A Historical Review of Railway Planning in Tokyo Metropolitan Area

by Hisao UCHIYAMA

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Before 1868 (the Meiji Revolution), population was more than 1.5 million.

In those days, the residential area was located only inside of the Yamate Line in the west.

Then after, the population was spreading out to the west.
2. Development in Railway Network of Tokyo

● Rail Network in 1905

1906: nationalization of the private rail

1982: privatization from the national rail

Map showing the railway network with stations such as Shinjuku, Shibuya, Yoyogi, and Asakusa.
Rail Network in 1925
● Rail Network in 1935
● Rail Network in 1945
2. Development in Railway Network

- Rail Network in 1955

![Rail Network in 1955](image-url)
2. Development in railway network

● Rail Network in 1965
2. Development in railway network

- Rail Network in 1975
● Rail Network in 1985
● Rail Network in 1995

M-MAP2 Work Shop 170706

2. development in railway network
2. Development in railway network

● Rail Network in 2005
● Rail Network in 2015
3. Tram Network in Tokyo

horse drawn streetcar (1982: Shinbashi)

Good-bye Tram (1962)

Apr. 1st in 1961
● Tram view this and that

Shibuya

Sept. 1968

Kachidoki drawbridge-closed

Takegawa

bridge for exclusive line

Kachidoki drawbridge-open
● Congestion of Tram

congestion: both of passengers and road traffic

Abolition of tram system

⇒ Introduction of metro system
4. Conventional Rail Network in Tokyo

- JNR 5 directional tactics for commuter
  1965～1971

  double track ⇒ four-track

① Toukaido・Yokosuka-line
② Chuuou-line
③ Tohoku-line
④ Joban-line
⑤ Sobu-line
● commuters’ Hell at Shinjuku-1
● commuters’ Hell at Shinjuku-2
● commuters’ Hell at Shinjuku-3
5. Congestion Degree vs Comfortable Ride

- **Passenger capacity of a vehicle:**
  - The sum of seating capacity and standing capacity

- **Standing capacity of a vehicle:**
  - Effective floor space / 0.3m²

100%

- To be able to spread a newspaper and to read it easily
- Recent target in Japan

150%

※ A capacity of a vehicle is around 140~150 passengers.
to be forced to fold a newspaper for reading it

to read barely enough a weekly magazine, even feeling pressure from surrounding passengers

not to be able to move a body and hands at all, since leaned body synchronizing with train swaying
● Daily Cross traffic volume by line (2015)

Inside of the Yamete:  ⇒  distribution

Outside of the Yamete:  ⇒  concentration

reference:
the 2015 Metropolitan Transportation Census Survey conducted by every 10 years
6. Person Trip Survey in Tokyo Metropolitan Area

- Expansion of PT Survey Area (1968 ~ 2008)

The PT survey was conducted every 10 years. Next is scheduled to be implemented in 2018.

※The survey area of 1998 was similar to that of 1988.
Example of the aggregated results

- Total Trips Travelled by residents

![Graph showing total trips from 1978 to 2008]

- From in to out trip
- intra trip

<table>
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<tr>
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<tbody>
<tr>
<td>from in to out trip</td>
<td>6,692</td>
<td>7,407</td>
<td>7,874</td>
<td>8,433</td>
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<td>intra trip</td>
<td>6,656</td>
<td>7,358</td>
<td>7,812</td>
<td>8,330</td>
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</tbody>
</table>

- 1978: 6,656
- 1988: 7,358
- 1998: 7,812
- 2008: 8,330

- Increase from 1978 to 1988: 1.11
- Increase from 1988 to 1998: 1.06
- Increase from 1998 to 2008: 1.07

6. person trip survey
Some companies have introduced flex time system.
7. Some Findings

1. Harmonious planning with future population distribution
2. Radial concentration from the suburbs to the city center
3. Intra distribution of passengers entering into the CBD
4. Priority placed on user (passenger) oriented planning
5. Easy access to the station, easy transferring, frequent service, punctual service, high-speed service, etc.

- Not discussed here but necessary to-

6. Scientific analysis with high accuracy as well as high resolution for accountability
7. Acquisition of financial support for realization
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Thanks for your kind attention.