

North Dakota Department of Transportation

Spatial Data Portal and Video Log Viewer Project



Introduction

- Brian Bieber – NDDOT Project Manager
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Introduction

● Project Background

– Integrate Pathways Van Images with GIS Data

- Follow PennDOT's lead – Tom Ten Eyck (PennDOT Bureau of Planning and Research)

– Why this?

- High impact application (money for additional applications!)
- Usage across all divisions
- Build excitement for GIS (again)
- Allow casual users access to spatial data in an easy to use application (even Executives would use it!)
- Get users thinking about what is possible
- Desktop application - >20Mbps – not conducive to T1 lines



Constraints

- RFP process (GIS Vendor Pool first)
- Budget
- Work within State IT infrastructure
- Finish by end of biennium (6/30/07)
- Proprietary Image/Database format
- ESRI technology

Project Scope Summary

- Project methodology included tasks for:
 - Requirements
 - Design
 - Test Plan
 - Development
 - Deployment Plan
 - Deployment
 - Training
 - Project Management



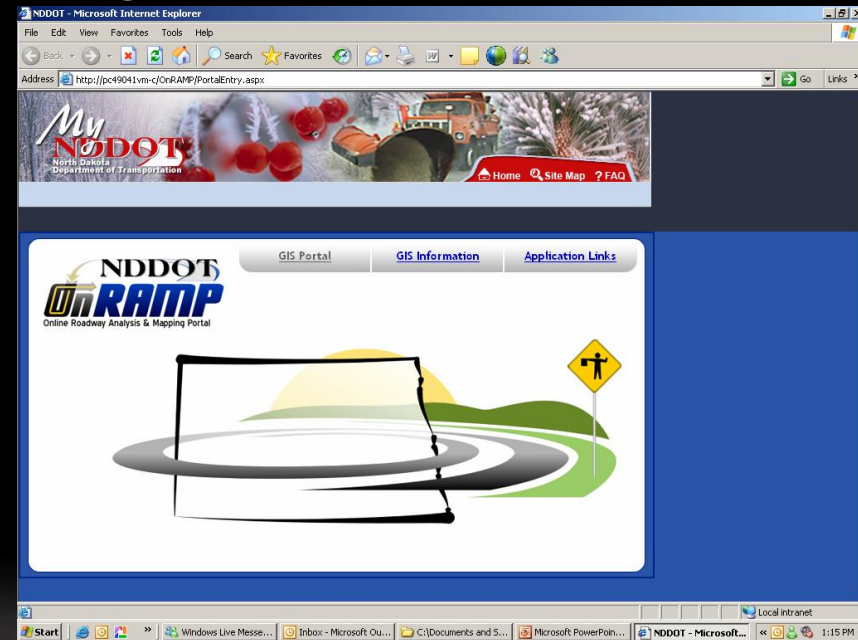
Project Scope Summary

● Spatial Data Web Portal

– Design Web Portal Home Page with links to:

- **GIS Web Portal**
- **Web Based Video Log**
- NDDOT GIS web Page
- NDDOT Web Applications

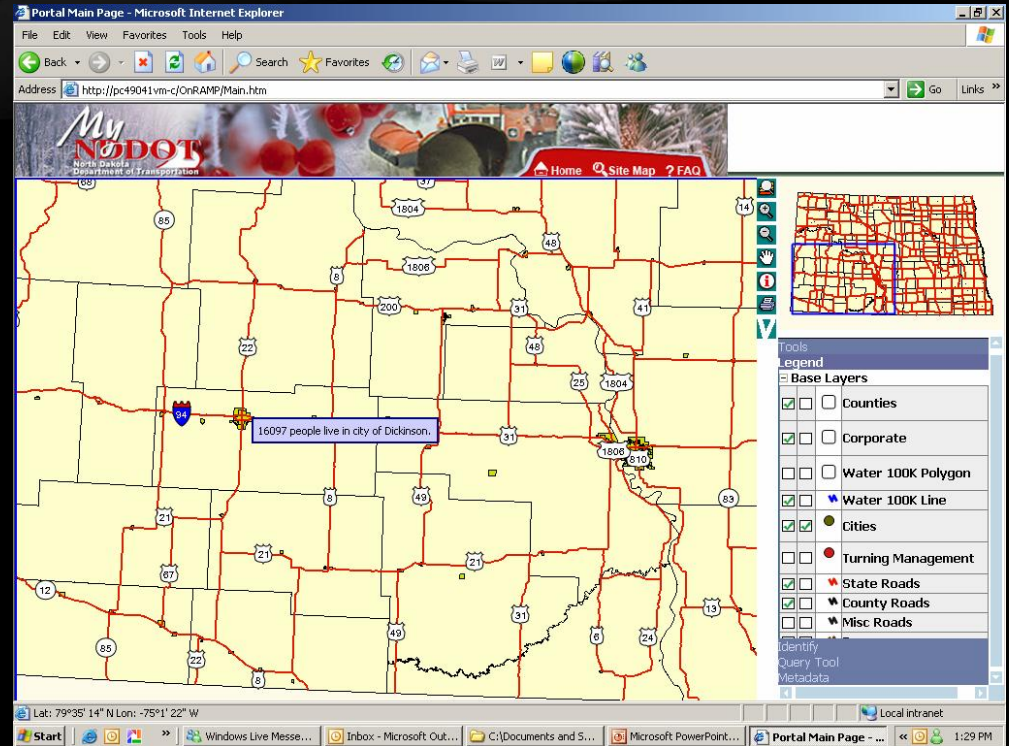
– Uses NDDOT Intranet style sheets



Project Scope Summary

● GIS Web Portal

- Multiple Business Theme Mapping
- Reference Map
- Map Navigation Tools
- Zoom to Boundaries
- Legend
- Identify Results
- SQL Query Tool
- Map Tips & Printing
- Used to select location for Web Based Video Log
 - Select via Map Click, Identify Results, or Mile Point Entry



Project Scope Summary

● Web Based Video Log

- Single Image Advance
- Continuous Run
 - Simulate 60 mph
- Go to Begin or End
- Reverse Direction
- Set Skip Interval
- Dynamic Map Panning
- Display Hi-Res Photo
- Save MPEG movie
- Map Navigation During Continuous Run
- Adjust Images for Alignment

Portal Main Page - Microsoft Internet Explorer

Address: http://pc49041vm-c/OnRAMP/Main.htm

My NDDOT North Dakota Department of Transportation

Home Site Map FAQ

Interval: 0

Start-14:59:33.648 end-14:59:33.828
end-14:59:37.62 end-14:59:55.258

Tools
Legend
Identify
Query Tool
Metadata

Date	11/7/2005 3:01:0 PM
District	5
Road Name	0094
IRI_Avg_e	66.00000
RUT_Avg_e	105.00000
FAU_Avg_e	176.00000
Route Id	15
MilePoint (mi)	2.1186
Route Set Id	314
Direction	I

Lat: 79°38' 36" N Lon: -78°3' 5" W

Windows Live Messenger, Inbox - Microsoft..., Microsoft PowerPoint..., C:\Documents and Settings\..., Portal Main Page..., ON-RAMP Video..., 3:01 PM



- GIS Portal GIS Information Application Links

NDDOT OnRAMP Online Roadway Analysis & Mapping Portal



Application Design Features

- Thin Client Application
 - Web Based Application with minimal client machine requirements
- Extensible Web Portal Foundation
 - Flexible design enabling future functionality
- Spatial Parameters for spatial integration
 - Pass location to video log and launch directly from other Web Based Applications.

Application Design Features

- LRS Techniques used for image placement
 - Combination of GPS and milepost offset for image placement
- Image Processing from Pathways
 - Utility developed to resize images and replicate file structure for rapid web access
 - Used to replace images as new data is captured
- Performance optimization
 - HTML file serving

Project Challenges

- Proprietary image filing/naming system
 - Analysis of Pathways image file structure, naming system and linking images to metadata

107005901251.jpg

Hours: 0-59 Seconds: 0-59

Folder/Section name under the main route folder. **107** **00** **59** **01** **25** **1** Image View: 1-Forward, 2-Side

Minutes: 0-59 Frames: 0-29

Formula for converting to raw frames: Formula for converting to raw frames: Formula for converting to raw frames:

Frames + Seconds * 30 + Minutes * 60 * 30 + Hours * 60 * 60 * 30 = RawFrames	→	25 + 1 * 30 + 59 * 60 * 30 + 0 * 60 * 60 * 30 = RawFrames	→	25 + 30 + 106200 + 0 = 106255
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This point falls proportionally between the following two records in the GPS file:

```
106233 48.3549019 -100.1138336 1512.9 0.0
106264 48.3548985 -100.1134921 1513.4 0.0
```

And proportionally between the following two records in the heading file:

```
106174 90.883483
106264 90.858241
```

And the the images can be related to the section file by identifying the beginning and ending image numbers in the set record:

```
!107!105107!106999!
```


Project Challenges

- No direct LRM to link images to their location on the NDDOT road network
 - Developed a hybrid placement methodology using GPS data where available but reverting to milepost interpolation techniques if no GPS data was available.
- Limited bandwidth at district offices
 - Image serving optimized for performance

Project Status

● Project Timeline

- Project kick off
 - October 2006 (Complete)
- Requirements and Design
 - December 2006 (Complete)
- Application Development, Test & Deployment Plans
 - January – April 2007 (75% Complete)
- Deployment for User Acceptance Testing
 - Late April 2007
- Production Deployment
 - Late May 2007



Future Plans

- Enhancements to Web Portal
 - Extend with general use applications
 - Straight Line Diagramming
 - Crash Data
 - GIS – Filenet Connector
- Application Integration
 - Launch Video Log from Business Applications
- Recommendations to other DOT's
 - Low hanging fruit to add momentum
 - Help users do their job more efficiently
 - Put \$'s to your ideas – costs & benefits
 - Evolutionary instead of Revolutionary



Questions?

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