Owner's Forum
March 2015 Update

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massDOT
Massachusetts Department of Transportation
Highway Division
Improving Public Trust

- **Program/Project Controls Unit**
  - HQ – Development & Implementation
  - District Offices - Monitoring
  - Transitioned into *Office of Project Controls & Performance Oversight*
  - Geared toward *Process Improvement*
  - Performance Scorecard
  - Program & Project Budget/Funding Controls
  - IT System Enhancements
Rising Costs

Higher customer demand for better and safer roads

Highly constrained funds to
  - Take care of aging infrastructure
  - Plan and Manage for the long term

Increasing demands from local, state and federal governments for State of Good Repair (SGR) mandate
PROJECTED SPENDING

- 2016: $0.00
- 2017: $500,000,000.00
- 2018: $1,000,000,000.00
- 2019: $1,500,000,000.00
- 2020: $2,000,000,000.00

Legend:
- TOBIN
- WT
- MHS
- STATE
- ABP
- FA
1. Transportation Asset Management Plan (TAMP)*

- A summary listing of the pavement and bridge assets on the National Highway System in the State, including a description of the condition of those assets
- Asset management objectives and measures
- Performance gap identification
- Life cycle cost and risk management analysis
- A financial plan
- Investment strategies
Asset management

2. Performance measures related to asset management
   - Safety
   - Infrastructure Condition
   - Congestion Reduction
   - System Reliability
   - Freight Movement and Economic Vitality
   - Environmental Sustainability

3. Minimum condition thresholds for each asset class – pavement, bridge and beyond
The 2009 Massachusetts Transportation Act defines Public-Private Agreements as:

- “A contract between a private entity and the Department that relates to the development, financing, maintenance or operation of a transportation facility.”

The market defines a Public-Private Partnerships (P3) as:

- A contractual arrangement between a public agency and a private sector entity to design, build, finance, operate and/or maintain a project. The contract allows the private sector to earn an appropriate risk-adjusted return on their investment and is structured to meet public needs by:
  - Optimizing the skills and resources of each party (both public and private);
  - Allocating the risks in the delivery of the service and/or facility to the parties best able to manage them.

The P3 spectrum includes:

- **<15 years contracts**
  - Operating and Maintenance contract
- **15 – 50 years contracts**
  - Includes arrangements such as Concession, DBF, DBFOM, DBFM
- **50+**
  - Monetization

Public sector → Risk transfer to private sector → Private sector
<table>
<thead>
<tr>
<th>Terms</th>
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</thead>
<tbody>
<tr>
<td>Brownfield Project – Project involving an acquisition of an existing operational asset.</td>
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<tr>
<td>Greenfield Project – Project involving the development of a new asset.</td>
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<tr>
<td>Concession – The contractual arrangement between the public and private sector.</td>
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<td>Risk Transfer – Allocating the risks to the parties best able to manage them.</td>
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<td>Special Purpose Vehicle (SPV) – A standalone legal entity that develops and operates the project.</td>
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<td>Availability Payments – A performance based-payment used to compensate the private sector.</td>
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<td>Milestone Payments – A payment mechanism linked to the full or partial delivery of a project.</td>
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<td>Value for Money – A best-value approach to delivering a project which accounts for its whole-life costs.</td>
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<tr>
<td>Whole Life Costing – Total cost of owning an asset over its entire asset life (construction, operations, financing, and life-cycle)</td>
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<tr>
<td>Handback Requirements – Requirement that an asset must be turned over to the public at the end of a P3 agreement.</td>
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</table>
## MassDOT Traditional Delivery Method

<table>
<thead>
<tr>
<th>Delivery Model</th>
<th>Design</th>
<th>Construction</th>
<th>Operations/Maintenance</th>
<th>Financing</th>
<th>Ridership/traffic</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design-Bid-Build</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>○</td>
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<tr>
<td>Design-Build</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Design-Build-Operate-Maintain</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Design-Build-Finance-Operate-Maintain (Availability Payment)</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Design-Build-Finance-Operate-Maintain (Real User Fee)</td>
<td>●</td>
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</tbody>
</table>

- ○ - Risk retained by Public Sector
- ● - Risk transferred to Private Sector
Training, Engagement & Outreach

March 11 & 12, DCU Center, Worcester

www.massdotinnovation.com
Internal Systems Improvements

Welcome to the Contract Management System

- Create New Construction Contract
- Search Contracts
- Create Other Contract Type
- Reporting Center
- Prequalified Construction Contractors
- Help
Training, Engagement & Outreach

Controls Guidelines

- Construction Contract Time Determination
- Attachment A: Important Work Restraint
- Attachments B & C: Normal Work Shift
- Attachment D: Example 8:00 ‘Limitated’
- Attachment E: Incentive/Disincentive
  - Example of Incentives for High Pct.

Automated Process - Online

- Task Based Work Flows
- Procedures
- Forms & Letters
- Schedules
- Specifications
Demonstrating Benefits

BROADWAY OVER INDIAN HEAD RIVER
HANOVER/HANSON

Applied Innovation
- Value Engineering Change Proposal (VECP)
- Precast bridge structural elements
- Full road closure (eliminating phasing)
- Contractor incentives/disincentives

Results
- Reduced impact to traffic by 18 months.
- Cost avoidance of $303K

TIME SAVINGS: 19 months

PLEASANT STREET BRIDGE
GRAFTON

Applied Innovation
- Design-build delivery
- Water diversion structure foundation
- Precast bridge structural elements
- Contractor incentives/disincentives

Results
- Open to traffic 64 days early
- Cost avoidance of $509K

TIME SAVINGS: 13 months

ROUTE 2 OVER ROUTE 2A
PHILLIPSTON

Applied Innovation
- Design-build delivery
- Heavy lift technology (using SPMT)
- Contractor incentives/disincentives

Results
- Reduced impact to traffic by 14 months.
- Cost avoidance of $2.5M (inc. road users benefit)

TIME SAVINGS: 14 months

HIGH STREET HILL OVER WESTFIELD BROOK
WINDSOR

Applied Innovation
- Precast arch
- Contractor incentives/disincentives

Results
- Open to traffic within one construction season
- Cost avoidance of $75K

TIME SAVINGS: 3 months

ROUTE 1A OVER THE PARKER RIVER
NEWBURY

Applied Innovation
- Encouraged contractor efficiency
- Approved roadway closure after bid opening
- Eliminated pedestrian bridge

Results
- Cost avoidance of $1.2M

TIME SAVINGS: 17 months

ROUTE 28
METHUEN

Applied Innovation
- Encouraged contractor efficiency
- Approved roadway closure after bid opening

Results
- Cost avoidance of $590K

TIME SAVINGS: 12 months
ABP-ELIGIBLE STRUCTURALLY DEFICIENT BRIDGE STATUS

PROGRAM GOAL

STRUCTURALLY DEFICIENT BRIDGE PROJECTION WITHOUT ABP FUNDING

PROGRAM INCEPTION

STRUCTURALLY DEFICIENT ABP-ELIGIBLE BRIDGES


419  511  543  697
Challenges

- Culture Change
- Coordinate Training of Hundreds of Employees
- Acceptance by Massachusetts Trade Organizations
- Enhancement of Third-Party Coordination
- Reporting of data collected from multiple systems
- Flexibility & Control to Add/Remove Projects from Program
The Future

- **Asset management**
  - MAP21
  - State legislation

- **Expansion of Project Controls**

- **Succession Planning**
  - Fellows program
  - Assistant Schedulers
  - Extensive Training

- **Certified Construction Manager**
  - CE-6 Grade
  - Parallel P.E. Track

- **Momentum**
  - Continuing ‘Roll-out’ to all of Highway Outreach and training with Designers
  - Performance management
OVERALL MASSDOT HWY ON-TIME COMPLETIONS

Late Completion %  On-Time Completion %

2005: 65% (35%)  2013: 32% (65%)
2006: 74% (26%)  2014: 33% (67%)
2007: 84% (16%)  2009: 57% (43%)
2008: 87% (13%)  2010: 32% (68%)
2009: 57% (43%)  2011: 22% (78%)
2010: 32% (68%)  2012: 32% (68%)
2011: 22% (78%)  2013: 35% (65%)
2012: 32% (68%)  2014: 33% (67%)

Avg 22.5%  Avg 64.8%