



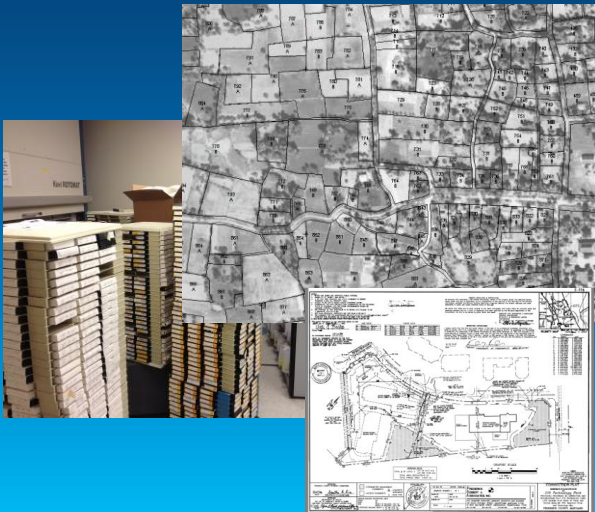
Cadastral Technology: *From Fit-for-Purpose to Multipurpose*

Brent Jones, PE, PLS

bjones@esri.com

System of Record

Organizes and Manages the Legal Record of Ownership, Value and Location



Cadastral History



Quebec, Canada

Parcel Query

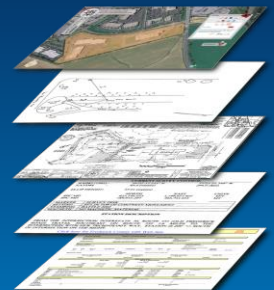


Auckland,
New Zealand

Tax Parcels



Wisconsin



GIS

Enables Multiple Types of Systems



Web GIS Shifts the Focus

Improving Government Operations

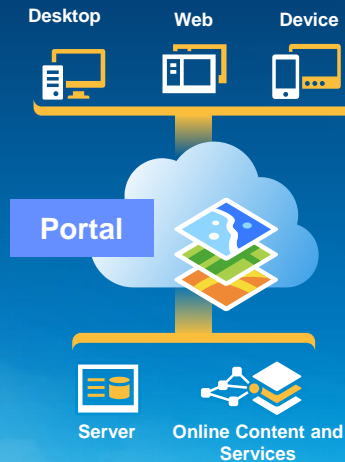


Client / Server	→	Web Services & App
Stand Alone Desktop	→	Connected Desktop
Data Models	→	Web Maps
Static Data	→	Real-Time
Custom Applications	→	Configurable Templates and Apps
All Purpose Applications	→	Focused Apps
Proprietary Data	→	Open Data & Shared Services

WebGIS | anatomy

Components that power web GIS

Simple
Integrated
Open



Web GIS

Available in the Cloud . . .
. . . and On-Premises

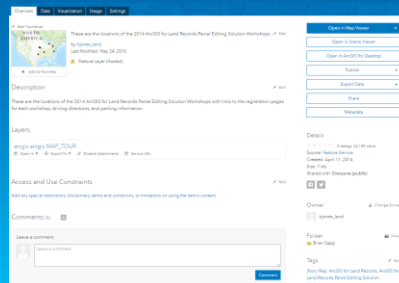
Web Services

Organizes and Securely Shares Data.....

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

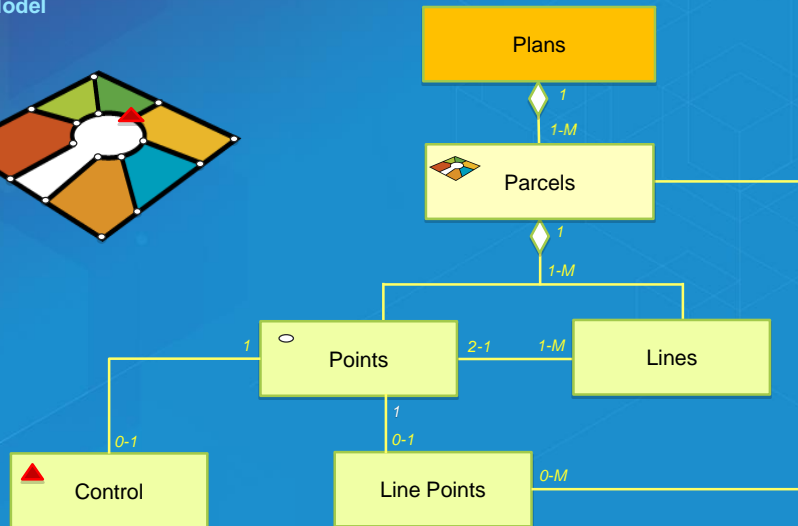
https://

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

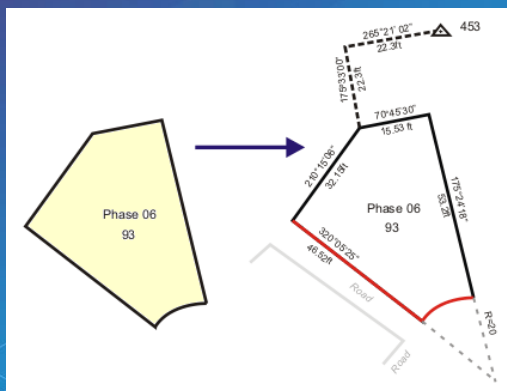


What is a Parcel Fabric?

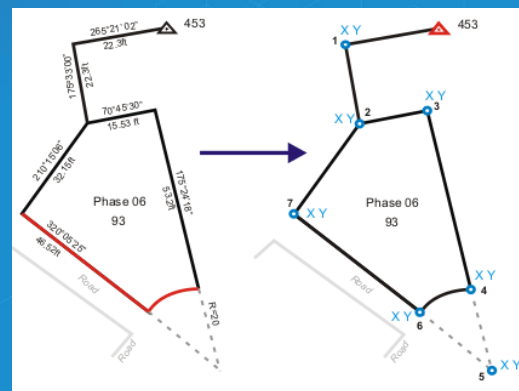
Parcel Fabric Data Model



Parcels

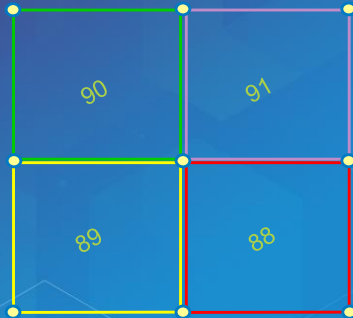


Parcel Polygon has related lines

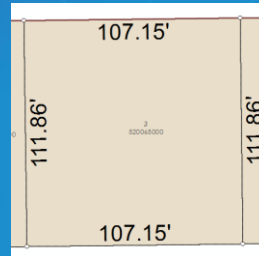


Lines have related points

Lines and Points



of lines= 16
of points = 9
of parcels = 4



Lines store record dimensions

From Point

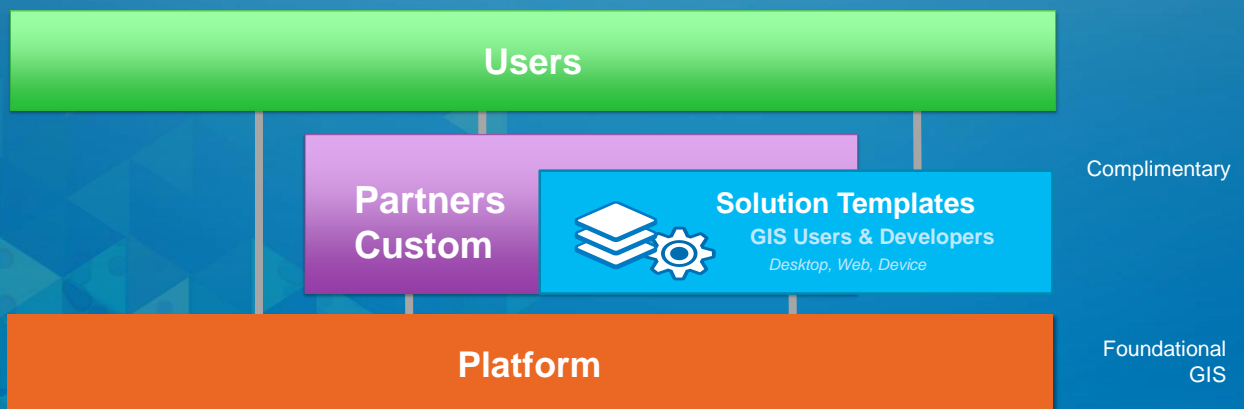
To Point

1	N89°17'14"E	107.150			2
2	S0°42'46"E	111.860			3
3	S89°17'14"W	107.150			4
4	N0°42'47"W	111.860			1

Points are stored on the ends of lines or curves

GIS Solutions

► Apps and Workflows



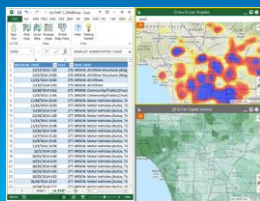
Providing Opportunities to . . .
Embed, Extend, and Implement

GIS Apps (powered by services)

Support your workforce and workflows

- Maps for Office
- Collector for ArcGIS
- Operations Dashboard
- Explorer for ArcGIS
- Navigator for ArcGIS
- Workforce Manager
- Drone2Map
- Insights for ArcGIS
- ArcGIS Earth
- Templates....

Maps for Office



Insights

Open-Source Maps & Apps

Hundreds of Ready-to-Use Solutions

- Easily Configurable
- Fully Supported
- No Cost

Open-Source
Solutions

500,000+ Downloads

Local & State Government

Utilities & Telecom

Public Safety &
Emergency
Management

Military &
Security



Delivering Innovation & Best Practices

Open Data Portal

Auto ETL and Custom Search



Online

Hosted Web GIS



Online Mapping, Apps and Content



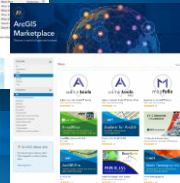
New and Improved

- Smart Mapping and 3D
- Analysis Tools
- Vector Tiles
- Credit Allocation
- Enhanced OGC Support
- Better Administration
- Social Logins

Coming

- Improved Search & Data Management
- Org-to-Org Collaboration
- Raster Analysis
- More Content

Marketplace

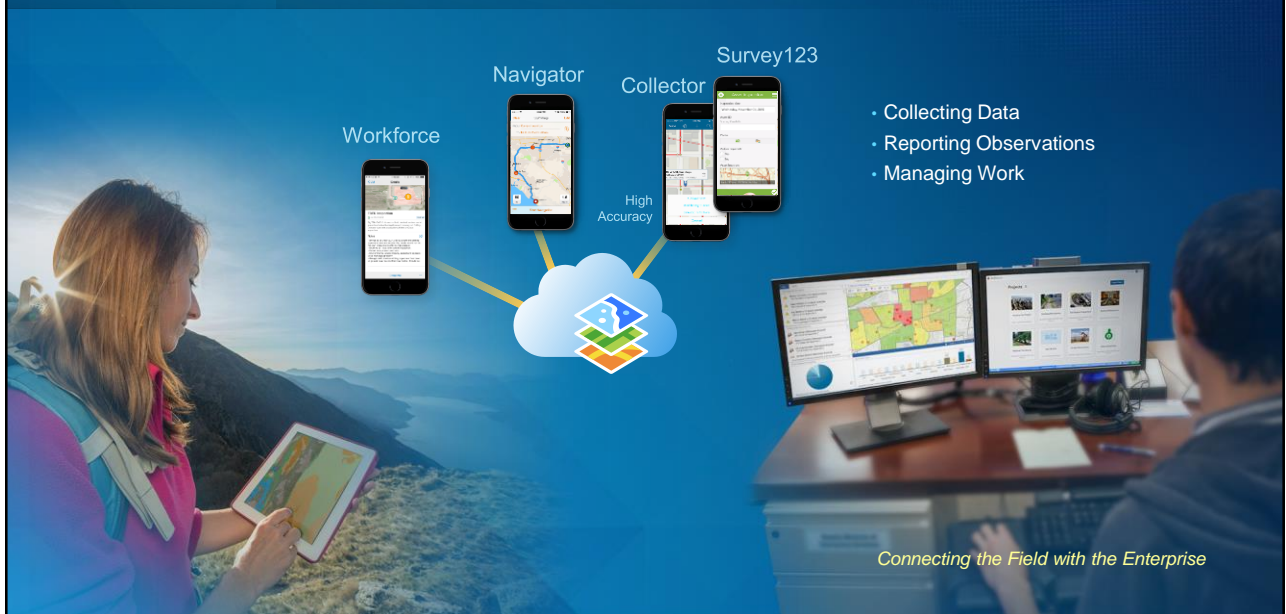


3.2 MILLION Users	+30%
94 BILLION Map Views	+35%
6.2 MILLION Items	+40%
15.3 MILLION Open Data Downloads	+411%

... Making Continuous Improvements

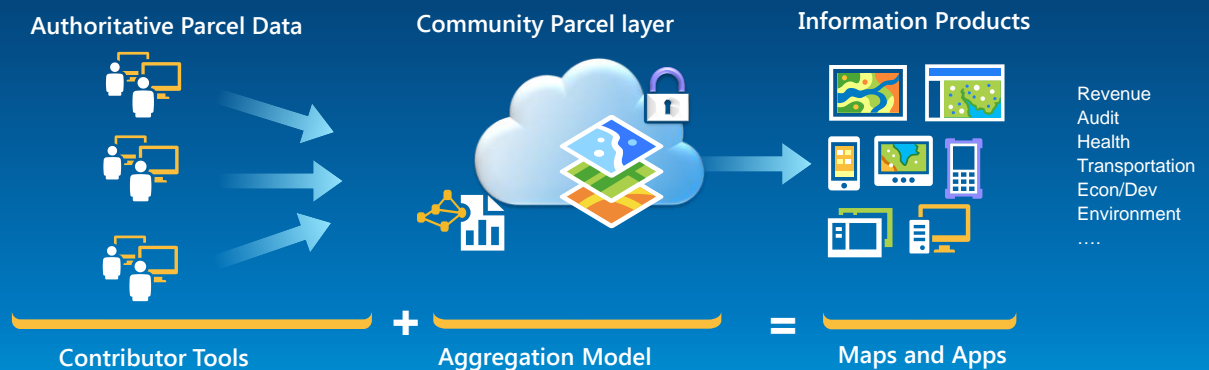
Field GIS

Taking GIS Beyond the Office



Community Parcels

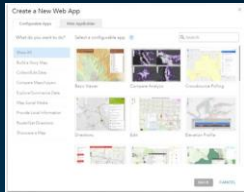
Web GIS Solution for Parcel Aggregation



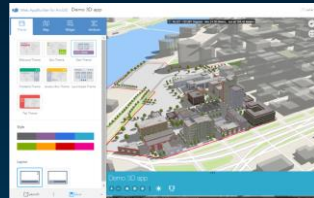
App Builders

Easy-to-Configure and Create Apps

Configurable Web Apps



Web AppBuilder



Browser Based

AppStudio



Native Devices

Living Atlas

Ready-to-Use Maps and Data

Compiled from the Best Available Sources

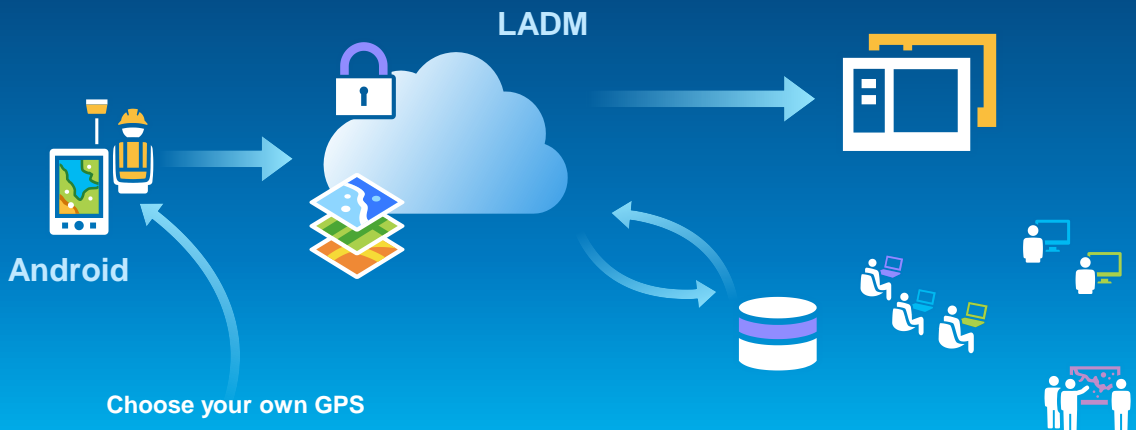
Basemaps | Imagery | Demographics | Landscape

Thousands of Maps & Layers
Tens of Thousands of Open Datasets

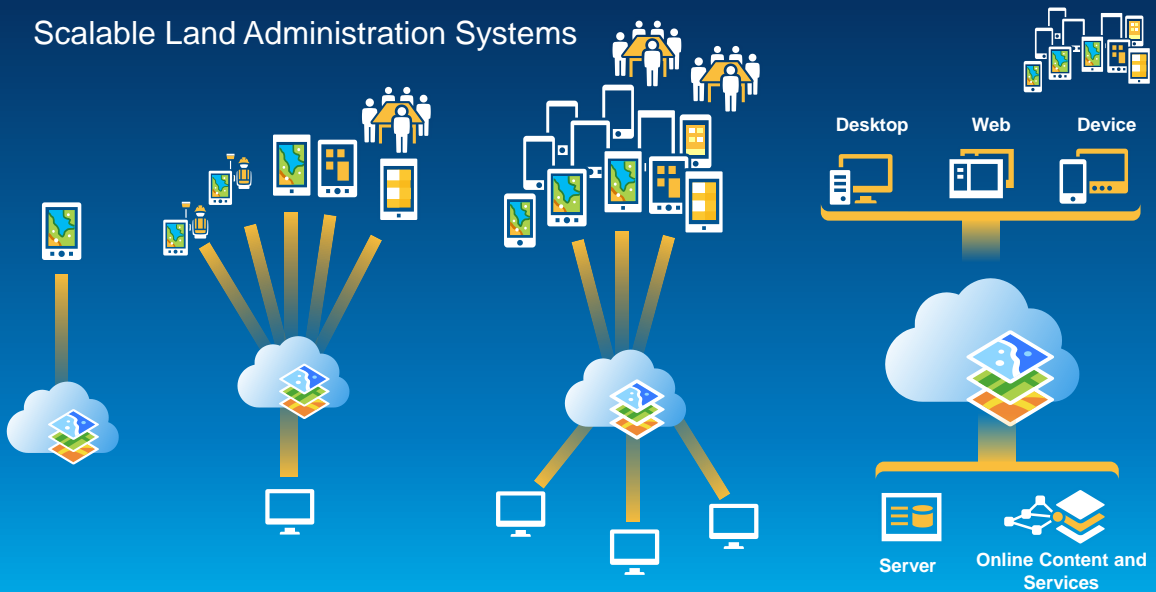
Millions of User Contributions . . . Billions of Views per Week

Leveraging Modern Approaches

COTS and configurable



Scalable Land Administration Systems



Startup Cadastre Workflow

Fit for Purpose....Fit for the Future.....Scaleable.....Secure....

Field Data Collect

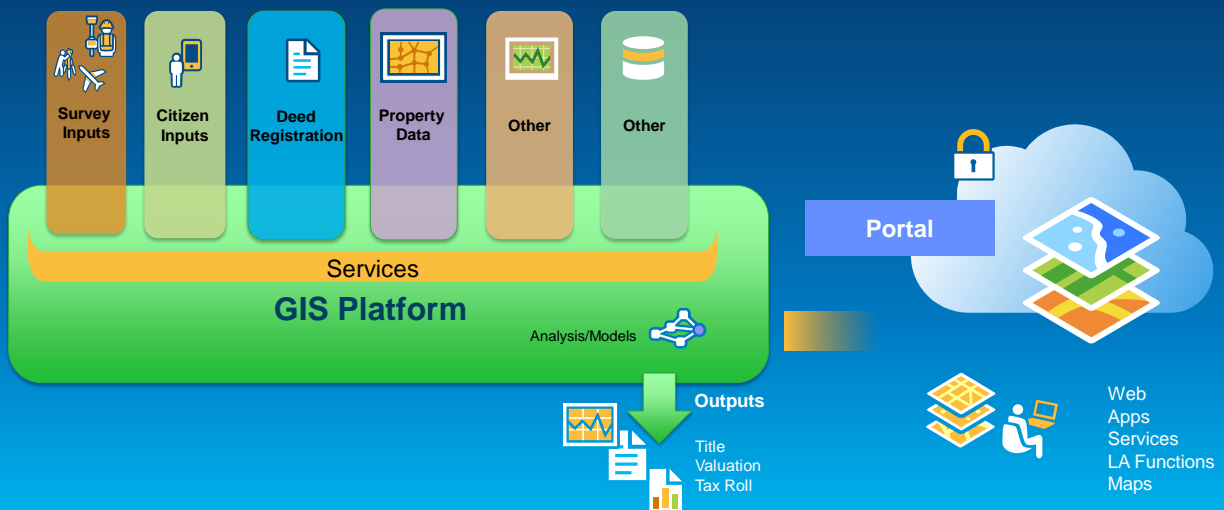
Mangage

Share/Publish



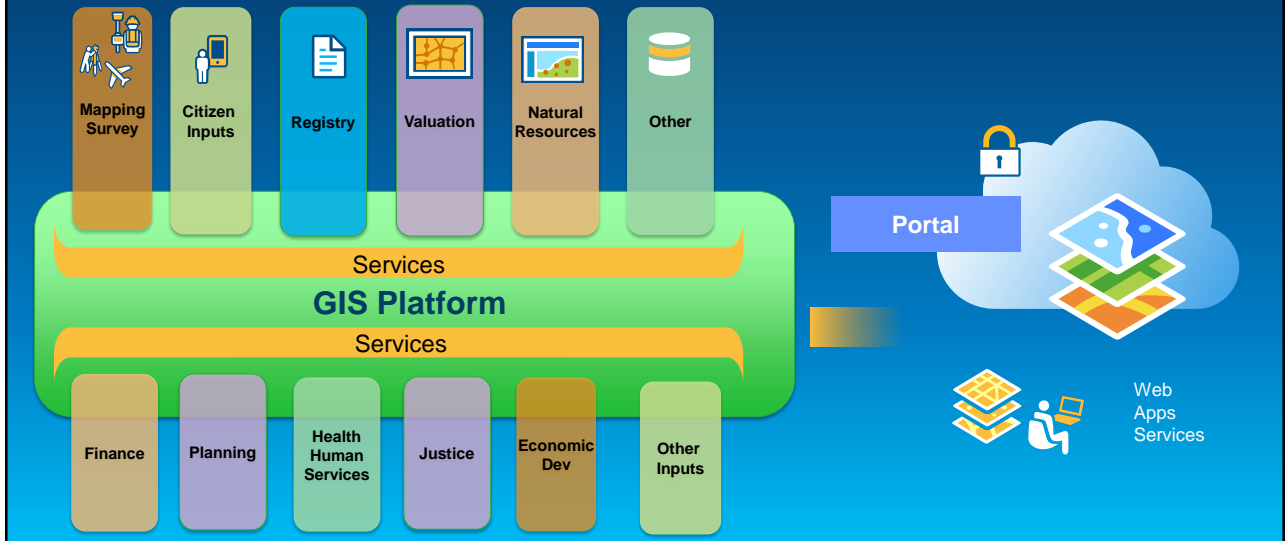
Land Administration Solution – GIS Platform

Services integration.....



Multipurpose Cadastre – GIS Platform

Secure, Scalable for Sustained Operations.....



Understanding our world.

LADM FFP – Colombia Example

Fit-for-purpose and fit-for-the-future in a couple of weeks.....

- Fast-to-Implement
- Standards-based
- Low Cost
- Accurate
- No Software Development
- Secure
- Leverages External Data
- Uses Many Devices
- Future Proof
- Scalable
- Repeatable
- Works Disconnected

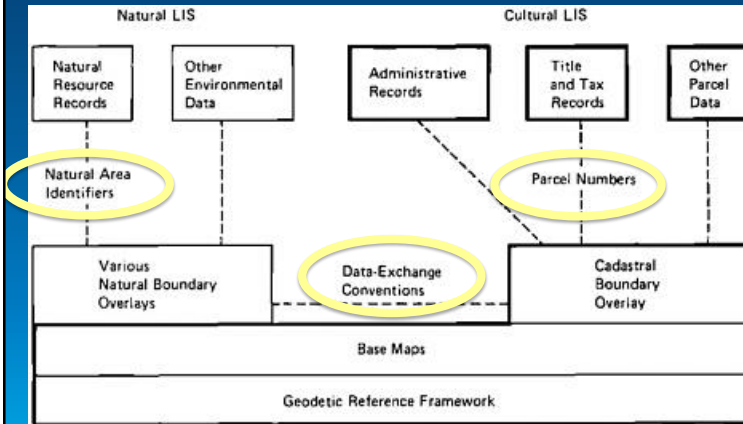
Multipurpose Cadastre

GIS enabling a longstanding vision.....



Multipurpose Cadastre

Organizes and Manages the Data and Information for Sharing and Collaboration



Multipurpose Cadastre System.... An integrated land information system containing legal (e.g., property ownership or **cadastre**), physical (e.g., topography, man-made features), and cultural (e.g., land use, demographics) information in a common and accurate reference framework.

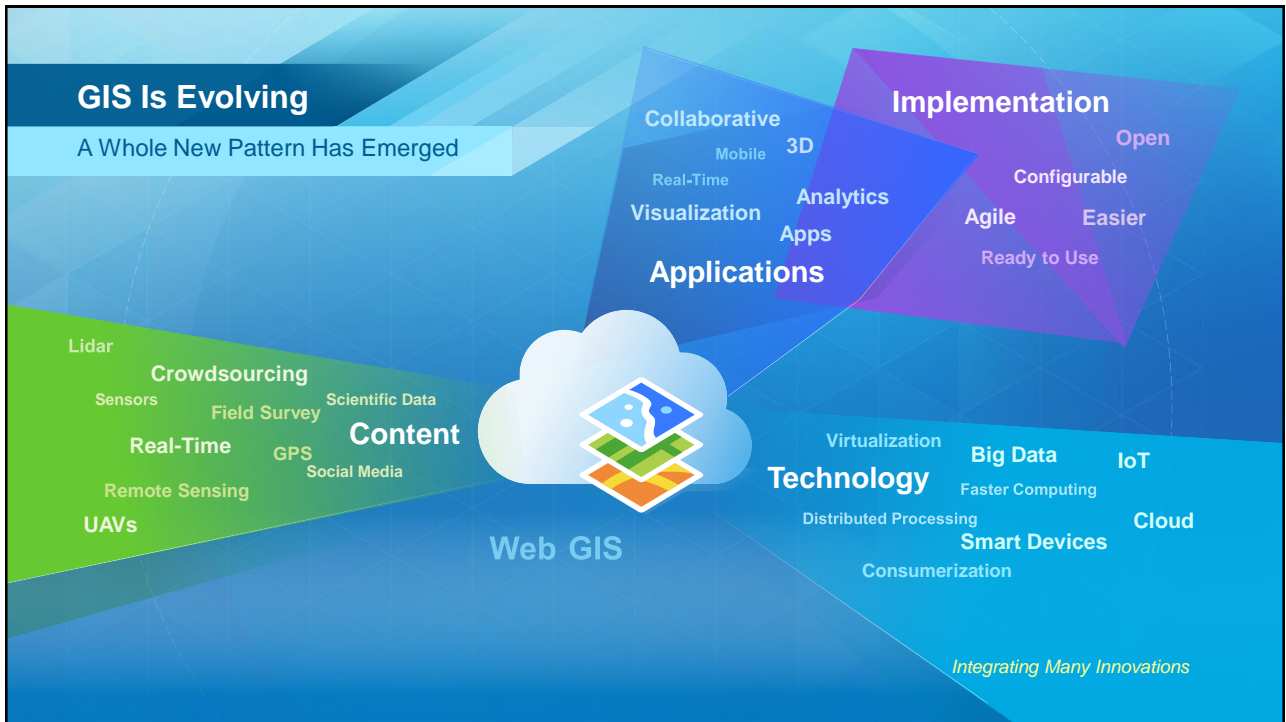
1. Parcel Numbers
2. Data-Exchange Conventions
3. Natural Area Identifiers

Necessary Components of a Multipurpose Cadastre

Many countries have the components, but are not organized properly

1. Survey Reference Frame
2. Current, Accurate Large Scale Maps
3. Cadastral Data/Map
4. Unique Parcel Identifier (PIN) on All Properties
5. Land Data which includes PIN





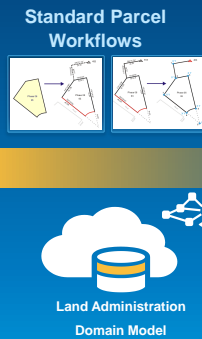
Startup Cadastre Workflow

Fit for Purpose....Fit for the Future.....Scalable.....Secure.....

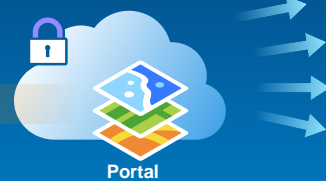
Field Data Collect



Manage



Share/Publish

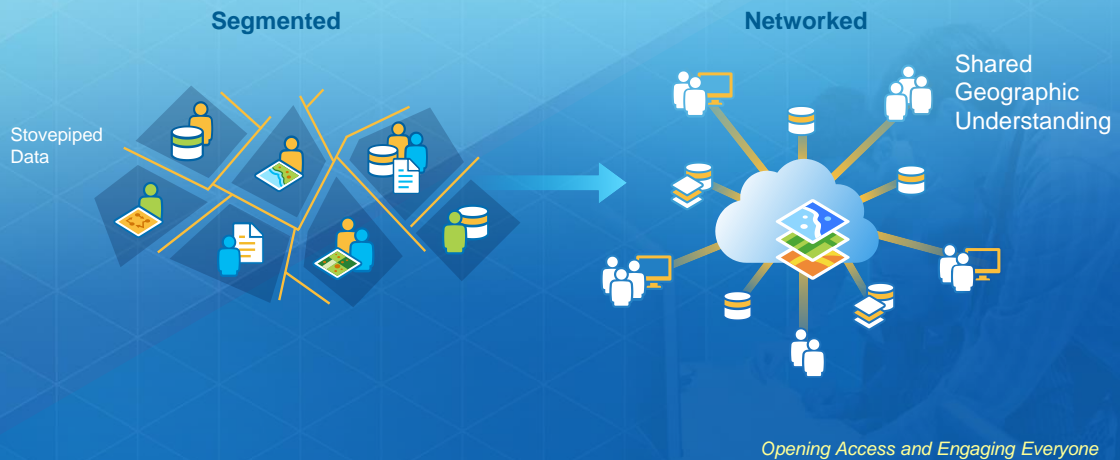


Outputs

Title
Valuation
Tax Roll

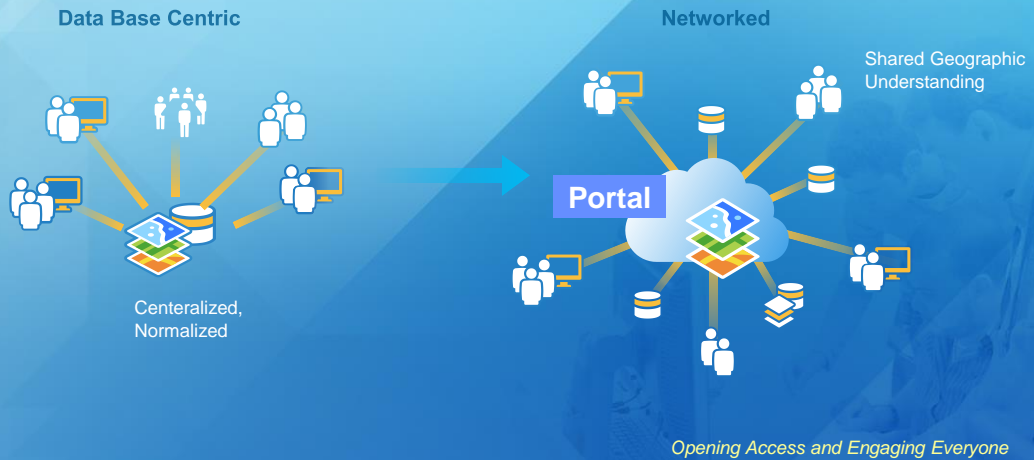
Web GIS Integrates Organizations

Creating Shared Information and Facilitating Collaboration



Web GIS Supports Multipurpose Cadastre

Creating Shared Information and Facilitating Collaboration



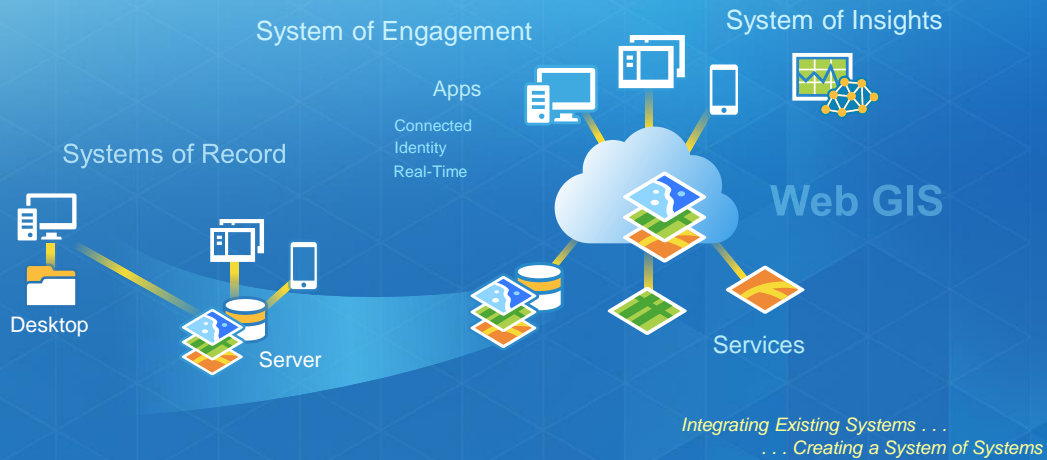
GIS Provides the Framework and Process

For Applying Geography



Web GIS Is Transforming GIS

Opening, Integrating and Simplifying Everything



How to Scale with All of These Challenges

