Project Management Challenges and Opportunities

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Virginia Department of Transportation

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Topics

- Virginia Department of Transportation
- Challenges
- Project Management Culture
- Best Practices - NCHRP 20-68A, US Domestic Scan Program, Scan 07-01
- Opportunities
VDOT Mission

Plan, deliver, operate and maintain a transportation system that is safe, enables easy movement of people and goods, enhances the economy and improves quality of life.
VDOT Shared Values in Public Service

• Be responsive to customer needs, consider what VDOT does in terms of how it benefits our customers, and treat customers with respect, courtesy, and fairness

• Commit to safety and continuous improvement in everything we do, learning from mistakes and successes alike
VDOT Shared Values in Public Service

- Trust, respect, support, and encourage each other
- Respect and protect the public investment
- Make decisions based on facts and sound judgment and accept accountability for our actions
VDOT Shared Values in Public Service

• Strengthen our expertise in using information, tools, and technology to achieve high performance and stay on the cutting edge

• Think ahead, acting and planning creatively for today and tomorrow
VDOT Construction Districts
About VDOT

- Responsible for maintaining 3rd largest state-owned road system in US
- 58,000 miles of state maintained roadway system
About VDOT

- 20,914 Structures
  - 19,380 (93%) Maintained by VDOT
  - 1534 (7%) Maintained by Localities
- 2 Mountain Tunnels
- 4 Underwater Crossings
- 3 Toll Roads & 1 Toll Bridge
- 4 Ferry Services
- 41 Rest Areas
- 107 Commuter Parking Lots
About VDOT

- FY 2011 annual budget is $3.32 billion
  - 6.5% Administrative and Support Services program budget
- 58% of the supporting revenues are from State sources
- Federal revenues represent 27% of funding
- Remaining 15% are from other sources such as bonds and local revenues
- $1.7 billion (50%) is allocated to maintenance and operations
- $1 billion (30%) is allocated to construction
About VDOT

• $4.2 billion current operating budget

• Includes carryover of prior year maintenance balances, ARRA Projects, new federal grants, bonus obligation authority and other miscellaneous adjustments
Challenges

- VDOT’s FY 2011 Transportation Revenues

[Bar chart showing transportation revenues by source.]
Challenges

• Current environment requires rigorous planning and increasing efficiency…
  – Aging infrastructure
  – Financial constraints and long term financial uncertainty
  – Increased population and congestion
  – Community involvement and stakeholder expectations for more, cheaper, better and faster project delivery
Challenges

• …While maintaining strong engineering and technical expertise
  – “Graying” DOT workforce
  – Environmental sensitivity
  – Complexities in state, federal and environmental policies
  – DOT must be nimble, flexible and anticipate/plan for change
Challenges

VDOT FTE Strength at 6,862
1000 Employees eligible to retire
Project Management Culture

- Project Management philosophy to project development
- Matrix and Projectized organization
- Program delivery and Project Management decentralized to Districts
Project Management Culture

• Central Office supports Districts and
  – Develops statewide policy
  – Manages statewide programs
  – Provides specialized technical expertise
Project Management Culture

• Matrix organizational structure
• Dedicated PMs in District Project Management Office (PMO)
  – focus on project management exclusively
  – responsible for most complex projects
• Dual-Hat PMs sign and seal plans and manage projects
Project Management Culture

• Projectized organizational structure
• Program Directors
  – Responsible for Major projects (multi-$Billion budgets - Woodrow Wilson Bridge)
  – Senior Project Managers
  – Highest levels of authority
  – Dedicated project teams
Project Management Culture

- Visionary leaders
- Proud history of technical excellence and engineering expertise
- Strong project management focus
Project Management Culture

• Project Manager
  – Has overall responsibility for guiding the project through the process and is the person who either “accomplishes the task” or “ensures others accomplish the task” necessary for successful project delivery
Project Management Culture

• Project Manager is responsible for
  – Project scope
  – Schedule
  – Budget
  – Quality and performance
  – Resources
  – Communications and stakeholder relationships
Project Management Culture

- Project Manager roles
  - Serve as single point of contact
  - Assemble and direct team
  - Represent DOT at public meetings
  - Resolve project issues
  - Monitor performance and development
  - Integrate deliverables and coordinate flow of information
Best Practices

- NCHRP 20-68A, US Domestic Scan Program, Scan 07-01
- First-ever Domestic Scan
- Focused on best practices in project delivery management
Best Practices

• Scan Team Members
  – James C. McMinimee, P.E., Utah DOT-AASHTO Co-Chair
  – Shari Schaftlein, FHWA-FHWA Co-Chair
  – Thomas R. Warne, P.E., Subject Matter Expert
  – Sidonia S. Detmer, PMP, Virginia DOT
  – Mark C. Lester, P.E., South Carolina DOT
  – Gerard F. Mroczka, P.E., Indiana DOT
  – David B. Nichols, P.E., Missouri DOT
  – Joyce N. Taylor, P.E., Maine DOT
  – Alan T. Teikari, P.E., FHWA
  – Connie Yew, P.E., FHWA
Best Practices
Best Practices

• Aggregated 10 topics into this scan
• Narrowed project management into four focus areas
• Sought practices that had measurable results
• Sought practices that resulted in on-time and on-budget performance
Best Practices

- Four focus areas
  - Project Management
  - Performance Measures
  - Contracting Practices
  - Community Involvement
Best Practices

- Agencies visited
  - Virginia Department of Transportation
  - Florida Department of Transportation
  - Missouri Department of Transportation
  - Arizona Department of Transportation
  - City of Phoenix
  - Washington Department of Transportation
  - Utah Department of Transportation
Best Practices
Best Practices

- Project Management major categories
  - Project Management Structure
  - Risk Management
  - Use of Consultants
  - Investment in GIS and data management tools for project delivery
  - Maintaining Core Competencies
Best Practices

• Project Management Structure
  – Well-defined roles and responsibilities
  – Centralized and decentralized models
  – Good “hand offs” during the process
  – Accountability for performance
  – States provide training, certification not required
Best Practices

- Risk Management
  - Addressing NEPA prior to STIP inclusion
  - Washington’s Cost Estimate Validation Process (CEVP)
  - Contracting methods chosen to reduce risk (e.g. DB, CMGC, CM at R)
  - Missouri’s Radical Cost Control Program
Best Practices

• Use of Consultants
  – Levels ranged from 25 to over 80%
  – Utah’s streamlined selection process
  – Where high use was noted—evaluation systems were in place
Best Practices

• GIS and Data Management Systems
  – States leveraged GIS and data to expedite and improve project delivery
  – Utah’s ePM resource scheduling budgeting system
  – Florida’s ETDM program improves permitting and relationships
Best Practices
Best Practices

• Maintaining Core Competencies
  – Universal Concern
  – Trend toward more consultant use
  – No Observed Best Practice
Best Practices

• Performance Measurement Systems
  – What gets measured gets done
  – Ease of use both internally and externally were key
  – Transparency was most evident in Missouri, Virginia and Washington
  – UDOT’s ePM reduced duplicative data entry to support their system
Best Practices

• Performance Measurement Systems
Best Practices

• VDOT’s Dashboard attributes
  – Ease of use and public transparency
  – Demands accountability for performance
  – Manage the projects not the data
  – Defining the business rules is critical
  – “Real time” updates of information
  – Every “dial” has a champion
Best Practices

- Contracting Practices
  - States had extensive experience with innovative delivery tools
  - Each agency used the tools available (e.g. CMGC, DB, CM at R) based on legislative authority
  - Agencies cited fewer claims, better cost control, improved schedules when using these practices
Best Practices

• Early and continuous community involvement
  – Brand management can be done at the agency or corridor level
  – WSDOT tells the news whether good or bad
  – Formal and informal public surveys are used—Utah has years of data available
Best Practices

• Early and continuous community involvement
  – NEPA was recognized as necessary, and States found ways to leverage the process
  – Good planning and effective integration of public involvement with STIP/TIP processes
  – PMs who work directly with third parties and public were more effective
Best Practices

• External relationships are important
  – States worked hard to cultivate and honor external relationships
  – Florida’s ETDM initiative integrates stakeholders and resource agencies
  – WSDOT’s MAP Team co-locates resource agencies and agency personnel for more efficient decision-making
Best Practices

We, the Washington State Departments of Ecology, Fish and Wildlife, Transportation, the United States Army Corps of Engineers, and King County do believe that by working together, in the same location on the same projects, permit and regulatory decision-making for state transportation projects will be improved for all.

Accordingly, we commit to launching this first Multi-Agency Permitting Team (MAP Team) at the Department of Ecology’s Northwest Regional Office on this 14th day of October, 2003; and, in so doing, further commit to empowering this first MAP Team with the responsibility to uphold and embrace the public call for:

- Governmental cooperation, collaboration, creativity, and team work;
- Streamlined permitting and regulatory decision-making;
- Effective environmental protection and impact mitigation; and
- Efficient delivery of transportation improvement projects that balance and are accountable to community, economic, and environmental values.

With our signatures, we enthusiastically declare "open for business" this first MAP Team, pledge our full support, and commit to continuing to work together to achieve the transportation and environmental protection goals that are vitally important to all citizens of the State of Washington.

Doug MacDonald, Secretary, Washington State Department of Transportation 10/14/03
Linda Hoffman, Interim-Director, Washington State Department of Ecology 10/14/03
Jeff Koehn, Director, Washington State Department of Fish and Wildlife 10/14/03
Col. Debra M. Lewis, District Engineer, Seattle District, U.S. Army Corps of Engineers 10/5/04
Stephanie Warden, Director, King County Department of Development and Environmental Services 10/3—04
Opportunities - VDOT’s Dashboard
### Project Delivery

**On Time: 72%**  
(FY2011 Target: 75%)

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**On Budget: 90%**  
(FY2011 Target: 85%)

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<tr>
<td>Total</td>
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### Environmental Compliance

Cumulative Statewide Average: 99.9%

### Contracts Evaluated for On Time Status

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Opportunities

- Strategies for Creating and Sustaining Success
  - Operate in the open
    ...let the public in, create public trust
  - Measure and communicate performance
  - Create public expectations
    ...then it’s hard to go back
  - Create sustainable success
    ...to last beyond the next administration
Opportunities

- VDOT’s Quarterly Report Card
- Accountability through Transparency
Opportunities

VDOT On-Budget and On-Time Performance

- On-Budget
- On-Time
FYE 2005 Construction Contracts - Completed

Time - Budget Graph
(Original Due Date by June 30, 2005 - Dashboard data as of 05/13/08)

200%

Contracts with Final Vouchers Paid in FY02

Time - Budget Graph
FY02 FY05

150%

100%

50%

0%

Percent of Scheduled Time Used

50% 100% 150% 200% 250% 300% 350%

Percent of Contract Award Paid

FYE 2008 Construction Contracts - Completed

Time - Budget Graph
(FY08 FY08 FY10)

Percent of Scheduled Time Used

0% 50% 100% 150% 200% 250% 300% 350%

Percent of Contract Award Paid

FY 2010 Construction Contracts - Completed & Active

Time - Budget Graph
(FY 2010 Completed Contracts
FY 2010 Active Contracts)

Percent of Scheduled Time Used

0% 50% 100% 150% 200% 250% 300% 350%
Opportunities
Critical PM Skills

- Lead and inspire
- Excellent communicator
- Thrive amidst ambiguity
- Prioritize
- Build effective teams
- Motivate
- Address issues

- Plan
- Resolve conflict
- Make timely decisions
- Inform stakeholders
- Manage processes
- Integrate deliverables
Opportunities

• Project Management Office (PMO)
  – Small highly skilled unit provides Department focus on project management
  – Committed to supporting Project Managers
    • Defining agency PM policy and procedures
    • Implementing PM tools and techniques
    • Ensuring delivery of relevant PM training
Opportunities

- Project Management Policy establishes expectations
  - Commissioner’s Department Policy Memorandum outlines roles and responsibilities for Executive Team, Districts, Divisions, Project Manager and Project Team
  - Chief Engineer’s PM Policy provides framework for consistent application in development and delivery of all transportation projects
Opportunities

- PM Policy defines different categories of projects
Opportunities

• Category I Projects
  – Low complexity and schedule risk
  – Simple low risk rehab projects
  – Minor drainage improvements
  – Simple widening projects
  – Overlays on major corridors
  – Short duration, straightforward operations
  – Familiar work, favorable conditions
Opportunities

• Category II Projects
  – Low to medium complexity and schedule risk
  – Intersection improvements
  – Minor reconstruction projects
  – Major drainage improvements
  – Turning lane addition
  – Single season projects
  – Familiar work, typical conditions
  – Limited number of concurrent operations
Opportunities

• Category III Projects
  – Medium complexity and schedule risk
  – New bridge (1-3 spans) construction
  – Major reconstruction/realignment
  – New roadway construction
  – Major intersection improvements
  – Multi-season projects
  – Multiple concurrent operations and work paths
Opportunities

- Category IV Projects
  - High complexity and schedule risk
  - Multiple bridges, roadways, ramps
  - Large very complex projects
  - Major traffic impacts
  - Several major subcontractors
  - Challenging work and conditions
Opportunities

- Category V Projects
  - Construction program projects (Mega-projects)
  - Major projects, challenging conditions
  - Typically combinations of Cat. III & IV projects
  - Woodrow Wilson Bridge
  - Springfield Interchange
Opportunities

• PM Policy includes Project Manager actions (Required and those to Consider)

<table>
<thead>
<tr>
<th>Project Management Procedures and Checklists</th>
<th>Project Category</th>
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<td>Project Scope and Team Meeting</td>
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<td>Project Development Schedules</td>
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<td>Project Development Budget/Estimates</td>
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<td>C    C    R     R     R</td>
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<tr>
<td>Pre-Advertisement Conference</td>
<td>C    R    R     R     R</td>
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</table>
Opportunities

- Consistent application of PM contributes to more efficient delivery of program and improved predictability
- Framework for integrating PM tools and techniques for efficient program delivery
- Project Manager’s ability to “think” and tailor process to specific project has major impact on project schedule and budget
Opportunities

• PM Tools – MS Project in design
Opportunities

- PM Tools – Primavera P6 in construction
Opportunities

- Transportation Project Management Institute (TPMI)
  - Established in 2009
- Partnership between VDOT, University of Virginia (UVA) and Virginia Transportation Construction Alliance (VTCA)
Opportunities

• TPMI
  – Industry and DOT Project Managers
  – Residential, 2-week program designed to develop professionals to lead the development and delivery of transportation projects.
Opportunities

• TPMI
  – Provide hands-on experience in relevant transportation project management issues/challenges through a case study
  – Solidify project management knowledge and skills through lectures/discussions with experienced faculty from academia, government, and industry
  – Build communities of project managers
Opportunities

- TPMI Team Focus
Opportunities

- TPMI - The program schedule was aggressive and the expectations of the participants high as it should be if this is our future as an organization. One doesn’t know what they are capable of until they are pushed to their limits and this program accomplished that goal. By pushing everyone to peak performance, bonds were formed between the participants that would not have been formed otherwise. This process pushed everyone outside of their comfort zone and required them to engage fully in the institute and to separate from their normal work activities back at the office.
Dr. Kerzner’s 16 Points to Project Management Maturity

1. Adopt a project management methodology and use it consistently.
2. Implement a philosophy that drives the company toward project management maturity and communicate it to everyone.
3. Commit to developing effective plans at the beginning of each project.
4. Minimize scope changes by committing to realistic objectives.
5. Recognize that cost and schedule management are inseparable.
Dr. Kerzner’s 16 Points to Project Management Maturity

6. Select the right person as the project manager.

7. Provide executives with project sponsor information, not project management information.

8. Strengthen involvement and support of line management.

9. Focus on deliverables rather than resources.

10. Cultivate effective communication, cooperation, and trust to achieve rapid project management maturity.

11. Share recognition for project success with the entire project team and line management.
Dr. Kerzner’s 16 Points to Project Management Maturity

12. Eliminate nonproductive meetings.
13. Focus on identifying and solving problems early, quickly, and cost effectively.
14. Measure progress periodically.
15. Use project management software as a tool – not as a substitute for effective planning or interpersonal skills.
16. Institute an all-employee training program with periodic updates based upon documented lessons learned.
Woodrow Wilson Bridge
Woodrow Wilson Bridge
Opportunities

• Many great leaders were Project Managers

• Project Management is
  – Leadership
  – Exciting
  – Rewarding
  – Integral to efficient development and delivery
Questions

• What contributes to Virginia being responsible for the 3rd largest state owned road system in US?

• What is the difference between Category IV and Category V projects?

• What makes Virginia’s Transportation Project Management Institute unique?

• Where does Virginia spend the majority of its funding?

• What tool does Virginia DOT utilize to track and communicate project status to the public?

• What Scheduling tools are used in Virginia DOT?
Questions with Answers

• What contributes to Virginia being responsible for the 3rd largest state owned road system in US?
  – Secondary system (48K+ miles)

• What is the difference between Category IV and Category V projects?
  – Cat V projects are considered to be Major or mega-projects that include combinations of Cat IV and III projects

• What makes Virginia’s Transportation Project Management Institute unique?
  – Participation from Industry and DOT Project Managers and a transportation-focused case study work
Questions with Answers

• Where does Virginia spend the majority of its funding?
  – Maintenance and operations 50%

• What tool does Virginia DOT utilize to track and communicate project status to the public?
  – Virginia DOT Dashboard

• What Scheduling tools are used in Virginia DOT?
  – MS Project and Primavera P6