



Modernization of Field Operations for In Situ Data Collection

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VISION

A Geographic Platform
for Official Statistics



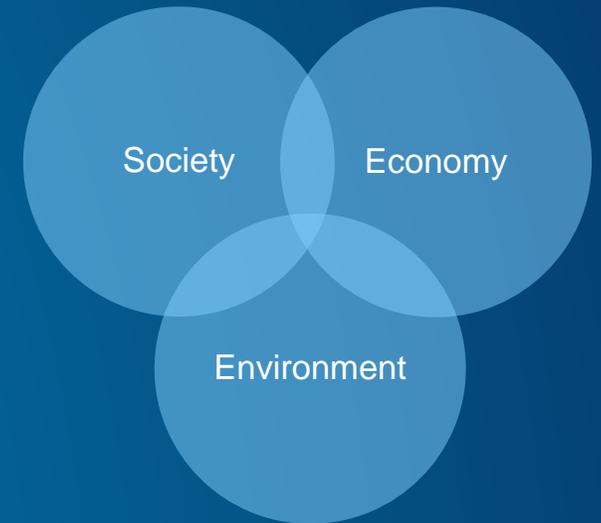
The Business of Official Statistics

Statistics published by government or other public agencies

- National Statistical Offices exist to provide information to the general public, government and the business community in the economic, demographic, social and environmental fields.
- This information is essential for development in these areas and for mutual knowledge and trade among the States and peoples of the world.
- Fundamental Goals include:
 - Protect confidentiality of responses
 - Minimize the burden on the people who provide the responses
 - Ensure accuracy, timeliness, relevance and credibility

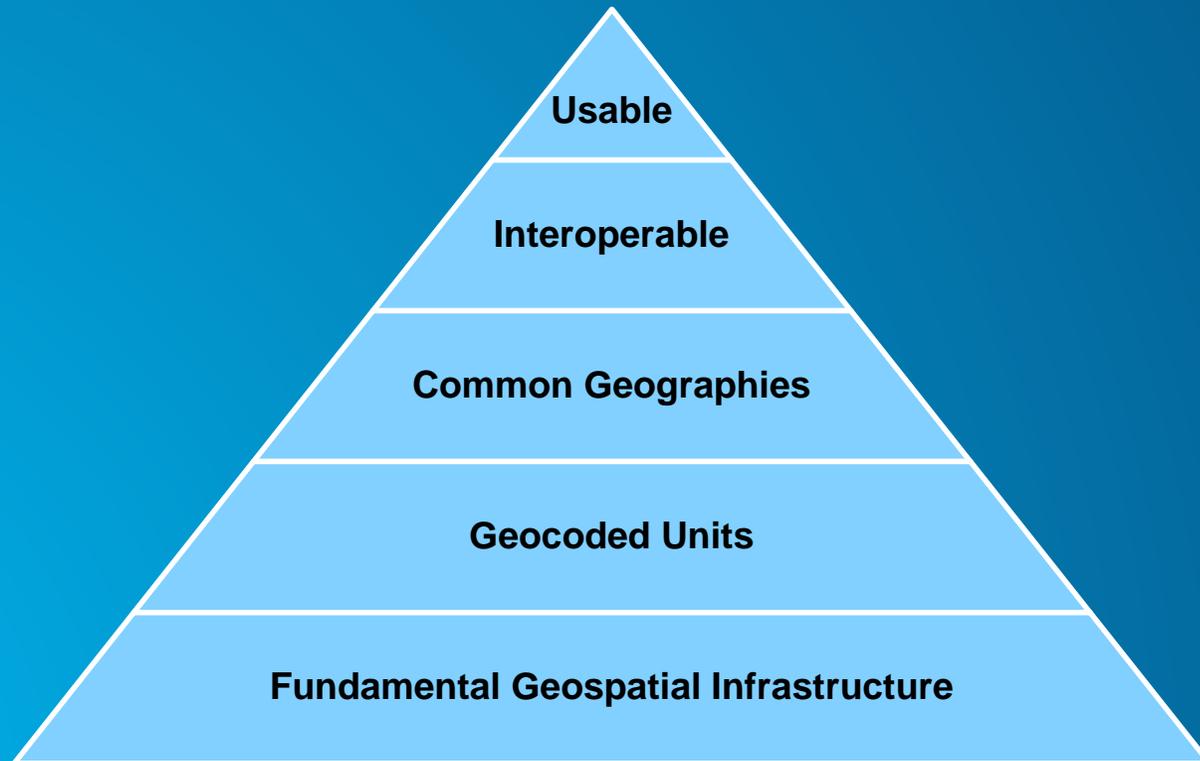
Common Indicators:

Population
Housing
Gender
Employment
GDP
Consumer Price Index
Purchasing Parity
Trade
Environmental
Energy

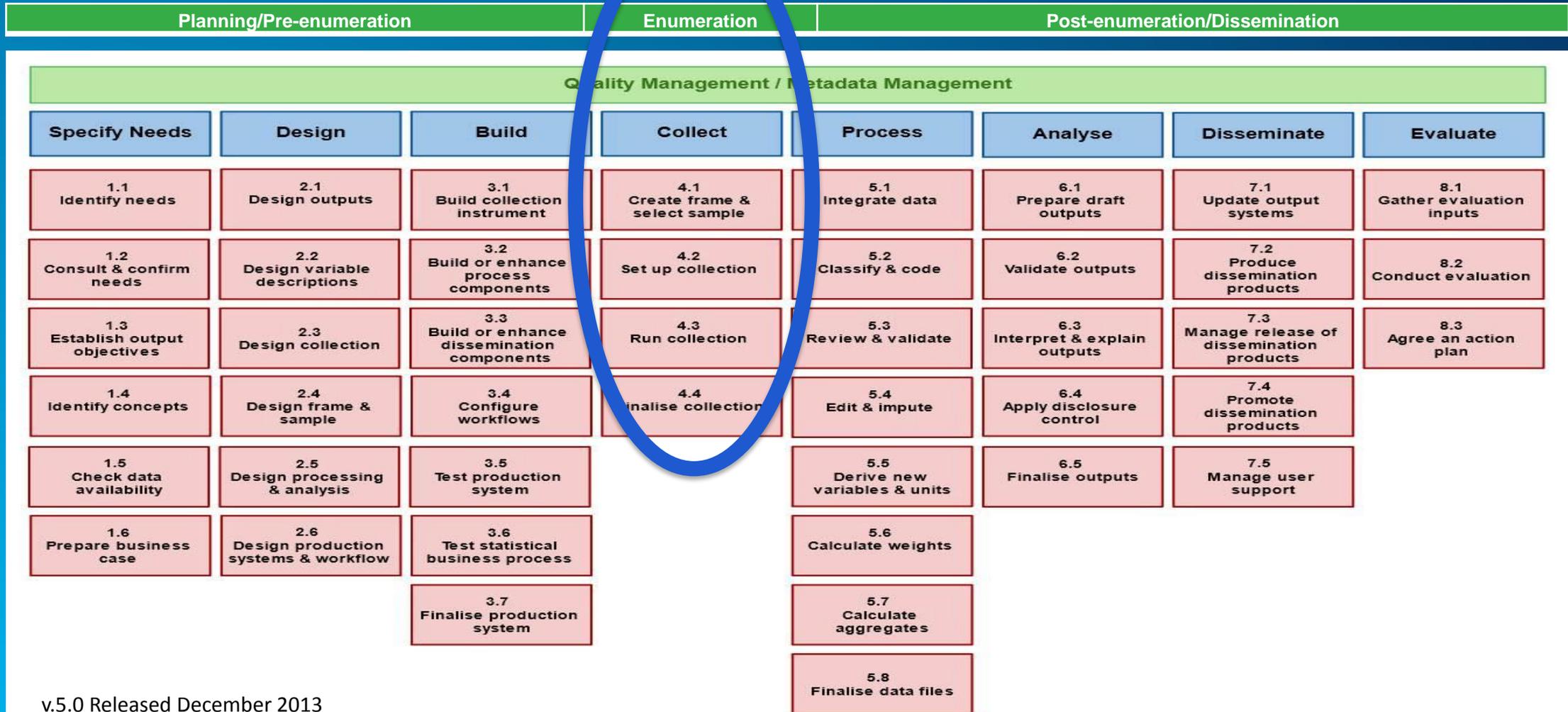


Official Statistics

Why is GIS important?



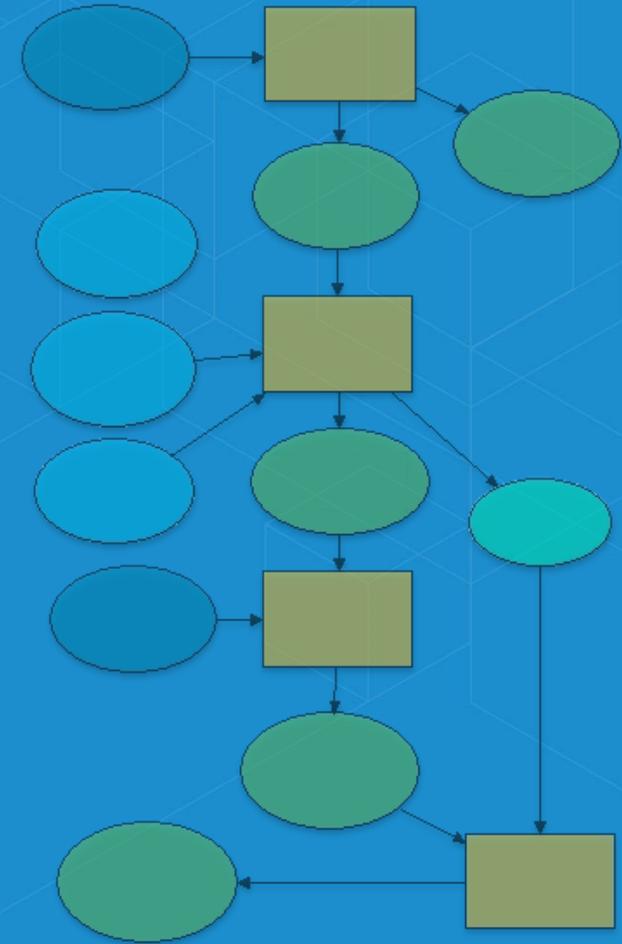
Generic Statistical Business Process Model (GSBPM)



v.5.0 Released December 2013

Workflows

Workflow definition derived from:
Business Process Management Center for Excellence Glossary, 2009
https://www.ftb.ca.gov/aboutFTB/Projects/ITSP/BPM_Glossary.pdf



Workflow

Creating Shared Information and Facilitating Collaboration



Why do we care?

Impact of good workflow design

LEAN
Maximize value

LEAN
Minimize waste

SIX SiGMA
Eliminate defects

Field Operations: In-Situ Data Collection



Considerations: In-Situ Field Data Collection

- People
- Hardware
- Software (Ease of Use)
- Connectivity (Access)
- Training
- Security
- Time Management
- Device Management
- Database Management

DATA QUALITY

Accurate & Authoritative

Collection | Lots of Devices



Collection | Lots of Apps



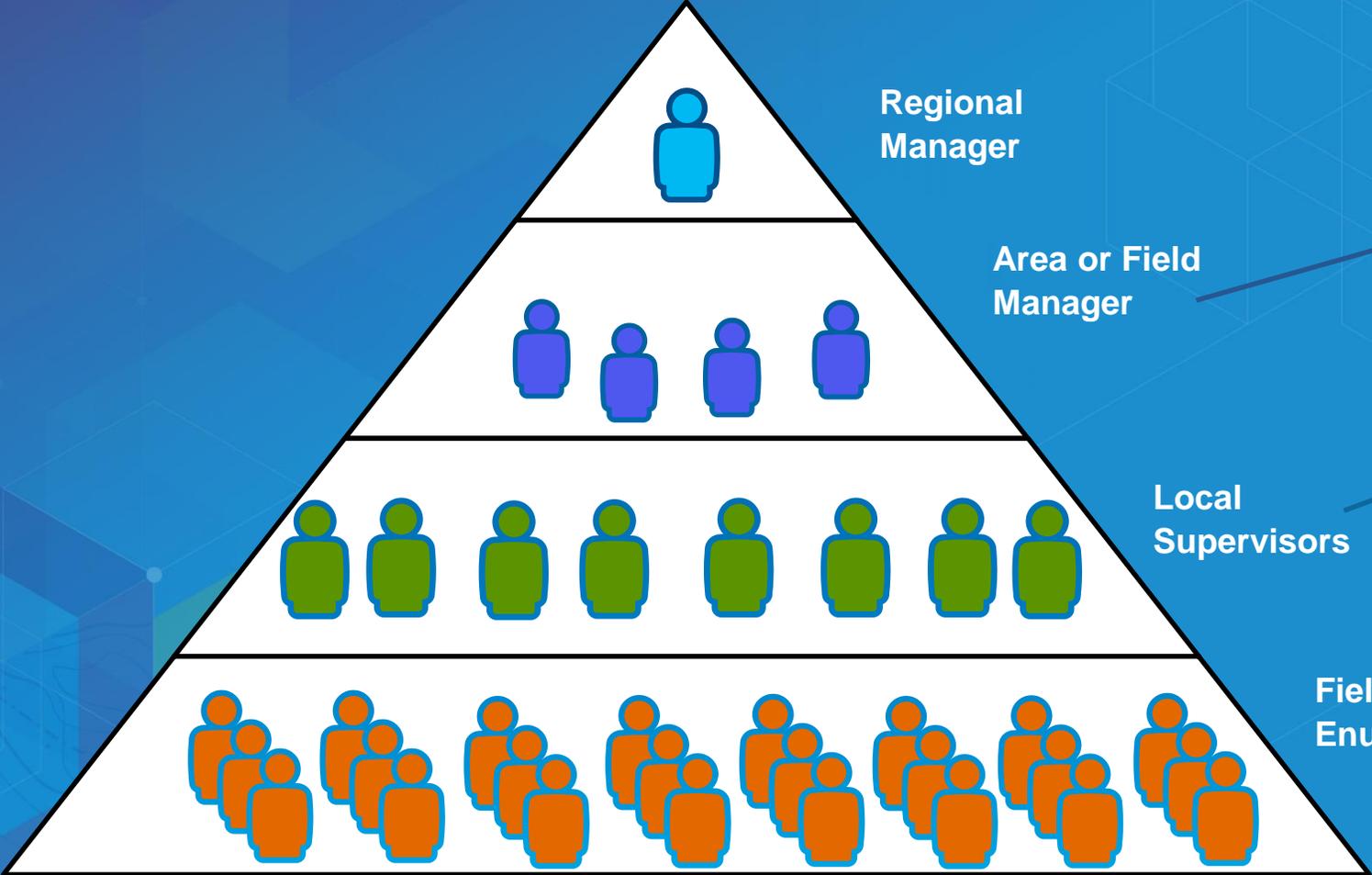
Considerations: In-Situ Field Data Collection

- Other Challenges...
 - Project accuracy requirements
 - Sample Size needed
 - Network availability
 - Desired basemap for collection
 - Datum transformations
 -

Field Operations In Situ Data



Field Staff Hierarchy



Regional Manager

Area or Field Manager

Local Supervisors

Field Enumerators

What are appropriate Staffing Ratios?

Local Supervisor to Field Manager X:X

Enumerator to Local Supervisor X:X

Planning

Territory Optimization with GIS

A story map    

1. Intro

2. Territory Types

3. Assignment

4. Existing Areas

5. Drive-Time Areas

6. No Boundaries

7. New Boundaries

8. Scheduling

9. Get More Info

A Dive into Territory Planning with GIS (Geographic Information Systems)

By: Wolfgang Hall, whall@esri.com

Effective territory planning and optimization is critical for many businesses. Almost every organization that uses field crews for sales, services, or deliveries has a need for organizing field staff into territories or regions.

Well-defined territories increase efficiency, response time, and customer satisfaction while cutting costs.

Territories can be either loosely defined or based on fixed geographical areas, such as postal codes. Work within territories can be different every day or make use of pre-planned, repeating routes. Some of the customer locations may require recurring weekly or monthly visits.

This story map tutorial will explore how these different types of territories can be created and optimized using GIS. The typical process includes two main steps:

1. Territory Assignment: assigns customer locations to balanced territories
2. Territory Scheduling: schedules varying daily routes to customer locations



[Story Map Enumeration Area Creation](#)

Apps for the Field

Workforce
for ArcGIS

Navigator
for ArcGIS

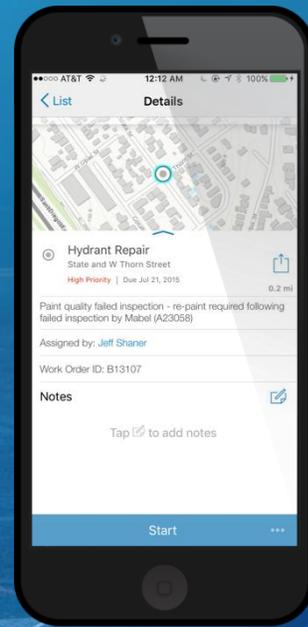
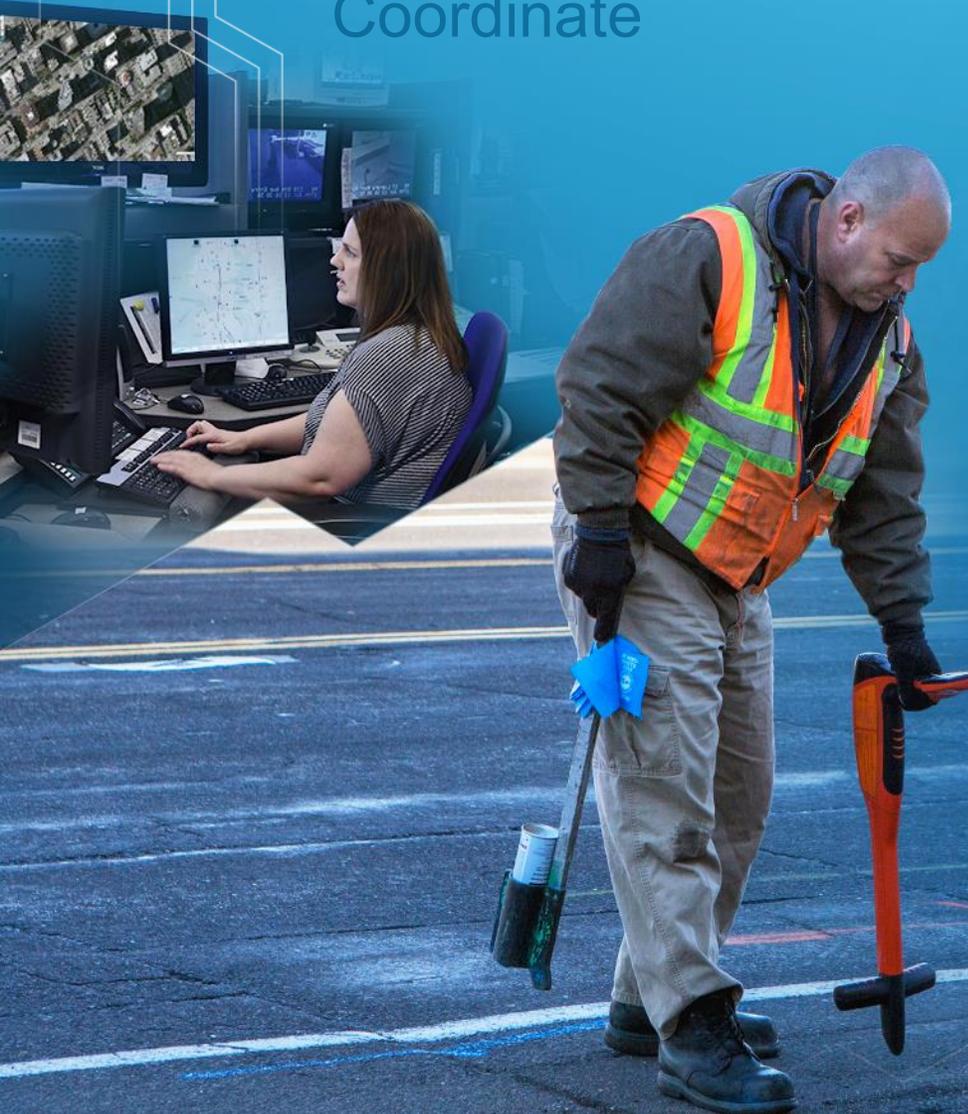
Collector
for ArcGIS

Survey123
for ArcGIS

Drone2Map
for ArcGIS

Apps for the Field

Coordinate



Workforce
for ArcGIS

Navigator
for ArcGIS

Collector
for ArcGIS

Survey123
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Drone2Map
for ArcGIS

Apps for the Field

Navigate



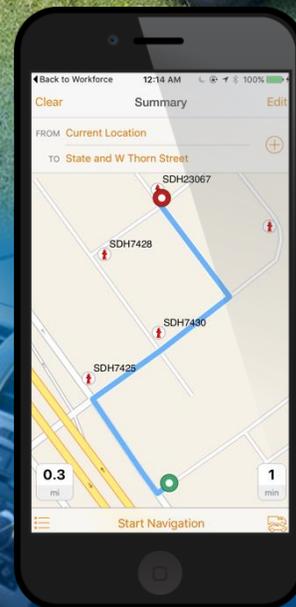
Workforce
for ArcGIS

Navigator
for ArcGIS

Collector
for ArcGIS

Survey123
for ArcGIS

Drone2Map
for ArcGIS



Apps for the Field

Capture



Workforce
for ArcGIS

Navigator
for ArcGIS

Collector
for ArcGIS

Survey123
for ArcGIS

Drone2Map
for ArcGIS

Coordinating field to office workflows

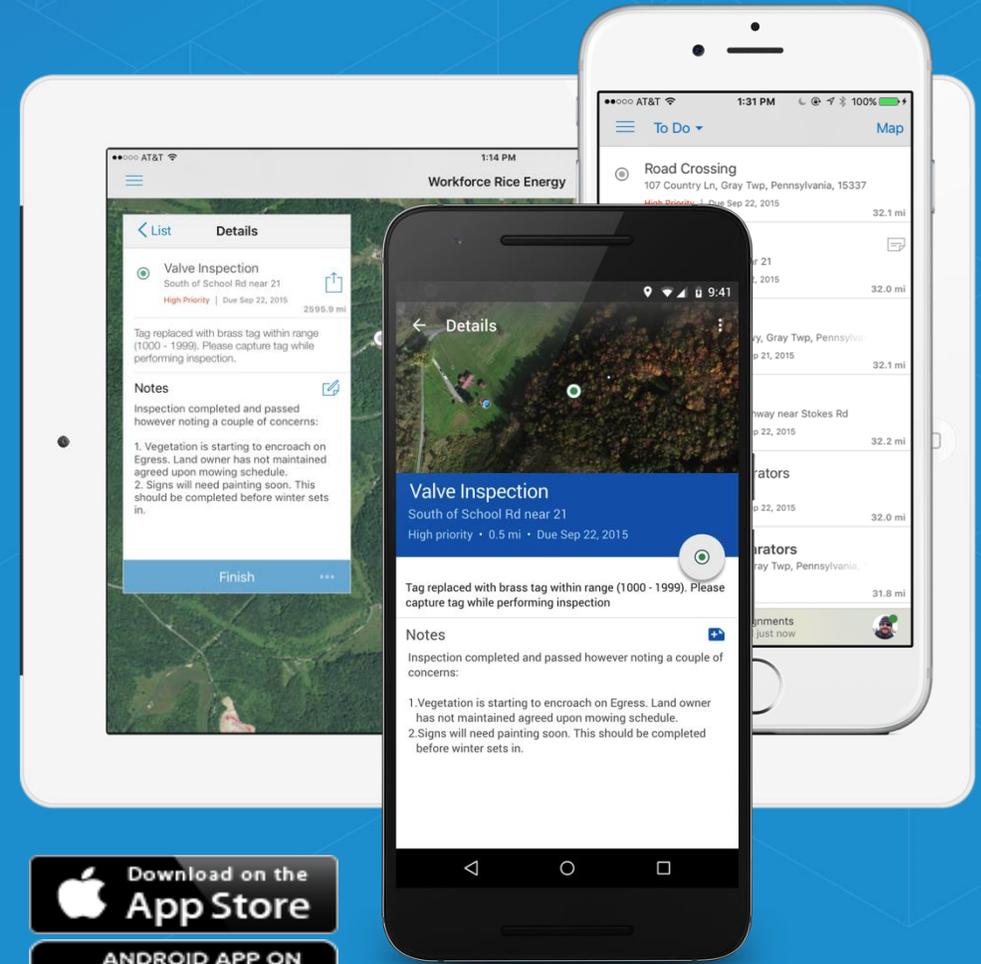


- Field workforce optimization
- Efficiently plan and assign work
- Receive assignments and report status from the field

A composite image showing the ArcGIS Workforce website on a desktop browser and the mobile app on two smartphones. The website header includes the Esri logo and navigation links. The main content area features a large circular graphic with the text "Workforce for ArcGIS" and "Smarter Field Workforce Coordination at Your Fingertips". Below this, there are four key features highlighted: "A 360° View Keeps Things Right", "Real-time Awareness", "Smart Devices, Smart Workers", and "Integrated with ArcGIS". The mobile app interface shows a "To Do" list with various assignments, including "TDED Inspection", "Inspection", "Teardown", and "New Drilling Assessment", each with a priority level and distance. The desktop browser shows the URL "www.esri.com/products/workforce-for-arcgis" and the user name "Jeff".

Coordinate

- View and complete work assignments
- Organize your work list
- Receive notifications
- Set your working status
- Add and edit notes
- View referenced attachments



Dispatch work

- Create new work assignments
 - By Geocode
 - Using the Map
 - From features
 - Automatically
- Assign, re-assign and cancel work
 - Individually
 - In bulk
- Filter and sort assignments
- View all mobile workers
- Search the map

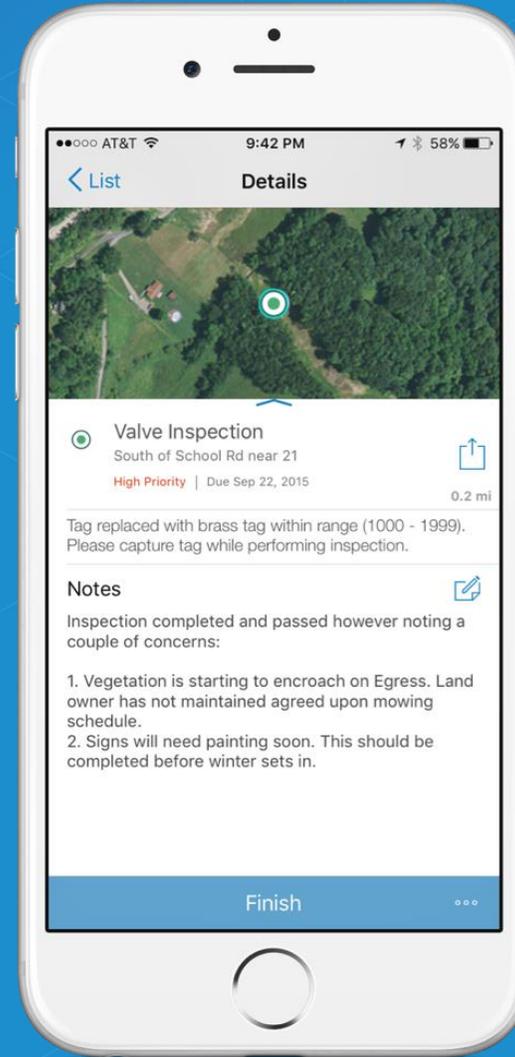
The screenshot displays the Esri dispatch work interface. On the left, the 'Create an Assignment' form is visible, with fields for Assignment Type (Valve Inspection), Location (Jacksonburg Site), Assigned to (Zachary Schmitt), Priority (Medium), Due (03/09/2016), Work Order ID (A12598), and Description (Quarterly Valve Inspection Report required). On the right, the 'Assign a Worker' dialog is open, showing a list of workers with their current assignment counts. Below the worker list, a table shows the status and priority of assignments for selected workers.

Worker	Count
Jeff Shaner	12
Zachary Schmitt	0
Adam Rusmisl	5
Brian Schill	12
Brian LeMasters	
Chris Rusmisl	
Grant Curfman	
John Olesh	
Robert Campbell	
Thomas Teeling	
James Joynson	
Andrew Mellema	

Status	Due	Priority	Assignee	Sort
<input type="checkbox"/> 4 assignments				
<input type="checkbox"/>		Meter Dropped Medium		
<input type="checkbox"/>		Meter Dropped Medium		
<input type="checkbox"/>		Corrosion Dropped Pin Medium Priority		

Work Assignments

- Properties of a Work Assignment
 - Status, Due Date, Priority, Assignee, Type
- States
 - Unassigned, Assigned, In Progress, Paused, Completed, Declined
 - Date/Time stamps
- Priorities
 - None, Low, Medium, High, Critical*
- Attachments
 - Documents, Pictures



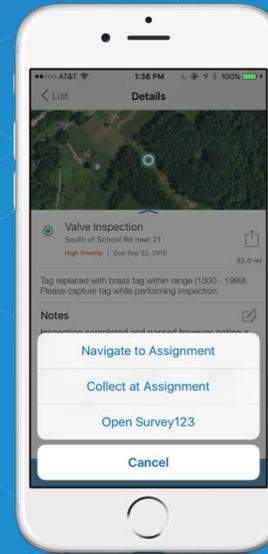
Workers

- Dispatchers and Mobile Workers
- Worker Details
 - Contact Number, Title, Notes
- Worker Status
 - Working, On Break, Not Working
- Worker Location
 - Current Location, Location Tracks

The screenshot displays a mobile application interface for managing workers. At the top, a map shows a location track with a white circle indicating the current location. A worker profile card for Jeff Shaner is shown, including a profile picture, name, address (1027 W. Boylston Hwy, Gray, PA), and a 'Call' button with the number 909-754-3397. Below the profile, the 'Workload' section shows '13 Assignments' and a '+ Create assignment here' button. The 'Status' section shows a green location pin icon and the text 'Working'. A 'Field Operations' dropdown menu is open, listing three status options: 'Working' (selected with a blue checkmark), 'On Break' (yellow dot), and 'Not Working' (gray dot). At the bottom, a card displays '13 Assignments Updated just now' with a 'Sort' button and a small profile picture of the worker. A distance indicator shows '0.2 mi'.

Get to assigned work

- Integrated with ArcGIS Apps so you can:
 - Get to the location of work assignments using Navigator for ArcGIS



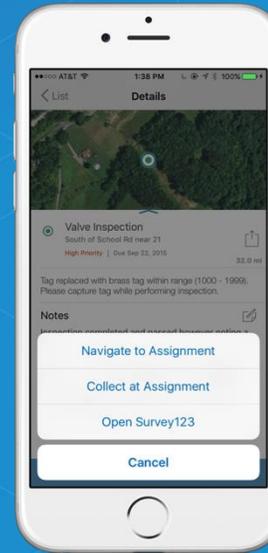
Open Navigator
and create a route



Return to Workforce
at destination

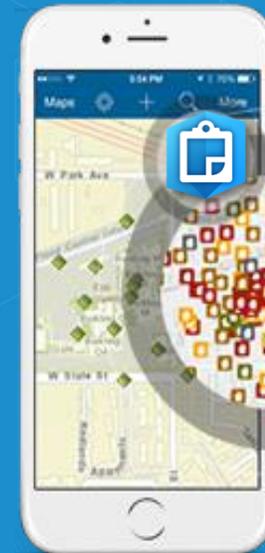
Collect at location

- Integrated with ArcGIS Apps so you can:
 - Get to the location of work assignments using Navigator for ArcGIS
 - Complete your work using:
 - Collector for ArcGIS



Return to Workforce when finished

Open Collector and go to location



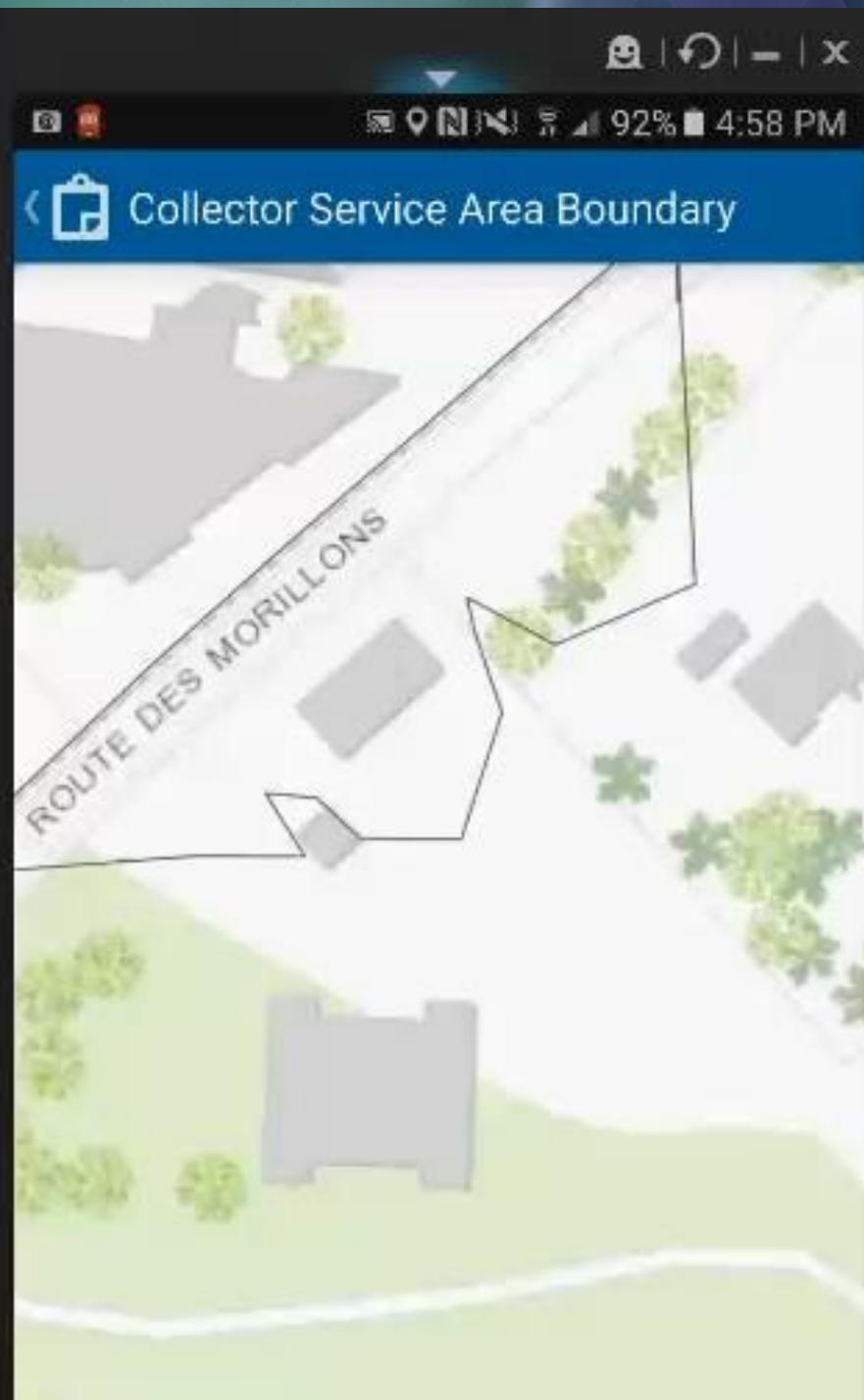


Collector for ArcGIS

Map Centric Data Collection

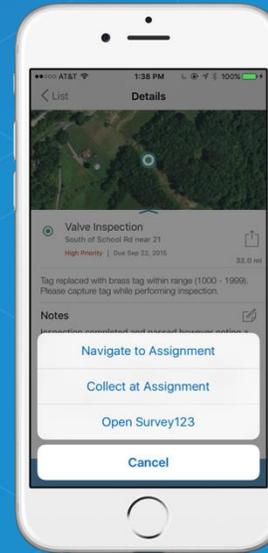
High Precision

Works offline



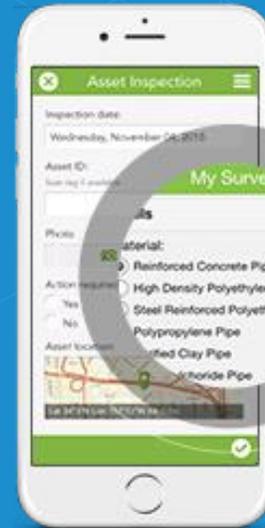
Survey at location

- Integrated with ArcGIS Apps so you can:
 - Get to the location of work assignments using Navigator for ArcGIS
 - Complete your work using:
 - Collector for ArcGIS
 - Survey123



Return to Workforce when finished

Open Survey123



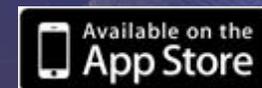
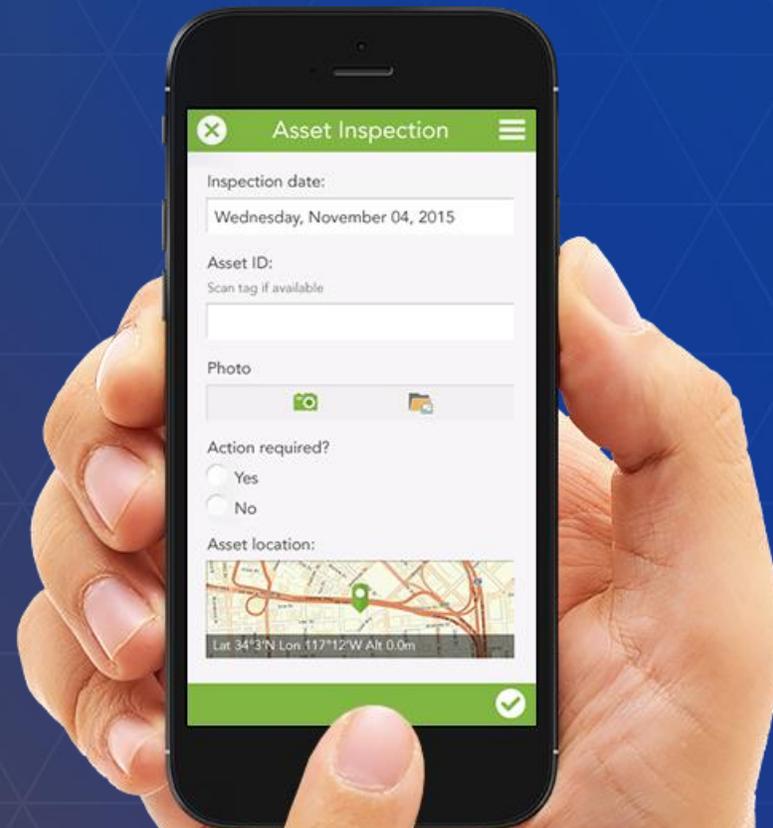


Survey123 for ArcGIS

Form-centric Data Collection

Smart Forms

Works Offline





Operations Dashboard

Real-time monitoring

Key Performance Indicators

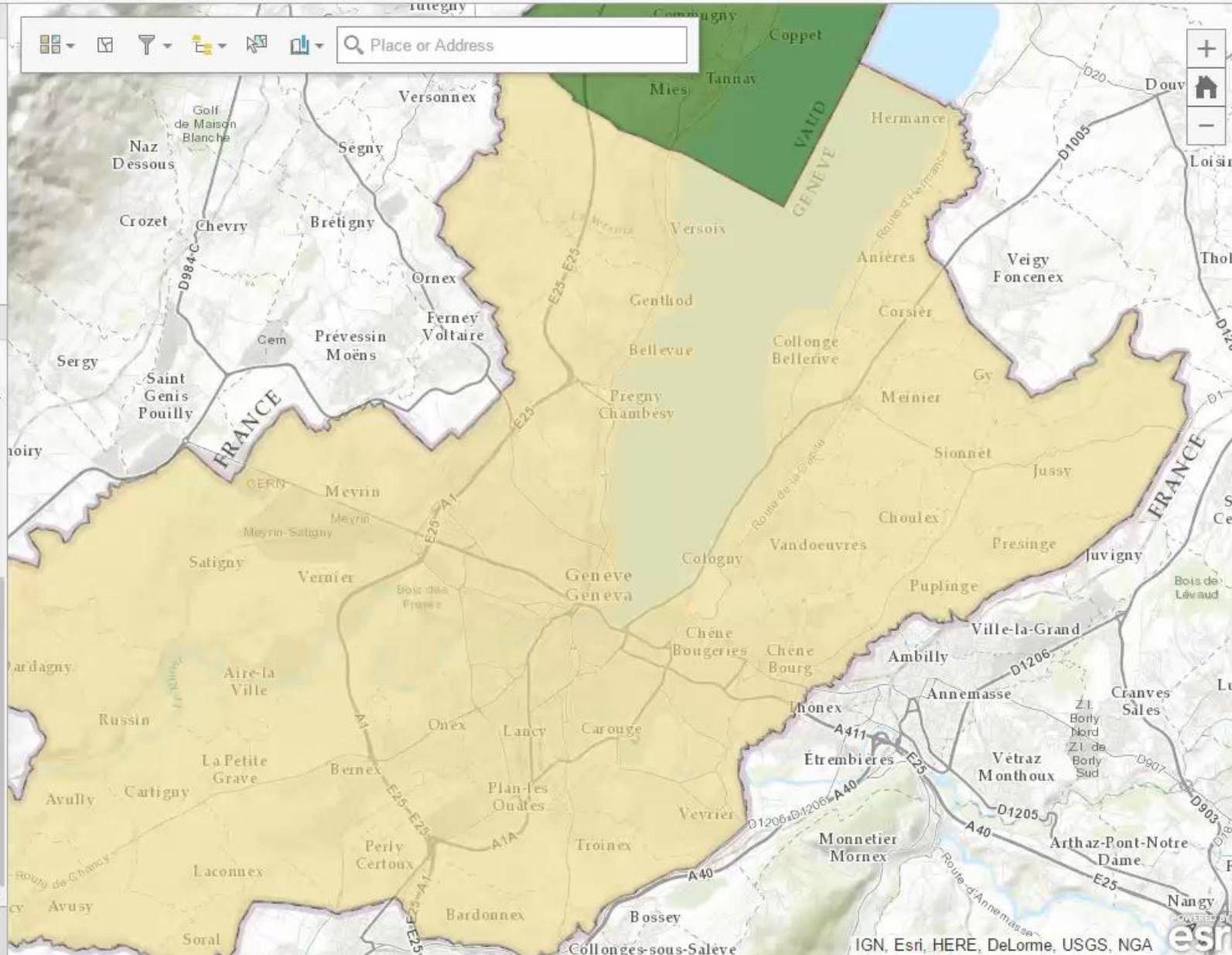
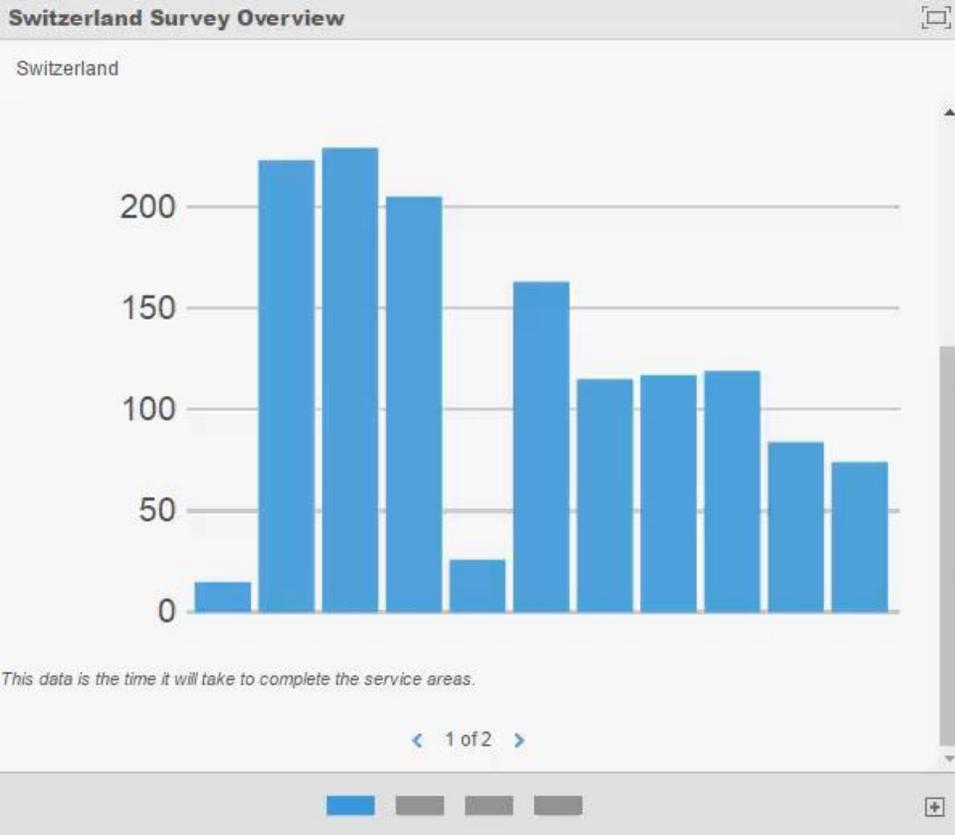
Workforce



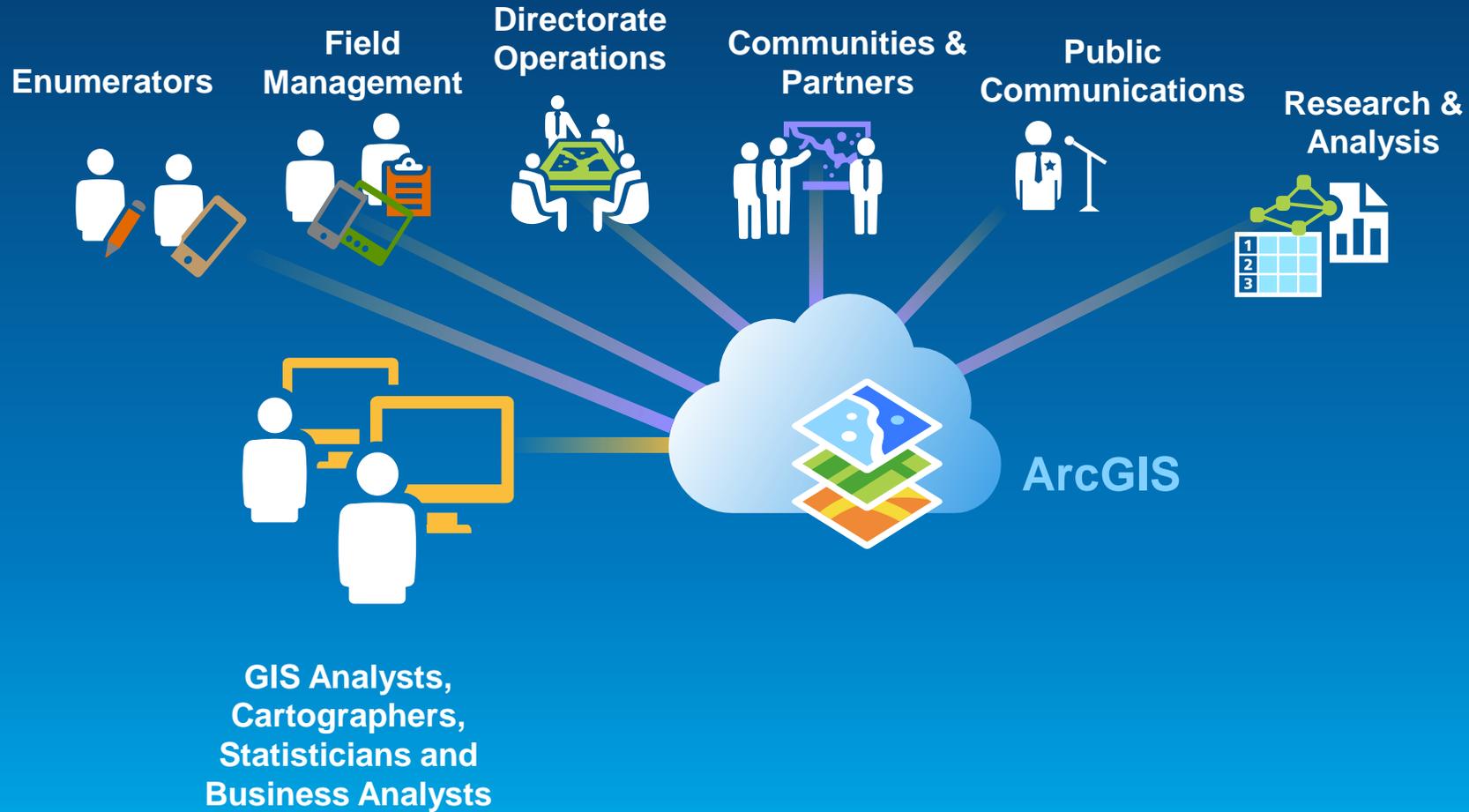
Legend

Summary Commune Completed

- > 1,732 to 2,099
- > 682 to 1,732
- 0 to 682



Location Platform Can Support All Phases...

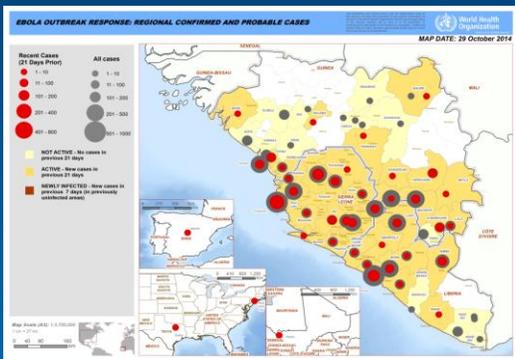


Collection of Apps



Understanding the World with Statistics

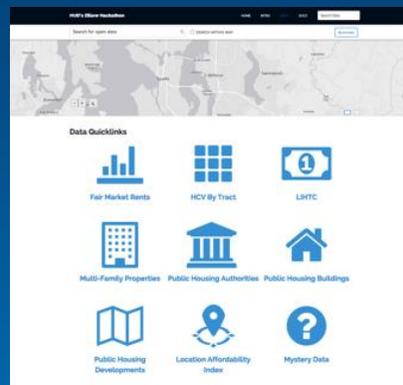
Applied: Ebola Outbreak Response



West Africa

Dissemination: Open Data

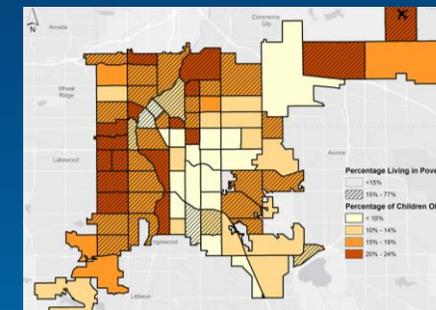
National



State/Local

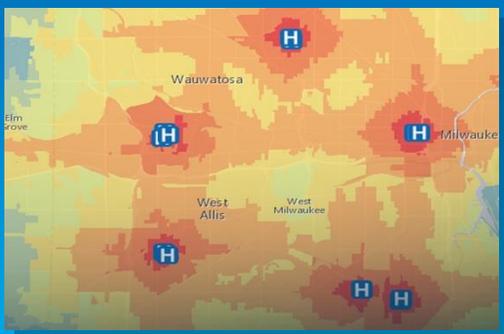


Applied: Poverty Levels



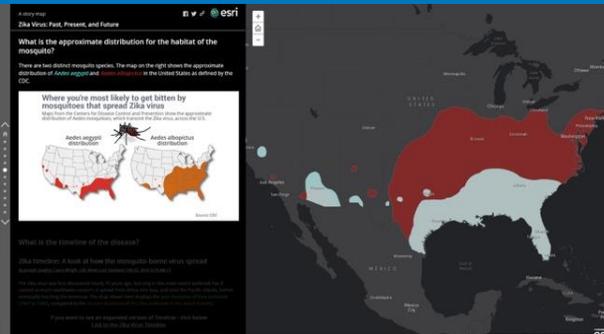
Denver, CO

Applied: Access to Healthcare



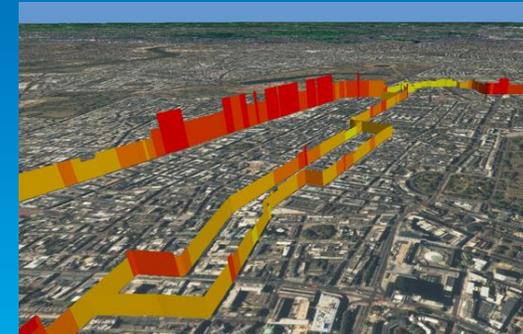
Milwaukee

Applied: Potential Zika Virus Areas



US

Applied: Commuting Patterns & Pollution Levels



London

Applied: Green Infrastructure Planning



New Orleans



Story Maps

Everyone has a story to tell.

Harness the power of maps to tell yours.

[Official Statistics Dissemination Story Map](#)



Understanding our world.