



A GIS Master Plan in Public Works

Sean Gill

Account Manager - State and Local Government

Topics

- Apps to support field operations
- Analytics capabilities
- A modern approach for connecting with citizens
- Solutions that support specific public works workflows



Business Challenges for Public Works

The primary objective for any public works organization is to provide for a safe, vibrant and growing community for its citizens. On a daily basis, they face a number of demands and challenges including:

- **Containing operational costs**
- **Responding to unfunded mandates**
- **Increasing demands for services**
- **The need to be more transparent**
- **Managing and maintaining assets**
- **Growing need to support disaster preparedness and recovery efforts**
- **Development and maintenance of data industry standards as a System of Record**



Esri Supports Public Works Organizations

- **Maintain an authoritative inventory of public assets**
- **Analyze the effective life of new and aging infrastructure and visualize proposed improvements**
- **Coordinate capital project investments and maximize public expenditure**
- **Reduce the cost of field operations, maintenance activities, and optimizes decision making**
- **Improve operational awareness and response to a storm, natural disaster, special event, or an incident**
- **Improve customer service**



Common Business Patterns Throughout Public Works Activities

Mapping & Visualization



Understand locations and relationships with maps and visual representations

Data Management



Collect, organize, and maintain accurate locations and details about assets and resources

Field Mobility



Manage and enable a mobile workforce to collect and access information in the field

Monitoring



Track, manage, and monitor assets and resources in real-time

Analytics



Discover, quantify, and predict trends and patterns to improve outcomes

Design & Planning



Evaluate alternative solutions and create optimal designs

Decision Support



Gain situational awareness, and enable information-driven decision making

Civic Engagement



Communicate and collaborate with citizens and external communities of interest

Sharing & Collaboration



Empower everyone to easily discover, use, make, and share geographic information

Public Works Business Solutions

Planning & Engineering

- Maximize Capital Investments
- Manage Right of Way Activities
- Improve Decision Making

Transportation

- Reduce Traffic Fatalities
- Promote Public Parking
- Identify High Risk Roadways

Platform for
Collaboration & Innovation



ArcGIS

Operations & Maintenance

- Inventory Right of Way Assets
- Engage the Public
- Manage storm, natural disaster, and special events
- Debris Management

Environmental Services

- Manage Mosquito Populations



Esri's Public Works Solutions

Engineering

Maximize Capital Investments

- Develop Capital Plans
- Prioritize Public Spending
- Inventory Moratoriums
- Engage External Agencies
- Review Project Portfolio
- Share Capital Plan
- Record Construction Progress
- Communicate Project Status
- Monitor Capital Projects
- Share Project Status

Reduce Traffic Fatalities

- Analyze Crash Data
- Report Pedestrian Safety Issues
- Locate High Risk Roadways
- Explore Serious Injury Crashes

Manage Right of Way Activities

- Apply for Right of Way Permit
- Manage Permit Review
- Review Permit Applications
- Enhance Public Comment
- Monitor Right of Way Permits
- Share Right of Way Permits

Promote Public Parking

- Public Parking

Operations

Maintain Public Road Network

- Inventory Public Road Network
- Track Maintenance Agreements
- Inventory and Share Road Closure Information
- Inventory Administrative Areas
- Index Plans and Drawings

Inventory Right of Way Assets

- Inventory Street Intersections
- Inventory Street Signs
- Inventory Traffic Signals
- Inventory Streetlights
- Inventory Railroad Crossings
- Inventory Bridges
- Inventory Sidewalks
- Inventory Cycling Infrastructure
- Inventory Pavement Markings
- Inventory Guardrails
- Inventory Calming Devices
- Inventory Street Furniture
- Inventory Street Trees

Engage the Public

- Submit Request for Service
- Adopt an Asset
- View Trash Schedule
- Enhance Public Comment
- Prioritize Public Spending
- Locate Parks or Activities

Manage Storm, Natural Disaster, and Special Events

- Snowcop Dashboard
- Waze Dashboard
- Customer Care App
- Disaster Public Info Map
- Special Events Management
- Storm Issue Reporter
- Disaster Response Plan Story Map
- Field Assessment Map
- Yard Maintenance Map

Environmental Services

Manage Mosquito Populations

- Engage Citizens
- Conduct Field Operations
- Suppress Adult Mosquitoes
- Control Juvenile Mosquitoes
- Monitor Mosquito Populations
- Track Vector-Borne Diseases

Esri's Public Works Solutions

Engineering

Maximize Capital Investments

- Develop Capital Plans
- Prioritize Public Spending
- Inventory Moratoriums
- Engage External Agencies
- Review Project Portfolio
- Share Capital Plan
- Record Construction Progress
- Communicate Project Status
- Monitor Capital Projects
- Share Project Status

Reduce Traffic Fatalities

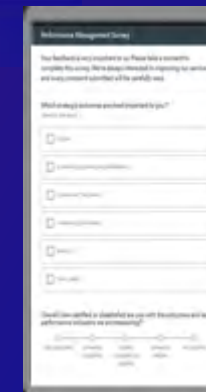
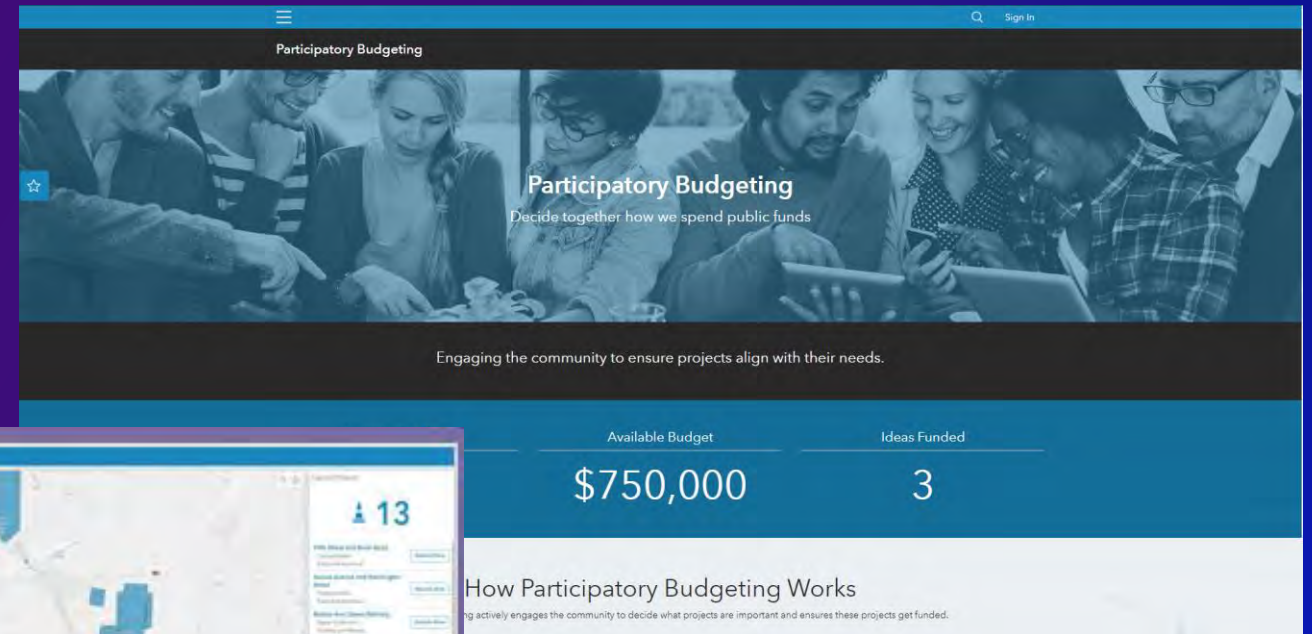
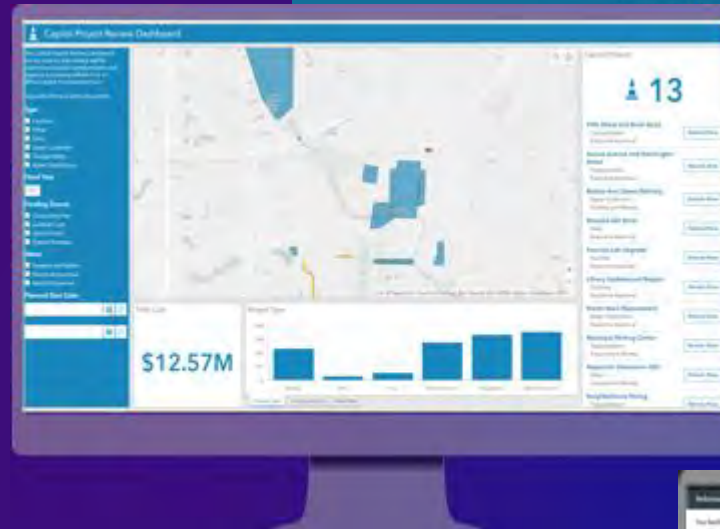
- Analyze Crash Data
- Report Pedestrian Safety Issues
- Locate High Risk Roadways
- Explore Serious Injury Crashes

Manage Right of Way Activities

- Apply for Right of Way Permit
- Manage Permit Review
- Review Permit Applications
- Enhance Public Comment
- Monitor Right of Way Permits
- Share Right of Way Permits

Promote Public Parking


- Public Parking



Esri's Public Works Solutions


ArcGIS Solutions

OverviewResourcesLaunch ArcGIS Solutions



ArcGIS Solutions

Industry-specific configurations for ArcGIS



ArcGIS Solutions is a collection of focused maps and apps that helps address challenges in your organization. They leverage your authoritative data and are designed to improve operations, gain new insight, and enhance services in government, utility, defense, public safety, intelligence, and commercial business.

www.solutions.arcgis.com



Field Mobility

Improving Operational Efficiency

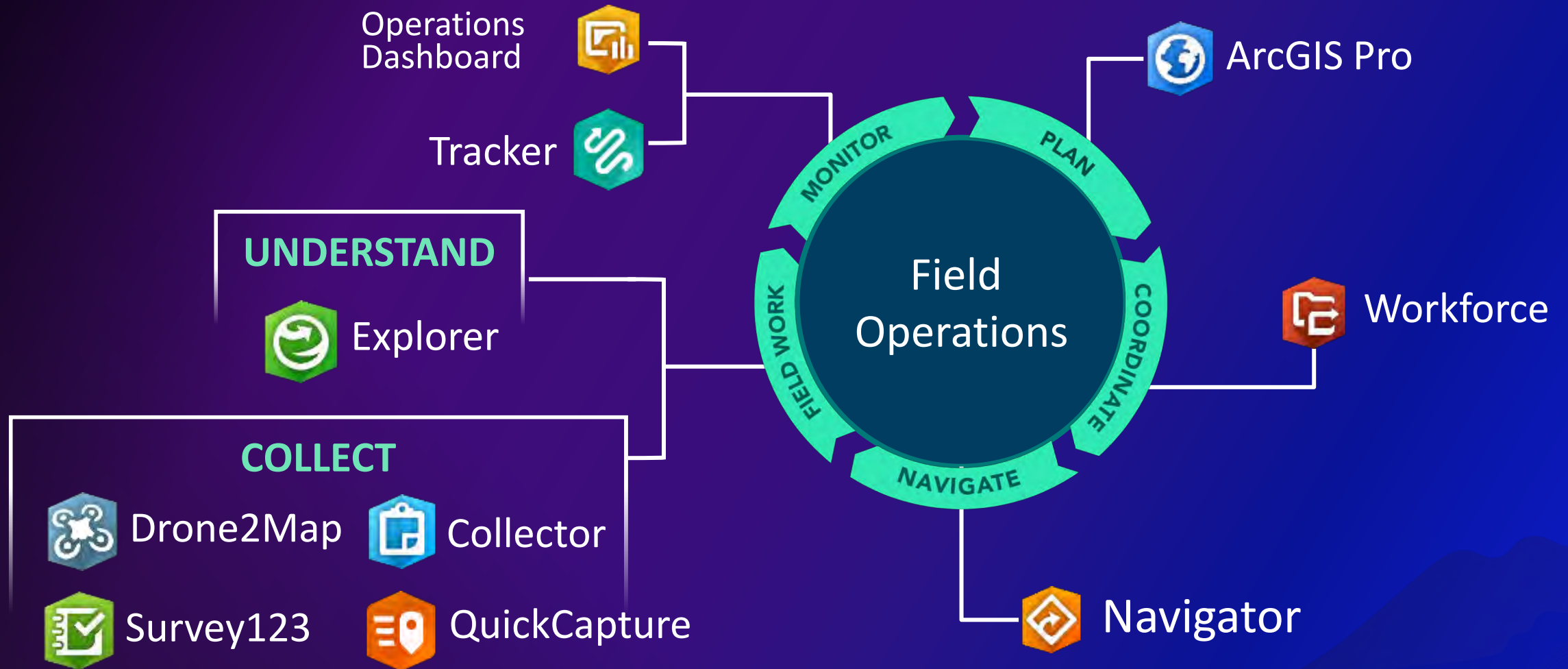


Empower Everyone with Apps

Easy-to-use apps that work on any device, anywhere, anytime



Esri for Field Operations



Field Operations | ArcGIS Field Maps and specialized apps



Specialized Apps

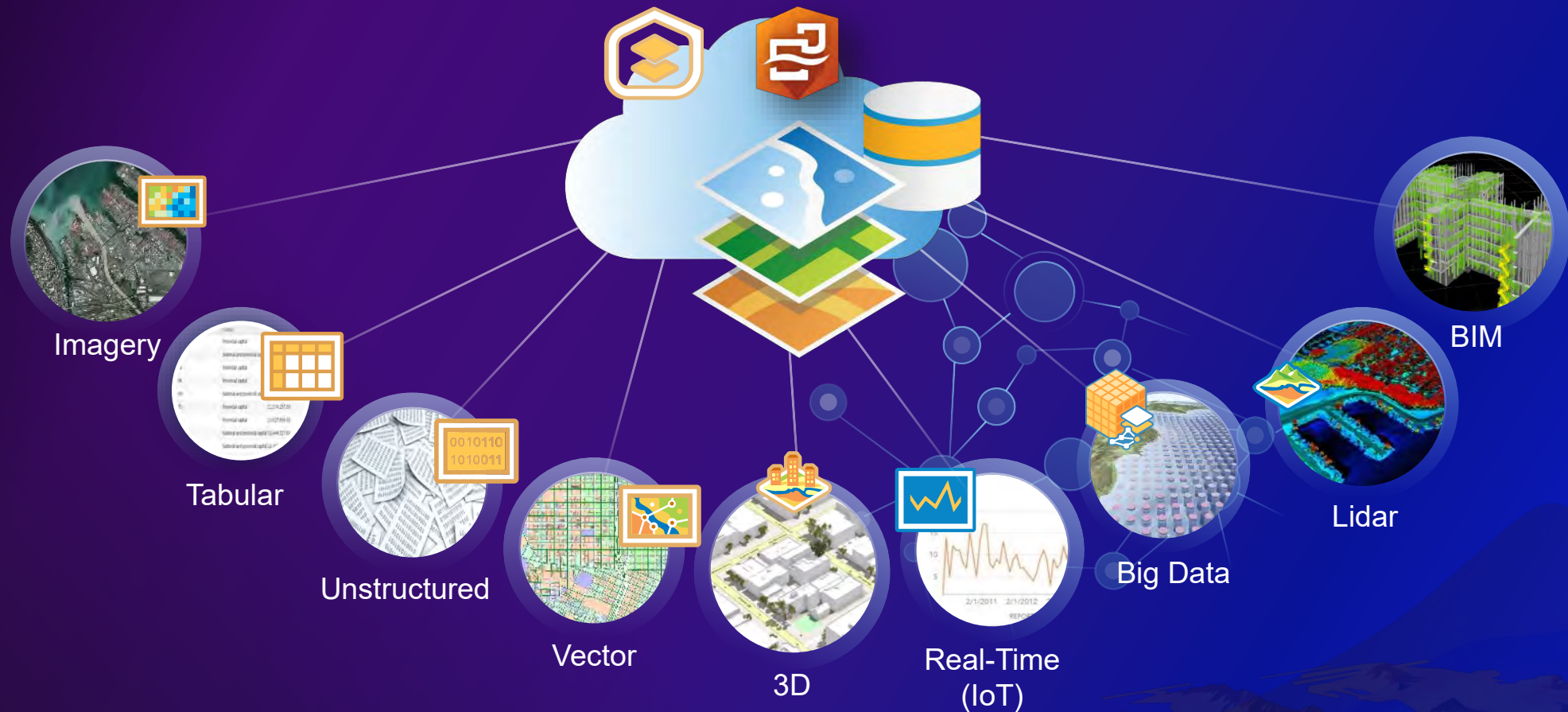
ArcGIS Survey123
ArcGIS QuickCapture
ArcGIS Mission Responder
ArcGIS Indoors
ArcGIS Earth



Location Intelligence & Analytics

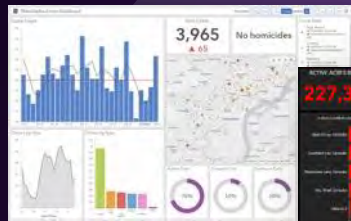


Data-Driven Performance through Data and Analytics



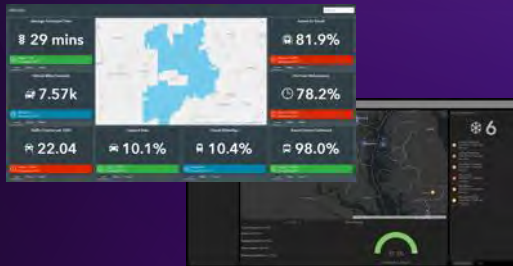
Esri Analytics – Capabilities

Web GIS

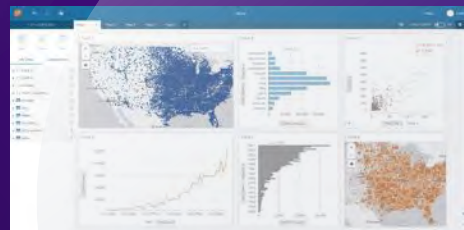


Operations Dashboard for ArcGIS

ArcGIS Solutions for Public Works



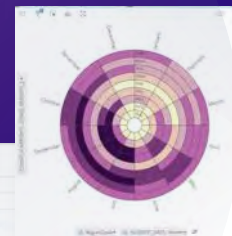
Insights for ArcGIS



Many Data Types

Spatial and Tabular Analysis

Location Analytics



Real-Time

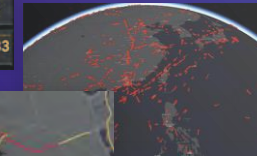


Supporting High-Velocity Data Streams

Tracking, Monitoring, and Alerting



AVL Integration

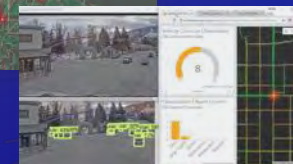


Integrating Sensor Networks and IoT

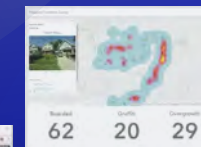
AI and Machine-Learning



Accident Prediction



Feature Identification



Property Condition Survey

Community Engagement – Importance to Public Works

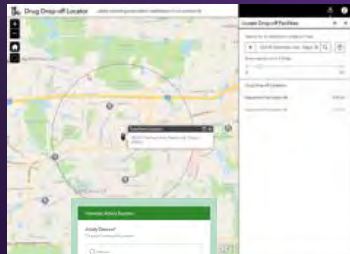
- **Public Information:** Improve transparency/accountability
- **Public input/solicited comment**
- **Unsolicited comments**
- **Citizens as sensors**
- **Promote volunteerism/citizen participation**
- **An opportunity for a public works organization to tell its story**



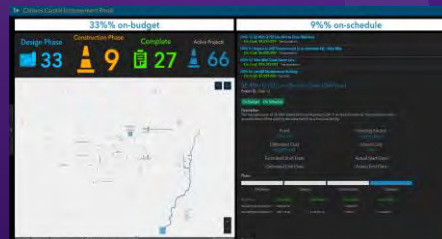
Solutions for Citizen Engagement

Focused Solutions

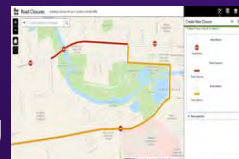
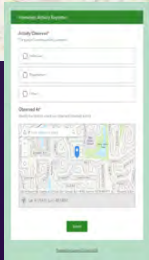
Participatory Budgeting



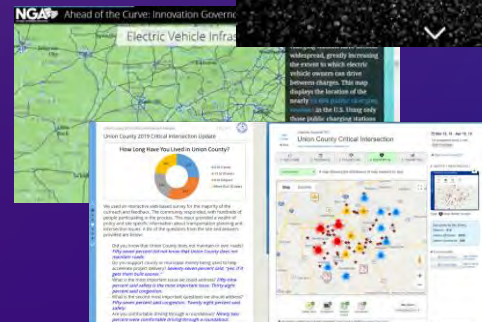
Civic Engagement



Citizen Problem Reporting

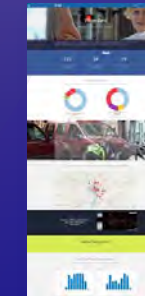


Story Maps



Public Information

ArcGIS Hub



Community Portal



Performance Reporting



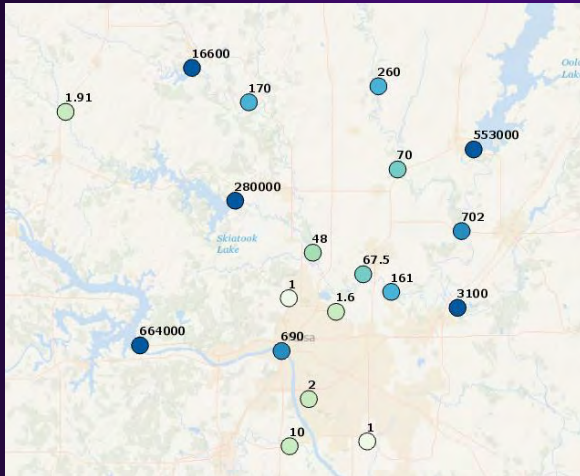
Open Data



Real-Time Operations

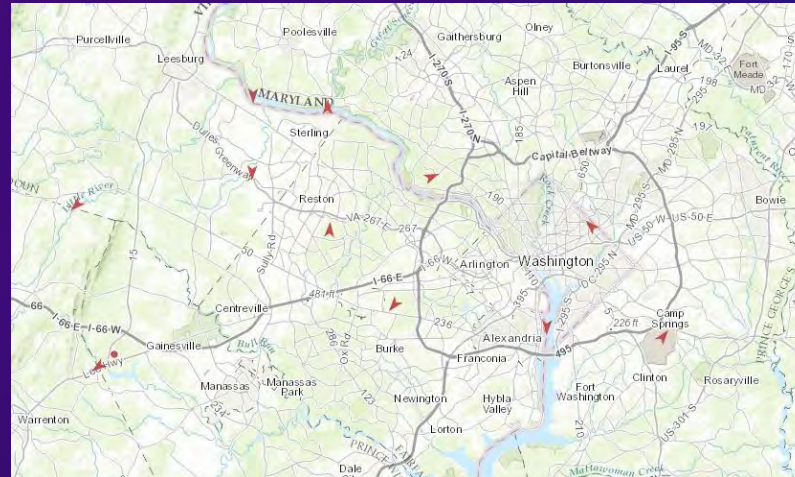
- A story of integration – multiple data streams that form a comprehensive picture.
- Track, manage, and monitor assets and resources in real-time.
- Gain situational awareness - actionable information supporting on the fly decision-making based on events happening in real-time.

Stationary sensors...



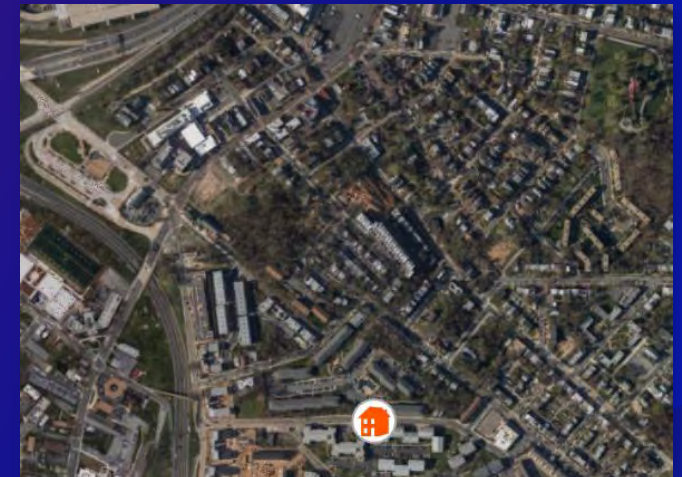
- water gauges
- weather stations
- air quality sensors

Things that move...



- vehicles
- storms
- people

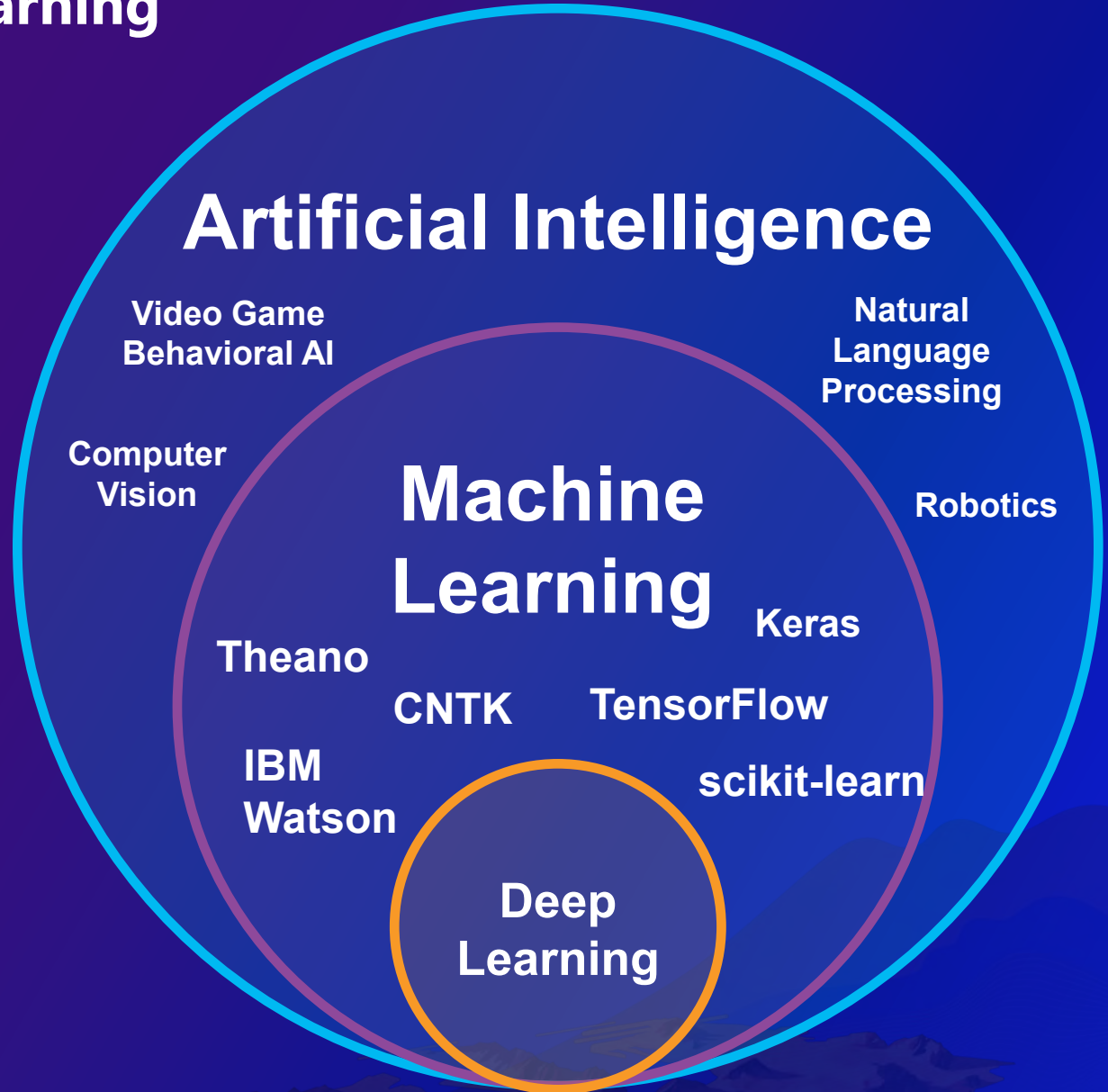
Things that “just happen”...



- crimes
- lightning
- accidents

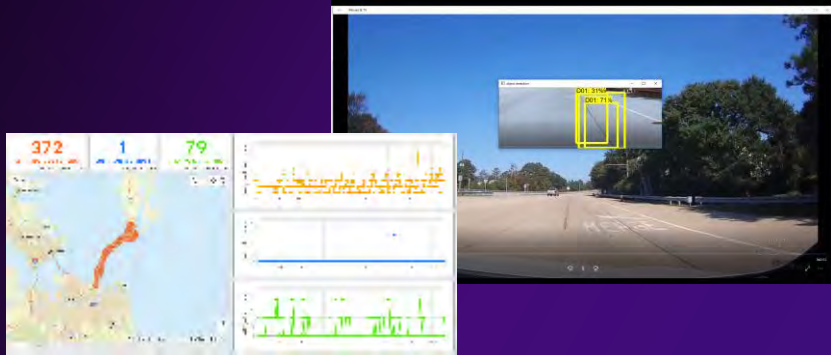
Artificial Intelligence and Machine Learning

- Find objects, detect change, and classify land
- Spatial data science workflows
- Make predictions from current and historical data
- Spatially analyze big data
- Through imagery, find things faster, with greater accuracy, at whatever scale that needs examining

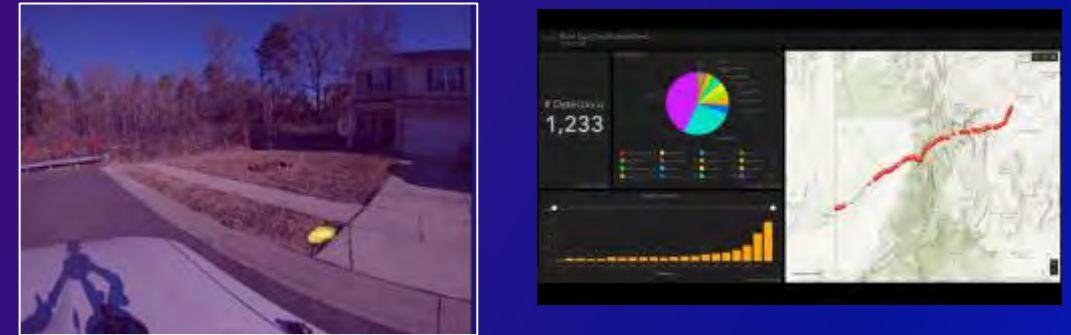


Artificial Intelligence and Machine Learning

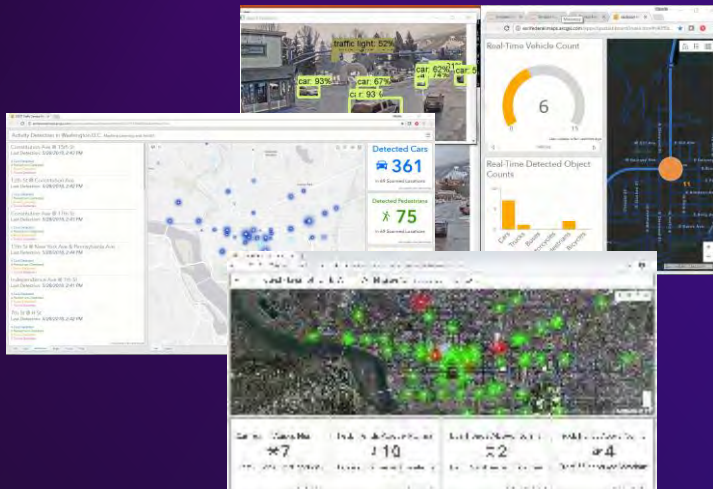
Road Crack Detection



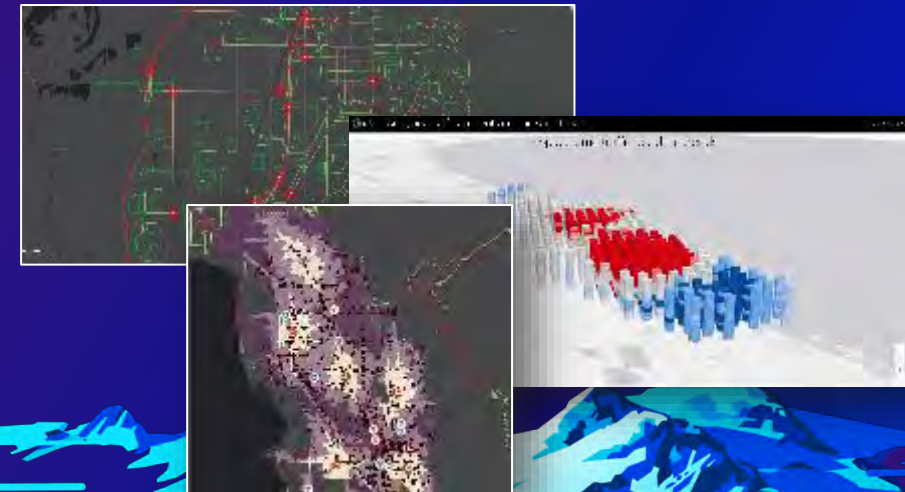
Road Asset Extraction from Oriented Imagery



Traffic Analysis from CCTVs



Crash Risk Prediction & Pattern Mining



ArcGIS GeoBIMSM

Connected Projects in Context

Supporting Integrated
Visualization & Query

Interconnecting ArcGIS with
Autodesk Construction Cloud



Site Context Evaluation
Design & Construction Coordination
Project Coordination
Documentation Review
Proposal Review
Visual Analysis
Interactive Query

Apps

Enabling Collaboration Across Teams . . .
. . . Improving Project Coordination & Delivery

Explore

Collaborate

Communicate

Thank You!
Sean Gill - Account Manager

E: S.Gill@esri.com

Solution Engineer

Pam Kersh

E: pkersh@esri.com

Training Consultant

Tamara Adamson

E: tadamson@esri.com

