

Tennessee Department of Transportation

East Tennessee Human  
Resource Agency  
(ETHRA)

Agency Safety Plan  
(ASP)

June 2020

**Revision History**

<b>Date</b>	<b>Revision</b>	<b>Description of Revision</b>
TBD	0	Initial draft issuance
20200608	1	Post Agency Assessments changes Complete...2020 Performance Targets updates complete

**Agency Safety Plan Approvals<sup>1</sup>**

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NAME Date  
(Board of Directors/City Council/City Commissioner)

<sup>1</sup> This signature page provides State (TDOT) approval of the PTASP and all addenda. Refer the Participating Agency Addenda for each agency's approval of the PTASP and their agency-specific addenda.

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The mission of the Tennessee Department of Transportation (TDOT) is to provide a safe and reliable transportation system for people, goods and services that supports economic prosperity in Tennessee. TDOT's Office of Public Transportation carries out this mission by providing both financial and technical assistance to transit agencies and projects in the state. This joint Agency Safety Plan (ASP) is the result of a collaborative effort between TDOT and the participating Tennessee public transportation agencies that opted in for coverage under the joint plan instead of writing their own ASP.

The 11 small public transportation operators for which this ASP has been prepared are:

- Bristol Tennessee Transit
- Clarksville Transit System
- SETHRA - Cleveland Urban Area Transit System
- East Tennessee Human Resource Agency
- First Tennessee Human Resource Agency
- Jackson Transit Agency
- Johnson City Transit
- Kingsport Area Transit Service
- Knox County Community Action Committee Transit
- Knoxville Area Transit
- City of Murfreesboro Transportation Department

TDOT certifies that this ASP meets the requirements of 49 CFR Part 673 and that all agencies covered under this joint ASP will have completed any remaining documentation required in Addendums 1-11 not later than the July 20, 2020, the federal deadline for Public Transportation Agency Safety Plan certification. TDOT will continue to support the participating agencies as they work beyond the ASP deadline to continue maturing SMS throughout their organizations.

Suzanne Carlson

TDOT Multimodal Director

June 8, 2020

# 1. Safety Management System Overview

## 1.1. SMS Introduction

Safety Management Systems (SMS) is a formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk mitigation. SMS includes systematic and proactive procedures, practices, and policies for managing risks and hazards. By bringing employees together from all levels of the agency to manage risk, SMS helps agencies detect and address safety problems earlier, share and analyze data more effectively, and measure safety performance more precisely.

Four main components make up SMS:

- **Safety Management Policy** (Section 2) is a transit agency's documented commitment to safety. The policy defines the transit agency's safety objectives and the safety accountabilities and responsibilities of its employees.
- **Safety Risk Management** (Section 3) is the process for identifying hazards and analyzing, assessing, and mitigating safety risk.
- **Safety Assurance** (Section 4) is the processes that ensures the implementation and effectiveness of safety risk mitigation and ensures that the agency meets or exceeds its safety objectives through the collection, analysis, and assessment of safety data.
- **Safety Promotion** (Section 5) is a combination of safety training and communication applied to the agency's transportation system to support SMS.

Refer to Appendix A for Definitions of terms used in this plan and refer to Appendix B for Acronyms and Abbreviations used in this plan. Refer to the Participating Agency Addenda for agency-specific information to supplement the joint Agency Safety Plan (ASP).

## 1.2. Goal, Objectives, and Purpose

### 1.2.1. Goal

The overarching goal of this ASP is to enhance all aspects of safety within the participating public transportation agencies by guiding effective and proactive management of safety risks in their systems and prioritizing capital investments using performance-based planning.

### 1.2.2. Objective

The objective of this ASP is to establish processes and procedures to support the implementation of SMS that meets Federal Transit Administration (FTA)-mandated requirements under the PTASP Final Rule (49 CFR Part 673).

### 1.2.3. Purpose

The Tennessee Department of Transportation (TDOT) ASP formalizes the SMS principles and strategies for demonstrating Safety Management Policy, Safety Risk Management, Safety Assurance and Safety Promotion through all operation and maintenance activities. The ASP defines the process for identifying, evaluating, and resolving hazards associated with operations of a bus system involved in revenue service. This process helps achieve the highest practical level of operational safety for the riding public, employees, and anyone encountering the System.

### 1.3. Applicability and Scope

Recipients and sub-recipients of FTA Urbanized Area Formula Grant Program funds under 49 U.S.C. § 5307 are required to comply with the PTASP Final Rule<sup>2</sup>. TDOT sponsored this ASP for sub-recipient agencies to opt in for coverage under it or to opt out and develop their own ASP. The following Tennessee public transportation agencies (hereinafter collectively referred to “Participating Agencies”) opted to meet their PTASP requirements under 49 CFR Part 673 through participation in the TDOT ASP:

- Bristol Tennessee Transit
- Clarksville Transit System
- Cleveland Urban Area Transit System
- East Tennessee Human Resource Agency
- First Tennessee Human Resource Agency
- Jackson Transit Agency
- Johnson City Transit
- Kingsport Area Transit Service
- Knox County Community Action Committee Transit
- Knoxville Area Transit
- City of Murfreesboro Transportation Department

This ASP meets all the requirements under 49 CFR part 673 and encompasses the equipment, facilities, plans, procedures, operation and maintenance as they relate to a bus system. The ASP is scaled to the size, scope, and complexity of the Participating Agencies.

### 1.4. ASP Review and Updates

The TDOT ASP will be reviewed at least annually and updated as necessary to ensure that it remains current and consistent with FTA guidance and industry best practice. TDOT will initiate and coordinate the ASP annual review, in coordination with the participating agencies. Additionally, when a significant change occurs within TDOT or the participating agencies, TDOT will coordinate with the Participating Agencies to consider if any updates to the ASP are needed. The ASP will also be updated as necessary following any ASP audit to ensure the SMS remains current and applicable. If revised, the ASP will be re-issued to all ASP recipients. TDOT is responsible for updating the ASP in partnership with the applicable transportation agencies.

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<sup>2</sup> FTA deferred the applicability of the PTASP requirements for small operators who receive funds through FTA’s Formula Grants for the Enhanced Mobility of Seniors and Individuals with Disabilities Program under 49 U.S.C. § 5310 and for Formula Grants for Rural Areas Program under 49 U.S.C. § 5311.

## 2. Safety Management Policy

### 2.1. TDOT ASP Safety Management Policy Statement

The participating Tennessee public transportation agencies covered by this Agency Safety Plan (ASP) recognize management of safety as a core agency function and are dedicated to planning, designing, constructing, operating and maintaining transportation systems that optimize the safety of passengers, employees, consultants, contractors, emergency responders, and the public.

Accountability for safety begins with the Accountable Executive and permeates all levels of employees. The following safety objectives reflect the agencies' overarching safety goals and demonstrate commitment to establishing, implementing, and continually improving Safety Management Systems (SMS):

- Integrate safety management into the primary responsibilities of all employees;
- Support safety management through the allocation of resources and promotion of a safety culture that facilitates safe practices and effective employee safety reporting and communication;
- Define roles and responsibilities for all employees that contribute to safety performance and SMS;
- Implement risk-based hazard management consistent with risk acceptance levels;
- Operate an employee safety reporting program that ensures no action will be taken against any employee who discloses a safety concern unless disclosure indicates beyond reasonable doubt an illegal act, gross negligence, or a deliberate disregard of regulations or procedures;
- Comply with or exceed legislative and regulatory requirements and industry standards;
- Ensure systems and services that support operations meet or exceed agency safety standards;
- Provide safety information and training to ensure all employees are competent in safety management for tasks allocated to them;
- Establish and measure safety performance against data-driven safety performance targets; and
- Continually improve safety performance and implementation of SMS.

By applying SMS as outlined above and detailed in this ASP, the participating Tennessee public transportation agencies are committed to making safety the top priority of all agency operations.

### 2.2. Safety Accountabilities and Responsibilities

Under SMS, identified positions have specific responsibilities under SMS. Refer to the Participating Agency Addenda for a matrix under each Participating Agency that names the specific agency position(s) and committee(s) responsible for each role described below.

#### 2.2.1. Accountable Executive

The Accountable Executive is a single, identifiable person who has ultimate responsibility and accountability for implementing and maintaining the agency's SMS and ASP. This is the same person responsible for carrying out the agency's Transit Asset Management (TAM) Plan. The Accountable Executive has control or direction over the human and capital resources needed to develop and maintain both the agency's ASP and TAM Plan. The Accountable Executive is also responsible for ensuring action is taken, as necessary, to address substandard performance in the agency's SMS. This individual is the primary decision-maker who is ultimately responsible for both safety and TAM.

### 2.2.2. Chief Safety Officer (or SMS Executive)

The Chief Safety Officer, or SMS Executive, can also be Accountable Executive. This person will have adequate training to take responsibility for safety and act as the SMS Executive. The Chief Safety Officer has the authority and responsibility for day-to-day implementation and operation of the agency's SMS and must have a direct line of reporting to their Accountable Executive. Participating Agencies may designate a Chief Safety Officer who serves in other operational or maintenance capacities<sup>3</sup>.

### 2.2.3. All Employees

In addition to the Accountable Executive and/or Chief Safety Officer, each transit agency has identified those with authority and responsibility for day-to-day implementation and operation of the agency's SMS.

All agency employees are responsible for safety. Each employee is required to work safely, correct unsafe behavior, identify and report safety hazards, and abstain from performing any task that the person feels could injure themselves or others.

### 2.2.4. Safety Committee(s)

Some agencies have safety committees and others incorporate safety into other activities to ensure that the system is operated and maintained in a safe manner. The Safety Committee can support SMS by informing and assuring agency management of safety issues affecting the agency and addressing safety issues assigned to it by the agency's executive management.

## 2.3. Integration with Public Safety and Emergency Management

There are several internal and external programs that may affect safety management. Refer to Participating Agency Addenda for agency-specific integration of programs and a list of the plans and procedures that support the transit agency's public safety and emergency management activities.

## 2.4. Safety Performance Targets

The transit agencies have established targets that represent a quantifiable, measurable safety performance or condition. The transit agencies will regularly monitor the performance of their system to ensure they are meeting their targets and improving safety outcomes. At least annually, when reviewing and updating their ASP, the transit agencies will evaluate their safety performance to determine whether they should change their safety performance targets. Agency safety performance targets are categorized below by safety performance measures:

- **Performance Measure: Fatalities** – Total number of reportable<sup>4</sup> fatalities and rate per total unlinked passenger trips, by mode.
- **Performance Measure: Injuries** – Total number of reportable injuries and rate per total unlinked passenger trips, by mode.
- **Performance Measure: Safety Events** – Total number of reportable events and rate per total vehicle miles, by mode.
- **Performance Measure: System Reliability** – Mean distance between failures, by mode.

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<sup>3</sup> A Chief Safety Officer may only serve in other operational or maintenance capacities if they are employed by a transit agency that is a small public transportation provider as defined CFR Part 673, or a public transportation provider that does not operate a rail fixed guideway public transportation system.

<sup>4</sup> The thresholds for "reportable" fatalities, injuries, and events are defined in the National Transit Database Safety and Security Reporting Manual, available at <https://www.transit.dot.gov/ntd/2019-ntd-safety-and-security-policy-manual>.

Refer to Participating Agency Addenda for safety performance targets specific to each Participating Agency, as applicable.

TDOT will coordinate with the Participating Agencies to make the safety performance targets available to the state's Metropolitan Planning Organizations (MPOs), as applicable, to aid in the planning process. To the extent possible, TDOT will facilitate coordination with the MPOs for setting safety performance targets. MPOs that represent the participating agencies include:

Bristol MPO	Johnson City MPO
Clarksville MPO	Kingsport MTPO
Cleveland MPO	Knoxville TPO
Jackson MPO	Nashville MPO

## **2.5. SMS Documentation and Records**

At all times, the transit agency will maintain documents that set forth in this ASP, including those related to the implementation of its SMS and result from SMS processes and activities. The transit agency will maintain documents that are included in whole, or by reference, that describe the programs, policies, and procedures that the agency uses to carry out its ASP. These documents will be made available upon request by the FTA or other federal entity. The transit agency will maintain these documents for a minimum of three years after they are created.

## **2.6. Employee Safety Reporting**

Each transit agency will establish and implement an employee safety reporting program that allows employees and contractors to report safety conditions or hazards to senior management, which describes the protections for employees who report safety conditions or hazards, and which describes employee behaviors that may result in disciplinary action.

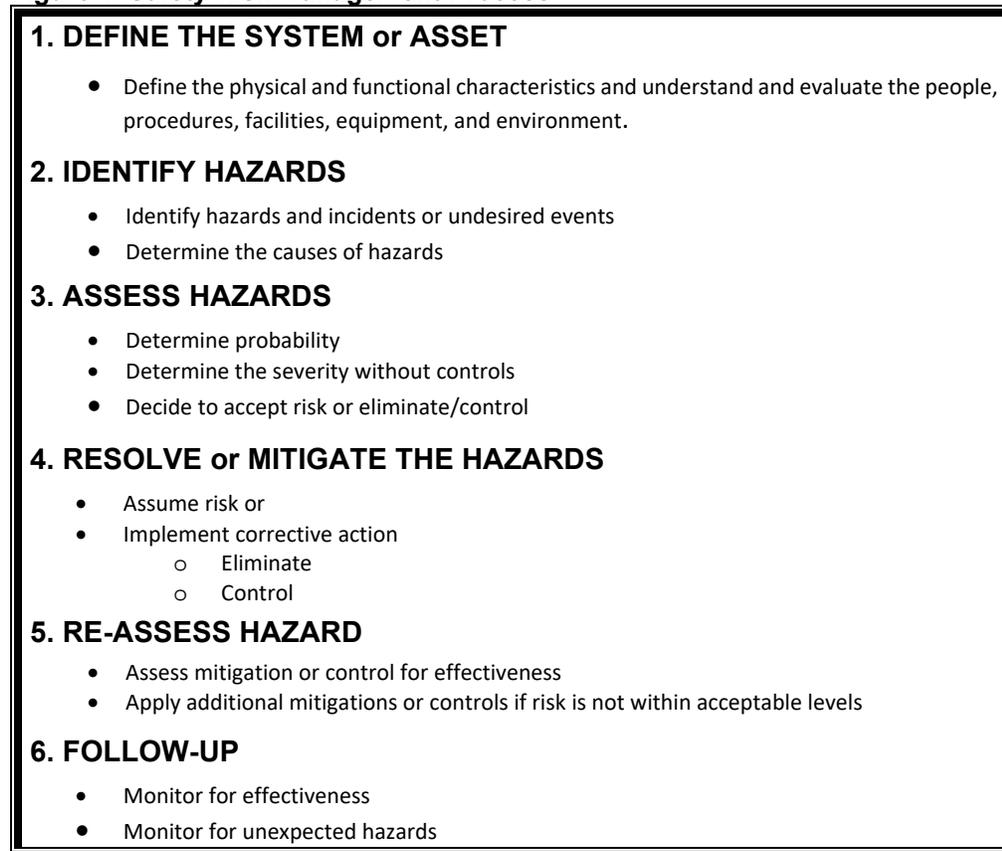
Refer to the Participating Agency Addenda for agency-specific employee safety reporting program descriptions.

## 3. Safety Risk Management

### 3.1. Introduction

This chapter provides detail on Safety Risk Management (SRM). SRM includes the activities that a public transportation agency undertakes to control the probability or severity of the potential consequence of hazards. Major SRM sub-components include Hazard Identification and Analysis and Safety Risk Evaluation and Mitigation. Figure 1 below summarizes the six basic steps of SRM.

**Figure 1. Safety Risk Management Process**



### 3.2. Hazard Identification and Analysis

The first step in a hazard analysis is defining the systems and sub-systems subject to hazards, followed by identifying specific physical and procedural hazards related to the identified systems and subsystems.

#### 3.2.1. System Description

The TDOT ASP covers the public transportation systems listed in Table 1 and described further below. These Participating Agencies are a mix of fixed route and demand systems.

**Table 1. Agency Descriptions**

Agency	Number of Fixed Route Bus Vehicles	Number of Paratransit Vehicles	Number of routes	Annual Vehicle Revenue Miles	Annual Unlinked Trips
Bristol Tennessee Transit	6	4	6	183,071 (2017)	62,542 (2017)
Clarksville Transit System	16	10	11	1,529,584 (2018)	696,387 (2018)
SETHRA - Cleveland Urban Area Transit System	7	11	5	361,330 (2017)	149,446 (2017)
East Tennessee Human Resource Agency	0	100 vans	N/A	4,475,998 (2017)	269,540 (2017)
First Tennessee Human Resource Agency	0	100+ vans	N/A	2,557,165 (2016)	163,433 (2016)
Jackson Transit Authority	13	7	11	774,480 (2017)	504,281 (2017)
Johnson City Transit	15	12	11	684,857 (2017)	668,161 (2017)
Kingsport Area Transit Service	7	6	6	323,618 (2017)	173,992 (2017)
Knox County Community Action Committee Transit		37	N/A	1,420,705 (2017)	163,593 (2017)
Knoxville Area Transit	72	25	27	3,236,168 (2019)	2,748,602 (2019)
City of Murfreesboro Transportation Department	7		7	249,111 (2017)	250,808 (2017)

### **Bristol Tennessee Transit**

The Bristol Tennessee Transit operates six buses over six fixed routes of service from 6:15am until 6pm Monday through Friday (except city observed holidays). The Bristol Tennessee Transit also operates four vans that provide Americans with Disabilities Act (ADA) service and Job Access service.

### **Clarksville Transit System**

The Clarksville Transit System operates eighteen buses over eleven fixed routes of service from Monday - Friday 4:40am-9pm and Saturday 6:40am to 9pm (except certain city observed holidays). The Clarksville Transit System also operates eleven vans that provide service. The mission of the Clarksville Transit System is to plan, implement, maintain and manage a public transportation system that allows for maximum mobility for the community with an emphasis on safety, quality and efficiency.

### **Cleveland Urban Area Transit System**

Cleveland Urban Area Transit System (CUATS) is operated by the Southeast Tennessee Human Resource Agency (SETHRA). CUATS operates seven buses over five fixed routes with service from 6am - 7pm Monday through Friday (except city observed holidays). The CUATS also operates eleven vans that provide ADA service and Job Access service.

**East Tennessee Human Resource Agency**

East Tennessee Human Resource Agency (ETHRA) operates over 100 vans that provide ADA and Job Access services from 7am – 5:30pm Monday through Friday (except city observed holidays).

ETHRA Public Transit provides door to door transportation services with flexible schedules to meet the needs of its passengers. ETHRA's Public Transit's goal is to provide affordable, safe, dependable public transportation.

**First Tennessee Human Resource Agency**

First Tennessee Human Resource Agency (FTHRA) operates over six fixed routes of service from 6:15am until 6pm Monday through Friday (except city observed holidays). The Bristol Tennessee Transit also operates four vans at provide ADA service and Job Access service.

**Jackson Transit Authority**

The Jackson Transit Authority (JTA) operates 13 buses over 11 fixed routes of service from 6am until 10:30pm Monday through Saturday (except city observed holidays). Jackson Transit Authority also operates seven vans that provide ADA service and Job Access service.

**Johnson City Transit**

Johnson City Transit (JCT) operates 15 buses over 11 fixed routes of service from 6:15am until 6:15 pm Monday through Friday and 8:15am through 5:15pm Saturday (except city observed holidays). Jackson Transit Authority also operates seven vans that provide ADA service and Job Access service.

**Kingsport Area Transit Services**

The Kingsport Area Transit Services (KATS) operates seven buses over six fixed routes of service from 7:30am until 5:30pm Monday through Friday (except city observed holidays). Kingsport Area Transit Services also operates six vans that provide ADA service and Job Access service. The KATS bus and van service is a valuable asset to the community and the city is encouraged by its progress and growth. These services are provided to residents of the city of Kingsport with a population of over 53,000.

**Knox County Community Action Committee Transit**

Knox County CAC operates over 37 vans that provide ADA and Job Access services from 5am through 9pm Monday through Saturday (except city observed holidays). Limited employment transportation is provided twenty-four (24) hours a day, seven (7) days a week. Knox County CAC Transit provides accessible, demand response public transportation services to the residents of Knox County who live within Knox County outside of the City of Knoxville, to those individuals who live within the City of Knoxville outside the KAT service area, and to those city residents who are not served by the KAT fixed route system, including those who live too far from a bus stop or who's destination is not within the KAT service area.

**Knoxville Area Transit**

The Knoxville Area Transit (KAT) operates 72 buses over 27 fixed routes of service from 5:30am until 12:15am Monday – Friday, 7am – 12:15am on Saturdays, and 8:15am to 9:15pm on Sundays (except city observed holidays). Knoxville Area Transit (KAT) also operates 25 vans that provide paratransit service.

**City of Murfreesboro Transportation Department**

The City of Murfreesboro Transportation Department is responsible for the administration and operation of public transportation service (Rover) within the City of Murfreesboro. The Rover

system operates seven buses over seven fixed routes of service from 6am through 6pm Monday through Friday that serve designated bus stops. Transit service operations also include demand-response paratransit service as required by ADA and the FTA.

### 3.2.2. Identifying Hazards

A safety hazard is:

- Any real or potential condition that can cause personal injury or death or damage to or loss of equipment or property,
- A condition that may be a prerequisite to an accident, or
- Is a situation that has the potential to do harm.

Hazards are identified through a variety of sources, including those listed below. In addition, SMS enables every employee to identify hazards through Safety Promotion efforts and non-punitive hazard reporting, described further in Section 5.

- FTA's *Hazard Analysis Guideline for Transit Projects* (January 2000)
- Accident/incident data and experience
- Accident/incident data from other bus systems with similar characteristics
- Hazard scenarios
- Applicable industry standards
- Field assessments and surveys
- Project-specific design data and drawings, reviews, testing, and start-up activities

The following tools and techniques may be used for hazard identification and analysis:

- Preliminary Hazard Analysis (PHA)
- Operational Hazard Assessment (OHA)
- Accident/Incident Analysis
- Job Hazard Analysis (JHA)

## 3.3. Safety Risk Evaluation

After identifying system-specific hazards, SRM assesses safety risk by first identifying the potential to do harm in the system and then analyzing options to mitigate the hazard to an acceptable level. The process seeks to identify and define as many hazardous conditions as possible and initiate the safety risk mitigation process before those conditions or associated activities cause an accident.

### 3.3.1. Analyzing Risk

The methodology for analyzing safety risk has two elements: evaluating hazard severity and evaluating hazard probability. The US Department of Defense's *Standard Practice for System Safety, MIL-STD-882E*, establishes system safety criteria guidelines for determining hazard severity and probability. This ASP adapts the MIL-STD-882E Risk Assessment and Hazard Risk Index matrixes to the transit environment for use in the Participating Agencies' safety risk assessment process.

#### 3.3.1.1. Determining Severity

Hazards are rated in terms of their effect on transit customers, employees, the public, and the operating system. Hazard severity is a subjective measure of the worst credible case consequence that results from design inadequacies, component failure or malfunction, human error, environmental conditions, or operating or maintenance practice, and procedure deficiencies. The ratings are illustrated in Figure 2. The categorization of hazards is consistent

with risk-based criteria for severity and reflects the principle that not all hazards pose an equal amount of risk.

**Figure 2. Hazard Severity Definition**

SEVERITY	CHARACTERISTICS			
	People	Equipment/Services	Financial	Reputational
<b>Catastrophic 1</b>	Several deaths and/or numerous severe injuries ( <i>per event</i> )	Total loss of equipment or system interruption, requiring months to repair	Estimated loss from the incident in excess of \$500,000	Ongoing media coverage, irreparable reputational damage, government intervention (weeks – months)
<b>Critical 2</b>	Low number of deaths and/or serious injury* ( <i>per event</i> )	Significant loss of equipment or system interruption, requiring weeks to repair	Estimated loss from the incident in excess of \$100,000-\$499,999	Prolonged media campaign, serious reputational damage, sustained government involvement (days - weeks)
<b>Moderate 3</b>	Minor injury and possible serious injury ( <i>per event</i> )	Some loss of equipment or system interruption, requiring seven or less days to repair	Estimated loss from the incident in excess of \$10,000-\$99,999	Adverse media coverage, reputational damage, government involvement
<b>Minor 4</b>	Possible minor injury ( <i>per event</i> )	Some loss of equipment, no system interruption, less than 24 hours to repair	Estimated loss from the incident in excess of \$1,000-\$9,999	Local media coverage and some reputational damage
<b>Insignificant 5</b>	No injury	Minor damage to equipment no system interruption, no immediate repair necessary	Estimated loss from the incident is likely less than \$1,000	No adverse media coverage or reputational damage

\*Per 49 CFR 673, serious injury: 1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; 2) Results in a fracture of any bone (except simple fractures of fingers, toes, or noses); 3) Causes severe hemorrhages, nerve, muscle, or tendon damage; 4) Involves any internal organ; or 5) Involves second or third-degree burns, or any burns affecting more than 5 percent of the body surface.

### 3.3.1.2. Determining Probability

The probability that a hazard will occur during the planned life expectancy of the system element, sub-system or component is described qualitatively, in potential occurrences per unit of time, events, population, items, or activity. A qualitative hazard probability is derived from research, analysis, evaluation of safety data from the operating experience of the agency or historical safety data from similar bus systems, and from expert opinion. Figure 3 summarized the hazard probability categories.

**Figure 3. Hazard Probability Categories**

PROBABILITY LEVEL	SPECIFIC INDIVIDUAL ITEM	FLEET OR INVENTORY	FREQUENCY
<b>Frequent A</b>	Likely to occur frequently in the life of a system	Continuously experienced	> 1 event / month
<b>Probable B</b>	Will occur often in the life of a system	Will occur frequently in the system	> 1 event / year
<b>Occasional C</b>	Likely to occur sometime in the life of an item	Will occur several times	> 1 event / 10 years
<b>Remote D</b>	Unlikely, but possible to occur in the life of an item	Unlikely, but can be expected to occur	> 1 event / 20 years
<b>Improbable E</b>	So unlikely, it can be assumed occurrence may not be expected	Unlikely to occur, but possible	> 1 event / 30 years

### 3.3.2. Assessing Risk

Together, hazard severity and probability measure a hazard's magnitude and priority for applying the control measures. Hazards are then examined, qualified, addressed, and resolved based on the severity of a potential outcome and the likelihood that such an outcome will occur. The value derived by considering a hazard's severity and probability is the Hazard Risk Index. The resulting risk index is a measure of the acceptability or undesirability of the hazard and is applied to the Risk Assessment Index.

Assignment of a Hazard Risk Index enables agency management to properly understand the amount of risk involved by accepting the hazard relative to what it would cost (schedule, dollars, operations, etc.) to reduce the hazard to an acceptable level.

Figure 4 identifies the Hazard Risk Index based upon hazard severity and probability and outlines the criteria for further action and decision authority based upon each index category. The Hazard Risk Index is used to assist the decision-making process in determining whether a safety risk should be eliminated, controlled, or accepted. This helps prioritize hazardous conditions and focus available resources on the most serious hazards requiring resolution while effectively managing available resources.

For example, if the potential for an accident/incident reveals a Category 1 (catastrophic) occurrence with a Level A (frequent) probability, the assessed level of risk is Unacceptable and the system safety effort is directed toward eliminating the hazard or at the very least to implementing redundant hazard control measures. A Category 1 (catastrophic) or Category 2 (critical) safety risk may be tolerable if it can be demonstrated that its occurrence is highly improbable. This approach provides a basis for logical management decision-making that considers the hazard's severity and probability.

**Figure 4. Hazard Risk Index**

HAZARD RISK INDICES					
Frequency Or Probability	Severity Category				
	1 Catastrophic	2 Critical	3 Moderate	4 Minor	5 Insignificant
(A) Frequent	1A	2A	3A	4A	5A
(B) Probable	1B	2B	3B	4B	5B
(C) Occasional	1C	2C	3C	4C	5C
(D) Remote	1D	2D	3D	4D	5D
(E) Improbable	1E	2E	3E	4E	5E

**LEGEND**

	<b>Unacceptable</b> - Cannot be accepted as is, <b>must</b> be mitigated
	<b>Undesirable</b> - Acceptable with Executive-level signoff
	<b>Acceptable w/ Review</b> - Acceptable Operational-level signoff
	<b>Acceptable</b> - Can be accepted as is.

**3.4. Safety Risk Mitigation****3.4.1. Treating Risk**

As safety risks are identified, whether through a formal risk assessment or informally such as through employee reporting mechanisms, hazards can be resolved by deciding to either assume the risk associated with the hazard or to eliminate or control the risk. Mitigation to bring a hazard to an acceptable level of risk is applied in the following order of precedence, listed from most effective at the top of the list to least effective mitigations at the bottom:

- Avoidance
- Elimination
- Substitution
- Engineering Controls
- Warnings
- Administrative Controls such as Operations and Maintenance Procedures
- Personal Protective Equipment and Guards

**3.4.2. Hazard Tracking**

Once mitigations are agreed upon for identified hazards, mitigations are tracked through the agency's safety certification process to ensure all concerns raised have been addressed and mitigated properly. This hazard tracking and certification process may be done through reports, logs, worksheets and/or similar methods that allow for updating if changes occur that impact the findings of the safety analysis. The Participating Agencies use a hazard tracking worksheet in Microsoft Excel to capture and track hazards from analysis through implementation. Refer to Appendix C for a blank copy of the hazard tracking worksheet.

## **4. Safety Assurance**

### **4.1. Overview**

Safety assurance includes safety reviews, evaluations, audits, and inspections, as well as data tracking and analysis and investigations. Safety Assurance encompasses the processes within the transit agency's SMS that ensures the implementation and effectiveness of SRM and ensures that the agency meets or exceeds its safety objectives through the collection, analysis, and assessment of information. Each transit agency will conduct an annual review of the effectiveness of its safety risk mitigations through its safety assurance efforts.

### **4.2. Safety Performance Monitoring and Measurement**

SMS generates data and information that senior management need to evaluate whether implemented safety risk mitigations are appropriate and effective, and how well an agency's safety performance fits with their established safety objectives and safety performance targets. Safety performance monitoring will occur through routine monitoring of operations and maintenance activities. It also includes risk monitoring to track implementation and success of mitigations and controls put in place to manage risk.

Each Participating Agency will establish audit and evaluate safety in compliance with this ASP and SMS. The programs will:

- Monitor compliance and sufficiency of procedures for operations and maintenance
- Monitor operations to identify ineffective, inappropriate, or unimplemented safety risk mitigations
- Conduct investigations of safety events to identify causal factors
- Monitor information from safety reporting systems
- Document audit outcomes
- Collect and track safety data

### **4.3. Management of Change**

Each Agency under this ASP will re-evaluate safety when significant change occurs within the agency. These changes may include:

- New contractor providing service
- New buses brought into fleet
- New or changed routes
- Other changes that might have a safety impact.

If the change has a safety impact, risk associated with the change will be evaluated, treated and documented. If the change does not have a safety impact, no further steps will be taken.

### **4.4. Continuous Improvement**

Each agency will evaluate their SMS program annually to identify areas of improvement and any changes that require input for the agency to grow in safety management.

## **5. Safety Promotion**

### **5.1. Introduction**

Agencies under this plan will utilize Safety Promotion to communicate and disseminate safety information to strengthen the safety culture. Safety Promotion includes safety lessons learned, reporting systems, recommendations based on safety metrics, and safety training. The goal is to foster a positive safety culture where employees receive ongoing training and updates of safety progress; feel comfortable reporting safety issues or concerns; and understand why safety is important and how they impact safety.

### **5.2. Safety Communication and Culture**

#### **5.2.1. Safety Communication**

Transit agencies will communicate safety and safety performance information throughout the agency's organization that, at a minimum, conveys the TDOT safety management policy statement in Section 2.1 above; each covered agency's employee safety reporting program procedures and policies; and, information on hazards and safety risks relevant to employees' roles and responsibilities. The communication will be used to inform employees of safety actions taken in response to reports submitted through an employee safety reporting program.

#### **5.2.2. Dissemination of Lessons Learned**

Transit agencies will review lessons learned from incidents, accidents and reported hazards and provide feedback regarding findings. This communication is an important step in letting employees know that they are important to the agency.

### **5.3. Competencies and Training**

Each transit agency will establish and implement a safety training program for all employees and contractors directly responsible for safety in the agency's public transportation system. The training program must include refresher training, as necessary. Safety training will also be part of new-hire training and specific job safety training. Training and competencies of all staff will be documented and tracked.

Refer to the Participating Agency Addenda for agency-specific safety training programs.

#### **5.1. Contractor Safety (as applicable)**

When contracting for services that have a safety component and/or may impact safety or assessed risk, procurement language and specification requirements will be included, as applicable. Contractors will demonstrate job-appropriate competencies and training that meet or exceed the requirements of the agency.

## Appendix A – Definitions

<b>Accident</b>	An Event that involves any of the following: A loss of life; a report of a serious injury to a person; a collision of public transportation vehicles; a runaway train; an evacuation for life safety reasons; or any derailment of a rail transit vehicle, at any location, at any time, whatever the cause.
<b>Accountable Executive</b>	A single, identifiable person who has ultimate responsibility for carrying out the Agency Safety Plan of a public transportation agency; responsibility for carrying out the agency's Transit Asset Management Plan; and control or direction over the human and capital resources needed to develop and maintain both the agency's Agency Safety Plan, in accordance with 49 U.S.C. 5329(d), and the agency's Transit Asset Management Plan in accordance with 49 U.S.C. 5326.
<b>Agency Safety Plan (ASP)</b>	The documented comprehensive agency safety plan for a transit agency that is required by 49 U.S.C. 5329 and 49 CFR 673.
<b>Assessment</b>	An estimation of the size/scope of risk or quality of system or procedure.
<b>Cause</b>	Events that, result in a hazard or failure. Causes can occur by themselves or in combinations.
<b>Change</b>	To modify, alter, or make different.
<b>Chief Safety Officer (CSO)</b>	An adequately trained individual who has responsibility for safety and reports directly to a transit agency's chief executive officer, general manager, president, or equivalent officer. A Chief Safety Officer may not serve in other operational or maintenance capacities, unless the Chief Safety Officer is employed by a transit agency that is a small public transportation provider as defined in this part, or a public transportation provider that does not operate a rail fixed guideway public transportation system.
<b>Configuration Management</b>	A management process for establishing and maintaining consistency of a product's performance, functional and physical attributes with its requirements, design, and operational information throughout its life.
<b>Control</b>	Anything that mitigates the risk of a hazard's effects. A control is the same as a safety requirement. All controls are written in requirement language.
<b>Effect</b>	The effect is a description of the potential outcome or harm of the hazard if it occurs in the defined system state.
<b>Equipment</b>	A complete assembly, operating either independently or within a sub-system or system, that performs a specific function.
<b>Equivalent Authority</b>	An entity that carries out duties similar to that of a Board of Directors, for a recipient or subrecipient of FTA funds under 49 U.S.C. Chapter 53, including sufficient authority to review and approve a recipient or subrecipient's Public Transportation Agency Safety Plan.
<b>Event</b>	Any Accident, Incident, or Occurrence.
<b>Hazard</b>	Any real or potential condition that can cause injury, illness, or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.

<b>Hazard Tracking</b>	A closed-loop means of ensuring that the requirements and mitigations associated with each hazard that has associated medium or high risk are implemented. Hazard tracking is the process of defining safety requirements, verifying implementation, and re- assessing the risk to make sure the hazard meets its risk level requirement before being accepted.
<b>Human Factors</b>	A multidisciplinary effort to generate and compile information about human capabilities and limitations and apply that information to equipment, systems, facilities, procedures, jobs, operations, environments, training, staffing, and personnel management for safe, comfortable, efficient and effective human performance.
<b>Incident</b>	An event that involves any of the following: A personal injury that is not a serious injury; one or more injuries requiring medical transport; or damage to facilities, equipment, rolling stock, or infrastructure that disrupts the operations of a transit agency.
<b>Investigation</b>	The process of determining the causal and contributing factors of an accident, incident, or hazard, for the purpose of preventing recurrence and mitigating risk.
<b>Maintenance</b>	Any repair, adaptation, upgrade, or modification of equipment or facilities. This includes preventive maintenance.
<b>Mitigation</b>	Actions taken to reduce the risk of a hazard's effects.
<b>National Public Transportation Safety Plan</b>	The plan to improve the safety of all public transportation systems that receive Federal financial assistance under 49 U.S.C. Chapter 53.
<b>Occurrence</b>	An Event without any personal injury in which any damage to facilities, equipment, rolling stock, or infrastructure does not disrupt the operations of a transit agency.
<b>Oversight</b>	To validate the development of a defined system and verify compliance to a pre-defined set of standards.
<b>Performance Measure</b>	An expression based on a quantifiable indicator of performance or condition that is used to establish targets and to assess progress toward meeting the established targets.
<b>Performance Target</b>	A quantifiable level of performance or condition, expressed as a value for the measure, to be achieved within a time period required by the FTA.
<b>Probability</b>	An expression of often an event is expected to occur.
<b>Process</b>	A set of interrelated or interacting activities which transforms inputs into outputs.
<b>Public Transportation Agency Safety Plan (PTASP)</b>	A safety plan based on the Safety Management System approach. The FTA's PTASP Final Rule (49 CFR Part 673) requires States and certain operators of public transportation systems that receive Federal financial assistance under 49 USC Chapter 53 to develop and implement ASPs.
<b>Public Transportation Safety Certification Training Program</b>	The certification training program established either for Federal and State employees, or other designated personnel, who conduct safety audits and examinations of public transportation systems, and employees of public transportation agencies directly responsible for safety oversight, established through interim provisions in accordance with 49 U.S.C. 5329(c)(2), or the program authorized by 49 U.S.C. 5329(c)(1)
<b>Qualitative Data</b>	Subjective data that is expressed as a measure of quality; nominal data.

<b>Quantitative Data</b>	Objective data expressed as a quantity, number, or amount; allows for more rational analysis and substantiation of findings.
<b>Requirement</b>	An essential attribute or characteristic of a system. It is a condition or capability that must be met or passed by a system to satisfy a contract, standard, specification, or other formally imposed document or need.
<b>Reportable Event</b>	<p>A safety or security event occurring on transit right-of-way or infrastructure, at a transit revenue facility, at a transit maintenance facility, during a transit related maintenance activity or involving a transit revenue vehicle that results in one or more of the following conditions, as defined in the National Transit Database Safety and Security Reporting Manual (2019):</p> <ul style="list-style-type: none"> <li>• A fatality confirmed within 30 days of the event</li> <li>• An injury requiring immediate medical attention away from the scene for one or more person(s)</li> <li>• Property damage equal to or exceeding \$25,000</li> <li>• Collisions involving transit revenue vehicles that require towing away from the scene for a transit roadway vehicle or other non-transit roadway vehicle</li> <li>• An evacuation for life safety reasons</li> </ul>
<b>Risk</b>	<p>The composite of predicted severity and likelihood of the potential effect of a hazard in the worst credible system state.</p> <p>(1) <b>Initial.</b> The composite of the severity and likelihood of a hazard considering only verified controls and documented assumptions for a given system state. It describes the risk at the preliminary or beginning stage of a proposed change, program or assessment.</p> <p>(2) <b>Residual.</b> The risk that remains after all control techniques have been implemented or exhausted and all controls have been verified. Only verified controls can be used to assess residual risk.</p>
<b>Risk Acceptance</b>	Agreement by the appropriate management official that he/she understands the safety risk associated with the change and he/she accepts that safety risk.
<b>Safety</b>	Freedom from unintentional harm.
<b>Safety Assurance</b>	Processes within a transit agency's Safety Management System that functions to ensure the implementation and effectiveness of safety risk mitigation, and to ensure that the transit agency meets or exceeds its safety objectives through the collection, analysis, and assessment of information.
<b>Safety Culture</b>	The product of individual and group values, attitudes, competencies, and patterns of behavior that determine commitment to, and the style and proficiency of, an organization's safety management. In addition, the four key components of a safety culture are reporting culture (encourage employees to divulge information about all hazards that they encounter), just culture (employees are held accountable for deliberate violations of the rules but are encouraged and rewarded for providing essential safety-related information), flexible culture to changing demands, and learning culture (willing to change based on safety indicators and hazards) uncovered through assessments, data, and incidents).
<b>Safety Management Policy</b>	A transit agency's documented commitment to safety, which defines the transit agency's safety objectives and the accountabilities and responsibilities of its employees in regard to safety.

<b>Safety Management System (SMS)</b>	The formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of a transit agency's safety risk mitigation. SMS includes systematic procedures, practices, and policies for managing safety risks to the lowest acceptable level practicable.
<b>Safety Promotion</b>	A combination of training and communication of safety information to support SMS as applied to the transit agency's public transportation system.
<b>Safety Requirement</b>	A control written in requirements language.
<b>Safety Risk Management (SRM)</b>	A process within a transit agency's ASP for identifying hazards and analyzing, assessing, and mitigating safety risk. SRM is a formalized, proactive approach to system safety and applied to all changes to ensure all risks are identified and mitigated prior to the change being made. It provides a framework to ensure that once a change is made, it continues to be tracked throughout its lifecycle.
<b>Serious Injury</b>	Any injury which: <ul style="list-style-type: none"> <li>(1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received;</li> <li>(2) Results in a fracture of any bone (except simple fractures of fingers, toes, or noses);</li> <li>(3) Causes severe hemorrhages, nerve, muscle, or tendon damage;</li> <li>(4) Involves any internal organ; or</li> <li>(5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.</li> </ul>
<b>Severity</b>	The measure of how bad the results of an event are predicted to be. Severity is determined by the most probable outcome.
<b>Source (of a hazard)</b>	Any potential origin of system failure, including equipment, operating environment, human factors, human-machine interface, procedures, and external services.
<b>State Safety Oversight Agency (SSOA)</b>	An agency established by a State that meets the requirements and performs the functions specified by 49 U.S.C. 5329(e) and the regulations set forth in 49 CFR part 674.
<b>System</b>	An integrated set of constituent pieces that are combined in an operational or support environment to accomplish a defined objective. These pieces include people, equipment, information, procedures, facilities, services, and other support services.
<b>Transit Asset Management Plan</b>	The strategic and systematic practice of procuring, operating, inspecting, maintaining, rehabilitating, and replacing transit capital assets to manage their performance, risks, and costs over their life cycles, for the purpose of providing safe, cost-effective, and reliable public transportation, as required by 49 U.S.C. 5326 and 49 CFR part 625
<b>Validation</b>	The process of proving that the right system is being built, i.e., that the system requirements are unambiguous, correct, complete, and verifiable.
<b>Verification</b>	The process that ensures that the system requirements have been met by the design solution and the system is ready to be used in the operational environment for which it is intended.

## **Appendix B – Acronyms and Abbreviations**

<b>ADA</b>	Americans with Disabilities Act
<b>CAP</b>	Corrective Action Plan
<b>CFR</b>	Code of Federal Regulations
<b>CUATS</b>	Cleveland Urban Area Transit System (operated by SETHRA)
<b>ETHRA</b>	East Tennessee Human Resource Agency
<b>FHA</b>	Fault Hazard Analysis
<b>FTA</b>	Federal Transit Administration
<b>FTHRA</b>	First Tennessee Human Resource Agency
<b>JHA</b>	Job Hazard Analysis
<b>JTA</b>	Jackson Transit Authority
<b>JTA</b>	Johnson City Transit
<b>KAT</b>	Knoxville Area Transit
<b>KATS</b>	Kingsport Area Transit Services
<b>Knox County CAC</b>	Knox County Community Action Committee Transit
<b>MPO</b>	Metropolitan Planning Organization
<b>OHA</b>	Operational Hazard Assessment
<b>OSHA</b>	Occupational Safety and Health Administration
<b>Participating Agencies</b>	The Tennessee public transportation agencies covered by the joint PTASP
<b>PHA</b>	Preliminary Hazard Analysis
<b>PM</b>	Preventative Maintenance
<b>PTASP</b>	Public Transportation Agency Safety Plan
<b>SETHRA</b>	Southeast Tennessee Human Resource Agency
<b>SMS</b>	Safety Management Systems
<b>SRM</b>	Safety Risk Management
<b>TAM</b>	Transit Asset Management
<b>TDOT</b>	Tennessee Department of Transportation

### Appendix C – Hazard Tracking Worksheet

Preliminary Hazard Analysis													
General Description			Hazard Cause / Effect			Risk Index			Corrective / Mitigation Action		Risk Index		
Reference	Overall System	Hazard	Potential Causes	Operational Effects	Safety Effects	Severity	Probability	Risk	Design Mitigations	Operational Mitigations	Resolution Severity	Resolution Probability	Resolution Risk
Use a number to track hazard, ie Bus #1	BUS (or other system)	Trip and Fall on Bus	Wet floor	Delay of service	Minor to sever injury	3	B	3B	Slip resistant Flooring	Driver Training	3	C	3C
			Hard braking						Handholds placed regulary				
			Human error (standing on moving vehicle)										

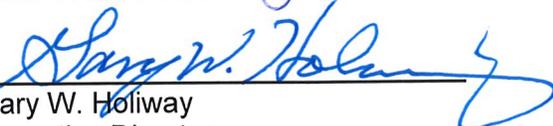
# Participating Agency Addenda

These Participating Agency Addenda provide additional agency-specific information to supplement the joint ASP, including agency safety roles and responsibilities, safety training programs, safety reporting programs, and safety-related agency plans and procedures, as applicable. Each addendum applies only to the agency for which it is written and approved.

**Addendum 4 – East Tennessee Human Resource Agency**

**PTASP and Addendum 4 Approvals**

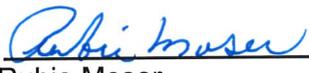
**Prepared by:**  6/12/2020  
 Ron Woody  
 Chair of the Board of Directors  
 Date

**Approved by:**  6/11/2020  
 Gary W. Holiway  
 Executive Director  
 Date

**Approved by:**  6/11/2020  
 Mike Patterson  
 Transportation Director  
 Date

**Approved by:**  6/11/2020  
 Brent Gagley  
 Assistant Transportation Director/Accountable Executive  
 Date

**Concurrence:**  6/11/2020  
 Scott Russell  
 Safety and Training Officer  
 Date

**Concurrence:**  6-11-2020  
 Rubie Moser  
 Safety and Training Specialist  
 Date

**Concurrence:**  6/11/2020  
 Gina McAlpin  
 Operations Manager  
 Date

**Concurrence:**  6/11/2020  
 Tyrone Hicks  
 Maintenance Administrator  
 Date

## Safety Roles and Responsibilities

The matrix below names the positions at East Tennessee Human Resource Agency (ETHRA) responsible for the safety roles and responsibilities described in Section 2.2 of this ASP.

East Tennessee Human Resource Agency Roles & Responsibility	Mike Patterson Transportation Director	Brent Gagley Assistant Transportation Director	Scott Russell Safety Officer	Rubie Moser Safety Specialist	Gina McAlpin Operations Manager	Ty Hicks Maintenance Administrator
Accountable Executive (AE)	A	P	N	N	N	N
Chief Safety Officer (CSO) (SMS Implementation)	A	R	P	S	N	N
Safety Management Policy	A	P	S	R	R	R
Safety Risk Management (Hazard ID/Mitigation)	A	R	P	S	R	S
Safety Assurance (Audits/Inspections)	A	R	S	R	R	P
Safety Promotion (Communication/Training)	A	R	P	S	R	R
Hazard Identification & Safety Risk Assessment	A	R	P	S	R	S
Safety Reporting & Follow-up	A	R	S	P	R	R
Safety Performance Targets & Measurement	A	S	P	R	R	R
Accident Investigation	A	R	P	S	R	R

### KEY

A	Approval
O	Oversight
P	Primary
S	Secondary/Support
R	Review/Comment
N	Not Applicable/No Significant Role

## Integration with Public Safety and Emergency Management

ETHRA conducts internal exercises and drills based on emergency response procedures, and their safety risk management program.

## Safety Performance Targets for 2020

2019 Annual Vehicle Revenue Miles: 4,637,572

Number of Fatalities	Rate of Fatalities Per 100K VRM	Number of Injuries	Rate of Injuries Per 100K VRM	Number of Safety Events	Rate of Safety Events Per 100 VRM	Total Major Mechanical Failures	Miles between Major Mechanical Failures (System Reliability)
0	0	2	0.04	3	0.06	71	65,318

## Hazard Identification and Tracking

ETHRA accepts the hazard identification and tracking methods in the joint plan.

## Safety Training Program

ETHRA requires training in the following safety-related areas:

- New driver training, including a minimum of 32 hours of training from ETHRA training/safety coordinator and/or senior driver prior to providing services
- Driver training, annual minimum of 15 hours across 20 training areas

### **Employee Safety Reporting Program**

**ETHRA will implement a standard employee safety reporting form and anonymous collection drop box no later than July 20, 2020.**

- 2019 ETHRA Transportation Procedures Manual, July 2019