

AMERICAN SOCIETY OF HIGHWAY ENGINEERS
Greater Hampton Roads Chapter

VDOT Smart Scale Dashboard

Jay Styles

Andrew Cadmus



ON TIME



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DEVELOPMENT



DELIVERY



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\$ ON BUDGET



01 Background & Smart Scale

02 Business Rules & Analytics

03 Web-App Demo

04 Web-App Development

05 Results

01

Background & Smart Scale

Smart Scale Dashboard

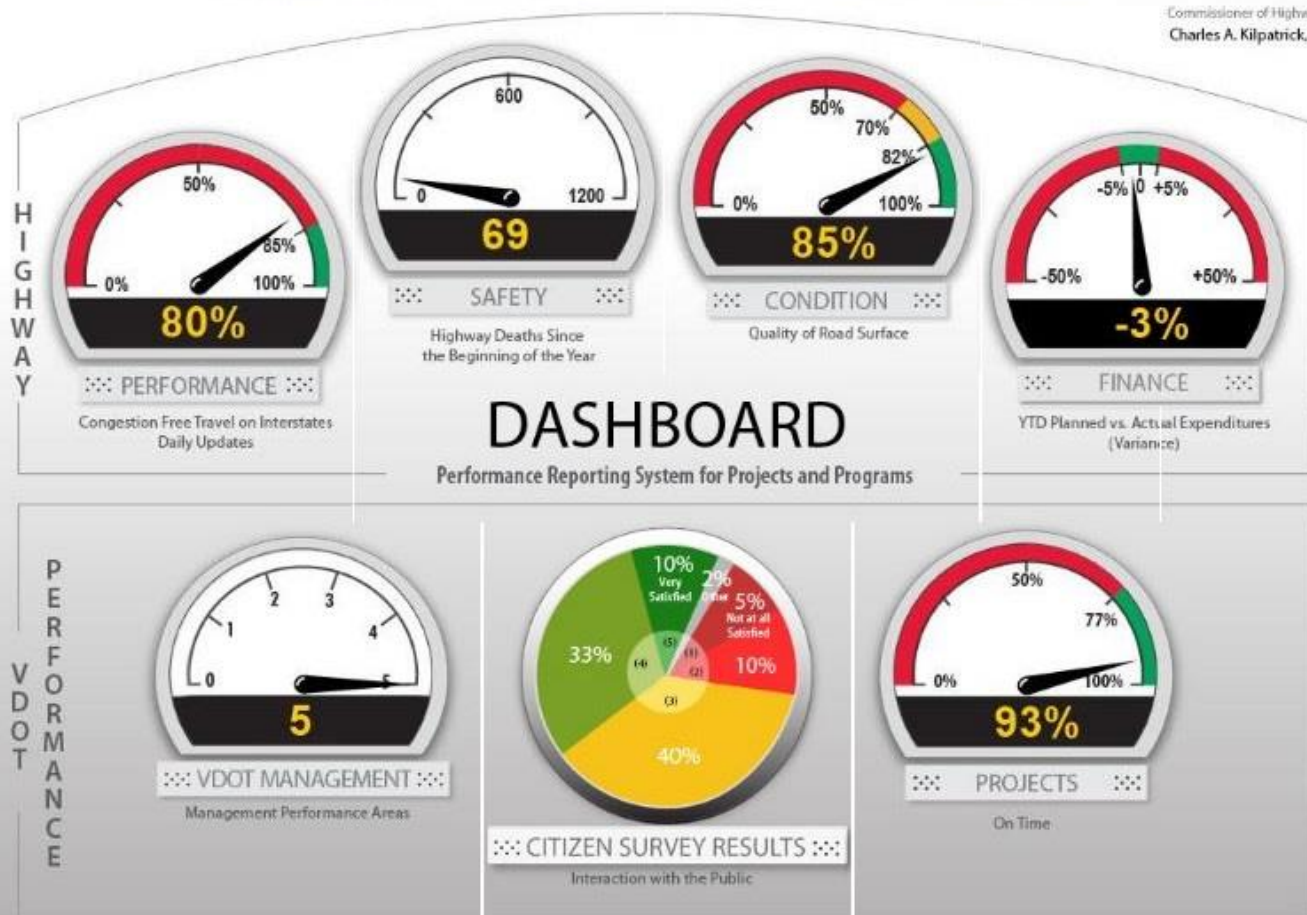
- State Legislature passed House Bill 2
- Selects projects based on objective data
- Fully funds selected projects
- Eliminates the phase by phase funding



**SMART
SCALE**

*Funding the Right
Transportation Projects
in Virginia*

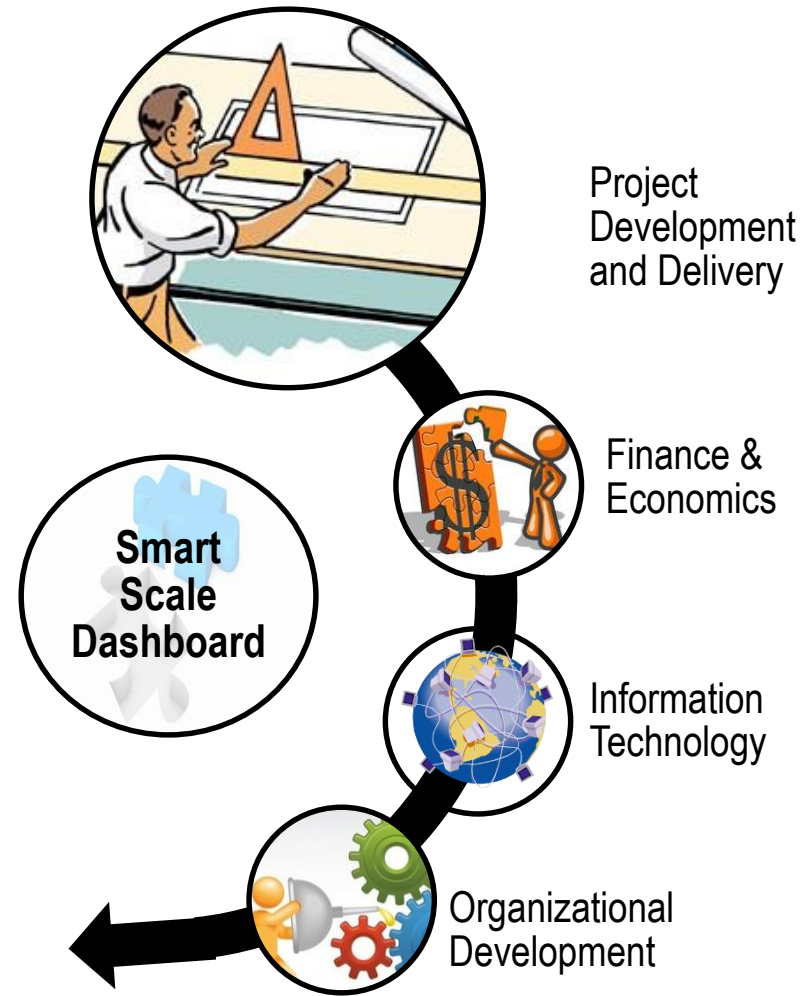
VDOT's Current Statewide Dashboard



- One of the first public transport dashboards touting:
 - Transparency
 - Accountability
 - Performance
- Limitations
 - Internal Controls
 - Built-in Exceptions
 - Lagging Metrics

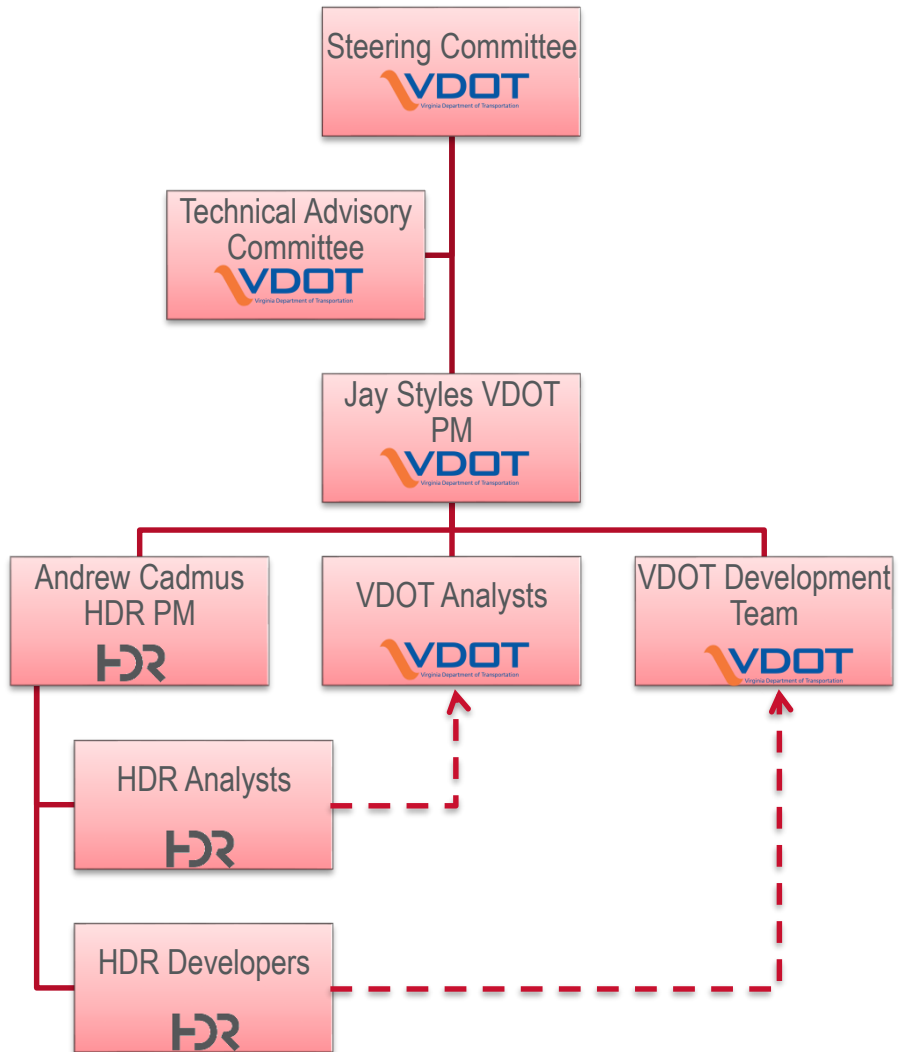
A Unique Team for a Unique Project

- This was not an IT project
 - Required intimate knowledge of VDOT business practices
 - Project controls for design and construction
 - Relationships with VDOT PMs
- Involved variety of disciplines:
 - Project Management & Delivery Expertise,
 - Data Analytics,
 - Web Developers,
 - User Design Specialists,
 - Database Experts



Our Team

- Steering Committee
 - VDOT Executive Leadership
 - Provided overall direction and approvals
- Technical Committee
 - VDOT Technical experts in processes and procedures
 - Facilitated management and project manager buy-in
- Analysts
 - Developed enhancements to business rules
 - Quantified impacts
- Developers
 - VDOT database developers
 - HDR web-app developers and user design specialists



02

Business Rules & Analytics

Business Rule Development

- Evaluated existing dashboard
- Met with key stakeholders
- Findings:
 - Performance measured ONLY at the end
 - Need for leading indicators (early start/finish)
 - Schedule baselining inconsistent
 - Need to be mindful of VDOT culture

Development:

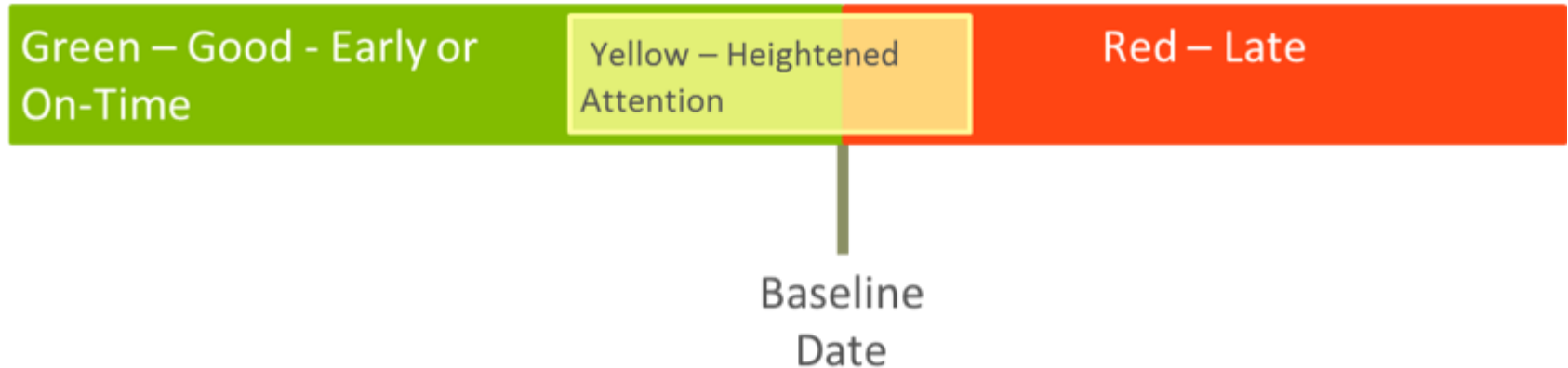
Planning, design, and procurement for a project

Delivery:

Construction or a project or delivery of products or services to finish the project.

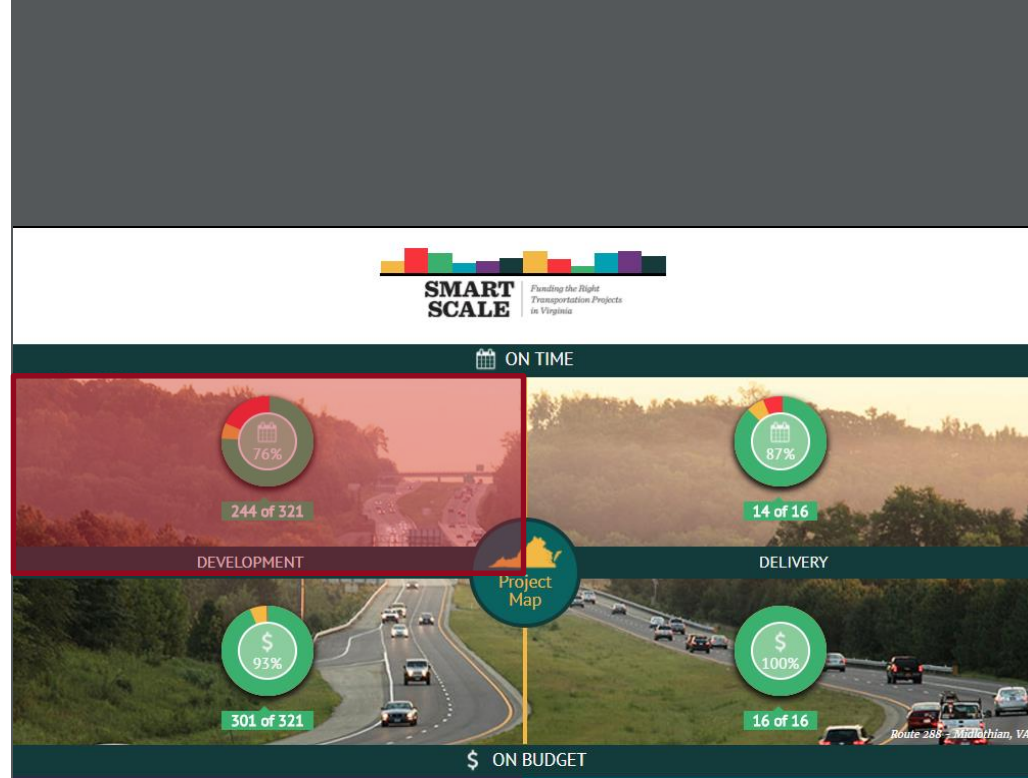
On-Time Metric Enhancements

- Identified critical interim milestones to measure performance
- Redefined Red, Yellow, and Green to encourage early-start/early finish culture
- Automatic baselining of projects at certain milestones (Development)
- Restricting the duration of key activities (Development)
- Defaulting projects to “red” if critical schedule information was missing.



Project Development On-Time

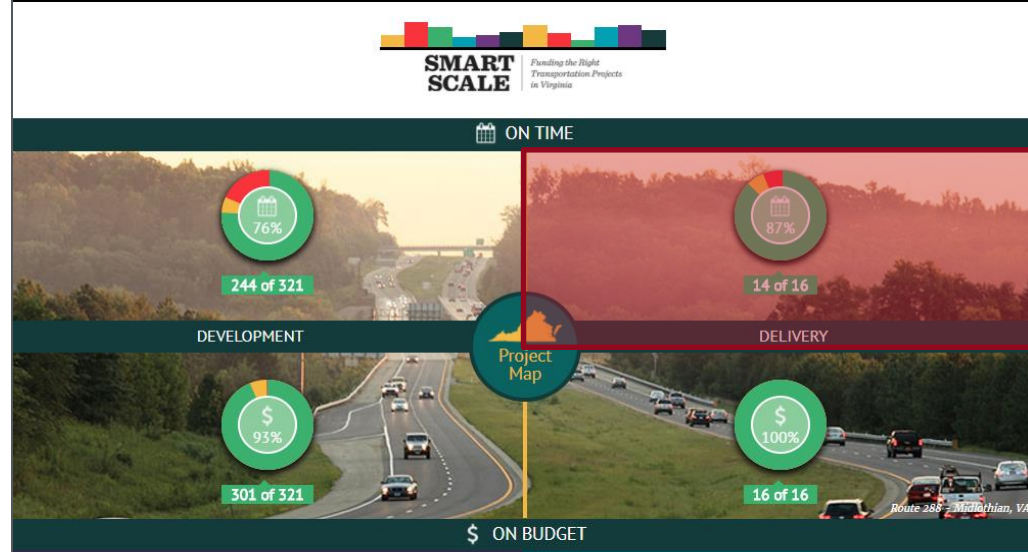
- Measures the performance of meeting project milestones from the time it is approved by the Commonwealth Transportation Board (CTB) until Delivery begins (Award).
- The initial project kickoff activities (Local Agreement, Start Development, and Determine Requirements) are scheduled and fixed (or baselined) upon CTB funding approval.
- The remainder of the schedule becomes baselined after its full scope has been finalized and approved for design. You will know when a project schedule has been baselined when dates are no longer italicized on the project details page.



Milestone Activity	Activity Code	Early Finish			Late Finish	
Local Agreement	10	>30 days early	≤30 days early	Baseline End Date	≤12 days late	>12 days late
Start Development (Authorize PE)	12	>30 days early	≤30 days early		≤12 days late	>12 days late
Determine Requirements (Scope Project)	22	>30 days early	≤30 days early		≤12 days late	>12 days late
Engage Public (Approve Willingness, Adopt Location/Design)	47, 49	>30 days early	≤30 days early		≤12 days late	>12 days late
Start Purchasing Right-of-Way (Authorize R/W & UT Funds)	52	>30 days early	≤30 days early		≤12 days late	>12 days late
Utility Relocation	67U	>30 days early	≤30 days early		≤12 days late	>12 days late
Complete Purchasing Right-of-Way (Acquire Right-of-Way)	69	>60 days early	≤60 days early		≤12 days late	>12 days late
Obtain Permits	70	>60 days early	≤60 days early		≤12 days late	>12 days late
Solicit Bids (Advertise Project)	80	>60 days early	≤60 days early		≤12 days late	>12 days late
Start Delivery (Award Contract)	84	>30 days early	≤30 days early		>0 days late	

Project Delivery On-Time

- Measures the performance of meeting project milestones during Delivery, from Award through completion
- Schedules become baselined at the time of Award, when the contractor has committed to a specific schedule for completion.



Milestones	Early Finish			Late Finish	
Project Specific Interim Milestones	>14 days	≤14 days	Baseline End Date	≤7 days	>7 days
Complete Delivery	>0 days			>0 days	

On-Time Measurement

- By adding interim milestones and redefining red, yellow, and green, we have completely changed the way projects are measured and reported.
- Projects can now go from green to red, and back to green based on the current performance, not just the at the end.
- We give the project managers and leadership time to add resources and recover a schedule.

Project Development

Start Design

ROW Obtained

**Permits
Complete**

Advertisement

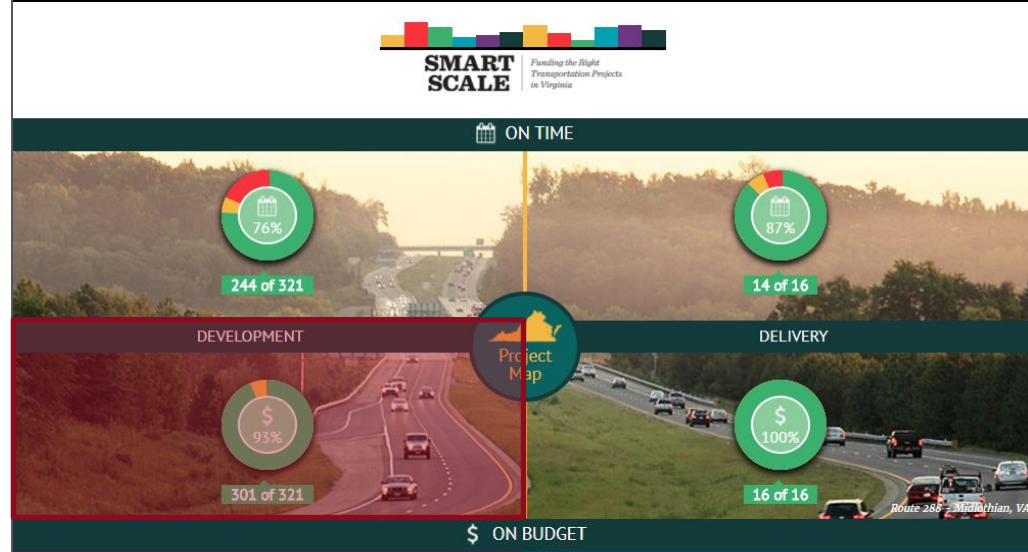
Award

On-Time Budget

- The business rules for on-budget vary by phase but generally work to encourage projects to be within the approved CTB budget for Development or 10% of the awarded contract for Delivery.
- On-Budget Status:
 - **Green (G):** Good – Estimated or actual cost is on or under budget
 - **Yellow (Y):** Heightened Attention – Estimated or actual cost is slightly over budget
 - **Red (R):** Over Budget – Estimated or actual cost is over budget and exceeds contingencies

Project Development On-Budget

- Compares the CTB approved budget to the current total project estimate
 - The total project estimate is used because during this phase, engineers and procurement representatives must always consider the entire cost of the project through Delivery.
- Total project budgets are fixed when the project is approved for funding by the CTB



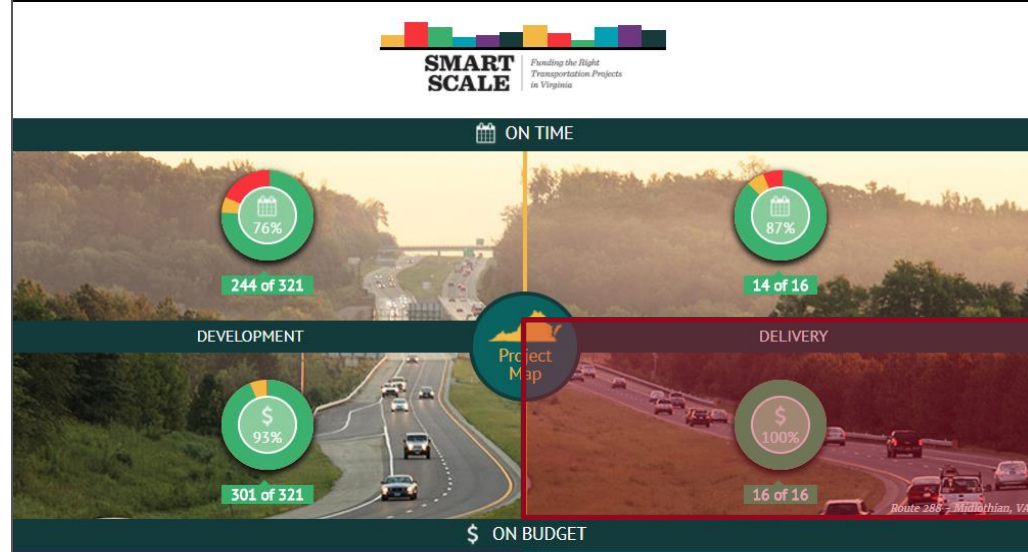
Development On-Budget

- Total project cost performance is measured by comparing the current project estimate to the budget approved by the CTB as illustrated in the chart below.
- Projects with a current estimate that are over one year old, or are missing, will result in a status of yellow.

Approved Budget	Current Estimate		
<\$5 million	≤0	>0 to <20%	≥20%;
\$5 million to \$10 million	≤0	>0 to >\$1M	≥\$1M
>\$10 million	≤0	>0 to <10% or <\$5M*	≥10% or ≥\$5M*

Project Delivery On-Budget

- Compares the contract award amount to the current total project estimate.
- Total project budgets are fixed when the project is approved for funding by the CTB.



Delivery On-Budget

- Delivery project cost performance is measured by comparing the current project estimate and actual cost to the contract cost

Status	Projects have not been executed; no status		
Active	Neither the current contract amount nor the cost of work to date exceed the award amount by more than 3%	Either the current contract amount or the cost of work to date exceeds the contract award amount by 3% to 10%	Either the current contract amount or the cost of work to date exceeds the contract award amount by more than 10%
Completed	Un-audited final cost is within 110% of award amount	Cost of work to date or the current contract amount exceed the original award amount by 3% to 10%	Un-audited final cost is not known (After acceptance but before the 35 day period is closed): Either the cost of work to date or the current contract amount exceeds 110% of the award amount

03

Web-App DEMO

<http://dashboard.vasmartscale.org/>

04 Web-App Development

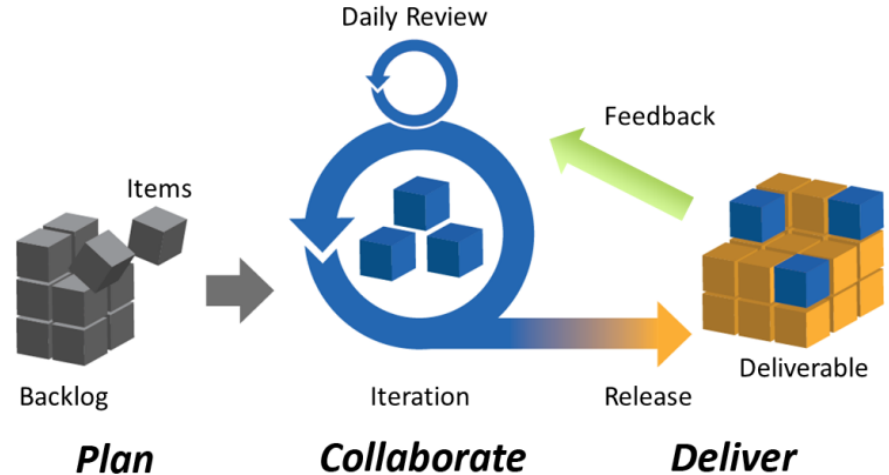
Web App Development

- Performance Measure Driven
- Intuitive Mobile First Design
- Agile Development Process
- Cloud hosted
 - Scalable
 - High Availability



69%
of projects are
ON-TIME
Target: 70%

	Total
Green	114
Yellow	30
Red	21



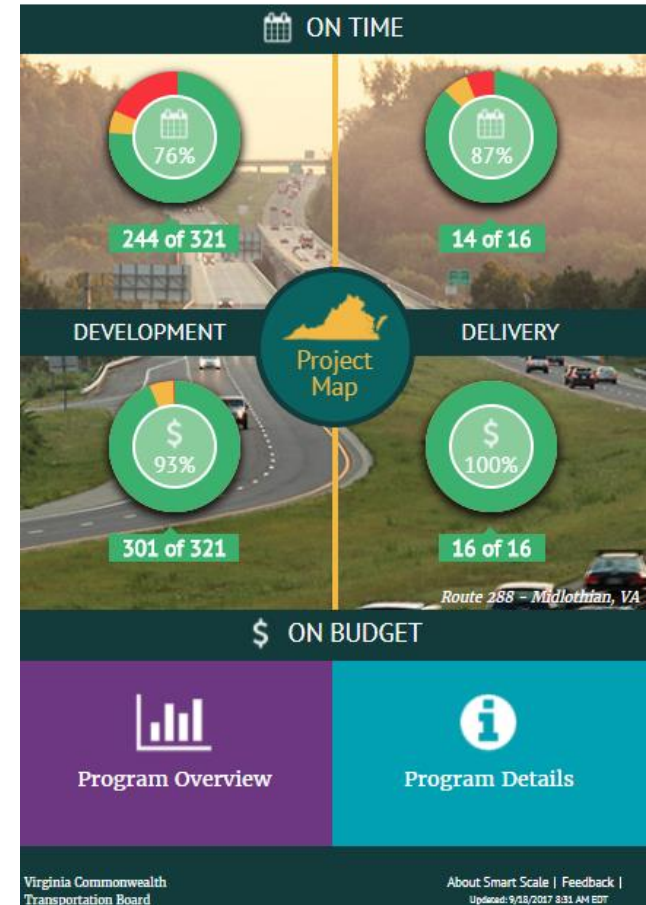
05 **Results**

Results

- Tool to help us meet goals in project delivery
- Measure entire program
- Well received by governing bodies
- Transparency
 - 80 visits per day on average
 - 2,600 in August

Lessons Learned

- Collaboration b/w Technology and Program Mgmt. essential to success
- Diverse cross functional teams added value and aided communication
- Steering Committee, Technical Committee, and outreach is critical to buy-in from users.





QUESTIONS