

**Federal GIS Conference**

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# **Solving Your Top 10 Production Issues with ArcGIS Extensions**

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How can we do production work  
faster, better and cheaper?

# Production issues relate to...

Data

Management

Cartography



# Producing Data

**Data validation is time-consuming**

**Data being created is of poor quality**

**Understanding data quality is difficult**





# Producing Data

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Data being created is of poor quality

Understanding data quality is difficult

Data  
Reviewer  
  
Production  
Mapping



# Managing Production

Knowing if we will meet our deadlines is difficult

There is no consistency in how work is done

Takes too long for new staff to become effective



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Workflow  
Manager

Task  
Assistant



# Producing and Sharing Maps

Getting the same results from multiple cartographers

Difficult to make complex, specification driven maps

Difficult to find the map you need when you need it

Maintaining data and maps at multiple scales is costly



# Producing and Sharing Maps

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Maintaining data and maps at multiple scales is costly

Production  
Mapping

Production  
Mapping  
Server





How can we create **data** better, faster and cheaper?

# Issue 1: Data validation is time-consuming



# Solution 1: Automate data validation with batch jobs

- Encapsulate quality rules
- Configured from 40+ automated checks
- Designed once and executed many times

No duplicates

No Multiparts

Critical  
attributes  
must be  
populated

No overlaps

esri  
ArcGIS Data Reviewer Checks

Database Validation Checks

Connectivity Rules: Returns geometries for features that violate the geometric network connectivity rules.

Domains: Validates coded values and range domains to ensure that all data meet domain constraints.

Relationships: Searches for records that are orphaned or have improper cardinality in a relationship class.

Subtypes: Searches for feature classes with improper or null subtypes.

Table Checks

Execute SQL: Finds features based on a SQL query WHERE clause.

Regular Expression: Finds features with attribute values that violate the regular expression.

Table to Table Attribute: Returns rows whose attributes match those of a feature class or table and/or comply with a user-defined WHERE clause comparing the attributes between feature classes and/or tables.

Unique ID: Checks the values of a set of fields across a set of tables and feature classes for uniqueness within a given workspace.

Default Checks

Topology Checks

Batch Jobs

Default

- Invalid Geometry Check (StructurePnt)
- Invalid Geometry Check (StructureSrf)
- Invalid Geometry Check (TransportationGroundCrv)
- Attribute Checks
  - SQL Check - Controlling Authority Can't be 'No Information' - Building\_S
  - SQL Check - Feature Function Can't be 'No Information' - Building\_S
  - SQL Check - Roof Shape is not defined - Building\_S
- Spatial Checks
  - Multipart Polygon Check - Buildings must not be multipart - Building\_S
  - Multipart Line Check - Road segments cannot be multipart - Road\_C
  - Cutbacks Check - Angle is too sharp - Building\_S
  - Cutbacks Check - Angle is too sharp - Road\_C
  - Geometry on Geometry Check - Buildings must not overlap - Building\_S
  - Buildings and roads must not overlap - Buildings\_S and Road\_C
  - Duplicate Geometry Check - Duplicate building surfaces - Building\_S
  - Duplicate Geometry Check - Duplicate building points - Building\_P



# Solution 1: Automate data validation with batch jobs

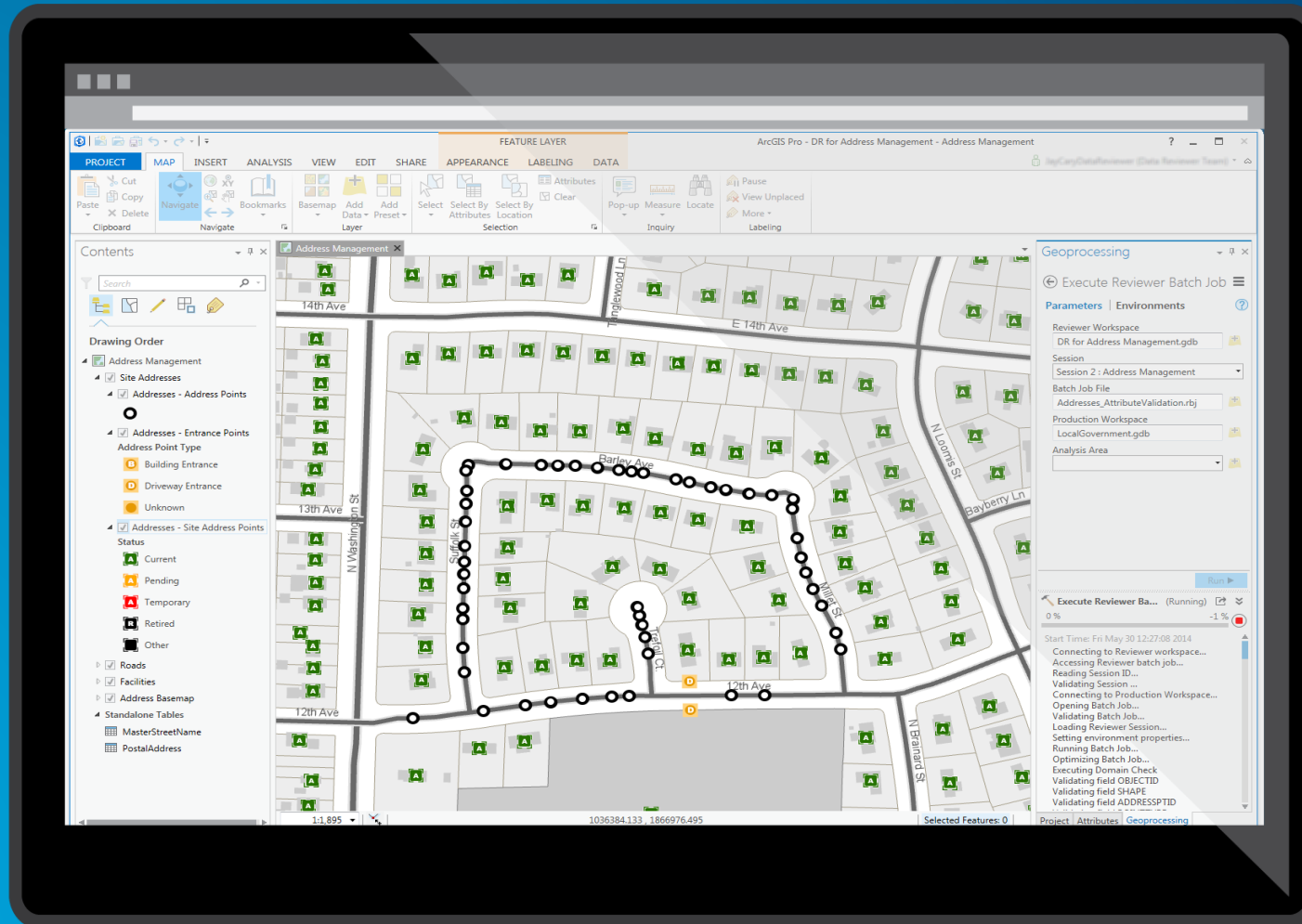
ArcMap

The screenshot displays the ArcMap Data Reviewer interface. The main map shows a network of pipes and valves with various status indicators. The 'Layers' panel on the left lists several data layers, including 'Reviewer Dataset', 'Reviewer Points', 'Reviewer Polylines', and 'Reviewer Polygons'. The 'Reviewer Batch Job Manager' dialog is open, showing a tree view of checks such as 'Duplicate Geometry Check', 'Duplicate Storm Manholes', and 'Valency Check'. The 'Reviewer Table' at the bottom provides a detailed view of the data being reviewed, including columns for record ID, object ID, subtype, reviewer category, and check titles.

RECORDID	OBJECTID	SUBTYPE	REVIEWERCATEGORY	CATEGORY	REVIEWERCODE	SESSIONID	CHECKTITLE	ORIGINCHECK	NO1
519	21		1	Feature Record	202	1	Domain Check	Domain Check	
520	23		1	Feature Record	202	1	Domain Check	Domain Check	
521	24		1	Feature Record	202	1	Domain Check	Domain Check	

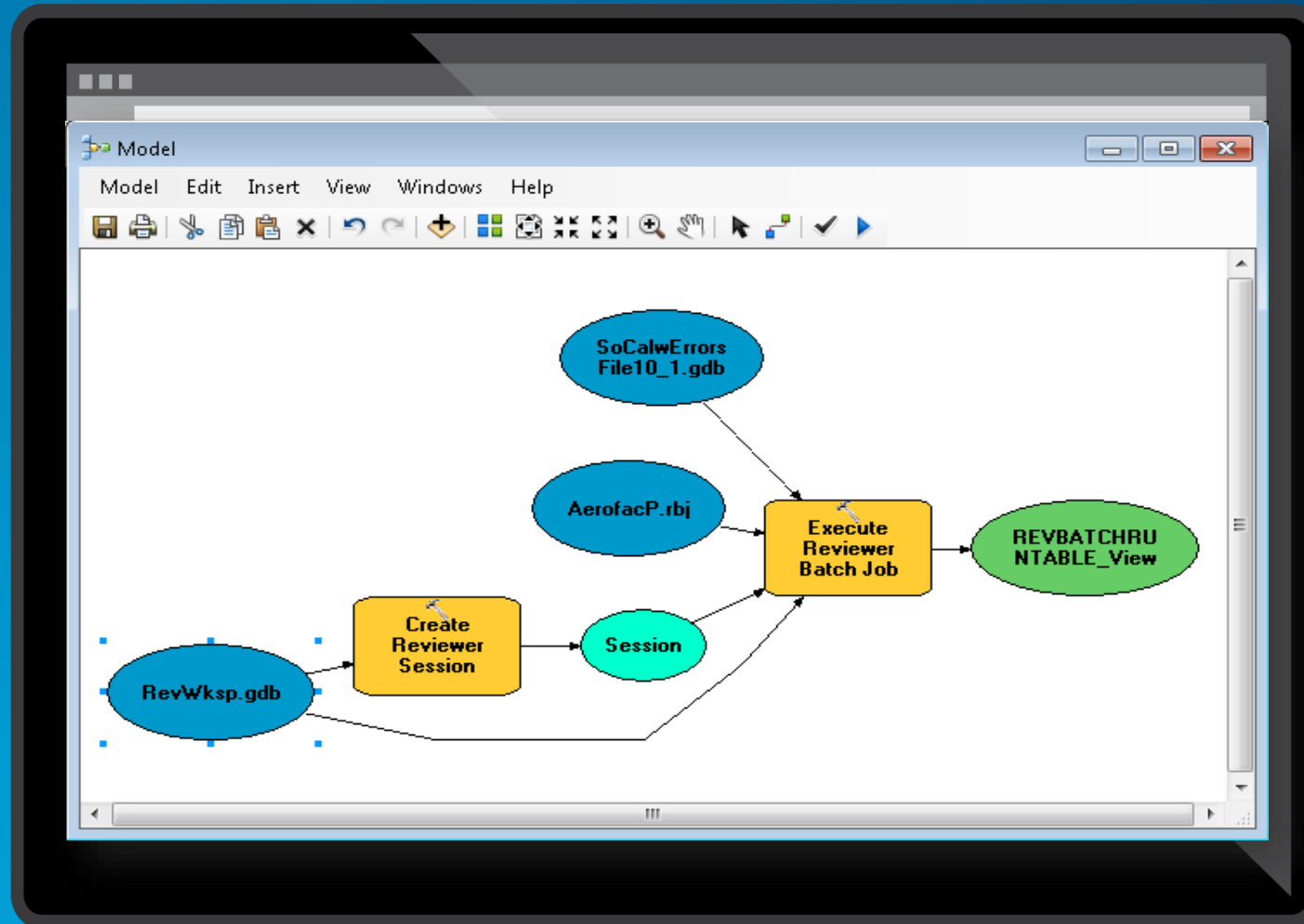
# Solution 1: Automate data validation with batch jobs

ArcGIS Pro



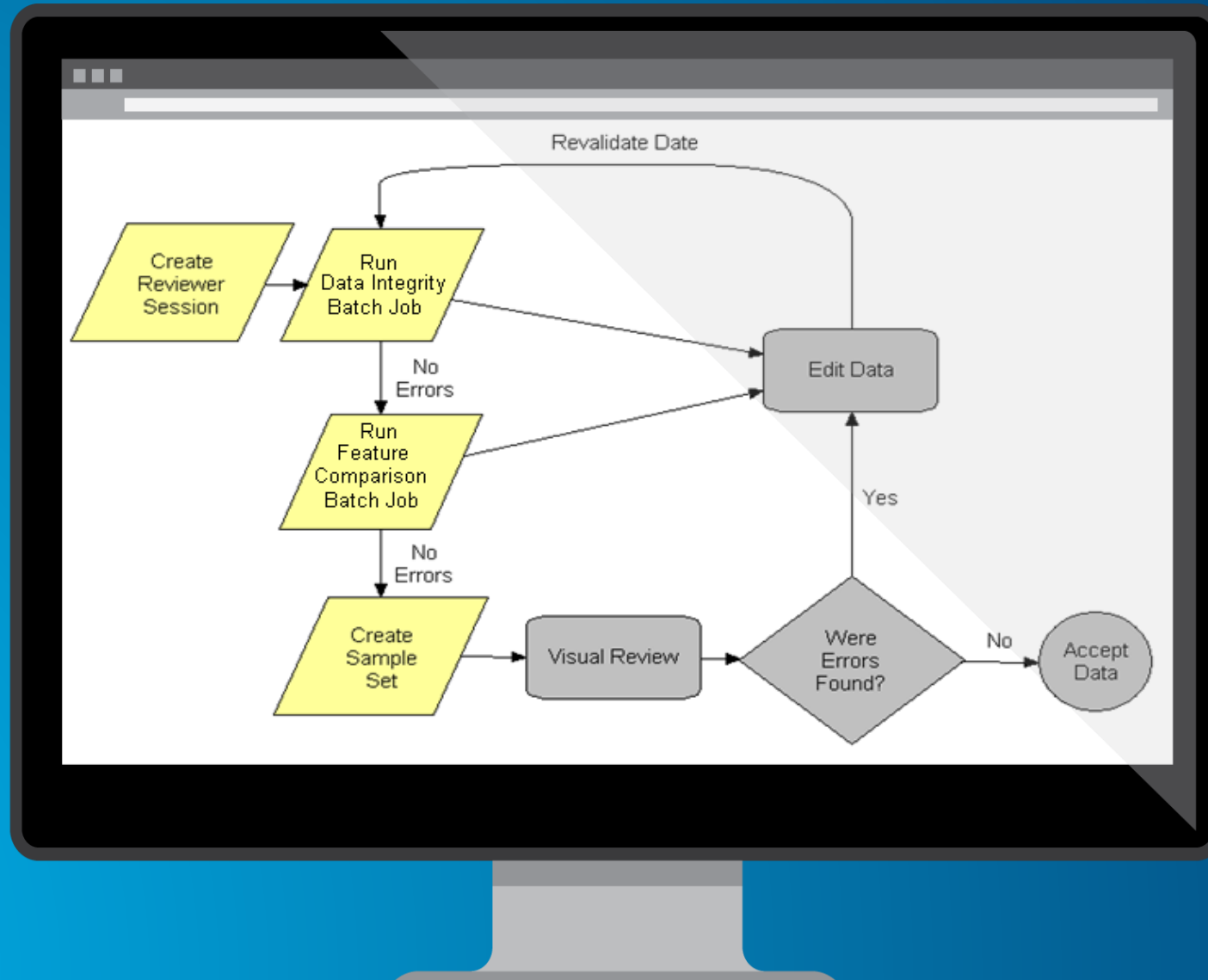
# Solution 1: Automate data validation with batch jobs

Models/Python scripts



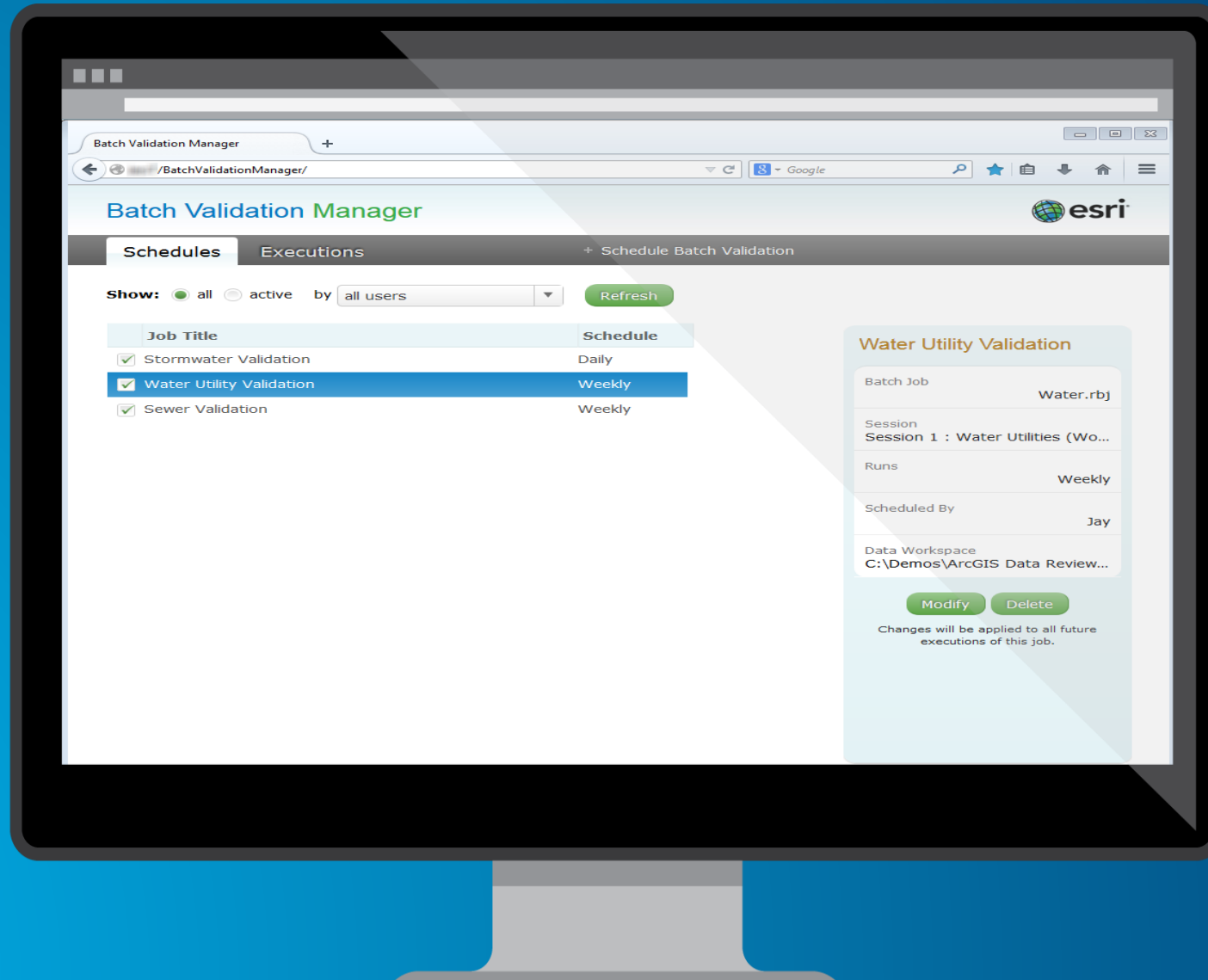
# Solution 1: Automate data validation with batch jobs

ArcGIS Workflow Manager



# Solution 1: Automate data validation with batch jobs

ArcGIS Data Reviewer for Server



## Issue 2: Data being created is of poor quality

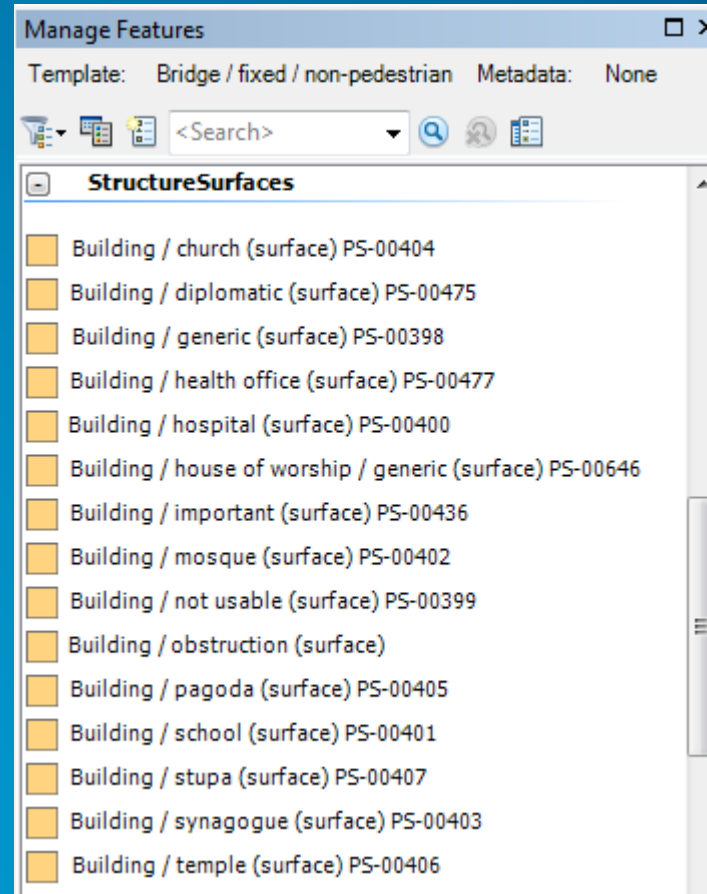
The diagram illustrates three data quality issues in a GIS context:

- Multipart features:** A light green polygon with a cyan outline is shown as two separate, adjacent shapes, indicating that a single feature is represented by multiple parts.
- Duplicates:** A light green rectangle with a cyan outline is shown with a small window titled "StructureSurfaces" overlaid on it. The window lists two entries, both labeled "Building", representing duplicate records for the same feature.
- Missing Attribute values:** A light green rectangle with a cyan outline is shown with a table of attributes overlaid on it. The table has two columns: the attribute name and its value. The "Controlling Authority" attribute has the value "No Information", which is circled in red to highlight the missing data.

Attribute	Value
Area	-999999
Controlling Authority	No Information
Creation Date and Time	noInformation

## Solution 2: Validate features while editing

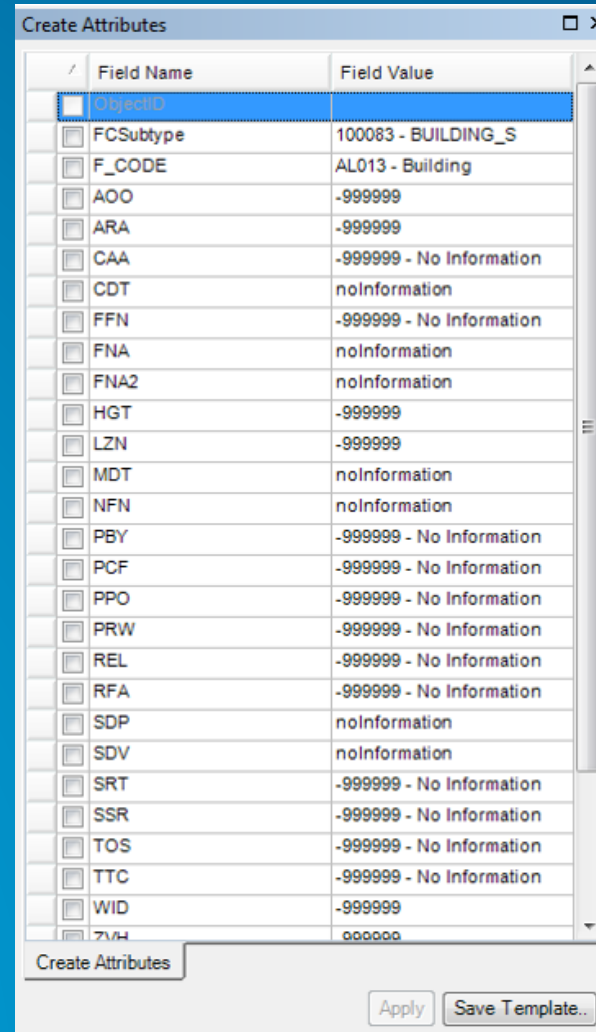
- Enforce standards
  - Templates





## Solution 2: Validate features while editing

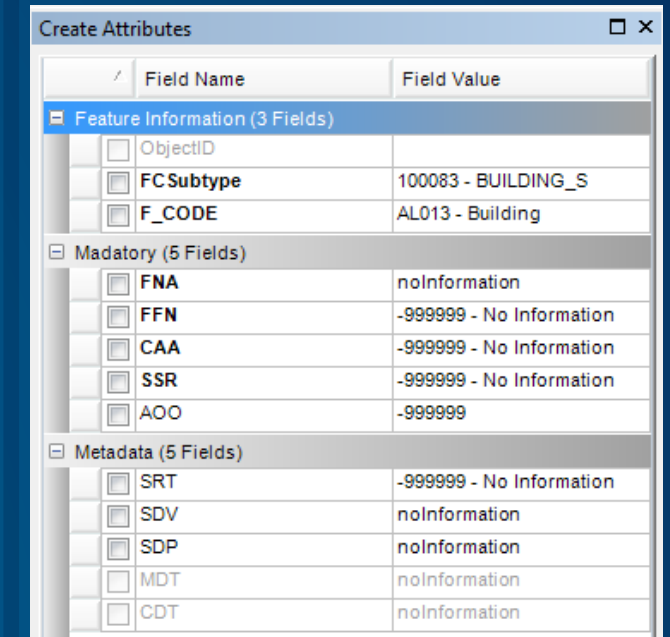
- Enforce standards
  - Templates
  - Attribute display



The 'Create Attributes' dialog box displays a table with the following data:

Field Name	Field Value
<input checked="" type="checkbox"/> ObjectID	
<input type="checkbox"/> FCSubtype	100083 - BUILDING_S
<input type="checkbox"/> F_CODE	AL013 - Building
<input type="checkbox"/> AOO	-999999
<input type="checkbox"/> ARA	-999999
<input type="checkbox"/> CAA	-999999 - No Information
<input type="checkbox"/> CDT	noInformation
<input type="checkbox"/> FFN	-999999 - No Information
<input type="checkbox"/> FNA	noInformation
<input type="checkbox"/> FNA2	noInformation
<input type="checkbox"/> HGT	-999999
<input type="checkbox"/> LZN	-999999
<input type="checkbox"/> MDT	noInformation
<input type="checkbox"/> NFN	noInformation
<input type="checkbox"/> PBY	-999999 - No Information
<input type="checkbox"/> PCF	-999999 - No Information
<input type="checkbox"/> PPO	-999999 - No Information
<input type="checkbox"/> PRW	-999999 - No Information
<input type="checkbox"/> REL	-999999 - No Information
<input type="checkbox"/> RFA	-999999 - No Information
<input type="checkbox"/> SDP	noInformation
<input type="checkbox"/> SDV	noInformation
<input type="checkbox"/> SRT	-999999 - No Information
<input type="checkbox"/> SSR	-999999 - No Information
<input type="checkbox"/> TOS	-999999 - No Information
<input type="checkbox"/> TTC	-999999 - No Information
<input type="checkbox"/> WID	-999999
<input type="checkbox"/> Z/A	oooooo

Buttons: Apply, Save Template..



The 'Create Attributes' dialog box displays a grouped view of fields:

- Feature Information (3 Fields)**
  - ObjectID
  - FCSubtype (100083 - BUILDING\_S)
  - F\_CODE (AL013 - Building)
- Mandatory (5 Fields)**
  - FNA (noInformation)
  - FFN (-999999 - No Information)
  - CAA (-999999 - No Information)
  - SSR (-999999 - No Information)
  - AOO (-999999)
- Metadata (5 Fields)**
  - SRT (-999999 - No Information)
  - SDV (noInformation)
  - SDP (noInformation)
  - MDT (noInformation)
  - CDT (noInformation)



## Solution 2: Validate features while editing

- Enforce standards
  - Templates
  - Attribute display
- On-the-fly

Create Attributes

Field Name	Field Value
Feature Information (3 Fields)	
<input type="checkbox"/> ObjectID	
<input type="checkbox"/> FCSubtype	100083 - BUILDING_S
<input type="checkbox"/> F_CODE	AL013 - Building
Mandatory (5 Fields)	
<input type="checkbox"/> FNA	noInformation
<input type="checkbox"/> FFN	-999999 - No Information
<input checked="" type="checkbox"/> CAA	5 - Military
<input checked="" type="checkbox"/> SSR	41 - Flat
<input type="checkbox"/> AOO	-999999
Metadata (5 Fields)	
<input type="checkbox"/> SRT	-999999 - No Information
<input type="checkbox"/> SDV	noInformation
<input type="checkbox"/> SDP	noInformation
<input type="checkbox"/> MDT	noInformation
<input type="checkbox"/> CDT	noInformation

Validation Results

**Errors (1):**

**SQL Check - Feature Function Can't be 'No Information' - Building\_S:** Each building must have a Feature Function Value, please define a value.

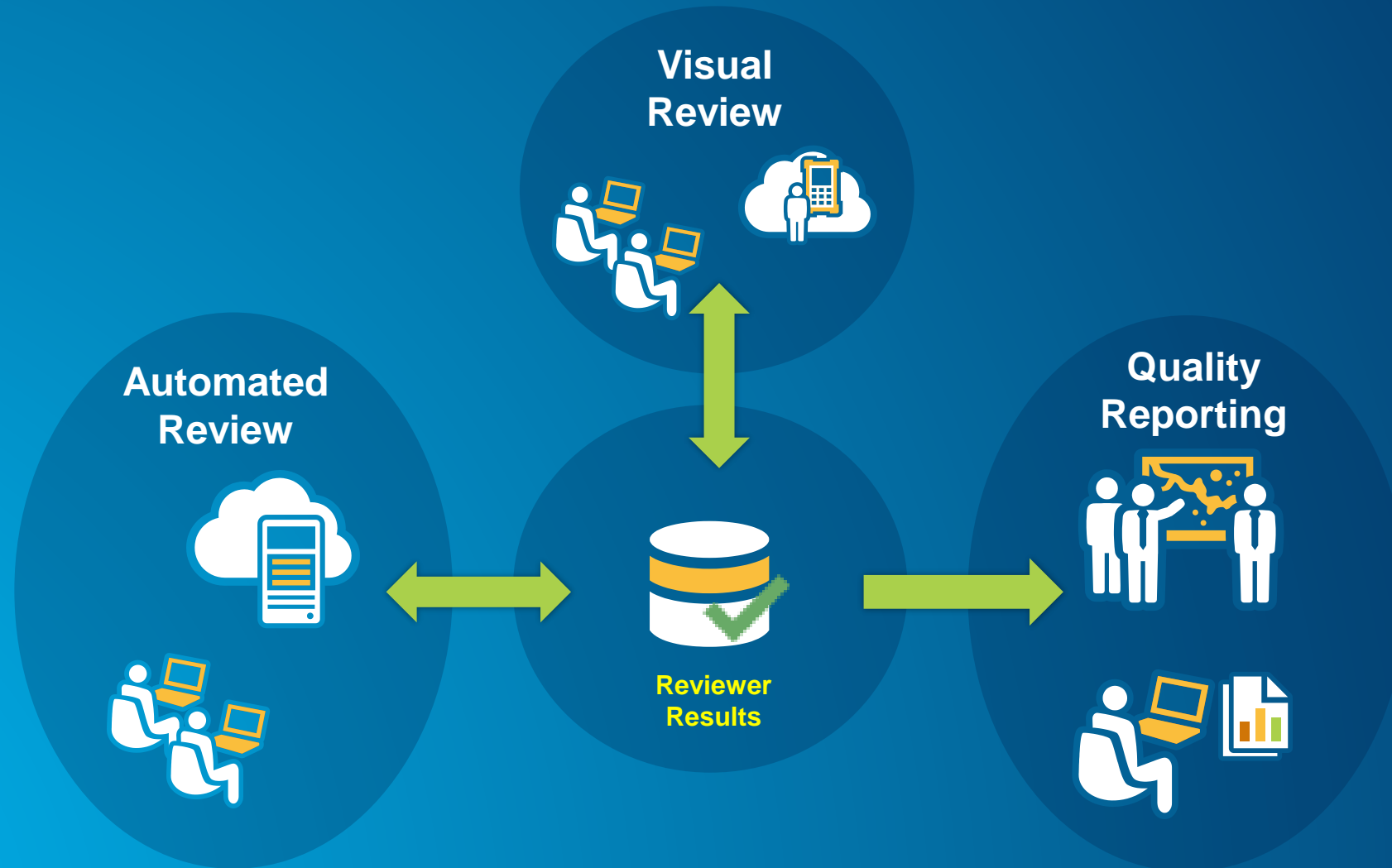
OK

# Issue 3: Understanding data quality is difficult



*How Can We Make it Pervasive?  
... Involving Everyone*

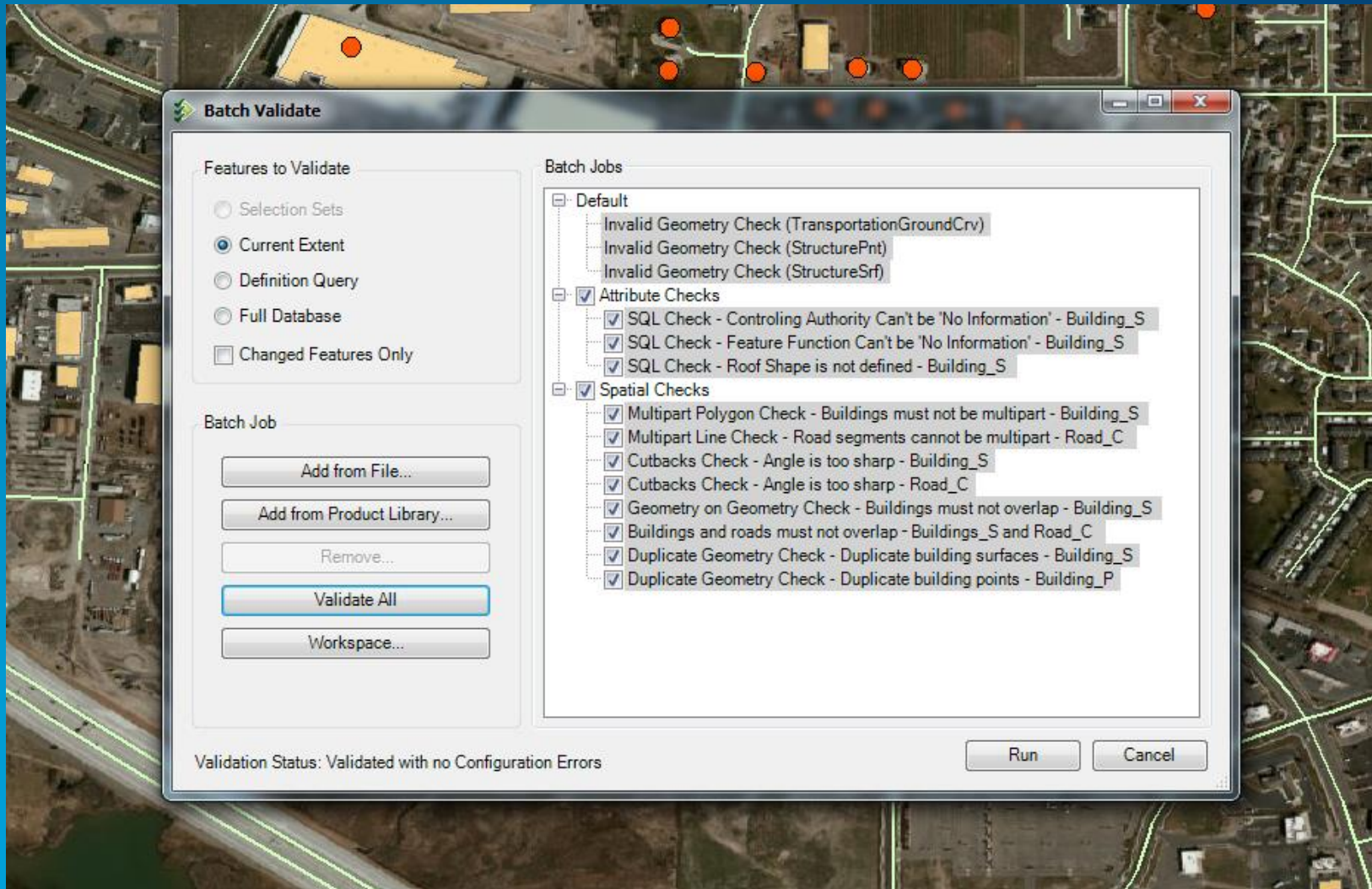
## Solution 3: Centralize quality results in a geodatabase





# Data validation

Sherry Fagin



For analysts, we're encapsulated data validation rules in a batch job.



The screenshot displays the ArcMap interface with a map showing a yellow building footprint. A validation error dialog box is open, stating: "Errors (1): SQL Check - Roof Shape is not defined - Building\_S: Roof shape is not defined. Please define a roof shape, if possible." Below the map, the Reviewer Table is visible, showing a table of validation results.

Phase	Status	Source Subtype	Check Title	Check Notes	Severity	Description	Created On	Created By	Corrected On	Correction Notes	Corrected By	Verified On	Verification Notes	Verified By
	Reviewed	BUILDING_S	SQL Check - Controlling Autho...	Each building must have a cont...	2	(CAA = -999999)	Tuesday, February 10, 201...	QC Tech	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
	Reviewed	BUILDING_S	SQL Check - Roof Shape is not defi...	Roof shape is not defined. Please...	2	(SSR = -999999)	Tuesday, February 10, 201...	QC Tech	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>

For editors, we're using templates, field configurations and on-the-fly validation to ensure new errors are not introduced.

### Automated Check Report By Origin Table

Report generated on 2/10/2015 7:42 AM

Reviewer Workspace Location: C:\Demo\FedGIS\Top10\FedGIS\_Top10\_Final\ReviewerWorkspaceTop10.gdb

Session(s): Session 8 : QC Tech

Batch Job Name	Date/Time	Origin Table	Check Type	Check Title	Severity	Records Validated	Total Results	Total Percent Accuracy	Distinct Results	Distinct Percent Accuracy
C:\Users\Documents\CTM_FedGIS_Checks_v1.1.rbj						1455	40	97.25%	24	98.35%
	2/10/2015 12:38:17 PM									
		StructurePnt				60	4	93.33%	4	93.33%
			Duplicate Geometry Check							
				Duplicate Geometry Check - Duplicate building points - Building_P	3	30	4	86.67%		
			Invalid Geometry Check							
				Invalid Geometry Check (StructurePnt)	5	30	0	100.00%		
		StructureSrf				495	36	92.73%	20	95.96%
			Cutbacks Check							
				Cutbacks Check - Angle is too sharp - Building_S	2	55	0	100.00%		
			Duplicate Geometry Check							
				Duplicate Geometry Check - Duplicate building surfaces - Building_S	2	55	8	85.45%		
			Execute SQL Check							
				SQL Check - Controlling Authority Can't be 'No Information' - Building_S	2	55	4	92.73%		
				SQL Check - Feature Function Can't be 'No Information' - Building_S	1	55	1	98.18%		
				SQL Check - Roof Shape is not defined - Building_S	2	55	4	92.73%		

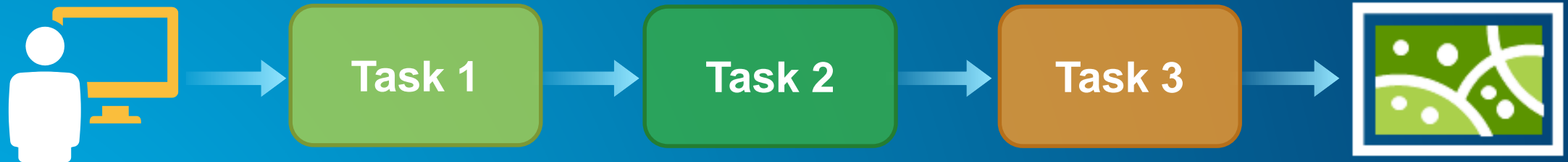
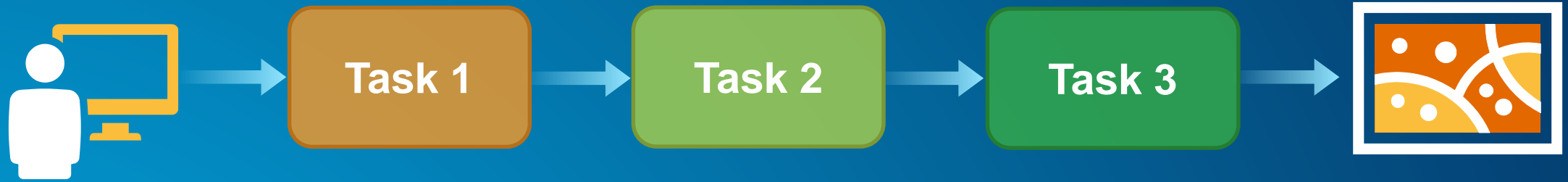
For managers, we've equipped them with automated reporting capabilities from desktop and server.



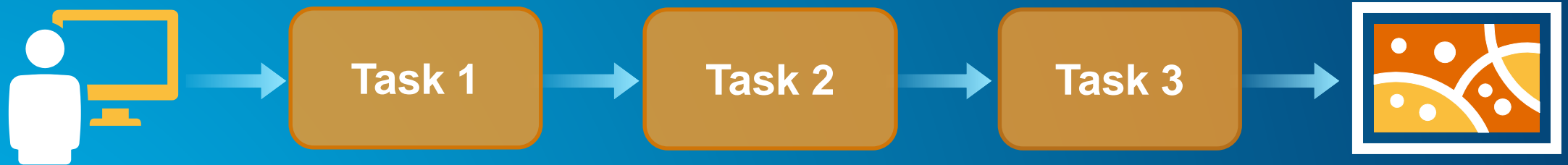
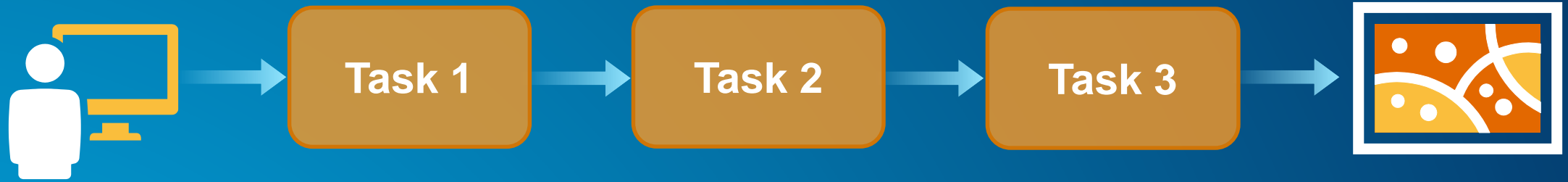
How can we **manage** our work to make better, faster and cheaper products?



## Issue 4: Keeping staff on task

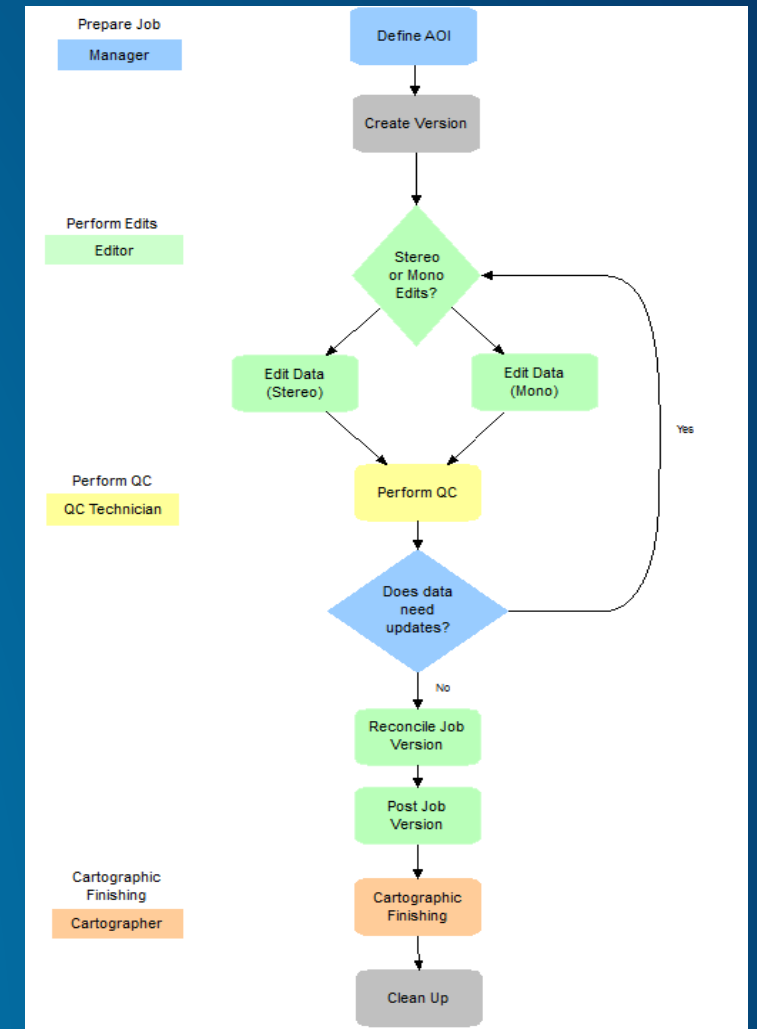


## Solution 4: Keeping staff on task

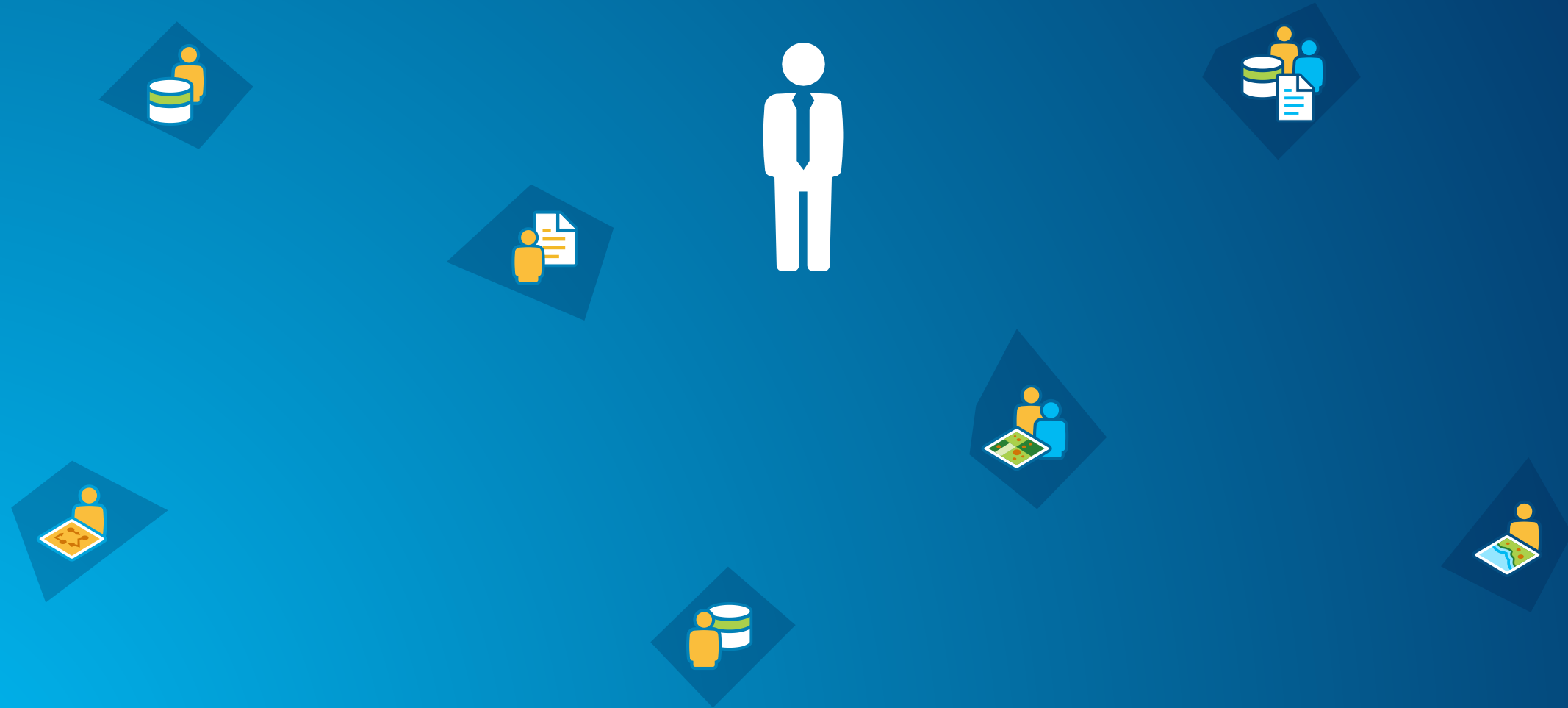


# Solution 4: Defining workflows with Workflow Manager

- Configurable to your business processes
- Repeatable across projects and areas
- Cross team interaction



# Issue 5: Keeping staff on time



# Solution 5: Managing jobs with Workflow Manager

- Jobs - unit of work
- Descriptive properties
  - Assignment
  - Dates
  - Data
  - Area of interest
  - History

The image displays a software interface for managing jobs. On the right, a window titled "Job Query Results - Map View" shows a map with a grid overlay. Several job locations are marked with labels: Job 1, Job 2, Job 5, Job 6, Job 7, Job 8, Job 9, Job 1210, Job 1612, Job 2012, Job 2412, Jollyville, Round Rock, Georgetown, and Taylor. Job 2412 is highlighted with a red box and labeled "Austin".

On the left, a "Job Properties" dialog box is open, showing details for Job ID: 1612. The job is in "Editing" status, with the "Current Step" set to "Visual Review". It is "5% Complete" and has an "AOI Defined". The "General" tab is selected, showing the following fields:

Assignment:	QA/QC Technician
Job Owner:	GIS Manager
Job Name:	TOPO_JOB_1612
Priority:	High
Parent Job:	

The dialog box also includes tabs for "Dates", "Data Workspace", and "Description", and a toolbar at the bottom with icons for "Properties\*", "Extended Properties", "History", "Notes", "AOI", "Attachments", and "Hold".

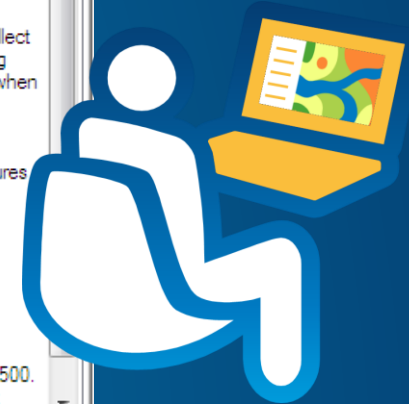
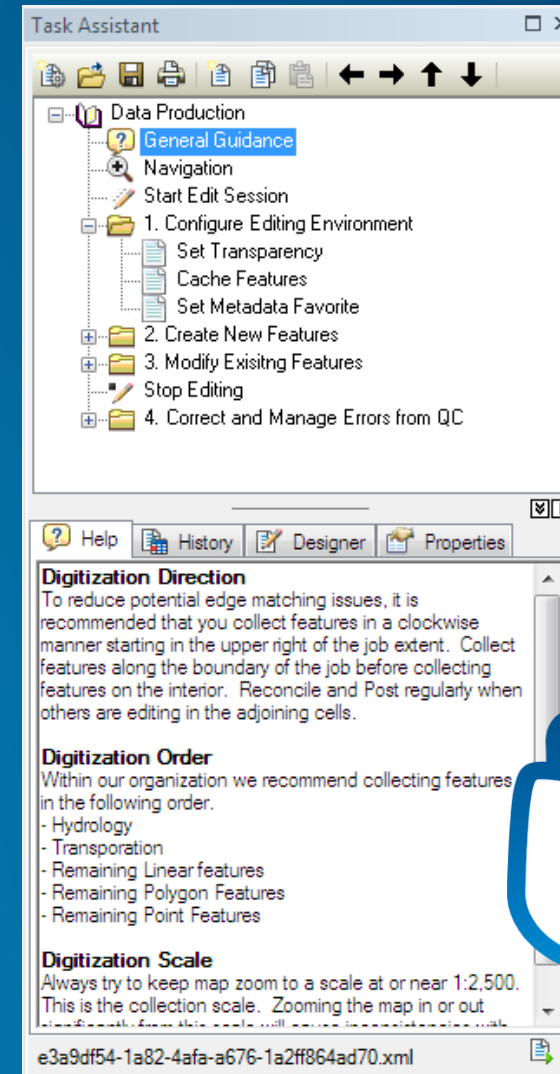
In the bottom right corner, there is a circular diagram illustrating a workflow. It features a central database icon (cylinder) with arrows pointing to and from various icons representing people, documents, and data sources. A large white silhouette of a person in a suit stands to the right of the diagram.

## Issue 6: Training new staff



# Solution 6: Executing task based workflows with Task Assistant

- Share knowledge
  - Experienced users create
  - New users execute
- Communicate best practices
- Integrated into ArcMap



# Case Study

Timmons Group  
Courtney Moore

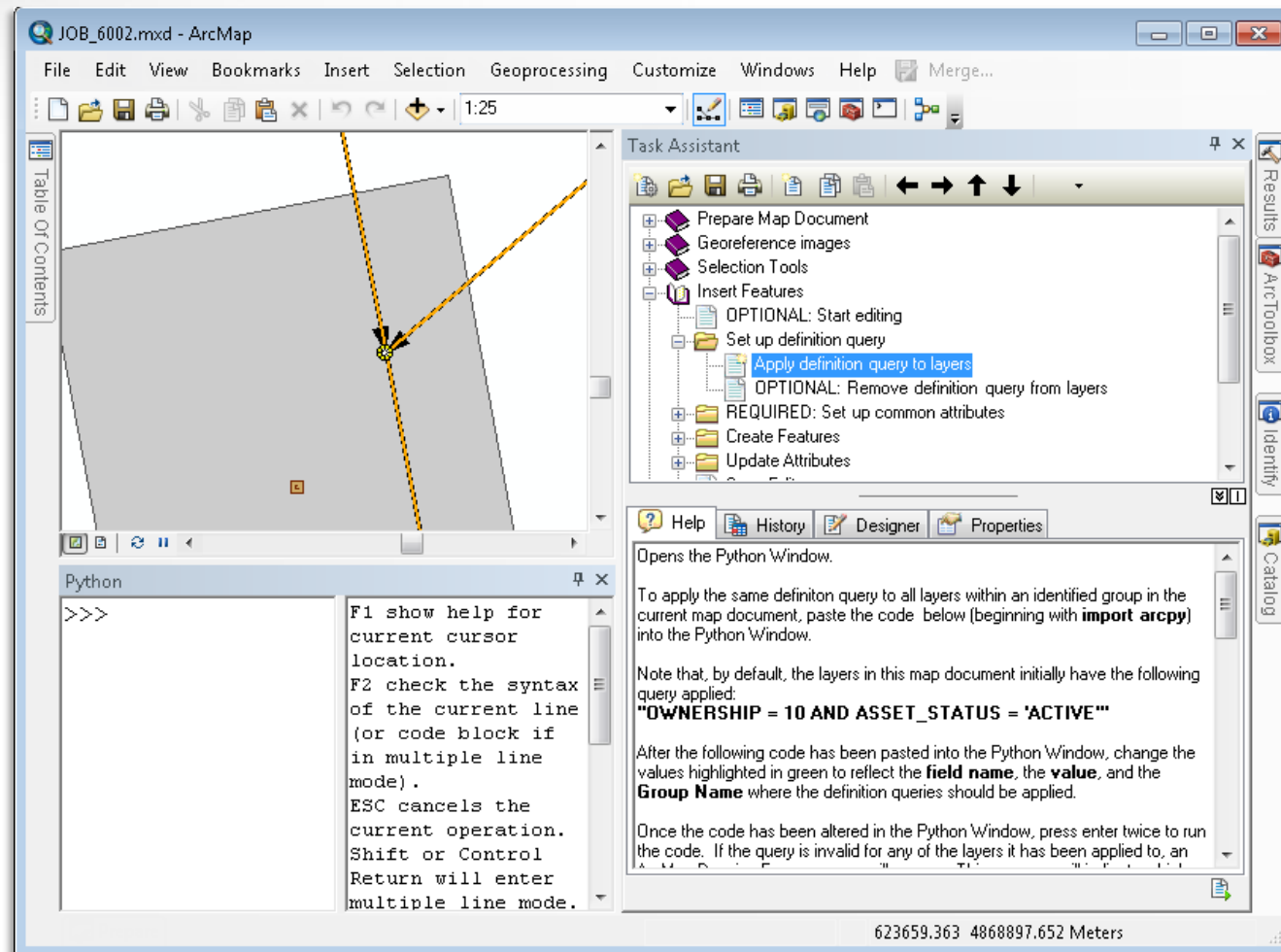


# York Region Canada

- ✓ Geographic Information Systems Branch (GISB)
- ✓ Previous tools: Feature Object Class Extensions
- ✓ Migrated to: Esri's Production Mapping



# Guided Editing with Task Assistant Manager



# Automating Editing with TAM

The screenshot displays two windows from the ArcGIS software interface. The 'Layer Item Editor' window is in the foreground, showing a list of layer members and their properties. The 'Task Assistant' window is in the background, showing a list of tasks and their associated settings.

**Layer Item Editor**

Check layers to include them in the Task Assistant Step. Selecting layers displays their properties in the Property Grid where they can be edited.

Dataframe: Layers

Layer Members:

- Water
- GoSync
- GOSYNCADMIN.w\_Valve\_Inspe
- GOSYNCADMIN.w\_UGEncl\_Ins
- WW\_W.Water\_Network\_Juncti
- WW\_W.w\_Chamber
- WW\_W.w\_Fitting
- WW\_W.w\_Valve
- WW\_W.w\_SamplingStation
- Facility
- WW\_W.w\_FlowMeter
- WW\_W.w\_PumpingStation
- WW\_W.w\_ProductionWell
- WW\_W.w\_TreatmentPlant
- WW\_W.w\_WaterStorage

Layer Properties:

Appearance	
Name	WW_W.w_Fitting

TOC	
All TOC	Unchanged
Selectable	On
TOC Highlight	Unchanged
Visibility	On

Selectable  
The initial layer feature selectability

Set All Selected Layers Visibility Off Set

Reset All Reset Layer Clear All Ok Cancel

**Task Assistant**

Prepare Map Document

Georeference images

Selection Tools

- Clear selection
- Make Water layers selectable**
- Make Wastewater layers selectable

Insert Features

Modify Features

Delete Features

Basic QAQC

Save and Exit

Help History Designer Properties

Name	Make Water layers selectable
<b>ArcMap</b>	
Commands	Command Items
Data Frame	Layers
Feature Template	Template Settings
Geoprocessing	Geoprocessing Items
Layers	Layer Settings
Snapping	Snapping Settings

Layers  
A list of layer information associated with the step

# Manage Features & Attribute Window

**Roads**  
Grid ID: Selected: X of XXX

Standard | Additional | Comments | Metadata

Undo Zoom

Full Name:  Road Class:

Left From Address:  Left From Source:  Flow:

Left To Address:  Left To Source:  One Way:

Right From Address:  Right From Source:

Right To Address:  Right To Source:  Segment ID:

Left Zone:  Left Party:  Road Number:

Right Zone:  Right Party:  Road Segment:

Yield Range:

Edit Street Name Create New Name

File M Value Resolution M Value Copy Paste

Back Next Mass Attribute Update Apply Cancel OK

Manage Features

Template: 1050 Metadata: None

force

**WW\_W.ww\_WastewaterForceMain**

- 100
- 1050**
- 1200
- 150

Create Update Metadata Selections: 0

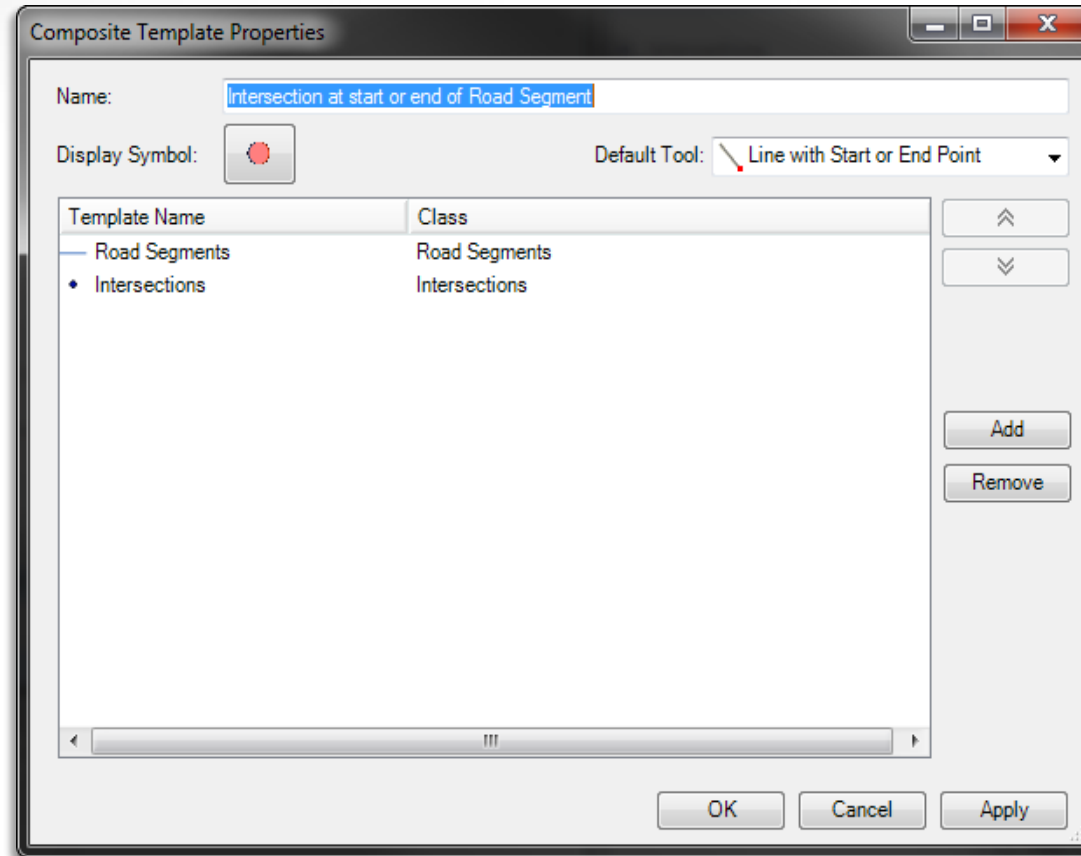
Create Attributes

Field Name	Field Value
<input type="checkbox"/> DATACAPTURE_METHOD	As Built
<input type="checkbox"/> MUNICIPALITY	<Null>
<input type="checkbox"/> INSTALL_DATE	<Null>
<input type="checkbox"/> ASSUMPTION_DATE	<Null>
<input type="checkbox"/> COMMISSION_DATE	<Null>
<input type="checkbox"/> HUB	<Null>
<input type="checkbox"/> ASSET_STATUS	Active
<input type="checkbox"/> FLOW_MEASUREMENT_ID	<Null>

Create Attributes

Apply Save Template..

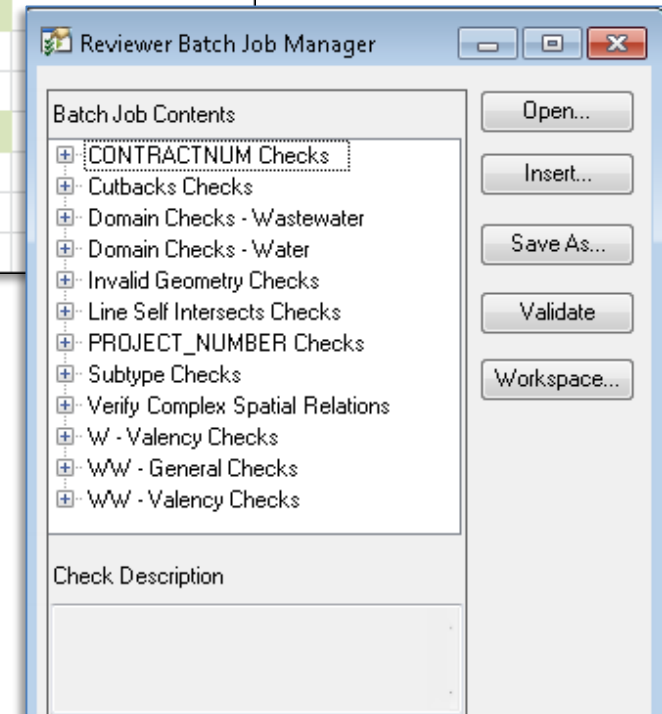
# Composite Template Construction Tools





# Data Quality with Data Reviewer

Wastewater Network Valency Checks			
Check #	Error Description	Check Description and Data Reviewer Parameters	Hard Fail (Yes/No)
Check 1a	Reducer not connected to exactly 2 Gravity Main pipes	Searches for points or nodes of linear features that intersect with a specified number of linear features	
	Valency Check	Feature Class / Subtype 1: ww_Fitting: Reducer	
		Where Clause: ASSET_STATUS = 'Active'	
		Fields to Include for Feature Class 1: None	
		Feature Class 2: ww_WastewaterGravityMain	
		Where Clause: ASSET_STATUS = 'Active'	
		Fields to Include for Feature Class 2: None	
		Validation Method: Valency at point location	
		Valency Operation: <> (not equal to) 2	



# Reporting with Data Reviewer

## Report By Total Record Count

Report generated on 10/22/2012 10:49 AM by jenniferk  
Reviewer Workspace Location: K:\projects\QAQC\DataRev.gdb  
Session(s): Session 1 : QA/QC

Origin Table	Check Type	Check Title	Total Records*	Total Results	Total Percent Accuracy	Distinct Results	Distinct Percent Accuracy
PAR.DBO.Addresses			95	1	98.95%	1	98.95%
	Commit to Reviewer Table Tool						
		Commit to Reviewer Table Tool	95	1	98.95%		
PAR.DBO.Parcels			5929	31	99.48%	31	99.48%
	Batch Check						
		Domain Value Check	5929	6	99.90%		
	Batch Check						
		Geometry Check	5929	25	99.58%		
Total			6024	32	99.47%	32	99.47%

\*This report is based on the total number of records in the Origin Table at the time this report is generated.

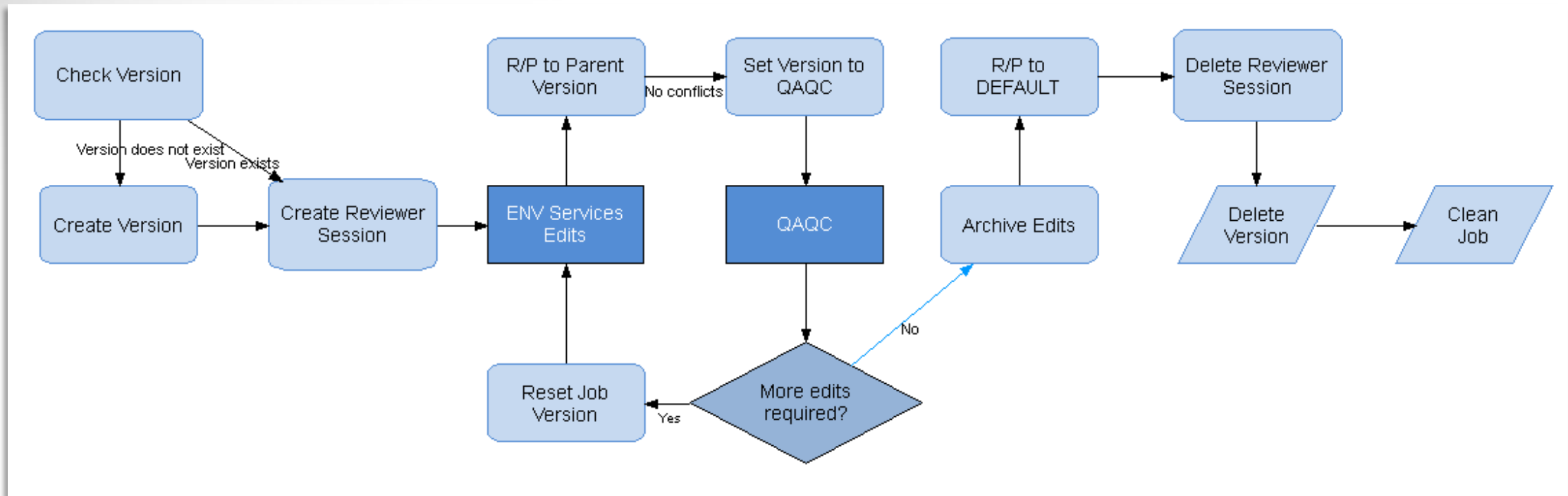
# On-the-Fly Validation

The screenshot displays the ArcMap interface with a map of parcel boundaries and address points. A 'QA/QC Tools' panel is visible on the left, showing 'Selected Records' and 'Current Extent' options, along with a search field and buttons for 'Query', 'Cancel', and 'Export Results'. The 'Number of features selected: 1' is shown at the bottom of the panel. A 'Validation Results' dialog box is open in the center, displaying a warning: 'ADDPTTYPE is NULL: Address Point Type (ADDPTTYPE) is required.' The background map shows a grid of parcels with several red dots representing address points. A 'Manage Features' panel is also visible on the right, showing the 'Address Points' layer and the 'Windward Crescent' feature selected. A 'Reviewer Table' is visible at the bottom of the map, showing the following data:

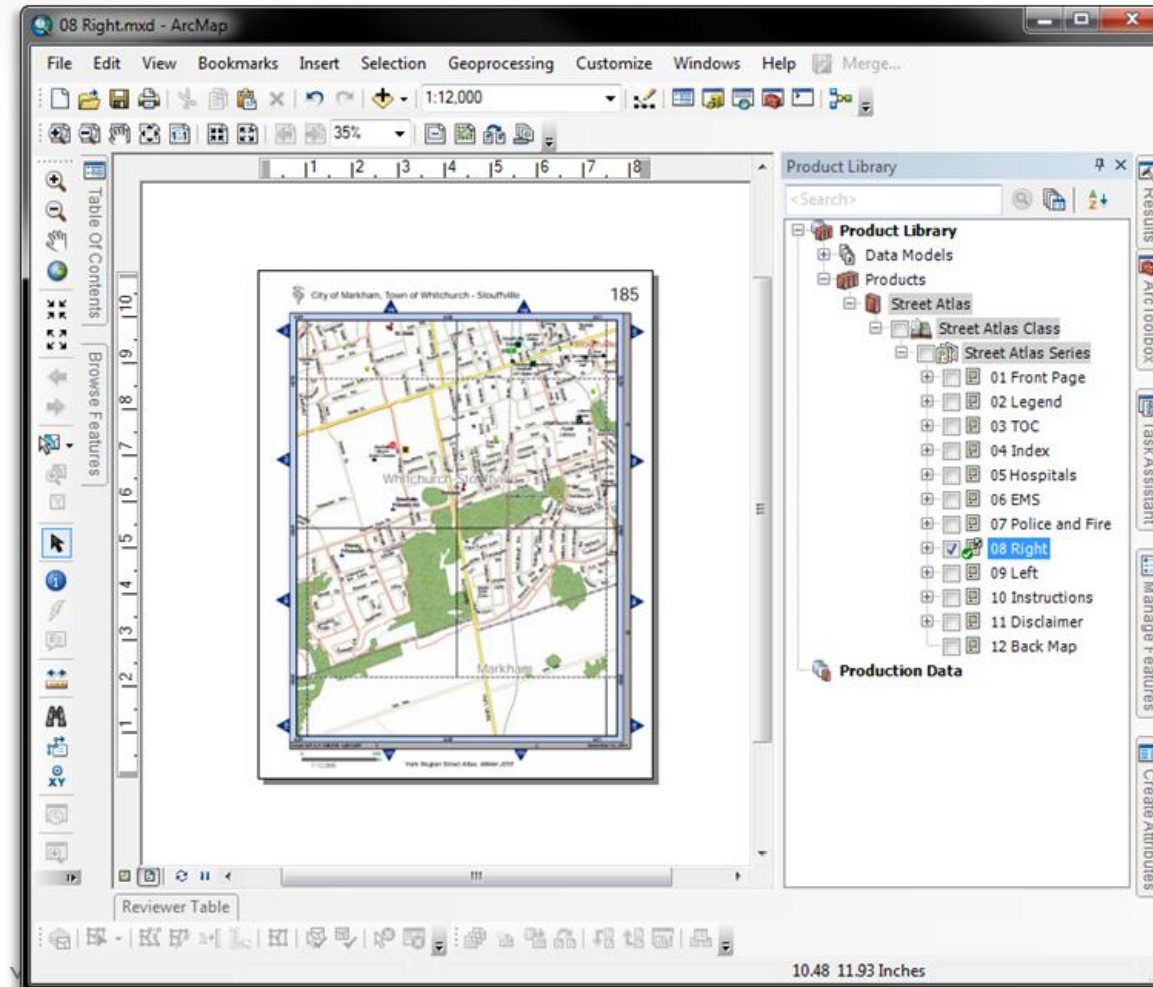
Field Name	Value
ADDPTID	148404
ADDPTTYPE	<Null>
ATTMODBY	<Null>
ATTMODDT	<Null>
BLOCKID	<Null>



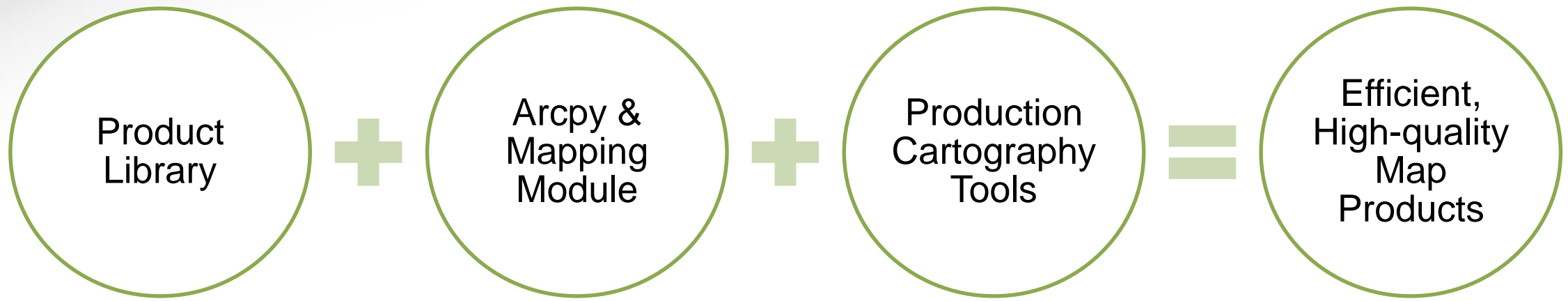
# Process Management with Workflow Manager



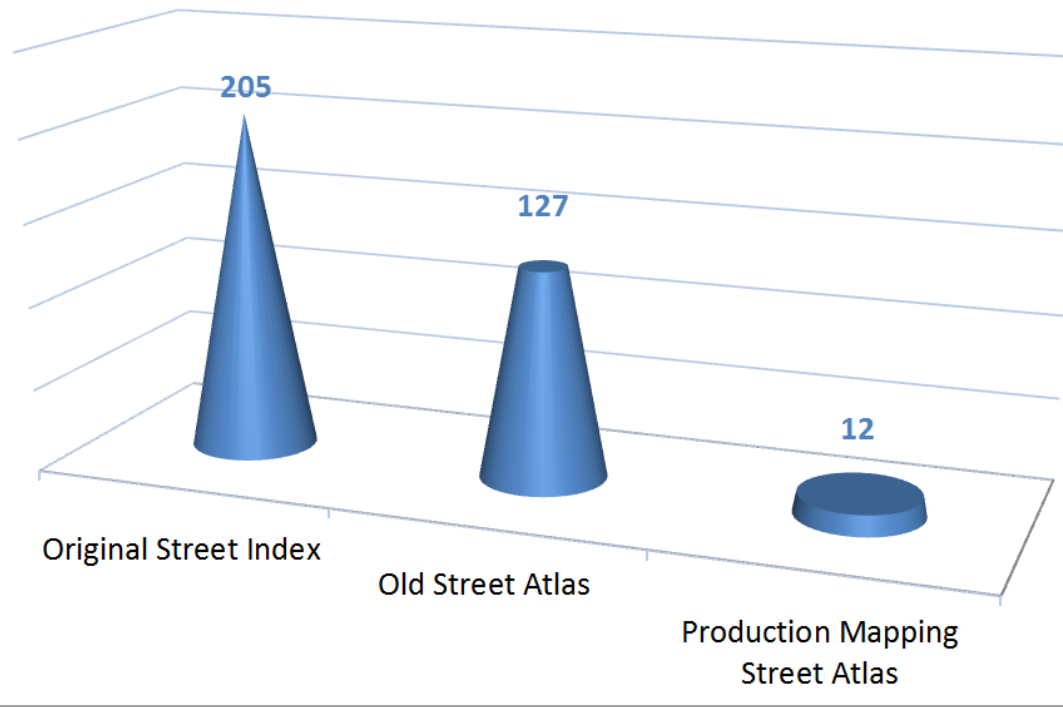
# Atlas Production with Product Library



# Atlas Production with Product Library



### Hours Required to Produce A Single Street Atlas Issue



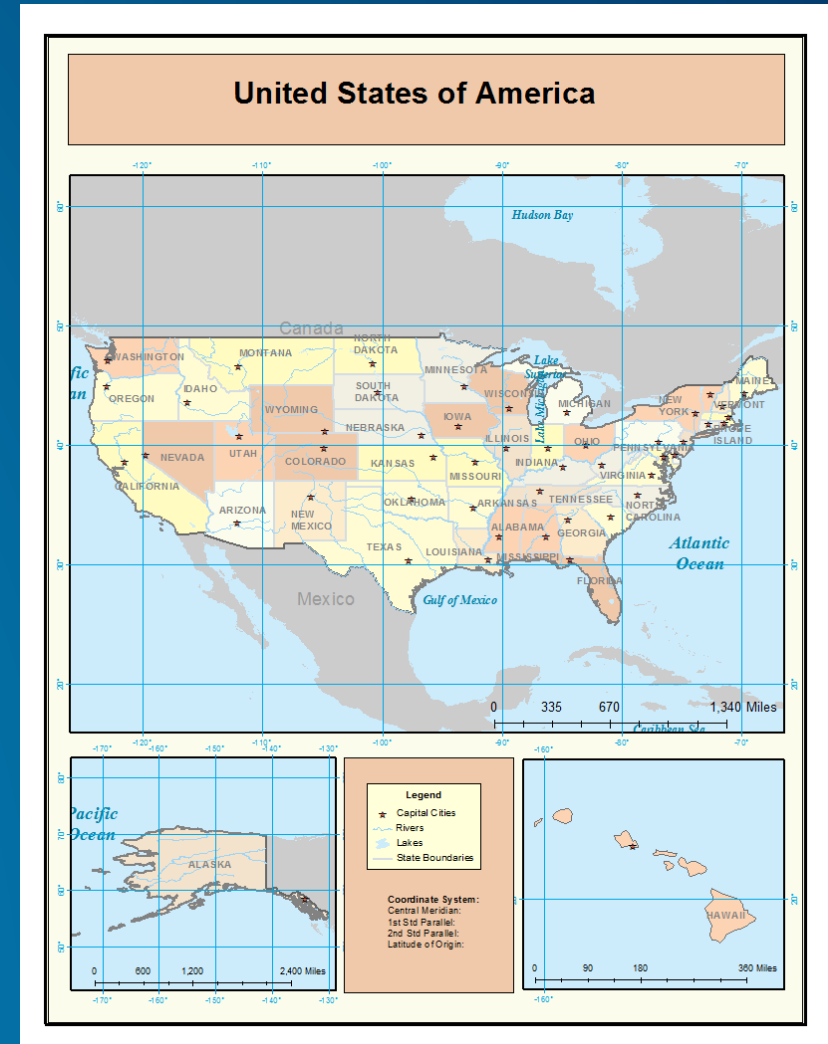
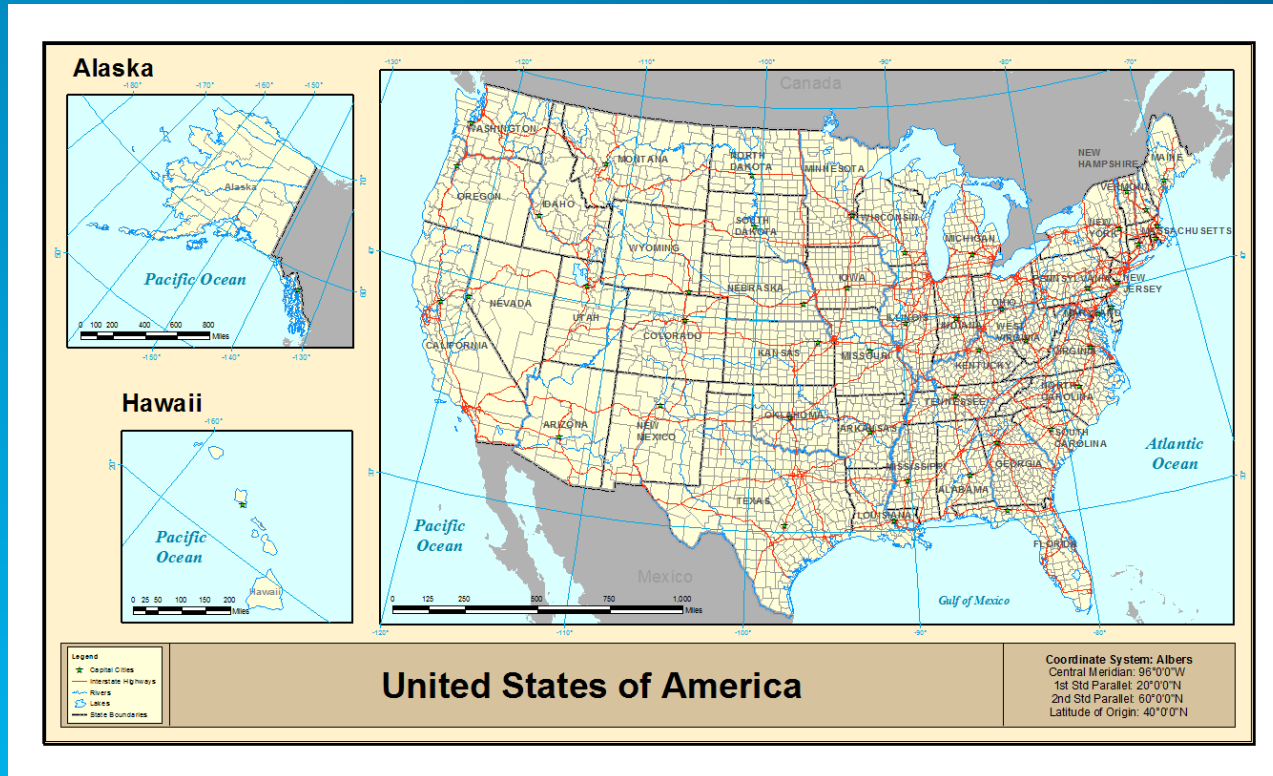
This result represents a gain of over 40 person hours each time the Street Atlas is produced, and a simpler, more repeatable and accessible process.



How can we create **cartographic output** better, faster and cheaper?



# Issue 7: Getting the same results from multiple cartographers



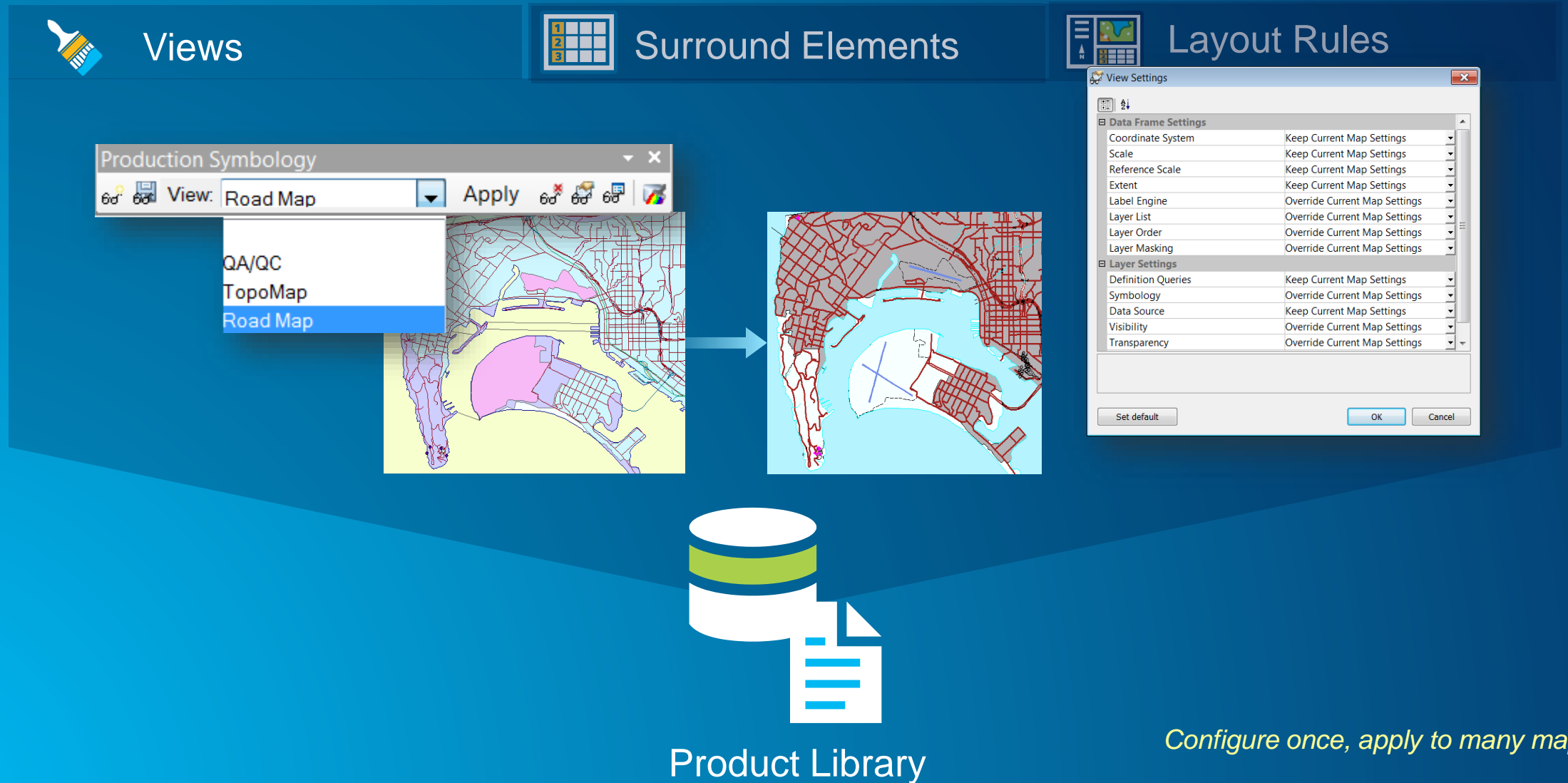
## Solution 7: Centralized cartographic rules and behavior



Product Library

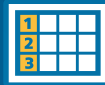
*Configure once, apply to many maps*

# Solution 7: Centralized cartographic rules and behavior





# Solution 7: Centralized cartographic rules and behavior



Surround Elements

Category	Reference Number	Feature Name
1	4	Industrial plant with warehouses
1	12	Warehouse and storage facility
1	10	Underground POL storage
1	5	Market
1	9	Truck depot
4	25	Al Kut Military Hospital
5	43	Military facility
5	34	Helipad
5	35	Helipad
8	61	Transformer station
8	66	Water treatment plant
8	51	Bus depot
8	62	Transformer station
8	57	Diesel power plant
8	53	Dam
8	54	Dam
8	68	Water treatment plant
8	58	Helipad
8	50	Bus depot
9	74	Imam Muhammad Abu Al Hasan

Interactive Table Design

Edit View Table Layout Elements Tools

X-units: Points Y-units: Points Scale: 1:31,644,378 Source: Map scale Frame: Overview Map

Table Layout

	A	B	C	D	E	F	G
1	ROAD CLASSIFICATION						
2	Primary highway, hard surface		Light-duty road, hard or improved surface				
3	Secondary highway, hard surface		Unimproved road				

Elements

Cell	Type
(2A)	TextElement Text

OK Cancel Apply

Database Element...

Database Location: C:\Users\madh4998\Documents\ArcGIS\Tutorial Data\Cartography\Pr Browse...

Database Connection Information

Geodatabase Type: Personal  
Owner: N/A  
Username: N/A  
Privileges: Read / Write

Picture

Preview

Description

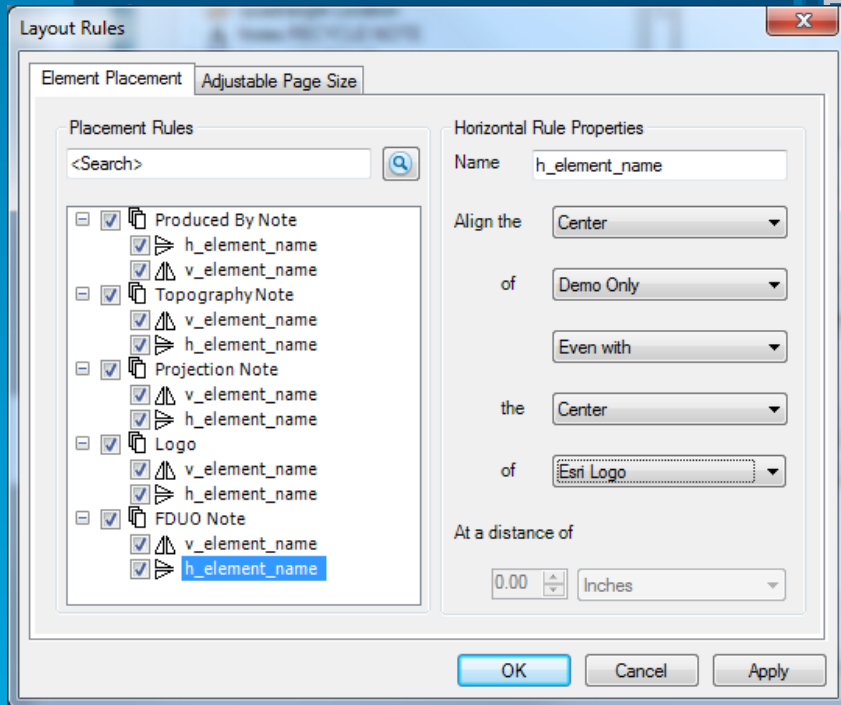
Insert Close



Product Library

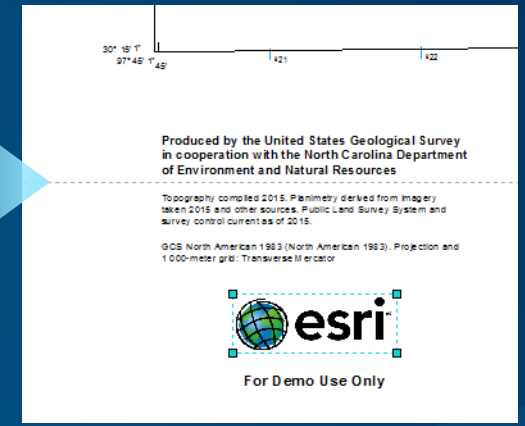
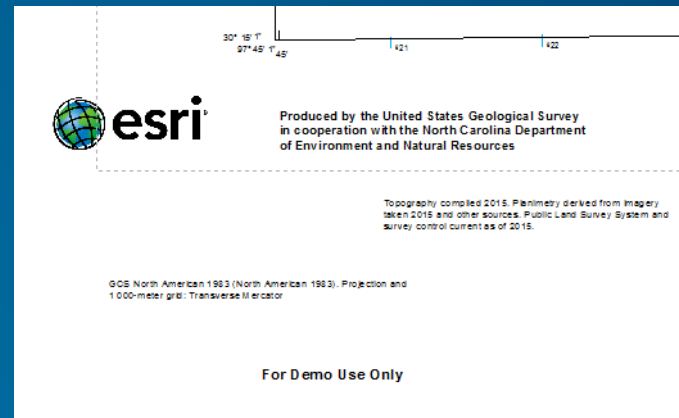
Configure once, apply to many maps

# Solution 7: Centralized cartographic rules and behavior



Surround Elements

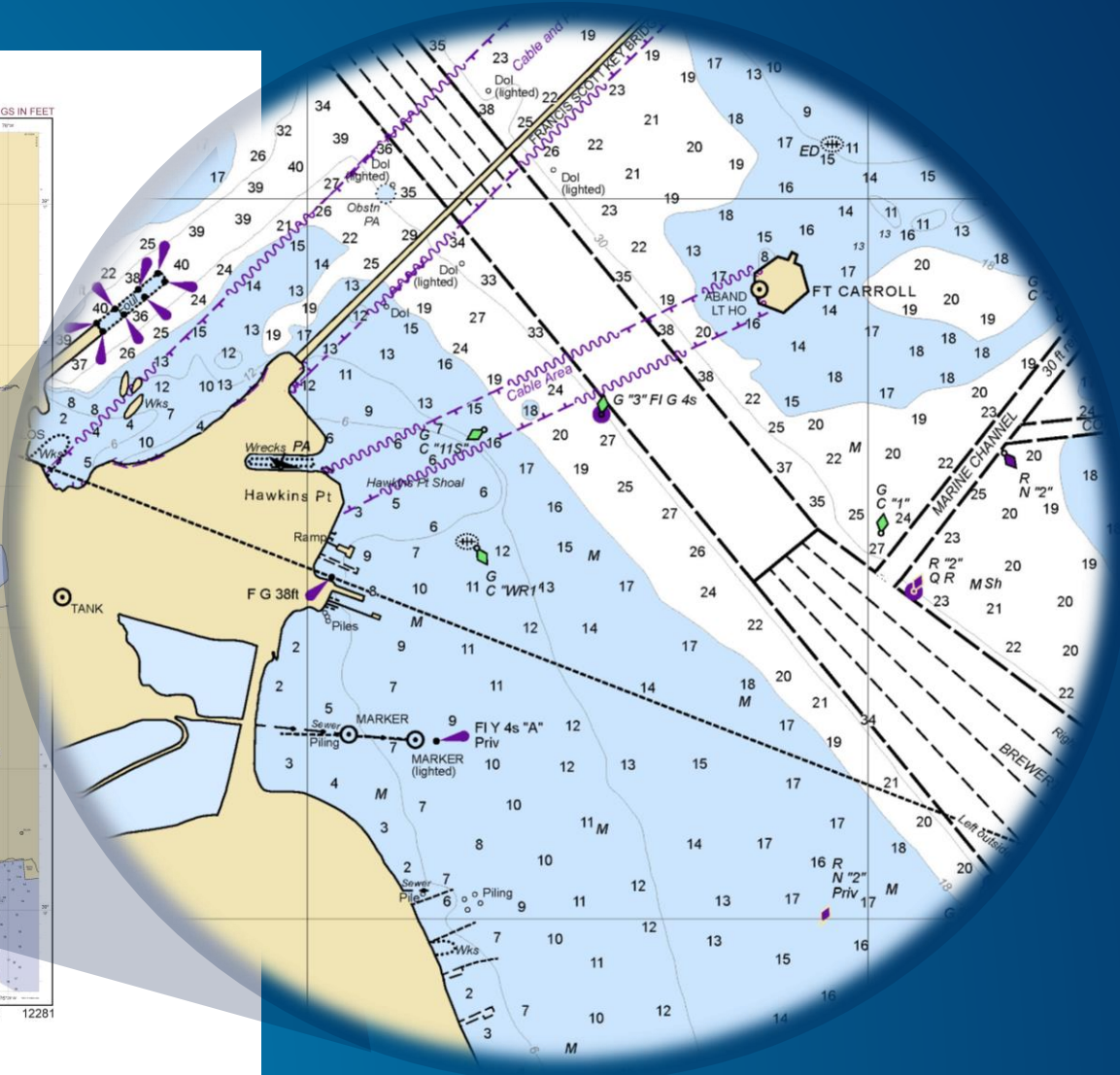
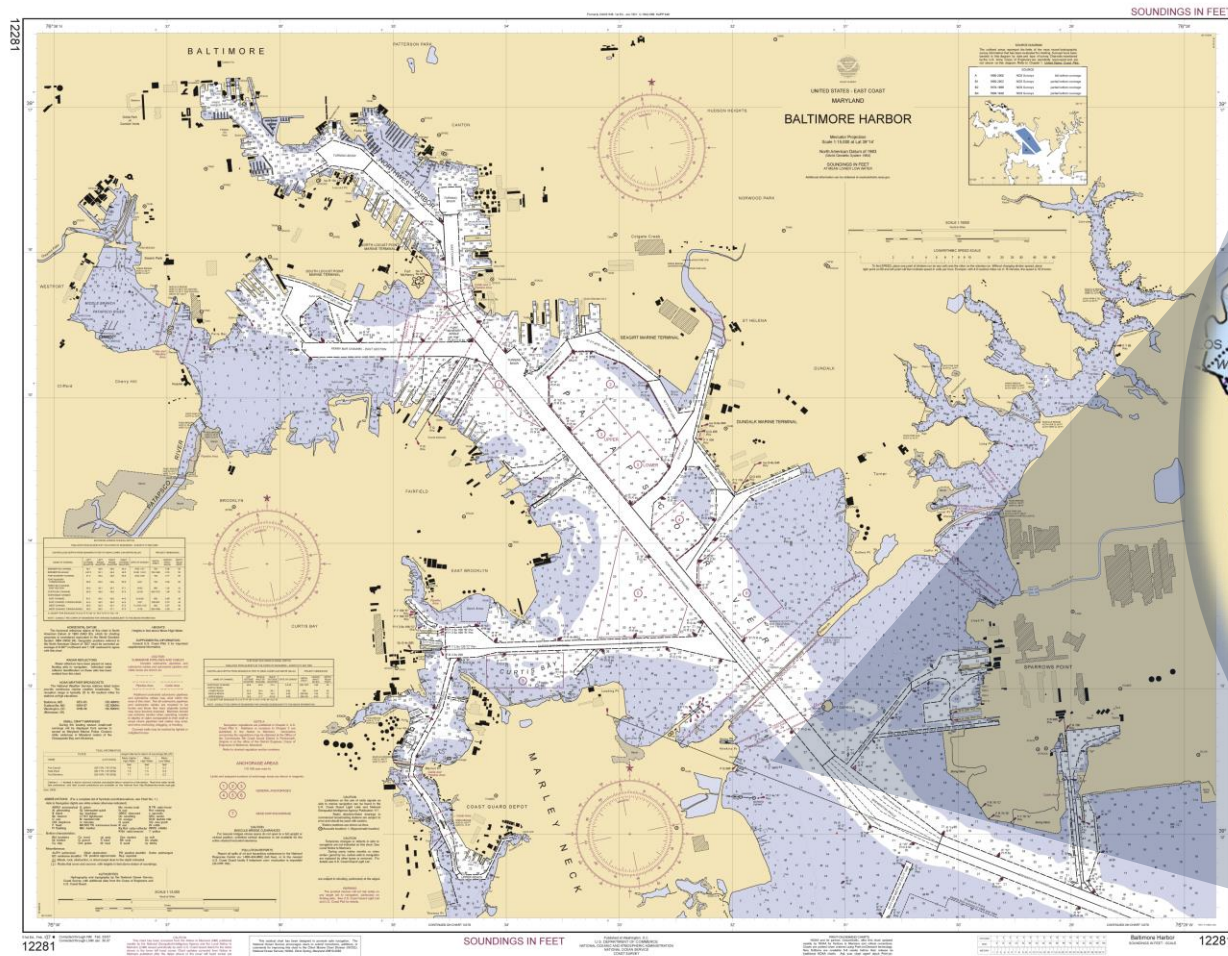
Layout Rules



Product Library

*Configure once, apply to many maps*

# Issue 8: Difficult to make complex, specification driven maps





# Solution 8: Make specification driven maps with Production Mapping

Visual Specifications

Grids & Graticules

Visual Specifications Advanced View

Rule Type	Specification	Rule Description	Dataset	SQL Statement	Preview
Representation	CTM_25K	Tower	StructurePnt ...	SELECT <TargetTable.OID> FROM <TargetTable> WHERE F_CODE = 'AL241'	Str
Representation	CTM_25K	Church	StructurePnt ...	SELECT <TargetTable.OID> FROM <TargetTable> WHERE HWT in (000, 002, 003, 004)	Str
Representation	CTM_25K	Building/Shad	StructureSf	SELECT <TargetTable.OID> FROM <TargetTable> WHERE F_CODE = 'AL013' OR F_CODE = ...	Str

Show:

**1L015 - BUILDING**  
POINT FEATURE... SYMBOL#1L015P011

**ATTRIBUTES:**  
HWT - HOUSE OF WORSHIP TYPE  
000 - UNKNOWN  
002 - CATHEDRAL  
003 - CHAPEL  
004 - CHURCH  
NAM - NAME CATEGORY  
ANY

**PARAMETERS:**  
Origin: Center of square  
**FILL: SQUARE**  
Lineweight: 0.630mm  
Length: 0.630mm  
Color: BLACK (#58600)

**LABEL: NAM**  
Type Size: 6 point  
Type Style: Upper/Lower Case, Condensed  
Color: RED (#60862)

**POSITUT**  
Posicut: #21  
Color: BLACK (#58600)

Cross lineweights : 0.20 mm  
Origin : Base of cross



Product Library





















# Solution 8: Make specification driven maps with Production Mapping

Visual Specifications

Colors & Graticules

Color Separation

Color Mapping Rules (changed)

Input	Input Value	Output	Output Value	Tint %	Overprint
	RGB 255 255 255		CMYK 0 0 0 0	n/a	<input type="checkbox"/>
	RGB 0 0 0		CMYK 0 0 0 100	n/a	<input type="checkbox"/>
	RGB 153 0 0		CMYK 40 100 100 0	n/a	<input type="checkbox"/>
	RGB 255 0 0		CMYK 0 100 100 0	n/a	<input type="checkbox"/>
	RGB 230 0 0		CMYK 10 100 100 0	n/a	<input type="checkbox"/>
	RGB 221 232 198		CMYK 13 9 22 0	n/a	<input type="checkbox"/>
	RGB 118 145 59		CMYK 54 43 77 0	n/a	<input type="checkbox"/>
	RGB 255 247 191		CMYK 0 3 25 0	n/a	<input type="checkbox"/>
	RGB 230 200 0		Mustard 10 22 100 0	100	<input type="checkbox"/>
	RGB 205 233 239		CMYK 20 9 6 0	n/a	<input type="checkbox"/>

Current Map Review

Use this button to add colors from map to the table. Only colors that are not in the table will be shown.

Show preview for selected input color(s), vector graphics only. This starts the PDF viewing application registered in your system.

1 out of 24 selected ⚠ Warning(s) ...



Product Library

## Issue 9: Difficult to find the map you need when you need it

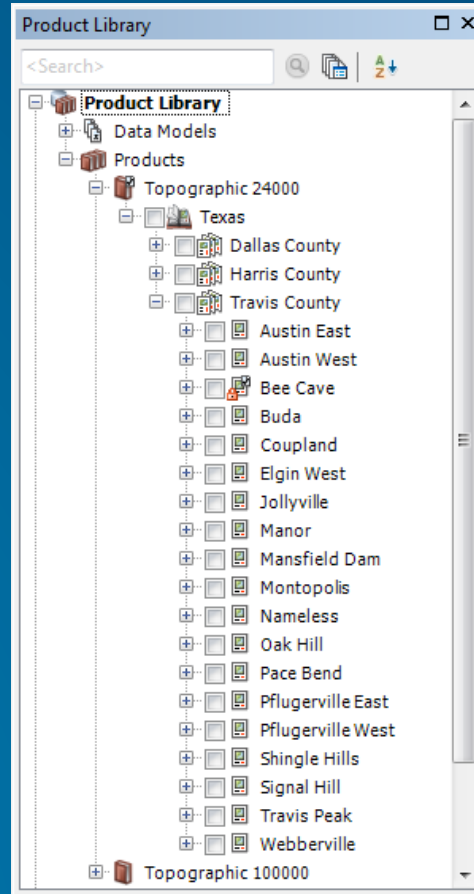




# Solution 9: Product catalogs and self-service mapping



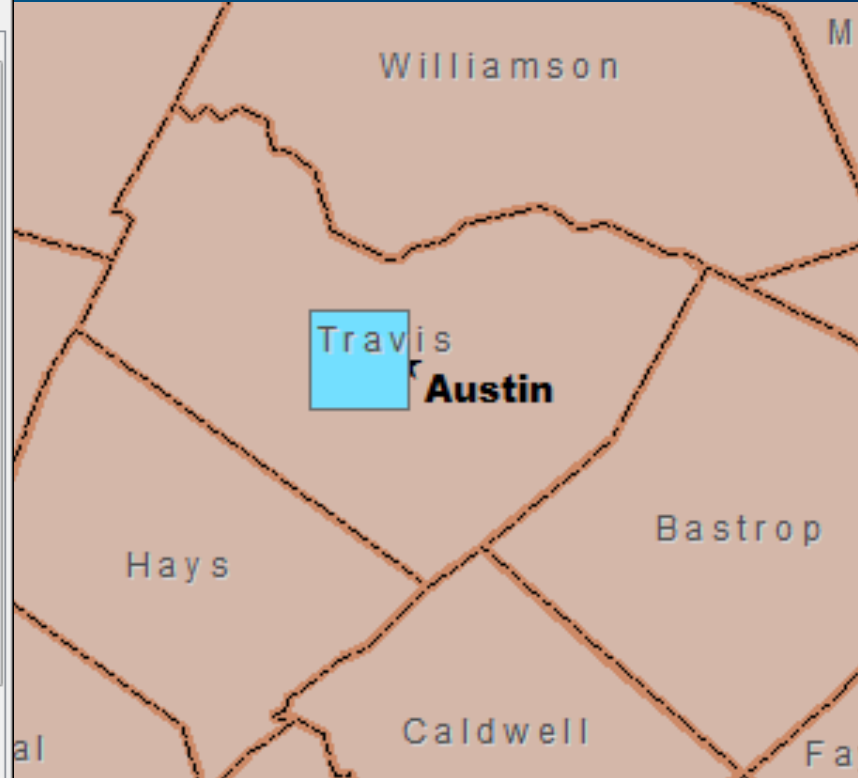
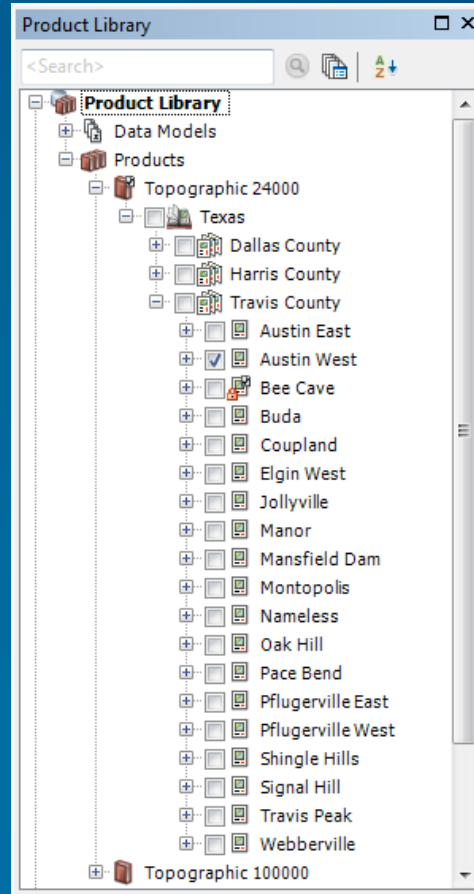
Product Library



# Solution 9: Product catalogs and self-service mapping



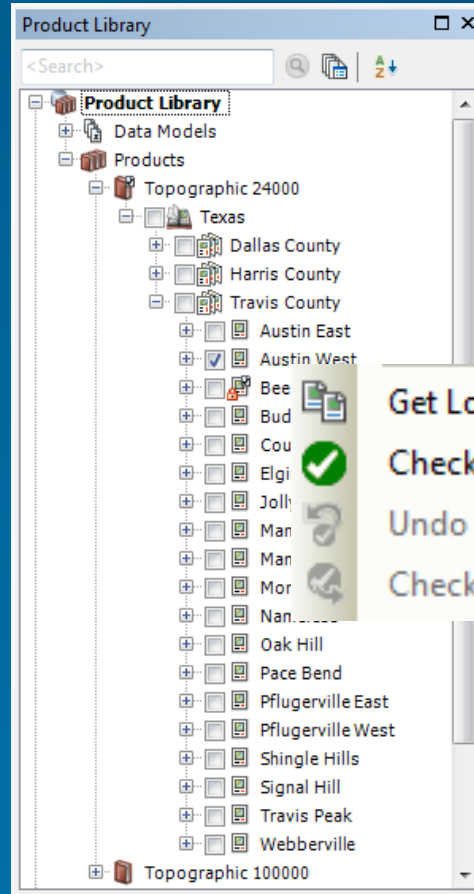
Product Library



# Solution 9: Product catalogs and self-service mapping



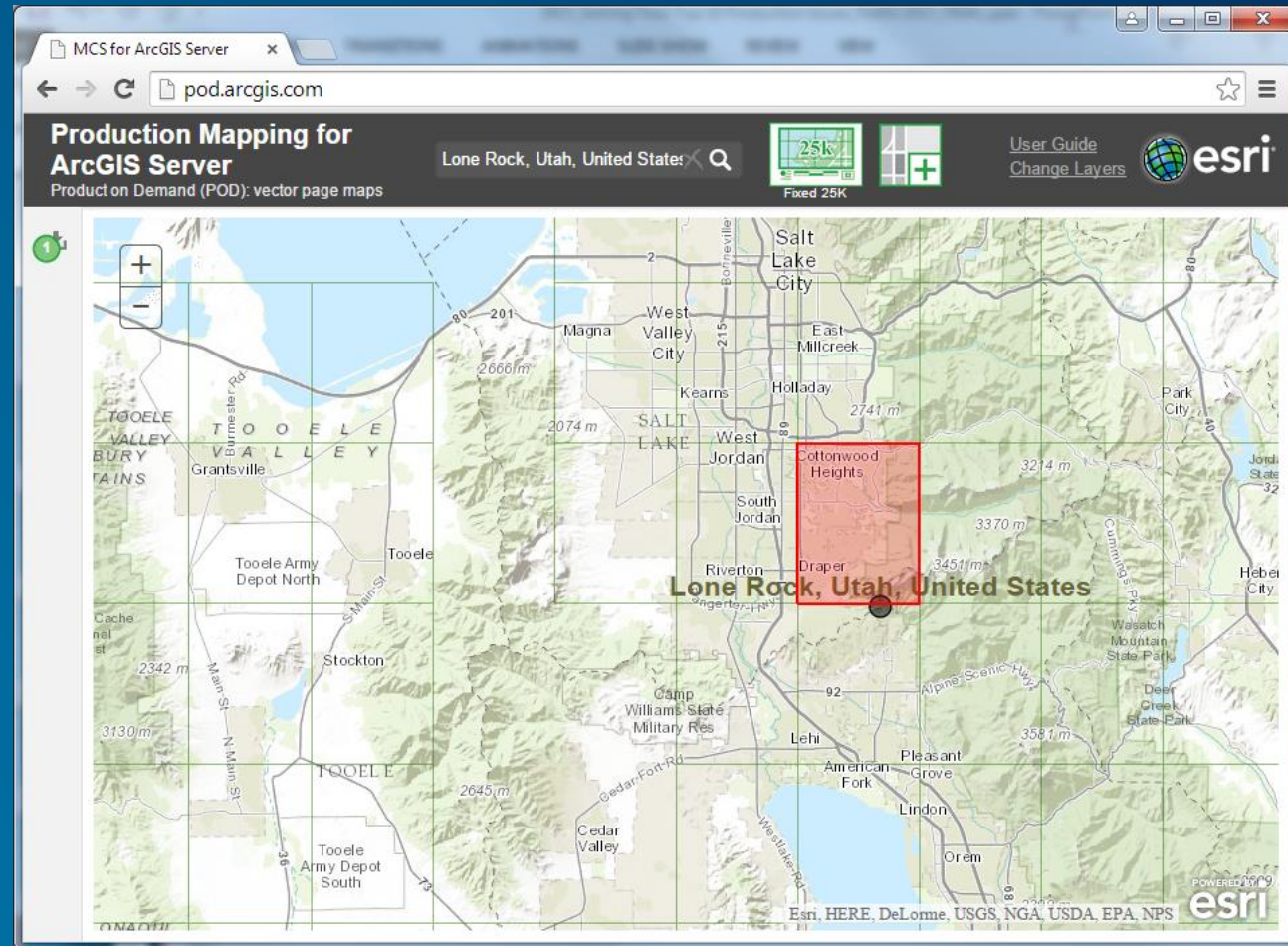
Product Library



# Solution 9: Product catalogs and self-service mapping



Production  
Mapping Server

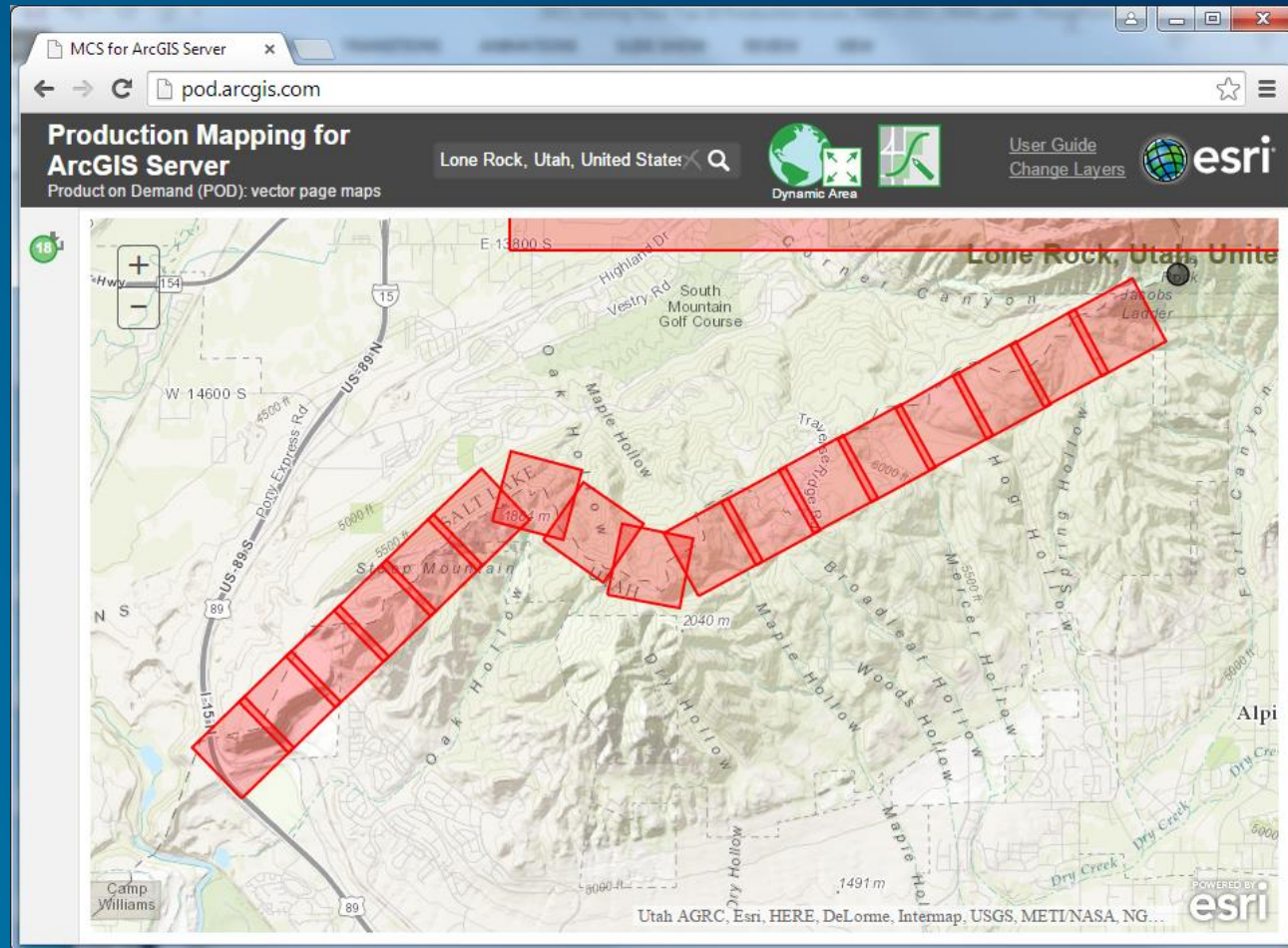




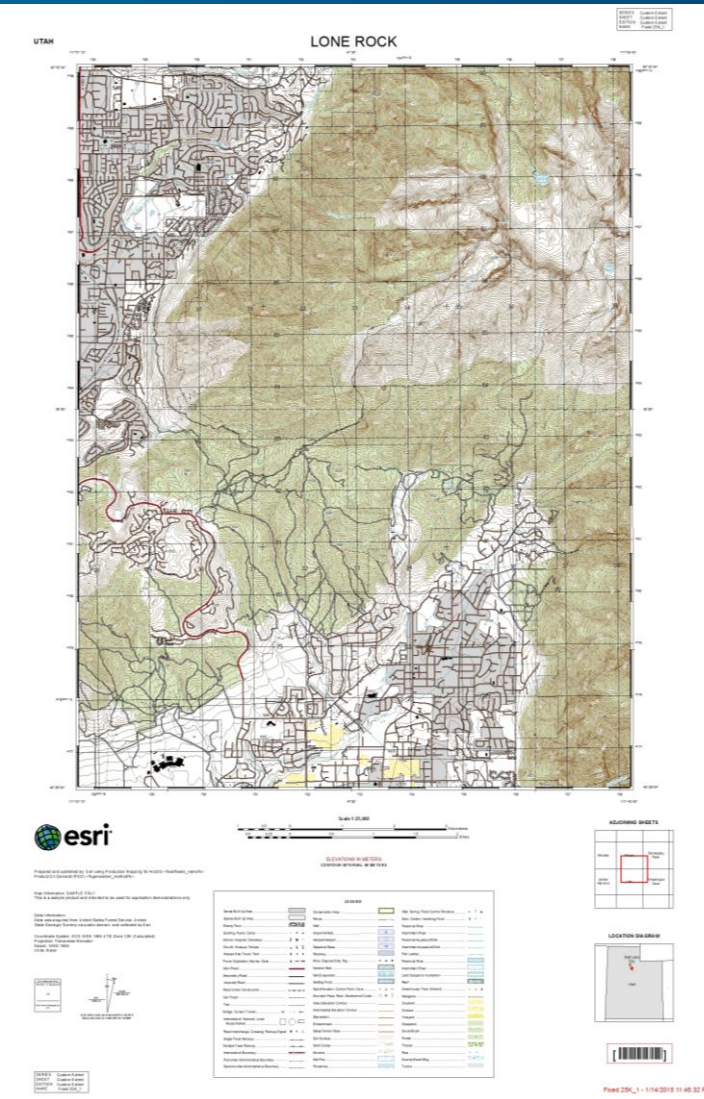
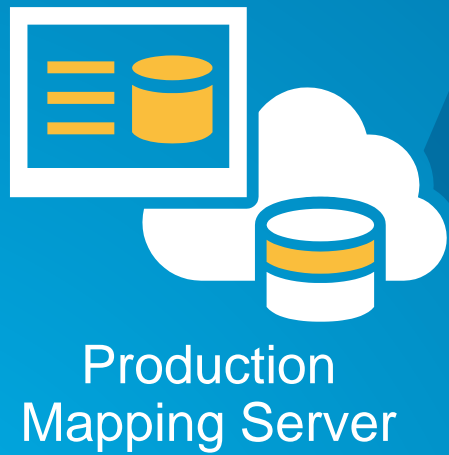
# Solution 9: Product catalogs and self-service mapping



Production  
Mapping Server



# Solution 9: Product catalogs and self-service mapping













# Production Mapping for ArcGIS Server

Product on Demand (POD): vector page maps

Lone Rock, Utah, United State: 



### Choose a Product...

Fixed 25K      Dynamic Area      Dynamic Scale

Product: Fixed 25K

Product Description: Produces a map to a 1:25000 scale with a set page size of width 25 inches and height 35 inches.

Export Format: PDF

Scale: PDF


Page Size: TIFF

Multi-page PDF

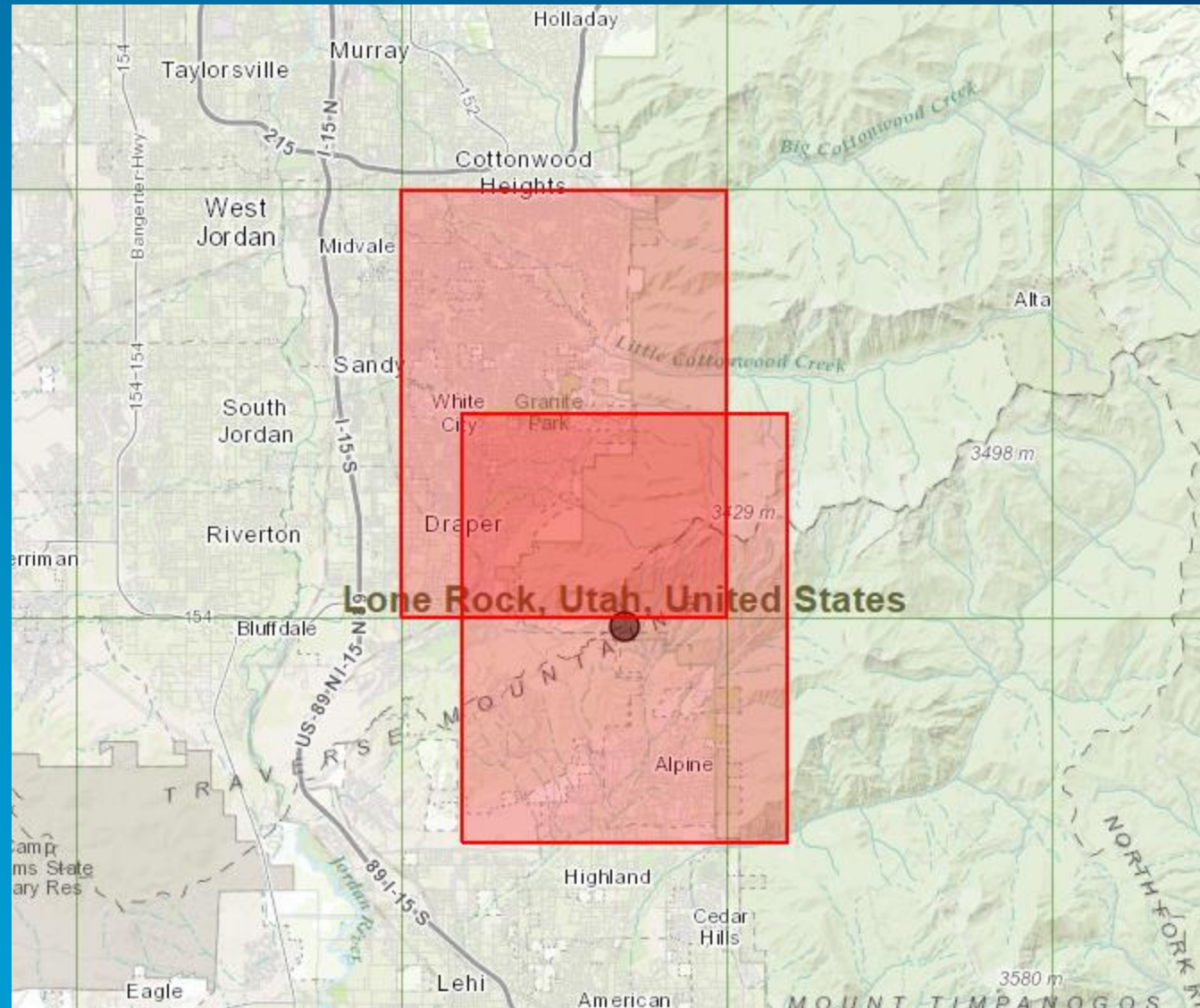
Production PDF

Layout GeoTIFF

Map Package

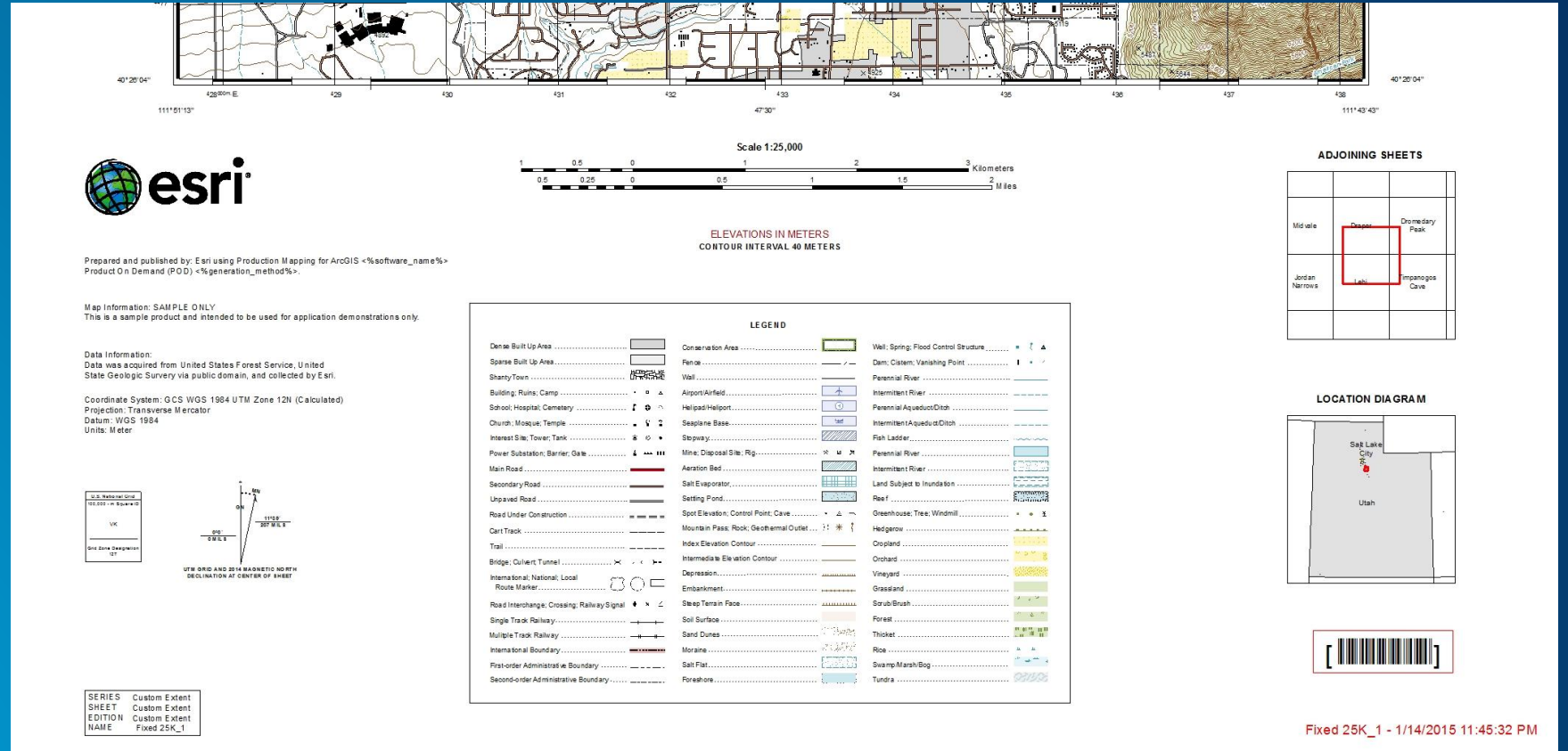
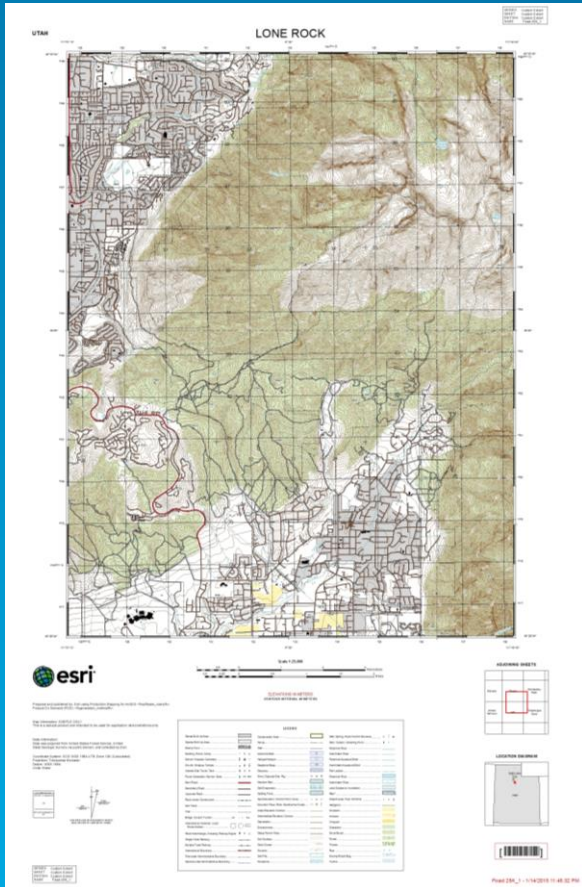
 Dynamic Page

You can choose the type of map to be produced and the format you want it in



You can create a map that follows the traditional map sheet extents or an extent that better covers the desired ground area.





Maps produced, regardless of extent, meet your cartographic specifications.



The application understands scale, projection, rotation, etc so you don't have to. You only need to know what area needs to be covered.





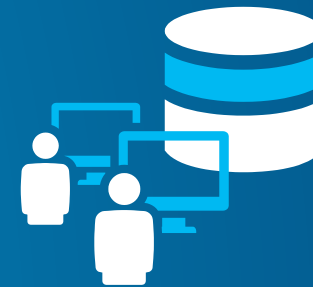
# Issue 10: Maintaining data and maps at multiple scales is costly



1:12,500

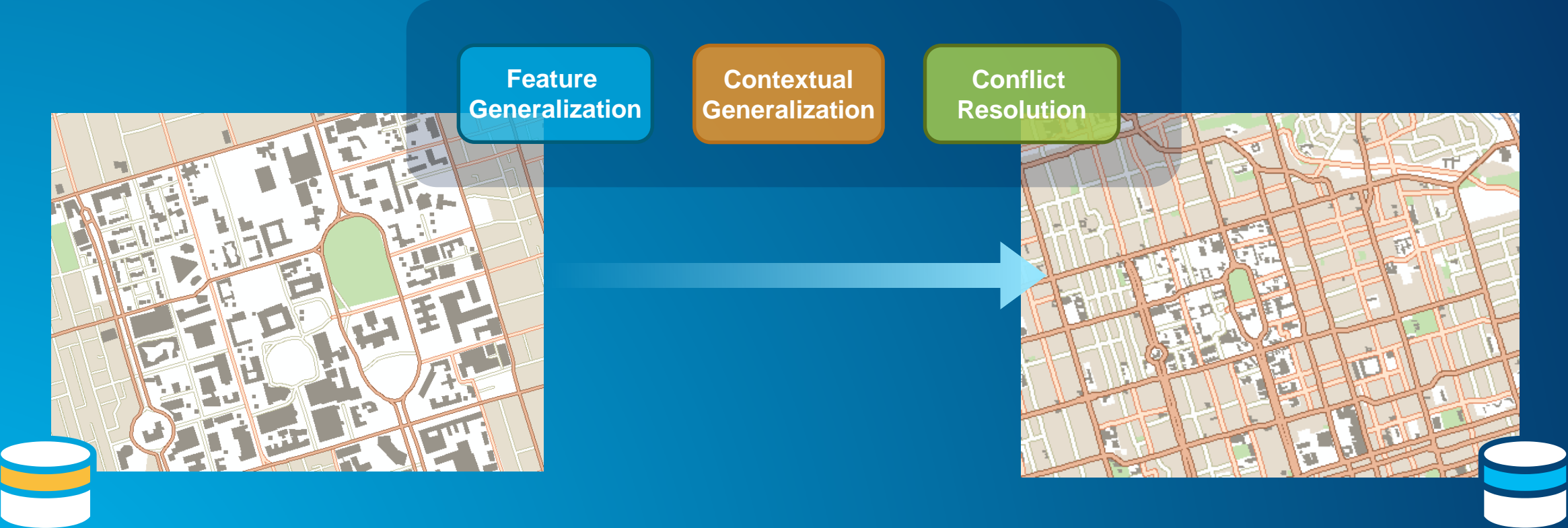


1:50,000





# Solution 10: Cartographic Generalization



# Case Study

Dutch Kadaster

## Dutch Kadaster – case study

Manual Generalization



Automated Generalization





## Dutch Kadaster – case study

### Manual Generalization



25 cartographers  
5 year update cycle

### Automated Generalization



6 computers, 6 CPUs each  
3 week production time

## Dutch Kadaster



Using ArcGIS, including tools for map automation and generalization, Dutch Kadaster realized a 5,000 percent savings in the time required by traditional cartographic methods for map production.

**ArcNews Winter 2013/2014**

<http://www.esri.com/esri-news/arcnews/winter1314articles/transforming-national-map-production>



How can we do production work  
faster, better and cheaper?



# Producing Data

Data validation is time-consuming

Data being created is of poor quality

Understanding data quality is difficult

Data  
Reviewer  
  
Production  
Mapping



# Managing Production

Knowing if we will meet our deadlines is difficult

There is no consistency in how work is done

Takes too long for new staff to become effective

Workflow  
Manager

Task  
Assistant



# Producing and Sharing Maps

Getting the same results from multiple cartographers

Difficult to make complex, specification driven maps

Difficult to find the map you need when you need it

Maintaining data and maps at multiple scales is costly

Production  
Mapping

Production  
Mapping  
Server



# ArcGIS Extensions Covered

- **Workflow Manager for ArcGIS and Task Assistant**
  - [www.esri.com/workflowmanager](http://www.esri.com/workflowmanager)
- **Data Reviewer for ArcGIS**
  - [www.esri.com/datareviewer](http://www.esri.com/datareviewer)
- **Production Mapping**
  - [www.esri.com/productionmapping](http://www.esri.com/productionmapping)
  - Includes Workflow Manager, Task Assistant and Data Reviewer
- Email questions and comments [productionmapping@esri.com](mailto:productionmapping@esri.com)

**Federal GIS Conference**

February 9–10, 2015 | Washington, DC



**Don't forget to complete  
a session evaluation form!**

## Federal GIS Conference

February 9–10, 2015 | Washington, DC



# GIS Solutions EXPO, Hall D

Monday, 12:30pm – 6:30pm

Tuesday, 10:45 AM–4:00 PM

- Exhibitors
- Hands-On Learning Lab
- Technical & Extended Support
- Demo Theater
- Esri Showcase





Understanding our world.