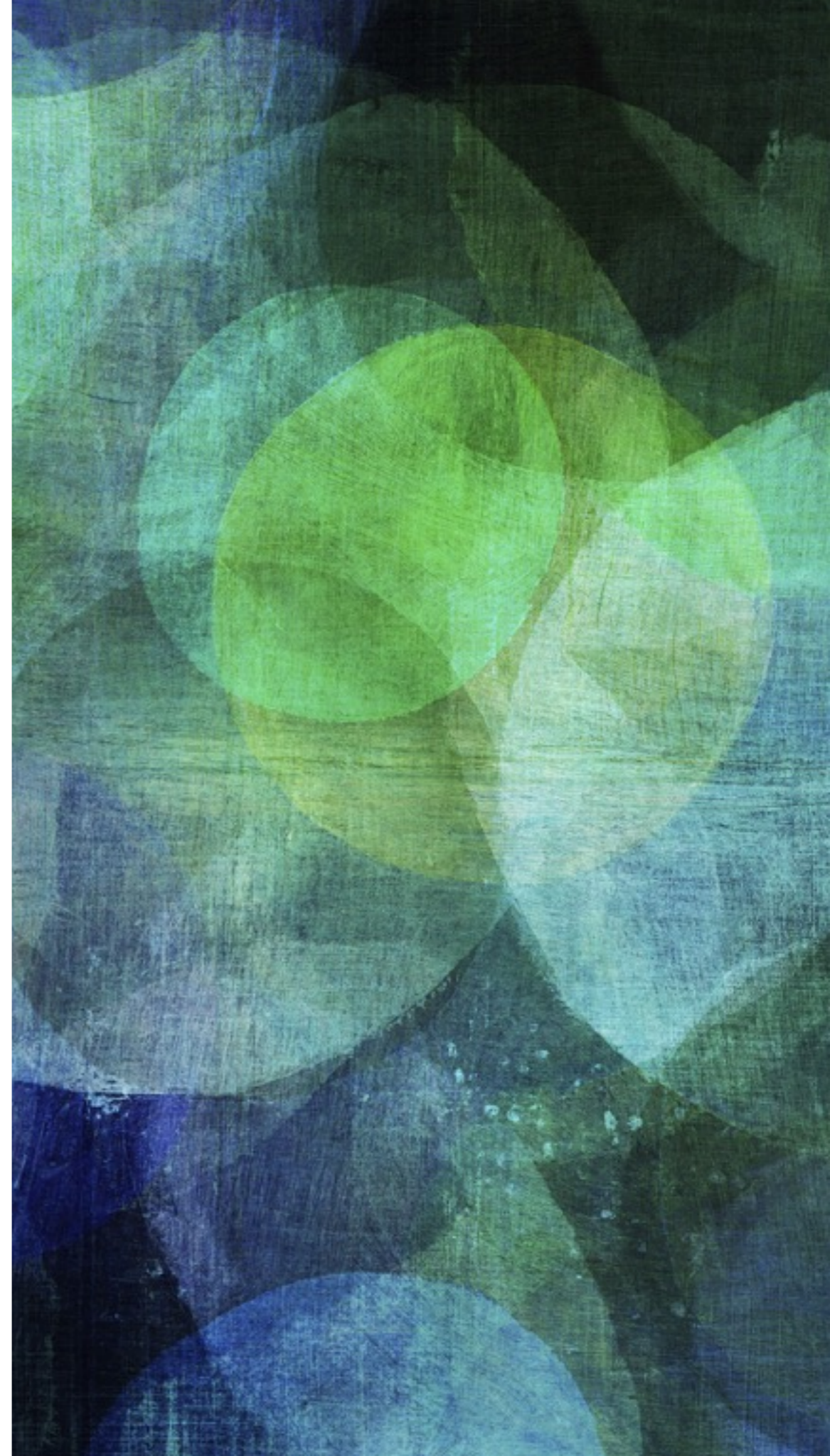


FLEXIBLE TRANSIT COMMUTE & TRIP PLANNING

*Kristin Tufte, Parker Emerson, Kushal
Datta, Alekh Jindal
NATMEC 2016 - May 2, 2016*



FLEXIBLE TRANSIT COMMUTE & TRIP PLANNING – MOTIVATION

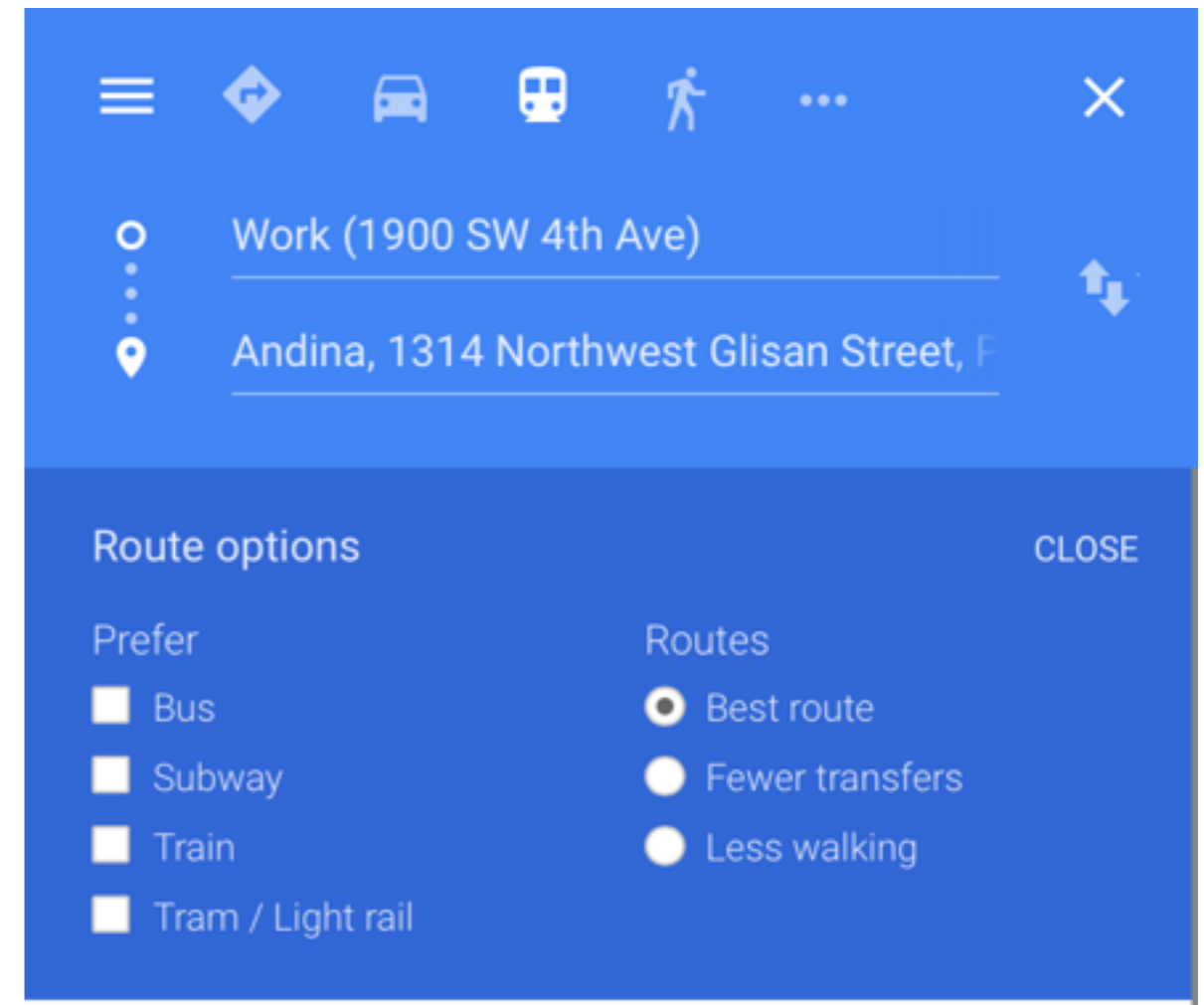
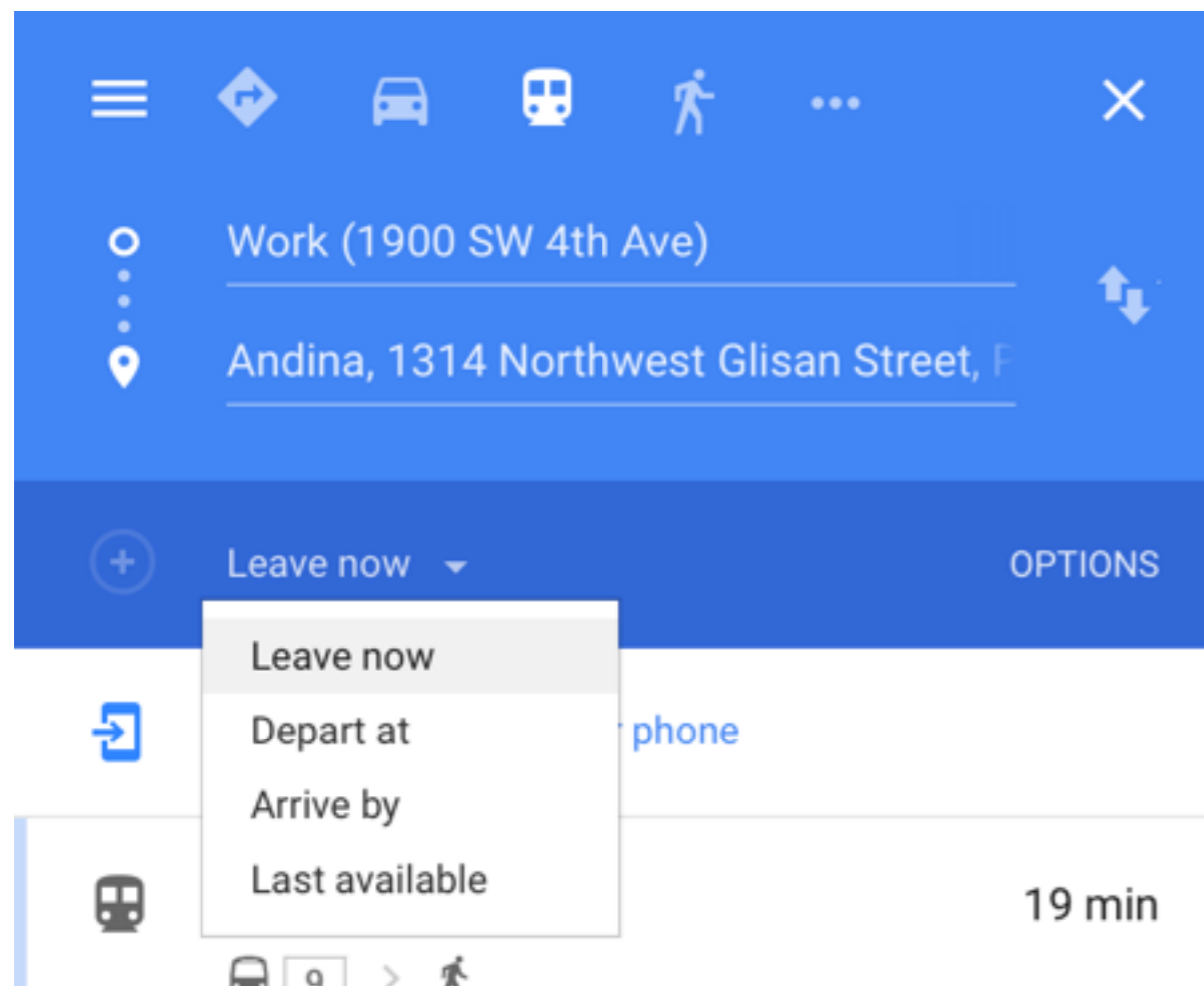
- “If I waited 45 minutes, would I get a seat on the bus?”

FLEXIBLE TRANSIT COMMUTE & TRIP PLANNING – MOTIVATION

- “If I waited 45 minutes, would I get a seat on the bus?”
- “I want to plan a commute”

FLEXIBLE TRANSIT COMMUTE & TRIP PLANNING – MOTIVATION

- “If I waited 45 minutes, would I get a seat on the bus?”
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TRIP PLANNING – CURRENTLY

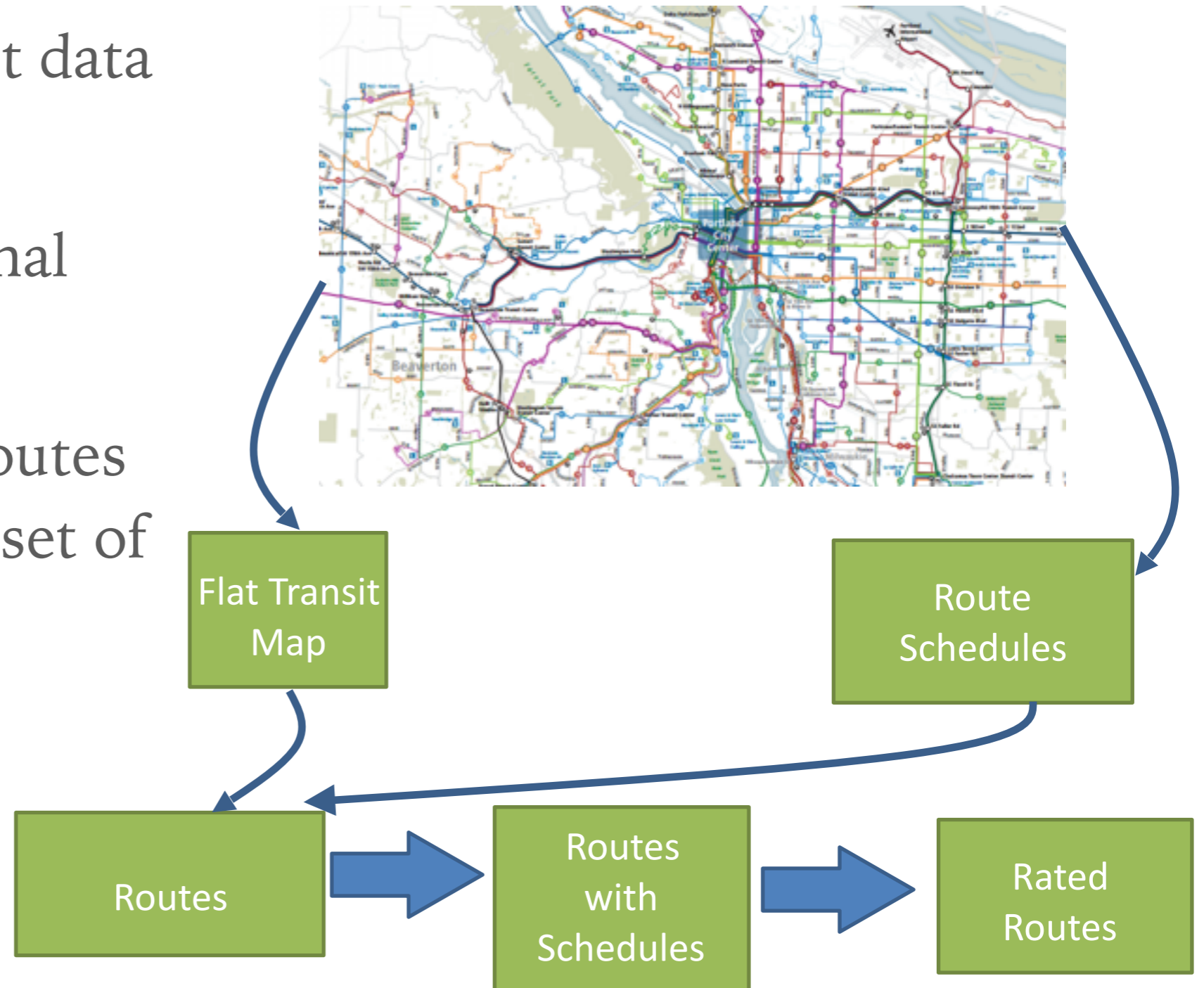
- “Get me from A to B as quickly as possible sometime soon”
 - Fastest trip; Fewest transfers; Shortest walking distance
 - Leave now; Depart at; Arrive by; Last available
- Essentially speed of route options

FLEXIBLE TRANSIT COMMUTE & TRIP PLANNING – GOALS

- Flexible Departure - rate routes based on:
 - Bus crowding
 - On-time performance
 - Stop amenities (shelter, coffee)
- Commute-Oriented Planning:
 - Consistent departure time
 - Average on-time performance
 - Shortest average trip over a week

PRELIMINARY PROTOTYPE

- Designed for TriMet data
- Implemented in PostgreSQL relational database (RDBMS)
- Status: Weighted routes function over a subset of TriMet data



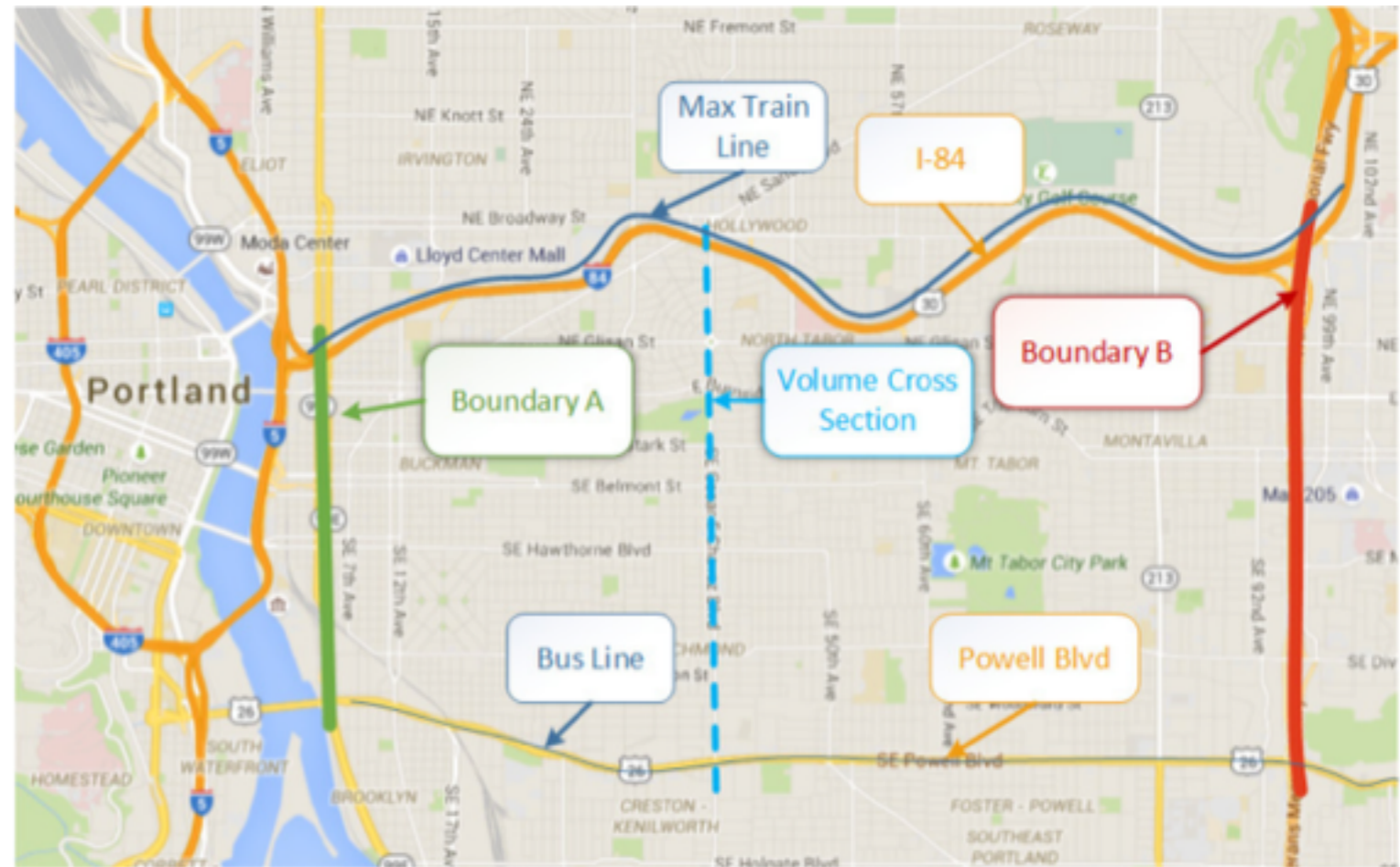
LESSONS LEARNED

- The Good:
 - Used data structure (schema) from the TriMet database (think GTFS)
 - Data in PostgreSQL allows flexible querying
- The Bad & Ugly:
 - Development went slow
 - PostgreSQL User Interface very difficult to work with for graph data - severely limited progress
- I'd want: Graph-based User Interface, Relational data storage

DATA MANAGEMENT CHALLENGES & OPPORTUNITIES

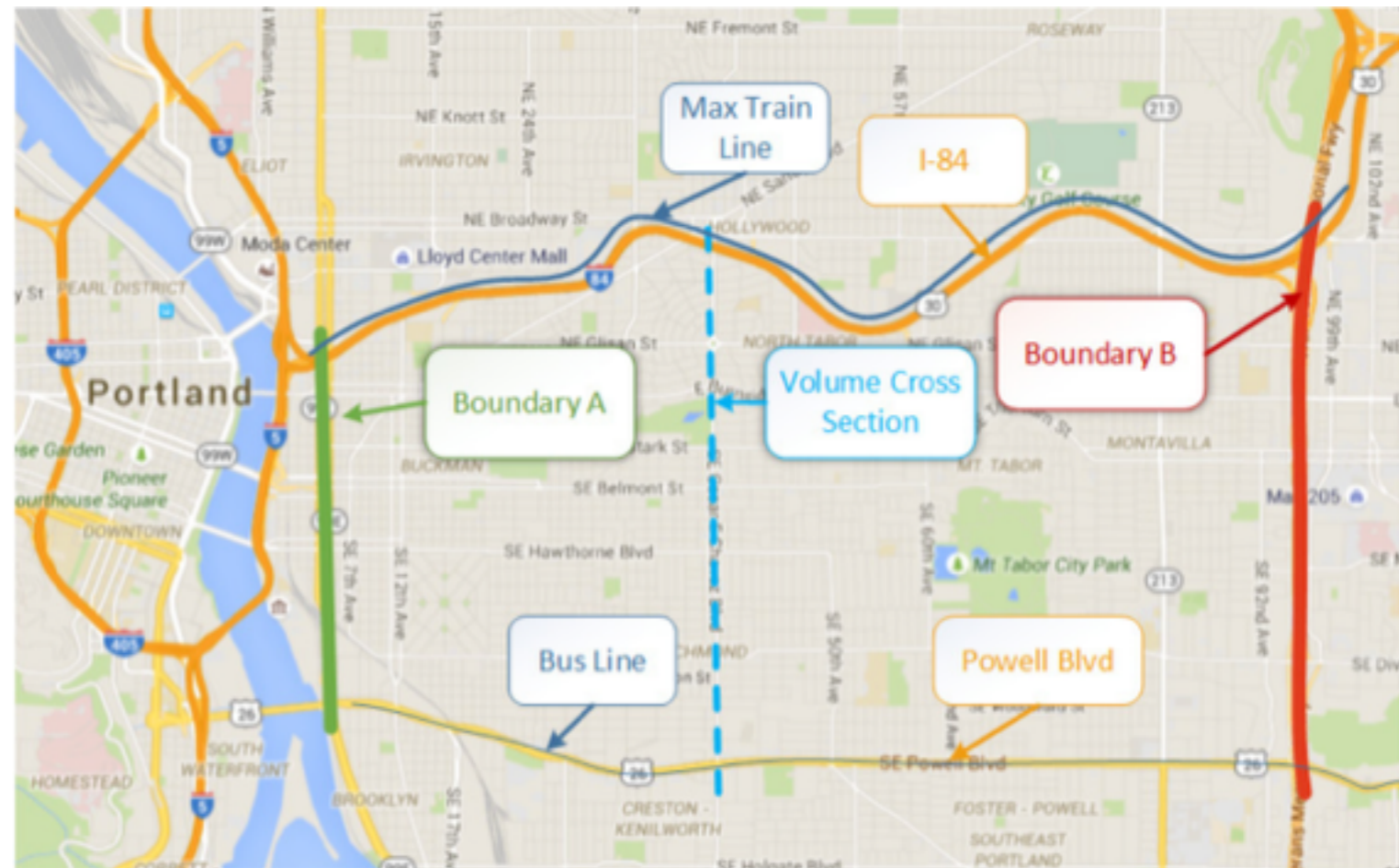
DATA MANAGEMENT CHALLENGES & OPPORTUNITIES

- Example: Counts of Bluetooth readings cannot be used as a volume count...



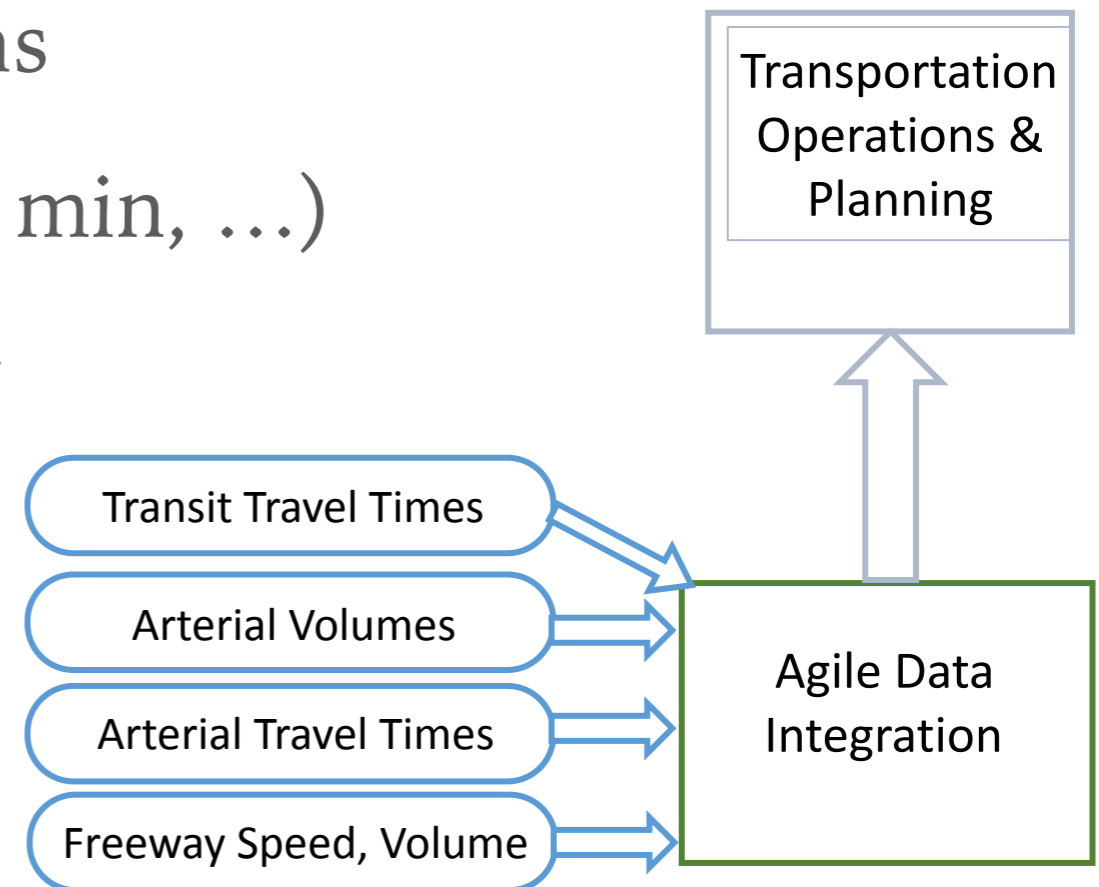
DATA MANAGEMENT CHALLENGES & OPPORTUNITIES

- Data Properties: Using Abstraction to Enhance the Use of Data in Decision Making
 - Capture rate
 - Accuracy
 - Quality rating
- Capture properties and propagate through the system



DATA MANAGEMENT CHALLENGES & OPPORTUNITIES

- Data Integration
 - Varying Spatial Representations
 - Varying Time Scales (20 sec, 5 min, ...)
 - Varying Levels of Data Quality
- Currently mostly ad-hoc
- Proposal: Agile Integration
 - Fast, lightweight integration
 - Integrate “on-the-fly”



Thank you. Questions?

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