HANOVER STREET CORRIDOR STUDY

includes the Vietnam Veterans Memorial Bridge

Public Information Meeting
Tuesday, January 31, 2017
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)
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
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
• 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

Hanover St Corridor Study Area
I-95 Access Improvement Study
Port Covington (Sagamore)
Port Covington (Under Armour)
• 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
1/2 Mile Pedestrian Study Area (walkable within 30 minutes)

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

- 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 Frankfurist Avenue to Potee Street

Constrained geometry at intersection of Hanover Street at Frankfurist Avenue
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
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
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
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

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

Assessments based upon guidelines established by the current AASHTO publications – *Manual for Bridge Element Inspection* and *Movable Bridge Inspection, Evaluation, and Maintenance Manual*. 
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<td>Replace/Augment with</td>
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<td></td>
<td></td>
<td>“Pedestrian Friendly”</td>
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<td></td>
<td></td>
<td>Period Lighting Standards</td>
<td></td>
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<td>Concrete w/ Steel Rail</td>
<td>Replacement</td>
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<tr>
<td>Floor System</td>
<td>Reinforced Concrete w/ Steel</td>
<td>Replacement</td>
<td>Detailed Inspection</td>
</tr>
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<td></td>
<td>Encased Members</td>
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</tr>
<tr>
<td>Concrete/Steel</td>
<td>Composite Steel Truss with Concrete</td>
<td>General Rehabilitation</td>
<td>• Detailed Inspection</td>
</tr>
<tr>
<td>“Arched” Superstructure</td>
<td></td>
<td></td>
<td>• Non-linear Structural Analysis - Member Capacities</td>
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<td></td>
<td></td>
<td></td>
<td>• In-situ metallurgical Study of Steel Members</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Evaluate Riveted Connections</td>
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Assessments based upon guidelines established by the current AASHTO publication – *Manual for Bridge Element Inspection*
### Arcade North Approach Spans

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<td>Architectural Evaluation of Period Lighting Standards</td>
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<td>Reinforced Concrete</td>
<td>Replacement</td>
<td>N/A</td>
</tr>
</tbody>
</table>
| **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
Intersection safety is critical to intermodal connectivity

Barriers to Multimodal Safety, Connectivity, and Accessibility
Pedestrians feel unprotected

Crosswalks not adequately visible

Barriers to Multimodal Safety, Connectivity, and Accessibility
Barriers to Multimodal Safety, Connectivity, and Accessibility

Crosswalks not adequately visible

Free right turn can create conflicts between pedestrians and truck traffic

Signage not supporting pedestrian safety, comfort or convenience
Unmet demand for pedestrian facilities

Street lighting designed for vehicles rather than pedestrians

Barriers to Multimodal Safety, Connectivity, and Accessibility
Narrow, unprotected sidewalk space creates intimidating situation for pedestrians.

Lack of accessible crossing at bascule span creates barrier for bicyclists.

Insufficient bicycle facilities and high-speed traffic can create intimidating condition for bicyclists.

Lack of pedestrian scaled lighting reduces perceived safety.

Narrow, unprotected sidewalk space creates intimidating situation for pedestrians.

Barriers to Multimodal Safety, Connectivity, and Accessibility
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)
Multimodal desire lines are the paths that travelers desire to use to move between various destinations, regardless of transportation mode.
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?