Commuter's Transport in Tokyo

Hirohide KONAMI (Ph.D.)
Professor, Toyo University, Tokyo

1. Introduction and Summary

A study on commuter's transport in Tokyo was carried out in 2000 sponsored by the National Land Agency, Office of the Prime Minister. The study was aimed to estimate the future number of inbound commuters in Tokyo region and to find some good solution to ease the congestions of commuters' train.

As a result, it will be said that the total number of inbound commuters may be stabilized in the beginning of 21st century or decreased by around 10% by the year of 2015. Even though, it is necessary to improve or construct new commuters' railways because the present congestion in peak hours is still unendurable and the number of inbound commuters may still increase based on the data of Mori Building that the total increase of office buildings in down town is still great and many of them are now under construction.

It is proposed that the half of the establishments in down town should change the beginning time of office hours in the morning by 30 minutes behind, and then the peak congestion will be eased by about 12%.

Furthermore, it is recommended to promote the development of home offices, to encourage the companies to construct down town dwelling facilities by means of taxation or governmental subsidies, and to consider the introduction of the new taxation or fare system to cut off the peak of the congestions.

2. The Structure of Tokyo Region

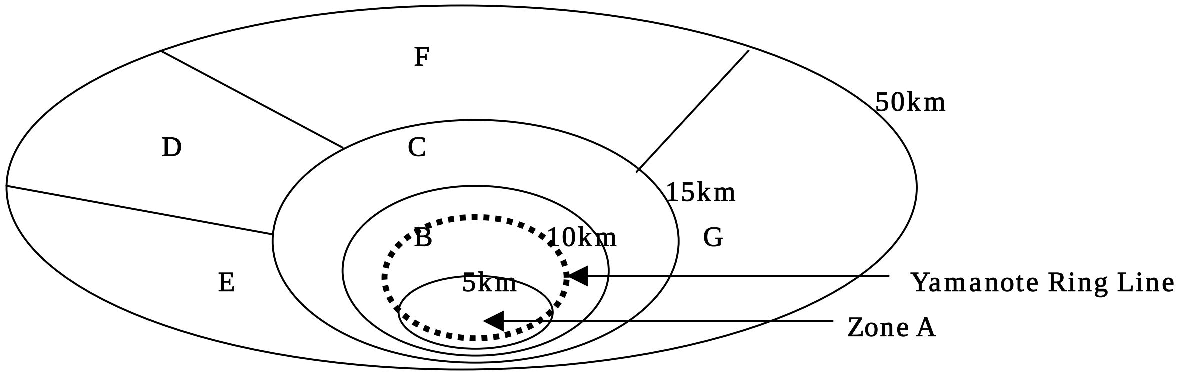
Tokyo Metropolitan Area consists of 4 zonal areas such as 3 special wards in down town, 10 special wards surrounding former 3 wards, 10 outside special wards and 4 suburban areas formed by West Tokyo, Kanagawa Pref., Saitama Pref. and Chiba Pref. as shown in Table 1 and Fig. 1.

Table 1　Structure of Tokyo Region

Area	Population	Area	Population
A: Down Town 3 wards	244	E: Kanagawa Pref.	8,246
B: Mid. 10 wards	2,366	F: Saitama Pref.	6,759
C: Out side 10 wards	5,357	G: Chiba Pref.	5,798
D: West Tokyo	3,806	Total	32,577

(In thousand in 1995)

Fig. 1　Structure of Tokyo Region



The number of job opportunities and seats of students equal or over 15 years old within down town 3 wards (zone A) and mid 10 wards (zone B) is 5,610 thousand while the population of the area is 2,610 thousand and the number of workers and students equal or over 15 years old is only 1,660 thousand. This implies that the number of commuters inbound to the zone A and B is about 4 million which derived by the gap between 5,610 and 1,660.

The transport modes of these inbound commuters are mainly railways, 92% to zone A and 88% to zone B. Arrival time of these commuters is concentrated from 8:30 to 9:00 in the morning by 27% or about 1 million.

The number of railway lines at the border of Yamanote Ring Line, which connects down town 3 wards and mid 10 wards as a ring, is 40 in2000. They are shown in Table 2. The most congested lines are Tokaido Line (No.1 in Table 2), Chuo Rapid Line (No.14), Keihin-Touhoku Line North (No. 25), Joban Line (No. 31), Sobu Line East (No. 33), and Tozai Line East (No. 38). The peak hour congestion rate, which shows the index based on the legal capacity as 100, of those lines are over 200 in 1999. This means that it is impossible to keep one's own standing position because of the side pressure caused by the acceleration and braking. The legal capacity is different by the size of a carrier. The most popular carrier is 2.83 meters wide and 20 meters long which has the capacity of 60 seats and 80 standings. One train usually consists of 6 to 15 carriers. Average would be around 10.

The population of zone A was 289 thousand in 1990 and 273 thousand in 2000. That of zone B was 2,740 thousand in 1990 and 2,594 thousand in 2000 while the total population of Tokyo region was 31,269 thousand in 1990 and 32,876 thousand in 2000. This shows the population migration from center to suburbs implying the increase of the number of commuters.

3 The Change of Inbound Commuters

The number of inbound commuters to zone A, based on the national population census, shows the slight increase between 1985 and 1995. The total inbound commuters including students was 2,150 thousand in 1985 and 2,203 thousand in 1995. Those to zone A plus B was 3,490 thousand in 1985 and 4,048 thousand in 1995. Therefore, it is clear that the number of job opportunities and the seats of students are increasing more rapidly in zone B than in zone A. But, the both of those are showing the decreasing tendency in recent years by the economy recess.

According to the long-term estimation, the number of commuters to zone A and B may decrease by 4 ~ 16% by the year of 2015. If the economy growth recovers the rate of before 1995, then the decreasing rate is only 4% and if the present tendency continues, then the decreasing rate becomes 16%. It may not be acceptable that the present economy condition will continue for coming 15 years and the right estimation would be around 10% decrease of the total number of commuters to zone A and B. But this is not enough to ease the existing congestion. Furthermore, the new construction of office buildings in zones A, B and C is still active and they may promote the increase of commuters in the worse direction if those construction sites concentrate in zone A and B.

4 Study Conclusion

The study concludes the short-term suggestions as follows.

(1) The introduction of flextime system in each establishment may function to cut the peak of the congestion. But, according to the answers from the establishments, it has been already introduced in possible sections and may have some difficulties to include the other sections such as customer services. Then, this policy may not work well any more.

(2) To promote the time lag commuting by 30 minutes for half of the offices in zone A and B seems to work well according to the simulation study. At first we though that as the most congested band of Yamanote Ring Line border takes additional 15 to 30 minutes to arrive at down town offices then the 30 minutes delay in zone A may cause the higher peak around the Yamanote border. But, it may not be acceptable to change to beginning time of office hours in zone A because the offices in zone A are mainly headquarters and governmental functions. Therefore, the simulation was made to include all of the establishments in zone A and B to delay the begging time of office hours by 30 minutes just for half of the workers in each establishment. In other words, the half of the workers in each establishment in zone A and B should change their arrival time 30 minutes behind. The result showed the great impact to cut the peak of the congestion by 12%.

(3) To promote home office or remote office system by means of information technology may work well to decrease the number of commuters. If those workers can stay and work at home a day between Monday and Friday, 20% of commuters will be reduced. But, the company managers answered that they need some governmental subsidies or tax incentives to promote those systems.

(4) To promote down town housing for the down town workers will have great advantages not only for the reduction of commuting distance but also for the activation of urban functions in those areas. But, as the construction cost of dwelling units in down town is so expensive, the establishments in the area require the scheme of public housing or governmental subsidies to realize down town housing.

(5) The fundamental solution will be the improvement of railway systems. Not only the new construction but also the better service is required such as the more frequent service after the peak hours. The longer interval of railway service after the peak hours will discourage the commuters to take the train behind.

Table 2 Inbound Railway Lines Crossing the Yamanote Ring Line

No.	Name of Railway Lines	Type	No. of Cars /Train	Peak Interval
1	Tokaido	Suburban	15	2—3 min.
2	Keihin-Tohoku South	Commuters	10	2—3
3	Yokosuka	Suburban	15	3
4	Odakyu-Odawara	Commuters	10	2—3
5	Keihinn Kyukou	Commuters	10	2—3
6	Tokyu-Toyoko	Commuters	10	2—3
7	Tokyu-Mekama	Commuters	8	2—3
8	Tokyu-Ikegami	Commuters	6	2—3
9	Tokyu-Shintamagawa	Commuters	10	2—3
10	Tokyo (Haneda) Monorail	Monorail	6	4
11	Toei-Asakusa South	Subway	10	2—3
12	Teito-Hibiya South	Subway	10	2—3
13	Teito-Chyoda South	Subway	10	2—3
14	Chuou Rapid	Commuters	10	2
15	Soubu West	Commuters	10	2—3
16	Keio-Keio	Commuters	10	2—3
17	Keio-Inokashira	Commuters	6	3
18	Seibu-Shinjuku	Commuters	10	2—3
19	Teito-Tozai West	Subway	10	3
20	Teito-Marunouchi	Subway	6	2—3
21	Seibu-Ikebukuro	Commuters	10	2—3
22	Tobu-Tojo	Commuters	10	2—3
23	Toei-Mita	Subway	8	3
24	Teito-Yurakucho	Subway	10	3
25	Tohoku	Suburban	15	6---10
26	Keihin-Tohoku North	Commuters	10	2---3
27	Saikyo	Commuters	10	3
28	Takasaki	Suburban	12	4---10
29	Teito-Hibiya North	Subway	10	2—3
30	Teito-Namboku	Subway	8	4
31	Joban	Suburban	15	4---6
32	Soubu Rapid	Suburban	10	3
33	Soubu-East	Commuters	10	3---4
34	Keiyo	Commuters	8	3---4
35	Keisei	Commuters	8	2—3
36	Toei-Asakusa North	Subway	8	3
37	Toei-Shinjuku	Subway	10	3
38	Teito-Tozai East	Subway	10	3
39	Teito Ginza	Subway	6	2
40	Teito-Chiyoda North	Subway	10	3

Note: No. 1 to 13 are to the direction of zone E,
No. 14 to 20 to the direction of zone D,
No. 21 to 30 to the direction of zone F, and
No. 31 to 40 to the direction of zone G.

[END]

Biography

Hirohide KONAMI(Ph.D.)

1942	Born in Tokyo
1966	BS, University of Tokyo, Department of Urban Engineering
1966	City Bureau, Ministry of Construction
1971～72	MCP candidate at GSD, Harvard University
1989	Director for Integrated Transport Policy, NLA, Office of the Prime Minister
1995	Deputy Director General, PWRI, Ministry of Construction
1996	Visiting Professor, University of the Philippines
1997	Professor, Toyo University, Graduate School of Regional Development Studies, Tokyo

e-mail: hiro@konamike.net   Tel.& Fax. (+81)276-82-9002