



SAFETY BEST PRACTICES

Date: September 30, 2019 Project #: 23805
To: COIC, Project Management Team
From: Susan Wright, PE and Bryan Graveline (Kittelson & Associates, Inc.)
Subject: Bend TMP Scope Task 6H – Safety Best Practices

TABLE OF CONTENTS

Introduction.....	1
Safety Culture	2
Safety of Operators and Passengers in Transit Vehicles	2
Safety of Passengers at Bus Stops	3
Safety of Pedestrians and Bicyclists at Mobility Hubs/Park-and-Rides	3
References	5

INTRODUCTION

As part of the process of updating the City of Bend Transportation System Plan, the project steering committee approved Transportation Plan Goals that define the community's desired outcomes for the transportation system. One of these goals is to ensure safety for all users. This includes working to:

- Reduce serious injuries and fatalities
- Maximize safe routes within and between neighborhoods and throughout the community for all users
- Design and build facilities and routes that maximize safety for pedestrians and bicyclists
- Ensure safe speeds

While this goal applies to all modes of the City of Bend's transportation system, a safe and secure transit system plays an important role in accomplishing this goal citywide.

A safe and secure transit system is the result of several critical pieces. It includes safety of operators and passengers inside transit vehicles, safety of passengers waiting at transit stops, and safety of pedestrians and bicyclists accessing transit stops. Ultimately, it is reflected in the commitment of the transit organization to safety, called Safety Culture.



SAFETY CULTURE

Safety Culture refers to the shared values (what is important) and beliefs (how things work) that interact with an organization's people, structures, and control systems to produce behavioral norms (the way we do things around here). Building a positive safety culture within an organization is critical to safety performance. In a survey for TCRP Report 174, respondents determined that the five most important elements of Safety Culture are:

- 1) Safety is recognized as the highest organizational priority, and both management and employees are committed to that priority.
- 2) Adequate training is provided so employees have an understanding of how to perform their job duties in a safe manner.
- 3) There is open, frequent, and effective communication on safety.
- 4) Adequate financial and human resources are dedicated to ensure the safety and health of employees.
- 5) Management and employees are willing to interrupt schedules and service for safety reasons.

SAFETY OF OPERATORS AND PASSENGERS IN TRANSIT VEHICLES

Unfortunately, there are very few security measures available to prevent violence from occurring on board a transit vehicle. Buses are not reserved. They are public open access vehicles available for use by an unrestricted general population. Buses are populated by anonymous riders who present nothing more than fare media or card to get on board. Typically, individuals who represent security risks are not pre-identified or barred from riding because their propensity to violence is generally unknown. There is virtually no screening for weapons or dangerous implements prior to boarding. Riders are placed in close proximity to one other, strangers, friends, and associates alike with on and off access readily available in case a hasty retreat is required. In summary, the openness of public transit systems makes difficult to protect from safety or security threats.

BEST PRACTICES TO IMPROVE SAFETY

The remaining option for preventing violence on board a conveyance is the deployment of security forces. Although this response is more so one of deterrence, it is technically possible to prevent an incident from occurring if security personnel are physically present and able to stop an ongoing attack or criminal assault. Examples of security countermeasures include:

- Police or security staffing on board conveyance
- Visible surveillance systems
- Screening
- Physical barriers – compartment barriers or shielding
- Barring systems
- Public address system and signage



In addition to preventing violence on board, the safety of operators and passengers can also be positively influenced by regular preventive maintenance (PM) of vehicles. Routine maintenance checks by a certified technician at specified intervals can help maintenance departments anticipate repairs and prevent mechanical failures that could result in transit vehicle crashes or other unsafe conditions. Regularly scheduled PM activities should supplement services performed as a reactive measure to address unexpected failures and maintenance needs.

SAFETY OF PASSENGERS AT BUS STOPS

Crime or violence at a bus stop is usually a matter for investigation and resolution by local authorities. Normally a small- or medium-sized agency would not be directly impacted by an event occurring at one of these locations. However, concern about the perception of passengers that an agency's bus stops are unsafe could adversely impact ridership. Prevalent crimes include typically either those involving public nuisance or public offense (driving in public, drug violations, lewd or disorderly conduct), or crimes against persons (petty thefts such as pickpocket or jewelry snatching, robbery, assault, or rape).

BEST PRACTICES TO IMPROVE SAFETY

Anecdotally, it would not be unusual for a transit agency to be familiar with those locations along their bus routes where crime occurs. These locations, known as “hot spots,” usually possess certain environmental characteristics that create both opportunity for crime and concealment or routes of escape to preclude apprehension. To the extent practical transit agencies should consider bus stop or shelter placement and security taking the following factors into consideration.

- Place bus stops where surveillance by shop owners, managers, employees, guards, or caretakers is possible
- Place bus stops away from the vicinity of liquor stores, bars, and taverns
- Physical incivilities (trash, graffiti, abandoned buildings, disrepair, unkempt lots) and social incivilities (rowdy behavior, drug dealing, public drunkenness, prostitution, panhandling, and loitering) result in higher crime and resident fear.
 - o Work with the local police department and the city to prevent these incivilities from occurring near bus stops.

SAFETY OF PEDESTRIANS AND BICYCLISTS AT MOBILITY HUBS/PARK-AND-RIDES

The design of larger transit facilities, such as mobility hubs or park-and-rides, can have a great impact on the safety of pedestrian and bicyclists, including patrons walking to or from parked vehicles. The design of these facilities thus calls for careful integration of transit, pedestrian, bicycle, and automobile transportation.



BEST PRACTICES TO IMPROVE SAFETY

Mobility hubs and park-and-ride facilities should be well-lit and be free of barriers immediately adjacent to transit loading areas. Bus stop signs and street furniture, as well as other passenger amenities, should not interfere with transit loading, patron queueing, or pedestrian access. Pedestrian facilities must be designed to meet ADA requirements. At a minimum, pedestrian spaces should be provided with wheelchair ramps and curb cuts, detectable warning strips at curb ramps, and a barrier-free path between handicap parking spaces and the transit terminal. Additional amenities such as Braille signage and audible signals should be considered as aids to visually impaired patrons.

Individual access and service modes should be organized within the park-and-ride facility to minimize conflicts and to maximize the efficiency of the various operations. This is achieved by providing separate access driveways for transit and non-transit modes and providing separate access for short-term waiting/kiss-and-ride activities. The following location priorities are suggested in terms of proximity to the express transit line served by the facility:

1. Bus loading-unloading
2. Taxi loading-unloading (may mix with buses or cars)
3. Handicapped, bicycle, and motorcycle parking
4. Passenger drop-off and pick-up
5. Short-term parking
6. Long-term parking

Pedestrian paths within park-and-ride lots should be continuous, unobstructed, and clearly distinguishable; good visibility is essential, and conflicts between pedestrians and motor vehicles and buses should be minimized. Pedestrian pathways should generally allow for direct travel between the point of entry into the facility and the transit boarding area. This allows pedestrians to use the aisles between parking stalls to walk directly to the boarding area. Alternatively, raised pedestrian pathways between facing stall rows can provide direct access to the boarding area and are preferable, where they can be provided.

Pedestrian paths that cross vehicle routes should provide maximum visibility. This can be achieved by either varying the pavement medium or by raising the pedestrian path above the driving surface. In the latter approach, the pedestrian path can be used as an enlarged traffic bump, raising the pedestrian above the paved surface and providing a traffic-calming device as well.

CET could also sponsor travel training to educate riders on safe driving, bicycling, and walking practices at park-and-rides to decrease the likelihood of unsafe movements. This training could be in the form of public service announcements on the bus, at the park-and-ride, or in the media.



REFERENCES

1. City of Bend. *Bend's Transportation Plan Goals*. 2018.
2. American Association of State Highway and Transportation Officials. *Guide for Geometric Design of Transit Facilities on Highways and Streets*. 2014.
3. Transit Cooperative Research Program. *Improving Safety Culture in Public Transportation*. 2015.
4. Transit Cooperative Research Program. *Policing and Security Practices for Small- and Medium-Sized Public Transit Systems*. 2015.
5. Transit Cooperative Research Program. *Preventive Maintenance Intervals for Transit Buses*. 2010.