



What's Next

for Transit Signal Priority at TriMet?

10/4/24

Agenda

- 1 What is TSP?
- 2 Where is TSP deployed?
- 3 What's next?
- 4 What are the Challenges?
- 5 Questions



What is TSP?

1

What is Transit Signal Priority (TSP)?



TSP is a *communication system* between **traffic signals** and **transit vehicles** to reduce delay at intersections

TSP is **not** bus signals, queue jumps, but can support them

In Oregon only **light-rail and streetcars can preempt** traffic signal phases, so buses rely on changing timing

What has been the TSP communication?

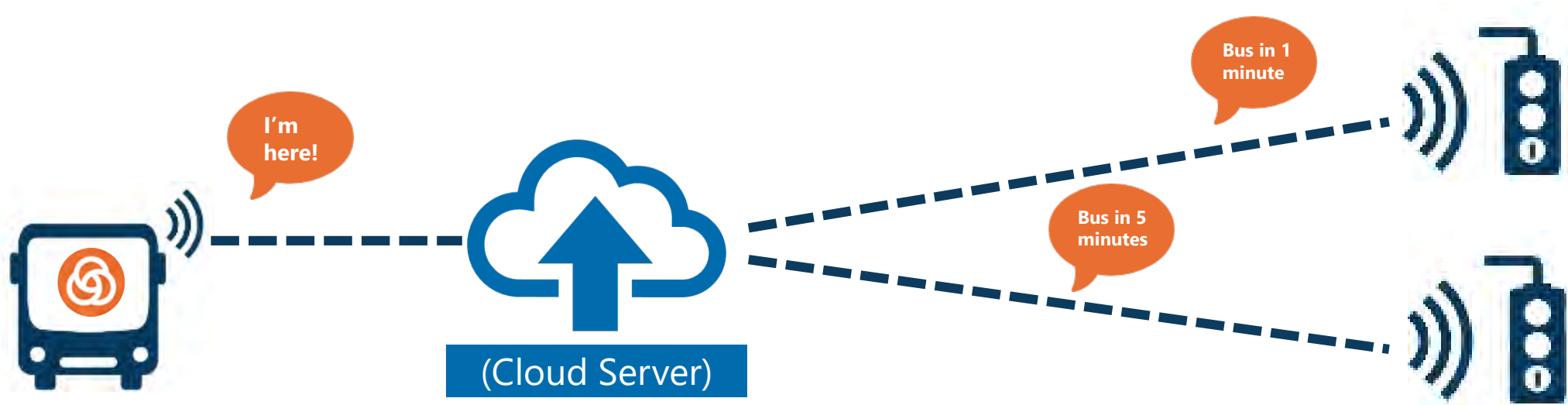
For the past 20 years, TriMet has relied on **infrared technology**

Communication required **line of sight** between the bus emitter and signal detector

Challenging to **evaluate** impact and maintain signal **detectors**



How does Next Generation TSP work?



Buses use cell signal technology to share their speed and location with a cloud server

The communication network uses data to estimate when the bus will arrive at certain signals

The cloud server then sends this information to the signals

This allows the signals to adapt to let the bus pass through.

For example, by extending a green light if the bus is about to approach.

**Where is NextGen TSP
deployed?**

2

FX2-Division TSP

Division Transit Project implemented NextGen TSP at 57 signals in Portland and Gresham



15-20% decrease in transit travel times

	Inner SE PDX	Outer SE PDX	Gresham
2-Division	17.3 min	19.0 min	13.0 min
FX2-Division	14.4 min	15.3 min	11.1 min

17% improvement

20% Improvement

14% Improvement

Over 20% decrease in variability

19.0 ± 5½ min	13.0 ± 5½ min
15.3 ± 4½ min	11.1 ± 3½ min

TSP Spot Improvements

Inner SE Portland – Hawthorne & Madison

Activated TSP at 7 signals Grand to 12th Avenue

Benefited 4 bus lines, 2 Frequent Service

Decreased time signal delays by 45% or 20 seconds per trip



Spot improvements allow us to experiment with new technology and treatments



Resources



[New bus only signal saves time for TriMet riders \(TriMet 2024\)](#)

[Transit Signal Priority 101: Technology keeps buses out of traffic \(TriMet 2022\)](#)

[TriMet's FX2 Division races toward one-year mark with transit-signal-priority-enabled time savings \(TriMet 2023\)](#)

[The Future of Transit Signal Priority \(DKS\)](#)

What's next?


3

Better Bus

Partnership between TriMet & Oregon Metro

Identify, design, and build a set of BB projects in partnership with local jurisdictions.

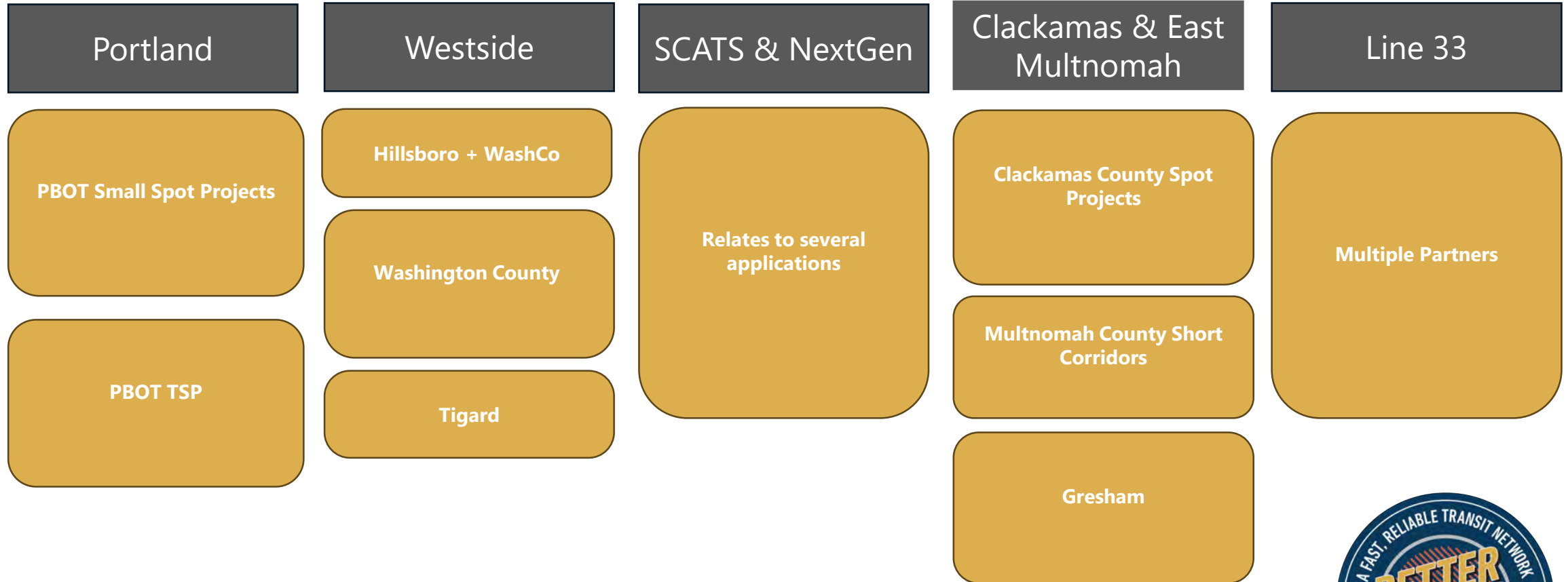
Develop a pipeline of BB projects that are ready to advance to construction as funding is identified.



Better Bus Toolkit

Treatment Theme	Core
Transit Lanes	Bus Lane <ul style="list-style-type: none"> • Dedicated Bus Lane • Business Access and Transit (BAT) Lane • Peak Hour or Pro-Time Lane • Curbside Lane • Offset Lane • Left Side Lane • Shared Bike-Bus Lane • Shared Bus-Freight Lane • Red Pavement
Bus Stops and Operations	Stop Balancing Curb Extensions Transit Islands
Street Infrastructure	Street Design and Modifications Bus On Shoulder
Traffic Control	Bus Movement Exemptions <ul style="list-style-type: none"> • Right Turn Except Bus • Left Turn Except Bus • Transit-Only Access Transit Signal Priority (TSP) Traffic Signal Phase Modification and Timing Bus Signal Phase and Signal Head Queue Jump Signal

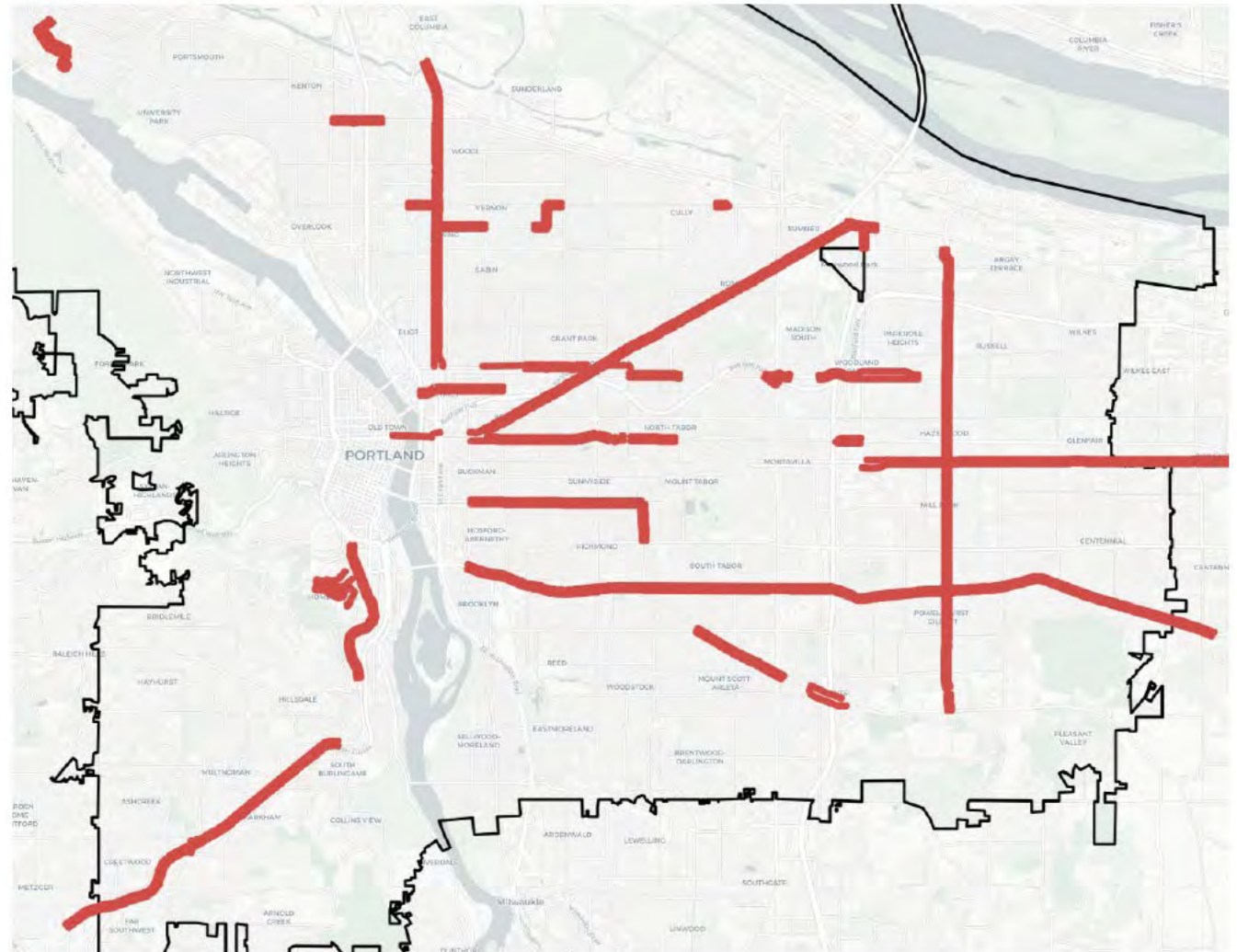
Better Bus Projects



City of Portland TSP

- Select **15 locations** (3-7 adjacent intersections) along the proposed corridors (red) for NextGen TSP implementation
- Encompasses 206 total PBOT signals
- Screen down to **10 locations** based on existing infrastructure and cost for Better Bus implementation

Figure 3 Project Corridors



Preparing all Agencies

TSP 101

How can your area get TSP?

Step 1: Assess your existing communications systems and the level of effort to upgrade your system

Step 2: Have your traffic engineers meet with TriMet to determine how they would like LYT to communicate with your system

Step 3: Work with TriMet to set up an Intergovernmental agency agreement (IGA) if you do not have one already

Step 4: Upgrade equipment, implement, test, and refine the TSP system.

Step 5: Enjoy improved speed and reliability, reduced GHG emissions, and a safer system for all users.


 The TriMet logo features the word "TRIMET" in white, uppercase, sans-serif font on a dark blue background. The letter "I" is replaced by an orange circle containing a white stylized knot or infinity symbol.

TriMet is here to help!

TriMet is working to simplify TSP implementation for all partner agencies.

TriMet will pay for the first 5 years of LYT licensing

TriMet can provide technical expertise and support to agency staff

TriMet and Oregon Metro have programs like Better Bus to help fund TSP improvements



What are the Challenges?

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FX System Plan Coordination


FX System Plan - Accelerate delivery of cost effective and feasible FX projects. Time savings is a key criteria for federal funding.

Don't want to jeopardize ability to receive funding for significant corridor investments with near-term TSP.



Don't forget the human aspect

Since TSP allows buses to communicate with signals **consistent operator behavior** is important

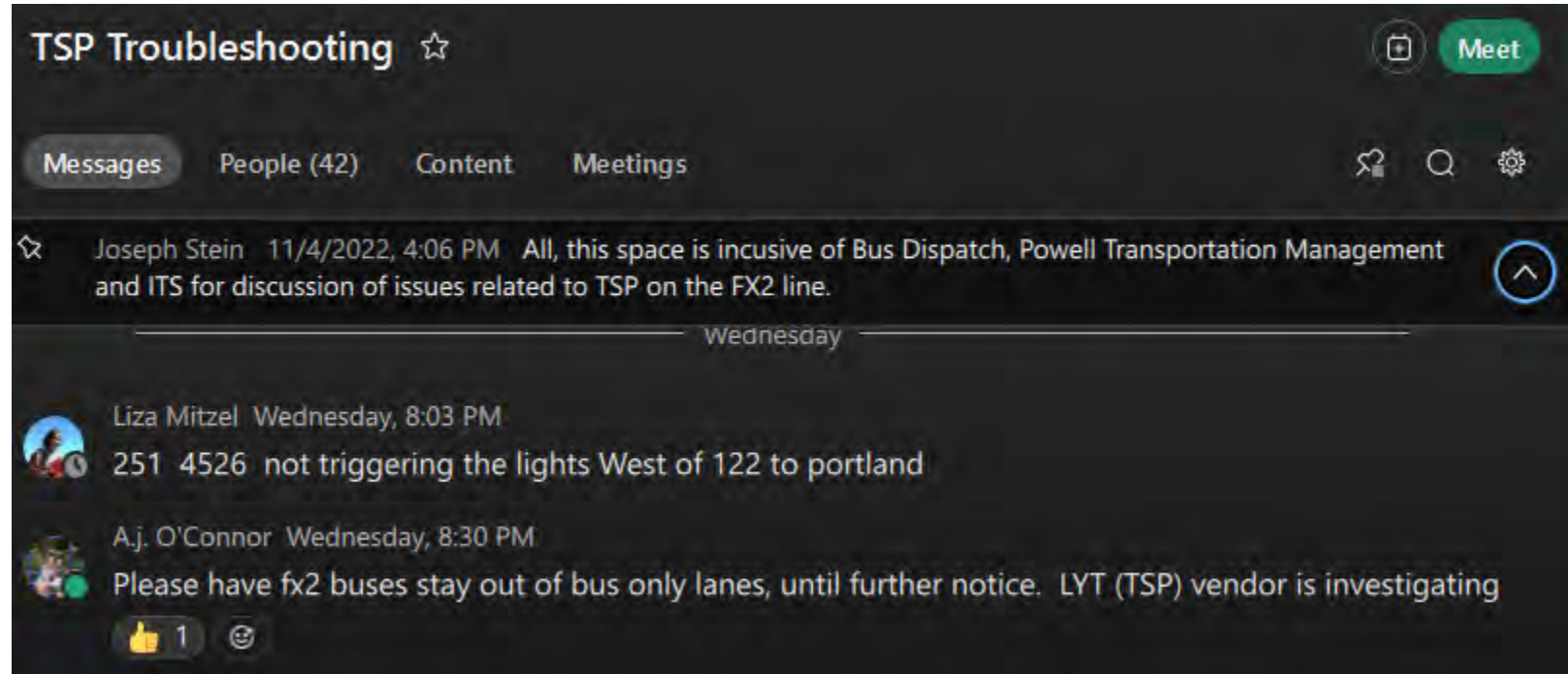
	Advisory revised Friday, May 31, 2024 10:52 page 1 of 1
Print from W:\Global\Reroutes Starts Sunday, June 2, 2024	
Affects blocks: 1003, 1006, 1401, 1402, 1403, 1404, 1405, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 7335, 7342	
14-Hawthorne/Foster Item #127721 Effective Sunday June 2 2024 until end of service Saturday June 15 All Hours Signal priority light (TSP)	
The Signal Priority Light (TSP) is active at Hawthorne & 11th. Please use the 4 bus only lane to trigger the light, which will allow you to move ahead of traffic.	
Bus operators do not dwell for a “stale green” or dwell at a time point anywhere BEFORE or WITHIN Hawthorne between Grand and 12th or Madison between Grand and 12th.	

Outreach can include reroute sheets, flat screen visuals, garage manager briefing, discussions with specific operators, etc.

TSP is not a set and forget treatment

Successful management requires a partnership between IT, Operations, & Planning

Also creates new expectations from partners for bus operations



Who pays?

Projects pay for **one-time** communication upgrades, civil improvements, & TSP setup

TriMet pays for **on-going** license costs to LYT, TSP vendor

But now that partners can optimize signals for all modes and know performance issues in real-time **who pays to maintain?**

Questions



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