Marc Kratzschmar

Implementing the Canadian National Road Network linear referencing data model at New Brunswick DOT
Acknowledgements

• New Brunswick DOT Project Team
  – Kim Mathisen
  – Dawn Vincent Dixon
  – Pablo Romero
  – Dean Fletcher

• Exor Project Team
  – Zubran Solaiman
  – Sarah Kistulinec
  – Jon Libby
Three Stories

National Road Network

New Brunswick DOT Project

Network Data Lessons

Not much time, but they’re all related
Canadian National Road Network (NRN)

National Street Data Model
National Street Database

National Partnership
Led by NRCan

Objective: One homogeneous (core) geometry for the entire Canadian Landmass and maintained by closest to the source providers.
Canadian National Road Network (NRN)
Canadian National Road Network

Unpaved

Start at 30 meters

End at 70 meters

LRS View

Thanks to Marcel Sabourin
Canadian National Road Network (NRN)

7 Segments

Speed limit
Unpaved
Deer

Thanks to Marcel Sabourin

Segmented View
NBDOT TRAMS Implementation

Transportation Related Attribute Management System (TRAMS)
Implement Provincial Version of National Road Network (NBRN)
Implement Provincial Version of National Road Network (NBRN)

- Topological Differences
  - Junctions at County Boundaries
- Different Event Model
  - Roads as traversals, not events
- Convenient Denormalization
  - Control Section IDs on CSNM events
NBDOT TRAMS Implementation Objectives

Implement Provincial Version of National Road Network (NBRN)

Replace Legacy Systems

Transportation Network Management System (TNMS)

- Legal Roadway Database
- Custom Application
  - Oracle Forms Application
  - Oracle Data Warehouse
  - Periodic Snapshots (With synchronization to relate historic to current data)
NBDOT TRAMS Implementation Objectives

Implement Provincial Version of National Road Network (NBRN)

Replace Legacy Systems

Transportation Network Management System (TNMS)

Highway Digital Map (HDM)
- GIS street centerline
- Caris to ArcGIS migration
NBDOT TRAMS Implementation Objectives

Implement Provincial Version of National Road Network (NBRN)

Replace Legacy Systems

Integrate Spatial and Logical Data

Anchor Sections and Control Sections from HDM
NBDOT TRAMS Implementation Objectives

- Implement Provincial Version of National Road Network (NBRN)
- Replace Legacy Systems
- Integrate Spatial and Logical Data

Anchor Sections and Control Sections from HDM
Control Sections and Roads and Events from TNMS

<table>
<thead>
<tr>
<th>Road</th>
<th>Name</th>
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<tbody>
<tr>
<td>1</td>
<td>Rt 2</td>
</tr>
<tr>
<td>2</td>
<td>Maple St</td>
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<td>2</td>
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<td>3</td>
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<td>5</td>
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<td>6</td>
<td>5</td>
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<table>
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<tr>
<th>Asset</th>
<th>CS</th>
<th>Start</th>
<th>End</th>
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<tbody>
<tr>
<td>Bridge 4</td>
<td>1</td>
<td>1km</td>
<td>2km</td>
</tr>
<tr>
<td>Sign 5</td>
<td>2</td>
<td>4.5km</td>
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</table>
Implement Provincial Version of National Road Network (NBRN)

Replace Legacy Systems

Integrate Spatial and Logical Data

Exor suite of network data management software
- Network Manager, Spatial Server, Asset Manager, Spatial Manager

Reorganization to combine maintenance teams
<table>
<thead>
<tr>
<th>WBS</th>
<th>Task Name</th>
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<tbody>
<tr>
<td>1</td>
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<td>1.1</td>
<td>Project Initiation and Scoping</td>
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<td>1.1.5</td>
<td>Install scoping workshop system</td>
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<td>Review scope impact</td>
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<td>Testing and Acceptance</td>
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<td>Set up test environment</td>
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<tr>
<td>1.6</td>
<td>Roll Out</td>
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<tr>
<td>1.7</td>
<td>Project Management</td>
</tr>
</tbody>
</table>

![Gantt chart for NBDOT TRAMS Implementation Project](chart.png)

Small Project
NBDOT TRAMS Implementation Project

Big Mistake
Network Restructuring

Precision Issues

3.15 rounds to 3.2
3.2 + 3.2 + 3.2 = 9.6
9.45 rounds to 9.5

Adding rounded numbers introduces inaccuracy
Network Restructuring

Cardinality Issues

Result of merging B to C then A to CB
Result of merging B to A then C to AB
Network Restructuring

Lessons

• Network data can be restructured
• Think it through first
  • Sequence is everything
• Plan to test
• Plan to rework
Thank you for your time. Any questions?

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