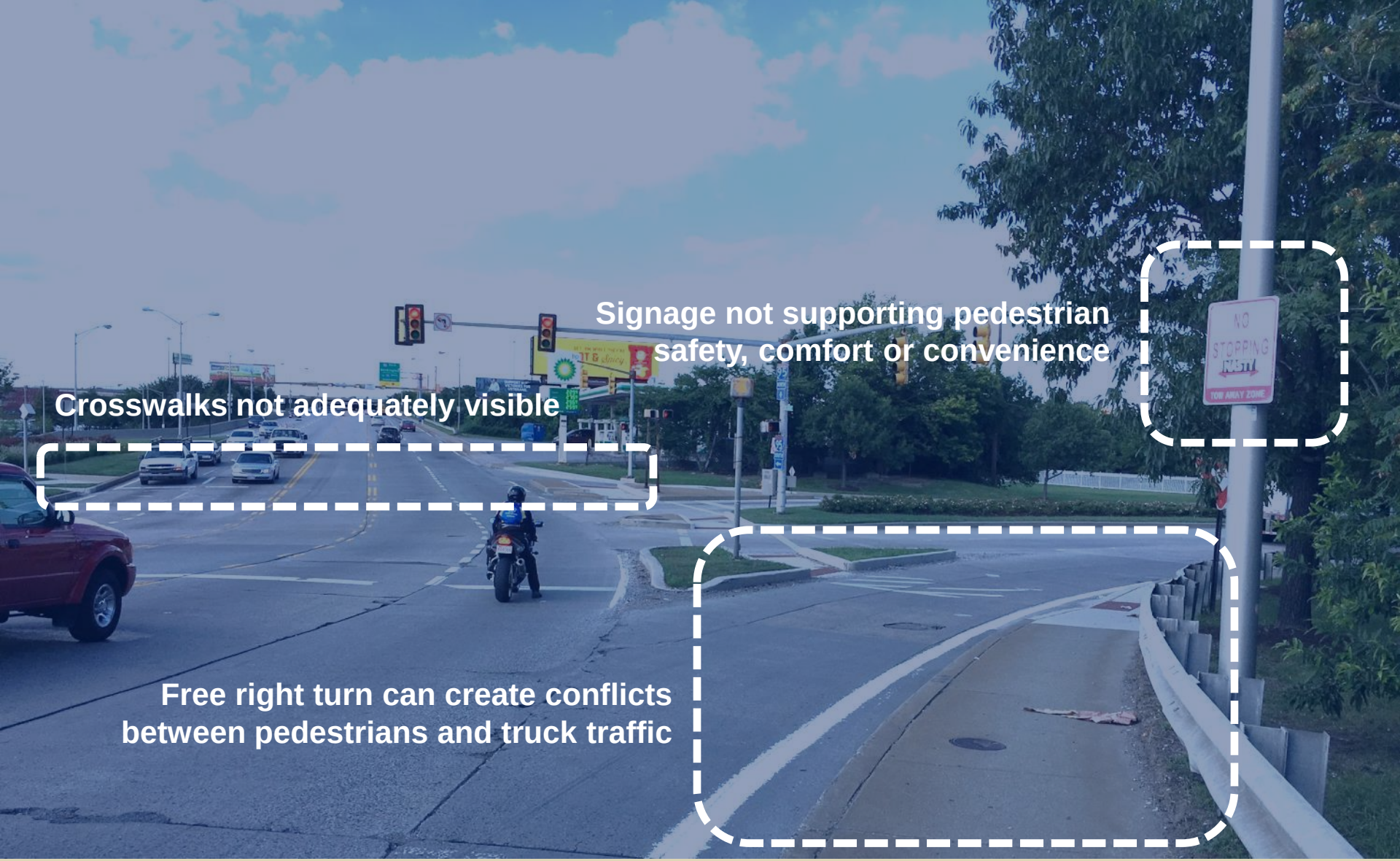

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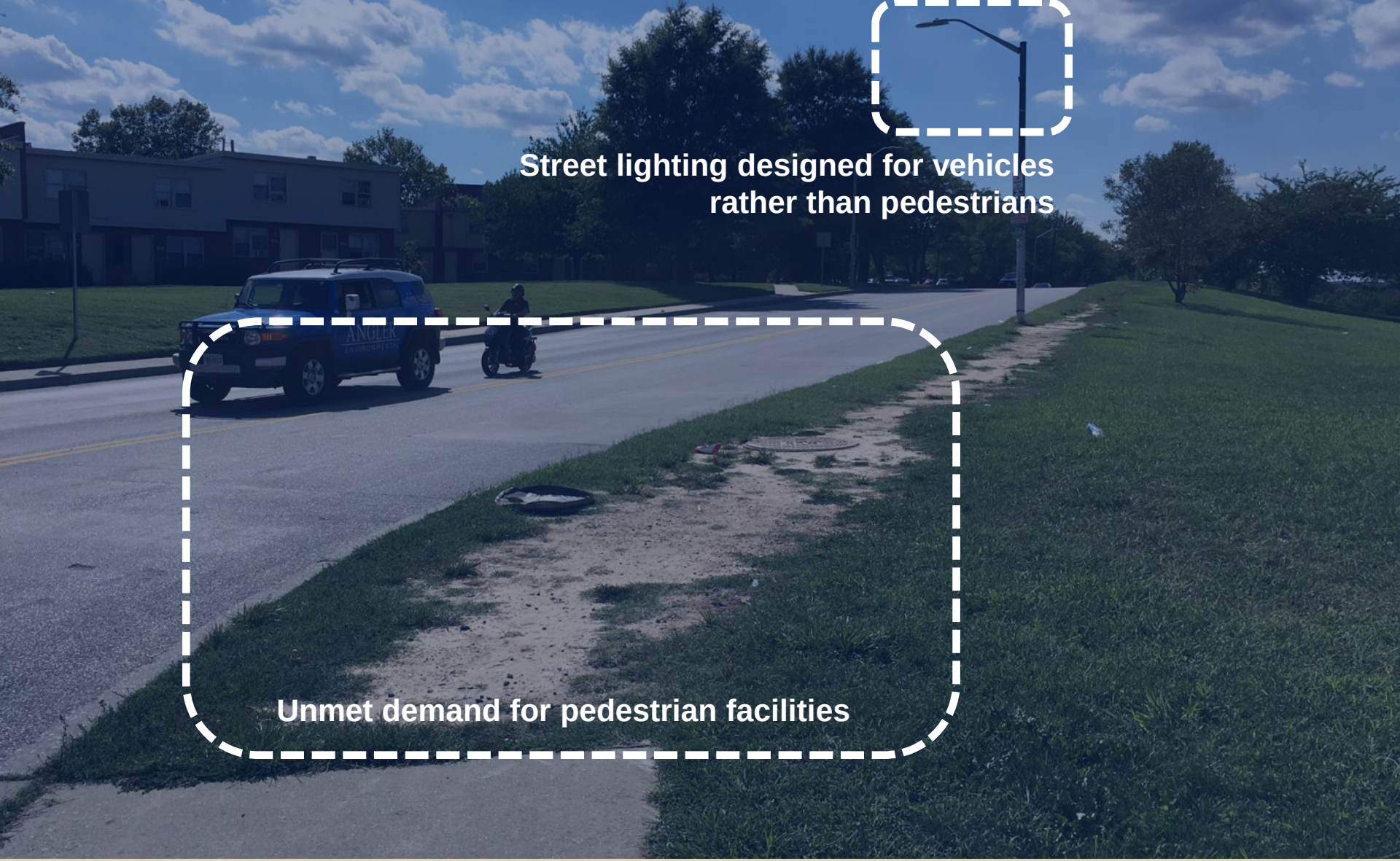

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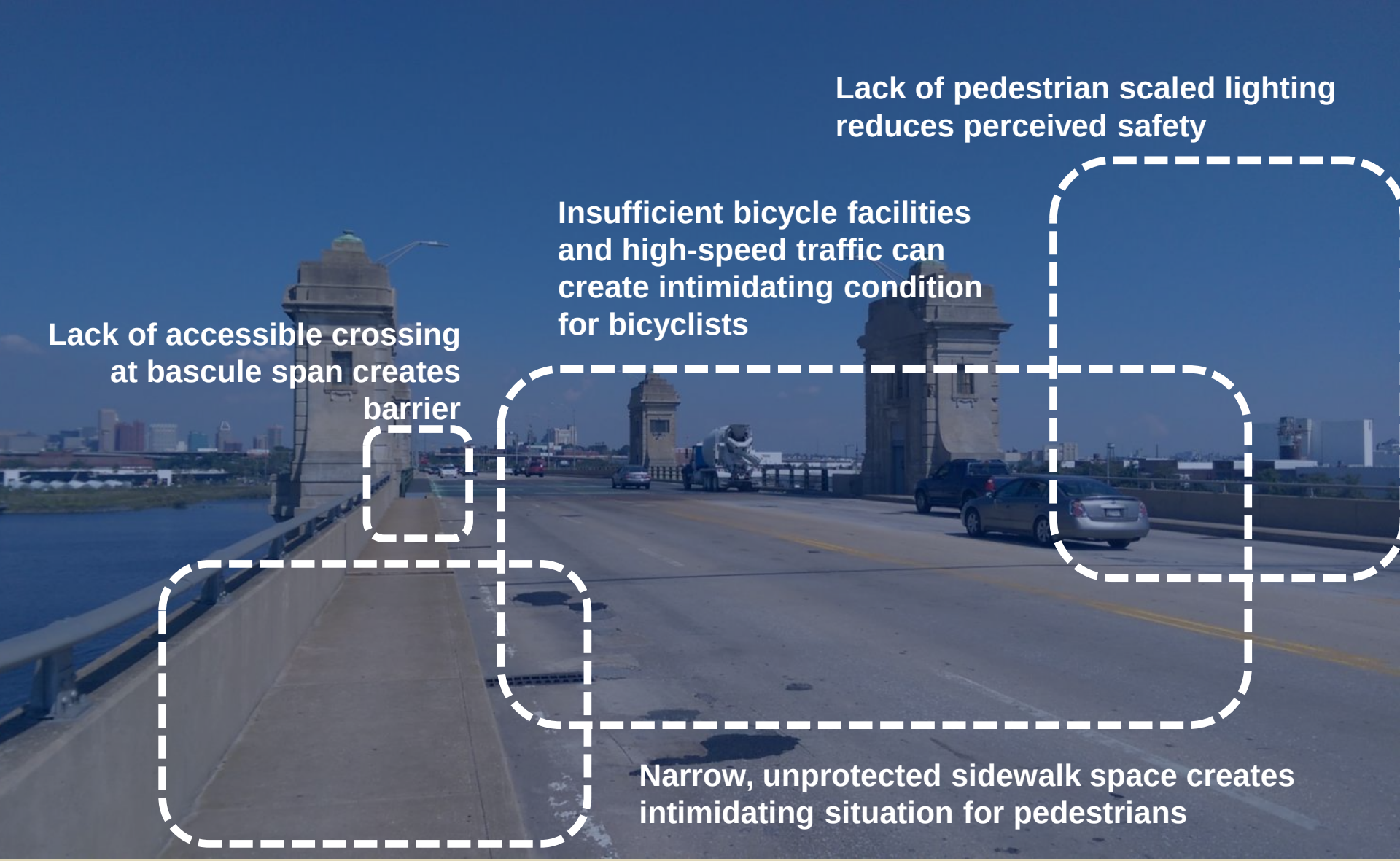

Barriers to Multimodal Safety, Connectivity, and Accessibility

Hanover Street Corridor Study
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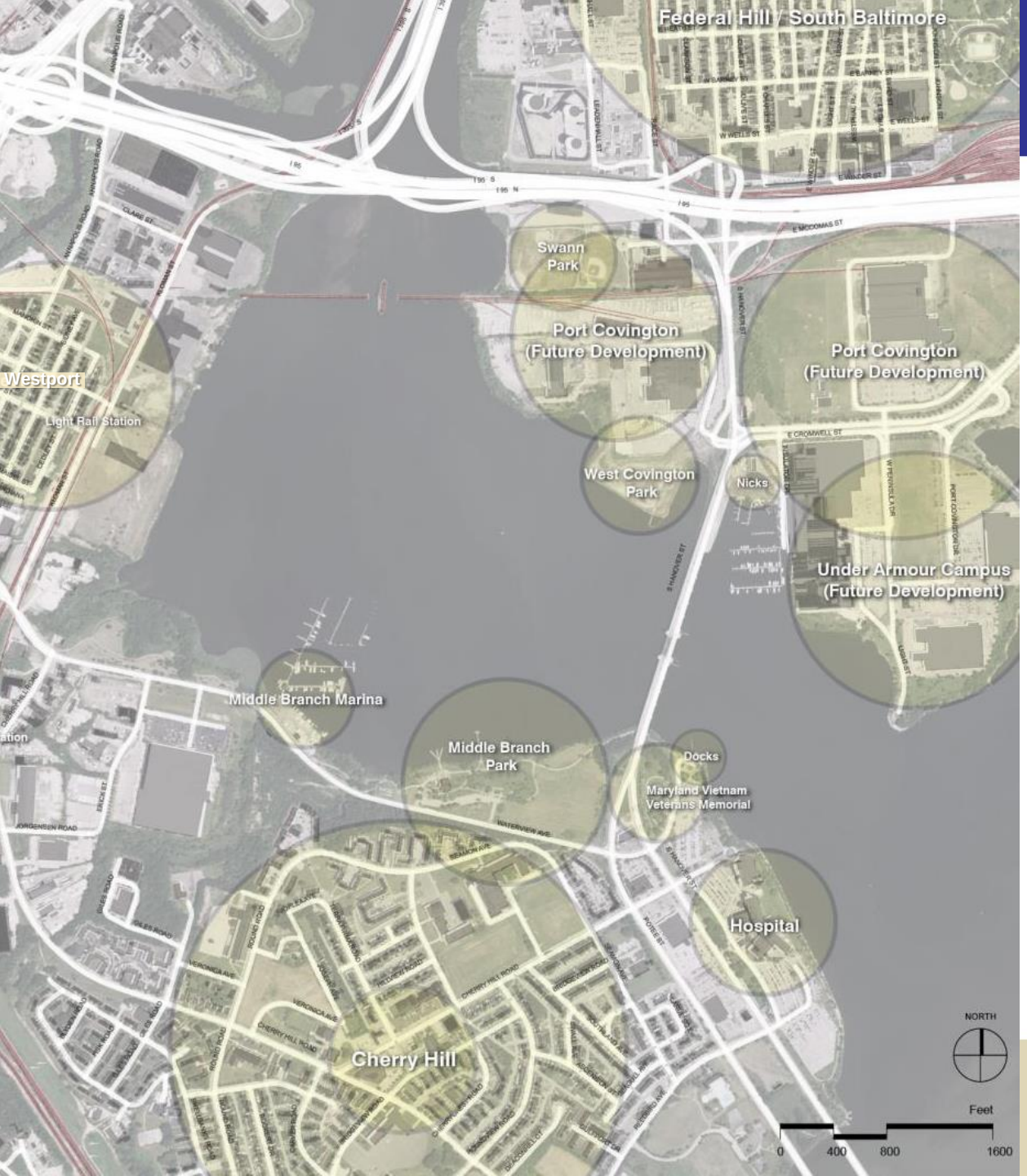
Summary of Corridor Conditions

- Sidewalks adjacent to trucks and high speed traffic
- Lack of accessibility to bus stops (no sidewalks or obstructed sidewalks)
- Lack of pedestrian type lighting
- Some pedestrian signals and curb ramps not in compliance with current ADA design standards
- Crosswalks in need of maintenance
- Insufficient bike facilities
- Poor bridge deck and pavement conditions
- Movable span operating system that constrains maritime access

Addressing Barriers: Next Steps

- Identify design opportunities and constraints
  - Evaluate future demand and traffic conditions on Hanover Street, including the effect of new development at Port Covington and other area growth
  - Investigate other potential routes and alignments to accommodate traffic patterns
  - Develop typical sections and concepts to improve safety, connectivity, and accessibility
  - Determine costs and impacts of the various concepts
- Continue robust public outreach program
- Continue coordination with adjacent projects
  - I-95 Access Improvements
  - Port Covington Development

Study Area Destinations



Residential

- Cherry Hill
- Westport

Recreational

- Middle Branch Marina
- Swann Park
- West Covington Park
- Middle Branch Park

Commercial / Industrial

- MedStar Harbor Hospital
- Port Covington (future development)
- Under Armour Campus (ongoing development)

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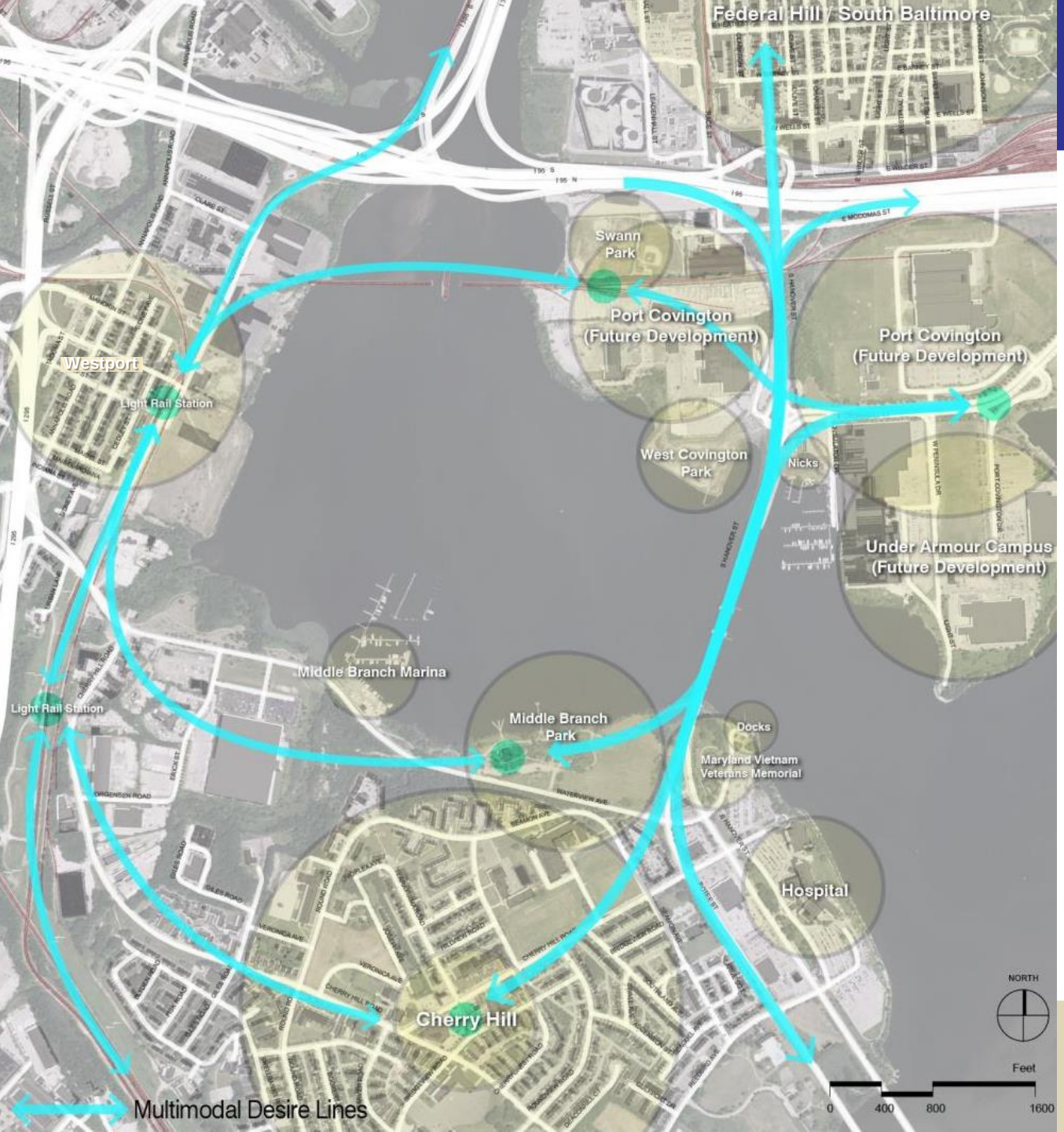
Design Opportunities



Multimodal desire lines are the paths that travelers desire to use to move between various destinations, regardless of transportation mode

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Your Input…

…will help us develop potential improvements!

- How do you use the corridor?
- What is working well in the corridor?
- What other barriers exist in the corridor?
- What improvements would benefit the people who travel to, from, and within the corridor?