Adventures in Transportation from a (Big) Data Perspective

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**Portal**

- Portland-Vancouver Transportation Data Archive
  - Policy of Open Data
  - Publicly-funded (Thanks to NSF, FHWA, Metro, RTC, TREC)
  - Focus on open-source software
  - ~3 TB PostgreSQL Database
  - Begun in 2004 (10 years!)

**Freeway**
- ODOT, WSDOT, Lane County

**Arterial**
- City of Portland, Clark County, Clackamas County,
  *Washington County, Gresham, Tigard, Beaverton, Vancouver*

**Transit**
- TriMet
  - C-TRAN
Data Sources in Portal

**FREEWAY**
- Radar: Speed, Count, Length
- Loops: Speed, Count

**TRANSIT**
- Ons, Offs, On-time performance, ...

**ARTERIAL**
- Travel Time
  - Travel Time & Variable Speed Signs
  - Crash

**WEATHER**

**RADAR**
- Speed, Count, Length

**BIKE LOOP**
- Count

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"FREEWAY TRANSIT Ons, Offs, On-time performance, ..."
How is Portal Used?

- Travel Time and Variable Speed Sign Project Development
- Education
  - Cloud Data Management
  - Civil & Environmental Engineering
- Performance Reporting (Metro)
- Travel Model Development
- Bottleneck Analysis (ODOT)
- Traffic Signal Analysis
- Arterial Concept of Operations
- I-84 Traffic Management Plan
- Ronler ATMS Project (Washington Cty)
Observations
Variety in spades...

- **Types of Variety:**
  - ODOT Integers vs. WSDOT Strings
  - Three arterial traffic signal systems
  - Three arterial travel time systems
  - Inductive loops and high-definition radar

- **Also variety in:**
  - Time granularity (20 sec, 5 minute, 1 hour)
  - Data quality
  - Spatial: Segment vs. point
Volume & Velocity

- Smart Phone Data:
  - Waze
  - Google (Maps)
  - NPMRDS (Nokia)

- Arterial Traffic Systems

- Sensor installation explosion
Use Cases
Corridor Flow

Two questions

- How long does it take to take the light rail vs. drive? Or ride a bike?
- What percentage of people bike? Ride transit? Drive?
Connected Vehicles

- V2V: Forward Collision Warning
- V2I: Transit Priority; Red Light Violation Warning
- Possibly lots of data (really!)

Figure credit: http://www.dot.gov/fastlane/connected-vehicle-pilots-coming-region-near-you
THANK YOU!

http://portal.its.pdx.edu

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