eConstruction

Virginia Department of Transportation

Dakota Clifford

Key Priorities

Time, Budget, Quality

Business Process Reengineering

- Complexity Reduction
- Change Management
- Strengthen Core Competencies

Digital Transformation

- User Focus
- Reduce Fragmentation
- Data Driven Decision Making
- Eliminate Paper Processes

3D/4D MODELING

3D engineered model linked to project schedule (4D)
Automated Machine Guidance (AMG)

UNMANNED AERIAL SYSTEMS

Unmanned Aerial Systems (UAS)
Alignment Verification
Aerial Phtogrametry
Lidar Scanning
Measurment and Analysis

DOCUMENT MANAGEMENT SYSTEMS

Submittal processes
Workflow mapping
Project Document Management

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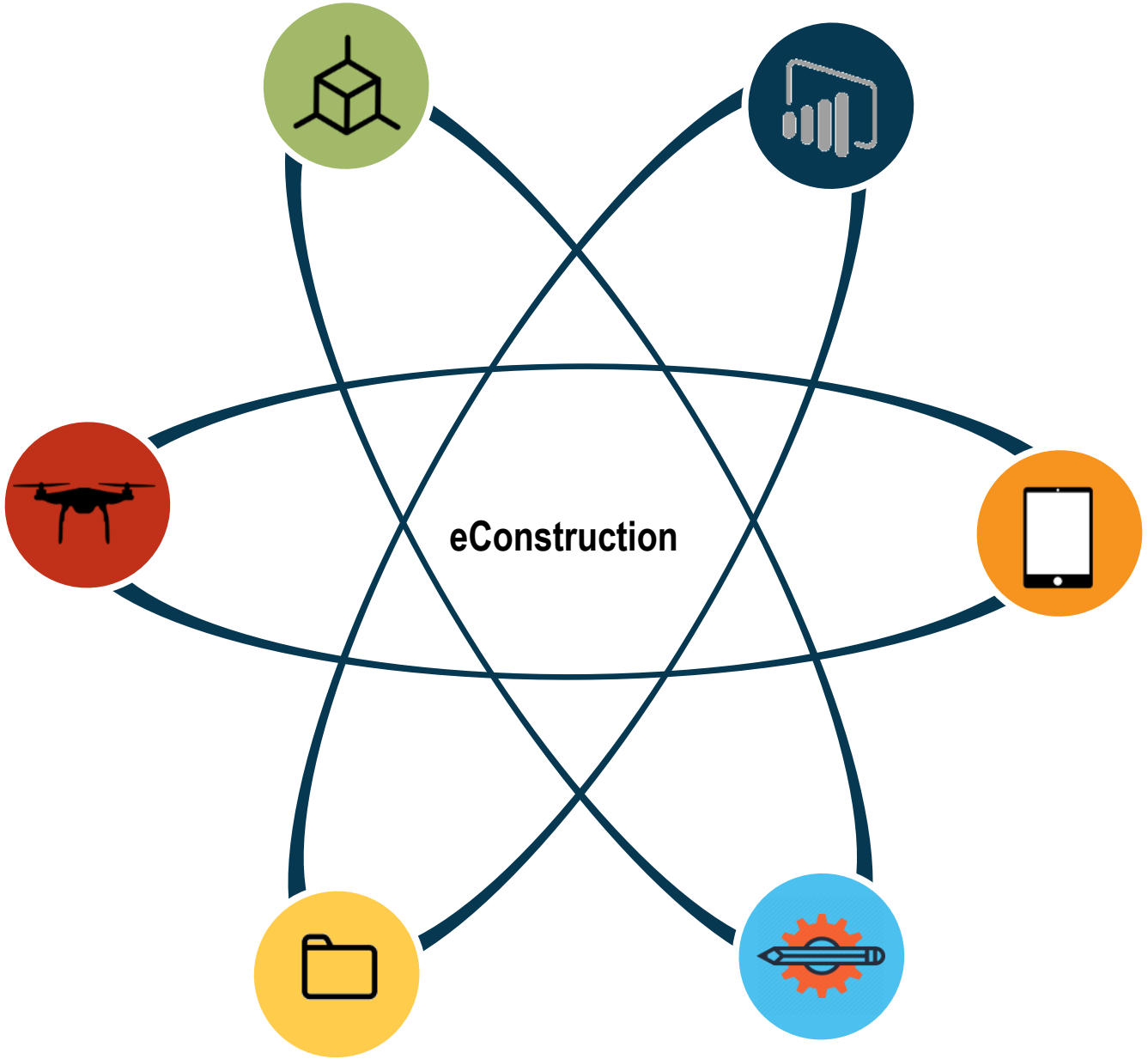


DIGITAL STRATEGY

Project Analytics and Dashboarding
Evaluation of Current Systems
Business Process Re-development
Seamless Integration

TABLET BASED INSPECTION

PlanGrid Pilot/ Implementation
Headlight Pilot Program

JOBSITE TECH & FURTHER RESEARCH

Headlight Data Usage
RFID
eTicketing
System Integrations
Augmented Reality
3D Printing
Further Research & Development

Pilot Approach

Test Field User Applications

- Asses program strengths and limitations
- Collect User Feedback
- Identify additional areas for use

Develop Best Practices

- Help set standard for larger scale use
- Establish internal experts/power users

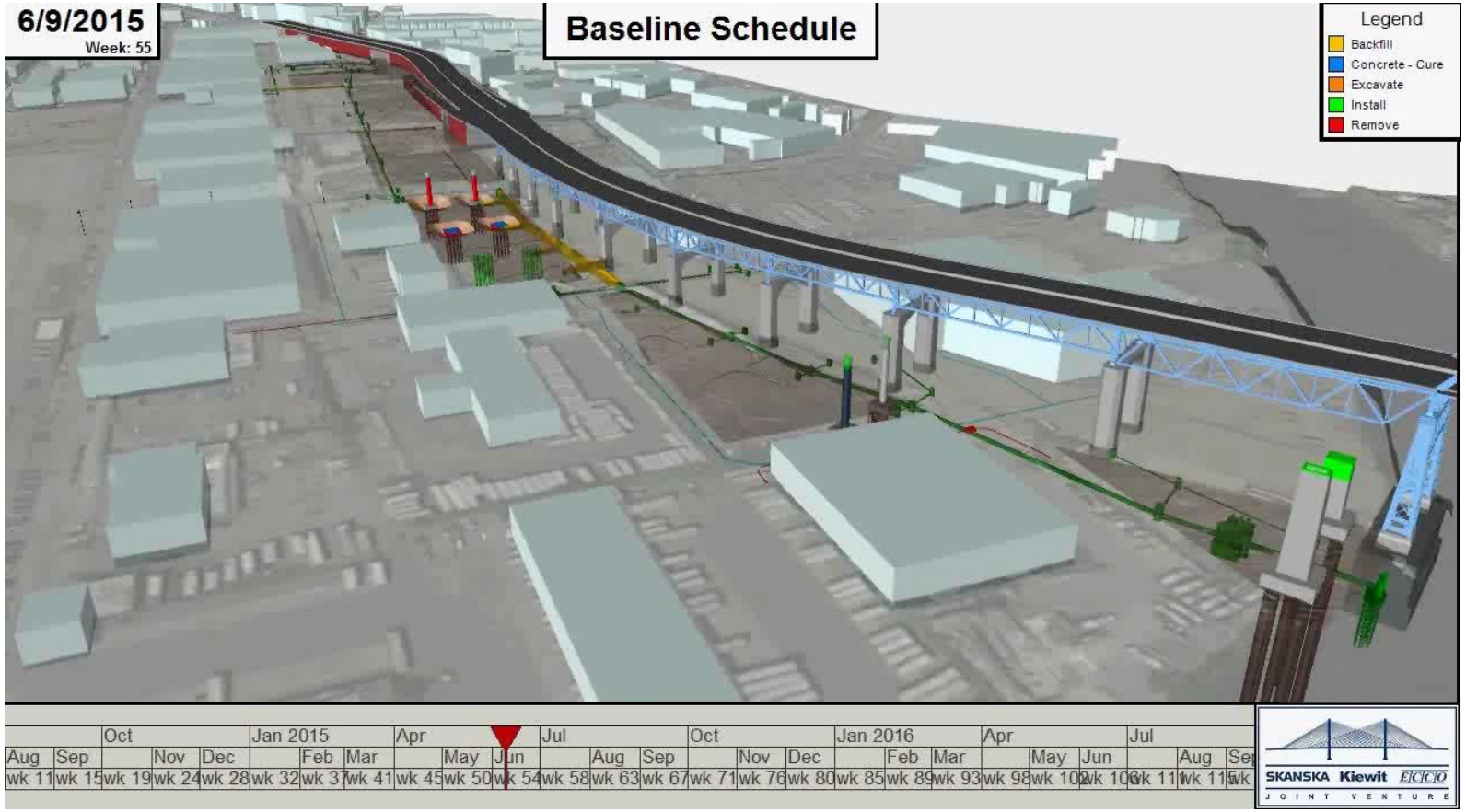
Asses Value

- Formal return-on-investment analysis
- Usability Assessment

3D/4D Modelling

- 3D Engineered Model linked to the schedule (4D)
- Post-award requirement
- Included on Hampton Roads Bridge Tunnel Expansion Project and identifying additional Projects

3D/4D Modelling



Unmanned Aerial Systems

- Currently in Pilot Phase
- Working to identify appropriate applications
    - Materials Measurement
    - Alignment Verification
    - Environmental Inspection
    - MOT Set-up

Document Management Systems

- Encompasses both Document Management and Submittals
  - Working to identify best DMS
- Piloting ProjectWise Deliverables Management
  - Submittals Workflow Management Tool
  - Deployed Statewide on Design Build
  - Piloting on Design-Bid-Build

Tablet Based Inspection

- Three Parts to Tablet Based Inspection Program
  - iPad Deployment
  - PlanGrid Implementation
  - Headlight Pilot

PlanGrid Pilot Program

50

Projects

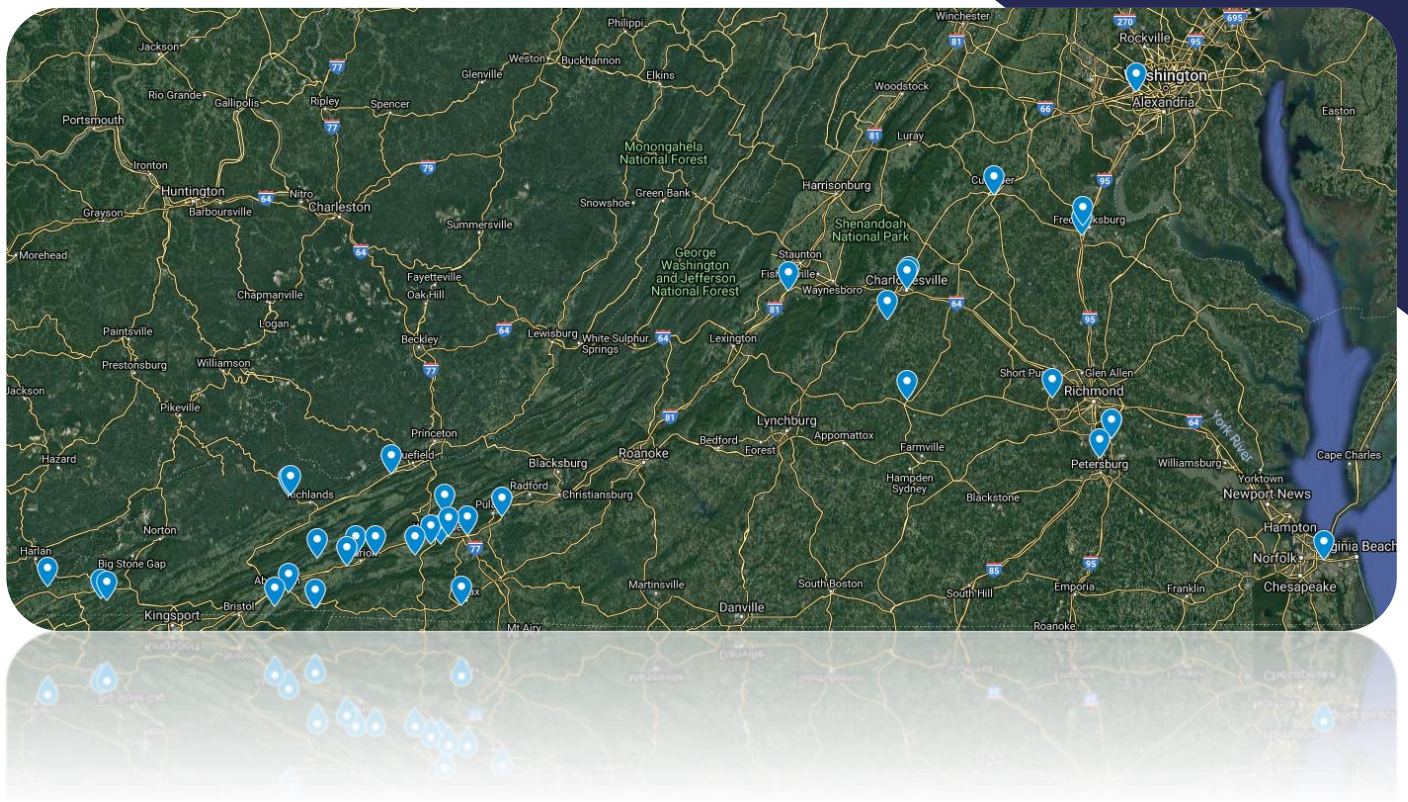
- Design Build
- I-66 OTB Mega-Project
- Emergency, on-call, schedule

75

Pilot Program Participants

8

Districts Participating



Pilot Program Results

3.6

Average Total hours/wk saved

4.2

Additional hours/wk spent on jobsite by inspectors

16

Additional photos taken per week per inspector

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Headlight Pilot Program

9

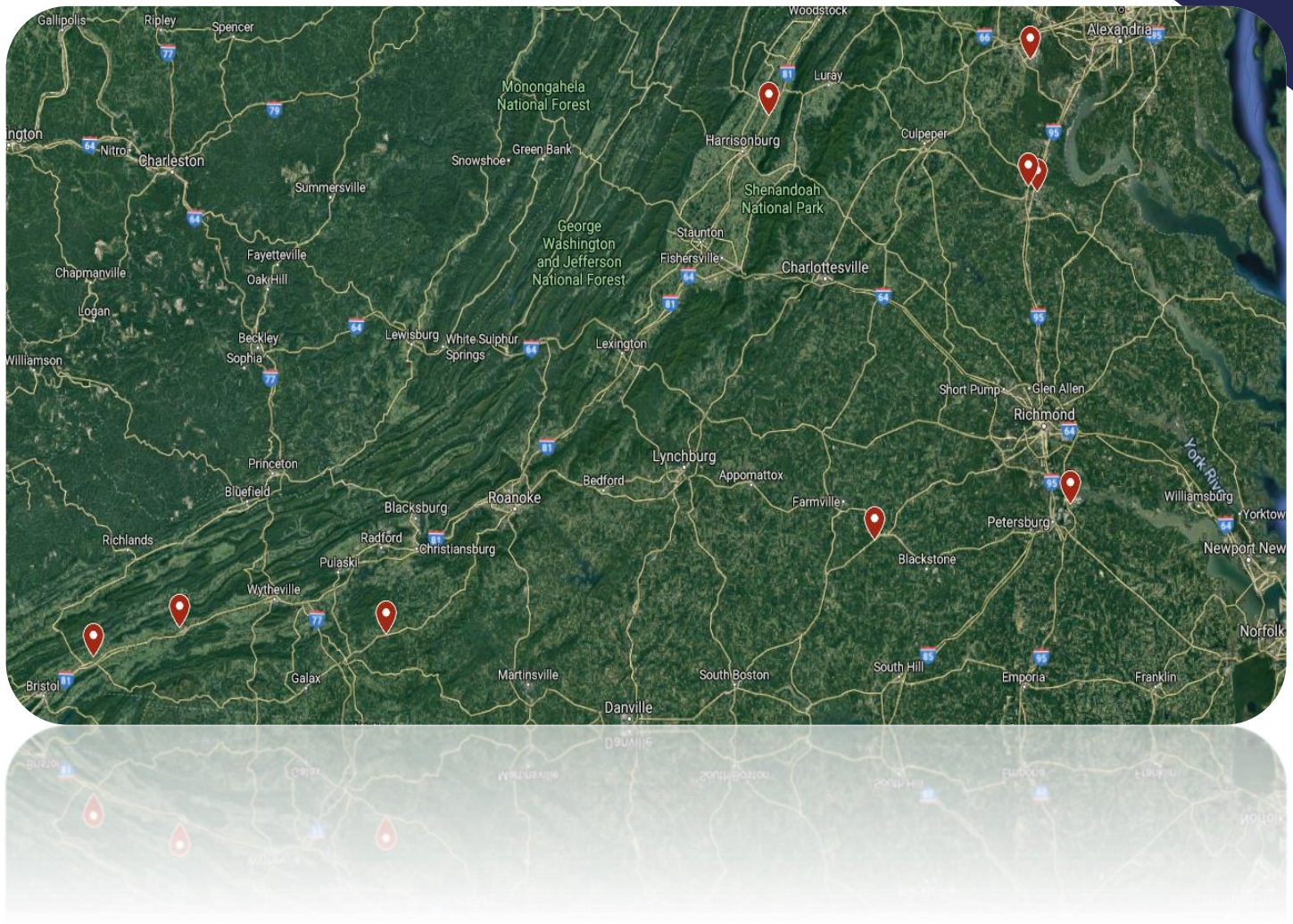
Projects

45

Users

8

Districts



Headlight Pilot Program

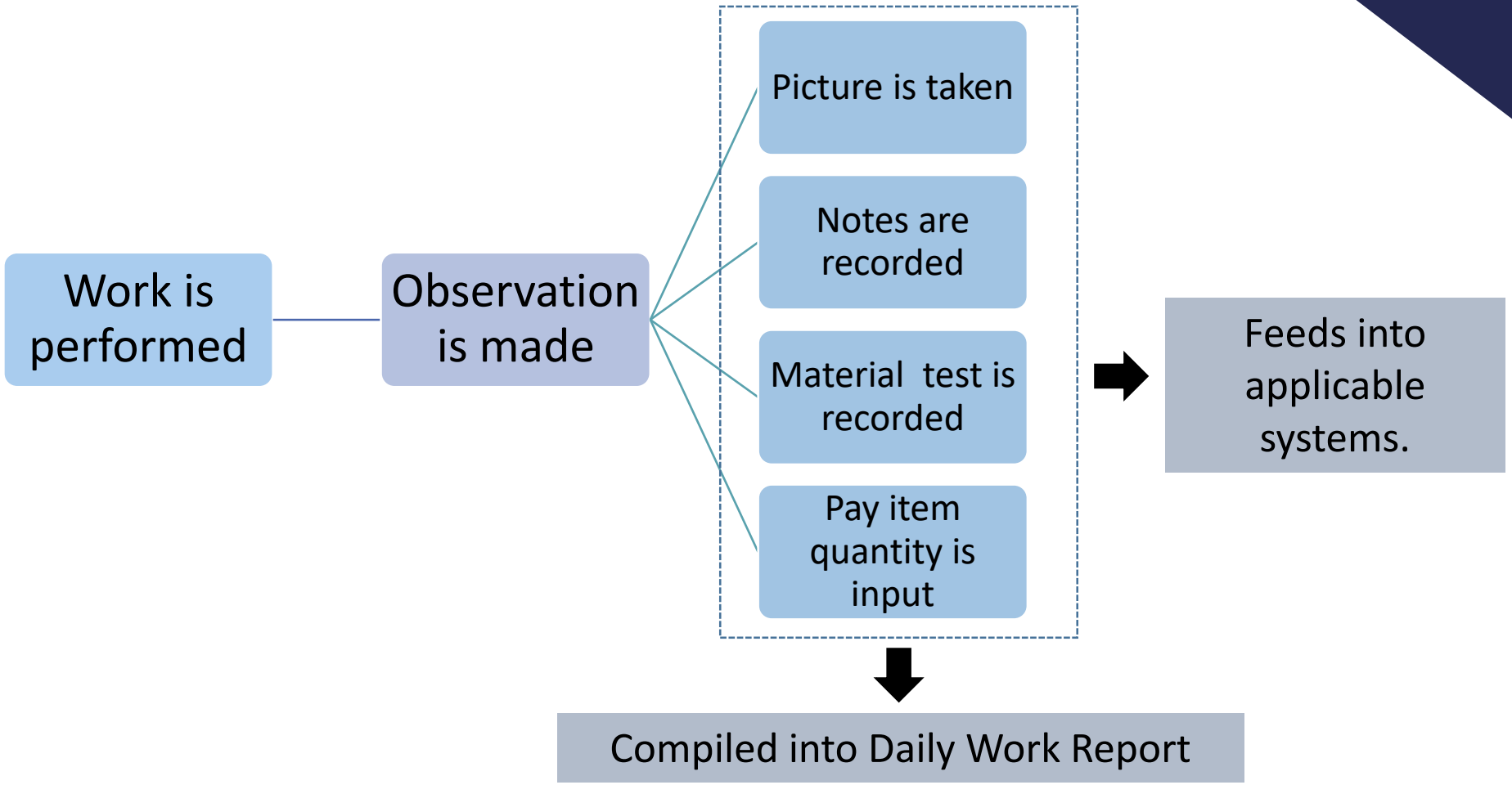
Cloud-based Reporting Tool

- Used to collect data in field
- Real Time Data

Data First Reporting

- Starts with Data, populates reports as needed
- Metadata associated with each observation
- Benefits Include:
  - More Data
  - Higher Quality Data
  - Easier to find data
  - Programmatic Level Analytics

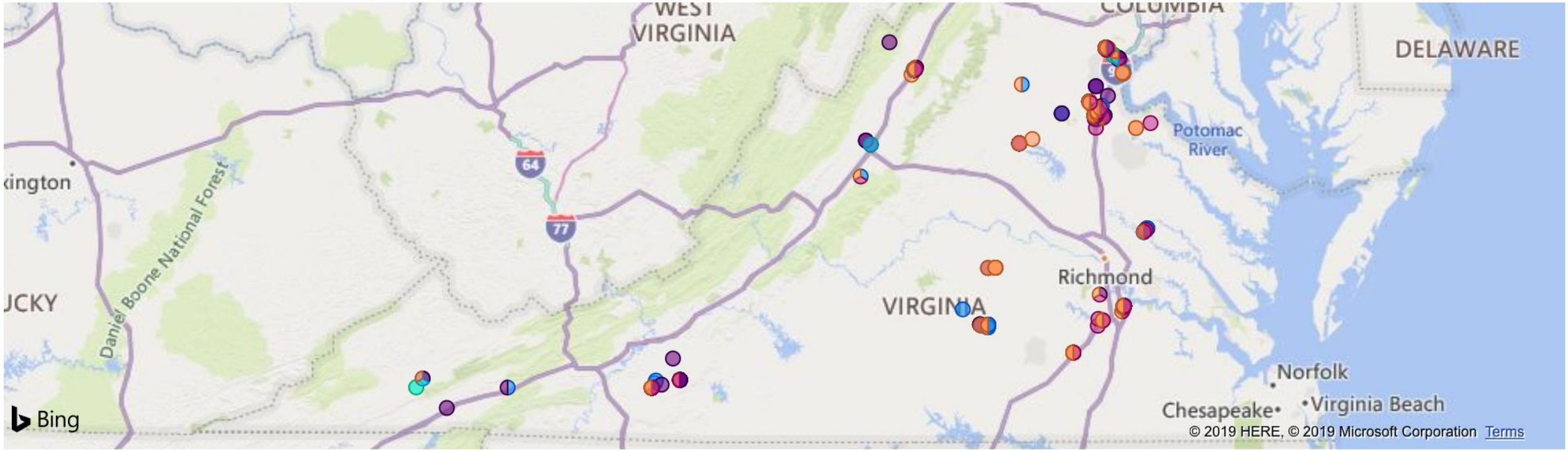
What is Data-First Reporting?



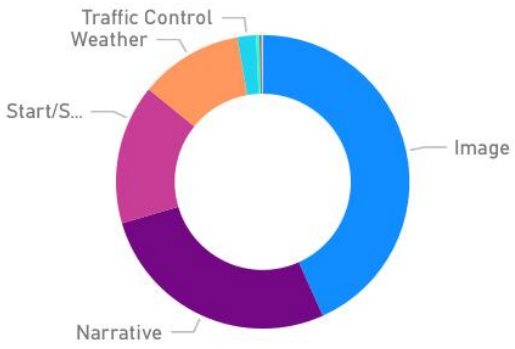
Virginia Department of Transportation - Construction Programs Dashboard (R&D Only)

Observations Statewide

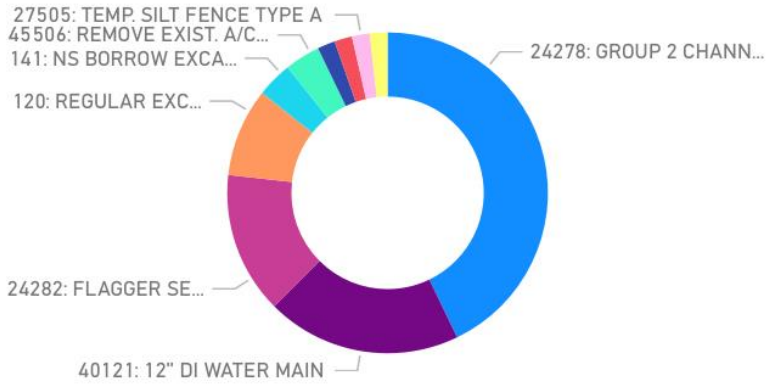
Type Density Measurement File Image Materials Narrative Start/Stop Work Temperature Traffic Control Video Weather



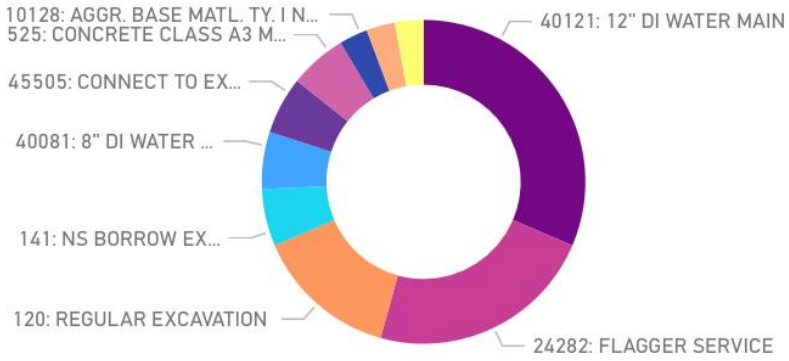
Count of Type by Type



Top Ten Pay Items by Qty



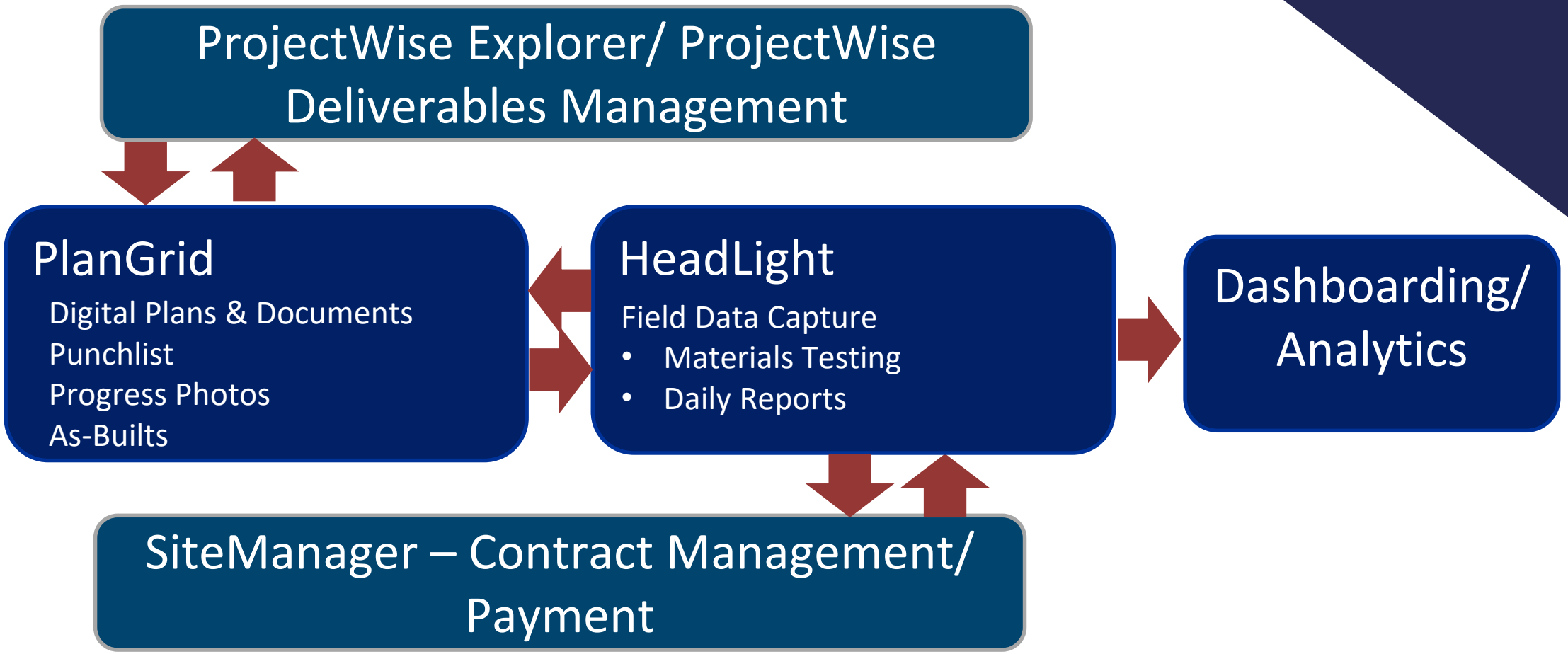
Top 10 Pay Items By Cost



Jobsite Tech & Further Research

- Jobsite Technologies
  - RFID
  - eTicketing
  - Augmented Reality
  - 3D Printing
- Data Management
  - Dashboarding
  - Project Level Analytics
  - Systems Integrations
- Further Research and Policy
  - Evaluation of Alternatives
  - Upcoming Technologies
  - Policy guidance

eConstruction Integrations



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