

Guided mass transit system(GMTS) prospects in the Asian region

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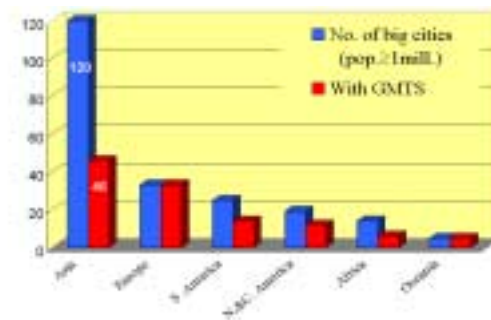
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In this report, the necessity of Urban Mass Transit System in Asia is briefly explained. Topics are; 1. Many large cities without guided mass transit system(GMTS) in the Asian region. 2. Distinguished features of GMTS, 3. A broad variety of characteristics of each system, 4. Necessity of huge amount of investment to introduce GMTS in the urban area.

1 . Overview

In the right chart , the blue column gives the number of large cities whose population is one million or more and the red column gives those with GMTS, in each region of the world; Asia, Europe, South America, North & Central America, Africa and Oceania. From this chart, it is clear that in the Asian region there are many large cities without even an inch of GMTS, resulting in heavy traffic congestion on the road which is causing social problems such as loss of life, loss of time, a lot of energy consumption and emission of harmful substance.

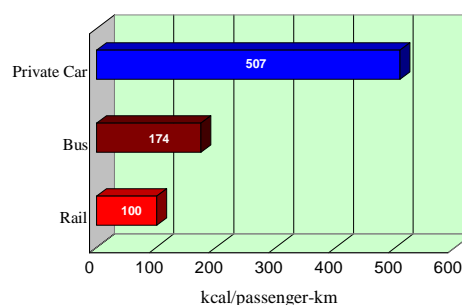


2. Distinguished features of GMTS

GMTS has manifested distinguished features as the means of urban transport: 1. High degree of safety, 2. High transport capacity, 3. High speed, 4. High on-time performance, 5. Less energy consumption, 6. Less air pollution and 7. Efficient land use. As the safety of GMTS (rail) is truly remarkable, it is not necessary to add even a few words on this chart comparing rail, buses and private cars.

	Fatality Rate		Injury Rate	
Rail	0.05	1	0.11	1
Bus	0.82	16	59.72	542.9
Private car	11.7	234	856.86	7,790

unit: persons/bill. passenger-km

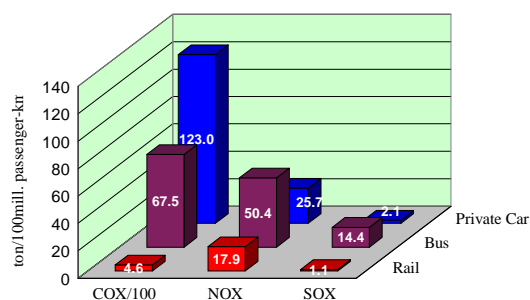


The right chart above shows energy consumption by a private car, a bus and rail which means GMTS. As for energy consumption, that for GMTS is about one-fifths of a private car and 58% of a bus. In the chart in the next page, the left row gives the amount of COX in terms of ton/100mill.passenger-km, and the middle row gives that of NOX and the right row gives that of SOX.

The figures for COX is divided by 100 to display in the same graph.

キーワード Guided mass transport, Urban development, large cities, investment

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The front line is for rail, the middle for a bus and the back line for a private car. Again it is very clear that GMTS is remarkably environmentally friendly, and this character is very important for sustainable development of the urban area.

3. A broad variety of characteristics of each system

There are many kinds of GMTS utilized in the urban area. Each system has its own characteristics in terms of transport capacity, maximum speed, land use and so on. Therefore, to select the most appropriate system in accordance with the needs of the target area is crucially important and a thorough study on the needs not only at present but also in the remote future is required. There are various types of GMTS in the urban area in Japan: (1) Elevated Urban Rail (2) Full Subway (3) Mini-Subway with Linear Motor (4) Medium Speed MAGLEV, (5) Mono-Rail (Straddled) (6) Mono-Rail (Suspended) (7) So-called Downtown People Mover and (8) Light Rail. The maximum speed of each system varies from 130 km/hour to 50 km/hour and the maximum transport capacity at peak time varies from 100,000 to a few thousand per hour.

4. Necessity of huge amount of investment to introduce GMTS in the urban area.

As a conclusion, since a heart of a downtown of a big city is highly developed, a huge amount of investment is required to introduce GMTS in the highly developed urban area. Moreover, the fare of GMTS should be limited within moderate range as a means of public transport which ordinary commuters including students use almost every day. Therefore, the introduction of GMTS should be subsidized at least partly and it has a rational taking the above mentioned distinguished features of the system and the consequent benefit for the society into account. As a matter of course, it is inevitable to execute elaborate economic and financial assessment of the project and it's a paramount duty of civil engineers.

参考文献

- <http://www02.u-page.so-net.ne.jp/tg7/acecc/010417PM%20Record.htm>