Adding Continuous Truck Counts to the Regional Data Archive (PORTAL)

Regional Freight TAC Meeting
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What’s in the PORTAL Database?

Loop Detector Data
20 s count, lane occupancy, speed from 500 detectors (1.2 mi spacing)

Incident Data
140,000 since 1999

Bus Data
1 year stop level data
140,000,000 rows

Weather Data
Every day since 2004

Days
Since July 2004
About +700 GB
6.9 Million
Detector Intervals

VMS Data
19 VMS since 1999

WIM Data
22 stations since 2005
30,026,606 trucks

Crash Data
All state-reported crashes since 1999 - ~580,000
Please, click on a pin to explore a station or select a station from the list in the upper left hand corner and click go.
Freeway Performance Measures

- Volume (Counts)
- Speed
- Occupancy
- Vehicle Miles Traveled
- Vehicle Hours Traveled
- Travel Time
- Delay
- Reliability
Interstate 5 Northbound

About 38.6 kilometers
Estimated Monthly Travel Time I-5 North September 2006

- Percent Congested
- Free Flow Travel Time
- Mean Travel Time
- 95th Percentile Travel Time

Lyman and Bertini, 2007
Travel Time Comparison, Northbound I-5, September 2004-2006

From monthly performance reports

Lyman and Bertini, 2007
Systematically Identifying Bottlenecks

Bottlenecks recurring at least 50%, 75%, and 90% of the time in Feb. 2008

Systematically Identifying Bottlenecks

Bottlenecks recurring at least 75% and 90% of the time in Feb. 2008

Systematically Identifying Bottlenecks

Bottlenecks recurring at least 90% of the time in Feb. 2008

Limitations of Existing Detection

• Only on freeways
  – Efforts to add arterial streets underway
• No information about type of vehicles
• Hardware and firmware upgrades not cost effective
This Project

• Develop system for permanent truck counts
  – 20-second intervals, 24 hours per day, 365 days per year
  – Explore freeway and arterial applications

• Likely uses of data
  – Measuring performance specific to freight
  – Transportation modeling in support of freight
  – Possible operational enhancements
Methods for Defining Trucks

- Manual (e.g. visual)
- Axle Sensors
- Vehicle Length
- Machine Vision
- Other Technologies
Dual-loop configuration

\[ v_{off} = \frac{L_{loop} + L_{int}}{t_{off2} - t_{off1}} \]

\[ L_{veh} = v_{off} (t_{off2} - t_{off1}) - L_{loop} \]
<table>
<thead>
<tr>
<th>Vehicles Classification</th>
<th>Range of Length (in ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FHWA</td>
</tr>
<tr>
<td>Passenger vehicles (PV)</td>
<td>Less than 13</td>
</tr>
<tr>
<td>Single unit trucks (SU)</td>
<td>13 to 35</td>
</tr>
<tr>
<td>Combination trucks (CU)</td>
<td>36 to 61</td>
</tr>
<tr>
<td>Multi-trailer trucks (MU)</td>
<td>62 to 120</td>
</tr>
</tbody>
</table>
All Trucks
Mean = 63.28 n = 77935
Next Steps

• Identify test locations
• Develop independent hardware and software
  – Working with OSU Industrial Engineering faculty D. Kim and D. Porter
• Validate and fine tune method
• Deploy and integrate
Questions?

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