Tokyo Past, Now and Future: Transportation and Development
～Aging, Structural Change, Sustainability～

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Mamoru Taniguchi
Professor, University of Tsukuba
Mamoru Taniguchi, Dr. Eng.

Chair of Department of Policy and Planning Sciences

International Federation for Housing and Planning (Previous Council Member)

In Japan, Member of
National Land Council
Council for Transport Policy
National Council for Infrastructure
Central Environment Council
Population density of Tokyo metropolitan area (1970)

Unit: People/km²

Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision ~Change and Future of Metroplis according to the Date~.(2014)
Population density of Tokyo metropolitan area (2010)

Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision ~Change and Future of Metroplis according to the Date~. (2014)
首都圏における市街地の拡大

出典：新谷洋二, 都市交通計画, 技法堂出版, 1993（1880年から1957年の図）
Urban Area : Sprawl
Tokyo suburb (1956)
Urban Area: Sprawl
Tokyo suburb (1991)
Late development areas after 1985, that locate far from train stations cause serious problems in near future. How to explain citizens? → ‘Inferno Cartton’
典型的郊外住宅地

六地蔵

那古

の
Population estimation of Tokyo metropolitan area

Source: Mohri, Morio (2014) and National Institute of Population and Social Security Research
Population Desity 2010
Increase of Population Density 2000~2010
Railway network of Tokyo metropolitan area (1960)

Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision ~Change and Future of Metropolis according to the Date~. (2014)
Railway network of Tokyo metropolitan area (2010)

Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision ~Change and Future of Metroplis according to the Date~.(2014)
<table>
<thead>
<tr>
<th>City Name</th>
<th>Tsukuba</th>
<th>Tozuka Ward (Yokohama)</th>
<th>Tama</th>
<th>Mishima</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>52,568</td>
<td>113,514</td>
<td>9,746</td>
<td>64,971</td>
</tr>
<tr>
<td>2010</td>
<td>214,590</td>
<td>274,324</td>
<td>147,648</td>
<td>111,921</td>
</tr>
<tr>
<td>Ratio</td>
<td>4.11</td>
<td>2.42</td>
<td>15.15</td>
<td>1.72</td>
</tr>
<tr>
<td>Main Station</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Route</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>1. Tsukuba~Tsuchiura (Tsukuba Line)</td>
<td>Tozuka ~ Tokyo (Yokosuka Line)</td>
<td>1. Seiseki Sakuragaoka ~ Shinjuku 2. Shinjuku ~ Tokyo (Chuo Line)</td>
<td>Mishima ~ Tokyo (Tokaido Line)</td>
</tr>
<tr>
<td>Required Time to Tokyo Sta. (min)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>168</td>
<td>44</td>
<td>75</td>
<td>111</td>
</tr>
<tr>
<td>2010</td>
<td>62</td>
<td>41</td>
<td>58</td>
<td>55</td>
</tr>
<tr>
<td>Ratio</td>
<td>0.37</td>
<td>0.93</td>
<td>0.77</td>
<td>0.50</td>
</tr>
<tr>
<td>Frequency of Service (/3h)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>4</td>
<td>14</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>2010</td>
<td>17</td>
<td>57</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Ratio</td>
<td>4.25</td>
<td>4.07</td>
<td>2.22</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Source: Mohri et al. (2014)
Mode of transportation in world cities

- **Tokyo**: Train 48% (20%), Bus 3% (20%), Bicycle 14% (20%), Walk 23% (20%), Car 12% (20%)
- **Seoul**: Train 30% (20%), Bus 22% (20%), Bicycle 15% (20%), Walk 23% (20%), Car 11% (20%)
- **Greater London**: Train 12% (20%), Bus 15% (20%), Bicycle 30% (20%), Walk 40% (20%)
- **New York**: Train 12% (20%), Bus 10% (20%), Bicycle 39% (20%), Walk 33% (20%), Car 6% (20%)
- **Beijing**: Train 21% (20%), Bus 32% (20%), Bicycle 21% (20%), Walk 20% (20%), Car 4% (20%)

Transportation share of trips in Tokyo metropolitan area

<table>
<thead>
<tr>
<th>Year</th>
<th>Train</th>
<th>Bus</th>
<th>Car</th>
<th>Motorcycle</th>
<th>Bicycle</th>
<th>Walk</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>24.8</td>
<td>17.0</td>
<td>5.7</td>
<td>43.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>22.8</td>
<td>24.4</td>
<td>12.9</td>
<td>33.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>25.1</td>
<td>27.5</td>
<td>14.8</td>
<td>27.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>25.5</td>
<td>32.9</td>
<td>14.6</td>
<td>22.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>29.7</td>
<td>28.0</td>
<td>14.1</td>
<td>21.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision ~Change and Future of Metropolis according to the Date~. (2014)
Change of Commuting Minutes (Only Season Thickets Passengers)

（注）定期券利用者の平均鉄道所要時間。鉄道利用者に対して行ったアンケート調査の結果。
（資料）国土交通省「大都市交通センサス（鉄道定期券・普通券等利用調査）」
http://www2.ttcn.ne.jp/honkawa/2340.html
行動群分析への展開

Differet Groups (Transportation Modes and Lifestyle)
Transportation mode of trips to Tokyo city area

Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision ~Change and Future of Metropis according to the Date~.(2014)
Transportation mode of elderly people (Over 65 years old)

Source: Mohri, Morio: Tokyo Metropolitan Area: Change for 50 years and Future Vision ~Change and Future of Metroplis according to the Date~.(2014)
Population estimation of Tokyo metropolitan area (Over 65 years old)
Decrease of Trip Numbers

TRIP NUMBERS/Person Day

TOKY MET.

← Young → Old
Purpose of Network-based Compact City

Challenges of Urban Area

Current urban trend

- Depopulation and Aging
- Urban Sprawl

Deterioration of functions supporting urban lives

- Difficulty in maintaining medical, welfare, and commercial service
- Shrink of the public transportation network and deterioration of the quality of the service

Regional Economic Decline

- Regional industrial stagnation
- Increase of vacant lands and stores, decline of downtown

Strict Governments’ Finances

- Increasing social security costs
- Addressing the aging infrastructure

Effects of Compacness

Maintenance and improvement of urban livability

- Maintaining community services
- Improving accessibility to local services
- Social participation by the elderly

- Making urban Environment to safe and comfortable for the elderly and households with children

Revitalization of regional economy

- More productive in service industries, such as public transport, medical care, welfare and commerce.

- Maintaining and improving business environment

Reduction of administrative cost

- Reducing the maintenance cost of for infrastructure
- More efficient in administrative service
- Maintaining land value and the revenue of property tax
- Controlling social security cost through health enhancement

- Financially sustainable urban management

Less burden on global environment

- More efficient use of energy
- Reducing CO2 emission

- Realization of urban structure with low carbon emission

Polycentric Network-based Compact City with city center and local cores linked by user-friendly public transport
Working Toward “Network-based Compact City”

- Based on the Act on Special Measures concerning Urban Reconstruction and Act on Revitalization and Rehabilitation of Local Public Transportation Systems amended in 2014, the local municipalities are expected to guide houses and community amenities into key areas and to develop a sustainable local public transportation network which connects these areas, while taking the entire city structure into account.
- In order to encourage the municipalities to guide community amenities into designated districts, the Japanese Government provides incentives such as budgetary support for creating and implementing such plans.

Siting Optimization Plan (created by cities)
- Community amenity advancement district
  - Identify the areas where certain amenities are encouraged to be sited
    - Promote establishment of urban functions (such as welfare, healthcare, commerce.)
    - Provide tax and financial incentives to service-attracting facilities
    - Relax floor area ratio requirements, etc. for rebuilding welfare and healthcare-related facilities
    - Effective use of public real estate and unused/underused land
  - Walkable city Support development of pedestrian walkways
- Residential advancement district
  - Establish areas that attract residents and maintain population density
  - Improving living conditions within districts
    - Enable housing developers to make proposals on urban planning and landscape planning
  - Lenient control of residential developments outside the districts
    - Prior notification of a large residential development outside the district, followed by consultation with local municipalities.

Polycentric network-based Compact City
- Guide and concentrate community amenities to key areas
- Reinforce public transportation services
- Improve transit hubs
- Walkable/bike-friendly development

Local public transportation networking plan
- Developed by local government lead
- Integrated with city development
- Takes the whole city structure into account to redevelop public transportation networks for the entire region

Regional public transportation reorganization plan
- Developed by local government, with consent from the operators, etc.
  - Circular transportation system
  - Feeder lines such as community buses
  - Demand-responsive bus (taxi)

Source: Ministry of Land, Infrastructure, Transport and Tourism
Siting Optimization Plan Area

Urban Planning Area

Urbanization promotion area

Residential advancement district

Community amenities advancement district

Source: Ministry of Land, Infrastructure, Transport and Tourism