PURPOSE OF PRESENTATION

• MDTA Background and Capital Program
• Discuss basic bridge facts
• To highlight the progress that has been made in advancing the program to replace the Governor Nice Bridge
• To discuss the proposed approach (the “framework”) for the selection of a project delivery method and the development of the financial and project management plans
• Although exact timing remains TBD, and will be driven by the final decision on the funding and delivery method, the assumed time frame for the start of construction is between 2020 and 2025
MDTA

- Established in 1971
- Purpose
  - Construct, manage, operate, and improve toll facilities
- Funded by toll revenues, not tax dollars
- Headquarters - Point Breeze Office Complex, Baltimore
- 9 Facilities
  - Bay Bridge
  - Baltimore Harbor Tunnel
  - Key Bridge
  - Fort McHenry Tunnel
  - Hatem Bridge
  - Intercounty Connector
  - John F. Kennedy Highway
  - Nice Bridge
  - Point Breeze
- Heavy Reliance on A/E Firms
MDTA Facilities

- Toll facilities consist of high-volume signature bridges, tunnels and highways that are major interstate and U.S. routes.

* Note: the ICC uses All Electronic Tolling (No Toll Plazas)
## Maryland Transportation Authority

### 6-Year Planned Budget

- **($Millions)**

<table>
<thead>
<tr>
<th>Years</th>
<th>FY 2014</th>
<th>FY 2015</th>
<th>FY 2016</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>TOTAL</th>
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<tr>
<td>Mega Projects</td>
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<td>$74.5</td>
<td>$12.22</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
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<td>All Other Major Projects</td>
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<td>$157.30</td>
<td>$63.18</td>
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<td>System Preservation and D&amp;E</td>
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<td>$190.00</td>
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<td>$284.50</td>
<td>$273.00</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$527.8</strong></td>
<td><strong>$421.8</strong></td>
<td><strong>$315.8</strong></td>
<td><strong>$364.1</strong></td>
<td><strong>$333.2</strong></td>
<td><strong>$259.7</strong></td>
<td><strong>$2,222.50</strong></td>
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</tbody>
</table>
Capital Planning Six-Year Program

Funding by Phase

($Millions)

- Project Planning, $0
- Design, $179
- Right-of-Way, $25
- Construction, $2,019
- Other, $204.9

Total Capital Program $2.2 Billion
I-95 Improvement Project
Hatem and Tydings Bridge Underwater Repairs
Bay Bridge Paint Projects
Travel Plaza Redevelopment

Maryland House final rendering

Chesapeake House final rendering
Upcoming Significant Capital Projects

- Rehabilitation Suspension Spans - Westbound Bay Bridge
- Rehabilitate Decks of Eastbound Bay Bridge
- Replace Canton Viaduct
- Baltimore Harbor Tunnel Replace Vent Fans
- Replace Deck and Superstructure of Bridge over Patapsco Flats
- Nice Bridge Replacement  
  Subject of this presentation
Nice Bridge History

• Named in 1968 after Maryland Governor Harry W. Nice
• Opened December 15, 1940

Fast Facts

Construction Dates: March 1938 - December 1940

Original Cost: $5 million

Length of entire facility, including bridge and approaches: 2.2 miles

Bridge Length: 1.7 miles of two-lane bridge;

Main span: vertical clearance is 135 feet and 800 feet length

Traffic Volume: 6.8 million vehicles (both directions)
EXISTING BRIDGE FACILITY

---

**Virginia**
- To Dahlgren
- Naval Surface Warfare Center Dahlgren Division

**Maryland**
- Nine Bridge Toll Plaza
- To Newburg
- Bucktown Generation Station

**Potomac River**

**Governor Harry W. Nice Memorial Bridge**
- 1.7 mile long bridge
- 2 lanes, 22-feet wide
- (3.75% approach grades)

**Steel truss arch bridge, opened December 1940**

**Plan scale in feet**

0 1,000 2,000 3,000 4,000 5,000

---

**Bridge dimensions**
- Height: 106.5'
- Width: 480'
- Length: 800' c. to c. of Piers
- MLW: 0.00

**Sources:**
- Truss, Foundations, River Bottom - 1940 Contract Documents
- Clearance Diagrams - War Dep't. Drwgs.

*136.5' actual minimum clearance on existing bridge; 135' minimum proposed for new bridge.*

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Maryland Transportation Authority
EXISTING FACILITY MAINTENANCE

• BRIDGE
  - NB-2371-000-002R – Clean and Paint Structural Steel & Misc. Structural Repairs ($13.4M*)

• FACILITY COMPLEX
  - NB-2646-000-006R – Replace Underground Storage Tanks with Aboveground Storage Tanks ($550K*)
  - NB-2686-000-006 - Replace Roofs of Administration & Maintenance Buildings & Rehab Roof of Metal Storage Building ($448K*)
  - NB-2718-000-006 - Replace Generators at Administration and Maintenance Buildings ($669K*)

*Total Project Costs from FINAL FY ‘14-’19 CTP
PLANNING TASKS COMPLETED

✔ Environmental Assessment (EA) signed by FHWA 7.30.2009

✔ Finding of No Significant Impact (FONSI) signed by FHWA 11.27.2012

✔ In-depth Bridge Inspection and Fatigue Analysis completed (2013)


✔ $56M in advanced funding allocated for Preliminary Engineering & ROW
NEPA TYPICAL SECTIONS

Existing typical section

Alternate 7 Modified typical section

*Traffic Study underway to “Right Size” the bridge
GUIDING PRINCIPLES

Complete the Harry W. Nice Bridge replacement project consistent with:

- The context of MDTA’s statewide program and other future system priorities
- Project Goals and Objectives (see next page)
- Purpose & Need from Finding of No Significant Impact (FONSI)
PROJECT GOALS AND OBJECTIVES

- Continue to maintain the now 70+ year old steel truss bridge in Fair to Satisfactory Condition.
- Undertake all pre-construction activities and eventual construction for the replacement structure and removal of the existing structure in an environmentally sensitive manner and consistent with the approved NEPA documents and applicable permits.
- Design, construct, operate and maintain a cost-effective replacement structure that provides a safe, durable and efficient new Nice Bridge for at least 100 years, under the most financially advantageous toll structure that provides best-value for MDTA and our customers.
Learning from Others

Doug Robb & Ken Butler
Indian River Inlet Bridge, DE

Huey Long Bridge, LA
Steve Spohrer
Audubon Bridge, LA

Suzanne Plezia
Gerald Desmond Bridge, CA

David Capobianco
Tappan Zee Bridge, NY

Tim Conway
Kosciuszko Bridge, NY

Roger Prince
Goethals Bridge, NY

Maryland Transportation Authority
“Lessons Learned” Workshop (Cont’d.)

**Value Adding Examples:**

**Procurement**
- All presenters used a fixed price contract. Suggested to advise the proposers of the project budget, so that the award is based on the scope for the price.

**Cost Estimates**
- Risk assessments should be used to determine appropriate contingencies. Contingencies should be reported in the Financial Plan, and it is appropriate to include a reasonable allowance item in the contract.

**Bridge Types and Aesthetics**
- Cable stay commonly used today for projects with main span lengths 650' to 1,500' (+). The panel believed that cable stay/extradose bridges are most economical type for spans ≥ 500'.

**General Design & Construction**
- Tie the materials acceptance criteria to the corrosion plan, so that the project service life Design assumptions are tied to actual Construction performance.

**Construction**
- Be careful with the provisions for weather delays. The risk allocation needs to be clearly spelled out to prevent claims.
PROJECT DELIVERY OPTIONS

**DBB:**  Design-Bid-Build

**CM/GC:**  Construction Manager/General Contractor

**DB:**  Design-Build

**DBOM:**  Design-Build Operate Maintain

**DBFOM:**  Design-Build-Finance-Operate-and-Maintain
Evaluation of Delivery/Procurement Options

Develop Risk Register
- identify
- assess
- assign

Risk Workshop(s)
(includes Market Soundings)

Financial Analysis
- Public Options
- Private Options

Value for Money Analysis

Select Project Delivery Method
(includes additional risk and delivery method workshops)

Prepare Financial and Project Management Plans

T&R Projections
- toll policy decision (timing)
- existing conditions
- economics, demographics
- traffic models
- T&R projections
- strengths/risks of projections

Cost Estimates
- construction
- O&M
- capital expenditures
- timing escalation

Engineering/Bridge Concepts
- toll policy decision (cash)
- channel clearances
- profile, typical section
- safety, levels of service
PRELIMINARY ENGINEERING TASKS UNDERWAY

1. Comprehensive “due diligence” activities, including:
2. Engineering Concepts and Cost Estimates
3. Traffic/Revenue Study
4. Advance Coordination with Federal/State Agencies (Navy, USCG, and Army Corps of Engineers)
5. Assessment of Project Risks
7. Assessment of Project Delivery Options
8. Financial Plan
9. Project Management Plan
10. Procurement of GEC and PE consultants
**FINANCIAL QUESTIONS TO BE ADDRESSED**

- A Range of public and private Funding Options:

<table>
<thead>
<tr>
<th>Public</th>
<th>Private</th>
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</thead>
<tbody>
<tr>
<td>DBB, DB, CM/GC, DBOM</td>
<td>P3/DBFOM</td>
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<tr>
<td>MDTA Toll Revenue</td>
<td>MDTA Toll Revenue:</td>
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<tr>
<td>- Pay go</td>
<td>- progress/milestone payments</td>
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<tr>
<td>- Bond finance</td>
<td>- deferred (availability) payments repaying:</td>
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<tr>
<td>- Repay TIFIA loan</td>
<td>• PABs</td>
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<tr>
<td>Federal Funds</td>
<td>• Private bank loans</td>
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<td>• TIFIA</td>
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<td>• Private Equity</td>
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</table>

- Operational options will include MDTA Staff vs. Private sector operation and/or maintenance
FINANCIAL QUESTIONS TO BE ADDRESSED CONT’D.

- Two basic Toll Collection System options [affects T&R, O&M, Capital Expenditures, and Cost Estimates]:
  - AET (All Electronic Tolls)
  - ORT (Open Road Tolling + Cash)
- Toll Schedule Structure/Sensitivity Analyses and other factors
ENGINEERING QUESTIONS TO BE ADDRESSED

- Engage USCG regarding Navigational Channel/main span length
- Prescriptive vs. Performance Design Criteria
- Forecast long-term traffic needs and available capacity

- Use Lessons Learned, Market Soundings, and Industry meetings to help inform sizing of construction packages and quality management plan.
The management of project risks, primarily through the assignment (or allocation) of those risks to the party/parties in the best position to manage those risks, is often a key factor in the Project Delivery method decision.

Typically the assuming party has a level of control over factors that affect risks and are positioned to:

- minimize the adverse impacts of the risk on themselves, and
- minimize the adverse impacts of the risk on others

Clearly, MDTA’s decision in regard to selecting a Project Delivery method will have an effect on the assignment of project risks.
NEXT STEPS

• Continue Preliminary Engineering and ROW activities
• Continue Financial and Funding analysis
• Determine Project Delivery Decision (Est. End of CY 2015)
• Develop the Financial and Project Management Plans
Questions?
APPENDIX
**POTENTIAL TIMELINE FOR BRIDGE REPLACEMENT**

*Note:* Assumes Financing Plan is approved, that Full Funding is obtained, and that the existing bridge remains in a state of good repair.

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<tr>
<td>&quot;Due Diligence&quot; Studies (1) and Secure GEC/PEs</td>
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<td>Refine Project Goals &amp; Objectives</td>
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<td>Bridge Concept Refinements/Cost Estimates (2)</td>
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<td>Toll Policy Assumptions/Traffic &amp; Revenue Study (3)</td>
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<td>Identify, Assess, Assign Project Risks/Hold Workshop (3)</td>
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<td>Conduct Market Soundings (Industry Surveys)</td>
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<td>Secure Permits: USGC, MDE, etc.</td>
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<td><strong>Board Decision Delivery Method by Dec. 2015</strong></td>
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Notes:

1. Surveys, Geotech, Utilities, Ordinance Detection/Survey, Right of Way Requirement, etc.
2. Key issues to be addressed include feasible bridge types, bridge aesthetics, clear span over navigational channel (existing bridge provides 800-feet), approach roadway/bridge profile, tolling strategy, bridge typical section (esp. the proposed 95-foot width), utility relocations, and work zones/staging areas.
3. Preliminary findings required prior to decision on delivery method.

Potential activities for MDTA Board involvement

<table>
<thead>
<tr>
<th>DBB or CM/GC</th>
<th>Procure/Design/Award</th>
<th>Construction</th>
<th>Remove Old Br.</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>DB or DBOM</td>
<td>Prel./Procure/Award/Design</td>
<td>Construction</td>
<td>Remove Old Br.</td>
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<tr>
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<tr>
<td>P3/DBFOM</td>
<td>Prel./Procure/Award/Design</td>
<td>Construction</td>
<td>Remove Old Br.</td>
</tr>
</tbody>
</table>

NTP for construction in 50 to 51 months

NTP for construction in 40 to 44 months

NTP for construction in 48 months
# Toll Rates for Nice Bridge

Effective July 1, 2013; collected SB direction only

## Cash/Base & Commercial Rates

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Current Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-axle</td>
<td>$6.00</td>
</tr>
<tr>
<td>3-axle</td>
<td>$12.00</td>
</tr>
<tr>
<td>4-axle</td>
<td>$18.00</td>
</tr>
<tr>
<td>5-axle</td>
<td>$36.00</td>
</tr>
<tr>
<td>6-axle+</td>
<td>$45.00</td>
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</table>

## Maryland E-ZPass Rates

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Current Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuter</td>
<td>$2.10*</td>
</tr>
<tr>
<td>2-axle</td>
<td>$5.40</td>
</tr>
<tr>
<td>3-axle</td>
<td>n/a</td>
</tr>
<tr>
<td>4-axle</td>
<td>n/a</td>
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<tr>
<td>5-axle</td>
<td>n/a</td>
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<tr>
<td>6-axle+</td>
<td>n/a</td>
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</table>

## Video Toll Rates (includes Commercial)

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Current Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-axle</td>
<td>$9.00</td>
</tr>
<tr>
<td>3-axle</td>
<td>$18.00</td>
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<td>4-axle</td>
<td>$27.00</td>
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<tr>
<td>5-axle</td>
<td>$51.00</td>
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<tr>
<td>6-axle+</td>
<td>$60.00</td>
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</table>

## Commuter Discount Plan Breakeven Point

<table>
<thead>
<tr>
<th>Facility</th>
<th>Number of Trips</th>
<th>Per trip Price</th>
<th>Price</th>
<th># of trips to break-even</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nice Bridge</td>
<td>25</td>
<td>$2.10</td>
<td>$52.50</td>
<td>9**</td>
</tr>
</tbody>
</table>

* Commuter discount plans are available for customers with valid E-ZPass Maryland accounts driving two-axle vehicles. Plans for the Bay and Nice bridges are $52.50 and offer 25 trips. Plans end after 45 days or when all of the trips are used, whichever comes first.

** Based on cash/base toll; the break-even point based on the Maryland E-ZPass two-axle toll is 10 trips.
DBB: Design-Bid-Build

DBB has been the traditional project delivery method for MDTA, wherein MDTA manages the sequential design, procurement, construction, and operations/maintenance of their projects. MDTA contracts with an engineering firm to prepare the engineering criteria, plans and specifications that fully define the project. MDTA (and their engineer) also develop construction cost estimates using the design plans and historical construction costs.

For the Nice Bridge, and assuming multiple contract packages focusing on the various types of work (for example: reconstruction of the campus, etc.), MDTA would award the contract(s) to the lowest responsive and responsible bidder(s). MDTA would provide robust QC during construction.

MDTA may elect to perform the operations/maintenance (O/M) with its own forces after the warranty period ends for the contract(s), or may elect to contract for some or all of the O/M work.

In MD, successfully used on: Woodrow Wilson Bridge and I-95 ETL

(Also, VDOT/MDOT have contracted O&M services under a “TAMS” contract to a private party: DBi Services, LLC)
CM/GC: Construction Manager/General Contractor

Also called the Construction Manager at-Risk (CMR) method by some states, the CM/GC would allow MDTA to engage a construction manager concurrent with the design process in order to provide constructability input throughout the design phase. The Construction Manager is typically selected on the basis of qualifications, past experience or a best-value basis. During the design phase, the construction manager would provide input regarding scheduling, pricing, phasing and other input that would help the owner design a more constructible project.

At approximately 60% to 90% design completion, the owner and the construction manager would negotiate a ‘guaranteed maximum price’ for the construction of the project based on the defined scope and schedule. If this price is acceptable to both parties, they execute a contract for construction services, and the construction manager would become the general contractor.

The FHWA does not presently have regulations concerning CMR. If Federal funds are used, State DOTs must request FHWA approval to use CM/GC under SEP-14.
DB: Design-Build

MDTA would place responsibility for design and construction of the project into a single contract. MDTA would define the project requirements (often at the 30% complete design plan phase), along with design criteria and performance specifications.

The procurement process is typically a two-step process: A Request for Qualifications (RFQ) typically results in 3 to 5 teams being shortlisted. The shortlisted teams then submit proposals based on Draft/Final Request for Proposals (RFP). Proposals are evaluated on a combination of technical and price factors and awarded (using the best value approach) to the team that best meets the RFP criteria. The owner retains innovative concepts from the RFP phase that may be incorporated by the awarded DB team.

Upon award of the contract, the DB team would complete the project design, obtain any remaining permits, and construct the project in accordance with the contract requirements. MDTA would provide Quality Assurance Oversight, with QC and QA by the DB Team. Upon completion, MDTA may elect to perform the operations / maintenance with its own forces, or may elect to contract for some or all of the work, after the warranty period ends for the contract(s). QA/QC is often supplemented by consulting independent out of state contractors.

In MD, successfully used on: InterCounty Connector   [although greater reliance on owner QC and QA seems in order]
DBOM: Design-Build Operate Maintain

The DBOM method combines the design and construction responsibilities of the DB method with performance-based operations and maintenance contracting for a specified period of time, often 10 to 15 years (or longer). The DBOM signatory (referred to as a concessionaire) would contract with MDTA for various project elements, but would maintain overall accountability to MDTA for performance of the contract.
P3: Public-Private Partnership (P3)/Design-Build-Finance-Operate-and-Maintain (DBFOM)

MDTA could add full or partial project financing to the responsibilities of the P3 team. P3 contracts are typically 30+ years in length. Because the private partner assumes responsibility for financing at least a portion of the project, the types of private companies that are typically responsive bidders on P3/DBFOM are multi-faceted concessionaires who create large teams to deliver the Project throughout the entire length of the contract.

Contract negotiation and award is typically the lengthiest of the delivery methods. Similar to DBOM, MDTA would provide quality assurance oversight for the design and construction process. DBFOM brings additional oversight by equity and debt providers to protect their investments and expected rate of return. Due to the length of the concession, P3 teams are particularly cognizant of life-cycle costs during design and construction. Because numerous financial factors are considered in the RFP evaluation, the most technically capable and/or lowest cost team may not be considered the best-value.

In Progress: The MTA is currently engaged in a P3 procurement for the $2B+ Purple Line LRT project in Prince George’s and Montgomery counties. Six (6) teams submitted Statement of Qualification (SOQ) in late 2013; four (4) were shortlisted in early 2014.