



Introduction to Safety Performance Indicators and Targets

Overview and Purpose

Through the Public Transportation Agency Safety Plan (PTASP) regulation at 49 C.F.R Part 673 (Part 673), the Federal Transit Administration (FTA) requires transit agencies to implement a Safety Management System (SMS) to manage safety risk, which can help agencies maintain or improve their safety performance.¹

An SMS generates information to help transit agency management determine whether or not the agency is meeting its safety objectives. Agency managers leverage information generated from Safety Risk Management (SRM) and Safety Assurance (SA) activities to understand how safety investments impact safety performance.

Agencies may develop **safety performance indicators (SPIs)** and **safety performance targets (SPTs)** to help them monitor and track safety performance. *SPIs and SPTs serve as valuable tools you can use to prioritize resources to address safety risk and monitor how well investments are working.*

Part 673 defines Agency Safety Plan requirements that can be supported through the development and use of SPIs and SPTs:

Summary of Requirement	SPTs & SPIs
Part 673.11(a)(3): <i>The plan must include performance targets based on the safety performance measures established under the National Public Transportation Safety Plan.</i>	✓
Part 673.15(b): <i>An agency must coordinate with States and Metropolitan Planning Organizations (MPO), to the maximum extent practicable, in the selection of State and MPO safety performance targets.</i>	✓
Part 673.23(b): <i>An agency must monitor operations to identify safety risk mitigations that may be ineffective, inappropriate, or were not implemented as intended.</i>	✓
Part 673.27(d)(1): <i>An agency must establish a process to assess its safety performance. (this requirement only applies to rail and large bus providers per Part 673 definitions)</i>	✓

FTA has developed this introductory guide to help transit agencies develop SPIs and SPTs as part of the agency's ongoing safety performance monitoring and measurement activities.

¹ The guidance in this document is not legally binding in its own right and will not be relied upon by the Federal Transit Administration as a separate basis for affirmative enforcement action or other administrative penalty. Compliance with the guidance in this document (as distinct from existing statutes and regulations) is voluntary only, and noncompliance will not affect rights and obligations under existing statutes and regulations.



SPIs and SPTs in Practice

How can your agency use SPIs and SPTs?

1. You can use them to see if you are meeting your overall safety objectives. If you operate rail transit service or if you are a large bus provider according to Part 673, FTA requires your agency to have a continuous improvement process to assess safety performance. You should evaluate your agency's safety performance regularly and determine whether you should change your safety performance targets when you update your Agency Safety Plan.
2. You can use them to help you monitor the effectiveness of your safety risk mitigations. They can tell you whether or not action taken to address safety risk (your mitigation) is working as intended.

In practice, SPIs and SPTs can help your agency answer the question:

“Are our safety activities (safety investment) achieving our safety objectives (desired safety performance)?”

How Do I Develop SPIs and SPTs?

Step 1: Know what you want to accomplish.

Before you define SPIs and SPTs, you will want to make sure everyone involved understands the associated **safety objective**. Safety objectives can refer to the formal safety objectives FTA requires you to define in your written statement of safety management policy, but more often in practice refer to the intended safety outcome of a safety risk mitigation.

Before developing an SPI, make sure that you can clearly answer the following question:

“What are we trying to accomplish?”

Let's use a simple example to demonstrate this concept. Suppose your agency experiences a growing number of injuries. Your agency's leadership commits to addressing this issue. This becomes a safety objective: **“reduce injuries”** – thereby focusing the investment of resources.



Safety objectives are brief, high-level, and non-quantifiable statements of the agency's desired safety outcomes. They represent what your agency is trying to achieve.

Part 673.23(a): A transit agency must...have a written statement of safety management policy that includes the agency's **safety objectives**.

Step 2: Ask, “Do we have the right data?”

You cannot monitor or measure safety performance effectively without data. Without data, you must rely solely on the knowledge of subject matter experts (SMEs). However, excess data or extraneous data collection can be detrimental and overwhelming. Data collection is most beneficial when it is targeted and driven by a purpose. Data needs to serve the agency to effectively assess safety performance and to validate the effectiveness of safety risk mitigations.

In a transit agency environment, it is important to leverage the knowledge of your agency’s SMEs to ensure you know what data is available and reliable for monitoring purposes.

Step 3: Define the SPI.

Think of an *SPI* as *the indicator that you will watch while working to achieve your safety objective*. Using our injury example from earlier, you might choose *FTA-reportable injuries per vehicle revenue mile (VRM)* as your SPI. This is the data point you would watch to monitor your progress toward your safety objective (reduce injuries).

What makes a good SPI?

- It is clearly defined (explicit and unambiguous).
- SMEs have weighed in to define it.
- It is measurable or quantifiable.
- It can be measured by data available to your agency.



An SPI is a measure or data point that you will watch to monitor safety performance.

There are two common types of indicators used to support safety performance monitoring and measurement: **lagging SPIs** and **leading SPIs**.

Lagging SPIs leverage data related to things that have already happened. Transit agencies define lagging SPIs using historical data of negative outcomes, such as accidents, incidents, and occurrences. Examples of lagging SPIs include:

- *The number of fire/smoke events in transit stations requiring evacuation per month.*
- *The number of traction power insulators involved in fire/smoke conditions per week.*

Leading SPIs measure conditions that have the potential to become or contribute to a negative outcome before the outcome occurs. Leading SPIs can be very valuable because they allow you to monitor precursors to events and offer the opportunity to act before something bad happens. An example of a leading indicator is:

- *The number of defective traction power insulators reported through the employee safety reporting program per week.*



Step 4: Define the SPT.

An SPT should always include two key components:

1. The **desired improvement** in safety performance; and
2. The **amount of time** for achieving the improvement.



An SPT is a quantifiable level of improvement from the present-day, baseline value of associated SPIs, to be achieved over a specified timeframe.

Before you can define your SPT, you need to know your current (or baseline) safety performance. This will represent the starting line for your safety performance improvement.

Remember our injury example? Before defining our SPT, we need to know the baseline for our SPI (our current rate of injuries). Based on a review of existing data, we determine that the agency is experiencing 50 FTA-reportable injuries per 10 million VRM.

Next, we need to ask, “what do we want to achieve?”

Consulting data from peer agencies and our own historical data, we determine that a rate of 25 injuries per 10 million VRM would be acceptable. So now we know where we want to go.

Next, we need to ask, “how fast do we want to get there?”

We decide that we would like to achieve our desired outcome within the next year.

*Now we can define our SPT: **Reduce FTA-reportable injuries by 50% within one year.***

An SPT represents our predicted improvement in safety performance as a result of our safety activities (i.e., mitigations). The SPT, built on an appropriate SPI, allows us to know whether or not our safety investment has actually achieved our safety objective.

Remember, **A target doesn’t need to be perfect.** Meeting or missing a target doesn’t need to automatically trigger action; it will serve as an input to decision-making, not a replacement for it.

Examples of SPIs and SPTs



Safety Objective: Reduce passenger slip and fall events on vehicles.



SPI 1: Number of passenger injuries from slip/fall events on vehicles per vehicle revenue mile. (Lagging)



SPT 1: Reduce the number of passenger injuries from slip/fall events on vehicles per vehicle revenue mile by 10% over the next 12 months.



Safety Objective: Reduce right-of-way (ROW) near miss events.



SPI 1: Number of ROW near miss events per month. (Lagging)



SPT 1: Reduce the number of ROW near miss events per month by 25% over the next 12 months.



SPI 2: Number of events when ROW workers did not have 15 seconds advance warning to safely evacuate tracks per month. (Leading)



SPT 2: Reduce the number of events where ROW workers did not have 15 seconds advance warning to safely evacuate tracks per month by 50% over the next 12 months.



SPI 3: Percentage of ROW worker training courses completed on schedule each month. (Leading)



SPT 3: Increase the number of employee training courses completed on schedule each month to at least 95% over the next 6 months.



Safety Objective: Implement an employee safety reporting program



SPI 1: Percentage of high safety risk reports analyzed and forwarded to appropriate departments within one day of reporting. (Leading)



SPT 1: Increase percentage of high safety risk reports analyzed and forwarded to appropriate departments within one day of reporting by 10% over 3 months.



SPI 2: Percentage of medium safety risk reports analyzed and forwarded to appropriate departments within three days of reporting. (Leading)



SPT 2: Increase percentage of medium safety risk reports analyzed and forwarded to appropriate departments within three days of reporting by 10% over 3 months.



SPI 3: Percentage of low safety risk reports analyzed and forwarded to appropriate departments within one week of reporting. (Leading)



SPT 3: Increase percentage of low safety risk reports analyzed and forwarded to appropriate departments within one week of reporting by 10% over 3 months.



PTASP Technical Assistance Available Now

- Access one-on-one Agency Safety Plan support
- Learn and share through the PTASP Community of Practice
- Explore the PTASP Resource Library

<https://www.transit.dot.gov/PTASP-TAC>