



Flow Labs



TRI  MET

Proving Transit Priority Works for Everyone



Citizen Engineers and TriMet validate transit signal priority performance with Flow Labs.

If We Prioritize Buses, What Happens to Everyone Else?

Across the country, cities are expanding transit signal priority (TSP) to move buses faster and improve reliability. Yet one question always follows: *"If we prioritize buses, what happens to everyone else?"*

Traditional field studies can't easily answer that — they're slow, costly, and rarely capture the full impact on drivers, cyclists, and pedestrians.

To solve this challenge, **TriMet** partnered with **Citizen Engineers** to evaluate a new TSP system along its **FX2-Division Bus Rapid Transit corridor in Gresham, Oregon**. Using Flow Labs' **Probe-Based Signal Performance Measurement (PBSPM) platform**, the team conducted a before-after analysis showing that bus travel times improved without creating multimodal tradeoffs.

This case study demonstrates how agencies and their partners can use Flow Labs' data-driven tools to validate TSP performance quickly, confidently, and without deploying field hardware.



Building Confidence Through Verified Data

TriMet, the transit agency serving the Portland metropolitan area, continues to invest in a smarter, more connected bus network. One of its most ambitious corridors is the FX2-Division Bus Rapid Transit (BRT) line, running from downtown Portland through East Portland and into the City of Gresham, Portland's largest suburb and a vital connection for commuters and residents in historically underserved areas.

After successfully implementing cloud-based transit signal priority (TSP) for the BRT itself, TriMet faced a new challenge: how to extend TSP to intersecting bus routes without degrading the BRT's performance or delaying cross traffic, including vehicles, pedestrians, and cyclists.

Key challenges included:

- Limited visibility into general-purpose traffic and multimodal impacts when granting transit priority.
- Balancing priorities between crossing bus routes and the mainline BRT.
- Tight project deadlines tied to fiscal-year deadlines.
- No existing tools for measuring second-order effects on left turns, and side streets.

To assess the impacts of the new TSP system, TriMet retained Citizen Engineers, a progressive transportation planning and engineering firm based in the Pacific Northwest. Citizen Engineers, in turn, partnered with Flow Labs to provide multimodal data and analytics — allowing the team to evaluate results in real time, with **no additional field hardware or staff deployment required**.

The Solution: Evaluating TSP with Flow Labs

LYT, TriMet's TSP provider, had already deployed a cloud-based priority system along the FX2 corridor. Citizen Engineers' task was to evaluate its impacts across all modes — ensuring that bus travel time improvements did not come at the expense of general-purpose traffic, pedestrians, or cyclists.

By combining transit performance data from LYT with Flow Labs' PBSPM analytics, Citizen Engineers gained a complete view of corridor performance. The team measured:

- Bus travel times and intersection delay
- Side street and left-turn movement delays
- Percent arrivals on green and number of stops

Flow Labs' continuous data feeds and automated before-after analytics allowed Citizen Engineers to quantify both the benefits and tradeoffs — something previously impossible with manual "floating car" runs or limited field observations.

“We didn’t have to send people out to count or measure. I just called Flow Labs, and the data was there. It’s a game-changer — we couldn’t have done this level of analysis at all, and certainly not this quickly, without Flow Labs.”

— [Jim Peters](#), Citizen Engineers

Results: Verified Gains Without Tradeoffs

Citizen Engineers analyzed weekday data from two weeks before and after the TSP system went live in June 2025, combining continuous multimodal data from Flow Labs with transit performance data from the TSP provider. This created a full picture of how the corridor operated — capturing vehicle travel times, intersection delays, and multimodal movements across all users.

Measures Analyzed:

- Transit: Travel Time and Intersection Delay (from LYT)
- Traffic: Travel Time, Control Delay by Movement, Arrivals on Green, and Number of Stops (from Flow Labs)

Using Flow Labs’ platform, the team was able to visualize these measures in real time and evaluate how each movement and mode responded to the new signal timings.

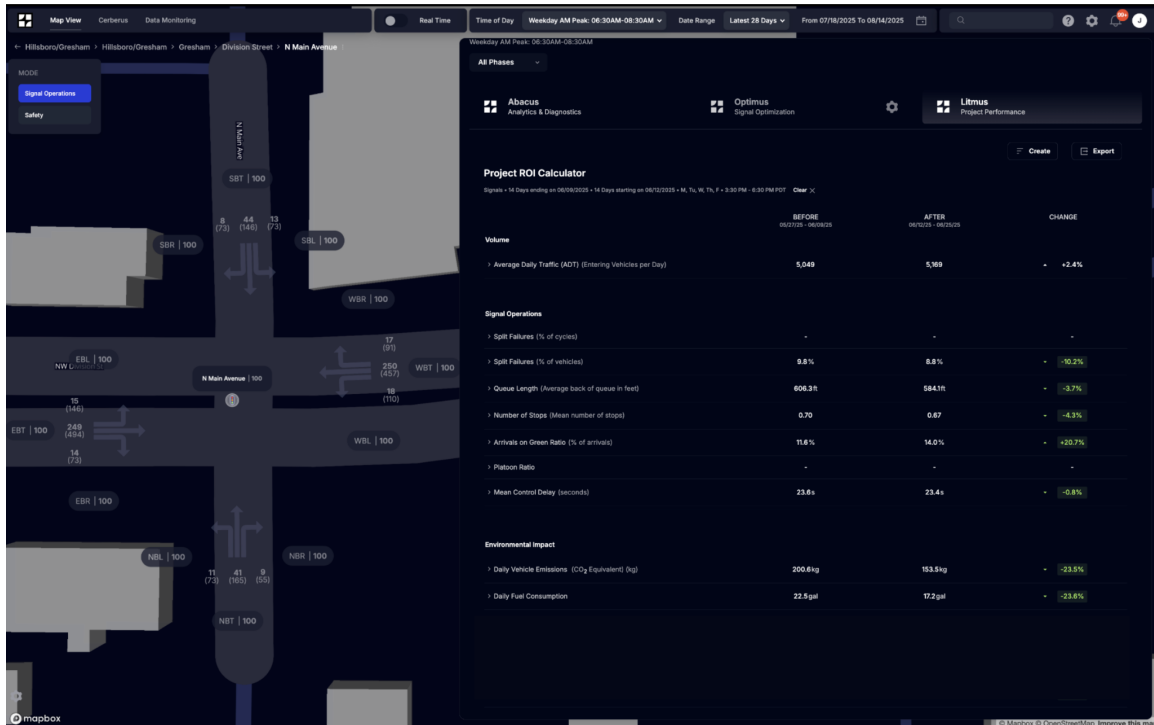
The results told a consistent story. **Transit delay at intersections decreased by up to 67%**, confirming that the new TSP system successfully improved transit performance. At the same time, Flow Labs’ data showed that **passenger vehicles experienced 1-3% lower intersection delay**. Other metrics including travel times, arrivals on green and stops showed negligible and statistically insignificant differences validating that transit signal prioritization had no adverse impacts on passenger vehicles.

Equally important, the FX2 BRT line maintained its original travel time and reliability, even as crossing routes gained signal priority — evidence that TriMet’s strategy for expanding TSP worked as intended.

The analysis also underscored the speed and efficiency of using Flow Labs’ cloud-based data. Instead of weeks of fieldwork and manual data review, Citizen Engineers conducted the entire before–after analysis within days, completing results in time for TriMet’s fiscal reporting deadline.

“We proved that you can prioritize transit and still maintain balance across other modes. That’s incredibly important for regional buy-in.”

— [Jim Peters](#), Citizen Engineers



Tools like Litmus allowed Citizen Engineers to conduct detailed and accurate before-after analyses across a number of metrics including control delay, queue length, arrivals on green, and stops in a matter of seconds.

By combining the transit data from LYT with Flow Labs' roadway analytics, Citizen Engineers delivered a complete and accurate picture of corridor performance — one that demonstrates how signal priority can enhance transit service **without compromising performance for other modes**.

From Evaluation to Policy-Driven Optimization

Beyond its technical success, this project showed a new way to approach corridor management. Citizen Engineers used Flow Labs data to align signal timing decisions with community values — balancing efficiency, and active transportation goals. That same capability is now shaping new projects, including work in Vancouver, Washington, where the focus is on pedestrian and cyclist safety.

This project showed how smaller, high-skill engineering teams can achieve large-agency results with the right data tools. For Citizen Engineers, Flow Labs provided instant multimodal visibility that replaced weeks of manual collection — allowing them to evaluate complex signal systems quickly, accurately, and within budget. For TriMet the combination of LYT and Flow Labs data helps them feel comfortable rolling out TSP on more corridors to improve speed and reliability for Transit Riders.

With Flow Labs' AI-powered optimization platform (Optimus), Citizen Engineers plans to extend this approach further, allowing agencies to define policy objectives — such as “favor transit,” “protect cyclists,” or “minimize side-street delay” — and receive data-driven signal timing recommendations automatically.

“No hardware, no waiting, and the best data coverage we’ve seen. It’s not about guessing anymore — we can finally see what’s happening and adjust in real time.”

— **Jim Peters**, Citizen Engineers

Conclusion

TriMet’s Gresham project demonstrates how data-driven evaluation can make transit signal priority both effective and equitable. With Flow Labs, Citizen Engineers achieved the visibility, speed, and insight to balance complex multimodal tradeoffs, meet tight deadlines, and deliver measurable results. Flow Labs’ multimodal data, hardware-free deployment, and vendor-agnostic analytics have become essential to how Citizen Engineers and agencies like TriMet operate — enabling faster analysis, better visibility, and clearer decisions across every mode. This before–after TSP analysis now serves as a blueprint for how agencies and their partners can expand transit priority programs transparently, confidently, and in alignment with community goals.

Ready to measure your own TSP performance or validate multimodal outcomes? Flow Labs helps agencies and engineering partners turn connected data into clear, actionable insights — without hardware, guesswork, or delay.

Contact our team to see how you can achieve results like these in your network.

Contact Info.

Email: contact@flowlabs.ai

Website: <http://www.flowlabs.ai>