WASHINGTON STATE DEPARTMENT OF Natural Resources
Peter Goldmark - Commissioner of Public Lands
Tracking Road Maintenance and Right of Way Easements on Forest Roads

By Jeffrey Holden
Washington Department of Natural Resources
Part 1

The Problem
Road Maintenance
Agreements
Transportation Books
## Transportation Books

<table>
<thead>
<tr>
<th>Reference</th>
<th>Instrument</th>
<th>K. R.</th>
<th>King County</th>
<th>Miles</th>
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Agreements

1. Indexed
2. Scanned
Exhibits

Where is the easement?
Problem

• Where?

• Not available to all employees
Part 2

The Solution
Solution

Display Road Maintenance and Easements in Geographic Information Systems (GIS)
Roads
Digitizing Roads
# Road Attributes

<table>
<thead>
<tr>
<th>ROAD_ROUTE_ID</th>
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<td>ROAD_NM</td>
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<td>ROAD_NO</td>
<td>AA-0002</td>
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<td>ROAD_CONTROL_CD</td>
<td>10: WA DNR - Department of Natural Resources</td>
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<td>ROAD_RESPONSIBILITY_CD</td>
<td>1: DNR Maintained</td>
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<tr>
<td>ROAD_STATUS_CD</td>
<td>5: FP Abandoned</td>
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<td>ROAD_PUBLIC_ACCESS_CD</td>
<td>4: Not Driveable By Four-Wheeled Highway Vehicles</td>
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<tr>
<td>ROAD_SURFACE_CD</td>
<td>8: Other</td>
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DNR Routes
Select Road Segments
Create Route

[Image of the Make Route dialog box with options for specifying the measure starting point, measure values, and checkbox for ignoring spatial gaps. The 'Make Route' button is circled.]
Road Assets

Road Assets are Points

• Bridges
• Culverts
• Road barriers
• Rock pits
Culverts
Topology Rules

• Routes are on ROADs
• Routes are one part
• No overlaps
• Nodes only at intersections or attribute changes
• Point features should be on roads
Fish Barrier to replace
Culverts
Linear Referenced Events

• A point or line segment along a route
• An associated table has a
  – ROAD_ROUTE_ID
  – FROM_DISTANCE_FT
  – TO_DISTANCE_FT
Planned Road Maintenance

- 10: Bridge
- 11: Fish Stream Culvert
- 12: Live Stream Culvert
- 13: Armored Ford Culvert
- 20: Cross Drain Culvert
- 21: Rolling Dip
- 22: Drivable Water Bar
- 23: Undrivable Water Bar
- 24: Ditch Out
- 30: Flume/Downspout
- 31: Energy Dissipater
- 32: Catch Basin
- 33: Silt Trap
- 40: Road Barrier
- 41: Gate
- 42: Cattle Guard
Planned Road Maintenance

• Culvert Replacement
• Cross ditches
• Gate installation
Fish Barrier replaced

Before

After
A Point Event
Planned Road Maintenance

• Ditching
• Brushing
• Grading
• Decommissioning
• Abandonment
Planned Road Maintenance
Road Easements
Attributes

Right of way easement agreements are linked to Nature
Part 3

Route Events Tool
Route Events Tool

ArcGIS Add-in
C# .NET
ArcObjects
To Add-in the Route Events Tool

1. Customize Add-ins
2. Add Folder
3. Add path
Install Route Events Tool

3. Check the DNR Route Events Toolbar
Route Events Toolbar

DNR Route Events Toolbar

Agreement 55-000012
Route ID: PC-TO-5615
ROAD 6402 ROAD field ROAD_NM

Layer events
Dock-able Window
Toolbar
Zoom to Road Maintenance

1. Press All Events
1. Press Toggle Route Events Dock-able windows button.
Event in a few clicks

1. Click on route
2. Refresh Route Events
3. Save Event
4. Attributes Edit
Attributes

1. ROAD_ROUTE_ID: PC-TO-5615
2. ROAD_WORK_CD: 30
3. EVENT_OFFSET: -20

Other attributes:
- FROM_MEAS_FT: 200
- TO_MEAS_FT: 500
- FROM_MEAS_MI: 0.0379
- TO_MEAS_MI: 0.0047
- ROAD_WORK_ACTIVITY_CD: 10
- RMAP_COMMITMENT_FLG
- EVENT_OFFSET
- ROAD_PROJECT_NM: <Null>
- ROAD_PROJECT_NO
- ROAD_PROJECT_FPA_NO: <Null>
- ROAD_FEMA_EVENT_NO: <Null>
- ROAD_FUND_CD
- RMAP_BLOCK_CD
- RMAP_PRIORITY_CD: 0
- ROAD_WORK_DESC: Ditching on right side of road
- ROAD_WORK_METHOD_CD: 0
Forest Roads Team Members

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- Patrick Caton
- Don Hiller
- Region GIS editors and forest engineers
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Questions