Agenda

1. Brief Description of Client and Stakeholders
2. Overview of Project Goals
3. Summary of Project Tasks
4. Overview of the Project Workflow
5. Tools and Technology
NJTPA Regional Transportation System

Road Network:
- 147 million vehicle miles each day
- 26,000 miles of roads, including 177 miles of toll roads
- 4,800 bridges

Transit Network:
- 732,000 trips daily
- 13% of commuters ride transit
- 250 bus routes
- Commuter rail: 390 miles of track, 150 stations

Population:
- 8,938,174 (NJ-Statewide)
- 6,722,270 (NJTPA Region)
- 75% of total
NJTPA Region

Bergen  |  Morris
Essex   |  Newark
Hudson  |  Ocean
Hunterdon  |  Passaic
Jersey City  |  Somerset
Middlesex  |  Sussex
Monmouth  |  Union
          |  Warren
North Jersey Transportation Planning Authority

The Metropolitan Planning Organization for Northern New Jersey

STANDING COMMITTEES
Planning & Economic Development Committee
Project Prioritization Committee
Freight Initiative Committee
Regional Transportation Advisory Committee
Primary Project Goals

1. To develop a system and process to access key asset data from within the 13 county sub regions

2. To develop a **unified data model** that transformed the individual county asset data layers into a singular (region wide) dataset

3. To develop a reporting tool set that would support Federal MAP-21 Reporting Requirements
Project Tasks

Task 1: Data Gathering and Assessment

Task 2: Design Data Model

Task 3: Deploy and Refine Model

Task 4: Report/Document/ Training

*Frequent TAC meetings to provide progress and solicit feedback*
Project Tasks

Task 1: Data Gathering and Assessment

- Started with a Vision Survey
- Gathered approximately 91 datasets (13x7)
  - Bridge
  - Pavement
  - Signs
  - Signals
  - Inlets
  - Outfalls
  - Guiderails
- Published the data to ArcGIS Online
## Identified County Data Sets

<table>
<thead>
<tr>
<th></th>
<th>Pavement</th>
<th>Bridges</th>
<th>Signs</th>
<th>Guiderail</th>
<th>Inlets</th>
<th>Outfalls</th>
<th>Signals</th>
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**Legend**
- County data submitted and consolidated to geodatabase
- Denotes originally identified as available data source by County

**Note:** Pavement and bridge data provided by NJDOT
Project Tasks

Task 2: Design Data Model

- Performed a detailed review of the existing data
  - Type, format, quality, attributes, domains, commonalities, etc.

- Design of unified AMDM schema

- Design and development of ETL scripts
Project Tasks

Task 3: Deploy and Refine Model

- On-site installation
  - Populated unified geodatabase
  - ETL scripts
  - Scheduled task
Project Tasks

Task 4: Report/Document/Training

- System Requirements
- Implementation Plan
- Reporting tools
- User Manuals
- Conduct On-Site Training Sessions
Overview of Project Workflow

Workflow Steps:

- Step 1 Acquisition of data from county sub-regions
- Step 2 Consolidation of county sub region data into file GDB’s
- Step 3 Publishing of county-level feature services to NJTPA’s AGO
- Step 4 Development of unified schema and geodatabase model
- Step 5 Development of ETL data migration scripts
- Step 6 Migration of county-level feature services to unified GBD
- Step 7 Deployment of unified GDB and ETL to NJTPA
- Step 8 Deployment of reporting tools to NJTPA
- Step 9 Publishing of unified feature services to NJTPA AGO
**Project Workflow (9) Step Program**

**STEP 1:**
Acquisition of relevant county data

**13 County Sub Regions**
- Bergen County
- Ocean County
- Essex County
- Passaic County
- Hudson County
- Somerset County
- Hunterdon County
- Sussex County
- Middlesex County
- Union County
- Monmouth County
- Warren County

Data included spreadsheets, shapefiles, PDF’s, etc.

**STEP 2:**
Consolidation of County Data
Data downloaded from SharePoint site by Project Team
Data compiled into County-Level Geodatabases

**Workflow Steps:**
- Step 1: Acquisition of relevant data from NJTPA county sub-regions
- Step 2: Consolidation of county sub region data into file geodatabases
- Step 3: Publishing of county-level feature services to NJTPA’s AGO Organization
- Step 4: Development of unified schema and geodatabase model
- Step 5: Development of ETL data migration scripts
- Step 6: Migration of county-level feature services to unified geodatabase
- Step 7: Deploy populated unified geodatabase and ETL scripts to NJTPA’s server (Alpha)
- Step 8: Deployment of the reporting tools to NJTPA’s server (Beta Version)
- Step 9: Publishing of regional level feature services to NJTPA ArcGIS Online Org

**STEP 3:**
Publish county-level feature services
NJTPA ArcGIS Online County-Level
Same NJTPA AGO Account (Org)

**STEP 4:**
Development of unified schema and geodatabase model

**STEP 5:**
Development of ETL data migration scripts

**STEP 6:**
Migration of county-level feature services (from AGO) to unified geodatabase

**STEP 7:**
Deploy populated unified geodatabase and ETL scripts to NJTPA’s server
Populated Unified Geodatabase in Baker Development Environment (ALPHA)

**STEP 8:**
Feature services published to AGO (from NJTPA ArcGIS Server)

**STEP 9:**
Deployment of reporting tools
Populated Unified Geodatabase in NJTPA/EGIS Environment (BETA/FINAL)
Project Workflow Process

13 County Sub Regions

- Bergen County
- Ocean County
- Essex County
- Passaic County
- Hudson County
- Somerset County
- Hunterdon County
- Sussex County
- Middlesex County
- Union County
- Monmouth County
- Warren County
- Morris County

Data included spreadsheets, shapefiles, PDF’s, etc.

County-level data posted to project Sharepoint site
Project Workflow Process

13 County Sub Regions

- Bergen County
- Ocean County
- Essex County
- Passaic County
- Hudson County
- Somerset County
- Hunterdon County
- Sussex County
- Middlesex County
- Union County
- Monmouth County
- Warren County

County data was downloaded, assessed, and compiled into geodatabases
Project Workflow Process

Publish Individual County-Level Geo-databases into NJTPA ArcGIS Online Organization
Project Workflow Process

County Users have access to the feature services in AGO
Project Workflow Process

The ETL process populates the unified data model (ArcSDE) with current information. Scheduled to run on a periodic basis.
Project Workflow Process

Feature services from unified model were published into NJTPA AGO
Project Workflow Process

NJTPA staff have access to the asset data via AGO
The NJTPA is the federally authorized Metropolitan Planning Organization for 6.6 million people in the 13-county northern New Jersey region. Each year, the NJTPA oversees more than $2 billion in transportation improvement projects and provides a forum for interagency cooperation and public input. It also sponsors and conducts studies, assists county planning agencies and monitors compliance with national air quality goals.
Reporting Tool

NJTPA Asset Management Data Model Reports

Reports
- Pavement
- Bridge
- Signs
- Signals
- Guiderail
- Inlets
- Outfalls

NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY
# Deficient Bridge Deck Area Report
(Based on Deck Condition Rating of 4 or Less)

Click here for additional information

<table>
<thead>
<tr>
<th>County</th>
<th>Summary of Deficient Deck Area (Sq. Ft.)</th>
<th>Total Deck Area (Sq. Ft.)</th>
<th>Deficient Deck Area Percentage</th>
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</thead>
<tbody>
<tr>
<td>Bergen</td>
<td>45,663</td>
<td>647,179</td>
<td>7 %</td>
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<tr>
<td>Essex</td>
<td>49,364</td>
<td>1,009,499</td>
<td>5 %</td>
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<tr>
<td>Hudson</td>
<td>118,745</td>
<td>627,610</td>
<td>19 %</td>
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<td>Hunterdon</td>
<td>4,327</td>
<td>109,026</td>
<td>4 %</td>
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<td>Middlesex</td>
<td>20,323</td>
<td>639,502</td>
<td>3 %</td>
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<td>Monmouth</td>
<td>6,240</td>
<td>342,106</td>
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<td>Morris</td>
<td>19,565</td>
<td>261,301</td>
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<td>Ocean</td>
<td>18,755</td>
<td>170,587</td>
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<tr>
<td>Passaic</td>
<td>8,929</td>
<td>310,021</td>
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<td>Somerset</td>
<td>9,596</td>
<td>191,015</td>
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<tr>
<td>Sussex</td>
<td>3,429</td>
<td>41,599</td>
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<tr>
<td>Union</td>
<td>6,562</td>
<td>470,820</td>
<td>1 %</td>
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<tr>
<td>Warren</td>
<td>5,841</td>
<td>86,512</td>
<td>7 %</td>
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</table>

Total Deficient Deck Area in NJTPA Subregion: 317,399.00
## Sign Summary Report

[Click here for additional information]

<table>
<thead>
<tr>
<th>County</th>
<th>Total Number of Signs by County</th>
</tr>
</thead>
<tbody>
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<td>Bergen</td>
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<td>Essex</td>
<td>15,965</td>
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<td>Hunterdon</td>
<td>12,136</td>
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<td>Middlesex</td>
<td>31</td>
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<td>Monmouth</td>
<td>24,653</td>
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<td>Morris</td>
<td>16,695</td>
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<td>Ocean</td>
<td>55,487</td>
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<td>Passaic</td>
<td>14,378</td>
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<td>9,129</td>
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<td>Sussex</td>
<td>12,339</td>
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<tr>
<td>Union</td>
<td>19,335</td>
</tr>
<tr>
<td>Warren</td>
<td>8,690</td>
</tr>
</tbody>
</table>

*Total number of signs in NJTPA Subregion: 188,925*
Project Workflow Process: (Data Maintenance)

AGO Collector

County-level data configured for use with Collector
Using ArcGIS Collector
Using ArcGIS Collector
Using ArcGIS Collector

Ocean Signs
Missing location

- BARCODE_ID
- MUTCD_CODE
- CLASS
- DESCRIPTION
- SHEETING
- BACKING
  - <No value>
- BACKGROUND

LEGEND

SUPPORT

BREAKAWAY
- <No value>
- Yes there is an attachment
- No there is no attachment
- <No value>

RETROREFLECTIVITY

MOUNTING HEIGHT
Using ArcGIS Collector

Ocean Signs
long: -74.259578 lat: 39.921475

BARCODE_ID
030500

MUTCD_CODE
M1-6

CLASS
Guide

DESCRIPTION
Rt 530

SHEETING
Engineer Grade

BACKING
Wood

BACKGROUND

We Make a Difference
Challenges/Accomplishments

Challenges

➢ County data schemas were variable and inconsistent (except for signs)
➢ TAC committee reviews – differing opinions often made it difficult to maintain, scope schedule and budget
➢ Need common workflow from counties to maintain integrity of unified data base

Accomplishments

➢ Facilitated County collaboration
➢ Provided examples of the value of data standardization
➢ Tool to support field-based asset updates
➢ Regional asset feature reporting
Questions/Comments?

Tom Tiner, CP, GISP
Director of Asset Management
Michael Baker International, Inc.
609-807-9521
ttiner@mbakerintl.com