Creating a Compact City through Innovative Public Transportation Networks

~ New Urban Planning Strategies to Meet the Twin Challenges of Decreasing Populations and Aging Societies ~

Toyama City
Toyama’s Compact City Management Strategy

<Challenges of Toyama City>

① Reduced population and ultra-aged community
② Decay of public transportation due to extraordinary dependence on vehicles
③ City center lost its appeal
④ Relatively high administrative cost of the city
⑤ Adequate maintenance of social capital
⑥ Divergence between average and healthy life expectancy

By revitalizing public transport, including railway track lines, and by concentrating various city functions such as residential, commercial, business and cultural buildings along public transport lines, we can create a compact city.

<Concept Illustration> Targeted city structure - dumplings and skewers

Skewer: Public transport offering a higher level of service
Dumplings: Population centers connected by the skewers, allowing pedestrian access to various city amenities

<Three pillars for the Strategy>

① Revitalizing public transport
② Revitalizing the city center
③ Encouraging residents to relocate to zones along public transport lines
By creating the LRT network, we hope to modify the current life style of too much dependence on automobiles and realize a town with every city amenity within walking distance.
Design and Construction of Toyama’s LRT

JR Toyama Port Line (a local line), which had been suffering from declining numbers of passengers, was revitalized as Japan’s first complete LRT. This was achieved by adopting a two-tiered system in which the public sector constructs the track while the private sector operates the business.

Former JR Port Line

The New “Portram”

- Light Rail Attendants
- Low floor cars/ barrier-free stations
Results of Passenger Use for Toyama LRT

- Weekdays: 2.1 times as many passengers as before; Weekends: 3.4 times as many passengers using the new service.

- Increase in daytime use by senior citizens (Lifestyle Change)

Reduction in environmental load:
- method of transportation for current LRT users
  - New Passengers 20.5%
  - JR Toyama Port Line 46.7%
  - Car 11.5%
  - Bus 13.3%
  - Taxi 3.5%
  - Bicycle 1.6%
  - Walking 2.8%

Sudden increase in the number of passengers:
- Weekdays: 4,794 (2.1 times)
- Holidays: 3,536 (3.4 times)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005(JR)</th>
<th>2006(Toyama LRT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>2,265</td>
<td>1,046</td>
</tr>
<tr>
<td>2006</td>
<td>4,893</td>
<td>4,917</td>
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<td>2007</td>
<td>4,723</td>
<td>3,988</td>
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<tr>
<td>2008</td>
<td>4,869</td>
<td>3,533</td>
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<tr>
<td>2009</td>
<td>4,826</td>
<td>3,353</td>
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<tr>
<td>2010</td>
<td>4,809</td>
<td>3,347</td>
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<tr>
<td>2011</td>
<td>4,737</td>
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<td>2012</td>
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<td>2013</td>
<td>4,796</td>
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<tr>
<td>2014</td>
<td>4,659</td>
<td>3,244</td>
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<tr>
<td>2015</td>
<td>4,904</td>
<td>3,517</td>
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</table>

Per Day Changes in Ridership According to Time of the Day (Weekdays)

Per Day Ridership According to Age Bracket (Weekdays)
Attractive City Center with Comprehensive Ability

※Changes in Land Prices in the City Center (Regarding the price in 2007 as 1) (Toyama Prefecture Posted Land Price・Land Price Research, Price Directory 2011)
Posted Land Price (National Research, Record Date: January 1st) Land Price Research (Prefectural Research, Record Date: July 1st)
Encouraging residents to relocate to zones along public transport lines

[Transition of social change (moving-in - moving-out) in city center (inner city)]

[Transition of social change (moving-in - moving-out) in districts promoting dwelling along public transport lines]

Number of residents in the zones along city center and public transportation lines

- 2005: 117,560 people (About 28%)
- 2017: 154,668 people (About 37%)
- 2025 (Projected Total): 162,180 people (About 42%)

Projected change in number of residents by activating public transportation or encouraging residence within the zone.
Economic effect of Shinkansen (1)

- **Ripple Effect (Toyama prefecture):** \(42.1 \text{ billion yen ($37.6m)}\)

  1. Increase in number of entry in one year after opening: \(15.4 \text{ billion ($140M)}\)
     - 494 thousand people / y [Survey before opening: 240 thousand / y]

  2. Business investments and new employments triggered by Shinkansen: \(26.7 \text{ billion ($242M)}\)
     - Business investment: \(23.1 \text{ billion} \) (Excluding land acquisition cost)
     - New employments: 2,910 people

  *Source: Report by Toyama prefecture*

- **Industrial Location (Achievement of Toyama's grant system):**
  - Three enterprises from the metropolitan area established 2 manufacturing bases and 1 call center
  
  \(\Rightarrow\) The total investment is approx. \(4.6 \text{ billion ($46M)}, \) created 75 new employments
Economic effect of Shinkansen (2)

Number of visitors

- 2014: 662 (10k)
- 2015: 671 (10k)
- Increase: +90k (+1.4%)

Number of main accommodation facilities users in Toyama city

- 2014: 74.5 (10k)
- 2015: 94.2 (10k)
- Increase: +1,970k (+26.4%)
Direction Connection of Urban Monorail Kokura Line to JR Kokura Station & Care and Maintenance of the Environs

Atsushi Fujimoto
Urban Transportation Policy Division
Buildings and City Planning Bureau
City of Kitakyushu
Map of Area along the Monorail Line
Road Conditions Before Construction of Monorail
Urban Monorail Kokura Line
# Breakdown of Funding for Project Costs

## I. Initial Project FY 1978 to FY 1984
Total project costs: JPY 68.1 billion

<table>
<thead>
<tr>
<th>Municipal expenditure</th>
<th>Capital</th>
<th>Municipal loans</th>
<th>Loans from Development Bank of Japan</th>
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</thead>
<tbody>
<tr>
<td>JPY 9.7 bil</td>
<td>JPY 2.2 bil</td>
<td>JPY 22.4 bil</td>
<td>JPY 10 bil</td>
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<tr>
<td>National expenditure: JPY 20.8 bil</td>
<td>JPY 3 bil</td>
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<table>
<thead>
<tr>
<th>Eligible project costs</th>
<th>Non-eligible project costs</th>
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<tr>
<td>JPY 30.5 bil</td>
<td>JPY 3 bil</td>
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<table>
<thead>
<tr>
<th>Infrastructure project cost</th>
<th>Project costs (other)</th>
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<tbody>
<tr>
<td>JPY 33.5 bil</td>
<td>JPY 34.6 bil</td>
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</table>

Related street development projects Approx. JPY 34.2 bil
Urban Development Challenges

1. Strengthening nodules between public transportation modes
2. Improving pedestrian flowline
3. Improving landscape appropriate for a city center
4. Eliminating shortages of public space
5. Maintenance of elderly and handicap-friendly facilities

Measures to solve problems

- Expansion of urban monorail’s Kokura line
- Improvement of plaza at the south exit of JR Kokura Station
- Improvement of public accessway to the north and south of Kokura Station
- Improvement of pedestrian deck at the north exit of JR Kokura Station
Monorail Terminal Station and Pedestrian Walkways
Location of Direct Connection Point to Kokura Station
3-Dimensional Road System

*Allows highways and buildings to be constructed in the same space*
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* Allows highways and buildings to be constructed in the same space
Breakdown of Funding for Project Costs

II. Extension project FY 1994-1997

April 1, 1998 Extended section opened
Kilometers in operation: 8.8 km
Total costs: JPY 13.5 bil

<table>
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<tr>
<th>Municipal expenditures</th>
<th>Capital</th>
<th>JRA subsidy</th>
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<tbody>
<tr>
<td>JPY 4 bil</td>
<td>JPY 1.8 bil</td>
<td>JPY 1.2 bil</td>
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<table>
<thead>
<tr>
<th>National expenditures</th>
<th>Municipal expenditures</th>
<th>JPY 2.5 bil</th>
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<tbody>
<tr>
<td>Eligible project costs</td>
<td>Non-eligible project costs</td>
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</tr>
<tr>
<td>JPY 8 bil</td>
<td>JPY 2.5 bil</td>
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<table>
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<tr>
<th>Infrastructure project costs</th>
<th>Projects (other)</th>
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</thead>
<tbody>
<tr>
<td>JPY 10.5 bil</td>
<td>JPY 3 bil</td>
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Related street development projects:
- Improvement of public accessway to the north and south of Kokura Station
  Approx. JPY 8 bil
- Improvement of plaza at the south exit of Kokura Station
  Approx. JPY 3 bil
- Improvement of pedestrian deck at north exit of Kokura Station
  Approx. JPY 6 bil
- Development of Kokura Station by JR Kyushu
  Approx. JPY 26 bil
Monorail After Extension

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<tbody>
<tr>
<td>定期 (千人)</td>
<td>11,424</td>
<td>11,181</td>
<td>11,047</td>
<td>12,346</td>
<td>12,485</td>
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<tr>
<td>定期外 (千人)</td>
<td>4,365</td>
<td>4,238</td>
<td>4,294</td>
<td>4,905</td>
<td>4,820</td>
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(単位: 千人)

4月1日
小倉駅延伸開業
South Exit Before & After Improvement Project

Before

After
Existing North-South Public Accessway on Western Side of the Station
North-South Public Accessway
North-South Public Accessway
(Event Space)
Pedestrian Deck at North Exit of Kokura Station
Before & After Improvement Project

Before construction

Completed project
Pedestrian Deck at North Exit of Kokura Station
After Improvement Project
Thank you for your kind attention.