MOBILITY MANAGEMENT

Handbook
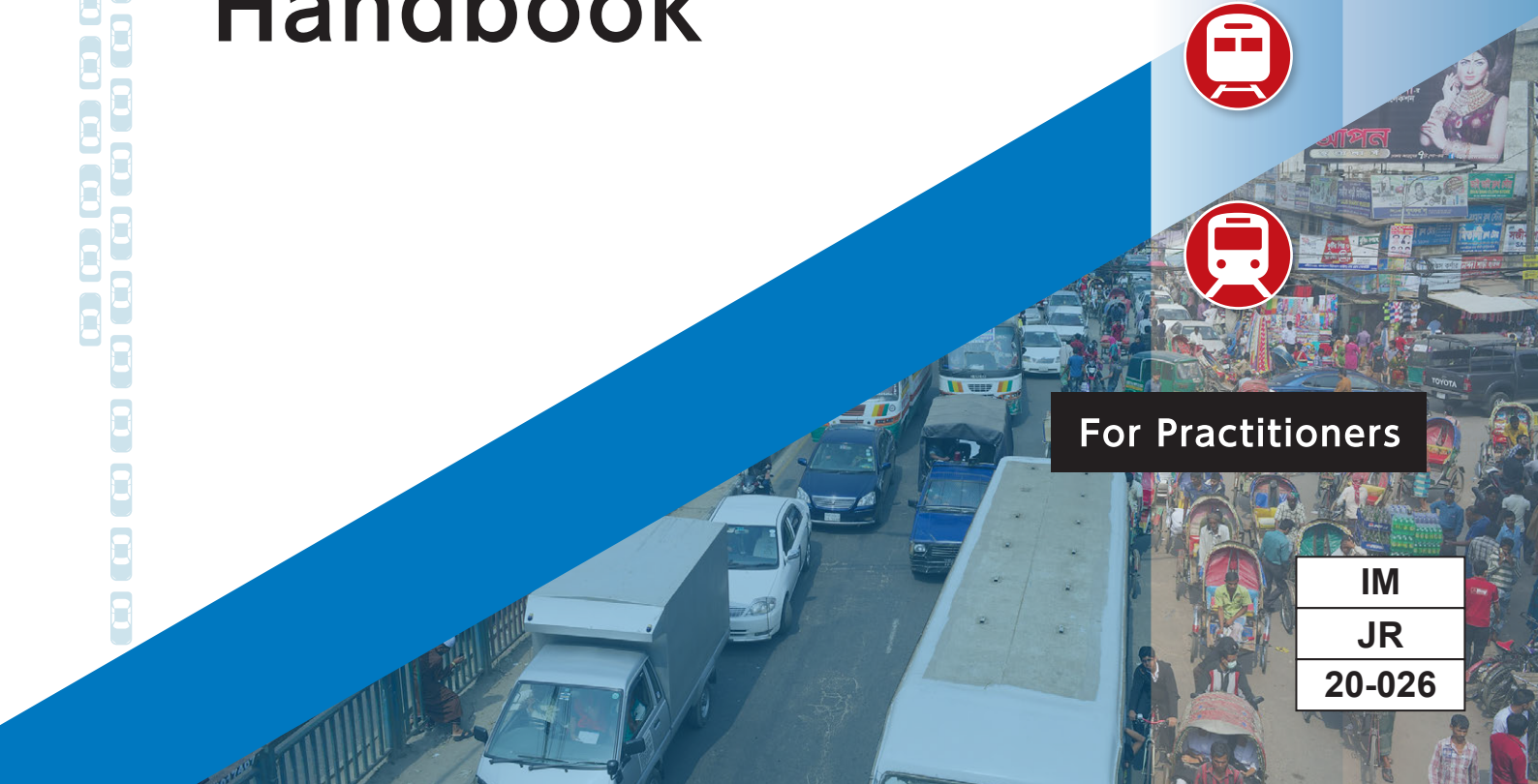
For Practitioners

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CHAPTER 1   Introduction

Automobiles and motorbikes are convenient transport modes in many cities around the world. Income growth brought about by economic development enables people to own such vehicles. Moderate use of these vehicles can make economic activities more efficient, and serve as a driving force to sustain economic development. However, excessive dependence on vehicles can have negative impacts on societies such as traffic congestion, air pollution, and greenhouse gas emissions. In the medium to long term, it can cause a decline in public transport services, causing them to suffer due to lack of revenue, and making urban transportation management a challenge. Infrastructure development and public transport service improvements have been implemented to promote increased use of public transport instead of automobiles and motorbikes. These policies, however, may not always directly lead to changes in travel behavior.

This handbook introduces Mobility Management (hereinafter called "MM"), a transport policy effective for alleviating the issues mentioned above. The primary audience is expected to be government officers who are tasked with planning and/or implementing this policy, as well as public transport operators and researchers. It explains the concept and the methodology, and provides a number of actual cases implemented to promote an understanding of the policy and even to develop implementation capacity. This handbook has a summarized version, MM for stakeholders, which targets a wider audience that includes policy makers and stakeholders in the transport field. The summarized version can be used as presentation material when planning and implementing MM, hence more people will take interest in it.

This handbook consists of six chapters, a project review, and tools as shown in Figure 1-1. You are reading Chapter 1, the Introduction. Chapter 2 explains the concept and background of MM and its position in a transport planning context. In Chapter 3, more practical pieces of information are explained such as target selection, communication principles, and effect measurement. Then Chapter 4 follows, providing various case studies to give readers a selection of real world cases to refer to when looking for target information. Chapter 5 explains how to begin MM, giving various information and tips on the adoption of MM in budgeting, team building, etc. Chapter 6 covers approaches and provides advice from well-experienced professionals for effective and sustainable MM activities. Then Case Studies presents MM in a broader context, focusing on various activities attributed to urban scale transport planning. Finally, the tools contain useful materials for those who are going to implement MM policies.
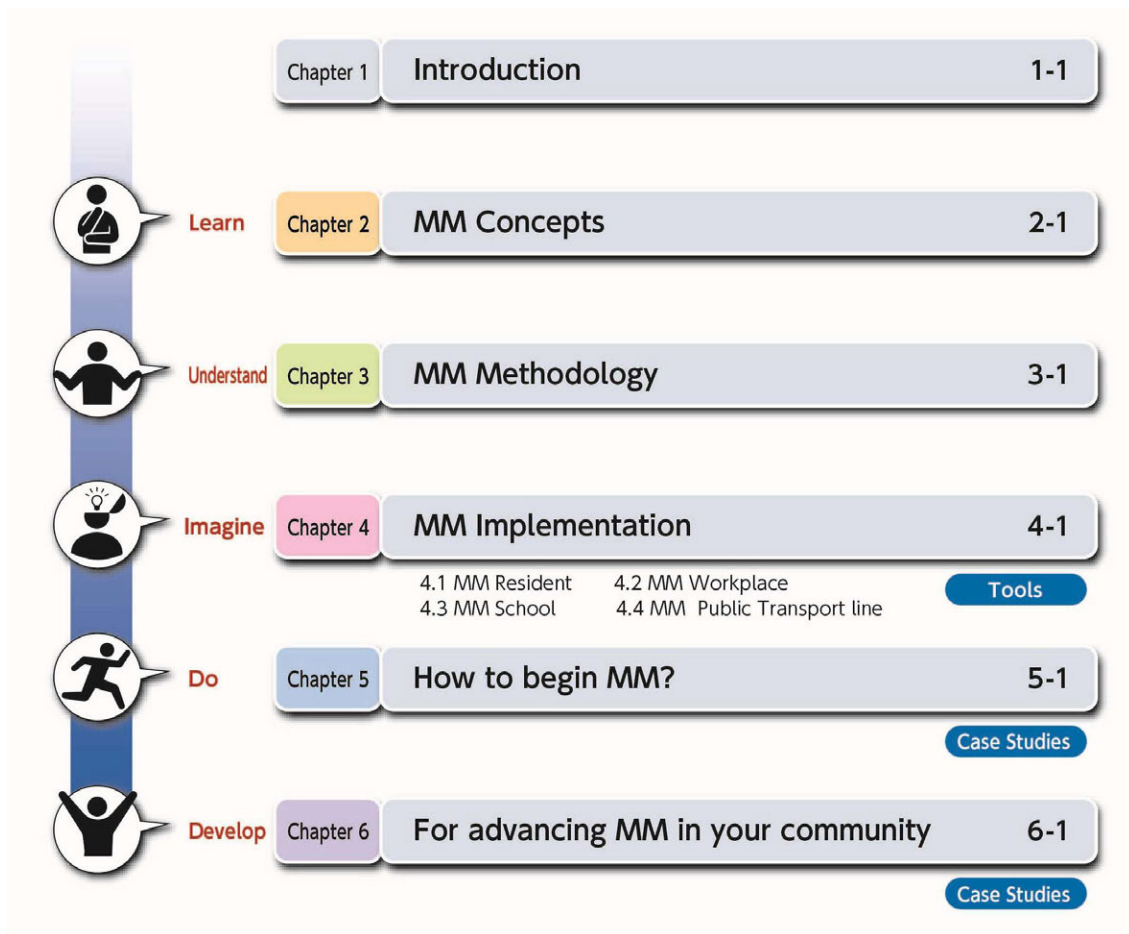
Figure 1-1 Handbook Overview

In Chapter 4, the readers can directly refer to sections on specific transport issues that their respective cities are facing as indicated in Figure 1-2, which guides them exactly where to read.
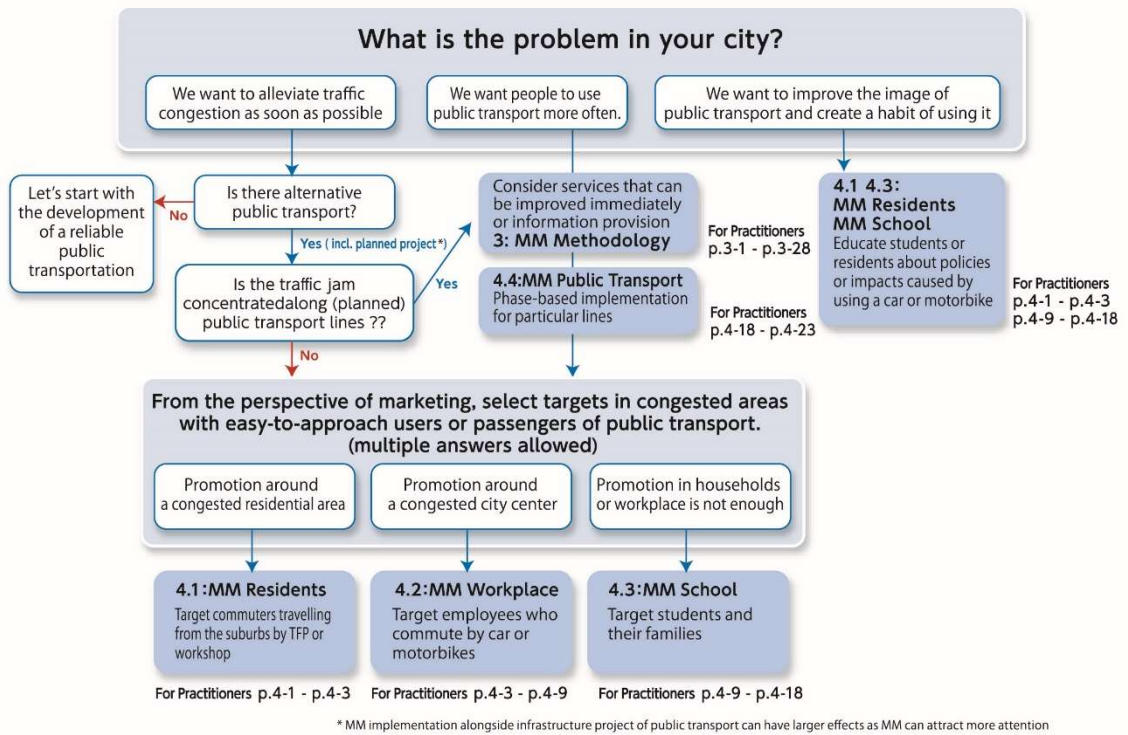
Figure 1-2 Mobility management types corresponding to urban issues

Figure 1-3 helps the primary audience of this handbook – the government officers – to find the best case studies to refer to depending on their current responsibilities.

Those who are establishing transportation policy or want residents to understand them

P4-11 ● In Hadano city, the school MM was positioned in the TDM implementation plan and implemented in collaboration with educational administration.

P2-11 ● Kyoto city established "walkable town Kyoto" Charter, they educated at elementary school and publicized on radio and with posters. About 30% of citizens touched on information about the charter.

P5-16 ● Kyoto City established Managing Authority for Walkable City Kyoto, in which various stakeholders taked part in

P5-3 ● In Vientiane city and Fukui city, instant TFP was conducted when conducting PT surveys.

P5-4 ● "Car Free Day"

Those who are conducting survey or construction for the development of railways or BRTs

P5-6 ● Promote understanding of MM by stakeholders at workshops and seminars.

P4-17 ● Placing MM as a part of project, and secure budget for PR, etc.

P5-5 ● Approach potential public transport users by School MM

P4-19 ● Sendai City carried out various promotion at each stage of new subway project

Those who want to promote the use of existing railways or buses

P5-5 ● In Binh Duong, MM was conducted at workplaces and schools along the bus line. Bus usage of MM target people almost doubled.

P5-2 ● In Kawanishi city and Sendai city, they created a map that incorporated the opinions of residents.

P5-7 ● Obihiro city implemented household MM to promote usage of bus and improvement of service levels. After implementation, the bus ridership increased.

P4-6 ● Uji city created specific maps and timetables for each workplace.

P5-8 ● Provision of information to search services by developing GTFS

P5-4 ● "Car Free Day"

Figure 1-3 References depending on reader's responsibility

CHAPTER 2   Mobility Management Concept

2.1   What Is Mobility Management?

Mobility Management[1] is a communication-oriented measure to encourage more smart and appropriate ways of using travel modes for solving travel issues such as traffic congestion. In contrast to conventional transport policies, such as building transport infrastructure or improving transport services, MM aims at helping targeted individuals to think about their communities and change travel behavior by themselves, leading to more sustainable transport systems for society. This new concept is built on three principles that are not given much attention in conventional transport policies: voluntary, psychological, and individual

Building transport infrastructure or improving transport services to make them more economically attractive are meant to change travel behavior. MM, on the other hand, encourages persons to think about their communities and change their behavior voluntarily through provision of information or awareness. This means that MM deals with a change of behavior out of people's consciousness instead of changes in environment.

To this end, it is required to understand a behavior-changing process from the psychological perspective, dealing with consciousness and attitude on travel behavior. MM applies appropriate communication measures, depending on stages of the transport behavior changing process, which have been developed out of a scientifically proven theory in psychology. This approach enables dealing with behavioral mechanism that cannot be altered by conventional transport policies. For instance, MM approaches people who have a habit of using private vehicles and they are not using public transport just because they are not familiar with it at all. This habit can be addressed by timely and respectful communication measures of MM as shown in Figure 2-1.

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[1] Japan Society of Civil Engineers (2005) defines *Mobility Management* (MM) as "communication-oriented measure which encourages people to change their mobility voluntarily to more socially and individually desirable direction." Another definition by European Conference on Mobility Management (2009) includes organizing services and coordinating activities of different partners in addition to the communication and information measures. This handbook mainly explains MM as a communication-oriented measure.

This voluntary approach supported by psychological process can be more effective when applying individual-targeted communication, taking the circumstances and thoughts into account. Although it can take time and energy to do so, the timely and individually targeted communication can lead to higher chances of changing behavior and continuing the newly acquired behavior.
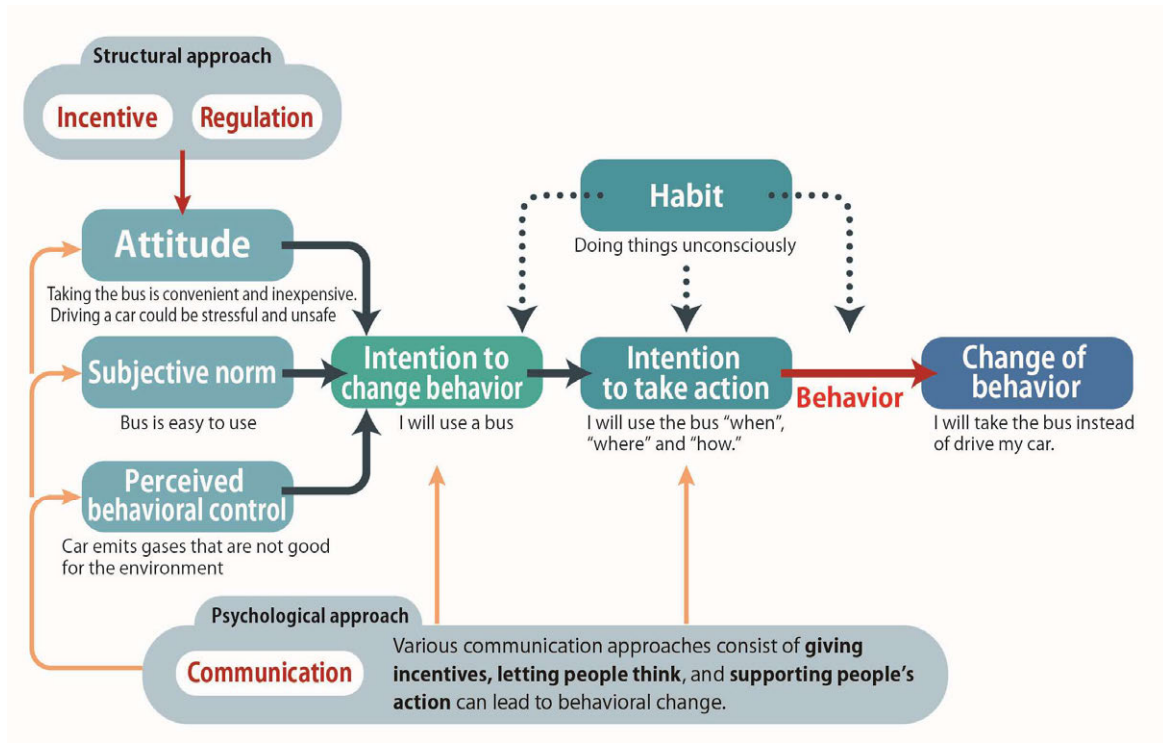
Source   JSCE(2005)

Figure 2-1 MM communication approach and the process of behavioral change

Even though the MM approach focuses on individuals, extensive results can be obtained by a large-scale implementation. South Perth in Western Australia achieved an 8% reduction of the private vehicle modal share and 10% increase in public transport ridership by implementing MM to approximately 170,000 households. This large-scale impact can improve mobility, and at the same time, help solve larger social issues such as urban sprawl and air pollution.
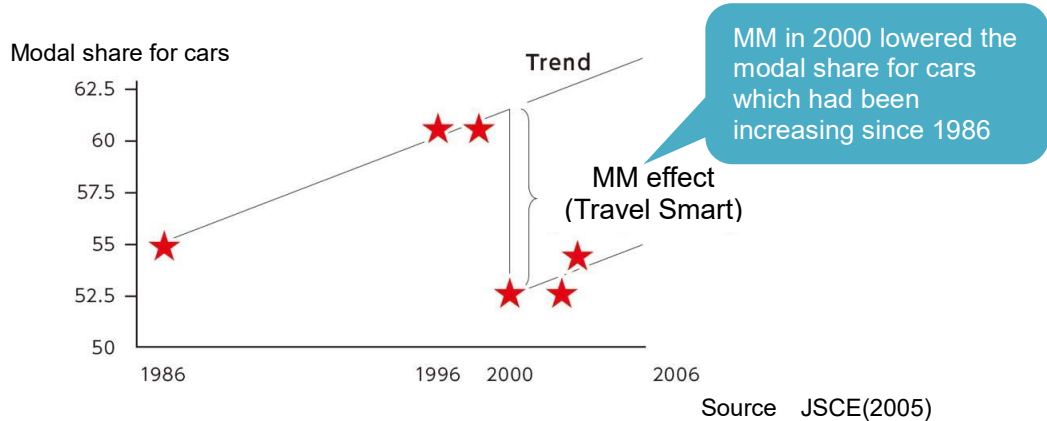
Figure 2-2 Modal share of cars in the City of South Perth over time

It should be mentioned that MM, although it is a communication-oriented measure, can require a certain level of public transport infrastructure and services. This handbook, however, focuses on MM as a communication-oriented measure.

Column: Related terminologies

■ Transportation Demand Management (TDM)

TDM aims at more efficient use of transport infrastructure by traffic reduction or allocation in terms of space and time. It is a demand-oriented approach, contrary to supply-oriented approach by road construction, dealing with infrastructure development for cyclists, pedestrians, and public transport as well as its service adjustments, such as price adjustment. TDM is a concept similar to MM and, in some cases, MM can be a part of TDM. However, MM is rather communication-oriented approach with emphasis on voluntary, psychological, and individual aspects.

■ Soft Measures

In UK, the terminology is sometimes used to describe a transport measure that encourages more use of sustainable transport modes (such as public transport or walking) instead of using private vehicles, which is quite similar to MM in approach. However, the terminology is not commonly used in the transport field. In Japan, on the other hand, the terminology is used to describe non-infrastructure measure, such as operation improvement, in contrast with "hard measure" where physical measures like infrastructure development are involved. To avoid confusion, this terminology will not be used in this handbook.

■ Public Relations (PR)

Although PR can be one of various MM measures, it is rather a promotion for a particular transport system, supplementing another transport measure such as infrastructure development or service improvements. MM can be one of various transport measures, expecting behavioral change in the long term or taking strategical position in transport planning.

2.2   Why Mobility Management?

2.2.1 Why did Mobility Management begin?

Many cities in the world have seen how economic growth led to urban sprawl and motorization, which caused various issues such as traffic congestion, air pollution, and uncontrolled development. Infrastructure development, mainly road construction, was carried out to tackle those issues. However, road expansions implemented to meet increasing demand induced further demand as they improved the service level. This led to more demand to construct roads, resulting in a vicious cycle.

But why has the use of vehicles been adopted so fast by so many people? The use of vehicles has advantages and disadvantages. For example, driving an automobile enables door-to-door transportation anytime people like while sitting comfortably in an air-conditioned space. People may not have to carry heavy shopping bags if they have vehicles. Apart from private vehicles, trucks enable on-time delivery and ambulances can transport patients to hospitals quickly.

Consequently, the use of vehicles has various social costs. For instance, greenhouse gas emissions per distance travelled from these vehicles is larger than those from public transport, accelerating global warming. It can also cause traffic jam, traffic accidents, and air pollution.

This illustrates that the use of vehicles can have more broad and long-term social impacts while benefiting individuals directly in the short term, which is the so-called social dilemma[2]. People are less likely to be aware of those broad and long-term social impacts, and so end up using their private vehicles excessively. Furthermore, the habitual use of vehicles can become part of their daily life, making it more difficult for people to change their behavior.

What problems does the excessive use of vehicles cause? Among several issues seen around the world, Fuji (2005) provides the following as major social problems:

<u>Problems from the perspective of road and environment</u>: Excessive number of vehicles using road infrastructure under limited capacity can cause congestion, leading to longer travel time and inefficient energy consumption. The associated vehicle emission generates air pollution and leads to global warming.

<u>Problems from the perspective of transportation</u>: Low public transport ridership due to excessive use of vehicles can lead to lower service levels, which in turn keeps more people away from using public transport. Road congestion also affects bus operations, leading to the same problem. The worst consequence of this can be service cancellation that can happen especially in regional cities.

<u>Problems from the perspective of regional cities</u>: The decline in service level of public transport or service cancellation can affect the attractiveness of living or visiting provincial cities. In many developed countries, population in these cities is in the decline or aging, becoming more difficult to maintain the same level of public services due to less densely populated urban areas. Excessive dependence on using vehicles can exacerbate this

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[2]Social dilemma describes a situation where rational choices by individuals can lead to irrational consequences for the society.

problem.

<u>Problems from the perspective of major cities</u>: In major cities, using vehicles has become a central part of life especially to those who are residing in the suburbs. Indeed, mega shopping centers and residential areas have been developed where people cannot visit or live without using vehicles, leading to urban sprawl. Urban management in these cities tends to be inefficient as it costs more to develop and maintain infrastructure such as roads.

<u>Problems from the perspective of cultural heritage</u>: The habitual use of vehicles in major and provincial cities, can make it more difficult for businesses and residents to stay in the city centers, changing the urban landscape.
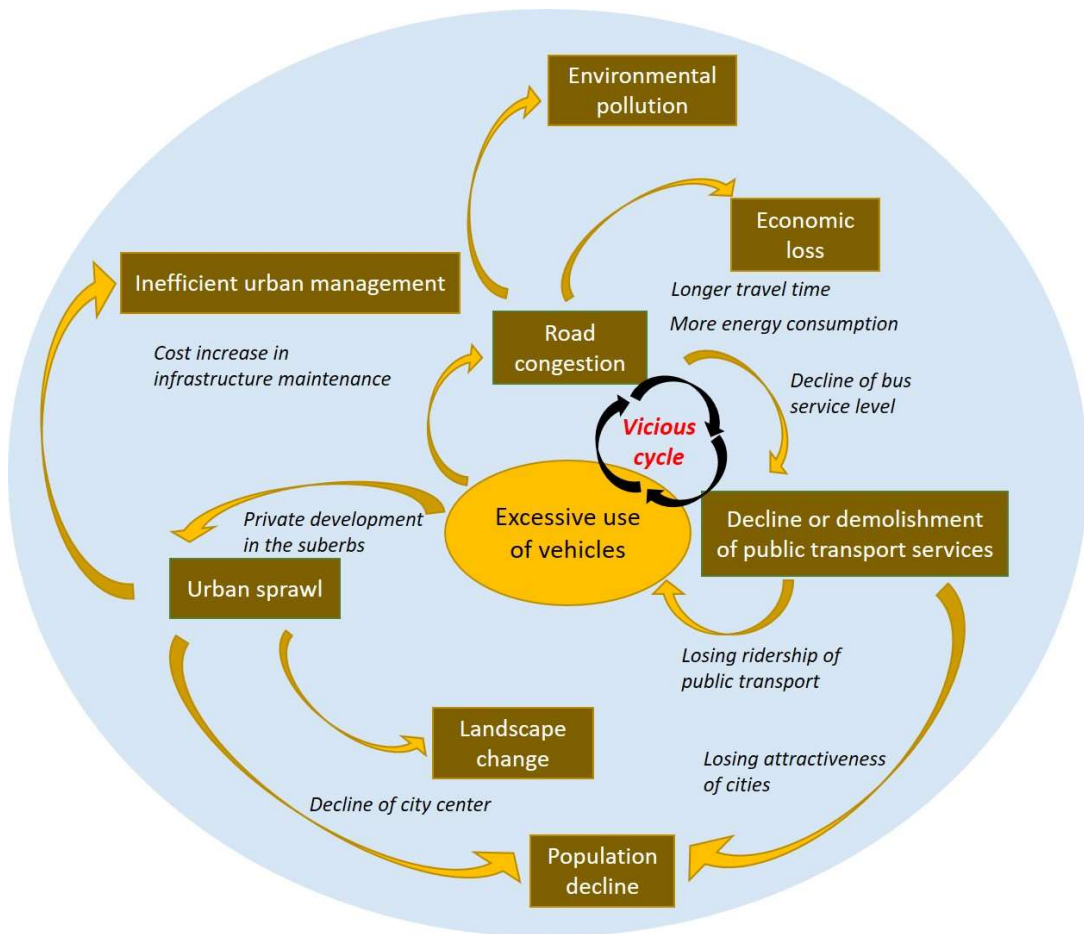
Figure 2-3 Chain effect caused by the excessive use of vehicles

The afore-mentioned problems are caused by the excessive use of vehicles. However, as discussed earlier, people are often unaware of the impacts, which makes it difficult to address them through conventional transport policies such as infrastructure development and regulations.

Meanwhile, scientific knowledge accumulated in the fields of psychology or behavioral economics helps in understanding the mechanism for change of behavior. By delivering messages such as "More moderate use of vehicles brings benefit," "More moderate use of

vehicles is not difficult," "More moderate use of vehicles is necessary," "I will use private vehicles in smarter ways," "When, where, and how I can use private vehicles in smarter ways," people can be convinced to change behavior. The keys for communication are "respectful", "easy to understand", "he right person", "individually", "two-sided", and "concreteness" as explained later in this chapter. Applying these findings, MM has been implemented in many cities in Europe, Australia, and Japan.

In Japan, for example, urbanization and its attendant motorization led by the economic development of the 1960's onward, caused vehicle ownership to increase rapidly, triggering extensive road construction and urban sprawl. Although this trend, supported by the pursuit for convenience, continued until the 1990's, the aging society and the stagnation of economic and population growth urged it to stop. These made it difficult to further develop infrastructure for urban sprawl. Furthermore, the aging society was not compatible with sprawled urban living and the poorly developed public transport system posed serious problem because elderly people were not able to drive a car. Enviromental concerns, such as greenhouse gas emission, also deepened. All these circumstances led to MM, starting around 2000, to improve public transport services and their promotion with the aim of less habitual use of vehicles. Putting more emphasis on making use of the existing infrastructure rather than building new ones, MM gained popularity and spread in many cities with the help of the central government.

2.2.2 Why is Mobility Management necessary in developing countries?

Due to recent economic development and motorization, automobile and motorbike ownership has been rapidly growing also in developing countries including ASEAN countries. The increase of motorbikes is a characteristic of these countries. The growth in motorization in these countries is so fast that infrastructure and TDM projects implemented are not able to cope, leading to more serious traffic congestion and air pollution. Furthermore, the modal share for public transport in most of these cities is in the decline, which is partly explained by the lack of brand management for public transport operated by authorities, small-size enterprises, or individuals. On the other hand, automobiles and motorbikes are advertised strategically by manufacturers, giving them urban and luxury images. As a result, a lifestyle supported by the habitual use of automobiles and motorbikes has become common, especially in the suburbs, causing the afore-mentioned problems. Eventually, this leads to revenue drop in public transport, leading to a decline in the service levels, which in turn gives more popularity to automobiles and motorbikes. The vicious cycle extends to bus services as severe congestion can affect their operations too.
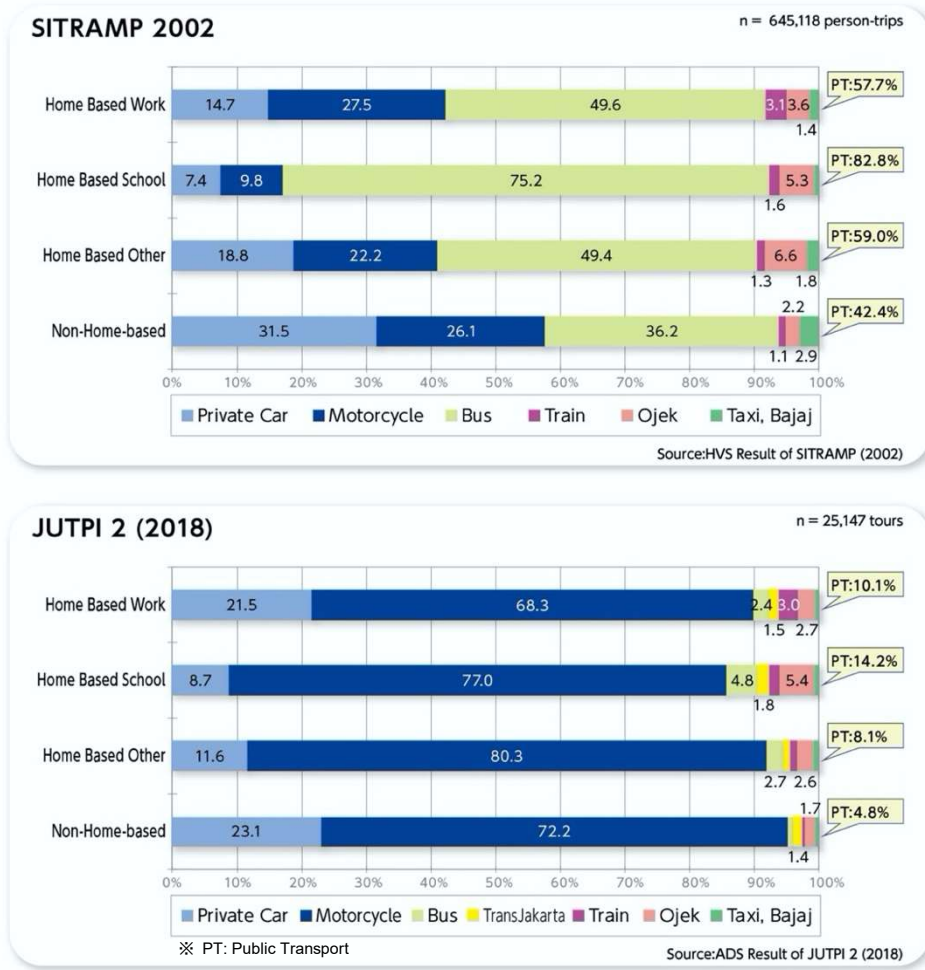
Source　above:JICA,BAPPENAS(2004), below:JICA,CMEA,BPTJ(2019)

Figure 2-4 Modal share in the Jakarta metropolitan area over time (2002, 2018)

To tackle the problem, several infrastructure projects have been implemented by developing countries, often with financial support from aid agencies, but resource limitations in those countries are too heavy that they cannot respond fast enough in addressing problems caused by rapid motorization. It is more important in this condition to apply the psychological approach in MM, in collaboration and synergy with other projects, making the most of existing infrastructure or promoting the effective use of new public transport. Unlike the conventional transport policies, MM can be implemented with limited time and resources, and it can approach the underlying cause of the problem. MM, therefore, seems to be more effective in developing countries.

Traditionally, large infrastructure projects tend to focus on the construction itself rather than on how the projects can be best utilized after completion, and they lack the strategy in approaching people through providing incentives, information, and advice. MM can be effective without much cost or effort by providing information and benefits quickly and respectfully with some local customization.

Column: SDGs and Mobility Management

Sustainable Development Goals (SDGs) given in the document "Transforming Our World: The 2030 Agenda for Sustainable Development" were agreed upon at the United Nations Sustainable Development Summit 2015. The document consists of 17 goals and 169 targets.

Out of the 17 goals, there are two closely related to the transport sector. "Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation" and "Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable."

Out of the 169 targets, there is one closely associated with MM that promotes the use of public transport. Specifically, Target 11.2 states that "By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons." More use of public transport alleviates problems caused by excessive use of vehicles, making transport systems more resilient and leads to sustainable cities which are inclusive, safe, and resilient.

Column: Mobility Management to Tackle COVID-19 Pandemic

As of July 2020, Corona virus disease (Covid-19) has been causing death and infection to a great number of people around the world. Some cities have taken lockdown measures, restricting movement while many people have chosen to stay home to avoid the risk of infection. Both measures significantly change transport behavior.

Public transport in many cities faces substantial declines in ridership due to concerns about the possible spread of infection in crowded trains; a large number of people working from home, as well as other reasons. Since public transport services often rely on ticket revenues, lower ridership can burden them financially. Even some cases of bankruptcy have been reported in public transport operations without government subsidies. On the other hand, public transport operators are expected to continue their services as indispensable infrastructure for essential workers, such as healthcare workers, and they need to reduce the risk of infection to their customers as well as to their employees. Thus, trains now often require passengers to maintain physical distance of 1 to 2 meters while also imposing the wearing of face masks. Ventilation as much as possible should also be observed.
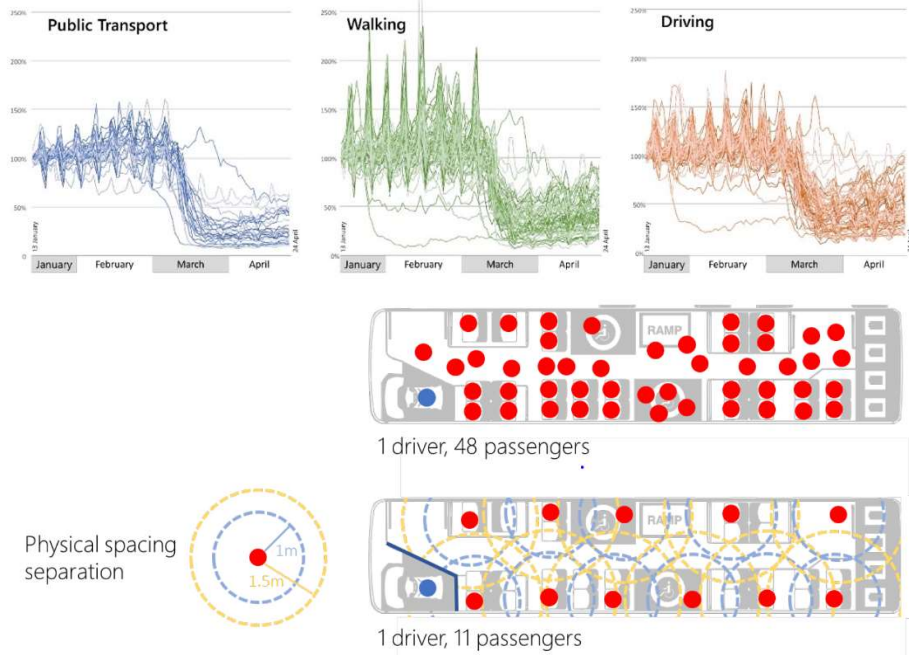
Source   OECD (2020)

**Figure Traffic volume drop in March 2020 due to Covid-19 pandemic by Apple Inc.
and the impact of social distancing in buses on transport capacity**

In these circumstances, the communication-oriented measure, Mobility Management, which attempts to change travel behavior, can be applied to develop and maintain sustainable public transport. In addition to mobility management based upon promotion, it can also be applied to speak to people who are reluctant to use public transport due to the fear of infection. For example, public transport operators should actively inform people of their prevention measures such as disinfection and ventilation of the trains while asking the passengers to observe social distancing and wearing face masks as shown in the image below. Furthermore, providing information about the level of congestion in trains may encourage people to shift the time of commuting to off-peak hours, contributing to lower risk of infection.
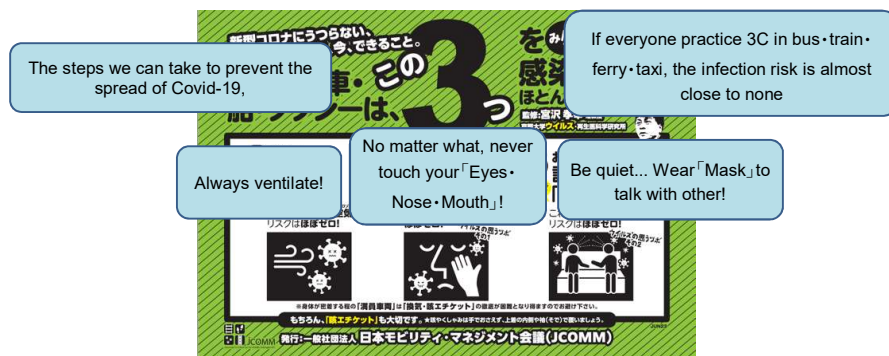
Figure Poster for Covid-19 control measures by JCOMM

2.3   Urban Transport Policy and Mobility Management

Although MM is a communication measure, it is also a transport policy which can be integrated with other transport policies having greater impacts such as infrastructure/facility development and service adjustments. For this approach to be effective, it is important to position MM in transport planning and relate it with other transport policies. For instance, various communication measures should be implemented, using social media and events, when introducing new public transport systems such as railway and bus because that is the time when more people will newly consider using public transport. In cases of bus network reorganization or public transport service improvements, the new systems should be made public using MM communication. The key point is not to apply MM as a form of public relation (PR) for other policies but to approach people's consciousness and attitude about their travel behavior. MM can also be beneficial from the perspective of successful improvement of public transport services as it is meant to identify people's frustration or need for public transport through communication, again, which can be realized by mainstreaming MM with other transport policies.

Moreover, transport policy is usually a significant part of a larger urban policy and often contributes to achieving urban visions or urban planning goals. Thus, having targets or goals related to traffic congestion or public transport in those high-level plans will help MM activities to be included in planning and implementation. For example, transport policies are particularly important for sustainable urban visions such as "Transit-Oriented City," "Environmentally Friendly City," and "Walkable City." Urban visions usually entails long-term planning involving various institutions and departments, so having transport-related goals can be an advantage when securing budgets and organizing teams for MM later on.
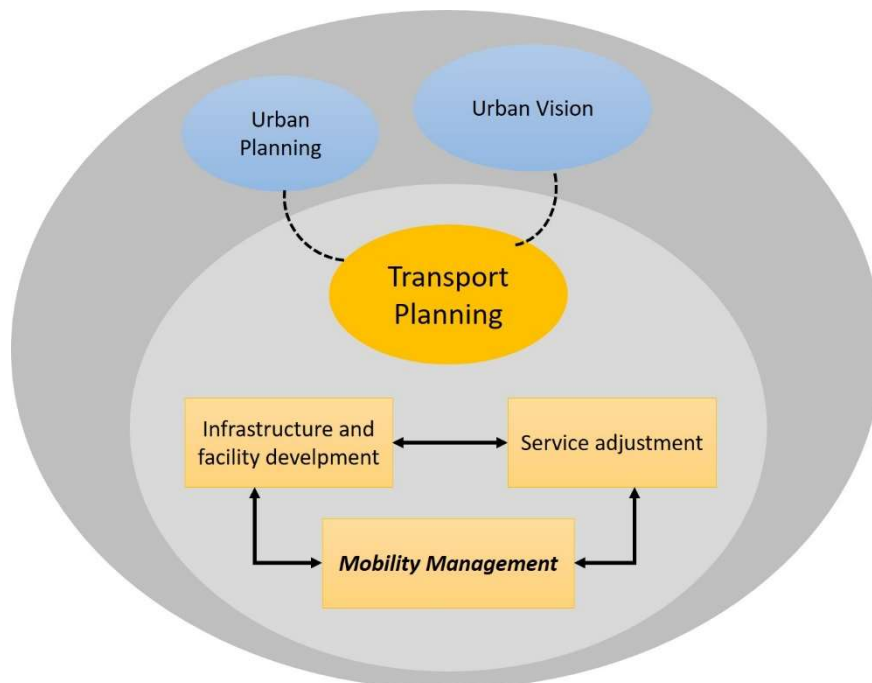
Figure 2-5 Urban transport policy and Mobility Management

In Kyoto, a charter for "Walkable City Kyoto" was developed, involving its citizens in discussions for the urban vision to be shared among them. The charter declares that the government works together with the citizens on creating a safe and walkable city. The charter was distributed widely by media and schools so that the vision can be shared among many people, which seems to be one of the successful factors for Comprehensive Mobility Management for Walkable City "Kyoto" (see Project Review 3). In addition, the City of Gold Coast defined their "Travel Behavior Change Plan" as one of various transport policies set in "Transport Strategy 2031" and developed its implementation plan (see Project Review 8).
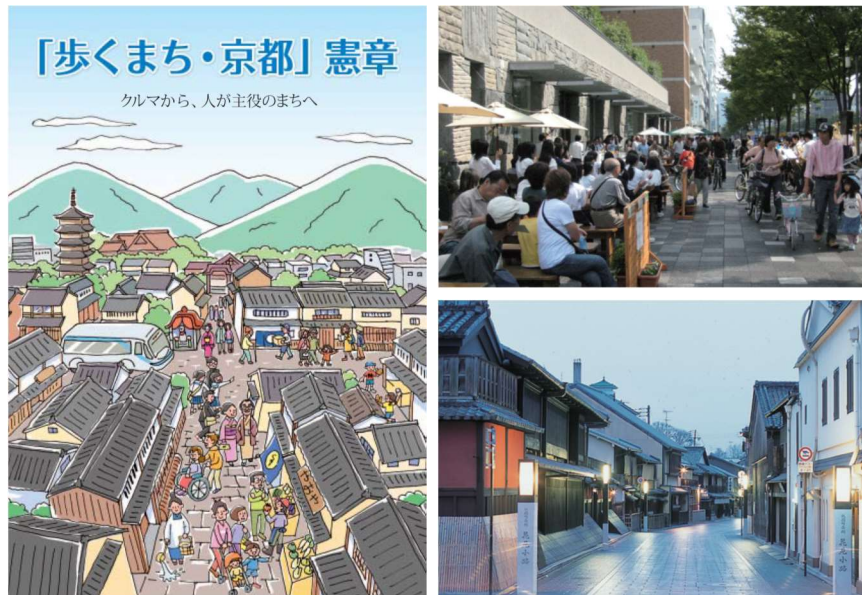
Source   left:Kyoto City(2014), right:Kyoto City(2012)

Figure 2-6 Charter for "Walkable City Kyoto" (left); Pedestrian environment and protected historical street of Kyoto City (right)
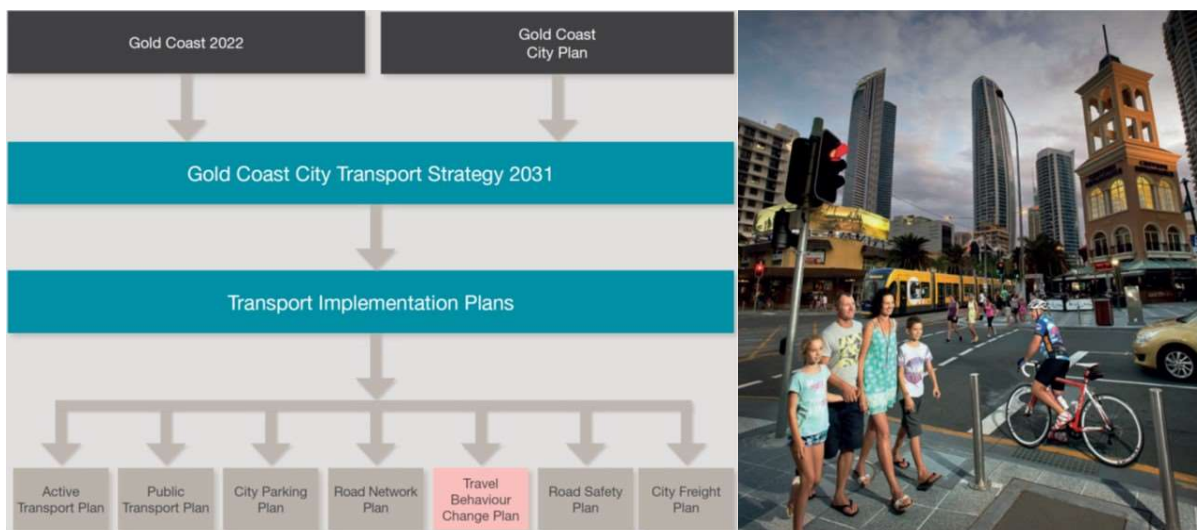
Source   City of Gold Coast(2017)

Figure2-7 Policy context of MM in City of Gold Coast (left) and its city center (right)

2.4 Six Principles of MM Communication: RETTIC

As MM is a communication measure as a transport policy that aims at encouraging people to change their travel behavior, the strategy is to carefully deliver the messages so that these MM messages can sink in at people's mind. MM has six principles in communication: Respectful, Easy to understand, The right person, Two-sided, Individuality, and Concreteness (RETTIC).

Table 2-1 Six Principles of Communication in MM

	Principle	Strategy	Reason	Example	Exception
Essential element	Respectful	Make the request as courteous as possible after clarifying the purpose of the program	Politeness is required more than the usual survey since it is communication.	Request from minister, governor, and mayor sent to each person.	Not applicable.
	Easy to understand	Make messages easy to understand	People do not comprehend messages that are difficult to understand. Intelligibility is extremely important in MM.	Consider the circumstance or the eye contact of the other.	Not applicable.
	The right person	Assign the right person	Since MM is interpersonal communication, its success cannot be expected if there is rudeness.	Assign an experienced person or a person who can be trusted to have proper communication in daily work.	Not applicable.
Important Element	Two-sided	Keep in mind "Two-sided" instead of one-sided content	One-sided content makes psychological repulsion.	Present disadvantages of car usage after presenting its advantages.	Those who already have sufficient intention to change their behavior.
	Individualized	Apply individual communication as much as possible.	In mass communication, it is hard to just change people's consciousness and behavior.	Apply Travel Feedback Program (see Chapter 3 for details).	Cases where the change of behavior can be expected easily
	Concreteness	Provide concrete information needed to change their behavior	Without concrete information, people do not change their behavior even if there is motivation.	Provide individual advice or apply action plan method.	Those who already have concrete information or can get information easily

2.4.1 Respectful

Respectful attitudes are important when giving awareness or feedback to persons about their behavior. Telling people arrogantly that "Your behavior is not smart" or "Your behavior is not environmentally friendly" will not lead to desired change. In order to deliver MM messages correctly, putting yourself in the other's shoes enables the use of respectful words and attitudes to come easily. In case of MM documents to be delivered to people, indicate information that will make them feel your respect, such as the purpose or background of the program, person in charge, and time needed to participate.
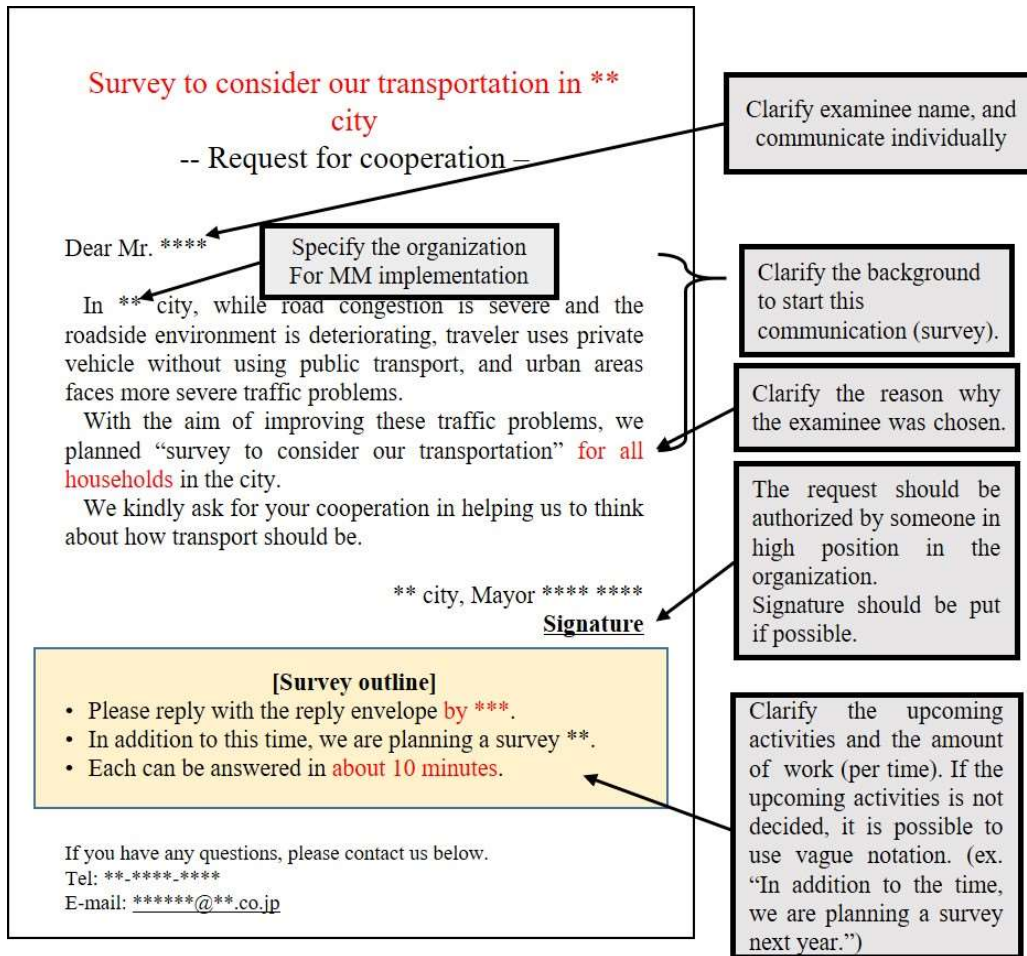
Source   JSCE(2005)

Figure 2-8 Request form for questionnaire survey

2.4.2 Easy to understand

Even if MM messages are very relevant and persuasive, if they are not easily understood by receivers, the messages will not sink in to their mind. The use of technical or administrative terms should be avoided as much as possible in written and verbal communication and these should be replaced with plain or easy-to-understand words. For illustrations or figures, they should be designed such that people will understand them intuitively.

Make it easy to understand by describing route numbers and coloring of bus route in the map that had too many lines.

Source   JICA,CBA(2020)
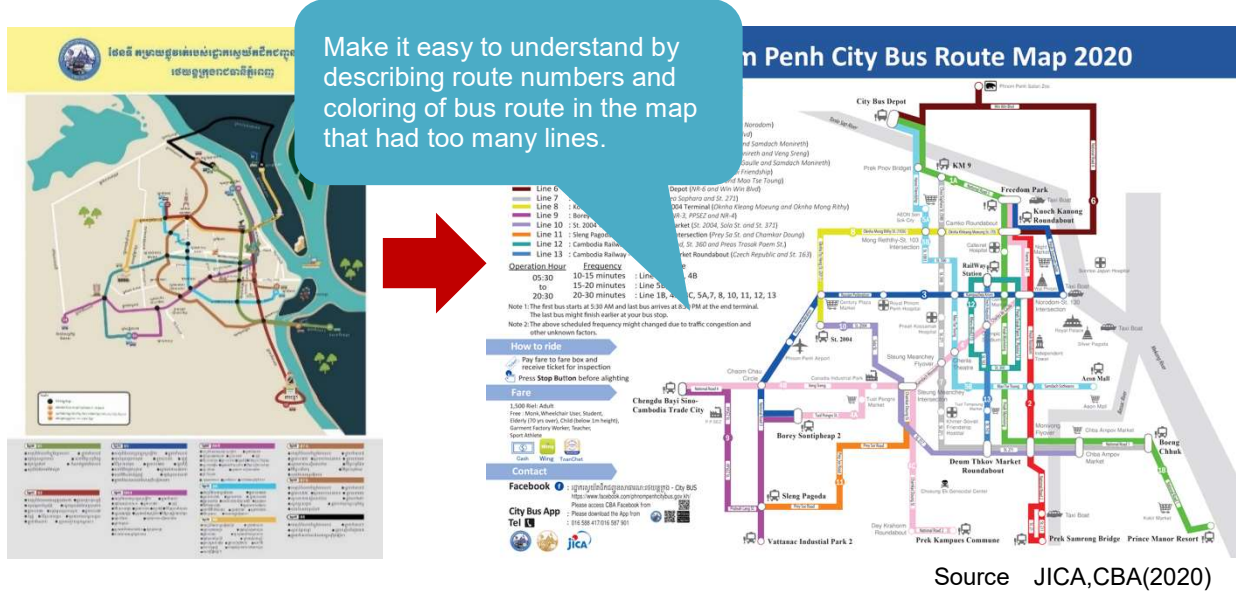
Figure2-9 Bus map improvement making it easy to understand

(left: old version; right: new version)

2.4.3 The right person

In order to deliver MM messages appropriately and help people change their behavior, applying solely the knowledge of MM would not be enough. The person in charge should be very communicative, being able to apply respectful and easy-to-understand approaches. No matter the form of communication– text messages, illustration, or face-to-face communication like during workshop or home visit – the right person who is able to put himself/herself in other's shoes should take charge. In the case where the right person is lacking in your organization, JICA provides a technical cooperation program conducted by MM professionals that give lectures and interactive trainings to develop knowledge and communication skills.

Source   left:JICA,DOT(2018), right:JICA(2019)

Figure 2-10 MM training by JICA

2.4.4 Two-sided

To encourage the change of behavior, MM messages should not be one-sided based on the sender's perspective. For instance, instead of emphasizing the negative side of using automobiles or motorbikes, the positive side should be mentioned also so that psychological repulsion of receivers can be eased, helping the messages to reach people's mind. Hence, in such situations mention also the positive side of using automobiles that includes convenience, comfortableness, and fashionability.

2.4.5 Individualized

In order for MM messages to be more effective, it is important that these are individualized yet delivered to many people. Such individualized messages are more likely to be received by people as these are regarded as personal, rather than standardized messages sent to many people, which can lead to the change of behavior. Messages can be individualized by face-to-face communication or involving feedback process in communication. The most effective way of delivering individualized messages is by home visit MM. Government officers or public transport personnel taking charge of MM visit residents in the area and give individualized information or advice. This can be a time-consuming approach but reports have shown the benefits have been worth the effort. Also, it is an opportunity to receive feedback on public transport operations which can be used for service improvement
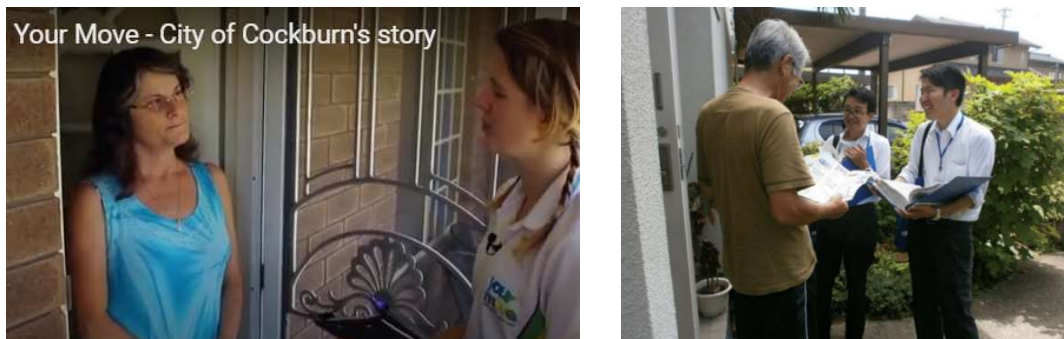
Source   left:City of Cockburn(2019), right:Toyama City et al(2019)

Figure2-11 MM by home visit approach

2.4.6 Concreteness

Including concrete information that can actually encourage people's change of behavior is also effective. In addition to expressing "More moderate use of vehicles should be encouraged," your explanation should also include concrete information such as alternative transport modes available, which can be incentive for the change of behavior. For example, in the case of promoting bus services, including concrete information on bus timetables, travel time, and costs of lines in the targeted area will help people decide whether they are able or willing to use it.
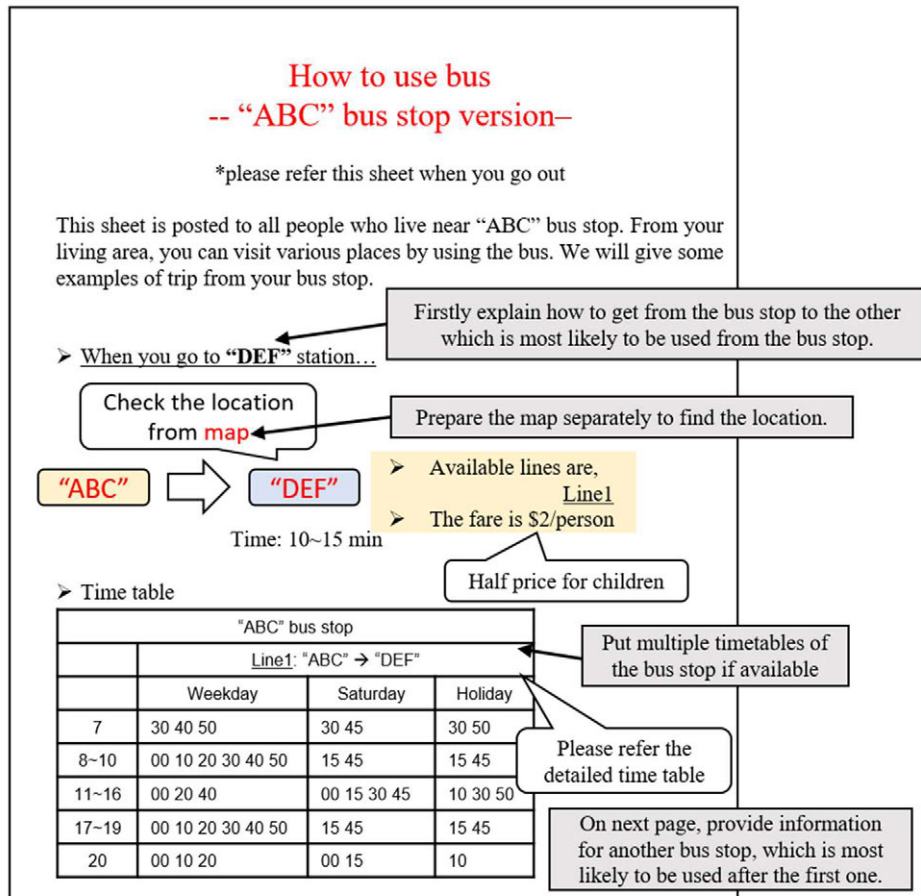
Source   JSCE(2005)

Figure2-12 "How to ride a bus" form

Out of the six principles, the first three – Respectful, Easy to understand, and The right person – are essential for MM communication, while the other three – Individualized, Two-sided, and Concreteness are desirable for MM communication to be more effective. These principles should be emphasized depending on the circumstances.

CHAPTER 3   Mobility Management - Methodology

3.1   The flow of MM examination

The flow of MM implementation is illustrated in Figure3-1. First, transport issues in the city or area should be identified, and their background or the root causes should be clarified. In case of traffic congestion, for example, more detailed information such as where the congested points are, whether it can be solved locally or it is rather a city-level issue should be clarified, leading to the target and the communication method to be defined. Furthermore, it is important to make a priority for issues identified so that resources can be allocated intensively, making MM activities more effective.

Selecting targets for MM is important to make the most of limited resources and budgets. The target selection includes implementation facilities (mostly resident, workplace, or school) and targeted public transport in addition to targeted areas. For the targeted public transport, it should be ensured that its capacity is sufficient to receive more people who are changing their transport behavior. In case of an insufficient capacity, or even a lack of public transport, infrastructure development or service improvement for public transport should also be planned. MM can be more effective in areas where the service level of public transport is high but the modal share for cars and motorbikes is also high. The targeted unit is usually based on residents, workplaces, or schools.

After the target selection, the most effective communication method should be considered in regard to local circumstances, financial resources, and human resources. (Please refer to the latter half of this chapter and Chapter 4 for details and examples of specific communication methods.) Relating to the target selection mentioned above, it is also important to consider a detailed communication method tailored for the target. For example, the communication method and contents should correspond individually to those who have a high service level of accessible public transport and those who do not. The same holds true for those who can use social networking services (SNS) and those who cannot.

Moving to the implementation stage of MM, it is crucial to continue a cycle of sharing the results with the target and other related partners, clarifying issues and problems in implementation, and improving programs. As described in 2.1, MM should be carried out continuously since excessive use of cars and motorbikes tends to spread naturally if no measures are taken. In addition, policy evaluation is important from the perspectives of securing a budget continuously and ensuring transparency. Therefore, it is necessary to objectively evaluate the impacts and give feedback about the results to various partners.

Even after MM is implemented, clarifying the points to be improved and sharing them with the involved partners will facilitate smooth implementation the next time onward, leading to continuous activities. The flow of examination and implementation is not much different from other policies such as infrastructure development, but compared to large-scale infrastructure development such as roads and railways, the time from preparation to implementation is short; so the cycle of implementation can be repeated several times in a short period of time. Also, it is not easy to modify large-scale infrastructure once it is completed, but MM allows for continuous improvements utilizing trial and error.
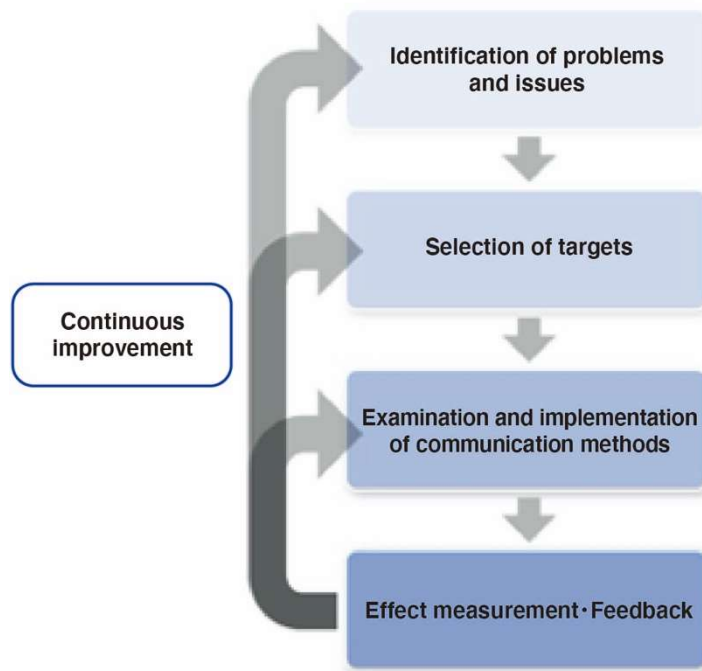
Figure 3-1 The flow of MM examination

3.2   Identification of problems and issues

3.2.1 How to identify problems and issues

Congestion at a certain intersection and a decrease in the number of certain bus routes are problems to be observed, and the government should quickly respond to each problem. However, in many cases, it is not possible to solve the problems only by responding to them one by one.

For instance, there are cases when the traffic congestion at an intersection is caused by the upstream flow. In this situation, even if traffic congestion countermeasures are taken at the problem intersection, the traffic congestion will not improve. Also, if traffic demand exceeds the capacity of the road or intersection, the traffic congestion will not ease unless the capacity is drastically increased or the traffic demand is reduced.

Considering the issue of public transport, for example, even if the service level is upgraded by renewing the vehicles, the number of passengers may not increase if the number of buses operating on a route is decreasing. If the road used by the bus route is congested, the required time cannot be shortened. If there is an excessive competition between bus operators, it may cause the operators to find customers at the intersection, which can be a bottleneck for traffic congestion. If there is excessive competition and there is no proper regulation, the bus operation will disregard safety and comfort, which will lead to deterioration of the image of the bus services. Furthermore, if there are safety issues, some members of the population, such as women and children, may not consider bus as a travel option in the first place. As a result, some people develop a habit of using cars without

considering taking buses at all. In such situations, there are many cases when people have never used the bus or even do not know how to use it.
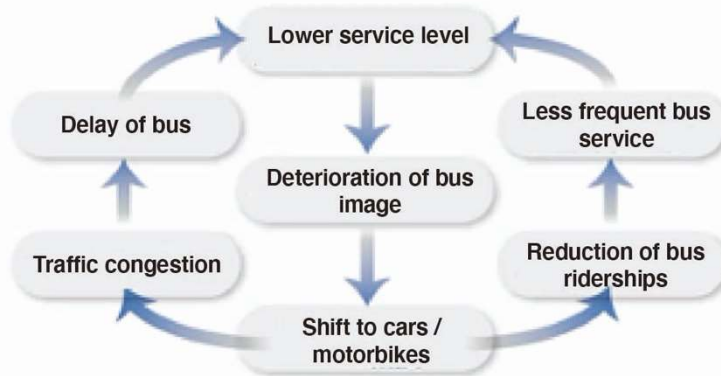
Figure 3-2 An example of vicious cycle in bus transport

This way, a comprehensive view of the urban traffic problem is taken into consideration when implementing MM. By grasping the root causes and identifying which countermeasure is adequate for which problem, more effective measures can be taken.

Among various ways to identify problems and issues, brainstorming in a group is one of the effective methods. For example, the KJ method is an approach of categorizing the issues by using cards and sticky notes. In this method, each phenomenon and problem is described on one card and the card is attached on a board where cards with related issues are grouped and arranged spatially to show their relationship. Figure 3-3 shows an example.

Source   JICA(2014)

Figure 3-3 KJ method

If there is an urban transportation master plan developed, it can be utilized for problem identification because some may have already been sorted out. When formulating an urban transportation master plan, a traffic survey is usually conducted, and various data are used to carry out quantitative analysis such as traffic demand forecasting.

In addition to the above analysis where some of the root causes of urban transport problems in specific areas can be identified, spatial analysis is also important to understand transport issues. Due to financial resources and time constraints, it is difficult to tackle problems in the whole region, although it is an ideal scenario. For this reason, specifying areas such as corridors, regions, and specific location, and identifying those with more serious problems or those related to the root cause becomes even more essential.

3.2.2 Classification of issues according to urgency, importance, and possibility of issue resolution

At an early stage of MM activities can be experimental, so it is not always necessary to work on an urgent or highly important issue. Instead, you should start with an issue that is likely to be solved, in other words, something you can do. In particular, MM often requires receiving cooperation from residents, workplaces and schools, and thus starting from the place where cooperation can be obtained can lead to prompt implementation. Furthermore, if a pilot implementation is successful and an appropriate feedback is provided, it will be possible to implement MM on a larger scale next time at the same place. In addition, implementing a pilot project promptly and explaining the results to policy makers will help in securing a budget for the next activity.

On the other hand, for MM to be implemented continuously over the medium to long term, a strategic approach is also necessary. As introduced in Section 2.2, since the issues caused by excessive use of cars and motorbikes vary widely in the scope and time of impact, it should be clarified which issues will be given priority. The issues should be identified taking into account the level of urgency and importance, the possibility of issue resolution, and financial resources. Generally, it is desirable to work on issues that are of high urgency and importance, but we cannot also ignore the constraints and the possibility of issue resolution.

3.2.3 MM in relation to other transport measures

After selecting the issues to be addressed, countermeasures should be considered. It is often the case that MM is carried out in combination with other measures rather than alone. For example, if there is a problem the service level of the bus, the service quality improvements should be addressed along with MM implementation. In addition, MM activities along with regulations on car usage as TDM, for instance, can produce synergistic effects.

It is possible to reduce the cost and bring out the effect by implementing MM in line with other public services not related to transport. For example, in Japan, a resident's card must be submitted at the time of relocation. This occasion can be used to provide information and survey about public transport, hence the cost of distributing materials for a survey can be reduced. Furthermore, as people relocate, they think about transportation in the new place, so it is the best time to effectively promote the use of public transport.

3.3 Selection of targets

MM efficiency depends on the selection of an appropriate target according to the identified issues. The main targets of MM are residents, workplaces, and schools in addition to those along certain public transport lines To examine effective communication methods for each target, understanding its characteristics is desirable. The following is an overview of typical MM implementation targets (locations). See Chapter 4 for details of each.

Table 3-1 Summary of MM targets

Target	Overview	Aim	Remarks
Residents	The most basic form of MM is implemented for local residents.	Residents in the same residential area often have similar transport problems, so effective MM is performed for these problems, aiming for behavioral change not only in commuting behavior but in various trip purposes.	It is also applied in the case of targeting people with various attributes, such as age or occupation, or in the case of combining it with other projects implemented in the same area (Person Trip survey, etc.).
Workplaces	Implement for employees of companies and organizations in cities or regions	Aiming to change the behavior of commuting, which is the main trip purpose in peak hours, of groups comprising of many employees who commute by car or motorbike.	The key is to get the participation of companies and private organizations, and it is necessary to consider a strategic implementation of MM, such as incentives for participation and persuasive communication.
Schools	Implement for those who do not drive cars or motorbikes, such as elementary school and junior high school students, as part of school curriculum.	Rather than solving the traffic problem instantly, it aims for long-term and lasting effect by promoting behavioral changes in the future of children. In addition, a wide range of effects can be expected because of a ripple effect on travel behavior of parents and families.	Engaging parents is also important because the change of students' commuting behavior involves the judgment of their parents.
The area along public transportation lines	Implement for residents, workers and visitors along specific transportation facilities such as railways, buses and roads.	Promotion of usage of public transport and alleviation of traffic congestion can be expected	It may be easy to secure a budget by collaborating with transport operators at the time of new public transportation improvement or operation improvement, and immediate effect can be expected by implementing it on a large scale.

3.4 Examination and implementation of communication methods

MM requires a close examination about its target, timing, and approach. In this chapter, the elements that make up MM communication, the methods using those elements, and various other approaches will be explained.

3.4.1 Elements of MM communication

MM communication can take three forms; "inform people," "let people think," and "support people." These forms can also be explained by the behavior-changing process introduced in 2.2, and it is effective to promote the change of travel behavior by taking appropriate communication according to each stage in the process.   The forms of MM communication for each stage will be introduced here.
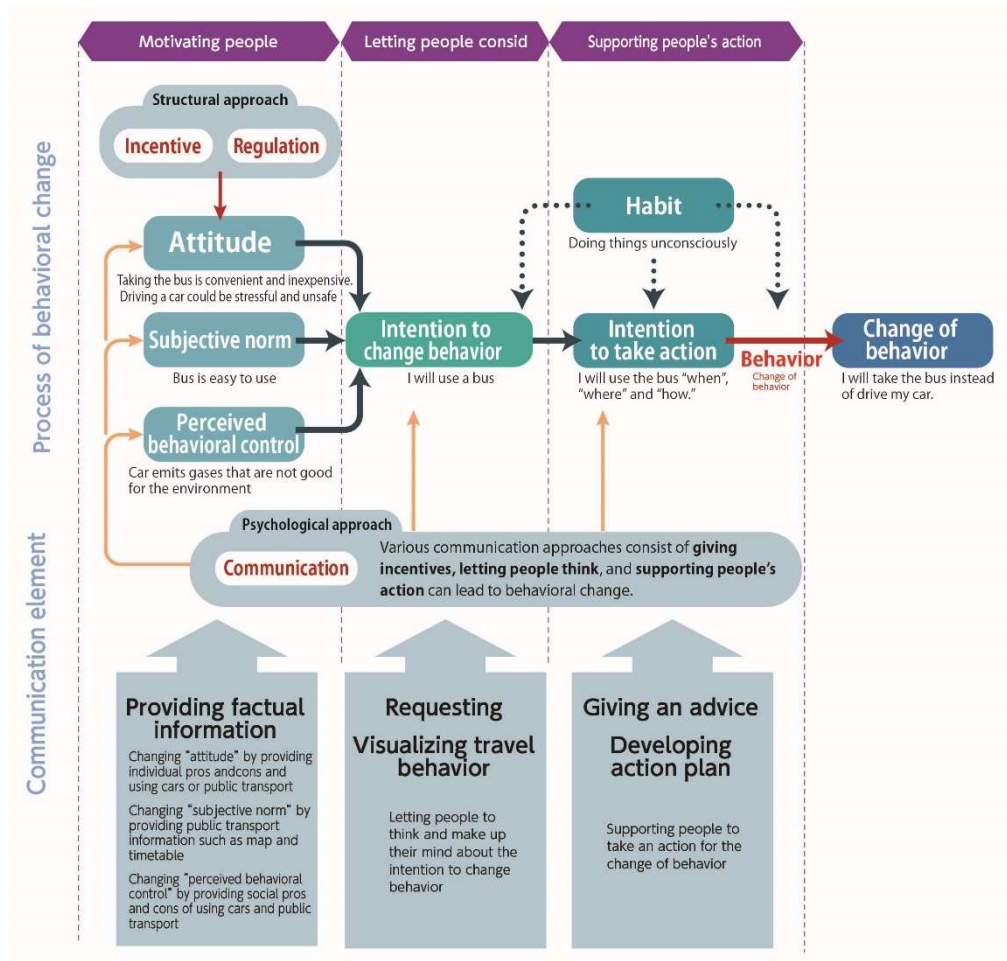
Figure 3-4 The process of behavioral change and MM communication elements

（1）**Providing factual information (Motivating people)**

This approach promotes the change of travel behavior by providing various factual information (such as public transport timetables and route maps, environmental and social impacts of using cars, motorbikes, and public transport) and their merits and demerits. This is the most basic technique in MM communication. There could be some people who know almost nothing about the basic information regarding public transport, so it is important to carefully convey the common facts to people, although these information are well known to local governments or transportation operators who are often implementation bodies of MM.

Please refer to Individual Merits and Demerits, Social Merits and Demerits, and Factual Information on Public Transport in Table 3.2 for specific descriptions.

(2) **Requesting (Letting people consider)**

By requesting for less frequent use of cars and motorbikes and promoting public transport, the change of behavior is encouraged. The main content is to inform people of what kind of action is desirable based on factual information, but depending on the way it is addressed, it may not be well received by the recipient. Therefore, it is important to convey the merits and demerits of each option (a two-sided approach).

(3) **Visualizing travel behavior (Letting people consider)**

Visualizing the travel behavior of the target person aims for his/her change of behavior. For example, providing information on carbon dioxide (CO_2) emissions caused by car usage or the time wasted due to traffic congestion may create awareness and reduce car usage. It is better to base the feedback on rather quantitative and easy-to-understand indicators as much as possible. This approach is considered to be more effective for individuals who are willing to refrain from using a car.

Calculation sheet for CO_2 emission

Calculate CO_2 emission caused by trips of you, or your fam[ily] days.
1. Write down the "Usage time" to each
2. Multiply the value of emissions per minute by the [valu]e o[f] enter it in the column of emissions by transport.
3. Your CO_2 emission is the sum of all the valu[es].

> Visualizing travel behavior by calculating CO_2 emission caused by daily trips for each travel modes

Transportation mode		CO2 emission per min	Usage time	Emission by transport
Walking		N/A		
Bicycle		N/A		
Motor bike		0.058		
Taxi		0.010		
Bus		0.039		
Tram		0.009		
Railway		0.025		
Subway		0.008		
Track		0.190		
Car (self-drive)		0.094		
Car (share-ride)		0.047		
Others		0.096		

★Your total emission is _____ kg

Source   JSCE(2005)

Figure 3-5 Calculation sheet for CO_2 emission

(4) Giving advice (Supporting people's action)

Giving advice can be a more convincing message than visualizing travel behavior as it provides concrete and individual communication on how to change the travel behavior of people who have the intention to do so. For people who intend to curb the use of cars, their intention for behavior change will be put into test by providing them specific advice such as alternative public transport timetables and routes depending on the individual's residence, working place, and traffic behavior.

(5) Developing an action plan (Supporting people's action)

Instead of giving information or advice, the target persons are expected to think for themselves of how exactly they can change travel behavior. The common tool for this approach, action plan form, asks when, where, and in what way to change behavior and asks the target person to describe the exact way to make this happen. It has been proven to be the most effective approach among the elements of MM communication.
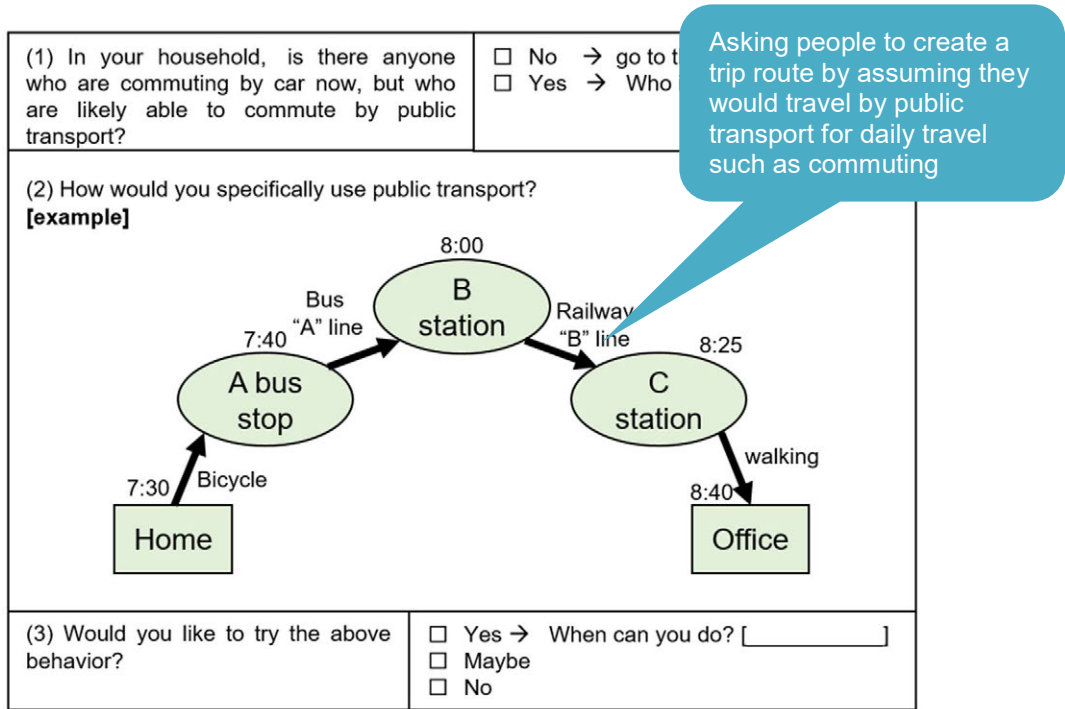
Source   JSCE(2005)

Figure 3-6 Action plan sheet for MM Public Transport line

Column: Nudge theory

Nudge theory is a concept of behavioral economics that aims to influence the behavior for the better using indirect suggestions like nudging someone. The theory is based on the idea that making a choice can be unconsciously biased so that it can be directed by strategic ways of providing information. Based on the fact that people tend to choose a default option unconsciously, for example, the default option for organ donation is set to be "yes" so that people need to choose "no" consciously if they do not want it, which has led to more organs to be donated. Another example is based on the social norm internalized by people. For instance, tax payment rate in a community was written in a notification letter sent to those who had not paid the tax. The indirect message about the expected behavior was successful as the tax payment rate improved later on.
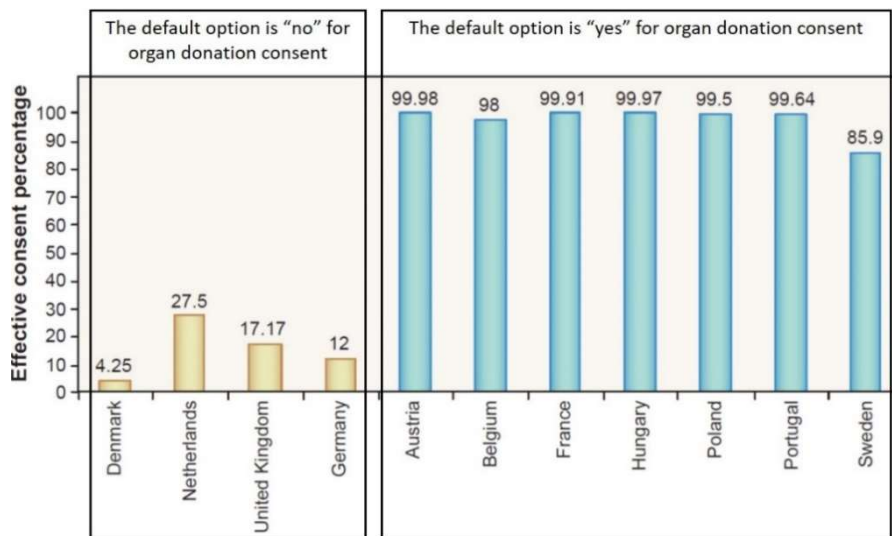
Source　Goldstein, D. (2013)

Figure: Effective consent percentage for organ donation in Europe

MM aims that people will be able to make a choice consciously by providing information about public transport or impacts on communities. The theory can be applied in the information provision such as indicating public transport is a default option in a survey form or providing public transport usage rate in the community.

3.4.2 Motivational information and incentive

Along with the above-mentioned elements of MM communication, the contents to be communicated is also important in MM measures. To give an awareness for the change of behavior and encourage the taking of action, it is crucial to consider motivational information and incentives.

(1) **Motivational information**

The main motivational information are shown in Table 3-2. When providing these information, it is important to consider the principles of MM communication explained in 2.4. To make it easy for many to understand, too much information is not recommended. In

addition, the content that emphasizes only the disadvantages of using a car may have an adverse effect. It requires more time and effort to provide information and a target tailored to an individual, but this can also have a greater effect. Please refer to "Tools" for specific information and ideas.
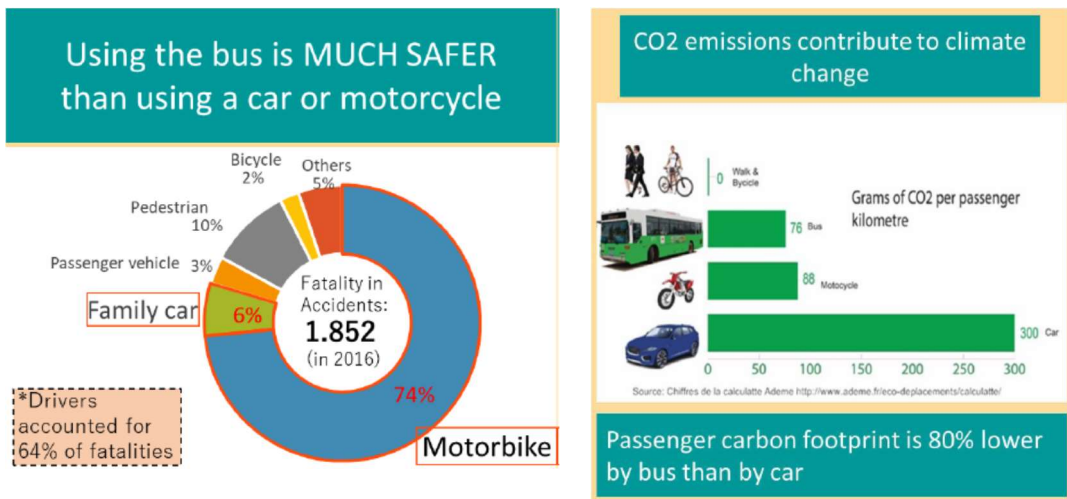
Table 3-2 Motivational Information

Classification	Item	Outline	Example
Personal pros and cons	Health	Compared to car or motorbike, the usage of public transport involves more walking, which contributes to maintaining health and improving physical strength.	Show how much calories are consumed when walking.
	Economy	Owning a car or a motorbike is more expensive than using public transport, e.g., purchasing costs, fuel cost, and maintenance costs.	Show how much they saved on gasoline cost by using vehicle less frequently.
	Traffic accident	There is a high possibility of having serious accident when using a car or motorbike.	Show an image of traffic accidents or stories of victims of traffic accidents
	Traffic congestion	Usage of road wastes time because of frequent traffic congestion.	Show the travel time in minutes saved by reducing traffic congestion.
Social pros and cons	Environment	Greenhouse gas emitted by car and motorbike affect global warming.	Show the amount of NOx emission from car and motorbike per travel distance, or the picture of sky not polluted near the area.
	Securing mobility	Usage of car and motorbike causes lower public transport service quality and lead to deprivation of mobility for those who cannot use a car or motorbike.	Present someone who has difficulty travelling due to lower mobility.
	Urban	Excessive usage of cars leads to urban sprawl and insufficient city management.	Show the difference in mobility between high-density and low-density city (e.g., difference in time required to reach public facilities such as schools or hospitals).
Information on public transport		Information about location, fares and route of public transport which can be alternative to car or motorbike.	Show routes from the target area to major facilities such as shopping malls and hospitals.
Individual feedback		Information on personal and social pros and cons according to individual travel behavior (calorie consumption, CO_2 reduction, etc.).	Show difference in monthly transport costs due to the change of transportation mode
Goal		Numerical targets based on the merits above.	

Source   JSCE(2005)

Column: Motivational information according to region

Since the kind of information and incentives leading to the change of behavior may vary depending on socioeconomics and culture, conducting research on information and incentives effective in target cities and regions is important for effective MM measures. In the survey about awareness on public transport conducted by JICA "Phnom Penh Public Bus Operation Improvement Project," MM professional in academics found that people there showed a stronger reaction to "risk of traffic accident" among various factual information on health and environment. Besides, Hiroshima University's "Effective measurement of motivation information in Bandung" in Indonesia showed a correlation between motivational information and individual attributes, indicating that there was different perception for motivational information depending on age and educational level.

■ Motivational information related to traffic accidents (traffic accident rate per transport mode) and environment (CO_2 emission per transport mode)

Source   JICA, CBA (2020)

■ The survey result about the perception towards various motivational information in Phnom Penh

Source   JICA, CBA (2020)

■ The correlation between the motivational information and individual attributes

Family with Small Children	Office Worker	Senior Citizens
Motivational information for Growth of Children	Motivational information for Health	Motivational information for Health
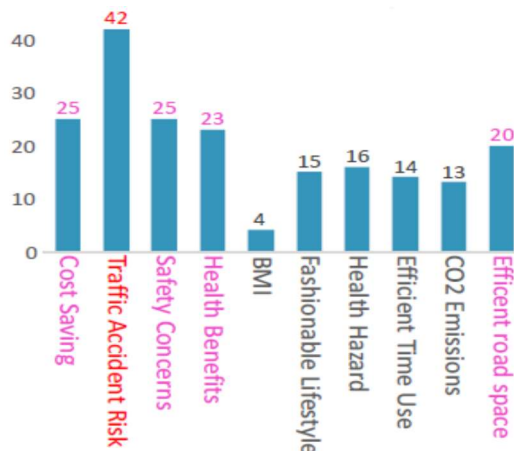
Source　Taniguchi(2020)
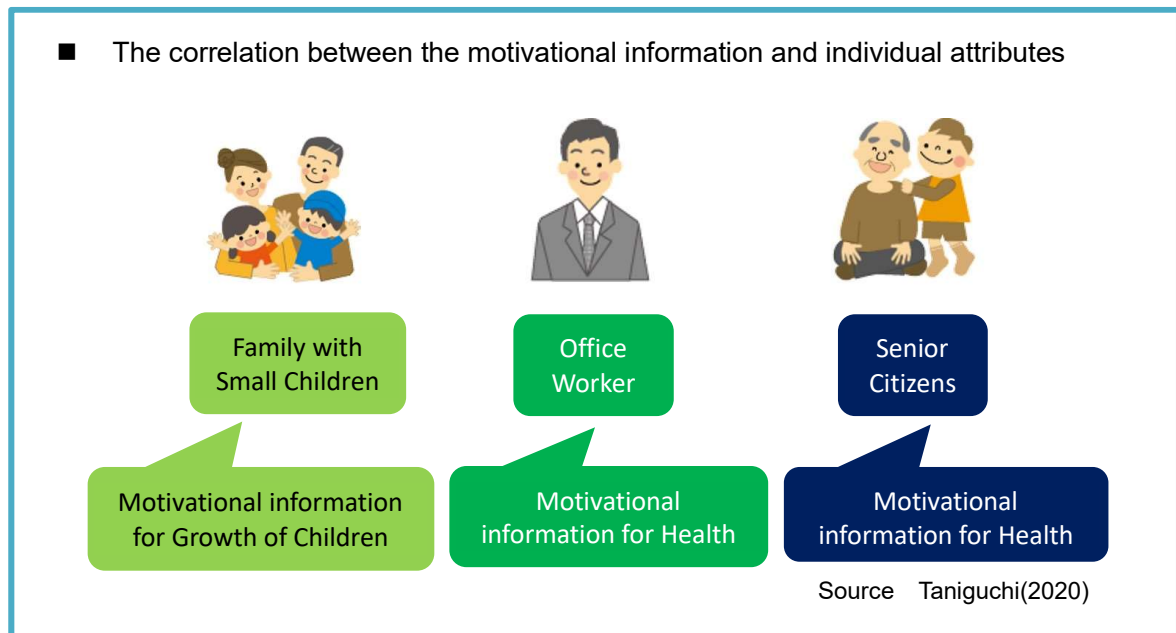
(2) Incentives

MM is a communication-oriented policy that leads people to voluntarily change their behavior, and it is not desirable to use gifts as an incentive. However, it can be considered to the extent that it attracts some interests and push people a little to participate. Specifically, it is possible to distribute public transport tickets or campaign goods, but in that case the following points should be noted.

- Targeting and incentivizing people who are reluctant to change their behavior is more cost effective.
- Giving incentives to people who will change their behavior only through communication may impair their willingness to do so, lose their motivation, and this could have an adverse effect.
- Expensive incentives can spoil voluntary actions and reduce the possibility of long-term behavioral changes, thus free tickets for one or two time use or inexpensive goods are better.
- It is more effective to set an expiration date on the free tickets as this can reduce the possibility of leaving the tickets unused.
- Providing incentives should be regarded by people as a trigger to change their behavior instead of a reward for it.

3.4.3 Methods for MM communication

(1) Home visits

This is a method in which an MM practitioner visits the residents' respective houses directly to distribute booklets or maps, and conduct a survey. Although it takes a lot of work, one-on-one face-to-face individual communication aims for more sustainable behavioral

changes. Since this is a communication method that is often unfamiliar to residents as well as to the local government and transportation operators who carry out MM, a more detailed explanation is given in 4.1.2.

(2) **Workshops**

Are a communication method for the change of attitude and behavior by gathering people together and encouraging them to exchange opinions about transport. The MM practitioner or local government staff takes the role of facilitator by providing information that encourages active communication among the participants. More detailed explanation is provided in 3.4.4.

(3) **Seminars**

Invited MM experts, transport administration officials, or transportation operators give lectures on effects of transportation, how to change travel behavior, and promotion measures for the use of public transport. The participants can include a wide range of audiences from schools, local residents, to people who are just interested in MM.

(4) **Newsletters**

Unlike the mass media, it is possible to examine the contents based on the target while communicating in one-way direction through documents and emails that are regularly delivered to a specific area or target such as public relations magazines of local governments.

(5) **Social media**

Establishing an MM account in social media such as Facebook and Instagram can reach an unspecified large number of people, and this also enables two-way communication by posting simple questionnaires and receiving user feedback. Moreover, since the information can easily be spread by people, it can be used for promotion at the time of new development of public transport and announcement of MM events. It should be noted that social media users are more likely to be younger.

(6) **Mass media**

It is a communication method that targets a large number of people through television, newspapers, and the Internet. While it is easy to efficiently send messages to many people, it is difficult to deliver messages with "individuality." With the use of television and newspapers, it can be difficult to get attention because the MM message can be just one of the many advertisements. In that case, an impressive and easy-to-understand message is required.

Column: MM through the use of ICT and MaaS

The development of technology has made it possible to provide personalized information in a more efficient manner. Smartphones are rapidly expanding in use around the world, making it easier to provide real-time information on public transportation through apps andother devices in smartphones that can be carried anywhere and at any time. This makes it possible to provide participants with more specific and timely information on public transport routes. Since the disclosure of data in the General Transit Feed Specification (GTFS) format by transit operators has become an important part of such an application, data disclosure efforts are also desirable as an MM activity if not already in place. (See 5.1.5.) In addition to providing one-way information, the app also has an advanced function for users to post comments, which is expected to be a tool for mutual communication such as feedback in MM. For example, Vientiane Capital State Bus Enterprise has a Facebook page with a staff member in charge to respond to users' inquiries in a timely manner.

Source   Vientiane Capital State Bus Enterprise (n.d.)

Figure   Facebook page of Vientiane Capital State Bus Enterprise

In addition, Mobility as a Service (MaaS), which has been in the spotlight in recent years, makes it possible to increase the convenience of public transportation use by providing transportation services in cities as an integrated service by setting fares, providing information, and suggesting routes across multiple transportation modes. For MMs that encourage the use of public transport through the provision of information, it is expected that MaaS, which disseminates multimodal public transport usage and its benefits, will be integrated with MMs to further increase the potential for public transport usage. For example, support for the introduction of MaaS itself as one of the activities of MMs, or showing CO_2 emissions, calorie consumption, probability of traffic accidents, etc. for each mode of transportation in a MaaS application, can be expected to lead to an effective shift to public transportation.
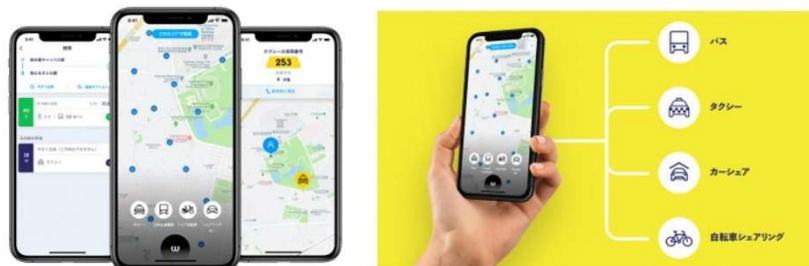
Source   Whim (n.d.)

Figure MaaS apps(Whim)

3.4.4 Practices of MM communication

MM programs can be designed flexibly by combining the elements and methods of MM communication explained above. The well-known practice of MM programs, Travel Feedback Program (TFP), and workshop are explained below. Understanding first the process of TFP and workshop, and then an MM program can be further developed by taking target characteristics and transport issues into account.

Travel Feedback Program (TFP)

TFPs can roughly be divided into three types. Full set TFPs consisting of 4 steps: preliminary survey, questionnaire, post-survey, and feedback, is considered the most effective MM program. Simple TFPs exclude post survey and feedback, while one-shot TFPs only include a questionnaire. Both simple TFPs and one-shot TFPs can be applicable depending on resources such as budget and time. It should be noted that a preliminary survey or a post survey can be carried out to some of the target persons in simple TFP or one-shot TFP to measure the effect.

Table 3-3 Types of Travel Feedback Program

	Full-set TFP	Simple TFP	One-shot TFP
Preliminary survey	●	●	▲
Questionnaire survey	●	●	●
Post survey	●	▲	▲
Feedback	●		

About 0～2 months
About 1～2 months
About 0～2 months

Source　JSCE(2005)

*● : mandatory、 ▲ : optional

Full-set TFPs can take anywhere from 1 to 2 weeks to a maximum of 6 months. Between questionnaire and post-survey stages, an interval period of 1 to 2 months is required because it is necessary to wait for the new behavior to be established to some extent after receiving the questionnaire; which is the most important part of TFP. Other steps can be performed in shorter intervals, depending on the preparation period.

【**First step: Preliminary survey**】
The main purpose of the preliminary survey is to request participation in the program and to obtain basic data for giving information and advice in the subsequent processes such as during effect measurement. The main contents of the basic data include the frequency of using cars and public transport, public transport awareness, and everyday transport behavior.

【**Second step: Questionnaire**】
Answering the questionnaire is the most important step performed in any type of TFP. It aims to change travel behavior by using motivational information (such as adverse effects of using cars and motorbikes and public transport information) and an action plan form that expects people to develop a detailed plan of behavioral changes. If a preliminary survey is carried out beforehand, the questionnaire should be conducted for those who have intentions of reducing the use of cars and motorbikes.

【**Third step: Post survey**】

The post survey is a step to measure the effect of the TFP, and done by collecting answers for the same questions in the preliminary survey. Then the answers are compared.

【**Fourth step: Feedback**】

Feedback is the process of communicating the results of the behavioral changes to the participants based on V- and post-surveys and giving feedback on them. It is important to express the results of the behavioral changes in specific numerical values such as CO_2 or calorie consumption so that the results can be easily understood.

The result of your footprint
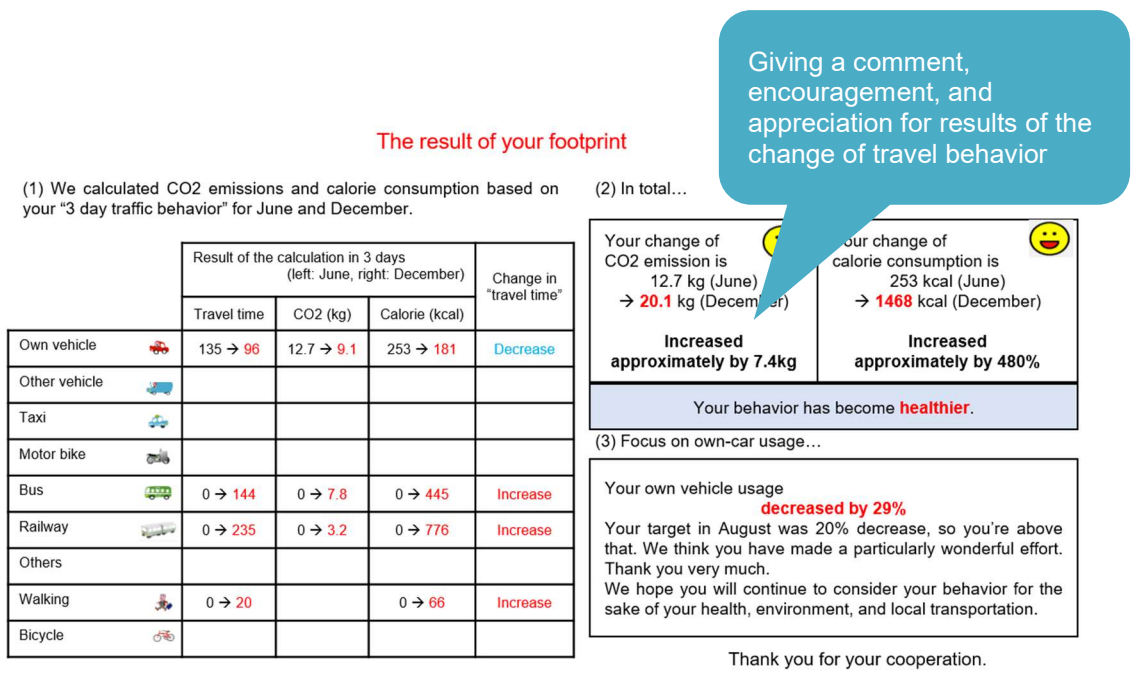
Giving a comment, encouragement, and appreciation for results of the change of travel behavior

(1) We calculated CO2 emissions and calorie consumption based on your "3 day traffic behavior" for June and December.

		Result of the calculation in 3 days (left: June, right: December)			Change in "travel time"
		Travel time	CO2 (kg)	Calorie (kcal)	
Own vehicle		135 → 96	12.7 → 9.1	253 → 181	Decrease
Other vehicle					
Taxi					
Motor bike					
Bus		0 → 144	0 → 7.8	0 → 445	Increase
Railway		0 → 235	0 → 3.2	0 → 776	Increase
Others					
Walking		0 → 20		0 → 66	Increase
Bicycle					

(2) In total…

Your change of CO2 emission is 12.7 kg (June) → **20.1** kg (December)

Increased approximately by 7.4kg

Your change of calorie consumption is 253 kcal (June) → **1468** kcal (December)

Increased approximately by 480%

Your behavior has become **healthier**.

(3) Focus on own-car usage…

Your own vehicle usage **decreased by 29%**
Your target in August was 20% decrease, so you're above that. We think you have made a particularly wonderful effort. Thank you very much.
We hope you will continue to consider your behavior for the sake of your health, environment, and local transportation.

Thank you for your cooperation.

Source   JSCE(2005)

Figure 3-7 Feedback information using Travel Record sheet

1) Handouts

Table 3-4 shows handouts often used in TFPs.

Table 3-4 Major Handouts for Each TFP Step

	Handout	Outline	Tools
Pre survey	Questionnaire	Entry form for personal attributes, travel behavior and awareness, etc.	"Tools" No. 3, 4
Communication questionnaire	Motivational information brochure	Information encouraging behavioral changes such as pros and cons of using public transport (see 3.4.2)	"Tools" No. 13,14,15,16,17,18,19
	Action plan form	A sheet to fill up how you can change your behavior. (see 3.4.1)	"Tools" No. 5
Post survey	Questionnaire	Collect the same data as in the pre survey	"Tools" No. 3,4

Source MLIT(2013)

Figure 3-8 Handout images

2) Delivering methods

TFPs use various forms of delivering documents such as surveys and brochures about public transport. Thus, defining efficient methods and ways to deliver the handouts and to approach people is essential for successful MM. Depending on the purpose or resource, the most appropriate approach should be applied by referring to the examples explained below.

a. Home visits

Government officers or employed staff visit homes directly, delivering the handouts and collecting the surveys. It involves face-to-face communication by person in charge of MM so that people feel safe and convinced of the purpose, and show willingness to be engaged. During the visit, a brief interview also can be performed, which is explained in detail later in this section. [4.1.2]

b. Resident associations

In cases where resident associations are available to be representatives of communities, the handouts can be delivered and collected through them. While they can be an efficient way to deliver the handouts, there are concerns that the handouts may not be really distributed to people, and that the surveys may not be sent back by associations. If it involves back-and-forth communication is required (such as with full-set TFPs), handouts distribution can be more challenging they need to be delivered individually.

c. Door-to-door handouts

Outsourcing the delivery of door-to-door handouts is a cost-effective way. As there is no face-to-face communication at all, the handouts should be well-designed to make sure that people take an interest and go through them.

d. Web/e-mail

If households have Internet connections, surveys and collecting feedbacks can be done online. By doing this, data management can be more efficient and messages can be more graphical than paper-based handouts. Printing and delivering cost can also be saved. However, it is not always the case that governments have e-mail addresses of the residents. In this case, the governments need to contact people using online advertisements, which can entail some expense. For this reason, making the first contact by another method, such as through home visits or residential associations, then communicating online for those who accept a survey in the first contact can be recommended.

Column: TFP combined with a transport survey

Fukui Prefecture carried out MM in 2005 making good use of a transport survey to 40,000 people implemented widely in the prefecture, which successfully cut down the cost for MM. In the transport survey, people were asked whether they were willing to participate in an additional survey, including a couple of questions based on Travel Plan Method. For those who accepted to receive further surveys, communication questionnaires were carried out to about 10,000 people, motivational brochures were sent, and a public transport map. Comparing the result of those who received the information and those who agreed to receive it but did not receive (control group), there was a difference of 12.3% in the frequency of use of cars after the implementation. A similar project of making good use of a transport survey is being planned by JICA in Vientiane in Laos.

Workshops

MM workshops are considered very effective for changing behavior as they are active participation-based events that provide opportunities where people can think and exchange ideas, learn, and get inspired from the other. Despite the disadvantage that workshops are better to be held in small groups to ensure everybody's participation, thinking and exchanging ideas about transport issues for a certain period of time can have more impacts

on behavior than text-based communication. Furthermore, as those who participate in this kind of workshop are assumed to be actively engaged in improving the society, these people can have influence on family members or friends in the communities, leading more people to change their travel behavior. Designing and preparing a workshop to make these things happen is, therefore, important for effective MM.

1) Facilitators

Facilitators play an indispensable role in making MM workshops successful. They are expected to encourage participants to be actively engaged while providing technical advice about MM. Moreover, creating a relaxed atmosphere and securing active exchange of ideas are also his/her responsibilities. For this reason, depending on available resources, experienced workshop facilitators can be assigned for effective MM instead of persons who just have MM knowledge.

2) Steps

A five-step workshop approach for changing behavior is explained below.

【First step: Introduction】

In the introduction, the participants, objectives of the workshop, and information provision are usually presented. Even though the participants know each other in workshops locally held, it is important to make sure that all the participants will still introduce themselves to make them feel relaxed and ready to be engaged in the workshop. An explanation about the objectives should be given such that all the participants have a sense of purpose. Rules around the workshop, such as respectful attitude towards the others, should also be explained at this point. In the information provision, various issues caused by an excessive use of cars and motorbikes are presented for the participants to think for themselves about how the situation can be improved.

【Second step: Being aware of one's own travel habits】

In this step, it helps people become aware of their usual travel behavior given in the pre-survey or in the workshop. Distance-based travel behavior should be clarified here so that people understand the fact that they are dependent on their vehicles for even short travel distances. Travel Records are a good tool for getting the participants to learn about environmental effects caused by their travel behavior.

【Third step: Learning about other's travel habits】

Learning about the travel behavior of others and being aware of their differences are also effective for changing travel behavior. If the pre-survey has been carried out and this provides information on the travel behavior of the participants, presenting the most common travel behavior among the participants helps them position their own behavior relative to others in the group (see Tools: Tool 1 Travel Record).

【Fourth step: Thinking of desirable changes in behavior】

This step involves an exchange of ideas between the participants about opportunities for the change in travel behavior given all the lessons learned in the previous steps. This results in

individual plans on how to change the current behavior developed by each participant.

【Fifth step: Setting a goal】

In the last step, each participant sets a goal with a concrete action plan. Using the Travel Behavior Review Sheet, the travel mode, distance, purpose, and frequency for which change in travel behavior can emanate and exactly how it can be changed, should be clarified. Then the plan should be presented to other participants. Presenting it in public would help people actually take action based on the plan (see Tools: Tool 8 Think about Travel Behavior sheet).

Source   Mie Prefecture(2016)

Figure 3-9 Workshop procedure

3.5   Effect measurement and feedback

### 3.5.1 Objectives and aims of effect measurement

Effect measurement is extremely important from the perspective of accountability of public work for the citizens and also from the expansion of MM activity continuously. In the UK (Smarter Choice, 2004) and Australia (Travel Smart, 2010), a budget for large-scale MM implementation and continuous activities is obtained by conducting more scientific MM effect verification, including academics, in the early stages. Looking back on the history of MM in Japan, it has been demonstrated that carefully showing the effects of the project, especially at the initial stage, leads to greater continuity of activities. Therefore, cost effective and robust verification should be conducted at the beginning of large-scale implementation and continuous activities.

Additionally, giving feedback to the participants and related partners based on effect measurement is also important as it can help them feel motivated and become more aware of the fact that they contribute to creating a better society. This will be the driving force of the next action/approach. Furthermore, when there are few people who have an experience or understanding of MM, it is also important to increase the number of MM promoters through careful feedback to relevant partners.

3.5.2 Method of effect measurement

(1) Measurement indicators

The most basic and concrete result, which is the basis of effect measurement, is how much the use of targeted transportation modes increased or decreased due to MM activities. The intention or awareness related to these can be also the indicators. The former is measured by using objective data such as sales data or a questionnaire; the latter is measured by a questionnaire.
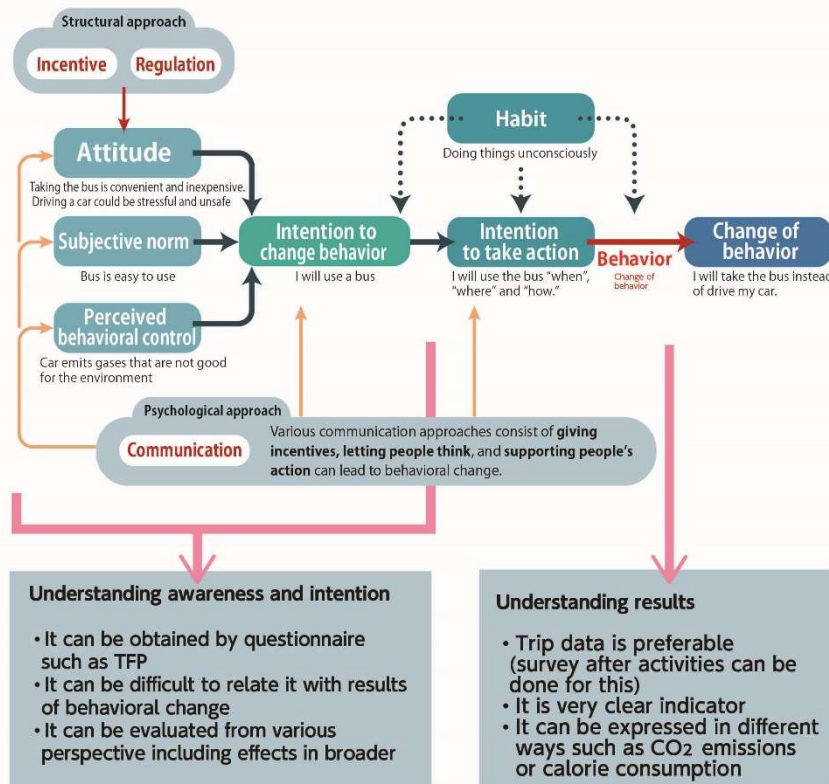
Source   JSCE(2005)

Figure 3-10 The process of behavioral change and effect measurement

In addition, for MM at workplaces or schools, it would be encouraging for local governments or transport operators who support MM activities to receive feedback from the person in charge at these workplaces and schools about what they think and learn through the activities. To this end, it is necessary to examine what kind of feedback will motivate MM practitioners.

(2) Effect measurement

Effect measurement collects data according to the indicators you want to acquire and the indicators you want to give feedback on. If it is difficult to collect actual usage data; the data obtained by questionnaire in TFPs can be used instead. In addition, interviews can be conducted with people involved in activities since their opinions can also be valuable for project evaluation.

**Table 3-5 Effect measurement and acquisition and measuring methods**

	Contents	Acquisition method	Measuring method
Behavior	Actual usage data	・sales data ・fact-finding	・evaluate at the time of implementing the policy and other periods (before and after implementation).
		・questionnaire survey（accident investigation）	・comparison between policy target group and control group
Awareness	Target user's opinion to use, consideration, etc.	・questionnaire survey (CA or accident investigation when providing information）	・comparison between policy target group and control group
Other remarks	Stakeholder's opinions, etc	・interviews	

Note: Control group is a group of MM participants who receives no MM information and message, only questionnare survey, to measure MM effect; their behavior is compared with the other group which receives MM information and messages
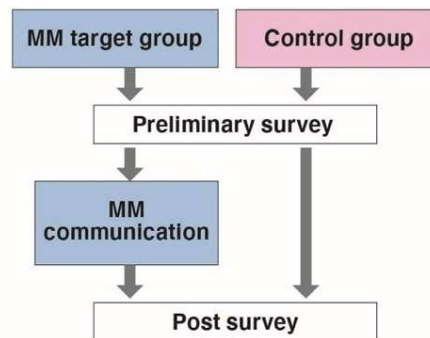
Source   JSCE(2005)

Figure 3-11 MM procedure with control group
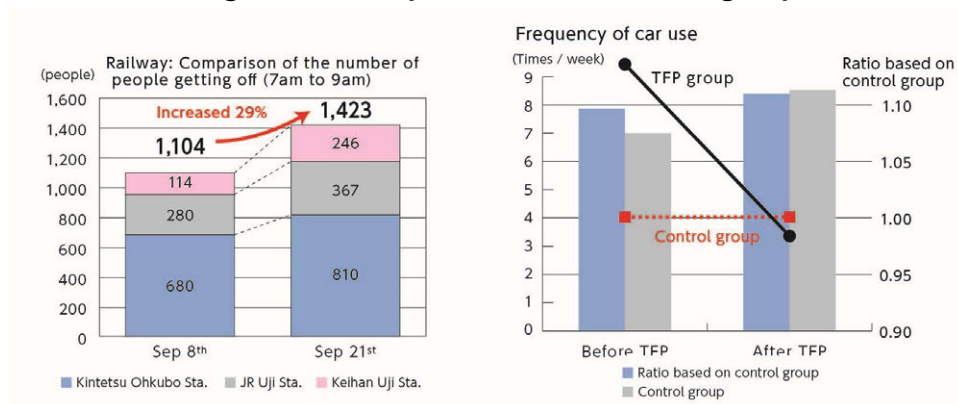
Source   Left: Shimada(2007), Right: Fuji(2006)

Figure 3-12 Examples of effect measurements

(3) **Cost effectiveness**

Benefit-to-cost analysis is very effective in showing numerically how much the cost is required to carry out the MM and how much is the benefit associated with it. MM is expected to bring various social benefits by restraining the use of cars and motorbikes and increasing the use of public transport and walking. The cost for implementing MM includes various expenses such as personnel expenses and goods. For example, MM at the time of license renewal conducted in Kyoto Prefecture showed a benefit-to-cost ratio of 21.5.

Table 3-6 Major social benefits by MM

Indicator	Content
Health improvement（reduction of medical expenses）	Compared to the use of car or motorbike, the use of public transport inevitably involves walking, which improves people's health and consequently reduces social security cost.
Reduction of traffic accidents	With less frequent use of cars and motorbikes, the probability of accidents will decrease, and the economic losses associated with the accidents will decrease.
Reduction of operation cost	Reduction of fuel costs associated with less frequent use of cars and motorbikes.
Reduction of travel time	With reducing traffic congestion, travel time is shortened and economic loss is reduced.
Environmental improvement	Reduction on greenhouse gas emissions by reducing traffic congestion made by less frequent use of cars or motorbikes.
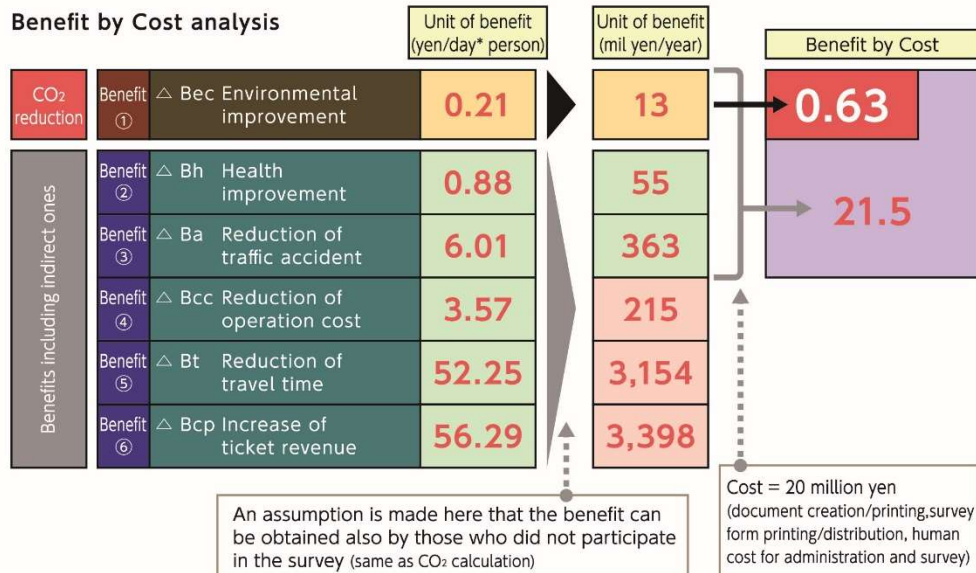
Source　Sato et al(2009)

Figure 3-13 Benefit-by-cost analysis in Kyoto prefecture

(4) **Feedback**

It is important to carefully give feedback about the results obtained to the target person and target organization. There are different ways to give feedback: individual feedback, feedback to the entire region, and feedback through an organization. In case of feedback given through an organization, it should also be carried out from the perspective of how the organization can increase motivation. Receiving feedback from individuals about public transport can be useful data for local governments or transport operators to develop service improvement policies.

Table 3-7 Feedback method for MM

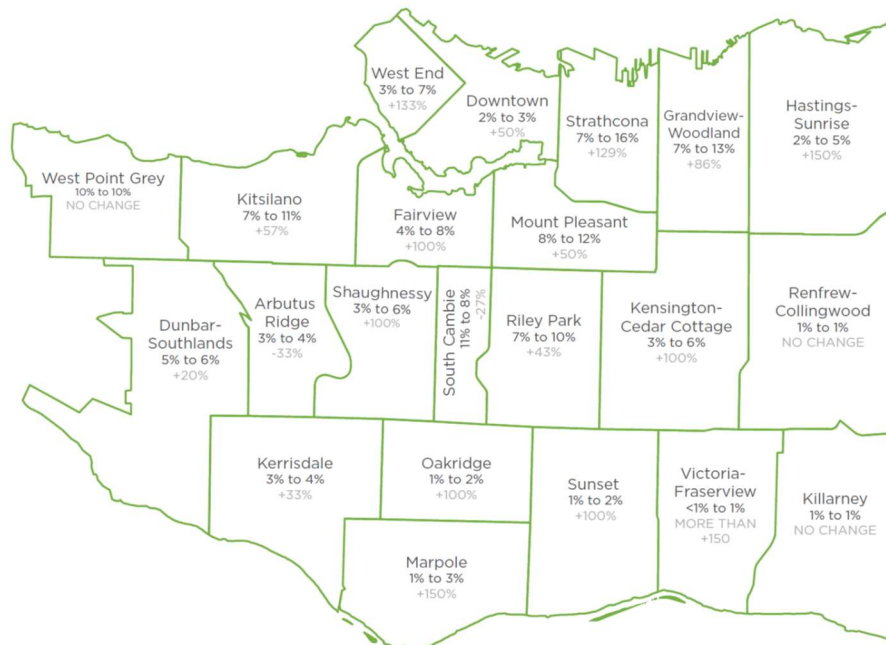| Target		Method	Examples	Remarks
Personal	Individual	Make feedback materials individually	• Overall change in usage • CO_2 reduction and calorie consumption according to individual results, etc.	Consider whether it should be sent directly to an individual or via a person in charge
	Organization /Community	Newsletters for organizations or regions	• Change in usage of target organizations • Change in awareness of the target person • Example of individual opinion (with visible effects)	
MM Target organizations (workplace, school, etc.)		Materials for internal reporting (workplace, etc.)	• Change in usage of target organizations • CO_2 reduction as an organization • Impact on organization activities (change in business efficiency, etc.)	
		Reporting materials for the person in charge	• Change in arrival time against the start time to work • Changes in the occurrence of accidents during commuting	This will depend on the responsibility of the person in charge
MM Implement organization （transportation operators, government, etc.）		Materials for internal reporting (workplace, etc.)	• Change in usage of target organizations • CO_2 reduction as an organization • Traffic congestion and changes in CO_2 emissions • Change in the number of public transport users • Cost effectiveness	Consider publication on public relations / web
		Reporting materials for person in charge	• Real voice from target person (arranging interview of individual voice)	

【Reference】Examples of ways to give feedback

■ **Evaluation by sales data/actual survey**

① City of Vancouver, which is also engaged in communication measures with the aim of significantly improving the share of active modes such as public transport by 2040, creates a follow-up report every year in which the project evaluation as well as the improvement of the modal share are provided.

② In the MM targeted for workplaces in Uji City, Kyoto Prefecture, surveys were conducted before, immediately after, and one year after the MM activity to examine the number of passengers getting off at railway stations used by people in the areas where MM was carried out.

CYCLING TO WORK
2011 → 2016

Source: Statistics Canada. *[2011], [2016], Census.*

West End
3% to 7%
+133%

Downtown
2% to 3%
+50%

Strathcona
7% to 16%
+129%

Grandview-
Woodland
7% to 13%
+86%

Hastings-
Sunrise
2% to 5%
+150%

West Point Grey
10% to 10%
NO CHANGE

Kitsilano
7% to 11%
+57%

Fairview
4% to 8%
+100%

Mount Pleasant
8% to 12%
+50%

Dunbar-
Southlands
5% to 6%
+20%

Arbutus
Ridge
3% to 4%
-33%

Shaughnessy
3% to 6%
+100%

South Cambie
11% to 8%
-27%

Riley Park
7% to 10%
+43%

Kensington-
Cedar Cottage
3% to 6%
+100%

Renfrew-
Collingwood
1% to 1%
NO CHANGE

Kerrisdale
3% to 4%
+33%

Oakridge
1% to 2%
+100%

Sunset
1% to 2%
+100%

Victoria-
Fraserview
<1% to 1%
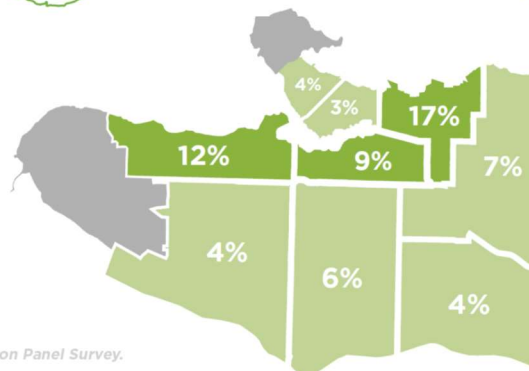MORE THAN
+150

Killarney
1% to 1%
NO CHANGE

Marpole
1% to 3%
+150%

**CYCLING MODE SHARE
BY HOME AREA**

2017

Cycling is most common
for people who live in
neighbourhoods **closer to
the downtown area.**

4%
3%
17%
12%
9%
7%
4%
6%
4%

Source: *City of Vancouver. [2017], Transportation Panel Survey.*

Source　City of Vancouver (2017)

Figure The modal share of bicycle in City of Vancouver
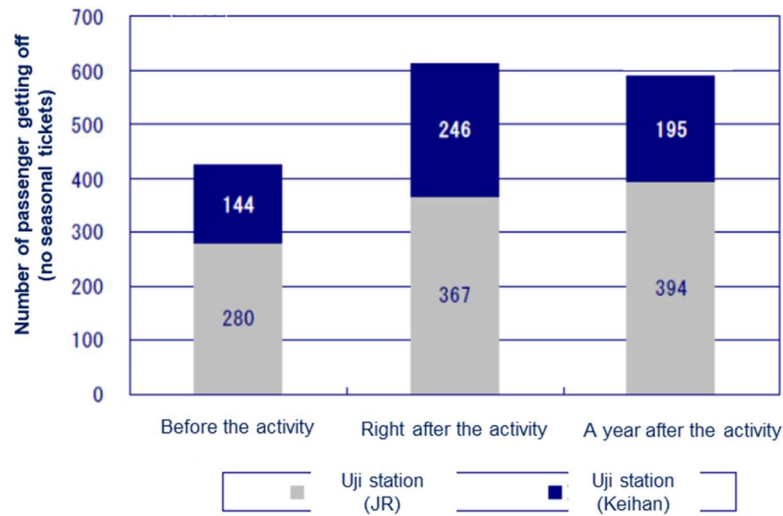
Souce   MLIT et al(2007)

Fugure The change of ridership at a railway station in Uji City

■   **Qualitative evaluation by questionnaire**

① In MM targeted at residents in Kawanishi City, Hyogo Prefecture, questionnaires were carried out on the travel time by car to two groups. One group comprised of those who received the information right after and three months after the MM activity; and the other group comprised of those who did not receive the information.

② In MM conducted in school in Fuji City, Shizuoka Prefecture, questionnaires were given to the students after and before the class to measure their understanding about public transport.
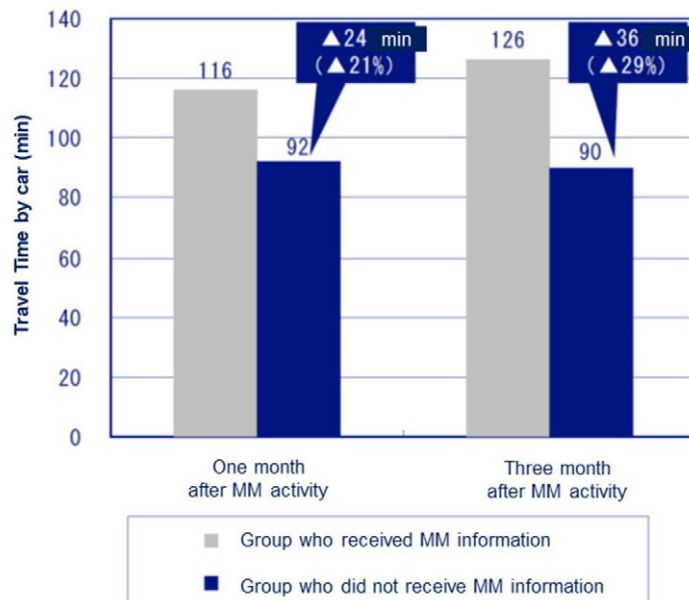
Source   MLIT et al(2007)

Figure The change of travel time by car in MM residents in Kawanishi City
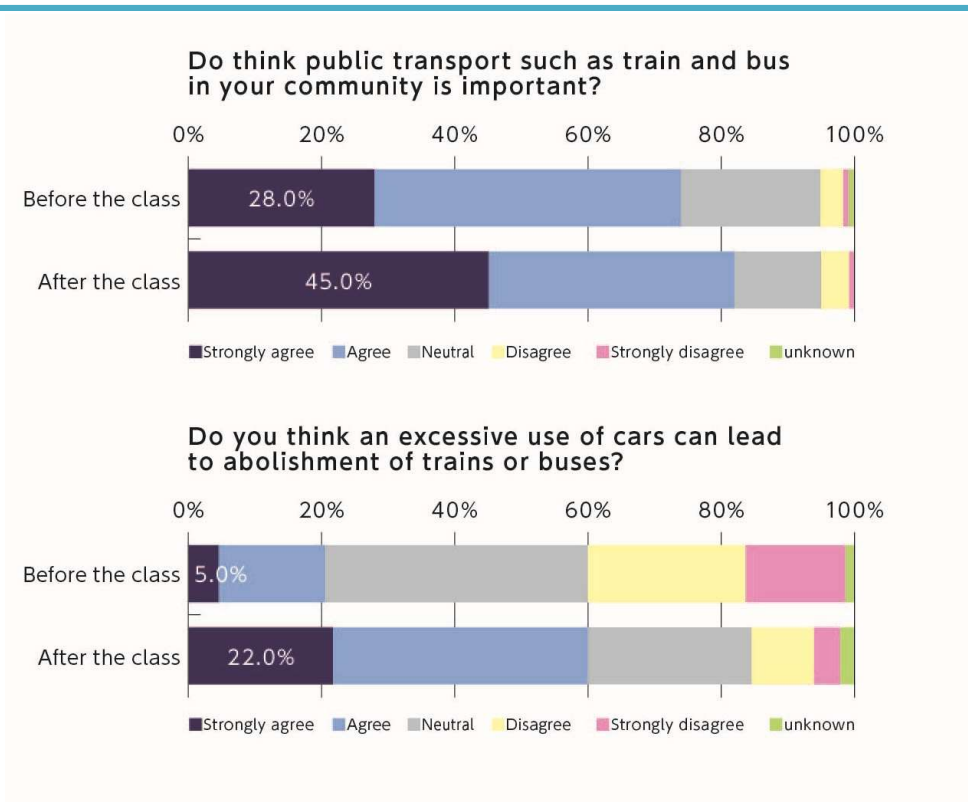
Source　MLIT et al(2007)

Figure The change of travel time by car in MM residents in Kawanishi City

■ **Input/output evaluation**

① In MM by home visit in Toyama City, efforts have been made for transparency and accountability of the project by making the number of households for questionnaire distribution and for the home visits public, in addition to the change in the number of public transport users.

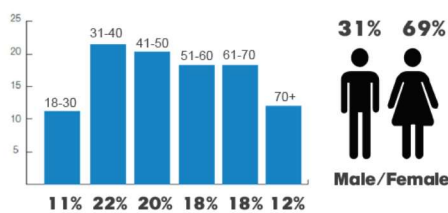② In MM in Cockburn City, Western Australia, the output itself of the project has been used as one of the outcomes of the project by providing the total number of people who participated in the program along with their attributions in the result report of the project.

Year	Survey Distribution	Response	Household Visit (successfully interviewed)
2016	4,500 households	914 households	205 households
2017	4,996 households	1,479 households	368 households

Year	Target	Household Visit	Household Visit (successfully interviewed)
2018	2,000 households	1,032 households	341 households

Participants

10,008 registered households

96% of participants agreed to receive phone coaching

60% remained engaged

Demographics

18-30, 31-40, 41-50, 51-60, 61-70, 70+
11% 22% 20% 18% 18% 12%

31% 69%
Male/Female

Top 5 activities

Walk, Gym, Sport, Cycle, Jog
34% 24% 19% 9% 5%
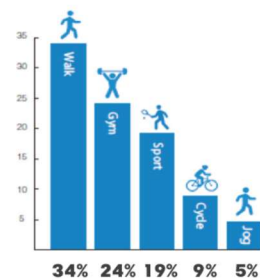
Source

Source　Above:Toyama City et al(2018)、Below: Government of Western Australia (2014)

Figure Home visit result in Toyama City (above) / MM participation result in Cockburn City (below)

CHAPTER 4   Mobility Management - Implementation

4.1   MM Residents

Mobility management implemented for residents can be considered the most common type of MM. The key strategy for successful MM for Residents is that it is implemented by the government to help residents think of issues in their communities as if these are their own, and thus change in travel behavior becomes voluntary. Taking advantage of government officials who are likely familiar with local issues and characteristics, governments are expected to effectively involve the residents for successful activities. Please refer to Section 3.4.3 for the methods applicable for MM Residents, as these include more variety of methods than other types of MM such as the Travel Feedback Program. In this section, a more detailed explanation is provided about MM by home visit (a unique method for MM Residents) and target selection leading to more efficient and effective activities.

4.1.1 Target

In order to achieve larger benefits by MM even with a limited budget, choosing the area where changing the travel behavior would not be too difficult is important. Another point to be considered for the target selection is whether MM contributes to resolving local issues. In case of alleviating traffic congestion at a certain location, for example, choosing an area upstream from the congested location, with good accessibility to public transport but with low level of ridership, can be an option.

For this case, existing survey results can be used to identify areas with high service levels but with low modal share of public transport. If there had been a transport survey carried out in the past, using an OD table[1] will be useful to identify targets.

At the early stage of MM implementation, starting with areas where the government can obtain cooperation from the community is also a viable option. Communities where the government has earned public trust or has a close relation with the residents' association may generally be more willing to participate. For affluent neighborhoods or collective housing sites with high level of security, reaching the residents can be challenging as this needs to be done through security administrators.

Before implementation, defining which household member is the target is also necessary. Instead of targeting all the household members, household members who are more likely to change their travel behavior should be chosen, such as those who travel by driving to offices or schools in the city center.

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[1] *Origin-destination trip table* is one of the essential data for transport and traffic surveys that provide the number of movements of people or vehicles between each given origin (row) and destination (column) zone.

4.1.2 Communication tips for MM by home visit

Although MM by home visit enables communication to be respectful and individualized, government officials need to be cautious as it is an approach to which such officials are not typically accustomed to. It is important to listen carefully to better understand issues and opinions about public transport, and this provides key information effective for a change in travel behavior. Toyama City in Japan, which has been promoting the use of public transport with the aim of developing a "Compact City," carried out MM by home visit in collaboration with the transport operator (please refer to Case Studies No. 2 for details) and presented a communication procedure for MM by home visit for others to learn from.
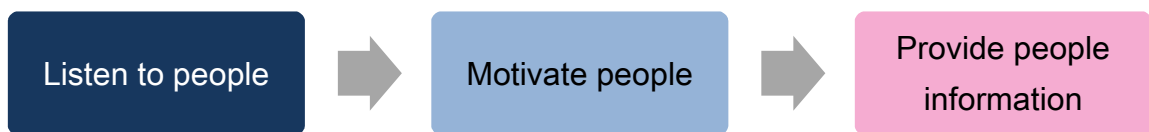
Source   Toyama City(2019)

Figure 4-1 Three step of MM by home visit

【**First step: Listen to people**】

First, it is important for the officials to listen carefully to the feedback without interrupting. This way, information can be collected including habit of travel behavior and opinion about public transport, as well as the reasons behind them. In a case when a pre-survey has been done prior to the visit, confirming and discussing the results can be done while demonstrating an understanding about it.

【**Second step: Motivate people**】

In the second step, a motivation for the change of travel behavior is presented based on the information collected in the first step. For those who are actively using public transport, this step can be excluded. For those who are not or have not used public transport at all, the officials can ask questions about whether they have a travel habit of driving that can be replaced with public transport. Various purposes of travel such as commuting, going shopping, and medical appointments can be discussed on whether those can also be made by public transport.

【**Third step: Provide people information**】

Given the outcomes of the previous steps, the officials provide useful information for people to change their travel behavior. Route maps and timetables can be provided for those who are not familiar with the local public transport; and for those who are already familiar with it, a brochure of interesting information, such as major destinations along public transport lines, can be provided. Free tickets for public transport or campaign items can also be given as extra incentive.

Source   Toyama City et al(2018)

**Figure 4-2 MM by home visit in Toyama City**

4.2   MM Workplace

As mobility management for the workplace (MM Workplace) is applied mainly for commuting trips (as the dominant trip purpose during peak time), the impact can be significant especially through getting a commitment from the employer, as it enables MM to reach the employees effectively. In a case when the government does not have contact with these companies or institutions, approaching them strategically with an understanding of their interests is necessary.

4.2.1 Target

MM Workplace can be divided into two types. The first is done in workplaces independently implementing MM, while the other is done through the government's or public transport operator's initiative. The former can be more effective, as it is led by the employer aiming for sustainable activities that could even influence the workplace culture. However, a disadvantage is that it can involve more work for the employer than the latter, which is led by the government or public transport operator. The first type still requires a person from the workplace to communicate with the government and/or the public transport operator, but the person does not have to be involved in MM implementation. This approach, however, does not necessarily guarantee that employees at workplaces actually participate in MM activities, so the activities or tools need to be well-designed to motivate them to do so. An advantage of this approach, on the other hand, is that it can be designed such that it influences not only employees' commuting travel, but also other travel by the employees or even the travel behavior of their family members. These two types of workplace MM are not distinct from each other and it often involves both institutions (employer and government/public transport operator), thus responsibilities can be flexible depending on the circumstances. Furthermore, MM implementation can be outsourced to consultants.

In the case of MM Workplace in Toyohashi, the government implemented a pilot Travel Feedback Program (TFP) targeting company employees. The government employees also participated in the activity, as it appealed to more companies when the pilot activity was expanded. Based on this experience, the following conditions should be taken into account when selecting targets in the city.

- Area with congestion occurring during commuting hours
- Area where public transport infrastructure is available to enable a shift of travel mode from private vehicles
- Workplaces with a substantial number of employees
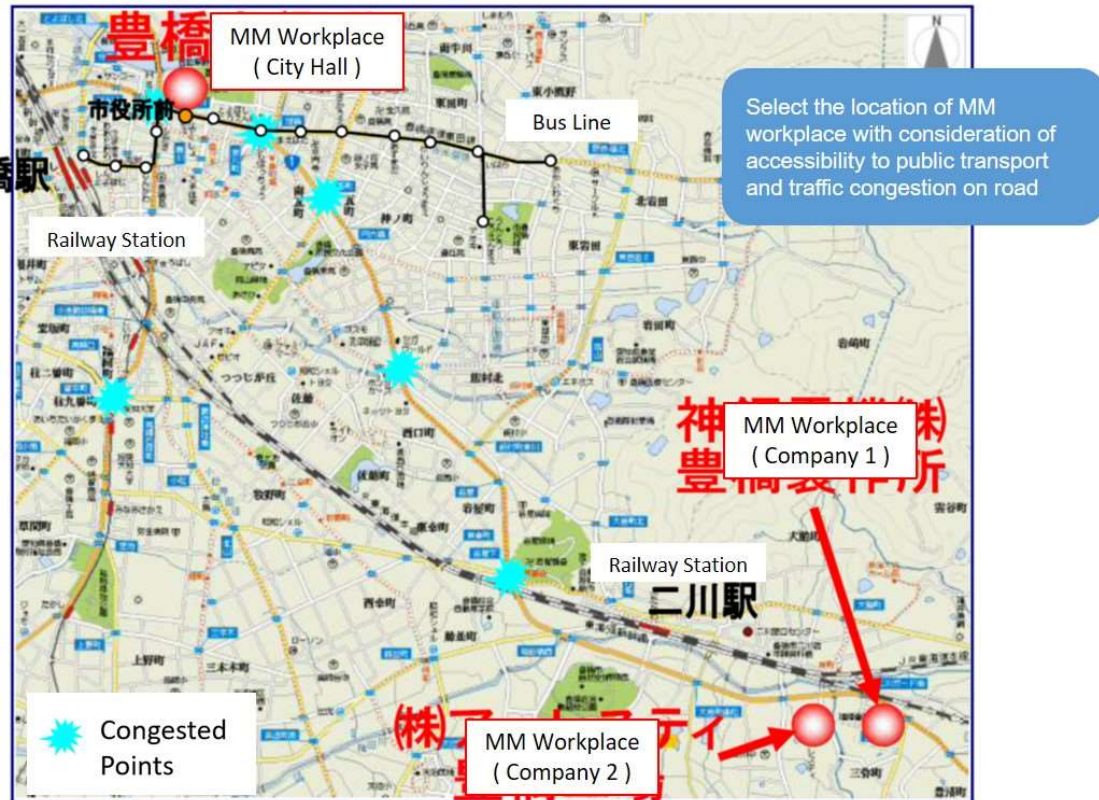
Source   Toyohashi City(2008)

Figure 4-3 MM target area and workplace in Toyohashi City

4.2.2 Incentive

Although institutions are social entities responsible for the societal impact of their activities, every institution has its own purpose, and thus not all institutions take interest in changing their employees' travel behavior. Specifically, private companies are profit-driven so they are less inclined to collaborate with the government without a clear profit motive. On the other hand, institutions providing commuting allowance can benefit financially from a more economical commuting mode by their employees. For institutions with their own parking, , they can benefit from more employees not commuting by driving in cases where the parking capacity is insufficient or there is a need to replace or even close such facilities. If companies have their own environmental goals, such as reducing greenhouse gas emissions, MM activities should be considered to be included into the corresponding action plan.

Another incentive can be in the form of brand-building for companies or institutions where they conduct non-profitable activities for social responsibility, giving them a positive image for potential employees, clients, customers, etc.. This can be a more effective incentive if their MM activities are made public on the local government's website, or through joining the mayor's award program for instance. As for incentives given to individual employees for their change in travel behavior, the motivational information explained in Section 3.4.2 can be referred to.

Source   MHI(2012)

Figure 4-4 CSR activity report in company home page (MHI)

4.2.3 Method

a. In-house communication

In-house communication can be done cost-effectively and can be easily carried out, such as through the intranet (digital) or posters (physical). Messaging through these forms can be difficult to individualize, so they should be well-designed to be attention-grabbing while taking into account the 6 principles of MM communication explained in Section 2.4.

Source   Toyohashi City(2018)

Figure 4-5 MM message to motivate people to join

b. **Travel Feedback Program (TFP)**

MM Workplace can also be applied through a TFP as explained in Section 4.1.1. TFP for MM Workplace should be implemented extensively by involving local companies and institutions, which can be done through local associations such as chambers of commerce, so that the impact can be significant enough to be evaluated. A one-time TFP done for workplaces in Uji, Kyoto Prefecture, involving 4,400 employees of multiple institutions, delivered a motivational information brochure, survey, and commuting map. The information delivered, such as a bus map and timetable, was customized for each workplace as shown in Figure 4-6, which provides an example from the Nintendo factory. As a result of this activity, ridership of a railway station in the area increased by 140% even a year after implementation.
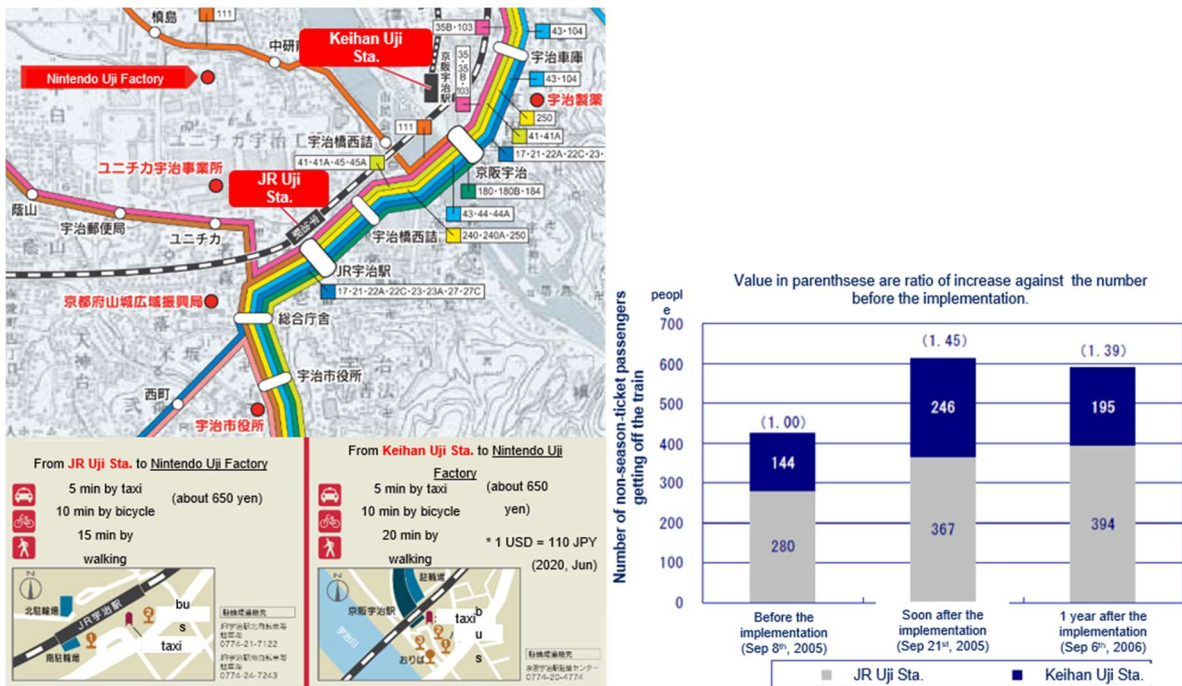
Source   left: Task force for Uji commutation trips project(2005), right: MLIT et al(2007)

Figure 4-6 Customized map for Nintendo factory (left) and MM effect (right)

c. **Car-free day/week activity**

This is an activity in which the use of vehicles is restricted or voluntarily given up during a certain day or period. It is usually initiated by the government or non-profit organizations, which invite companies or institutions to join the activity. However, it can be also implemented by companies or institutions which, if an alternative mode(s) of transport is available, prohibit employees to drive for commuting. Since 2008, Okayama Prefecture has been carrying out a car-free day activity over two weeks every year, involving local companies and institutions. The activity encourages not only the use of public transport, but also carpooling and staggered commuting hours to facilitate participation, maintaining over 100 institutions engaged. Another successful element of this activity is that the government awards prizes to institutions that implement individual activities for giving motivation. In Matsue City, a no-car week activity is carried out by asking institutions to publicly declare their participation, which is further made public by the government.

Figure 4-7 Logo of car-free day in Okayama (left) and awarding from Mayor (right)

d. **Shuttle bus services**

Shuttle bus services run by employers can bring direct benefits to the welfare of employees, and it can reduce their parking space requirements. MM Workplace carried out in an industrial district in Kyoto City attempted to combine shuttle bus services operated by different companies in the area. A trial operation of 24 days – including providing information through newsletters, promotional items, and brochures – achieved a ridership increase of 174%, which led to the regular operation of the service. The government played an important role in coordinating those companies through a council established specifically for this activity.

Figure 4-8 Instruction how to get shared shuttle bus in Kyoto City

Column: Certification system for environmentally friendly commuting

The Foundation for Promoting Personal Mobility and Ecological Transportation, better known as the "Eco-Mo Foundation", developed a certification system for institutions to encourage environmentally friendly commuting. The following four requirements must be met for the certification to be issued:

1) Assigning an employee to be in charge for related activities in the institution;

2) Keeping track of employees' commuting modes;

3) Carrying out concrete activities for environmentally friendly commuting; and

4) Making plans for environmentally friendly commuting.

To ensure that the activities are carried out, the foundation requires the institutions to submit an annual report. As of 2020, more than 700 institutions have been awarded certification.

Source   MLIT et al(2020)

4.3   MM School

Mobility management for schools (MM School) aims mainly to nurture Knowledge, Ability, and Attitude of students, as shown in Figure 4-9. Such MM activity is based on a commitment to provide knowledge about public transport in the community and its role, as well as the impacts from travel behavior in the society. Making good use of such knowledge, it is expected that people think, judge, and change their travel behavior not only for themselves but also for society as a whole. Moreover, this intends to develop an attitude to change behavior voluntarily and contribute to society, making MM activities more sustainable. In school education, in addition to knowledge acquisition and its application, developing an attitude to independently engage in social activities is an important element. In this regard, MM is well-suited for school education. MM School ultimately aims to develop "an ability to participate independently in creating a better society" by nurturing the three elements. MM School thus helps children have a habitual use of public transport, which can possibly mitigate transport issues in the future. MM School can be more extensive by involving the students' parents as well.

General knowledge about transportation society
- Significance and function of transportation and movement in life and society
- Impact of car use on society (Impact of exhaust gas on the global environment, etc.)
- Significance of public transportation, bicycle and walking (being kind to the global environment and health, being mobility that is indispensable for the elderly and students, etc.)
- Transportation related government and transportation function, traffic related laws and mechanisms

Knowledge of transportation around us
- State of traffic in familiar areas
- Public transportation routes, fees, timetable, fare payment method, etc.
- The characteristics of our daily movements and the resulting impact on the global environment

Ability to investigate and study the relationship between oneself and the transportation society
- Ability to collect and select necessary materials and utilize them appropriately regarding the relationship between the transportation society and myself.
- Ability to understand the characteristics of one's own transportation and gain insight and consideration about its impact on society.

Ability to properly utilize and judge knowledge about transportation society
- Ability to think and judge what actions and efforts are necessary for the movement of yourself and those around us to be a desirable movement for both people and society.

Knowledge

Knowledge required to realize a desirable transportation society

Ability

Ability to make appropriate judgments from the perspective of people and society/environment while appropriately utilizing knowledge about transportation society

Attitude

Attitude to voluntarily act or work towards the realization of a desirable transportation society

Attitude to actively participate in and contribute to public social activities
- Attitude to voluntarily act or encourage the movement of people around them to be desirable movements for individuals and society.
- Attitude to pursue and observe various aspects of desirable transportation system.
- Public spirit, morality, citizenship, etc.

Ability to actively participate in the formation of a better society

Ability to recognize the importance of participation in public and social activities, and to actively participate and contribute to it

Source   The Foundation for Promoting Personal Mobility and Ecological Transportation

Figure 4-9 Component consisting MM School

4.3.1 Target

Although elementary schools are the main targets for MM School in Japan, it can also be applied in high schools or even universities by changing the themes or approaches. In the case of MM School, aiming to change students' travel behavior in going to school, rather than educating them on more sustainable travel behavior for the future, means that the activity should involve the parents, as they are often responsible for the students' travel modes to school such as by the parents' driving for drop-off and pick-up.

MM School as implemented in Sendai City sets three-stage goals to be accomplished for learning the environment related to transport during the 6-year education in elementary school. It aims to enable the students to consider using public transport as an alternative to driving (or being driven). The curriculum has been designed to make MM School related to existing subjects so that the teachers can easily adopt it in the curriculum.
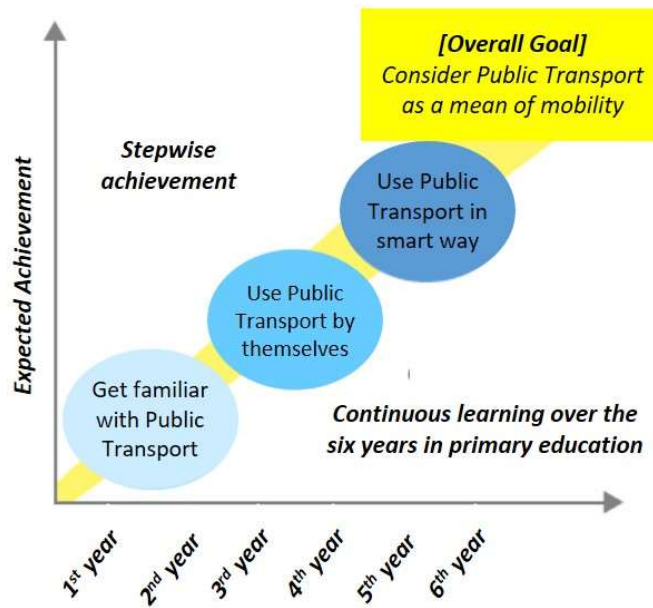
Figure 4-10 Goal setting of MM School in Sendai City

4.3.2 Implementing organization

It is indispensable for MM School that the transport department work closely with the education department, despite their respective differences in goals. Hence, the aim should not be defined only by transport-related interests, but more so by education-related goals where the necessary educational materials can be provided by the government.

Similar to MM Resident and MM Workplace, specialized knowledge about MM School can be provided by government officials or MM professionals. However, as MM School is often carried out in collaboration with teachers, it is important for the teachers to gain a basic knowledge about MM beforehand, which will contribute to more effective and sustainable MM activities. Getting the opinion or feedback from teachers in developing MM School helps in making the activities be more compatible with school education, which enables the activities to be in line with the school curriculum, reducing additional preparation cost for the school to implement the activities. Therefore, providing MM knowledge to the teachers and seeking their opinion at an early stage of planning are desirable. This way, the curriculum can be developed taking their inputs into account. Besides, it is desirable for schools to carry out MM School independently in the medium- and long-term; For this goal, the involvement of the ministry or department in charge of education is essential.

MM School as implemented in Hadano City was achieved through close collaboration of the transport and education departments. This was done by establishing MM School as one of several policies set in the 2004 Transport Demand Management Plan, where such policies were defined as city-level activities. The city took over MM School that were implemented independently by the schools, delegating responsibilities gradually from externally hired professionals to the teachers, as shown in Table 4.

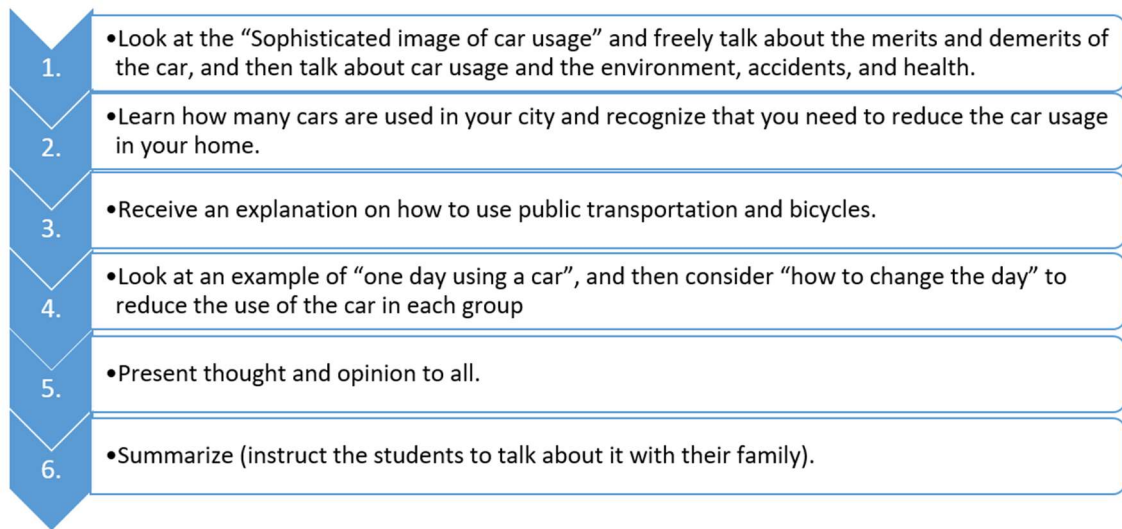**Table 4-1 Stakeholder's responsibilities for MM School in Hadano City**

	2004	2005	2006-08	2009	2010-11	2012
Moderator	School	School	School	School	School	School
Lecturer	External lecturer	School & External lecturer	School & External lecturer	School & External lecturer	School	School
Action plan/ class prep	External lecturer	School	School	School	School	School
Action plan commentary	External lecturer	External lecturer	External lecturer	External lecturer	School	School

Source   Fujii et al (2015)

4.3.3 Creating a curriculum

MM School targets students at various levels – from elementary schools to universities – so developing a curriculum corresponding to each level is important for delivering MM messages appropriately. MM School in elementary school, for example, should include extracurricular activities or game-based activities to make the learning experience more fun and easy to understand. Involving their parents is also important to get their support in ensuring that the students will better understand MM.
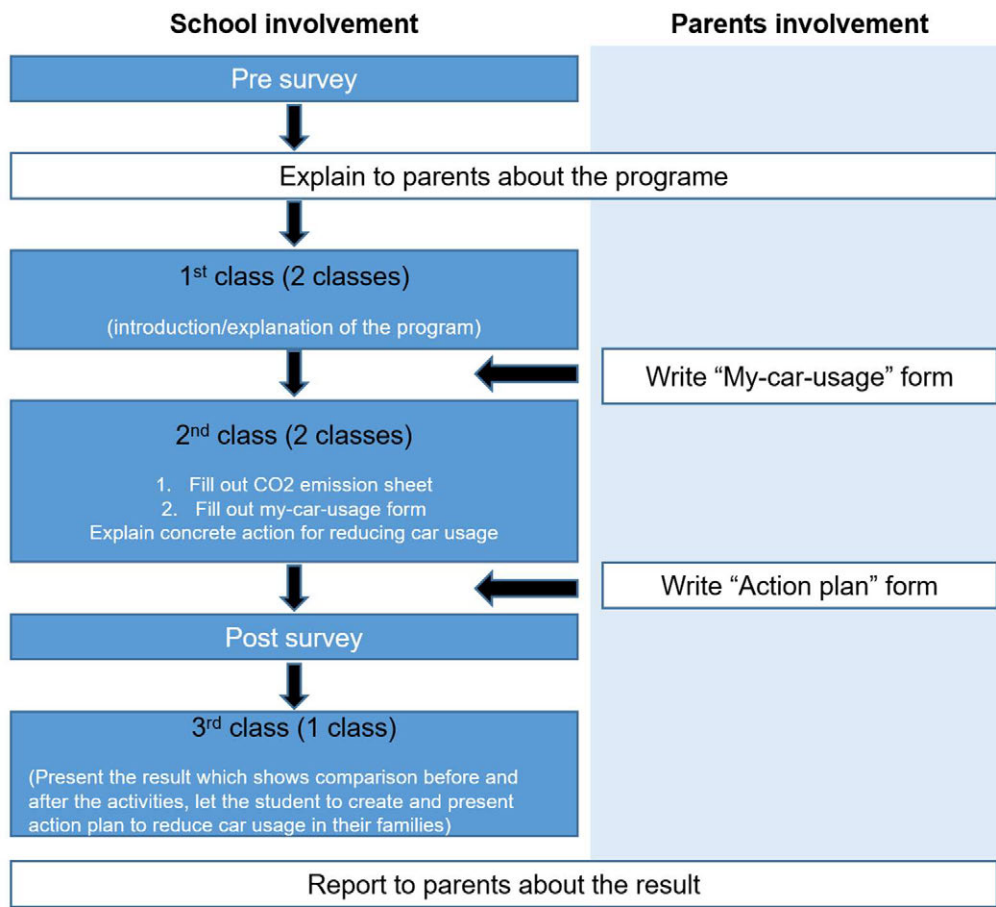
In a curriculum about the excessive use of cars, the aim is for the students to be able to discuss the advantages and disadvantages of using a car, and recognize that family members need to reduce such use. After that, the program encourages the students to think about how their usual behavior can be changed, by explaining how to use public transport and its merits. By intermixing group discussions or presentations with this process, it is possible to develop the communication skills needed to be acquired in everyday classes. Below is a curriculum sample put into practice through two 45-minute classes for fifth grade elementary school students in Hadano City.

1. •Look at the "Sophisticated image of car usage" and freely talk about the merits and demerits of the car, and then talk about car usage and the environment, accidents, and health.

2. •Learn how many cars are used in your city and recognize that you need to reduce the car usage in your home.

3. •Receive an explanation on how to use public transportation and bicycles.

4. •Look at an example of "one day using a car", and then consider "how to change the day" to reduce the use of the car in each group

5. •Present thought and opinion to all.

6. •Summarize (instruct the students to talk about it with their family).

Source   The Foundation for Promoting Personal Mobility and Ecological Transportation

Figure 4-11 Steps for a lecture related to car-oriented-society

When implementing TFP (see 3.4.4) in schools, developing a curriculum should take class hours into consideration. An example of such a curriculum is shown below referring to the Japan Society of Civil Engineers (2005). Several activities are carried out over three classes, ranging from explaining the program and conducting a questionnaire survey, to developing a solution to reduce the use of cars. If possible, it is ideal to verify the effectiveness of the program and encourage parents' involvement, by using Before and After questionnaires. For details of the tools shown in Figure 4-12, please refer to "Tools".

School involvement   **Parents involvement**

Pre survey

Explain to parents about the programe

1st class (2 classes)

(introduction/explanation of the program)

Write "My-car-usage" form

2nd class (2 classes)

1. Fill out CO2 emission sheet
2. Fill out my-car-usage form
Explain concrete action for reducing car usage

Write "Action plan" form

Post survey

3rd class (1 class)

(Present the result which shows comparison before and after the activities, let the student to create and present action plan to reduce car usage in their families)

Report to parents about the result

Source   JSCE(2005)

Figure 4-12   Curriculum example for TFP in MM School

4.3.4 Examples of themes in MM School

There are various themes related to transport covered by MM School. This handbook will introduce some major themes with reference to "Recommendations for Mobility Management Education" by the Transportation Ecology and Mobility Foundation.

- **Local public transport**

  Students learn about local public transport such as how it is operated, how it is used, and current issues. They also learn that issues like low ridership or financial difficulties for public transport can lead to a decline in service in a vicious cycle. Sendai City made a 15-minute video[2], titled the "Story Behind the Construction of Sendai Subway Namboku Line," and provided this to elementary schools as educational material to introduce the process of the construction of the subway.

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[2] Sendai Mediatheque Archive (https://www.smt.jp/library/teaching/archives/d14040.html)

- **Society dependent on cars**

  Students learn about impacts to individuals from the excessive use of cars and motorbikes, such as on health and the occurrence of collisions, along with social impacts such as congestion, air pollution, and greenhouse gas emissions.

- **Transit-oriented community development**

  Students understand the role of transportation in their communities, and learn how to make them more livable and attractive by improving the transport system. They also, learn about the current state of transportation that supports the mobility of people and goods, which bring about a bustling community. Furthermore, students are made to think about current transport challenges and ideal scenarios. As the approach aims to teach about the transport system in communities, and not limited to individual transport, it is necessary to devise explanations that can be related to students' behavior in daily life.

4.3.5 Implementation method

- **Conducting classes**

  Guest lecturers or teachers give a class with group work and discussions on various themes related to transportation, making a small modification from normal classes. The burden of coordination and preparation can be reduced by applying the existing curriculum, which leads to continuous activities.

Source   Sapporo City (2014)

Figure 4-13 MM School in the class

- **Public transport ride**

Lectures are first given about the roles of local public transport in the same way as a normal class. A group of students then goes to ride the local public transport such as trains and buses. It will help if a video about how to ride public transport is shown before the activity. It is especially suitable for lower elementary students who have never taken public transport without their parents.
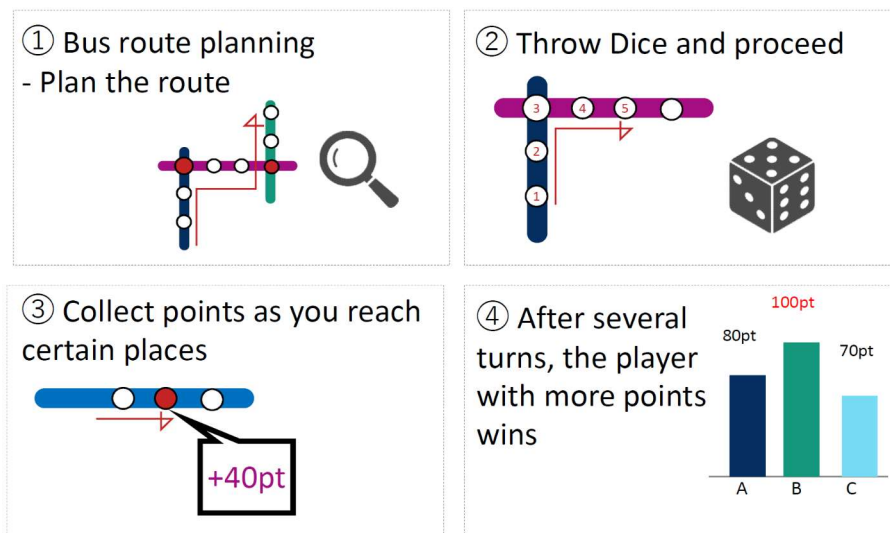

Source   JICA, DOT(2018)

Figure 4-14 Bus ride lecture in Bình Duong

- **Transport-related games**

A well-known game about transportation is called "Sugoroku game," which uses the route map of local trains and buses to teach the different roles of public transport and cars, and the problems associated with them (details are in "Tools"). In addition, as part of the MM program for developing countries, a simple version of the Sugoroku game has been proposed to develop the understanding on local public transport.

Source   JICA, CBA(2020)

Figure 4-15 Step of route planning board game

Source   JICA, DOT(2018)

Figure 4-16 Sugoroku game activity in elementary school in Bình Duong, Vietnam

- **Visiting transport operators**

One way to get more familiar with public transport is to visit the local transport operators. Students learn about supporting the use of public transport by taking a tour to see vehicle maintenance at depots, as well as operations at the control center. It is also recommended to include a public transport ride.
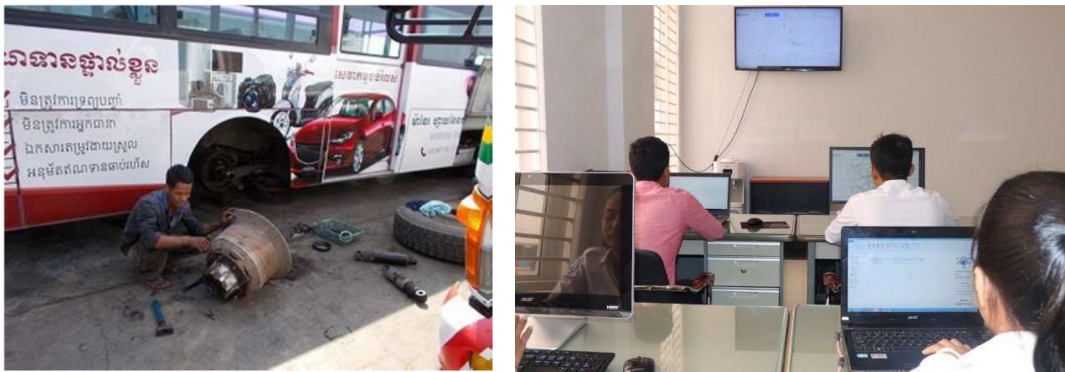
Source   JICA, CBA(2020)

Figure 4-17 Maintenance at depot (left) and operation at control center (right)

- **Seminar/workshop**

When targeting high school or university students, seminar style dissemination with more advanced contents such as social impact can be conducted, given the larger audience. In Vientiane City, Laos, lectures were given about the safety benefit of using buses at traffic safety seminars conducted by the police and schools.

Source JICA et al (2020)

Figure 4-18 Traffic Safety seminar in Vientiane, Laos

4.4 MM Public Transport Lines

Mobility management for public transport lines (MM Public Transport Lines) is intended for various people who may use these lines. It is important to encourage people who are already using the route to use it more, but it is even more important to reach those who are not using it. Immediately after new trains or buses start operation, people along the transport lines may not have the habit yet of using public transport and do not have trip information, so public transport use tends to remain low. Thus, it is important to carry out MM preparation and implementation before the opening. In addition, there could be instances where many residents along the lines do not know how to use public transport, even if it has been a while since the new service started operating. There are various reasons why people may not use it, but identifying the precise reason is important to take an effective approach. In this section, we will explain about the targets, the implementing entities, and the points to keep in mind. Please refer to Chapter 3, MM Residents (4.1), MM Workplace (4.2), and MM School (4.3) for implementation details.

4.4.1 Targets

MM Public Transport Lines is carried out at places where many people gather such as hospitals, shopping and residential areas, workplaces, and schools along the lines, with the aim to change travel behavior for various types of trip purposes such as commuting to work, commuting to school, and shopping. To carry out effective MM, those who can change travel modes easily should be targeted by considering their accessibility to the public transport stations/stops. Since the target area can be large in the case of public transport promotion as Park & Ride, conducting a simple survey and approaching people who are likely to change their behavior will lead to efficient activities. In addition to accessibility, the target should include highly populated areas with low ridership of public transport, or areas with low ridership of public transport whose service level is high.

4.4.2 Implementing organization

With the purpose to promote the use of specific public transport, the role of transport operators is more significant in this type of MM compared to their roles in the other types.

However, people may resist promotion that directly benefits the transport operators. Therefore, MM should be implemented under the initiative of the local government involved in the maintenance and operation of public transport, with transport operators cooperating by providing operational information and usage data. Consequently, the role of the transport operators is significant in examining effective MM messages as they are in frequent contact with users, and thus understand better the issues and needs that the users might have.

In Obihiro City, the local government had started operating demand buses on a trial basis, in cooperation with bus operators and taxi operators, to revitalize the bus operation that had been declining due to the increase in car usage and the shrinking population. It included a one-time TFP for promoting bus usage, whose result inspired the bus operator to embark on business activities such as door-to-door visits and creating a bus map, leading to an increase in bus users for the first time in 40 years.
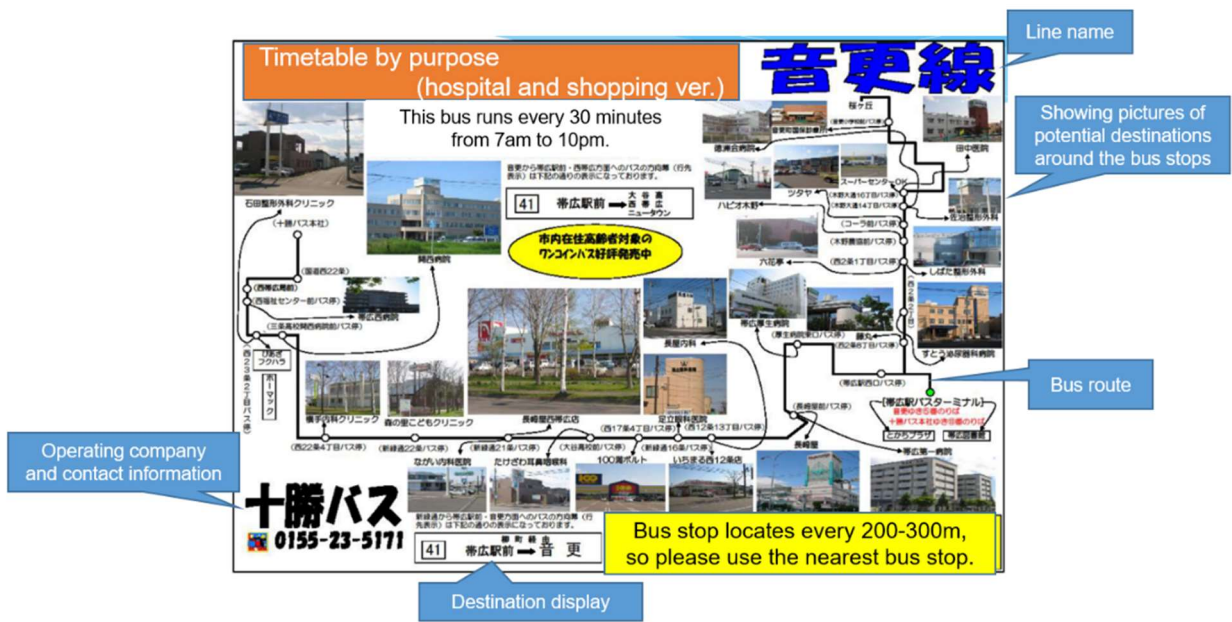
Source   Nomura(2013)

Figure 4-19 Purposed-based bus map (hospital/shopping ver.)

4.4.3 Implementation timing

MM can be implemented by itself, but it is important to choose the timing linked with other traffic measures for more effective results. Specific infrastructure development and operation improvement measures are shown in Section 2.3. The perfect time to implement MM aiming to increase the number of users is during the development of new public transport, the addition and reorganization of routes, and the revision of services and tariffs.

Under the name "WE_Sendai," Sendai City conducted a large-scale activity to promote the use of the Tozai Line subway, which opened in 2015. In addition to PR on social media such as Facebook and YouTube, external content creators and designers were hired to renew the image of public transport, and various events and workshops were held before the opening of the subway to enhance the momentum.

Figure 4-20 Public Relation for new subway line in Sendai City

4.4.4　MM activities at each stage of the transport project

When a public transport route is newly developed, a feasibility study (F/S) is usually performed to create an operation plan (operation planning stage); the design, procurement, construction, commissioning, etc. are carried out (implementation stage); and finally, the actual operation and maintenance of the public transport is executed (operation stage). By implementing various MM activities at each stage, more people will be encouraged to use public transport, and heavy reliance of cars can be effectively suppressed. Table 4-2 shows examples of MM activities at each stage of a transport project.

Table 4-2 MM activity examples at each stage of a transport project

	Project planning stage	Implementation stage	Operation stage
Project on specific transport system	Feasibility survey Loan evaluation and Contract conclusion by a loan institution	Design Procurement Construction Trial run	Operation and Maintenance
Examples of MM activities	Preparation for implementation of MM • Interview survey for effective MM policy/implementation system planning/recommendation • Planning/recommendations for MM measures • Planning/ recommendations for MM implementation system (implementing body, financial resources, schedule) • Promote understanding of stakeholders regarding MM (seminar, workshop, etc.) Examination of Public transport service improvement • Examine policies for facilities and systems that enhance the appeal of public transport as a whole (consider introduction of IC card, charge system, transfer facilities, MaaS, etc.) Examination of MM measures as measures against traffic congestion during construction period • Guidance to detour • Promotion of staggered commuting hours MM in school education • Educate students capable of public-friendly travel behavior in areas where public transport will be developed in the future	Preparation for implementation of MM • Make MM action plan for the operation stage • Detailed examination and construction for MM implementation system (implementing body, financial resources, schedule) • Promote understanding of stakeholders regarding MM (seminar, workshop, etc.) • Implementation of household or workplace MM as a pilot project Examination of Public transport service improvement • Design facilities and systems that enhance the appeal of public transport as a whole (prepare for introduction of IC card, charge system, transfer facilities, MaaS, etc.) Examination of MM measures as measures against traffic congestion during construction period • Guidance to detour • Promotion of staggered hours • MM by school education MM in school education • Educate students capable of public-friendly travel behavior in areas where public transport will be developed in the future Formulation and implementation of public relations strategy • Flyers, newsletters, posters, brochures, radio, webpage, events, and total design	Preparation for implementation of MM • Large-scale MM implementation along the line at the start of operation (household, school, workplace) • Implementation of MM in collaboration with TDM measures (implementation of public relations in collaboration with TDM measures) • Educate students capable of public-friendly travel behavior in areas where public transportation will be developed in the future Service improvement during operation • Public transport branding (especially for high-income earners) • Make map and timetable, provide information through website, provide DTFS data • Schedule and fare setting considering transfer • Improve transit connection from access/to egress transport, provide MaaS Continuous PR activities • Flyers, newsletters, posters, brochures, radio, webpage, events, and total design

The subway development project in Sendai City previously explained, various public relations activities were carried out at each stage from the preparation stage to the opening of the project in order to build interest in and expectations for the project and to promote the use of the project after its completion, leading to the success of the preopening promotional activities with public participation.

Table 4-3 Staged Promotion for the subway opening

Year	Project Progress	Project Stage	Purpose of Activities
1998〜	・Announcement of routes, station locations and vehicle types	Project preparation stage	・Gaining public recognition for the project
2003.1〜	・Government subsidy project adopted ・Railway Business License Application		・Stimulating the interest of citizens ・Deepen citizens' understanding of the project
2003.9〜	・Railway Business License accepted	Project initiation stage	・Deepening citizens' understanding of the project ・Fostering interest in community development along the subway line
2004.4〜	・Construction work permitted ・Defined in Urban Planning ・Environmental Impact Assessment published	Preparation Stage for the start of construction	・Building expectations for the project
2006.4〜	・Underground construction	Underground construction stage	・Building expectations for the project ・Fostering a sense of security about the construction process
2012.6〜	・Station and vehicle design decided	Preparation Stage for the opening	・Building expectations for the opening
2013.4〜	・Subway utilization plan developed ・Station name finalized		
2014.4〜	・WE Project ・Bringing in vehicles ・Opening schedule decided		
2015.4〜	・Station Building Tour ・Test-ride event ・Opening Ceremony		

CHAPTER 5   How to begin Mobility Management

5.1   Begin with a trial

Starting with anything feasible, and gaining experience and knowledge from it, is an effective strategy for MM to be more sustainable. During the course of the trial, more people could become interested and join future activities. Nevertheless, proving and showing the effects are still important, which can be made through data acquisition in the pilot project. In this section, we provide tips and approaches for implementation and feedback with various examples.

Column: Persuading stakeholders for the trial

There may be times when you want to implement MM, but it may be difficult to gain interest and understanding within your organization alone. In such cases, it can be useful to get advice and cooperation from outsiders. Enoshima Electric Railway, which operates a railway in the Kamakura area, well-known tourist destination, consulted a consultant to solve the problem of congestion and the flow of people in the station. This led to MM project which applied information provision to influent people's movement. The consultant analyzed data to persuade decision-makers of the effectiveness of the project, which also helped to expand the project. Getting cooperation from foreign specialists such as JICA is also effective approach to persuade the decision makers.

5.1.1   Small-scale pilot projects

Implementation in your workplace

MM Workplace done by local governments in Japan often targets government employees for the pilot project. Such project can be carried out within the organization and can be considered a model for other institutions to follow MM activities. In Toyohashi City, City Hall itself carried out eco-commuting activities as a model project, and it succeeded in getting the participation of companies and groups by informing them of the project benefits. Another approach to MM Workplace is giving incentives that utilize commuting allowance or an award system. In the case of public transport being run by the local government itself, encouraging the employees to use the incentive can help stabilize ridership.
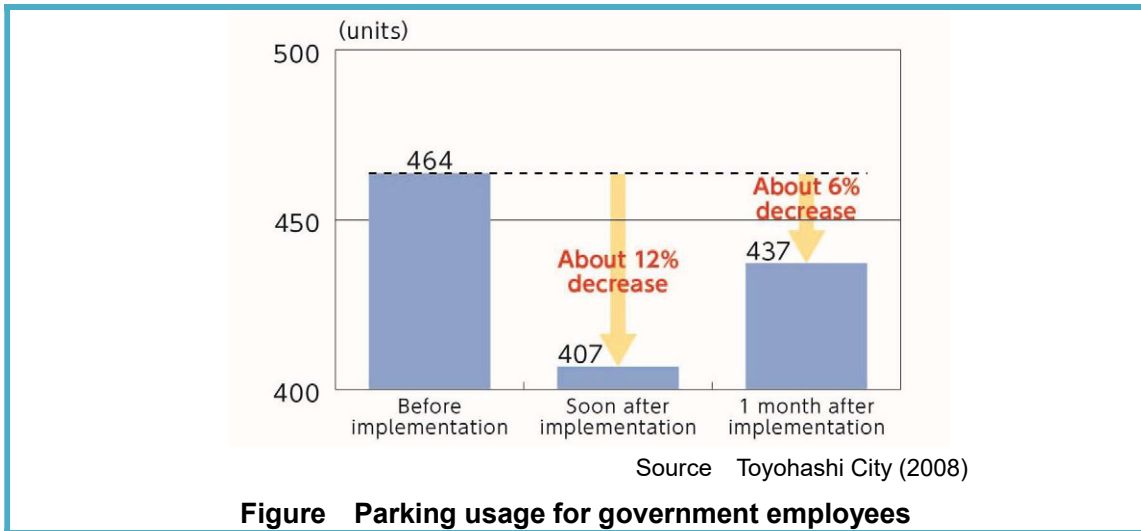

Source Toyohashi City (2008)

Figure Parking usage for government employees

Low-budget, short-term one-shot TFP implementation

A one-time Travel Feedback Program (TFP), the simplest form of TFP, can be implemented with a small budget over a short period of time, providing only motivational brochures, public transport maps, and questionnaires. Aside from these advantages, its effects have been proven, and thus a one-time TFP is recommended when the budget is limited or during trial implementation.

Making a well-customized map

Even with a limited budget, it is possible to customize existing maps tailored to each distribution target in a workshop involving local residents. These activities could provide opportunities for the person-in-charge to directly learn about local transportation issues along with the residents' perceptions, contributing to the capacity development of the practitioner and the preparation for future activities. Kawanishi City invited local residents to a workshop to create an easy-to-use map, and distributed copies to all the households. According to a questionnaire survey on 10 participants before and after the workshop, the vehicle usage time decreased (i.e., the average vehicle usage time over 3 days decreased by 71%).
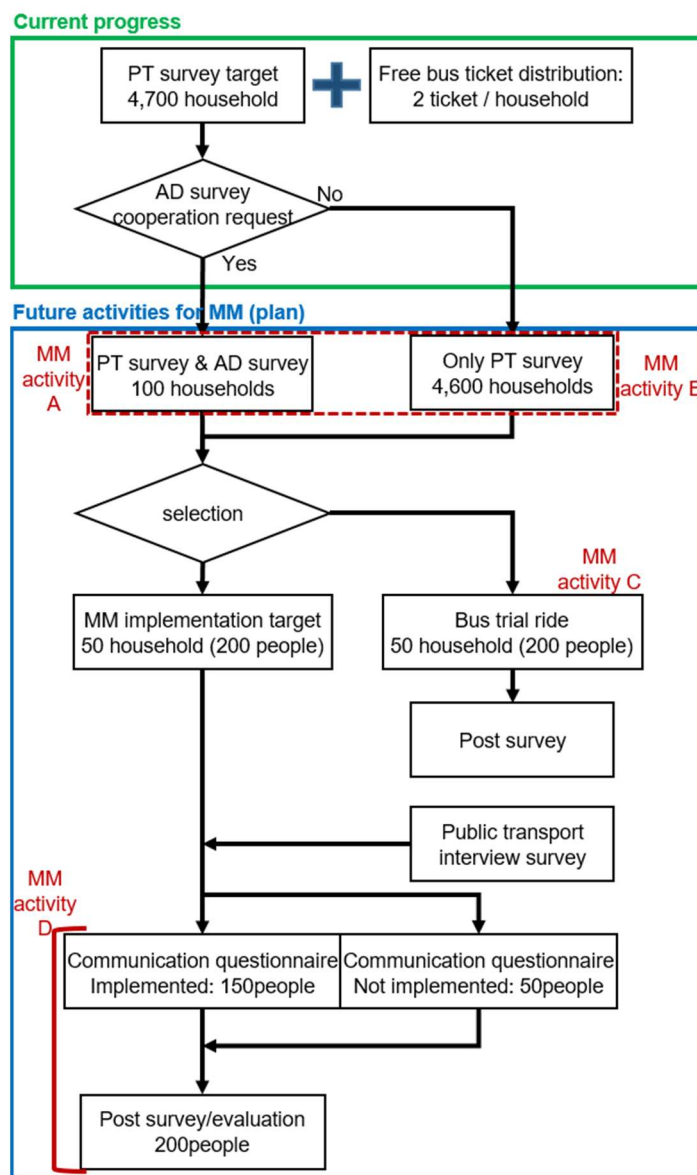

Source Kawanishi City (2005)

Figure Workshop in Kawanishi City

5.1.2 MM activities combined with existing projects

Implementation in conjunction with other questionnaire surveys

If there is a questionnaire survey being conducted by the local government, it is possible to obtain MM information by including some questions in the existing survey, reducing the MM cost. In Fukui Prefecture, a preliminary survey of TFP was carried out in a trip survey conducted by the central government. A motivational brochure and public transport map were sent to those who were identified in the survey. By combining the MM activity with the existing project, it succeeded in implementing large-scale MM with a limited budget. A similar project has been planned in Vientiane, Laos.

Current progress

| PT survey target 4,700 household | **+** | Free bus ticket distribution: 2 ticket / household |

AD survey cooperation request — No / Yes

Future activities for MM (plan)

MM activity A — PT survey & AD survey 100 households

Only PT survey 4,600 households — MM activity B

selection

MM implementation target 50 household (200 people)

Bus trial ride 50 household (200 people) — MM activity C

Post survey

Public transport interview survey

MM activity D

| Communication questionnaire Implemented: 150people | Communication questionnaire Not implemented: 50people |

Post survey/evaluation 200people

Source JICA et al. (2020)

Figure MM implementation flow combined with trip survey in Vientiane

MM activities carried out during transportation-related events

Providing information and conducting a questionnaire survey during transportation-related events, such as car-free day, can easily attract people's attention. This can also promote the change of travel behavior, bringing a synergistic effect of the event. An ASEAN example is the car-free day event initiated in Indonesia, which has been carrying it out since 2002, and aims for various cities in the region to follow and carry out similar events by sharing the event information online. Since MM also aims to reduce excessive dependence on cars and motorbikes, the cooperation for such events can be very effective.

Source   ASEAN (2017)

Figure   Car-free day in Phuket

MM activities in school classes

When conducting MM in schools, the workload of teachers who will carry out MM activities for curriculum development should be minimized by relating transport issues with existing subjects such as social studies. In Sapporo City, a MM message was delivered to first grade students in the class about ethics, where the expression of gratitude for bus operators is encouraged. Whereas, a MM message was delivered to sixth grade students in the social studies class when discussing tax expenditure, which covers money spent on public transport.

Source   Sapporo City (2014)

Figure   MM School in Sapporo City (for first grade students in elementary school)

5.1.3 Effective timely implementation

MM activities during high school enrollment

In lifestyle-changing events, such as school enrollment, new employment, or moving to a new home, the effect of MM is more likely to be pronounced because it is at the stage right before new travel behavior is formed. In Ibaraki Prefecture, a leaflet promoting public transport to both students and their parents was distributed to new students who enrolled in high school. As a result, higher public transport usage was reported between the first grade students who received the leaflet (41.8%) and the second grade students who did not receive it (31.6%), proving the effect of MM with timely implementation.
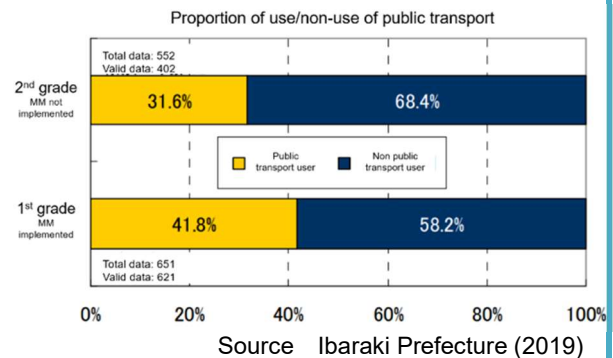
Figure   MM leaflet and implementation effect in Ibaraki prefectural high school

MM activities in line with service improvements of public transport

The timing of public transport infrastructure development and service improvement is an opportunity for people who have not used public transport until then to consider using it, and thus MM activities in line with such projects can create a synergistic effect. In Binh Duong, Vietnam, various MM activities – such as workshops and events in workplaces and schools – were carried out to create bus maps in line with other transport projects, such as improvement of bus facilities and operation plans, and introduction of IC cards. This resulted in an increase in the frequency of bus usage. It should be noted, as this example indicates, a certain service level of public transport is desirable for MM.
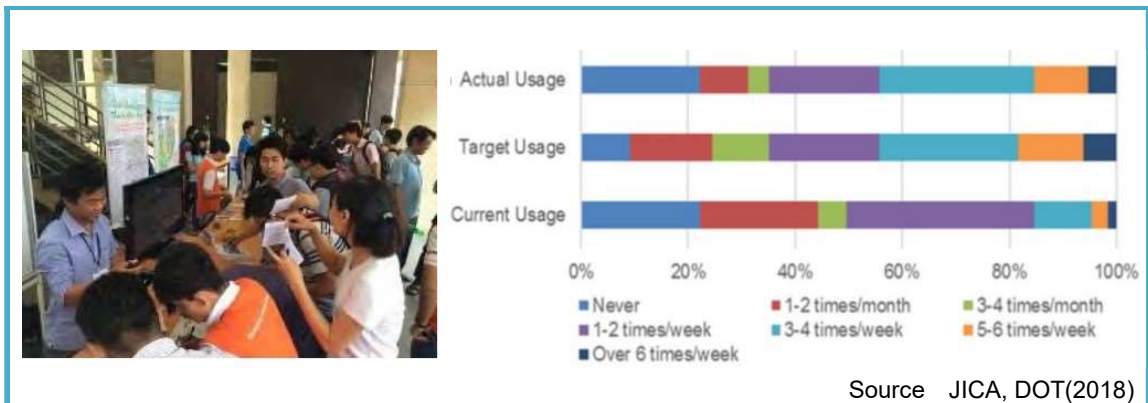
Source   JICA, DOT(2018)

Figure   MM event at university in Binh Duong

MM activities combined with existing seminars

If there are seminars and other events being held regularly, it is possible to allocate some time for public transport information. In Vientiane, Laos, the local bus authority accompanied by the police authority gave a traffic safety seminar in schools and communities, explaining that using public transport could lead to the reduction of traffic accident risk. Since the MM message was well associated with the contents of the seminar, the police became interested in the collaboration and requested the bus authority to join their seminars several times, which enabled the efficient provision of information to a large number of people.


Source   JICA et al. (2020)

Figure   Traffic safety seminar in Vientiane

5.1.4 Involving supporters

Cooperation with public transport operators' PR activities

Public transport operators with independent administration may have a budget for public relations (PR) and marketing. Involvement of such operators in MM activities by the local government could lead to more people changing their travel behavior. In Obihiro City, MM activities by the local government to revitalize the bus service, whose passengers had been decreasing, inspired the bus operators who carried out MM by home visit to create purpose-oriented bus maps for dissemination. The effort led to an increase in the number of passengers for the first time in 40 years.
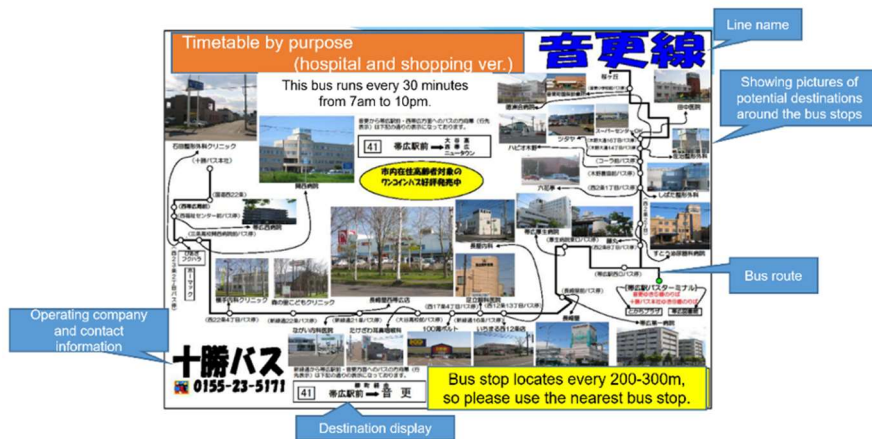

Source   Nomura(2013)

Figure   Purpose-based bus map created by public transport operator

MM activities as a family event

It is also key for MM's success to involve socially active persons concerned with issues relating to infrastructure that supports the environment and daily life, and to take an action. Such a person can influence others to follow, expanding the target base for MM activities. Kyoto Prefecture encouraged families to take the bus by offering free weekend rides to two children in elementary school accompanied by an adult. This campaign provided an opportunity for parents and children to think about the environment and public transport (buses).
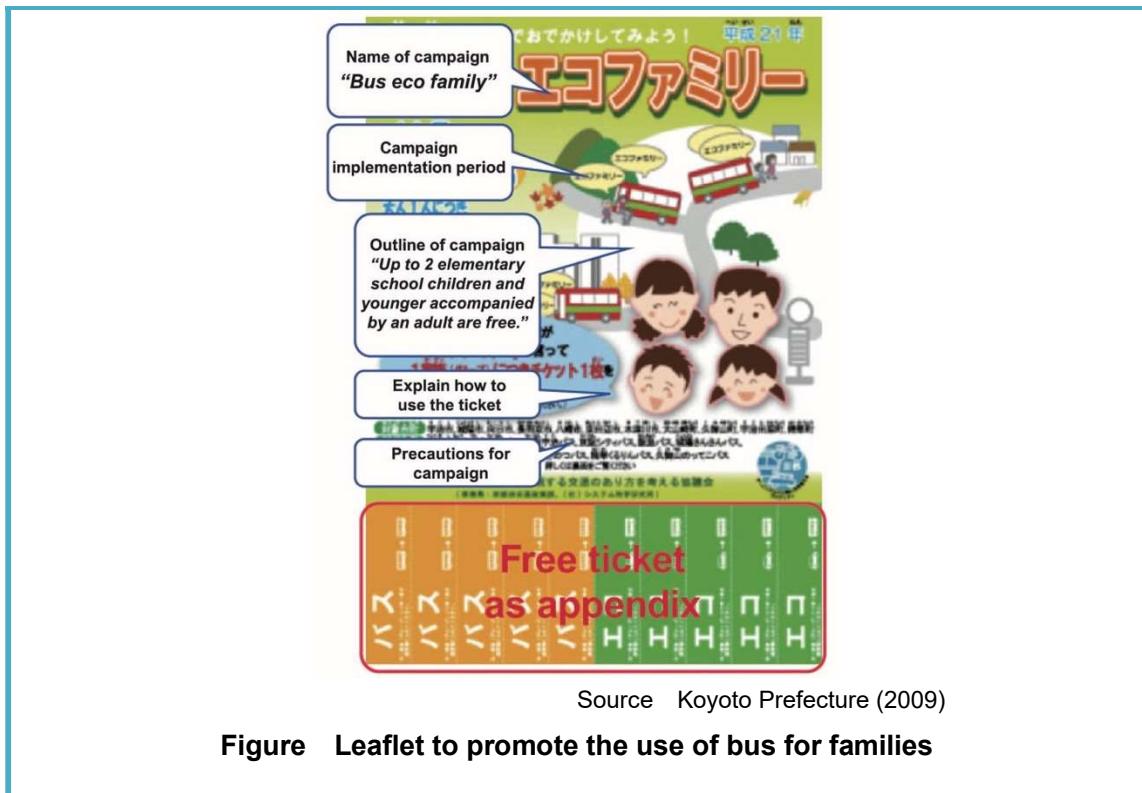
Source   Koyoto Prefecture (2009)

Figure   Leaflet to promote the use of bus for families

5.1.5   Call for ideas

Hackathon app development

In recent years, an event called a hackathon has spread in various countries for people to compete in developing software using open data. In Tokyo, a hackathon for developing apps takes place every year where various public transport operators provide the data to be used by the participants. An example of a winning app is one that displays 3D animation of the subway operation in Tokyo. In developing countries, standardization of data formats – such as GTFS (General Transit Feed Specification, formerly Google Transit Feed Specification) – and readily available data such as OpenStreetMap is also common, which promotes the development of MM application by encouraging the use of public transportation, Thus, it is important for public transport information to be provided in a standardized format such as GTFS.

Source   Asociation for Open Data of Public Transportation (2019)

Figure   App for subway operational information by 3D animation

Educational video contest

Another suggestion is to initiate an educational video contest, which seems to be relatively easier to participate in compared to software app development. In Kampala, Uganda, a contest was held to create an animated video to raise the residents' awareness about road safety. A number of unique videos were submitted reflecting local traffic behavior and environment, and the prize was given by the Uganda Municipal Transportation Bureau to the first and second place winners. These videos are available on the YouTube channel of the Transportation Bureau:

1st place:https://www.youtube.com/watch?v=GEdtsFDFIHI
2nd place:https://www.youtube.com/watch?v=Lzrifeo7Yr4

In Manila, Philippines, a painting contest was held for students as an initiative to familiarize them with the public transport concept and scheme.

Source   JICA (2018)

Figure   Awards ceremony of the video contest

5.2   How to expand MM activities

After a trial or small-scale MM implementation is realized, expansion is the next logical step of the MM concept. By broadening the range and scale of MM activities gradually, rather than ending them after a one-time implementation, one tends to get more support for advocating MM that leads to more voluntary action or change of behavior. In this section, we will discuss significant considerations for the expansion of MM activities, such as feedback that is important to motive targets and relevant partners, presentations to policymakers, financial constraints, and organization formation.

5.2.1   Importance of feedback

The most important thing that leads to the continuity of MM is the provision of careful feedback from the targets to relevant partners. As explained in Section 3.5, the result of individual behavioral change should be communicated to people and organizations who engaged in MM, while the project result should be shared to those who participated or cooperated in the activities; This way they will be motivated to continue their support and participation. The driving force for the continuity and expansion of MM activities is to communicate about the effect, by collecting as much data as possible such as public transport ridership data for the number of passengers, questionnaire results, and participants' opinions.

5.2.2   Effective presentation to policy makers

In order to actually implement MM on a large scale, the budget should be obtained through the understanding and decision of policy makers. For first-time MM activity, it is necessary to look into case studies from other countries that are applicable to your community, and explain them carefully to policy makers. This is because what is of most interest, especially to policy makers who will decide on project implementation, is what results to expect. The cost-effectiveness presentation [see Section 3.5.2 (3)] is a useful index that can briefly show what result can be expected from a certain amount of cost. An effective presentation can be made by using examples introduced in this Handbook applicable in your community that is new to the MM concept. In case your community has MM experience, you will be able to give a compelling presentation by including tips and challenges acquired by the participants, which you may get from the person in charge of MM implementation. There is a summarized version of this Handbook called "Mobility Management Handbook for Stakeholders" intended for a wider audience, such as policy makers and relevant organizations, to enable understanding of MM easily. Please use it when you present explanations to policy makers.
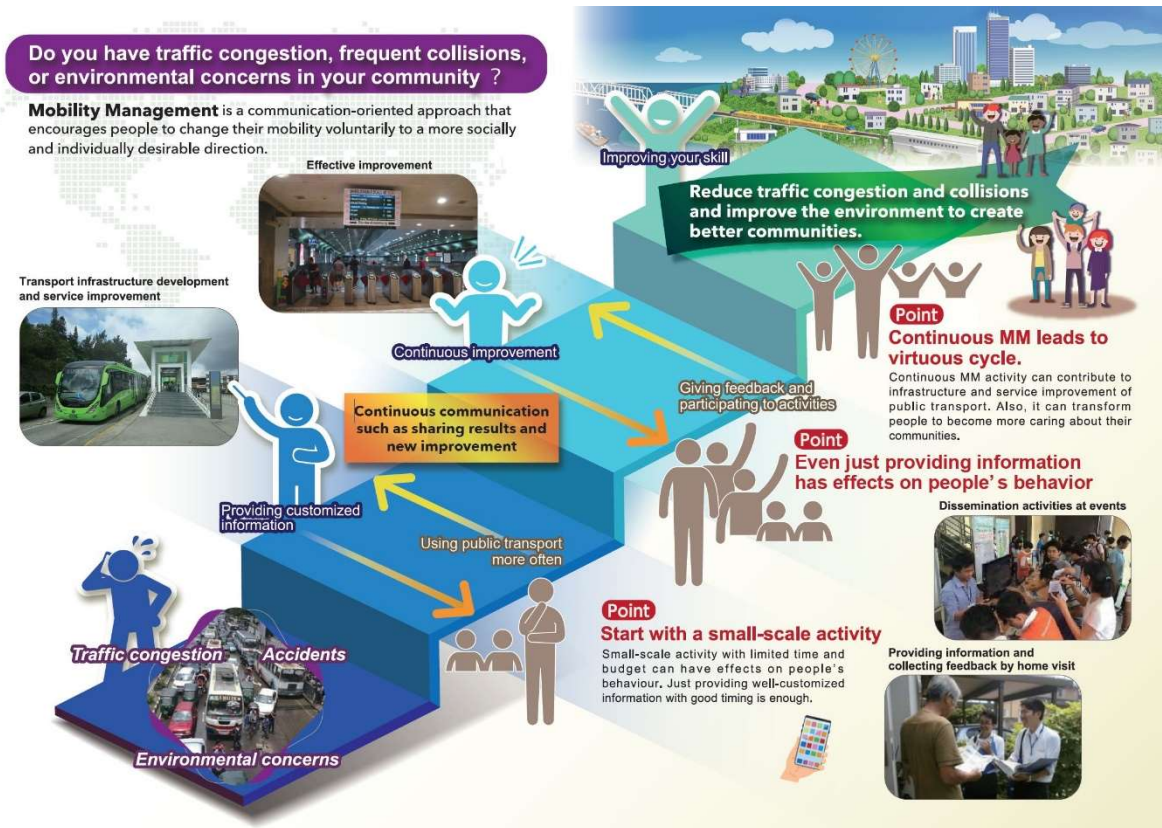
Figure 5-1 Mobility Management Handbook for Stakeholders 1ˢᵗ page

Column: Cost for MM activities

Sendai City spent about USD 28,500 to create and print a "motivational brochure" and "bus map" (23 thousand copies for each), while Toyama City spent about USD 14,300 mainly for commission fees and printing for the activities listed below. These cases do not include personnel cost for government officials.

- MM lectures at universities and vocational schools

- Transport map creation and distribution at City Hall

- Free-ride service for elementary school students during the summer holiday

Source   Toyama City(2019)
Figure   MM in Toyama City
(left: lecture, center: transport map, right: flyer of free-ride)
* Exchange Rate: 1 USD = 105 JPY (as of Aug. 2020)

5.2.3   Responding to financial constraints

In countries with no MM experience, it may be difficult to obtain the consent from policy makers, or the budget for implementation may be limited even if their consent is obtained. In order to carry out MM on a scale that can expect results to some extent, it will be necessary to fund the project strategically.

a) Funding from various fields

Although MM is a transport policy, it may also be considered to be a goal for other departments engaged in urban, environmental, and social security policy. To secure financial resources for MM implementation, it may be possible to work with other departments to synchronize projects or activities, so that MM goals will be integrated and achieved through utilization of financial resources from other departments, not just the transport department.

MM School is a good example, where educating children takes desirable actions from society through MM activities, an action that is also desirable to the education department, hence budget and personnel cooperation can come from them. In addition, as the use of public transport results in more walking and less use of cars and motorbikes, the budget

can be secured as a social security allocation that contributes to health promotion and medical cost reduction. MM activities can also be funded as a measure against global warming, as refraining from the use of cars and motorbikes reduces CO_2 emissions.
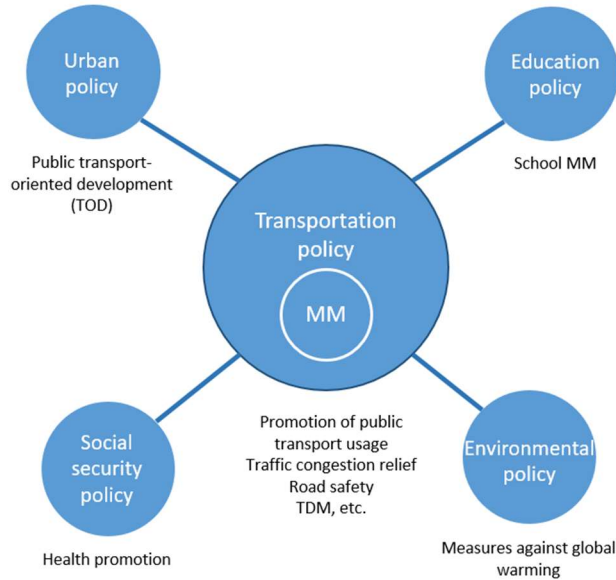

Figure 5-2 Financing opportunites from various feilds

Column: Grant system

In Japan, the central government has a system of providing grant funds to projects by local governments with a specific purpose, such as community development and regional revitalization. Many MM activities have been carried out with this scheme, where the local government clarifies the purpose and effect of the project, and the central government provides support based on the requirements to be met. It is effective in demonstrating the direction of the central government and encouraging local governments to take initiative.

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b) **Aid agencies**

Another approach is to obtain financial and technical cooperation from international organizations and aid agencies such as JICA. One of the missions of developed countries' aid agencies is to achieve the SDGs (Sustainable Development Goals). Specifically, "Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" and "Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable" are related to transport policies. Thus, adopting MM policies in the context of SDGs can increase the chance of getting support. Once a project is approved, it is important to plan and implement it from a long-term perspective, so that it can operate without relying on aid agencies in the future.

JICA has been providing assistance to several developing countries using various approaches so far, for the peace, stability, and development of the entire international community. In bilateral assistance that directly supports economic and social development

in developing countries, in addition to loan aid and grant aid, there is also technical cooperation that includes the dispatch of experts, acceptance of trainees, and provision of equipment. Until now, the scheme of technical cooperation has been used to implement MM or provide technical support for its adoption in various cities in Southeast Asia.

Table 5-1 Example of MM in bilateral assistance scheme by JICA

		Purpose	Transportation project case	Examples of MM
Loan aid		This is targeted at fields that contribute to the achievement of Sustainable Development Goals (SDGs), etc., while lending development funds at low interest rates under long-term and moderate conditions and maintaining ownership of developing countries.	Improvement of transportation infrastructure such as railways and roads	Promote the use of public transports that use improved railways and improved roads
Grant aid		Donate funds that do not require repayment, provide facilities and procure equipment for economic and social development. Since it is grant aid, it will be implemented mainly in countries with low income levels.	Small scale road maintenance and provision of buses, etc.	Promote the use of buses that use the roads that have been developed and the utilization of the buses that have been provided.
Technical cooperation		To promote the problem-solving ability and independence of developing countries, support human resource development, research development, technology dissemination, and institution building necessary for economic and social development in developing countries.	Formulation of master plan, technical support for public transport service improvement, training in Japan on public transport, etc.	At the time of master plan formulation, MM will be implemented as a pilot project and use will be promoted in line with improvements in public transport services

Column: Examples of MM implementation support in Europe

In Europe, the Intelligent Energy-Europe Programme for Energy Efficiency Improvement, funded by the Executive Agency for Small and Medium-sized Enterprises (EASME), carried out MM activities called "PTP-Cycle" across countries to promote the modal shift from cars to bicycles. A survey done one year after the activity showed an increase of 7% for commuting trip by bicycles. Replication of the activity was encouraged by proving its applicability to other cities, trainings, and benefit measurement for policy making. The program covers EU member countries and other European countries including Norway, Iceland, Liechtenstein, Croatia, and North Macedonia.

Source   Paul Curti, Kate Mouncher(2016)

c) **Utilization of universities**

It is possible to utilize research organizations like universities in the implementation of MM, especially when there is no MM achievement yet to speak of. As mentioned in Section 3.5.1, universities played a major role in the early stages of MM in Japan and Europe. In addition to the merits of conducting MM based on the scientific knowledge of researchers, the support of excellent students who seek work experience can be also tapped. MM can be implemented as a trial activity as part of their course curriculum. Furthermore, if consulting services can be provided by universities, it will be even more relevant to plan efficient and effective MM activities in partnership with these universities. In Binh Duong, Vietnam, university students in the city were given MM training to be facilitators, with the aim of future activities being carried out by local resources.

Source   JICA, DOT (2018)

**Figure 5-3 MM trainning to university students in Binh Duong**

d) **Collaboration with transport operators**

There are cases when transport operators are so independent by nature of their business scheme that the local government struggle to intervene. In such a situation, the adoption of MM relies on how close the cooperation can be between the transport operator and the local government. The cooperation can be carried out by the local government funding the project, with the operator providing the ridership data and information for planning and implementation purposes. However, if the transport operator understands the effect of MM, it might also be possible that they fund MM activities. In Japan, where there are many independent transport operators, quite a few MM projects have been carried out by this scheme (see Section 5.1.4).

5.2.4 Implementing organization

For the local government, the departments responsible for urban development and transportation, especially those in charge of transportation policies and planning, usually carry out MM implementation. To conduct an effective project, it is necessary to decide the section in charge of MM, and organize the team in consideration of the communication ability as explained in Section 2.4. Sendai City, with a population of about one million, has 22 personnel handling transport policy and management, mainly for two subway lines and over 500 bus vehicles. Out of those personnel, 13 staff belong to the "Public Transport Promotion Division", whose main task is MM activities. Moreover, the key to the success of MM does not lie only with the local government, but also on the cooperation of the central

government and regional administrative organizations. Furthermore, the establishment of an implementation system (see Figure 5-4) that takes into account the use of transport operators, academic experts, and consultants is also necessary. From the long-term perspective, it is also important to have all the stakeholders within local resources, so that MM activities becomes more sustainable.
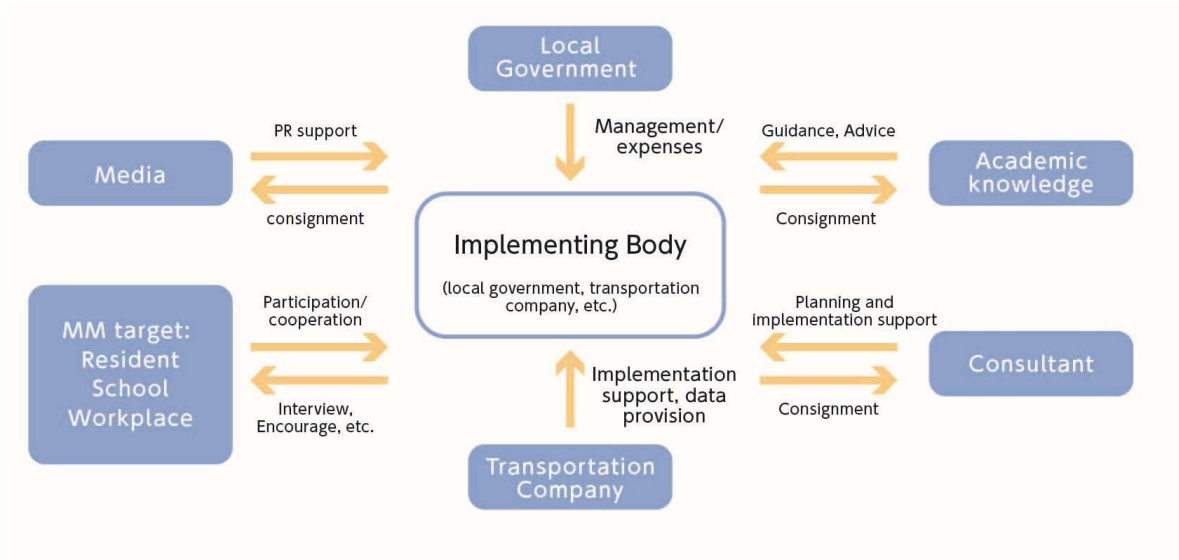
Source   JICA, DOT (2018)

Figure 5-4 Various stakeholders and its roles for MM implementation

In promoting the development of transportation towns in which MM is one of the pillars, Kyoto City reorganized its Transport Policy Office, expanded the operations under its jurisdiction, and established a new organization. In order to determine the direction of the new organization with regards to cross-sectoral efforts, the Promotion Headquarters was set up, in which many departments responsible for education, environment, tourism, etc. are headed by the Deputy Mayor. A subcommittee was set up for each individual project, and regular meetings were held to establish a system ensuring that the "comprehensive transportation strategy" is implemented.
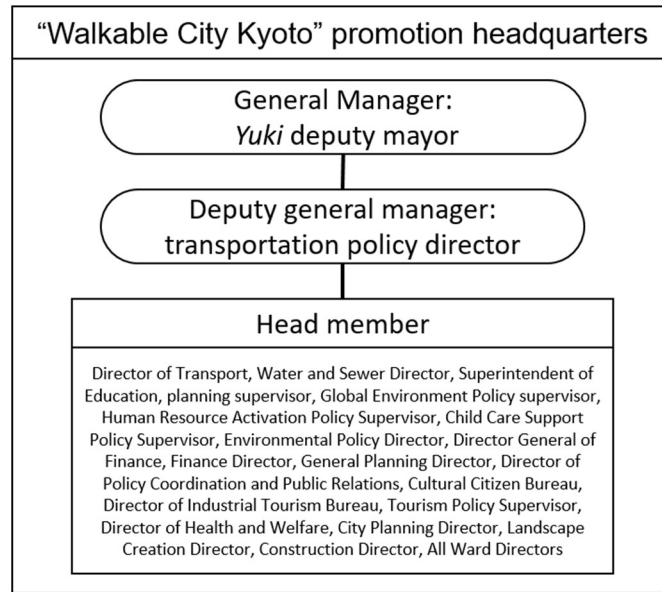
Source　Kyoto City (2010)

Figure 5-5 "Walkable City Kyoto" project task force

5.2.5 What to do when you are unsure?

When you are unsure, you may consult with a JICA local office to be introduced to MM academics and consultants in Japan. If there are local people with MM experience, start by seeking advice and information from them.

CHAPTER 6   To advance Mobility Management in your community

From Chapters 2 to 5, various examples of Mobility Management have been provided together with an explanation about the concept, the methodology, and so on. Again, MM is a communication-oriented measure targeting people, which aims for behavioral change by interactions and communication between various stakeholders: governmental officers or transport operators who carry out activities, academics and consultants who provide technical knowledge, and people who participate. There should be mutual communication. The key is to customize communication carefully for the target, while taking into account the six principles of MM communication as explained in Section 2.4. Next, continue and develop the MM activity by giving feedback and sharing results, instead of doing it only once. A detailed explanation for the methodology is provided in Chapter 3, whereas various examples and tips are given in Chapters 4 and 5. This Handbook emphasizes that it is important to start from what you can do, gain experience and supporters, and continue with the activity.

You may be inadvertently involved or get to participate with minor interest in MM activities, but with the sharing of experiences and lessons learned from the activity, more people would follow you. MM activities led by the local government (Toyama City in 4.1.4 and Obihiro City in 5.1.4), for example, were taken over by local transport operators who further developed the activities. Public participation is also key, as indicated in MM activities by Sendai City (4.4.3) and Kawanishi City (5.1.1), which aimed for its citizens to take an initiative then expand the activities. "Case studies" further provides examples by Kyoto City, Sendai City, and Toyama City, in which MM activities became successful and sustainable by combining activities with other transport-related initiatives.

In order to gain supporters and have continuous activities, it is important for the local government to share a goal or vision with the community. The "Charter" by Kyoto City as well as the "Transport Strategy" by City of Gold Coast are good examples of this strategy, where there is increased motivation and certain incentives for participation, showing that more efficient and effective activities can be carried out by sharing the goal and vision with the public. An ordinance by Niigata City ("Ordinance for the city to be more livable for people to walk, bike, or take public transport") helped to clarify responsibilities between stakeholders, including the government, citizens, employers, and transport operators. Such regulations should reflect the opinions of stakeholders, especially citizens, so that they will gain support from many people, which exactly exemplify MM activities carried out through careful communication. The core concept of MM is that the activities are advanced by collaboration with people who can think and act independently, wishing for the community to be better.

This Handbook aims for MM activities to be carried out in various countries and communities by introducing examples of cases or experience in Japan, Europe, Australia, and Canada. As explained in section 3.4.2 ("Motivational information according to region"), applying the methodology described in this Handbook directly into any place in the world is not a solution. First, there has to be a goal or vision set by local people in which MM activities are defined. Then it is important to lead to a virtuous cycle as shown in Figure 6-1, where MM activities are carried out by local people to address community issues through communication mainly about transport infrastructure supporting people's lives. This

Handbook, consisting of "Case Studies" and "Tools" in addition to MM explanations in the chapters, provides useful information that can be referred to throughout various stages of MM activities.
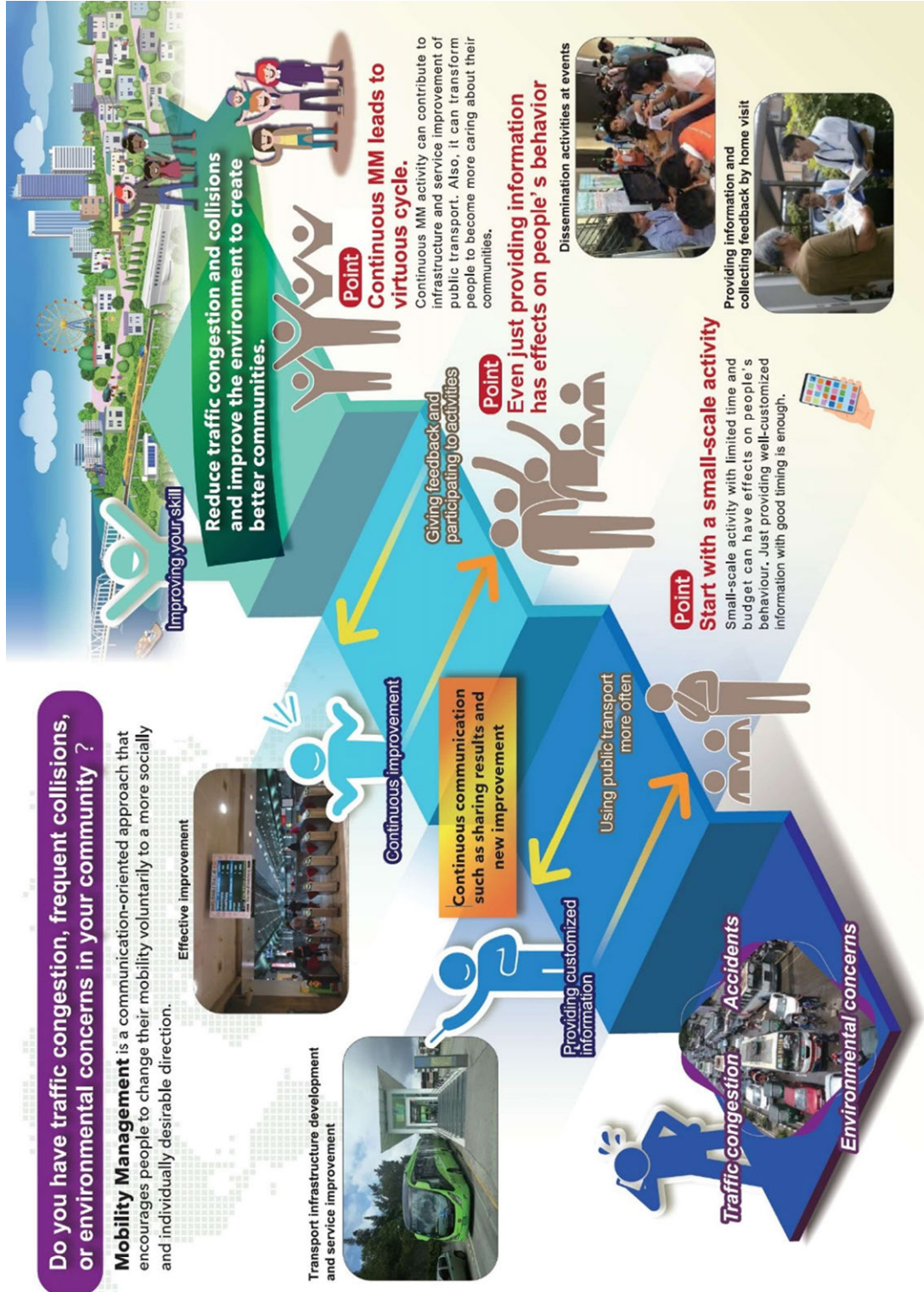

Figure 6-1 Virtuous cycle and goal for Mobility Management