
Thinking about the future of public transportation

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1. Study of BRT

There are many reasons why people do not take the bus as much as transportation policymakers expect, but the following three are probably the main ones: (1) the hassle of walking to (from) the bus stop, (2) the discomfort of waiting for the bus, and (3) the indefinite departure-to-destination arrival time. A countermeasure for reason (1) is to increase the number of bus stops, but the effect is limited because the number of routes is limited. A countermeasure for (2) is to improve the comfort of bus stops. In addition to a roof, shelter from the wind, and benches, it is nice to have video equipment to pass the time, and heating if the bus stop is in a cold region. Yet, it is difficult to find installation places and to perform continuous maintenance. On the other hand, the countermeasure for (3) is simply to operate buses on time. If the waiting time is minimized, it also serves as the countermeasure for (2), so ensuring punctuality is the key to promoting the use of buses. However, this is easier said than done because the presumption is that buses operate while sharing roads with many other types of vehicles.

For this reason, the Urban Planning Department is studying bus rapid transit (BRT) as the research on city development using advanced bus transportation systems (R1 to R5).

BRT is a system that ensures punctuality and speed by providing dedicated bus lanes and roads and by controlling traffic signals synchronized with bus operations. In addition, taking advantage of the exclusiveness and priority given by the system, articulated buses will be introduced to double or triple the transportation capacity per bus, thereby reducing operating costs and alleviating the labor shortage at the same time. Since the system ensures the exclusiveness and priority for the bus, the convenience for vehicle traffic other than buses will naturally decrease. Yet, this can be expected to have the effect of promoting a shift from the use of private cars to bus use.

In Japan, Niigata City, Gifu City, Fukuoka City, and other cities are operating BRT. In October last year, the Tokyo BRT connecting Tokyo's Toranomon Hills and Harumi began preliminary operations. Outside of Japan, Curitiba in Brazil, and Buenos Aires in Argentina are the

areas with advanced use of BRT (Photo 1).



Photo 1: BRT in Curitiba, Brazil

The Urban Planning Department is going to ascertain the actual operating conditions in cities in Japan and abroad that have been using BRT, identify the conditions and factors that enable BRT to achieve its objectives, and prepare a BRT introduction manual for local governments.

2. Study of green slow mobility

Next study to introduce is the study on green slow mobility that provides the so-called last one mile travel, which is being carried out as an elemental subject of the General Technological Development Project, Development of Technology for the Revitalization of Suburban Residential Areas to Accommodate a Mature Society (2018–2022).

Green slow mobility is defined as electric public mobility for four or more passengers on public roads at speeds of 20 km/h or less. While there are no restrictions on the type of vehicle, the most realistic option at this point is to use golf carts. Since it can handle narrow roads and steep slopes, it has the potential of operating in fishing villages with hilly terrain, for example. Also, since passengers can get on and off the vehicle directly from each seat, the vehicle can easily operate while allowing passengers to get on and off at any point along the route (Photo 2).

A noteworthy point is the openness of the vehicle, which allows passengers to talk and wave to passing acquaintances, making it more than just a community transportation vehicle, but a vehicle with the excellent

characteristics that promote communication.

On the other hand, there are issues of generating operating expenses, such as labor cost for drivers, matching personal demands and operation, and balancing convenience and safety. Thus, based on the analysis of the results of the test operation conducted at the Komamusashidai Housing Complex in Hidaka City, Saitama, draft guidelines will be prepared for the introduction, efficient operation, and safety assurance of green slow mobility.



Photo 2: Example of green slow mobility

* Taken in the FY 2018 experimental study support project for the examination of green slow mobility conducted by Ministry of Land Infrastructure and Transport

3. Based on an example of an elderly couple

This is a personal story, but I would like to introduce an incident that happened to an elderly couple in their 80s, who are relatives of mine and have a house on reclaimed land near Tokyo. While the husband was on his way home from a social gathering of his photography class, he fell and lost consciousness about 200 meters midway between the bus stop and his house, and it took two hours for a neighbor to find him. He was immediately transported to a hospital by ambulance, where he was hospitalized for three months, suffering from a neck injury that left him unable to move half of his body. Now, the function of his limbs has largely returned, but his lowered strength has not fully recovered.

The wife, on the other hand, drove herself to gymnastics classes at the community center, ballroom dancing, which is her hobby, and daily shopping. Six months after her husband's accident, she caused a traffic accident: when she started her car, it collided with a car parked across the aisle of the parking lot of a supermarket she frequently visited.

After experiencing the two accidents, family members discussed what to do with the old couple's car. Since buses are operating, they were able to get by without a car. Yet, going out for daily shopping and running errands

would become inconvenient. They considered replacing the car with a three-wheeled electric vehicle, but this would raise concerns about the safety of the drivers. The couple had a strong will to use the car for a while. Thus, the family decided to buy a new car that was just about to be released. Although there are still some concerns, the safety features of modern cars, such as anti-collision devices for objects and pedestrians, have evolved to the point where we can expect a considerable degree of all-round safety assurance in driving. Now, about six months have passed since the couple started using the car, and they love it because it is small and easy to drive.

This case reminded me once again that the QOL of the elderly is significantly reduced when they lose their means of transportation, and that the risks of going out on foot and other means should be considered for the elderly. The elderly are the ones who need personal mobility that provides door-to-door convenience and protection from the outside world. In the future, if public transportation is going to be responsible for the mobility of the elderly, it should be oriented toward the personalization of public transportation that can cover the entire trip for each person.

4. What will happen to public transportation in the future?

Automated driving technology will advance, and fully automated driving with AI will become widespread. The probability of accidents will be greatly reduced by advanced sensing and control technologies that far exceed human capabilities. Cooperative control of vehicle groups and traffic signals will enable efficient operation at high speeds with minimal distance between vehicles, which will greatly reduce road congestion. As the decarbonization of power generation progresses as the use of electric vehicles increases widely, the CO₂ emissions associated with driving will be minimized. This means the arrival of a universal design mobility society in which everyone can safely operate a car.

What should public transportation be like then? In terms of intra-city transportation, it is assumed that cabs will be unmanned, and their fares will be lower. The widespread use of car sharing and the integrated operation of shared cars and cabs will contribute to lower fares. For those who still find it difficult to pay the fare, cab coupons can be distributed electronically as a social minimum. At this point, the route bus would end its role.

It is uncertain if this prediction will come true or not, and even if it does, it is unclear how many years it will

take to realize it. However, mobility that is free in time and space is a universal value, and any plan that goes against it will not succeed in the long run. BRT and green slow mobility also need to be studied with this in mind.