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TRANSIT SIGNAL PRIORITY (TSP) BUYING GUIDE

WHY AND WHEN
TO UPGRADE



The COVID-19 pandemic has changed our daily routines, especially our use of public transit. People who depended on buses and trains for everyday travel have deeply felt the impact of pandemic restrictions.

Since March 2020, public transportation agencies nationwide have been working hard to find lost passengers. Today, public transit users spend up to twice as much time in transit than those who drive, often adding an extra 15 minutes to their commute. It's no surprise that many people are choosing to drive instead.

Public transportation systems must shorten these longer travel times to attract new riders. Making bus and train schedules predictable and regular is key. This helps transit vehicles get where they need to go without delay and can make public transit faster for everyone.

Traffic engineers and city planners know the problems associated with congested roadways. They work hard to make our trips safe and quick, looking for new ways to overcome delays. Delays caused by sub-optimized traffic signals that slow down buses impact costs, efficiency, and the operator and rider experience.

The need to solve this goes beyond improving commute times. It connects to larger goals like **Vision Zero**, which aims to prevent accidents and reduce emissions that lead to climate change. Working together—traffic partners, commuters, and cities—is crucial to achieving these objectives. Caring for the environment is a priority today, and people know that faster and more efficient commutes are two vital components that can help reduce environmental impacts. Efficient public transit attracts more riders, reduces pollution, and helps build a sustainable city. The future success of public transit depends on combining quick, safe travel with an enhanced experience for passengers and bus operators.








Cities now seek to use cloud-based smart transportation systems to make public transit, particularly buses, more efficient. These systems offer a cost-effective way for traffic management centers to cut down commute times, lower the number of traffic accidents and injuries, cut emissions, and minimize delays. Transit Signal Priority (TSP) is instrumental in accomplishing these city goals.

A good TSP system keeps the lights green for buses and smoothly integrates with the signals and traffic rules already in place. A TSP system based in the cloud uses the latest technology. It is easier to set up than older systems, which often can take months or even years and require lots of hardware installation and staff-hours.

What Is TSP, and How Does It Work?

TSP is a system that changes the timing of traffic signals to help buses avoid running late or getting stuck at a red light. Simply put, TSP improves traffic flow and cuts down on travel time for riders by:

-  Making red lights shorter when a bus is waiting to move.
-  Coordinating with bus-only lanes.
-  Adjusting for green lights so buses can go through intersections without stopping.
-  Using machine learning to adjust when lights change based on when buses are coming.
-  Changing signal timings to help buses merge back into traffic after picking up or dropping off passengers.



Studies have shown that TSP can speed commutes, reduce pollution, increase safety, and encourage more people to use public transit. It offers features like signal priority for buses, the ability for buses to move ahead of queues at lights, and the ability to work with the traffic systems already in place, giving traffic controllers a mix of oversight and detailed current data.

When Is the Time to Upgrade or Add TSP?

Deciding the right moment to upgrade or adopt Transit Signal Priority (TSP) can be critical for enhancing urban transit systems. Here are key indicators that it's time to consider a change:

- If you notice increasing congestion and longer travel times for your city's transit, it's time to assess the need for a TSP upgrade or implementation.
- When your existing TSP system's performance is unclear, an upgrade can provide valuable insights and improvements.
- Integrating an advanced TSP solution can significantly enhance efficiency for those implementing BRT or BRT lite elements.
- Cities that have committed to Vision Zero or climate change initiatives will benefit from the traffic flow improvements that a modern TSP system offers.

1. Do You Need to Upgrade Your Current TSP System? Does It Justify the Cost?

Here are some key questions to consider when looking to upgrade your city's Transit Signal Priority system:

- Functionality:** Can you prove its functionality and whether it is actually working?
- System Integration:** Does it work well with other programs?
- Data Analysis:** Can traffic managers easily understand and use the data?
- Hardware Upgrades:** How much effort and cost dougrades require?
- Customization:** Can you set specific rules for transit vehicles?
- Compatibility:** Is the software compatible with third-party vendors?
- Architecture:** Is it a modern, cloud-based, open-architecture solution or outdated hardware or software?

Evaluate whether your TSP system allows for easy use and effective coexistence with other programs. Check if your staff struggles with complex data or hardware upgrades. Consider whether your system enables data-driven decisions, customization, easy upgrading, and third-party connections.

Determine if your system is stuck with outdated software that limits functionality. Open-architecture systems integrate various components, using existing sensors and communication networks to adjust traffic signals effectively and affordably.

Also, examine if your system uses AI and machine learning, reducing guesswork and the need for human intervention by providing data driven predictions.



2. Does Your Current Solution Provide Adequate Data and Reporting?

Access to data is critical for making informed and timely decisions that can lower costs and enhance efficiency. A good TSP system offers real-time data to its users, which is vital for effective management. Without it, decision-makers often struggle to make crucial choices due to lacking or delayed information.

Besides, having real-time data at your fingertips streamlines the decision-making process and enables a proactive approach to transit system management. This means anticipating and addressing issues before they escalate, leading to a more reliable and efficient public transportation network.

Evaluate if your system is:

- Causing delays and backlogs due to inefficient reporting or hard-to-access data.
- Failing to provide deep insights needed for quick decision-making.
- Incompatible with existing technology and hardware.
- Demanding additional fees for necessary vendor support or integration.

It is essential to have a TSP system that is easy to implement and use and promotes efficient communication while adapting to new demands. Consider whether real-time data is available and how it

influences decision-making processes. Older systems may not deliver timely data to the officials who need it most.





3. How Much Does It Cost (Beyond Subscription Rates)?

Cities seek solutions that fit within tight budgets, emphasizing the importance of understanding all costs associated with your TSP system, not just the upfront fees. Hidden productivity, efficiency, and vendor service costs require careful consideration.

Evaluate costs related to:

- Extensive equipment maintenance, including sensor cleaning.
- Labor-intensive tasks linked to equipment upkeep.
- Updating and maintaining outdated systems.
- High expenses for security and data storage solutions.
- Manual data management and analysis which consume time and money.
- Downtime that results from complex software and systems use.
- Increased citywide bus fuel expenses.
- Frequent and costly vehicle maintenance needs.

Initial costs, such as subscriptions and licenses, may appear significant, but the real impact lies in inefficient solutions, leading to wasted time and money. Updating to a new cloud TSP system that promotes **efficiency** and **interoperability** could save substantial resources in the long run.

4. How Interoperable and Regionally Connected Is Your TSP System?

Interoperability is a crucial feature for any Transit Signal Priority (TSP) system aiming for success. Without the ability to seamlessly connect with both new and pre-existing technologies, as well as facilitate coordination between different jurisdictions like cities and counties, operational challenges can arise. An optimally interoperable TSP system ensures that actionable data and insights can be shared effortlessly among all relevant entities, including different locations and system types. Inefficient communication between these tools might result in unsafe and overburdened traffic intersections.

Evaluate if your system can:

- Reduce manual data analysis, thus improving staff efficiency.
- Centralize data access across city, county, and state data, saving time and effort.
- Maintain security across various systems.
- Integrate new technology without extensive system overhauls.

Achieving interoperability means creating a streamlined environment where systems collaborate effectively, eliminating the need for redundant logins and reducing the demand for IT support. Updating to a TSP system that supports enhanced compatibility is a step forward in achieving a more efficient and interconnected traffic management framework.



5. Why Should You Consider Upgrading Your Current TSP Solution?

Upgrading your TSP system is not merely a luxury but a strategic decision. Cloud-based modern solutions allow more security and incorporate open architecture and AI, resulting in saving time, reducing congestion, and improving safety. Machine learning capabilities mean the system constantly evolves, using past data for better future decision-making, unlike outdated TSP technologies.

Consider if your current system:

- Limits growth or causes bottlenecks in traffic management or planning.
- Fails to leverage machine learning for improved outcomes.
- Continues to require investment in expensive, outdated equipment.
- Could become more efficient and cost-effective with a new TSP solution.

Choosing a vendor that consistently updates and improves its TSP system ensures **streamlined and future-proof traffic management**. Upgrading can lead to greater efficiency, safety, and cost savings, aligning with modern climate goals.



6. Who Is the Ideal Candidate for a New TSP Platform?

The perfect TSP system should aim to:

- Cut down on congested and dangerous intersections.
- Address inefficiencies in public transit, like OTP, headway, and run times.
- Support climate change goals.
- Improve safety by reducing accidents and fatalities.
- Provide a secure solution for cities.

Cities facing severe congestion and looking for ways to improve commute times, reduce pollution, and enhance safety measures are prime candidates. Intersections especially suitable for TSP include those with long signal cycles, heavy traffic, or frequent delays in transit routes. Many urban planners and traffic teams face the challenge of addressing climate change while ensuring safer commutes. Building more roads and infrastructure, which often leads to more congestion and safety risks, is a costly approach that does little to reduce carbon emissions apart from introducing electric buses. However, electric buses face their own challenges, like maintaining a charge to complete routes. Cities trying to manage traffic flow, climate initiatives, and safety simultaneously are ideal for TSP technology.

Transit Signal Priority helps transit vehicles move through busy intersections more quickly, safely, and effectively.

Introducing TSP can have a wide-reaching positive impact, helping alleviate congestion in busy intersections and throughout broader urban areas and cutting carbon emissions by up to 10%. TSP offers numerous benefits by enabling more efficient transit routing that avoids congested areas and utilizing machine learning for more competent traffic management.


Security is crucial, and cloud-based solutions offer safer data storage and retrieval. If you're a city official, transit planner, traffic manager, or innovation officer looking for ways to improve your city's transit system without resorting to extensive construction, considering a new TSP system might be the solution you need.



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