FIG 2018 ISTANBUL

Presented at the FIG Congress 2018,
May 6-11, 2018 in Istanbul, Turkey

XXVI FIG Congress 2018

6–11 May 2018
ISTANBUL

Improving Cadastral Quality Management as a Foundation for Citizen's Trust

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Is there a Quality Issue with Cadastral Records?

Accessibility

Spatial units, Administrative units and spatial source

- Data does not exist
- Paper
- Silos
- Custom formats that need custom tools
- Fragmented to files

Poor Security and Auditing

- Who created it?
- When?
- Who modified it?
- What was modified?
- Why was it modified?
- Anyone with access to a file can modify it or delete it

Poor Topological Integrity

- Overlaps and gaps
- Small parcels / slivers
- Misalignment between different parcel types: administrative, ownership, tax, easements…
- Intersecting boundary lines, invalid geometries
- Data fragmented into separate areas/file can cause edge match issues

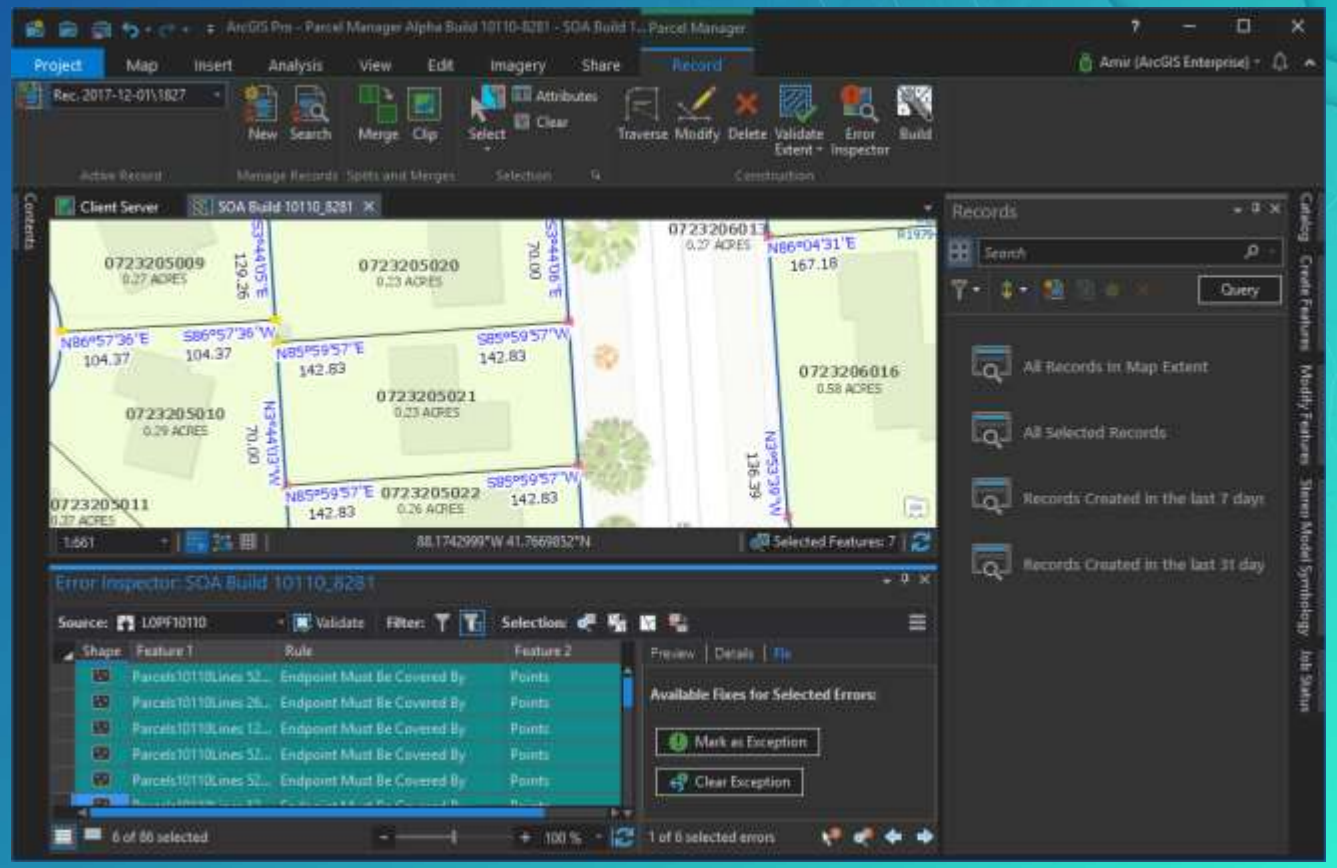
Must Not Overlap

Must Cover Each Other

Area Boundary Must Be Covered By Boundary Of

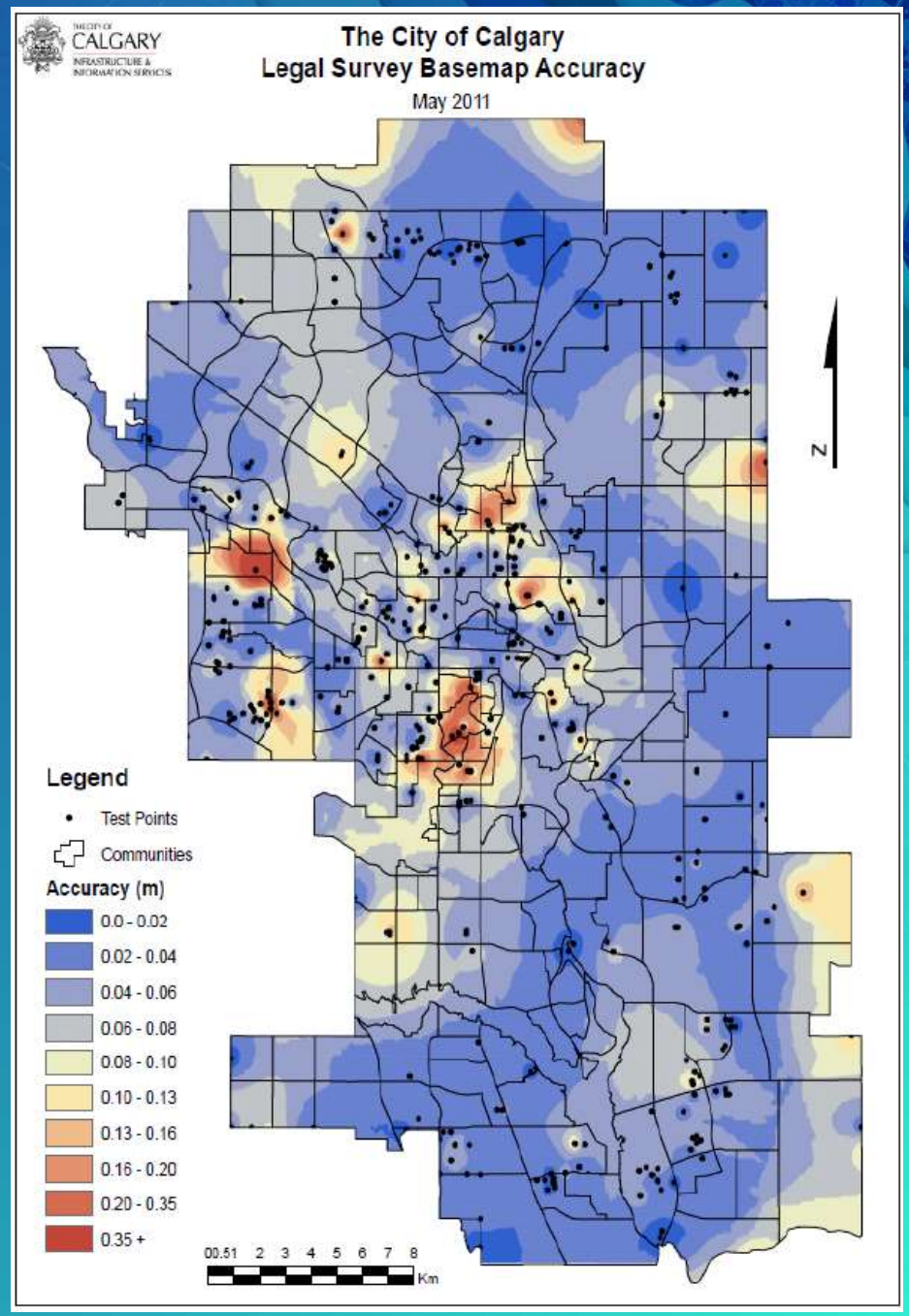
Poor Quality Metrics

- Cannot quantify errors: geometry, attributes, between systems…
- Cannot visualize errors
- Cannot track productivity
- → Cannot:
  - Prioritize fixing issues
  - Effective resource management



Questionable Spatial Accuracy

- Identifying poor spatial accuracy is easy
- But how bad is it? Where?
- Internal accuracy or external accuracy?
- Is there a “heatmap” of spatial accuracy?
- Missing metadata
- Data is often degraded to fit the legal system



Currency

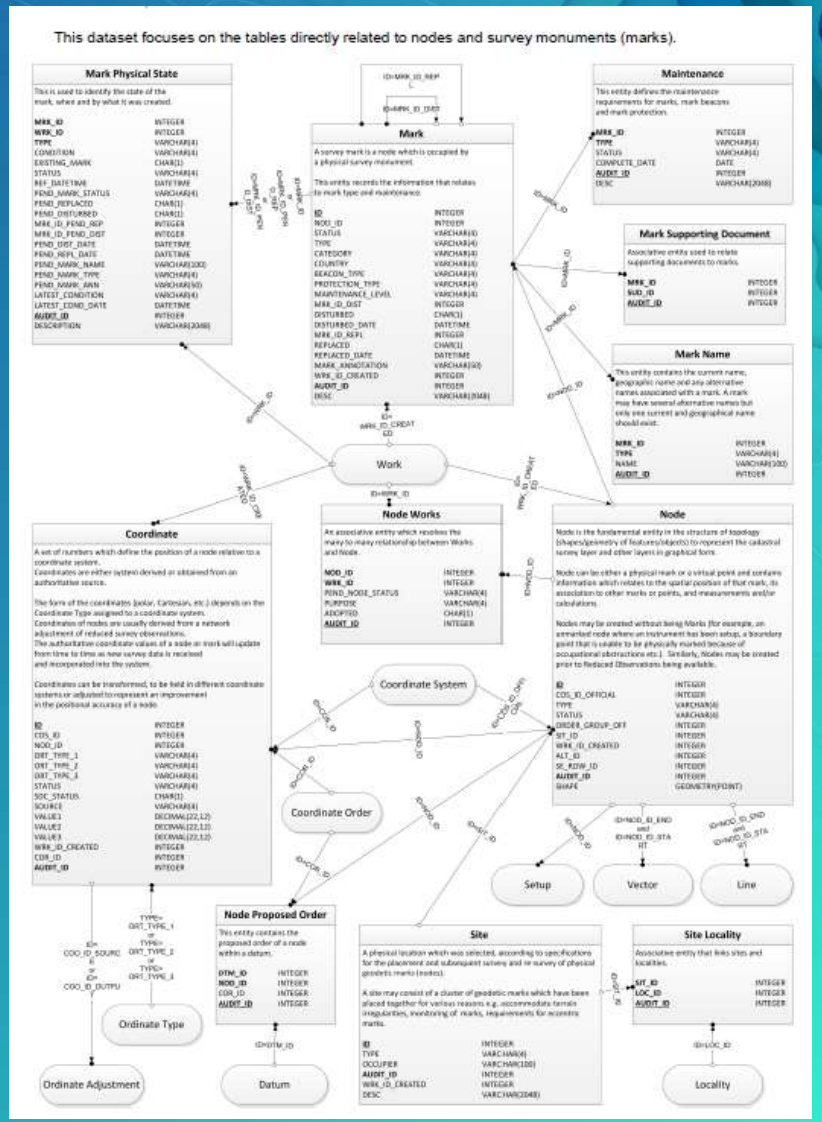
- Published data is not “live”
- Hard to determine when it was last updated
- What’s in the pipeline
- When it is expected to update?
- Why does it take so long?
- Can I get notified when it updates?
- Too much ETL (Extract transform Load). Hard to scale ETL.

Other

- Lack of historic data for chain of title research
- No Quality management
- Prevent bad data from being created
- Reduce duplicate data entry (chance for mistakes)
- Lack of established best practices
- Management - lack of operational dashboard to track KPIs

Stakeholders Engagement

- Meeting modern expectations:
  - Data must be current
  - Data must be accurate & reliable
  - Data must be easy to consume
  - Provided in a smart information product
  - High performance
  - Visually appealing
  - Accessible from any device
  - Include metadata



Losing Stakeholder Trust

- Cadastral agencies, the official authoritative source, are losing stakeholder trust

→

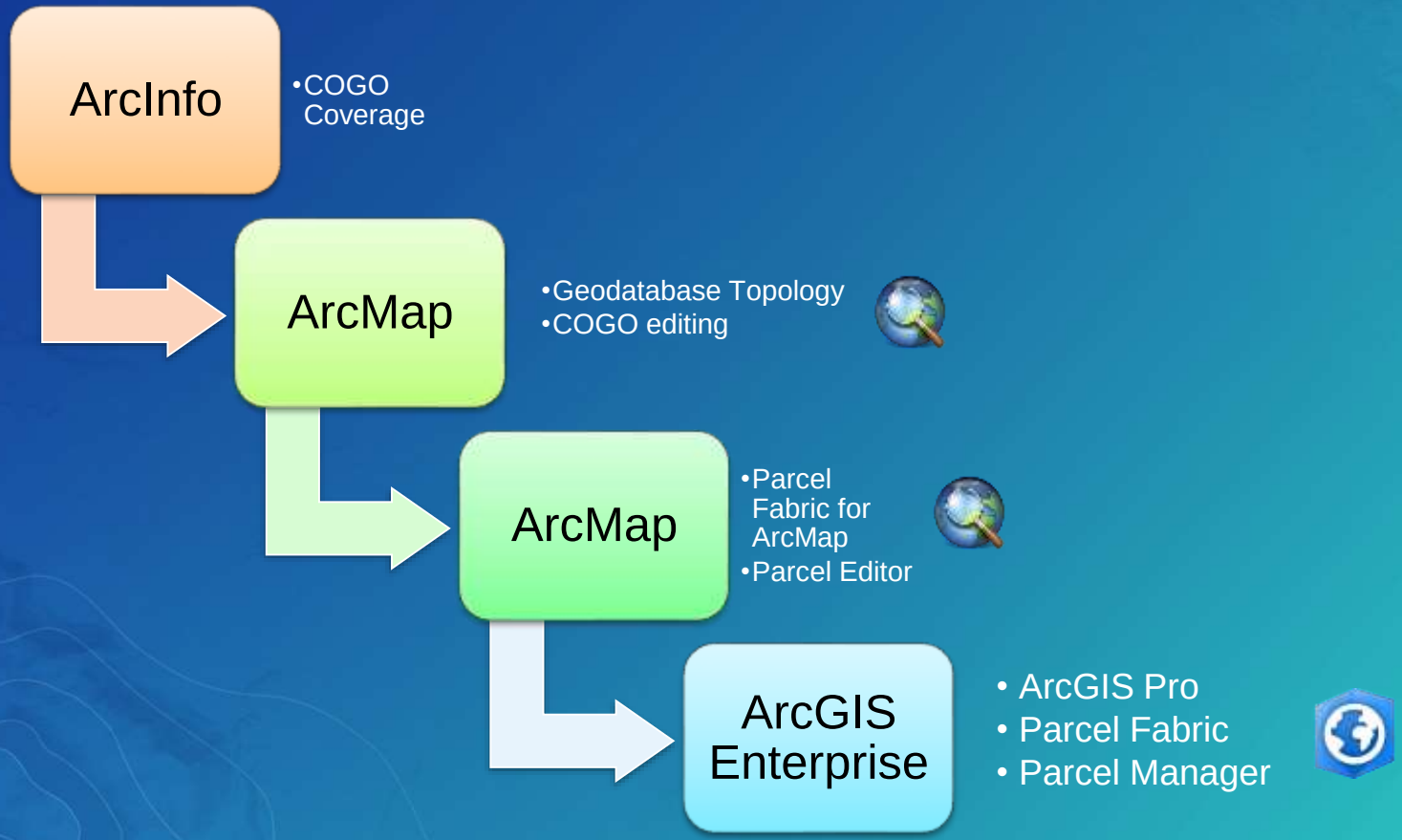
- When data cannot be trusted:
  - Create your own “shadow” dataset
  - Not used / ignored
  - Bad decisions

The Solution: Parcel Manager

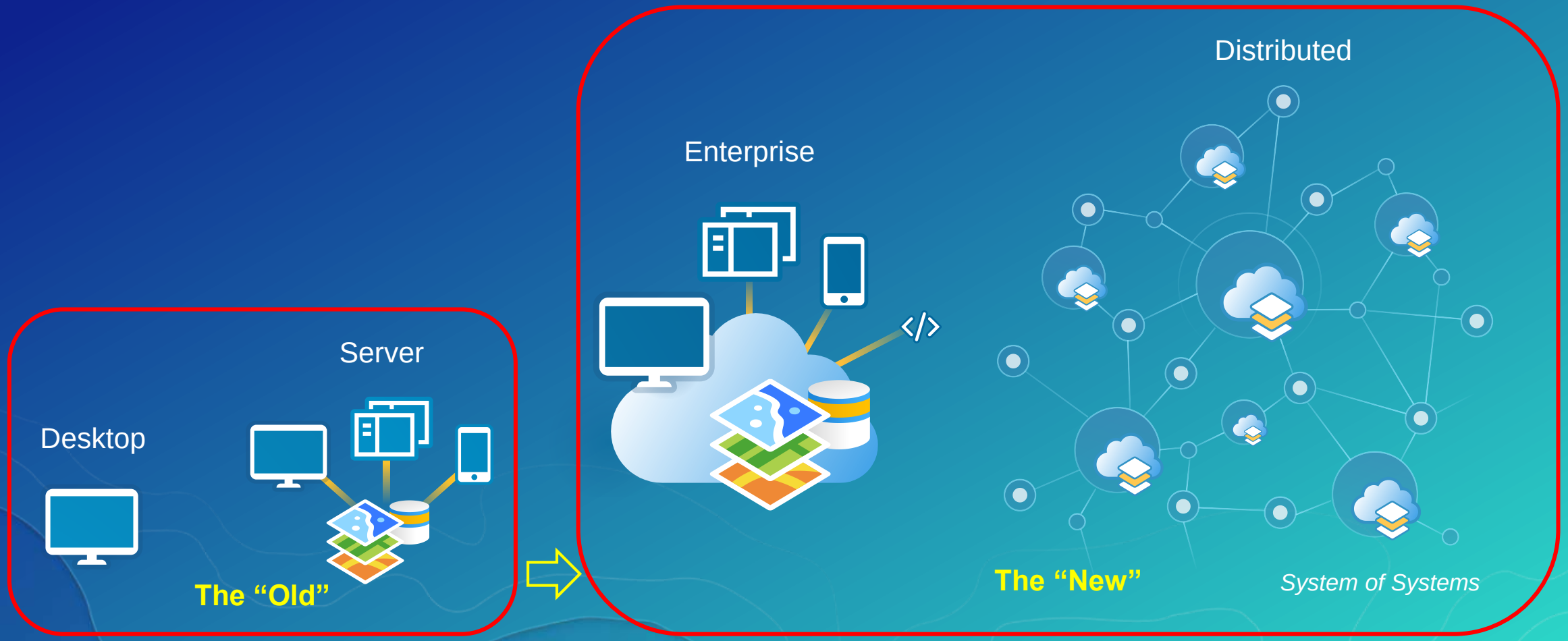
The Next Generation of Parcel Management

Parcel Manager

- Designed for the next 15-20 years



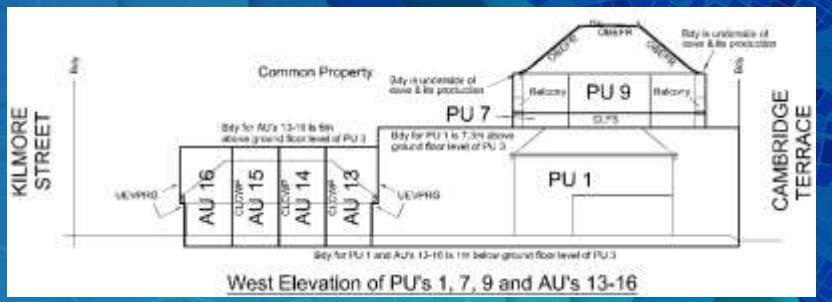
Service Oriented Architecture



Designed to Work Anywhere

Continue support for '*Metes and Bounds'* legal description but also for:

- Coordinate based cadastre (GNSS such as GPS)
- Systems with Overlapping and Shared parcel boundaries
- Any Client: field, web and desktop
- 3D cadastre
- Administrative boundaries (large parcels)
- Digital submission
- Web editing / crowd sourcing
- …

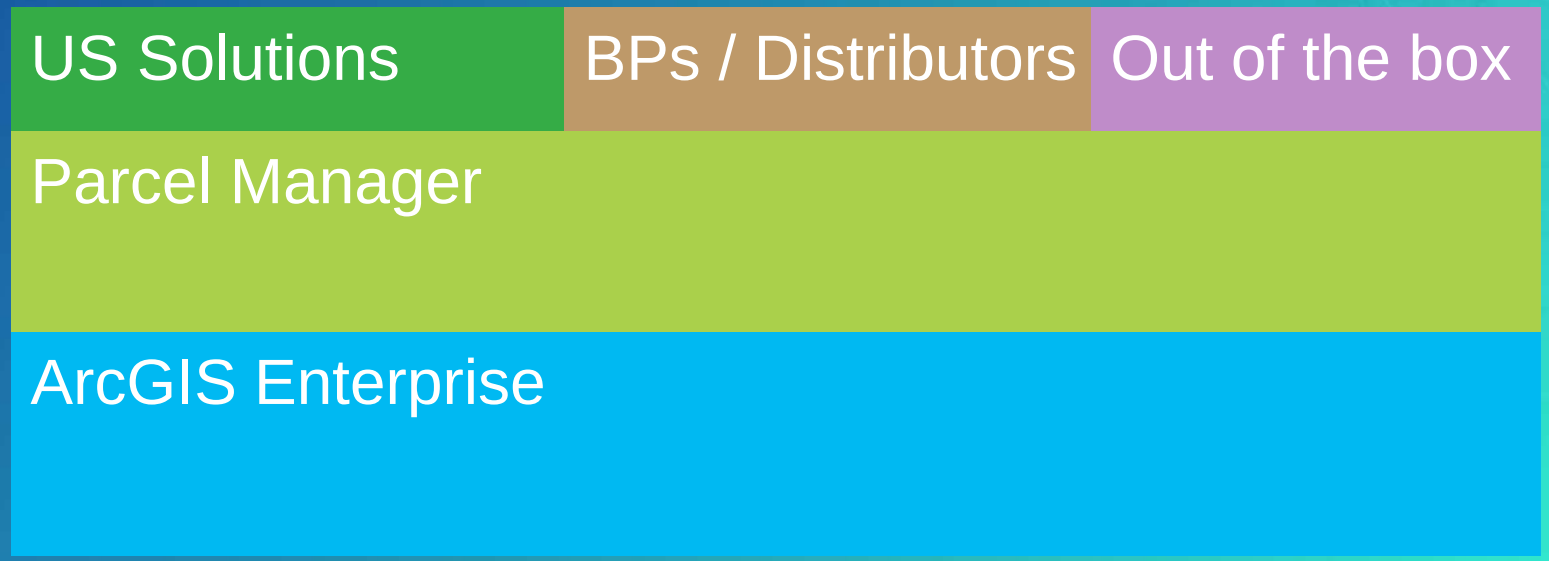


West Elevation of PU's 1, 7, 9 and AU's 13-16

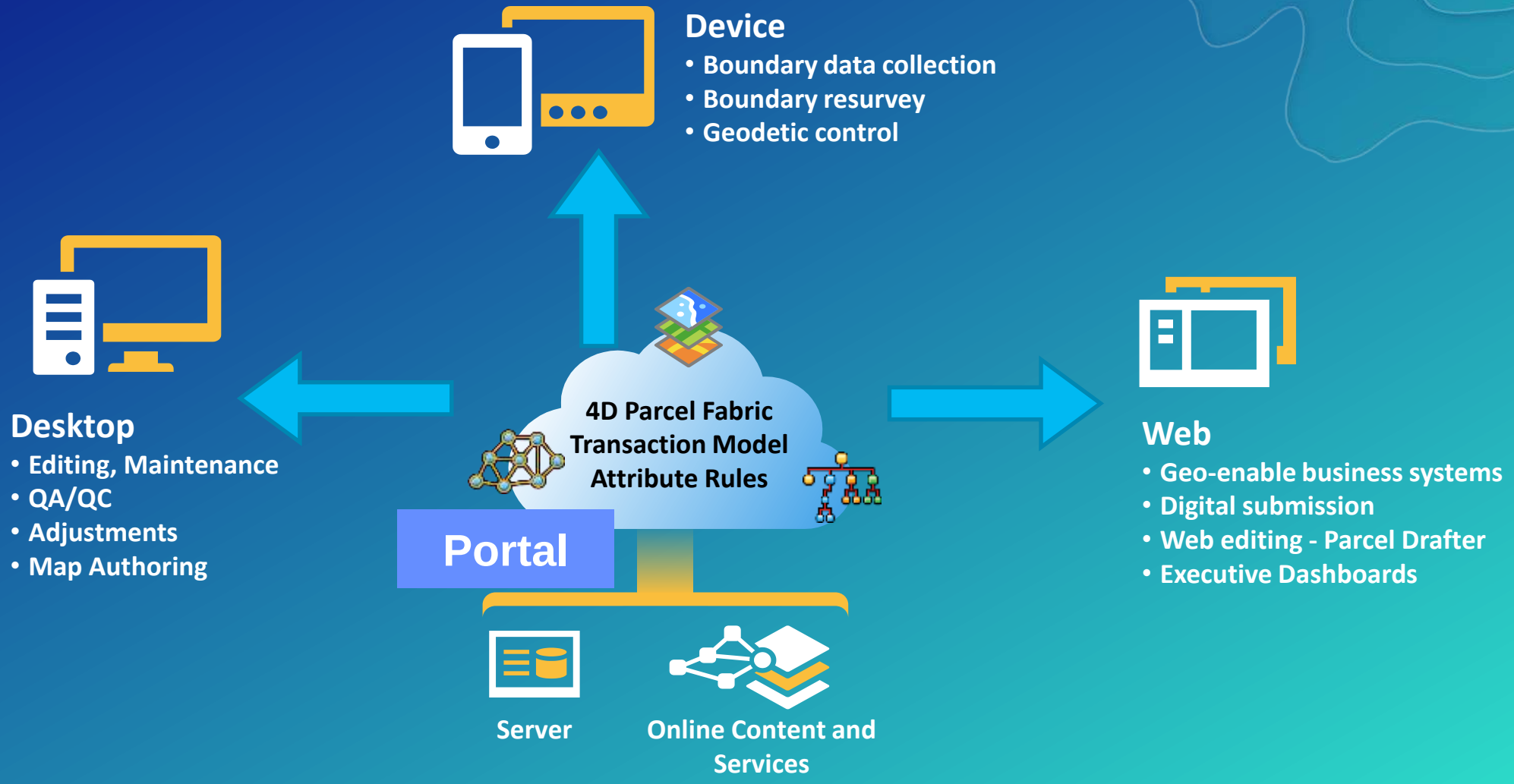
PERMANENT STRUCTURE BOUNDARY LEGEND	
CLFS	Unit boundary is centreline of floor slab & its production
CLCW	Unit boundary is centreline of common wall
CLCWP	Unit boundary is centreline of common wall & its production
IFCBW	Unit boundary is internal face of concrete block wall & its production
OBEFR	Unit boundary is offset 0.1m below the external face of roof
EFRP	Unit boundary is external face of roof & its production
PEFW	Unit boundary is production of external face of wall
UEVPRG	Unit boundary is underside of eaves & their vertical production upwards of the roof guttering

‘Works out of the box’

- Easy data migration → “migrate today, fix at your own pace”
- Simple information model
- Configurable!



Works on the entire ArcGIS Platform



Parcel Manager is Disruptive

Collect

Process

Admin Boundaries

Parcels

Easements

Control Points

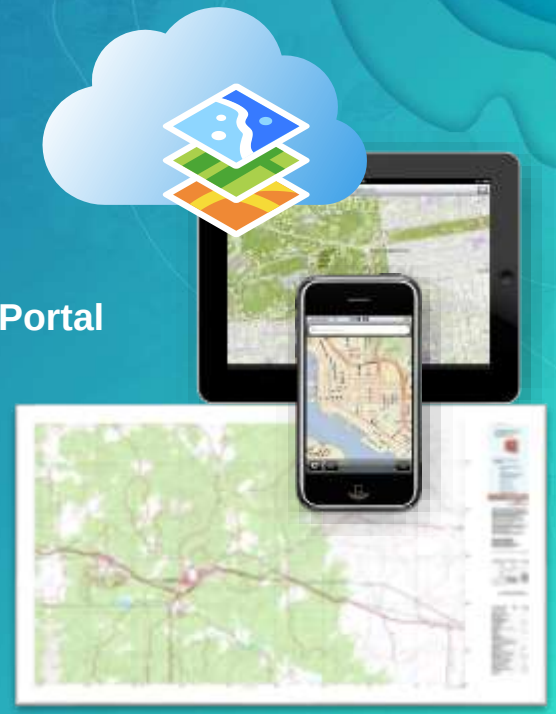
Cadastral Details

Survey Network

Produce

Share

Portal



Manage

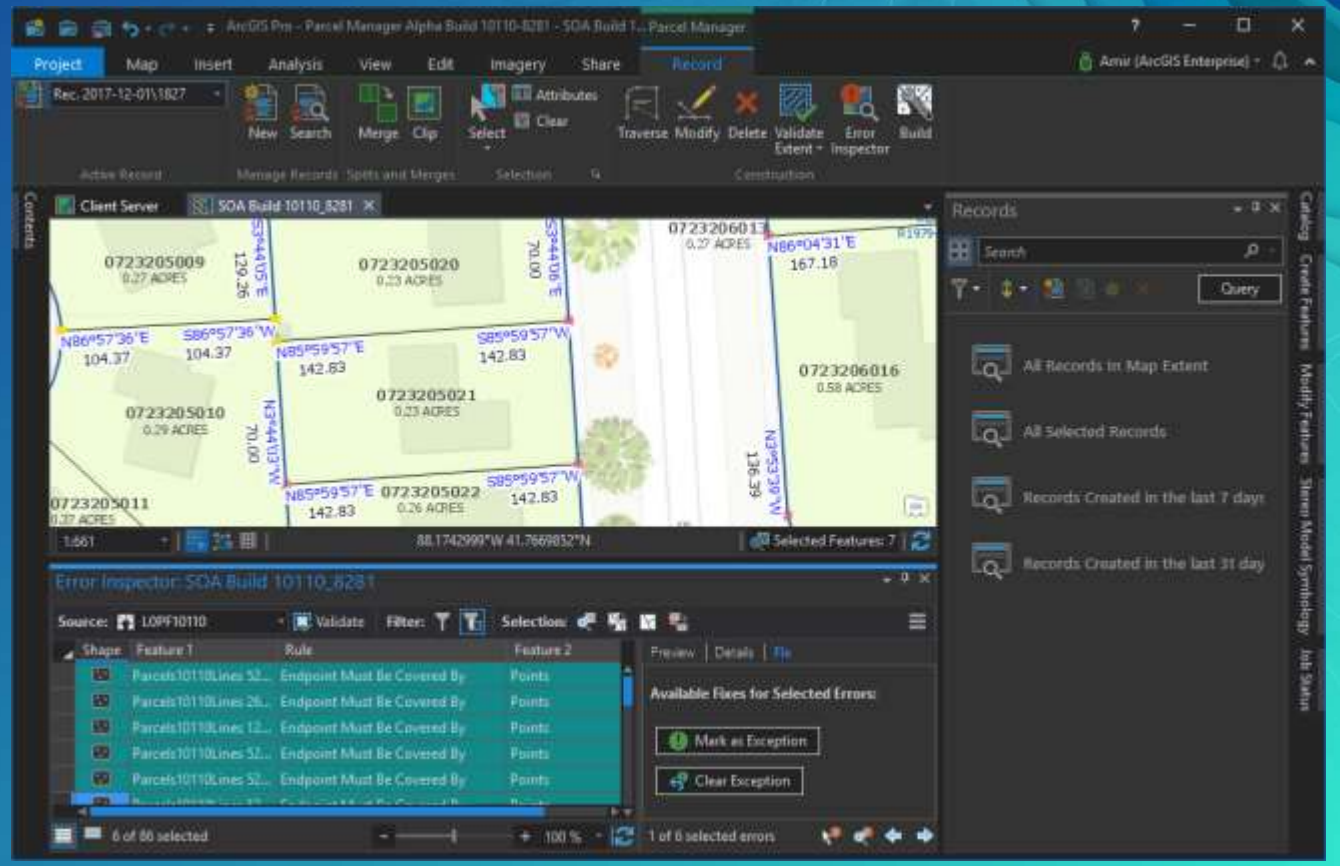
Specifications

Data Models

Workflows

Quality Matters

- Quality is the backbone in every ‘System of Record’
- Best of Breed:
  - Parcel rule engine
  - Topology rule engine
  - Validation rule engine
- Errors that can be visualized (feature service)
- Fix methods for common parcel issues
- Push QA to the field / submitting party



Efficiency

Do more, Do better, in Less time

- Map technicians:
  - Reduced learning curve (same editing UX & Tasks)
  - Efficient data entry (traverse)
  - Attribute rules
- System automation:
  - Geoprocessing tools and Python
  - Rich REST API to geo-enable business systems
  - PRO SDK
- Service based architecture means:
  - Service is always live and current
  - Portal for abstraction and user/role management
  - Less (no) ETL

Configurable Parcel Behavior

- **Administrators can:**
  - Configure parcel behaviors using parcel rules, topology rules and attribute rules
  - Easily migrate data or upgrade existing parcel fabrics for ArcMap
  - Configure maps and layers
  - Automate processes using geoprocessing and tasks
  - Leverage portal to create groups and manage users
  - Use the new low maintenance-high performance Branch versioning
  - …
- **Parcel editors can:**
  - Use any of the editing tools on ArcGIS Pro
  - Validate their edits against the rules
  - Visualize errors and use pre-defined fix methods to fix them
  - Use tasks for repeatable workflows
  - Edit and visualize in 2D & 3D
  - …

ArcGIS Pro Roadmap

https://community.esri.com/docs/DOC-11654-arcgis-pro-roadmap-february-2018

- **Near-term: next 1-2 releases**
- **Mid-term: next 2-3 releases**

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