



# CILTNA Webinar: Intelligent Transportation Solutions to Retain and Increase Ridership While Offering Enhanced, Equitable Services - The TriMet Approach - Part #2

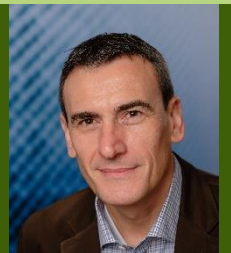
Wednesday, October 4, 2023

60 Minute Webinar

1:00 PM ET/ 10:00 AM PT/ 6:00 PM GMT

As the world has reopened from Covid shutdowns, transit agencies across North America have been rebuilding and even looking to expand their ridership. In this post pandemic world, cities have experienced shifts in mobility needs and travel patterns and TriMet aims to meet these mobility needs for all of our citizens. TriMet looks forward to continuing to be a valuable service to our citizens that rely heavily on transit, while also continuing to expand ridership by attracting choice riders.

**Moderated by: Andrew Young**, Chair US Chapter CILT North America



**A.J. O'Connor**, Director of Intelligent Transportation Systems at TriMet

**Adrian Pearmine**,  
Western Mobility Technology Solutions  
Leader at STV



► *Intelligent Transportation Solutions to Retain and Increase Ridership While Offering Enhanced, Equitable Services*

THE TRIMET APPROACH – PART 2

**Adrian Pearmine**  
*Western Mobility Technology  
Solutions Leader*  
STV Inc

**A.J. O'Connor**  
*Director of Intelligent  
Transportation Systems*  
TriMet





The Chartered  
Institute of Logistics  
and Transport

HOME | ABOUT | MEMBERSHIP | EDUCATION & TRAINING | NEWS | EVENTS

# INTELLIGENT TRANSPORTATION SOLUTIONS TO RETAIN AND INCREASE RIDERSHIP – THE TRIMET APPROACH

📅 15 February 2023 | On-line

🕒 12:00 – 13:00 [ America/Toronto ]

[BOOK YOUR PLACE >](#)

## Guest speakers

- > **A.J. O'Connor**, Director for Intelligent Transportation Systems at TriMet
- > **Adrian Pearmine**, National Director for Smart Cities and Connected Vehicles for DKS Associates

Moderated by **Andrew Young**, Chair, US Chapter CILT North America

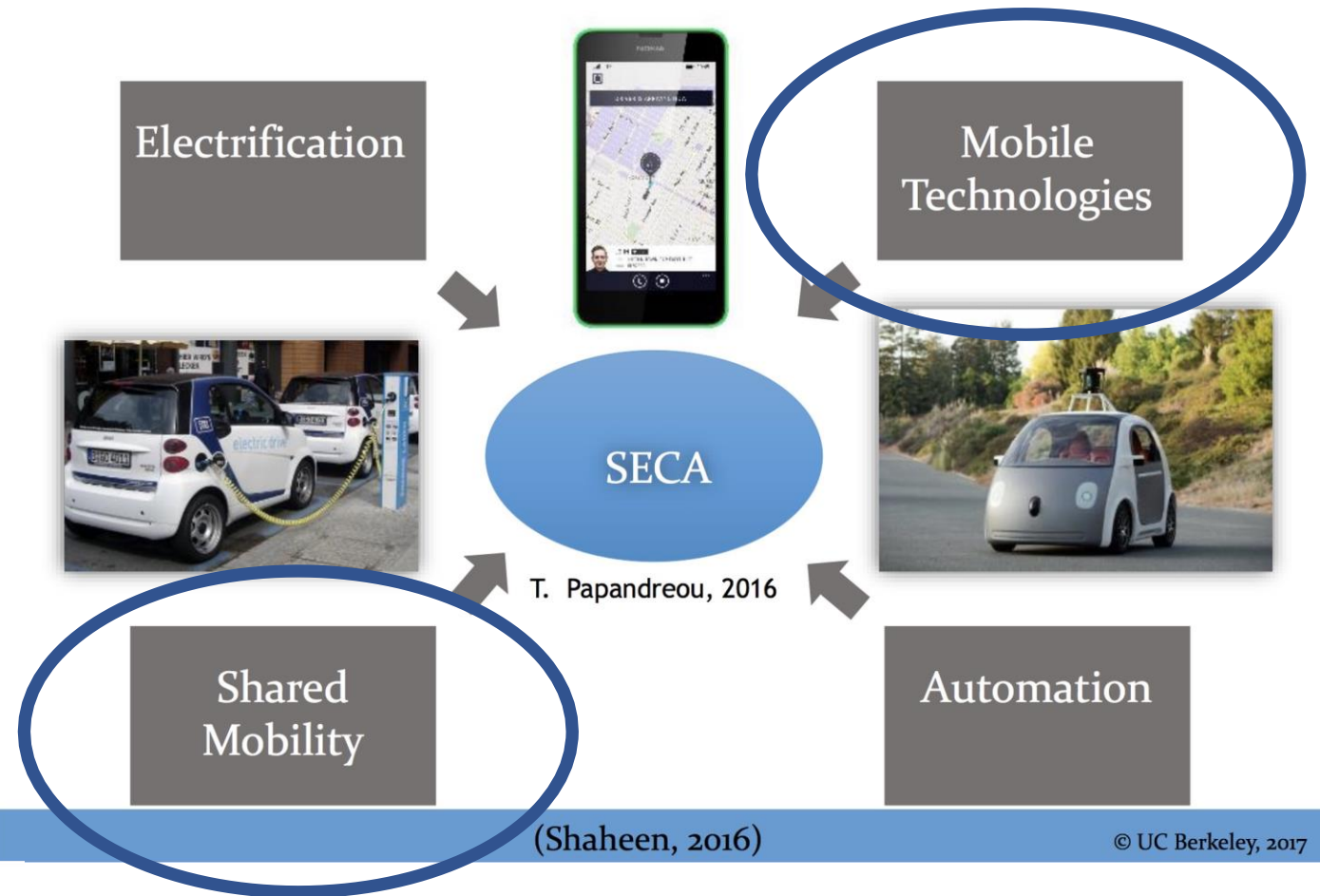


[youtube.com/watch?v=HN1dcIR5All](https://youtube.com/watch?v=HN1dcIR5All)

# Innovation and Disruption in Urban Mobility: Change Is Coming Fast

Susan Shaheen, PhD  
Email: [sshaheen@berkeley.edu](mailto:sshaheen@berkeley.edu)  
Twitter: [SusanShaheen1](#)  
LinkedIn: [Susan Shaheen](#)

## Convergence



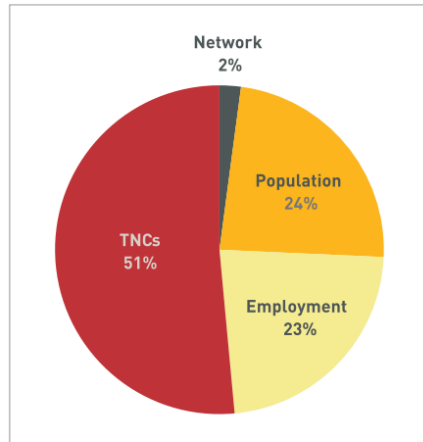
© UC Berkeley, 2017



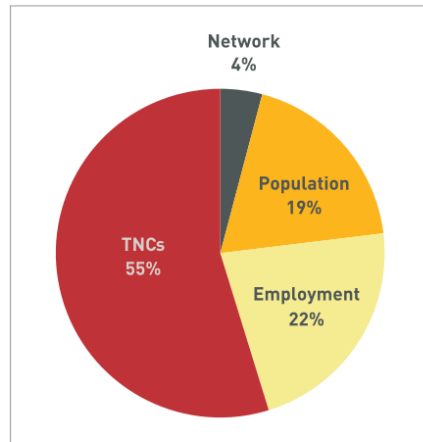


# TNCs & Congestion

FINAL REPORT | OCTOBER 2018



SHARE OF CHANGE IN DELAY BY FACTOR



SHARE OF CHANGE IN SPEED BY FACTOR

FIGURE 4. % CHANGE IN VEHICLE HOURS OF DELAY





# If Your Car Is Stuck in Traffic, It's Not Uber and Lyft's Fault

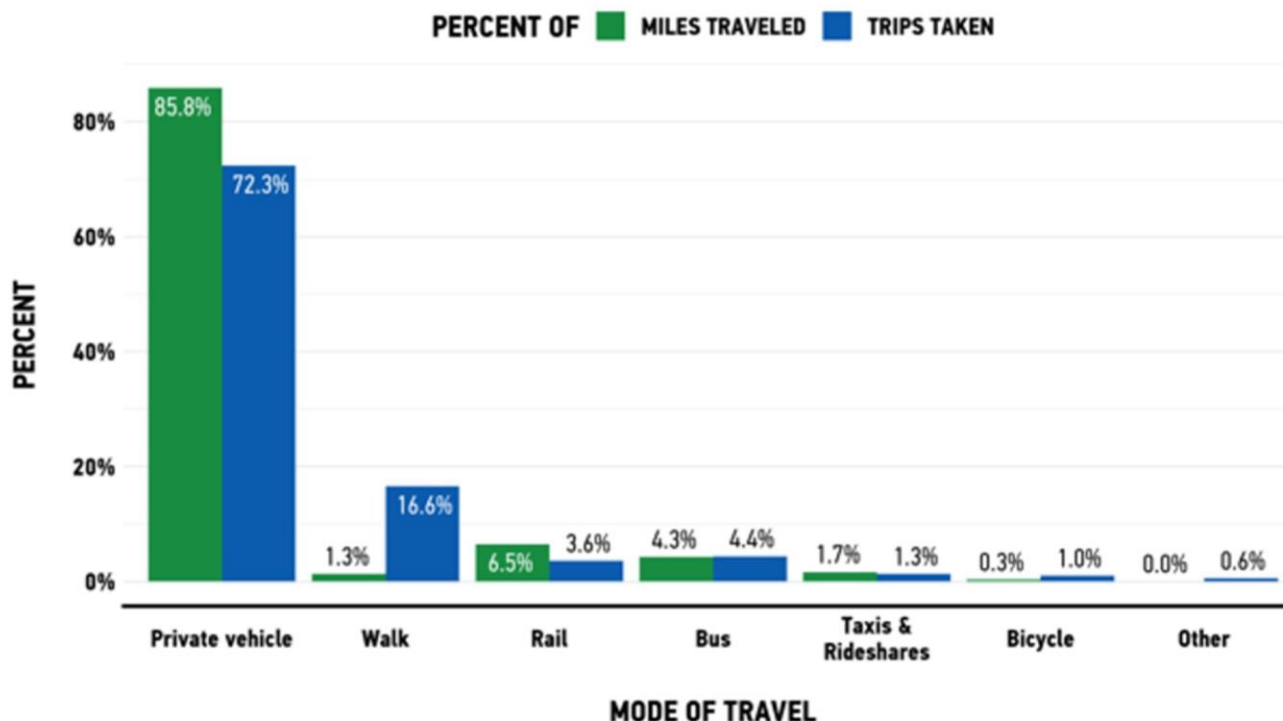
CITYLAB

Cities have been congested and transit has been poorly used for years before ride-hailing companies set up shop.

ROBIN CHASE JUL 27, 2018



IN U.S. CITIES  
WHERE RAIL  
TRANSPORT IS  
AN OPTION



# What can Public Transportation do?

*Discussed in February Session*

- Mobility Hubs
- Mobility as a Service
- Multimodal Trip Planner
- Advanced Fare Collection Systems (HOP Card)
- Rail Systems at same level of tech as busses





**TRI MET**

7000 NE Airport Way, Portland, OR, USA 97218

N Leonard St, Portland, OR, USA

Today  
Leave now

5 Modes Selected

**Take Transit**

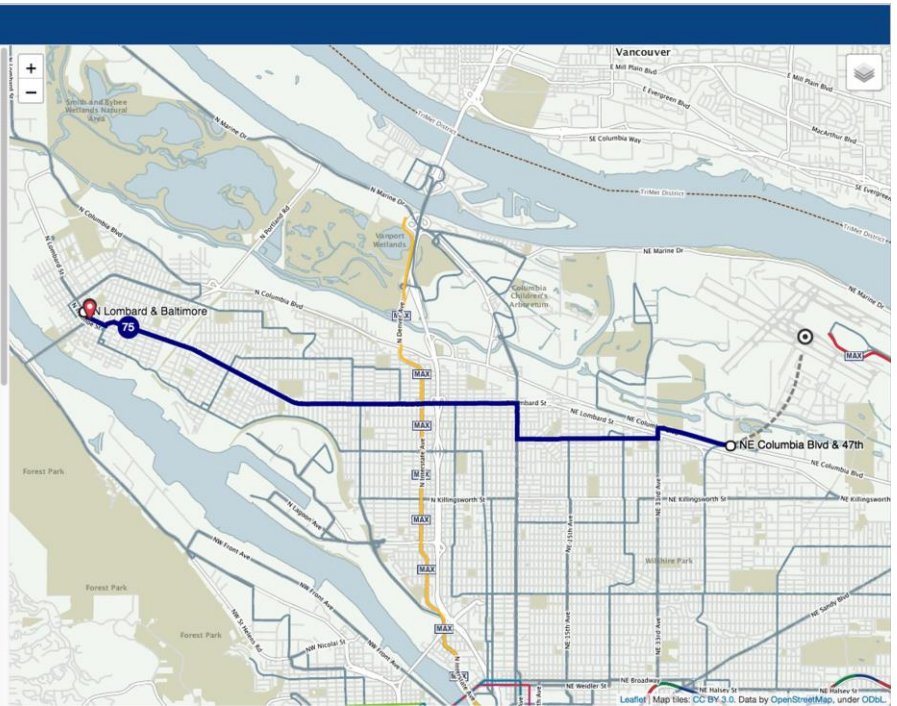
Bike + Transit   Park & Ride   car2go + Transit  
 Uber + Transit   Lyft + Transit

Walk Only   Bike Only

Filter Transit Modes  
 Bus   MAX & Streetcar   Wes   Aerial Tram

Travel Preferences  
 OPTIMIZE FOR: SPEED

Best Bet	Option 2	Option 3
44 min \$12.50+ 14 Cal	45 min \$12.50+ 14 Cal	46 min \$12.50+ 14 Cal



10:22a   S5 D V T   B1701   I7432   E60

7.8 mi

Ann. ON

0.9 mi

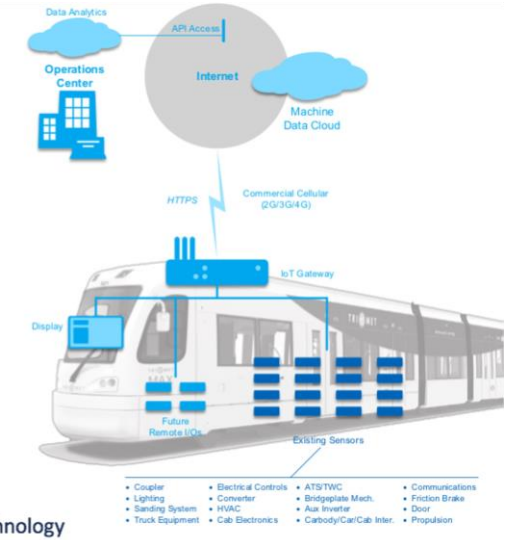
1.1 mi

Continue in same direction  
SW Lincoln St

Login  
Home  
Navigation  
Messages  
Fare  
Settings  
Emergency

Seven main categories of functionality:

- 1 Customer Information
- 2 Incident Management & Data
- 3 Real-Time Maintenance
- 4 Historical Maintenance
- 5 Safety and Security
- 6 Transit Signal Priority
- 7 Infotainment



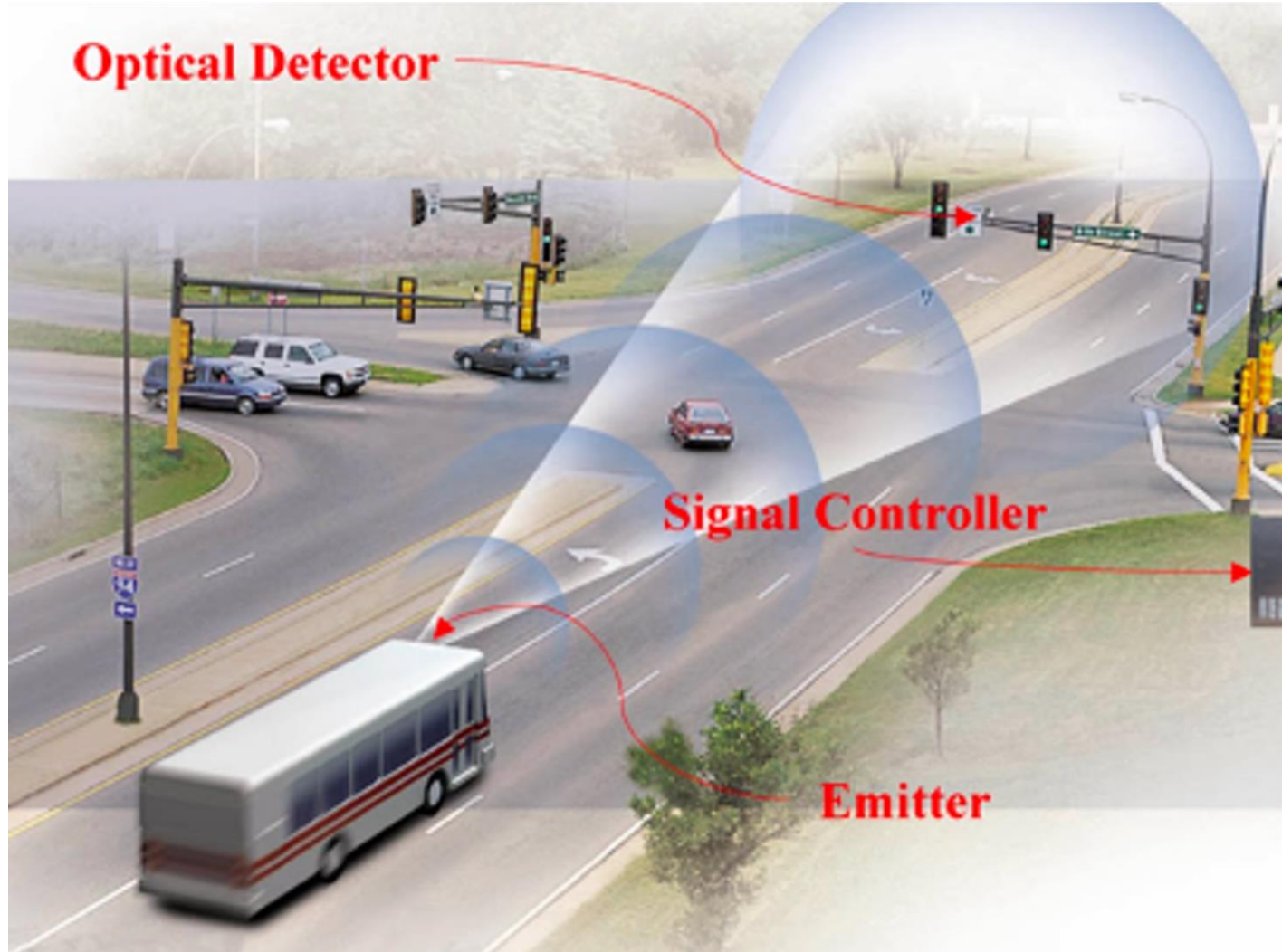
**TRI MET** Rail Operations Optimization Technology

# What can Public Transportation do?

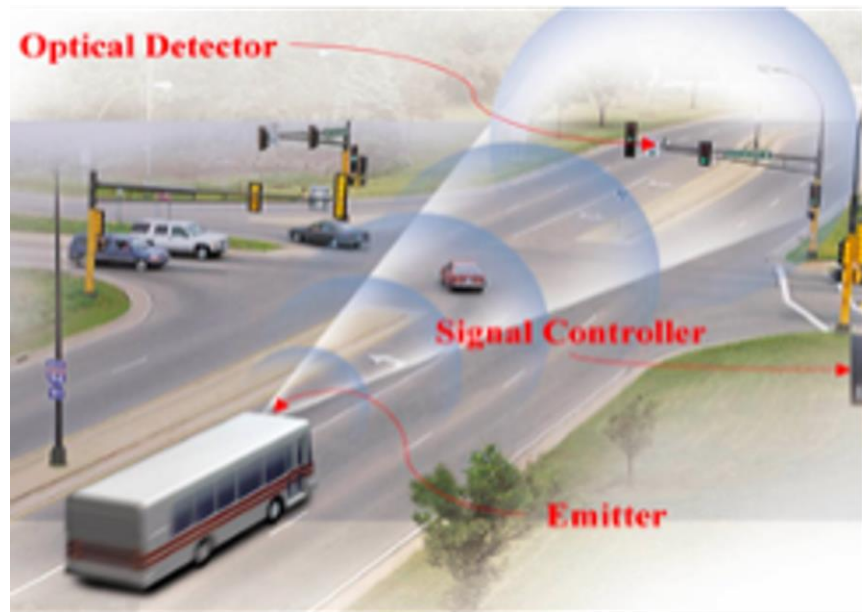
*Remainder of this presentation*

- National Trends of transit working with cities and other partners
- Combination of Infrastructure, Investment & Policy
- Focus on Corridors and High Capacity Service
  - Frequency
  - Speed
  - Reliability
- Next Generation Transit Signal Priority as key enabling technology

# Legacy Transit Signal Priority System



# Legacy TSP...



**Hardware Heavy**


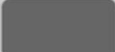


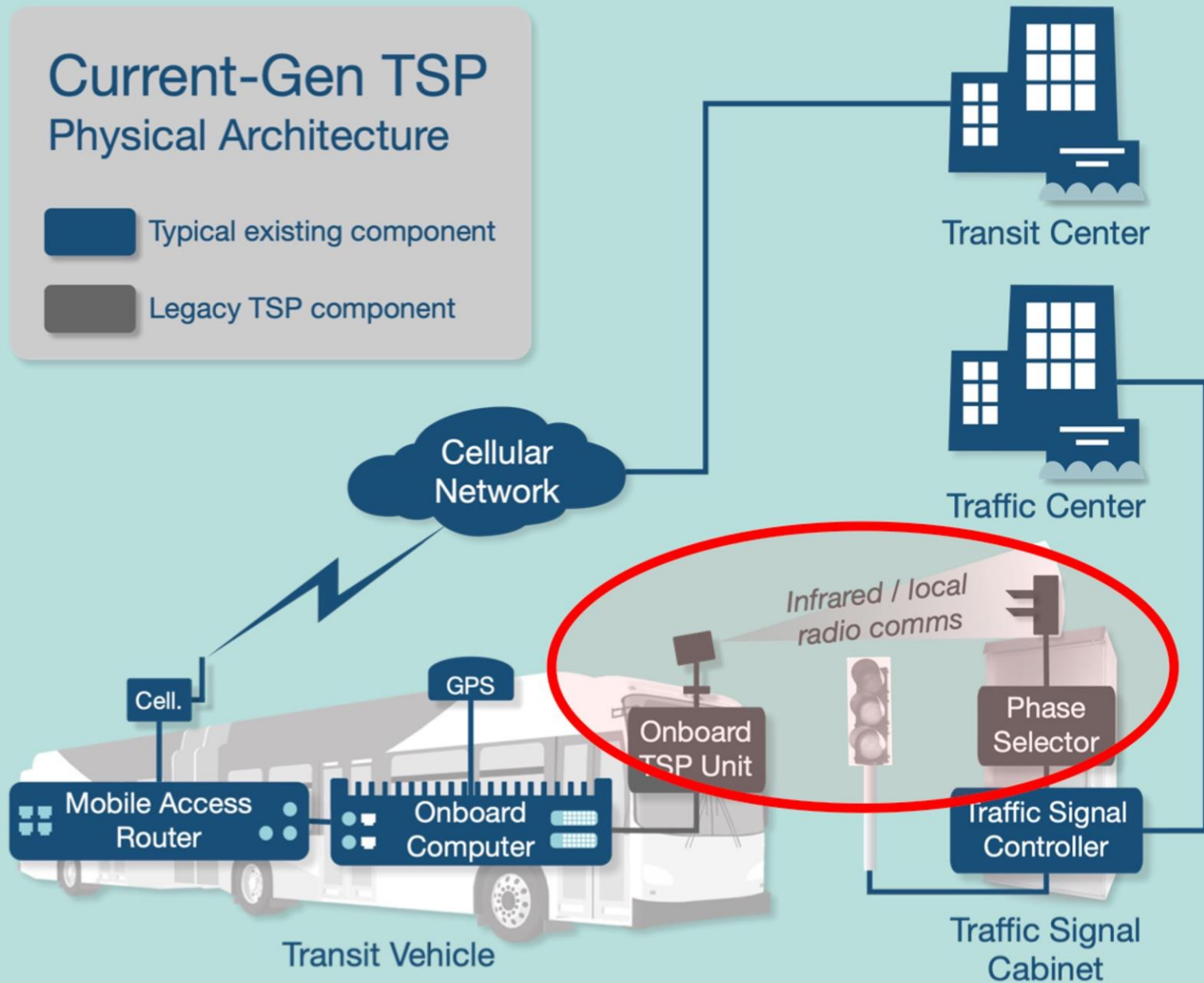
**Labor Intensive**



**Operational Challenges**

# Current-Gen TSP Physical Architecture

-  Typical existing component
-  Legacy TSP component



Detector  
(at signal)

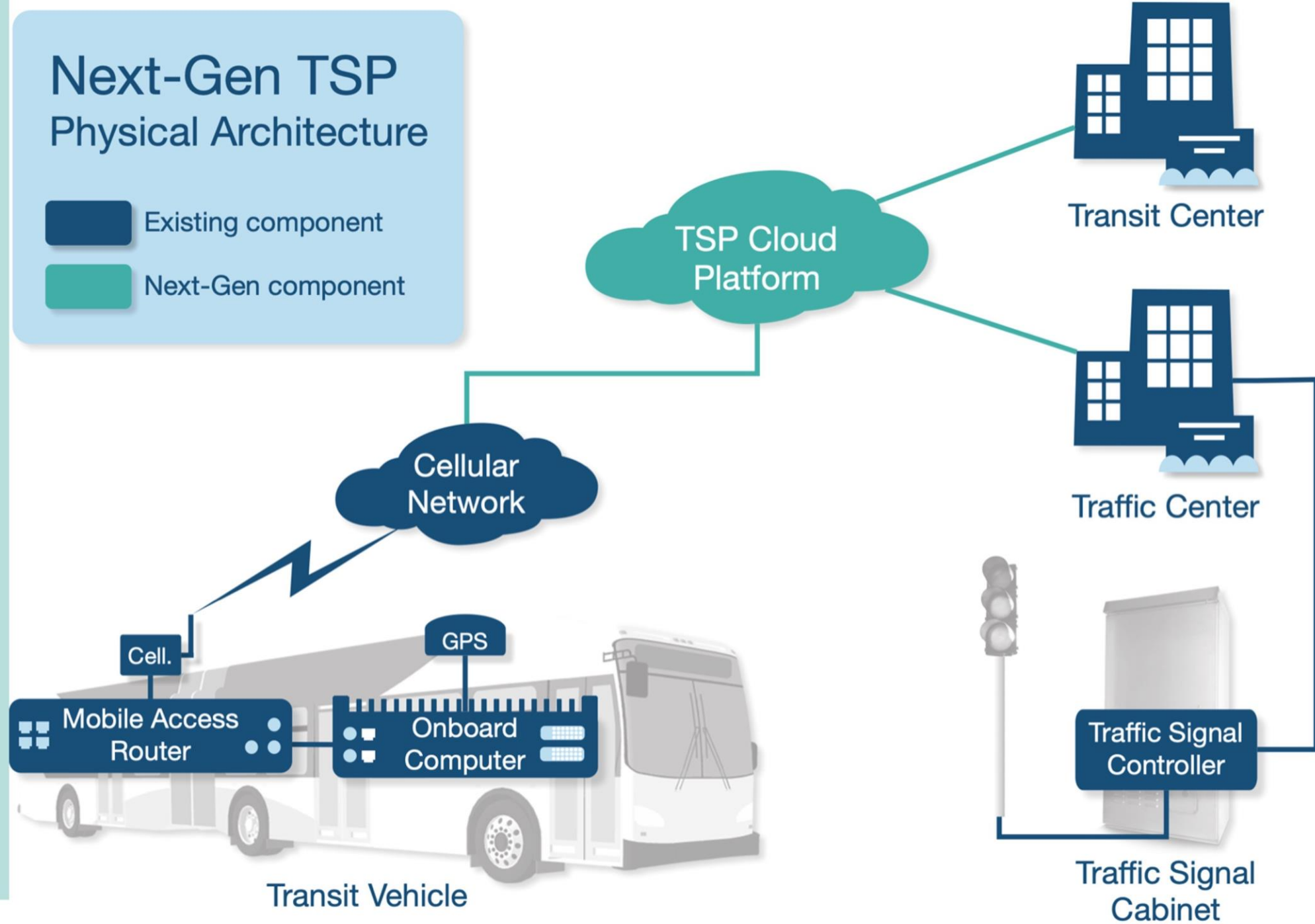


Emitter  
(on bus)



# Next-Gen TSP Physical Architecture

- Existing component
- Next-Gen component



# Priority to High Occupancy Vehicles



Prepared in part by:



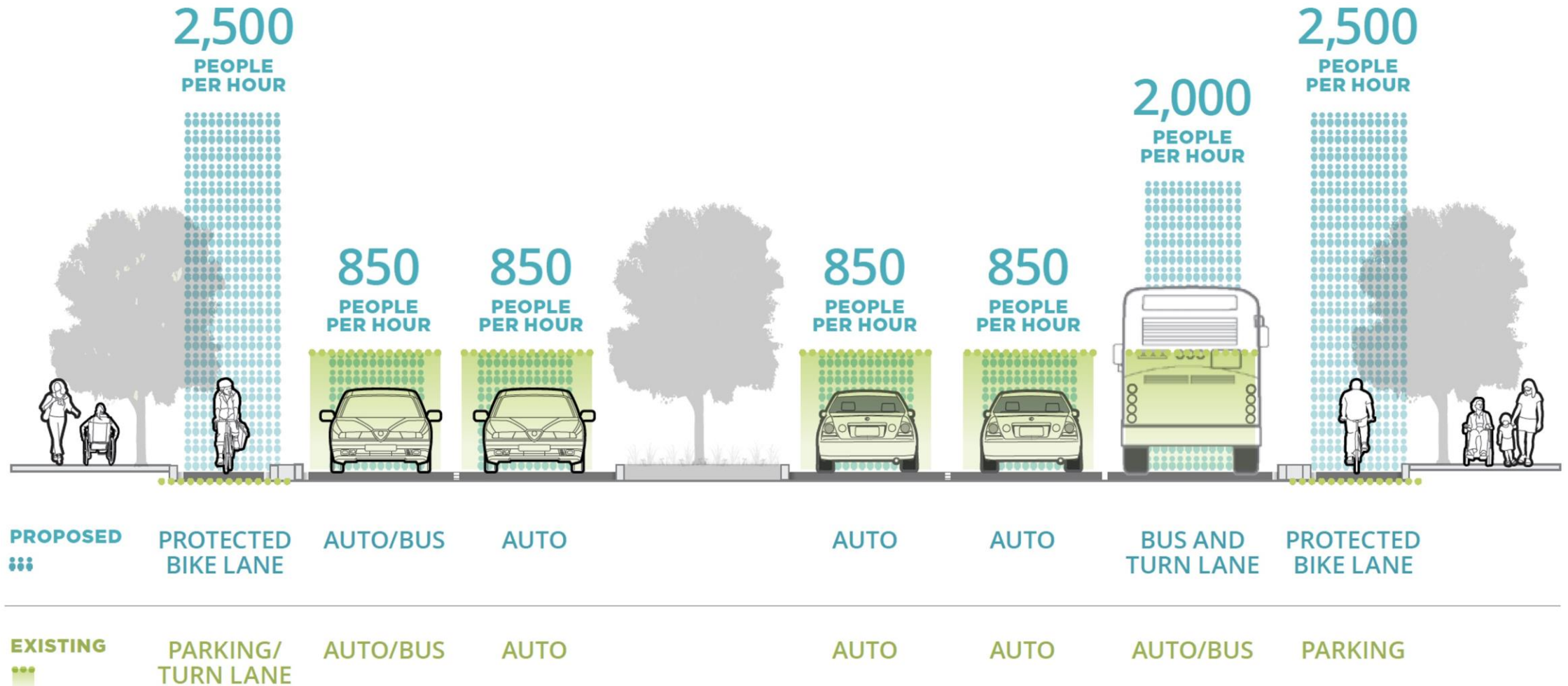
Granting agency:



Prepared in part by:



## REDESIGNED STREETS CAN ACCOMMODATE A GROWING CENTRAL CITY



W Burnside: new bus and protected bike lanes will increase the people moving capacity of the street





## Timeline



# DIVISION

## TRANSIT PROJECT



FX 2-Division is our new high-capacity bus service along Division Street in Southeast Portland. It's fast, efficient and convenient, and will reduce travel times between Downtown Portland and Gresham by 20%.

① Front door

Cash fare box and Hop reader;  
Board and exit with mobility devices;  
Ramp for mobility devices

② Middle door

Pay with Hop

③ Rear door

Pay with Hop;  
Board and exit with a bike

④ Priority seating

For seniors and people with disabilities

⑤ Getting off the bus

Touch strip/pull cord to tell operator  
to stop at the next station;  
Overhead sign and speaker announce  
the next station

⑥ Bike racks

Board at the rear door to use either of  
the two bike racks

⑦ Shelter

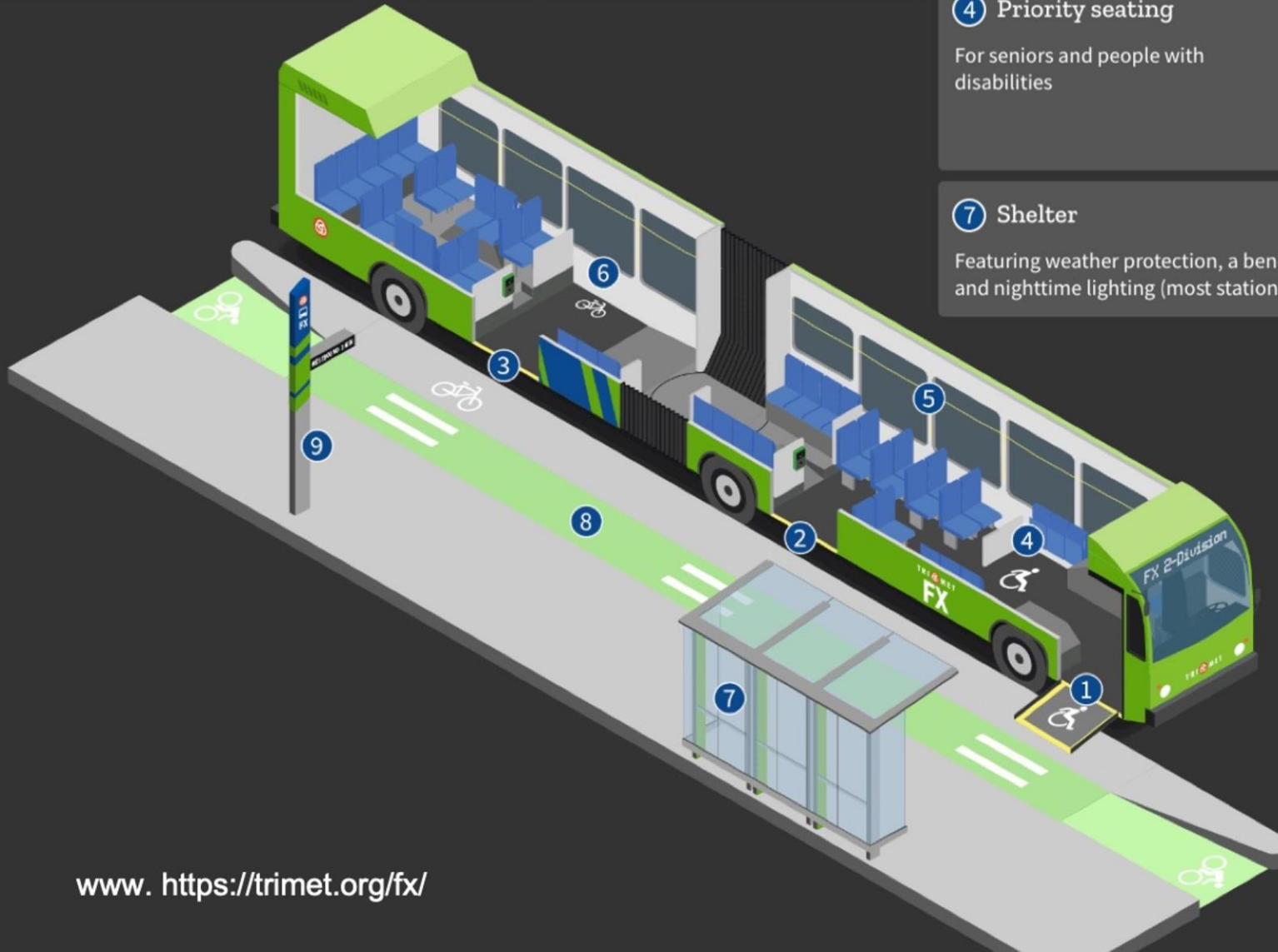
Featuring weather protection, a bench  
and nighttime lighting (most stations)

⑧ Bike lane

Bicyclists must yield to pedestrians

⑨ TransitTracker sign

Shows next bus arrivals in real-time





313 trimet.org  
FX2  
TRIMET  
STOP  
E290267

STOP FOR PEDESTRIANS

STOP HERE FOR PEDS

313

BICYCLE

WALK

WALK

Subway

ARC

ARC

CO ON



From backups to back-to-business.  
Mr. P. [Logo]

ONLY  
BUS

HAIR & NAILS  
[Phone Number]

ROIC

U TURN

Bicycle symbol

# TSP on Division FX2

## FX2-Division route





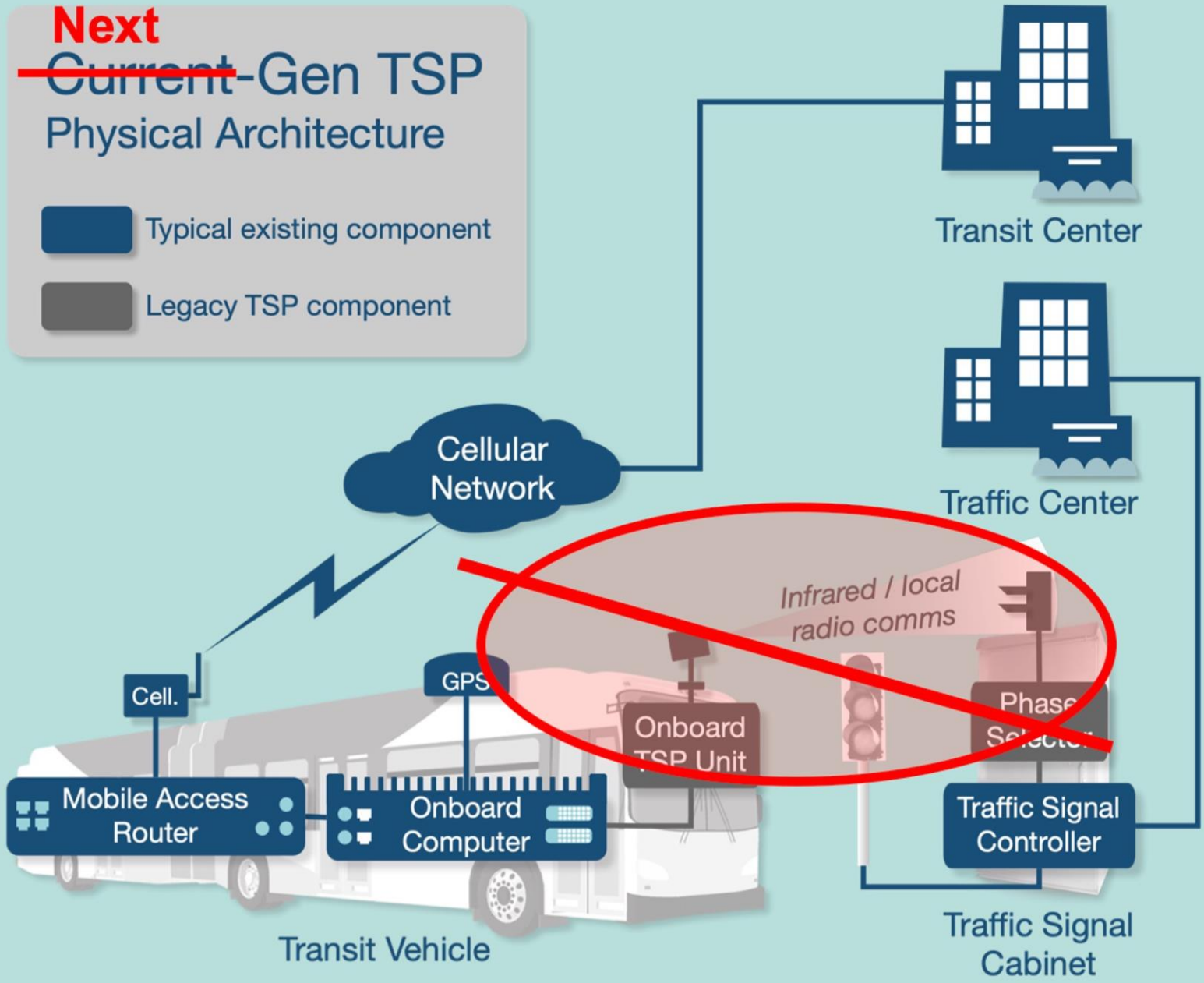
[www. https://trimet.org/fx/](https://trimet.org/fx/)



**Next**

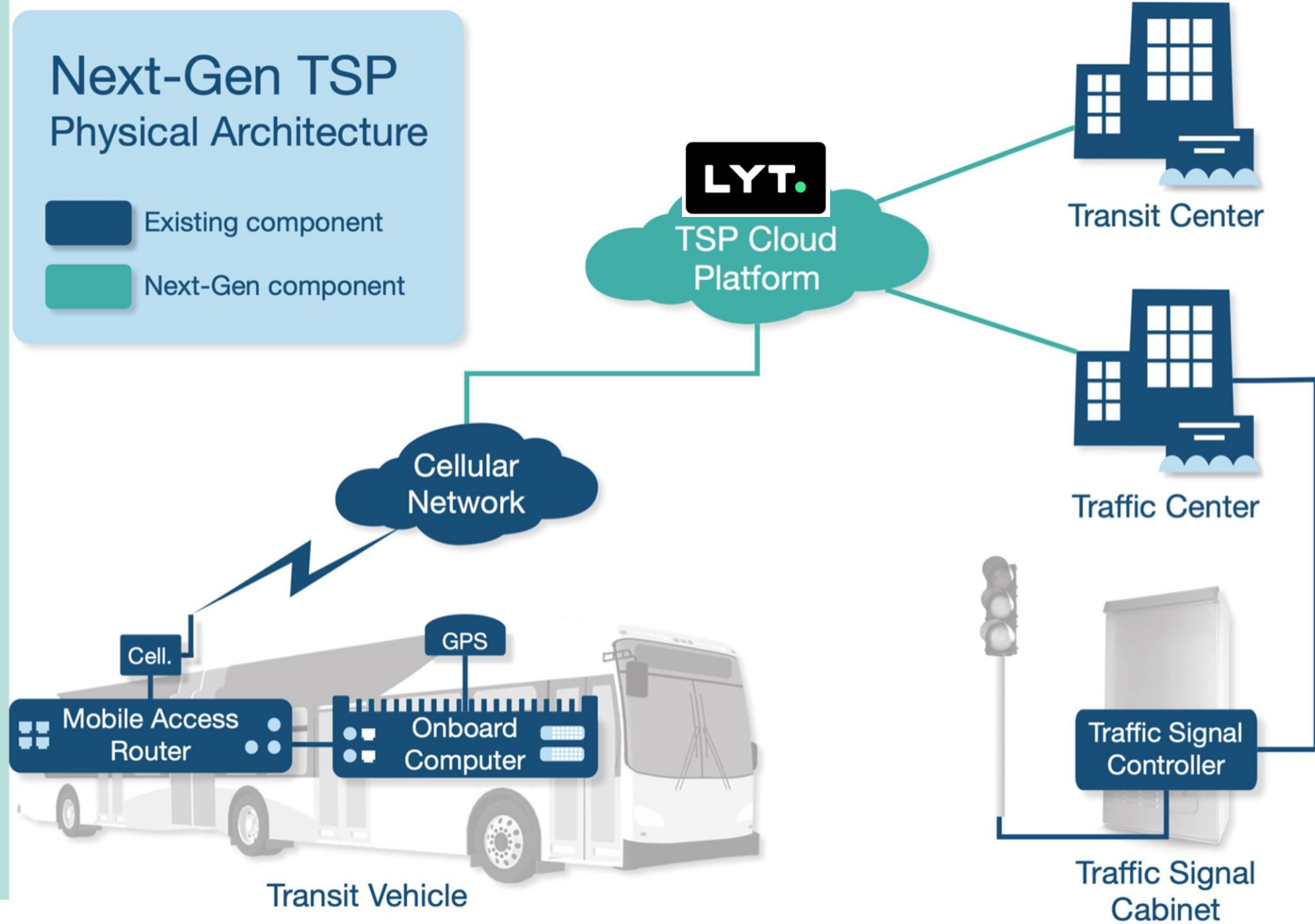
~~Current-Gen TSP~~  
Physical Architecture

-  Typical existing component
-  Legacy TSP component



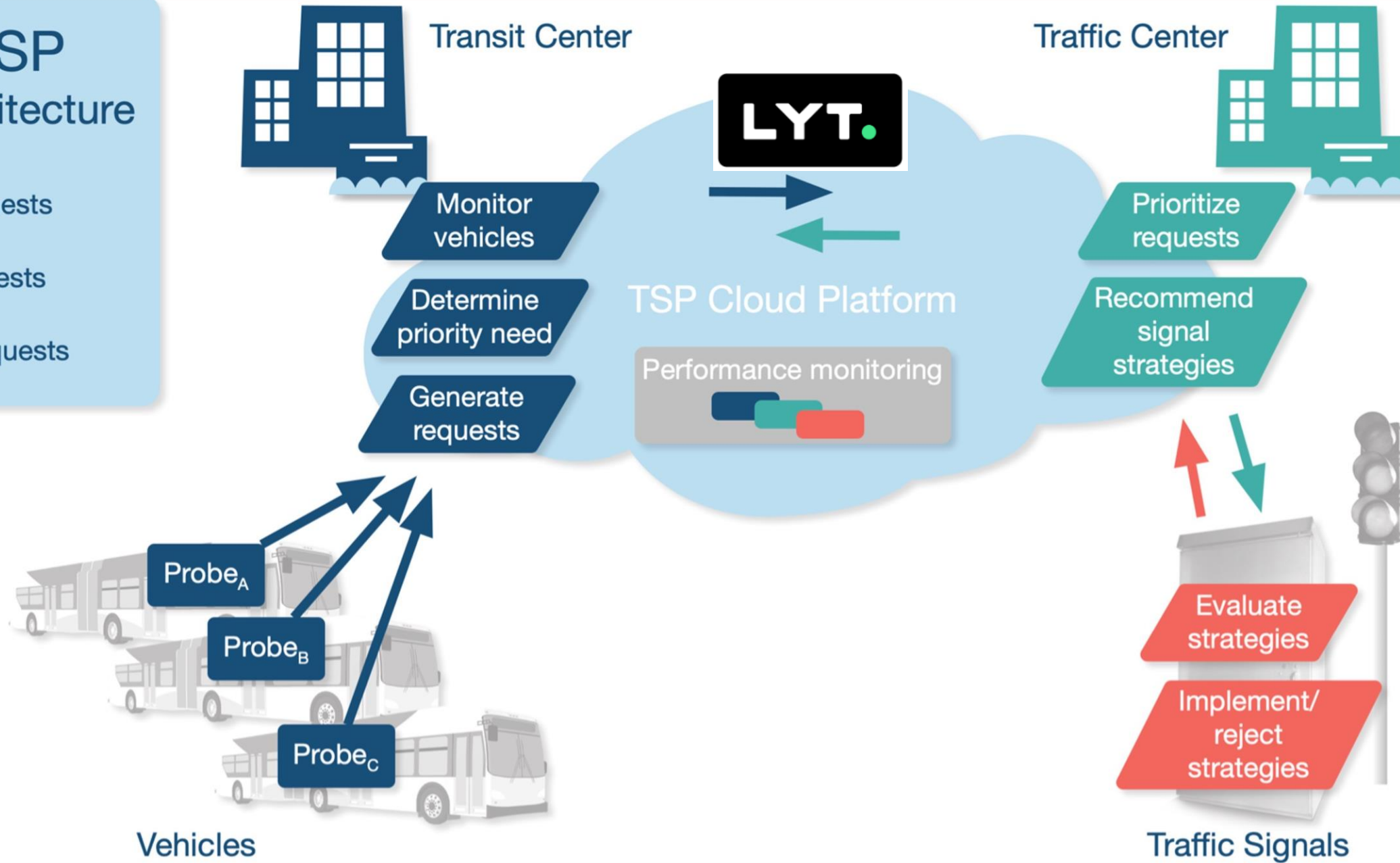
# Next-Gen TSP Physical Architecture

- Existing component
- Next-Gen component



# Next-Gen TSP Functional Architecture



-  Generate requests
-  Prioritize requests
-  Implement requests

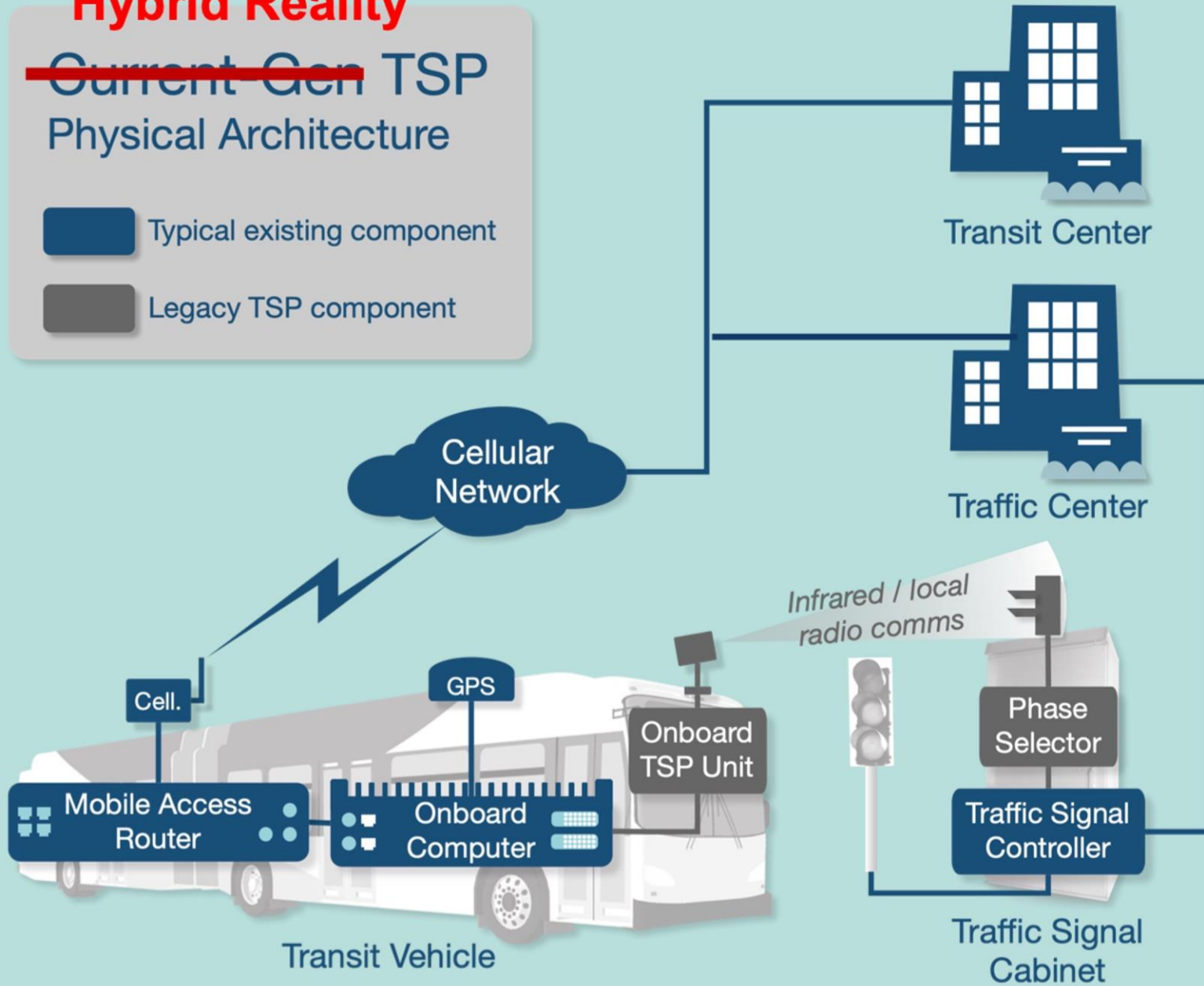




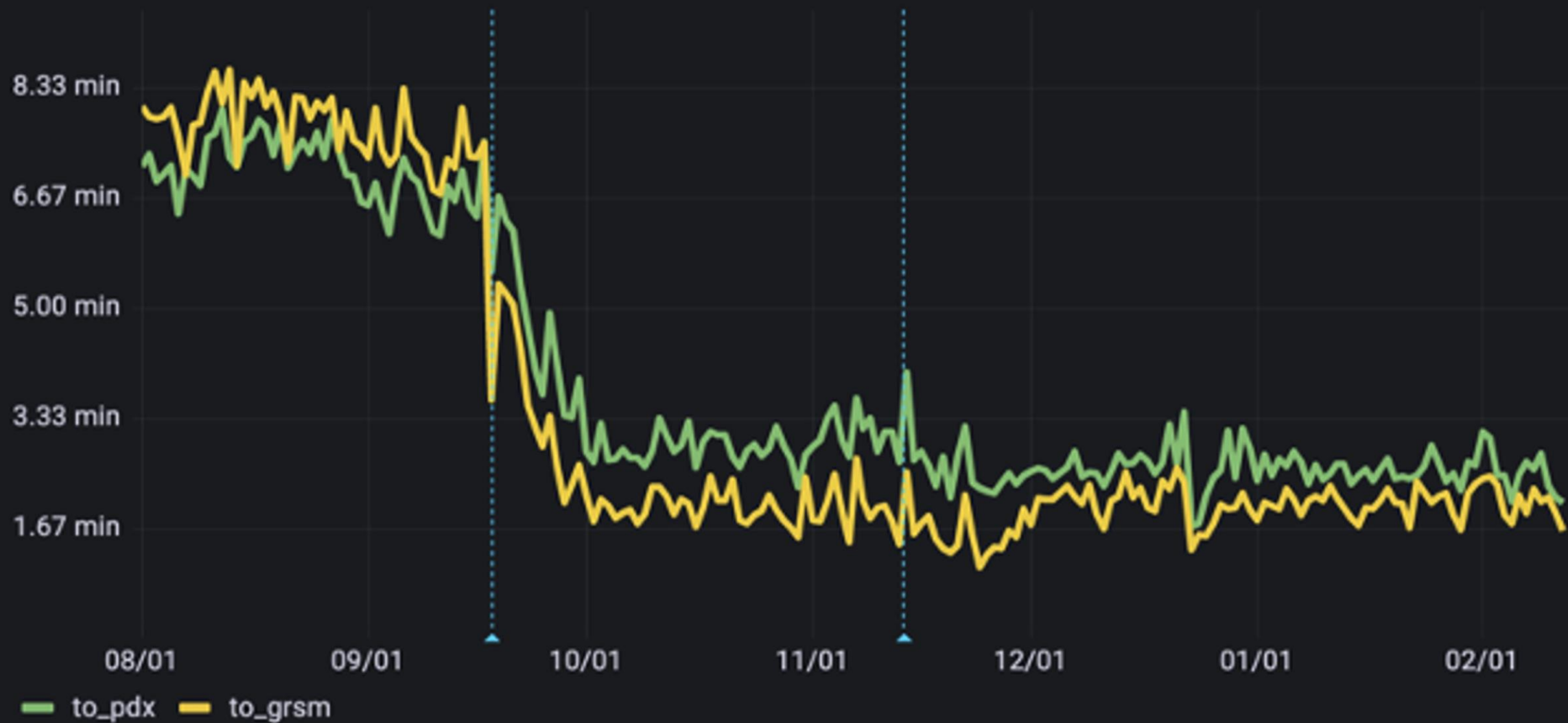
# Hybrid Reality

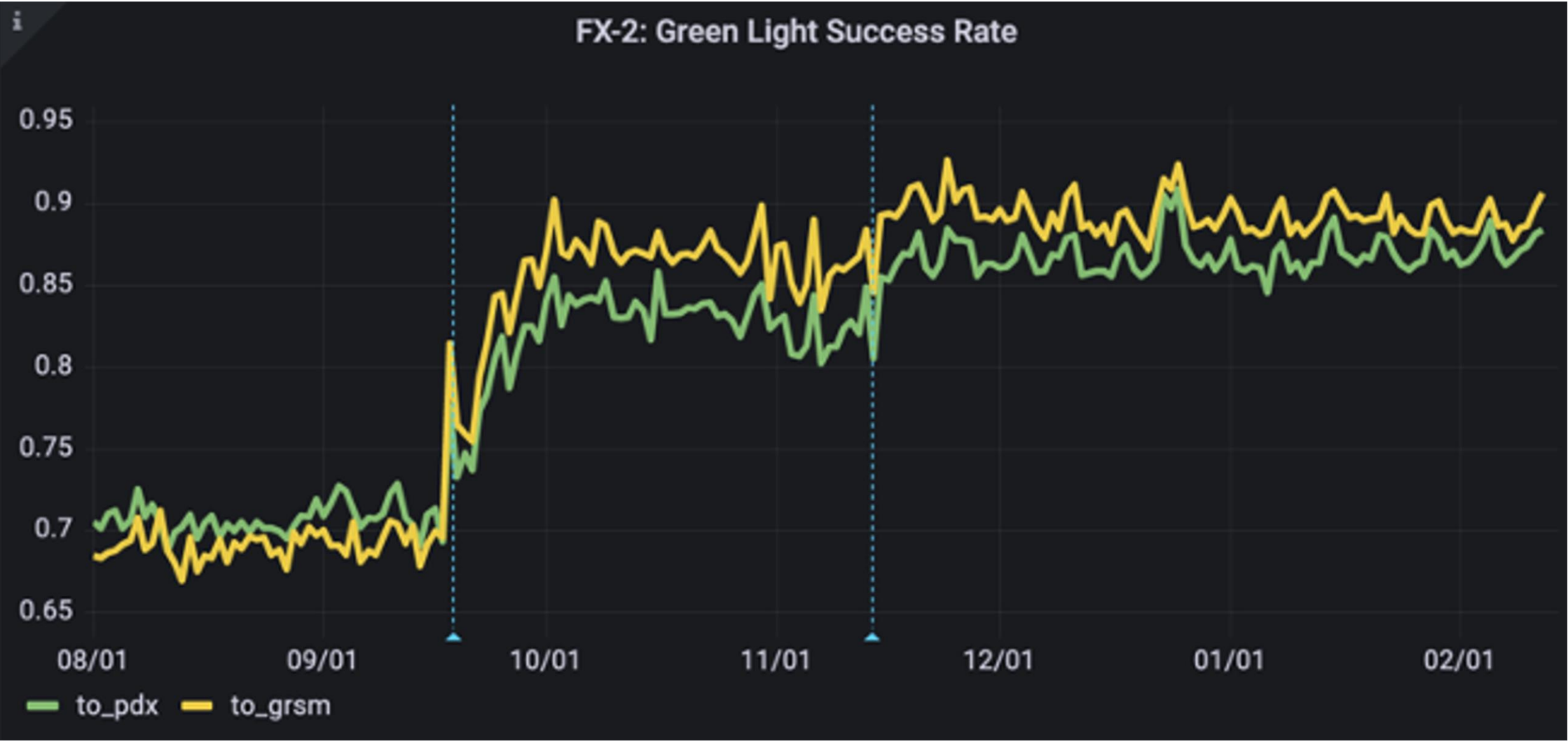
## ~~Current Gen TSP~~ Physical Architecture

-  Typical existing component
-  Legacy TSP component



# FX-2: Avg Red Light Wait Time





## On/Off Study Scenarios

- › **TSP off/PBOT off**
  - › *New Lyt Next Gen TSP functionality inactivated*
- › **TSP on/PBOT off**
  - › *Lyt solution activated*
  - › *BUT PBOT “custom logic” not active in controllers*
- › **TSP on/PBOT on**

Lyt is TriMet’s Next Gen TSP technology provider

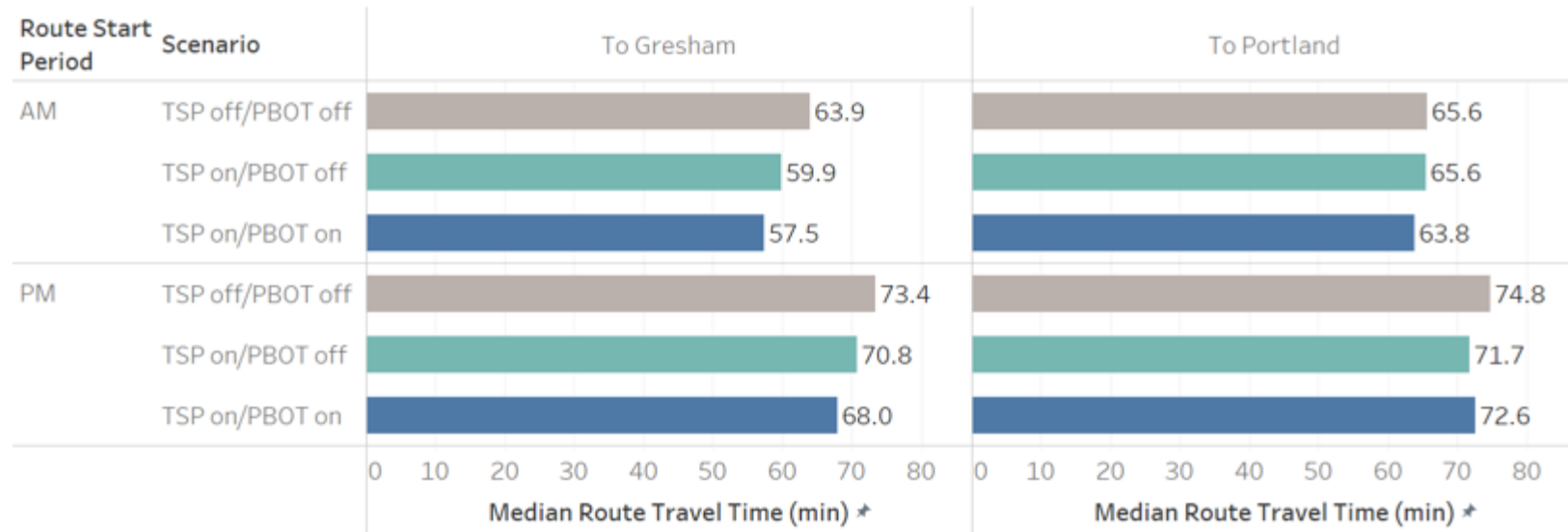
PBOT: Portland Bureau of Transportation

PBOT developed custom Signal system logic



Figure 2: Transit Round Trip Travel Time

Transit Travel Time by Route (Weekdays in May/June 2023)



Median of Route Travel Time for each Scenario by Time Period. The analysis uses TriMet’s automated vehicle location (AVL) data. Only weekdays were analyzed. The AM peak period is considered 6AM-8AM and the PM peak period is 4PM-6PM. Journeys that leave the corridor or do not travel along the full length of the corridor are excluded.

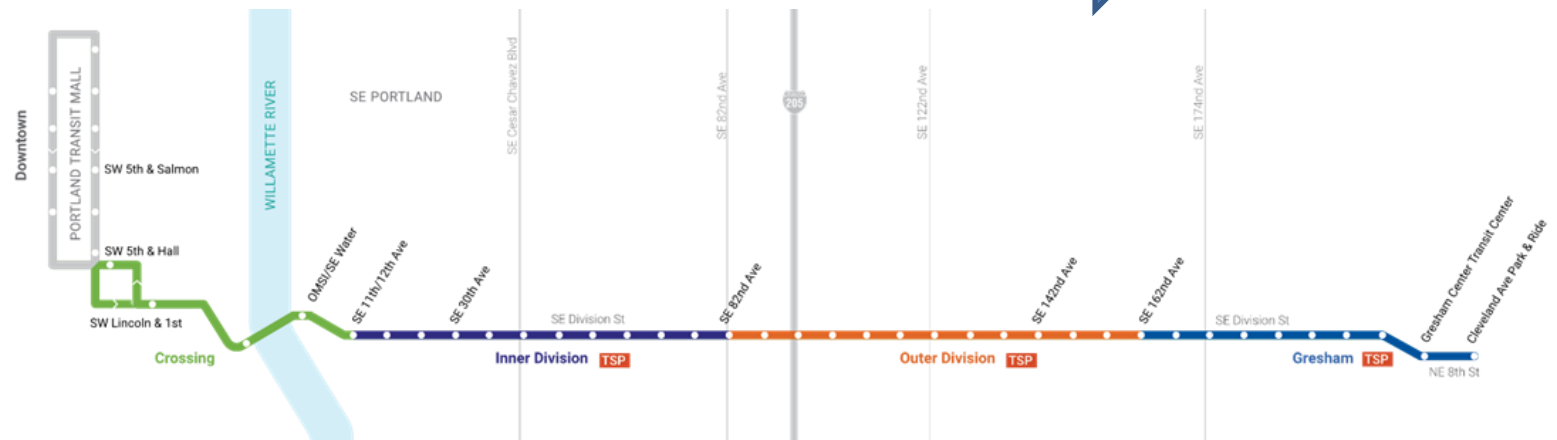


Figure 5: On-Time Performance

Direction	Segment	TSP off	TSP on/PBOT Logic off	TSP on
To Portland	Gresham TSP	92%	93%	95%
	Outer Division TSP PBOT Logic	80% 19%	89% 9%	92%
	Inner Division TSP PBOT Logic	67% 32%	87% 9%	14% 82%
	Downtown	13% 56% 31%	33% 59% 8%	47% 46%
To Gresham	Downtown	88%	90%	95%
	Inner Division TSP PBOT Logic	57% 42%	71% 26%	75% 23%
	Outer Division TSP PBOT Logic	47% 52%	67% 28%	9% 70% 21%
	Gresham TSP	38% 59%	15% 51% 34%	27% 51% 22%

■ Late  
■ On Time  
■ Early

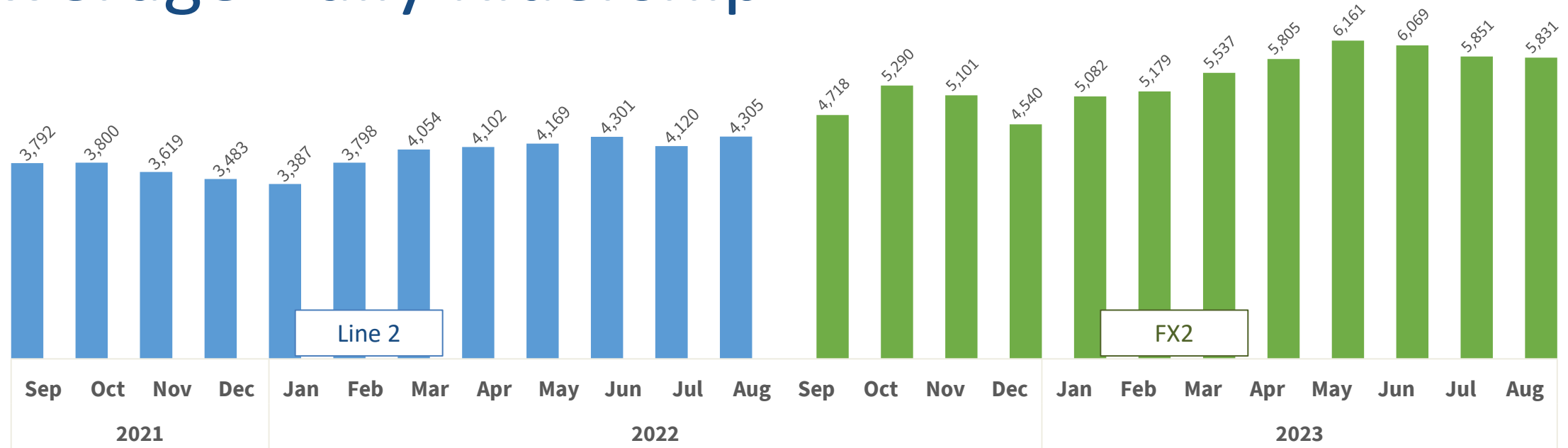
## On/Off Study Scenarios

- › **TSP off/PBOT off**
  - › *New Lyt Next Gen TSP functionality inactivated*
- › **TSP on/PBOT off**
  - › *Lyt solution activated*
  - › *BUT PBOT “custom logic” not active in controllers*
- › **TSP on/PBOT on**



## Line 2-Division vs. FX2-Division

# Average Daily Ridership



*In its debut year, FX2 served 40% more riders than the preceding year.*

Data source: automated passenger counters  
Daily averages include weekdays, weekends, and holidays



Route	Date Range	# of days	Total Riders
<b>2-Division:</b>	Sept 18, 2021 – Aug 19, 2022	336	1,312,000
<b>FX2-Division:</b>	Sept 19, 2022 – Aug 20, 2023	336	1,832,700



## 2023 Excellence in Transportation Awards

### TRANSPORTATION ACHIEVEMENT AWARD – TSMO

City of Portland, TriMet, DKS Associates, City of Gresham, ODOT, and WSP, for the Division Transit Project: Signal and TSP Operations



The City of Portland, TriMet, DKS Associates, City of Gresham, ODOT, and WSP, have received a 2023 Transportation Achievement Award in the Transportation Systems Management & Operations (TSMO) Category for their **Division Transit Project: Signal and TSP Operations**. The Transportation Achievement Awards recognize excellence in the advancement of transportation to meet human needs, by entities concerned with transportation, such as governmental agencies, Tribes, legislative bodies, consulting firms, industry partners, and other organizations. Awards are presented in five categories: Complete

Streets, TSMO, Safety, Planning, and Traffic Engineering.

Special thanks to technology partner:



Division Transit Project awarded ITE Excellence in Transportation

# Line 72 – A Transit Workhorse for our Community

**Highest Ridership Bus Line** – approximately 6,000 daily trips (More than Yellow & Orange MAX lines)

## Major Transit connections:

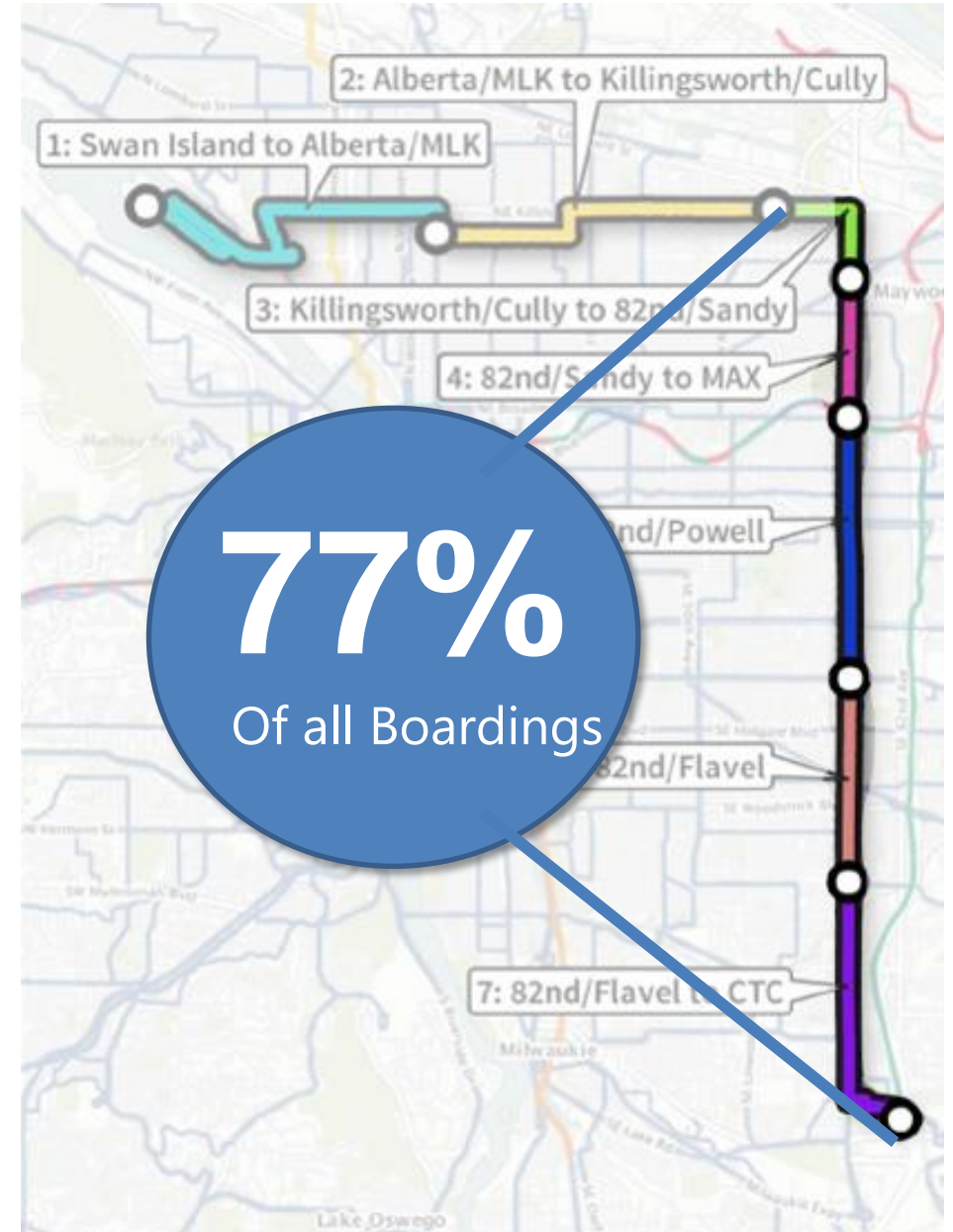
- MAX Blue, Green and Red Lines
- Intersecting 6 frequent service lines

## Connection to key destinations:

- Downtown Portland
- Downtown Gresham
- Milwaukie City Center

**Key Transfers** (Downtown PDX, Gresham, Milwaukie)

*An important way in which people get to school, work, shopping, medical appointments and everyday needs.*





# STATUS & NEXT STEPS

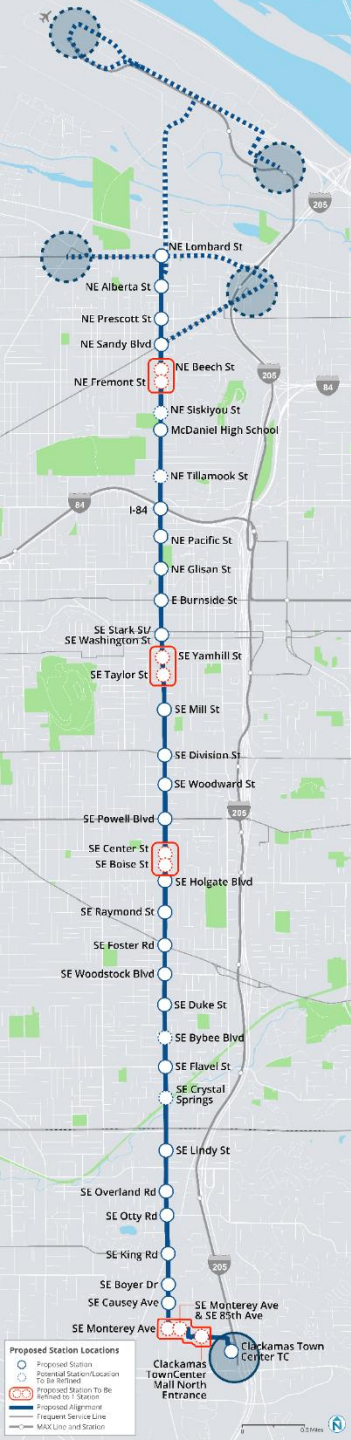
**Summer 2023** – Ongoing analysis & coordination. Community & stakeholder engagement

**Fall 2023** – Ongoing analysis and vetting of N. Terminus options. Updated baseline project estimate

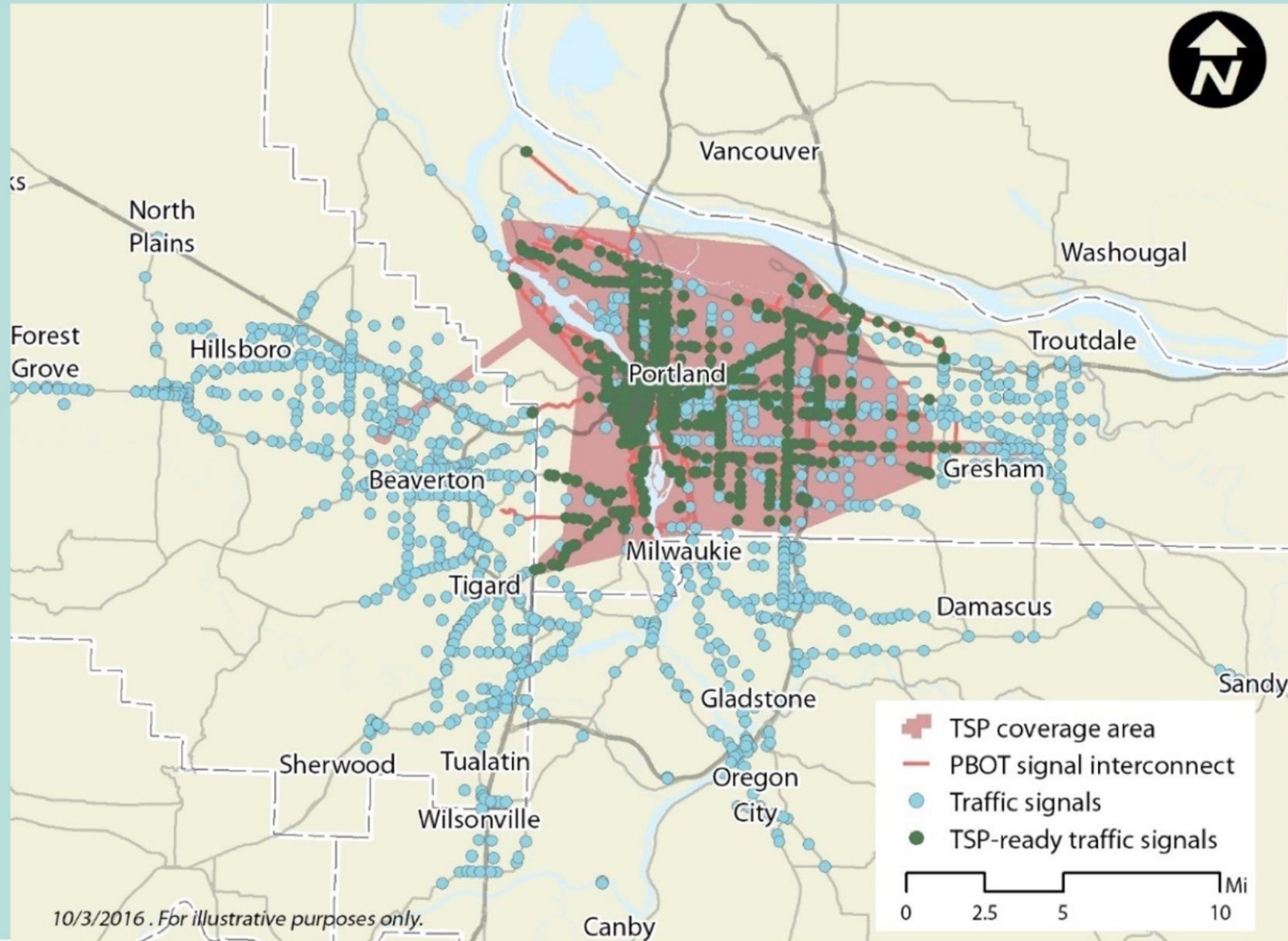
**Winter 2023** – N. terminus location(s) determined. Refined Station locations. Draft Funding Plan.

**Spring 2024** – Steering Committee vote to endorse draft Locally Preferred Alternative (LPA)

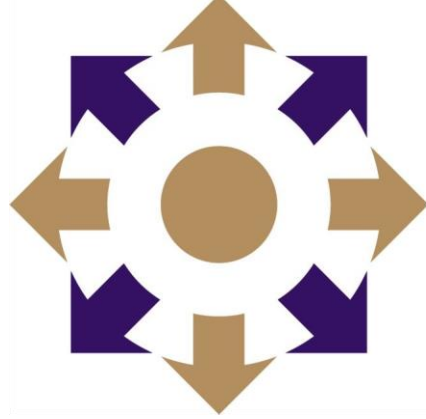
**Late Spring 2024** - Move into Project Development under the FTA Capital Investment Grant Program



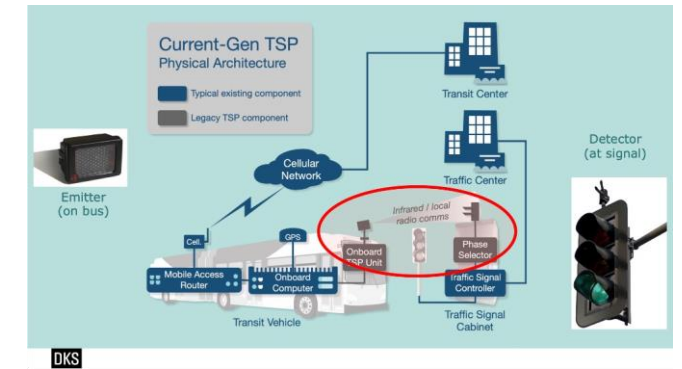
# TSP IN TRIMET'S SERVICE AREA CURRENTLY



Source:



## The Chartered Institute of Logistics and Transport



# Thank You

**Adrian Pearmine**

*Western Mobility Technology Solutions Leader*  
STV Inc

[adrian.pearmine@stvinc.com](mailto:adrian.pearmine@stvinc.com)

(503) 784-3750

**A.J. O'Connor**

*Manager of Intelligent  
Transportation Systems*  
TriMet

[oconnora@trimet.org](mailto:oconnora@trimet.org)

(503) 962-5615