Metro Transit
Strategic Initiatives Department Update

Supporting a culture of data-driven decision making…

Metropolitan Council Transportation Committee

September 25, 2017

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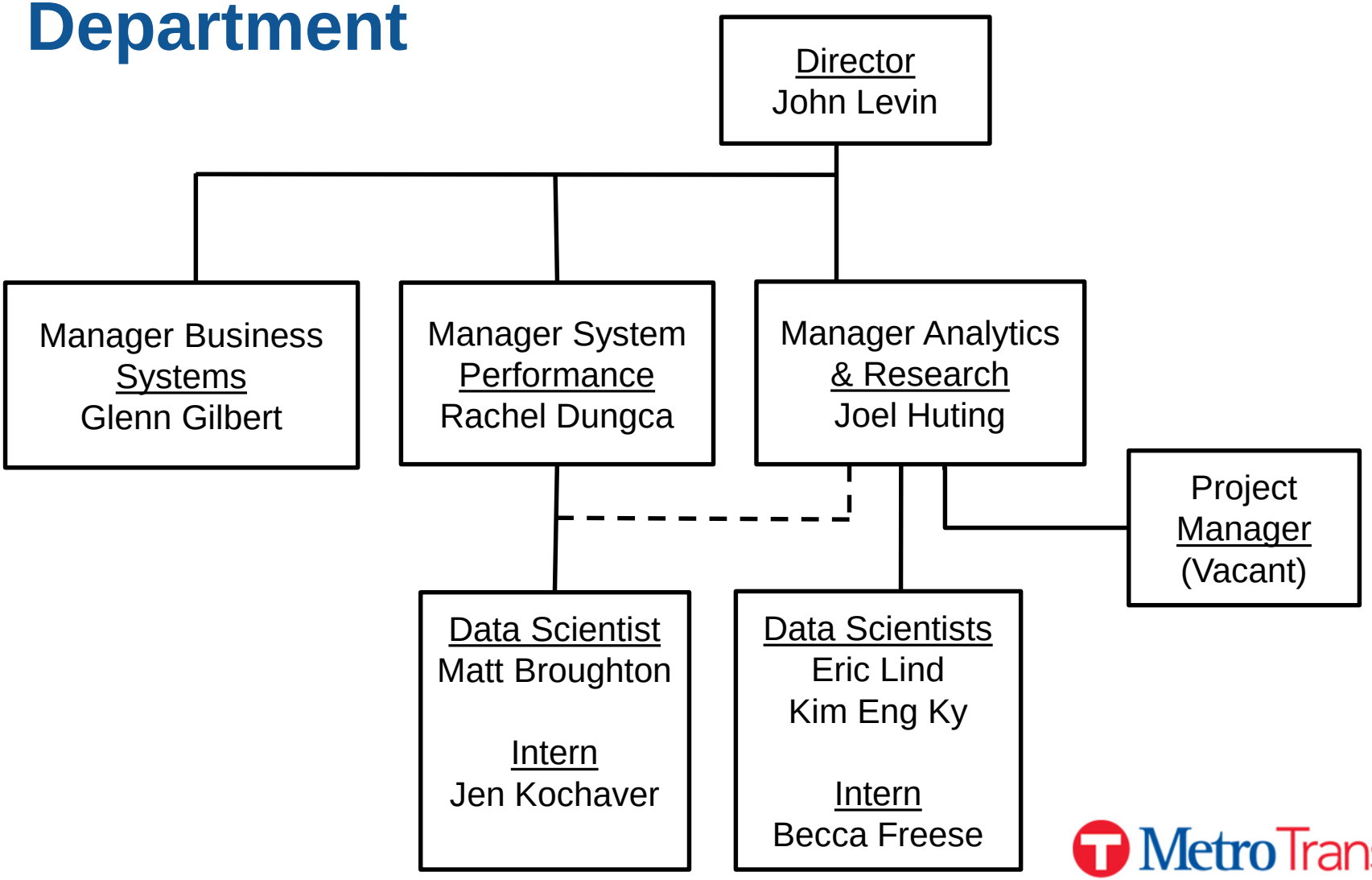
Metro Transit Strategic Initiatives

- Link use of data to specific business needs and challenges
  - Understand what is happening and why -> Allow faster, more effective response to changing conditions
  - Use predictions and forecasts to inform decisions -> Allocate resources (service, staff, etc.) to achieve goals
- Provide advanced support for data collection, data management, data analytics, and data visualization
- Build partnerships inside and outside Transit

Metro Transit Strategic Initiatives Department



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Example 1: Shelter placement

- How do we allocate limited resources for shelters and shelter features (heat and light)?
  - Important for customer satisfaction
  - High priority equity goal
- Partnership with Engineering & Facilities, Community Engagement, Better Bus Stops project

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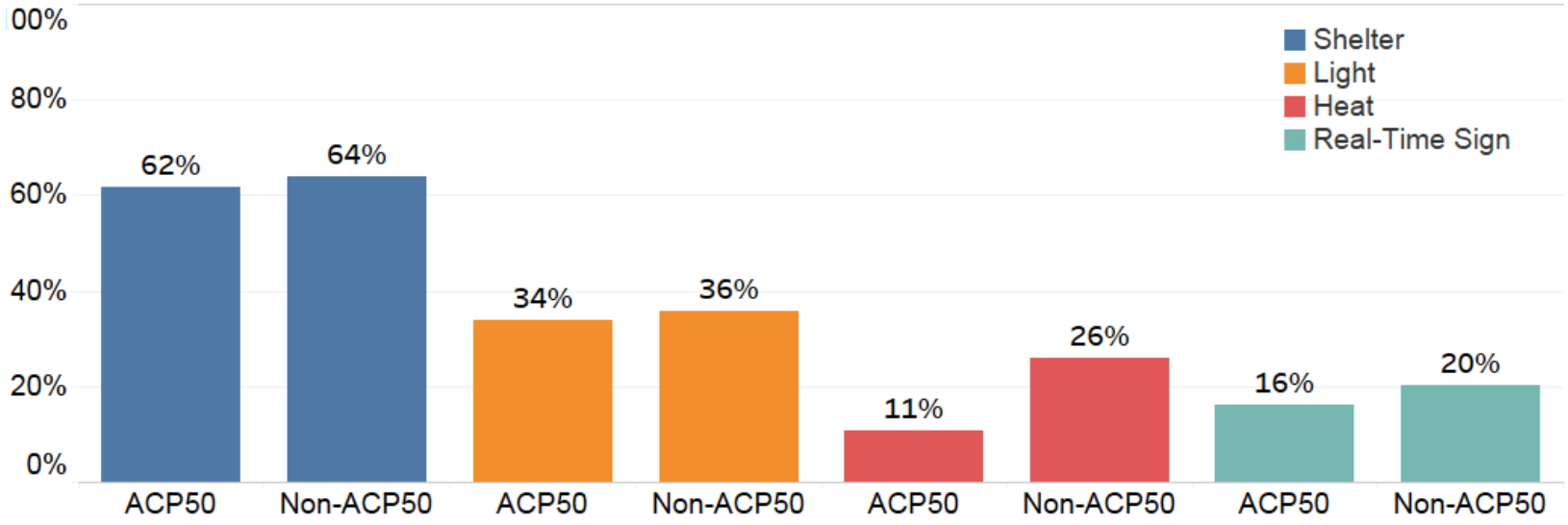
Data Collection and Analysis

- Assist with Better Bus Stops Survey
  - Survey questions that facilitate analysis
  - Support survey distribution to ensure adequate samples across demographics
  - Apply advanced analysis techniques
  - Help translate results into guidance, policy
- Develop equity-focused measure for shelters
  - Link performance measures to policy goals
  - Integrate data sets: facilities, ridership, demographics

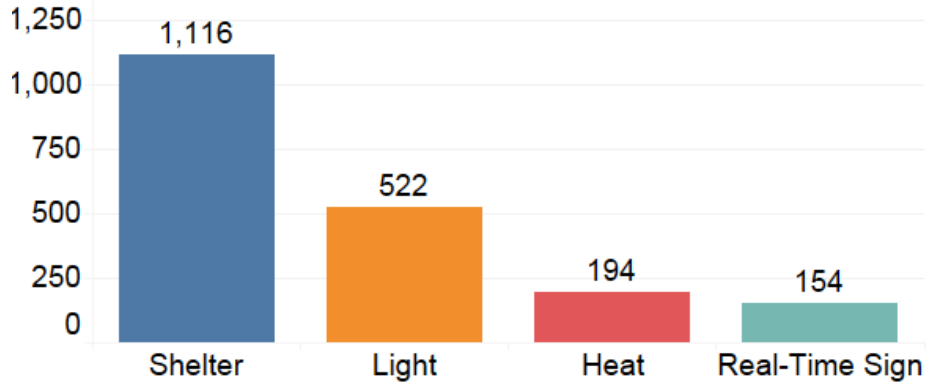
Percentage of Bus Boardings at Stops with Features

12,636 scheduled stops

62% of ACP50 Boardings | 64% of Non-ACP50 Boardings



Number of Stops with Features Available



Areas of Concentrated Poverty with >50% People of Color (ACP50)

- 40% or more of residents have family incomes less than 185% of the federal poverty threshold

- 50% or more of the residents are people of color

- 25% of boardings occur in ACP50 census tracts

200

Shelters Considered for Removal Criterion

20

Only plot stops that meet:

- (•) All Criteria
- ( ) Minimum Boarding Criterion
- ( ) High Boarding Criterion
- ( ) Considered for Removal Criterion

Only show stops near/in

- [ ] Hospital
- [ ] ACP50 area
- [ ] Social Service Center
- [ ] Disability or Elderly Housing
- [ ] Transfer Points

- [ ] Exclude Stops in Downtown Zone
- [x] Exclude Stops with Existing Shelters
- [ ] Plot All Stops

Enter a Number to Plot (0 for Plot All)

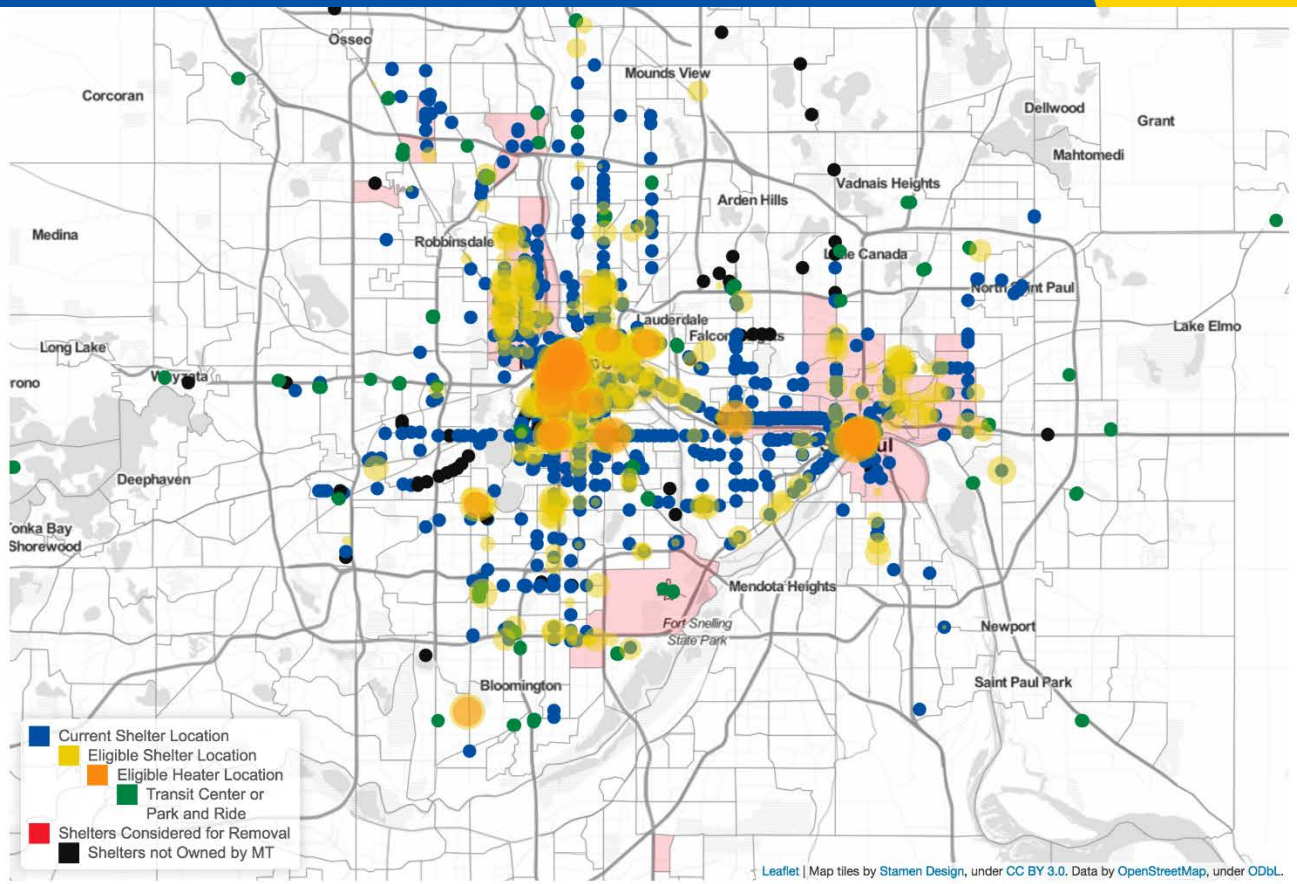
Low Criterion 0

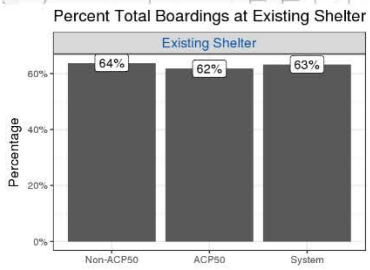
High Criterion 0

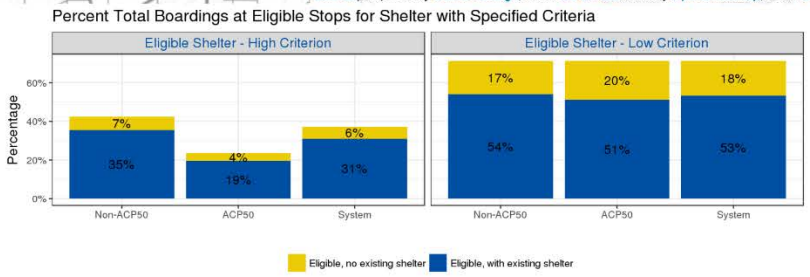
Update Criteria!

Download Report

Download Data







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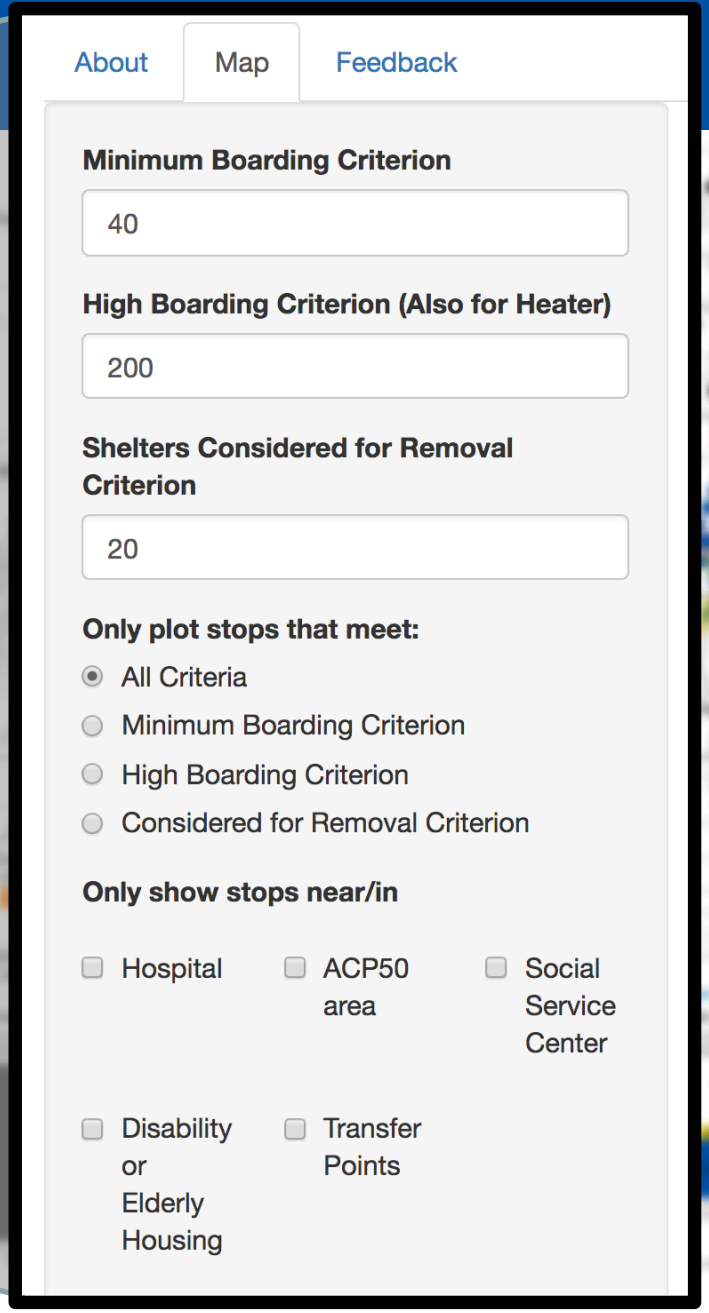

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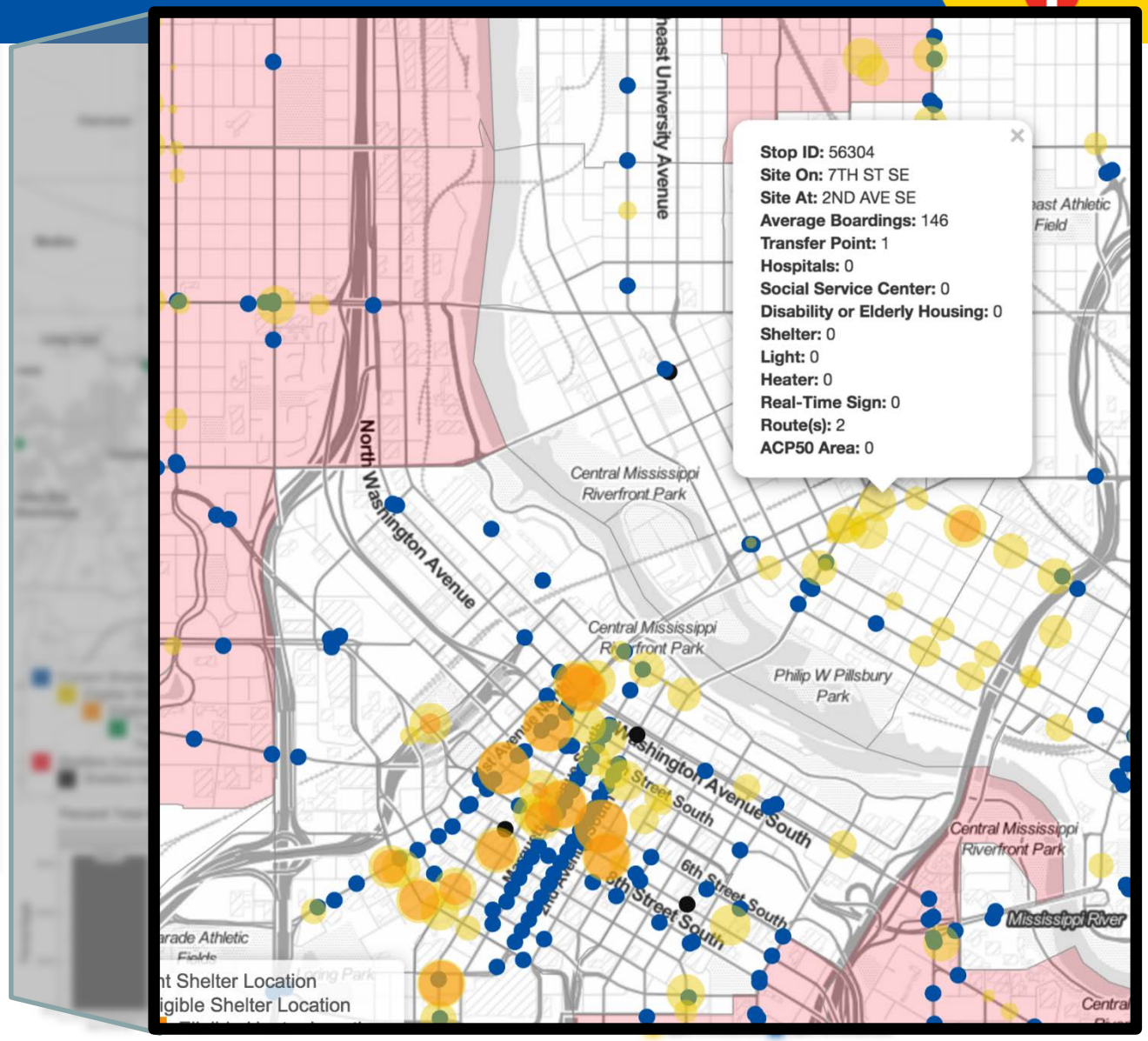

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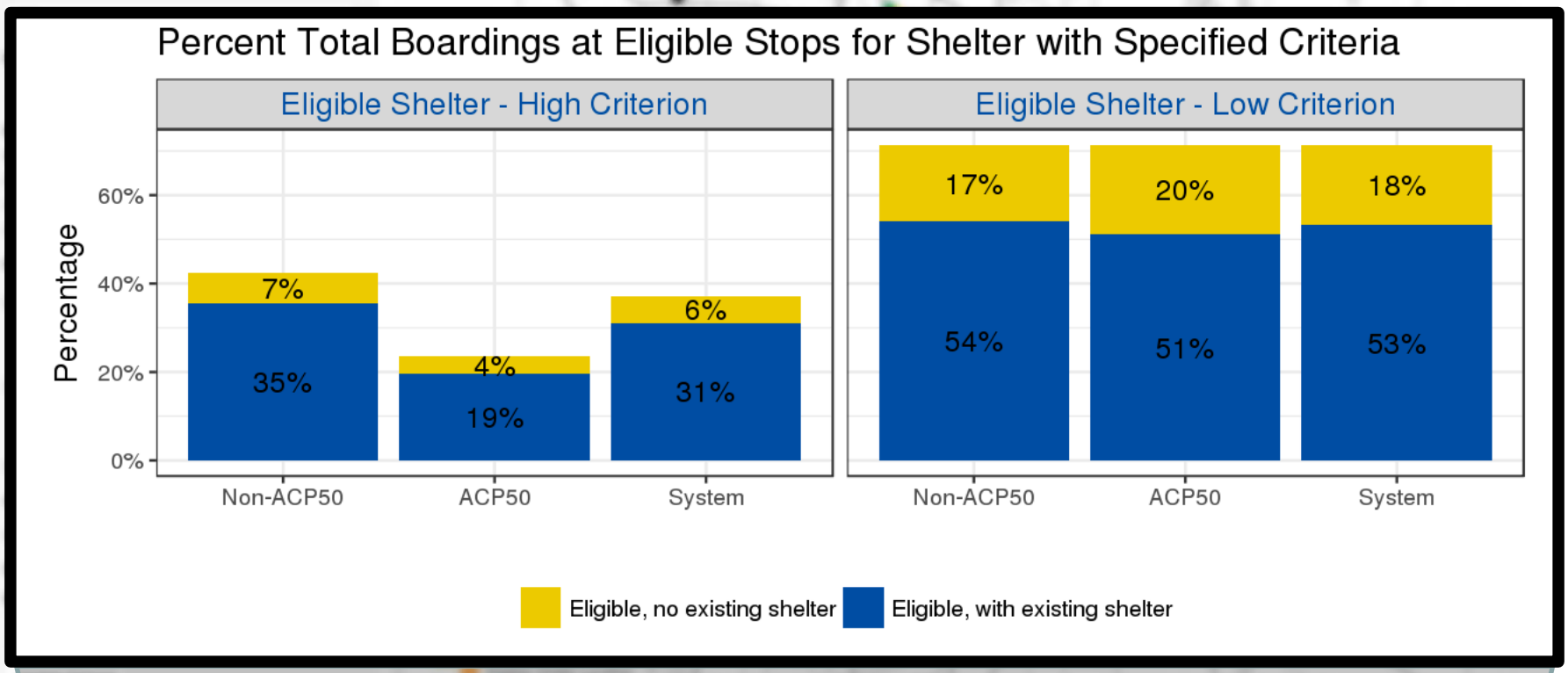

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Low Criterion

0

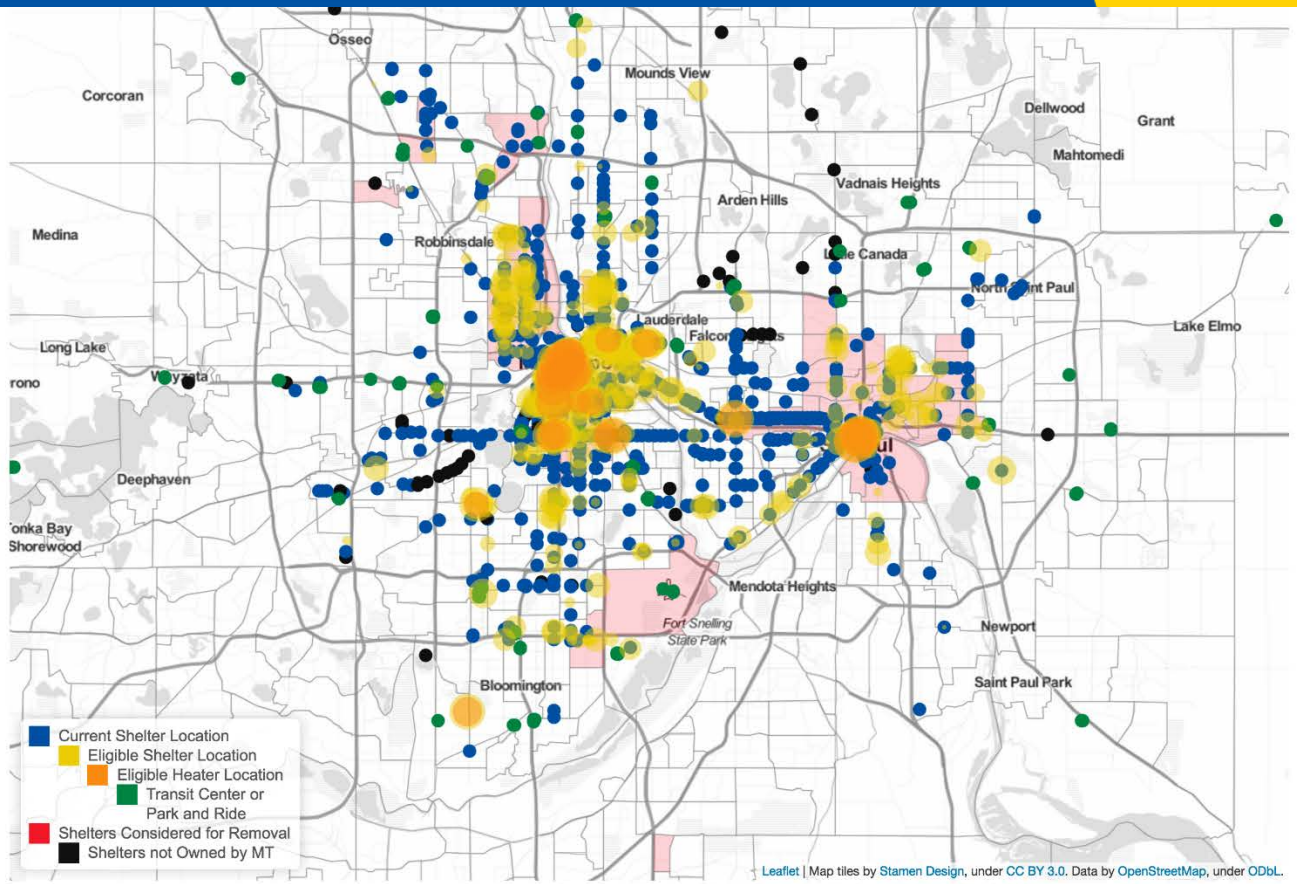
High Criterion

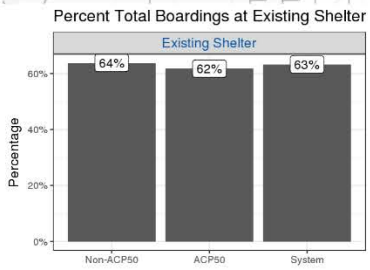
0

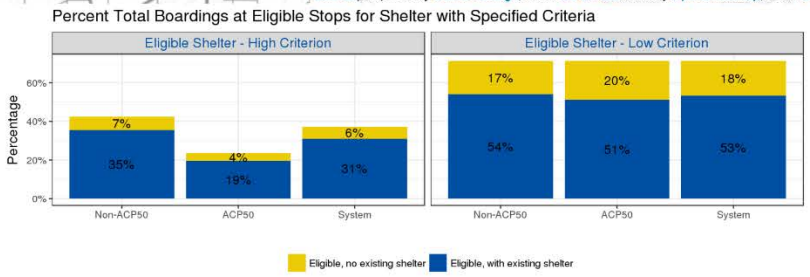
Update Criteria!

Download Report

Download Data







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Example 2: Service Reliability

- How can we provide highly reliable service for customers?
  - How do we measure reliability?
  - How do we focus efforts to improve?

- Partnership with Operations, Service Development

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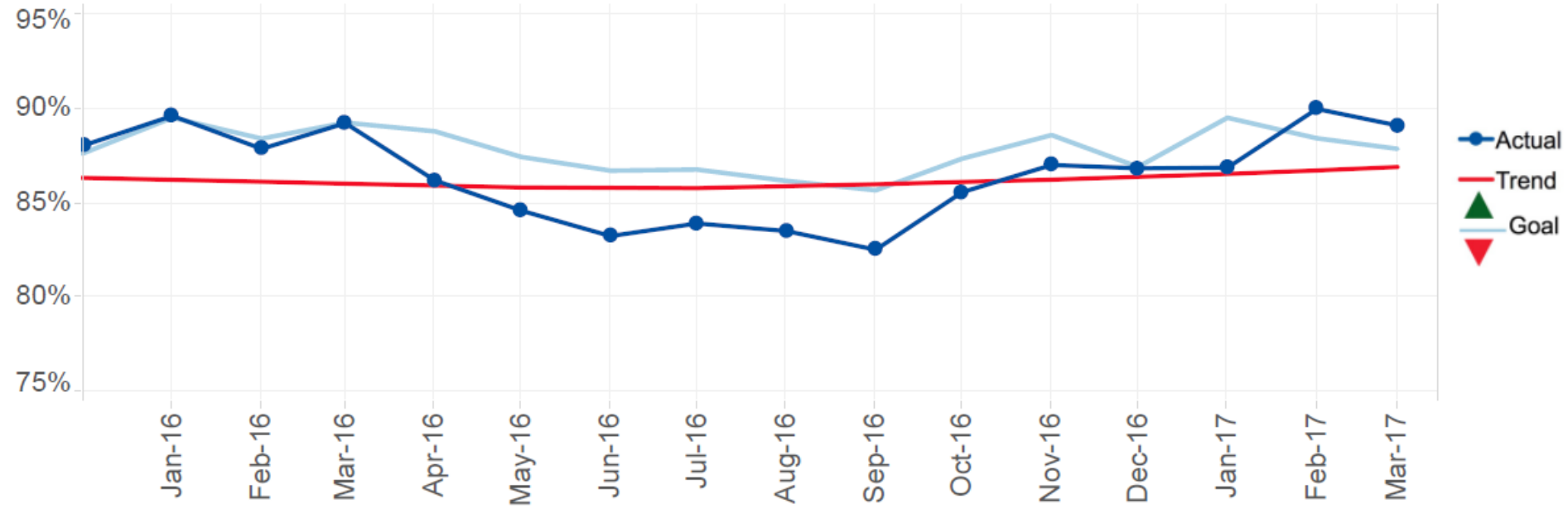
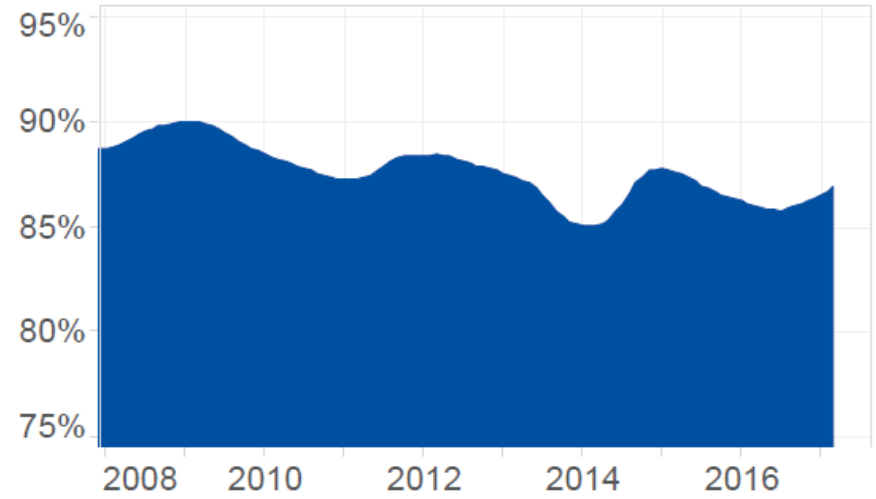
On-Time Performance — Bus

Bus operating between 1 minute early and 5 minutes late

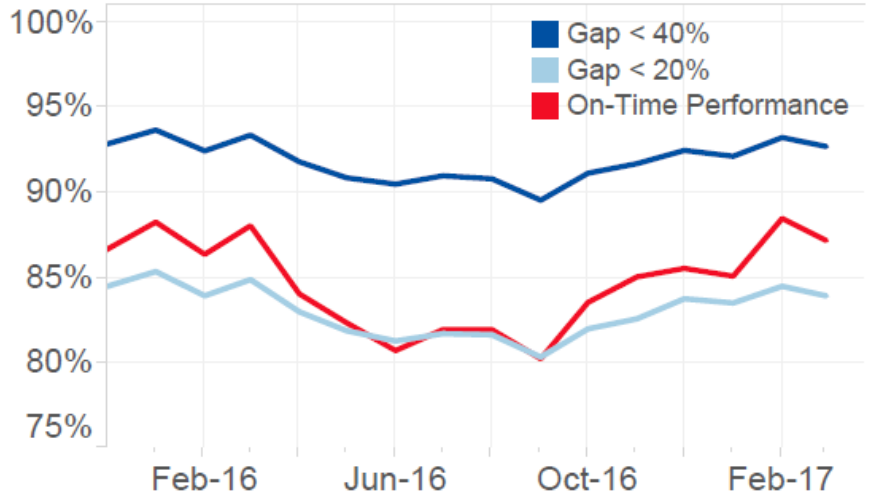
Goal: 87.8% | Mar: 89.1% (+ 1.2%) | Annual Goal: 87.6% | YTD: 88.6% | Headway Performance: 92.7%



Historical Trend

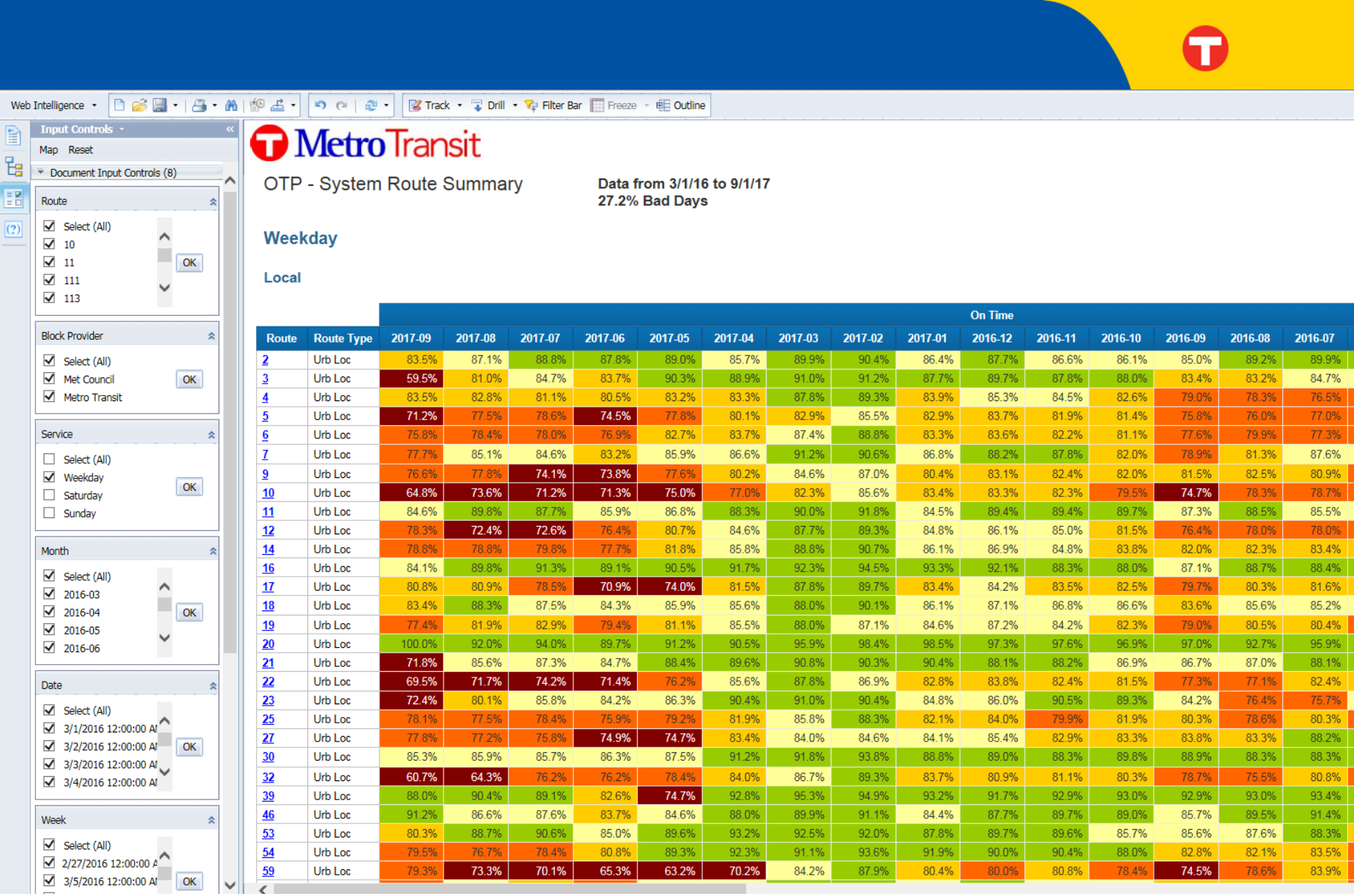


High Frequency Service Reliability



Diving Deeper

- Factors that affect on-time performance
  - Ridership and Go-To card use
  - Traffic, signal delay, obstructions
  - Weather, events, construction
  - Variation in operator experience, performance
- Tools to identify OTP issue
  - Where, when, who, why…
- Lead to improvements to: service control, schedules, training, coordination with public works



		On Time														
Route	Route Type	2017-09	2017-08	2017-07	2017-06	2017-05	2017-04	2017-03	2017-02	2017-01	2016-12	2016-11	2016-10	2016-09	2016-08	2016-07
2	Urb Loc	83.5%	87.1%	88.8%	87.8%	89.0%	85.7%	89.9%	90.4%	86.4%	87.7%	86.6%	86.1%	85.0%	89.2%	89.9%
3	Urb Loc	59.5%	81.0%	84.7%	83.7%	90.3%	88.9%	91.0%	91.2%	87.7%	89.7%	87.8%	88.0%	83.4%	83.2%	84.7%
4	Urb Loc	83.5%	82.8%	81.1%	80.5%	83.2%	83.3%	87.8%	89.3%	83.9%	85.3%	84.5%	82.6%	79.0%	78.3%	76.5%
5	Urb Loc	71.2%	77.5%	78.6%	74.5%	77.8%	80.1%	82.9%	85.5%	82.9%	83.7%	81.9%	81.4%	75.8%	76.0%	77.0%
6	Urb Loc	75.8%	78.4%	78.0%	76.9%	82.7%	83.7%	87.4%	88.8%	83.3%	83.6%	82.2%	81.1%	77.6%	79.9%	77.3%
7	Urb Loc	77.7%	85.1%	84.6%	83.2%	85.9%	86.6%	91.2%	90.6%	86.8%	88.2%	87.8%	82.0%	78.9%	81.3%	87.6%
9	Urb Loc	76.6%	77.8%	74.1%	73.8%	77.6%	80.2%	84.6%	87.0%	80.4%	83.1%	82.4%	82.0%	81.5%	82.5%	80.9%
10	Urb Loc	64.8%	73.6%	71.2%	71.3%	75.0%	77.0%	82.3%	85.6%	83.4%	83.3%	82.3%	79.5%	74.7%	78.3%	78.7%
11	Urb Loc	84.6%	89.8%	87.7%	85.9%	86.8%	88.3%	90.0%	91.8%	84.5%	89.4%	89.4%	89.7%	87.3%	88.5%	85.5%
12	Urb Loc	78.3%	72.4%	72.6%	76.4%	80.7%	84.6%	87.7%	89.3%	84.8%	86.1%	85.0%	81.5%	76.4%	78.0%	78.0%
14	Urb Loc	78.8%	78.8%	79.8%	77.7%	81.8%	85.8%	88.8%	90.7%	86.1%	86.9%	84.8%	83.8%	82.0%	82.3%	83.4%
16	Urb Loc	84.1%	89.8%	91.3%	89.1%	90.5%	91.7%	92.3%	94.5%	93.3%	92.1%	88.3%	88.0%	87.1%	88.7%	88.4%
17	Urb Loc	80.8%	80.9%	78.5%	70.9%	74.0%	81.5%	87.8%	89.7%	83.4%	84.2%	83.5%	82.5%	79.7%	80.3%	81.6%
18	Urb Loc	83.4%	88.3%	87.5%	84.3%	85.9%	85.6%	88.0%	90.1%	86.1%	87.1%	86.8%	86.6%	83.6%	85.6%	85.2%
19	Urb Loc	77.4%	81.9%	82.9%	79.4%	81.1%	85.5%	88.0%	87.1%	84.6%	87.2%	84.2%	82.3%	79.0%	80.5%	80.4%
20	Urb Loc	100.0%	92.0%	94.0%	89.7%	91.2%	90.5%	95.9%	98.4%	98.5%	97.3%	97.6%	96.9%	97.0%	92.7%	95.9%
21	Urb Loc	71.8%	85.6%	87.3%	84.7%	88.4%	89.6%	90.8%	90.3%	90.4%	88.1%	88.2%	86.9%	86.7%	87.0%	88.1%
22	Urb Loc	69.5%	71.7%	74.2%	71.4%	76.2%	85.6%	87.8%	86.9%	82.8%	83.8%	82.4%	81.5%	77.3%	77.1%	82.4%
23	Urb Loc	72.4%	80.1%	85.8%	84.2%	86.3%	90.4%	91.0%	90.4%	84.8%	86.0%	90.5%	89.3%	84.2%	76.4%	75.7%
25	Urb Loc	78.1%	77.5%	78.4%	75.9%	79.2%	81.9%	85.8%	88.3%	82.1%	84.0%	79.9%	81.9%	80.3%	78.6%	80.3%
27	Urb Loc	77.8%	77.2%	75.8%	74.9%	74.7%	83.4%	84.0%	84.6%	84.1%	85.4%	82.9%	83.3%	83.8%	83.3%	88.2%
30	Urb Loc	85.3%	85.9%	85.7%	86.3%	87.5%	91.2%	91.8%	93.8%	88.8%	89.0%	88.3%	89.8%	88.9%	88.3%	88.3%
32	Urb Loc	60.7%	64.3%	76.2%	76.2%	78.4%	84.0%	86.7%	89.3%	83.7%	80.9%	81.1%	80.3%	78.7%	75.5%	80.8%
39	Urb Loc	88.0%	90.4%	89.1%	82.6%	74.7%	92.8%	95.3%	94.9%	93.2%	91.7%	92.9%	93.0%	92.9%	93.0%	93.4%
46	Urb Loc	91.2%	86.6%	87.6%	83.7%	84.6%	88.0%	89.9%	91.1%	84.4%	87.7%	89.7%	89.0%	85.7%	89.5%	91.4%
53	Urb Loc	80.3%	88.7%	90.6%	85.0%	89.6%	93.2%	92.5%	92.0%	87.8%	89.7%	89.6%	85.7%	85.6%	87.6%	88.3%
54	Urb Loc	79.5%	76.7%	78.4%	80.8%	89.3%	92.3%	91.1%	93.6%	91.9%	90.0%	90.4%	88.0%	82.8%	82.1%	83.5%
59	Urb Loc	79.3%	73.3%	70.1%	65.3%	63.2%	70.2%	84.2%	87.9%	80.4%	80.0%	80.8%	78.4%	74.5%	78.6%	83.9%

Web Intelligence | Track | Drill | Filter Bar | Freeze | Outline

Input Controls

Map Reset

Document Input Controls (6)

Service

- [ ] Select (All)
- [x] Weekday
- [ ] Saturday
- [ ] Sunday

OK

Month

- [ ] Select (All)
- [ ] 2016-03
- [ ] 2016-04
- [ ] 2016-05
- [x] 2016-06

OK

Week First Day

- [x] Select (All)
- [x] 2/27/2016 12:00:00 A
- [x] 3/5/2016 12:00:00 AI
- [x] 3/12/2016 12:00:00 A
- [x] 3/19/2016 12:00:00 A

OK

Date

- [x] Select (All)
- [x] 3/1/2016 12:00:00 AI
- [x] 3/2/2016 12:00:00 AI
- [x] 3/3/2016 12:00:00 AI
- [x] 3/4/2016 12:00:00 AI

OK

Metro Transit

Route Information

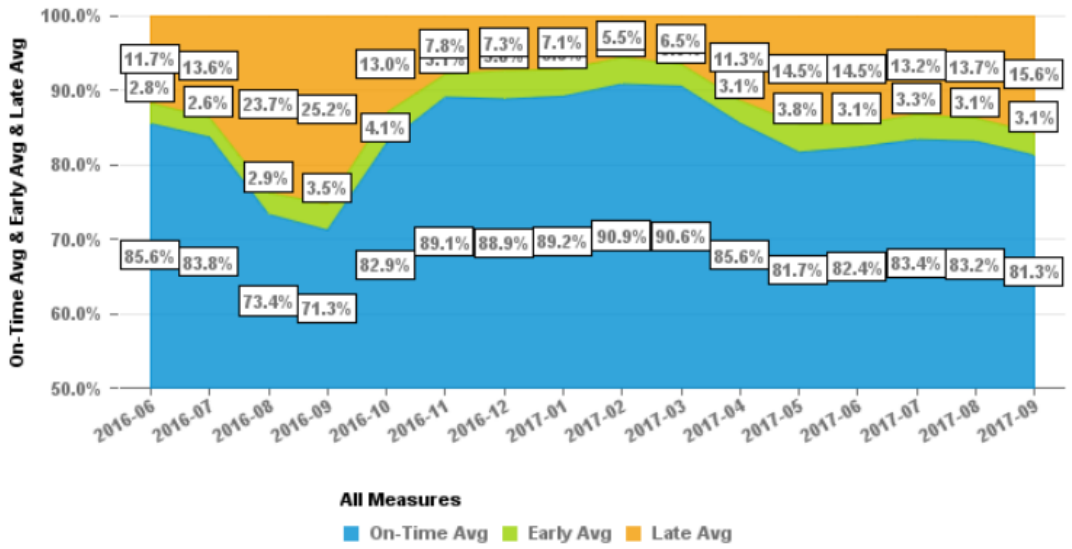
Route Trend Chart - Route 63

Data from 6/1/16 to 9/15/17
8.79% Bad Days

Weekday

Local

East



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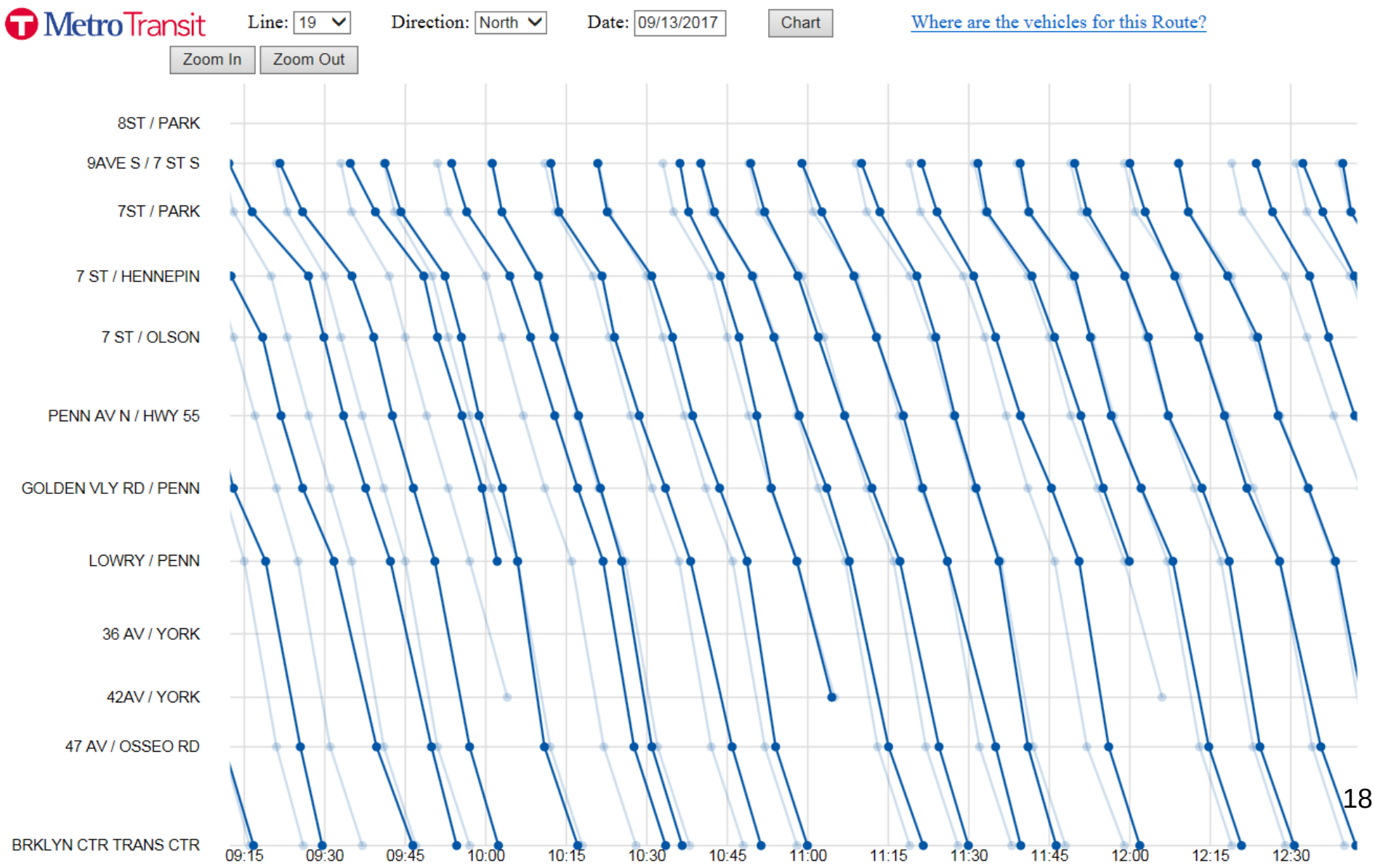
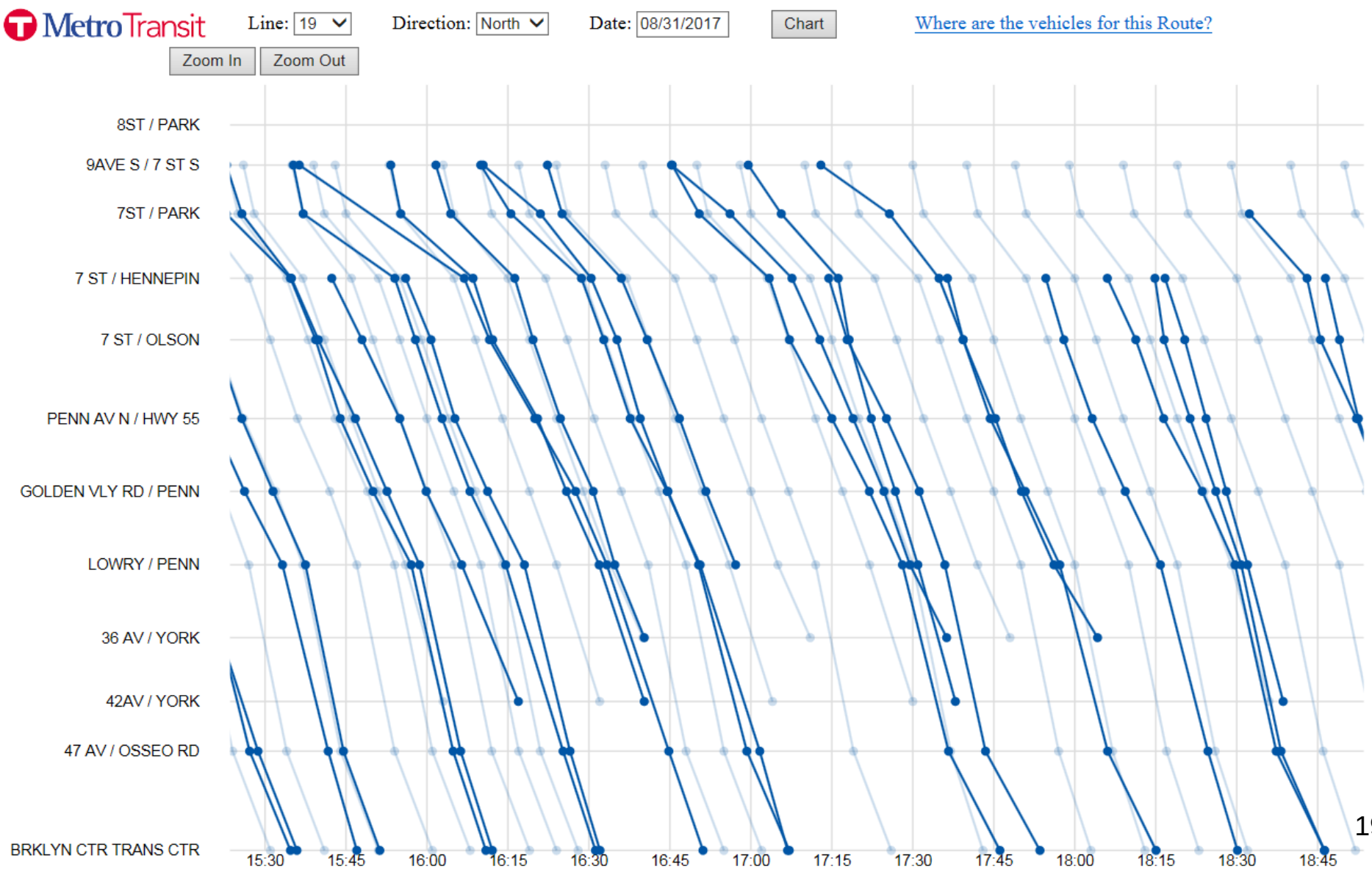

MetroTransit
Line: 19
Direction: North
Date: 09/13/2017
Chart
Where are the vehicles for this Route?
Zoom In
Zoom Out
8ST / PARK
9AVE S / 7 ST S
7ST / PARK
7 ST / HENNEPIN
7 ST / OLSON
PENN AV N / HWY 55
GOLDEN VLY RD / PENN
LOWRY / PENN
36 AV / YORK
42AV / YORK
47 AV / OSSEO RD
BRKLYN CTR TRANS CTR
09:15
09:30
09:45
10:00
10:15
10:30
10:45
11:00
11:15
11:30
11:45
12:00
12:15
12:30


Metro Transit
Line: 19
Direction: North
Date: 08/31/2017
Chart
Where are the vehicles for this Route?
Zoom In
Zoom Out
8ST / PARK
9AVE S / 7 ST S
7ST / PARK
7 ST / HENNEPIN
7 ST / OLSON
PENN AV N / HWY 55
GOLDEN VLY RD / PENN
LOWRY / PENN
36 AV / YORK
42AV / YORK
47 AV / OSSEO RD
BRKLYN CTR TRANS CTR
15:30
15:45
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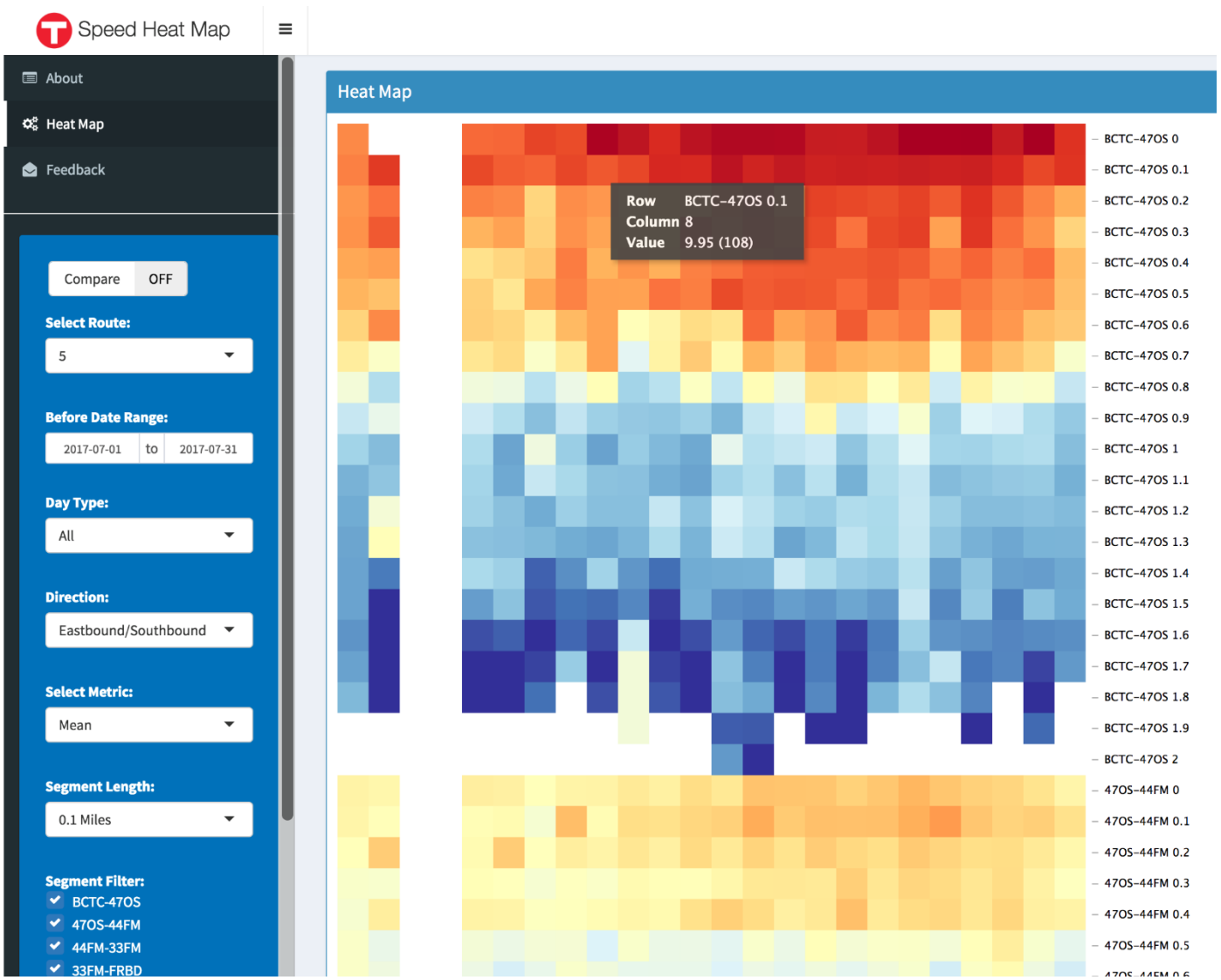

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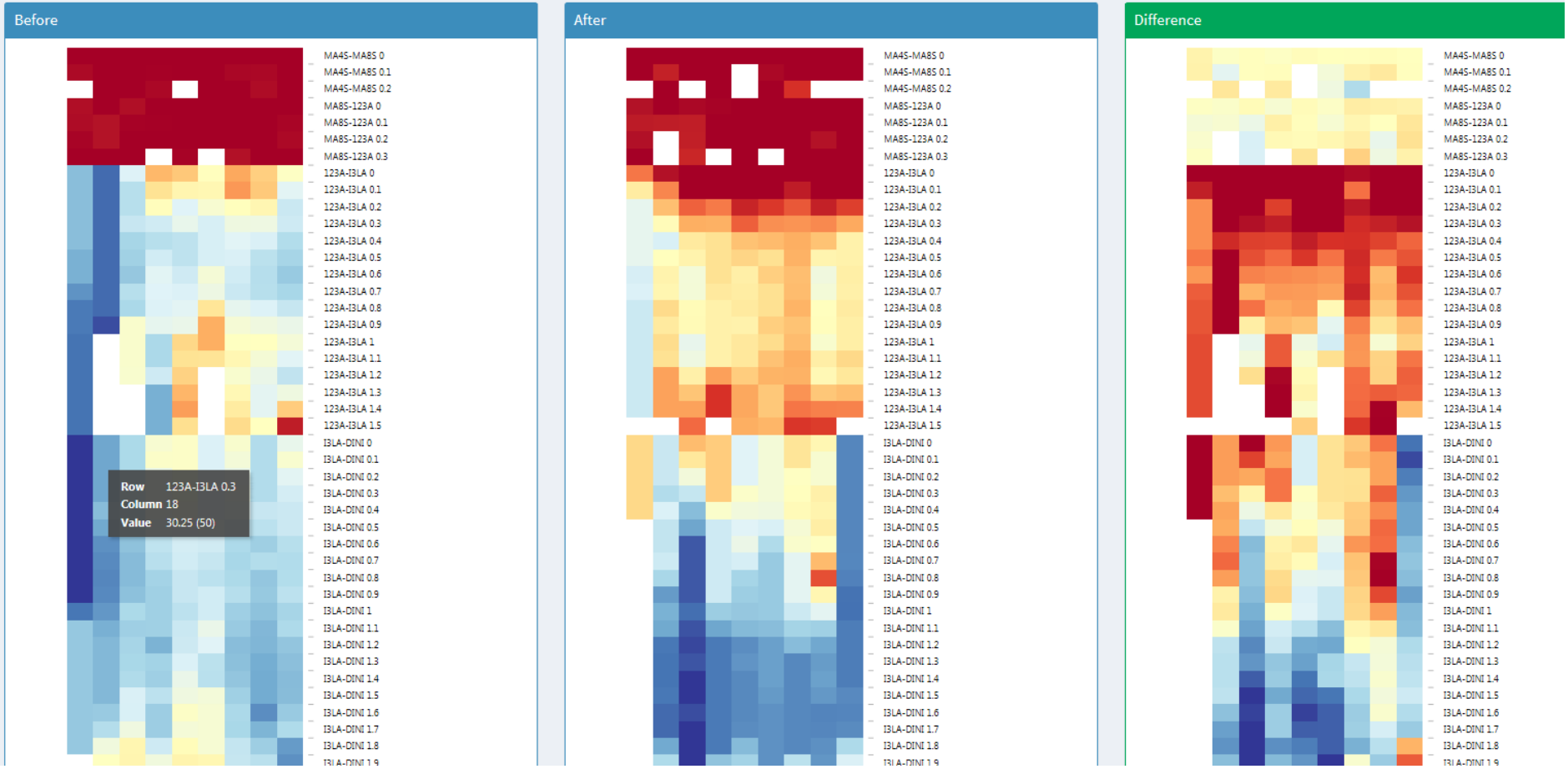
Change in I-35W South PM Peak Speeds



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Example 3: Service Planning

- Core question: How do we design a transit network to best meet customer needs?
  - Understanding travel demand and how riders use the system is essential for planning
- Partnership with Service Development, Metropolitan Transportation Services

Growing Data Sources

- Better understanding of travel demand, how transportation network is used, demographics of the travelers
  - Travel Behavior Inventory Transit On-Board Survey
  - Cell phone location data, auto and multimodal trips

- How to visualize data to inform decisions
- How to plan service changes and forecast results

Travel Behavior Inventory On-Board Survey 2016

- Interactive Plots
- O-D Map
  - by Route
  - by Block
  - by TAZ
  - by Tract
  - by Custom Bounding Box
- Heat Map
- Dot Density Map
- Flow Chart
- Feedback

Group Destinations by:

Block Group

Ignore Block Group/Tract with Observations fewer than:

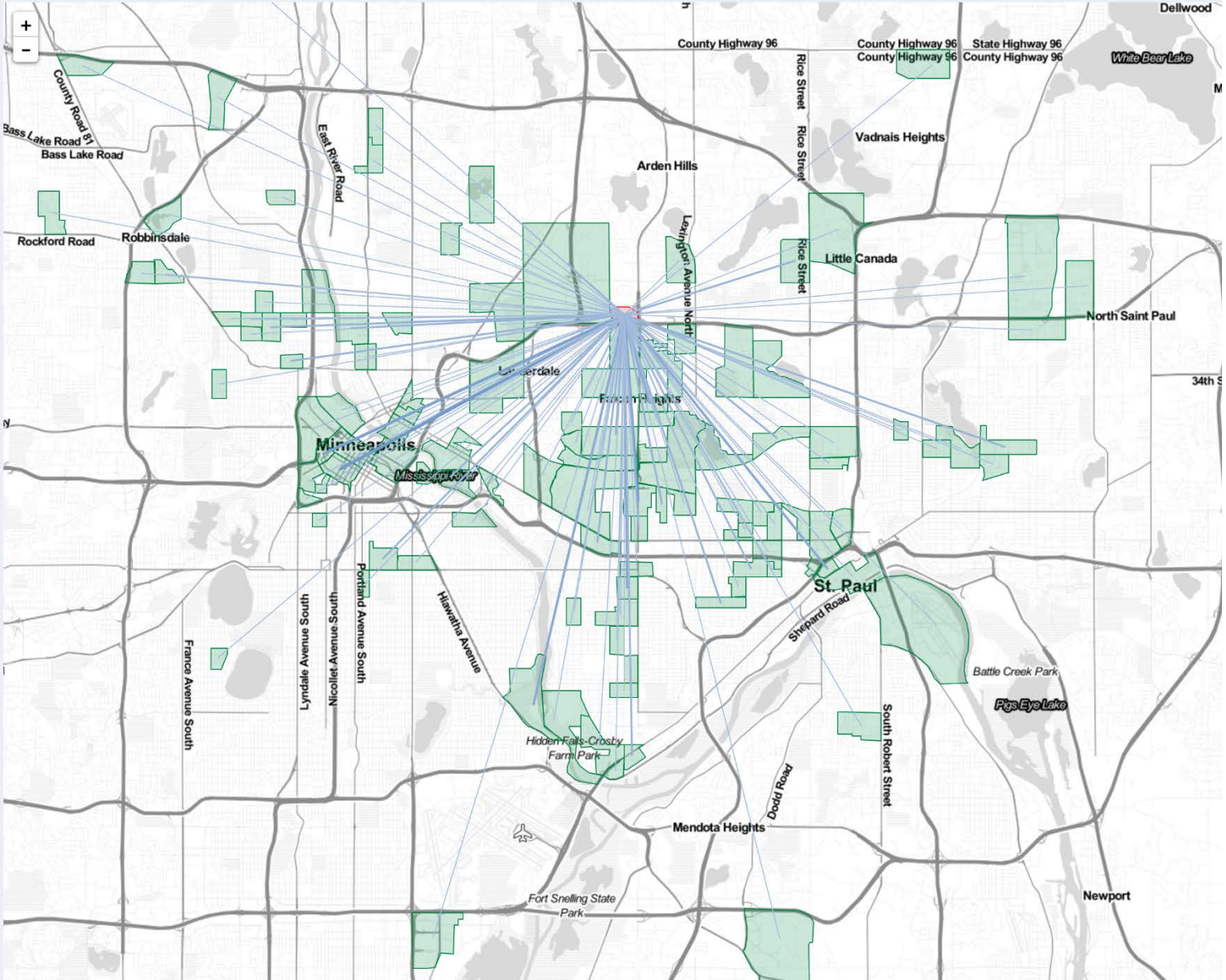
0

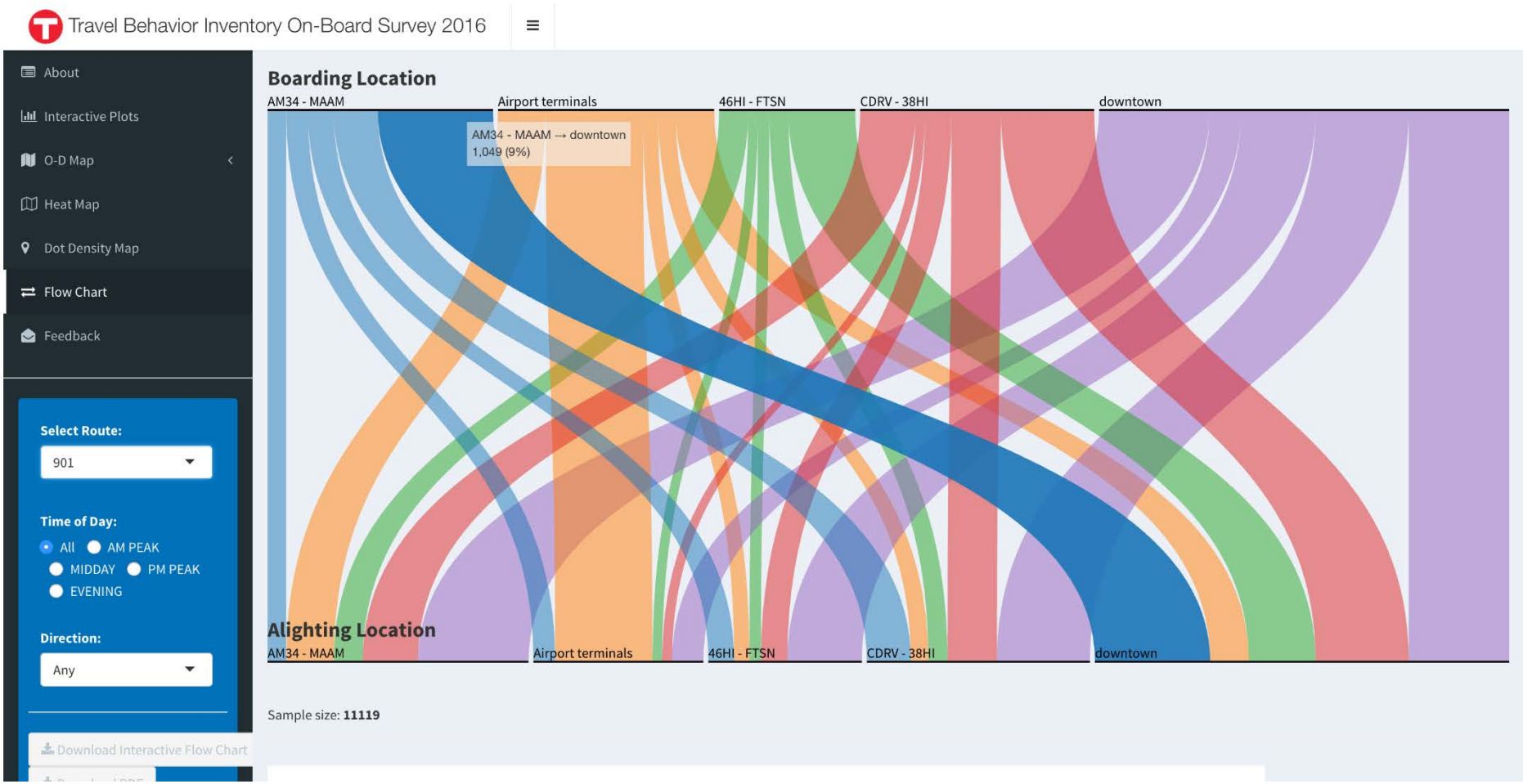
Route Filter:

2
3
4
5

Route Type Filter:

Time Period Filter:





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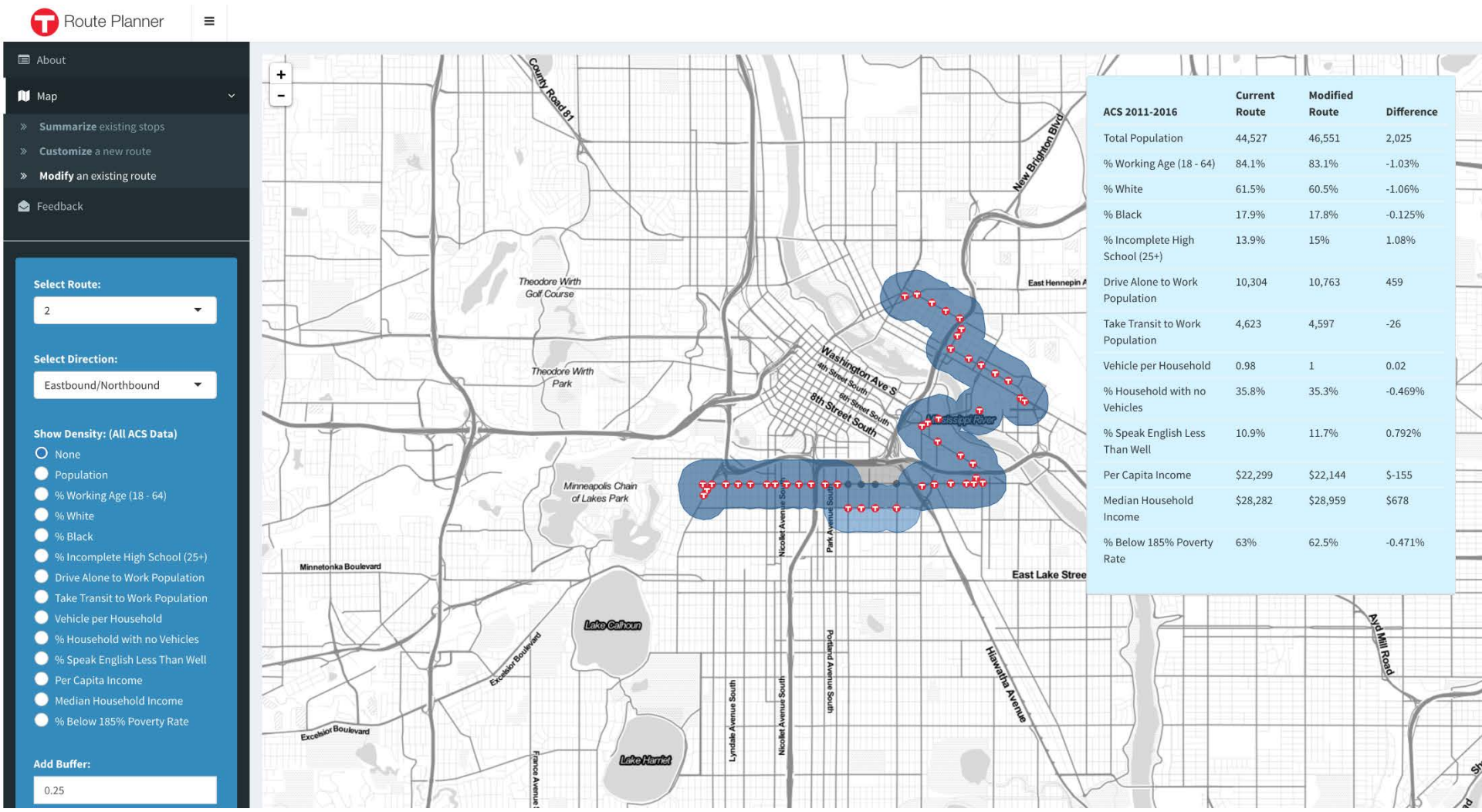

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Other areas of work

- Increase Mobility and Access to Opportunity
  - Origin/destination & travel demand data collection
  - Route and facility planning tools

- Maximize Operational Efficiency, Safety and Financial Integrity
  - Analysis and forecast of ridership changes
  - Workforce optimization and efficiency
  - Bus and rail accident analysis
  - Fare policy analysis
  - Fare evasion measurement
  - Building utility forecast and exception detection

Other areas of work, continued

- Improve the Customer Experience
  - Customer satisfaction survey design and analysis
  - Service quality analysis (speed, reliability, loading)
  - Accuracy and improvement of customer information

- Support Sustainable, Prosperous, and Equitable Communities
  - Equity of service design, facilities and fares
  - Equity in policing practices and outcomes

- Develop a Healthy, Resilient and Effective Workforce
  - Employee satisfaction and engagement survey and analysis
  - Operator retention analysis

Metro Transit
Strategic Initiatives Department

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