

Creating Value ...



... Delivering Solutions

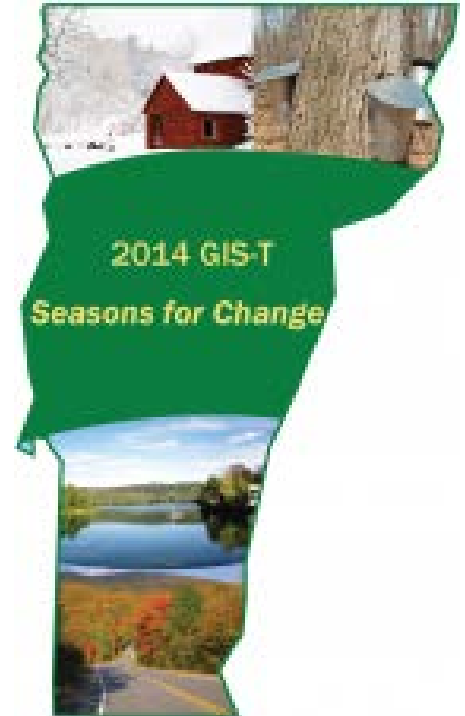
**North Jersey Transportation Planning Authority
Asset Management Database Model
May 7, 2014**

Baker

Presentation Agenda



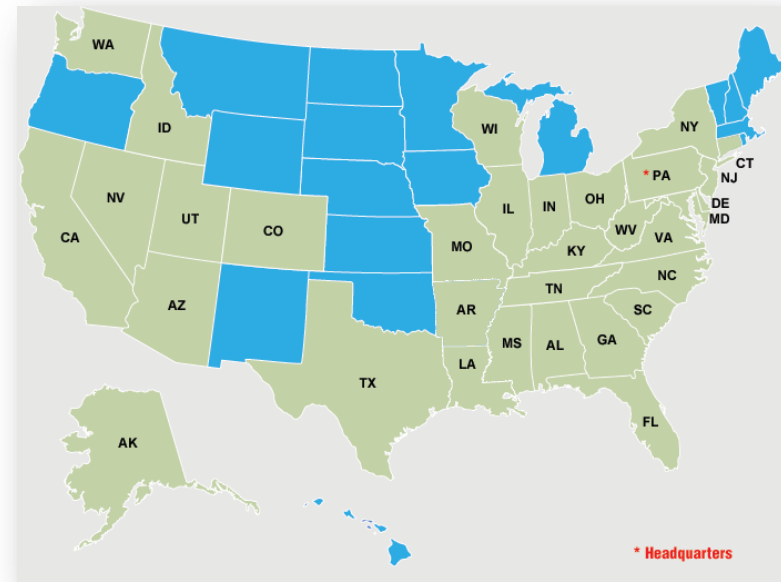
- Introduction
- Project's Background
- System Approach
 - Data Gathering
 - TAC Meetings
 - System Workflow (multiple iterations)
 - Collaboration with Esri
- Next Steps



About Us



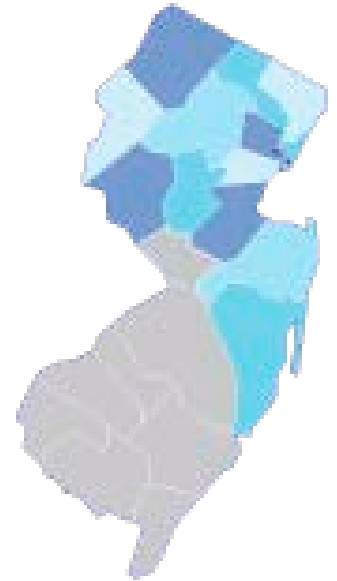
- Presenter – Justin Furch
 - GIT Software Development Supervisor
 - NJTPA Asset Management Data Model Project Manager
- Founded in 1940
- Engineering and consulting services
- Leader in transportation
- Public and private clients worldwide
- Over 3,200 employees
- Over 100 offices across the U.S. and internationally



Who is NJTPA?



- Federally authorized Metropolitan Planning Organization (MPO)
- 13 Counties:
Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, Warren
- Oversees \$2 billion in transportation improvement projects



Project's Purpose (RFP)



- *Develop a county-level Geospatial Information System (GIS) asset management model for cataloging, maintaining and managing a variety of physical assets (e.g. signs, roads, rail, bridges, pavement, guard rail, etc.) within the region.*
- *This project will work towards developing a framework to evaluate physical conditions of assets associated with regional infrastructure in order to appropriate project investments.*
- *To improve efficiency and to supplement statewide asset management systems currently in place.*

What that Means...



- **Scalable Transportation Asset Management Database, Common data model across 13 counties**
- **Continual collaboration with Sub-regions**
- **Support county field data collection**
- **MAP-21 Reporting Compliance**

Project Tasks



Task 1 – Conduct Needs Assessment

We are here

Task 2 – Design Asset Management System

Task 3 – Deployment and Refinement

Task 4 – Documentation and Training

County Data Questionnaire



- Available Data Elements
- Data Management Provisions
- Update Frequency



January 27, 2014

Dear County/City Engineer: (ESSEX)

The NJTPA is requesting information from the Subregions regarding a variety of physical assets (e.g. signs, roads, rail, bridges, pavement, inlets, guiderail, etc.) within their region. We are working to develop a county-level Geospatial Information System (GIS) asset management model for cataloging, maintaining and managing these identified and collected physical assets. As we do not want to duplicate your previous efforts, if you have already responded to the previous NJTPA pavement questionnaire in 2011, it would be greatly appreciate if you could resend your initial responses and provide additional responses to the asset management questionnaire below:

1. What department(s) within the County (City) is responsible for maintaining and managing the data associated with the regional roadway physical assets?

Essex County Department of Public Works
Office of the County Engineer

2. What is the funding source for the County (City) asset management effort? If funded by multiple sources depending on the jurisdiction of the roadway, list them all.

No funding source identified.

3. Does the County (City) currently have an asset management system in place? If so, what are the data collection methods and maintenance methods used? Please include name of software package.
No unified asset management system currently in place. Data maintained in GIS but no management system is currently used.

Questionnaire Findings



- **Most data did not include Linear Route Measures**
- **Custom Data Models**
- **Mixture of Management Tools**
- **Mixture of data collection methods**
 - Laptops
 - Trimble
 - Tablet (Windows-based)

Final Data Elements



- **15 county asset types initially identified**
- **Narrowed down to 8 most common asset types**

Asset number	Asset Class	NJTPA (roll-up) Reporting	County Reporting	Statewide Reporting	Potential Collector Asset
1	Signs (faces)	Yes	Yes	No	Yes
2	Sign Posts	Yes	Yes	No	Yes
3	Bridges	Yes	Yes	No	Yes
4	Signals	Yes	Yes	No	Yes
5	Inlets	Yes	Yes	No	Yes
6	Outfalls	Yes	Yes	No	Yes
7	Guiderail	Yes	Yes	No	No
8	Pavement (IRI)	Yes	No	Yes	No

Data Gathering



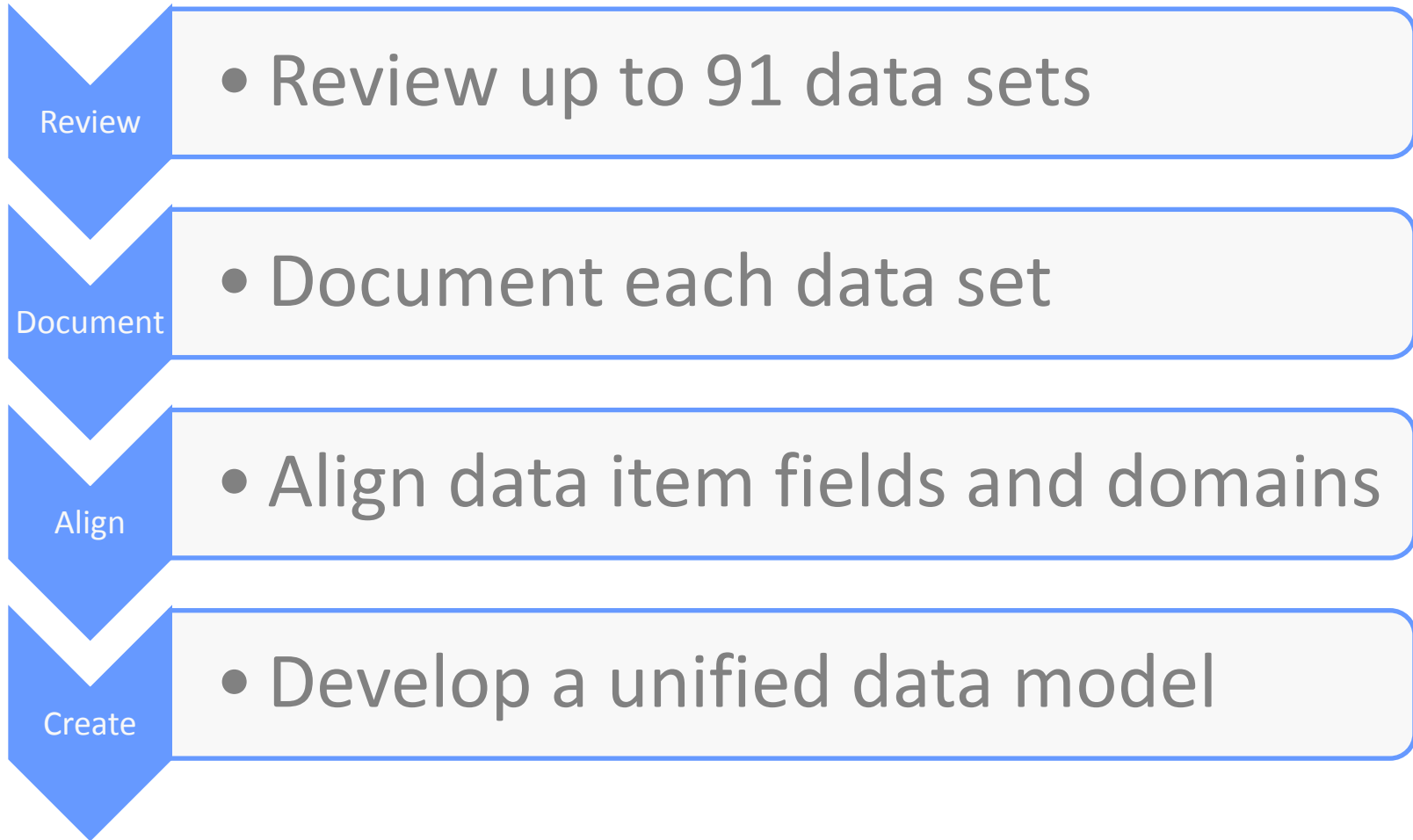
■ Project SharePoint Website

The screenshot displays a SharePoint web browser interface. The address bar shows the URL <https://projects.m...> and the page title is 'Data Submissions - All Doc...'. The site name is 'Baker' and the current page is 'NJTPA Asset Management Model Project Site > Data Submissions > All Documents'. The left navigation pane includes 'Libraries' (Project Documents, Data Submissions), 'Lists' (Calendar, Tasks), 'Discussions' (Team Discussion), and 'Recycle Bin' (All Site Content). The main content area shows a table of documents:

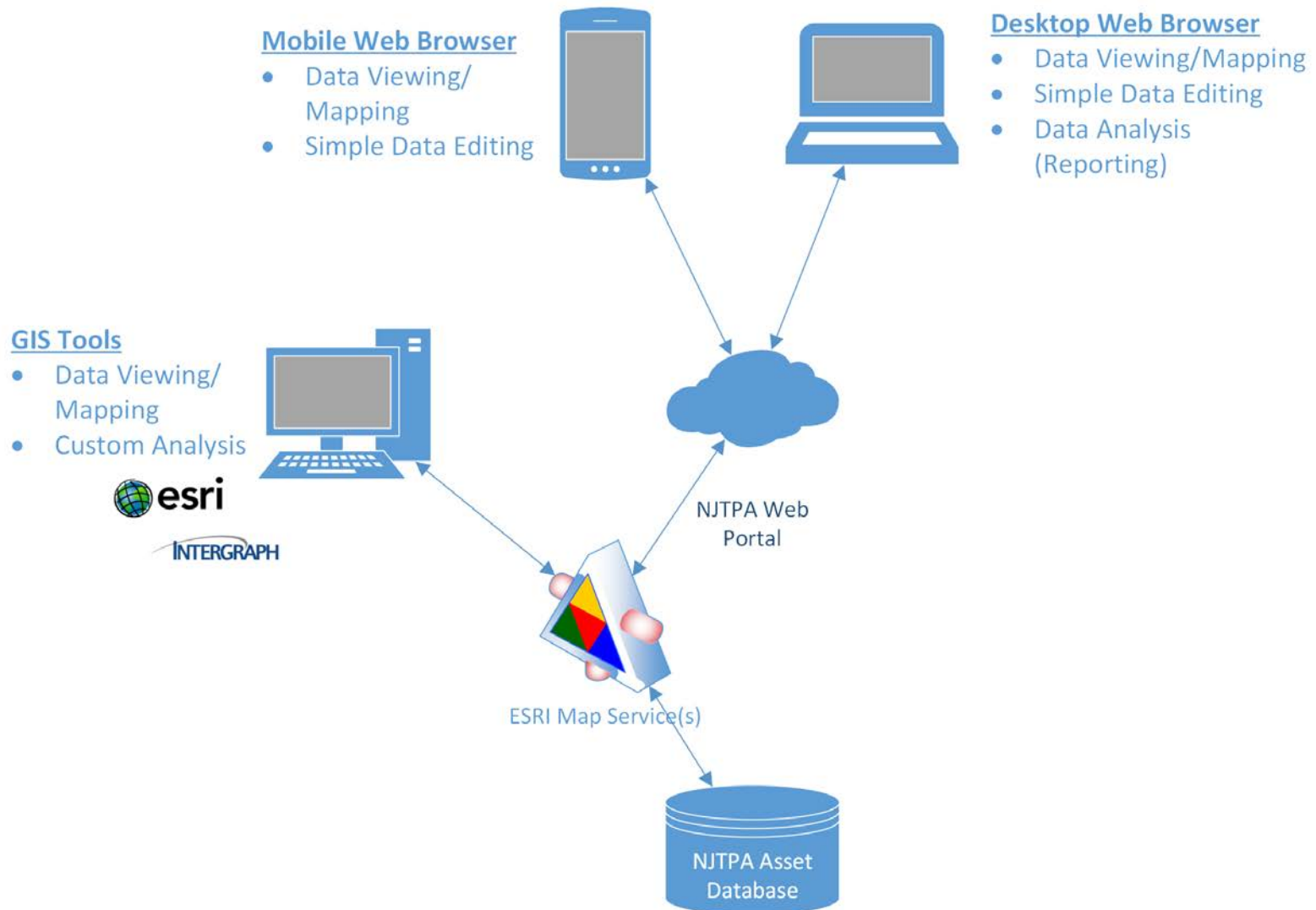
Type	Name	Modified	Modified By
Folder	Bergen	2/25/2014 10:39 AM	Justin Furch
Folder	Essex	2/25/2014 10:39 AM	Justin Furch
Folder	Hudson	2/25/2014 10:39 AM	Justin Furch
Folder	Hunterdon	2/25/2014 10:39 AM	Justin Furch
Folder	JerseyCity	2/25/2014 10:41 AM	Justin Furch
Folder	Middlesex	2/25/2014 10:40 AM	Justin Furch
Folder	Monmouth	2/25/2014 10:40 AM	Justin Furch
Folder	Morris	2/25/2014 10:40 AM	Justin Furch
Folder	Newark	2/25/2014 10:40 AM	Justin Furch
Folder	NJDOT	2/28/2014 6:00 PM	Justin Furch
Folder	Ocean	2/25/2014 10:40 AM	Justin Furch
Folder	Passaic	2/25/2014 10:40 AM	Justin Furch
Folder	Somerset	2/25/2014 10:40 AM	Justin Furch
Folder	Sussex	2/25/2014 10:40 AM	Justin Furch
Folder	Union	2/25/2014 10:41 AM	Justin Furch
Folder	Warren	2/25/2014 10:41 AM	Justin Furch

At the bottom of the table, there is a '+ Add document' button.

Data Analysis



Initial System Design



TAC Feedback on the Initial Design



- Presented to the Technical Advisory Committee (TAC)
- Dislikes:
 - Need to Conform to NJTPA's common model
 - Maintaining data in multiple places
 - Does not include disconnected editing for mobile inventory
- Likes:
 - Uhm...?

System Design Iterations



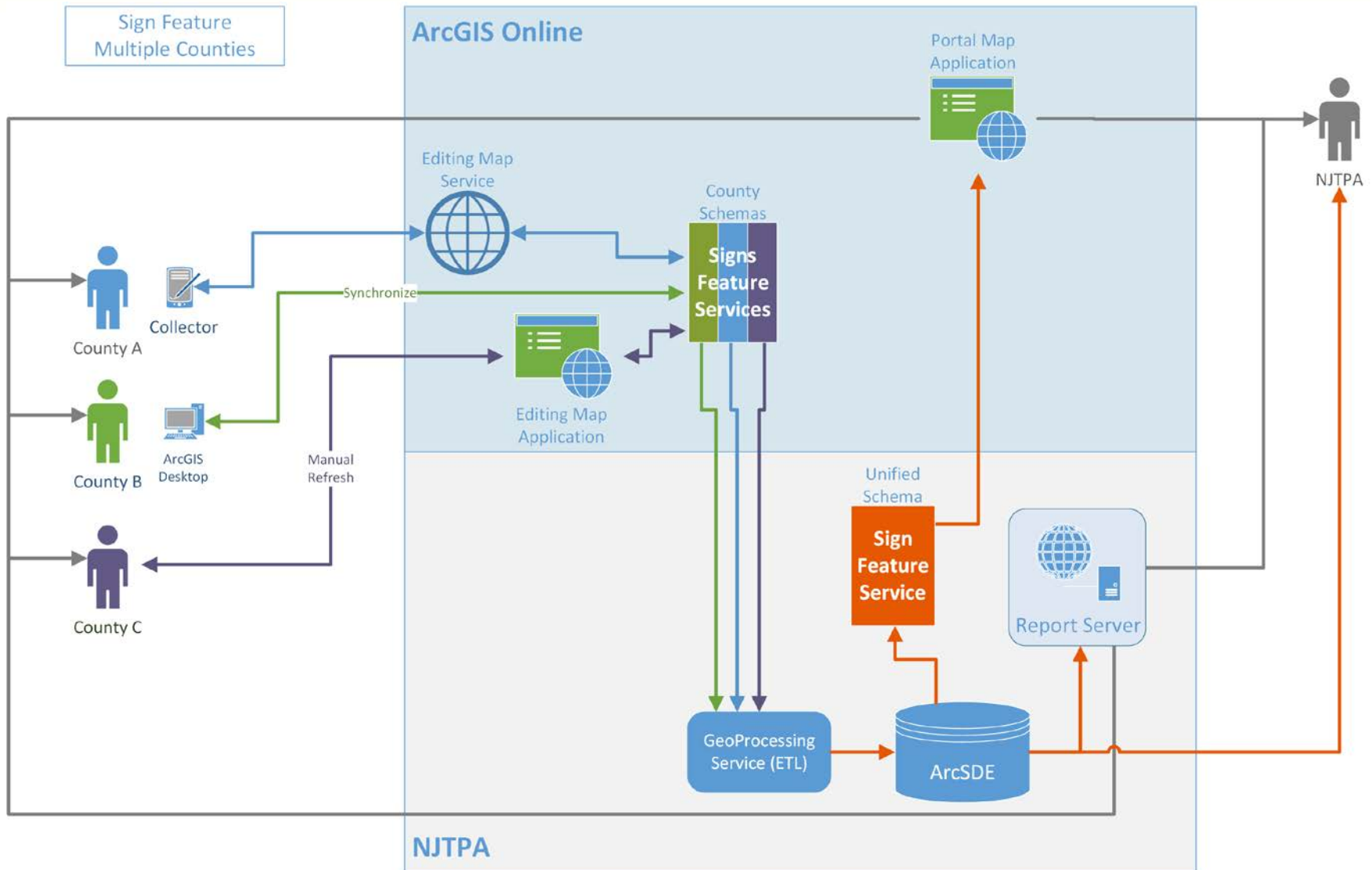
- **Performed 3 system design iterations**
- **Focused on solving:**
 - Allowing independent county data schemas
 - Flexible maintenance workflows
(disconnected editing, synchronization, etc.)
 - Disconnected mobile editing

Final Proposed Solution

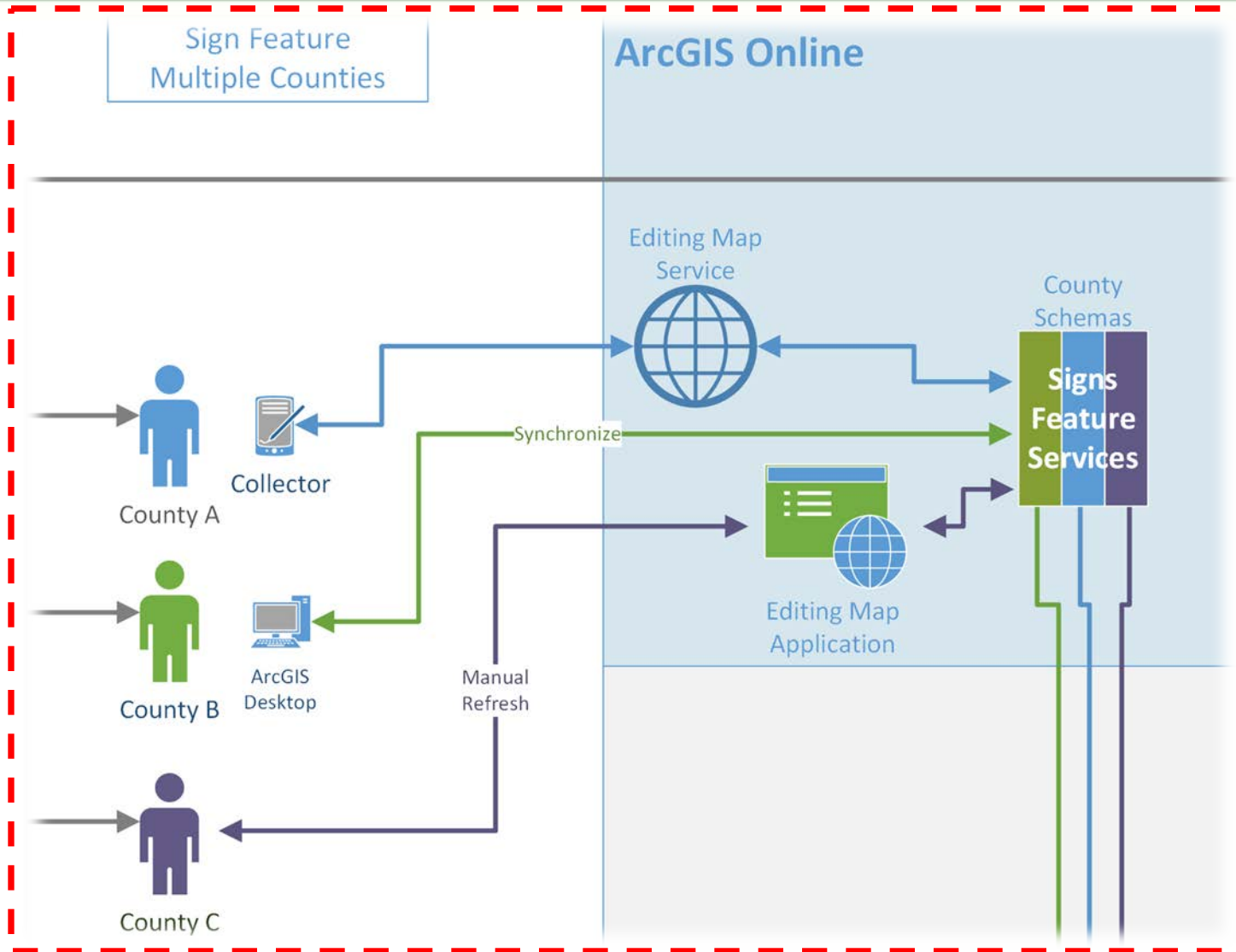


- **Hybrid Solution:**
ArcGIS Server and ArcGIS Online (AGO)
 - Utilize NJTPA's AGO account for county access and Web Portal Application
- **Partial COTS solution, leveraging AGO templates**
- **NJTPA Local Storage of unified data, for ad-hoc reporting and mapping**
- **AGO Feature Services for County datasets**

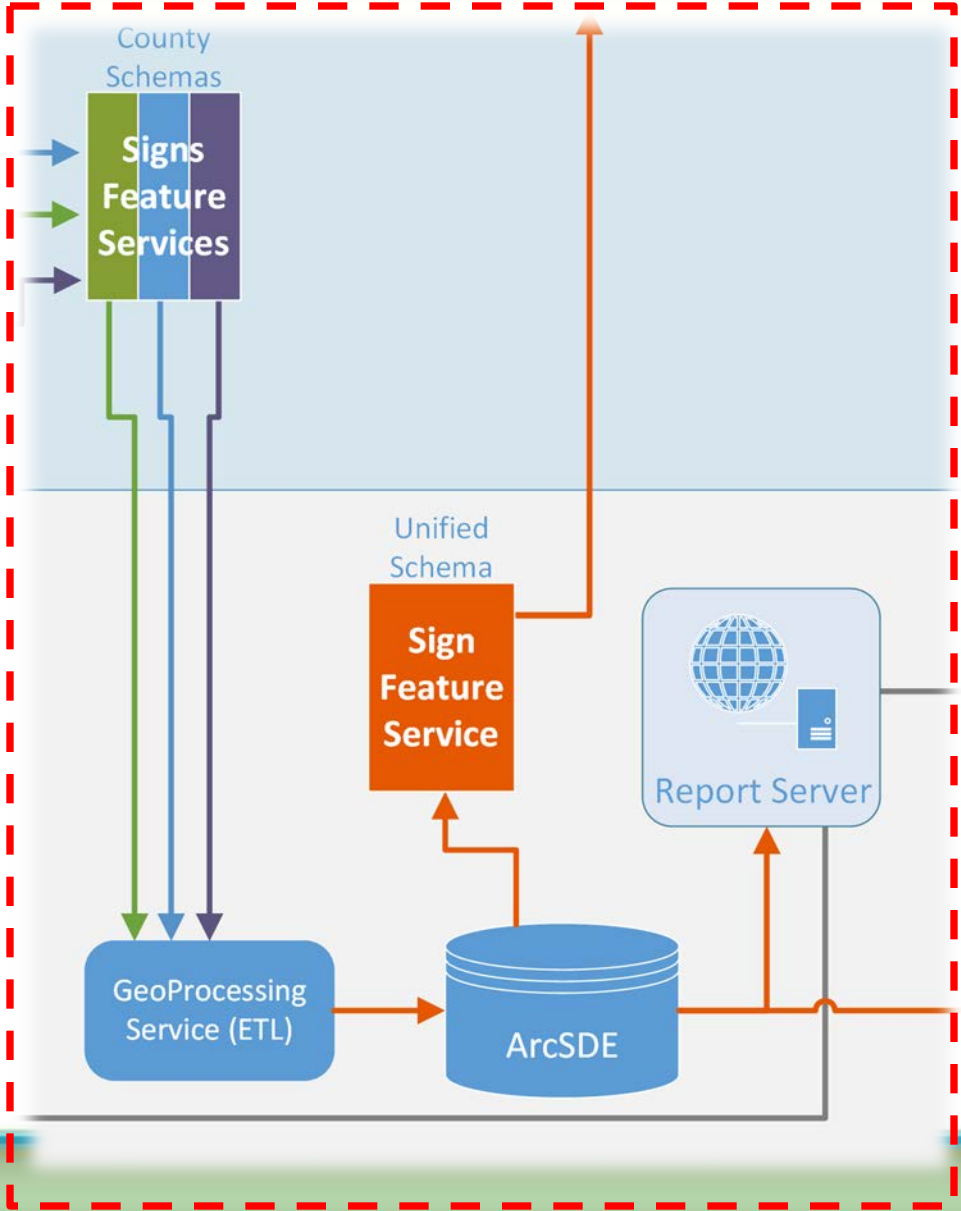
Finalized System Design



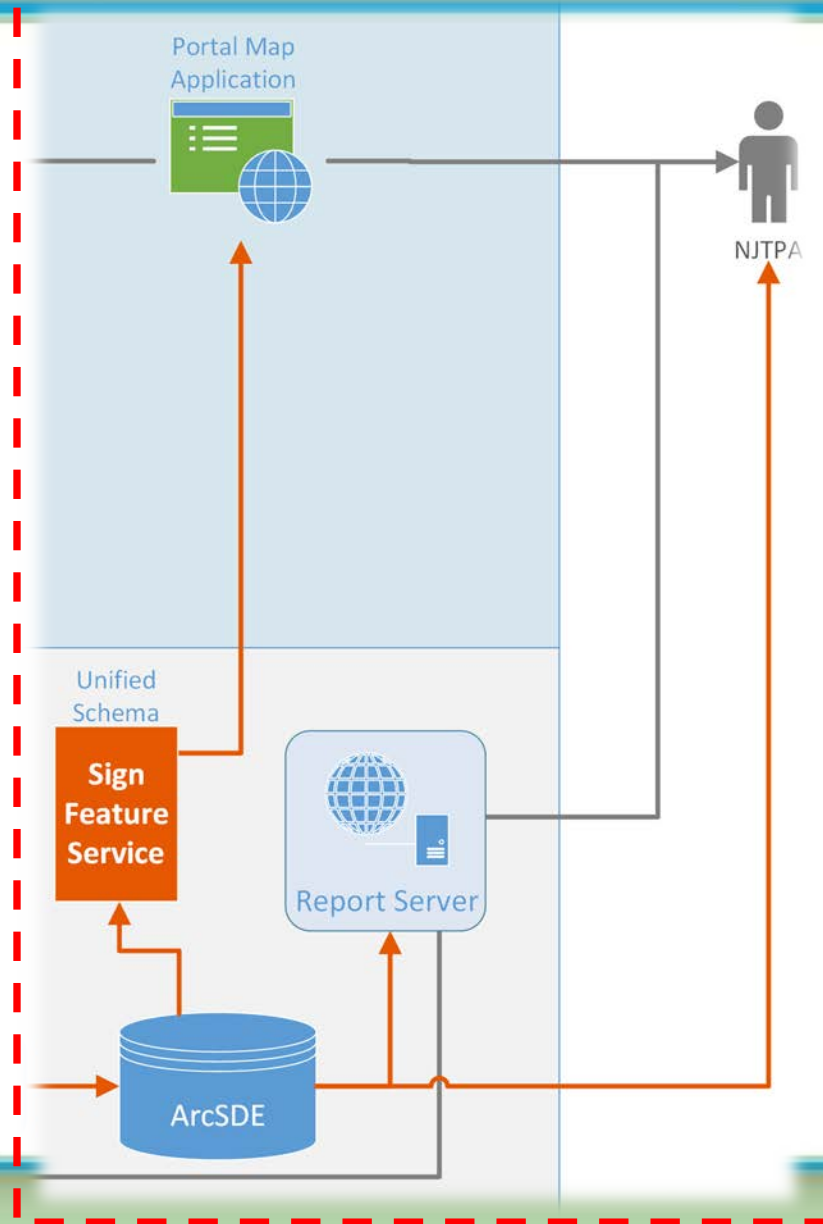
County Editing Environment



Unified Model Population



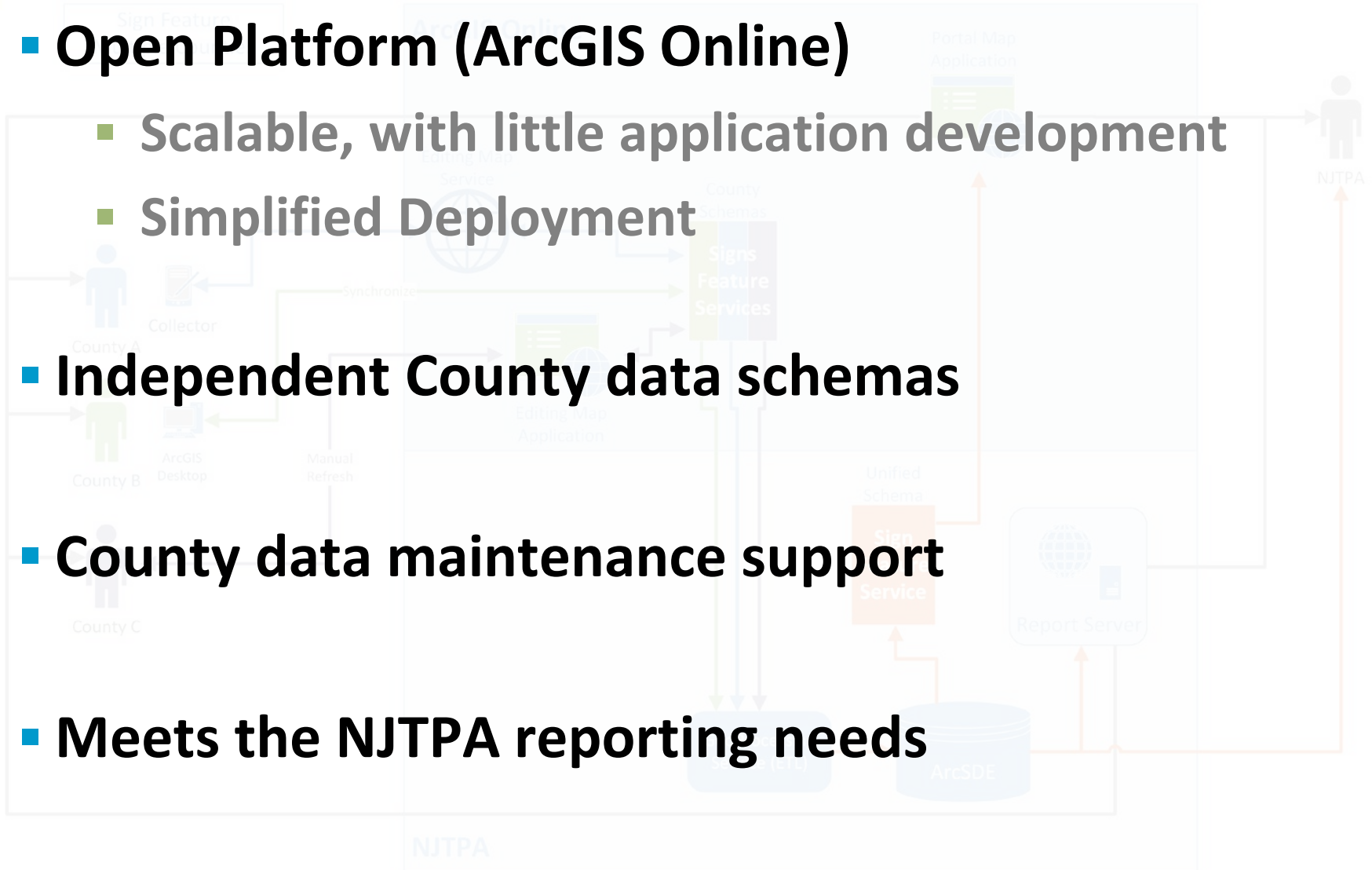
Application and Reporting



Finalized System Design



- **Open Platform (ArcGIS Online)**
 - Scalable, with little application development
 - Simplified Deployment
- **Independent County data schemas**
- **County data maintenance support**
- **Meets the NJTPA reporting needs**



Next Steps (a lot to do)...



- Finalize Data Gathering
- Build the NJTPA Unified Schema
- Create the GeoProcessing services
- Build the Application & Reporting
- Deployment and Documentation
- Questions?

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Questions and Answers

