Urban Railway System Development in Japan - Contribution of the Private Sector -

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Outline of Presentation

*Introduction*: Urban Railways in Japan

*Part 1*: Development Railway Systems in Japan

*Part 2*: Integration of Urban Railway Systems

Transition of population in Japan

The ratio above 65 years old
Introduction

Urban Railways in Japan

Station of Metro System

Station of JR East
Urbanization progressed along with population increase. Railways played an important role.

Transition of population in Japan:
- Over 75: The ratio above 65 years old
- 65~74
- 15~64
- 0~14

Railways with high market share
Roads with few congestions

Tokyo Metropolitan Area
Three Major Types of Railways in Metropolitan Areas in Japan

1) JR Lines

2) Metros

3) Private Railways*
   *: JV (private & public) is included

- Metropolitan areas have some types of railway operators, such as JR, Metros and private railways.
- These railways have been promoting independent businesses. (They own infrastructure and provide transport services without subsidies.)
Urban Railways Systems in Japan

<table>
<thead>
<tr>
<th>Metropolitan Areas</th>
<th>e.g. Tokyo, Osaka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-distance</td>
<td>Medium-distance</td>
</tr>
</tbody>
</table>

Combined Utilization

Convenient bus services from/to stations

Competitiveness against Cars
Part 1
Development of Railway Systems in Japan

1) JR Lines

2) Metros

3) Private Railways

Unique to Japan

The ratio above 65 years old

Transition of population in Japan
3) Private Railways

Integrated Development until 1970s

Background

✓ Road network was quite poor
✓ Expansion of urban rail network was required
✓ Land prices soared because of rapid urbanization

Private railway companies expanded suburban rail network along with land development.

Transition of population in Japan

The ratio above 65 years old

Ages

Present
### Outline of Large-scale Private Railways in Tokyo

<table>
<thead>
<tr>
<th>Company</th>
<th>Operating length (km)</th>
<th>Number of passengers (thousand)</th>
<th>Transport Volume (million P-km)</th>
<th>Passenger Traffic Density (thousand passengers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobu</td>
<td>463.3</td>
<td>2,425</td>
<td>12,440</td>
<td>74</td>
</tr>
<tr>
<td>Seibu</td>
<td>176.6</td>
<td>1,722</td>
<td>8,589</td>
<td>133</td>
</tr>
<tr>
<td>Keisei</td>
<td>152.3</td>
<td>730</td>
<td>3,746</td>
<td>68</td>
</tr>
<tr>
<td>Keio</td>
<td>84.7</td>
<td>1,734</td>
<td>7,417</td>
<td>240</td>
</tr>
<tr>
<td>Odakyu</td>
<td>120.5</td>
<td>1,998</td>
<td>11,337</td>
<td>258</td>
</tr>
<tr>
<td><strong>Tokyu</strong></td>
<td><strong>104.9</strong></td>
<td><strong>3,005</strong></td>
<td><strong>10,654</strong></td>
<td><strong>292</strong></td>
</tr>
<tr>
<td>Keikyu</td>
<td>87.0</td>
<td>1,229</td>
<td>6,259</td>
<td>197</td>
</tr>
<tr>
<td>Sotetsu</td>
<td>35.9</td>
<td>615</td>
<td>2,507</td>
<td>191</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,225.2</strong></td>
<td><strong>13,458</strong></td>
<td><strong>62,949</strong></td>
<td><strong>141</strong></td>
</tr>
</tbody>
</table>

Source: “Railways 2016 in terms of Figures” (MLIT)

8 large-scale private railways transport 13.5 million passengers/day.
3) Private Railways

Integrated Development until 1970s

*Kobayashi Ichizo model*

Private railway company

*Responsible for both projects*

Railway Construction

Land Development

Integrated Development (Railways + Real Estate)

The company could earn from both businesses

Railway development during rapid population increase

In some railway groups, affiliated businesses cover more than 50% of the total revenue.
Integrated Development since 1970s

Population increase has become gradual.

The ratio above 65 years old

Heavy costs and excess risk for the private sector.
Scheme of TX Project

Regional governments with private participation

Responsible for both projects

as shareholders

as executers of land readjustment projects

project 1
Railway Construction

project 2
Land Development

Station front of a TX station
Problems before the Law

- **Inconsistency with regional development**
  
  ✓ Regional development usually occurred after the railway line started its operation.

  ✓ Inconsistency with regional development such as road planning.
Aim of the Law

- Integrated Development Law-

- To solve inconsistency between railway planning and regional planning.

⇒ The law promotes to supply large area of residential/business district in an integrated manner.
Characteristic of the Law

- Integrated Development Law-

Concept of the Law

Integration of “railway construction” and “land readjustment”

Approach of “land readjustment”
Successful Outcomes

Success

✓ Railway construction
✓ Railway operation
✓ Land development

<Reference>
Projects until 1970s
(during rapid population increase)

Railway Construction → Private Sector
Land Development → Private Sector

Projects since 1970s
(during gradual population increase)

Railway Construction → Public Sector with private participation
Land Development → Public Sector with private participation

**Point 1**
Railway construction and urban development should be integrated.

**Point 2**
Public sector should also play an important role for the projects these years.
Passengers can enjoy integrated public transport services in metropolitan areas utilizing:

1) Transportation IC Card

2) Trough-train services
A single card is effective for JR, Metro and private railways. It is also effective for many shops and related services.
Three Types of Railways

Through-train Services

- Operation by a single operator
- Exchange of responsibility at a border station

- Different railway operators cooperate by promoting through-train services.
Passenger Through-train Services

Philosophy for Safety:
Separation of responsibilities at the border station

This philosophy is applied to all the passenger through-services in Japan such as:
1) JR & JR;
2) JR & Metro;
3) Private & Metro;
4) Other cases

e.g.) Shinkansen Lines

Key Issue

Integrated Operation & Maintenance

Through-services
Separation of Responsibilities

Vertical Separation
JRTT (Public)
JR Kyushu
JR West

Vertical Integration
JR West
JR Central

Passenger Through-train Services

Infrastructure of Railway A

- Rolling stock of Railway A
- Operation by Railway A
- Revenue to Railway A

Infrastructure of Railway B

- Rolling stock of Railway B
- Operation by Railway B
- Revenue to Railway B

○: Border Station
Japan

The system is working smoothly

Because of the commercial benefits of the two railways, the number of the sections has been increasing steadily.

**FIGURE.** Sections with passenger through-train services (Metropolitan Areas in Japan)
Open Access in EU Countries

Infrastructure of Railway A
- Rolling stock of Railway A
- Train Operation by Railway A
- Revenue to Railway A

Infrastructure of Railway B
- Rolling stock of Railway B
- Train Operation by Railway B
- Revenue to Railway B

Europe
Comparison of Railway Operation

**Japan** (passenger)

- **Railway Operation**
  - **Integrated Operation**
  - **Infrastructure Owner**

**Europe** & Some Followers?

- **Railway Operator A**
- **Railway Operator B**
- **Owner and Manager of the Infrastructure**
- **Coordination Problems**
- **Train Operations**
- **Infrastructure Management**

**Vertical Integration**

- **Ownership of infrastructure varies**

**Vertical Separation**

- **Direction aimed by EU policy**
Characteristics of Railway Operation in Japan

Vertically Integrated Operation

On each section, a single operator is responsible for the railway operation.

Vertical Integration

Provider of Rail Services

&

Provider of Rail Services

Owner of the Infrastructure

<Public sector>

Integrated Operation

Vertical Separation

Owner of the Infrastructure
Urban Railway System Development in Japan - Contribution of the Private Sector -

Thank you

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