

Keeping Public Transportation Passengers & Employees Safe:
Review and Recommendations for Transit Operational Best Practices
during the COVID-19 Pandemic

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Preface.

Public transportation is a vital community and regional asset. Keeping passengers and employees safe during the pandemic is essential to the social and economic well-being of the region, both for the duration of the pandemic and the prospects for economic recovery and prosperity.

One of the challenges in writing this paper has been the evolving nature of our understanding of the SARS-CoV-2 novel coronavirus and how it spreads, the disease it causes – COVID-19, and the ways in which we can effectively combat it.

This report is a summary of selected available literature and information from authoritative sources and other transit agencies about best practices and provides a series of recommendations based on what we know now. As our understanding continues to evolve and/or the circumstances change, this report and its guidance should be revisited and revised.

Introduction.

Earlier this summer GPCOG undertook a survey of available literature regarding transit operations during the COVID-19 pandemic at the request of the PACTS Transit Committee. In the U.S, 2.8 million transit riders, nearly one-third of transit commuters, are considered “essential” employees. Given the importance of transit operations and ridership to the health of the regional economy, our goal has been to sift through the range of materials and provide our transit partners with a shared resource identifying the best guidance for operations, communications, possible collaboration and cooperation, and make recommendations to support and rebuild ridership. Transit providers – not uniquely, but importantly– are challenged to provide as safe a workplace as possible as employers, provide a safe and sanitary service to riders, and communicate effectively to internal and external audiences about the steps being taken, what to expect, and how to be safe.

The scope of this effort has been to review existing guidance from authoritative sources and survey publicly available information on practices and communication with the public. The resulting report, while something of a “snapshot in time,” provides guidance for keeping the public and employees as safe as possible based on current understanding of the virus, how it spreads, and identified risk factors. This report summarizes and synthesizes available literature and may need to be revisited as circumstances evolve.

Executive Summary.

The transit agencies in the Portland, Maine area have responded to the pandemic and the needs of the region and should be proud of the work they have done to continue providing vital transportation services under extremely difficult circumstances. This report was developed as a resource to guide continuing operations to protect public health as the pandemic persists. This resource may need to be revisited and revised as circumstances continue to change.

We have identified four major recommendations in continuing operations during the pandemic, all based in authoritative guidance and industry literature, and most already common knowledge: social distance, wear masks, clean and sanitize, and ventilate.

- **Social distance:** Agencies should seek to maintain distance between people or, when that is not possible, provide physical barriers between employees and the public. Agencies also should seek to spread people out through the transit network by reducing vehicle seating capacity, thereby limiting crowding.
- **Wear masks:** Agencies should limit the spread of the virus through respiratory droplets and respiratory aerosols by requiring all passengers and employees to wear masks unless they are medically exempt and wear face shields as an alternative. Employees in regular contact with the public should preferably wear N95 masks.
- **Clean and sanitize:** Agencies should regularly clean visibly dirty surfaces with detergent or soap and water. Buildings and vehicles should be regularly sanitized with disinfectants. For high touch surfaces, EPA List N disinfectants should be used frequently. The transit network should move as quickly as possible toward touchless payment to further minimize points of human contact. Agencies should consider providing hand sanitizer to passengers.
- **Ventilate:** Agencies should maximize exchanges of interior air with exterior air, operating with windows open where possible. When not possible operating vehicle ventilation systems should run at high capacity bringing in as much fresh air as possible. Ventilation systems should use and maintain filters that are MERV-13 or higher. Agencies should consider the addition of ultraviolet germicidal irradiation (UVGI) devices to ventilation systems or standalone devices.

Effective communication is critical to rebuilding public confidence and ridership. The transit agencies in the Portland area have already committed to a coordinated, collaborative approach to communicating consistent messages about public health and safety, with an emphasis on reaching diverse communities. Transit providers also should designate a point person within their agencies to coordinate COVID related prevention and mitigation strategies to employees.

There are potential opportunities for providers to coordinate on the purchase of services and products that may lower costs, reduce administrative burden, and potentially strengthen or create more resilient supply chains. While existing contractual obligations may preclude joint

procurement in some services, agencies should explore the feasibility of cooperatively purchasing:

- Cleaning and sanitizing services
- Uniforms and other workwear
- Personal Protective Equipment (PPE)
- Driver partitions/shields and installation
- Hand sanitizer, and installation of hand sanitizer dispensers
- Cleaning products
- Ultraviolet germicidal irradiation (UVGI) devices
- Filters

Report.

Our review included a wide range of resources, including the U.S. Centers for Disease Control and Prevention, the Federal Transit Administration, the World Health Organization, the Harvard School of Public Health, Occupational Safety and Health Administration, the Transportation Research Board, the American Public Transportation Association, and others.

We reviewed safety procedures and practices, and public information resources available from transit providers in the larger Northeast region – the MBTA, Lowell and Worcester regional transit authorities in Massachusetts, Manchester, New Hampshire, the Greater Hartford Transit District, and Connecticut Department of Transportation’s transit operations. We have reviewed literature and practices around different modes – bus, paratransit, ferries, and rail. While some general principles apply across modes, we also have identified mode-specific recommendations (the configuration of ferries and mix of passengers, vehicles, and cargo, for instance, or the challenges related to paratransit and safely assisting passengers with disabilities).

The available literature is not as rich, or as specific, as we might like. No doubt you are familiar with many of the sources we surveyed and, like us, continue to search for the latest guidance. Six months or so into the pandemic – though it feels longer – we are still learning, and some of the guidance may evolve as our understanding evolves. As much as our findings and recommendations will address the situation as it is today, they may form the basis of our approach as long as the pandemic persists. As the pandemic eases, hopefully, some of the steps we will identify as best practices can gradually be relaxed as well. Should the pandemic worsen, as it may as we get into colder weather and seasonal flu season, additional steps or even more vigilance may be needed. It may be useful to think of each of the various strategies as a point along a spectrum where we decide to implement a practice or procedure that fits the situation.

Current Status.

The table on the following page summarizes publicly available information on current (September 2020) COVID-19 pandemic-related practices and messaging by transit providers in the PACTS region as well as other transit systems in the Northeast. It is important to note that this is only the information that is publicly available on providers’ websites and is not necessarily reflective of all steps being taken to ensure passenger and employee safety with regard to cleaning and sanitizing, ventilation, and other safety related practices and procedures.

Greater Portland Transit Providers.

Transit Agency	Social Distance	Wear Masks	Clean and Sanitize	Ventilate
BSOOB Transit	<ul style="list-style-type: none"> 50% passenger capacity 6-foot distance Rear door boarding and alighting 	<ul style="list-style-type: none"> Face coverings at all times 	<ul style="list-style-type: none"> Daily cleaning Electrostatic disinfectant gun and cleaning fogger 	
Casco Bay Lines	<ul style="list-style-type: none"> 6-foot distance Limited passenger capacity 	<ul style="list-style-type: none"> Face covering at all times 	<ul style="list-style-type: none"> Commercial grade backpack cleaning devices to sanitize Extra hand sanitizer dispensers Staff education and training related to COVID-19 proper hygiene 	
METRO	<ul style="list-style-type: none"> Limited passenger capacity to 30 per bus 6-foot distance No continuous riding; all trips one-way Rear door for boarding and alighting 	<ul style="list-style-type: none"> Face coverings at all times 	<ul style="list-style-type: none"> Twice daily cleaning and disinfectant Removing hanging hand straps from buses Info. Distribution to employees and passengers related to COVID 	
NNEPRA	<ul style="list-style-type: none"> 50% passenger capacity 6-foot social distancing Plexi-glass partitions in Café 	<ul style="list-style-type: none"> Face coverings at all times 	<ul style="list-style-type: none"> Equipment sanitized nightly Enhanced cleaning before and after each roundtrip 	<ul style="list-style-type: none"> Filtration systems with fresh air exchange every 4-5 minutes
RTP		<ul style="list-style-type: none"> Face coverings at all times 		
South Portland Bus Service	<ul style="list-style-type: none"> Passenger capacity limited to 20 per bus 6-foot distance 	<ul style="list-style-type: none"> Face coverings at all times 		
YCCAC	<ul style="list-style-type: none"> No 'joy riding' Maximum seating capacity 	<ul style="list-style-type: none"> Face coverings at all times 		

Other Regional Transit Systems.

Transit System	Social Distance	Wear Masks	Clean and Sanitize	Ventilate
Connecticut Department of Transportation (CTrail, CTtransit)	<ul style="list-style-type: none"> 6-foot distance 	<ul style="list-style-type: none"> Face coverings at all times 	<ul style="list-style-type: none"> Nightly sanitizing of all trains and buses using CDC-recommended protocols 	
Greater Hartford (CT) Transit District	<ul style="list-style-type: none"> 6-foot distance 	<ul style="list-style-type: none"> Face coverings at all times 	<ul style="list-style-type: none"> Daily cleaning with coronavirus disinfectant; nightly deep cleaning 	
Lowell (MA) Regional Transit Authority	<ul style="list-style-type: none"> No continuous riding Rear door boarding 	<ul style="list-style-type: none"> Face coverings at all times No eating or drinking on the bus 	<ul style="list-style-type: none"> Disinfect all buses daily with electrostatic mister or disinfectant sprayer All buses supplied with disinfectant spray 	
Manchester (NH) Regional Authority	<ul style="list-style-type: none"> 50% passenger capacity (restored to normal July 1) 	<ul style="list-style-type: none"> Face coverings for drivers at all times Face coverings urged for passengers 	<ul style="list-style-type: none"> Vehicles cleaned throughout the day 	
Massachusetts Bay Transit Authority	<ul style="list-style-type: none"> Protective barriers for drivers Routes prioritized to allow for physical distancing Real-time bus crowding information 	<ul style="list-style-type: none"> Face coverings at all times 	<ul style="list-style-type: none"> Decontamination with electrostatic fogger every 2 weeks All vehicles disinfected every 24 hours High contact areas cleaned every 4 hours Hand sanitizer, disinfectant wipes and sprays deployed throughout the system 	<ul style="list-style-type: none"> Windows opened on buses
Worcester (MA) Regional Transit Authority	<ul style="list-style-type: none"> Seat closures on transit vehicles Front door boarding/rear door exit 	<ul style="list-style-type: none"> Face coverings at all times 	<ul style="list-style-type: none"> Clean and disinfect every 24 hours Mid-route cleaning and misting 	

What We Know About the Virus.

Collective knowledge about the SARS-CoV-2 novel coronavirus and the disease it causes, COVID-19, has continued to develop since earlier this year. According to the U.S. CDC:

Based on what is currently known about the virus and about similar coronaviruses that cause SARS and MERS, spread from person-to-person happens most frequently among close contacts (within about 6 feet). This type of transmission occurs via respiratory droplets, but disease transmission via infectious aerosols is currently uncertain. Transmission of SARS-CoV-2 to persons from surfaces contaminated with the virus has not been documented. Transmission of coronavirus occurs much more commonly through respiratory droplets than through objects and surfaces, like doorknobs, countertops, keyboards, toys, etc. Current evidence suggests that SARS-CoV-2 may remain viable for hours to days on surfaces made from a variety of materials. Cleaning of visibly dirty surfaces followed by disinfection is a best practice measure for prevention of COVID-19 and other viral respiratory illnesses in community settings.

It is unknown how long the air inside a room occupied by someone with confirmed COVID-19 remains potentially infectious. Facilities will need to consider factors such as the size of the room and the ventilation system design (including flowrate [air changes per hour] and location of supply and exhaust vents) when deciding how long to close off rooms or areas used by ill persons before beginning disinfection. Taking measures to improve ventilation in an area or room where someone was ill or suspected to be ill with COVID-19 will help shorten the time it takes respiratory droplets to be removed from the air.

In the early stages of the pandemic, most of the emphasis was on good respiratory hygiene, distancing, and sanitizing objects and surfaces. We have since come to understand more about the effectiveness of masks or other coverings over the mouth and nose at reducing the risk of exposure to the wearer as well as those around them. This is particularly true because infected persons may show no symptoms while capable of spreading the virus to others. There is also more attention being paid to aerosol spread, where very small respiratory droplets stay suspended in the air longer than the so-called “ballistic” droplets on which six-foot distancing is based. This has led to an increase in attention to ventilation, filtering, and sterilization as exposure reduction strategies.

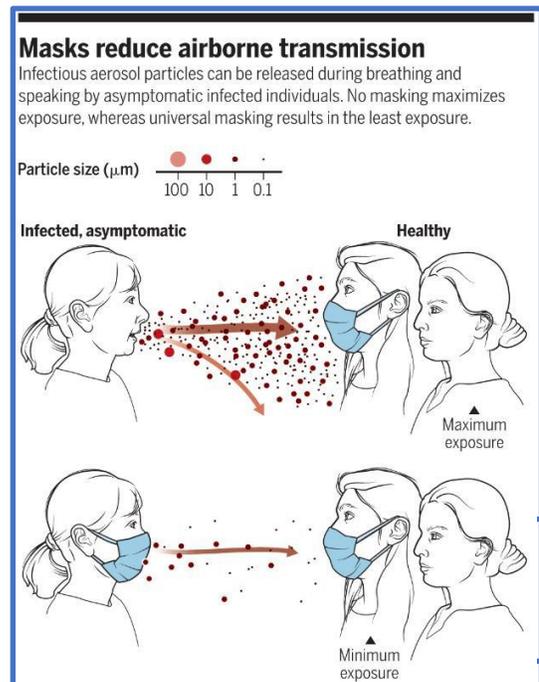
General Recommendations.

There are four major areas of recommendations in maintaining transit operations as safely as possible during the pandemic: distancing, face coverings, cleaning and sanitizing, and ventilation.

- Distancing:
 - Maintaining distance between people or providing physical barriers where distancing is not possible between operators and employees and the public.

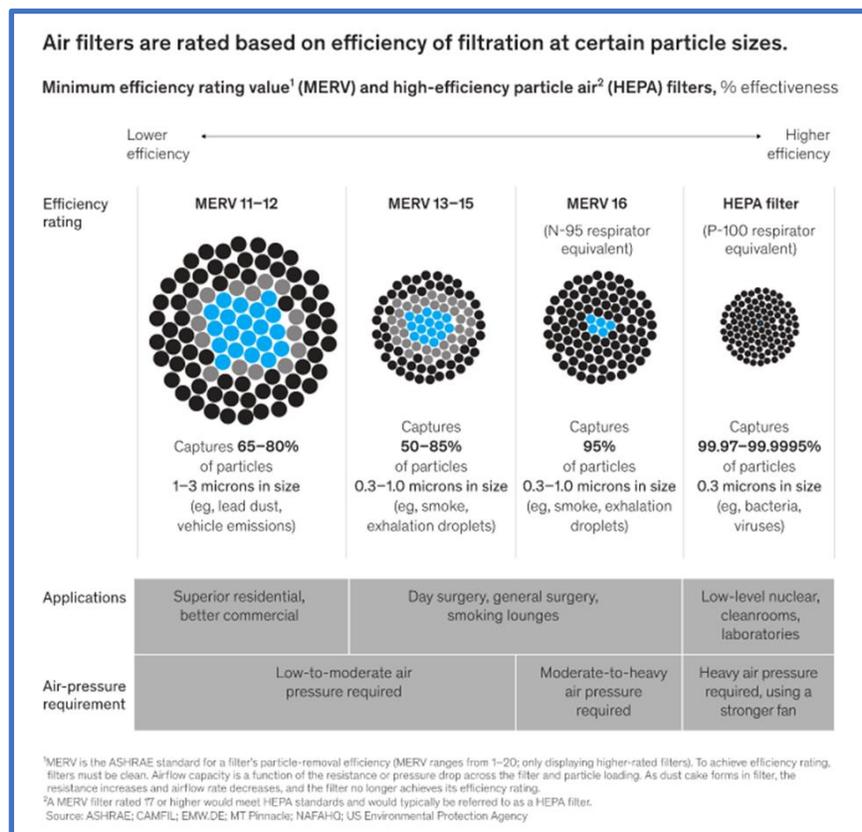
Consider changing boarding procedures if they present an exposure hazard that cannot be mitigated using transparent barriers of some kind (Plexiglass shields or enclosures, clear vinyl sheeting, etc.). Maintain distances of at least six (6) feet by using floor markings, restricting seating, and other capacity limiting measures.

- Maintaining a distance of at least six (6) feet helps limit the spread from ballistic respiratory droplets.
 - In combination with face masks, distancing also helps limit the spread due to respiratory aerosols.
 - Separation of passengers and operators
 - Where passengers require assistance, minimize contact to the greatest extent possible, ensuring both the passenger and operator are using masks or face coverings (ideally N95 for the operator)
 - Seating, capacity limitations can help maintain distance.
- Face coverings:
 - Passengers, drivers, operators, and other transit employees should be required to wear face masks whenever on a transit vehicle, in a transit facility, or where distancing is difficult.
 - Ideally, employees operating transit vehicles or working in other enclosed spaces for extended periods should wear N95 masks.



- Cleaning and sanitizing.
 - Make sanitizer available to passengers at the boarding entrance to vehicles, preferably touchless
 - All surfaces should be sanitized at the end of shift, trip, day, or other time that allows disinfectant to dry undisturbed.
 - High touch surfaces such as railings, handles, keypads should be wiped down regularly.
 - Only [EPA List N](#) disinfectants should be used.
 - Ensure supplies and stocking for continuous availability.
 - Consider using ultraviolet germicidal irradiation (UVGI) to destroy virus particles, as standalone air filter units or integrated into ventilation systems in combination with particulate filters.

- Mist/gas sanitizing, using foggers to disinfect hard to reach/clean surfaces and save time.
- Ventilation.
 - Maximizing exchanges of interior air with exterior air
 - Operating with windows open where possible
 - Operating vehicle ventilation systems at high capacity bringing in as much fresh air as possible when windows cannot be opened
 - Maintaining or upgrading ventilation systems to use MERV-13 or higher (HEPA is a commonly known standard)
 - Adding ultraviolet germicidal irradiation (UVGI). Using ultraviolet light to destroy virus particles, as standalone units or incorporated into ventilation systems in combination with particulate filters.



Passenger Safety.

Consistent with CDC guidelines, passengers on all forms of transit should:

- Wear face masks or other face covering
- Maintain physical distances as much as possible

Transit providers should:

- Make sanitizer available to passengers at the boarding entrance to vehicles, preferably touchless
- Sanitize high-touch surfaces frequently
- Use contactless payment methods
- Consider increasing levels of service, to the extent possible, to accommodate volume and maintain distancing

Employee Safety.

Beyond the confines of the transit vehicle, be it a bus, ferry, rail car, or paratransit vehicle, maintaining the health and safety of employees helps ensure continuity of service. Employees should receive information and be regularly reminded about how to protect themselves and their households and be encouraged to stay home and notify their supervisor if they are sick, display any symptoms of COVID-19, or know they were exposed to an infected person.

The Occupational Safety and Health Administration has extensive guidance on protecting workers in various environments, assessing hazards, and determining the appropriate measures (the use of what OSHA calls engineering controls, administrative controls, and personal protective equipment (PPE)) to protect employees.

Engineering controls involve isolating employees from work-related hazards. Where appropriate, these types of controls can reduce exposure to hazards without relying on human behavior. In a transit context, these may include:

- Instituting measures to physically separate or force distance greater than six feet between bus transit operators and passengers, such as installing physical barriers such as clear plastic sneeze guards or driver compartment partitions,
- Installing high-efficiency air filters in vehicle ventilation systems, and
- Increasing ventilation rates by leaving windows open as much as possible and, where not possible, operating vehicle ventilation systems for maximum circulation and intake of fresh air.

Administrative controls are changes in work policy or procedures to reduce or minimize exposure to a hazard. Training, plans, policies, and procedures that articulate and enforce means to reduce infection include:

- Identify a point person within the agency to coordinate COVID related prevention and mitigation strategies,
- Develop a database of staff qualifications, licenses, etc. as backup for critical positions to maintain continuity of service as much as possible,
- Review the stock and availability of essential protection and cleaning equipment and supplies,

- Consider screening employees, contractors, and visitors for symptoms through a mobile app, interview, or questionnaire prior to the start of a work shift,
- Keep staff informed and develop a basic ‘question and answers’ for employees,
- Continually educate staff and riders on how to manage and mitigate risks associated with COVID-19,
- Train workers who need to use protective clothing and equipment using material that is easy to understand and available in the appropriate language literacy levels,
- Develop protocol for cleaning and disinfecting facilities, buildings, and vehicles using disinfectants approved for use against COVID-19 (EPA List N disinfectants), and
- Implement flexible sick leave and supportive policies and practices, possibly including lenient emergency sick leave policies if sick leave is not offered to some or all employees.

OSHA regulations (29 CFR 1910.132) require employers to provide employees with the personal protective equipment (PPE) needed to keep them safe while performing their jobs. The type of PPE required is based on the risk of exposure while working. All types of PPE must be:

- Selected based upon the hazard to the worker
- Properly fitted and periodically refitted, as applicable
- Regularly inspected, maintained, and inspected as necessary
- Properly removed, cleaned, and stored or disposed of to avoid contaminations of self, others, or the environment.

In the context of transit operations, PPE would be limited to masks (ideally N95) for vehicle operators, crew, conductors, etc., especially those working directly with passengers or the public. In some situations, gloves would be appropriate for sanitizing surfaces or in the event physical contact or exposure to bodily fluids is involved.

Operations.

General principles of distancing, face covering, cleaning and sanitizing, and maintaining, improving, or maximizing ventilation apply across all modes of transit. They should be considered additive, not mutually exclusive, and not individually sufficient. These measures are:

- Distancing, maintaining physical distance or separation, including reducing passenger capacity, to reduce or prevent contact with respiratory droplets or aerosols and considering possible increases in level of service to help maintain distancing as passenger numbers increase, to the extent possible.
- Requiring face coverings to further limit the amount and extent of spread by droplets and aerosols.
- Sanitizing regularly for high frequency, high touch spaces and surfaces reduces the likelihood of transmission resulting from touching contaminated surfaces and then one’s eyes, nose, or mouth. Clean visibly dirty surfaces with detergent or soap and water

before sanitizing with an EPA List N disinfectant and allow time for disinfectant to dry undisturbed. Regular vigorous hand washing with soap and water, and sanitizing (using a sanitizer that is at least 60% alcohol) also destroys the virus. Limit contact with passengers requiring assistance, require face masks, and have operators or crew members sanitize their hands immediately afterward.

- Ventilation, maximizing the amount of fresh air being circulated in an enclosed space to dissipate respiratory aerosols, reducing or eliminating recirculation, and, where possible, installing and maintaining filters (ideally MERV-13 or higher) reduces the likelihood of transmission. Operate with windows open as much as possible or with ventilation system set up to bring in as much fresh air as possible, and use/maintain filtration in ventilation systems when running with open windows is not possible, using MERV-13 or higher without compromising system performance.

Considerations by Mode.

- Fixed route bus: install shields (an interior plexiglass cab) around the driver, separate boarding from the driver's compartment, and limit seating capacity.
- Paratransit: install shields (an interior plexiglass cab or other transparent flexible material) around or behind the driver, depending on vehicle configuration.
- Rail: limit seating capacity, install shields where employees and passengers interact. Conductors should minimize exposure in passenger cars. Install hand sanitizer near car entrances/exits and in/near restrooms.
- Ferry: encourage outside deck standing/seating as conditions permit, have occupants remain in their vehicles when possible, maintain face coverings and distancing, and limit interior seating capacity. Install hand sanitizer near vessel entrances/exits and in/near restrooms.

Communications.

Communication during a pandemic is critical. Agencies must communicate and reinforce new policies and procedures as they are developed and updated. Simplified messages are necessary during a crisis to ensure that the message reaches a distracted community.

- Communication language
 - Transit agencies should ensure that all messages and communications released are consistent and concise.
 - Communicate uncertainty clearly. Saying that not all information is available is more effective than speculating or making claims.
 - Identify which delivery methods should be used to disseminate communications, in which circumstance, and in coordination with which partners. Possible delivery methods could include traditional media (such as press releases, email distributions, websites, etc.), social media (such as Facebook, Twitter, text message alerts, etc.), and real-time data on vehicle occupancy to waiting riders via websites or mobile apps.
 - Provide numbers, context, history, and changes to procedures in a timely and straightforward fashion to bolster public trust.
- Communications to the public
 - Transit operators are responsible for informing the public of rules and guidelines while on the transit vehicle or in a transit facility. Transit agencies should provide the appropriate training and instruction to transit operators on how to disseminate rules and guidelines to the public.
 - Understand the diverse communication needs of the populations. Persons with disabilities and people with limited English Proficiency are especially vulnerable during pandemics. Agencies must understand how to meet the communication needs of all their constituents.
 - Clearly communicate boarding considerations or instructions to riders such as “rear door boarding only” on buses with the destination sign and automatic voice announcements at every stop.

Communications strategies should include messages and methods aimed at restoring confidence and restoring ridership. As with pandemic-related shutdowns and reopening of other businesses, people will generally only return when they feel it is safe. This makes messaging about not only service changes (frequency, boarding, fare policies) important, but safety (distancing efforts and adjustments, face covering requirements, cleaning and sanitizing practices, and ventilation) that much more critical. Some of these changes may also make transit more viable for those who had not used it before, which may help bolster ridership in the future.

Messages also should be delivered in languages and locations, and using methods that will reach diverse populations.

PACTS transit providers should consider developing a consistent set of messaging across all modes for all passengers and users to the greatest extent possible:

- Restoring confidence and rebuilding ridership.
- Communicating safety information to the public and users.
- Enforcing and reinforcing messages and practices.
- Providing language accessibility.
- Reaching diverse populations.

Collaboration.

There is a lot to consider and a lot to do in response to the pandemic. Where possible, it makes sense for PACTS transit providers to identify common needs and seek ways to meet them collectively, in a collaborative fashion, saving time and effort. As part of developing this report, we have identified several areas to pursue, though recognizing that some may involve contractual or other obligations that may preclude some opportunities:

- Communications, providing clear, consistent messaging in a unified way across all modes to restore confidence and rebuild ridership.
- Collective procurement of:
 - Cleaning and sanitizing services
 - Uniforms and other workwear
- Products:
 - Driver partitions/shields and installation
 - Personal Protective Equipment (PPE)
 - Hand sanitizer, and installation of hand sanitizer dispensers
 - Cleaning products
 - Ultraviolet germicidal irradiation (UVGI) devices
 - Filters

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