Team 3, Transportation Group, Infrastructure Management Department
Japan International Cooperation Agency (JICA)

Aiming for safe and reliable public transportation!

Photo: The Project for Improvement of Public Bus Operation in Phnom Penh, Cambodia

Outline

1. Purpose

In developing countries supported by JICA, the novel coronavirus (COVID-19) crisis has put public transportation in jeopardy because of a decline in public transport users due to limitations and restrictions on movement and insufficient support from public institutions.

For this reason, we have created this pamphlet to introduce efforts for sustainable operation and infection prevention measures against COVID-19 in public transportation, supporting practical measures by government authorities and transport operators in developed and developing countries around the concept of "Aiming for safe and reliable public transportation."

Note that the examples described in this pamphlet are just a list of measures in each country, and their effectiveness against coronavirus have not been verified.

2. Targets

- **JICA and related parties**
- **Government public transport authorities, municipalities, and transport operators**

Collection of Novel Coronavirus Measures of Global Public Transport Operators

The COVID-19 novel coronavirus (hereinafter novel coronavirus) which spread from January 2020 and infected the whole world has infected about over 100 million people as of the end of December 2020. The spread of this infection has had a major impact on the social and economic activities of countries, requiring various measures including in the public transport sector. Here we will introduce some examples of novel coronavirus measures in each country.

Ensure employee safety

Protecting public transport workers from novel coronavirus infections

Operation of guidelines for novel coronavirus measures

- Establishment and compliance with guidelines (internal rules)
- Launch of crisis management teams
- Advance emergency training

Prohibition of use of front door/isolation of driver's seats to ensure driver safety

- Prohibit use of front door (middle and rear doors only)
- Restrict use near the driver's seat
- Stop selling tickets inside vehicles

Understand the health status of employees

- Checking the physical condition of employees
- Temperature measurement before work
- Wearing masks/face shields
- Hand sanitizer

Promotion of contactless fare payment

- Contactless payment by IC card
- Advance payment on smartphones and mobile phones
- Promotion by PR

Control the infection of public transport passengers

Sharing necessary information and getting the cooperation of users for safe and secure public transport services

Passenger cooperation

- Wearing masks when using
- Temperature measurement before use
- Hand sanitizer
- Cough etiquette
- Refrain from loud conversation

Promotion of social distance inside vehicles

- Seat usage restrictions
- Passenger limits
- Promotion of off-peak use

Calling attention to prevent infection

- In-vehicle announcements
- PR with posters and stickers
- Sharing information online and on social media

Sharing congestion information using ITS

- Sharing congestion information online and on social media etc.
- Development of a dedicated app
- Connection with novel coronavirus tracking app

Collection of Novel Coronavirus Measures of Global Public Transport Operators

Maintain vehicles to control infection

Thoroughly sanitize and ventilate public transport vehicles in operation to control infection

Strengthening vehicle cleaning and sanitation

- Cleaning inside vehicles
- Strengthening the sanitization of multi-contact areas

Ventilation during operation

- Opening vehicle windows during operation
- Ventilation using air conditioners (Use of outside air ventilation function*)

*Check air conditioner performance

Coordinate operation

Creating operation plans in accordance with city lockdowns and self-restrictions on movement and activities

Review and coordination of operation plans

- Coordinate operation plans in line with social measures against novel coronavirus
- Operation management using AI and big data

Continuous service for essential workers

- Transportation of medical staff and medical products
- Support the mobilization of essential workers

Maintain public transportation facilities

Taking measures to prevent infection even at public transport facilities such as stations and bus stops

Enhance the cleaning and sanitation of stations and bus stops

- Cleaning inside facilities
- Strengthening the sanitization of multi-contact areas

Maintain equipment for hand sanitization

- Installation of alcohol sanitizer dispensers
- Installation of hand washing facilities

Promotion of social distancing inside facilities

- Social distancing markings at stations and bus stops
- Calling out cautions

Other measures inside facilities

- Ventilation inside facilities
- Infection prevention measures at counters etc.
- Automation/mechanization

Examples of Possible Measures – Public Transport Operators

Timing of Measures

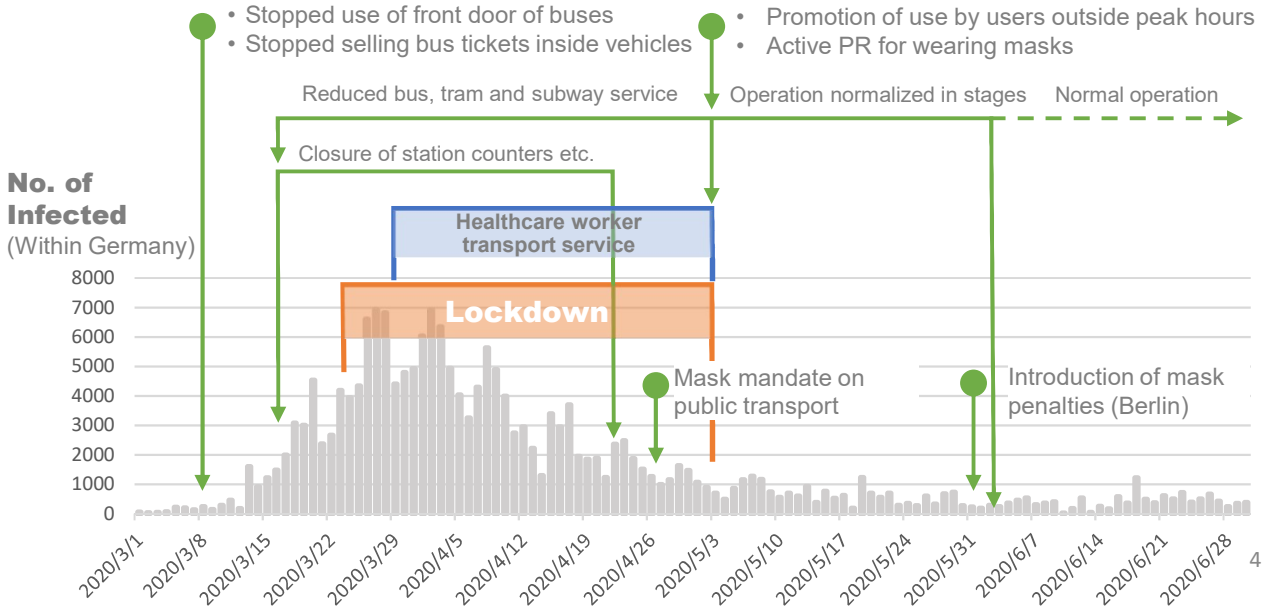
Prepare measures early for second and third waves to provide safe and secure services

	Preparations and Measures by Business Operators	Preparations and Measures for Users	
Normal times or when number of infected people is low	• Institutionalization of guidelines within offices • Establishment of headquarters for countermeasures • Develop a system to prepare for emergencies (when there is an infected person) and conduct training • Monitor the number of infected people in the area and devise timing for the introduction of measures	• Contactless payment development and promotion • App development and coordination • Development of methods for sharing information	Preparation and planning
Number of infected people increasing	• Employee health checks • Calling attention and introducing safety measures for employees • Strengthened cleaning and sanitization, ventilation in offices • Office work coordination and remote work • Strengthened vehicle cleaning and sanitization • Ventilation inside vehicles • Seat restrictions inside vehicles • Operation management • Introduction of hand sanitizer at stations and bus stops • Strengthened facility cleaning and sanitization • Cooperation with government and local Government, operation coordination • Coordination of counter operations • Monitoring of measures	• Calling attention to Passengers • Promotion of mask wearing and cough etiquette • Temperature measurement and confirming health before use • Promotion of hand sanitization and hand washing • Promotion of social distancing • Recommending decentralized use using off peak and avoiding congestion • Sharing congestion information • Sharing operation information with users	Implementation and monitoring of measures
Decline in the number of infected people	• Evaluation of measures • Review guidelines as appropriate	• Normalization of operations and sharing information with customers • Listening to the opinions of customers • Public transport safety PR	Evaluation

Examples of measures in Berlin, Germany

(However, the causal relationship between trends in the number of infected people and transportation measures has not been confirmed)

Measures were implemented in the special state of Berlin at the timings shown in the figure below



Collection of Novel Coronavirus Measures and Support Measures to Public Transport Operators from Governments and Local Governments around the World

Here we will introduce support measures for public transport operators by governments and local governments in each country.

Novel coronavirus measures of government and local governments

Implementing measures that can be handled by public institutions to control infection

Promotion of the development and operation of guidelines

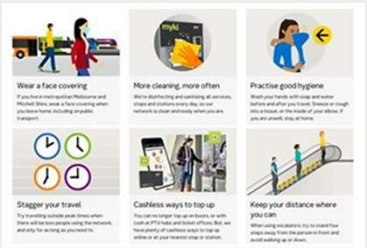
- Development of public transport guidelines
- Support for the development of guidelines (cost burden)
- Promotion and monitoring of guideline operation

Mandating mask wearing on public transportation

- System development
- Development of penalties
- Implementation of education and PR
- Enforcement

Sharing and spread of novel coronavirus measures

- Using media to spread information
- PR using posters and stickers
- Sharing information online and on social media



Support for public transport operators

- Provision of subsidies and supplies
- Expansion of subsidies
- Exemption from various fees and taxes
- Extension of payment deadlines

Implementation of infection precaution/prevention measures using IT

- Introduction and promotion of the use of a novel coronavirus contact/infection tracing app
- Introduction, promotion and support for contactless payment

Other measures

- Public transport use promotion campaign
- Introduction of sanitation equipment at transport facilities
- Opening of PCR testing sites at subway stations

Dangers to public transport due to novel coronavirus

Need for new measures and support for public transport operators for the sustainable operation of public transport

Impact of the novel coronavirus:

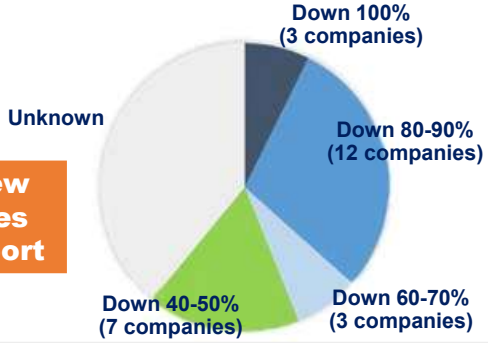
- Decrease in the number of public transport passengers due to lockdowns and self-regulated movement etc.
- Decline in public transport use due to increased work from home and switching to alternative forms of transport such as bicycle or foot
- Decrease in profitability due to passenger limits to ensure social distancing
- Increased burden from the cost of novel coronavirus measures

Need further discussion:

- **Recovery of public transport passengers**
- **Recovery from decline in sales due to decreased passengers**
- **Continued operation of guidelines**
- **Business continuity plans for post-coronavirus**

Need new measures and support

Decreased number of public transport passengers (Survey of 41 companies)



Examples of Possible Measures – Public Awareness of Public Transport Safety

It is necessary to share with customers that public transport is a safe and secure means of transport and to restore their trust for the future continuation of public transport businesses.

Avoiding the 3C's to provide safe and secure services

It is important to **avoid the "3C's"** to prevent the spread of novel coronavirus infections. This should also be implemented for public transport.

Closed Spaces: Ventilate by opening vehicle windows, or if they cannot be opened drive with outside ventilation or use the air conditioner

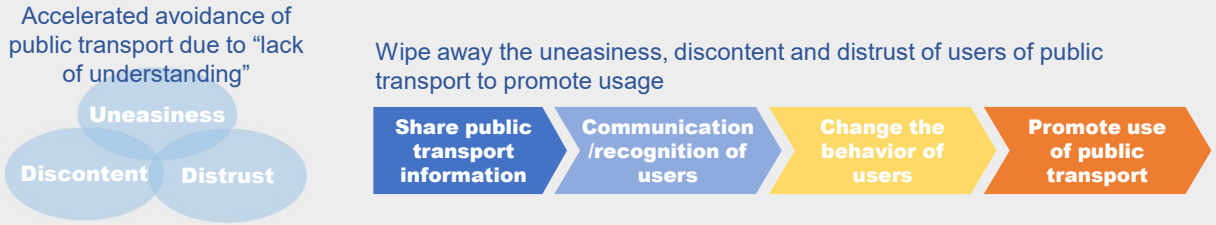
Crowded Places: Share congestion information in real time to alleviate congestion and allow off-peak use

Close-contact Settings: Encourage passengers to wear masks, suppress conversation and secure social distancing inside vehicles

Dispelling anxiety for public transport passengers

Many users of public transport are anxious about using it. It is necessary to devise measures to convey **"information"** and **"trust"** to users. Many users get their information from smartphones and PCs, so the active use of digital tools is effective. Information sharing methods must also consider the literacy rates in developing countries.

- Sharing measures against novel coronavirus infection: Promote user understanding using photos and videos
- Diversification of information: Increase awareness using media, posters, the internet and social media etc.
- Improved access to information: Improved ease of access (use of QR codes) and website visibility



Always updating and using the latest information and measures

Research and understanding of the novel coronavirus are progressing every day. Infection measures are also being updated, so effective measures should always be based on the latest information.

- Multi-contact surfaces such as seats, railings, straps, and stop buttons etc. with antibacterial and antiviral solvents
- New sanitization methods using UV light
- Digital stop buttons using smartphones etc.

Public transport supporting regional life

The novel coronavirus has had a significant impact on public transport operators. They require the understanding of users and continued support from governments and local governments.

- Public transport supports the activities of essential workers during the novel coronavirus crisis
- Means of transport for local socio-economic activities for the development of towns that are easy to live in
- Contributes to reduced environmental damages and traffic safety
- Effective means of transport in preparation for aging societies in developed countries

Future Issues – Evidence-based Measures

Research into measures against novel coronavirus is progressing. It is most effective to implement measures with a scientific basis.

In-vehicle ventilation (buses)

The “Project for Improvement of Public Bus Operation in Phnom Penh, Cambodia” conducted a ventilation test in buses, along with efforts to call attention crews as PR for citizens.

- There was a ventilation effect even if only one release location from the front window to the far back window diagonally opposite
- It took about 4 mins to ventilate (introduce air from outside) using an air conditioner
- When the inside air temperature exceeds 30 degrees, the inside air will be circulated so it is necessary to be careful about the inside temperature
(Depending on individual air conditioner performance)

Bus Ventilation Test

Top Photos
- Use of air conditioner
- Introduction of outside air
- Windows closed

Bottom Photos
- Use of air conditioner
- Introduction of internal air (30 degrees or higher)
- Windows closed

Source: The Project for Improvement of Public Bus Operation in Phnom Penh, Cambodia

Novel coronavirus sanitization

Infection with the novel coronavirus happens from droplets containing the virus. Infection can be controlled by sanitizing hands and multi-contact surfaces. If suitable disinfectants are not available, consider alternatives.

Hand sanitization
- Hand washing: Wash with soap or hand soap for 10 seconds and rinse with running water for 15 seconds
- Alcohol sanitization: Preferably including 70-95% ethanol concentration

Facility sanitization
- Chlorine bleach (sodium hypochlorite): Dilute to a concentration of 0.05% for use
- Detergent (surfactant): Detergents that contain effective surfactants (furniture and kitchen detergents) are effective
- Aqueous hypochlorite: Certain concentrations of aqueous hypochlorite are also effective

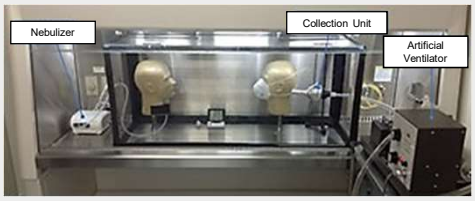
*For more information, please see the websites of the Ministry of Health, Labour and Welfare of Japan, or the National Institute of Technology and Evaluation (NITE).

Effectiveness of masks

Latest research shows that mask wearing is effective at suppressing both the diffusion of novel coronavirus into the air and its inhalation.

Encourage public transport workers and users to wear masks.

When wearing surgical (non-woven fabric) or cloth masks
- When a non-infected person wears a mask, the amount of virus inhaled is suppressed to 20-40% compared to when not wearing one



Source: Institute of Medical Science, University of Tokyo

For more details, see the website of the Institute of Medical Science, University of Tokyo, or https://www.ims.u-tokyo.ac.jp/imsut/content/000003662.pdf

For more details...

Details, include the source materials used in this pamphlet are summarized in the following report.

- JICA Rail and Bus Technical Cooperation Project Cooperative Survey
“Summary Report of Knowledge and Experience in Novel Coronavirus Measures in Public Transport around the World” September 2020 (Japanese Only)

Contact: Team 3, Transportation Group, Infrastructure Management Department, Japan International Cooperation Agency (JICA)

3S: Safety, Security and Sanitation to be implemented on public transportation!