

Transit Data and Performance Measurement



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Metro Transit, Minneapolis/St. Paul, MN**

Telling the transit story with data

- Our customers tells us that speed and reliability are vitally important
 - How do we use data and performance measures to address these needs?
 - How do we use data to partner with cities?
1. Headway performance
 2. Transit mode split / throughput
 3. Transit vehicle speed analysis tools



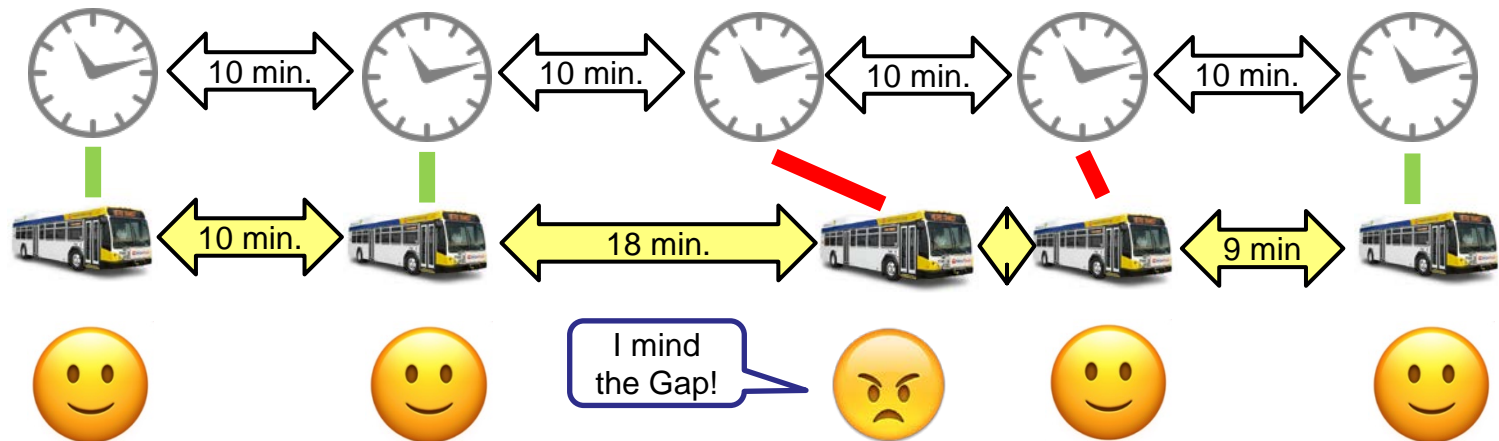
Alternative measures of service reliability

- On-time performance tells only part of the story
- What other options do we have?
- Key considerations
 - Reveal a different perspective
 - Reflect customer experience
 - Easy to understand
 - Feasible with available data

Headway adherence Wait assessment Missed trips Bunching and gaps Excess wait time Headway deviation
Run time deviation Run time variation Journey time Earliness index Delay index Median dwell time

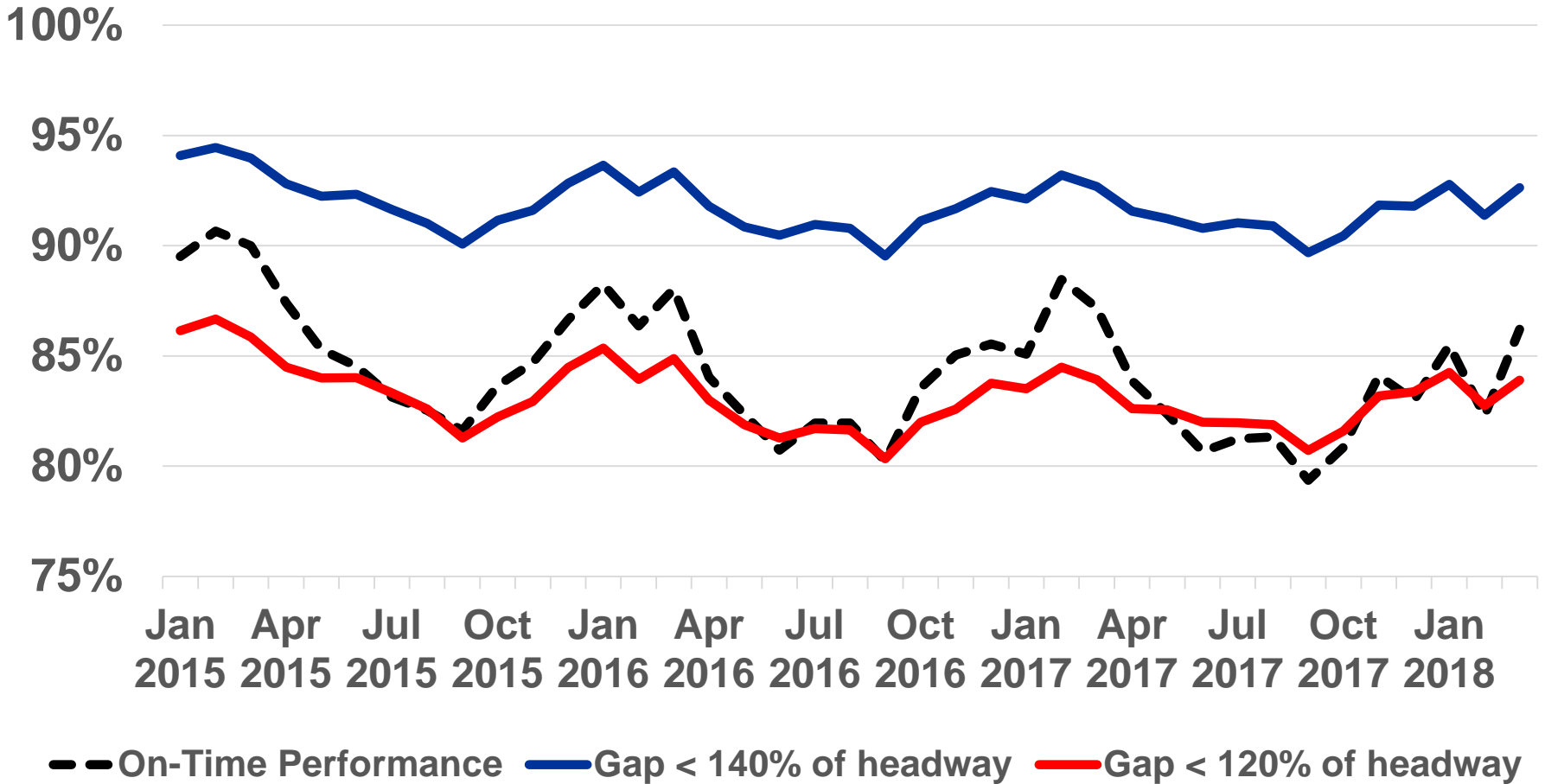
Headway Performance

- Focus on **Gaps** in service

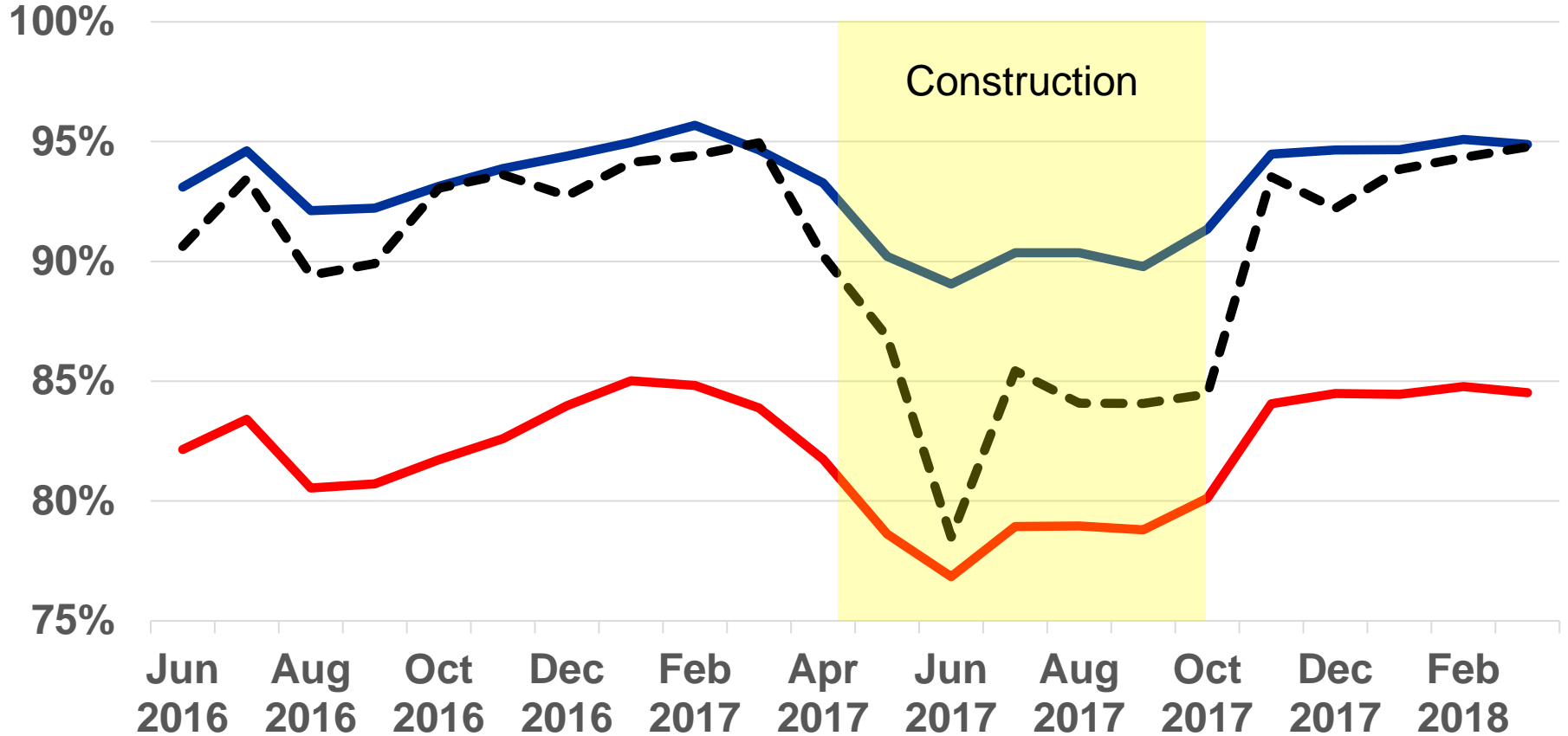


- Metric: Percent of observed headways within 140 percent of scheduled headway
- Example: 10 minute service, less than 14 minute gap

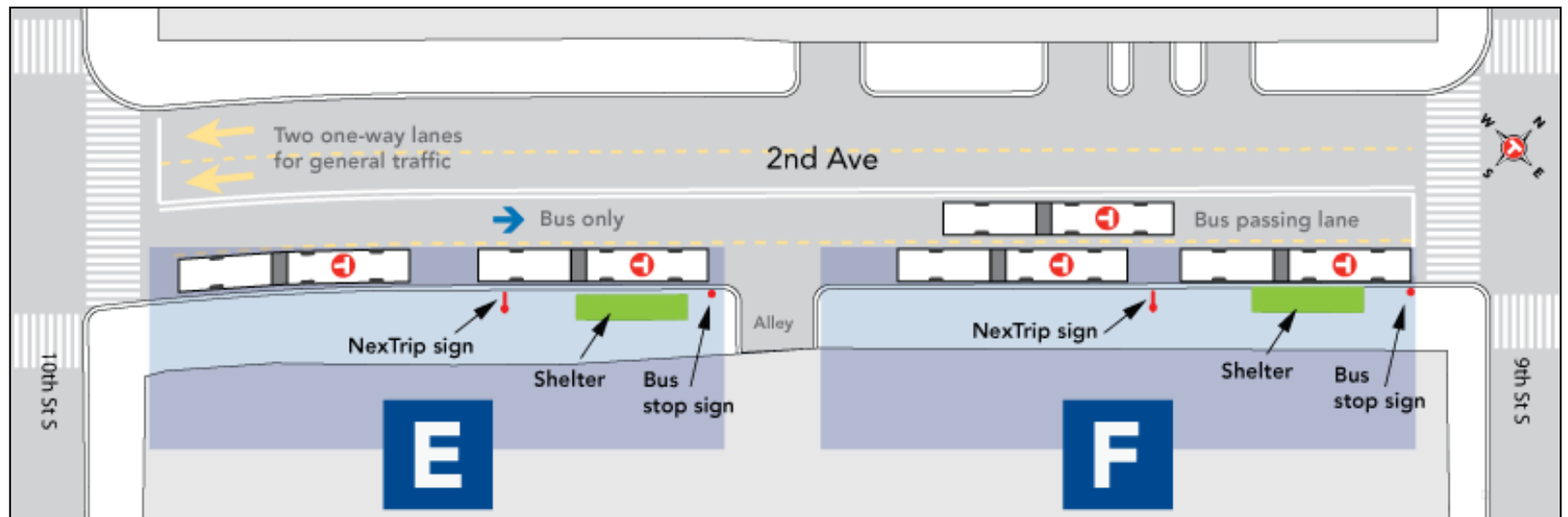
Metro Transit High Frequency Bus Service Service Reliability



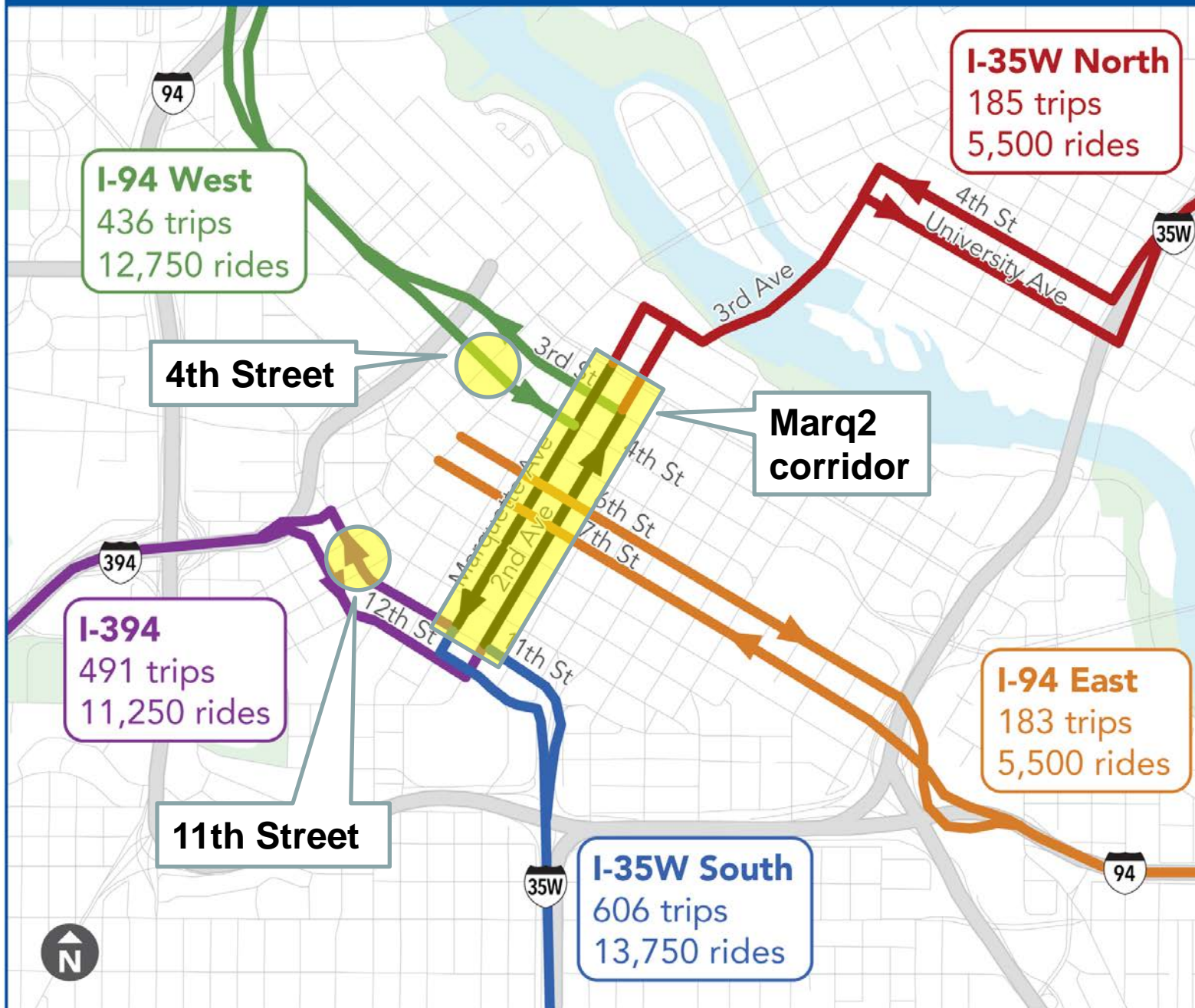
Metro Transit A Line Rapid Bus Service Reliability

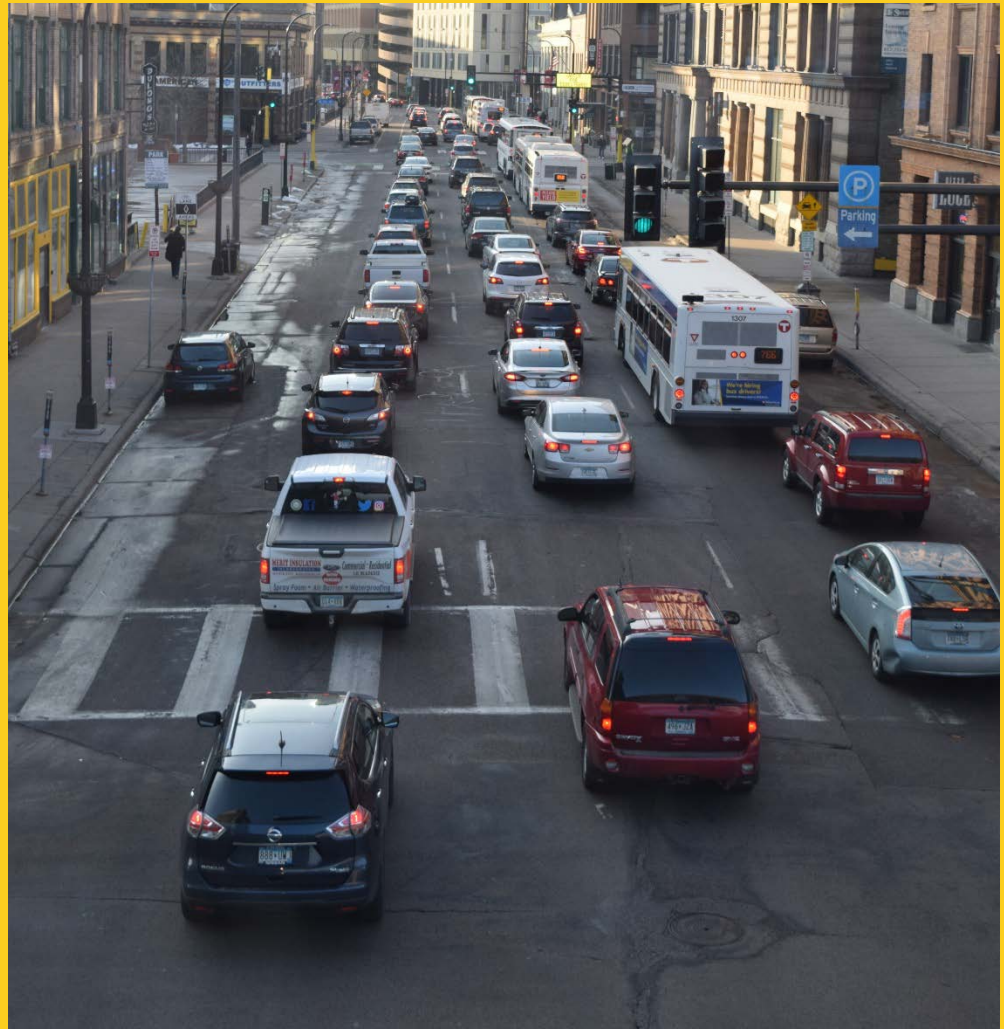
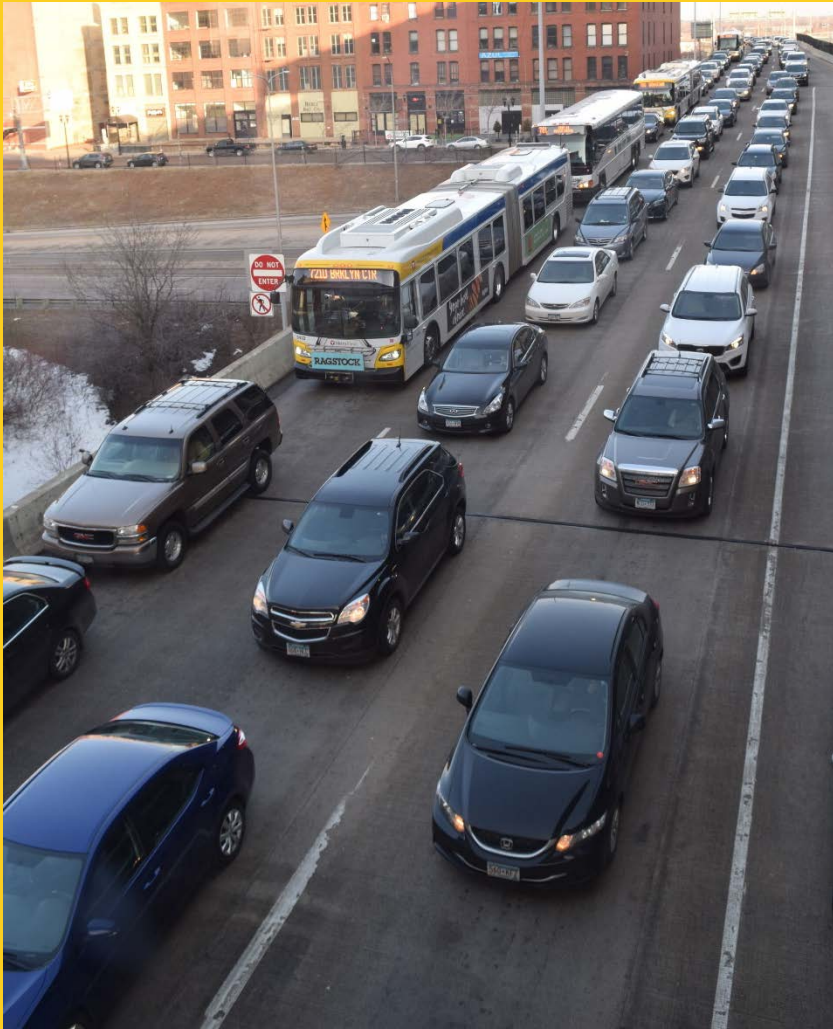


— Gap < 140% of headway
 — Gap < 120% of headway
 - - On-Time Performance



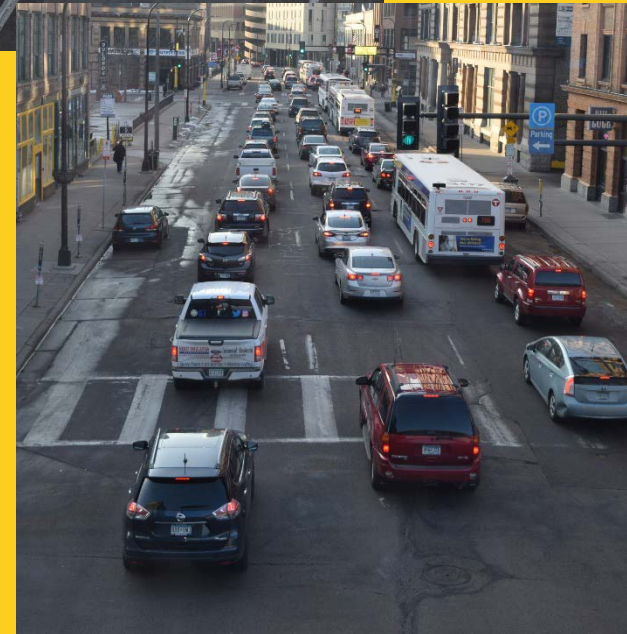
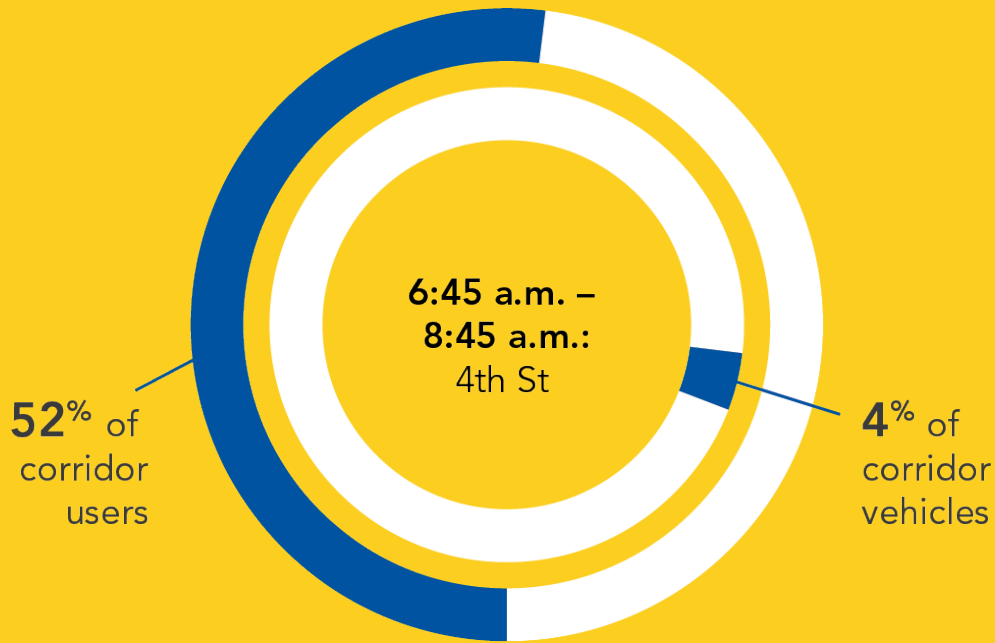
Downtown Minneapolis Express Bus Network





4th Street at 2nd Ave N.

4th Street Bus mode split



11th Street Bus mode split

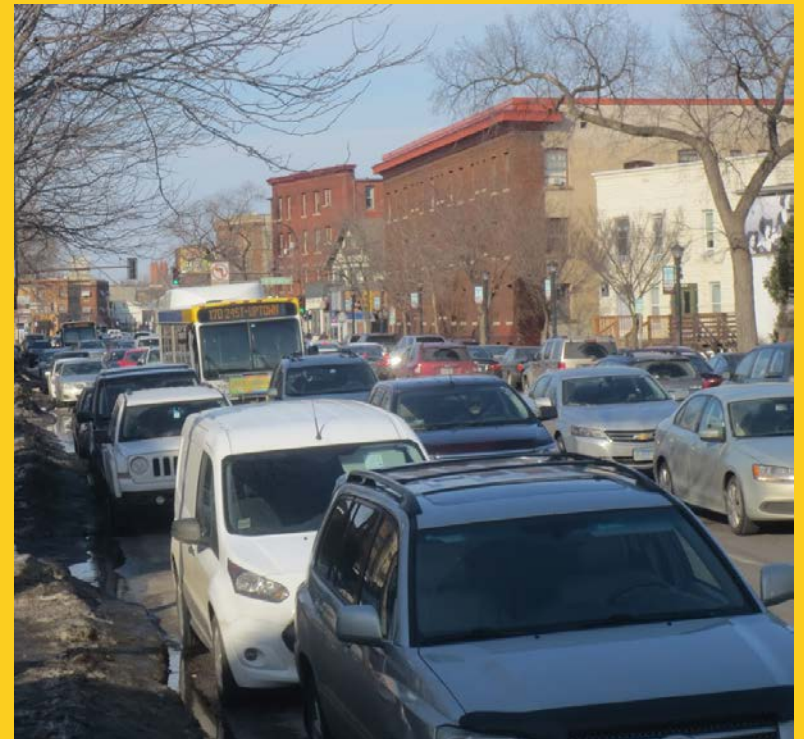
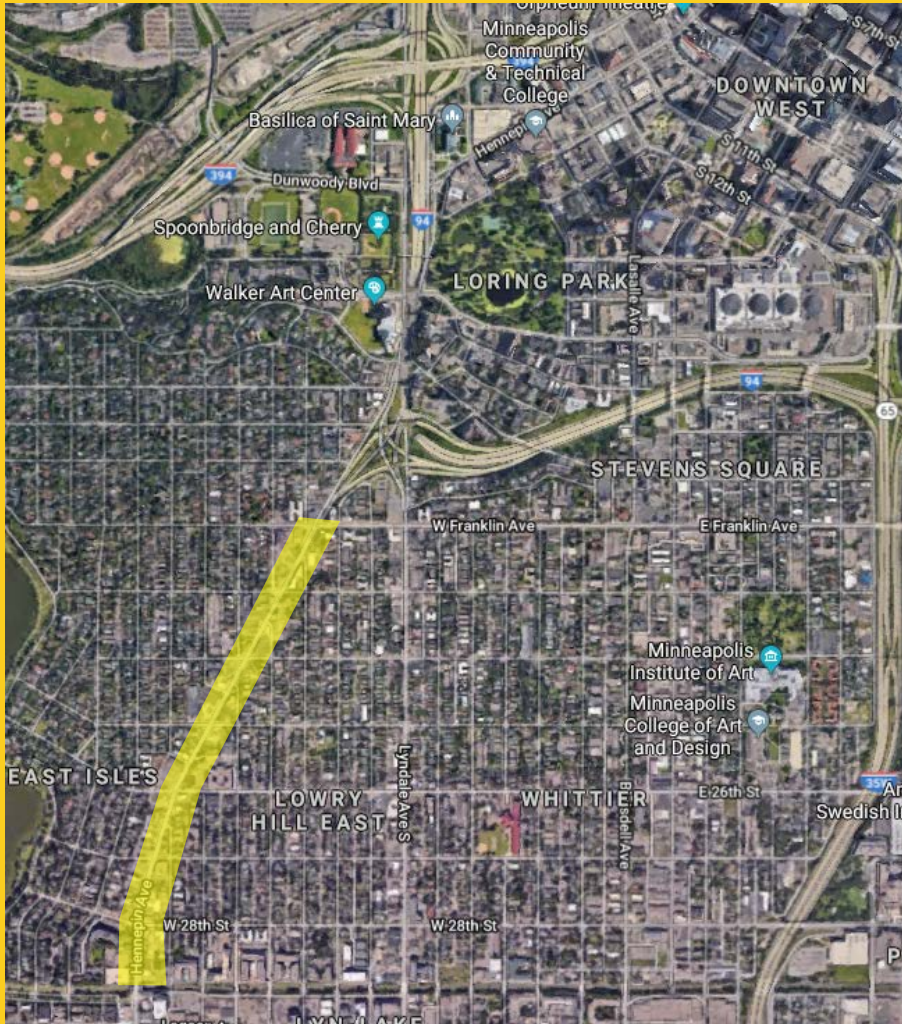


51% of
corridor
users

4% of
corridor
vehicles

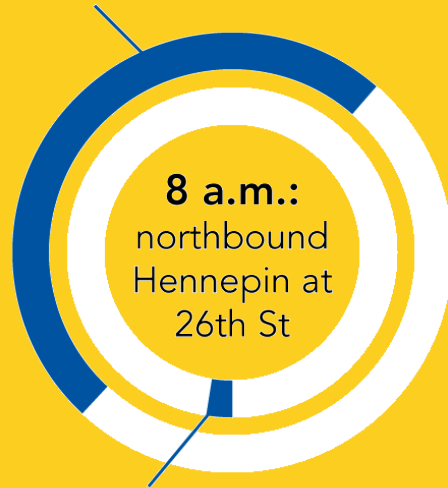


Hennepin Avenue Corridor



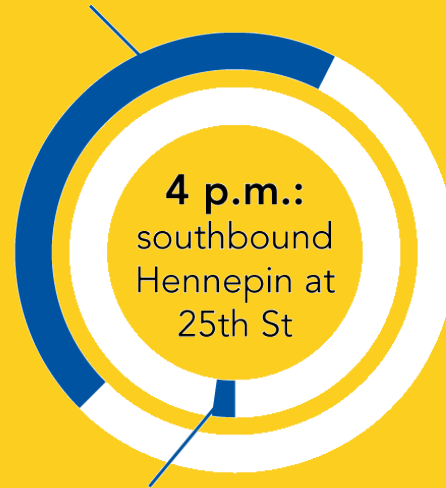
Hennepin Avenue – Peak Mode Split

49% of corridor users



3% of corridor vehicles

45% of corridor users

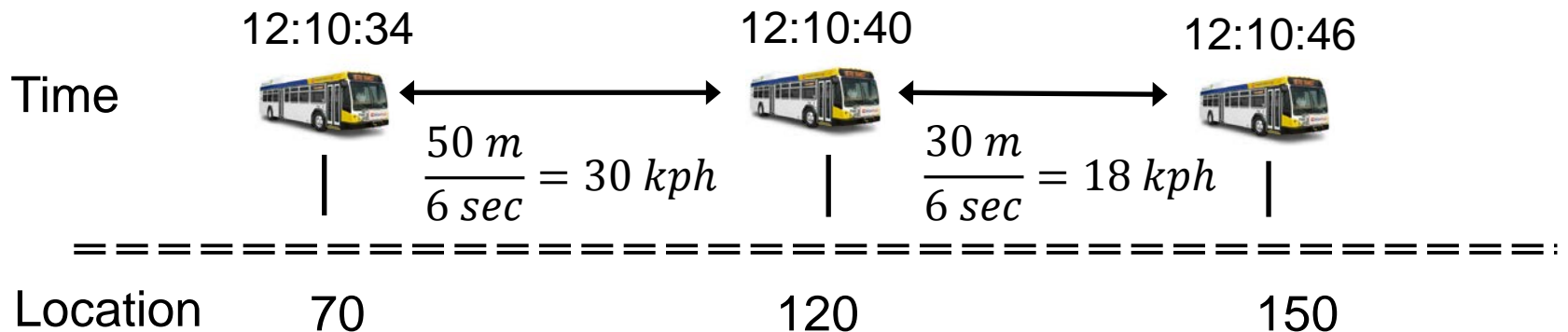


2% of corridor vehicles



Transit Vehicle Speed Calculation

- Vehicle locations reported every 6 to 20 seconds
- Calculate distance and speed along route section
- Aggregate observations to see average speeds
- Requires significant investment in data management

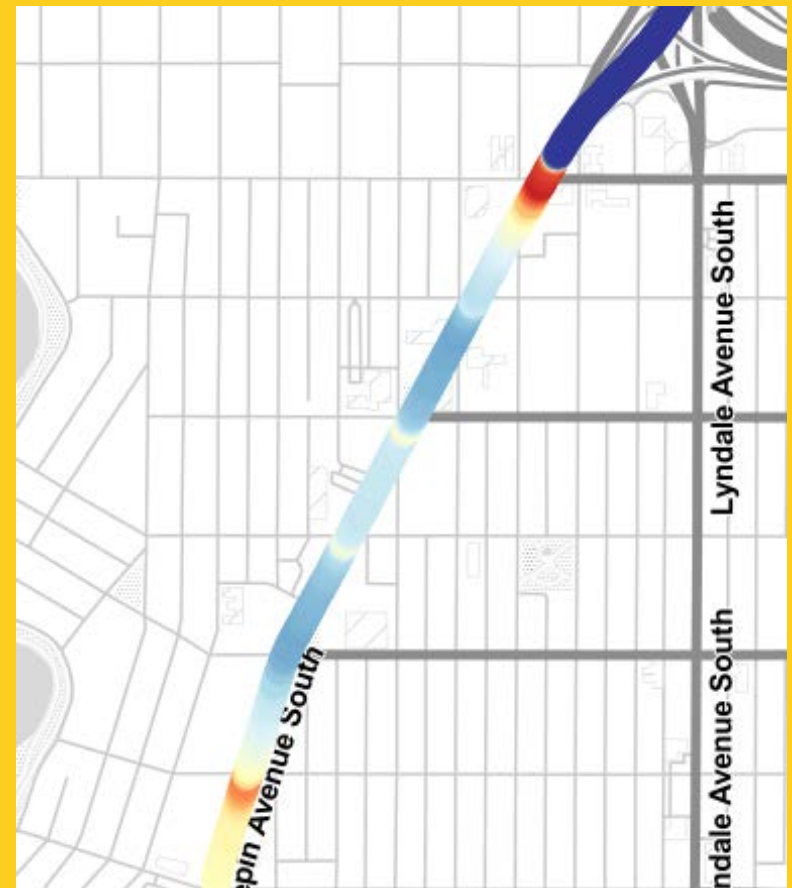


Northbound Hennepin Average Speed

Morning Peak



Midday



About

Load Logged Messages

Visualization

- Summary
- Speed Line
- Grid Heat Map
- Speed by Distance
- Time by Distance

Feedback

Route(s) - Direction(s)

6 - N

Compare

None

by Time of Day

by Day of Week

between Date Ranges

by Route

Date Range

2018-02-05 to 2018-03-09

Day Type

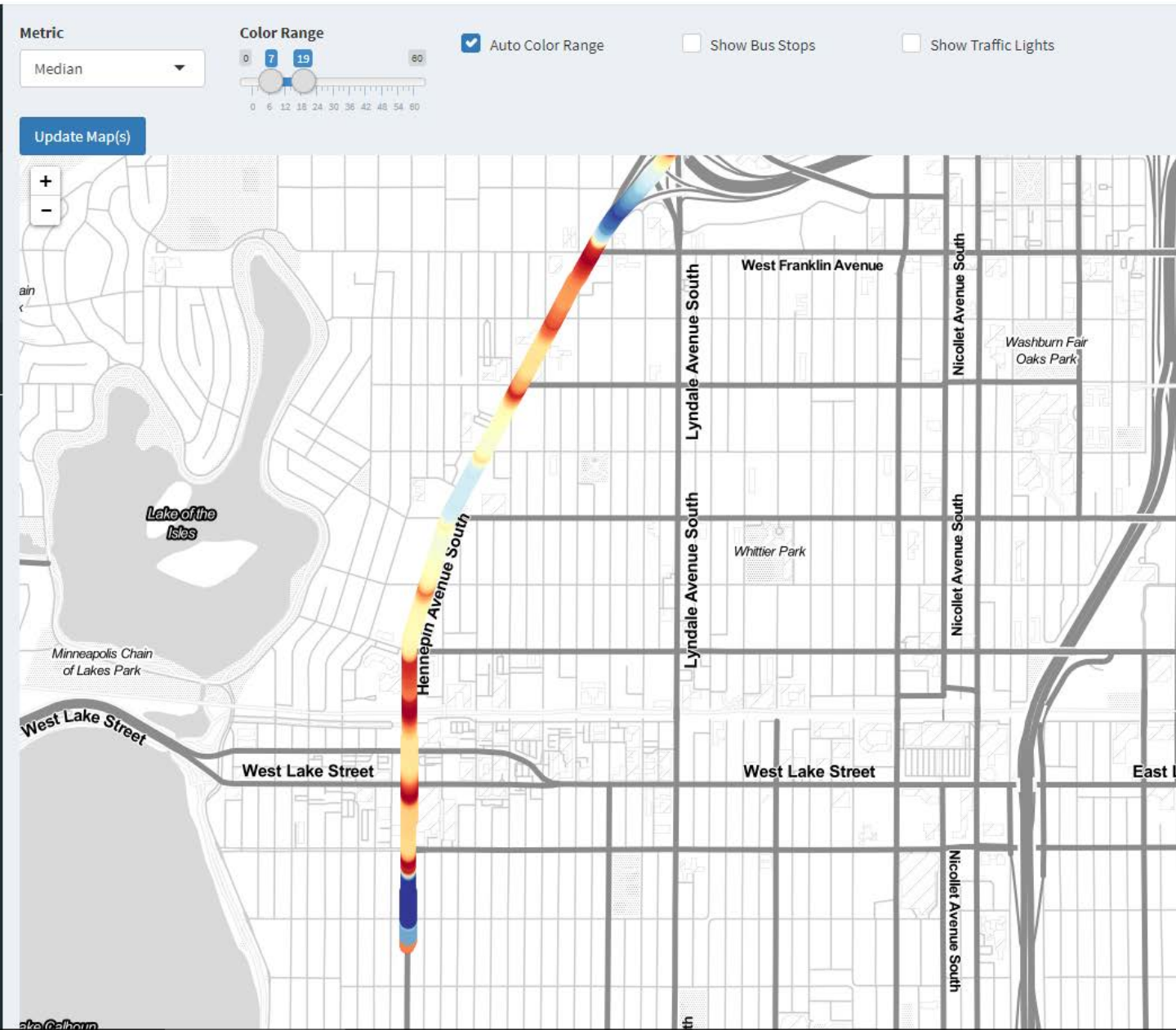
Weekday

Time Range

0 6 9 24

0 3 6 9 12 15 18 21 24

Show Selected Segment



- » Summary
- » Speed Line
- » **Grid Heat Map**
- » Speed by Distance
- » Time by Distance
- » Feedback

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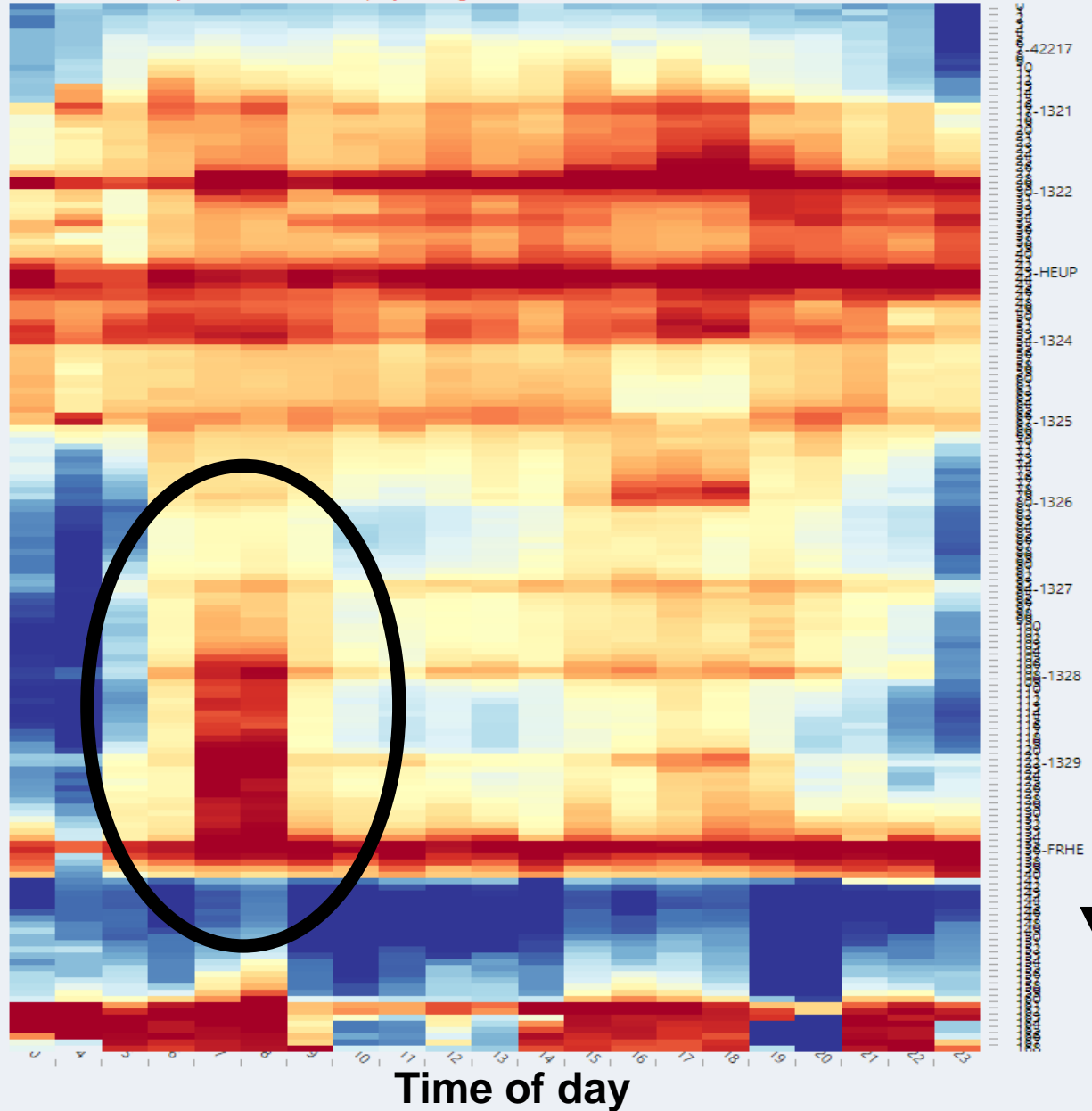
0

24

0 3 6 9 12 15 18 21 24

Show Selected Segment

Please select exactly two routes in the Display Settings box

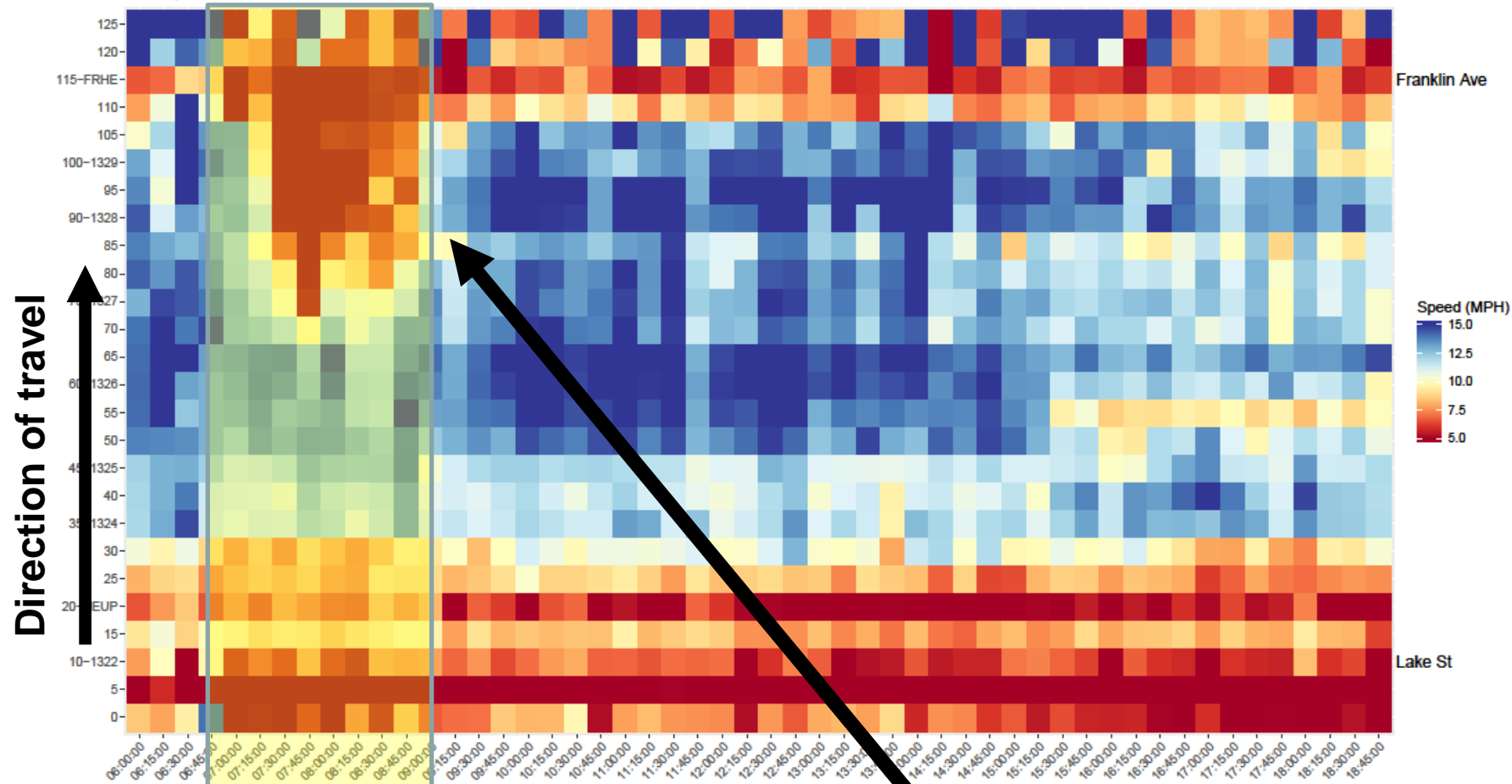


Direction of travel

Time of day

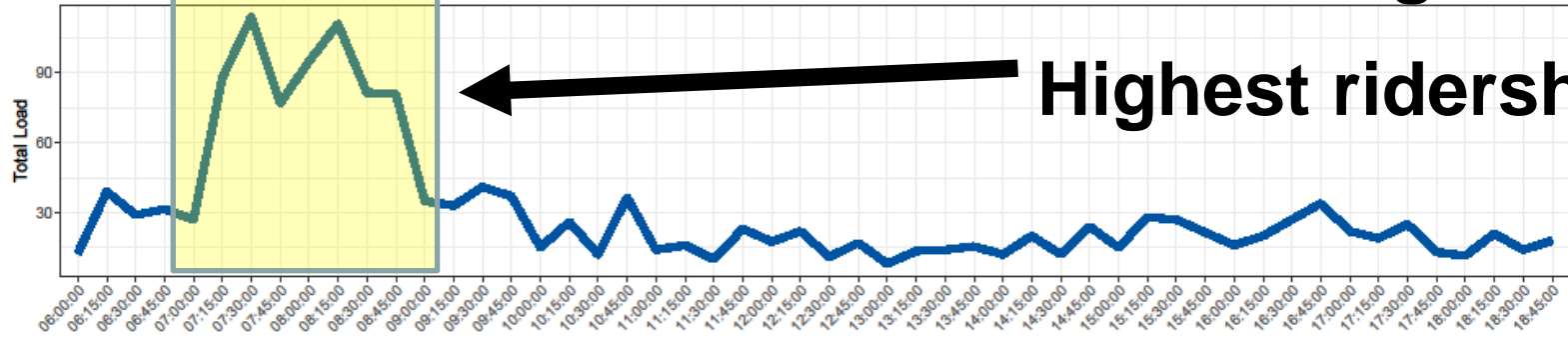
Speed - Routes 6, 17 and 114 Northbound

Weekday data from Feb 5, 2018 to March 9, 2018



Riders per 15 Minutes - Routes 6, 17, and 114 Northbound

Loads at Franklin Ave stop between Feb 5 and March 9, 2018



T Speed Visualization

- About
- Load Logged Messages
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 - Time by Distance
- Feedback

Route(s) - Direction(s)
6 - N

- Compare
- None
 - by Time of Day
 - by Day of Week
 - between Date Ranges
 - by Route

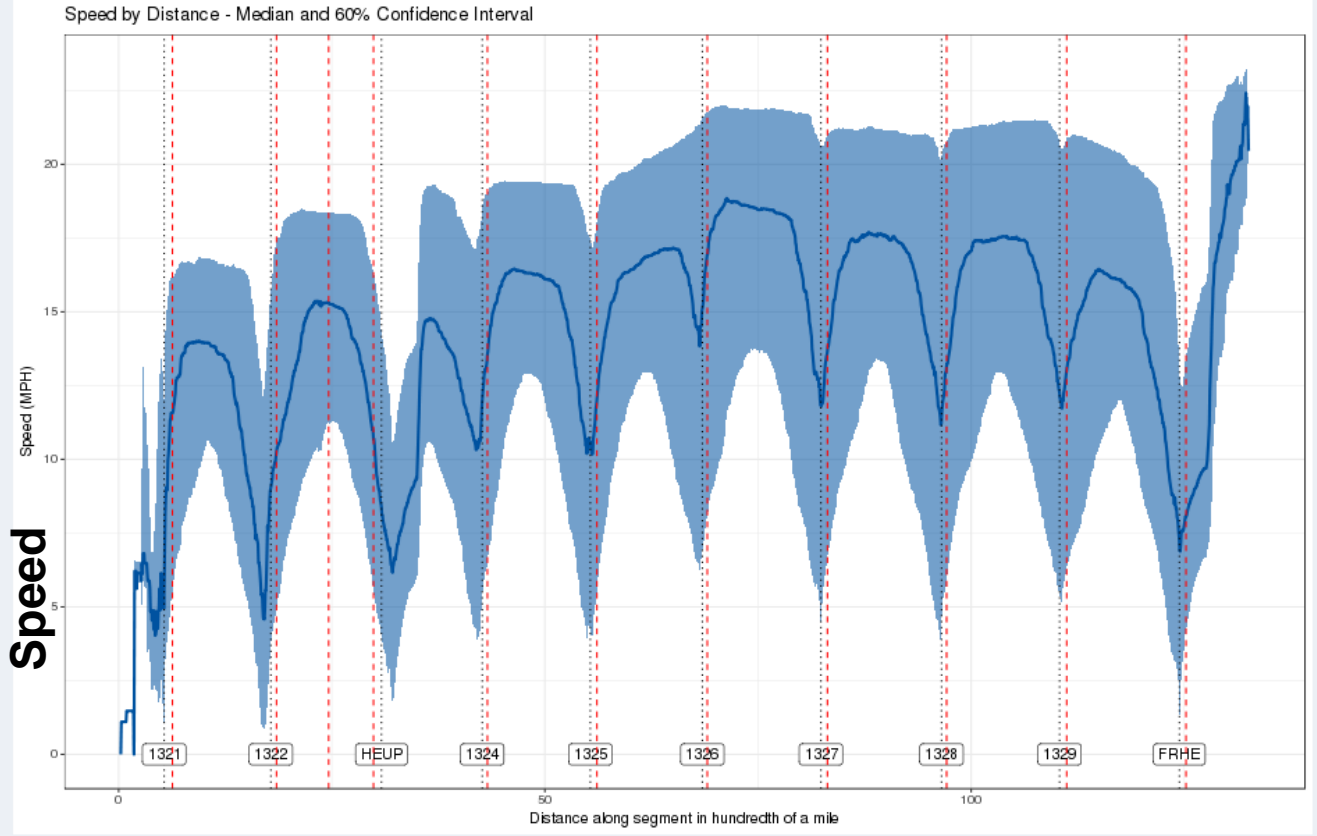
Date Range
2018-03-26 to 2018-04-06

Day Type
Weekday

Time Range
0 to 24

Lower/Upper Bounds [Update Plot\(s\)](#)

20th - 80th percentiles



Direction of travel

Speed Visualization

- About
- Load Logged Messages
- Visualization
 - Summary
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 - Time by Distance
- Feedback

Route(s) - Direction(s)
6 - N

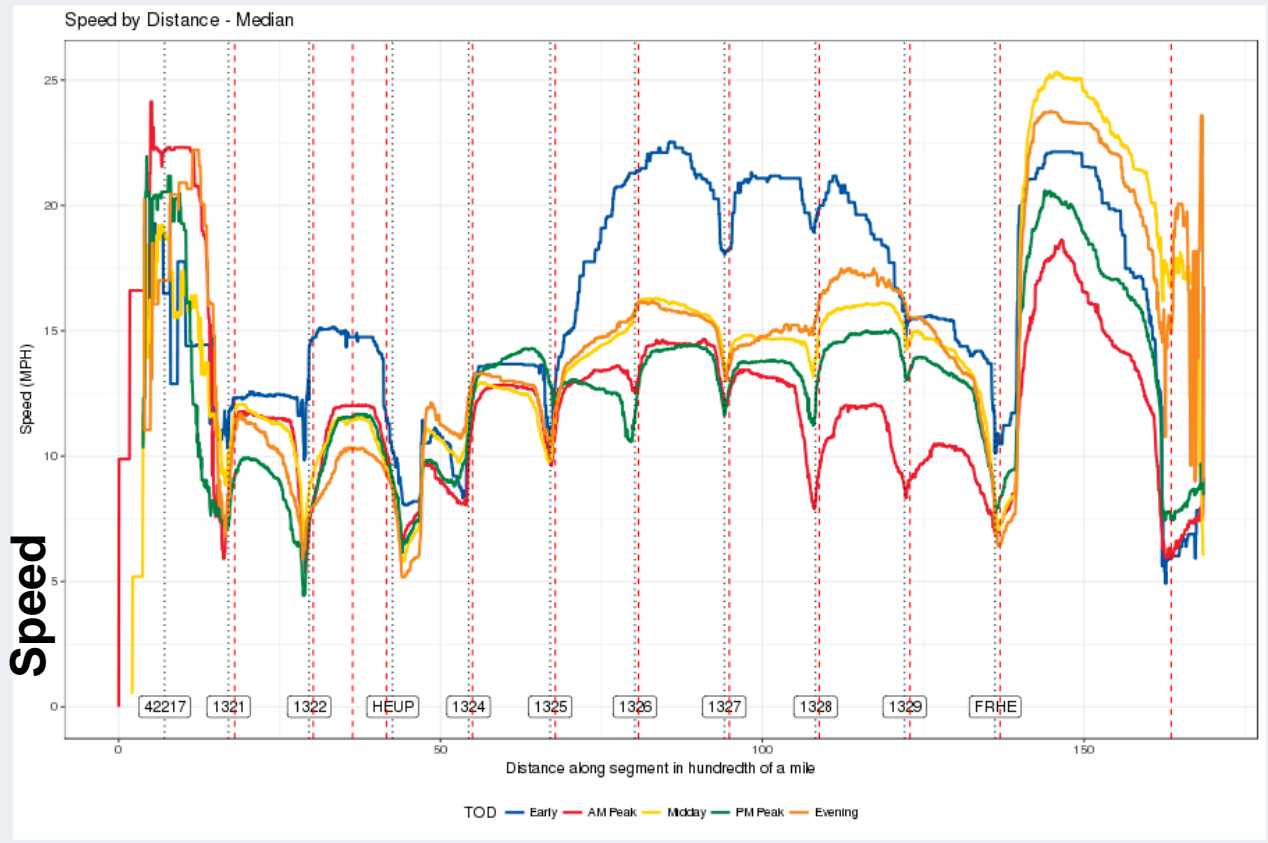
- Compare
- None
 - by Time of Day
 - by Day of Week
 - between Date Ranges
 - by Route

Date Range
2018-02-05 to 2018-03-09

Day Type
Weekday

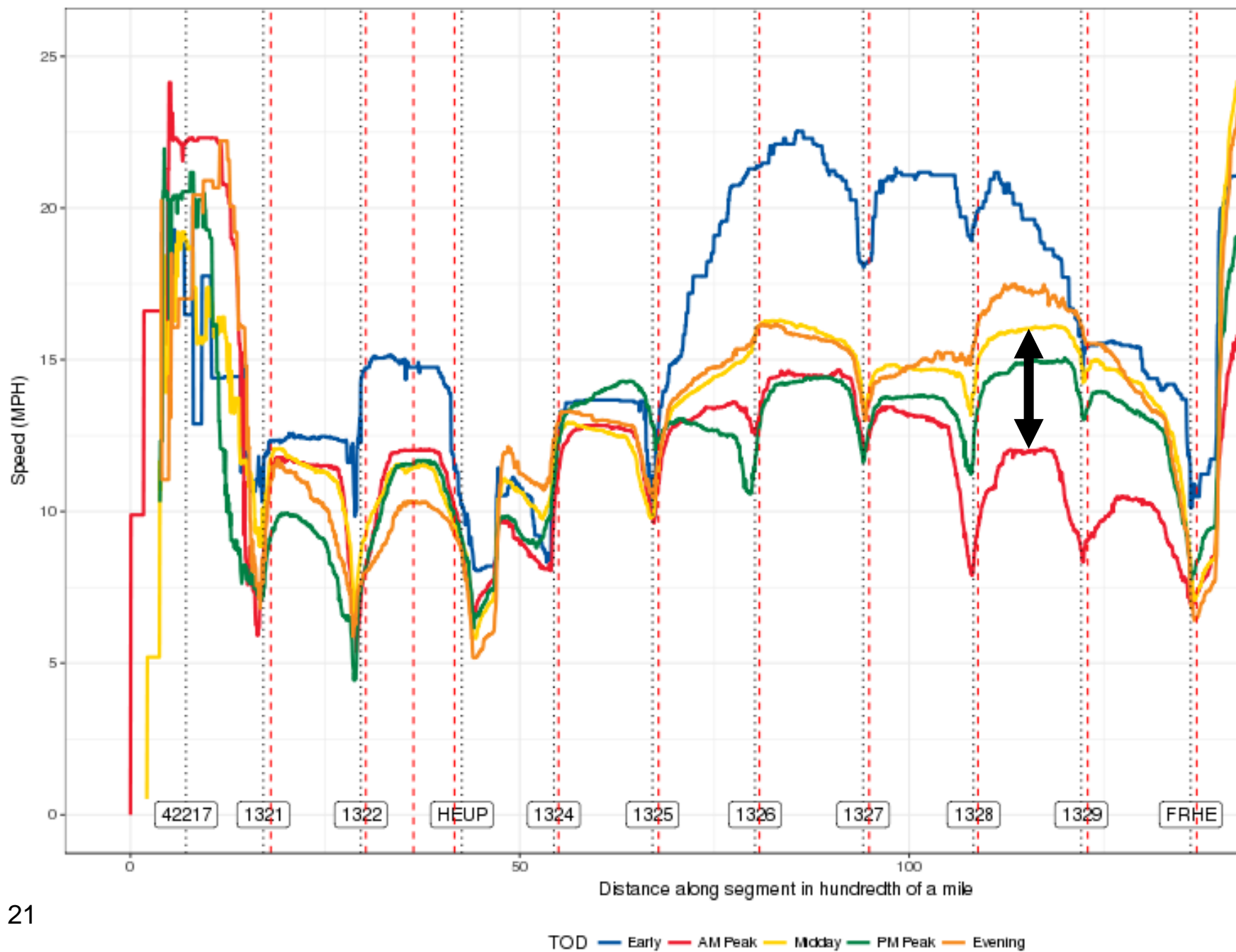
Show Selected Segment

Lower/Upper Bounds
Update Plot(s)
None



Direction of travel →

Speed by Distance - Median





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