

## **Mass Transit Safety**

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### **Introduction**

There are hundreds of mass transit authorities across the country. Safety concerns in this industry not only revolve around safe transport of customers utilizing these systems, but also the people who support day-to-day operations. Most individuals enjoy the conveniences of mass transit systems without giving a second thought to fleet maintenance, vehicle operator training, heavy construction, or security efforts. There are a plethora of safety initiatives that go on in front of and behind the scenes to provide safe transportation to the public.

Transit authorities can service multiple cities or states, making them subject to a variety of minimum safety standards outlined by these local or state jurisdictions. Additionally, safety cultures within mass transit authorities are greatly impacted by numerous federal and/or state safety regulations or oversight agencies, and tort liability acts. In some instances, public sector authorities can be held to relatively low limits of liability. This kind of protection can present challenges for safety professionals in implementing safety programs that require significant investment.

### **Transportation Issues**

Mass transit authorities allocate a great deal of resources for vehicle operators. Among other things, these resources address vehicle operations and occupational hazards training, drug testing programs, and public relations. Transporting passengers is the core of what all mass transit agencies do, and they must ensure that this primary objective is done in a safe manner.

Training of vehicle operators, both rail and bus, can be one of the most critical components in the transit industry. Vehicle accidents constitute a majority of the industries' liability claims, including associated Workers' Compensation cases. When it comes to transportation safety concerns, most resources come in the form of vehicle operations training. The industry uses a variety of programs that range from in-house certification processes to nationally recognized

training programs, such as the Smith System®. Typical training programs include extensive classroom, as well as behind the wheel, training.

Some larger transit systems integrate live motion simulators into operator training. These simulators are full-size mockups of bus and rail vehicle cabs that utilize virtual reality technology to simulate operation of vehicles in adverse weather conditions or city/suburban environments. The systems are so sophisticated they can simulate the feel of a jerking steering wheel when a bus has a flat tire. Simulators help operators with problem areas of their driving, such as judging a turning radius in a bus, multiple times without jeopardizing public or operator safety. Also, these simulators have been used by safety professionals to perform accident reconstructions.

Most private sector fleet operations are familiar and deal with the Department of Transportation (DOT) regulations when it comes to drugs, alcohol, and commercial driver's license (CDL) requirements. However, depending on the geographic service areas of public transportation, some mass transit authorities are governed by the Federal Transit Administration (FTA). Although the FTA does report to the DOT, there are some significant changes that may occur when transit authorities most comply with only FTA regulations; namely, transit authorities may be exempt from requiring physicals as part of their CDL programs. The FTA does mandate that drug and alcohol testing occur for safety-sensitive positions, which include bus and rail vehicle operators.

Safety and transportation personnel continually struggle with personal security concerns that result from operators in direct contact with a sometimes unruly public. Unfortunately, it is not uncommon in the industry for vehicle operators to be assaulted by passengers or bystanders. The threat and reality of physical violence on operators has resulted in numerous ways to protect our most vulnerable employees. Authorities have taken measures such as training operators in self-defense techniques, teaching strategies for verbally diffusing hostile situations, and completely shielding operators from the public by encapsulating them in protective cabs. Because safety concerns arise from operators collecting fares, several transit authorities utilize electronic fare box systems that separate operators from having to carry or maintain large sums of money.

Transit authorities also address transportation safety issues with a variety of non-revenue or support vehicles. These vehicles range from simple automobiles to highly sophisticated maintenance vehicles. Training associated with these vehicles ranges from simple defensive driving courses to specialized programs for operating boom cranes, rail-borne maintenance equipment, and heavy-duty wrecker vehicles.

## **Maintenance Issues**

Transit authorities not only have the responsibility to operate a safe fleet, but also maintain safe environments in fleet maintenance shops and at public facilities, such as bus stops, rail platforms, and transit centers. Fleet facilities, both public and private, present challenging situations, as safety issues can change dramatically depending on the mode of transportation, time of day, location, or weather conditions.

Transit safety professionals continually look for safer methods in maintaining safety critical vehicle components, such as brakes and steering mechanisms. Training mechanics on proper maintenance and repair of these systems is a job all to itself. The complexity of training issues are compounded by the fact that transit authorities may maintain buses from several different manufacturers, as well as engine or system components from various manufacturers. Other major

safety concerns revolve around hydraulic lifts and working under vehicles, fall protection issues associated with maintenance pits or working on top of buses, and exposure to harmful organic vapors or fiberglass fibers in paint and body shop operations.

Rail fleet maintenance shops encounter similar safety concerns as their bus fleet counterparts. However, electrical safety issues present another major safety concern in rail facilities that operate with contact systems or third rail configurations. Newer rail maintenance facilities have designed engineering controls to lock and tag out electrical energy before anyone can come into close proximity with energized lines. In light rail operations that utilize contact systems, a great deal of maintenance work is performed on top of the vehicle. These rail mechanics are therefore exposed to working at heights and are utilizing large cranes to lift and work on vehicle components.

During daytime operations, vehicles are traveling their assigned routes; leaving certain service areas of the facility almost completely abandoned, such as preventative maintenance areas, fueling and vehicle wash lanes. During nighttime operation, mechanics work feverishly to get minor defects repaired or perform preventative maintenance to meet pull out the next morning. Fueling and bus wash lanes become very active and significantly increase vehicle traffic in vehicle yards, resulting in greater exposure to vehicle and pedestrian accidents within the facility. Mechanics must wear high visibility clothing in these environments as vehicles are constantly being moved in the dark of night.

Also, returning vehicles can come back with a host of health issues, namely bloodborne pathogen exposures. Vehicle cleaners are faced with not only general housekeeping in the vehicles but often encounter issues where passengers have contaminated a vehicle with bodily fluids. As unpleasant as this situation is to discuss it is a common occurrence, which cleaners must be prepared and trained to handle. Now that terrorism has come to the forefront of everyone's mind, safety professionals are looking for ways to combat biological or radiological contamination on vehicles.

Few large vehicle maintenance shops are equipped to protect mechanics from the hot and cold conditions of summer and winter months. In summer months, heat stress becomes a major concern as mechanics work in non-air-conditioned environments around hot engines in possibly several layers of clothing and personal protective equipment. Carbon Monoxide can become a serious issue during the winter season, especially for transit properties located in the northern areas of the country. Mechanics, in an effort to escape the cold, will close roll-up doors and continue working on vehicles in enclosed environments. Safety professionals are continually inspecting local and general exhaust systems to minimize or eliminate the threat of carbon monoxide poisoning.

Public facilities, such as bus stops, transit centers, and rail platforms, can number in the thousands, far exceeding the number of fleet maintenance shops. Employees who support public facilities are a very mobile workforce and do not have as many resources readily available to them as their fleet maintenance counterparts. Individuals that go out to clean these public facilities can find themselves exposed to vehicular traffic, resulting in the need for work zone safety. Public facilities employees need to be alerted on temporary traffic control requirements and flagging operations. Also, public facility maintenance crews use a variety of support vehicles, from mobile cranes to lift bus shelters to bucket trucks for landscape maintenance. Public facilities maintainers, like vehicle cleaners, can be confronted with exposure to bodily fluids. These individuals are therefore subject to Bloodborne Pathogen training and clean-up procedures.

Other mobile maintenance crews, such as track or signal and communication maintainers, experience similar safety issues as the public facility crews. The aforementioned crews, commonly referred to as Maintenance of Way (MOW), also deal with energizing and de-energizing electrical components for contractors that work along rail alignments. They require specialized training in dealing with not only basic electric safety, but also high voltage electricity. MOW personnel also use highly specialized mobile equipment, such as cranes, which bring about rigging safety concerns as well.

## **Construction Issues**

Road and heavy construction is no stranger to the transit industry. Per Federal Transit Administration (FTA) Project and Construction Management Guidelines, a group independent of the people actually doing the construction is required to routinely monitor construction activities to ensure safety compliance. Transit authorities normally fulfill this role and work with program management to ensure that policies, procedures, and work practices are compliant with all applicable federal, state, and local safety and health regulations and standards. All transit construction projects can be broken down into two major areas of concern: adherence to construction safety standards for contract employees and public safety.

Heavy construction is an integral part of developing an effective transit system. Mass transit authorities can easily find themselves designing and building roads, bridges, and steel-structured transit facilities either on dedicated property or in public areas. Despite some transit agencies' status as a public employer, all contractors must adhere to OSHA Construction Standards. If work is performed in a rail right of way, contractors may also be subject to additional track safety requirements imposed by the transit authority. Contractors must have proof of completing the track safety course on their person at all times and all activities must be coordinated through rail operations.

Public safety concerns come about when construction projects directly impact vehicle or pedestrian traffic on roads or at transit facilities. Safety professionals can no longer hang their hats on OSHA standards, which address occupational safety issues. Other resources, such as pedestrian barricading standards, city ordinances, or ADA considerations, must be utilized when construction sites impact pedestrian movements or vehicle traffic. Additional contract requirements may also be placed on contractors relative to internal policies or procedures, as well as system safety requirements monitored by state oversight agencies. If these projects occur on dedicated right of way or private property, then areas can be completely barricaded with little to no impact to the public.

Unfortunately, not all public facility construction projects can allow total shutdowns of the area, and the challenge of protecting the public becomes a very dynamic task when system upgrades occur. System upgrades have a direct impact on the public at large, as well as the continuing operation of transit systems. Passengers become impatient and try to circumvent construction site barricading to get where they need to go. Again, system upgrades can be isolated depending on the circumstances, but most transit systems need to continue moving and providing service to the public.

## Security Issues

Mass transit is one of the biggest targets for global terrorism. The numerous bus bombings in Israel and the Madrid rail attacks are evidence of the appeal of mass transit to inflict mass casualties. The Federal Transit Administration, along with the Department of Homeland Security, has provided guidance and resources to reduce the chance of a terrorist attack on transit systems across the country. Mass transit authorities, along with local jurisdictions, are partaking in a variety of exercises to identify, train, and respond to any perceived security threats.

Security and safety professionals are constantly looking to identify security threats before they develop into intentional acts of violence. Transit projects are reviewed in planning stages in hopes to engineer out any security issues. One of the most powerful tools that mass transit is using is the process of Crime Prevention Through Environmental Design (CPTED – pronounced sep-ted). CPTED is an approach in crime prevention that seeks to dissuade individuals from committing crimes by manipulating the physical environment in which the crime can occur. Some of the items identified using this approach can be as simple as overgrown landscaping that provides an area for an attacker to hide.

The Office of Domestic Preparedness is also traveling the country performing security threat assessments of the largest transit authorities. These threat assessments are being used to prioritize assets and identify ways to harden these possible targets. Smaller transit authorities can draw upon FTA security documents, such as *The Public Transportation System Security and Emergency Preparedness Planning Guide*, which uses basic threat assessments designed from the MIL-STD-882D likelihood and severity matrix.

There are several training resources available to transit professionals through the Transportation Safety Institute and the National Transit Institute. Everything from training manuals to interactive CD-ROMs are being utilized by transit agencies across the country. Transit agencies are utilizing these resources not only to train employees but the public as well. Systems are utilizing public address systems at rail platforms and transit centers to alert passengers to be aware of suspicious packages or activities. These simple announcements increase the number of eyes and ears that can identify potentially dangerous situations.

Because mass transit plays an integral role in responding to emergencies in local communities, emergency exercises have now been integrated into day-to-day operations. Transit authorities provide valuable resources to the community and first responders to large emergencies. Buses and rail vehicles across the country have been called in to act as ambulances, cool down areas for fire fighters, and transports for supplies. Systems have participated in many drills across the country to communicate what resources the industry has and how other agencies can utilize them. During the actual attacks of September 11<sup>th</sup>, mass transit was called upon to evacuate downtown and business district areas across the country.

Some transit agencies have dedicated transit police departments that are currently gearing up for potential terrorist attacks. Safety professionals in the transit industry are now addressing safety concerns of these first responders. Police now have to budget for respiratory fit testing and medical evaluations, as well as the training associated with the use and limitations of new personal protective equipment. Specialized divisions of the police are also undergoing training for hazardous materials operations.

There are some transit police organizations, through memorandums of understanding, that have total jurisdiction on responding to situations that occur on transit vehicles or properties. These agreements have forced some agencies to look into forming their own bomb squads and biological terror response teams. Outside of obvious safety concerns related to bomb detection, transit safety professionals have to deal with radiation safety. Radiation safety concerns not only come from detection of materials in a bomb, but also from portable x-ray units that are now common place with police.

## Summary

Although it plays a critical role, transportation safety is only the tip of the iceberg for safety professionals in this industry. Various maintenance activities, heavy construction projects, and security concerns continue to challenge transit professionals in developing safe modes of transportation. Loss control in the industry can prove to be an overwhelming task, given the complexity of mass transit operations and the politically charged environments these systems serve.

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