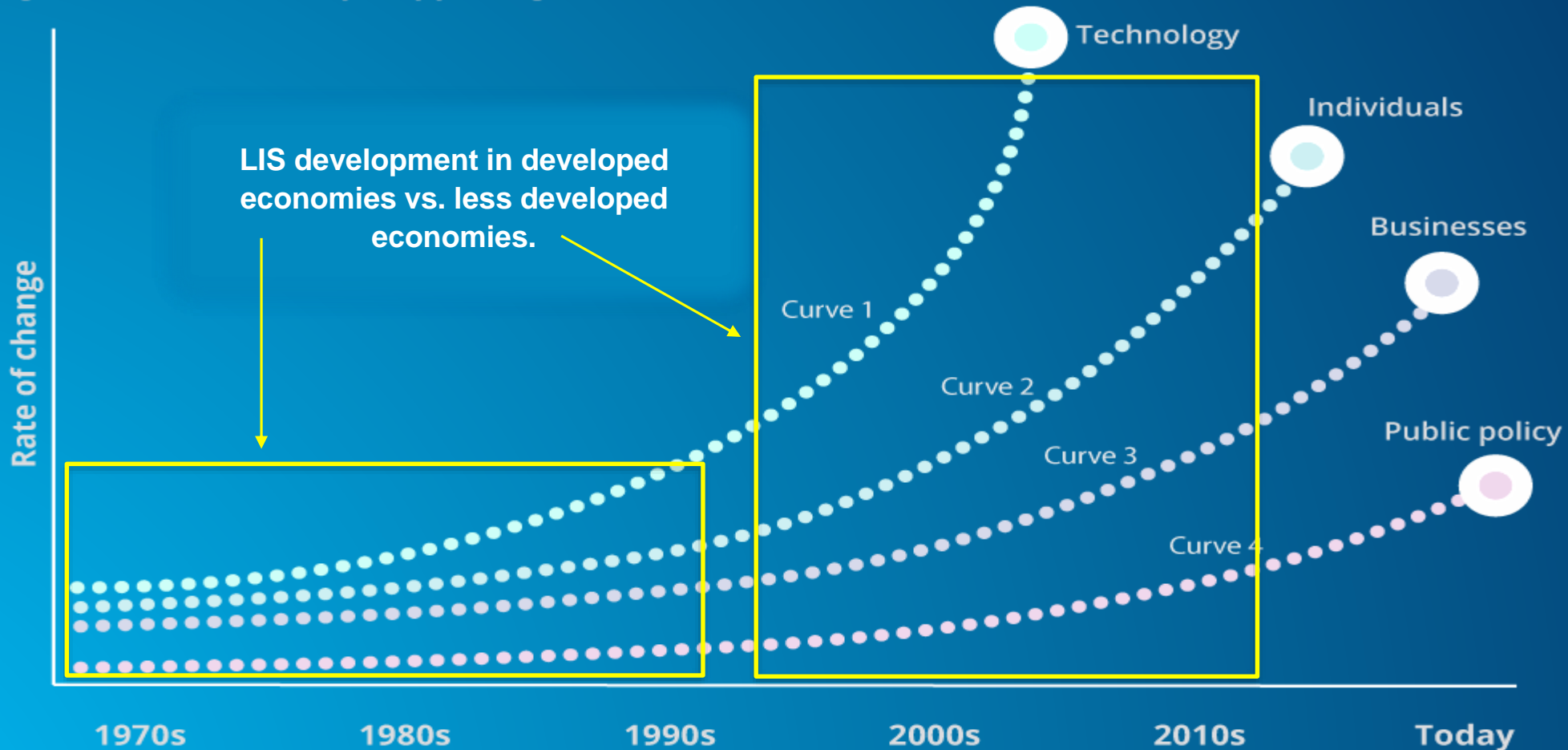# Using Scalable Technology Platforms to Deliver Fit-for-Purpose Land Administration

Timothy Fella

Esri

Technological Change and Ability to Adapt


Figure 2. What is *really* happening

LIS development in developed economies vs. less developed economies.

Rate of change

Technology

Individuals

Businesses

Public policy

Curve 1

Curve 2

Curve 3

Curve 4

1970s 1980s 1990s 2000s 2010s Today

Deloitte University Press | dupress.deloitte.com

What is Fit-for-Purpose Land Administration?

- **Flexible** in the spatial data capture approaches to provide for varying use and occupation.

- **Inclusive** in scope to cover all tenure and all land.

- **Participatory** in approach to data capture and use to ensure community support.

- **Affordable** for the government to establish and operate, and for society to use.

- **Reliable** in terms of information that is authoritative and up-to-date.

- **Attainable** in relation to establishing the system within a short timeframe and within available resources.

- **Upgradeable** with regard to incremental upgrading and improvement over time in response to social and legal needs and emerging economic opportunities.
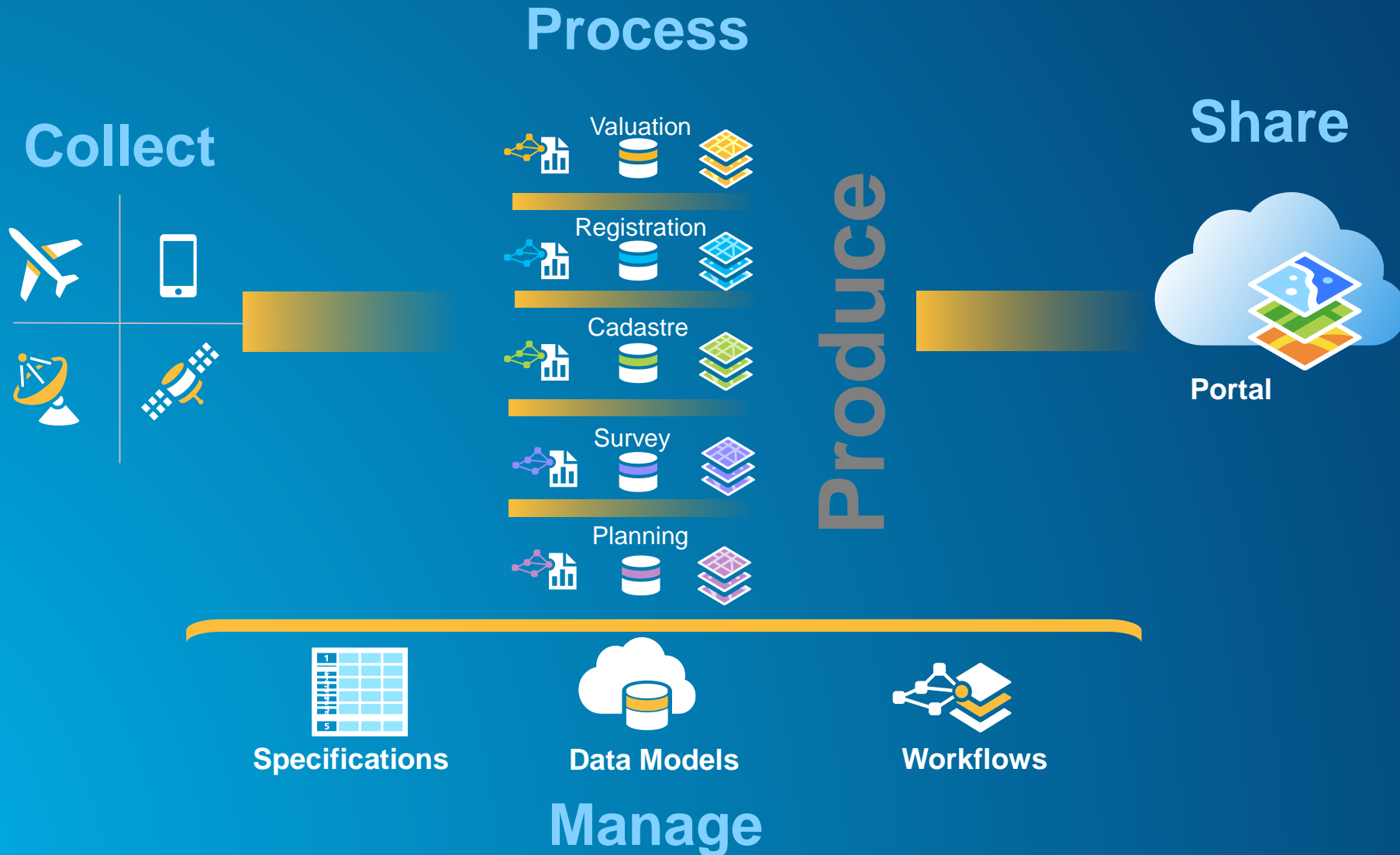
Land Administration Community's Response

Functional Requirements

Less ←——————————————————→ More

- **Open-source mobile data collection tools**

- **Commercial Off-the-Shelf (COTS) Solution**

- **Highly Customized Systems with Unique Requirements**

Drawbacks:

- Limited functionality
- No scalability
- No data editing and management capabilities
- Requires customization for each locale

Drawbacks:

- Unique requirements may be missing
- System not owned by customer
- Dependent on vendor and licensing costs

Drawbacks:

- Longer to develop & deploy
- Increased business risk
- Higher total cost of ownership
- Static System; not easily upgradeable
- Difficult to maintain

Fit-for-Purpose: Comparing COTS vs. Custom

Fit-for-Purpose Attributes		COTS		Custom
Reliable	+	Tested internally and by thousands of customers every day	_	Thorough testing requires huge investment of time and capital
Flexible in Terms of Spatial Data Capture Approaches	+	Yes	+	Yes
Inclusive of All Tenure Types	+	Yes	+	Yes
Participatory in Approach to Data Capture & Community Support	+	Yes	+	Yes
Affordable to Establish & Operate (Total Cost of Ownership)	+	Usually less expensive to acquire and maintain	_	Usually more expensive to create, test, debug, secure and maintain
Quick to Deploy	+	Shorter time to deliver	_	Longer time to deliver
Upgradeable	+	Evolving system with COTS releases and updates	_	Requires coding and services to upgrade/migrate

Upgradeable, Scalable & Modular
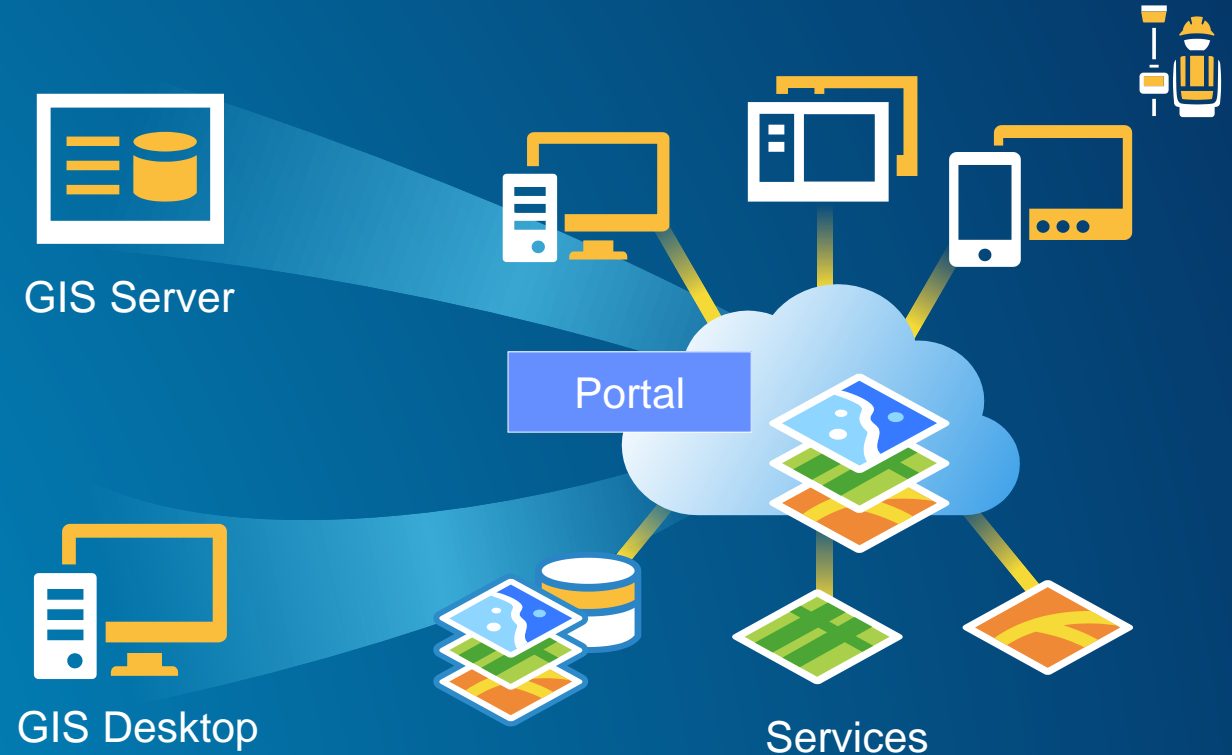
3. Full Enterprise Production

- ArcGIS Enterprise & Portal
- Parcel editing solution
- AGOL and ready to use content
- COTS Apps

2. Simple Desktop, Small Department

- Parcel editing solution
- AGOL and ready to use content
- COTS Apps

1. Getting Online – Fit-for-Purpose

- AGOL and ready to use content
- COTS Apps

GIS Server

Portal

GIS Desktop

Services

What is Web GIS?

Foundation of a modern GIS

- A pattern, or architectural approach
- Based upon services
- Supports Identity
- Cloud, on premises, or both
- Uses a Portal

Desktop   **Web**   **Device**

Portal

Server   **Online Content and Services**

A Portal is an essential component

Of a modern GIS

- Framework for managing content
  - Discover, share, and use content

- Manages users
  - Identity, roles, collaboration

- Supports a sharing model
  - Users, groups, privileges

- Supports a geoinformation model
  - Web maps, layers, scenes

- Hosted in the Cloud (ArcGIS Online)

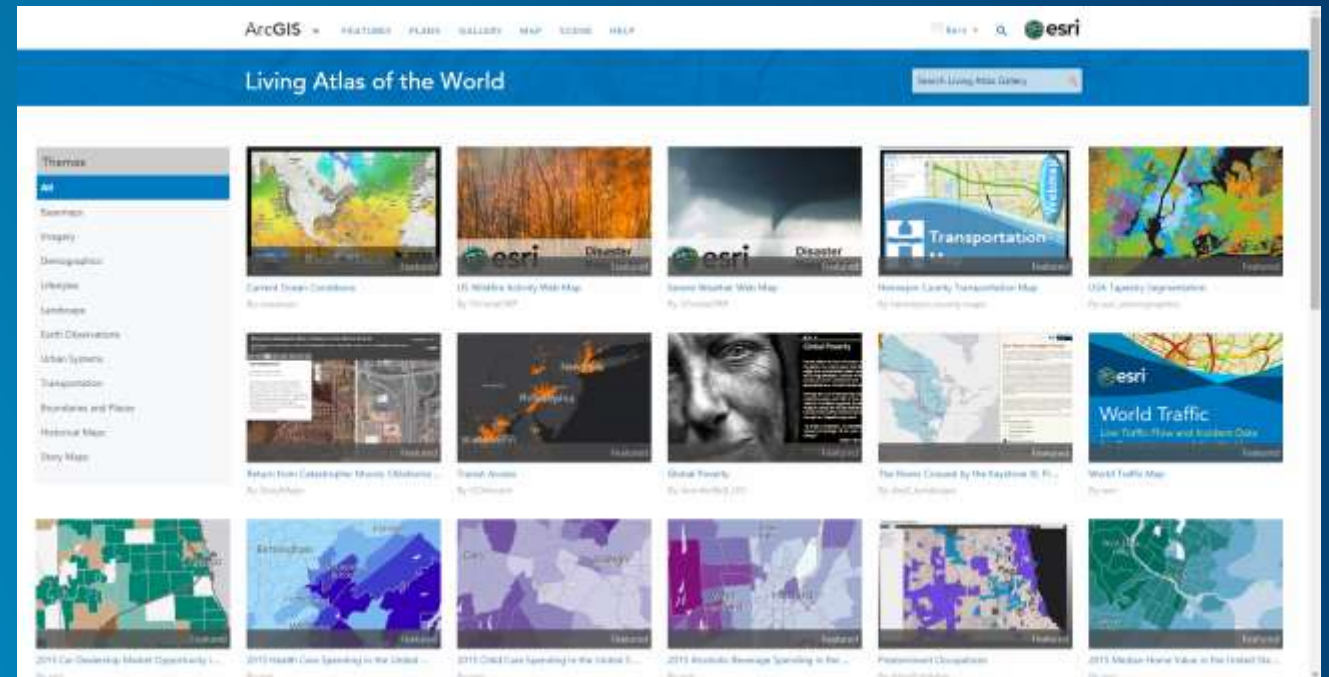- Hosted on-premises (Portal for ArcGIS)
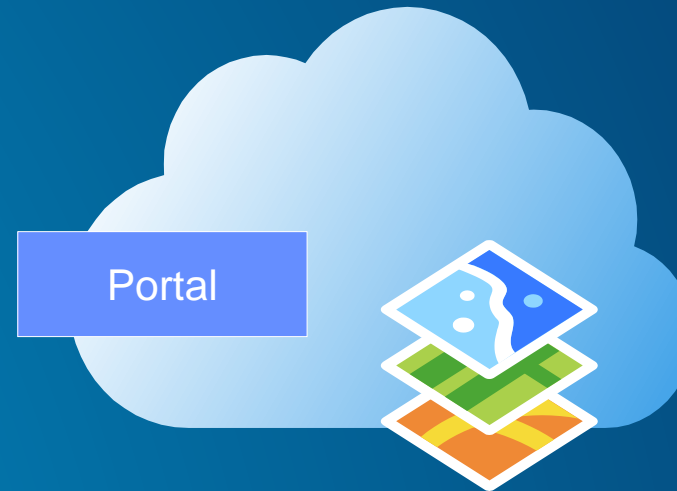
Portal

GIS Content

Living Atlas

- Basemaps

- Demographics and Lifestyle

- Transportation

- Urban Systems
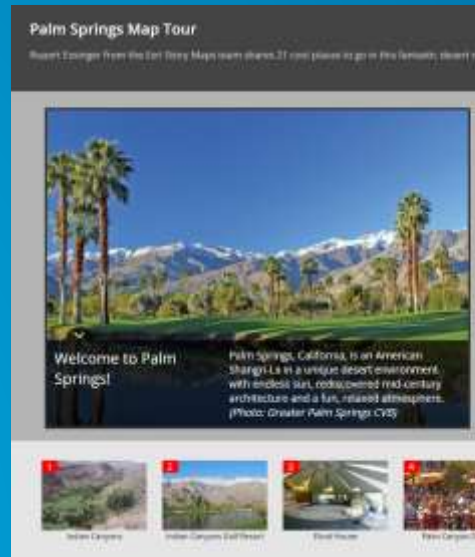
- Earth Observations

- Imagery

- Landscape

- More…

GIS Apps

Configurable, Hosted, no programming required
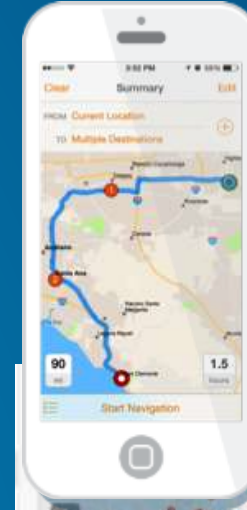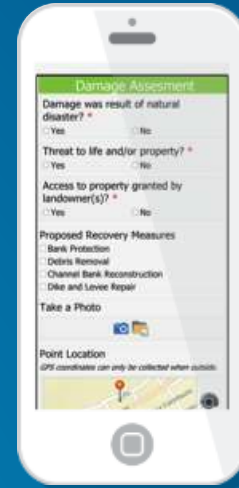
- Configurable app gallery
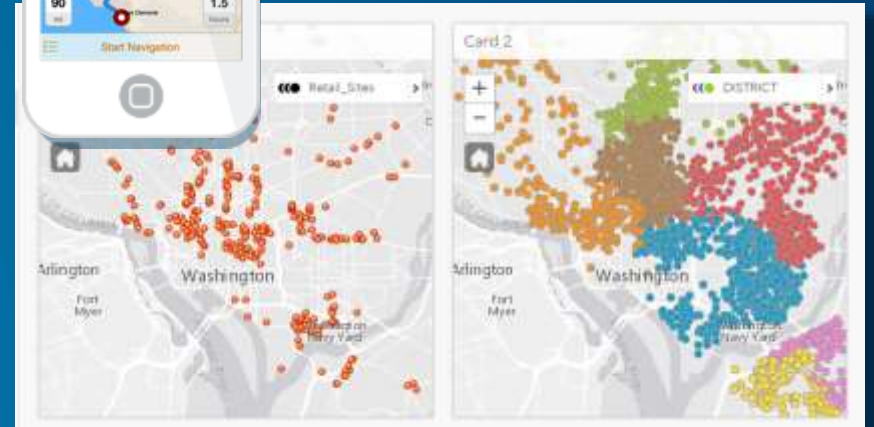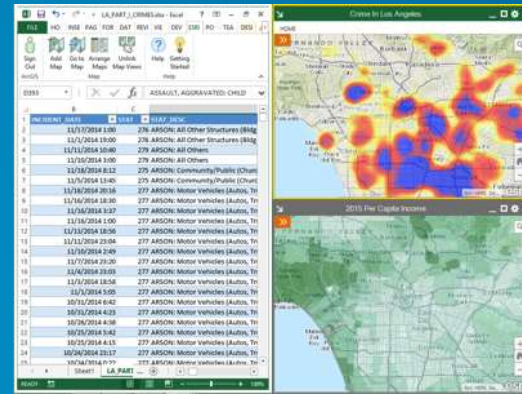- Web AppBuilder
- AppStudio

GIS Apps

Support your workforce and workflows

- Maps for Office
- Collector
- Operations Dashboard
- Open Data
- Navigator
- Workforce Manager
- Drone2Map
- Insights
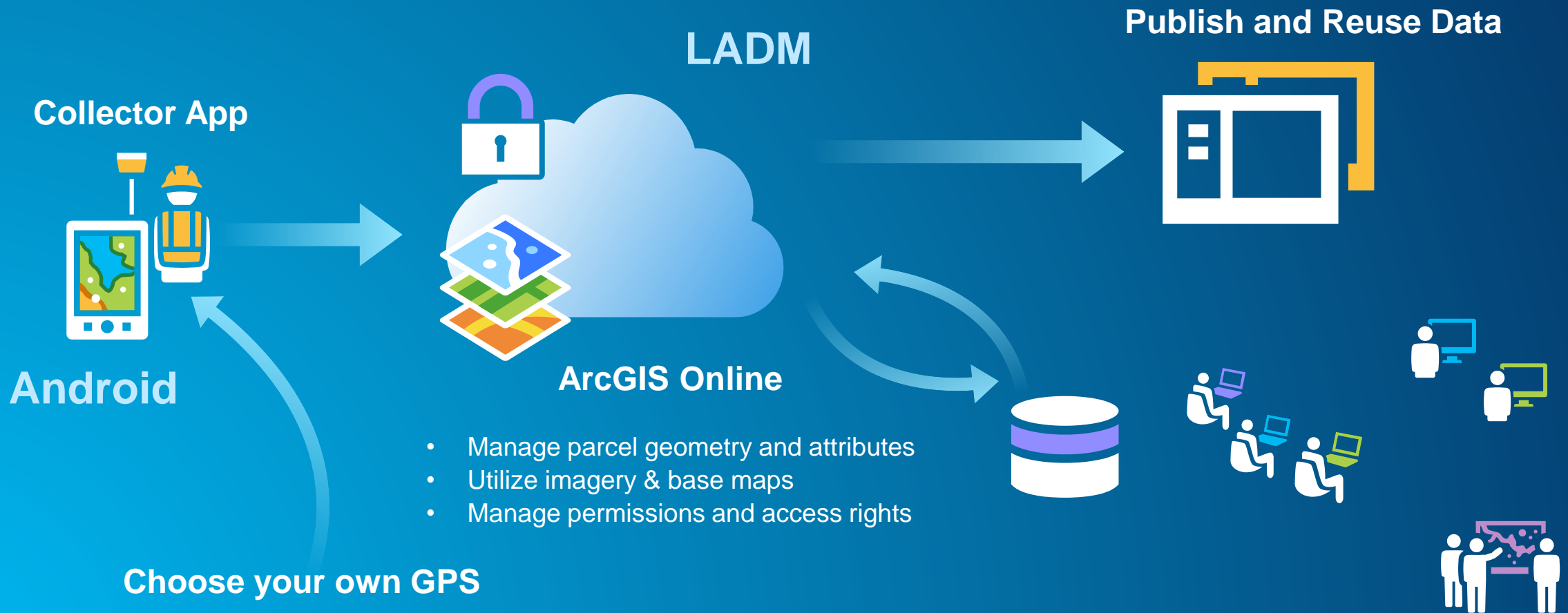- Earth

Maps for Office

Insights

ArcGIS Online

Cloud-based Web GIS

- Administration and security
- Hosted maps, publishing and analytics
- Hosted apps
- Hosted content (Living Atlas)
- Sharing and collaboration
- Integration with on-premises Web GIS

Cloud

SaaS

Users

Apps

ArcGIS Delivers Fit-for-Purpose Land Administration

COTS and configurable

LADM

Publish and Reuse Data

Collector App

Android

ArcGIS Online

- Manage parcel geometry and attributes
- Utilize imagery & base maps
- Manage permissions and access rights

Choose your own GPS

Why this Approach?

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

- Fast-to-Implement
- Scalable
- Low Cost
- Reliable
- No Software Development
- Secure

- Leverages External Data
- Accurate
- Future Proof
- Standards-based
- Repeatable
- Works Disconnected

Colombia – Fit-for-Purpose

- Data model LADM / STDM
- Trimble R1 GNSS (sub-meter)
- Orthophotos basemap (digital)
- Collector for ArcGIS on Android
- Cloud Data Storage (spatial and legal)
- Collect Once - participatory aspect

Esri Land Administration Modernization Program

- 72 countries eligible

- Legally mandated cadastral organizations

- Full Esri platform

- 4 year program

- Perpetual licenses

- Small annual administrative fee ($10k per year)

Questions?

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