Smarter, Faster Transit:

How Signal Priority Reduces Bus Idle Time

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Every year, transit buses spend countless hours idling at intersections—burning fuel, releasing avoidable emissions, and leaving passengers frustrated[1]. These delays disrupt schedules, reduce operational efficiency, and add costs for transit agencies. In some cases, prolonged idling may even damage roadway surfaces through sustained pressure and heat.

Fortunately, there is a smart way to keep buses moving: Transit Signal Priority (TSP). And with Panasonic's CIRRUS platform, agencies have the data-driven tools to further maximize its impact.

TSP is a proven strategy that helps reduce delay by adjusting traffic signal timing to prioritize transit vehicles. This can include extending green lights, shortening red phases, or reordering the signal cycle. The result? Faster trips, fewer emissions, and more reliable service. Cities worldwide are implementing TSP to improve transit performance and the rider experience[2].

1. Kotz, A., & Kelly, K. (2019). MOVES activity updates using fleet DNA data: Interim report (NREL/TP-5400-70671). National Renewable Energy Laboratory. https://www.nrel.gov/docs/fy19osti/70671.pdf
2. National Academies of Sciences, Engineering, and Medicine. (2020). Transit signal priority: Current state of the practice. The National Academies Press. https://doi.org/10.17226/25816

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Streamlined Transit for Utah

To explore TSP's real-world impact, we highlight here a collaboration between **Panasonic** and the Utah Department of Transportation (UDOT), focused on optimizing signal timing along Utah Transit Authority's (UTA) Route 850.

Using the CIRRUS platform, we analyzed data from multiple intersections along the corridor to evaluate the effectiveness of TSP. Idle time data from 2023 and 2024 was reviewed for approximately 30 buses, grouped by TSP status:

- Buses **granted** TSP requests
- Buses that **requested but did not receive** TSP
- Buses that **did not request** TSP

Key Findings

20%
reduction

in intersection idle time for buses that received TSP, compared to those whose requests were not granted

12%
reduction

in intersection idle time for buses that received TSP, compared to those that did not request it

These results indicate that TSP—especially when monitored and fine-tuned—can **meaningfully reduce** intersection idle time, improving operational efficiency.

Idle-Time Savings

The idle time reduction seen on Route 850 suggests that TSP can deliver tangible cost and environmental benefits. And with Panasonic's CIRRUS platform, agencies can quantify those gains, track progress, and target areas for improvement. Even modest changes can add up.

For example, if a hypothetical mid-sized transit fleet experienced about 2,000 intersection idle events per day, and each event was shortened by six seconds—mirroring the 20% reduction seen on Route 850—that **fleet could approximately save each year**:

1,100
gallons of fuel[3]

$4,000
in fuel costs[4]

12 metric tons
of CO_2 emissions[5]

3. Argonne National Laboratory. (2018). Vehicle idle reduction savings worksheet [PDF]. https://www.anl.gov/sites/www/files/2018-02/idling_worksheet.pdf (per the worksheet, a transit bus idling with no load uses 0.97 gallons of diesel per hour)
4. U.S. Energy Information Administration. (2024). Gasoline and diesel fuel update. https://www.eia.gov/petroleum/gasdiesel/ (per the series, in the U.S. in 2024, the average cost of diesel was $3.76 per gallon)
5. U.S. Environmental Protection Agency. (2024). Greenhouse gas equivalencies calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator (per the calculator, every gallon of diesel emits 10.2 kilograms of CO2).


“Achieving consistent success
requires more than infrastructure—
it requires insight.”

Smart Signal Strategies

Transit signal priority is already making transit systems faster, greener, and more efficient. The Route 850 case study reinforces its value with measurable, real-world results. But achieving consistent success requires more than infrastructure—it requires insight.

CIRRUS by Panasonic gives transit agencies the tools to monitor TSP performance, identify missed opportunities, and optimize service delivery. By transforming traffic data into actionable intelligence, the CIRRUS platform has the potential to help agencies improve schedule reliability, reduce costs, and advance sustainability goals.

“Every year, transit buses spend **countless hours** idling at intersections—burning fuel, releasing avoidable emissions, and leaving passengers frustrated.”

Ready to improve your transit system?

Contact us to learn how **Panasonic** can help enhance the benefits of TSP in your community.

About the Author

Candace Smith is a quantitative researcher in Panasonic's Smart Mobility Office, where she focuses on the impact of connected vehicles on roadway mobility and safety. With over 10 years of experience, she has led research and analytics projects across the state government, energy, and transportation sectors. Candace holds a Ph.D. in sociology, with an emphasis on quantitative research methods, from the University of Oklahoma.

About CIRRUS by Panasonic

CIRRUS by Panasonic is a division of the Panasonic Corporation of North America's Smart Mobility Office. Formed in 2017, our connected vehicle applications are among the first to shift signal priority applications from legacy hardware units to cloud technology.

The CIRRUS platform enables instant and safe communication between vehicles, infrastructure, intersections, and the operations teams who manage them. Our optimized, patent-pending algorithms incorporate data from edge devices, external systems, and cloud products for a scalable, complete, end-to-end solution. Learn more at **https://mobility.na.panasonic.com/CIRRUS**