Leveraging State Maintained Geodatabase for 511

Alaska DOT&PF
LogicTree Corporation
Open Roads Consulting
Overview

- **Project Requirement**
  - Utilize state’s Enterprise Geodatabase (EGDB) to support 511 IVR, Web and Condition Reporting System

- **Fulfilling a Vision**
  - Create accurate geodatabase for state-owned and maintained roads
  - Leverage geodatabase to serve multiple customer groups and agencies within the state
  - Use 511 project to expand interest in leveraging state resources
AKDOT&PF Needs

- Several groups within a DOT develop applications that require geospatial data
  - RWIS
  - Asset management
  - Pavement management

- Supporting Operations and Maintenance
  - Resource Management
    - Equipment dispatched to specific locations
  - Emergency Response
    - Pinpointing location of incidents
  - Accurate Planning & Construction Management
Vision for Multi-Use Geodatabase

- Make it easy for Alaska agencies to share spatial data
  - Traveler information / Intermodal trip planning
  - Commercial Vehicle
  - Weather and field device data
- Consistent presentation of map features
  - AKDOT&PF internal applications
  - Sharing data with other state and local agencies
  - Communicating with the traveling public
# AKSOT&PF EGDB Project Milestones

<table>
<thead>
<tr>
<th>User Needs/Requirement Analysis</th>
<th>GPS/Photolog Data Collection Program</th>
<th>General End User Application Development</th>
<th>Func Area Application Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Geodatabase Design</td>
<td>Editing Application Development</td>
<td>Traffic Data System Transportation Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td>Data Business Plan Concept of Operation</td>
<td>Data Business Plan Transportation Database IT Infrastructure Whitepaper</td>
<td></td>
</tr>
</tbody>
</table>

[511.Alaska.gov]
AKDOT&PF EGDB Overview

Enterprise Geodatabase

End User Applications

Geodatabase Maintenance Tools

Photolog/GPS Data Collection & Processing
Geodatabase Management and Access

1. **Maintenance application**
   - For power GIS and database managers: to manage the geometric network and inventory data, including editing and maintenance functions.

2. **Desktop**
   - For users with some GIS experience: A user-friendly mapping interface to query and display centerline, inventory and other business data.

3. **Web – GIS application**
   - For all ADOT&PF staff: To view the centerline network and attribute data via the internet.
Maintaining the Geodatabase
Enterprise GIS Web Portal

[Image of the Enterprise GIS Web Portal interface]
Data Collection Program

- Transportation Network
  - Routes
  - State Owned Routes
  - Higher FC Routes
  - Remote Routes
  - 1/3 State Routes Annually
LRS Based Enterprise GDB

- Quicker access: normalized data format; RDBMS
- More efficient data storage and management
  - Store network geometry once
  - Avoid creating topological division where attribute changes
  - Mapping event data on the fly
  - Manage network and events in a seamless way
Features of the AKDOT&PF Geodatabase

- Contains state owned & maintained roads & local roads
  - Coordinated Data System (CDS) numbers for each road
  - Linear Referencing System (LRS)
- AK specific features
  - Road signs, bridges, mileposts, trailheads, etc.
## Enterprise Geodatabase Features

### Point Events
- Sign (milepost)
- Cultural feature
- Traffic signal
- Maint, facility
- Culvert
- Traffic station
- Enviro Point
- Intersection
- MMS Asset Group
- Acc Named Inter Accident
- Mountain Pass’ Emerg. Call Box

### Line Events
- Bridge
- NHS
- AHS
- STRAHNET
- Federal Aid
- AK Route #
- FC
- AK Forest Hwy
- STIP
- Rest Area
- Turnouts
- Rumble Strips
- Guardrail
- Traffic Direction
- Paved Shoulder
- # of Lanes
- Median
- Road Surface
- PMS section
- Posted speed
- HPMS Link
- Traffic Link
- MMS Inventory
- MMS Responsibility
- MMS Category
- MMS Group
- Acc Named Int
- Acc Named seg
- Inventory Direction

### Jurisdiction Boundaries
- Region
- Census Area
- Borough
- City
- Public Safety
- Maintenance District
- Urban Area
- Maintenance Area
- Maintenance Station
- House District
- Senate District

### Network
- Link
- Node
- Route Feature

### External Databases
- STIP
- Traffic
- Accident...
Leveraging the Geodatabase for 511

- 511 was the first new application to leverage the Geodatabase
- AKDOT&PF sought team to build scalable, flexible 511 platform around the Geodatabase
  - Support broader vision of 511
  - Encourage coordination with other stakeholders
Sharing Data with State and Local Agencies

- Municipality of Anchorage
  - Share event & construction data with DOT
  - Local GIS Data added to the state geodatabase
- Cross-Agency Coordination
  - Marine Highways
    - Integration of routes and schedules on map
  - National Park Services
  - Department of Natural Resources
Integrating the Geodatabase for 511

- LogicTree and Open Roads customized presentation
  - Construction of Alaska maps
  - Additional map server
    - Export data from ESRI → create open source stack
    - Create new styles, layers and cartography to represent accurate, user friendly maps.
  - Consistent view between back-end and front-end
- Coordinated effort between contractors and AKDOT&PF
  - Worked together to enhance geodatabase for 511
  - Identified data quality issues that impacted 511 and other future uses
511 Ride – Base Map
511.Alaska.Gov Map
Condition Reporting System

- Integrated Alaska Geodatabase
- Designed to incorporate variety of data sources
  - Zoom to any route, state or local
  - Plot events on map
  - Automatically snap events to given route
  - Paint roadway overlays
- Solution built to support Alaska’s specific needs
  - Events reference-able across multiple agencies
511 RIDE – Editing Events

511 Message Builder
System msg: Road construction on Northbound BRAYTON DRIVE at LORE ROAD Occurring until mid September Lane restrictions. Website: http://www.alaskanavigator.org DOT Contact: 907-344-2593 Contractor: 907-646-9617
Submit to 511: Web Phone
Customize Message
Impact on 511

• More precise reporting of Weather Advisories and Incidents (IVR and Web)
  • Pinpoint placement of weather advisories
    • Weather changes dramatically in short distance
    • Lat/Long of advisory mapped to NWS feed
    • IVR will report advisories within segments or across multiple segments
  • Highly detailed Incident Reporting
    • Ex: Massive equipment trucks / Bridge repairs
  • Information targeting Commercial Vehicle Operators and Travelers
Impact on 511

Hakina Bridge, MP 44 of the McCarthy Road is open intermittently with vehicle load restrictions.
Impact on 511

Route Summary Report

Select a Highway or Route #. Then select Go to get a complete report.

Select Highway
Select Route #

Select Highway
(Use Ctrl key to select multiple highways)

Alaska Highway
Unimak Highway
Copper River Highway
Dalton Highway
Denali Highway
Edgerton Hwy/McCarty Rd
Elliott Highway
Glacier Highway
Glenn Highway
Haines Highway
Haines Highway
Klondike Highway
Milikof Highway
Parks Highway
Portage Glacier Road
Richardson Highway
Seward Highway
Steele Expressway
Sterling Highway
Taylor Highway
Tok Cutoff Highway

Highway Summary
Incidents: 0 nos
Planned Events: 2 nos
Driving Conditions: 0 nos
Impact on 511

Alaska Department of Transportation & Public Facilities 511 Travel in the Know

Planned Events

1. Dalton highway from Milepost 175 to Milepost 197
   Gross weight limit - Lane restrictions - Narrow lanes - Width restrictions.
   Expect delays (duration unknown) - Future lane closure - Future road closure - Intermittent lane closures - Intermittent lane restrictions - Lane closures - Long delays (15 min - 1 hr) - Opened to traffic - Road closure.
   Abrupt edges - Be alert to flaggers - Be prepared to stop - Changing traffic patterns - Flagging operations - Gravel surface - Heavy equipment on roadway - Heavy equipment on shoulder - Motorcycles use extreme caution - New traffic pattern - Pilot car operations - Rough surface - Use caution when traveling through this area - Use extreme caution - Warning - Workers on roadway - Workers on shoulder.
   Thank you for your patience.
   Varying work is being done along project length. Haul Trucks are on parts of the project. Day and night shift are both in operation. Road Closures are being used to install large diameter culverts throughout the project. Paving will begin July 30th and uneven lanes are to be expected.

2. Dalton highway from Milepost 260 to Milepost 321
   Lane closures - Long delays (15 min - 1 hr).
   Be prepared to stop - Changing traffic patterns - Flagging operations - Heavy equipment on roadway - Heavy equipment on shoulder - Motorcycles use extreme caution - Pilot car operations.
   The work zone is from MP 312 APL Pump #3 and MP 314 Surprise Raise, and both flaggers and pilot cars are present. Expect heavy truck traffic between MP 305 and the work zone.

Always check the National Weather Service reports BEFORE you travel.
Information available at http://511.alaska.gov or dial 5-1-1.
Impact on 511

- Availability of data to other agencies
  - Resource management
  - Construction Management
  - Marine Highways
  - Emergency Response
  - RWIS
  - Local Construction/Incident
  - Crash Data system
  - Pavement management

State Agencies
Summary

- Alaska had a geodatabase asset to leverage
- Looked at 511 as a communications tool to be leveraged
- Recognized multiple agencies in Alaska could benefit from integrated geodata and traveler information
- LogicTree/Open Roads provided customized solution
  - IVR / Web / Condition Reporting
  - Not a standard, off-the-shelf solution
  - Investment and partnership with State
Contact Information

Jill Sullivan, ADOT&PF  
(907) 465-8592  
jill.sullivan@alaska.gov

Brent Isenberg, LogicTree  
(301)928-8908  
bisenberg@logictree.com

Lisa Idell-Sassi, ADOT&PF  
(907) 465-8952  
Lisa.idell-sassi@alaska.gov

Jeff Adler, Open Roads  
(703)636-7294  
jadler@openroadsconsulting.com