

# The Underutilization of GIS & How to Cure It

Adam Carnow – Esri

## Seasonal Tornado Density

Federal Emergency Management Agency  
Region V  
Chicago, Illinois, USA  
By Thomas Griffin

Contact  
Jesse Rozelle  
jesse.rozelle@fema.dhs.gov

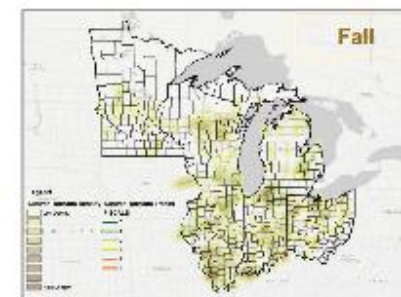
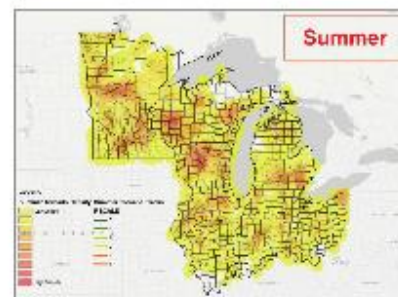
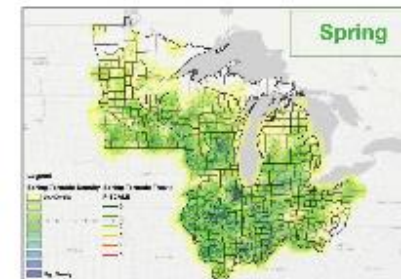
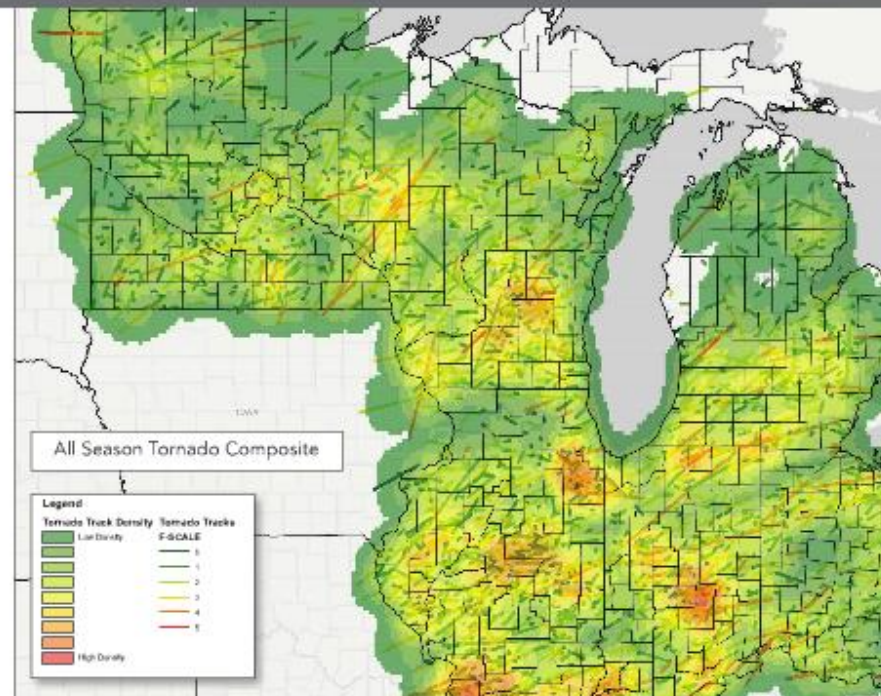
Software  
ArcGIS 10 for Desktop

Data Sources  
Esri, NOAA, FEMA

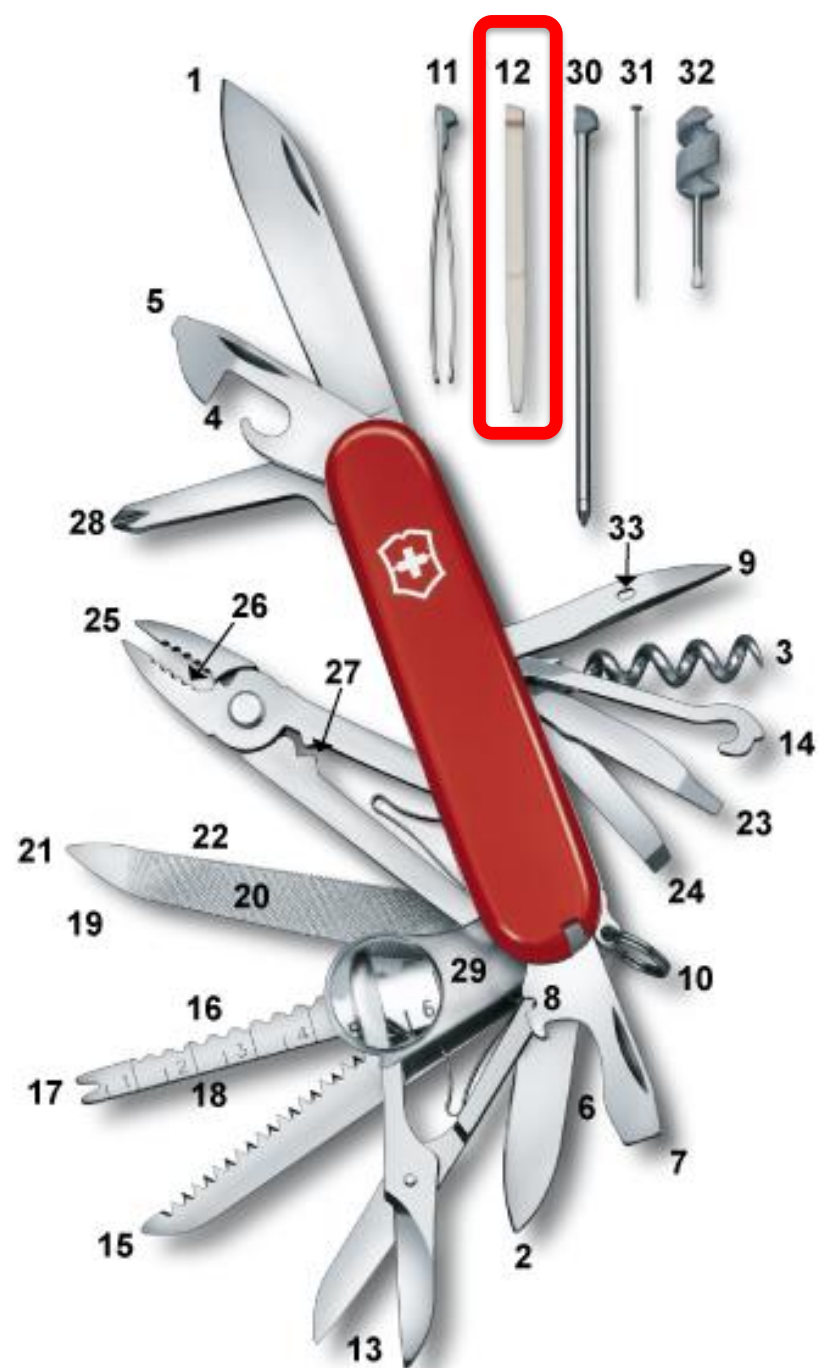
This seasonal tornado density map displays an analysis for Federal Emergency Management Agency (FEMA) Region V (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). Data was taken from the National Oceanic and Atmospheric Administration (NOAA) website about every recorded tornado since 1951. The track for every tornado that entered a Region V state was collected, and a line density was created. The data for these tornadoes also included information on when each tornado occurred, allowing the tornadoes to be further analyzed based on the season in which they occurred.

The purpose of this map was to identify any possible trends, take a closer look at relevant data, and tell a story through the use of GIS. Though tornadoes are very difficult to predict with any degree of accuracy, interesting assumptions can be deduced quickly and easily by looking at the data when it is visually represented. For instance, the map shows that tornadoes occurring during the winter months tend to be farther south where the weather is warmer, while tornadoes occurring during the summer months tend to spread farther north. The ability to see and understand this type of information better using GIS is potentially life-saving and is being used within FEMA more and more every day.

Courtesy of Federal Emergency Management Agency Region V.

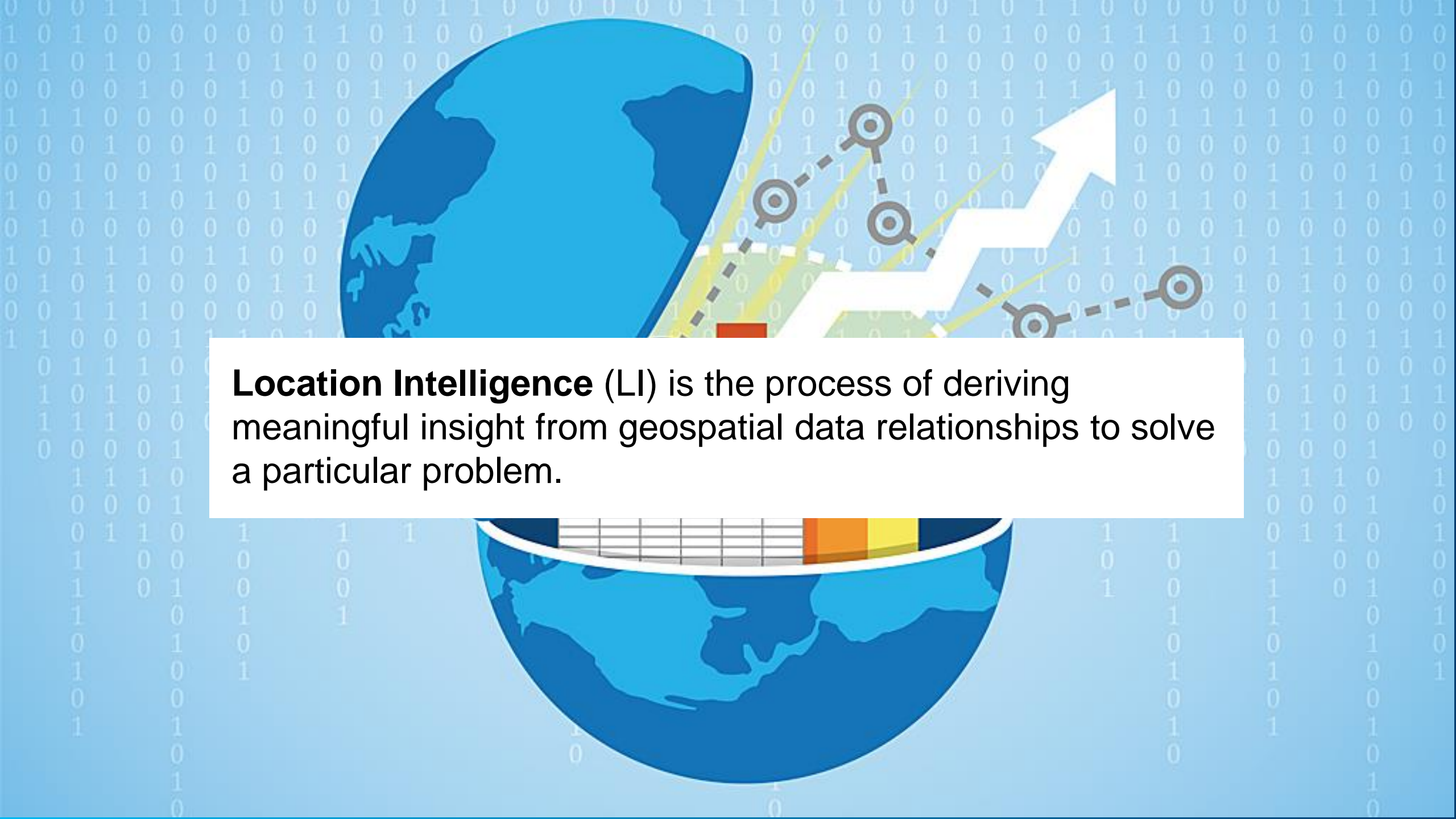






**Business Intelligence (BI)** is the set of techniques and tools for the transformation of raw data into meaningful and useful information for business analysis purposes.

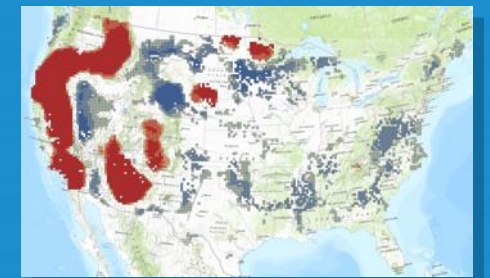
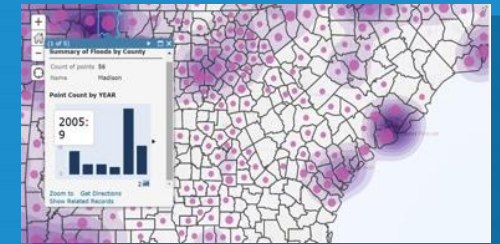
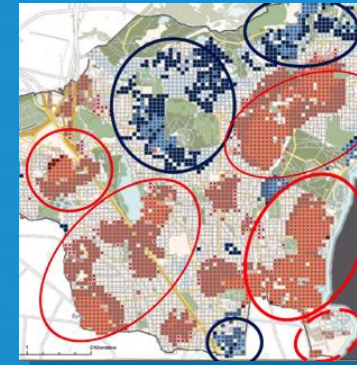
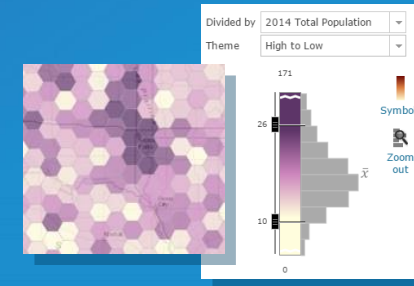




**Location Intelligence (LI)** is the process of deriving meaningful insight from geospatial data relationships to solve a particular problem.

# GIS was Created to Perform Spatial Analysis

- Understanding Where
- Measuring Size, Shape & Distribution
- Determining How Places are Related
- Finding the Best Locations & Paths
- Detecting & Quantifying Patterns
- Making Predictions







**STOP  
UPDATING**

**START  
EVOLVING**

Benjamin Niaulin

<http://www.slideshare.net/benjaminniaulin/stop-updating-start-evolving-the-digital-workplace-truth>

**#DigitalWorkplace**

**We're stuck in a routine...**



**We want to help you transform...**





Spatial Analysis



Apps



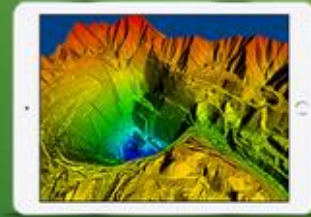
Content



Real-Time GIS



Big Data



Mapping and Visualization



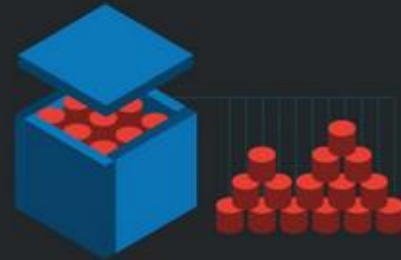
Imagery and Remote Sensing



3D



CAD



Data Management



Geodesign



Community Engagement

## PRIORITIES

Season 2, Episode 9  
*Cloud Services*state**scoop**

# Government leaders report feeling overwhelmed by demands of civic engagement

New survey results show that managing the data and expectations of their communities is often more than than government officials are ready for.

By *Jason Shueh*

DECEMBER 19, 2017 6:20 PM

BIO ▾

WEBINAR

## REIMAGINING THE BACK OFFICE

JANUARY 23, 2018 | 1-2 PM EST

REGISTER NOW »

infor statescoop

RELATED ARTICLES



**This is not a battle between On-Premises and The Cloud...**

MUST READ [INTERNET OF THINGS PROJECTS: WHY YOUR BUSINESS NEEDS TO BUILD A DIGITAL DOUBLE](#)

# Cloud computing will virtually replace traditional data centers within three years

Cloud data center traffic will represent 95 percent of total data center traffic by 2021, says Cisco.



By [Steve Ranger](#) | February 6, 2018 -- 11:16 GMT (03:16 PST) | Topic: [Cloud](#)

Get clear on cloud. Download the latest Truth in Cloud Research report.

[Read the report](#)

**VERITAS**  
The truth in information.

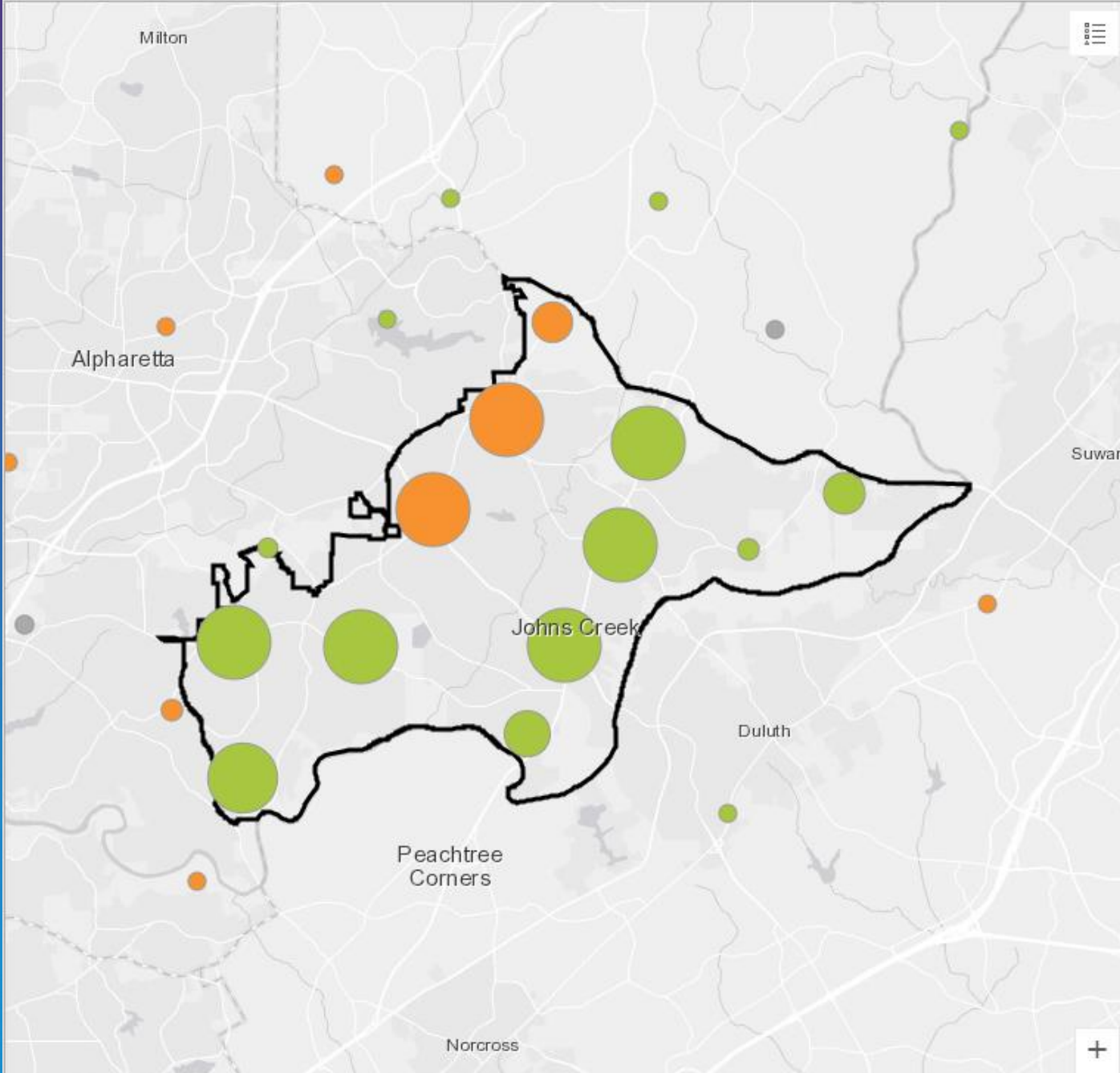
0

258

1605



**This is not a battle between On-Premises and The Cloud...**



# 878

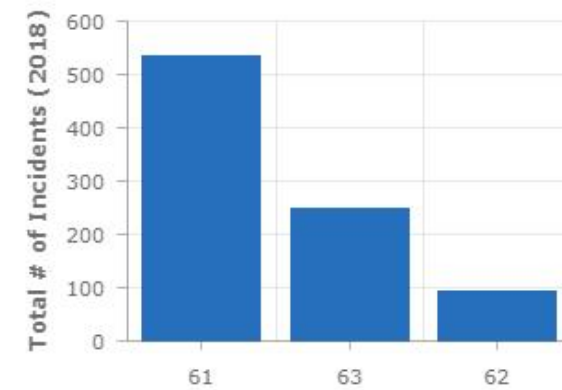
total fire incidents in 2018

*Last update: a few seconds ago*



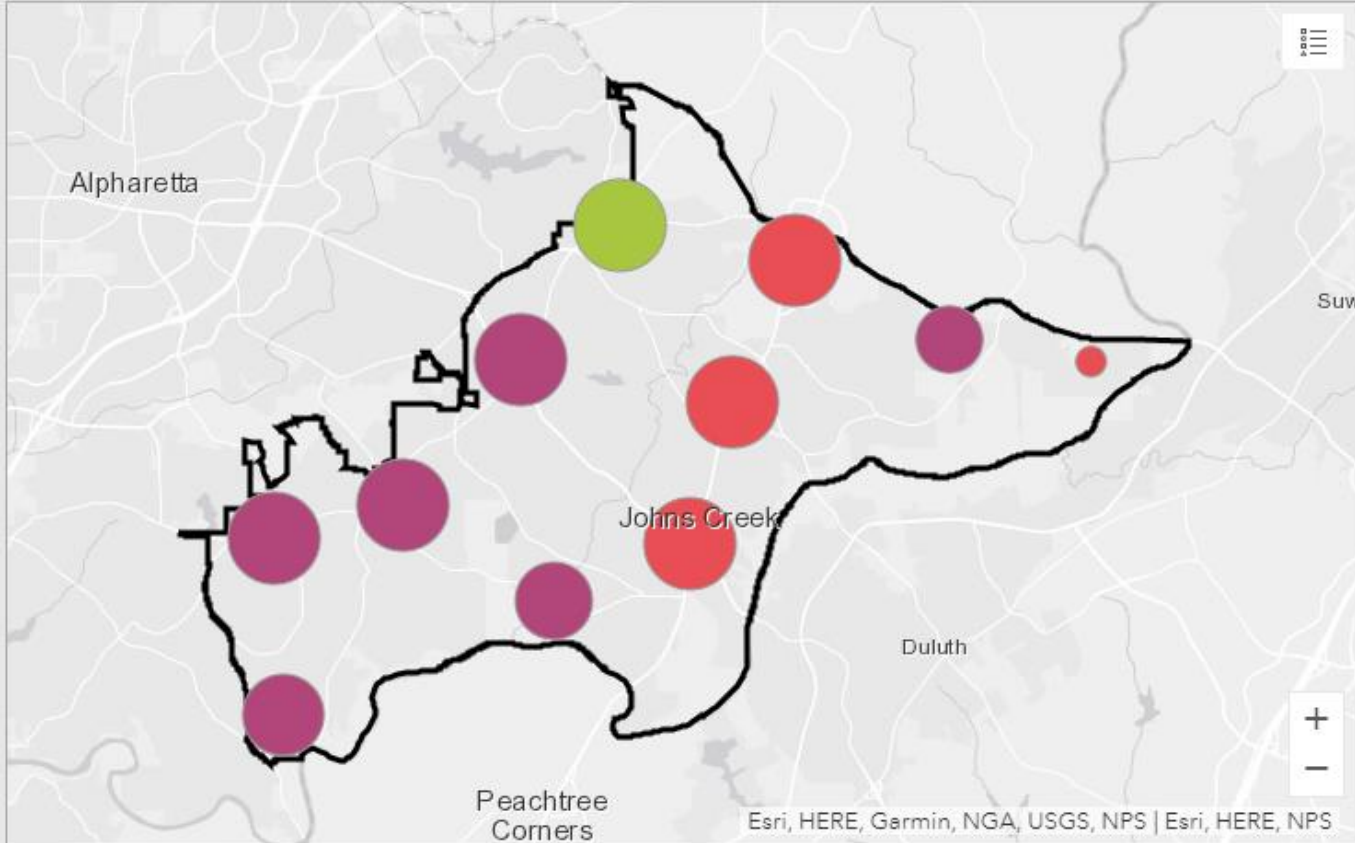
% of calls in 2018 where Fire Department has arrived within 10 minutes of call

*Last update: a few seconds ago*

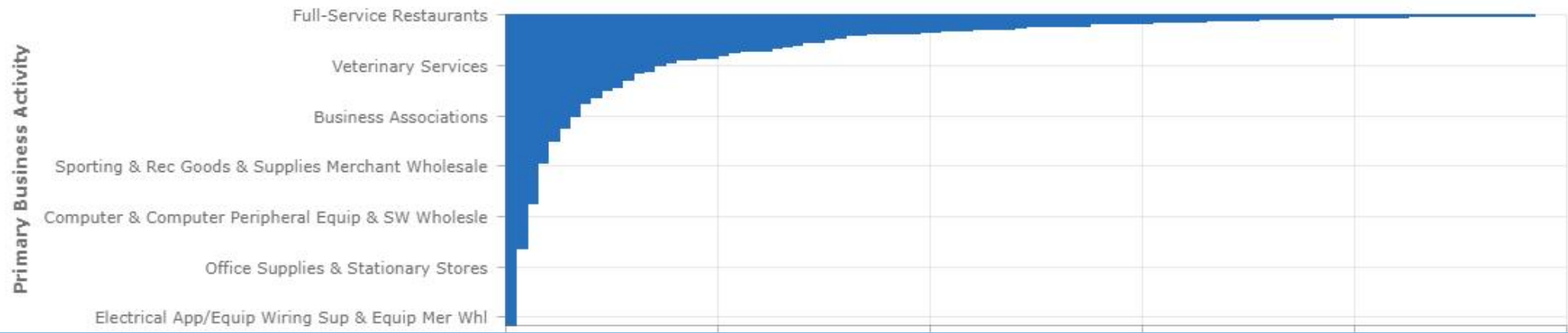


It's about providing different services... different experiences...





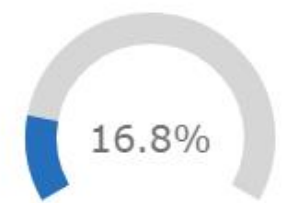
Businesses by Primary Activity



# 53

new businesses opened and licensed this year

*Last update: a few seconds ago*



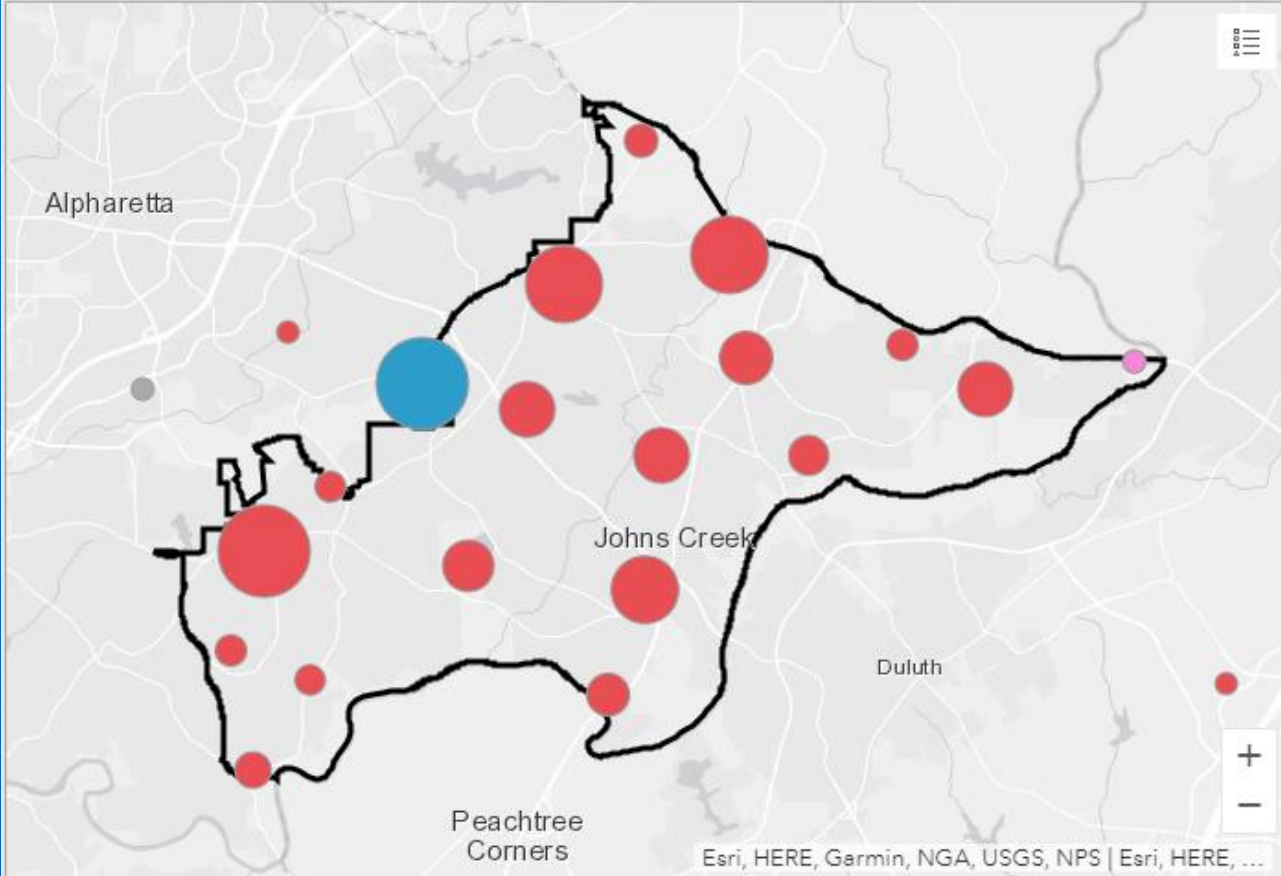
% of existing businesses have renewed their license from 2017

*(Businesses have until March 31, 2018 to renew before incurring fines)*

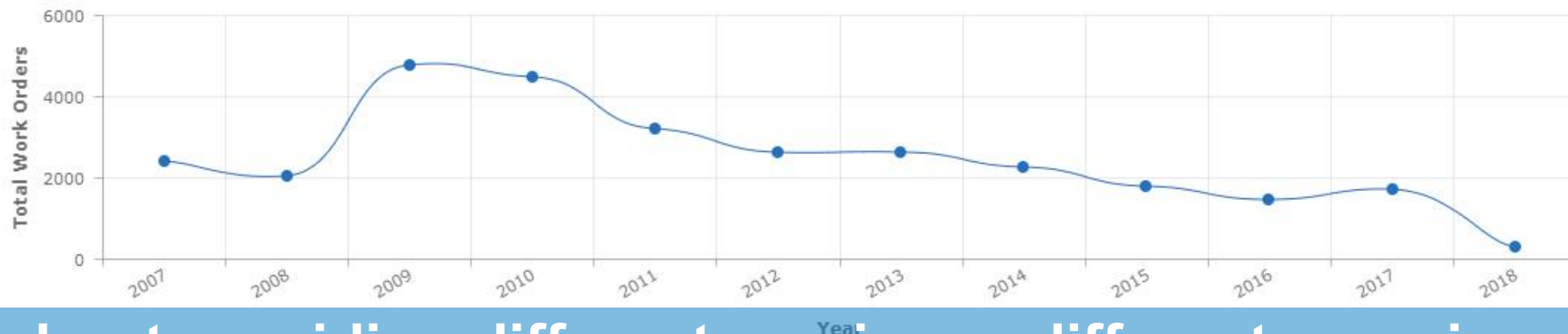
*Last update: a few seconds ago*

It's about providing different services...different experiences...

*Last update: a few seconds ago*

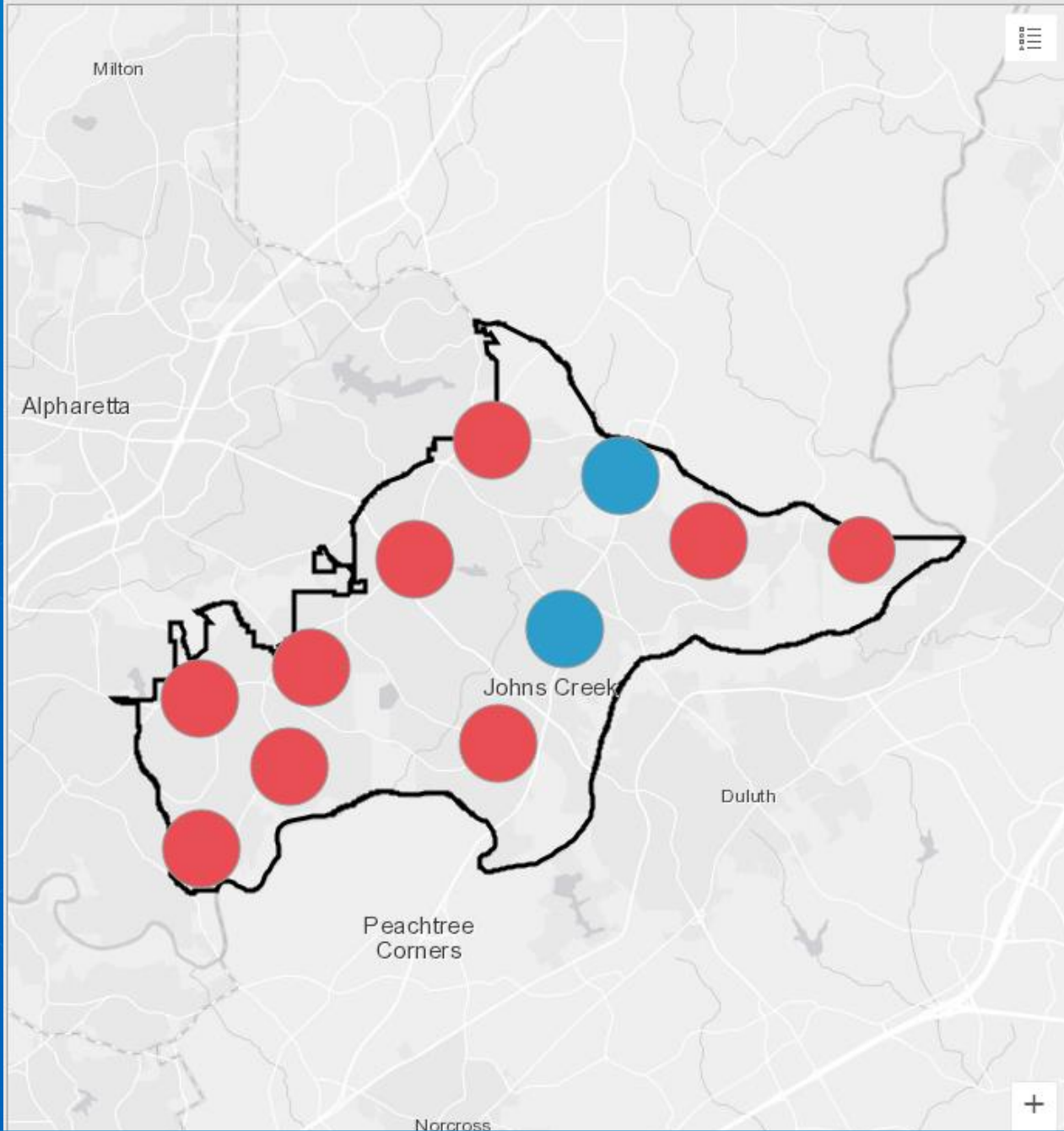


Work Orders by Year Completed



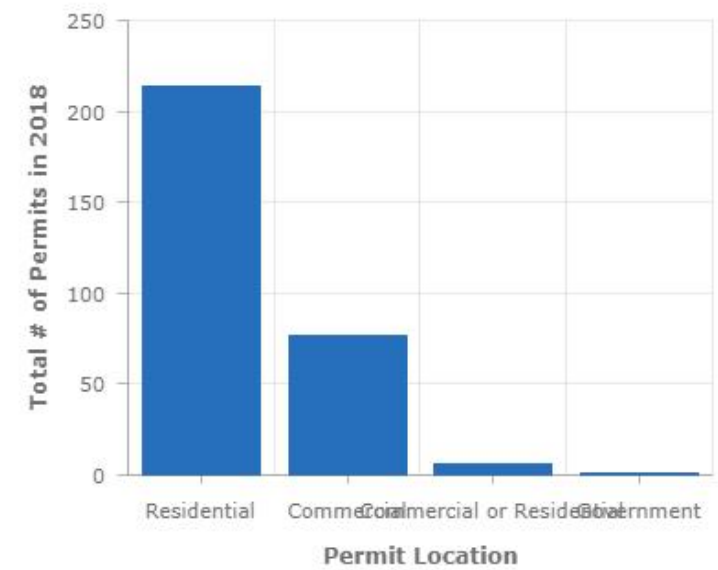
It's about providing different services...different experiences...

*Last update: a few seconds ago*

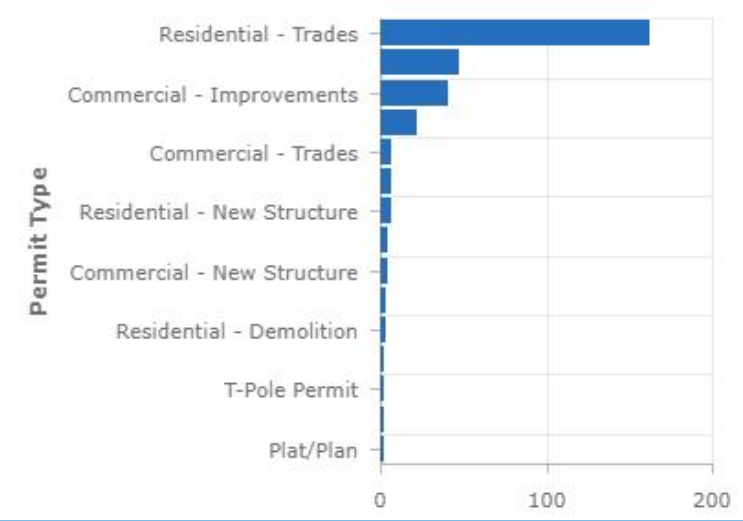


**114**  
permits processed in the last 30 days

*Last update: a few seconds ago*

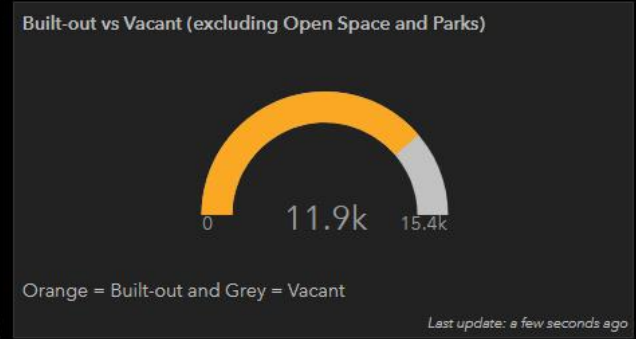
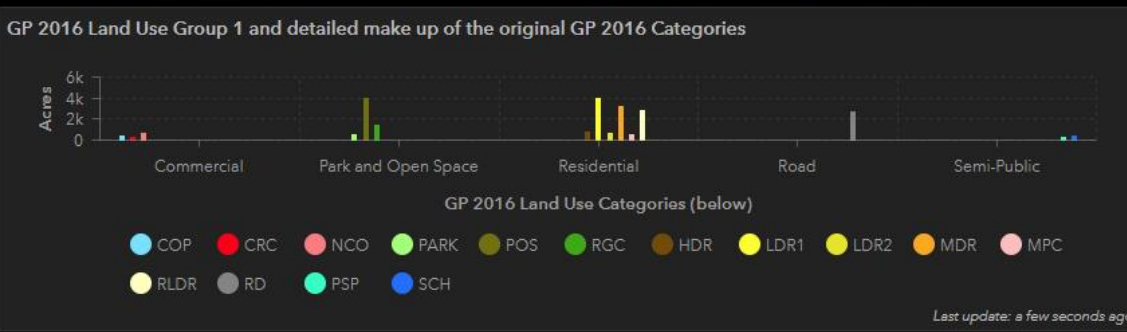
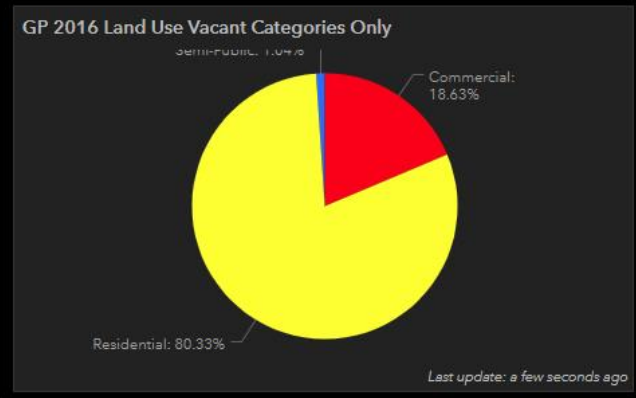
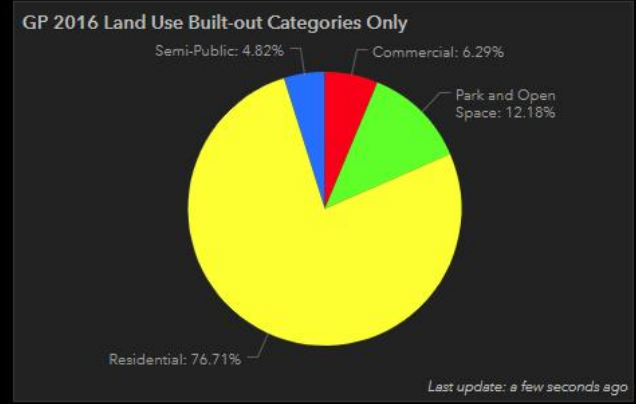
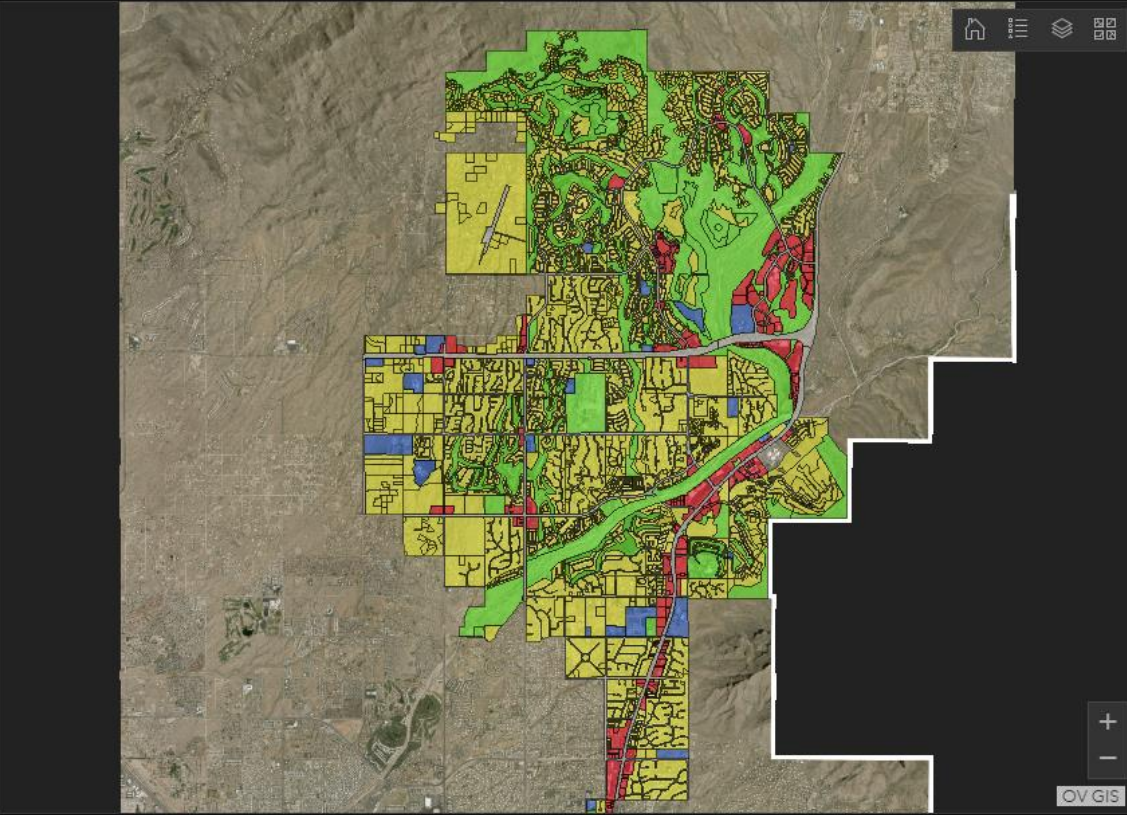
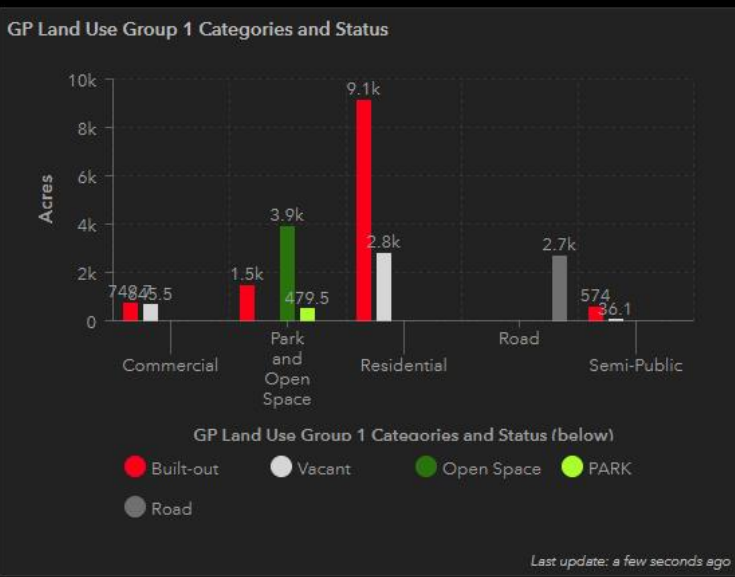
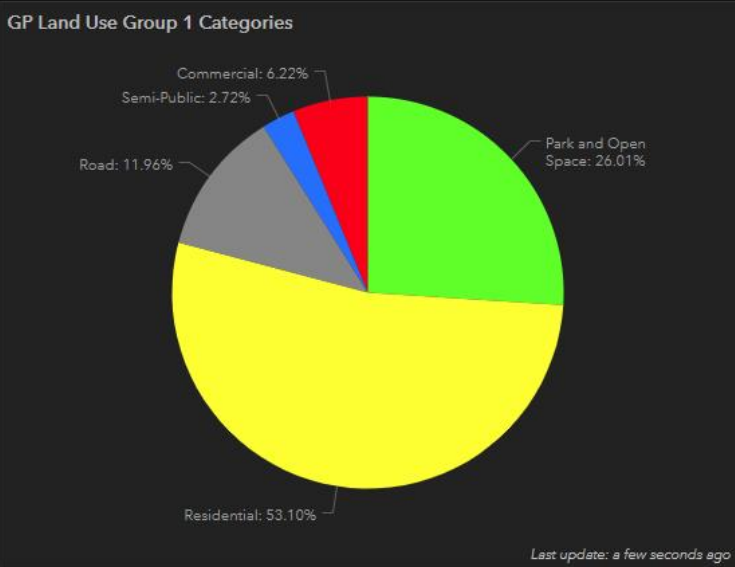


*Last update: a few seconds ago*



*Last update: a few seconds ago*

**It's about providing different services...different experiences...**



It's about providing different services...different experiences...

**Filter Options**

**Age Range (select one or more)**  
 select age range(s) [dropdown]

**Group (select one or more)**  
 select group(s) [dropdown]

**Month (select one or more)**  
 select month(s) [dropdown]

**Day of Week (select one or more)**  
 select day(s) [dropdown]

**Gender**  
 select gender [dropdown]

**Select Date or Date Range**  
 [calendar icon] [clock icon]

[calendar icon] [clock icon]

**Opioid Abuse Probable**

**535**  
 out of 670

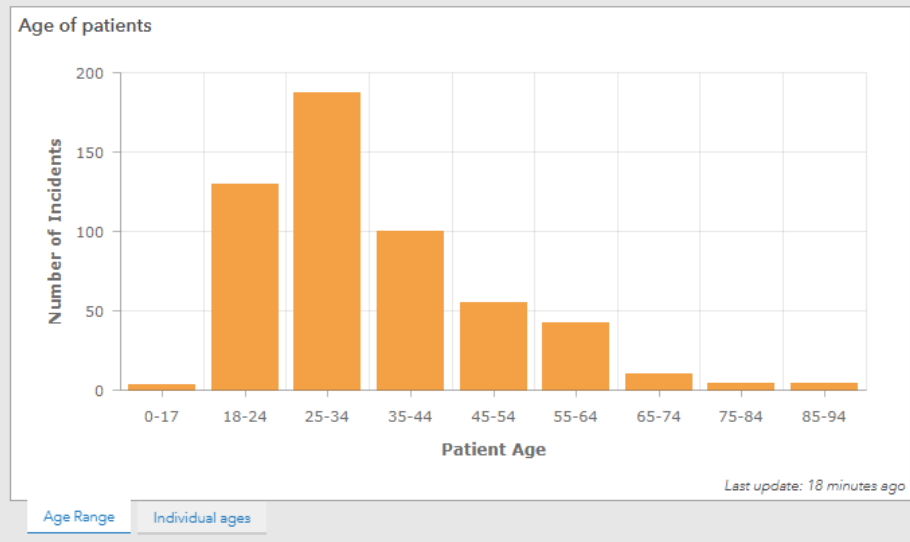
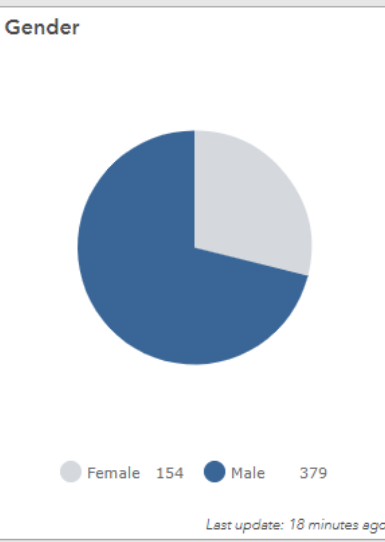
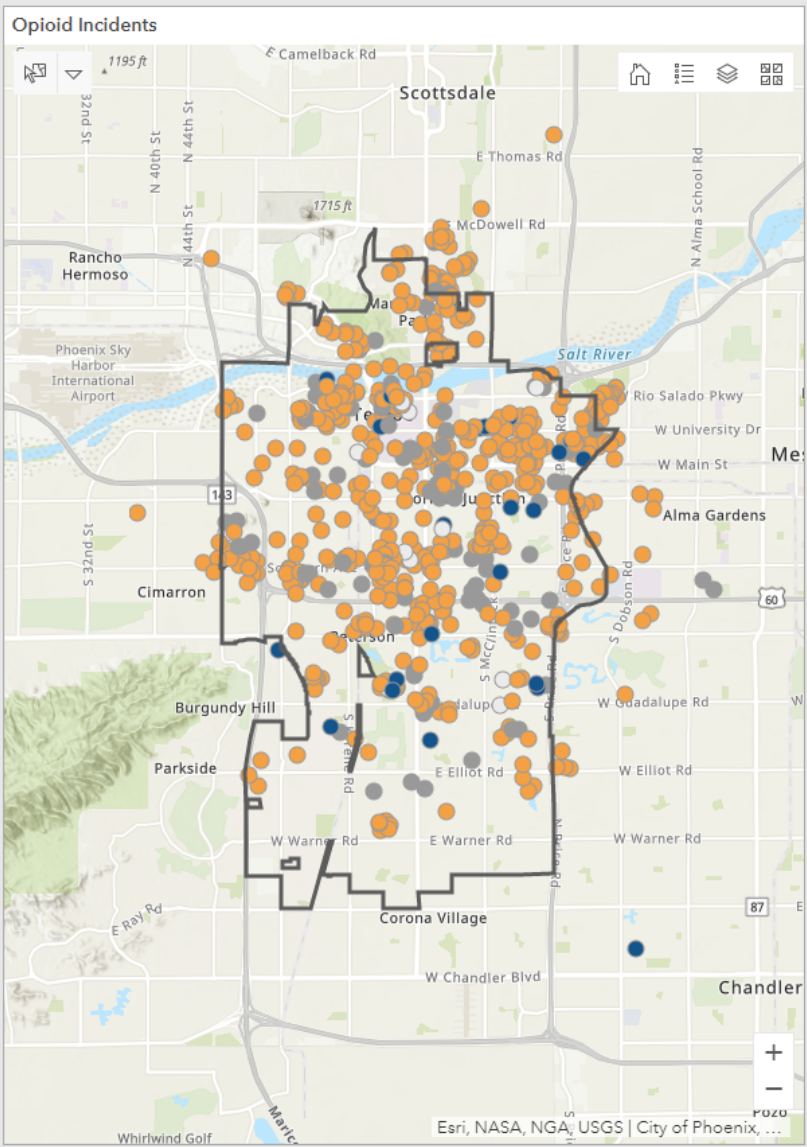
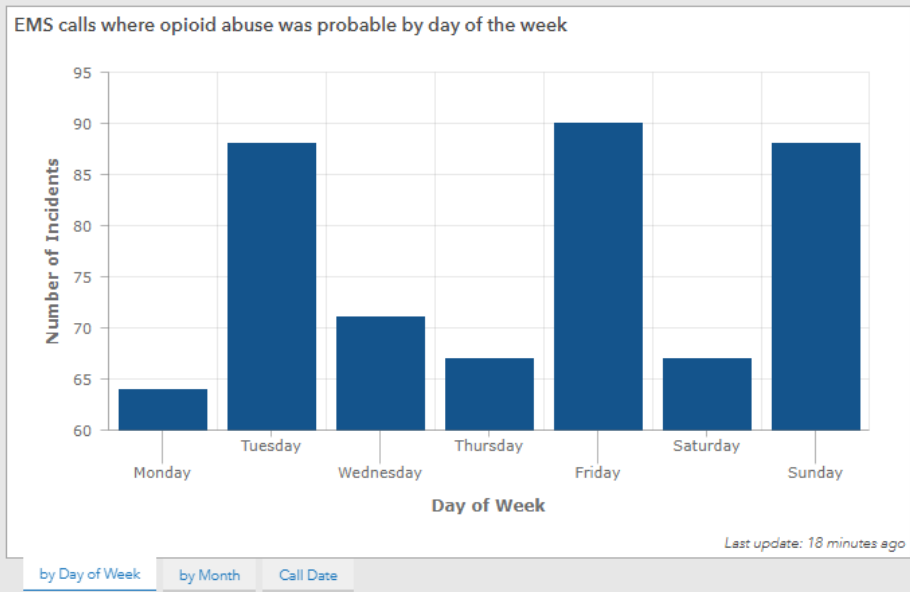
Last update: 18 minutes ago

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**Narcan/Naloxone Given**

**310**  
 out of 535

Last update: 18 minutes ago



Tips on interacting with the dashboard and information about the data included is found at <http://bit.ly/2swqghNR>

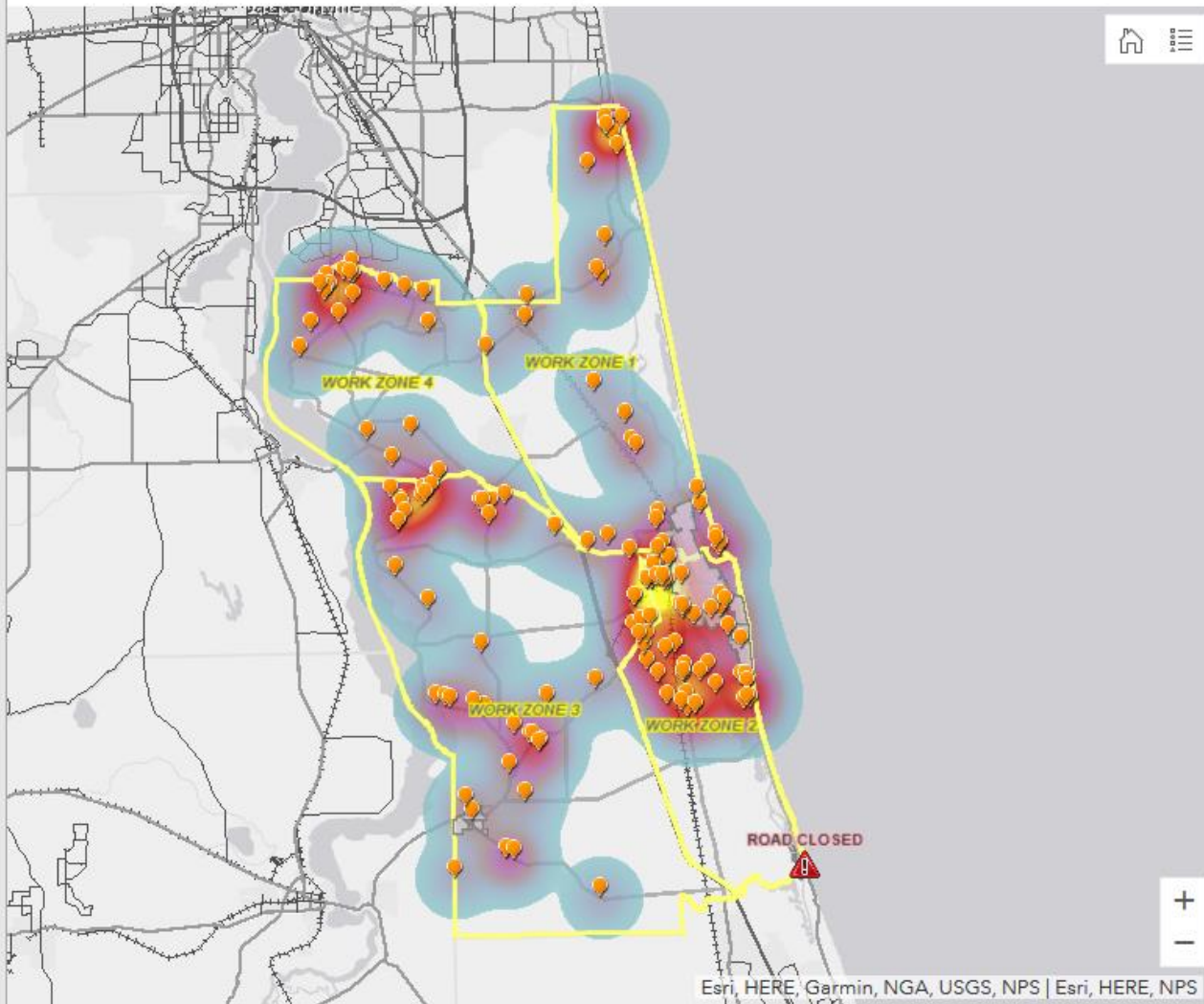
Operations dashboard is best viewed using Google Chrome, Firefox, or Safari web browsers

**It's about providing different services...different experiences...**

### Closed Roads



### St. Johns County Public Works Open Service Request for Hurricane Irma Event



### Road Related Requests

# 360

Last update: a minute ago

### Drainage Related Requests

# 214

Last update: a minute ago

### Sign & Signal Related Requests

# 93

Last update: a minute ago

### Number of Service Requests

# 719

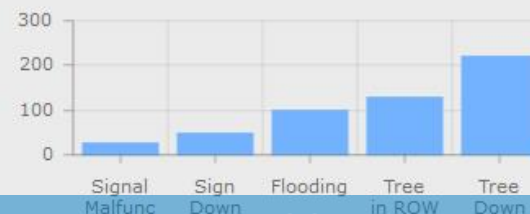
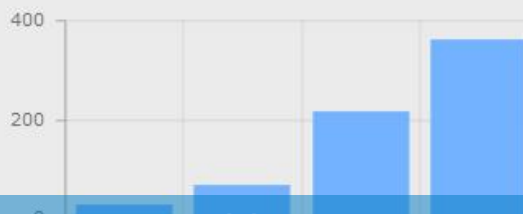
Last update: a minute ago

### Completed Service Requests

# 568

Last update: a minute ago

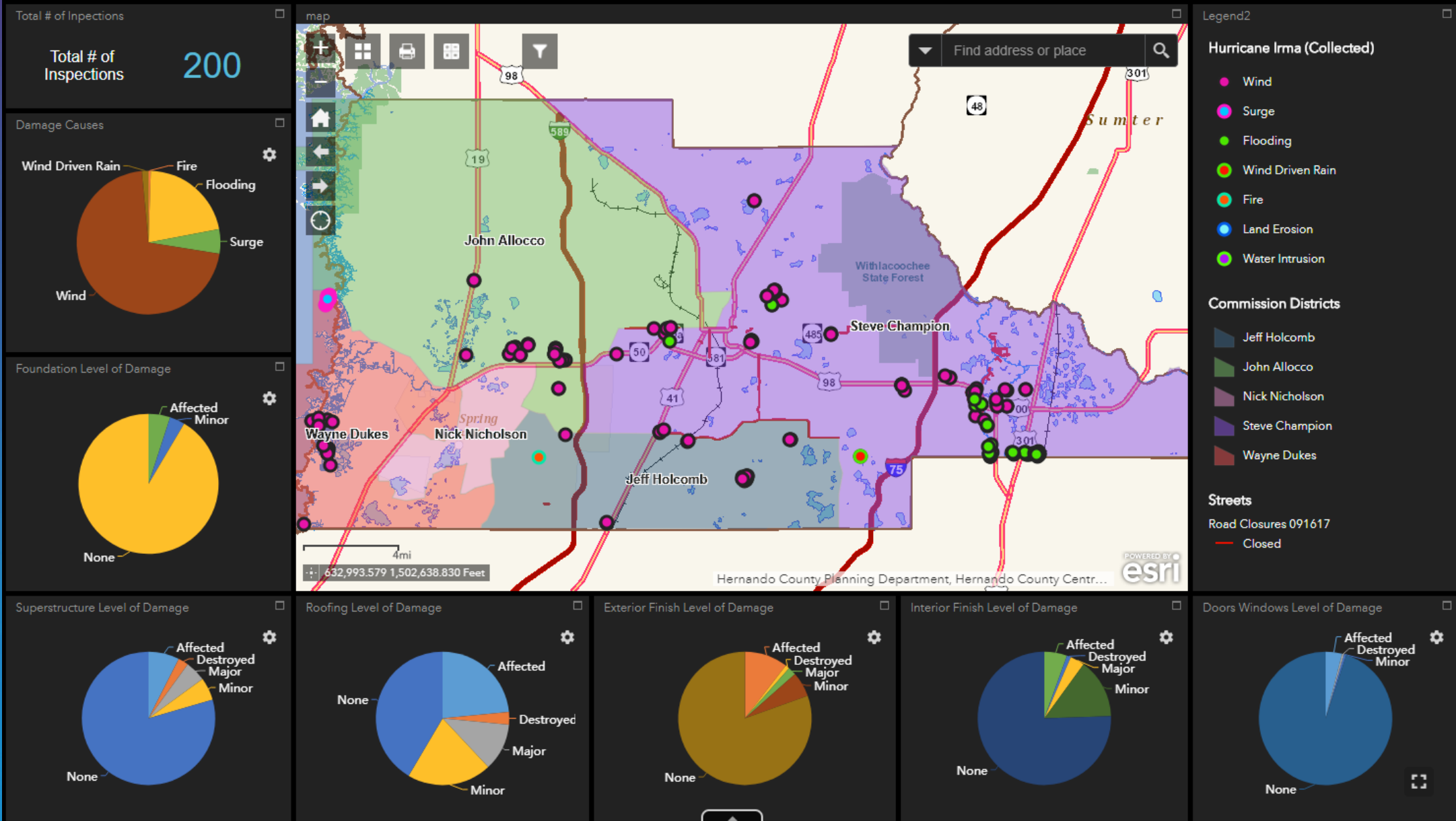
### Service Request Count



### Recent Service Requests

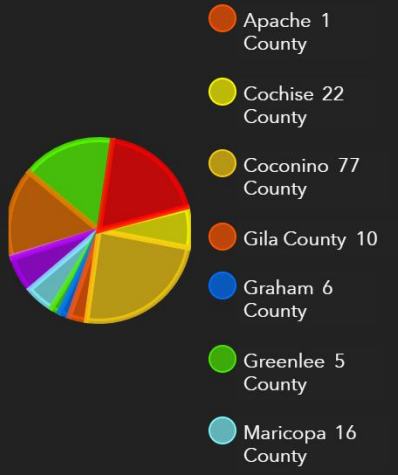
- 10/2/2017, 11:16 AM - Clean Ditch
- 10/2/2017, 5:03 AM - Sign Leaning

# It's about providing different services...different experiences...



It's about providing different services...different experiences...

## Individual County Count Summary



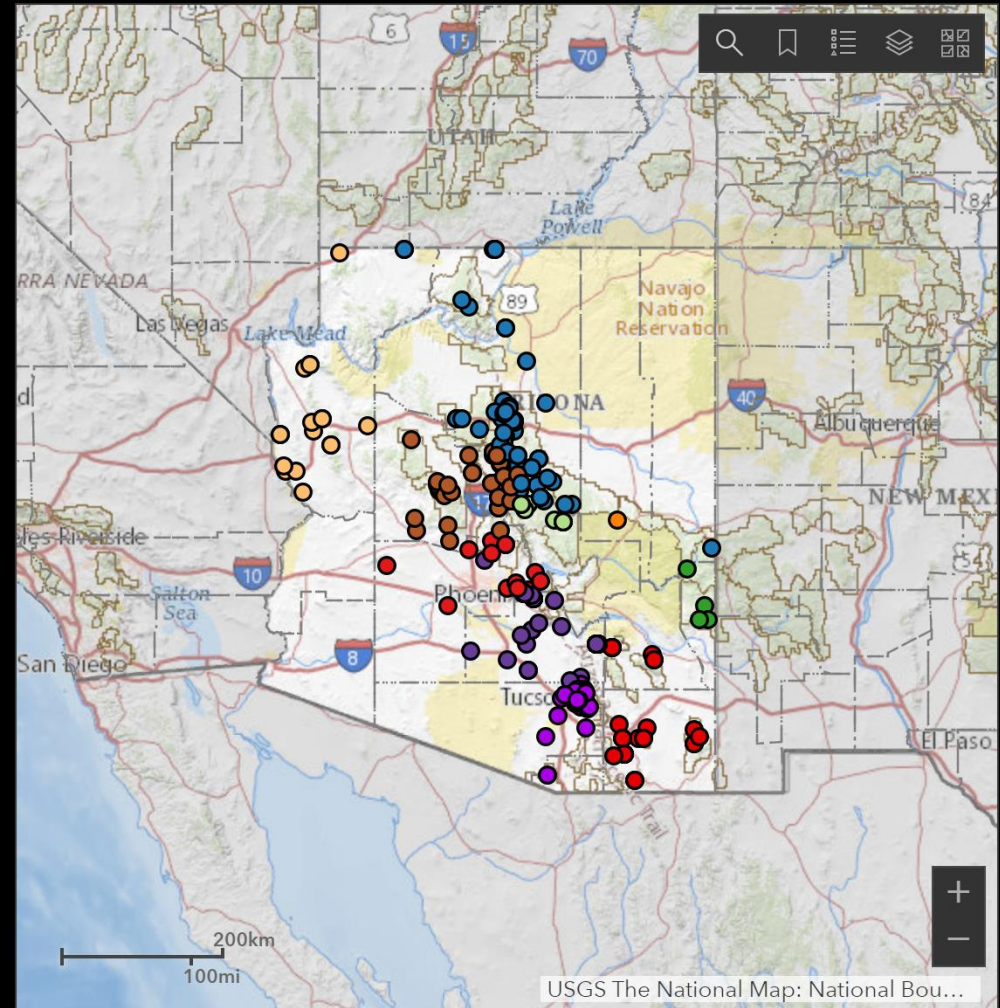
**Total Operating Cost**  
**\$50.038k FY 19**  
**\$2.904M FY 18**

**Total Missions**  
**319 Missions FY 19**  
**476 Missions FY 18**

## Recovery Type Summary



Last update: a few seconds ago



## SAR Missions in the last 24 Hours

0

## SAR List Breakdown (Click to Zoom)

- Start Date: 11/14/2018  
County: Pima County
- Start Date: 11/14/2018  
County: Pima County
- Start Date: 11/12/2018  
County: Maricopa County
- Start Date: 11/12/2018  
County: Maricopa County
- Start Date: 11/12/2018  
County: Coconino County
- Start Date: 11/12/2018  
County: Coconino County
- Start Date: 11/12/2018  
County: Coconino County
- Start Date: 11/11/2018  
County: Pinal County



**Reported Traffic Accidents**

**8**

Decrease: -8

Filtered by map extent


*Last update: a few seconds ago*

- Recent Alerts**
- JAM** | Moores Mill Rd  
4/26/2018, 2:01 PM
  - ACCIDENT** | I-75 N  
4/26/2018, 2:01 PM
  - WEATHERHAZARD** | I-285 S  
4/26/2018, 2:01 PM
  - JAM** | Clairmont Rd  
4/26/2018, 2:01 PM
  - JAM** | I-75 N  
4/26/2018, 2:01 PM
  - JAM** | SR-13 S  
4/26/2018, 2:01 PM
  - JAM** | to I-85 S / I-75 S  
4/26/2018, 2:01 PM
  - JAM** | I-75 N  
4/26/2018, 2:01 PM
  - ACCIDENT** | Exit 51-B: I-285 N Chattanooga  
4/26/2018, 2:01 PM
  - ACCIDENT** | Exit 51 A-B: I-285  
4/26/2018, 2:01 PM
  - WEATHERHAZARD** | I-285 S  
4/26/2018, 2:01 PM

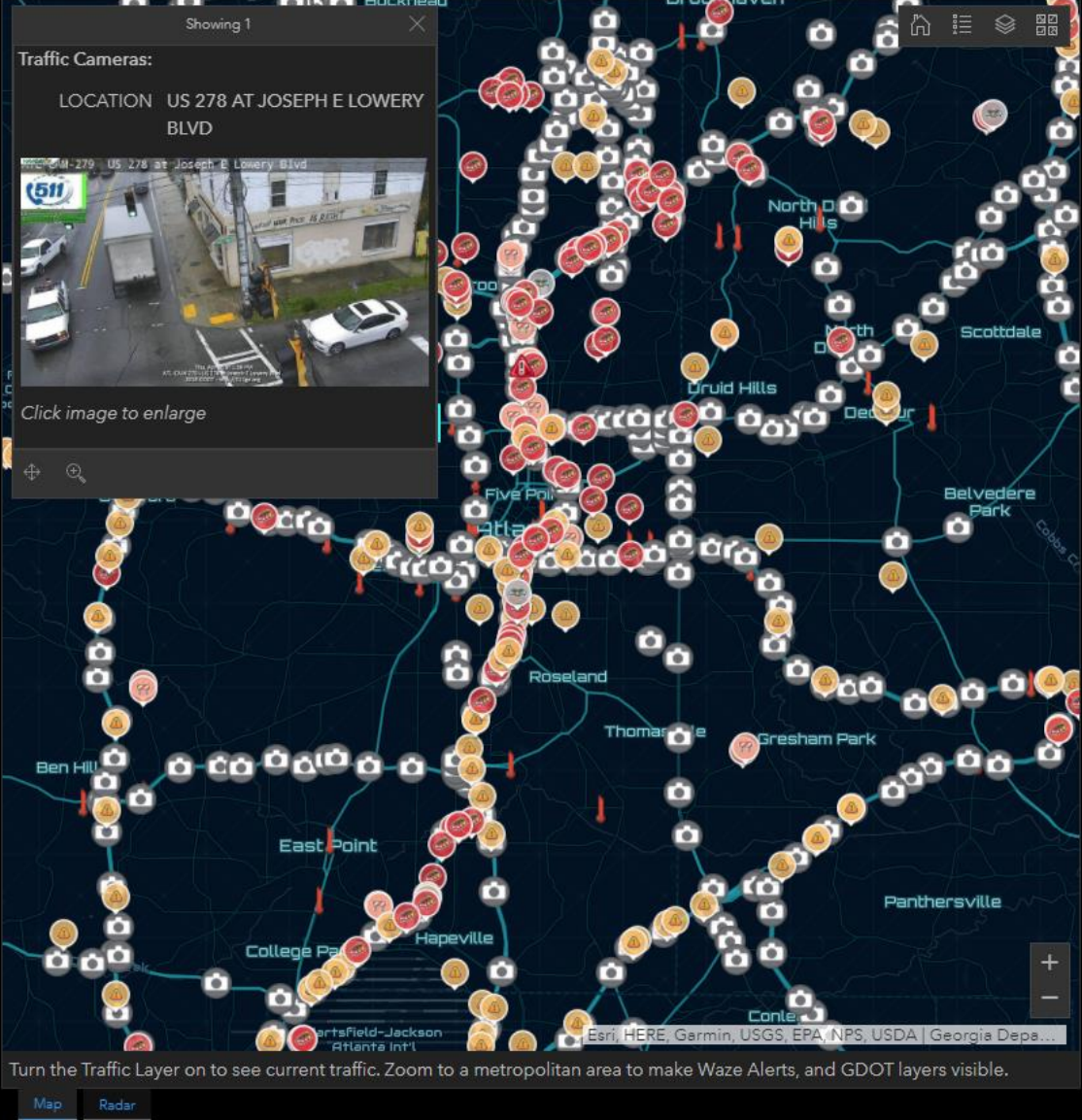
Showing 1

Traffic Cameras:

LOCATION US 278 AT JOSEPH E LOWERY BLVD



Click image to enlarge



Turn the Traffic Layer on to see current traffic. Zoom to a metropolitan area to make Waze Alerts, and GDOT layers visible.

Map Radar

**Reported Traffic Jams**

**114**

Decrease: -1

Filtered by map extent

*Last update: a few seconds ago*



**Reported Road Closures**

**19**

Decrease: -7

Filtered by map extent

*Last update: a few seconds ago*

**High Impact GDOT Incidents**

**0**

Decrease: -1

Filtered by map extent

*Last update: a minute ago*

Indicator List

No Data

Filtered by map extent

Indicator List

**GDOT Planned Traffic Interruptions**

**120**

Filtered by map extent

*Last update: a few seconds ago*

Indicator List

It's about providing different services...different experiences...



**WHAT they want, WHEN they want, WHERE they want, RIGHT AWAY...**

# THE AVENGERS

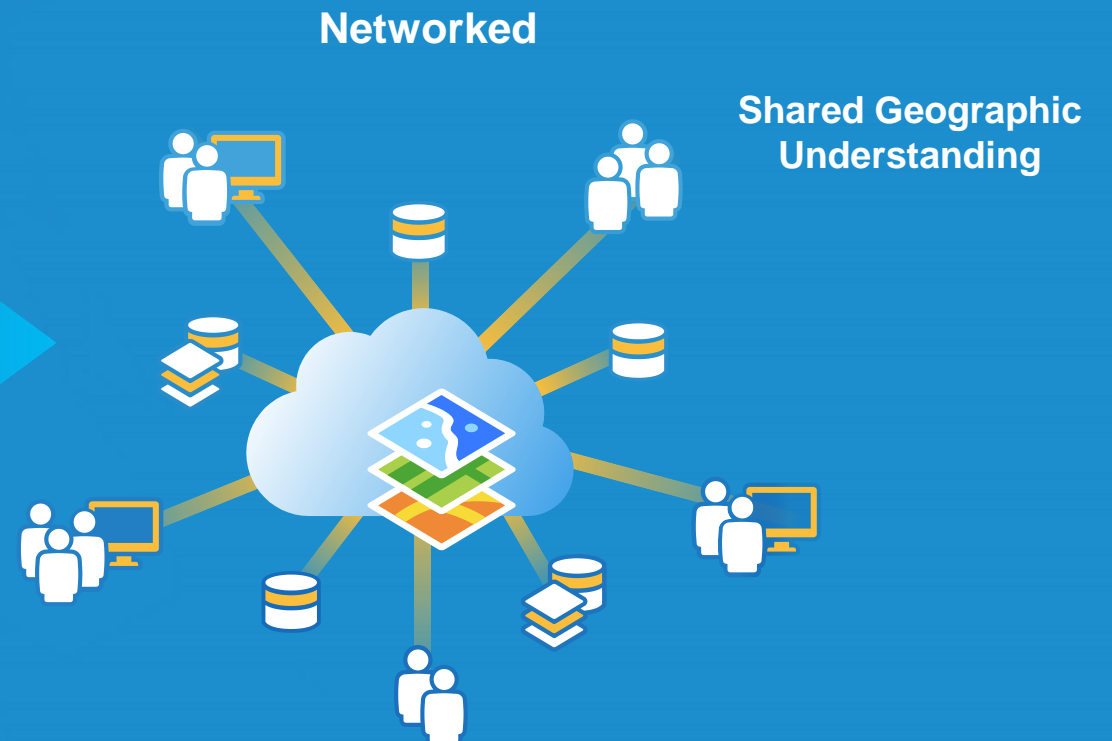
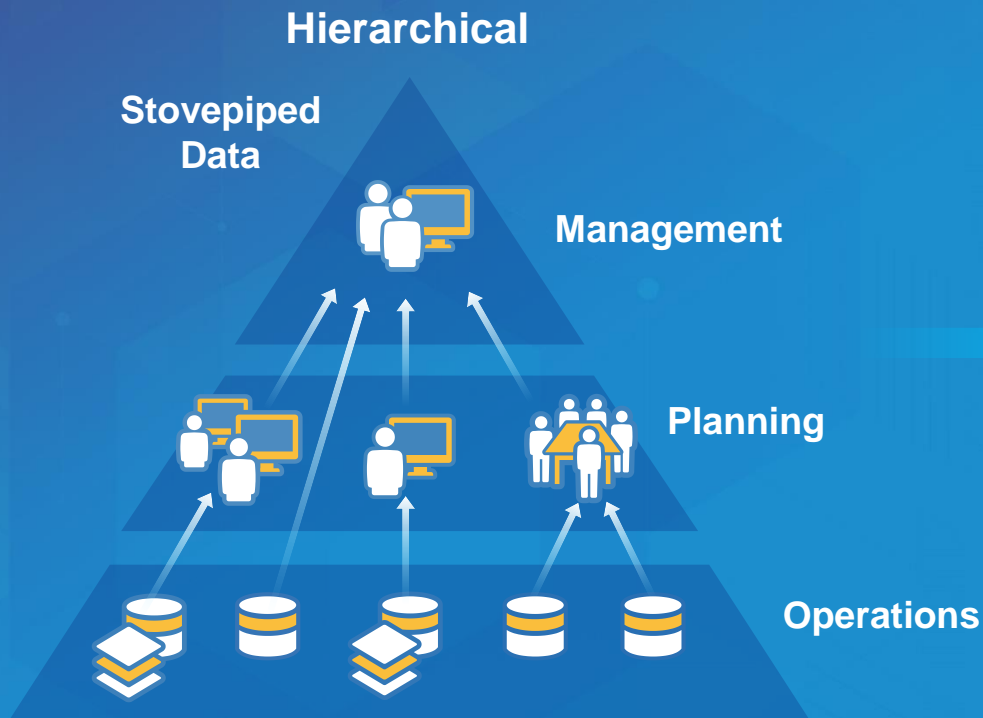


RYAN MEINERDING

Use **GROUPS** to enable staff to collaborate...

# Web GIS Transforms Organizations

Creating Shared Information & Facilitating Collaboration





Using easy-to-use, focused apps that are **MOBILE & READY-TO-GO...**

## Goal:

Give everyone alternatives, but keep them in a known, controlled and secure environment, while using the latest and most authoritative data.



**We want to help the business get the work done...**



By giving them choices...





Time for us to WAKE UP...



Time for us to TRANSFORM...



Government of South Australia

Department for Communities  
and Social Inclusion



CHARLOTTE  
WATER

Walgreens

Store Location: 9372  
Address: 674 Far Hills Ave.

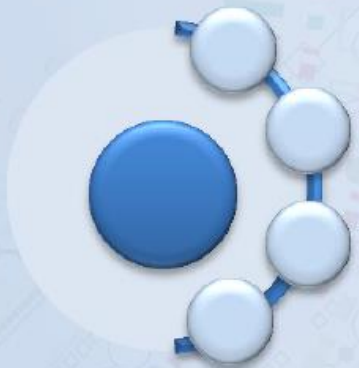
Distance: 9.4  
Customer: Yes  
Store Locator: 184

Lot: 395  
Size: 485 a  
County: Warren

# **DCSI** Geospatial Strategy

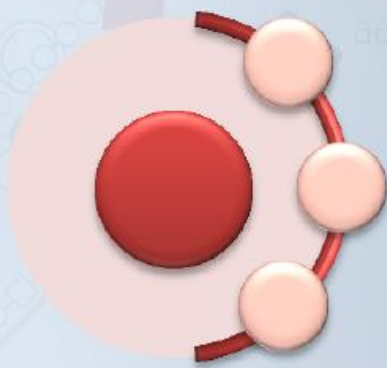
## Coordinate

Facilitate collaboration



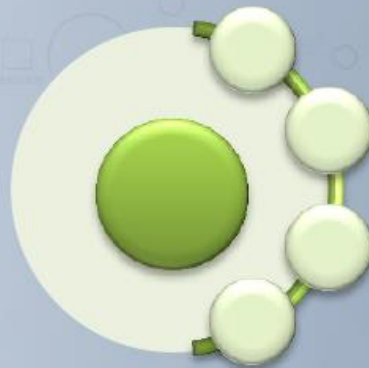
## Simplify

Improve business practices



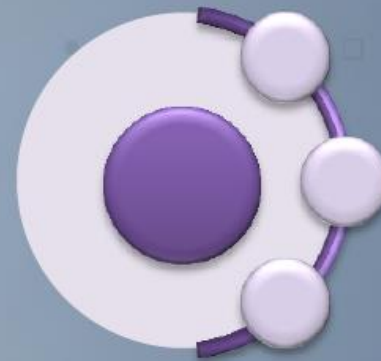
## Innovate

Smarter service offerings



## Enable

Informed decision makers





**Charlotte Water Map Room before their GIS implementation**



**Charlotte Water Fitness Center in their old Map Room**



Ingrid Bruce  
GIS Manager, City of Rancho Cucamonga





# Los Angeles GeoHub

LA Metro Bus Routes

The GeoHub is the City's new public platform for exploring, visualizing, and downloading location-based Open Data. You can also analyze and combine Open Data layers using maps, as well as develop new web and mobile applications. Let's make our great City even better, together!

[Find Data](#)

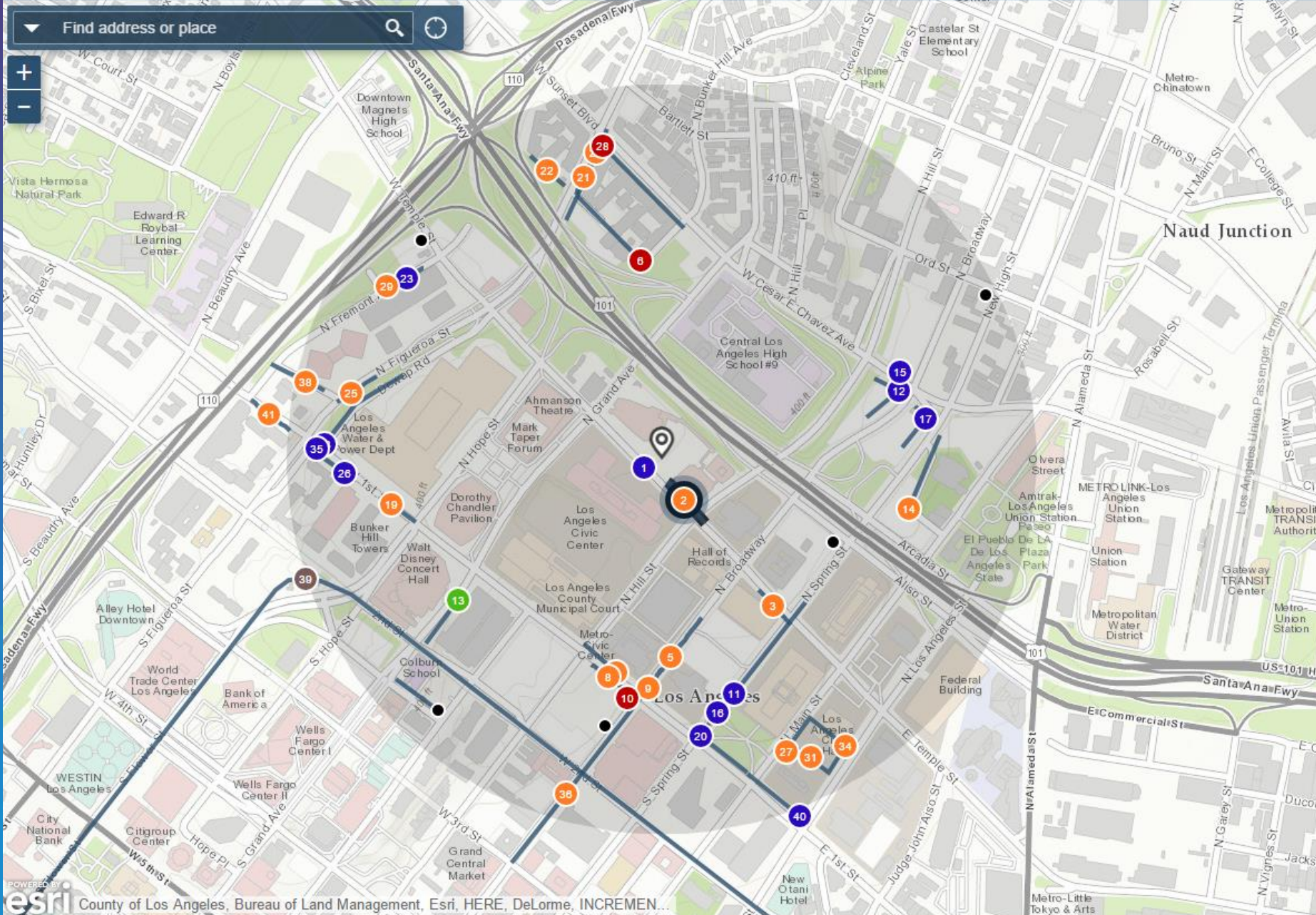
# Street Wize

Legend

Current Work

Upcoming Work

Find address or place



# 41

Projects

Search Radius (0.5 mi)

**2** City Capital Improvement Projects  
0.06 MILES Remaining: 11 months

ID	18977-4
Agency	Bureau of Engineering
Category	BOE CIP
Type	Capital Improvement Project - SSRP N07 Broadway & Pico BI
Description	Secondary Sewer Renewal Program.
Contact Name	Mary Thomas
Contact Phone	(213) 485-1552
Start Date	Oct 07, 2015
End Date	Aug 31, 2017
Status	In Progress
Report	<a href="#">More info</a>

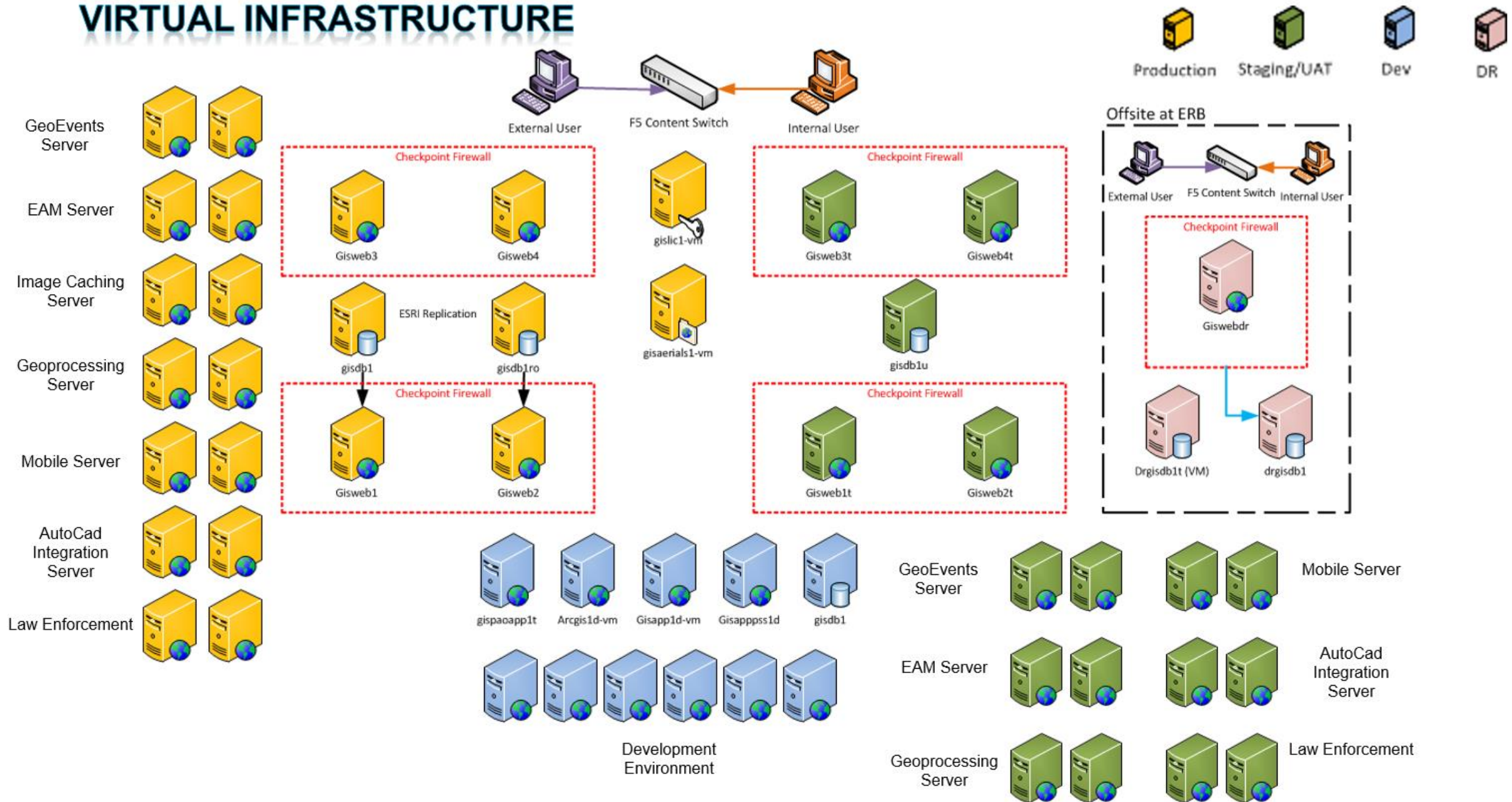
**3** City Capital Improvement Projects  
0.24 MILES Remaining: 11 months

**4** Sewer & Stormdrain Permits  
0.25 MILES Remaining: 1 year



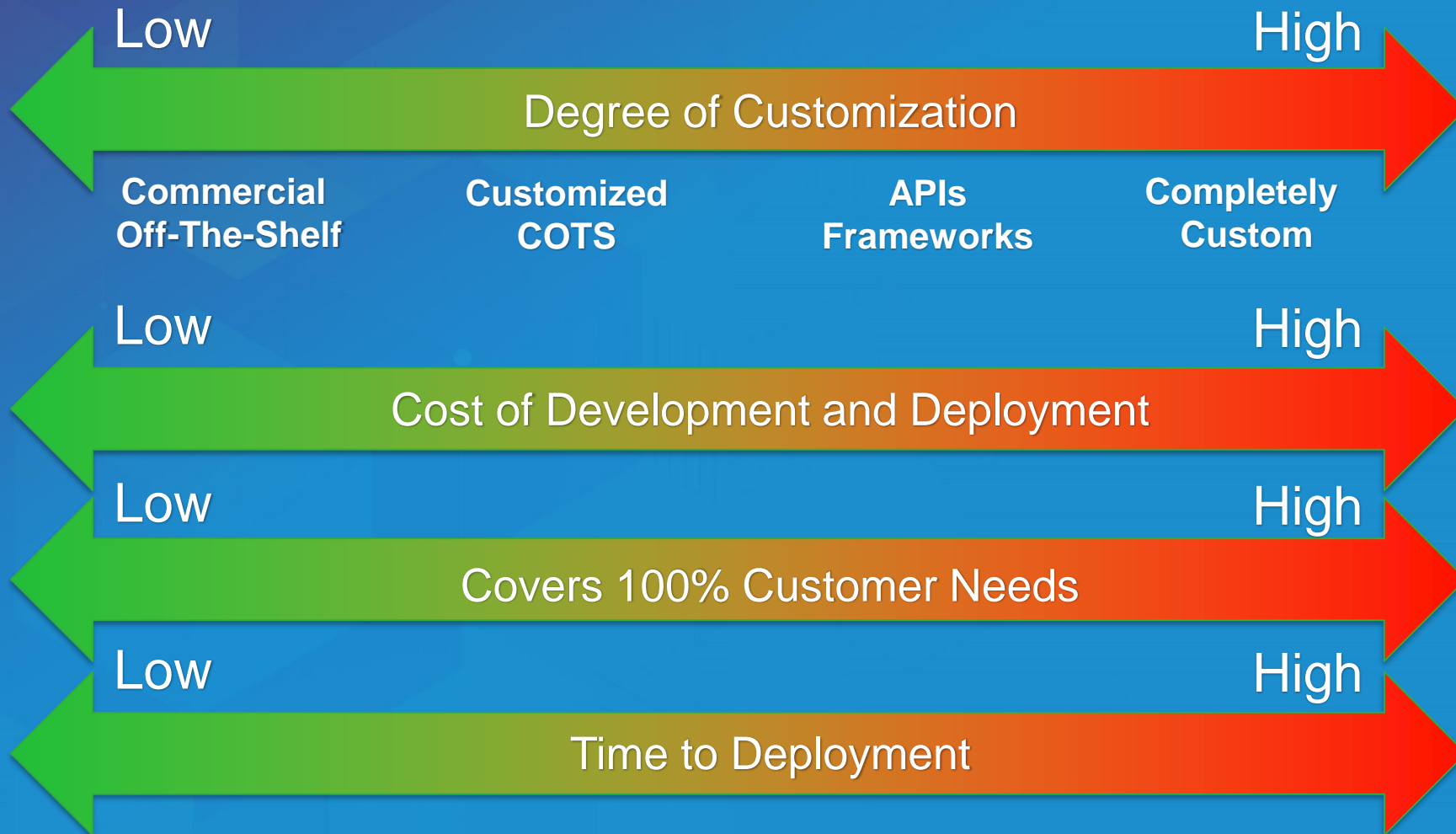
Do we need to rebrand GIS to Location Intelligence?

# VIRTUAL INFRASTRUCTURE



If you're going to raise your game, you need to upgrade your infrastructure...

# Commercial off the Shelf or “COTS”



**YOU WERE SO PREOCCUPIED WITH WHETHER OR NOT YOU COULD**

**YOU DIDN'T STOP TO THINK IF YOU SHOULD**



# The Underutilization of GIS Technologies – 2011

**...Generally, people outside of GIS think of GIS just as “maps” or a graphic product, or the younger brother of CAD...**

- **Promote the System**
- **Get a “GIS Health Check-Up”**
- **Use a Best of Breed approach**
- **Consider Software as a Service (SaaS) i.e., cloud**
- **Set GIS up as the Central Hub**

## Mapping the Cause: Using GIS to Determine Potential Causes for Cancer

AUGUST 27, 2015 BY [TROY LAMBERT](#)

*White Paper* [White Paper Reveals 12 Hidden Gems in GeoExpress Software](#)

Much talk lately in the tech world is related to Big Data and how useful it really is. The debate centers not only around making relationships, but how to determine which relationships are significant. How do we make all the demographic data we've gathered meaningful?

CONNECT WITH GISUSER



**GEOGRAPHIC INFORMATION SYSTEMS**

CUSTOMIZABLE REAL-WORLD GRADUATE DEGREES  
AND CERTIFICATES FOR BUSY ADULTS.





**GIS is often seen as “maps” or a visual graphics product, and the more advanced capabilities are ignored because they remain unknown to key departments and decision makers.**

Much talk lately in the tech world is related to Big Data and how useful it really is. The debate centers not only around making relationships, but how to determine which relationships are significant. How do we make all the demographic data we've gathered meaningful?



# GIS Should be about Digital Transformation



Posted for [Esri](#)



# GIS Should be about Digital Transformation



**GIS is about discovery. It's not about replicating maps that have been around for years. It's about visualizing trends for better decision making. It's about using spatial analytics to provide insight. An Enterprise GIS is not a series of spatially enabled or map-based applications. It is a location intelligence platform. Who cares about making maps faster? Enterprise GIS can transform the business by lowering costs and hassles, greatly improving decision making, and communicating to executives in ways they have never seen before.**

# ArcGIS Common Patterns of Use

## 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

## Constituent Engagement



Communicate and collaborate with citizens and external communities of interest

## Sharing & Collaboration



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

# GIS Maturity Assessment Matrix

	Mapping & Visualization	Data Management	Field Mobility	Monitoring	Analytics	Design & Planning	Decision Support	Constituent Engagement	Sharing & Collaboration
Elections	Green	Green	Red	Red	Red	Red	Red	Yellow	Red
Emergency Management	Green	Green	Green	Yellow	Yellow	Red	Yellow	Yellow	Red
Fire	Green	Green	Red	Yellow	Yellow	Yellow	Red	Yellow	Red
Health & Human Services	Yellow	Yellow	Red	Red	Red	Red	Red	Yellow	Red
Land Records	Green	Green	Yellow	Yellow	Green	Red	Green	Green	Yellow
Law Enforcement	Green	Green	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow
Parks & Recreation	Green	Green	Red	Red	Yellow	Red	Yellow	Yellow	Yellow
Planning & Development	Green	Green	Red	Yellow	Green	Yellow	Yellow	Green	Yellow
Public Works	Green	Green	Green	Yellow	Yellow	Red	Yellow	Yellow	Yellow
Transportation	Green	Green	Red	Yellow	Yellow	Red	Red	Yellow	Red
Utilities	Green	Green	Green	Yellow	Yellow	Red	Yellow	Yellow	Green

**Green** = Meeting Need, **Yellow** = Partially Meeting Need, **Red** = Not Meeting Need



# Keys to Success

Follow Best Practices

- **People**
- **Data**
- **Process**
- **Technology**



AN ESRI  
WHITE PAPER

DECEMBER 2018

## Architecting the ArcGIS Platform: Best Practices

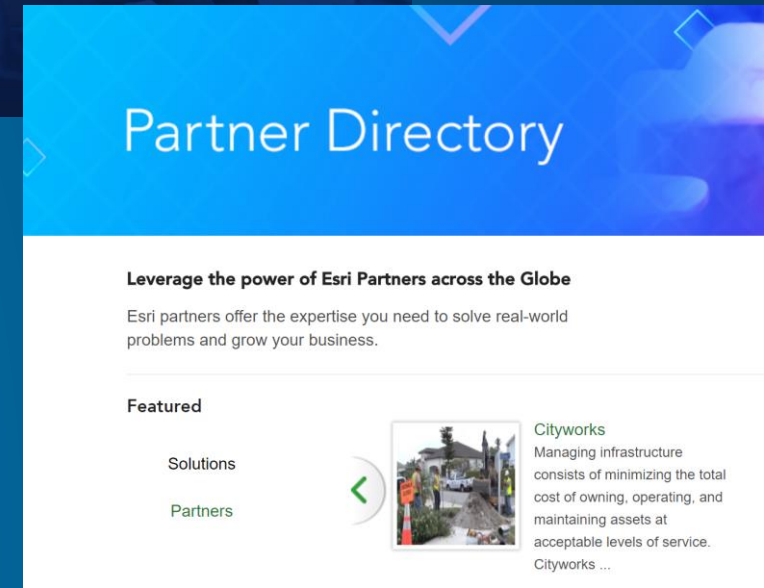
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# Develop Strong Partnerships

## Esri Team and Esri Partners

- **Esri Team**
  - Account Team (Manager and Solution Engineer)
  - Subject Matter Experts
  - Training Consultant
    - Workforce Development Plan
  - Technical Support
    - Premium Support
  - Professional Services
    - Packages, Rent-a-Tech, Projects
  - Esri Enterprise Advantage Program (EEAP)
- **Esri Partners**
  - Specialties (ArcGIS Online, ArcGIS for Local Government)
  - ArcGIS Marketplace





# Develop Strong Partnerships

## Develop and Grow Your Internal Team

- Executive Champion(s)
  - Alleviate their Pain
  - Support their Vision
- IT Leadership
- Align the GIS Plan with the IT Plan & the Organization's Plan
- Enable collaboration and empower others
- Mindset of a GIS Consulting Firm
- Market Spatial Analysis
- Measure and document the impact (ROI)

GIS Project ROI and Benefits Report		
Project Name:		
Department or Division:		
Project Manager/Sponsor:		
Project Completion Date:		
Executive Summary: (Concisely state the problem and its impact on the organization then describe the solution.)		
Describe current workflow or limitation: (Be as detailed as needed)		
Describe proposed enhancement: (Be as detailed as needed)		
Current Workflow Costs: (Enter values in left column (see wage notes below). Values in right column are calculated.)		
Hours to complete current workflow	6.0	Current Workflow Total Cost
Hourly wage rate*	25.00	Current Workflow Total Cost
Annual occurrence of workflow	75	
Other workflow costs (consumables/travel exp., etc.)	\$50.00	
Enhanced Workflow Costs		
Hours to complete workflow after enhancement	2.0	Enhanced Workflow Total Cost
Hourly wage rate*	25.00	Enhanced Workflow Total Cost

**THE LANGUAGE OF SPATIAL ANALYTICS**

Using *The Science of Where* to understand our world—mapping where things are, how they relate, what it all means, and what actions to take.


Understanding where	Measuring size, shape, and distribution	Determining how places are related	Finding the best locations and paths	Detecting and quantifying patterns	Making predictions
<ol style="list-style-type: none"> <li>Understanding where things are (location maps).</li> <li>Understanding where the variations and patterns in values are (comparative maps).</li> <li>Understanding where and when locations and values change.</li> </ol>	<ol style="list-style-type: none"> <li>Calculating individual feature geometries.</li> <li>Calculating geometries and distributions of feature collections.</li> </ol>	<ol style="list-style-type: none"> <li>Determining what is nearby or coincident.</li> <li>Determining and summarizing what is within an area(s).</li> <li>Determining what is closest.</li> <li>Determining what is visible from a given location(s).</li> <li>Determining overlapping relationships in space and time.</li> </ol>	<ol style="list-style-type: none"> <li>Finding the best locations that satisfy a set of criteria.</li> <li>Finding the best allocation of resources to geographic areas.</li> <li>Finding the best route, path, or flow along a network.</li> <li>Finding the best route, path, or corridor across open terrain.</li> <li>Finding the best supply locations given known demand and a travel network.</li> </ol>	<ol style="list-style-type: none"> <li>Where are the significant hot spots, anomalies, and outliers?</li> <li>What are the local, regional, and global spatial trends?</li> <li>Which features/objects are similar, and how can they be clustered, classified, and identified?</li> <li>Are spatial patterns changing over time?</li> </ol>	<ol style="list-style-type: none"> <li>Given a success case, identifying, ranking, and predicting similar locations.</li> <li>Finding the factors that explain observed spatial patterns and making predictions.</li> <li>Interpolating a continuous surface and trends from discrete sample observations.</li> <li>Predicting how and where objects spatially interact (attraction and decay).</li> <li>Predicting how and where objects affect wave propagation.</li> <li>Predicting where phenomena will move, flow, or spread.</li> <li>Predicting what-if.</li> </ol>

esri THE SCIENCE OF WHERE

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**It's time to seize the opportunity in front of you.**



Don't aspire to make a living,  
aspire to make a difference.

Denzel Washington

# Thank You!

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**@SpatialAce**

**GeoNet**

The Esri Community

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