Transit Advisory Committee for Safety (TRACS) 16-01 Final Report

02/27/17

Building Toward a Strong Safety Culture

Within the Bus and Rail Transit Industry

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Executive Summary

The Federal Transit Administration (FTA) tasked the Transit Advisory Committee for Safety (TRACS) with developing practical recommendations that detail how processes, practices, tasks, and individual employee responsibilities can support a strong safety culture.

Representatives from state and local transit agencies, labor unions, state safety oversight agencies, research organizations, and national transportation associations worked together to create recommendations for FTA to guide improvements in safety culture. These recommendations address improvements at the agency, state, and national levels. This report begins by introducing and defining safety culture, and then discusses the elements of, and barriers to, a strong safety culture, best practices that support a strong safety culture, and safety culture assessment practices. It then presents TRACS' recommendations to support safety culture in transit agencies at the agency, state, and national levels.

The recommendations focus on FTA establishing and promoting elements that support a strong safety culture in transit agencies. Recommendations discussed in this report include:

- Encouraging establishment and promotion of labor-management safety committees;
- Supporting establishment of non-punitive, confidential, close-call safety reporting systems[1];
- Developing adaptable, usable safety culture assessment tools;
- Supporting training at all levels of the transit agency on safety management system (SMS) principles, root-cause analysis, and the promotion of a positive safety culture;
- Encouraging regular safety communication;
- Encouraging safety empowerment and evaluation; and
- Encouraging the proactive involvement of oversight agencies in SMS principles and positive safety culture for transit agencies.

TRACS recommends that FTA take a stronger role in implementing change and driving improvements in safety culture to support SMS principles and approaches for transit agencies.

Together, the recommendations in this report represent a comprehensive review of the strategies available to FTA and transit agencies in building and improving a strong culture of safety. By following these recommendations, FTA can promote transit agencies' safety culture to drive continuous progress in safety policies, procedures, and practices, thereby driving the advancement of SMS approaches.

[1] Also known as "safety reporting systems," to indicate any safety issue is reportable, not just ones that have resulted in a close call or near miss.

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FTA's Tasking 16-01 to TRACS

The safety of public transportation under the Safety Management System (SMS) model is largely dependent on a strong safety culture. Research and studies identify components necessary to build a culture that advances and prioritizes safety, but organizational structures that have departments with competing priorities may impede the establishment of an effective safety culture. A transit system built around the principles of SMS is most effective when the entire organization prioritizes safety above all else, and works together in designing, implementing and evaluating the system, investigating incidents and close calls. A successful SMS and a strong safety culture depend on the existence of the free flow of communication across all levels of an organization without the fear of reprisal.

The Federal Transit Administration (FTA) recognizes that strengthening a safety culture can take years and is ultimately a continuous process. FTA wants to encourage implementation of measures that will strengthen safety culture at every level within the transit industry. Therefore, FTA is tasking TRACS to develop practical recommendations detailing how processes, practices, tasks, and individual employee responsibilities can support a strong safety culture.

Issues to be considered included, but were not limited to:

1) To what extent organizational culture, such as reporting relationships and authority, affects safety culture;
2) What may inhibit the growth of a strong safety culture, as well as what may weaken a safety culture;
3) A description of the ideal organizational structure, accounting for how various components of the organization interact with each other, reporting relationships, relative authority, resources, and other aspects;
4) How required training, grant requirements, and other interventions might promote the strengthening of safety culture; and
5) An evaluation of how labor/management communication and committees may promote or hinder a strong safety culture.

Introduction

Why Safety Culture is Important

A strong safety culture empowers a transit organization at all levels to understand and proactively control its risk in order to ensure the safety of passengers and workers. A weak safety culture places an organization in danger of accidents through an inability to understand and control the risks involved in performing its work. Implementing and fostering a strong safety culture is a challenging process that requires continuous improvement.

In recent years, accident investigations by the National Transportation Safety Board (NTSB) have identified safety culture deficiencies as an important contributing factor. For example, following the 2006 Chicago Transit Authority (CTA) derailment, the NTSB stated that "overall, a deficient safety culture existed at the CTA."[2] Similarly, for the 2009 Washington Metropolitan Area Transit Authority (WMATA) fatal collision, NTSB stated that "contributing to the accident were WMATA's lack of a safety culture."[3] Even when the NTSB does not cite safety culture by name, their reports state that organizational accidents result from underlying systemic deficiencies. For example, the 2010 San Bruno, California pipeline rupture was described as an organizational accident: "organizational accidents have multiple contributing causes, involve people at numerous levels within a company, and are characterized by a pervasive lack of proactive measures to ensure adoption and compliance with a safety culture." [4] The 2010 Marshall Michigan pipeline rupture was described in very similar terms.

Underscoring the degree of importance they assign to safety culture, in 2014 the NTSB identified safety culture among their "Most Wanted" list of priorities for the year; their goal to promote operation safety in rail mass transit explicitly identifying necessary changes in safety culture as a key component. Clearly the NTSB recognizes the value of a strong safety culture in preventing accident and injury, and also strives to communicate the importance of safety culture to industry.

While NTSB accident investigations underscore the importance of safety culture, the ability of researchers and practitioners to provide practical recommendations for achieving strong safety culture lags behind. The purpose of this letter report is to provide practical recommendations for how a transit organization can develop and maintain a strong safety culture.

Defining Safety Culture

The safety literature has proposed a variety of formal definitions of safety culture. Some common *informal* definitions of safety culture provide a starting point: safety culture is often referred to as "the way we do things around here," or perhaps more revealing, "What we do around here when nobody is watching." These definitions, however, do not do fully capture the importance of a systems perspective in understanding safety culture.

The term safety culture was first used in 1986 by the International Nuclear Safety Advisory Group's (INSAG) as part of their report on the Chernobyl disaster[5]. In investigating this disaster, INSAG concluded that such a catastrophic failure could not be adequately explained through the fault of an individual or the failure of a specific technical system, but rather a systemic pattern of failure to value safety across all levels of the organization. While elements

[2] National Transportation Safety Board. (2007). *Derailment of Chicago Transit Authority Train Number 220 between Clark/Lake and Grand/Milwaukee Stations, Chicago, Illinois, July 11, 2006*; Page 40.
[3] National Transportation Safety Board. 2010. *Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains near Fort Totten Station, Washington, D.C., June 22, 2009;* Page XIII.
[4] National Transportation Safety Board. (2011). *Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, California, September 9, 2010*. Pipeline Accident Report NTSB/PAR-11/01. Washington, DC.
[5] International Atomic Energy Agency. (1986). *Summary Report on the Post-Accident Review Meeting on the Chernobyl Accident* (Safety Series No 75-INSAG-1). International Atomic Energy Agency, Vienna.

such as human error or mechanical failure may have been immediate proximal causes, the organization-wide deficiency in safety culture is what allowed these errors to occur and go uncorrected.

Following the INSAG reports, there was substantial interest in the concept of safety culture, especially in the field of nuclear plant safety. One of the most widely cited formal definitions is from the Advisory Committee on the Safety of Nuclear Installations (ASCNI) report,[6] which describes safety culture as:

> *"… the product of individual and group values, attitudes, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health & safety programmes. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventative measures." (p.999)*

While the concept of safety culture has its roots in nuclear plant safety, it has since spread to other safety-critical industries, including transportation. The U.S. Department of Transportation Safety Council[7] defines safety culture as "the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands."

A definition from the Transit Cooperative Research Program (TCRP) Report 174 best encapsulates the Committee's view of safety culture:

> *"Safety culture is shared values (what is important to all public transportation system members who are responsible for safe, efficient revenue service) and shared beliefs and attitudes (how the transportation system works and what individual roles should be) that interact with all system members, safety policies, procedures, and rules to produce behavioral norms (the way we do our jobs, whether observed or not)." (p. 7).*

First, it states that safety culture is *shared*. Members of a transportation system may have a wide variety of individual values, attitudes, and beliefs relevant to safety, but part of what distinguishes individual values from a culture is that it is shared across an organization. An employee with unsafe attitudes is not the same as an organization with a poor safety culture. Whether attitudes are safe or unsafe, what makes them a culture is when they are shared across the entire organization. Often these shared safety attitudes are understood, but unspoken; it is not necessary to discuss them, because they are manifested in all aspects of the organization, from day-to-day work behaviors to longstanding policies and procedures.

This definition follows by specifying that a safety culture has common values, beliefs, and attitudes, a strong safety culture values safety first. The sign of a strong safety culture is not just saying that safety is important, but demonstrating through actions that safety is a value held above all else. Beliefs shape people's expectations for how things work in a transportation system. Even if an individual values safety, that person will not act on this attitude if he/she believes nothing will be done by reporting safety concerns, or if there is an anticipated punishment for reporting errors. Shared beliefs are a component of an organization's safety culture. Regardless of what an organization's formal policies are, the actions of transportation system members are shaped by how they believe the system actually works.

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[6] In Advisory Committee on Safety of Nuclear Installations (ASCNI), 1993, Study group on human factors, third report: Organizing for safety (as cited in Choundry, Fang, & Mohamed, 2007).

[7] Safety Council (2011). Safety Culture: A significant driver affecting safety in transportation, research paper prepared for the USDOT Safety Council, U.S. Department of Transportation, Washington, DC.

Together, these elements of safety culture shape the behaviors of members of the transportation system. Safety culture derives from a consistent pattern not just across individuals, but also across time. A single instance of safe or unsafe behavior does not establish a safety culture. As a pattern of safety behavior persists in an organization over time, it solidifies into a set of shared behavioral norms, in the form of cultural values and expectations. Once firmly established, these behavioral norms can be strong enough to shape behavior across situations, and over time safety evolves into "the way we do our jobs, whether observed or not."

Across these definitions, and many others in the literature, three major interactive components of safety culture emerge: shared psychological, behavioral, and organizational elements. While different sources may assign a different name to each component, the same three components are repeatedly identified.[8]

The psychological elements include shared attitudes, values, beliefs, and perceptions. Regardless of what the organization may say, their policies are filtered through this shared psychological framework to interpret "the way we do things around here."

The behavioral elements include all observable behavior relevant to safety. Regardless of what organizational policies may state, or what shared attitudes and values workers may hold, they will only have an impact on safety once they are translated into behavior by themselves and peers. Other factors may encourage or discourage actually translating values into behaviors.

Finally, organizational elements include policies, procedures, structure, management, and leadership. These components create the complex system that is an organization, and when properly aligned serve to promote a strong safety culture.

Evidence for the Effects of Safety Culture

There is a growing body of evidence from organizational research that safety culture measurement can predict quantifiable safety performance outcomes. A 2009 meta-analysis[9] of 90 studies found that a strong safety culture improves the safety knowledge and safety motivation of workers, resulting in improved worker safety performance. Improved safety performance ultimately translates into fewer accidents and injuries. In the maritime transportation industry, safety culture factors were identified as leading indicators of accidents and near misses.[10] Similarly, a survey of safety climate in a heavy manufacturing organization was found to directly predict injury severity and indirectly predict injury rates (through its effect on observable safety behavior) in the five months following the implementation of the survey.[11]

Furthermore, there is evidence that interventions designed to improve safety culture result in measurable improvements in safety performance. In the rail industry, safety culture interventions have been linked to reductions in unsafe behavior and reportable incidents.[12]

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[8] e.g., Person, Behavior, Environment from Geller, 1994; 1997; Person, Situation, Behavior from Cooper, 2000; 2006; Normative, Pragmatic, and Anthropological Culture from Edwards et al., 2013.

[9] Christian, M.S., Bradley, J.C., Wallace, J.C., & Burke, M.J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology, 94*(5), 1103-1127.

[10] Grabowski, M., You, Z., Song, H., Wang, H., & Merrick, J. R. (2010). Sailing on Friday: Developing the link between safety culture and performance in safety-critical systems. *Systems, Man and Cybernetics, Part A: Systems and Humans, IEEE Transactions on*, *40*(2), 263-284.

[11] Johnson, S. E. (2007). The predictive validity of safety climate. *Journal of safety research*, *38*(5), 511-521.

[12] Zuschlag, M., Ranney, J. M., & Coplen, M. (2016). Evaluation of a safety culture intervention for Union Pacific shows improved safety and safety culture. *Safety Science*, *83*, 59-73.

Moreover, the evidence from research supports that poor safety culture predicts higher accident rates, and that interventions to improve safety culture can reduce accident rates. However, implementation can be challenging, and not all interventions are successfully implemented. A review of case studies of 17 organizations[13] carrying out safety culture interventions across a variety of industries found that eight organizations were able to successfully reduce the frequency and/or duration of time lost to accidents. Successful interventions were characterized by energy, creativity, and support; engagement and empowerment of the workforce in a learning/change process; training and motivating managers; and a planned and systematic approach.[13]

Therefore, it is valuable to review characteristics of a strong safety culture, barriers to the development of a strong safety culture, as well as the ideal organizational structure for supporting a strong safety culture.

[13] Hale, A. R., Guldenmund, F. W., Van Loenhout, P. L. C. H., & Oh, J. I. H. (2010). Evaluating safety management and culture interventions to improve safety: Effective intervention strategies. *Safety Science*, *48*(8), 1026-1035.

Elements of, and Barriers to, a Strong Safety Culture

Figure 1: Elements of Safety Culture

Safety is a Core Value

In a strong safety culture, ***safety is the top priority***. At all times, across all levels of the organization, safety is placed above all other priorities. If hazardous, potentially harmful, safety concerns are identified, operations affected by the hazard that pose an imminent safety risk do not continue until the safety concerns have been resolved. Competing demands, such as productivity, profitability, and/or on-time performance are not prioritized above safety. When competing demands are prioritized over safety, safety culture suffers.

Leadership and Management Commitment

A strong safety culture requires strong leadership and management commitment to safety. Leadership sets the example for safety that the rest of the organization follows. Leadership and management provide a model for commitment to safety by not just communicating that safety is important, but by "walking the talk." In other words, leadership and management commitment to safety involves demonstrating that safety is a priority through every-day actions.

Weak or inconsistent commitment to safety, on the other hand, serves as a barrier to developing a strong safety culture. For instance, leadership and management fail to lead by example when placing scheduling or production concerns above safety. Leadership and management may not demonstrate personal commitment to safety, delegating safety concerns down to others lower in the organization. Leadership and management commitment to safety may be inconsistent, rather than an enduring element of the organization's culture. Leadership may also fail to provide the time and budget necessary to address safety hazards in the workplace, eroding employee trust that the organization cares about worker safety.

Employee Involvement and Empowerment

Employees are empowered when they feel like valued members of the organization because their safety and work concerns are heard and addressed. Employees must actively identify hazards and report them to their supervisors/managers who should take appropriate action. Where unions exist, a strong safety culture can be buoyed by the involvement of employee unions. Part of a strong safety culture is collecting employee input on rules and decisions, and soliciting reporting and suggestions from employees on safety concerns. Union involvement provides a channel through which these concerns can be communicated, and union leadership provides advocates who can help ensure employee concerns are heard and acted on; they can also offer a channel for top-down communication, providing feedback to employees on how their concerns were addressed.

Employee involvement in safety occurs when they feel responsible for their personal safety, and the safety of coworkers. Employees are an invaluable source of information for understanding the safety hazards faced during business operations, for providing ideas on how to improve policies and procedures, and for understanding what impact any changes made will have on the work they do. It is not enough just to have employees participate in safety activities; they need to have the power to make changes. Employees should be able to voice safety concerns without fear of reprisal, and understand that when a safety issue in the organization is identified, their concerns will be considered and addressed. When there is an immediate safety risk, employees should feel empowered in their ability to stop work activities.

Lack of employee involvement serves as a barrier to developing a strong safety culture. If employees put their job in jeopardy by voicing safety concerns, or if they are afforded only limited input regarding safety rules and procedures, employees do not feel responsible for safety beyond looking out for themselves. Safety then becomes someone else's job. Furthermore, if a worker in an organization does not know what their own responsibilities are with regards to safety, then it is challenging for them to become more involved, or become empowered in safety processes.

Employee Motivation

When employees perceive that there is a positive, strong safety culture within the organization, they are more motivated to expend the effort necessary to behave safely[14]. When employees perceive that the organization cares about their safety, when there are clear-cut safety rules, policies, and procedures, and when there is clear communication between top leadership, management, front-line supervisors, and employees, employees are motivated to comply with safe work practices and participate in safety activities. Furthermore, when the reporting systems are perceived as fair, employees are more motivated to enact safe behaviors on the job.

However, when employees perceive that the safety culture is weak or suffering, they are less likely to be motivated to behave safely on the job. This is evident when there is ambiguity in communications, roles, and responsibilities regarding safety. Employee motivation suffers heavily under a reward system that is based on punishment or absence of safety events, as it encourages employees to underreport safety issues, thereby putting their lives and their organization at risk.

Communication

In a strong safety culture there is open and effective communication across the organization. Top-down communication from leadership and management is consistent and clearly communicates the value of safety and the required safety policies. Bottom-up communication from employees provides information on safety risks

[14] Griffin, M.A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of Occupational Health Psychology, 5,* 347-358.

encountered, how they can be addressed, and whether changes made to improve safety are working. There is communication between peers on safety issues, so that coworkers know that they are looking out for one another's safety and hold each other accountable for not following safety rules or procedures.

Feedback is a critical element of communication in a strong safety culture. If leadership and management expect workers to report safety concerns and follow safety rules and procedures, in turn they have an obligation to provide feedback, such as what changes have been made in response to reported safety concerns, and how those changes have impacted safety performance within the organization.

A breakdown in communication and information flow serves as a barrier to developing a strong safety culture. If leadership and management do not consistently discuss safety in communications to workers, safety will appear unimportant in comparison to the issues that are more frequently discussed. Even if the organization is using data collected and acting on reported safety concerns, if timely feedback is not provided it may appear that nothing has been done in response to employee reports of safety concerns. This, in turn, decreases the likelihood that employees will report concerns going forward.

Reporting and Accident Analysis

A strong safety culture includes formal systems for data collection and non-punitive reporting of safety concerns and near misses. Close calls and near misses occur more frequently, and thus provide more information on the state of safety performance in an organization. Formal channels for reporting near misses should ensure the anonymity of the worker reporting the incident. Close-call reporting is sponsored by the Federal Railroad Administration (FRA) and being implemented in the railroad industry. Indeed, the implementation of close-call reporting in the railroad industry saw significant, positive improvements in safety culture across four pilot sites, including increased positive employee perceptions of: management commitment to safety, coworker helping behaviors, supervisor fairness, and labor-management relations.[15] Previously TRACS has recommended the establishment of a confidential, non-punitive close-call safety reporting system in rail transit[16].

Furthermore, a strong safety culture is bolstered when organizations engage in root-cause analysis for safety events. When organizations investigate all issues that contribute to negative safety outcomes, they are more likely to identify leading indicators that can prevent the recurrence of negative safety outcomes. When root cause analyses are systematic and documented, they reduce the frequency of negative safety events over time. Furthermore, systematic root-cause analysis helps transform a reactive safety culture into a proactive safety culture, because it aids in mitigating hazards before they occur.

Conversely, when an organization forgoes root-cause analysis and instead focuses solely on human error, this can indicate a weak safety culture. The safety culture and high reliability organizations (HRO) literature indicate that casting blame for an accident leads to a suboptimal response to hazard precursors that might be potentially identifiable in accident investigations. Blaming usually is focused on the individual most proximal, physically and temporally, to the accident, who makes the final mistake. Blaming is counterproductive to safety, and more specifically, counterproductive to prevention.

[15] Ranney, J.M., Zuchslag, M.K., Morrell, J. Coplen, M.K., Multer, J., & Raslear, T.G. (May-June 2013). Evolutions of demonstration pilots produce change: Fourteen years of safety culture improvement efforts by the Federal Railroad Administration. *TR News*, 286, 28-36.

[16] FTA TRACS. (2012). Establishing a confidential, non-punitive, close-call reporting system for the rail transit industry.

However, blaming is a natural phenomenon. Fundamental attribution error[17] is the tendency to exclusively attribute or over-attribute the cause of safety events, such as accidents, to the internal characteristics of individuals (character or intention), rather than external factors. When this is done in the organizational context, it is not uncommon to either terminate the individual's employment as a remedy, or punish them to change their behavior.

The problem of fundamental attribution error in accident investigations occurs when investigators blame the individual and consider the investigation closed. Without considering all causal factors, one cannot determine issues that if addressed, could prevent safety events in the future. When an organization allows decision makers to engage in fundamental attribution error, there is a slew of consequences, including: lower workforce morale, alienation, and the loss of critical safety-related information from the first-line employees who operate and maintain the system. All of which can lead to a weak culture of safety.

The following illustrates the difference between a blaming and non-blaming culture following Parker and colleagues' safety culture framework demonstrating the dimensionality from pathological (weak) to generative (strong) safety culture[18]:

Pathological	Reactive	Calculative	Proactive	Generative
Who causes accidents in the eyes of management?				
-- Individuals are blamed, and it is believed that accidents are part of the job. -- Responsibility for accidents is seen as belonging to those directly involved.	--There are attempts to remove "accident-prone" individuals. -- It is believed that accidents are often just bad luck. -- The responsibility of the system for accidents is considered but has no consequence.	-- Faulty machinery and poor maintenance are identified as causes as well as people. -- There are attempts to reduce exposure. -- Management has a THEM rather than US mentality, and it takes an individual rather than systems perspective.	-- Management looks at the whole system, including processes and procedures when considering accident causes. -- They admit that management must take some of the blame.	-- Blame is not an issue. -- Management accepts it could be responsible when assessing what they personally could have done to remove root causes. -- They take a broad view looking at the interaction of systems and people.

Trust between Management and Employees

Trust has to be developed over time. Employees need to be able to trust that when they report safety concerns, they will be addressed fairly, in a timely fashion, without reprisal. Similarly, management needs to be able to trust that employees will follow safety rules and responsibilities, and report problems when they occur. Management has to provide a model for employees to follow. A consistent pattern of fair treatment over time allows both management and employees to develop trust.

A lack of trust between management and employees leads to breakdowns in communication, which compromises the integrity of the reporting system, and exacerbates issues surrounding the topic of human error in accident investigations. Members of the organization, from workers to leadership, are inadvertently incentivized to look out

[17] Ross, L. (1977). The intuitive psychologist in his shortcomings: Distortions in the attribution process. In: L. Berkowitz (Ed.), *Advances in Experimental Psychology, 10,* (pp. 173-220). New York: Academic Press. See also, Reason, J. (1997). *Managing the risks of organizational accidents.* Burlington, VT: Ashgate, pp. 126-127, 231.

[18] Parker, D., Lawrie, M., & Hudson, P. (2006). A framework for understanding the development of organizational safety culture. *Safety Science, 44,* 551-562.

for themselves first and foremost in order to avoid blame for failure, to the detriment of the safety of the organization as a whole.

Employees are Treated Fairly

In an organization with a strong safety culture, employees are treated fairly, and there is a clear distinction between acceptable and unacceptable behavior. A non-punitive environment does not mean that any and all behavior is acceptable; rules still exist in non-punitive environments. Behaviors that are unsafe should be prohibited. Clear communication is necessary for employees to know what behaviors are unacceptable. Leadership and management are just as accountable for following safety rules and procedures as any other worker; they should not be allowed to violate safety rules when it is convenient for meeting other organizational goals. Fair treatment of employees also requires fairness and consistency in dealing with rule violations. When rule violations occur, there should be a fair appeals system in place to dispute them in case of disagreement.

Performance Monitoring Systems and Standards

Apart from data on near misses, determining effective measurement of safe operations of work processes is important for organizations. In order to understand the state of safety in an organization and to understand whether safety promotion efforts are having the intended effect, there needs to be a system in place to continuously monitor information relevant to safety. Hazard monitoring, risk assessment, and ongoing collection and analysis of safety performance measures are essential in understanding and improving the safety of the organization. A safe organization cannot wait for an accident to occur to determine where there are shortcomings in their safety procedures, they must proactively monitor their safety systems to prevent catastrophic events.

In addition, in a strong safety culture, responsibilities are clearly defined and consistently enforced. It is clear who in the organization is responsible for safety, and what one's own duties are with regard to safety. Workers are expected to follow safety rules and procedures, and those expectations are communicated, and workers are held accountable for following safety rules and procedures. Performance evaluation and reward systems reflect performance in safety the same way they reflect performance in other job aspects.

Employees that routinely do not comply with organizational procedures undermine performance monitoring. Non-compliance can occur for a number of reasons. For example, organizations may not provide adequate processes, procedures, or resources for the work to be performed as specified, leaving employees in the position to find workarounds. In some cases, it is based on pressure from management, in others, it could be that the rules, policies, and procedures are impractical. Leaders or managers may be less strict about enforcing adherence to procedures when work falls behind schedule. Implicitly, management could be encouraging the meeting of production goals at the expense of safety. In addition, there may be too many rules and procedures, leading employees to violate them out of necessity. On the other hand, the procedures in place may be unclear or poorly communicated, leaving employees to violate them unknowingly.

It's important to note that one rule violation is not indicative of a weak safety culture, but systemic non-compliance is. Regardless of the reason for rule violations, if they become routine this can undermine a strong safety culture.

Safety as a Stand Alone or Separate Process

Failure to integrate safety into regular work processes can serve as a barrier to developing a strong safety culture. When members of the organization view safety as exclusively consisting of what is contained in their safety rulebook and what they cover in their mandatory safety training, there is no transfer of safety training in the application of day-to-day work processes. Safety can also be viewed as a separate process when the responsibility for safety falls solely upon the safety department; safety is viewed as someone else's job.

Training

An organization with a strong safety culture provides the training necessary to carry out work safely. Members of an organization must know how to do their job before they can be expected to perform effectively in their work role. In many organizations, the nature of the work is dynamic. Regular, effective training efforts are necessary to ensure that workers have the knowledge and skills necessary to perform their job regardless of turnover in staff and changes in job and/or safety procedures.

In some cases, the training methods or content are ineffective. For example, formal training may exist to cover job tasks, but does not sufficiently address safety issues. Alternately, training may be informal or on the job. In other cases, training may be inadequate because it is not refreshed or because training programs are not updated to incorporate new procedures, equipment, or the documentation of new safety hazards and how to effectively mitigate them to control risks.

Inadequate safety training for employees serves as a barrier to a strong safety culture. Regardless of whether employees are motivated, involved, or empowered, they cannot act safely if they are insufficiently trained.

Continuous Improvement

Continuous improvement is an essential element to a strong safety culture. An organization with a strong safety culture does not work to prevent the last accident that occurred from happening again; instead they strive to understand what will be the next accident, and how it can be prevented. While there are challenges that organizations face in the improvement of safety culture, any improvements to safety are a step in the right direction. Whether an organization has a strong safety culture already, or if they are not yet there, continuous improvement is necessary to ensure that the organization can anticipate and deal with the challenges they face in operating safely.

A lack of continuous improvement serves as a barrier to a strong safety culture. Failure to continuously improve occurs when the organization does not use accident information or other data to make improvements. Even if safety data is routinely collected and analyzed, it is meaningless unless it is acted on to improve safety. Continuous improvement also suffers when safety recommendations are not acted upon, or the organization fails to make safety improvements in a timely manner.

Resources Provided for Safety

In a strong safety culture, resources are routinely allocated for safety. Safety processes such as communication, reporting, and training require time and resources to function. In strong safety cultures, top leadership and management ensure that the organization has the resources necessary to support safety.

State Oversight agencies and the FTA must have adequate resources as well. As James Reason, a noted safety culture scholar, states:

> *[If] regulators are to be other than convenient scapegoats, they will have to be provided with the legislation, the resources and the tools to do their jobs effectively. They are potentially one of the most important defenses against organizational accidents. Societies, just like the operators of hazardous systems, put production before protection. As we have seen, safety legislation is enacted in the aftermath of disasters, not before them. There is little or no political kudos to be gained from bringing about a non-event, although, in the long run, meeting this challenge successfully is likely to be much more rewarding.*

Every society gets the disasters it deserves. Let's hope that, in the next millennium, the regulators are seen to deserve something better than has so far been the case. Then, perhaps, we will all be safer.[19]

Inadequate resources can serve as a barrier to a strong safety culture. Top leadership and management may mismanage resources or the allocation of resources, placing priority of competing demands over safety needs and improvements. Furthermore, resources can be impeded through legislation and congressional budget allocation.

Strong Safety Culture	Weak Safety Culture
Safety is the top priority	Competing demands (e.g., on-time performance) are prioritized over safety
Leadership/management commitment	Weak/inconsistent commitment
Employee involvement/empowerment/motivation	Lack of employee involvement/empowerment/motivation
Open and effective communication	Breakdown in communication and information flow
Formal systems for data collection & non-punitive reporting of safety concerns	Focus on human error, lack of or no root-cause analysis
Trust between management and employees; fair treatment	Mistrust between management and employees; unfair treatment
Effective performance monitoring systems and standards	Routine non-compliance with safety rules, policies, and procedures
Adequate/effective training	Ineffective training methods/content
Continuous improvement	Lack of continuous improvement
Effective allocation of resources	Inadequate allocation of resources

Table 1 Elements of, and Barriers to, a Strong Safety Culture

Safety Culture in High Reliability Organizations

An example of what a strong safety culture looks like in action can be found in HROs.[20] An HRO is one that can repeatedly (thousands of times) operate high-risk processes without a catastrophic event despite significant hazards, time constraints, and complex technologies. Examples of HROs include nuclear power plants and aviation. While there is no industry that considers accidents or fatalities "acceptable," for most organizations, the focus is on minimizing the number of accidents. In contrast, for an HRO, one major accident is too many; there is no acceptable number of catastrophic failures at a nuclear power plant.

Transportation systems can also be viewed as a type of HRO. There is a high degree of potential risk involved in many transportation systems, and the worst cases for failure can be catastrophic. In passenger transportation especially, there is no room for failure to perform safely. Above all other concerns, passengers are expecting to arrive safely at their destination.

The five principles of HROs identified by Weick and Sutcliffe[21] are consistent with a strong safety culture:

[19] Reason, J. (1997). Ibid. p. 188.
[20] Roberts, K. (1989). New challenges in organizational research: High reliability organizations. *Industrial Crisis Quarterly, 3,* 111-125.
[21] Weick, K., & Sutcliffe, K. (2007). *Managing the Unexpected: Resilient Performance in an Age of Uncertainty*. San Francisco, CA: Jossey Bass.

1) **Preoccupation with failure** – report failures as they occur and monitor leading indicators of failure before they happen in order to understand sources of error and prevent them from leading to major failures.
2) **Reluctance to simplify** – understanding that accidents and incidents are a result of systemic factors, and that if you fail to take into account the complex factors that influence safety outcomes, you will fail to adequately account for them.
3) **Sensitivity to operations** – gathering the information necessary to understand how operations are actually functioning in practice, regardless of how they are supposed to be functioning on paper. Different components of an organizational system or the context that surrounds it may cause them to function in unexpected ways.
4) **Commitment to resilience** – even in the best organizations, errors will still sometimes occur. It is not possible to anticipate or prevent every possible source of error. An organization needs to be able to continue to operate safely even when errors do occur, and needs to be prepared to prevent small errors from growing into large ones.
5) **Deference to expertise** – not every member of an organization can be an expert in all aspects of its operations. Line level employees need to understand when they have reached the limits of their knowledge and need to ask for help from management; management needs to realize that line level employees are the experts at their own jobs.

HROs are designed around an assumption that failures will occur. In order to prevent a catastrophic failure, a system cannot be designed entirely around avoiding errors. Rather, the system must be designed around the assumption that sooner or later, errors will occur, and the system must be capable of coping with these errors and continuing to perform safely despite their occurrence.

Best Practices: Organizational Factors that Support a Strong Safety Culture

In order to provide a picture of the ideal organizational structure in transit agencies that supports a strong safety culture, it is necessary to cross-reference ideal organizational factors with a validated model of organizational functioning. The Weisbord Model[22] applies a systems perspective to organizational functioning and allows for the categorization of effective organizational components based on six factors: purposes, structure, relationships, rewards, helpful mechanisms, and leadership; these six factors are impacted by the external environment's inputs and outputs. The elements of safety culture are discussed in relation to Weisbord's model in the following section in order to detail the ideal organizational structure and factors that would support a strong safety culture. Please note that the following description of the functional capabilities of the ideal organizational structures described may differ for small and large transit agencies (for a list of best practice recommendations, please reference Appendix A).

[22] Weisbord, M.B. (1976). Organizational diagnosis: Six places to look for trouble with or without a theory. *Group & Organization Studies, 1*(4), 430-447.

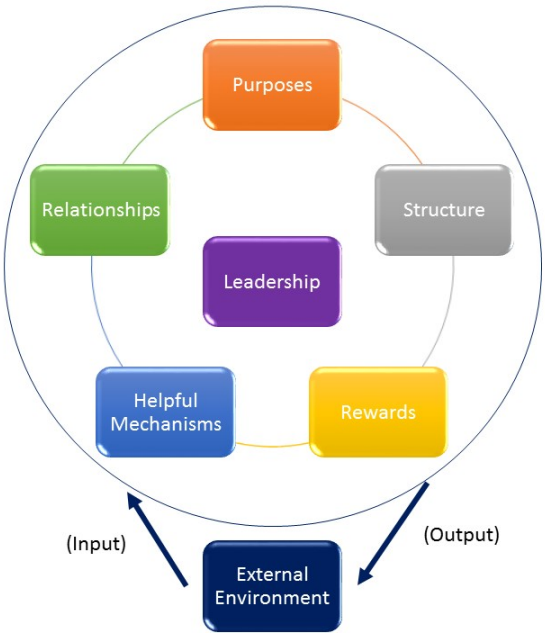

Figure 2: Weisbord Six-Box Model

Purposes

Goal clarity and goal agreements are the two most important factors subsumed under Weisbord's Purposes box. Goal clarity refers to the extent to which employees understand the organization's mission and purpose, while goal agreements refers to employees' support of the organization's mission and purpose. In a transit agency with a strong safety culture, the agency's mission and purpose details not only the safety of employees, but the public as a whole. In that respect, safety comprises a core value within the agency's written mission and purpose.

When there is a strong safety culture, employees will support the core value of safety through active involvement in safety. This could take a number of forms, such as participating in labor-management safety committees, motivation to behave in a safe manner, and engaging in the reporting of near misses that may inform future hazard analysis and mitigation efforts. A workforce that supports the safety mission and purpose of the organization aids in fostering a just culture; a culture where employees are encouraged to report safety-related information and where there are clear distinctions between acceptable and unacceptable behavior.

Structure

Under Weisbord's model, structure refers to the fit between the internal structure of the organization that is meant to support the organization's mission and purpose. In a transit agency with a strong safety culture, this internal structure is supported by the presence of an internal safety office. Safety offices write and manage the safety policies, guidance, standards, and protocols of an agency, and aid operating departments on implementing policies. It is the responsibility of the safety office to be familiar with the agency's greatest safety issues, as well as the mitigation efforts in place that are intended to promote a safe work culture. True to the ideals of SMS, the safety office orchestrates ways to measure the effectiveness and efficiency of the processes in place, and proactively looks at new trends to see what other issues or concerns may be on the horizon.

The safety office manages safety training and identifies the safety-sensitive employees that require extra training and awareness around safety issues. Training ensures that employees stay current on safe practices and procedures with regards to their job tasks and requirements. Training supports an informed culture, or a culture in

which employees have knowledge about the human, technical, organizational, and environmental factors that impact safety within the transit agency.

When it comes to triennial oversight agency audits and the procurement and design of new vehicles, the safety offices are active participants. Ideally, the safety office would operate independent of—though in equal influence with—other departments within the agency to prevent conflicts of interest. For example, when the safety department is embedded in an organizational structure that also has a claims department reporting to the same organizational entity (e.g., director of operations), conflicts of interest will arise. Claims departments serve an advocacy role, which can conflict with safety culture best practices, such as root-cause analysis. The claims department may be quick to settle on human error, where root-cause analysis may conflict with that finding.

Furthermore, transit agencies with a strong safety culture clearly define safety and other organizational roles and responsibilities. Agencies with strong safety cultures also clearly define how the roles and responsibilities of departments (e.g., bus operations and maintenance) interact with each other.

Relationships

Relationships refer to the relationships between individuals, between the different units within the organization that perform different tasks (e.g., operations and mechanical), and relationships between employees and their job tasks and requirements. In a transit agency with a strong safety culture, relationships would be evidenced by a number factors.

Trust between management and employees, as well as the fair treatment of employees within the transit agency, supports relationships subsumed under Weisbord's model. When there is fairness and trust, reporting relationships are strengthened. Front-line employees and supervisors feel supported by their organization in the reporting of safety concerns and issues.

Relationships are also reinforced by open, effective communications at all levels of the transit agency. The head of the agency and board of directors clearly communicates the safety-related policies, procedures, and practices with the safety office and senior management. Middle-management and front-line supervisors communicate down the chain of command to front-line employees, so that there is no ambiguity in understanding what is expected with regard to safety.

In addition, the transit agency maintains a working relationship with the oversight agency and the FTA so that effective safety improvements and solutions are implemented and enforced.

Rewards

Rewards refers to the comparison between the formal rewards offered by the organization and the perceptions of rewards and punishments by employees. Transit agencies that employ confidential, non-punitive, close-call safety reporting systems support their workforce and their organization by providing an avenue for employees to report safety-critical information without fear of reprisal (for an example of an employee reporting structure and procedures in transit agencies, please see Appendix E). Furthermore, close-call reporting systems aid in the collection of safety data necessary for the agency to understand hazards their workforce faces and to implement mitigation strategies and continuous improvement that can further SMS principles. Continuous improvement supports a learning culture in the organization, or one in which the organization utilizes safety information to

support safety reforms. When a transit agency is supported by a learning culture, they view accidents and errors as providing opportunities to learn rather than providing opportunities to punish[23].

In a transit agency with a strong safety culture, accidents are investigated utilizing root-cause analytical methods, rather than using human error as a crutch. When organizations utilize methods such as root-cause analysis that involves the investigation and determination of all system factors that lead to a safety event, this increases the perception of fairness for employees and builds trust between the workforce and management. Taken together, this supports the development of a reporting culture, or one in which employees feel comfortable aiding the organization's safety initiatives by reporting their errors and near misses.

Helpful Mechanisms

Under Weisbord's six-box model, helpful mechanisms indicates the processes that organizations must attend to in order to remain competitive. These include planning, control, budgeting, and other information systems that aid employees in doing their jobs and meeting the organization's objectives. In a transit agency with a strong safety culture, labor-management safety committees can serve a vital role. The number one function of an agency's labor-management safety committee is the engagement of bottom-up communication of safety issues. Labor-management safety committees highlight the hazards that are brought forth to their attention and mitigate those hazards over which they have decision-making authority. This aids in establishing and maintaining a positive reporting culture, because employees see that those hazards that fall under labor-management safety committee purview are being dealt with in a timely manner. Furthermore, labor-management safety committees are given the power to communicate safety issues up the chain of command to the relevant department and/or safety department, so that these issues can be documented and addressed in a timely fashion. It is also important to note that employees themselves serve a necessary function in addressing/reporting hazards when they are first observed.

Oversight agencies also serve as a helpful mechanism to transit agencies with strong safety cultures. The oversight agency is responsible for inspecting states' transit agencies, ensuring that they comply with safety regulations and ensuring that any safety violations are addressed. This involves maintaining an ongoing database of any safety violations identified and how the transit agency addressed the violation.

When a strong safety culture is present in a transit agency, the oversight agency has taken a more active role in the development and continuous improvement of SMS processes in the transit system, and subsequently, safety culture (refer to Appendix B for a discussion on how safety culture fits into SMS). Much like the transit agency itself, the oversight agency values safety as the highest priority.

Leadership

The goal of leadership in Weisbord's model is to maintain balance among the other boxes (i.e., purpose, structure, relationships, rewards, and helpful mechanisms). In a transit agency with a strong safety culture, this balance is maintained by strong leadership and management commitment to safety and the allocation of resources to meet the safety needs of the agency.

Top leadership in the transit agency shows commitment to safety through transparent communications, valuing safety as a top priority, and allocating adequate resources to the ongoing collection and analysis of data to inform safety decisions and improve safety for all employees and the public as a whole.

[23] Reason, J. (1997). *Managing the risks of organizational accidents*. Aldershot: Ashgate.

Front-line supervisors serve as the foundation between top-down safety improvements and bottom-up safety communications. When policies, procedures, and practices are altered or changed, front-line supervisors ensure that employees know the changes, understand the changes, and alter their safety processes and behaviors accordingly. In addition, front-line supervisors ensure that safety issues raised by employees are communicated up the chain of command and provide feedback to employees on the resolution status of raised safety concerns. A labor-management safety committee can assist in this process. In a transit agency with a strong safety culture, front-line supervisors have the authority to implement mitigations when minor safety hazards are reported by employees.

External Environment

While the external environment does not comprise one of Weisbord's six boxes in the model, it is no less important. The external environment refers to any outside forces that exert impact on the organization (e.g., geographical location and/or government regulations). The organization, in turn, can also impact the external environment (e.g., through factors that may lead to increased industry regulations).

An essential aspect of the external environment for transit agencies with strong safety cultures is FTA support. The FTA is responsible for ensuring the safety of transit systems through effective regulatory oversight. FTA should work with transit agencies in order to craft safety standards and regulations that will have their intended effect in improving safety. Furthermore, FTA is responsible for collecting relevant data to understand what safety hazards to transit currently exist or are anticipated in the future, and whether existing standards and regulations are ensuring hazards are sufficiently addressed. FTA should have the responsibility to not only monitor and regulate the safety performance of transit agencies, but also to provide guidance and resources for how to address safety concerns or violations that have been identified. In transit agencies with strong safety cultures, FTA plays a vital role in ensuring that there are sufficient resources for the support and improvement of safety.

In addition, in transit agencies with strong safety cultures, there is an emphasis on public safety. Transit agencies not only work to ensure public safety, but also gather feedback from the public on innovations and improvements regarding safety. Transit agencies with strong safety cultures not only communicate safety-critical information to employees, but the public as well, ensuring knowledge and understanding for all those invested.

Weisbord Model Element	Organizational Factors
Purposes	Agency mission/purpose emphasizes safety above all else
Structure	Present and active safety office
	Defined roles and responsibilities
Relationships	Trust
	Fair treatment
	Open and effective communication
	Maintain working relationship with oversight agency and FTA
Rewards	Confidential, non-punitive, close-call safety reporting system
	Root-cause analyses
	Continuous improvements
Helpful Mechanisms	Labor-management safety committees
	Employee reporting
	Oversight agency

Leadership	Strong leadership & management commitment to safety
	Effective allocation of resources
	Active involvement of front-line supervisors
External Environment	FTA support

Table 2 the Ideal Organizational Structure and Factors that Support a Strong Safety Culture

Assessment

There are a variety of methods in which one could assess safety culture, and given that safety culture is a multi-dimensional construct encompassing psychological, behavioral, and organizational components, it should be assessed via multi-method measurement. Effective safety culture measurement captures all three components: psychological components, behavioral components, and organizational components. Methods of safety culture measurement include: direct observations, interviews, focus groups, performance indicator tracking, and surveys.

Direct observations[24] are most useful in assessing the behavioral components of safety culture. Direct observations provide objective information regarding a variety of aspects within the organization, including: effectiveness of training, management, accountability, and behavior expectations. However, direct observations can be time-consuming, expensive, and difficult to quantify when they are not integrated into routine supervisor and manager responsibilities. Furthermore, they provide only a snapshot of the safety culture at any given time, and thus should be utilized with other measurement methods.

Interviews[24] can be useful in gathering information on safety culture within an organization because respondents are not bound by the wording or structure of a written survey. Interview methods allow for probing by the interviewer in the effort of gaining better clarity in the responses given by the interviewee. In addition, interviews can be standardized, such that all interviewees receive the same set of questions and responses can be coded to create themes that relate to various safety culture elements. In order for interviews to provide a more comprehensive picture of safety culture within the organization, interviews have to be administered to an accurate representation of the overall workforce within the organization. Furthermore, like direct observations, interviews can be time-consuming and costly.

Focus groups[24] can be used in conjunction with, or as an alternative to individual interviews. They are often less time-consuming and costly, as one interviewer can facilitate discussion and feedback from a number of employees at one time. In order for focus groups to be effective, they need to be administered by skilled facilitators who are able to engage all participants in the discussion. Focus groups tend to be less flexible than individual interviews because they do not allow for the same level of probing that can take place in individual interviews. Additionally, there is the possibility that a minority of participants can dominate the discussion, whereby their responses may differ from what would be gleaned by individual interviews. When everyone participates in the discussion, however, focus groups can provide information on a variety of elements of safety culture, as participants discuss, influence one another's responses, and compare ideas.

Performance indicator tracking[24] (e.g., accidents, violations, errors, etc.) can be used to provide insight into the strengths and/or weaknesses of safety culture at any given time. There is no single indicator that could accurately reflect the overall state of an organization's safety culture. Rather, performance indicators can be used to monitor

[24] TCRP 174 Federal Transit Administration. (2015). *Improving safety culture in public transportation.* (Transit Cooperative Research Report No. 174). Washington, D.C.: U.S. Transportation Research Board. TCRP 174

trends as a function of time and can provide insight into the direction in which safety culture is going within the organization.

Last, but not least, surveys[24] can be utilized to assess safety culture at any given time within the organization. Survey methods are more efficient than the other assessment methods mentioned above, require fewer resources, and can engage the views and perceptions of a large number of employees. Surveys also offer the advantage of anonymity and confidentiality, so employees often feel more comfortable offering their true opinions rather than what the organization would like to hear. Surveys also allow the flexibility of looking at safety subcultures, in other words, looking at the safety culture within occupational groups.

The major limitation to survey methods is that there is little to no flexibility in responses, they are based on the questions asked. In addition, responses are impacted by the structure and construction of the questions posed. Another issue with surveys is that they can have low response rates, and when the response rate is low, the results may not be representative of the population of employees. Response rates are also negatively impacted when surveys are both voluntary and confidential. Response rates can be increased by: making surveys mandatory, providing time on shifts to complete the survey, offering incentives, and making the survey web-based.

Safety culture components lend themselves better to certain measurement methods than others. The psychological component of safety culture is best suited to survey methods for examination. Survey instruments are better equipped to examine employee safety-related attitudes, beliefs, and perceptions. As stated previously, often when assessing safety culture, what one is really assessing is safety climate, or a safety culture snapshot. Survey methods can also be supplemented with more qualitative methods, such as interviews and focus groups, which allow for more tailoring of questions and probing, to better understand employees' view-points. Behavioral components of safety culture can also be captured through a variety of methods, including self-reported employee behavior via survey[25], direct peer observations[26] and external observations[27].

Organizational components of safety culture are slightly more difficult to assess. One needs to have a clear understanding of the policies and procedures within the organization, both safety-related and otherwise, as formally written and as put into practice. Methods that may be useful include: observational checklists and measures of leadership behavior, focus groups, and structured interviews with top leadership and management.

Additionally, when changing or implementing a new safety system, policies, or procedures, organizations should consider conducting a pre-assessment of safety culture and a post-assessment in order to gauge changes in employee perceptions and behaviors. This would allow the investigation of whether changes have had a positive (or negative) impact on the overall culture of safety within the organization.

Nonetheless, safety culture assessment is important and valuable to any organization, including transit agencies. For one, safety culture assessment allows organizations to investigate the safety perceptions and behaviors that may lead to accidents and injuries. Moreover, regular safety culture assessment, like safety performance measures, allows organizations to track progress and trends in safety culture change efforts and provides a source of motivation and feedback from employees at all levels of the organizational hierarchy. Last, but not least, regular

[25] Cooper, M.D., & Phillips, R.A. (1994, January). Validation of a safety climate measure. In *Occupational Psychology Conference of the British Psychological Society* (Vol. 3, No. 5).
[26] Komaki, J., Barwick, K.D., & Scott, L.R. (1978). A behavioral approach to occupational safety: Pinpointing and reinforcing safe performance in a food manufacturing plant. *Journal of Applied Psychology, 63*(4), 434.
[27] Sulzer-Azaroff, B. (1987). The modification of occupational safety behavior. *Journal of Occupational Accidents, 9*(3), 177-197.

safety culture assessments identify not only strengths and weaknesses, but also potential areas of improvement and can aid organizations in identifying leading safety indicators.[28]

Lagging and Leading Indicators

Currently, there are a variety of indicators used to monitor and manage safety performance and safety culture in public transportation. These indicators fall into two categories: lagging and leading. Broadly stated, lagging indicators measure past performance, incidents, results, and outcomes. While leading indicators utilize outcome measures as a predictor of future performance through the assessment of actions, behaviors, and processes[29]. Many transit agencies report lagging indicators, such as accidents and injuries, which can offer insight into an organization's safety culture, but cannot contribute, in and of themselves, to improving safety culture.

The collection of leading indicators can "serve as a catalyst for change" in the organization[29], supporting improvements in safety culture. However, many transit agencies do not collect leading indicators, which can be used to alert agencies of developing safety problems and vulnerabilities. The collection and assessment of leading indicators is further necessary in moving transit agencies from a reactive state of safety to a proactive state. Examples of safety culture leading indicators may include: safety audit results, root-cause analysis of near misses, time to resolve employee safety concerns, safety agenda items on the transit agency board meetings, number of safety education/outreach efforts, and number and breadth of staff involvement in safety committee meetings.

The collection of leading and lagging indicators are not only vital to informing and improving safety culture within organizations, but also to implement an effective SMS.

[28] Committee on Offshore Oil and Gas Safety Culture, Transportation Research Board, Marine Board, Board on Human-Systems Integration, & Division of Human Behavioral and Social Sciences and Education. (2016). Beyond compliance: Strengthening the safety culture of the offshore oil and gas industry. Transportation Research Board: Washington, DC.

[29] Blair, E., & O'Toole, M. (2010). Leading measures. *Professional Safety, 55*(8), 29-34.

Recommendations

In an effort to identify tools and processes that can promote a culture of safety at agencies of various sizes and modes, the Committee recommends the following be considered by FTA for implementation. The recommendations listed below are in logical order of implementation and do not indicate particular order of importance.

1. Encourage **establishment and promotion of labor-management safety committees within all transit agencies.**

   Safety committees comprised of individuals who represent the labor union, management, and front-line employees are the first defense in safety and are well positioned, if properly trained and supported, to identify current safety concerns and potential safety risks, conduct root-cause analysis and recommend mitigation solutions. FTA should provide guidance to transit agencies on labor-management safety committee best practices in an effort to promote effective SMS across the industry and thus a strong safety cultures (please see Appendix D for examples). Labor-management safety committees should have the authority to mitigate risks and hazards at a certain threshold, and have the ability to report more serious hazards to top safety officials within the organization. The agency leadership needs to be committed to the timely and effective resolution of the safety concerns and solutions arising out of these committees.

2. **Support establishment of non-punitive, confidential, close-call safety reporting systems within all transit agencies.**

   The collection of data on close-call safety events is one of the premier methods for collecting and determining leading indicators of safety within transit agencies. As such, FTA should support the establishment of a confidential, non-punitive, close-call safety reporting system within transit agencies, for all modes. The analysis of close-call data, by internal peer review teams, like labor-management safety committees trained in incident investigation and root-cause analysis, can reveal safety trends, which can lead agencies in the effort of mitigating hazards prior to becoming catastrophic safety events. Additionally, while the focus has been on close-call reporting, any safety issue can be reported, regardless of whether there was a close call or near miss. For example, FTA and others are working on pilot projects for "safety reporting systems" which will likely include the features of non-punitiveness, confidentiality, close-call and near-miss reporting, as well as other safety issue reporting[30]. Such safety reporting systems aid in the empowerment of employees in voicing their safety concerns without fear of reprisal, and being engaged in finding solutions, thus strengthening the safety culture.

3. **Develop adaptable, usable safety culture assessment tools.**

   FTA should develop an assessment tool that transit agencies can use to understand the strengths and weaknesses of their safety culture. This safety culture assessment tool should promote a three-pronged approach: a qualitative approach, a quantitative approach, and a behavioral/compliance checklist approach. Qualitative approaches are used to gain an understanding of underlying reasons, opinions, and motivations and typically involve asking of open-ended questions, giving participants freedom in how to respond. Quantitative approaches involve the use of forced-choice survey responses to quantify attitudes,

[30] The Aviation Safety Reporting System (ASRS) is a common prototype for many safety reporting systems. Please see ASRS Program Briefing (2015) for an overview of the ASRS system found at: https://asrs.arc.nasa.gov/docs/ASRS_ProgramBriefing2015.pdf

opinions, and behaviors by generating numerical data. Checklists are a type of informational aid used to assess important or relevant actions that are observable. The qualitative approach should include focus groups and interviews in the assessment of safety culture; the quantitative approach should include an employee survey utilizing valid and reliable measures (i.e., reputable measures that are accurate and consistent; see Appendix C for examples) in the assessment of safety culture; and the behavioral/compliance checklist would aid in the identification of policies, procedures, and practices that promote a strong safety culture in transit agencies. The safety culture assessment tool should be modular and useful in establishing baseline estimates of safety culture and should be re-administered in conjunction with the triennial audit process to assess time-based trends in safety culture elements.

4. **Support training at all levels of the transit agency on SMS principles, root-cause analysis, and the promotion of a positive safety culture.**

   FTA should support training on SMS principles, root-cause analysis, and safety culture at all levels, given that safety is the responsibility of employees at all levels of the organization. Training should be adapted to the role of each level within the organization. Transit agency leadership (i.e., CEO, Board of Directors), middle-management, front-line supervisors, and front-line employees should understand the importance of safety within the organization and the benefits of safety to the organization and the public. Training supports shared accountability and responsibility across all levels within the organization as part of ongoing, continuous improvement.

5. **Encourage regular safety communication within all transit agencies.**

   Communication is a fundamental pillar of a strong safety culture and essential to moving SMS forward within transit agencies. As such, FTA should encourage the establishment of communication structures within transit agencies in an effort to support SMS principles and processes in the promotion of a strong safety culture. These communication structures could include, for example, post-incident lessons learned, joint employee-management meeting outputs, toolbox talks, and safety briefings.

6. **Encourage safety empowerment and evaluation within all transit agencies.**

   When employees and front-line supervisors are empowered in the promotion of safety within their organization, the safety culture flourishes. FTA should provide guidance on best practices in empowerment of employees. Empowerment for employees comes in the form of reporting safety-related issues and hazards in the effort of promoting safety within the organization, as well as seeing that the issues that they are bringing up are being addressed (see page 10 of this report). Empowerment for front-line supervisors comes in the form of providing middle-managers the tools and decision-making authority to establish mitigations for minor safety-related issues, risks, and hazards. Furthermore, FTA should provide guidance on the inclusion of a safety component for all jobs within transit agencies. This aids in keeping all levels of the organization responsible for safety, as all employees (top, middle, and front-line) would be subject to evaluations of safety within- and related to- their jobs.

7. **Encourage the proactive involvement of oversight agencies in SMS principles and positive safety culture for transit agencies.**

   Oversight agencies play a strong role in influencing safety culture for transit agencies. FTA should assist oversight agencies in promoting SMS principles and positive safety culture for transit agencies that fall under their purview. Oversight agencies should act as a coach for transit agencies, aiding in the safety promotion pillar of SMS, and possibly including a behavioral and compliance checklist on SMS principles and safety culture as part of the triennial audit process mandated by 49 CFR Part 674. Furthermore, FTA

should encourage regular meetings between oversight agencies and rail transit agencies (RTAs), to address problems before they become formal actions and safety issues that are not regulated, and to establish an appropriate role-based working rapport.

Conclusion

The role of safety is not designated by a six-letter word attached to a title or position: it is a responsibility handed to all. All members of an organization have a role to play in safety, whether that be as watchdog, facilitator, or fixer. In most cases, danger will only come to pass after it has passed through many idle hands.

The U.S. Department of Transportation Safety Council released *Safety Culture: A Significant Driver Affecting Safety in Transportation* in May 2011. The concluding paragraph of the report reads as follows:

> *"At the end of the day, safety culture is about prioritizing safety through attitudes and actions at all levels of an organization. Employees should feel that safety is a personal responsibility, and be willing to communicate concerns to the organization through clearly defined reporting systems and processes without fear of retaliation or reprisal. The most-often cited element needed to foster a safety culture is strong leadership. Leaders need to demonstrate their commitment to safety for their organizations."*[31]

Leaders must demonstrate their commitment through action, not pleas, charisma, or motivational speeches. Simply labeling something as policy has not, and will not, be enough. Likewise, operators and other service employees must embrace a sense of togetherness: that being safe and alert of potential dangers will impact the safety and wellbeing of their peers.

[31] US Department of Transportation Safety Council. (2011). *Safety Culture: A Significant Driver Affecting Safety in Transportation*. Retrieved from http://dotnet.dot.gov/about/safety-council/safety-research-paper.pdf, Page 13.

Appendix A: Best Practice Recommendations put forth by TRACS Safety Culture Committee Sub-Group

1. Safety should be the primary core value.
2. Leadership and management should demonstrate strong commitment to safety
3. Dedication to effective safety training should be evident in the organization.
4. Oversight agencies should adopt as many SMS best practices as possible in order to better align with the organizational structure of the individual transit agencies. In addition, oversight agencies should take a more proactive role in assisting transit agencies as they develop their State Safety Plans.
    a. This includes a designated person serving as SMS coach for agencies the oversight agencies oversees.
5. Middle-managers should be empowered as decision-makers.
    a. In an effective safety culture, middle-managers serve as the gatekeepers between the top and the bottom of the organization.
    b. Middle-management positions should yield them empowerment to be involved in the process of mitigating and promoting safety.
    c. Agencies should allow middle-managers to fix issues below a certain financial threshold without approval from a CEO or Board of Directors.
        i. For example, a supervisor would have the authority to address any issue that comes up so long as it's below a predetermined threshold.
    d. Middle management should also have the authority to put a safety initiative into action.
        i. Financial threshold would be predetermined.
        ii. The idea is if a safety tool works at a micro level, it may work at a macro level.
        iii. There is potential for a small investment to have large, tangible dividends.
6. Safety officials should be involved from the start of any project development process.
    a. Doing so would help to mitigate issues that tend to arise once safety is invited into a developing project, and eliminates the notion that safety is burdensome.
7. There should be an evaluation process for all employees.
    a. Employees should be evaluated on productivity and safety.
    b. There should be a 360 process to address issues found during evaluations (360 method is a good option).
8. Employees in all transit agencies should receive Occupational Safety and Health Administration (OSHA)-like training.
    a. OSHA-like training would involve advancing employee knowledge on the recognition, avoidance, and prevention of safety and health hazards in the workplace.
9. There should be a reward system for those who identify hazards or promote safety innovation.
    a. Celebrations or rewards for days without reported issues promote non-reporting. Money dedicated to group recognition should instead be distributed individuals who recognize long-overlooked hazards, voice safety initiatives that are adopted by the agency, etc.
    b. Agencies can recognize employees at meetings or in a bulletin with a simple "thank you" if they lack the financial resources or prefer not to hand out monetary awards.
        i. Helps to reaffirm the agency's appreciation for front-line employees, and shows the employees that the agency values their wellbeing.
10. There should be a best practices document that would allow agencies to look at their peers (similar agency size, mode, etc.) and learn about tools and processes that could benefit them.

11. Blame cultures should be avoided in all transit agencies. Systemic root-cause analytic approaches should be the pervasive model.
12. There should be documentation of “lessons learned” following an accident as a way for staff and junior staff to learn.

Appendix B: How Safety Culture Fits into SMS

Like other federal transportation agencies (e.g., FAA, FMCSA), FTA has undertaken a SMS approach in order to enhance transit safety. SMS seeks to advance safety by providing a proactive, systemic framework for identifying hazards and controlling risks while maintaining assurance that these risk controls are effective. The four basic components to SMS are: safety management policies and procedures, risk management, safety assurance, and safety promotion. While safety culture is present at some level in each of these basic components, it is primarily present in safety promotion. The safety promotion component of an effective SMS includes a combination of communication and training around safety in order to enhance employees' awareness and empower them to perform safety, which in turn promotes positive safety performance and awareness of safety issues in the organization.[32]Safety promotion not only supports an effective SMS, but a strong safety culture as well. "Safety Promotion has the wider meaning of how the safety concepts, philosophy, and culture of the organization are integrated into the way business is conducted in a visible, purposeful, and proactive manner.[32]" In essence, an effective SMS provides a basis for a strong culture of safety that impacts the entire organization.

Safety Culture and SMS

Organizations exist within socio-technical systems that are comprised of layers.[33] At the center is the individual, or the employee, and their work system and activities within that work system (the first layer). The middle layer is the socio-organizational context, which is comprised of the organizational structure, human resources, labor-management relations, and safety culture. The outside layer is the external environment, which is comprised of industry standards, the economic environment, demographic context, and safety regulations.

At each layer of the socio-technical system, there are processes in place in order to mitigate negative safety-related outcomes (e.g., accidents, injuries, incidences, near misses, fatalities, etc.). Defense against negative safety-related outcomes within an organization requires that at each layer of the system, there are overlapping and mutually supporting protective controls. Effective SMS and safety culture rely on controls at the environmental, organizational, technical, and people-based levels.[34] These control processes may consist of technical devices,

[32] American Public Transportation Association (APTA). (2016, March). Safety management system manual: Public passenger transportation systems. Retrieved from https://www.apta.com/resources/safetyandsecurity/Documents/3-15-16%20%20APTA%20Safety%20Management%20System%20Manual%20(without%20appendices).docx

[33] Carayon, P., Hancock, P., Leveson, N., Noy, I., Sznelwar, L., & van Hootegem, P. (2015). Advancing a sociotechnical systems approach to workplace safety – Developing the conceptual framework. *Ergonomics, 58*(4), 548-564.

[34] National Energy Board. Advancing Safety in the Oil and Gas Industry: Statement on Safety Culture.

personal protective equipment, system design, rules and procedures, and training and supervision. In sum, control processes refer to those environmental, organizational, technical, and people-based processes that are in place within an organization in order to mitigate negative safety-related outcomes (e.g., incidents, accidents, and fatalities).

When an organization's control processes are functioning at their optimal levels, negative safety-related outcomes are lessened. However, when organizational deficiencies develop, gaps are created, which weakens the safety system. Over time, these gaps, or vulnerabilities in the system, "may create an accident trajectory resulting in catastrophic losses."[30] However, lack of accidents are not a sufficient indicator that an organization's control processes are functioning effectively. It is the organization's safety culture that can mutually influence every layer within the organizational system, and help protect the organization against major ***and*** minor safety-related errors that can lead to catastrophic failures. Indeed, research has shown that organizations with more optimal safety culture have a lower rate of accidents, near misses and injuries, among other safety outcomes.[35]

As a risk control factor, labor-management safety committees should be established in all organizations. Within the transit industry, each mode has a safety committee, and these safety committees should help steer safety promotion, performance, and compliance at all levels of the organization. However, when failures occur in the safety system, or when there are changes to the safety system, these failures or changes should be independently validated and verified in order to ensure that the safety system is functioning at an optimal level or that changes implemented are indeed taking place and working. Furthermore, oversight agency committees should be independent to ensure that safety inspections are unbiased, which allows for the investigations to reach causes at the root level.

MS Pillar	Safety Culture Elements
Safety Policies and Procedures	Leadership commitment Role clarity Just Culture
Safety Risk Management	Prospective focus on risk Challenging key assumptions Flexible culture Safety as a priority Resiliency
Safety Assurance	Accountability Informed managers Communication and feedback Reporting culture Employee involvement and empowerment Continuous learning
Safety Promotion	Employee involvement and empowerment Leadership commitment Adequate training and resources Informed culture

[35] Grabowski, M., You, Z., Song, H., Wang, H., & Merrick, J.R. (2010). Sailing on Friday: Developing the link between safety culture and performance in safety-critical systems. *Systems, Man, and Cybernetics, Part A: Systems and Humans, IEEE Transactions on, 40*(2), 263-284.

Table 3: Safety Culture expressed within SMS 4 Pillar Model

Safety Policies and Procedures

The safety policy and procedures pillar defines roles, responsibilities, and relationships outlined in the organization's policies and procedures regarding safety. The safety culture elements of leadership commitment, role clarity, and just culture encompass the SMS pillar of safety policies and procedures. In order for this pillar to be a successful piece of SMS, it requires leadership commitment, which is often reflected in a policy statement. It also requires that the safety responsibilities of managers and employees at all levels of the organization are clearly defined, thus role clarity is essential for this pillar. Furthermore, to ensure compliance with policies and procedures, there must be a just culture. This is because a just culture emphasizes the distinction between acceptable and unacceptable behavior, especially with regards to safety.

Safety Risk Management

The safety risk management pillar is a formal process composed of describing the system, identifying hazards, assessing risk, analyzing risk, and controlling risk. The safety culture elements of prospective focus on risk, challenging key assumptions, flexible culture, safety as a priority, and resiliency comprise this pillar. The organization must be able to anticipate risks and hazards in order to better identify and implement mitigation strategies. Further, in the effort of continuous improvement, current risk control strategies must consistently be challenged in order for safety to continually improve. In addition, there must be a flexible culture, one in which employees are comfortable in breaking with the old ways in order to adopt new, more effective strategies regarding safety. And last but not least, safety needs to be a priority at all levels of the organization, and employees and the organization must be resilient. A strong safety culture is achieved despite failure, not by avoiding failure. Processes and procedures need to be designed with failure in mind, and employees should be able to perform their work safely even when failure occurs.

Safety Assurance

The safety assurance pillar is comprised of processes and procedures to ensure that the strategies developed through safety risk management are adequate and assurances that the organization's SMS is functioning effectively. The safety culture elements that embody the safety assurance pillar include: employee involvement and empowerment, accountability, informed managers, communication and feedback, reporting culture, and continuous learning. Employee involvement and empowerment is essential to the safety assurance pillar, as this involves the employee being comfortable in reporting safety concerns and having a role in enacting safety-related changes. This ties in with the reporting culture, as employees who provide information on safety close calls provide valuable safety performance data that drives continuous improvement and safety risk management and mitigation. Management must be informed on the safety policies and procedures, and everyone must be accountable for safety. This aids in the assurance that the SMS is functioning effectively.

Safety Promotion

The safety promotion pillar is comprised of the means, processes, and procedures that ensure employees are trained and competent to perform their work roles safely; and that communications between employees and management regarding safety issues are frequent and effective. The safety culture elements that encompass safety promotion include: employee empowerment and involvement, leadership commitment, adequate training and resources, and an informed culture. Employee empowerment and involvement occurs when employees feel supported by their organization, they are more motivated to behave in a safe manner and to embody the organizations safety-related policies and procedures and promote safety throughout the organization. Leadership commitment is necessary, as this signals to employees that safety is a top priority throughout the organization and helps to ensure that safety communications are frequent and timely. Adequate training and resources are essential to safety promotion as a trained personnel force is more likely to embody the safety policies and procedures that

are important to an organization. Furthermore, ongoing training signals to employees that the organization cares about safety. And last but not least, an informed culture of safety drives effective communications at all levels of the organization.

Appendix C: Adaptable, Valid, Reliable Measures of Safety Culture Facets

Transport Canada Safety Culture Checklist

Checklist for Assessing Safety Culture			
Scoring: YES = This is definitely the case in my organization (score 1); ? = "Don't know," "Maybe," or "Could be partially true," (Score 0.5); NO = This is definitely not the case in my organization (Score 0)	**YES**	**?**	**NO**
Mindful of Danger: Top managers are ever mindful of the human factors that can endanger their operations.			
Accept Setbacks: Top management accepts occasional setbacks and nasty surprises as inevitable. They anticipate that staff will make errors and train them to detect and recover from them.			
Committed: Top managers are genuinely committed to [transit] safety and provide adequate resources to serve this end.			
Regular Meetings: Safety-related issues are considered at high-level meetings on a regular basis, not just after some bad event.			
Events Reviewed: Past events are thoroughly reviewed at top-level meetings and the lessons learned are implemented as global reforms rather than local repairs.			
Improved Defense: After some mishap, the primary aim of top management is to identify the failed system defenses and improve them, rather than to seek to divert responsibility to particular individuals.			
Health Checks: Top management adopts a proactive stance toward safety. That is, it does some or all of the following: takes steps to identify recurrent error traps and remove them; strives to eliminate the workplace and organizational factors likely to provoke error; brainstorms new scenarios of failure; and conducts regular "health checks" on the organizational process known to contribute to mishaps.			
Institutional Factors Recognized: Top management recognizes that error-provoking institutional factors (under-staffing, inadequate equipment, inexperience, patchy training, bad human-machine interfaces, etc.) are easier to manage and correct than fleeting psychological states, such as distraction, inattention and forgetfulness.			
Data: It is understood that the effective management of safety, just like any other management process, depends critically on the collection, analysis and dissemination of relevant information.			
Vital Signs: Management recognizes the necessity of combining reactive outcome data (i.e., the near-miss and incident reporting system) with active process information. The latter entails far more than occasional audits. It involves the regular sampling of a variety of institutional parameters (scheduling, budgeting, fostering, procedures, defenses, training, etc.); identifying which of these vital signs are most in need of attention, and then carrying out remedial actions.			
Staff Attend Safety Meetings: Meetings relating to safety are attended by staff from a wide variety of departments and levels.			
Career Boost: Assignment to a safety-related function (quality or risk management) is seen as a fast-track appointment, not a dead end. Such functions are accorded appropriate status and salary.			
Money vs. Safety: It is appreciated that commercial goals and safety issues can come into conflict. Measures are in place to recognize and resolve such conflicts in an effective and transparent manner.			
Reporting Encouraged: Policies are in place to encourage everyone to raise safety-related issues (one of the defining characteristics of a pathological culture is that the			

messengers are “shot” and whistleblowers dismissed or discredited).			
Trust: The organization recognizes the critical dependence of a safety management system on the trust of the workforce – particularly in regard to reporting systems. A safe culture – that is, an informed culture – is the product of a reporting culture that, in turn, can only arise form a just culture.			
Qualified Indemnity: Policies relating to near-miss and incident reporting systems make clear the organization’s stance regarding qualified indemnity against sanctions, confidentiality, and the organizational separation of the data-collection department from those involved in disciplinary proceedings.			
Blame: Disciplinary policies are based on an agreed (i.e., negotiated) distinction between acceptable and unacceptable behavior. It is recognized by all staff that a small proportion of unsafe acts are indeed reckless and warrant sanctions but that the large majority of such acts should not attract punishment. The key determinant of blameworthiness is not so much the act itself – error or violation – as the nature of the behavior in which it was embedded. Did this behavior involve deliberate unwarranted risk-taking or a course of action likely to produce avoidable errors? If so, then the act would be culpable regardless of whether it was an error or a violation.			
Non-Technical Skills: Line management encourages their staff to acquire the mental (or non-technical) as well as the technical skills necessary to achieve safe and effective performance. Mental skills include anticipating errors and rehearsing the appropriate recoverable recoveries. Such mental preparation at both individual and organizational levels is one of the hallmarks of a high-reliability system and goes beyond routine simulator checks.			
Feedback: The organization has in place rapid, useful and intelligible feedback channels to communicate the lessons learned from both the reactive and proactive safety information systems. Throughout, the emphasis is upon generalizing these lessons to the system at large.			
Acknowledge Error: The organization has the will and the resources to acknowledge its errors, to apologize for them and to reassure the victims (or their relatives) that the lessons learned from such accidents will help to prevent their recurrence.			

Interpreting Your Score

16 – 20: So healthy as to be barely credible
11 – 15: You’re in good shape, but don’t forget to be uneasy
6 – 10: Not at all bad, but there’s still a long way to go
1 – 5: You are very vulnerable
0 : Jurassic Park

Safety Culture Survey Tool – American Short Line Railroad Association (ASLRRA)

Survey Constructs

Continuous Improvement: Organization engages in ongoing, iterative correction of safety issues.

- Example Items:
  - The [transit agency] seeks out better practices for safety
  - The [transit agency] compares its safety performance to industry standards and makes adjustments to improve safety

Coworker Safety/Helping Behaviors: Encouragement between coworkers to work safely and perform activities that go above and beyond workers' job requirements to benefit others, including the public.

- Example Items:
  - Employees expect other employees to behave safely
  - Employees in my department care about safety

Formal Safety Indicators: Organizationally instantiated procedures and systems for reporting and addressing both occupational and process safety hazards, including the following: a reward system that is perceived as fair and transparent by promoting safe behavior and discouraging or correcting unsafe behavior; accessibility, familiarity, and actual use of an organization's safety reporting system; and implementation of formal safety programs

- Example Items:
  - The safety reporting procedures are easy to use
  - When an employee reports a safety problem, it is corrected in a timely manner
  - Managers ensure disciplinary actions are appropriate, consistent, and support safety

Individual Safety Behaviors: Specific individual behaviors directly related to safety, including the following: Individual's willingness to exert effort to enact safety behaviors and the valence associated with those behaviors; adhering to safety procedures and carrying out work in a safe manner; willingness to help coworkers, promote the safety program within the workplace, demonstrate initiative, and put effort into improving safety in the workplace

- Example Items:
  - I carry out work in a safe manner
  - I regularly engage in efforts to improve the safety of my workplace
  - While working, I maintain awareness of my surroundings

Management Commitment to Safety: Employee perception that safety is important to management, including the following: Responsibility for safety programs and outcomes; feedback given to employees on how to improve safety and performance; management involvement in safety activities on a routine basis; communication with employees about safety procedures and safety issues; staffing levels that are adequate to meet work demands

- Example Items:
  - Managers routinely verify that communications on the importance of safety have been heard and understood
  - There is management and supervisory oversight of work activities, such that safety is supported
  - Managers make sure the staffing levels are consistent with the demands related to maintaining safety and reliability

Organizational Commitment to Safety: The degree to which an organization's senior leadership prioritizes safety in decision-making, and allocates adequate resources to safety management, including the following: Priority given to safety in the allocation of company resources even though they are not required by regulations; organization fosters a climate where employees are treated with dignity and respect; compliance with regulated aspects of safety such as training requirements, manuals and procedures, equipment maintenance, and the coordination of

activity within and between teams/units; and attitudes and values expressed in words and actions by leadership regarding safety – reflects commitment to safety at the top levels of the organization

- Example Items:
  - Safety is a core value at my [transit agency]
  - Checklists and procedures are easy to understand
  - Employees at all levels of the [transit agency] treat each other with dignity and respect

Risk Taking Behavior: Engaging in behaviors that could increase risk of accidents and injury (negative)

- Example Items:
  - I have to break rules in order to get the job done
  - I don't have time to follow the safety rules

Safety Communication: Communications (e.g., media, safety board) maintain a focus on safety

- Example Item:
  - Safety communications to employees are timely, frequent, and accurate

Training Quality: Formal safety training provided by the company

- Example Item:
  - Employees receive adequate, ongoing training to work safely

Scoring Scheme

All items are assessed on along 5-point Likert scale ranging from *1* (strongly disagree) to *5* (strongly agree). Scale scores are calculated by taking the average or mean. Some items are reverse-coded.

Parker et al. (2006) Safety Culture Scale[18]

Pathological	Reactive	Calculative	Proactive	Generative
Benchmarking, trends and statistics.				
Compliance with statutory HSE reporting requirements, but little more. Benchmarking only on finance and production.	Try to respond as other companies do, and worry about the cost of accidents, and their placing in the "safety league". Statistics report the immediate causes of accidents.	Benchmark on incidents and accidents. Display lots of data publicly throughout the organization. Focus on current problems that can be measured objectively and summarized numerically.	Benchmark against others in same industry, driven by management. Try to be the best in the industry. Look for trends, understand them and use them to adapt strategy. Explain findings to supervisors.	Benchmark outside the industry, using both "hard" and "soft" measures. Involve all levels of the organization in identifying action points for improvement.
Audits and reviews.				
Unwilling compliance with statutory inspection requirements. Audits are mainly financial. HSE audits are unstructured, and only after major accidents.	Accept being audited as inescapable, especially after serious or fatal accidents. No schedule for audits and reviews, as they are seen as a punishment.	There is a regular, scheduled audit program. It concentrates on known high hazard areas. Happy to audit others, but being audited is less welcome. Audits are structured in terms of management systems.	Extensive audit program including cross-auditing within the organization. Management and supervisors realize that they are biased and welcome outside help. Audits are seen as positive, if painful.	Full audit system running smoothly with good follow up. Continuous informal search for non-obvious problems with outside help when needed. There are fewer audits of hardware and systems, and more at the level of behaviors.
Incident/accident reporting, investigation and analysis.				
Many incidents are not reported. Investigation only takes place after a serious accident. Analyses don't consider human factors or go beyond legal requirements. Protect the company and its profits.	There is an informal reporting system and investigation is aimed only at immediate causes, with a paper trail to show an investigation has taken place. Investigation focuses on finding guilty parties. There is little systematic follow up and previous similar events are not considered.	There are procedures producing lots of data and action items, but opportunities to address the real issues are often missed. The search for causes is usually restricted to the level of the local workforce.	There are trained investigators, with systematic follow-up to check that change has occurred and been maintained. Reports are sent company-wide to share information and lessons learned. There is little creativity in imagining how the real underlying issues could affect the business.	Investigation and analysis driven by a deep understanding of how accidents happen. Real issues identified by aggregating information from a wide range of accidents. Follow up is systematic, to check that change occurs and is maintained.

Hazard and unsafe act reports.				
There are no reports.	Reporting is simple and factual. Focus is on determining who or what caused the situation. The company does not track actions after reports.	Reports follow a fixed formal for categorization and documentation of observations. Number of reports is what counts. The company requires complete forms without blanks.	Reporting looks for "why" rather than just "what" or "when". Quick submission of reports is appreciated, and blanks in forms can be filled in later. Management sets reporting goals.	All levels actively access and use the information generated by reports in their daily work.
Work planning including PTW. Journey Management				
There is no HSE planning and little planning overall. What work planning there is concentrates on the quickest, fastest and cheapest execution.	HSE planning is based on what went wrong in the past. There is an informal general planning process, based primarily on managing the time taken for a job.	There is a lot of emphasis on hazard analysis and Permit to Work. There is little use of feedback to improve planning, but people believe that the system is good and will prevent accidents.	Planning is standard practice, with work and HSE integrated in the plan. Plans are followed through and there is some evaluation of effectiveness by supervisors and line management.	There is a polished planning process with both anticipation of problems and review of the process. Employees are trusted to do most planning. There is less paper, more thinking, and the process is well known and disseminated.
Contractor management.				
Get the job done with minimum effort and expense.	The company only pays attention to HSE issues in contracting companies after an accident. The primary selection criteria is price, but only poor safety performance has consequences for choice of contractors.	Contractors meet extensive pre-qualification requirements, based on questionnaires and statistics. HSE standards are lowered if no contractor meets requirements. Contractors have to get up to speed on their own.	HSE issues are seen as a partnership. Pre-qualification is on the basis of proof that there is a working HSE-management system. Joint company-contractor safety efforts are observed and the company helps with contractor training.	No compromises to work quality. Find solutions together with contractors to achieve expectations even if this means postponing the job until requirements are met.

Competency/training - are workers interested?				
Training is seen as a necessary evil. Attend training when it is compulsory by law. Workers don't mind exchanging a harsh working environment for a couple of hours training off the job.	Training is aimed at the person-"If we can change their attitude everything will be all right." After an accident money is made available for specific training programs. The training effort diminishes over time.	Competence matrices are present and lots of standard training courses are given. Acquired course knowledge is tested. There is some on-the-job transfer of training.	Leadership fully acknowledges the importance of tested skills on the job. The workforce is proud to demonstrate their skills in on-the-job assessment. Training needs start to be identified by the workforce.	Issues like attitudes become as important as knowledge and skills. Development is seen as a process rather than an event. Needs are identified and methods of acquiring skills are proposed by the workforce, who are an integral part of the process rather than just passive receivers.
Work-site job safety techniques				
There are no techniques applied. Look out for yourself.	After accidents a standard work-size hazard management technique is brought in, but there is little systematic use after initial introduction.	A commercially available technique is introduced to meet the requirements of the management system, but leads to little action. Quotas are used to demonstrate that the system is working. Nothing else is used.	Job safety analysis/job safety observation techniques are accepted by the workforce as being in their own interest and they regard such methods as standard practice.	Job safety analysis, as a work-site hazard management technique, is revised regularly in a defined process. People (both workers and supervisors) are not afraid to tell each other about hazards.
Who checks safety on a day-to-day basis?				
There is no formal system, so individuals take care of themselves as they see fit.	External inspectors check sites after major incidents. Cursory site checks are performed by line supervision/management when they are visiting, mostly after incidents or inefficiencies. There is no formal system for follow up.	Site activities are regularly checked by the line management, but not on a daily basis. Inspections aim at compliance with procedures.	Supervisors encourage work teams to check safety for themselves. Managers doing walk-rounds are seen as sincere. They engage employees in dialogue. Internal cross-audits take place, involving managers and supervisors.	Everyone checks for hazards, looking out for themselves and their work-mates. Supervisor inspections are largely unnecessary. There is no problem demanding shutdowns of operations.

What is the size/status of the HSE department?				
If there is a department, it consists of one person or a small staff in the HR department.	The department is small and has no power. It is seen as a career backwater, and once in it is hard to get out. The staff is on call constantly, but usually very much in the background. The department is seen as a police force.	HSE positions are given to middle management with good backgrounds who can't be placed elsewhere. It is a large department with some status and power, mainly performing number crunching and sending people on training courses. The HSE manager reports to someone in a position of operational authority.	HSE is seen as an important job, given to high fliers. HSE professionals are recruited directly and advisors are appreciated by the line. All senior people in operations must have HSE experience. The HSE manager reports to the top management of the company.	There may not be an HSE department because it is not needed, as the safety culture is right. HSE responsibilities are distributed throughout the company. If there is a department it is small but powerful, having equal status with other departments.
What are the rewards of good safety performance?				
None is given or expected - staying alive is reward enough. There are only punishments for failure.	There are disincentives for poor HSE performance. The understanding that positive behavior can be rewarded has not yet arrived. Managers' bonuses tied to LTI performance.	Some lip service is paid to good safety performance. Safety awards such as T-shirts or baseball hats are made. There are safety competitions and quizzes. TRCF is used when calculating bonuses.	There are some rewards and good performance is considered in promotional reviews. Evaluation is process-based rather than on outcomes.	Recognition itself seen as high value. Good HSE performance is intrinsically motivating.

Appendix D: Best Practice Examples on Labor-Management Safety Committees

New York City (NYC) Transit Example

Goals and Objectives

Identify and address local safety concerns at various work locations.

Committee Structure

Labor-management safety committee shall include:

- The responsibility center head or designee (joint chair)
- Designated Union representative (joint chair)
- Additional personnel may attend for the purpose of providing support or information update to the proceedings of the meeting

Responsibilities

Labor-management safety committees are responsible for:

- Conducting local safety committee meetings each month. Once schedules for such meetings are established, each committee member is responsible for adhering to the set schedule. Schedules should be set for a consistent date each month (i.e., 1st or 2nd Tuesday or Wednesday of the month, etc.). Cancelled meetings shall be rescheduled for the same month unless otherwise agreed to by each committee member. Committee members who are unable to attend should notify the management representative at least two hours before the scheduled start.
- Pre-meeting covering the following:
    - Reviewing the tracking database which serves as the minutes of the last safety meeting.
    - Reviewing each On the Job Injury (all accidents) for the past month.
    - Reviewing trends from STOP, facility safety inspections, etc. as presented by management or Union representatives.
    - Introducing new safety items.

Note: Safety Committee members are encouraged to address Operational issues in the course of day-to-day operations.

- Performing a safety walk-around (inspection).
    - Wearing the required personal protective equipment (PPE) during the safety inspection.
- Meeting after the safety inspection to discuss observations/findings of inspections.
- Recording safety items on a tracking database and assigning a priority6 number and responsible party to each item by the management representative. The management representative will share the draft minutes with the designated union representative and seek written comments prior to issuing the minutes. The written comments shall be provided within two (2) workdays, the absence thereof will indicate concurrence.

Note: All items should be listed/logged even if there are disagreements and the reason for the disagreement should be noted.

- Conducting periodic inspection of items in the tracking database by the responsible party for identifying (if unable to correct immediately) and reporting prior to each meeting. ***Do not wait for the monthly meeting to review documented safety issues.***
- Faxing the tracking database (minutes of the meeting) to be accomplished by the management representative within 5 business days of meeting to the Division/Department Head, the Office of System Safety (OSS), to the Director of Safety and Health, Transport Workers Union (TWU), Local 100, the Union Divisional Head or other designated union representative, and to each committee member and attendee. The sign in sheet indicating the attendees must be attached to the minutes.
- Faxing significant items to the divisional safety committee or the departmental safety committee if divisional committees do not exist.

NYC Transit – Transit Workers Union (TWU) 100 Contractual Language

SECTION 1.9 - SAFETY COMMITTEE

A. The Authorities agree to continue to provide adequate, clean, safe and sanitary working conditions, in conformance with the minimum standards of applicable law.

B. The Authority will give consideration to the feasibility of conducting a training session for the Union's Safety Representatives and the appropriate supervisors and managers.

At this training session, the Safety Representatives will be instructed to follow the contractual safety procedure; and to refer perceived safety violations to the attention of the Union's Safety Office and the appropriate managers at the location of the perceived violation.

C. The joint TA/TWU and OA/TWU Safety Committees shall be continued. The Committees shall have as their objective the continuation and improvement of practices designed to ensure safe working practices and conditions in the operation and maintenance of the facilities of the Authorities. The committee shall operate according to the following procedures:

l) Local Safety Committee
At the local level, the designated Union representative employed by the department at that location shall meet monthly with the responsibility center head to discuss safety issues of mutual concern with no loss of pay to the Union representative. Either member of the Local Safety Committee may place items on the agenda for the monthly meeting. Written minutes of these meetings shall be kept and copies sent to System Safety, the department head and the TWU Director of Safety.

2) Departmental Safety Committee
Issues unresolved by the Local Safety Committee may be referred in writing, as required, to a Departmental Safety Committee composed of the department head and the corresponding TWU Vice President. The committee shall meet within forty-eight (48) hours (two work days) of receipt of a written request to discuss such unresolved issues.

3) Senior Labor-Management Safety Committee
Issues unresolved by the Departmental Safety Committee may be referred in writing, as required, to the Senior Labor-Management Safety Committee. The Committee shall be composed of the Authorities'

Assistant Vice President, System Safety, and the TWU Director of Safety. The committee shall convene within forty-eight (48) hours (two work days) of receipt of the request for a meeting.

4) Presidential Review
Where the Senior Labor-Management Committee has been unable to resolve the safety concern submitted to it, the issue may be given directly to the Presidents of the Authorities and the Union for discussion and possible resolution.

5) Emergency Safety Issues
In emergencies, relevant Authority Senior Management will meet their counterparts from the Union (TWU Vice Presidents) to investigate emergency situations, day or night, and attempt to correct problems where possible. If not possible, the issue will be advanced to the Senior Labor-Management Safety Committee for review. The parties agree that where a resolution is not achieved after the Senior Labor-Management Safety Committee meeting, an expedited arbitration will be requested.

6) TWU Safety Committee
Five (5) representatives of the Union's choice may be released with pay for the purpose of prioritizing the Union's safety concerns which do not lend themselves to immediate resolution. These suggested priorities shall be forwarded to the Senior Labor-Management Safety Committee which shall review the suggested priorities and develop an action plan, if and as appropriate, for dealing with these concerns.

The five (5) full time safety union representatives will be provided the two (2) day Dupont Safety Training currently provided to managers and supervisors.

7) This procedure has been agreed to in order to facilitate the resolution of safety concerns and shall not be construed to waive the existing contractual or legal rights or either party.

Southeastern Pennsylvania Transportation Authority (SEPTA) Example

Goals and Objectives

Address safety and loss control issues unique to a specific work location and/or operating environment. The labor-management safety committee (i.e., Location Safety Committee) should:

- Promote safety and health for all employees at the location.
- Proactively identify safety, health, and environmental hazards and then recommend remedial controls thereto.
- Facilitate employee conformance to applicable safety regulations, programs, and/or procedures.
- Investigate and evaluate all injury causing accidents to retroactively identify cause/hazards and recommend remedial action to prevent recurrence.
- Periodically inspect the facility, vehicles, and/or operation and promptly report and correct the identified hazards.
- Promote proactive participation by all employees in the safety and loss prevention process.

Committee Structure

The Director at a location shall establish a working team of employees to serve as labor-management committee members (i.e., Location Safety Committee Members). At a minimum, the labor-management safety committee shall include a minimum of:

- One manager
- One rank-and-file (i.e., front-line) representative selected by the union
- One infrastructure maintenance representative

Responsibilities

Labor-management safety committees (i.e., Location Safety Committees) are responsible for:

- Meetings
    - Each month, the committee shall meet to:
        - Discuss safety-related matters
        - Evaluate accidents/injuries pertinent to the location/operation
        - Discuss safety and health related issues that have been provided by location employees
    - The meeting date shall be established by the committee and, to the extent possible, should be held on the same day and time each month
    - The Director shall ensure that all committee members are given time away from their primary work responsibility to participate in meetings
    - The committee shall identify an individual to serve as Committee Chairperson and an individual to serve as recording Secretary
    - Each meeting shall have an agenda that is published at least one week prior to the next meeting and shall include, but not be limited to the following:
        - New Business – newly identified safety concerns raised by the employee population
        - Old Business – previously identified concerns that are still being resolved
        - A general discussion of the accidents or injuries realized at the location and a discussion to identify some strategies for reducing if not eliminating the hazards contributing to the accidents/injuries
        - Unresolved items that may need to be forwarded to the Joint Health & Safety Committee
    - Publish meeting minutes and at a minimum, distribute to:
        - Committee members
        - The System Safety Liaison
        - The Director of System Safety
    - Ensure all employees have access to meeting minutes
- Periodic Inspections
    - When practical, members of the committee should periodically conduct workplace inspections
        - Identify hazards, safety concerns, or lack of compliance with existing safety programs and practices

    - Inspection process and identification and/or mitigation of hazards should be documented
        - May use safety checklists and protocols
    - Copies should be kept in accordance with records retention policy
- Accident/Injury Trending
    - The Committee should evaluate the general details of their workplace accidents/injuries to determine if there are any trends/triggers contributing to the incidents
    - The Committee should work to address identified hazards/issues
- Additional functions/responsibilities
    - The Committee should promote safety and health initiatives
    - Each member of the Committee must be willing to provide guidance to other employees when they observe safety practices not being adhered to

SEPTA – TWU 234 Contractual Language

The Authority and the Union will continue to develop and implement a comprehensive health and safety program, including at a minimum, the Joint and Location Health and Safety Committees, hazard identification and correction procedures, employee training and education, and safety awards and rewards programs; and under the policy direction of the Joint Health and Safety Committee, Workers' Compensation and accident/personal injury claims cost containment programs.

The following provisions regarding the JHSC and LSCs shall govern the establishment, operation and duties of such committees which shall act jointly for all three divisions of the Authority (CTD, Frontier and Victory) represented by Local 234. The provisions regarding safety incentive programs similarly shall govern the rights and entitlements of employees in all three of the same divisions on a joint basis.

I. Joint Health and Safety Committee (JHSC)

A. There shall be an Authority and Union Joint Health and Safety Committee. Each party shall appoint a Co-Chair for the Committee. The President of the Union may appoint at least two (2) staff members, plus five (5) rank-and-file employee members. All members should have prior experience as a Location Safety Committee member as well as knowledge, familiarity, and experience in the operating environment. Members must have demonstrated a good record in attendance, discipline, safety, and accident prevention. The Union's Chairperson shall be responsible for overseeing the Union's commitment to the Committee. The Chief Officer of Safety and Risk Management will serve as the Authority's Co- Chair. Permanent Authority members of the Committee will also include the Chief Bus Operations Officer, the Chief Subway/Light Rail Operations Officer, the Chief Engineer, and the Director/Assistant Director of System Safety. Representatives of System Safety, Workers' Compensation, Claims, Medical and other departments will attend as required by issues scheduled on the agenda.

B. The functions of the Joint Health and Safety Committee will be as follows:

1. Establish mutual goals to reduce health hazards in the workplace, occupational injuries, vehicle accidents, and passenger claims.
2. Working pursuant to the policy direction of the Joint Labor- Management Accident Reduction Committee, establish pro-active programs with employees to:

(a) Keep the maximum number of employees injury-free and productive.
(b) Reduce the number and severity of accidents.
(c) Insure employees receive prompt and complete medical attention and follow-up.
(d) Return injured employees to full duty as soon as possible.

3. Conduct annual training of new location safety committee members to ensure familiarity with processes, procedures and current issues.
4. Conduct periodic evaluations to assess progress toward committee goals and develop means to evaluate Location Safety Committee performance.
5. Make periodic inspections of Authority vehicles and/or facilities in accordance with Authority rules and regulations, and promptly report hazardous conditions.
6. Provide guidance, direction and support to the Location Safety Committees, and work to resolve complaints they are unable to resolve.

C. Joint Health and Safety Committee meetings will be scheduled at least once a month. Seven (7) days prior to the monthly meeting, the Co-Chairs of the Committee shall exchange a written agenda or list of items to be discussed at the meeting. The minutes as reported by the Authority will address items discussed by the parties at the meeting.

D. The Authority agrees to share with the Union accident and injury statistics, final reports on accidents, workplace environmental test results, and reasonable requests for information related to agenda items that are legitimate subjects for discussion at Joint Health and Safety Committee meetings, provided this information is not privileged information, i.e., restricted under doctor/patient or lawyer/client relationships.

E. The Authority will pay each Union committee member at his/her regular rate of pay, the equivalent of one (1) eight (8) hour day per month, for their attendance at the Joint Health and Safety Committee meeting and for performing safety-related work assigned to them by the Union.

F. As part of the Joint Health and Safety Program, the Authority will make forms available to all employees to report safety hazards in the workplace. Such forms will be placed at locations determined by the Joint Health and Safety Committee and location committees.

G. The Committee recognizes that under certain circumstances, the presence of employees who are not regular members of the Committee would be useful in the Committee's deliberations. The invitee(s) will be mutually agreed to by the Co-Chairs and such requests will be made a minimum of seven (7) days prior to a scheduled meeting.

H. Proposed changes or additions to the Joint Health and Safety Program must be submitted to the Joint Health and Safety Committee for review and approval.

II. Location Health and Safety Committees (LSCs)

A. Location Health and Safety Committees (LSC) will be established at designated Authority locations. The number of Union personnel assigned to each
LSC will be determined by the following formula: (1) Transportation: one (1) member for every one hundred (100) authorized heads, or portion thereof, at the location, and (2) Maintenance: one (1) member for every fifty (50) authorized heads, or portion thereof, at the location, provided that there be

a minimum of two (2) union representatives on each LSC, or a minimum of three (3) in locations with more than 100 employees. The Union may determine the mix of maintenance and transportation representatives on each LSC, provided that there shall be at least one (1) Maintenance representative on each LSC for locations with at least fifty (50) authorized Maintenance heads and at least one (1) Transportation representative on each LSC for locations with at least one-hundred (100) authorized Transportation heads. Management will be represented at LSC meetings by the Director or Assistant Director of Transportation, the Director or Assistant Director of Maintenance, and the Buildings Foreman, or their respective equivalents. Committee meetings will be held once per month, with an agenda composed of safety and accident reduction topics. Committee meetings will be held monthly and will be chaired by a facilitator chosen by the Location Safety Committee. Any change to the structure of the committee must be agreed upon by the Co-Chairs of the Joint Health and Safety Committee.

B. Location Health and Safety Committees are advocates for improved safety and health conditions and workers' compensation and accident/personal injury claims cost containment in their locations. The functions/goals of the Location Health and Safety Committees under the direction of the Joint Health and Safety Committee will include:

1. Setting goals and developing programs to reduce workers' compensation claims and liabilities as well as accidents and personal injury claims.
2. Identifying, evaluating and recommending controls for safety and health hazards in the workplace.
3. Promoting safety and health education in the location.
4. Making periodic inspections of facilities and/or vehicles in accordance with Authority rules and regulations and promptly reporting hazardous conditions.
5. Making recommendations for employee safety and health training programs.
6. Assisting management by ensuring compliance with safety procedures such as Personal Protective Equipment (PPE) which are applicable to that particular location committee.
7. Involving pro-active participation by the Union in all of the above.

C. Rank-and-file members of the Location Health and Safety Committees are selected by the Union from a list of volunteers solicited jointly. When selecting committee members, the Union will consider the employee's safety, discipline, attendance, and accident history/record. Members should have knowledge, familiarity and experience in the operating environment. The Authority agrees to pay Union rank and file members to attend location committee meetings at their regular rate of pay, for one meeting per month. Periodically, additional assignments may be made or meetings held by the Location Safety Committee, provided that the responsible JHSC co-chairs mutually agree.

D. Periodic meetings between the Joint Health and Safety Committee and a representative of each Location Health and Safety Committee to guide, train, identify problems and evaluate the performance of the location committees will be scheduled by mutual agreement of the Co-Chairs of the Joint Health and Safety Committee.

Appendix E: Metropolitan Atlanta Rapid Transit Authority (MARTA) Employee Reporting Example

B. Safety Hazard Notification & Escalation Process

The following steps outline the Safety Hazard Notification & Escalation Process. This process ensures that all the safety hazards are captured, documented, and actions for resolution are tracked. Adherence to this process is mandatory for all represented and non-represented employees, and contractors.

IMPORTANT: Imminent hazards (life threatening, could cause serious injury or mishap) that cannot be resolved must be reported to the office director, Department of Safety and Quality Assurance, ATU full-time officers and JHSC committee officers immediately.

Any employee who has the authority and ability to abate and/or resolve a hazard should do so until the issue is fully resolved.

1. To report an unsafe hazard or condition, any employee must complete a Safety 1st Report. A copy of the Safety 1st Report is submitted to their immediate supervisor.

NOTE: Any employee discovering an unsafe condition is expected to eliminate the situation if it is safe for them to do so within their authorization to act. For example: picking up an object (trip hazard) in a walkway or closing an unattended file drawer.

Any MARTA employee (represented or non-represented) or contractors may submit a Safety 1st Report.

   - Employees who wish to remain anonymous must submit their concerns through a third party, such as a supervisor, union officer, or Department of Safety and Quality Assurance representative.
   - Reprisals shall not be taken against any employee for submitting a Safety 1st Report. Employees are encouraged to include names to ensure open communications regarding the results of the corrective actions.
2. The supervisor or ATU representative (recipient of the completed Safety 1st Report) reviews the Safety 1st Report and provides the employee with a signed copy to acknowledge receipt, and discusses the details and seriousness of the reported hazard. The supervisor or ATU representative who received the Safety 1st Report forwards copies of the report to their general superintendent, manager, director, the Department of Safety and Quality Assurance, ATU full-time officers and JHSC committee officers.
3. The supervisor (or recipient) receiving the report shall promptly investigate the situation and take appropriate action as prioritized here:
   - Assess the seriousness of the situation (life threatening, could cause injury, could cause a mishap, non-hazardous);
   - Remove persons at risk of death or injury;
   - Isolate, guard, or place warnings (lock-out/tag out);
   - Notify their immediate supervisor, dispatcher, communications center, or superintendent;

- Document all actions taken and communicate status back to the employee who reported the hazard.
- If upon investigation of the Safety 1st Report, the supervisor receiving the report determines that no hazard is found to exist, the reply shall include the basis for the determination of no hazard. If the employee is not satisfied with the response, they have three (3) calendar days to request that the supervisor escalate the issue to the Director (the supervisor must consult with his/her manager before developing a response to the Safety 1st Report).
- If the director, after discussion with the employee and the supervisor about the issue, also determines that the issue is not a hazard the employee then may use the Appeal Process.

4. If after taking appropriate action, the hazard is truly removed, the supervisor receiving the Safety 1st Report shall complete the report and discuss the results of the investigation and corrective actions taken with the employee who reported the hazard within five (5) calendar days.
5. The supervisor shall submit the completed Safety 1st Report to their general superintendent, manager, director, Department of Safety and Quality Assurance, ATU full-time officers, JHSC committee officers, and Shop/Unit Safety Committee. Safety 1st Reports, whether addressed immediately or as an open issue, should be attached to the Shop/Unit Safety Committee meeting minutes and forwarded to the MARTA Department of Safety and Quality Assurance as per the Safety Committee Communication Process.
6. If after taking appropriate action, the hazard is NOT removed, supervisors receiving the Safety 1st Report shall submit a status report to their general superintendents, manager, director, the Department of Safety and Quality Assurance, ATU full-time officers, and JHSC committee officers, no later than five (5) calendar days after receiving the report.
7. If the hazard remains unresolved, the Safety 1st Report shall be escalated to the director, immediately. The Department of Safety and Quality Assurance, ATU full-time officers, and the JHSC committee officers will be copied.
8. The director has five (5) calendar days to develop and present an action plan and/or a specific timeline for resolving the issue. The director will notify the AGM (or if no AGM; the DGM or CBSS), Department of Safety and Quality Assurance, General Safety Committee, JHSC co-chairs and all full-time ATU officers of the plan and corrective action status.
9. Within five (5) calendar days of notification to the JHSC, the co-chairs of the JHSC will assign, if needed, members of the JHSC (1 MARTA, 1 ATU) to evaluate the plan and corrective action status as reported by the director.
10. If the JHSC determines that the proposed corrective action and schedule for implementation is inadequate, the unsafe condition will be referred to the DGM/CBSS and ATU full-time officers for review.
11. All items referred to the DGM/CBSS and ATU full-time officers shall be reported on at the GM/CEO Safety Committee meeting to review the hazard, corrective action proposed, schedule, and status.
12. Final resolution results will be reported to the employee who reported the hazard, ATU full-time officers and JHSC as part of the monthly meetings and recorded in the minutes of the meeting.

Minutes are forwarded as per the Safety Committee Communication Process to all Safety Committees.

C. Appeals

If the originator of the Safety 1st Report is dissatisfied with the action taken or the response, concerns should be discussed with management and the JHSC. Further appeals can be made to the Department of Safety and Quality Assurance who will assist in presenting the issue to the JHSC.

The AGM of Safety and Quality Assurance shall document the following;

- A description of the alleged hazard including its location and standards violated, if known. A copy of the Safety 1st Report shall suffice.
- How, when, and to whom the original report was submitted.
- What actions (if known) were taken as a result of the original report.

The AGM of Safety and Quality Assurance will determine a course of action with responsible management working with the JHSC, and the ATU full-time officers.

The AGM of Safety and Quality Assurance shall respond to the originator of the appeal within 10 calendar days.

The JHSC will be briefed by a Department of Safety and Quality Assurance representative of all appeals and their status at each JHSC meeting.

Appendix F: Acronyms

FAST Act – Fixing America's Surface Transportation

FMCSA – Federal Motor Carrier Safety Administration

FRA – Federal Railroad Administration

FTA – Federal Transit Administration

HRO – High Reliability Organization

INSAG – International Nuclear Safety Advisory Group

NPTSP – National Public Transportation Safety Plan

NTSB – National Transportation Safety Board

RTA – Rail Transit Agency

SEPTA – Southeastern Pennsylvania Transportation Authority

SME – Subject Matter Expert

SMS – Safety Management System

SSO – State Safety Oversight

TCRP – Transit Cooperative Research Program

TRACS – Transit Advisory Committee for Safety

TWU – Transit Workers Union

WMATA – Washington Metro Area Transit Authority