



November Meeting

11/14/2018

AGENDA

1. Announcements
2. Esri Updates
3. Esri Roads and Highways Product Roadmap Discussion Continued
4. Roadway Characteristics Full Extent Project – Arizona DOT
5. Open Discussion

**** Please mute phones!! ****

ANNOUNCEMENTS

- GeoNet Site – *Coming Soon!*

Esri Updates/Product Roadmap Discussion

Nathan Easley

Roadway Characteristics Full Extent Project

Patrick Whiteford - AZDOT

Upcoming Meetings / Contacts

Wednesday, December 12, 2018

Contact Info:

Erin Lesh ealesh@ncdot.gov

Patrick Whiteford pwhiteford@azdot.gov



Product Team Update (RHUG meeting 11/13/18)

Capabilities currently under development

- **Multi-field (concatenated) Route ID support in ArcGIS Pro**
 - **Edit activities UI**
 - **GP tools**

Support Incidents/Defects

- BUG-000115036 - Line events created on a redline in Event Editor get "Route measures are null" after creating the route and applying updates in ArcMap (developer fixing)
- BUG-000116475 - From Measure when creating linear events with Stationing method doesn't change location after changing station location on second linear event created (developer investigating)
- BUG-000116664 In Roadway Characteristics Editor 10.6.1, selecting events by the route highlights the route, resulting in indistinguishable linear event features (developer investigating)
- BUG-000117296 Conflicts are introduced on routes when doing calibration point edits while the route edits are being posted in another version (developer investigating)
- BUG-000117260 For the first edit each day, Event Editor assigns the lock to ::AnonymousWebUser if Portal for ArcGIS is set up with enterprise logins (developer fixing)
- BUG-000117802 In Event Editor, grouped unique value symbology duplicates in layer list (developer investigating)

Documentation Updates/Training Opportunities

Documentation

- Roads and Highways online help update is live

Training

- No opportunities at this time



esri

THE
SCIENCE
OF
WHERE

ADOT's Roadway Characteristics Full Extent Project

RHUG November 14th, 2018

Patrick Whiteford, GISP – AZDOT

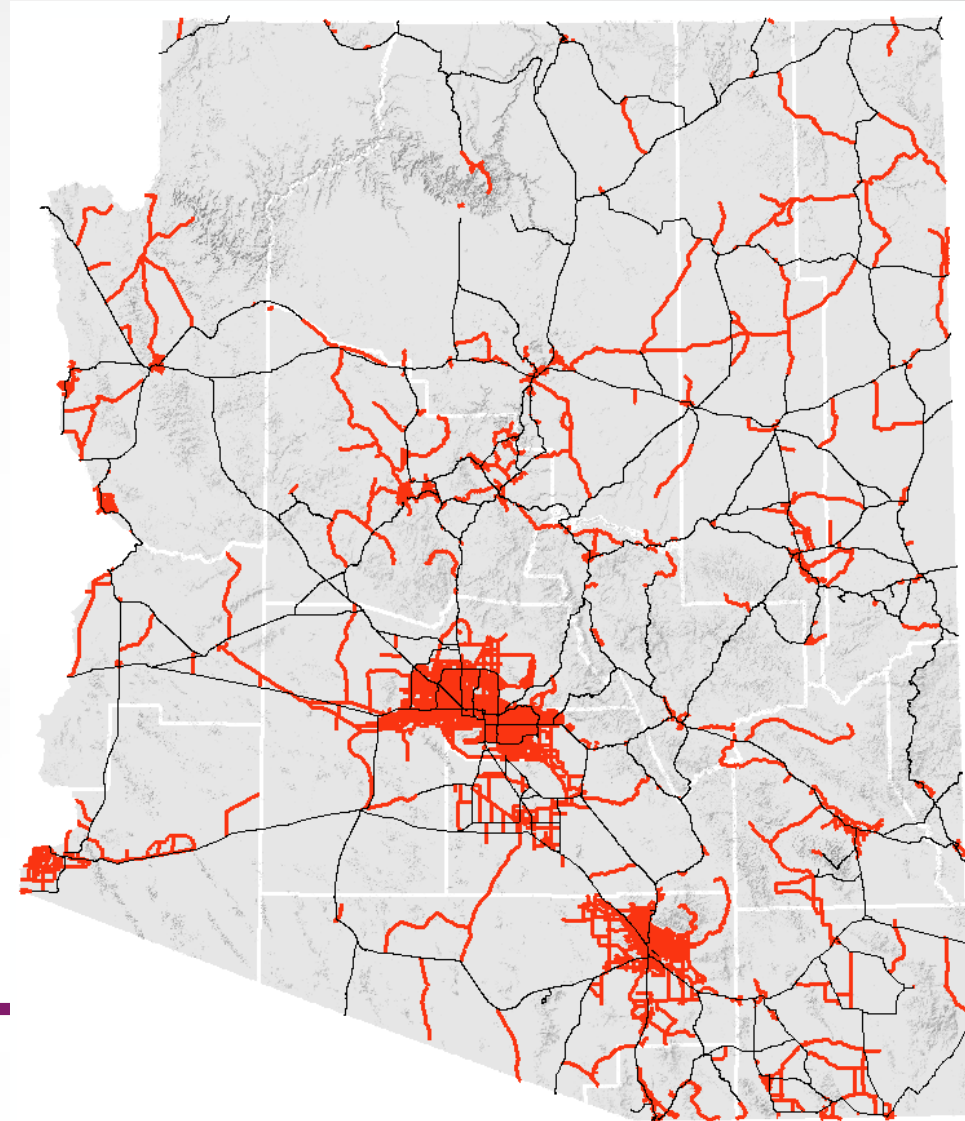
Overview

- Background
- Project Goals
- Extraction Methodology
- Data Integrity and Validation
- Sustainability
- Lessons Learned
- Future Steps

Background

- ❑ Need for Off-State Federal Aid System data
- ❑ PM2 and PM3
- ❑ Support MIRE, HPMS reassessment, and Safety Analyst
- ❑ Visualization

Functional Classification	Mileage
Rural Principal Arterial - Other	13.23
Rural Minor Arterial	142.5
Rural Major Collector	2,402.44
Rural Minor Collector	1,686.69
Urban Principal Arterial - Other Fwys & Expwys	9.57
Urban Principal Arterial - Other	497.69
Urban Minor Arterial	2,477.65
Urban Major Collector	1,888.71
Urban Minor Collector	225.96
	9,344.64



Model Inventory of Roadway Elements (MIRE)

- ❑ Listing of roadway inventory and traffic elements critical to safety management
 - ❑ 202 total elements
 - ❑ 37 fundamental data elements
 - ❑ Data required for on and off the State Highway System
- ❑ Guideline to help improve roadway/traffic data
 - ❑ Data for On/Off the State System
- ❑ Highway Performance Monitoring System (HPMS)



Jim Meyer?

OR



Quagmire?

Model Inventory of Roadway Elements (MIRE)

❑ 37 Fundamental Data Elements (FDE)

- Type of Governmental Ownership
- Route Number
- Route/Street Name
- Begin Point Segment Descriptor
- End Point Segment Descriptor
- Segment Identifier
- Segment Length
- Direction of Inventory
- Functional Classification
- Rural/Urban Designation
- Federal Aid/Route Type
- Access Control
- Surface Type
- Number of Through Lanes
- Median Type
- Annual Average Daily Traffic (AADT)
- AADT Year
- One/Two-Way Operations
- Unique Junction Identifier
- Location Identifier for Road 1 Crossing Point
- Location Identifier for Road 2 Crossing Point
- Intersection/Junction Geometry
- Intersection/Junction Traffic Control
- Annual Average Daily Traffic (AADT)
- AADT Year
- Unique Approach Identifier
- Unique Interchange Identifier
- Functional Classification
- Type of Governmental Ownership
- Interchange Type
- Ramp Length
- Ramp AADT
- Year of Ramp AADT
- Roadway Type at Beginning Ramp Terminal
- Location Identifier for Roadway at Beginning Ramp Terminal
- Roadway Type at Ending Ramp Terminal
- Location Identifier for Roadway at Ending Ramp Terminal

Project Goals

- ❑ Extract RCI data on all non-state Federal Aid routes
- ❑ Create data integrity/validation rules
- ❑ Implement route dominance
- ❑ Create methods for sustainability
- ❑ Document workflows



Extraction Methodology

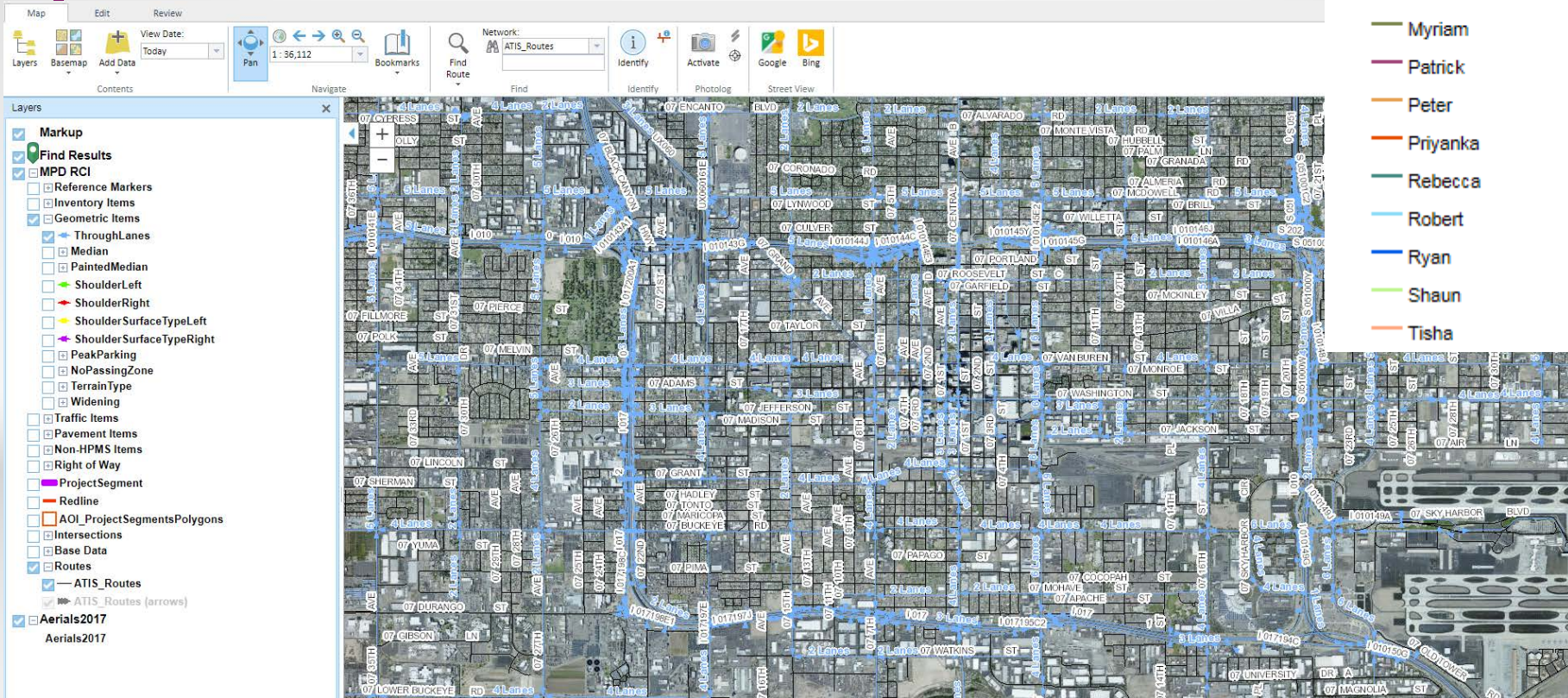
□ Identified the data items to be extracted

Data Item Type	HPMS Data Item	Event Name	Event Fields to Edit	Recommended Method of Extraction	Comments
Inventory Items	Facility Type	FacilityType event	FacilityType, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Structure	Structure event	StructureSubtype, StructureNumber, StructureMaterial, VCFeet, VCInches, LengthInFeet, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Access Control	AccessControl event	AccessControl, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	HOV Lanes	HOV event	NumberOfLanes, HOVType, InServiceDate	Verify extent	Verify with topology
	Peak Lanes	PeakLane event	NumberOfLanes, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Counter Peak Lanes	CounterPeakLane event	NumberOfLanes, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Right Turn Lanes	TurnLaneRight event	BeginWidthFt, EndWidthFt, NumberOfLanes, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Include lane tapers
	Left Turn Lanes	TurnLaneLeft event	BeginWidthFt, EndWidthFt, NumberOfLanes, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Include lane tapers
	Turn Lane Peak Restricted	TurnLanePeakRestricted event	NumberOfLanes, LeftOrRight, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Speed Limit	SpeedLimit event	SpeedLimit, SpeedLimitDirection, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Collect in both directions on undivided roadways. Will have overlapping records
Geometric Items	Through Lanes	ThroughLane event	NumberOfLanes, AvgLaneWidthFt, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Add the total lanes on an undivided roadway, include lane tapers
	Median	Median event	MedianType, Paint, BeginWidthFt, EndWidthFt, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Painted Median	PaintedMedian event	BeginWidthFt, EndWidthFt, TurnLaneTwoWayLeft, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	ShoulderSurfaceTypeLeft	ShoulderSurfaceTypeLeft event	SurfaceType, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	ShoulderSurfaceTypeRight	ShoulderSurfaceTypeRight event	SurfaceType, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Shoulder Left Width	ShoulderLeft event	BeginWidthFt, EndWidthFt, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Shoulder Right Width	ShoulderRight event	BeginWidthFt, EndWidthFt, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Peak Parking	PeakParking event	PeakParking, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
Pavement Items	No Passing Zones	NoPassingZone event	NPZDirection, NPZType, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Collect in both directions on undivided roadways. Will have overlapping records
	Travel Surface Type	TravelSurfaceType event	SurfaceType, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
Traffic Items	Junctions	Junction event	JunctionsSym, TrafficControl, TurnCode, Detection, Signalization, PotGreenTimeOnRoad, JunctionMaintBy, JunctionType, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Collect 2 points per intersection, the dominant and secondary route
Non-HPMS Items	Auxiliary Lanes	AuxiliaryLane event	BeginWidthFt, EndWidthFt, NumberOfLanes, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	find images
	Bicycle Lanes	BicycleLane event	BeginWidthFt, EndWidthFt, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Carriageway	Carriageway	CarriagewayDir, CarriagewayType, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Need to update domains, may be taken out of contract
	Passing Lanes	PassingLane event	BeginWidthFt, EndWidthFt, NumberOfLanes, PassingLaneType, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Curb & Gutter	CurbAndGutter event	CurbGutterType, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Addition of pedestrian facilities (sidewalk)
	Slow Vehicle Pullout	SlowVehiclePullout event	AvgSVPWidthFt, SVPDirection, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	Bus pullouts, work with MAG/PAG to get bus stop locations
	Variable Message Signs	VariableMessageSign event	VMSSStatus, VMSSFacing, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
	Channelizations	Channelization event	BeginWidthFt, EndWidthFt, Painted, Paint, InServiceDate	Engineering Plan Sheets, Aerial Imagery, Photo Log, Google Maps	
Review Only Items	National Highway System	NHS event	NHS, InServiceDate	Verify extent	Verify with topology
	Functional Classification	FunctionalClass event	FunctionalClass, InServiceDate	Verify extent	Verify with topology
	Urban Code	UrbanCode event	UrbanCode, InServiceDate	Verify extent	Verify with topology
	Ownership	OwnerMaint event	County, Ownership, Maintenance, InServiceDate	Verify extent	Verify with topology and use the CPM project from Works
	County Code	CountyCode event	CountyCode, InServiceDate	Verify extent	Verify with topology

Extraction Methodology

- Identified the data items to be extracted
- Roadway Characteristics Editor (RCE)

- RCI_Tracker
 - Unassigned
 - Bob
 - Caitlin
 - Completed
 - Greg
 - Jake
 - Jenn
 - Marvis
 - Myriam
 - Patrick
 - Peter
 - Priyanka
 - Rebecca
 - Robert
 - Ryan
 - Shaun
 - Tisha



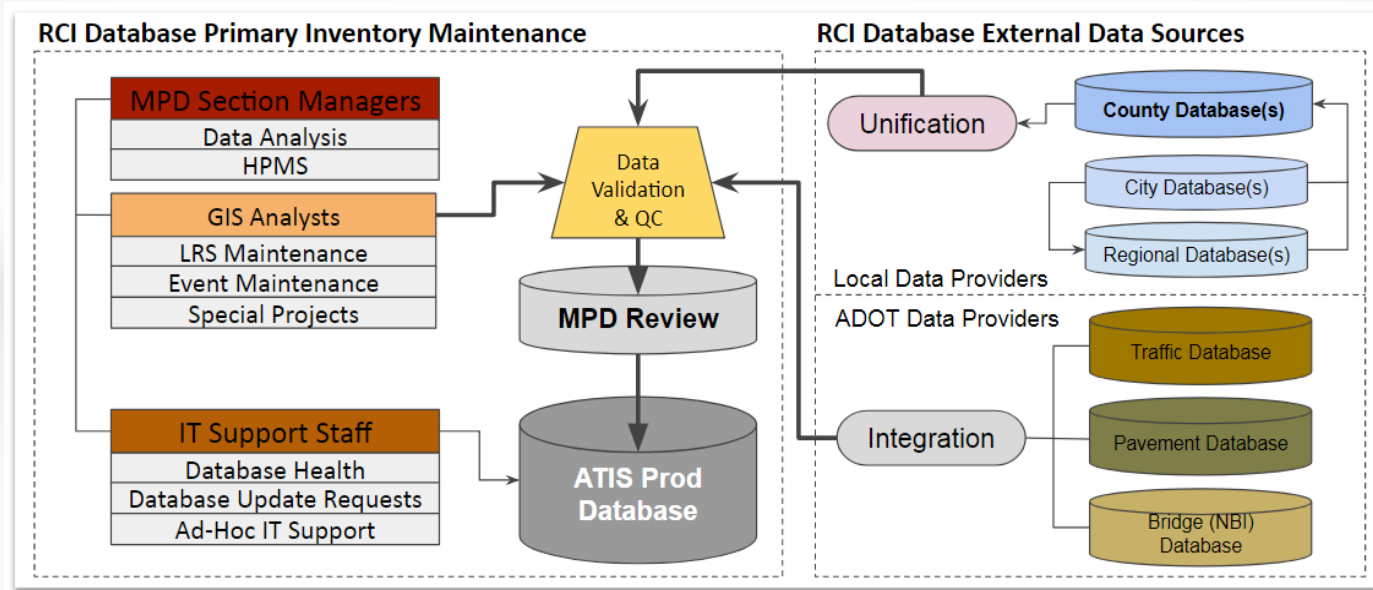
Extraction Methodology

- ❑ Identified the data items to be extracted
- ❑ Roadway Characteristics Editor (RCE)
- ❑ CADD data? Photo log, Aerial Imagery and Google Street View



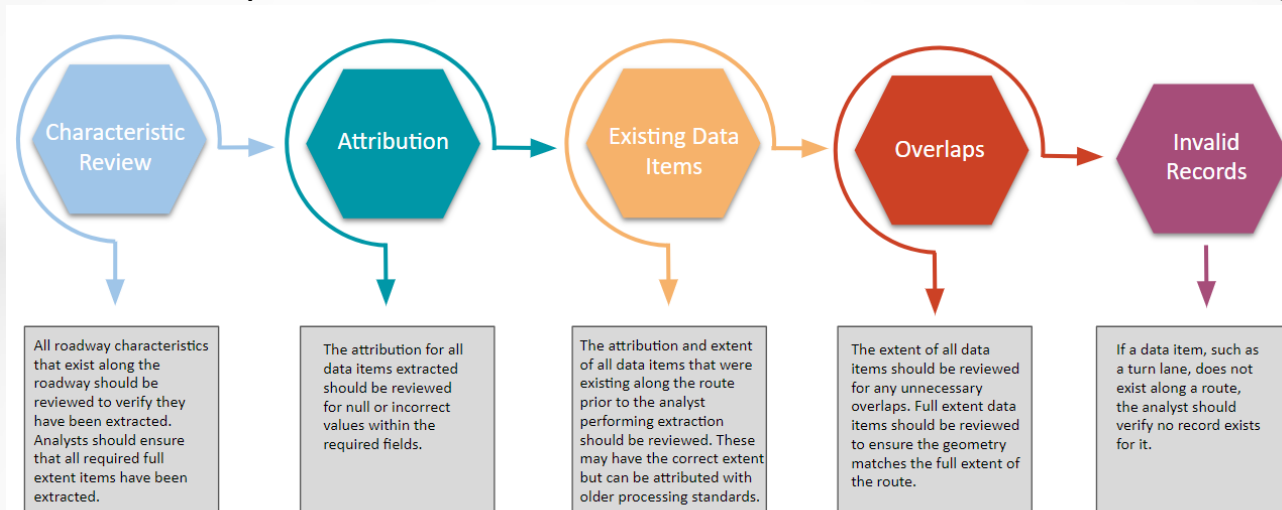
Extraction Methodology

- ❑ Identified the data items to be extracted
- ❑ Roadway Characteristics Editor (RCE)
- ❑ CADD data? Photo log, Aerial Imagery and Google Street View
- ❑ Extraction Training and Data Nuances



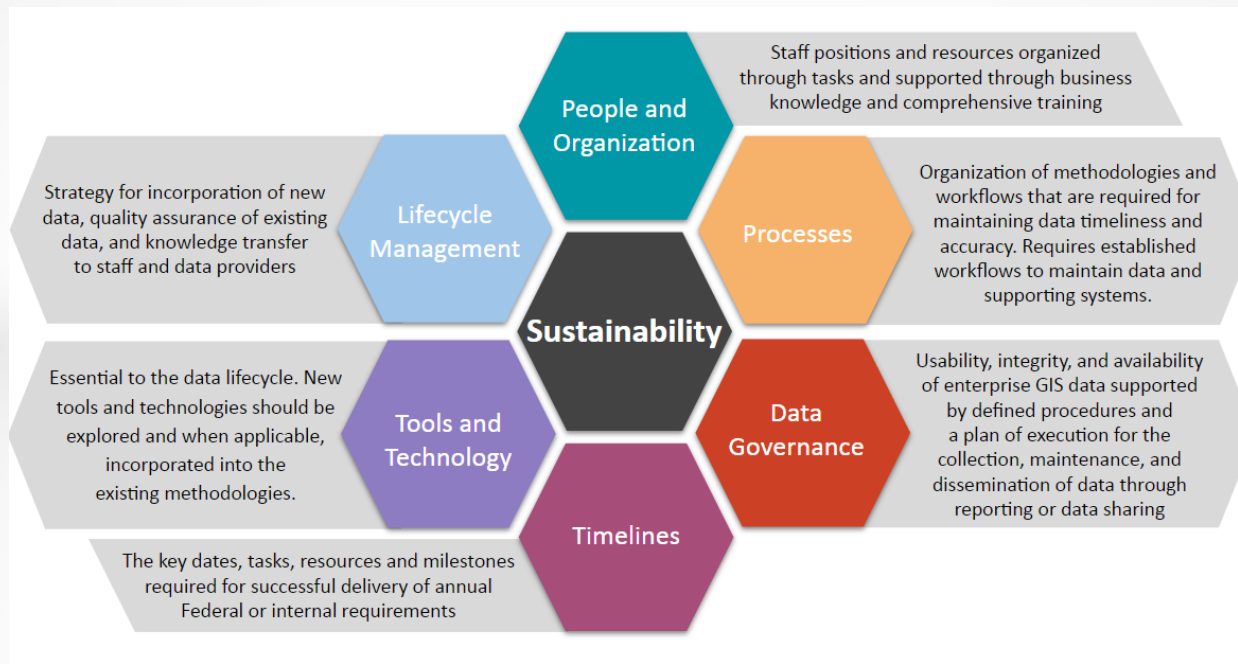
Data Integrity and Validation

- ❑ Topology Checks
- ❑ Implement Route Dominance
- ❑ Confidence Code
- ❑ Event and Cross Event Validation Rules
 1. Can't have a functional classification of interstate and have a unpaved surface type
 2. Can't have speed limit attribute without a "0" or "5" in the last digit



Sustainability

- ❑ Methods to keep data updated
- ❑ Automation and Workflow Updates
- ❑ Data Supply Chain
- ❑ Local Involvement



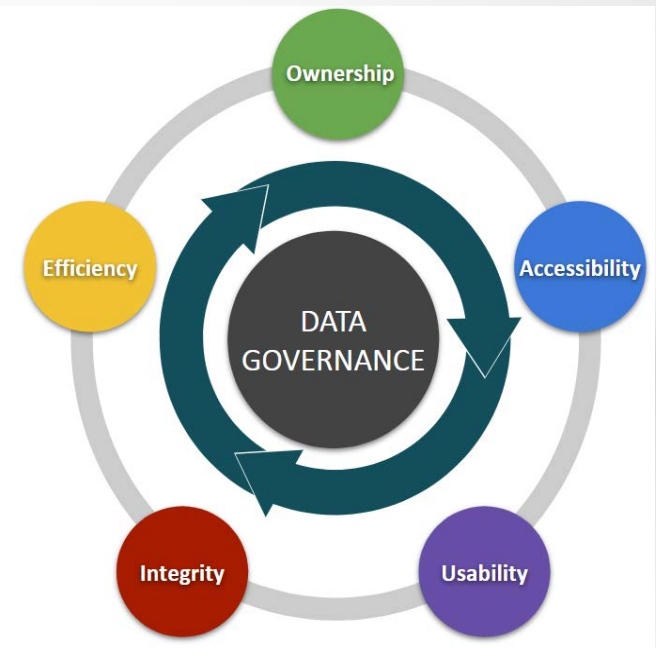
Lessons Learned

- ❑ Timeline Change
 - ❑ Support HPMS
- ❑ Documentation
- ❑ Need for QC early on
- ❑ Staffing...or lack there of
- ❑ Concurrent Projects
 - ❑ Centerline Unification (ARNOLD)
 - ❑ Functional Classification Rebalancing
 - ❑ Mobile Data Collection
- ❑ Technology



Future Steps

- ❑ Continued build out of data items
- ❑ Database changes
- ❑ Creation of a statewide traffic monitoring plan
- ❑ Data Governance Plan
- ❑ Agency Wide Data Maturity
- ❑ Local Involvement/Data Sources



Questions?

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AppGeo

1spatial



ADOT