



TSSCP

Advancing a Transit Strategic Safety Culture Paradigm

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THE TRANSIT STRATEGIC SAFETY CULTURE PARADIGM (TSSCP) is a tool designed to enhance the safety culture process in the U.S. transit industry by developing and implementing a sustainable safety culture to reduce incidents, improve service delivery, and enhance quality of life for customers and employees. Based on the Asian railway model of safety excellence, this model is a unique approach to establishing a sustainable safety culture in the transit industry that currently does not exist. It is also reflective of Deming's total quality management (TQM) process, which originated in Japan in 1954 and was introduced to the U.S. industrial sector as the 14 points TQM during 1960 and 1970 (Deming, 2017).

The need for an innovative safety model in the transit industry that ensures passenger and employee safety is long overdue. Advancing TSSCP provides a road map for developing and implementing a sustainable safety culture in the transit industry. This model advances a critical new way of thinking, conceptualizing and operationalizing a culture of safety that is thought to be far more important than safety climate regarding safety values, behaviors and attitudes of employees in reducing incidents (Zohar, 1980).

To reduce incidents in the transit industry and address serious inadequate leadership and human concerns, leaders must

KEY TAKEAWAYS

- This article discusses the transit strategic safety culture paradigm (TSSCP), a tool designed to enhance safety culture process in the U.S. transit industry.

- The model is based on the Asian railway model of safety excellence, an approach to establishing a sustainable safety culture in the transit industry.

- The article discusses transit safety culture, and outlines factors of TSSCP such as design, the role of leadership, guiding principles, training, employee engagement, workforce development and diversity, and strategy.

focus on a model that builds a strong, vibrant safety culture within the transit community. Transit leaders must engage all ranks of employees, contractors, labor management, politicians, citizens and all who share a common vision of safe and efficient operations of service delivery. Everyone must work toward zero incidents, fatalities and injuries by reducing incident rates along with addressing entrenched and systemic disregard for the two most critical components of a safety culture: customers and employees.

There are sound economic, legal, moral and ethical reasons

for reducing work-related incidents, as well as ethical, regulatory and humane concerns. Developing a strong safety culture holds tremendous potential for the transit industry because the benefits can result in a permanent reduction in incidents and a change in values and feelings that will be realized and measured by transit leadership, management and other stakeholders. Additional benefits include enhanced organizational performance by energizing and motivating employees, unifying stakeholders around shared goals, a higher mission and reshaping employees' behavior so that actions are aligned with strategic priorities (Daft, 2007).

Transit leaders must move beyond the position of viewing incidents as another unfortunate mishap or the cost of doing business in operations. They must be proactive, not reactive. They must draw on their courage and dedication to help the industry tap the potential of a TSSCP model and make safety a priority.

To describe TSSCP in detail, this article examines:

- defining transit safety culture;
- U.S. transit safety culture;
- the Asian railway model of safety excellence;
- TSSCP factors;
- TSSCP safety culture design;
- the role of senior leadership within TSSCP;
- transit mission, vision and guiding principles;
- education training and development within TSSCP;
- employee engagement;
- workforce development and diversity;
- TSSCP strategy.

A summary and discussion of prospective future implications emphasize the vital importance of TSSCP now and into the future.

Defining Transit Safety Culture

Transit as related to TSSCP is defined as those systems that operate under Federal Transit Administration regulation (previously 49 CFR Part 659; currently 49 CFR Part 673 and 674). These systems operate largely in urban communities with frequent stops (Note: the regulation governs rail transit).

How do we define a transit safety culture? It has been argued theoretically that every system has a safety culture, no matter how good, bad or indifferent that culture might be (Galloway, 2015). Literature also states that many leaders and safety professionals believe they have a strong safety culture when in fact

they have nothing more than a safety climate consisting largely of plans, policies and procedures. A safety culture operates at a much higher level than a safety climate (Zohar, 1980).

However, unlike the nuclear industry and other high-risk systems that have a defined safety culture, the transit industry has yet to define a transit safety culture. A Transit Cooperative Research Program (TCRP) report states:

Since little has been written about the role of safety culture in public transportation, the research team relied heavily on the literature of the theory of safety culture and its application to aviation, nuclear power operations, natural resource extraction and related fields. Early accident investigations and discussions of safety science mostly focused on technical failures and human error. There were a few studies that focused on organizational and social factors. For example, Turner (1978) used accident case studies to produce a theory of socio-technical accidents that examined such causes. (National Academies of Sciences, Engineering and Medicine, 2015)

This TCRP report finds that safety culture is complex and multidimensional, and that many theoretical models of safety culture exist (e.g., Westrum, Reason, Hudson, Guldenmund, Cooper). Of these models, two are of particular interest to the public transportation industry (National Academies of Sciences, Engineering and Medicine, 2015):

1) Reason's safety culture model: The most elaborate and sophisticated of these models is the Reason model, which is grounded in Reason's practical experience. It is this model that the research team believes has the most general application to the public transportation industry.

2) High-reliability organization (HRO) model: The research team believes that larger transit authorities operating heavy rail should consider adoption of the HRO model normally employed in high-risk industries such as aviation, nuclear operations and offshore petroleum operations. Two subway trains operating under communications-based train control at rush hour in the tunnels of New York City carry up to 5,000 passengers. The results of a head-on collision due to a communications-based train control failure and a subsequent fire at rush hour would lead to a total number of casualties that would exceed most high-risk industry incidents and could cripple all transportation within New York City for weeks.

The author agrees with the research finding that transit safety culture is complex and multidimensional. Accordingly, Schein (2004) states, "1) culture is deep and not to be taken lightly; 2) leaders need to manage culture or the culture will manage the leaders; and 3) culture is socially learned." Transit leaders and safety professionals must understand that the development of a transit safety culture is a large process that must be digested one bite at a time.

The TCRP report is subject to challenge. Based on the author's experience, HRO would be the most effective model for TSSCP implementation. First, transit is an unforgiving environment. The development and implementation of a sustainable transit safety culture must begin with knowing the transit environment and the many hazards and dangers employees encounter daily.

For example, transit employees often work near railway electrification systems, such as a third rail or an overhead catenary, or perform track inspections and repairs during revenue operations. One single failure can result in fatalities or severe injuries to persons in contact with the system including employees and passengers.

Examples of hazards transit employees have experienced include:

- a false indication from a supervisory control and data acquisition on a light rail or metro system that power is de-energized when power is energized;

- a train passes a work zone at a normal operating speed when a speed restriction has been implemented due to miscommunication between an operator and operation control center (OCC);

- a train operator is given instructions to make a reverse move (move against the normal flow of train traffic) from a terminal, but the instruction is not properly communicated to track inspectors and the train comes up behind a work crew;

- a train failing to properly shunt and OCC no longer able to identify the train on the supervisory control and data acquisition board or an indication that a train has occupancy at a terminal and the train has long departed;

- track maintenance employees inspect and perform track maintenance in many cases under live conditions daily.

These examples are real incidents that have occurred in the transit environment (NTSB, 2019).

Second, the HRO model mirrors the practices and applications found in the Asian railways, which have a documented process of reducing incidents by reducing technical and human errors. These risks and hazards become the rationale for introducing TSSCP to the transit audience.

Finally, the example cited in the TCRP study regarding New York transit with a communication failure during rush hour with more than 5,000 passengers is the exact reason the transit industry should implement a model similar to HRO. Transit systems must develop a model of strategic thinking regarding safety as a core value so that such an incident will never occur. This is the theory and essence of HRO and TSSCP.

U.S. Transit Safety Culture: What Is at Stake?

In the U.S. transit industry, incidents continue to plague transit systems daily. The transit industry moves vast numbers of people daily into, within, through and out of defined local metropolitan and regional communities. News media outlets have presented recent tragedies in rail transit systems as glaringly devastating events and will continue unless there is an effort to reduce transit incidents.

On June 22, 2009, the worst incident in transit history occurred in Washington, DC, on the Red Line of the Washington Metropolitan Area Transit System:

On June 22, 2009, at approximately 5 p.m., train 112 struck the rear of stopped train 214 near the Fort Totten station in Washington, DC. The lead car of train 112 struck the rear car of train 214, causing the rear car of train 214 to telescope about 63 feet into the lead car of train 112. Nine people aboard train 112 were killed as a result of the accident, including the train operator, and dozens were injured. (NTSB, 2010)

On Sept. 29, 2016, a New Jersey Transit System commuter train crashed at a Hoboken Terminal in Hoboken, NJ. The incident occurred during the morning rush hour, at one of the busiest transportation hubs in the New York metropolitan area. The events leading up to the crash remain unclear. One person died; 114 others were injured. The audit report from the incident cited a number of recommendations for the troubled system:

"The path forward should be to 'corporatize, professionalize and depoliticize,'" the audit states. "This means New Jersey Transit needs to operate more like a business than a quasi-agency and be more independent of state

government. The organization needs to fill key leadership positions with individuals who are true transit domain professionals." (TradePress Media Group, 2018a)

California Public Utilities Commission (CPUC) fined Bay Area Rapid Transit (BART) \$1.3 million for the deaths of two track workers during an October 2013 strike and placed BART on a 3-year probation for safety failures that led to the deaths. An article on the incident states, "After a lengthy investigation, the CPUC determined that BART violated several safety rules and requirements, and that some or all of the violations 'likely contributed in some manner to the incident,' commission officials said" (TradePress Media Group, 2018b). In February 2018, safety concerns caused the entire Baltimore subway system to close for a month (Campbell, 2018).

According to American Public Transportation Association (APTA, 2018) ridership data, the industry transported more than 10 million passengers in 2017. Social mobility and quality of life are at stake for millions of citizens (Chetty, Hendren, Kline, et al., 2014).

Without change, incidents will continue to plague the industry, creating lawsuits that cost taxpayers millions of dollars in payouts, which will directly impact transit system bottom lines and service delivery. The toxic safety culture will continue to create high employment turnover rates in the transit system. Employees will continue to be unwilling to report adverse events and unsafe conditions for fear of reprisal or belief that reporting will not result in change because of ineffective communication between workers and leadership. Employees will continue to feel they have no voice and that management is unjust. They will continue to not feel empowered to perform critical thinking and not feel commitment to the system's vision and mission (IHI, 2019). Employee inaction in the face of safety hazards will continue to plague the system and eventually a major incident may occur.

In systems that have developed and implemented sustainable safety cultures, employees are encouraged to work toward safety changes. Employees are empowered; they become engaged and take pride in their work product and work outcome. They take ownership for the service they deliver and have a passion for serving customers. They report safety hazards and concerns, and place emphasis on service delivery. It is proven that a safety culture model, when properly developed and implemented, yields a tremendous reduction in incidents, which can lead to a zero-incident rate in the transit industry, similar to the models observed in Asian railways.

Asian Railway Model of Excellence: Lessons Learned

To strengthen the U.S. transit industry safety culture paradigm, in spring 2017, APTA sponsored the International Transit Study Mission on Safety Culture, State of Good Repair and Innovative Operations to Hong Kong, Singapore and Tokyo, Japan. APTA selected countries in Asia because these systems have outstanding safety records in transporting more than 5.5 million passengers per day and have few incidents because of their outstanding safety culture models. Additionally, Asian railway systems have engineering and technological processes in place for monitoring, assessing and maintaining assets in a state of good repair (APTA, 2017).

The study sought to examine the safety culture, state of good repair, innovative operations and models of excellence, and return with lessons learned for the U.S. transit system. APTA selected 25 transit professionals to participate in this study mission. The author believes that the Asian railway model of excellence can be successfully developed, implemented and sustained in the U.S. transit industry just as TQM was implemented in the indus-

trial sector. Transit officials must stop relying largely on a safety climate model characterized by plans, policies, procedures and bulletins, which is based on a top-management-knows-best paradigm. Rather, understanding how to reduce incidents, fatalities and injuries in the rail transit industry depends on successfully developing and implementing a sustainable, strong and vibrant safety culture that builds upon customers, employees, training, caring, trust, mutual respect, value creation, enterprising spirit, open communication and employee engagement.

The APTA (2017) study found that in Asian railways, safety is a mind-set, and is at the forefront of the Asian railway systems' service delivery. Yet, there is no distinct office of safety, nor an executive director of safety position. Asian railway systems have corporate safety divisions responsible for developing the organizational safety plan, performance metrics and safety strategies to be implemented system-wide. Under the safety plan, each department is responsible for safety. Quality takes the lead on safety assessments and audits. Therefore, safety becomes the process that drives all functions and activities and is ingrained in the organizational culture as a core value, understood by all employees that everyone is responsible for safety.

Safety training is at the forefront of the Asian railway model. The motto of JR East in Tokyo, Japan, is that safety is the company's most important management value. Through its training center, the company works to implement that motto by improving organizational capability in the field. With the aim of training future employees, the training center provides an environment that includes technical training to develop specialties by using high-tech systems. The hands-on environment has equipment such as a practice railway track-electronic grade crossing, automatic train control with programmed route control system and a practice room for tickets and information system. The center uses multi-personal simulators and motion-capable instructional materials. It is equipped with an audio-visual room with a teleconferencing system that uses a large-screen television.

Similarly, Tokyo Metro in Japan has an elaborate training center with a motto of "developing personnel to provide peace of mind." Through this center, the company works to improve organizational capability (human capital) in the field to ensure this idea of providing peace of mind service. With the aim of developing human resources with a wide range of advanced skills and know-how in connection with the latest technology, the center not only provides staff with extensive training, but it also promotes cross-departmental coordination to improve the overall capabilities of the Tokyo Metro. In particular, Tokyo Metro has integrated training under one roof that was previously delivered by different departments. This approach breaks down potential silos that may exist in the training process.

During the study mission, the author observed and heard testimonies from executives of Asian railways about their experience coming up through the ranks of their transit systems as well as their academic training (Masaki, 2017). Experiences cited by the Asian railway senior leaders allowed them to view safety holistically in their systems as a critical core value. Not only were the Asian executive team members academically and technologically educated, managers and directors were also well trained in their respective disciplines and view training as a core value of their guiding principles.

Asian railway executives also discussed employee turnover (Masaki, 2017). The turnover rate in Asian railways is less than 1%. Executives explained that employees do not leave the Asian railway because the employment onboarding process is designed to give employees a career rather than a job; employees are highly engaged by

FIGURE 1
TSSCP CULTURE MODEL



an organization that is driven by a culture of optimal productivity and safety. This is what employees seek and the reason they stay.

Asian railway transit officials agree collectively that there is neither a clear definition for safety culture, nor metrics to measure a safety culture. However, even without a clear definition of safety culture or metrics to measure it, Asian railway systems have strong missions, visions and values in place that drive successful safety records. These guiding concepts and approaches have created a culture of caring, trust, mutual respect, value creation, enterprising spirit, open communication, and employee engagement that expand inside and outside the organization.

TSSCP Factors

Examination of data reveals the challenged state of safety in the U.S. transit industry as compared to the Asian transit models. Because the literature on transit safety culture is too limited in its validity and scope to effectively implement TSSCP, the author recommends considering several factors grounded in theory and research that may become the foundation for TSSCP. Each factor represents its own discipline and must be thoroughly considered for successful implementation. Figure 1 represents several of the factors and drivers that must be reviewed and weighted to form the foundation for TSSCP safety culture development.

Space is limited for demonstrating how each factor is implemented in the Asian railway model. However, this article discusses several factors including the leadership role in safety culture, mission and vision, training and development, procedural justice (workforce development and diversity) and engagement.

TSSCP begins with a fundamental concept that transit is at the forefront of a continuing effort to develop sustainable communities (mission). Everyone and every organization seek safe products, goods and services. Therefore, safety is at the forefront of service delivery, and training is at the forefront of safety. Safety, by definition, is an education, training and development process. Education, training and development become critically important because training is geared to enhancing employees' knowledge and job performance. These are fundamental human resources principles that should guide agency vision, mission and core values for those in transit service delivery. This safety mission is similar to the philosophy that drives the Asian railway model to include low incident rates, low turnover, employee engagement and excellent training.

The goal of a sustainable safety culture is based on the premise that a safety culture will, over time, modify human behavior, values and attitude about safety. Therefore, when a failure in a plan, policy, procedure or communication occurs within

a strong safety culture, safety behavior will ideally align with safety, teamwork, communication, trust, integrity and engagement to yield a safe environment (McElveen, 2012).

First, a fundamental precept of TSSCP is that all employees, including board members, CEOs, senior leadership, managers, line employees and contractors, have a duty, responsibility, authority and accountability for safety in the organization, as well as safety behaviors extending into every part of the external service delivery market. However, unless all are trained to understand and know their duty, responsibility, authority and accountability for safety, the goal of developing, implementing and sustaining a transit safety culture remains a serious challenge.

Second, TSSCP clearly outlines safety duty, responsibility, authority and accountability, which must be found everywhere with and within everyone in the system. Employees must take full responsibility and ownership for safety and the agency mission, vision and guiding principles. This is a vital part of any newly formulated and installed model or concept in any transit system. Safety culture is always about strategic thinking and acting to grow increasingly safer over time. Strategic thinking, behaving and acting safely in an exemplary continuous manner is an individual matter that is driven by perceptions and personal values in the organization, also driven by a culture of optimal productivity and safety.

Third, a basic precept of TSSCP is that the development and implementation of a sustainable safety culture can never be developed without humility, respect and goodwill. TSSCP must begin with employees being fully engaged members of the safety culture, trained and educated to know, understand and comprehend in a masterful way all applications and practices of safety and its relationship and synergy to this strategic paradigm. When TSSCP is fully known and understood by all involved in transit service delivery, the impact results in a performance management operating system that works at or near an optimal level of effectiveness and efficiency.

TSSCP Design

Before transit leaders can solve the safety culture problem, they must first understand it. To successfully develop and implement a sustainable transit safety culture under TSSCP, transit leaders must develop a safety culture design (in-depth study). This design must include members of transit boards, senior leadership, midlevel managers, line employees, stakeholders and customers from across the system to gain a more comprehensive perspective about the safety culture problems and solutions. Transit leaders must examine key fundamental questions regarding the system safety culture:

- What safety problems need to be solved? Problems must be defined and articulated as to the current state of safety in the system.
- Are the problems worth resolving? Leaders must state and understand the magnitude and impact of the organization's safety program and philosophy in terms of liabilities, risks and humility.
- Who is affected by the safety culture problems?
- Would the failure to address the problems negatively affect the culture of safety?
- Do we have a hierarchical management process versus an egalitarian approach?
- Is our decision-making process top-down versus consensual?
- Do we work successfully across the culture and multiple subcultures in the transit system?
- Is the transit structure in need of realignment?
- Is the transit system's history a major detriment to safety culture?
- What are the changing demographics of the workforce?
- Do employees feel respected and engaged?
- What does the onboarding process look like?

- Are we building human capital to meet transit needs in the 21st century?
 - Is the transit system driven by a culture of caring, trust, mutual respect, value creation, enterprising spirit, open communication and employee engagement?
 - Does the system suffer from racism and inequality?
 - Does state of good repair impact safety culture?
- Krause (2004) gathered data spanning a 20-year period working with leading organizations and concluded that the quality of leadership is the single most important factor governing safety culture. Krause examined five vital performance areas in which transit officials may be influenced:

1) How does safety leadership ensure performance improvement? It is widely recognized that organizational excellence requires leadership, but what does it mean to be a safety leader in terms of day-to-day activities? What kinds of behaviors must leaders engage in to create the safety performance improvement their organizations need?

2) Why should a senior leader be interested in safety? Some senior leaders are already motivated to improve safety (for various reasons) while others are not. What is the basis of the senior leader's motivation to improve safety, and how do organizations appeal to that motive most effectively?

3) What does a zero-incident safety culture look like? Today, many companies and their leaders state that achieving a "zero-incident" or "injury-free" safety culture is a serious objective. But is it possible to define that culture in practical terms? What day-to-day activities would employees at various levels engage in, and how would they differ from the activities of the cultures that employees actually work in?

4) Can one identify best practices in senior safety leadership? Is it possible to define in behavioral terms a set of practices that senior safety leadership should perform in order to shape safety culture? What kinds of behaviors and practices would be appropriate for such a culture?

5) Is leadership behavior subject to the same principles of behavior as that of frontline employees and supervisors? To influence the behavior of the senior leader concerning safety and health, one must understand what factors drive that behavior. Are these the same factors that drive behavior generally (as with frontline employees and supervisors) or are different factors involved for senior leadership? (Krause, 2004)

Using survey methodology, Krause (2004) found nine factors that predict positive safety outcomes: 1) procedural justice; 2) leader member exchange; 3) management credibility; 4) perceived organizational support; 5) workgroup relations; 6) teamwork; 7) organizational value for safety performance improvement; 8) upward communication; and 9) approaching others.

Leaders must address these pertinent questions while considering Krause's recommendations and the impact from the different perspectives: service delivery (customer), service providers (employees) and service maintainers (departments), and all stakeholders.

Transit leaders and their teams must develop a problem statement from the TSSCP design. Let's call this first step safety performance improvement process (SPIP). Note that SPIP is a process designed to address the problems identified from the problem design. SPIP is a system methodology that measures current safety performance outcomes

and develops or modifies existing processes to increase efficiency and effectiveness of current processes and system functions (Bisser, 2018).

After SPIP is completed, transit leaders must develop a safety continuous improvement philosophy (SCIP). While SPIP is a process, SCIP is a culture. SCIP is a system mind-set and framework philosophy that seeks to continuously improve and deliver products and service excellence of a system (Bisser, 2018). The objective of this SCIP is for senior leaders and managers to become more inclusive, "to be people who love to learn and love to teach, who liberate and innovate, who include others in the process of thinking imaginatively, and who challenge everyone around them to create a better business and a better world" (Pistrui & Dimov, 2018). From this fundamental identification design, transit senior leaders must shift the paradigm of a safety climate and discontinue viewing transit as just another business operation, rather, view the system as an HRO. That is, senior leaders must pursue safety within and without through a different set of lenses and begin to have all employees and all who come in contact with the system follow suit.

Senior leaders must discontinue the approach of just being in compliance (meeting the minimum requirements, standards and regulations) and create an approach toward the development and implementation of a sustainable safety culture. Senior leaders must ask themselves repeatedly, How do we become consistently excellent? (Bisser, 2018). This is the basis of a TSSCP sustainable safety culture.

When the necessary hypotheses are developed, senior leaders must find solutions and develop a strategic plan to solve safety culture challenges. At this point, CEOs and senior leaders are responsible for developing and communicating a new safety strategic plan for safety culture throughout the organization.

The TSSCP model requires yet another plan. Senior leaders must develop an organizational change plan (OCP), sharing changes that resulted from the design with managers, line employees, customers and all who come in contact with the system requesting vital feedback for the process. This OCP must be clear to all in the transit system. Kislik (2018) says:

From time to time, every leader has to deliver news that is hard for employees to hear. Even when businesses are doing well, organizational and structural change . . . can affect people's jobs in ways that create feelings of fear, anger or sorrow. Each employee . . . assumes, "Oh, this won't be good! How am I going to get my work done?"

Equip all levels of management to explain the context. Provide training and rehearsal or role-play time to everyone who will need to communicate the message; don't assume they'll have the right instincts. Otherwise, to escape their own discomfort, they may dump the news or blame management, either directly or indirectly.

The Role of Senior Leadership Within TSSCP

In an interview, Senator John Kerry said:

I think one of the greatest deficits of leadership is not to lead; not to have an ability to command respect for the notion that you know where you're going, you know where you want to go, but you're respectful of the other people.

It's not just domination by virtue of being there and being appointed. If people don't respect you, if they don't think you know what you're doing, if they don't know—if they have a sense of doubt about what the mission is or how it's going to be carried out, you got a problem. (Carmichael, 2018)

Senior leaders must drive cultural change by demonstrating commitment to safety and providing the resources to achieve those results.

Senior leaders must drive cultural change by demonstrating commitment to safety and providing the resources to achieve those results. They must understand the cause of the safety culture imbalance and use the data to create interventions and culture changes. Under TSSCP, the concept, theory and practice of safety culture must begin with the senior leadership and above because this is where the highest center of authority for safety exists. The message about safety must be consistent, sustained, promoted, rewarded and ingrained in the organizational vision, mission and culture with the objective of getting all employees to take ownership for safety. Accountability is key.

Senior leaders should have a strong working knowledge of systems and subsystems interrelationship so that safety communications of serious hazards are understood and resolved in a timely manner. Contrary to the Asian executive model, most U.S. transit industry CEOs, presidents, general managers or executive directors did not work their way up through the ranks. Under the TSSCP framework, this is viewed as a disadvantage because it is challenging for senior leaders to understand the complexity of transit system safety and the many day-to-day experiences encountered by line employees. Transit systems are tightly coupled, technologically complex organizations. These systems are comprised of multiple subsystems that are interdependent and interrelated (McElveen, 2012).

For example, a CEO who has never driven a bus would not understand an operator's experience operating a bus with "slack brakes" on a rainy day with a "crush load" of passengers. Nor would that CEO understand the experience of a train operator entering a platform with a six-car train at 40 mph and a passenger falls into the track bed. These are real experiences felt by line employees on a daily basis. Yet, some leaders have no idea of these experiences or the rules and policies that apply when employees need time off to recover mentally and physically from these devastating experiences.

Surveys, interviews, focus groups and research methods are ways that transit leaders can measure employees' perceptions about safety culture and become more in tune with their direct experiences. These useful tools are effective in assessing the state of a transit system safety culture and should be conducted on an ongoing basis to determine how employees actually feel about being safe within the system (IHI, 2019). However, senior leadership must be transparent regarding sharing data findings with all employees.

Safety culture development and implementation cannot be successful without clear, measurable strategies targeting the vision and mission, training and development and other key components of TSSCP. Senior leaders cannot take safety culture for granted. Parr (2012) says:

Culture, like brand, is misunderstood and often discounted as a touchy-feely component of business that belongs to HR. It's not intangible or fluffy, it's not a vibe or the office decor. It's one of the most important drivers that has to be set or adjusted to push long-term, sustainable success. It's not good enough just to have an amazing product and a healthy bank balance. Long-term success is dependent on a culture that is nurtured and alive. Culture is the environment in which your strategy and your brand thrives or dies a slow death.

TSSCP manifests over the long-term with the necessary goals and objectives such as education, training and development, engagement, customer focus (internal and external), and commitment to create a major shift in transit safety performance. The key concept in TSSCP is strategy. Strategy becomes the focus of this paradigm, which is the responsibility of senior leadership to develop and implement throughout the system.

Transit Mission, Vision & Guiding Principles

Developing the agency's mission is a primary factor needed to begin building the safety culture framework. The mission defines the agency's purpose and the types of quality service the agency wants to deliver to its customer. Therefore, all of the agency's activities and functions must be driven by that defined, understood and accepted mission. The mission must be ingrained in every process within the agency. Top leadership must implement key mission-driven strategies needed to sell the mission to department heads and employees so that they will become committed to and take ownership of the mission.

Transit industry leaders must learn to live and breathe the transit system mission and become mission-driven leaders. This is imperative in the process of developing and implementing a sustainable transit safety culture. As stated by Cardona and Rey (2008):

In deploying the mission, each leader is the primary change facilitator; together, mission and leadership work in tandem, with the potential to transform the culture of an entire organization. This combination of mission and leadership is what we call Mission-Driven Leadership.

They further note that top leadership must develop a "sense of mission." The mission must become a shared mission for each department and level of the organization. By doing this, the mission becomes more than just a set of general statements and the company's members are more likely to commit to and identify with it.

Cardona and Rey (2008) argue that the leader has a responsibility to develop a clear mission and vision for the organization. However, it is also the leader's responsibility to share, train, enforce and live the mission throughout every department within the organization and in doing so develop new leaders around the agency's mission (Burns, 1978). Each department leader then has a responsibility to train new leaders within their ranks; with this continuous process improvement, the organization will soon have safety culture mission-driven leaders evolving throughout, with all committed to supporting the core safety culture mission.

Understanding the transit mission and vision is critical. For example, remarking on the desperate need for more affordable housing in Charlotte, NC, Davis (2008) says:

By starting over, we can create guidelines that help us preserve existing affordable housing. These guidelines can create new housing close to job centers and along public transportation. Charlotte's housing policy must take transit and job opportunities into account, or it will be meaningless to the people it's intended to benefit.

Chetty, et al. (2014), explore community characteristics most likely to predict mobility for lower-income children. In their landmark study, Charlotte, NC, ranked 50th. One of the many drivers in this study was transportation/transit mobility along with education, housing and job opportunities. Again, transit is at the forefront of sustainable communities. It is the network that drives economy, economic development, quality of life and social network. Therefore, transit system missions are imperative and must be understood by all and implemented with this idea in mind.

In a recent review of multiple transit systems mission statements, the finding was startling. Not one system had the term *safety culture* as part of its mission statement, core value or guiding principle. In fact, one large and one midsize transit system did not have the word *safety* as part of its mission statement.

If safety is not defined as part of a system's mission, safety culture can never be developed, implemented and sustained.



How can employees be trained on safety values when safety is not stated in the system's core mission? In some transit systems, safety is cited as a "guiding principle" or "core value." However, if leaders do not develop the capabilities and provide support for guiding principles or core value statement implementation, then these statements are hollow with no real enforcement.

Education, Training & Development Within TSSCP

Asian railway training is world class. Training takes a major and continuing investment of human, financial, physical and technological resources to develop the appropriate human capital for the transit system, similar to the Asian railway model. This investment is important because people are at the heart of transit, and the better prepared (mentally and physically healthy) people are who operate the transit systems, the more value accrues to customers, internal and external. The less prepared either physically or mentally, the more likely the system will experience inefficiencies, breakdowns, suboptimality and higher operational costs.

Too often, transit system leaders seek operational improvements by allocating funds intended to fix isolated problems such as broken elevators or braking systems. However, this type of financial infusion does not drive the cultural change needed. Developing a culture of organizational change requires top to bottom adoption of new ways of thinking, measuring and valuing what we seek. In the end, we must develop a workforce that takes full ownership of services provided. Excellent customer service translates into goodwill not only for the transit system, but also for employees who will take pride in the execution of their duties.

Currently, the approach to change is simply to change top management with the assumption that it will drive systemic, organization-wide changes. Despite a verifiable direct correlation between excellent training and transit performance outcomes, transit training has largely not been viewed as a core value. Transit training is not typically considered a key component in the development of a sustainable transit safety culture, yet it is one of the key cornerstones for the development and implementation of a sustainable safety culture as seen in the Asian railway model of excellence.

As noted, leaders must have a working knowledge and understanding of the synergy, interdependence and interrelationships needed between systems and subsystems as well as the organizational culture and the many different subcultures to develop and implement a sustainable transit safety culture. Perhaps this is one of many barriers to a sustainable safety culture in U.S. transit systems. Therefore, education, training and development must become an imperative for transit system beginning with the CEO and senior leadership.

Najjipoor-Schutte and Patton (2018) cite some surprising findings:

- 68% acknowledged that, in hindsight, they weren't fully prepared to take on the CEO role;
- 50% said driving culture change was more difficult than they'd anticipated;
- 48% said that finding time for themselves and for self-reflection was harder than expected;
- 47% said that developing their senior leadership team was surprisingly challenging.

Additionally, the TSSCP safety culture model recommends in-depth training for CEOs, presidents, general managers and executive directors in the transit industry. One required training should be emotional intelligence. This recommendation is based on survey data that leaders struggle with the human component of leadership and ability to make connection with employees (Goleman, 2019; Lippincott, 2018). Emotional intelligence has four domains:

self-awareness, self-management, social awareness and relationship management (Goleman, 2015). Increasingly more data recommends that effective leaders should be thoroughly equipped with in-depth training in emotional intelligence to become well-rounded leaders, not just managing humans, but also being human.

TSSCP recommends critical thinking training as well for CEOs, presidents, general managers, executive directors and line employees in the transit industry. Critical thinking is the ability to apply intelligent problem-solving techniques to particular situations. It means asking the right questions of the right people; listening to responses and developing an approach to resolution that makes sense. Critical thinkers do not simply go with conventional thoughts or assumed practices. They prefer to explore critical job and organizational questions with curiosity to find the best possible solution through the following process:

- Understand the link between ideas.
- Determine the importance and relevance of arguments and ideas.
- Recognize, build and appraise arguments.
- Identify inconsistencies and errors in reasoning.
- Approach problems in a consistent and systematic way.

Emotional intelligence and critical thinking are about self-regulation. In the process of thinking critically, regulating one's own emotion helps to avoid bias in decision-making. Self-regulation is the key competency that connects emotional intelligence and critical thinking. Other common competencies between emotional intelligence and critical thinking are self-awareness (understanding of the self) and social awareness (understanding of others) (Vora, 2018).

Employee Engagement Within TSSCP

According to Buckingham and Coffman (1999), less than one-third of the U.S. workforce feel engaged. This statement rings true at most U.S. transit systems. Employee comments made during personal interviews, incident investigations, safety auditing, training sessions and evaluation forms collected at the end of training often support this proposition.

The concept, theory and practice of engagement are fundamental to TSSCP. As is well known in human resource management and organizational development, engagement in the workplace reflects a close and committed relationship between the employee and the organization. Many researchers have noted the essentially warm and close organizational nature of engagement reflected in these two readily available definitions:

- 1) a workplace approach resulting in the right conditions for all members of an organization to give their best each day, committed to their organization's goals and values, motivated to contribute to organizational success, with an enhanced sense of their own well-being;
- 2) a fundamental concept in the effort to understand and describe, both qualitatively and quantitatively, the nature of the relationship between an organization and its employees (Böckerman & Ilmakunnas, 2012; Kahn, 1990; Konrad, 2006; Lockwood, 2007; Macleod & Clarke, 2018; Schaufeli & Bakker, 2010; Wilkinson, Dundon, Marchington, et al., 2004; Wollard & Shuck, 2011).

An engaged employee is defined as one who is fully absorbed by and enthusiastic about his/her work and so takes positive action to further the organization's reputation and interests (Duncan, 2018). For at least two decades, engagement has been a paragon of workplace quality that is often highly correlated with organizational performance, productivity, appreciation and retention.

Leadership training for employees, leading from any position to make wise and useful decisions on the spot is an effective method of engagement. Leadership training can make a tremendous difference in preparing employees for career development

and to succeed in a leadership role, similar to the Asian railways model of excellence. Better understanding of the onboarding process by transit human resources can be another form of engagement. Klinghoffer, Young and Liu (2018) observe:

First impressions in the workplace really matter—and not just to the employer. New employees can begin to formulate impressions about organizations from the get-go, influencing their decision to stay with the company in the long term. Poor onboarding experiences can lead to unnecessary and preventable turnover, the cost of which can be as much as twice the employee's annual salary.

Transit officials must come aboard. Genuine engagement is much more than meeting with employees once a quarter at an all-hands meeting or attending an annual operational staff meeting. Genuine engagement is getting to know employees, actively engaging in the process and involvement into their issues and concerns by effective listening, especially on issues of safety. Creating a culture of caring, trust, mutual respect, value creation, enterprising spirit, open communication and employee engagement becomes imperative for true engagement in a transit environment.

Workforce Development & Diversity

Workforce development in transit is the process of preparing workers with needed skills to fill critical positions while emphasizing the value of workplace learning and addressing the agency mission and vision. The goal is to place workers in jobs with career development opportunities. Transit leaders must view workforce development as more than a single program or initiative. Workforce development must become an interconnected set of solutions designed specifically to meet transit system employment needs.

Workplace development will continue to be at the forefront of transit industry challenges. Neeley (2017) says:

According to a recent McKinsey Global report, the number of people in the global labor force will reach 3.5 billion by 2030—and yet there will still be a shortage of skilled workers. The result is likely to be intensified global competition for talent—we will need new skills, attitudes and behaviors that help us work across cultures. Our ways of thinking about careers, colleagues and collaboration will need to become more flexible and adaptable.

Niepow (2018) says:

The face of the workplace is changing, and the rail industry has some catching up to do. Whether in the form of age, sex or race, the demographic profile of the average American worker is vastly different than it was even a decade ago.

Citing Keith Creel, president and CEO of Canadian Pacific Railroad, Niepow continues:

[Creel] acknowledged that, for a long time, "white men have ruled this industry." Creating a "culture of respect" is key to bringing on new railroaders from all walks of life. When you come to the railroad, we all treat each other with respect and if we do that, everybody has the same opportunity. But recruitment is just one piece of the puzzle, of course. To retain workers, it's important to create strong emotional bonds. That emotional connection piece is huge in my mind. We can't just yell and scream our way to success. We've got to create emotional connection with people. We got to treat them with respect."

Transit system leaders must examine their workforce to determine demographics. Creel is correct that the railroad has been led for a long time by white men. It is known within the transit industry that workers largely are and have been minority, and that many do not feel respected by transit senior leadership. Rogers (2018) states, "A bigger issue is that leaders have an incomplete understanding of what constitutes workplace respect—so even well-meaning efforts to provide a respectful workplace may fall short." She continues that employees who feel respected are more grateful for and loyal to their firms.

Meyer (2017) says:

Over the past century, the biggest leadership trend in the U.S. and parts of Western Europe has been the abandoning of hierarchical management processes for a more facilitative, egalitarian approach. Command-and-control has been replaced with empowerment. Managers have been trained to stop telling their employees what to do and instead move to "management by objective," open-door policies and 360° feedback.

This approach is imperative for transit leaders to develop and implement a sustainable safety culture.

Leadership decisions being made daily regarding safety, operations and maintenance have a direct impact on the largely minority employee population and customers, without input from them. Leaders must become more acutely aware of the day-to-day experiences encountered by workers and must understand transit is an unforgiving environment. One mistake, mishap or failure could result in serious injuries or deaths. Senior leaders must become aware of the legitimate concerns and valuable insights from employees and customers when inadequate decisions are being made regarding operational and maintenance issues and must create ways to solicit and value the voices of workers and customers.

John Kerry says:

Politics is personal. People care about whether or not you get them, you understand what their lives are like, whether or not you can empathize with their lives and see how difficult it may be in certain circumstances, or other things. And it matters that you're there for people when they're in crisis or when they're down or so forth. (Carmichael, 2018)

Many veteran workers retiring creates a workforce gap in filling key positions such as maintenance and overhead catenary workers. Younger workers want to be more engaged and feel valued. Instead, many young employees sense the toxic culture during and shortly after their onboarding process. Many resign shortly after employment, which later becomes a cost burden to the system. Many younger employees entering transit operations have trouble adjusting to operation schedules and processes that have been in place for more than 50 years with no change, such as "swing runs," which is defined as two or more pieces of work with one or more breaks covering a duration of 10.5 to 12 hours or more.

Today's workers are coming into the transit systems with engineering and technological applications and understanding, and have a desire to belong and take ownership by offering creative input, not just to be an employee, but a crucial part of the system. Human resources divisions must begin to recruit, sustain and engage the best minds from across academic universities, community colleges and technology schools, along with advancing and motivating older employees through education, development and a culture of optimal productivity and safety.

By making intelligent changes to its culture, the transit industry will draw top-notch individuals and be better able to help

transport people. Under TSSCP, a core competency for tomorrow's transit workers will feature an exceptional employee with expertise to make effective decisions in any safety circumstance.

TSSCP safety culture design must take all these factors into consideration as senior leaders develop the SPIP, SCIP and OCP. These are growing concerns for the Association of American Railroads, as well as growing challenges in the transit industry.

TSSCP Strategy

Clark (2018) notes:

Almost every leader wants to make more time for strategic thinking. In one survey of 10,000 senior leaders, 97% of them said that being strategic was the leadership behavior most important to their organization's success. And yet in another study, a full 96% of the leaders surveyed said they lacked the time for strategic thinking. Of course, we're all oppressed with meetings and overwhelmed with e-mails (an average of 126 per day, according to a Radicati Group analysis).

But leaders presumably could take at least some steps to prioritize what they claim to be imperative. What could account for such massive misalignment between their stated goals and their actions?

First, strategic thinking does not necessarily require a large amount of time. Transit leaders must take the time to think strategically about what is imperative to their system, as a result of the SPIP and SCIP. TSSCP supports a culture of caring, trust, mutual respect, value creation, enterprising spirit, open communication and employee engagement, employee training and service delivery as imperatives. By developing clear, measurable strategies around these key components and having a strong vision and mission that incorporate safety as a core value and engaged employees through training and development, transit officials can strategically begin the process of developing and implementing a sustainable safety culture.

If employees do not have an ingrained understanding of their role and purpose, then it is difficult for them to take ownership. Williams (2004) states:

If people are uncertain as to what precisely they are supposed to be doing that actually leads to progress, then any system of accountability and responsibility will be eroded, and confusion, chaos and work-avoidance dynamics are the natural and predictable consequences.

Summary & Future Implications of TSSCP

The safety culture process dynamics are challenging because old paradigms and leadership behaviors are deeply ingrained and highly resistant to change. Leaders, safety officials, employees, contractors, unions and customers may not be willing to become 24/7 safety-conscious consumers and appliers of a safety culture process paradigm because of the layers of change required.

Transit systems can only improve upon a safety culture when leaders are visibly committed to change and all employees are made knowledgeable of safety responsibility (IHI, 2019). Leaders cannot believe that a quarterly meeting with employees is sufficient in developing, implementing and sustaining a safety culture. Leadership must become more engaged in the system processes and understand ramifications of leadership decisions on employees and others, rather than a mere walkthrough or an annual meeting. Leaders must understand that there is no room in a safety culture for those who point fingers or say, "safety is

not my responsibility" (IHI). Safety is and must become everyone's responsibility.

Risk and hazards are inevitable in transit, lurking and manifesting continuously. Whatever database is cited, far too many transit incidents, injuries and deaths occur in the U.S. Achieving a zero incident rate in the transit industry is not impossible if transit leaders draw on their courage and dedication to press on to help the industry tap the potential of TSSCP and make safety a transit priority. The adoption of TSSCP makes clear that implementing a safety culture (i.e., instituting safety as a core value) is crucial to developing and implementing a sustainable transit safety culture.

Transit is at the forefront of a sustainable community; it is the network that drives economy, economic development and quality of life. Safety is at the forefront of service delivery and training is at the forefront of safety. This is the mission of any transit system. This mission must be clearly understood by all involved in service delivery. Unless all involved are trained and understand the transit mission and take ownership that includes safety as a core value, developing and implementing a sustainable safety culture will remain a challenge.

Transit system leaders must understand that today's workforce demographics have changed drastically. Many veteran workers are retiring, which creates a workforce development gap. By making intelligent changes to its culture, the transit industry will draw top-notch individuals and be better able to help transport people to enrich their experiences and lives. Under TSSCP, a core competency for future transit workers will be expertise to make effective decisions in any safety circumstance.

Establishing a safety culture must continue to be a serious topic of discussion today and in the future of the transit industry to improve both the quality of life for transit riders and social mobility for millions of citizens who depend on transit daily. Reducing incidents and improving employee engagement through caring, trust, mutual respect, value creation, enterprising spirit, open communication and employee engagement become vital requirements for developing and implementing a sustainable transit industry safety culture. **PSJ**

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