Five Ways Public Works Agencies are Leading Smart Communities

Adam Carnow

2022 ESRI MIDWEST USER CONFERENCE

What is smart?

smart communities
smart tech
smart
smart luggage
smart appliances
smart tv
smart watch
roads
smart traffic
smart garden
smart car
smart transit
smart parks
smart bulbs
smart bed
smart security
smart phone
smart government
smart planning
smart app
smart banking
smart growth
smart engineering
smart maps
smart house
smart
clothes
smart operations
smart cities
smart performance
smart devices
smart factory
smart view
smart tablet
smart
packaging
smart goals
smart budget
smart mirror
smart pets
smart plugs
smart buildings
smart school
smart hubs
smart glasses
smart solutions
smart software
smart coffee
smart business

In Government, Location is Never an Afterthought

GIS is Recognized as a Foundational System

Citizen

Health
Connected
Homelessness
Equity
Livability
Opioid Crisis
Mobility
Housing
Public Safety
Aging Population
Economic Opportunity

Infrastructure

Broadband
Aging Structures
Telecommunications
Airports
Highways and Roads
Buildings
Water
Bridges
Land Use
Sewer

Environment

Green Infrastructure
Open Space
Climate
Sea-Level Rise
Air Quality
Inclement Weather
Renewable Energy
Pollution
Habitat Preservation

Technology Advancements

Sensors
Artificial Intelligence
Autonomous Vehicles
Machine Learning
Intelligent Things
Cloud
AR/VR
Drones
Internet of Things

GIS supports all aspects of government

It starts with identifying priorities…

Four Technology Tenets

Planning and Engineering

Urban and Community Design

Operational Efficiency

Good Government Services

Smart Community Information System

Data-Driven Performance

Through Data and Analytics

Civic Inclusion

Connecting with the Community

Planning & Engineering

smart Planning & Engineering

Modeling

Broadband

Multi-Modal

Mobility

Economic Growth

Natural Environment

Sustainability

Green Infrastructure

Infrastructure as a Sensor

Transit

Imagery

Climate Change

Human-Centered Design

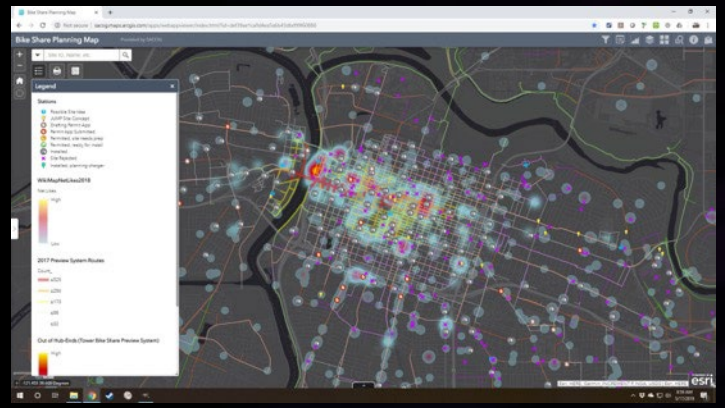
Infrastructure

3D

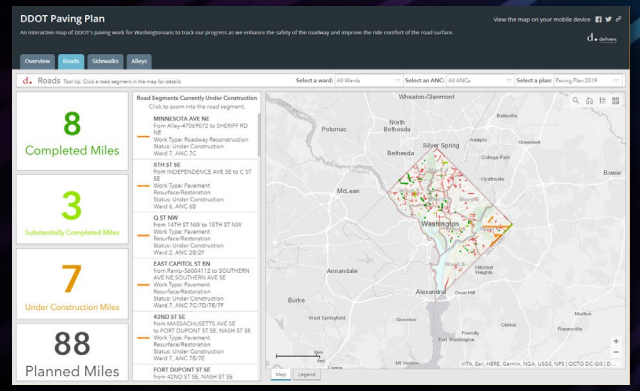
Resiliency

Planning and Engineering

Smart Communities Happen When Location Helps Great Things Get Built



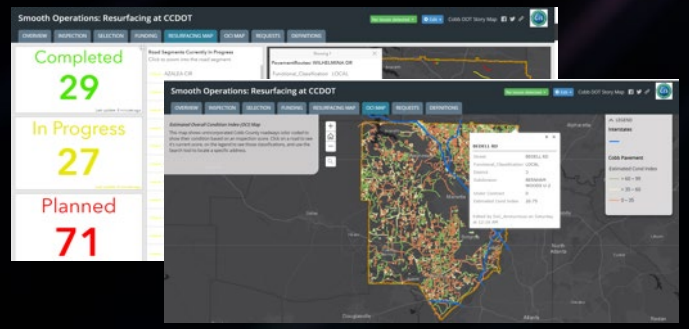
Sacramento Area Council of Governments, CA – Identify Key Locations to Install Bike Parking



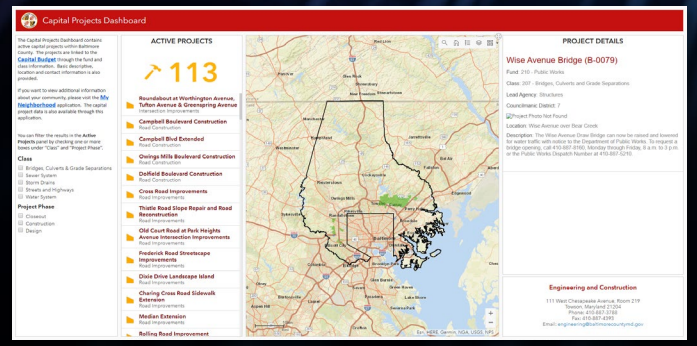
DDOT – Pavement Prioritization

Peachtree Corners, GA – Autonomous Vehicle Test Track

Manatee County, FL – Sea-Level Rise Analysis



Cobb County, GA – Prioritization of Street Repaving



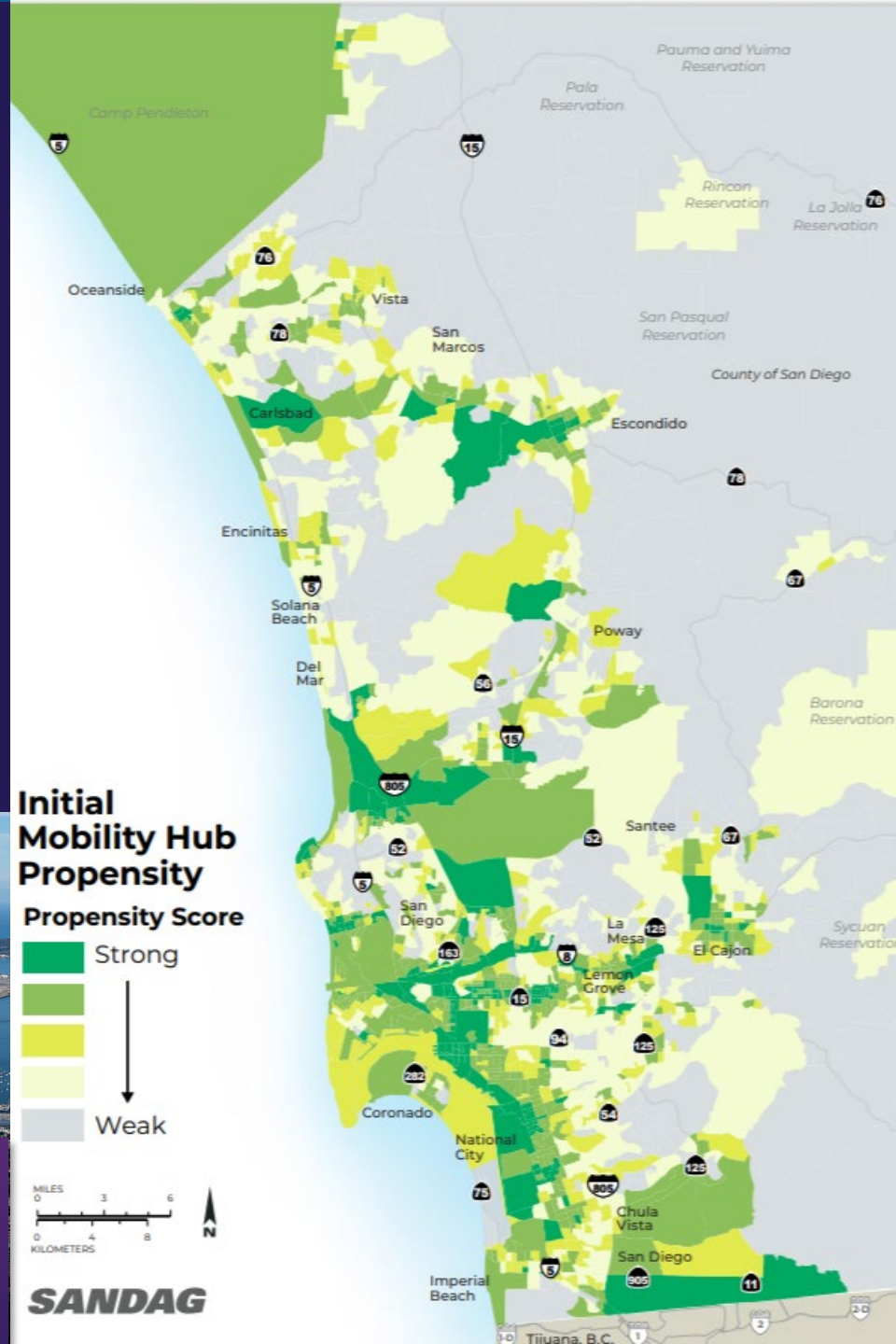
Baltimore County, MD – Capital Improvement Dashboard

Transforming Transportation

San Diego Association of Governments (SANDAG)

- **Next OS** – Enable new and better services
- **Complete Corridors** – Provide safe and reliable travel for everyone
- **Transit Leap** – Build on the current transit services
- **Mobility Hubs** – Bring together better transit and travel options
- **Flexible Fleets** – Include micromobility strategies, ride share, and microtransit options

TRANSPORTATION PLANNING

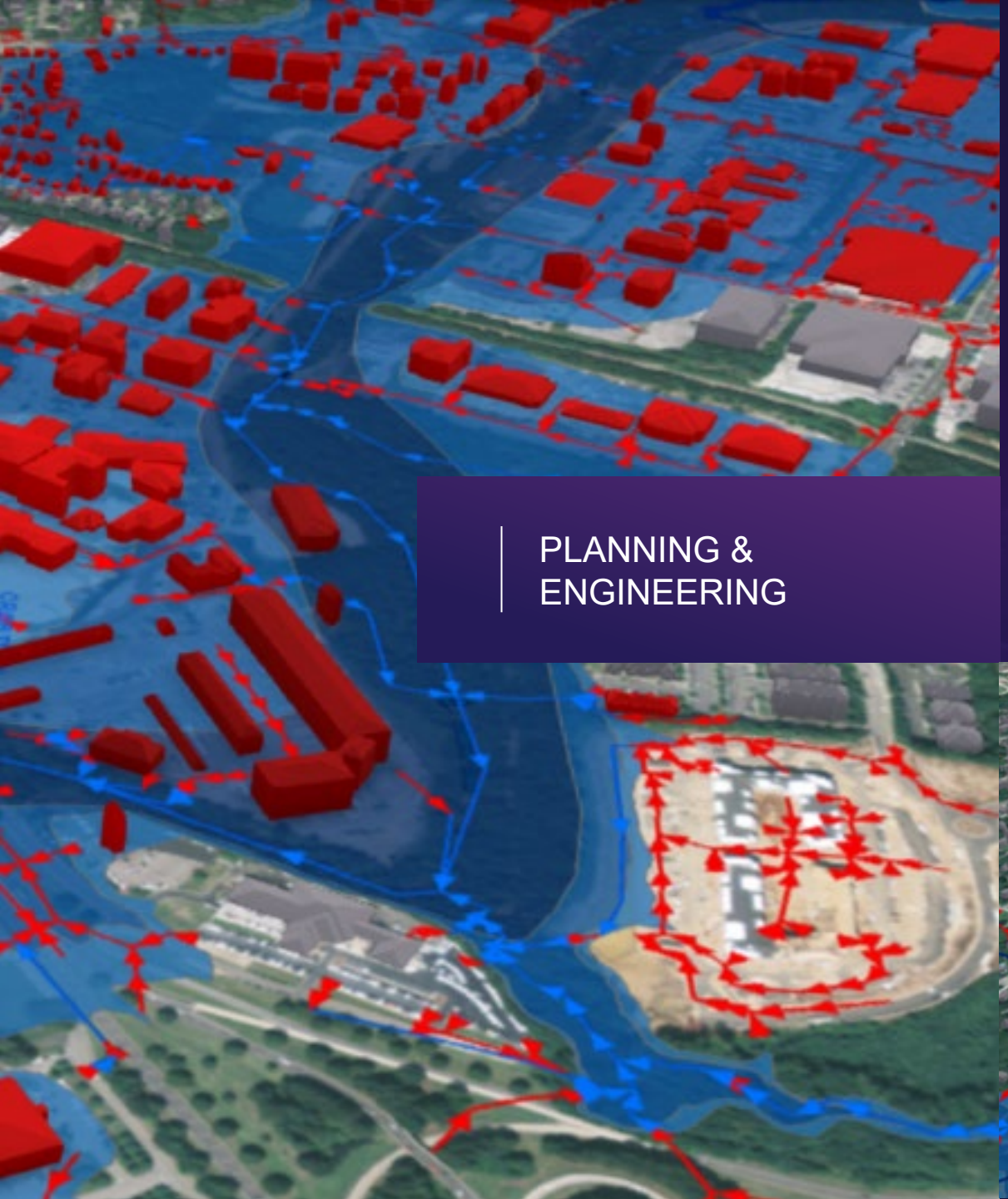


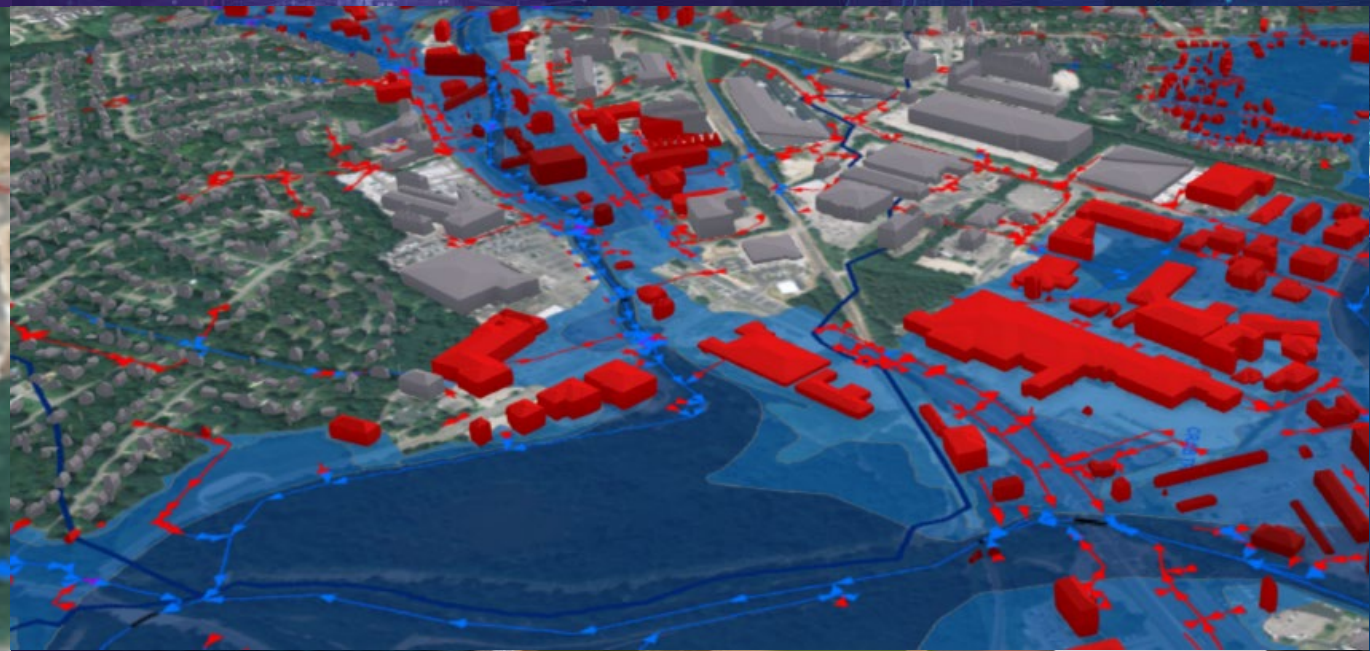
Mitigating Flood Risk

Raleigh, NC

Using 3D analysis to help understand flooding risk and sea-level rise to inform storm water strategy

PLANNING &
ENGINEERING





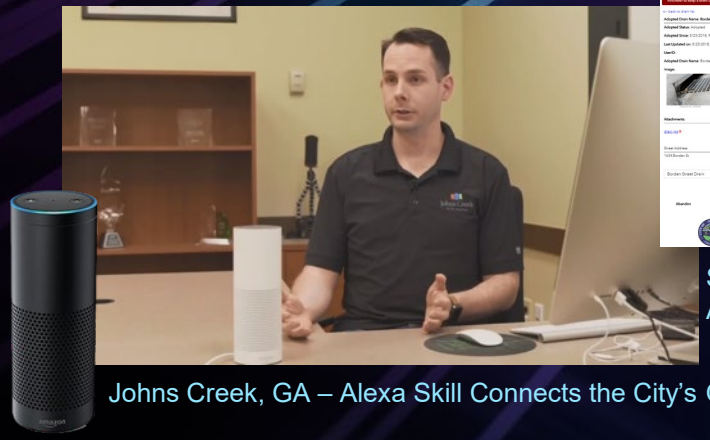
Operational Efficiency

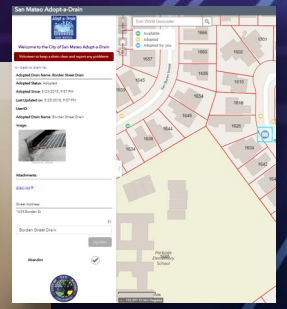
smart
Operational Efficiency
Asset Management
Fleet Management
Field Mobility
Streamlined Workflows
Inspections
Data Collection
Facilities
Service Delivery
Navigation

Operational Efficiency

Smart Communities Happen When Location is Used to Improve Efficiency

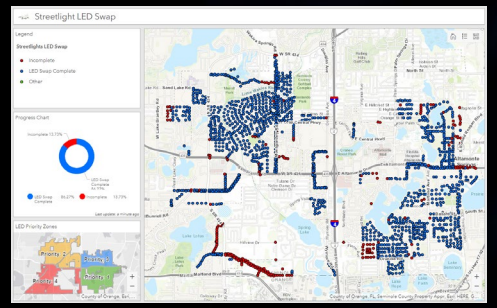
Palm Beach County, FL –
Mosquito Inspection



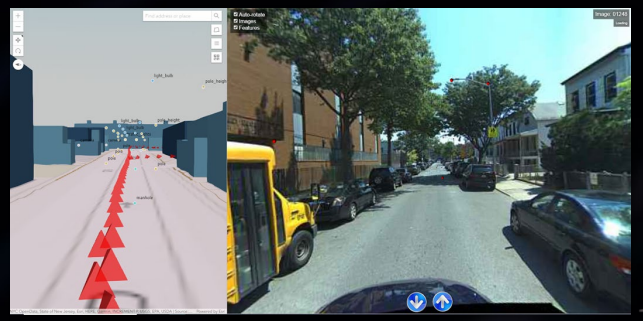


San Mateo, CA
Adopt-a-Drain

Johns Creek, GA – Alexa Skill Connects the City's Open Data



Altamonte Springs, FL –
Streetlight LED Swap



Brooklyn, NY – 5G Telecom Asset Inspection

Seminole Tribe of Florida –
Inspections with Drone Imagery

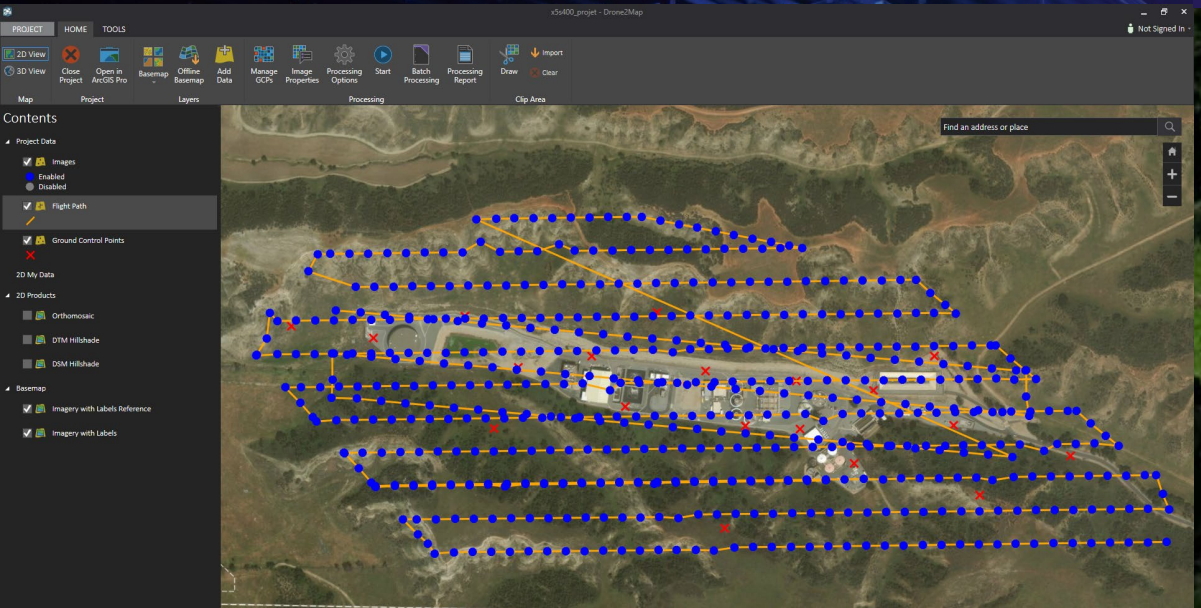
Saving Money with Drones

Onondaga County Water Authority, NY

Onondaga County Water Authority (OCWA)
Saves $6,500 per tank inspection.

- Drone-based solution provided quick turn around
- Largest tanks captured in 20 minutes
- Captured every square inch of the assets
- Data used for risk assessment

OPERATIONAL EFFICIENCY



Data-Driven Performance

Data-Driven Performance

Dashboards

Performance Management

IoT

Autonomous Vehicles

Real-Time

Analytics

Situational Awareness

Sensors

Artificial Intelligence

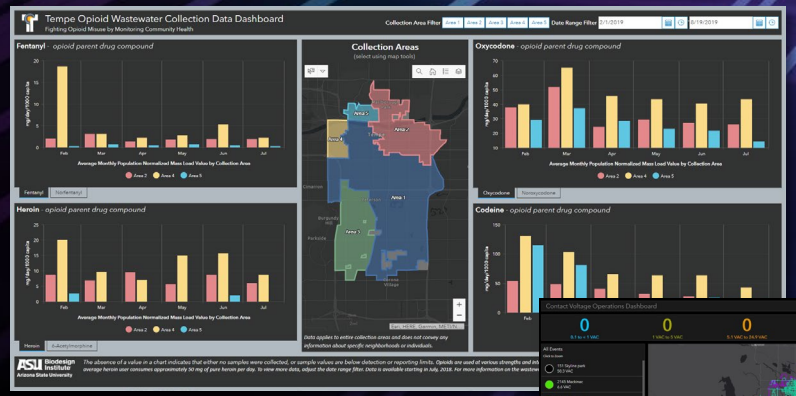
Environmental Monitoring

Machine-Learning

Data-Driven Performance

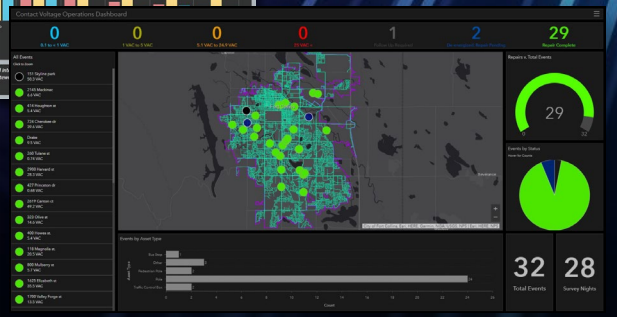
Smart Communities Happen When Governments Achieve Data-Driven Performance

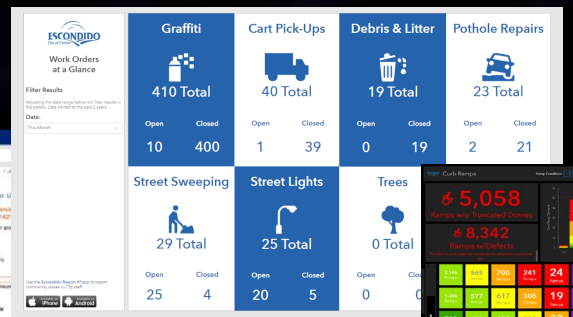
Cobb County, GA – Traffic Management Using Artificial Intelligence



Tempe, AZ – Wastewater Opioid Monitoring

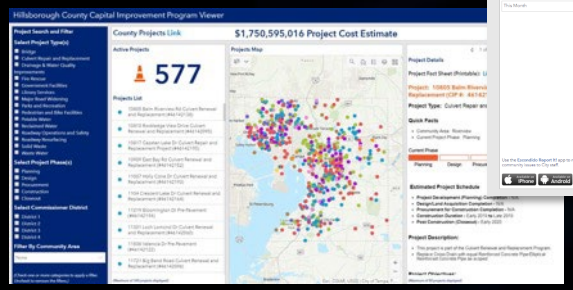
Fort Collins, CO – Monitoring Voltage



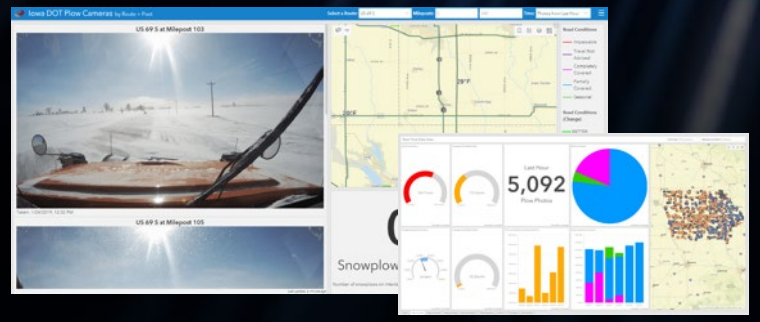


Escondido, CA

Vancouver, WA



Hillsborough County, FL – Capital Improvement Projects & Expenditures



Iowa DOT – Real-Time Monitoring of Snow Operations

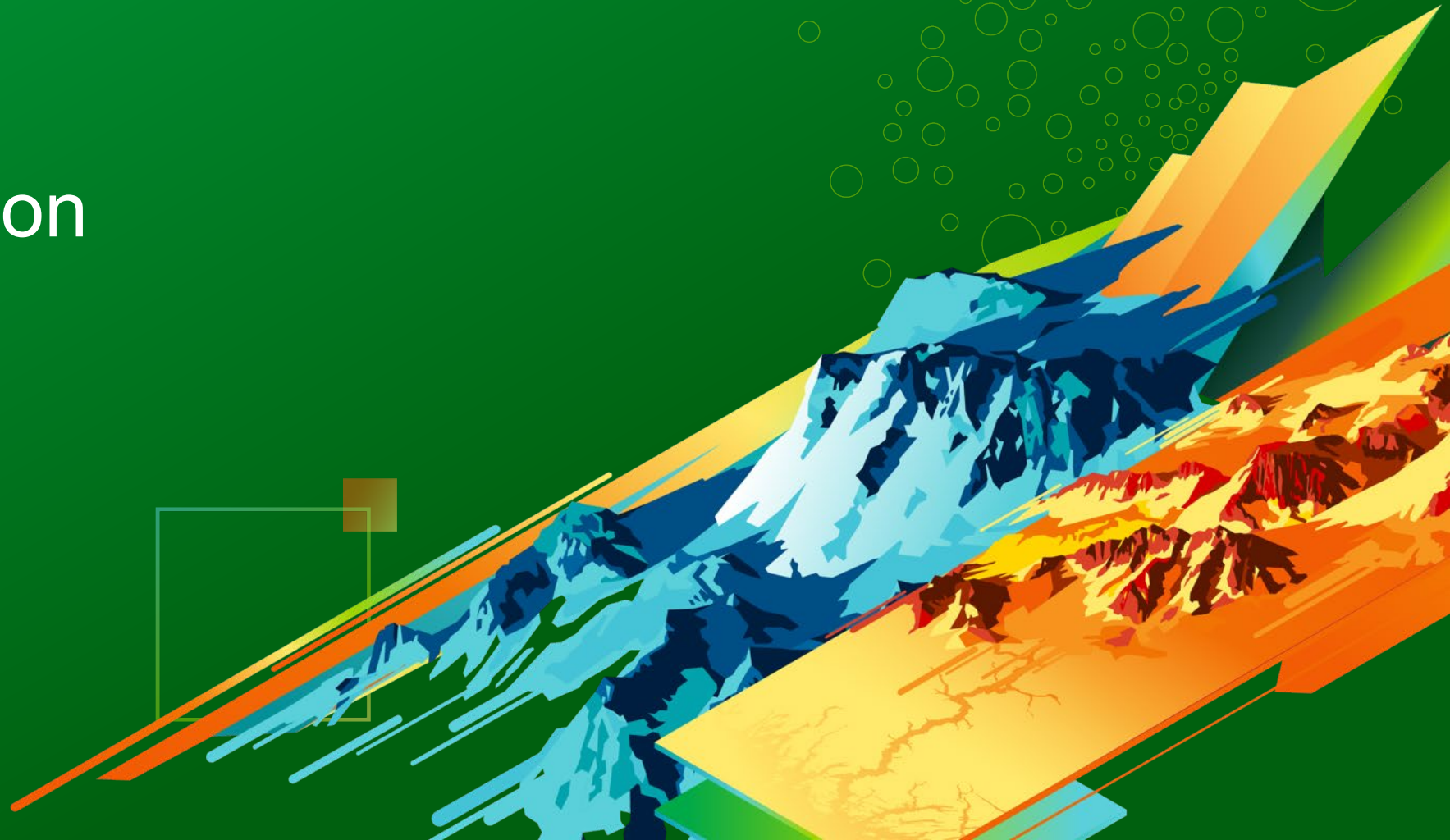
Pioneering Future-Ready Mobility

Cobb County, GA

The county is consuming vehicle and pedestrian data, along with real-time road closure and traffic accident information, to modify traffic patterns in real time.

DATA-DRIVEN PERFORMANCE

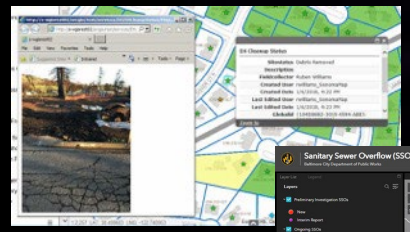
Civic Inclusion



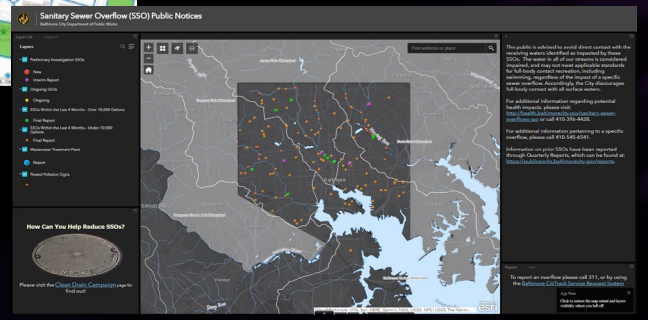
Civic
Inclusion
Communication
Public
Participation
Social Equity
Humans
in Crisis
Connected
Citizens
Crowdsourcing
Citizen
Engagement
Collaboration
Demographic
and Lifestyle
At-Risk
Populations
Economic
Opportunity

Civic Inclusion

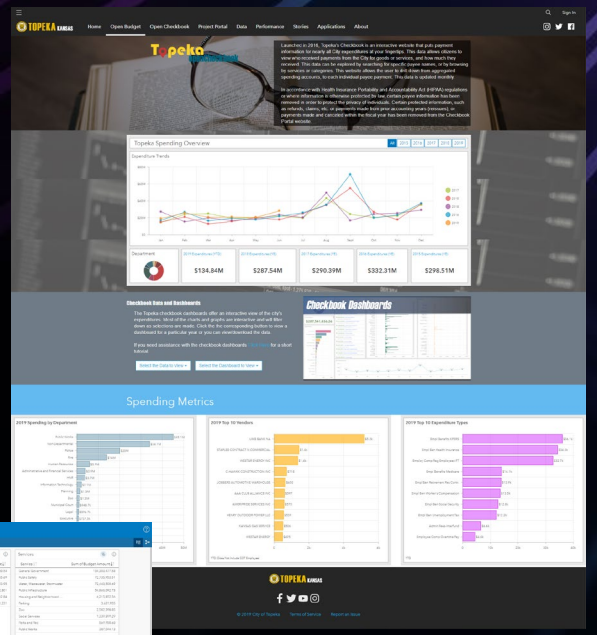
Smart Communities Happen When Governments Focus on Civic Inclusion



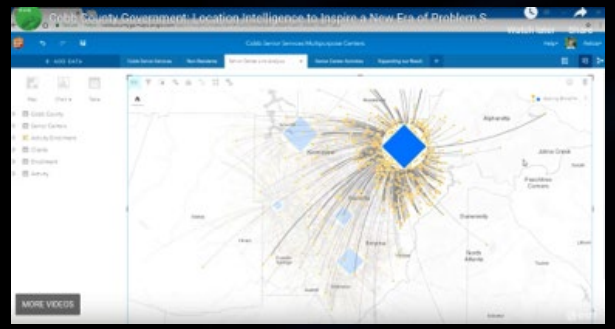
Sonoma County, CA –
Fire Debris Clean-Up Status



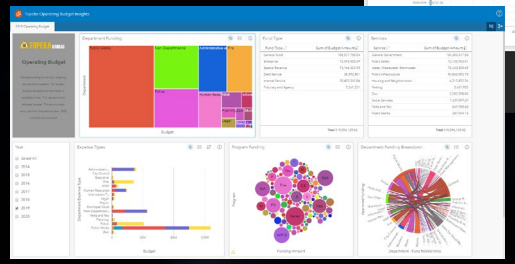
Baltimore, MD – Sewer Overflow Public Notification



Santa Clara Valley Transportation Authority, CA – Hub



Cobb County, GA – Enhancing the Lives of Senior Citizens

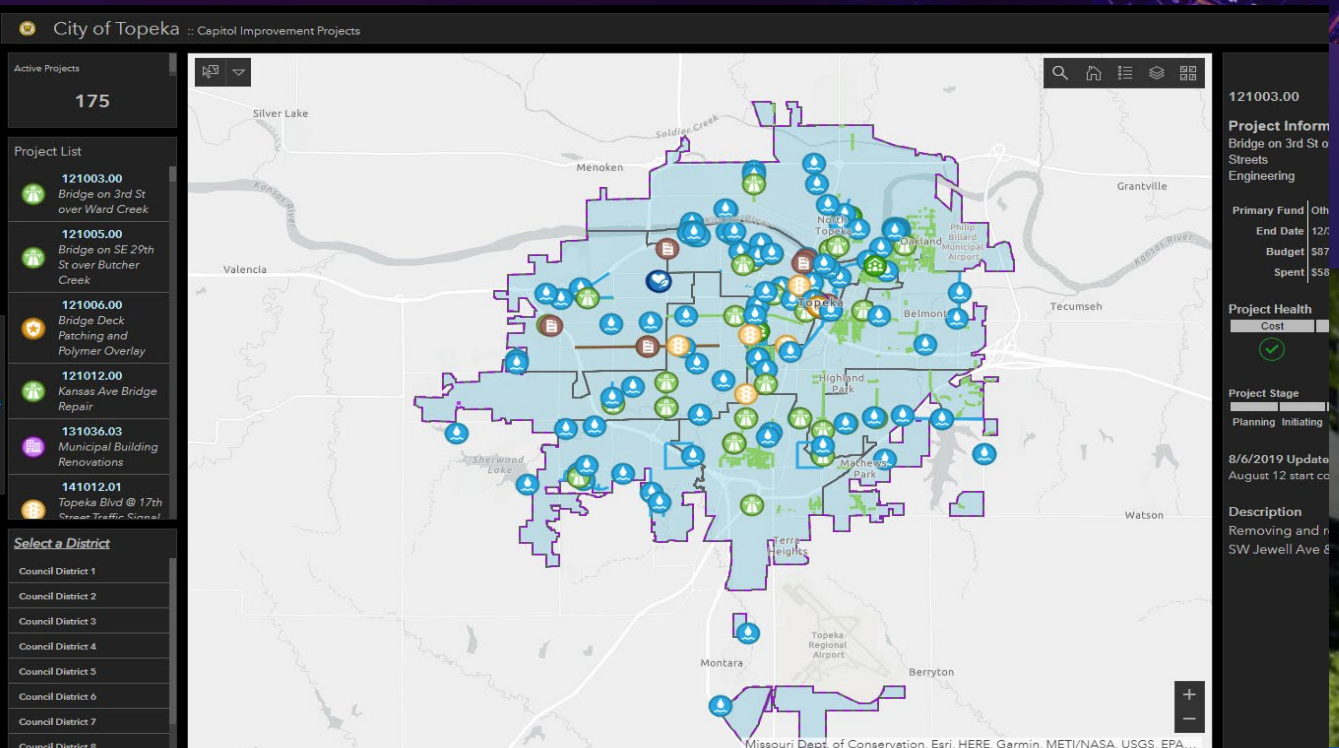


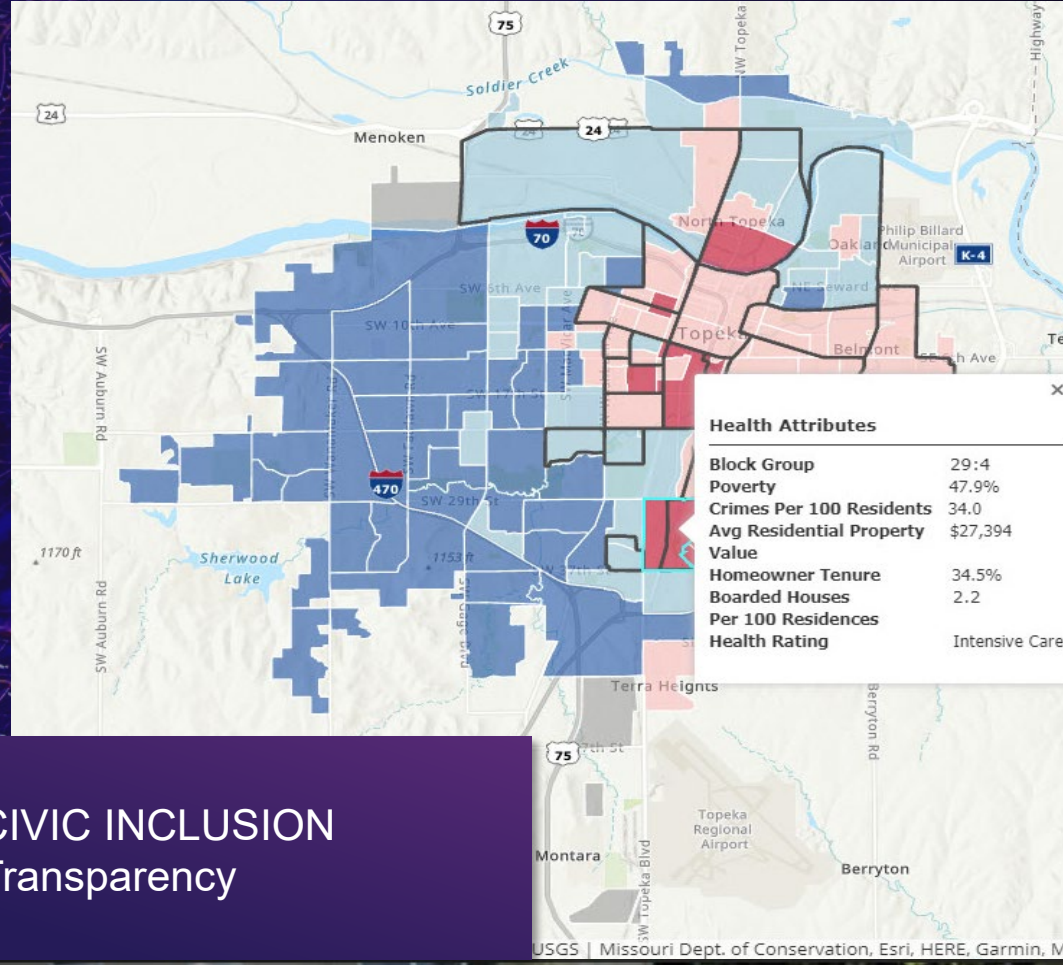
Topeka, KS –
Public Facing Operating Budget

Fostering Accountable Government

Topeka, KS

The city has developed an Open Performance engagement hub through their Open Checkbook and Neighborhood Health Index efforts.





CIVIC INCLUSION
Transparency

Smart Communities

Planning & Engineering

Operational Efficiency

Civic Inclusion

Data-Driven Performance

Start with Location

Get Started with a Geospatial Strategy

5 Ways Public Works Agencies are Leading Smart Communities

Optimize urban mobility

Address and respond to humans in crisis

Monitor drone traffic

Leverage artificial intelligence for infrastructure management

Design and support a sensor-driven world

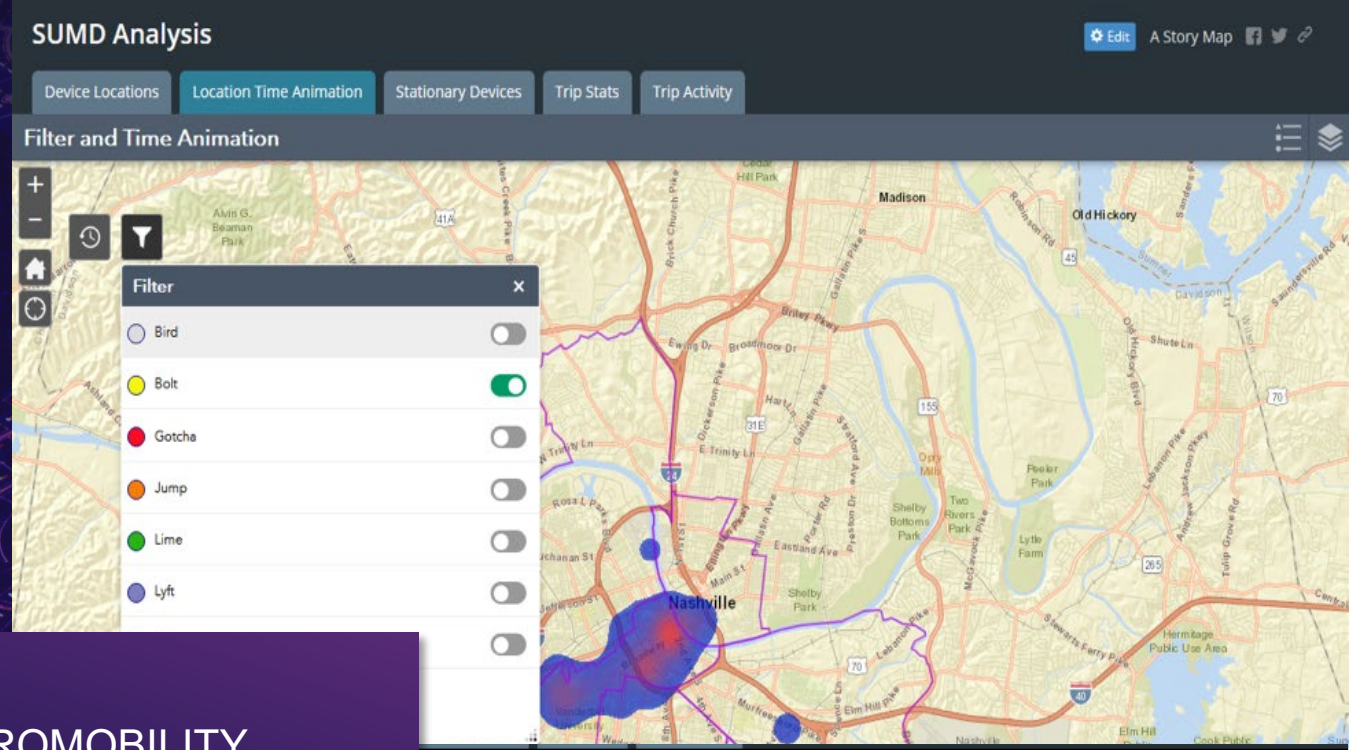
1 OPTIMIZE URBAN MOBILITY

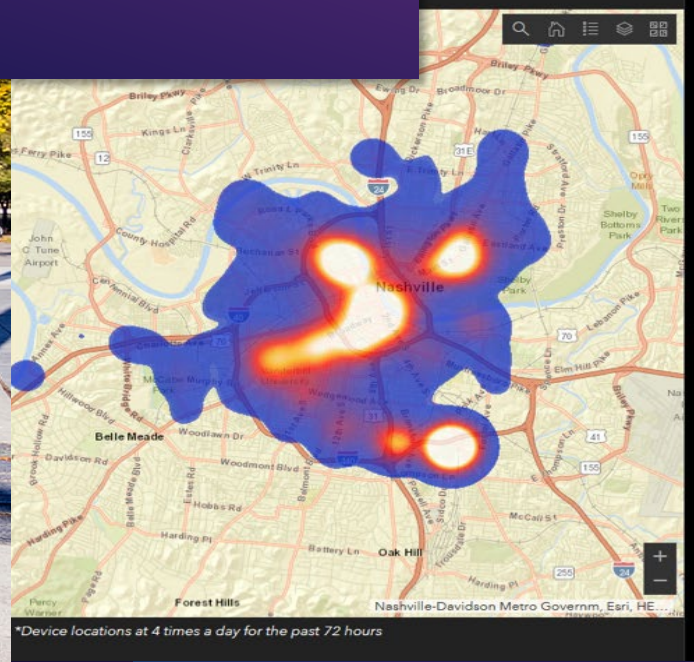
Approaches to Micromobility

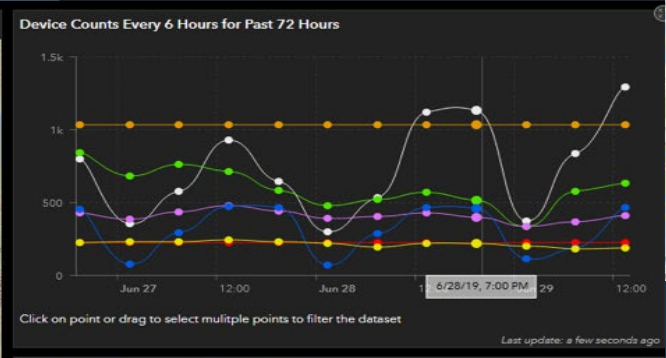
Nashville, TN

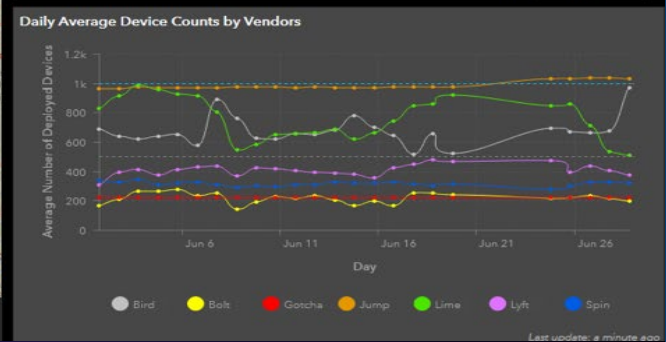
The City's Shared Urban Mobility Device Dashboard monitors scooter usage and distribution to optimize use and limit idle vehicles. Staff is able to improve traffic flow, improve public safety, and plan for future traffic patterns in real time.

MICROMOBILITY





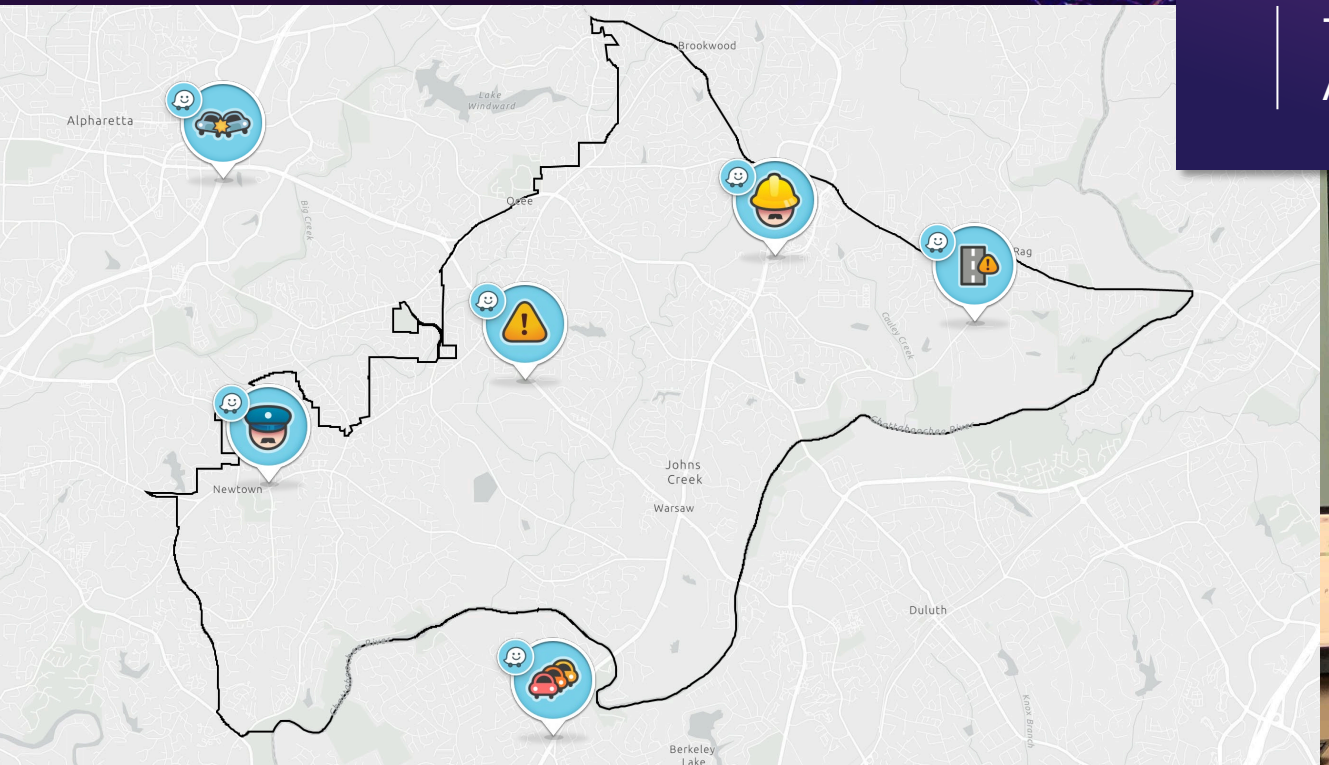




Becoming proactive with Waze data and GIS

Johns Creek, GA

55% of all traffic in Johns Creek both starts and ends outside of the city. Real-time traffic alerts from Waze are helping engineers understand where problems happen and respond proactively. The city shares planned road construction and events to Waze users.



TRAFFIC ALERTS

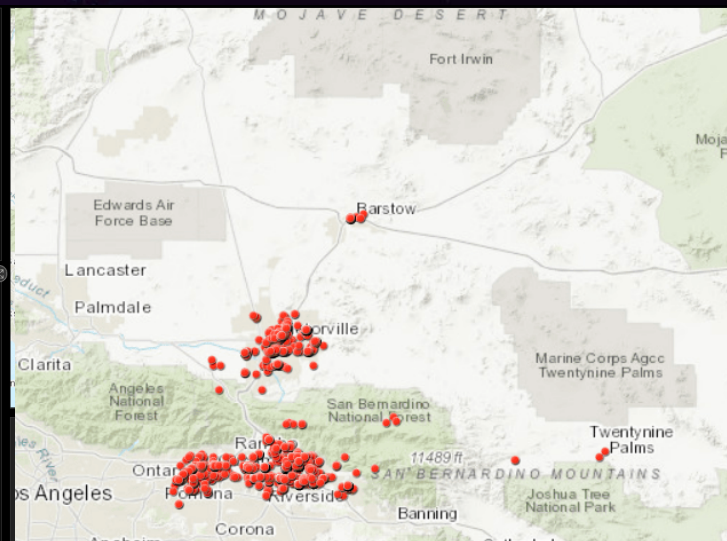
2 ADDRESS & RESPOND TO HUMANS IN CRISIS

Counting Homeless Population

San Bernardino County, CA

With just a few hours to act after a flooding, San Bernardino County's Homeless Outreach and Proactive Enforcement (HOPE) team had to relocate homeless populations that lived in the floodplain. Using mobile tools, they were able to make faster decisions

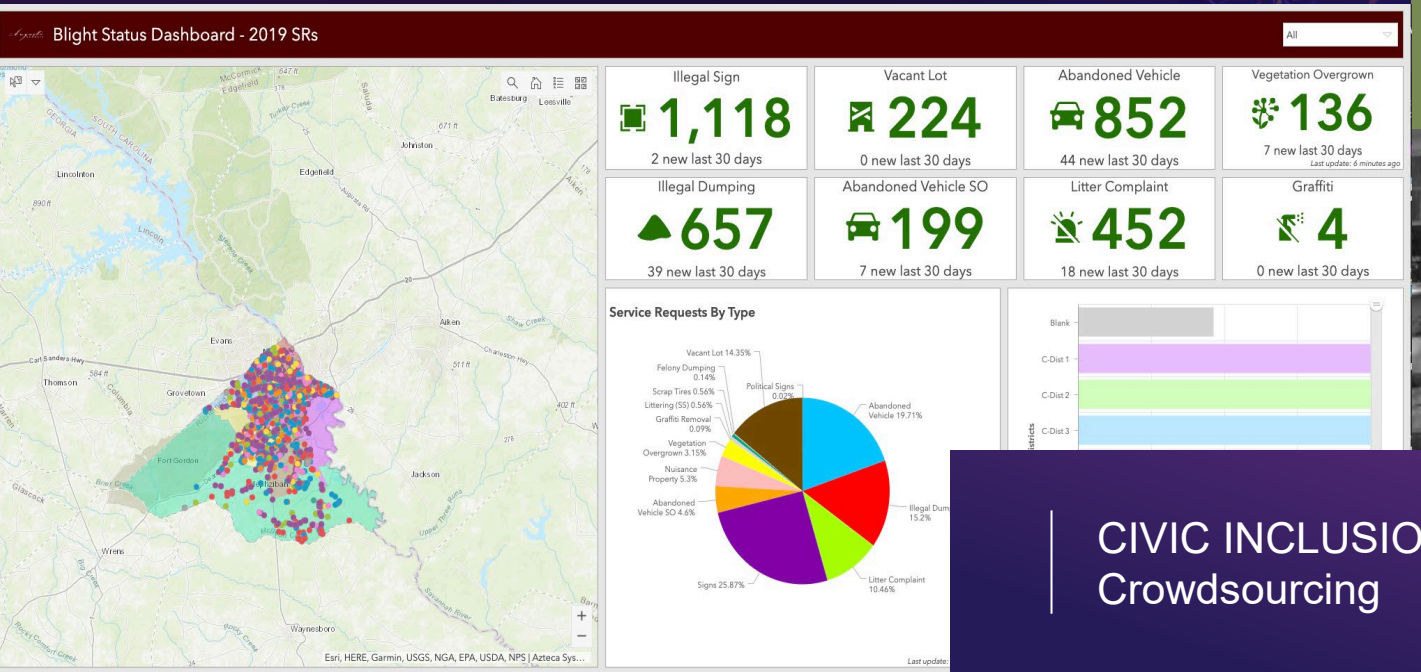
HOMELESS CRISIS



The Fight Against Blight

Augusta, GA

Blight threatens public safety, lowers property values and degrades quality of life. With the help of engaged citizens, Augusta's Fight Blight initiative is working hard to combat blight and clean up local neighborhoods. GIS helps tell their story and showcase progress on neighborhood transformation.



Open Augusta is the government's new public platform for a high level of openness and transparency. Visitors of the site can explore, visualize, and download location-based data. You can also analyze and combine data layers using maps, as well as develop new web and mobile applications. As the needs of citizens and elected officials become more finely-tuned and constructive feedback is turned into action items that will improve the site, the GEOHub will be enhanced and become more capable.

Let's make our great community even better, together!
#OpenAugusta #GEOHubAugusta

CIVIC INCLUSION
Crowdsourcing

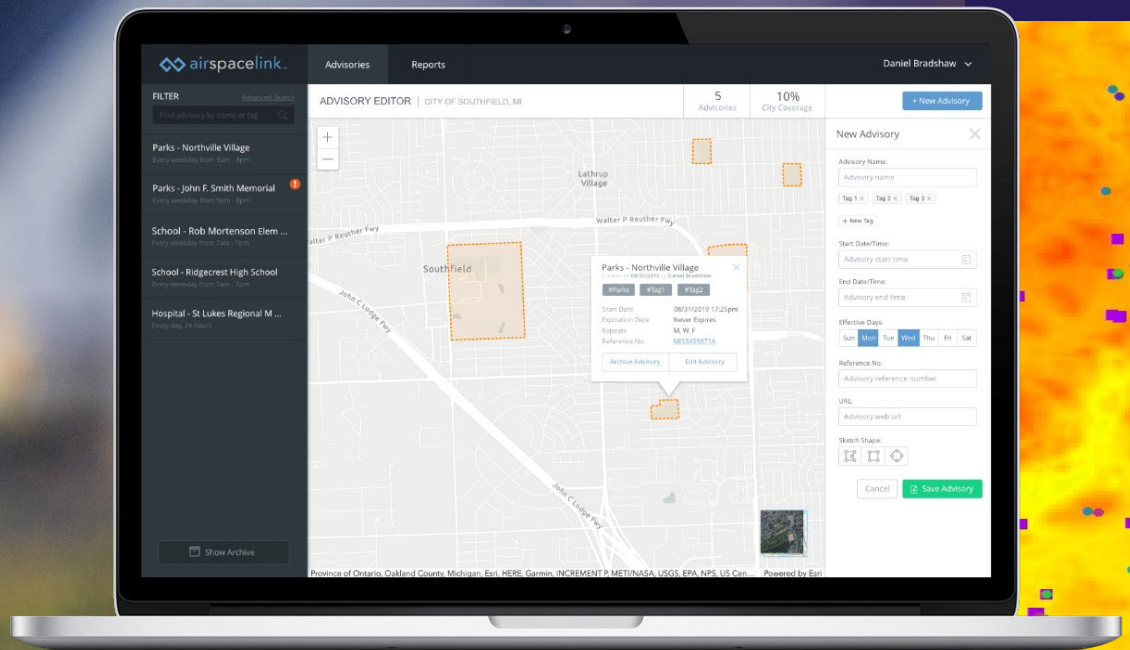
3 MONITOR DRONE TRAFFIC

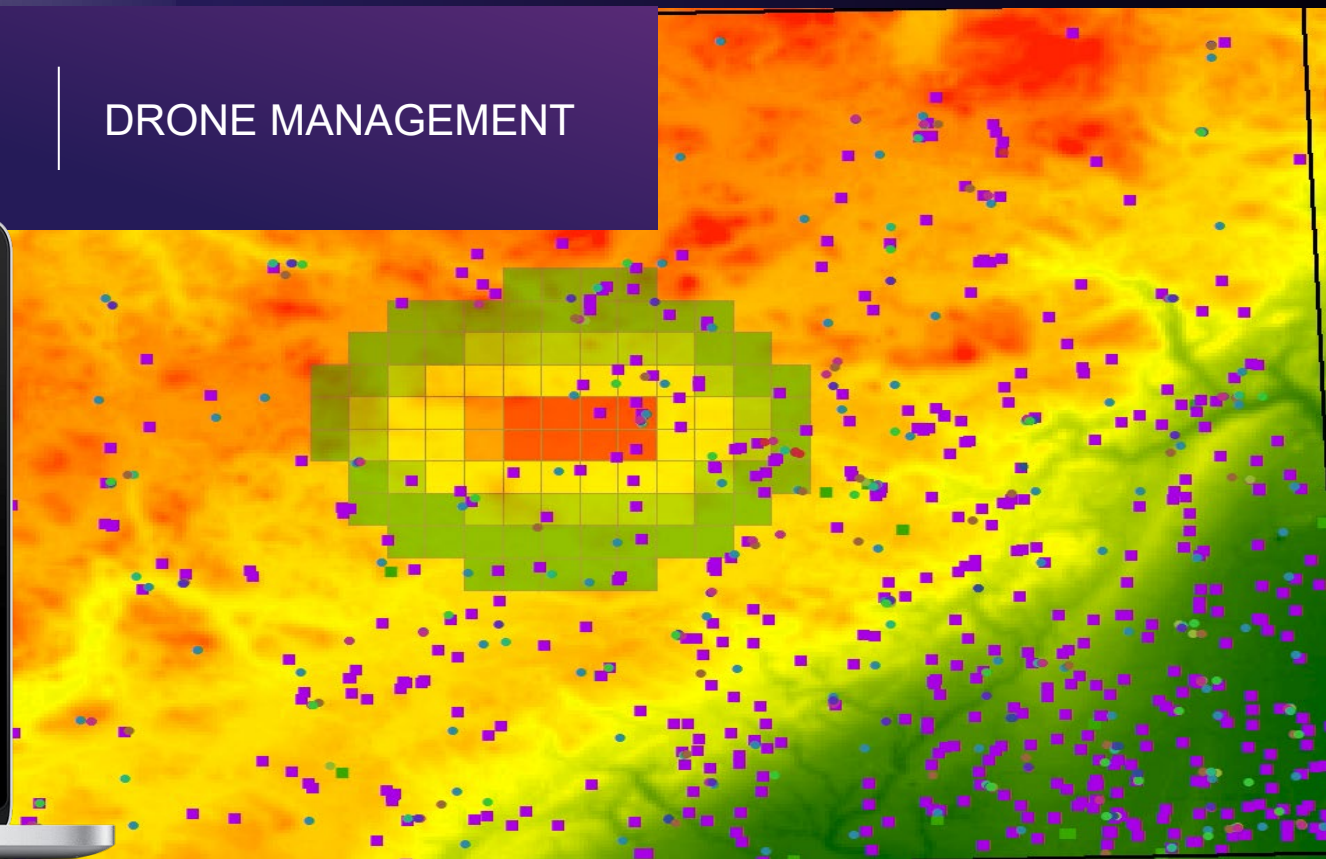
Monitoring the Highways in the Sky

Pittsfield Charter Township, MI

Using 3D analysis to help understand flooding risk and sea-level rise to inform storm water strategy.

DRONE MANAGEMENT





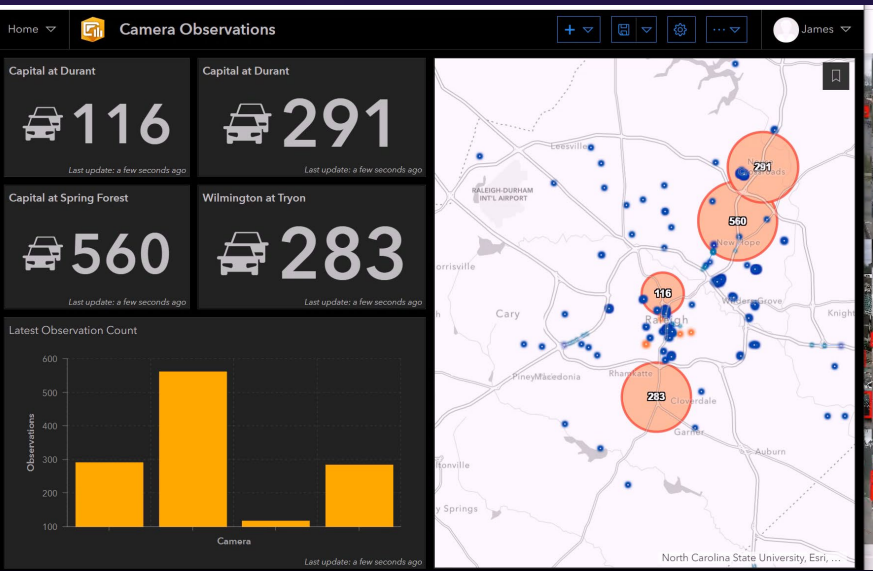
4 LEVERAGE ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

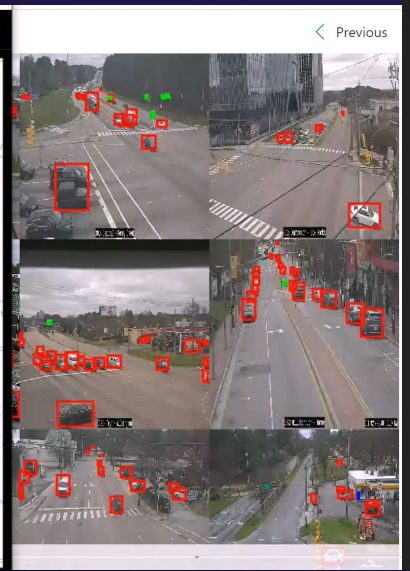
Raleigh: The Instrumentation of a City

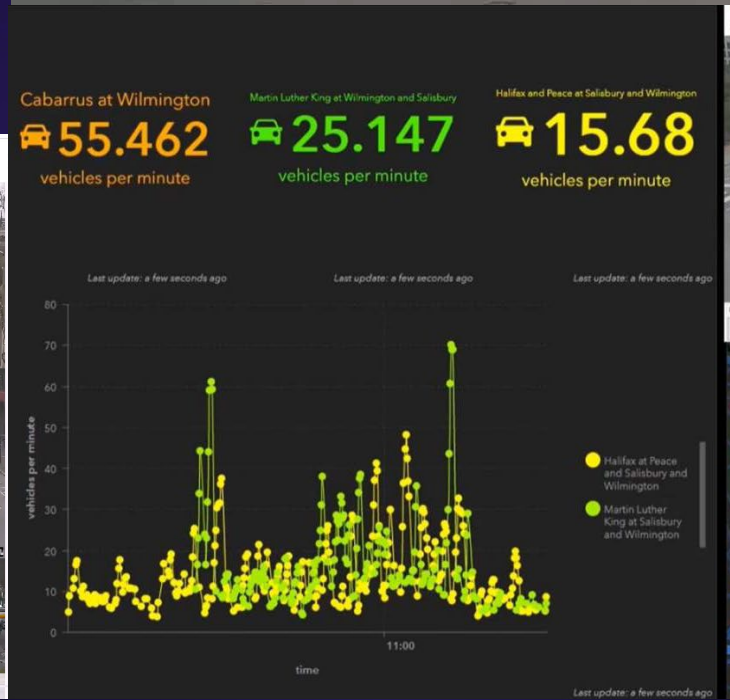
Applying AI/ML to Solve City Problems

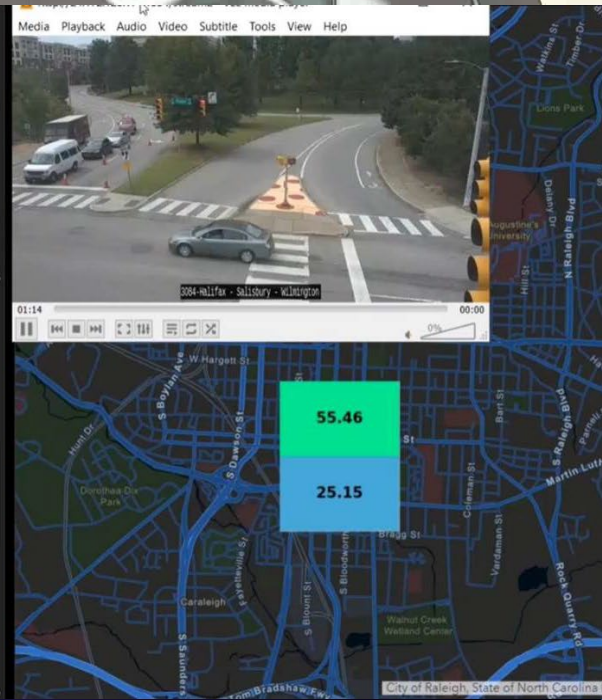
Raleigh, NC

The city integrated 160 camera feeds into their GIS in order to inform traffic management. By leveraging Machine Learning, they are also able to carry out object detection to count vehicles, types of vehicles, and traffic through intersections. This helps them better understand how residents move throughout the community.







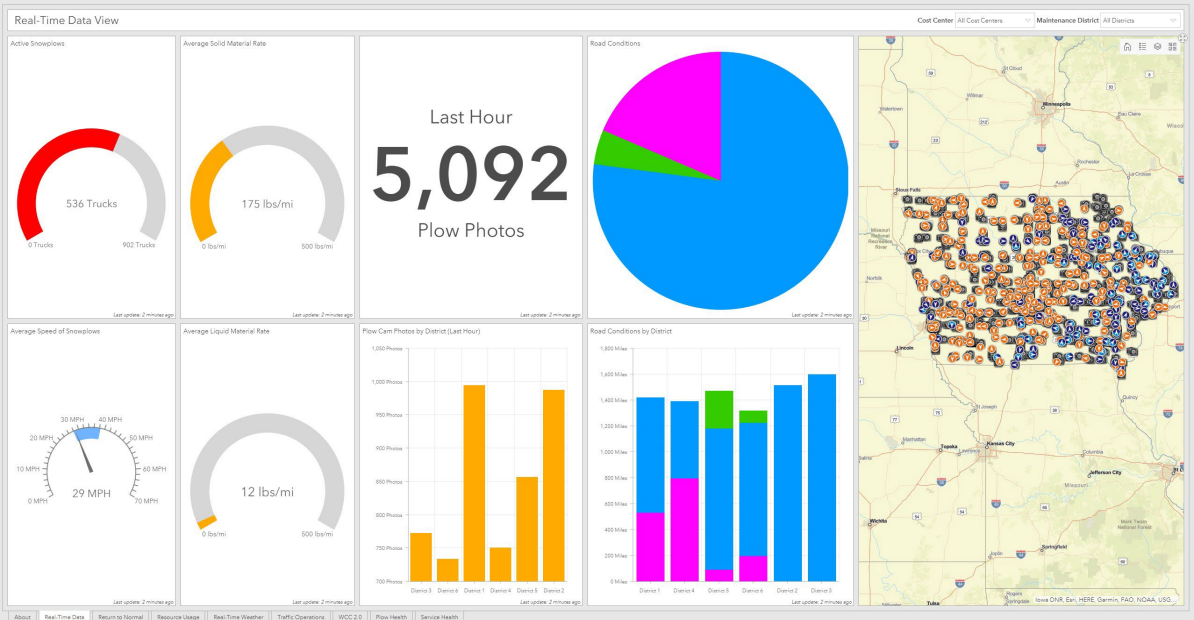


5 DESIGN & SUPPORT A SENSOR-DRIVEN WORLD

Keeping the Community Moving

Iowa DOT

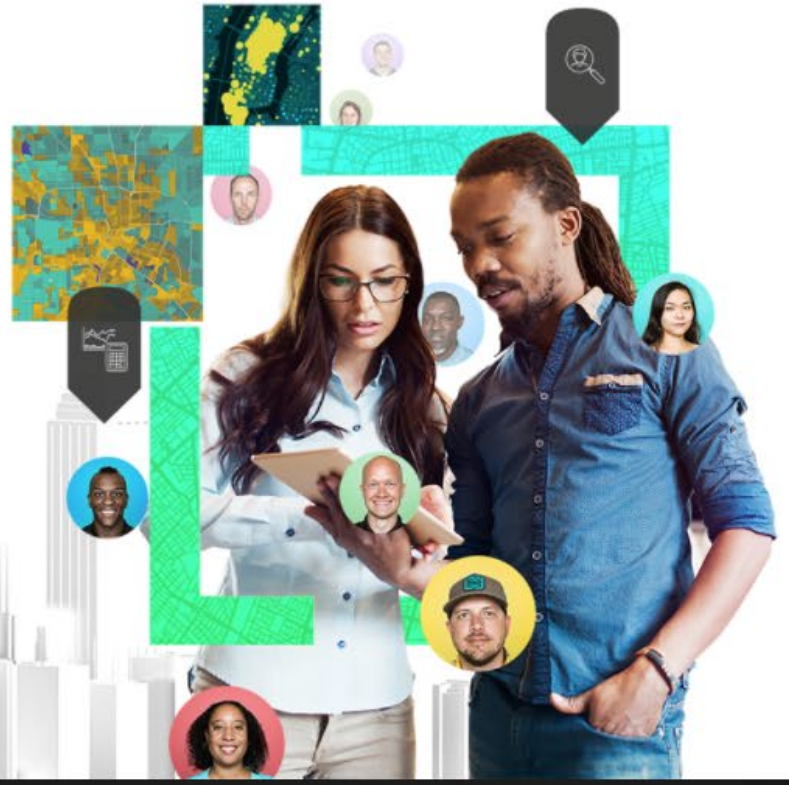
The Iowa DOT has been pioneering the use of live data feeds to dashboards for real-time improved efficiency. Their efforts included a cost calculator that communicated the fiscal impacts. This effort was extended to both internally and externally facing stakeholders. Most recently the state began applying Machine Learning to their program.



REAL-TIME OPERATIONS

The Path to GIS Success

The Path to GIS Success is one that requires skills across a wide realm of subjects beyond just technology, so Esri has assembled these resources to assist you.



What is The Path to GIS Success?

For decades, Esri has worked alongside thousands of customers of all sizes and industries across the globe. In our experience, the organizations that maximize the impact of GIS are those that proactively focus on the business of GIS. The resources on this site are the

The Approach to Maximize Impact

To maximize the impact of any technology platform, organizations need a thoughtful, consensus-driven strategy for using the platform to meet their business needs. The same is true with geospatial and geographic information system (GIS) technology.

A geospatial strategy defines how your organization will use GIS to achieve its goals. An effective geospatial strategy connects your business needs with the right people, processes, and technology to help you overcome challenges and improve results. With a geospatial strategy, you can use GIS to achieve location intelligence—the ability to understand why and where things happen—so that you can make better decisions and operate more efficiently.

To develop and execute your own geospatial strategy, Esri recommends using a proven approach. You can use this business-oriented approach to identify gaps and challenges in your organization, prioritize solutions that deliver real value, give your staff new knowledge and capabilities, and improve your workflows and processes. Through this work, you will be able to clearly articulate the business value of GIS to key stakeholders and maximize the impact of your GIS investment.

A geospatial strategy helps you

- Identify how to overcome business challenges.
- Allocate financial and staff resources through justifiable and documented recommendations.
- Deliver solutions and capabilities incrementally in a sustainable manner.
- Leverage people, processes, and technology within your organization.
- Leverage location intelligence to achieve your business goals more effectively.

Esri has worked alongside thousands of customers of all sizes and industries. In our experience, the organizations that maximize the impact of GIS are those that thoughtfully develop and execute a geospatial strategy.

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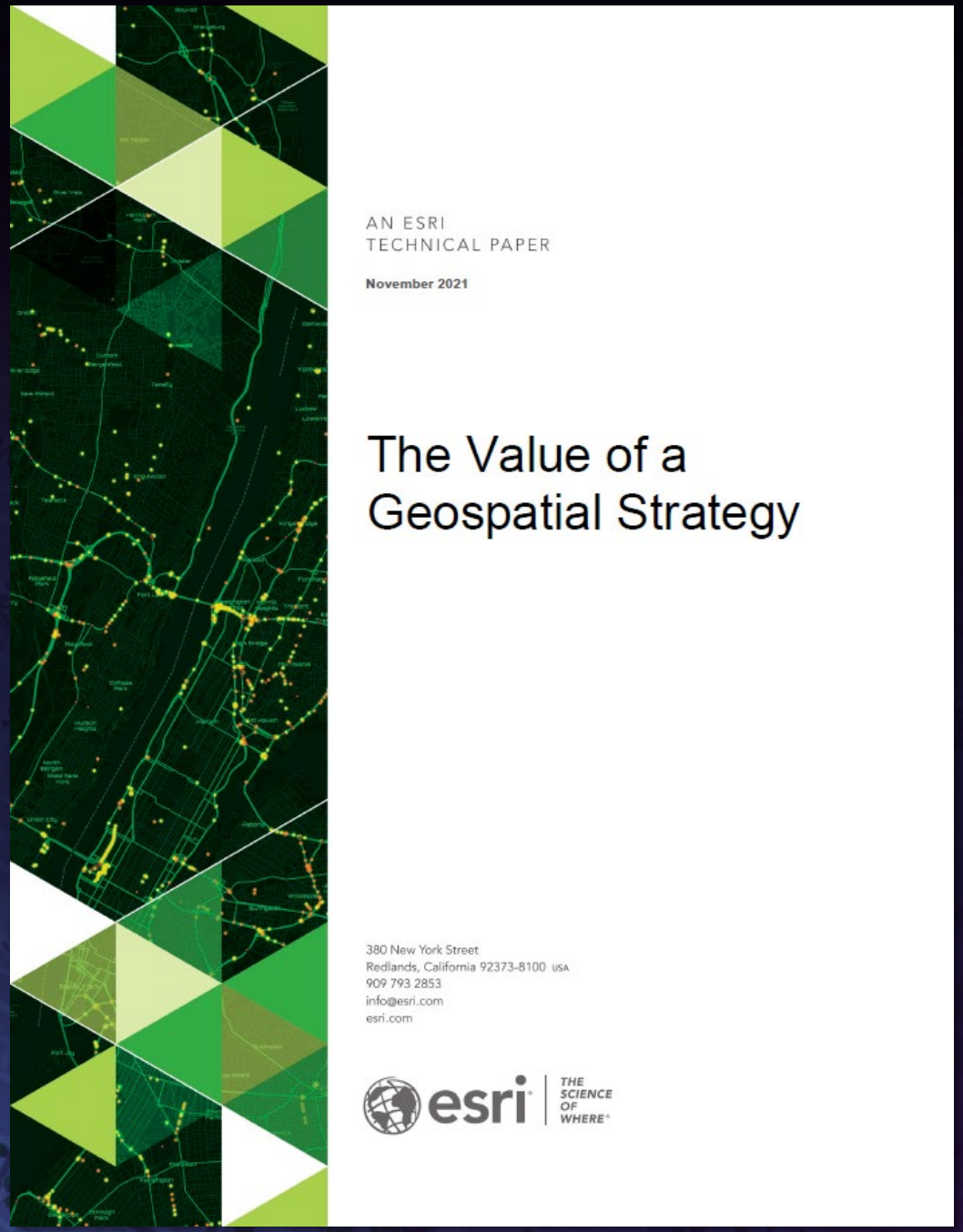

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TECHNICAL PAPER

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The Value of a Geospatial Strategy

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Thank You

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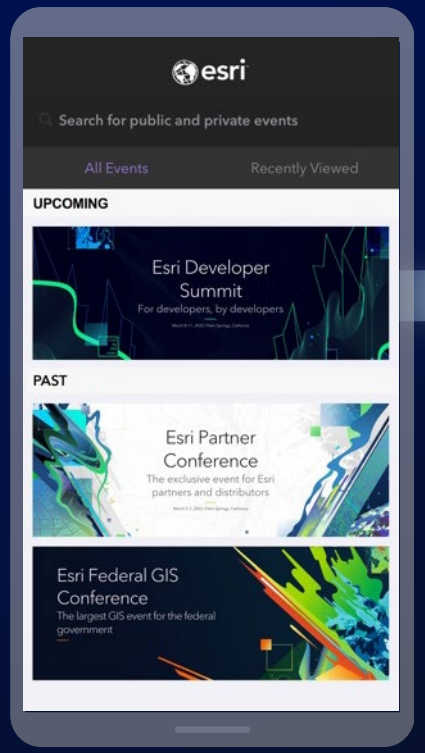
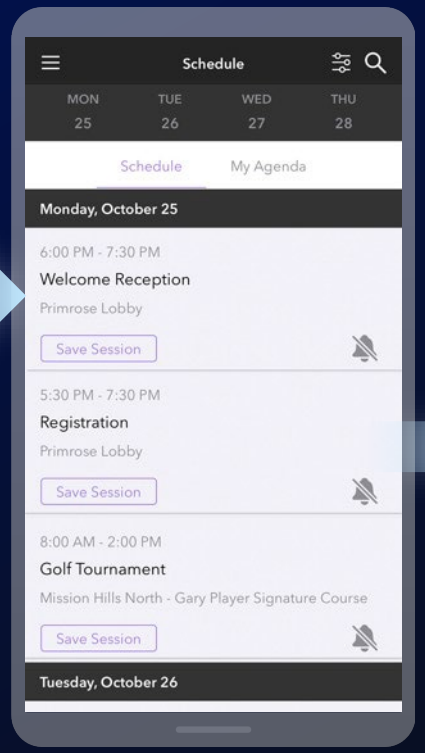
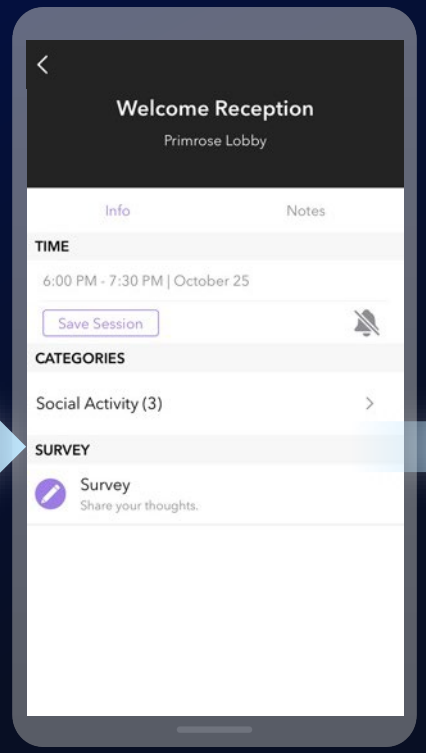


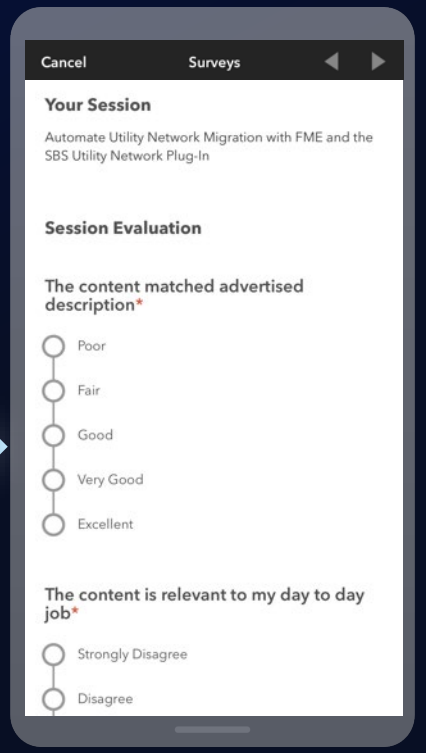
Select the session you attended



Scroll down to “Survey”



Log in to access the survey



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