

## IV-391

# A STUDY ON INTEGRATION OF NMT WITH PUBLIC TRANSPORTATION

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## 1. Introduction

In those developing cities where new traffic order is going to be implemented or new transportation plans are under discussion, high automobile ownership is often perceived as the embodiment of development, while other forms of transport, including rail, water transport, and NMT (non-motorized transportation), are frequently de-emphasized. Both NMT and public transportation have unique strengths and weaknesses. In combination, They offer a strong potential competitor to private motorized transportation for many types of daily trips.

## 2. Understanding of Public Transportation

The term "public transportation" covers many different types of vehicles, but most commonly it refers to buses and trains. Requiring far less fuel per passenger for each kilometer of travel and reducing emissions dramatically (see Table 1), buses and trains make good records on energy consumption and pollution.

Table 1 United States:  
Pollution Emitted During Work Commutes

(grams per 100 passenger-kilometers)

Transport Mode	HC	CO	NO
Rapid Rail	0.2	1	30
Light Rail	0.2	2	43
Bus	12	189	95
Auto	130	934	128

Public transport saves valuable city space. On the average 3 meters width of way, about 30,000 to 60,000 passengers can be transported per hour by subway and 3,000 to 11,000 passengers by light train. About 3,000 to 6,000 passengers can be transported by bus and only 600 by private automobiles. Public transportation also provides safer traffic environment for both automobiles and pedestrians in city center.

## 3. Understanding of NMT

Providing a low-cost, door-to-door transport mode, NMT emits no pollution, saves energy and requires less space for operating and parking. It is suited for short distant trips. Especially, bicycles take large proportion of NMT. In NMT dependent cities and most mixed traffic cities, like Beijing, China (see Table 2), bicycles are the main traffic means to be used daily for essential travels. In these cities, public transport services are insufficient to meet traffic demands. Bicycles are helping meeting the demands. In long-distance commuting

Table 2 Beijing, China:  
Modal Splits in 1986 (in percentages)

Public mass transit	24.3%
Bicycles	54.0%
Walking	13.7%
Private automobiles	4.3%
Rental automobiles	0.3%
Other modals	3.4%

the bicycle are complementary of public transport. But the present situation is that NMT, especially bicycles are not expected to be mixed in modern motorized transport areas in both developed and developing countries. It is often ruled out of the new urban transportation planning program.

#### 4. Integration of NMT with Public Transportation

##### a. NMT Access to Public Transportation

Integration of NMT with public transport benefits city centers greatly with auto-reduced zones. Bicycles play an important role in getting people to and from express public transport services. This requires safe access to transit stops and stations for cyclists and pedestrians. "Bike-and-Ride" facilities, which encourage commuters to cycle to rail stations instead of drive, are increasingly popular in Japan and Western Europe. In Japan, several different types of parking facilities are used ( see Table 3), the construction costs are various. The Chinese have been establishing bicycle-subway and bicycle-bus exchange hubs. It offers opportunities for increased public transport system efficiency.

Table 3 Japan:  
Bicycle Parking Facilities and Costs

Type of parking	Per unit capacity US\$
Ground-level parking lot	175
Multi-story Garage	260
Underground garage	975
"Rail-rack" storage system	390
"Merry-go-round" storage system	695
Robot crane "cycle-tower" system	1,110
Rent-a-Cycle port	435

##### b. Coexistence in Mixed Traffic

NMT is often ignored as part of transport systems. Therefore, coexistence of NMT with public and private automobiles on the road becomes unsafe if no any measures be taken. Traffic accidents often involve NMT users and pedestrians. Giving NMT the right-of-way has become a theme for city planners. Ring Roads in Tianjin, China give NMT users on the average 6 meters wide path to separate NMT from automobiles. It reduced the traffic accidents between automobiles and NMT in late 1980s(see Table 4).

Table 4 Traffic Accidents, Injuries and Fatalities for Beijing and Tianjin, 1985

(Per 100,000 Population)			
	Beijing	City center	Suburbs
Total accidents		107	75
Injuries		64	47
Fatalities		4	9
Tianjin			
Total accidents		26	105
Injuries		20	61
Fatalities		2	15

#### 5. Conclusion

Integration of NMT with public transportation is urgently needed to be implemented not only in developing countries but also developed countries. It has been proved a efficient commuting way to use in several cities in Japan, some European countries and China. The commuting time is shortened, city's traffic reduced, the city's nature air is remained, and the energy can be conserved. To practice the integration, there still are many problems as well as the points stated above need to be discussed, such as policies and regulations for NMT and reasonable land use planning for integrations of NMT with public transportation.

#### REFERENCE

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