Event Based Data from a 2070 Controller

Automated Traffic Signal Performance Measures Workshop

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Agenda

- Introduction
- Motivation
- Module Development
- Deployment Sites
- Data Collection
- Preliminary Results
- Next Steps
SPR 781: Snapshot

• Funding Agency: Oregon DOT

• Lead: Northern Arizona University

• Subs:
  – Portland State University (Sirisha Kothuri)
  – Iowa State University (Anuj Sharma)

• Objective
  – Different detection sources provide varying levels of accuracy
  – The impact of less than optimal detection on traditional call and extend operation is well known
  – How does sub-optimal detection impact the operation of higher level control algorithms, such as adaptive and/or traffic responsive?
Motivation

• Desire to collect high resolution event based data from 2070 running Voyage (Northwest Signal / Peek)
• Inspiration taken from ASC/3 event based data logger worked on while at Purdue
• Desire to collect as large a sample as possible
• Need for portable event based data logger
Data Flow

Vehicle Detectors
- Radar
- Video
- Loops

Traffic Controller

Video Feed
- Fit PC
- Dynamic Overlay

Detector Status

Event Log
Module Development

- Northwest Signal’s Testbox
Module Development
Module Development

- Data Flow Diagram
Module Development

- Visual interface that can be overlaid on screen / video
- Event based data file recorded from state changes
Module Development

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<th>2015070909ChgData.txt</th>
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Module Development
Module Development

• Use HyperCam to capture screen
• Slice video and data files into 1 hr increments with batch operation
• Will run “indefinitely”
Site Locations

[Map showing various locations in Oregon, including Salem, 122nd & SE Division, 97th & Lawnfield, Town Center Loop West & Wilsonville Rd, US 20 & Robal Rd.]
Town Center Loop West & Wilsonville Road, Wilsonville
Data Collection

- Used Fit PC and Axis encoder as hardware
- Ethernet connections
- Does not have to be onsite
Data Collection
Data Collection

- Minor issues occurred at 97th / Lawnfield & TCLW / Wilsonville related to MS Windows pop-ups
- Major issues at Bend severely limited data collection
- 122nd / SE Division was uneventful

<table>
<thead>
<tr>
<th>Location</th>
<th>Data Collection Dates</th>
<th>Good Data</th>
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<td>SW Wilsonville Rd. and Town Center Loop W</td>
<td>5/11/15 – 6/18/15</td>
<td>507 hrs (~21 days)</td>
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<tr>
<td>SE 97th Ave. and SE Lawnfield Rd.</td>
<td>6/18/15 – 7/28/15</td>
<td>599 hrs (~25 days)</td>
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<td>US 20 and Robal Rd.</td>
<td>6/25/15 – 11/6/15</td>
<td>196 hrs (~8 days)</td>
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<td>SE Division St. and SE 122nd Ave.</td>
<td>10/20/15 – 11/16/15</td>
<td>626 hrs (~26 days)</td>
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Preliminary Results

• Over 5 million unique records
• Tableau used as visualization tool
Preliminary Results
Lessons Learned

• Use Linux (yeah, we probably knew this before we started)

• IT policies make it challenging for an external partner to monitor data collection
  – Data lost due to site visit gaps

• Support from project partners is critical
  – ODOT
  – Clackamas County
  – Portland Bureau of Transportation
Lessons Learned

• Support from vendors is also critical
  – Northwest Signal / Peek
  – Detection vendors / manufacturers

• While data collection module does not need to be on site, much bandwidth needed

• Processing power can be an issue
Next steps

• Very promising for data collection under Voyage
  – Ability to monitor virtually anything in controller (Dynamic Object set)
  – Future of Voyage in question, however

• Scalable to other platforms, however detector status by channel must be reported
Acknowledgements

• Oregon Department of Transportation
  – Jon Lazarus, Boettcher, Dave Hirsch and SPR 781 TAC
• Dan Carson and Jon Meusch, formerly of Northwest Signal / Peek
• Clackamas County
  – Bikram Raghubansh
• Portland Bureau of Transportation
  – Paul Zebell
Questions?
Thank you!