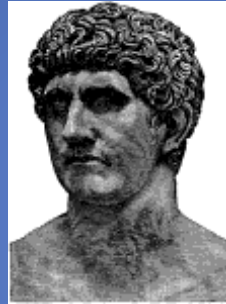


All Roads Lead to ROME

NCDOT ROME Project ... *So Far*

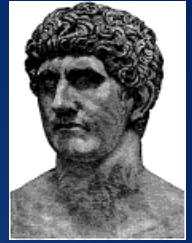


May 8, 2014

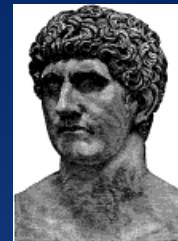
John Farley, GISP, CPM
GIS Manager

Adrien Litton
Esri

Topics

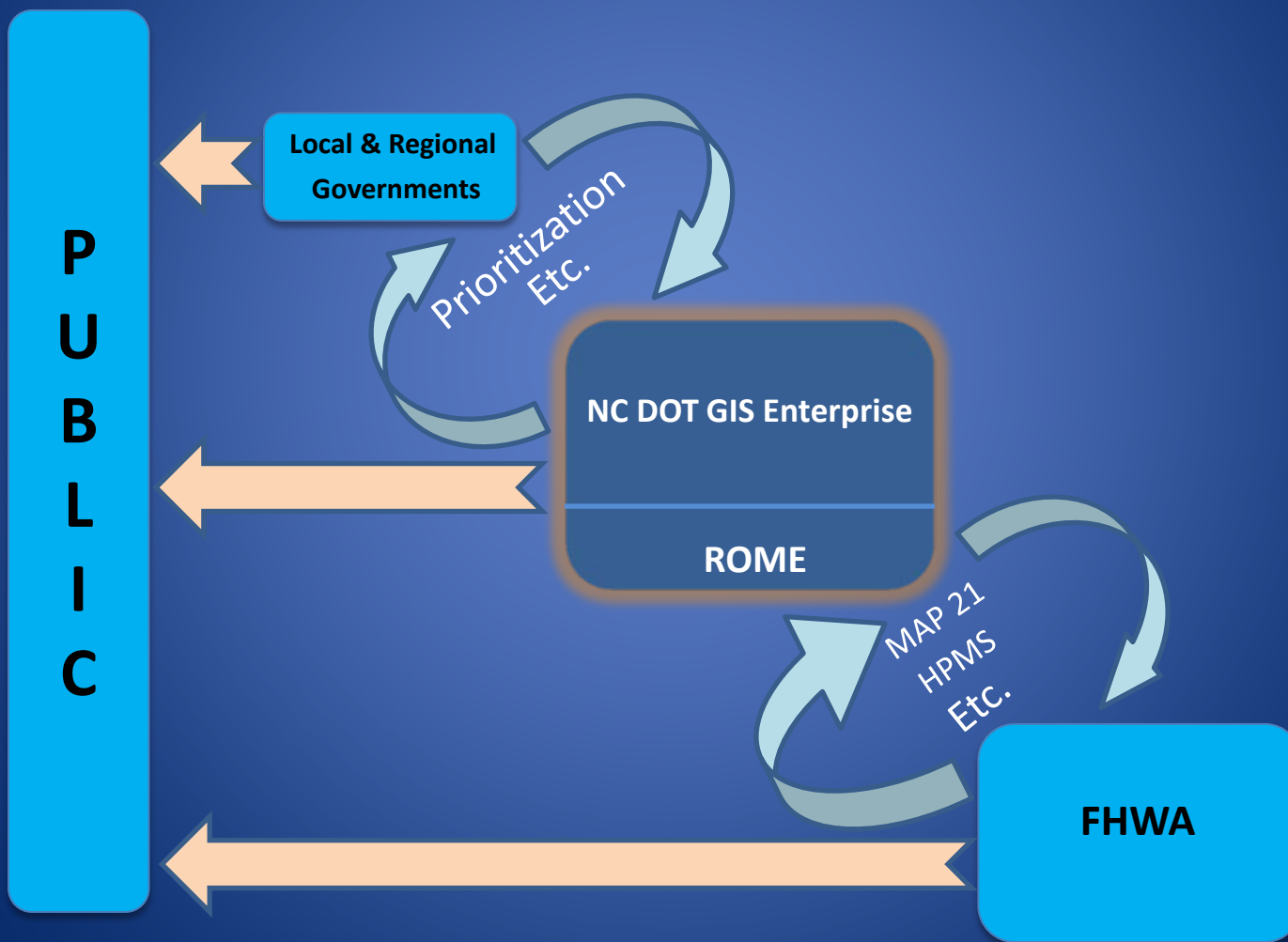
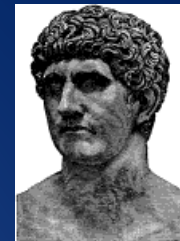


- ROME History (Big Picture, Background, Benefits)
- Collaboration – Esri/NCDOT, DOT Community, Vendors, etc.
- ROME Project Update
- Agile Assets integration
- Roads and Highways User Group (RHUG)
- Influencing R&H Product Enhancements
- NCDOT R&H Roadmap



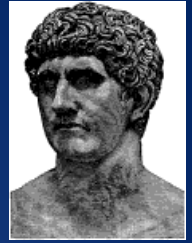
Rome Big Picture

ROME in the Big Picture



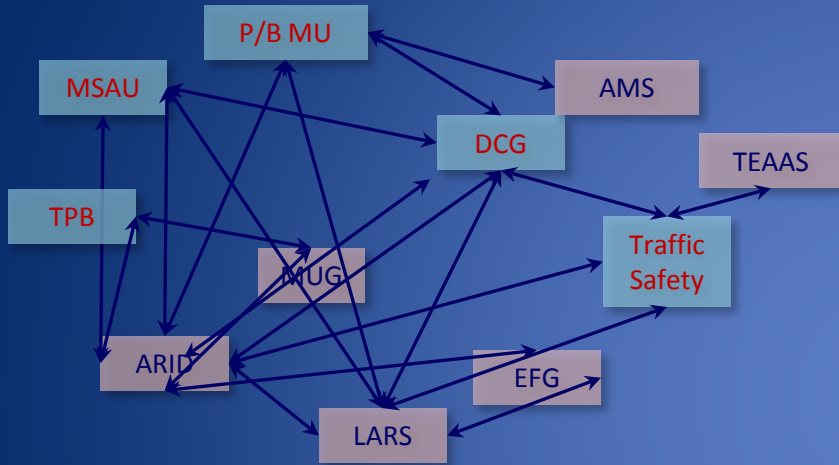
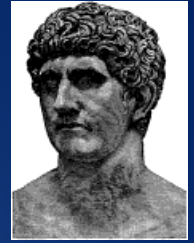
ROME Benefits

Road Operations and Management Effort (ROME)

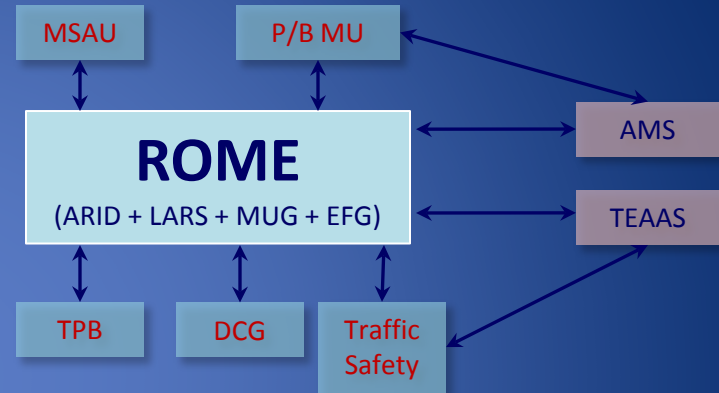


- NCDOT expecting significant change in coming years
 - Soaring population growth will require infrastructure investments, yet funding levels expected to stay modest
 - New Federal requirements (FHWA reporting) are being implemented
- The key to meeting these challenges is better information, delivered with timeliness and accuracy
 - A key component of ROME's ROI is *better information to drive better decisions*
 - Another significant cost savings from ROME will be streamlined workflows to improve efficiencies and effectiveness

Streamlining Workflows

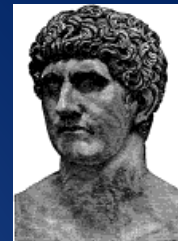


Current Situation



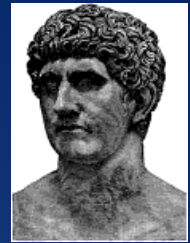
Future State with ROME

- With ROME, workflows between business units will be simplified and more *efficient*, providing more *timely and accurate* information



Collaboration

Collaboration - Early Days



Esri Roads and Highways v10.2.2 156 - Roadway Characteristics Editor

Map Edit Review

Layer: NumberOfLanes
Return attribute set

Attribute Set: Road Inventory
Version: dbo.DEFAULT

Clears Route
Calibrates Route
Reverses Route

Add Linear Events

New Edit Next Edit

Network (LRM): Milepoint (miles)

Route ID: [input]

From: [input]

Method: ReferencePoint offset

Location: [input]

Offset: [input] Feet

To: [input]

Method: Length

Length: [input] Feet

Dates

Start Date: 5/12/2014 Use route start date

End Date: [input] Use route end date

Retire overlaps
 Merge coincident events
 Prevent measures not on route

Next

Map showing road network with a highlighted green route and a yellow line segment.

Map Attribution: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contrib...

Route ID	From Measure	To Measure	NumberOfLanes	YR_SCORED	SURF_SCORE	PavementType	MED_WIDTH	MED
10025102	23.55	23.7	2	2008	7	Asphalt	0	4
10025102	23.7	23.85	2	2008	7	Asphalt	0	4
10025102	23.85	24.01	2	2008	7	Asphalt	0	4
10025102	24.01	24.29	2	2008	7	Asphalt	0	4
10025102	24.29	24.71	2	2008	5	Both Asphalt and Concrete	15	5

Page 1 of 2 | Record 1 to 25 | Total 28 Records

Layers Reports

Map showing a road network with a red line segment and a yellow rectangle highlighting a specific area.

Map Attribution: Esri

Project Activities Artifacts

Activity	Status	Assigned	Last Updated
Redline Planned Road	Complete	RIM 1	6/23/2011 3:50:29 PM
Add Road Characteristics	Assigned	RIM 1	6/23/2011 3:50:29 PM
Add Road Geometry	Assigned	LNM 1	6/23/2011 3:50:29 PM
Quality Review	Assigned	QC 1	6/23/2011 3:50:29 PM
Publish Planned Road	Created		6/23/2011 3:50:29 PM

Flowchart showing the process flow:

```

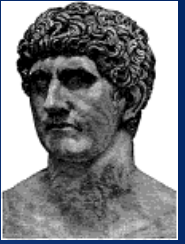
    graph TD
      A[Redline Planned Road] --> B[Add Road Characteristics]
      A --> C[Add Road Geometry]
      B --> D[Quality Review]
      C --> D
      D --> E[Publish Planned Road]
  
```

View Data

Add

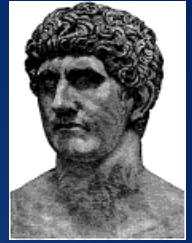
Many DOTs coming together to inform a product

Collaboration - Early Days

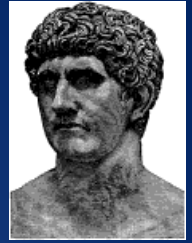


- DOT LRS and Road Inventory Systems (1999 – 2010)
 - All DOT's in need of a more robust LRS that was easier to use and maintain
 - Many developing extensive (and expensive!) custom solutions
 - Several reducing their GIS utilization in favor of other technologies
 - Many looking to Esri to help address the problem
 - Many ready and willing to engage and help Esri figure it out

Many DOTs coming together to inform a product

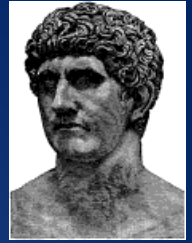


- NCDOT and several other DOTs were critical participants in beta testing of Roads and Highways
 - Feedback from beta dramatically changed the product
 - Architectural changes
 - Performance enhancements
 - Modified editing activities
 - More robust event behavior

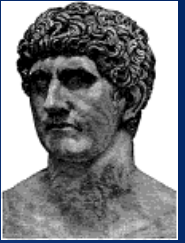


- NCDOT positioned as early adopter
 - Helped Esri make the case for a more robust LRS offering to support highway departments
 - Provided strong, constructive feedback to initial prototypes
 - Participated in beta testing
 - Continued collaboration throughout product design
 - ROME project requirements drove new R&H functionality
 - RCE is largely based on NCDOT's road inventory workflows and existing tools

Collaboration – Other DOT's

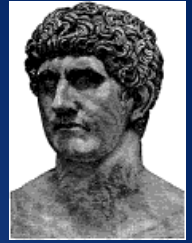


- MnDOT participated in a benchmarking program to prove that Roads and Highways was a viable approach
 - Several sessions over a 6 week period
 - Interactive technology transfer and edit session
 - Step-by-step walkthroughs of MnDOT's data maintenance requirements
 - Feedback from benchmarking sessions resulted in changes to the product that could be demonstrated during the next session



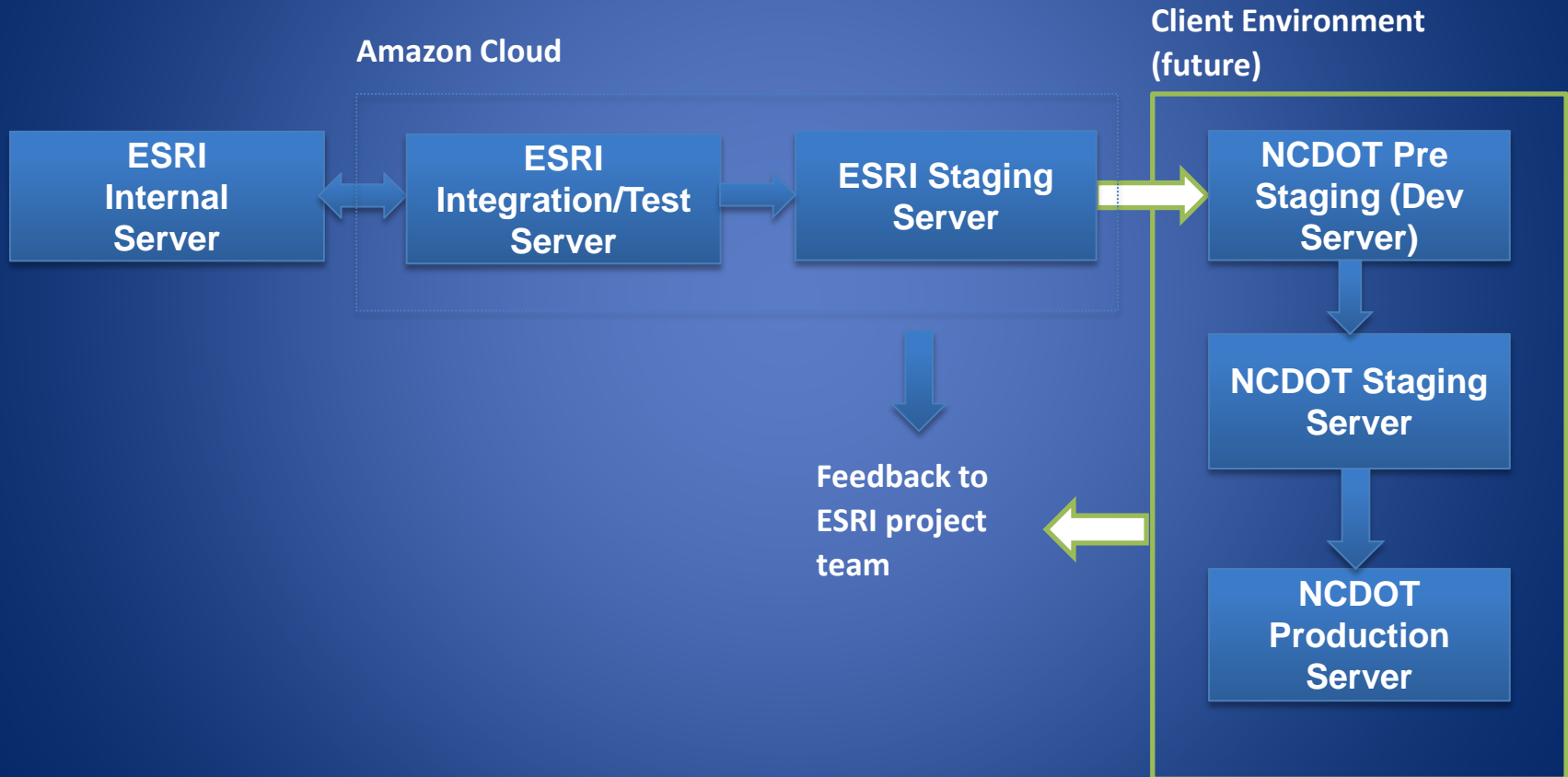
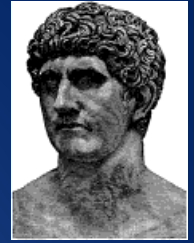
ROME Project Update

Current Status



- Phase I - Planning, Design, Data Migration
 - Planning and Design Tasks Complete
 - Two remaining Tasks – Prototype and Statewide Data Migration
 - Prototype Data Migration currently In progress
 - These Tasks Overlap with Phase II
- Phase II – Development, Deployment and Business System Integration
- Expected ROME Solution Delivery - 2015

Release Strategy

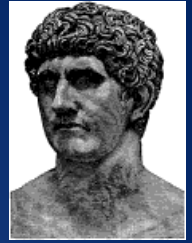




R&H and Agile Assets Integration

R&H and Agile Assets Integration

Focus on collaboration

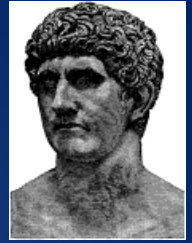


- A key driver to an LRS success is business unit buy-in
 - Keeping LRS data in sync across business units a big challenge
 - Many maintaining their own LRS
- Several DOTs had already, or were in the process of engaging Agile Assets for various needs
- NCDOT uses Agile Assets
 - Pavement Management
 - Maintenance Management
 - Bridge Management

Business unit buy-in critical to enterprise success

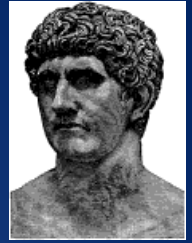
R&H and Agile Assets Integration

Focus on collaboration

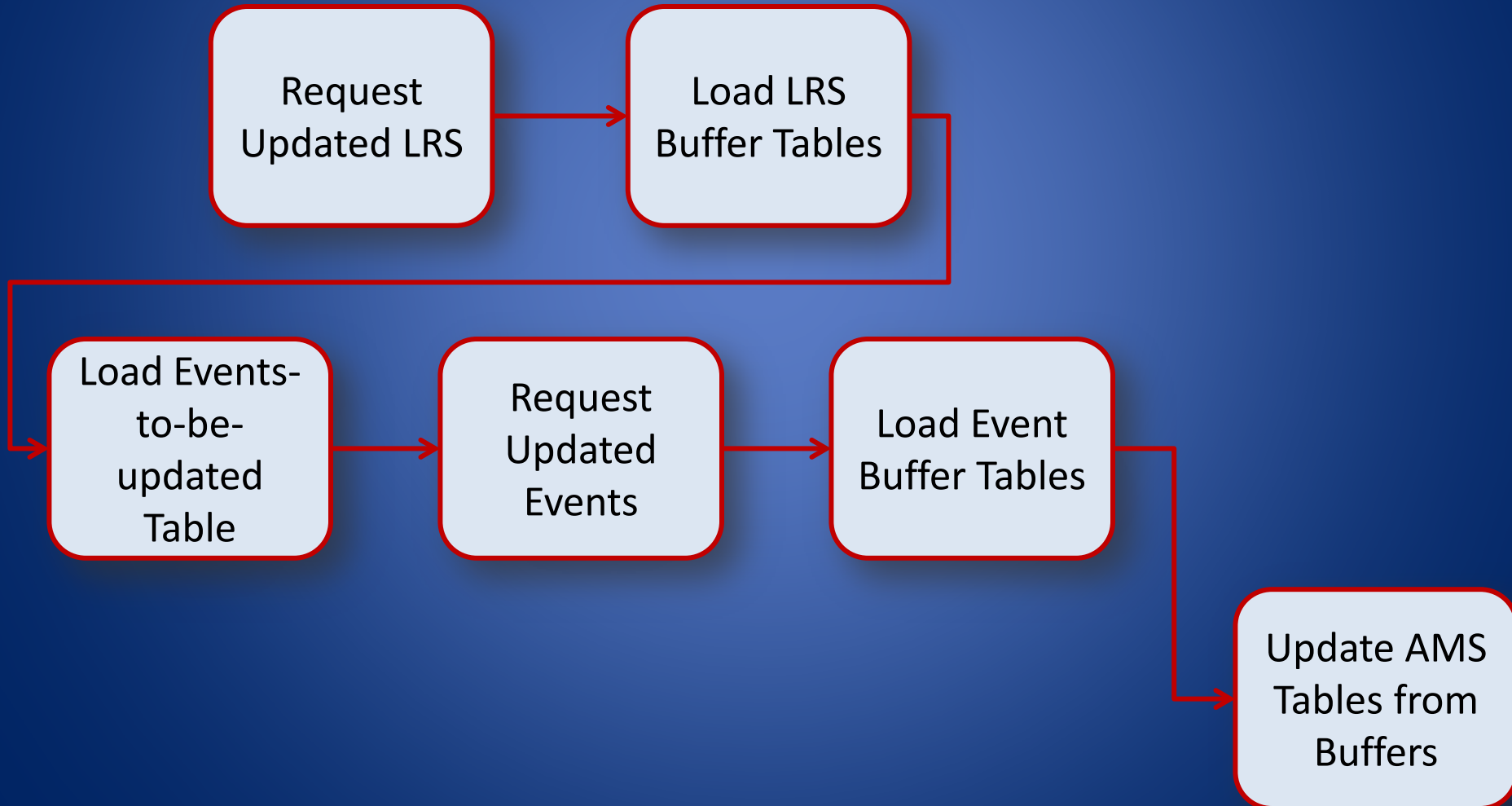


- Esri and Agile development staff worked closely
 - Constructed a Roads and Highways/Agile design for WVDOT
 - Completed a Roads and Highways Proof of Concept for NCDOT
 - POC was based on the WVDOT design
 - Additional Roads and Highways functionality was created to support the integration
 - Export of LRS
 - Export to file geodatabase and csv
 - Export concurrent routes table

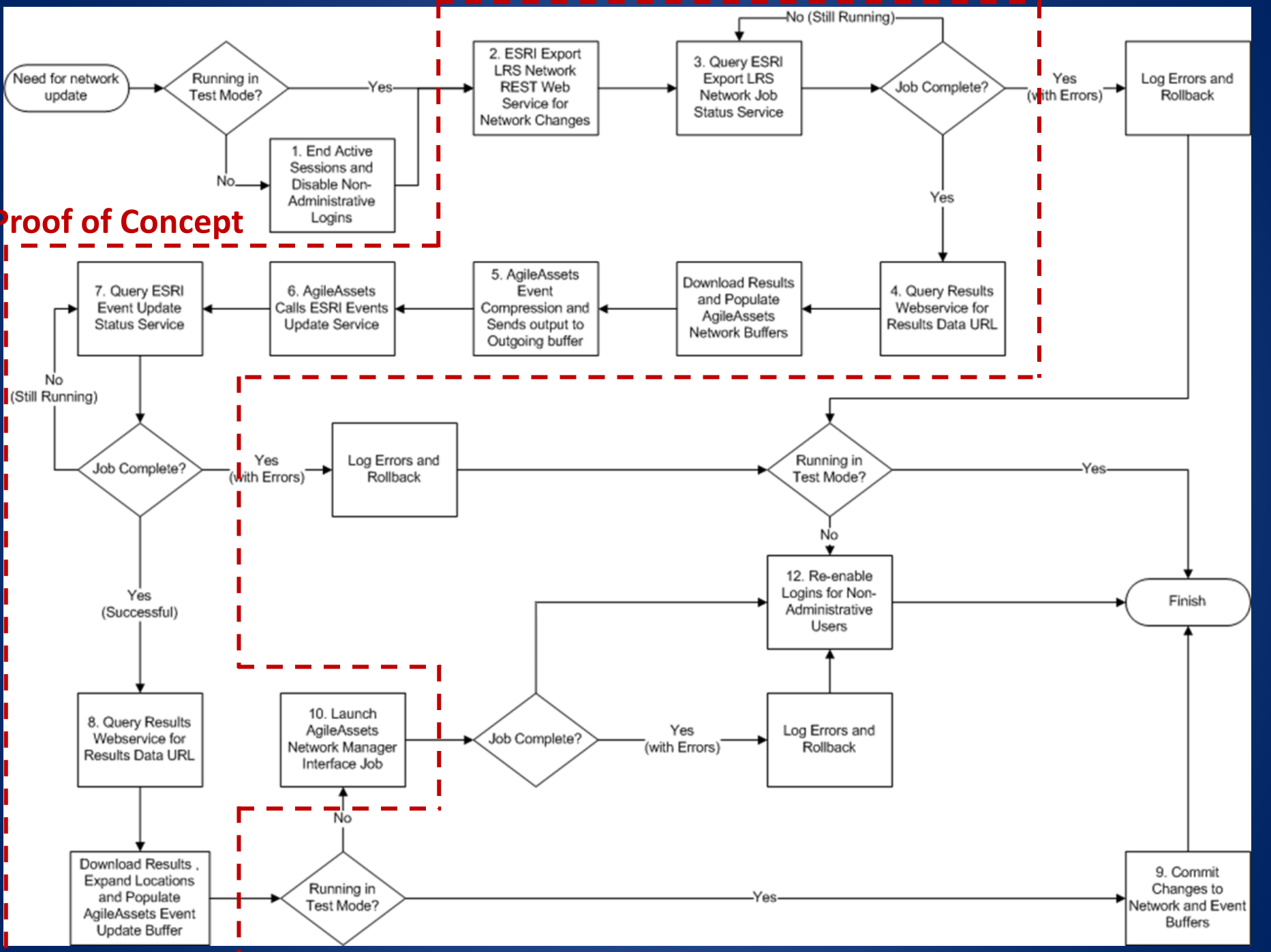
Business unit buy-in critical to enterprise success

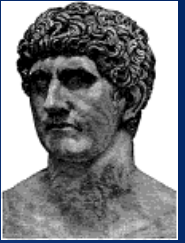


- Simplified workflows



Proof of Concept

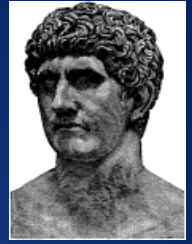




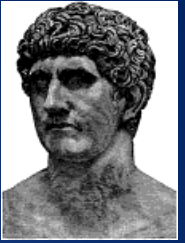
Roads and Highways User Group (RHUG)



Roads and Highways User Group (RHUG)

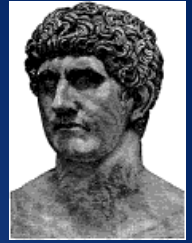


- The RHUG meets every Month on a call to discuss topics related to R&H implementations
 - Currently have 23 DOTs participating; number growing
 - Vendors and other members of the Transportation community are welcome
- Group has been invaluable in helping to understand challenges, best practices, risks, etc., with these projects
- March, NCDOT hosted a successful Esri and Agile Assets Proof of Concept



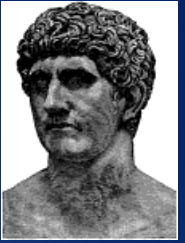
Influencing Esri's Product Enhancements

R&H Product Enhancements



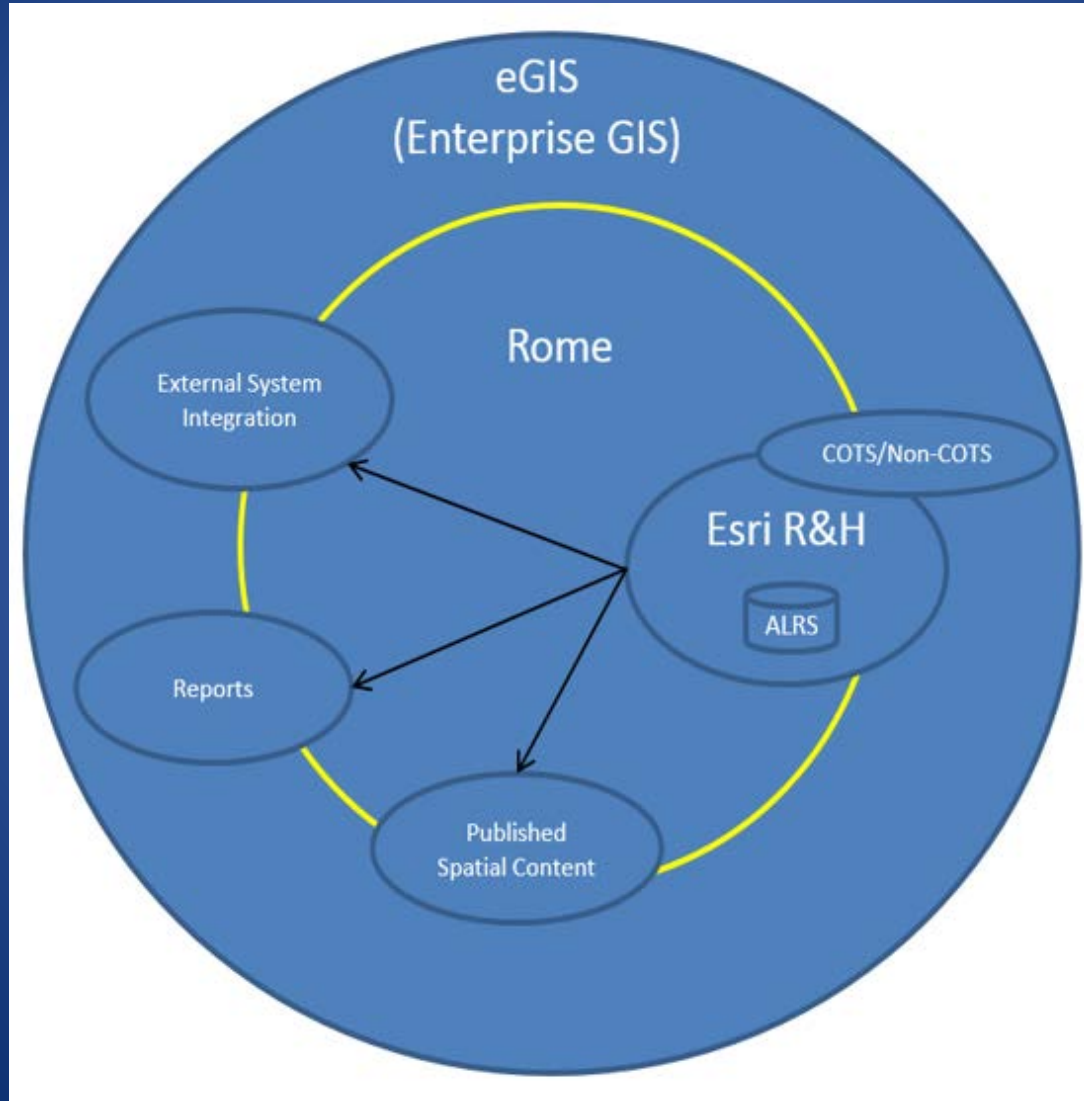
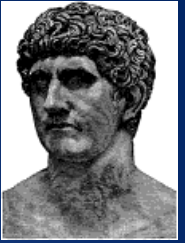
- Add events to redlines in RCE
- Data Reviewer integration w/ RCE (QC Checking)
- Reconcile and post in RCE
- Export Route Updates (to support integration with AgileAssets)
- Export changed events to CSV and File GDB (to support integration with AgileAssets)
- 3D measure length calculations
- Support routes calculated on 3D length
- Cartographic realignment (to support photo revision)
- Reverse route
- RCE Attribute Sets (to replicate ARID Layer Loader tool)
- Set target attribute set in RCE through WMX (to support DCG editing events)
- RCE Support for DGN and DLG
- Add Line Event (to replicate ARID functionality)
- Add event starting point by Intersection Offset
- Add event starting point by Station Offset
- Add event starting point by Coordinate Offset
- Select by Attribute Set (to show a table view of multiple events at once)
- Edit by Attribute Set (to allow editing in a table view of multiple events)
- Set version in RCE through WMX
- Set selected route in RCE through WMX (to support DCG editing events)
- Set selected widget in RCE through WMX (to support DCG editing events)
- Set temporal view date in RCE

Focus on collaboration

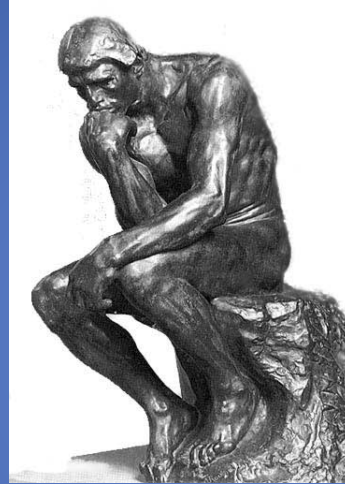


ROME Project Roadmap

ROME Roadmap



Questions?



Contact: John Farley, GISP, CPM
GIS Manager at NCDOT
jcfarley@ncdot.gov
919.707.2151

Contact: Adrien Litton
R&H Imp Lead at NCDOT
alitton@esri.com
909.793.2853