Support with the Formulation of a Comprehensive Plan for Public Transport

Part I
Basic concept of public transport planning in Tokyo

July 6, 2010

Bureau of Urban development
Tokyo Metropolitan Government
Outline of Tokyo
JAPAN in Far East Asia

Source: 「ANMC21」
Comparison of Taiwan/Taipei, Indonesia/Jakarta and Japan/Tokyo

<table>
<thead>
<tr>
<th>Country</th>
<th>Taiwan</th>
<th>Indonesia</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land area (km²)</td>
<td>36,008</td>
<td>1,811,570</td>
<td>377,930*¹</td>
</tr>
<tr>
<td>Population (×10³)</td>
<td>23,016</td>
<td>228,248</td>
<td>127,771*¹</td>
</tr>
<tr>
<td>Density (人/km²)</td>
<td>639</td>
<td>126</td>
<td>338</td>
</tr>
<tr>
<td>Railway (km)</td>
<td>1,694</td>
<td>7,985</td>
<td>27,343*²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City</th>
<th>Taipei</th>
<th>Jakarta</th>
<th>Tokyo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land area (km²)</td>
<td>272</td>
<td>662</td>
<td>2,187*³</td>
</tr>
<tr>
<td>Population (×10³)</td>
<td>2,607</td>
<td>9,140</td>
<td>12,790*³</td>
</tr>
<tr>
<td>Density (人/km²)</td>
<td>9,685</td>
<td>13,807</td>
<td>5,847*³</td>
</tr>
<tr>
<td>Railway (km)</td>
<td>91</td>
<td>150</td>
<td>1,178*³</td>
</tr>
</tbody>
</table>

*¹: Ministry of Internal Affairs and Communications 「Statistical Handbook of Japan 2009」
*²: Ministry of Land, Infrastructure, Transport and Tourism(2009)
*³: Tokyo Metropolitan Government(2009)
The metropolitan area

- **Tochigi**: 100km radius
- **Gunma** and **Ibaragi**: 50km radius
- **Saitama**: 30km radius
- **Chiba**: wards area 622km²
- **Yamanashi** and **Kanagawa**: Not explicitly mentioned, but likely within the metropolitan area

**Central Area**: Tokyo

The map illustrates the geographical boundaries and distances of the metropolitan area.
Gradually increasing,
But estimated will be decreasing after 2015.
Outline of Road
Expressway Network in Tokyo

For Sendai

Gaikan-do (Tokyo Gaikan Expressway)

Ken’o-do (Metropolitan Inter-City Expressway)

For Osaka

Chuo-Kanjo-sen (Central Circular Route)

Completed

Under construction

Planned
Completion Ratio of Loop Expressway Network

Tokyo

- Planned: 522 km
- Completed: 245 km
- 47% completed

Paris

- Planned: 313 km
- Completed: 267 km
- 85% completed

Berlin

- Planned: 222 km
- Completed: 217 km
- 97% completed

【2009】

【2009】

【2007】
Comparisons of Road Density

- **Tokyo (Wards area)**: 16.2%
- **London**: 16.6%
- **Paris**: 20.0%
- **New York**: 23.2%
- **Washington DC**: 25.0%
Current State and Target of Average Trip Speed

- **Average in Japan:** 34.1 km/h
- **Target for 2025:** 30 km/h
- **The Present Situation (Tokyo Wards Area):** 18 km/h
- **Marathon Runner (World Record):** 20.1 km/h
**Major Roads Network in Tokyo**

- **Gaikan-do**
  - (Tokyo Gaikan Expressway)

- **Chuo-Kanjo-sen**
  - (Central Circular Route)

- **Ken’o-do**
  - (Metropolitan Inter-City Expressway)

- Major Roads:
  - Radial Road No.9
  - Radial Road No.12
  - Beltway No.7
  - Radial Road No.13
  - National Road No.16
  - Beltway No.2
  - Chiba
  - Saitama
  - Kanagawa
  - Kamakura Kaido
  - Koshu Kaido
  - Sin-Ome Kaido
# Development of City Roads 2009

<table>
<thead>
<tr>
<th>Completion Ratio</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>57%</td>
</tr>
<tr>
<td><strong>Wards Area</strong></td>
<td>60%</td>
</tr>
<tr>
<td><strong>Other Area</strong></td>
<td>53%</td>
</tr>
</tbody>
</table>

Beltway: 66%, Radial Roads: 68%

### Detail of Wards Area

- **BeltWay**:
  - In basic plan: 15 km
  - Under construction: 69 km
  - Completed: 166 km (66%)

- **Radial Roads**:
  - In basic plan: 15 km
  - Under construction: 100 km
  - Completed: 250 km (68%)
Promoting Transportation Demand Management (TDM)
Transportation Friendly to People and the Environment

Promotion of Transportation Demand Management (TDM) Measures

Utilized ITS Technology

- **Demand-Forecasting Signal Control**: By forecasting traffic flow, the optimal signal control can be achieved. Rapid change in traffic flow can be corresponded.

- **Improvement and Optimization of Signal Control**: Traffic information panels give driver the information on traffic congestion and necessary time. They also suggest driver to make a detour, so that the traffic demand is diversified.

- **Diversification of Traffic Demand**: By forecasting traffic flow, the optimal signal control can be achieved. Rapid change in traffic flow can be corresponded.

**Improved Road Facilities**

- TV System for preventing illegal parking
- Modification of Lane
- Tuning of Signal
- Set-up of Baggage handling
- Set-up of Bus Bay
- Extension of Right-turn Lane
- Ensure of Baggage-handling Place

**Measures for a baggage**

- Set-up of Baggage handling
- Place out of the Lane
- Set-up of Red-colored Pavement (Reflection Pavement)

**Measures for Taxis waiting for customers**

- Set-up of Left-turn Lane
- Set-up of Baggage-handling

Source: Brochure “Hyper Smoothing Tactics”, (TMG, Tokyo PD, Tokyo Bureau of National Road)
Outline of Railway
Railway Network in Japan

Year 2008

Total length: 27100 km

- Shinkansen
- Around Tokyo
- Around Osaka
- Fukuoka
- Tokyo (Tokyo)
- Osaka (Osaka)
- Kyoto (Kyoto)
- Nagoya (Nagoya)
- Sapporo (Sapporo)

Asian Network of Major Cities (ANMC 21) Joint Project
Characteristic of Railway in Tokyo

- Railway network in Tokyo carries 24 million passengers daily.
- Peak-hour railroad operation interval: 1 to 2 min.
- Annual average delay per train: 0.7 min.
Development History of Railway Network to Expand the Metropolitan Area

1885
- Urban area
- Downtown: Horse tram

1926
- Urban area
- The urban area was expanded according to the restoration plan after the Great Kanto Earthquake. Private railway lines were begun constructing at this period.

1935
- Urban area
- Downtown: Commencement of street car network development
- Suburban residential developments progressed along the railway network.

1955
- Urban area
- Downtown: Reduction of street car network (abolition was decided in 1967) and development of subway network
- The urban area expanded further according to the Tokyo war restoration plan, and residential developments progressed accordingly.
## Railway Network in Tokyo (Nov, 2009)

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Number of Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JR Lines</strong> (Ex-National Railways)</td>
<td>419km</td>
<td>141</td>
</tr>
<tr>
<td><strong>Private Railways</strong> (7 major companies)</td>
<td>354km</td>
<td>292</td>
</tr>
<tr>
<td><strong>Subways</strong> (2 major companies)</td>
<td>300km</td>
<td>234</td>
</tr>
<tr>
<td><strong>Monorail, New Transit and Others</strong></td>
<td>76km</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,178km</td>
<td>767</td>
</tr>
</tbody>
</table>
Zones accessible in 5 minutes, in 10 minutes walk from station

Ring road No.7

Ring road No.8

JR Yamanote Line

Yamanote Street

5 mins. walking distance (r = 400m)

10 mins. walking distance (r = 800m)

JR Yamanote line

Other railway lines

Planned railway lines
The Current Conditions of Urban Transportation in Tokyo

World-Leading Railway Line Development

Comparisons of Route Density and Transportation Modes in Tokyo and Major Overseas Cities

<table>
<thead>
<tr>
<th>Route density (km/km²)</th>
<th>Tokyo</th>
<th>London</th>
<th>Paris</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.01</td>
<td>0.74</td>
<td>0.41</td>
<td>0.74</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shares of Movement by Transportation Mode</th>
<th>Tokyo</th>
<th>London</th>
<th>Paris</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local railways and subways 86%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorcycles 11%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buses 1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other 1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorcycles 1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buses 7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other 2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local railways 30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subways 35%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorcycles 3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buses 9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other 2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local railways 21%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subways 37%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Motorcycles 7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buses 7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other 7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local railways 7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subways 54%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: "Urban Transportation in Metropolis (1999)"
The Current Conditions of Urban Transportation in Tokyo

Railway Crowding

Overcrowding ratio
Transport capacity index
Passenger number index

(Tokyo area)

Source: 「WHITE PAPER ON MLIT IN JAPAN (2008)」
Improvement of Railway

◆ A basic plan concerning the development of transport links on the rapid-transit railway in Tokyo metropolitan area

◆ History

Policy report of the council for transport revised almost every 10 to 15 years recently.

Policy Report No. 18 of the Council for Transport
(Issued in January, 2000)

◆ Target year ⇒ 2015

◆ Basic Aspects

1) Decrease average ratio of train congestion future target 150% at peak time
2) Improve express service
3) Ease access to airport and Shinkansen
4) Make traffic service barrier-free and seamless
Planned Route of Policy Report No. 18

Planned Route A1

Route that should be opened by 2015

Planned Route A2

Route that should start building by 2015

Planned Route B

Route that construction should be examined in the future
Oedo Line (Subway Line No. 12) Route A1

Development costs: 1,400 billion yen (34 bil. yen/km)
Total length: 41 km  Number of stations: 38
Number of passengers: 782,000/day (2007)
Opened: Dec. 2000
Oedo Line (Subway Line No. 12) Route A1

- Shinjuku
- Ikebukuro
- Roppongi
- Akihabara
- Tokyo
- Tokyo Disney Resort
- Ginza
- Haneda
- Yokohama
- New line
- To four-track line
- A1
- A2
- B
Fukutoshin Line (Subway Line No. 13)  Route A1

Operation:
One-man driving by ATO system

Development costs : 250 billion yen (28 bil.yen/km)
Total length  : 8.9km (Ikebukuro-Shibuya)
Number of stations : 9 (New open)
Number of passengers 259,000/day (2008)
Opened: Jun. 2008
Asian Network of Major Cities (ANMC 21) Joint Project

Fukutoshin Line (Subway Line No. 13)  Route A1

Ikebukuro  Shinjuku  Akihabara  Tokyo  Tokyo Disney Resort  Ginza  Haneda  Yokohama

New line  To four-track line

A1  A2  B
Narita Rapid Railway to Narita Airport  Route A1

In fiscal 2010, Narita rapid railway will be opened.
Connect the center of Tokyo with Narita Airport in 36 minutes

Access Time from the Main Airport of the World Cities

- **Heathrow**, ENGLAND: 16 min
- **Charles De Gaulle**, FRANCE: 29 min
- **Rome**, ITALY: 30 min
- **Narita**, JAPAN (Near Future): 36 min
- **Chicago**, USA: 5 min
- **Kimpo**, KOREA: 45 min
- **Beijing**, CHINA: 45 min
- **Narita**, JAPAN (NOW): 51 min
Narita Rapid Railway to Narita Airport  Route A1

- Narita
- Tokyo
- Akihabara
- Shibuya
- Ginza
- Tokyo Disney Resort
- Haneda
- Yokohama
- Ueno
Current State of A1, A2 and B Routes

- **All A1 Routes** have already opened or been under construction
- but, **Any A2 and B Routes** are not even begun to start construction

Problems

1. Finding the entity who will raise his hand
2. Securing the funds for huge project expense
3. Improving of profit margin
Subsidy System for Railway Development

Traditional Way of Construction of Railways

- 100% loan or funds

Subsidy System for Subways

- Nation 25%
- Local G 28%
- Loan or Funds 47%

New Subsidy System for improvement of urban rail service project

- Nation 1/3
- Local G 1/3
- Loan or Funds 1/3

Subsidy 53%

Subsidy 66%

- In Japan, private railways had been constructing their new lines by their own finance.
- However, in Metropolitan area, to conquer those problems and promote construction of necessary lines, various subsidy systems are established.
Promoting Barrier-free Facilities
Transportation Friendly to People and the Environment
Promoting Barrier-Free Facilities

Under the Accessible and Usable Transportation Law, upon new construction of stations and other passenger facilities, newly introducing buses or other types of vehicles or in other circumstances, compliance with barrier-free standards is required. Likewise, under the guidance of individual municipalities schemes are incorporated to achieve barrier-free facilities in stations, nearby roads, traffic signals and other infrastructure. This leads to advances in barrier-free status in stations, nearby roads and other amenities.

The Current Conditions of Urban Transportation in Tokyo

“Barrier-Free” Improvements

The setting situation of elevators and escalators in the Tokyo railway stations

<table>
<thead>
<tr>
<th>EV・ES</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>J R+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Railways</td>
<td>72.0%</td>
<td>77.1%</td>
<td>81.4%</td>
<td>83.9%</td>
<td>85.1%</td>
</tr>
<tr>
<td>Tokyo Metro</td>
<td>75.8%</td>
<td>78.0%</td>
<td>79.5%</td>
<td>84.1%</td>
<td>86.8%</td>
</tr>
<tr>
<td>Toei Subway</td>
<td>67.7%</td>
<td>78.3%</td>
<td>84.5%</td>
<td>88.0%</td>
<td>90.1%</td>
</tr>
<tr>
<td>Total</td>
<td>72.1%</td>
<td>77.5%</td>
<td>81.6%</td>
<td>84.7%</td>
<td>86.3%</td>
</tr>
</tbody>
</table>

The setting situation of barrier-free restrooms in the Tokyo railway stations

<table>
<thead>
<tr>
<th>Stations with barrier-free restrooms</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>J R+ Private Railway</td>
<td>65.4%</td>
<td>69.4%</td>
<td>73.1%</td>
<td>76.5%</td>
<td>78.4%</td>
</tr>
<tr>
<td>Tokyo Metro</td>
<td>68.2%</td>
<td>76.5%</td>
<td>78.0%</td>
<td>79.5%</td>
<td>80.1%</td>
</tr>
<tr>
<td>Toei Subway</td>
<td>92.9%</td>
<td>94.9%</td>
<td>97.0%</td>
<td>98.2%</td>
<td>99.1%</td>
</tr>
<tr>
<td>Total</td>
<td>69.8%</td>
<td>74.3%</td>
<td>77.4%</td>
<td>80.4%</td>
<td>81.9%</td>
</tr>
</tbody>
</table>
Promoting Seamless Transportation
Transportation Friendly to People and the Environment
Promoting Seamless Transportation

—Structure of “through routes”—

4 railways in “Direct Through Service”
Transportation Friendly to People and the Environment

Promoting Seamless Transportation

- Improved Transport Convenience -

Ikebukuro St.

To Shinjuku

To Akabane

To Tabata

Saikyo Line

Shounan-Shinjuku Line

(Previous Plan)

Platforms were arranged by Line
Transportation Friendly to People and the Environment
Promoting Seamless Transportation

— Improved Transport Convenience —

Ikebukuro St.

To Shinjuku

Saikyo Line

Shounan-Shinjuku Line

(Improved Plan)
Platforms were arranged by Direction of Trains

To Akabane

To Tabata
Thank you very much!