

GIS/Valuation
*Technologies
Conference*

GIS 101 for Assessors

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Lauren Voelker



Agenda

- What is GIS
- Why GIS is Important for Assessors
- Platform and Geospatial Infrastructure
- Key Assessor Workflows
 - Valuation
 - Public Engagement
 - Parcel Management
- Value Analysis and GIS
- Public Engagement

GIS/Valuation Technologies Conference



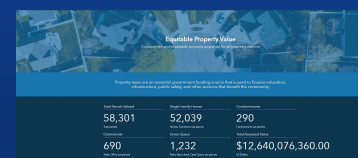
GIS Comprehensive Geospatial Infrastructure



Enterprise Data Management,
Mapping, Analysis and Collaboration



Dashboards



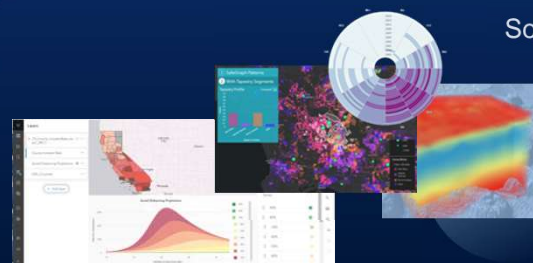
Hubs



StoryMaps



Solutions



Analysis and Data Science

Visualization
& Exploration



Apps and App Builders

GIS Technology Is Advancing Rapidly

Integrating and Leveraging Many Innovations



GIS – Technology Platform for Local Government

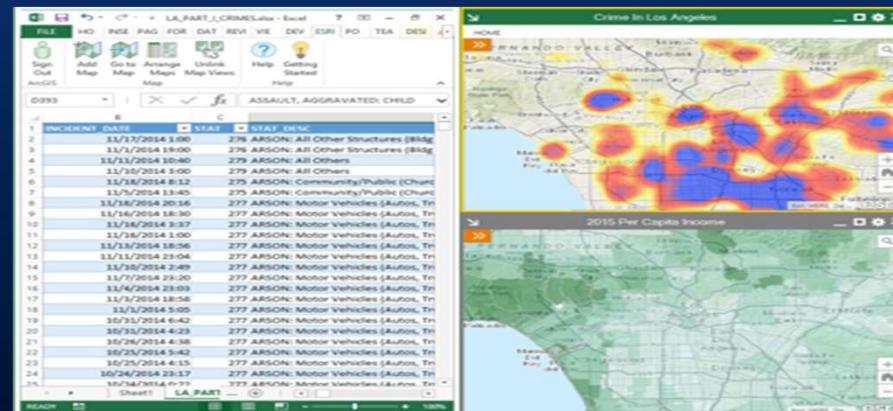
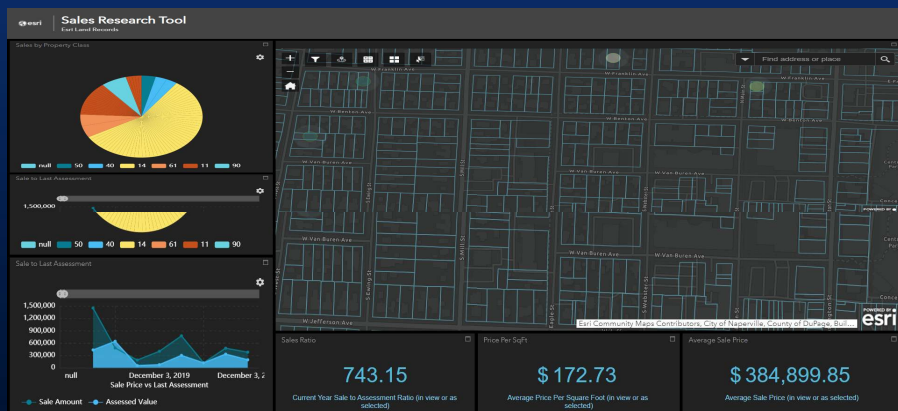
GIS enabling new capabilities, communication and efficiencies in local government



Why GIS for Assessors? – GIS is Mission Critical

Benefits, Challenges, Opportunities

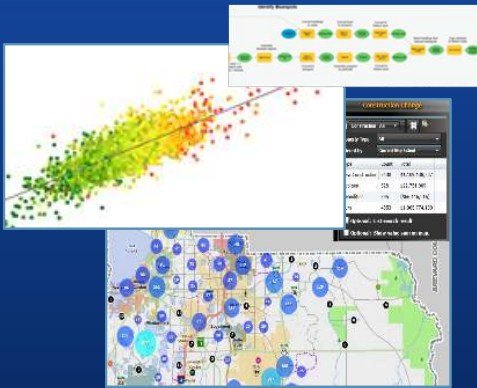
- Maintain Public Trust
- Improve Public Engagement
- Better Communicate
- Monitor Change
- Exploratory Analysis
- Understand Trends
- Share Data
- Locate Outliers/Data Quality
- Improve and Augment Data
- Exploratory Analysis
- Improve Values
- Forecast
- Transparent Operations
- Sync Business Systems
- Reduce Operational Costs
- Understand Backlog
- Reduce Phone Calls
- Optimize Field Appraisers
- Schedule and Manage Staff
- Edit and Manage Parcels
- Staff Churn



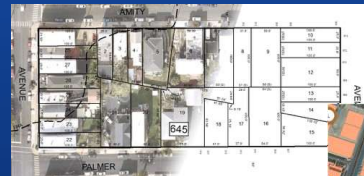
Assessment Capabilities

Analytical capabilities and apps for assessors, data scientists and modelers

Spatial Modeling & Analysis



Tax Mapping Using Parcel Fabric



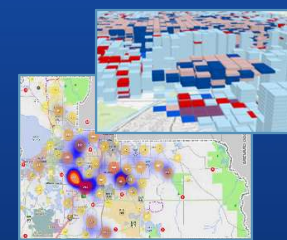
Parcel History



Field Apps



Outlier Detection



Exploratory Analysis

Dashboards

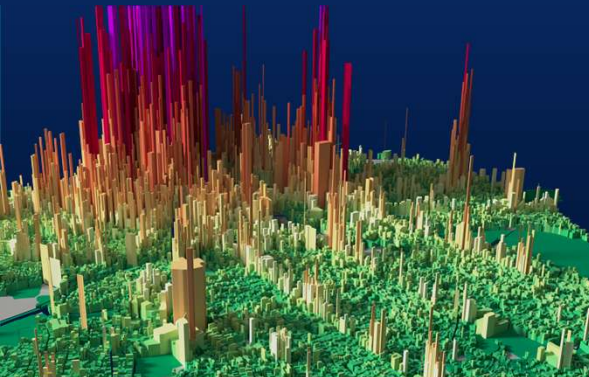
Valuation



Abandoned Property



Taxable Property Value



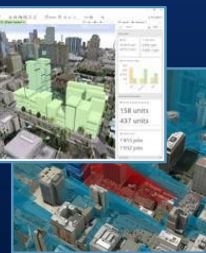
CAMA Integration



Data Enrichment



3D



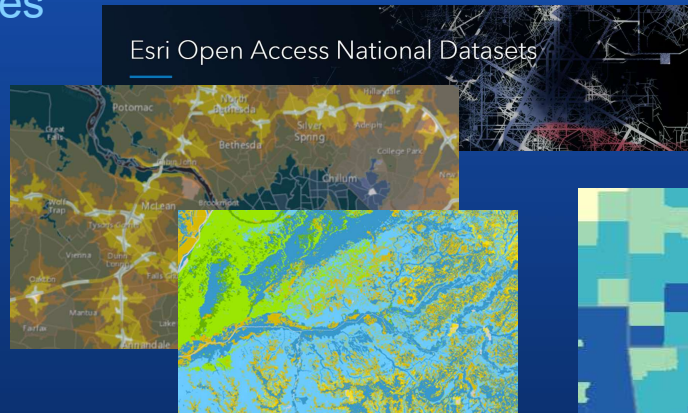
Tax Delinquencies



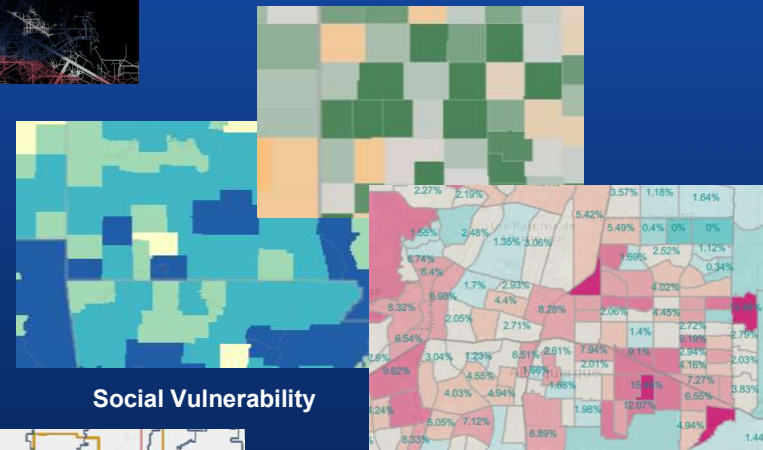
Policy Maps & External Data

Extend and enrich your capabilities

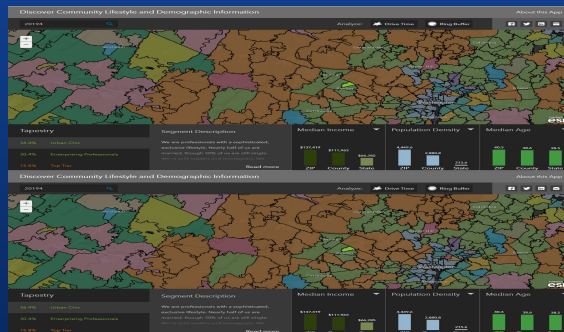
Esri Open Access National Datasets



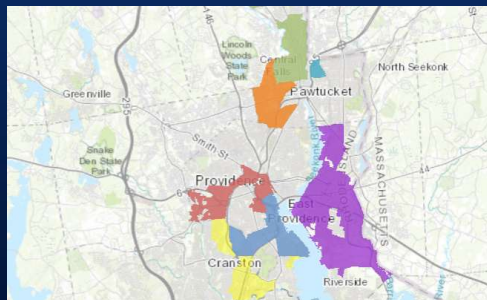
Authoritative National Datasets



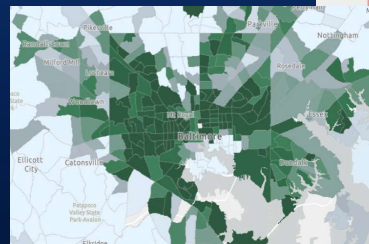
Social Vulnerability



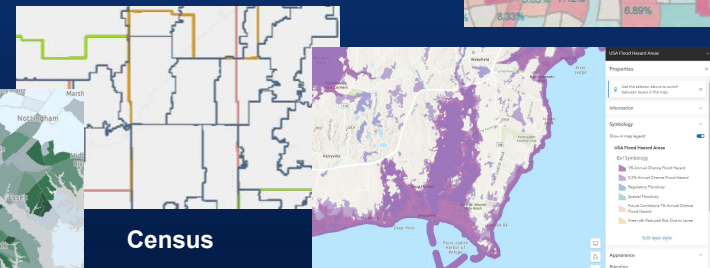
Demographics



Enterprise Zones and TIFs



Income



Census

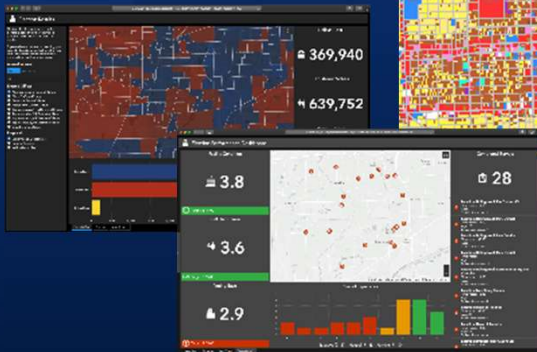
FEMA Flood Hazard Areas

... Integrate policy data to improve decisions....

GIS Solution Templates

Core Capabilities and Ready-to-Use Industry Configurations

Local & State
Government



Benefits for all of government

- Land Records
- Health and Human Services
- Elections
- Public Works
- Water Utilities
- Transit
- Emergency Management
- Law Enforcement
-

Tools
Data Models
Apps
Comprehensive Workflows
Maps
Widgets
Add-Ins
Dashboards

Get up and running faster.....

GIS Serves Your Entire Organization

Delivering efficiencies and new capabilities to your entire organization



- Cross Cutting
- Shared
- Authoritative
- Real-Time

Web Services

Changing how we work, share and communicate....

Evolving with Enabling Technology



Client / Server
Stand-Alone Desktop
Data Models
Static Data
Single Server
Custom Applications
Proprietary Data
2D Features
Spatial Analysis
Digital Cartography



Web Services & Apps
Connected Desktops
Web Maps & Layers
Real-Time
Distributed Computing
Configurable Templates and Apps
Open Data & Shared Services
3D Features
Spatiotemporal & Big Data Analytics
Smart Mapping

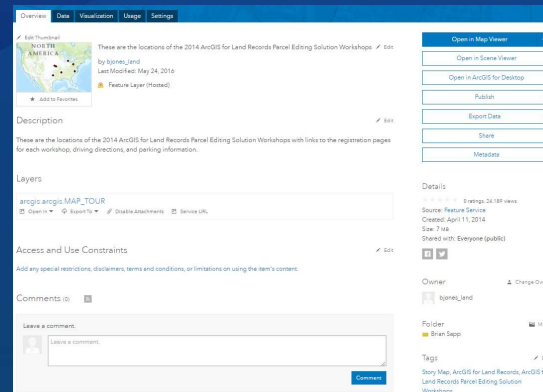
Web Services

Organizes and Securely Enables Sharing Data.....

https://

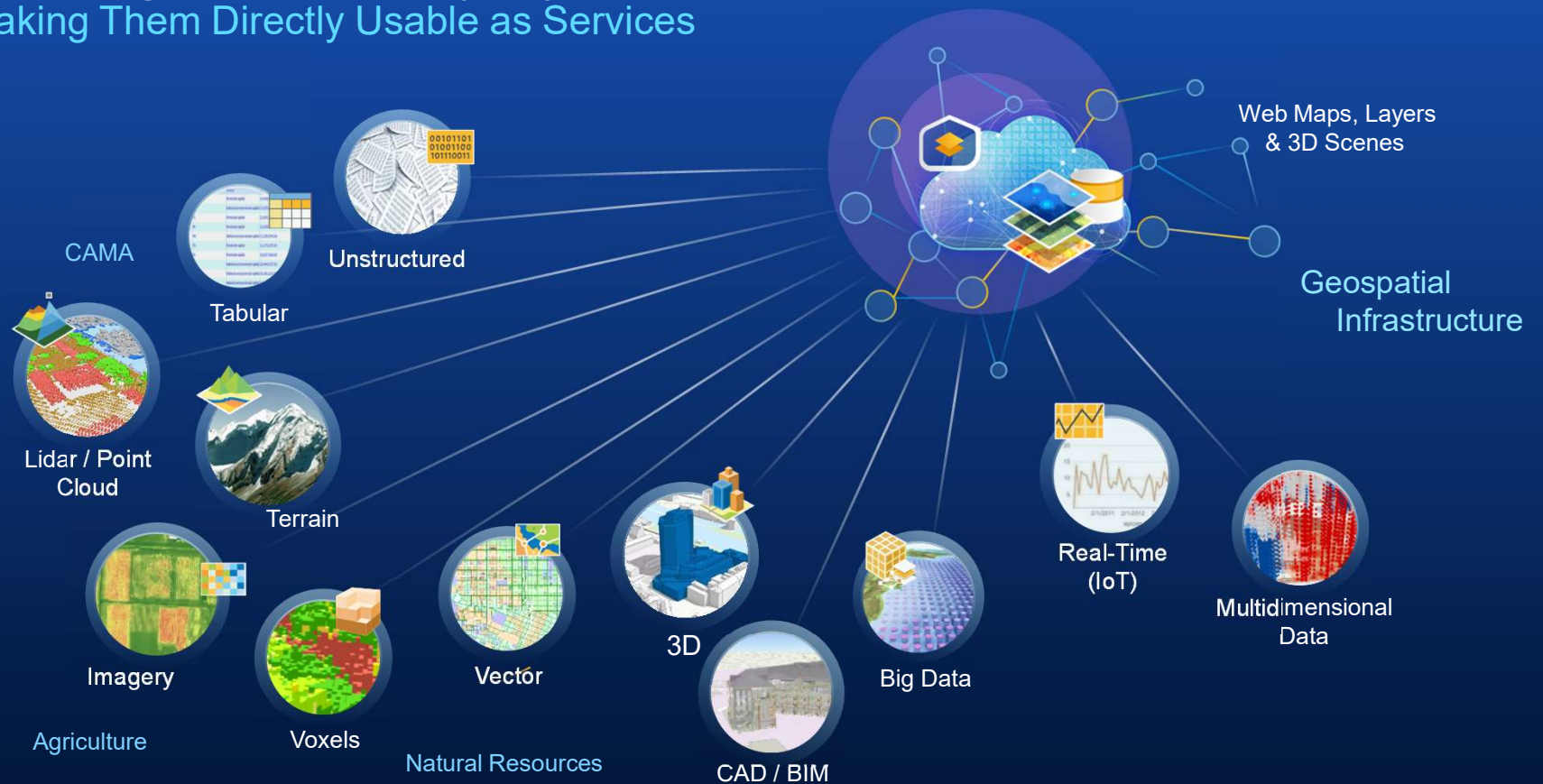
<http://esriland.maps.arcgis.com/home/item.html?id=5969689b642840e39cf0491669484e0b>

- Secure
- Standards-based
- Scalable
- Stable
- Controlled Access via Identity
- Control Who Does What
 - View
 - Query
 - Edit
- Monitor/Track



GIS Integrates Every Type and Format of Data

.....Making Them Directly Usable as Services



Web Apps

Extend the Reach of GIS to Everyone



Across Organizations and Beyond

Examples

GIS is an Enterprise Platform

Geospatial infrastructure integrating workflows and data of all types



GIS is an Enterprise Platform

Geospatial infrastructure integrating workflows and data of all types

Parcel Management

Improve Efficiency and Accuracy



Public Engagement

Maintain Public Trust and Confidence



Value Analysis

Improve and Visualize Values

Purpose-built tools for parcel management and cadastre

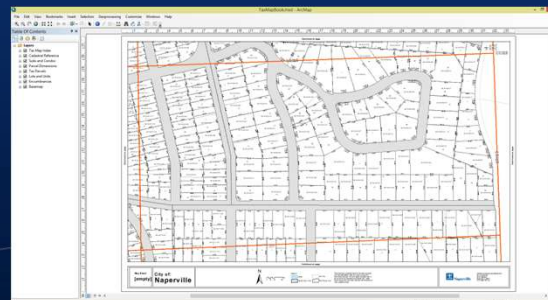
Draft Deed Descriptions



Data Quality Tools for Parcels

Parcel Topology

Map Book Production

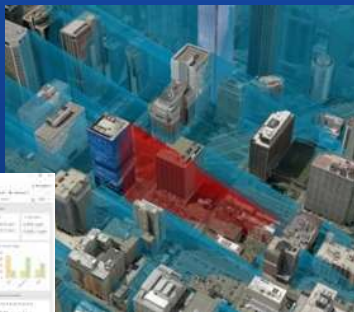


The map shows Texas divided into 11 regions, each with a unique color and a grid overlay. The regions are: Upper Rio Grande (pink), High Plains (purple), West (blue), Central (yellow), South (green), North (orange), Northwest (light blue), Northeast (light green), Metroplex (dark green), South Central (light orange), and Gulf Coast (light green). Each region is further subdivided into smaller areas, some labeled with names like 'Dallas', 'Houston', 'San Antonio', etc.

Improve efficiency and data quality.....

3D Parcels and Cadastre

Manage and analyze strata rights – minerals, utilities, condominiums....



3D Measurement



Shadow Analysis



Scenarios
and Dashboards

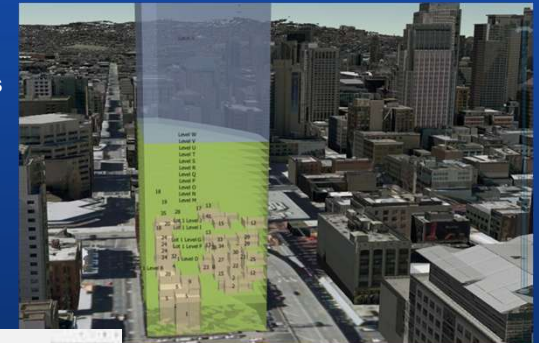


Line of Sight

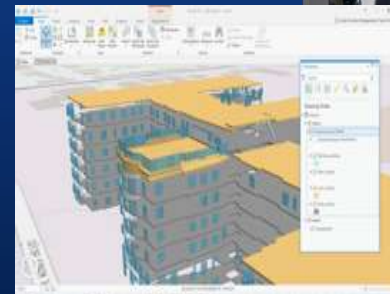


Viewshed Analyses

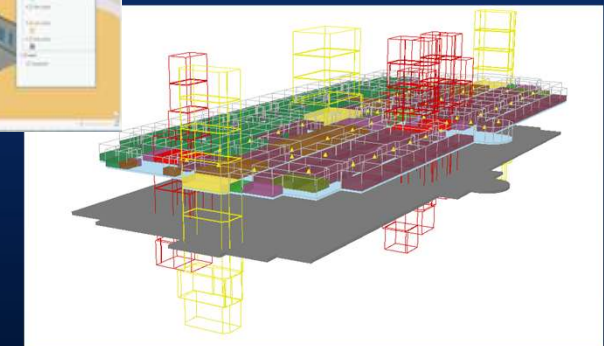
3D Parcels



BIM Integration



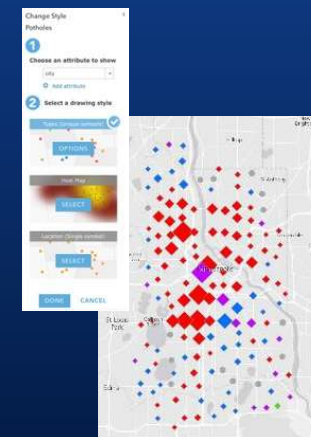
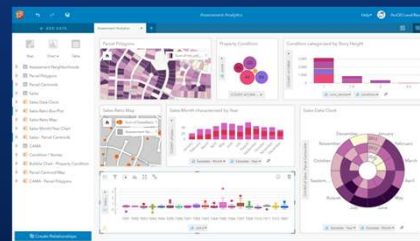
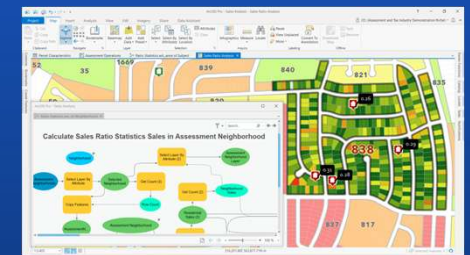
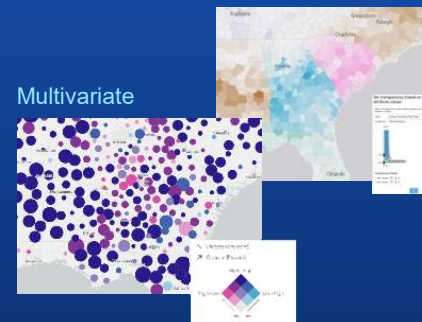
Dynamic Modeling
and Reporting of Space



Examples

Spatial Analytics for Valuation Modeling

- Geographically Weighted Regression
- Forest-based Classification and Regression
- Kriging
- Multivariate
- Spatial Interpolation
- Clustering
- Outlier Detection
-



Explore

Analyze

Enrich

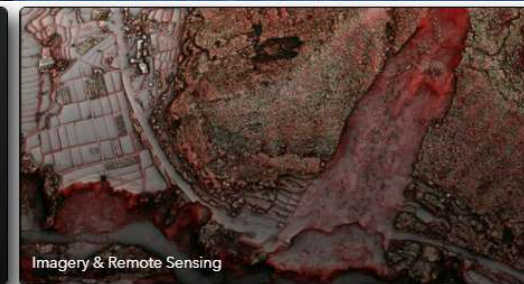
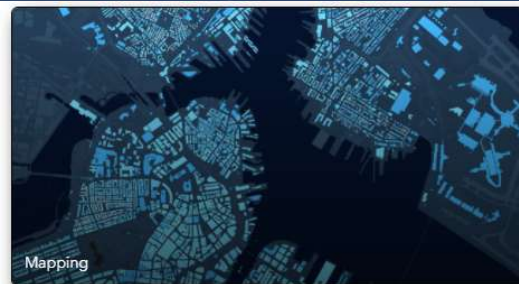
Visualize

Share

Guided lessons based on real-world problems

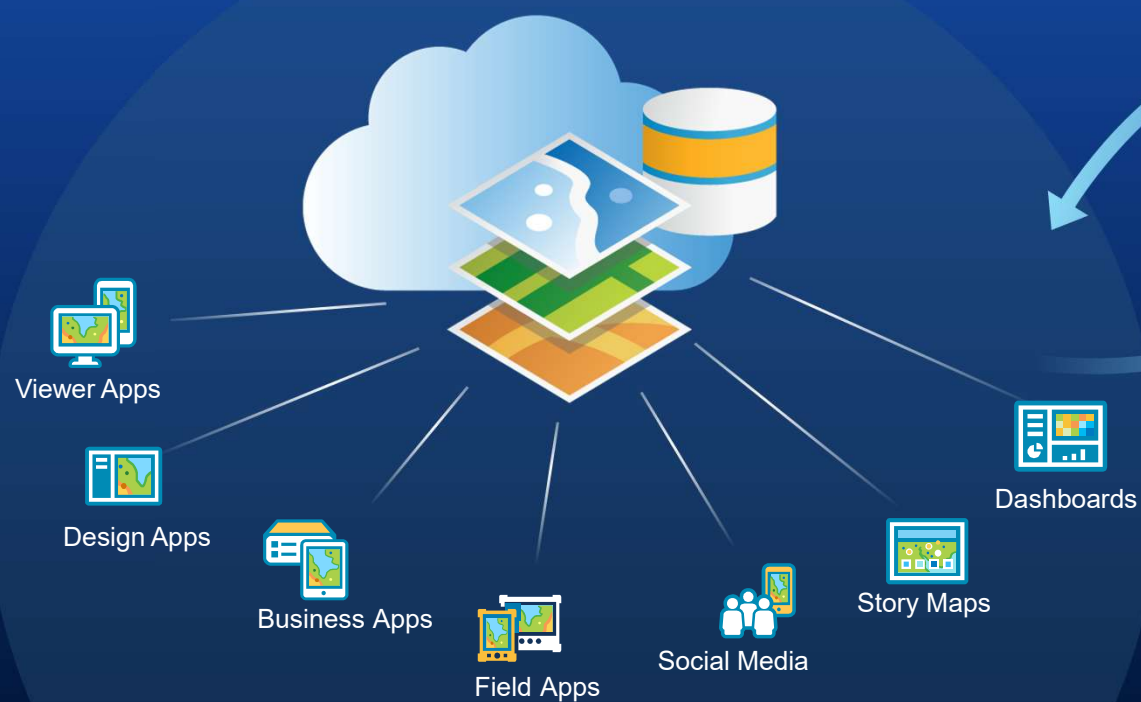
SEARCH ALL CONTENT

[Learn.arcgis.com](https://learn.arcgis.com)



GIS and CAMA

GIS Integrates Your Office Systems



ETL
Services

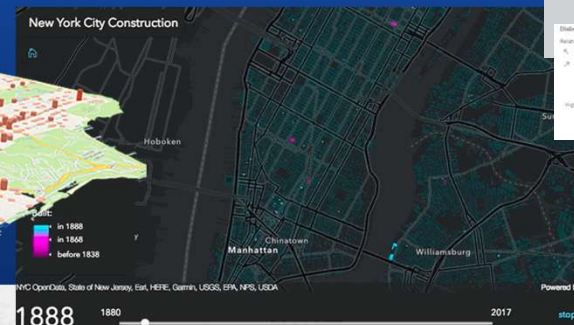
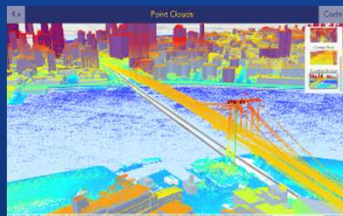
**CAMA
Recorder
Permits
Public Works
.....**

*Geography Provides the
Integration Platform*

Examples

Exploratory Analysis and Smart Mapping

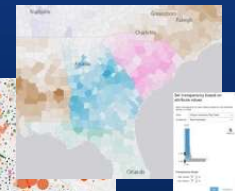
Understand the factors impacting property value and use



Relationship Map (Multivariate)



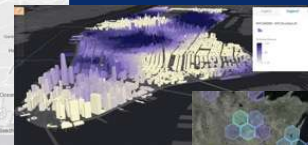
Graduated Symbols



Size & Color



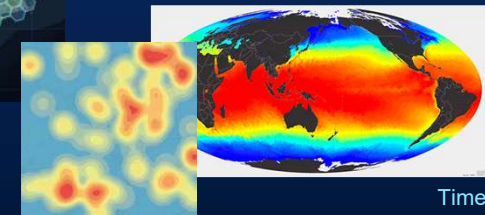
Fast Performance WebGL



Thematic



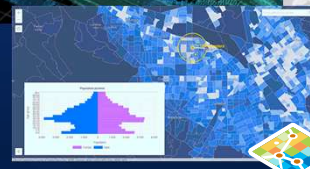
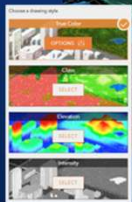
Firefly Style



Smart Heat Map

Time

Smart 3D



Vector Feature Tiles



Dynamic Clustering

Dynamic and Data-Driven Mapping

Enrich Your Data for Improved Analysis

Integrating all types of data

Improved Analysis



Spatial Analysis and Data Science

Enabling better understanding through geospatial data science

Many Improvements

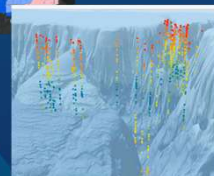
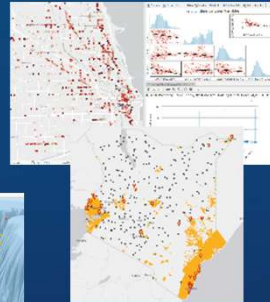
- Functionality
- Scalability
- Accessibility

Spatial Statistics

Balanced Zones



Logistical Regression

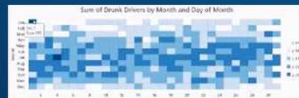


3D Interpolation (EBK)

Charting



Scatter Plot Matrix



Calendar Heat Map



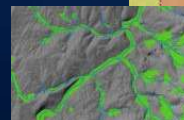
Data Clock

Raster Functions

Forest-based Classification and Regression

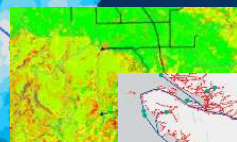


Floodplain Delineation



DEM Error

River Classification



Cost Distance



Improved Processing



Tool History to Models

Enterprise

Pro



Models to Python

Scalable GeoAnalytics



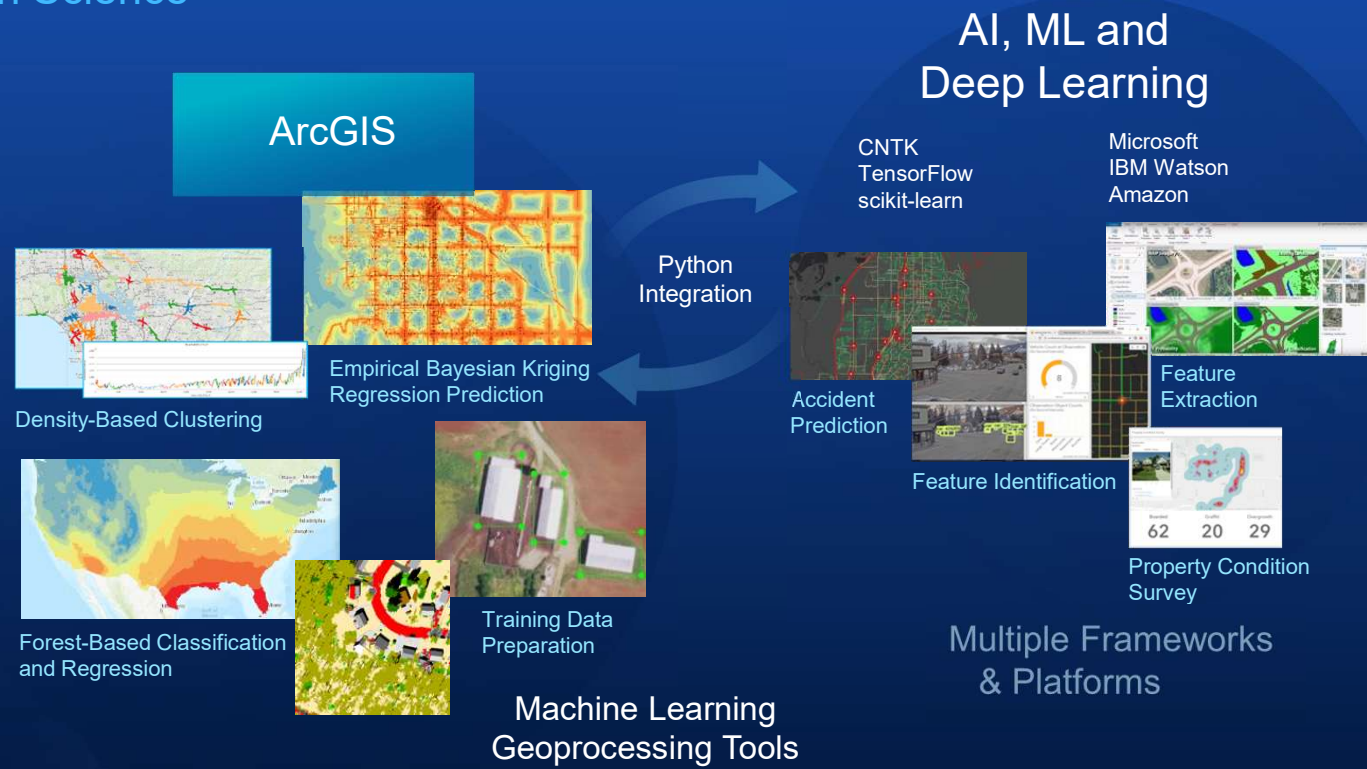
Deep Learning



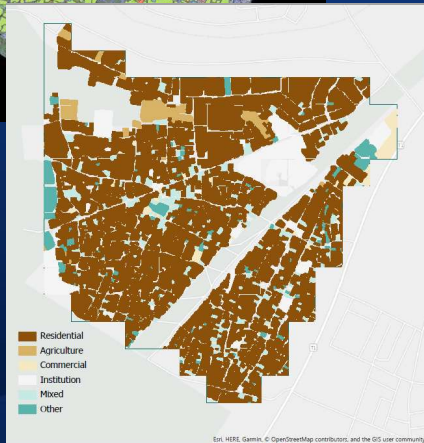
Hosted Python Notebooks

AI, ML and Deep Learning

Integrating Open Science



Artificial Intelligence and Imagery



Feature Extraction of Property Boundaries

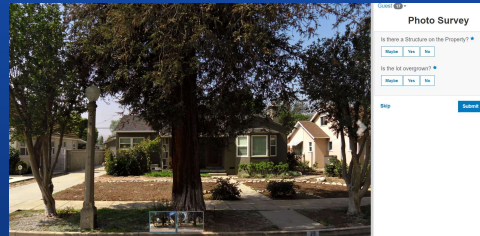


Photo Survey App

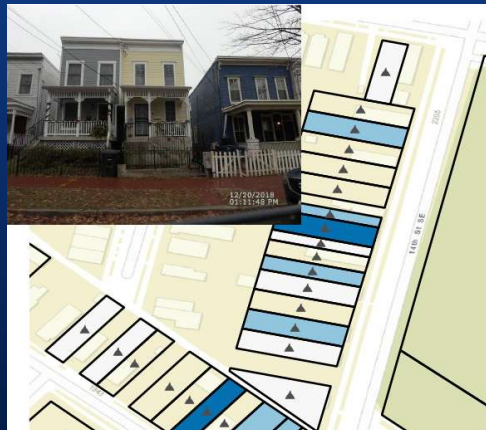
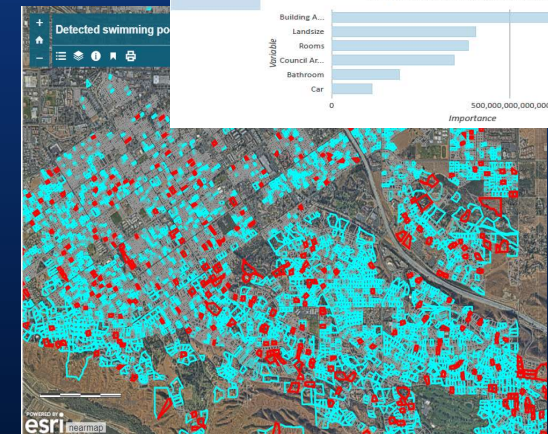
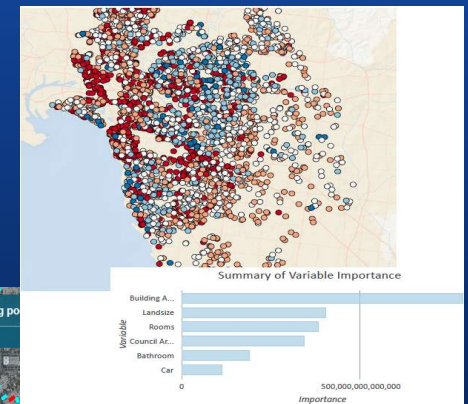


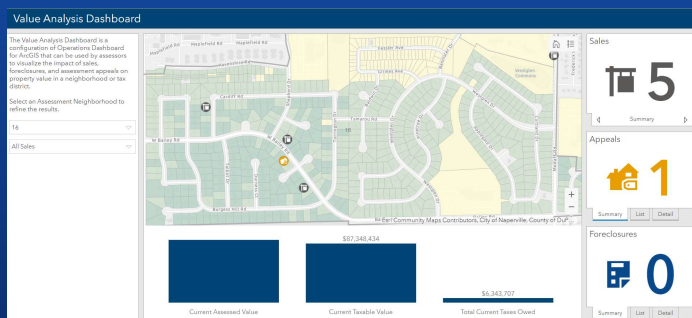
Image Classification from Street-Level Photos

Forest-based Classification for Valuation

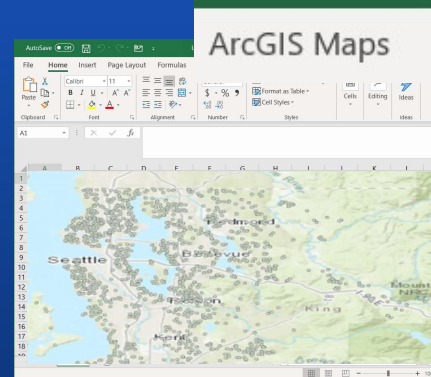


Feature Extraction for Tax Assessment

Value Analysis Apps



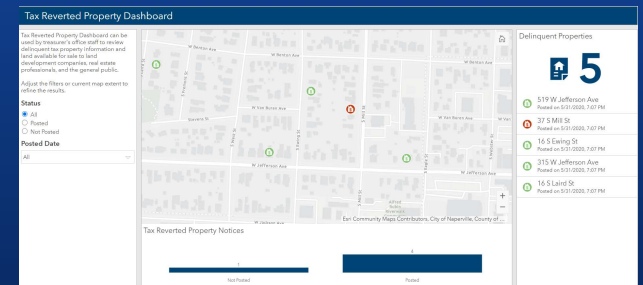
Value Analysis Dashboard



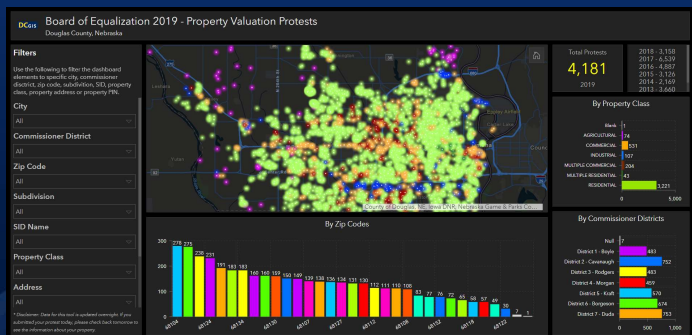
Maps for Office Excel



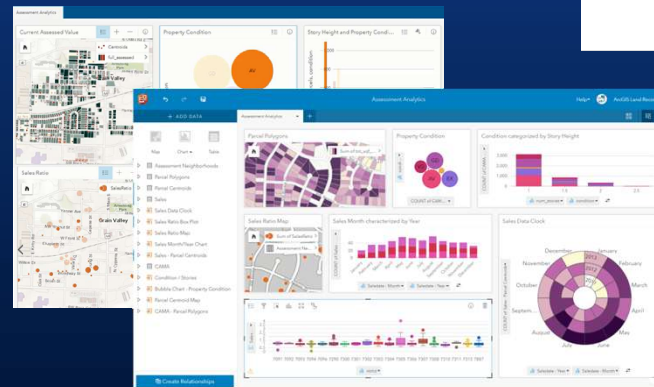
Photo Survey with Street-level Photos



Manage Tax Reverted Property



GIS Dashboard



Insights



Community Analyst

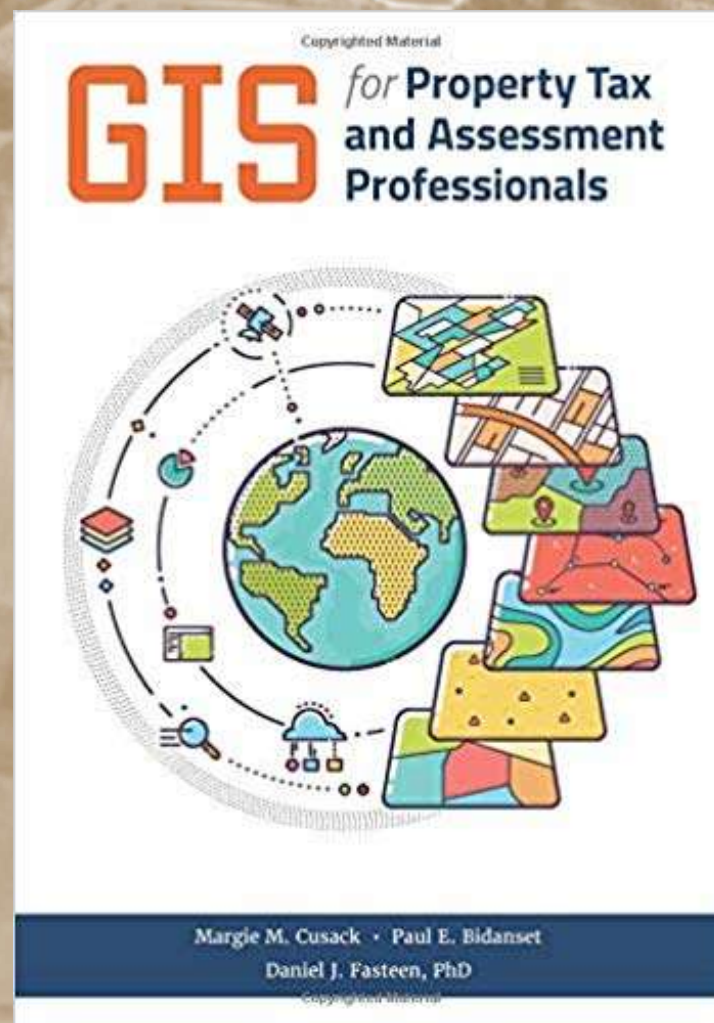
Value Analysis

Improve values with spatial analysis

GIS and Assessment Book

Table of Contents

- GIS and the Valuation Official
- Land Record Mapping in GIS
- Data Collection, Verification and Measurement
- Value Mapping and Geographic Analysis
- GIS and Mass Appraisal Models
- Using GIS to Serve the Taxpayer
- The Future of GIS



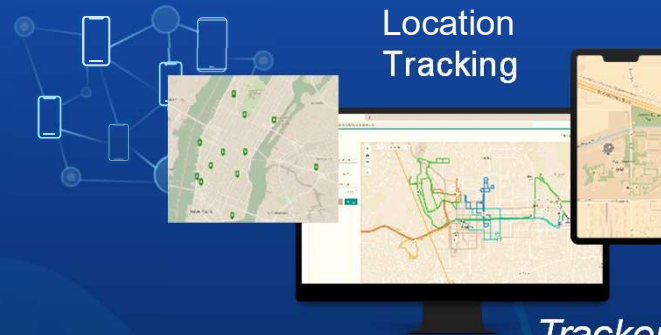
Examples

Managing Field Operations

Location-Enabling All Aspects of Field Work

- Tracking
- Offline Workflows
- Optimized Routes
- Preplanned Routes

Location
Tracking



Tracker

Planning and
Management

Workforce



Dashboard

Navigation



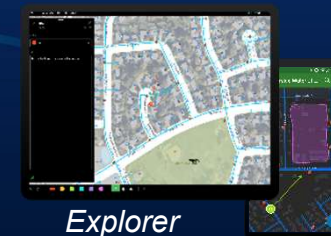
Navigatior

High
Accuracy

Data Capture



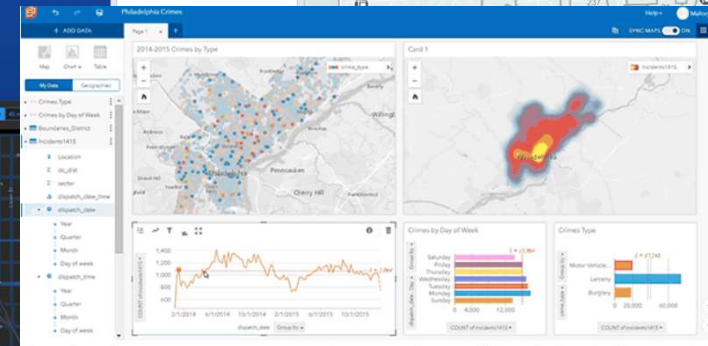
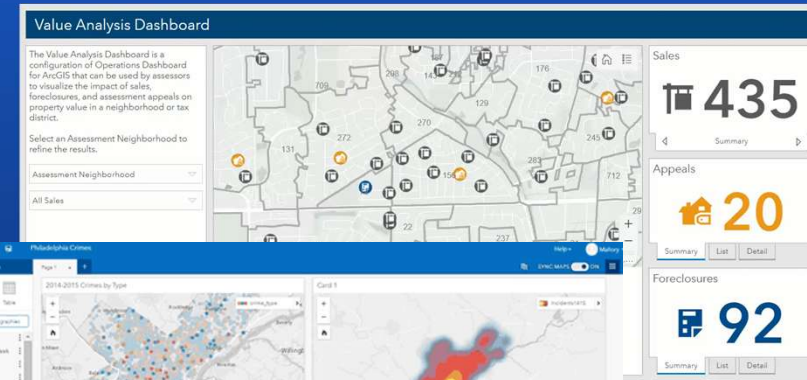
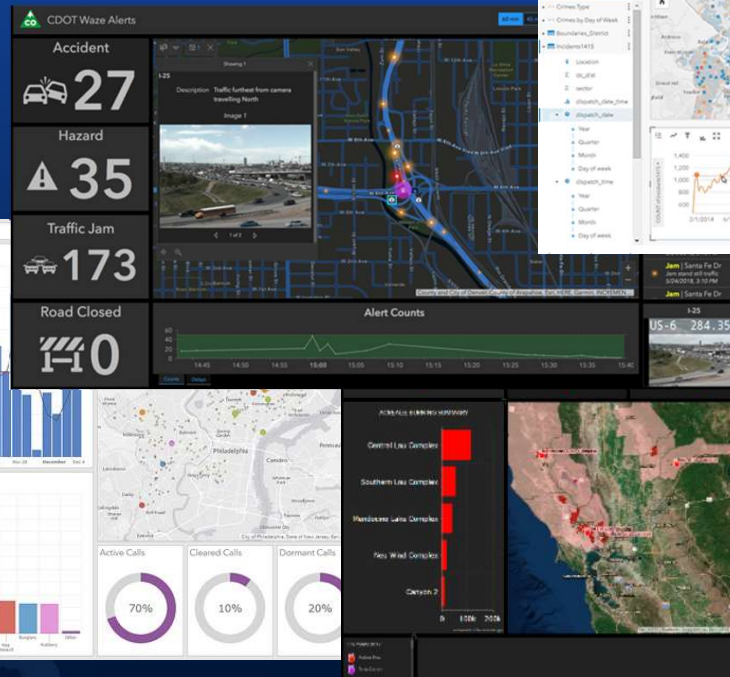
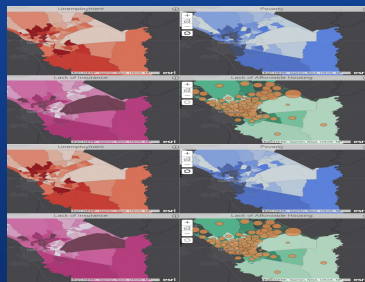
Maps & Mark Up



Explorer

Analyzing, Monitoring and Reporting

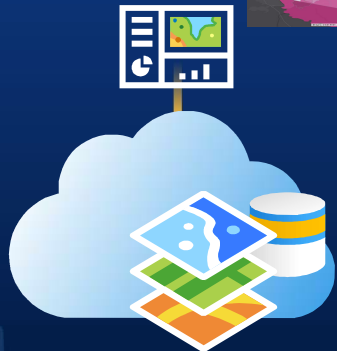
Dynamic visual reports, value analysis, work status.....



Appeals and Foreclosure Tracking



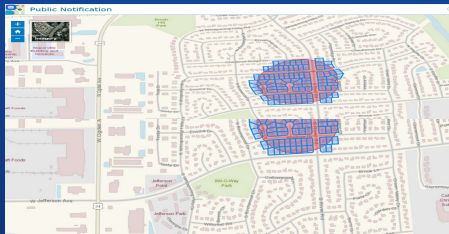
Parcel Production



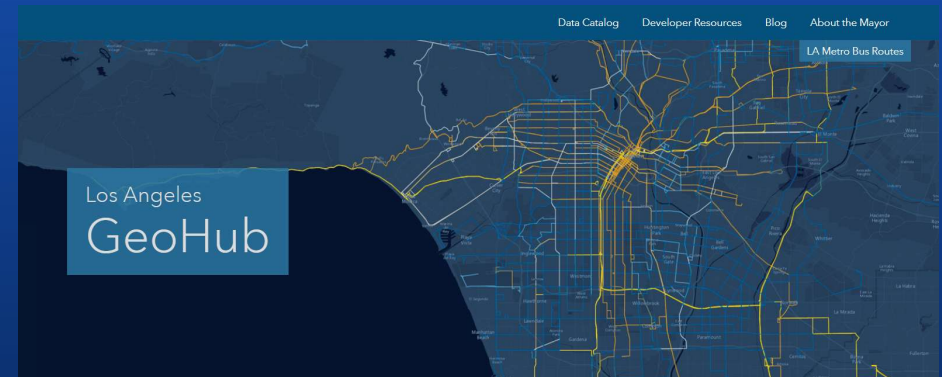
Any Data Feed

Public Engagement

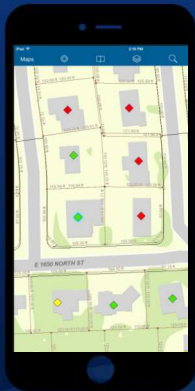
Engaging land holders, businesses and citizens with government



Public Facing Web Maps



ArcGIS Hub



Mobile Apps

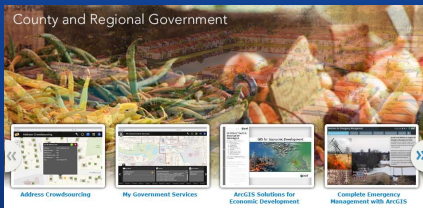


Portals

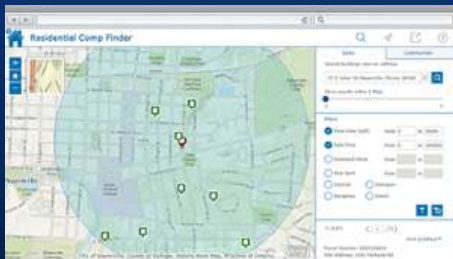


Story Maps

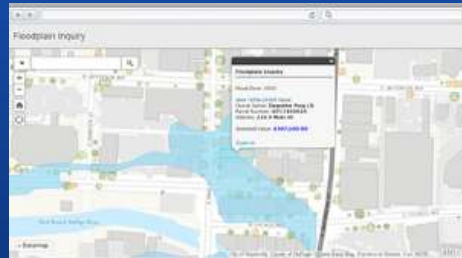
Public Engagement Apps



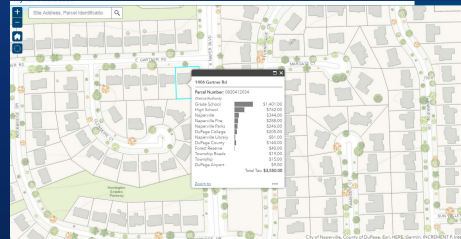
Open Data



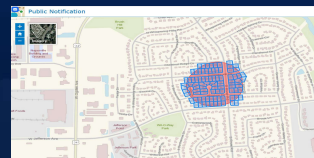
Residential Comp Finder



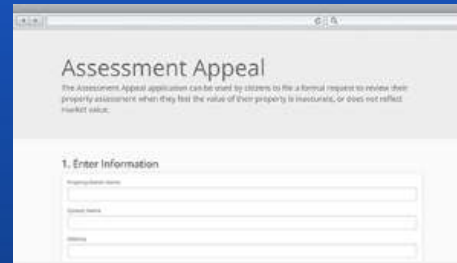
Identify Flood Risk



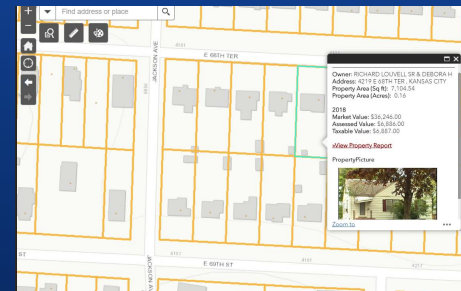
My Tax Distribution



Public Facing Web Maps



File Assessment Appeals



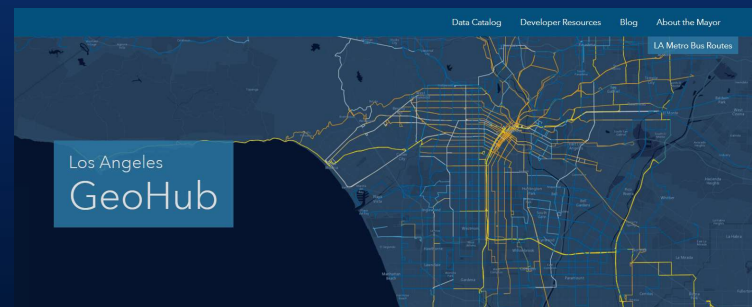
Parcel Viewer



Mobile Apps



Story Maps



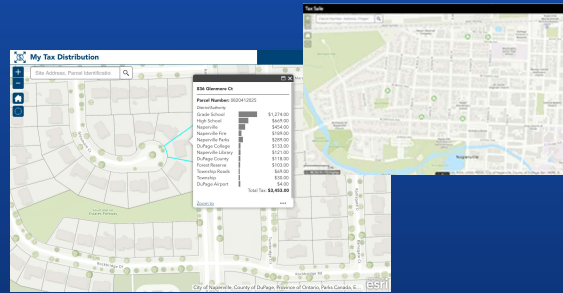
ArcGIS Hub

Public Engagement and Transparency

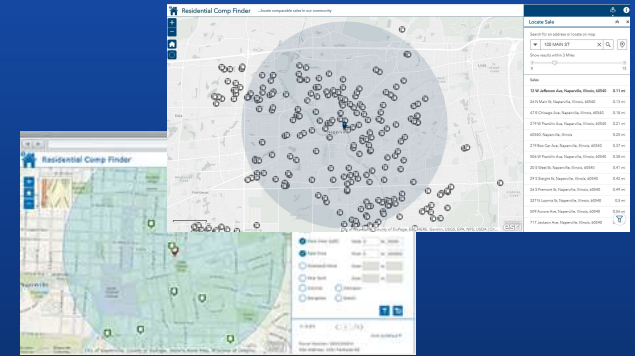
Supporting the ongoing public trust and confidence



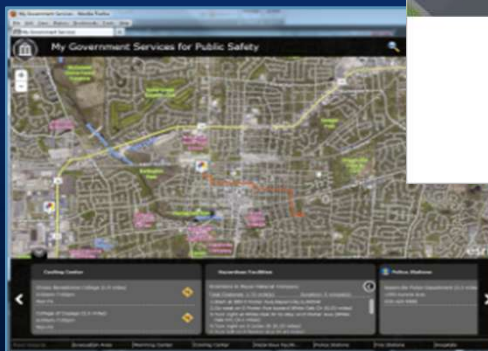
Device Responsive
Maps and Apps



Parcel Map & Property Information



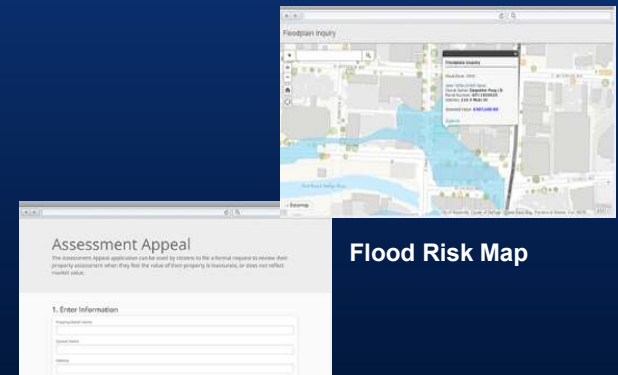
Comparable Sales



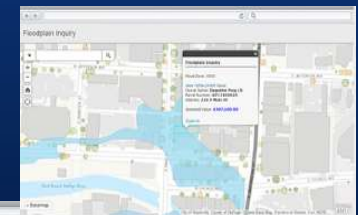
Hubs



Open Data



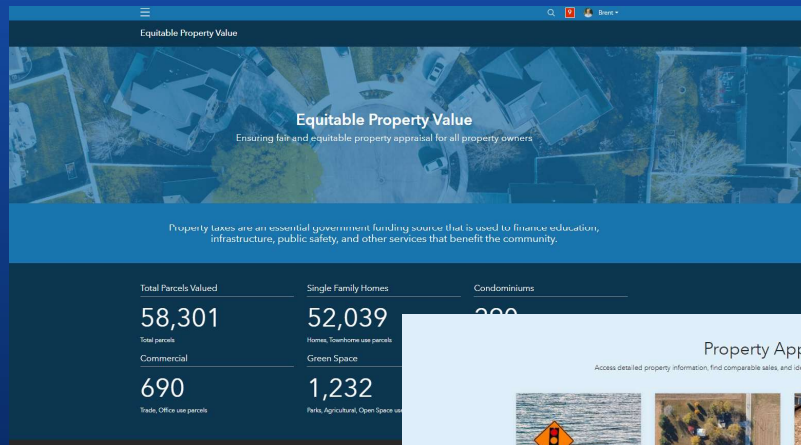
Online appeals



Flood Risk Map

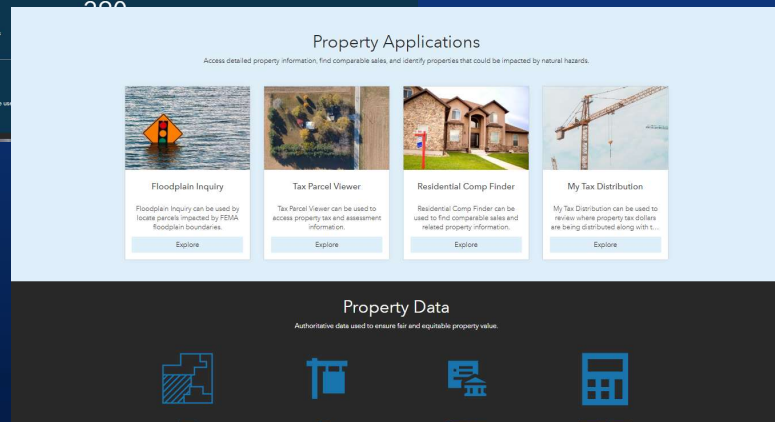
Equitable Property Value

Hub Initiative Improving Public Engagement



Summary Statistics

SaaS Solution



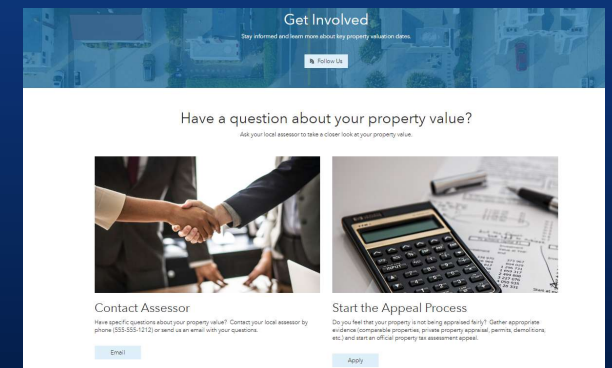
Property Apps

Community Events

Reaching out to ensure our community understands the property valuation and tax process.

June 2020							Aug 10	Tax Sale Property Auction City of Naperville, Illinois, Illinois
Sun	Mon	Tue	Wed	Thu	Fri	Sat		
31	1	2	3	4	5	6	Oct 15	Property Tax Workshop City of Naperville, Illinois, Illinois
7	8	9	10	11	12	13		
14	15	16	17	18	19	20		
21	22	23	24	25	26	27		
28	29	30	1	2	3	4		

Community Tools



File Appeals

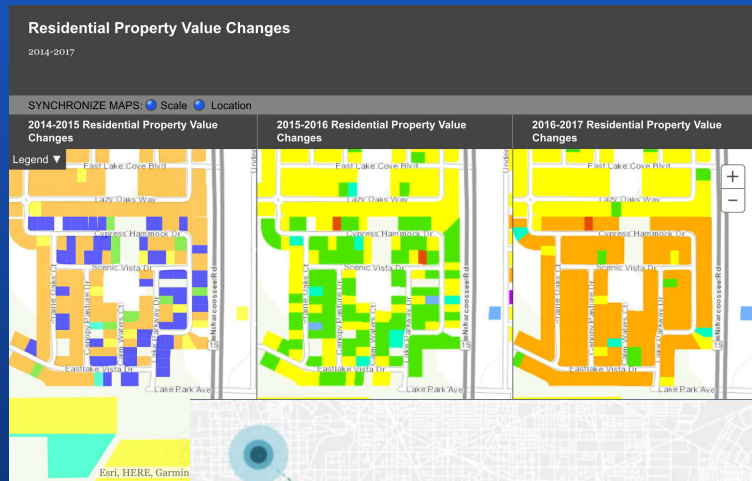
go.esri.com/HUB4Assessors

Public Engagement

- Modern transparency &
- Storytelling with Data

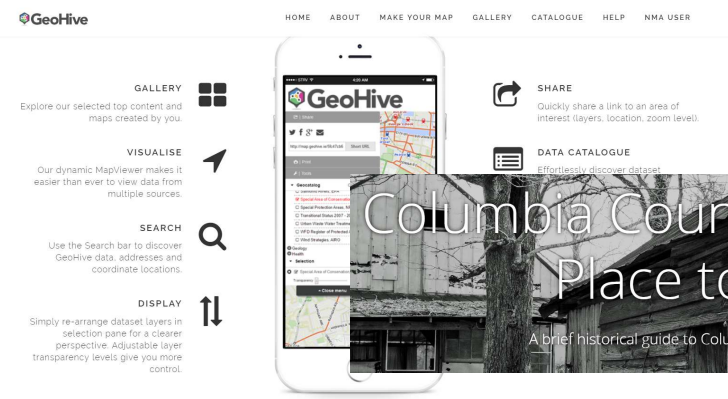
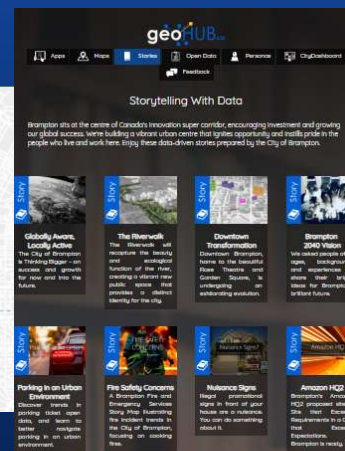
- Economic Development
- Initiative Driven
- Public Trust and Confidence

- 250,000+ Open Datasets
- 2500+ Organizations
- <http://hub.arcgis.com/pages/open-data>



Open Data DC

Connecting You with Government Data



Montgomery County Maryland

Examples

Resources

Many ways to get help



meetup

Assessor and GIS Meetup

[meetup.com/Assessor-ESRI-Meetup/](https://www.meetup.com/Assessor-ESRI-Meetup/)

Modeling

Value Analysis

Insights

Dashboards

Parcel Fabric Meetup

[meetup.com/Esri-Parcel-Fabric-Meet-Up/](https://www.meetup.com/Esri-Parcel-Fabric-Meet-Up/)

Parcels

Least Squares Adjustment

Workflows

Data Migration

Peer and professional support network.....

Resources

Many ways to get help

Land Records & Valuation

<https://community.esri.com/t5/land-records-and-valuation/ct-p/land-records-valuation>



Esri Community

ArcGIS Parcel Fabric

community.esri.com/community/arcgis-parcel-fabric/

Registry Integration

Value Analysis

Insights

Dashboards

Parcels

Least Squares Adjustment

Workflows

Data Migration

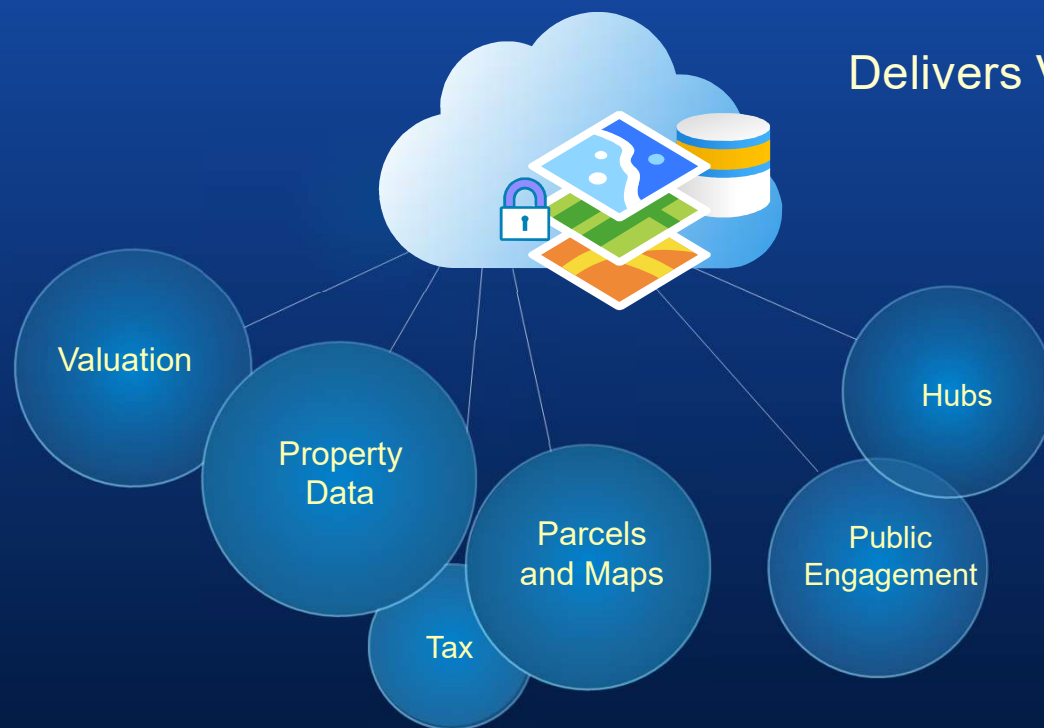
Online Learning – Valuation with Machine Learning

<https://learn.arcgis.com/en/projects/build-house-valuation-models-with-machine-learning/>

Peer and professional support network.....

GIS

Comprehensive Geospatial Infrastructure



Delivers Value to Assessors

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