TOD in Japan
Role of Private Railroad Company: Regional Development through Leveraging Synergy Between Transport Network and Urban Development Projects

World Bank’s GEF6 - TOD Workshop in Beijing, July 15-19, 2022
Yoshinobu FUKASAWA
Appointed Professor, Kyushu Sangyo University
Yoshinobu FUKASAWA

- Formerly in MLIT and UN-Habitat ROAP
- 2017-2020, Nishi Nippon Railroad Co. Ltd. (NNR)
  - Engaged in company’s overseas deployment
- Since 2020, Specially Appointed Professor, Kyushu Sangyo University (九州産業大学)
  - Engaged in Global Leadership Program
- Exploring possibility of applying Japan’s TOD concept in addressing rapid urbanization in Asian cities
Contents of presentation of today

1. TOD in general
2. Case study of NNR 1
3. Japan-type TOD
4. Case study of NNR 2
5. A few points to discuss
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   • Depopulation and shrinking cities / areas
   • Applicability of Japan-type TOD to the cities in Asia
TOD, Peter Calthorpe

**TOD as New Urbanism**

- Inter-state highways in US since 1950s → monocultural detached houses + large-scale shopping malls + office spaces in suburbs

- Expansion of low-density suburban areas +
  Sharp hollowing-out of the centers of large cities (degradation of commercial areas, loss of employment)

- Serious reflection: revaluing diversity, community, human-scale → new wave of urban development = New Urbanism

Compact spatial arrangement around transit stations

- Station → small-size commercial area → residential area (middle-density to low-density)

- Houses within walking distance + reduction of car use

Based on Takashi Yajima, 「TOD 概念の由来・拡大と日本型 TOD」, July 2019 edition, a+u「35都市のTODM-持続的なまちづくりのマネジメント」
Evolution of Calthorpe’s TOD

1. TOD: originally, guiding concept of town planning in suburban area → reduction of car use by more walk and public transport → contribution to better urban / global environment, conservation of natural environment

2. TOD: originally, → area development with more use of public transport + urban development / redevelopment of spaces near/around terminal stations in city centers + greater use of within/above/under stations

3. TOD as interesting subject for research by experts of urban development / urban transport + one of the useful means for practitioners to consider

Based on Takashi Yajima, 「TOD 概念の由来・拡大と日本型 TOD」, July 2019 edition, a+u 「35都市のTODM-持続的まちづくりのマネジメント」
Japan-type TOD
Transport Oriented Development

- Terminal Station
- Department Store
- Commercial
- Housing
- Shopping
- Terminal Station
- Tourist

New life-style emerging
Before motorization in Japan

- Large investment to railroad + quick revenue by housing/urban projects
  → Land-value capturing mechanism built in, internalization of positive externality

- Successful business model, created by Ichizo Kobayashi, the founder of a private railroad company Hankyu Railway in Osaka in 1920

- Replicated by other companies incl. Nishi-Nippon Railroad Co., Ltd.

- Outline to be presented by example of NNR

Based on YAJIMA and IEDA et. al., 2014
Japan-type TOD
Transport Oriented Development

Aug 1930, Parisette

Official Website of Takarazuka Revue:  https://kageki.hankyu.co.jp/fun/history1923.html, 20220719
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Fukuoka city-region

- 5.1 million population
- 5,000 km²: OK for daily commuting / shopping
Fukuoka city-region

- Urban centers: balanced distribution
- Public transport connects urban centers
- NNR, JR, subway, bus-network, etc.

Fukuoka Prefecture

Fukuoka City
NNR’s Railroad and Bus Network

Railway (as of FY 2021)
- Operating km: 106.1 m
- Operating distance / year: 3,841 km
- Average No. of passengers / day: 231,000 persons

Bus (as of FY 2021)
- No. of vehicles: 1,589 (※ 2,482 incl. group companies)
- Operating distance / year: 7,183 km (※ 109 million km incl. group companies)
- Average No. Passengers / day: 384 K persons (※ 545 K persons incl. group companies)

NNR.’s website: https://www.nishitetsu.co.jp/
7 Aug 2022
Nishi-Nippon Railroad Co., Ltd. in Fukuoka

- Bus
- Railways
- Real estate for rent
- Real estate for sale
- Logistics
- Leisure Services
- Hotel
- Supermarket
- Leisure Services

NNR’s website, brochures, etc. 2021
## NNR’ Business Portfolio

<p>| | |</p>
<table>
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<tr>
<td><strong>Capital</strong></td>
<td>JPY 26.2 billion (USD 243.3 million) (FY 2019)</td>
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<tr>
<td><strong>Group companies</strong></td>
<td>86 companies and 1 incorporated educational institution (FY 2019)</td>
</tr>
<tr>
<td><strong>Consolidated operating revenue</strong> (FY 2019)</td>
<td>JPY 389.4 billion (USD 3.622 billion) (FY 2019)</td>
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![Pie chart showing business portfolio percentages](chart.png)

- **Transport**: 20%
- **Real estate**: 16%
- **Commercial**: 19%
- **Logistics**: 23%
- **Hotel, tourism**: 11%
- **Others**: 11%

Based on NNR 会社要覧2019 (Nishitetsu Overview 2019)
NNR in Fukuoka
NNR in Fukuoka

- Founded in 1908
- Urban commuter train (106 km long) + 3,000 buses (FY 2018)
- 1 million passengers daily (FY 2018)
- Housing, hotels, office, commercial development, amusement facility・・・
NNR in Fukuoka

Synergy of public transport network and urban development
NNR’s success
→ Fukuoka’s growth
→ NNR’s further opportunity

NNR’s DNA to contribute to Fukuoka’s growth

Unique way to make profit
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History of Japan-type TOD and urbanization

1st wave of urbanization: 1920 – 1935
- Light industry, pre-motorization
  - New railroad development + housing development along railroads + department store at the terminal station
- 1923 Great Kanto Earthquake in Tokyo, 100,000 death, demand for safer residential area
  - Housing development alongside of existing railroads

2nd wave: 1955 - 1970
- Heavy chemical industry, high-pace economic growth
- Huge demand for affordable housing in 3 major metropolitan areas
  - “New towns” – mega-mass housing projects for middle income group + railroad extension / transport capacity upgrading

- Shift of economy: greater demand for office / commercial spaces
- JNR privatized to JRs → ex JNR’s land unlocked for urban redevelopment
  - Integration of the upgrading of railroad stations and the redevelopment of neighboring urban areas

Based on YAJIMA and IEDA et. al., 2014
Construction of “New Towns” with railroad extension in Tokyo

- Japan’s high-pace economic growth during 1955 to 1970
- Huge demand for affordable housing for middle-income group – similar to some MIC countries of today?
- Construction of new towns in outskirts of city center
  - Japan Housing Corporation (now UR) provided housing
  - Railroad companies extended existing lines
  - Various PPP (incl. appropriate land value capturing

Ex. Tama New Town in Tokyo:
1965 Development plan authorized; 3,000 ha, target pop. 600,000, 30 km from CBD

Based on YAJIMA and IEDA et. al., 2014
Example in Hong Kong: Rail and Property (R+P) by MTR Corporation Ltd.

- Public-owned real-estate development right to be sold to MTR Corporation Ltd. (香港鉄路有限公司) at the price of \textit{before}-railroad-
  dev.

- \textbf{Capturing space value appreciation} through middle-to-high-rise
  condos, commercial / office dev. \(\rightarrow\) cost recovery of railroad dev.

- Stations of airport express line and the terminals (Kowloon and Hong
  Kong stations) underneath of reclaimed land \(\rightarrow\) \textit{large-scale spatial}
  dev. in / around /above such stations

- Dev. of station spaces by R+P in \textbf{38 stations / 82 stations}, 2011

Based on YAJIMA and IEDA et. al., 2014
Other cases of TOD in Japan

- Tokyo Station Area
- Takanawa Gateway Station Area
- Osaka Station Area
- Minato Mirai 21 District / Minatomirai Line
- Tsukuba Express / Kashiwa-no-ha Campus Station Area
- Sapporo Station Area
- Toyama Station Area
- Toyama Station Area

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NNR Tenjin Solaria: Railroad Terminal + Commercial Development

Tenjin area (most lively commercial area in Fukuoka): terminal station + department store, since 1936

Tenjin’s functions:
1. Connection point (railroad, long-distance buses, local-line buses, subway)
2. Commercial hub, inviting even competitors to operate
3. Open space ensuring migratory route, contrary to confining shoppers
4. underground promenade connecting all functions

Solaria → upgrade value of Tenjin as a whole → upgrade entire area along transport network + attract people from around Kyushu

Based on NNR 110th Anniversary Memorial Book, 2018

NNR website, brochures, etc., 2021
Other NNR initiatives in support of Tenjin and Fukuoka

- **Urban regeneration**
  - Time to rebuild old buildings.
  - 17 ha, 100 buildings, numerous stakeholders
  - NNR facilitates coordination in close collaboration with the City

- **Airport operation**
  - Privatization of airport operation since 2019
  - NNR leads consortium with other leading companies
  - Expand airport efficiency: 21 to 35 million passengers

Website of Fukuoka International Airport Co., Ltd., 7 August 2022
NNR Housing development along railroad

1966-2018: 12,819 units (house or land), 11,181 units (condominium)

Cotton Hills Misawa
3.4 ha, 2017～
33 minute to Tenjin terminal

Station

Chikushi-ekimae
3.4 ha, 2017～
33 minute to Tenjin terminal

NNR website, brochures, press releases, etc., 2021
Close collaboration of NNR station and tourism

Redevelopment of NNR Yanagawa station

- NNR Yanagawa station renewed in 2015
- Extension of creek nearer to station for easier boat riding
- Station square improved, commercial facilities improved

Yanagawa: historical creek network and cultural attractions

Access from station to boat-riding point improved
NNR railroad uplifting and urban redevelopment

- Surface crossing of railroad and road
- Constant traffic congestion, accident risks
- Divide of neighboring urban spaces and communities


- Open space created + urban spaces reconnected
- Communities reconnected and revitalized + better land use
- Better and safer train operation
Collaboration of NNR station and town upgrading

NNR - Kurume City Comprehensive Partnership Agreement (2018)

- Decreasing population, competition with a large shopping mall with car access, less-active station square
- Mutual benefit of NNR and Kurume City under decreasing population
  - Sustainable continuation of public transport operation
  - Town upgrading / urban renovation
  - Upgrading of value of the area along the NNR railroad line
Area management along NNR line

- 62 stations along NNR Omuta Line
- 13 municipalities along the line

Based on NNR material, 2021
Bean-pod area-management

Station ≠ a mere station build, but an effective device to promote brand of nearby area

Integration of a series of stations and nearby areas as one area: “Bean Pod” area management

Promote sense of “My Rail” and upgrade the value of railroad line as a whole (cf. Tokyu 3-year Management Plan, 2005)

Partnership of railroad company and various stakeholders

Based on YAJIMA and IEDA et. al., 2014
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Japan-type TOD and Sustainability

Japan-type TOD: is it sustainable?

- In the context of urban expansion, Japan-type TOD contributed to:
  - Creation of **sustainable spatial area structure**, with railroad transport of less environmental burden
  - Preventing uncontrolled land-use shift from nature / agriculture to urban use
  - Providing **affordable housing and urban functions** to newly developed areas along railroad, leading to creating new life style
  - Gradual development process over time contributing to diversity of residents and communities
  - Sustainable business management through **internalizing positive externality of land value appreciation**

Based on Towards creation of sustainable low-carbon cities, 2015, PP. 92-194
Japan-type TOD and Shrinking Cities / Areas

TOD Practice in Japan: Tokyo - A Global City Created by Railways, Yajima and Ieda et. al., 2014
Japan-type TOD and Shrinking Cities / Areas

- Depopulation and aging of residents, dependance to cars
- Way of living and land-use: **along** railroad, **away** from railroad
- Way of using public transport: too little passengers for feeder buses

How can Japan-type TOD address the challenges?

1. Areas away from railroad: gradual shift of land use to green, urban agriculture, public spaces, etc.?
2. Restrengthening of areas along railroad: redevelopment of terminal station, life-support functions near stations, rehousing support, etc.
3. Feeder bus network: innovative measures required, such as car-sharing, on-demand bus, various MAAS APPs, etc.?
4. **Innovative business mechanism required**: enable smooth shrinking of areas away from railroad, and still sustainable as business!! (*Internalization of positive externality during urban expansion phase*)

Based on YAJIMA and IEDA et. al., 2014, Yoshinaka, 2015, etc.
Mobility innovation by NNR

**Mobility as a Service**

- **My route**: APP to search routes and transport modes, purchase tickets
- Piloted in Fukuoka
- Collaboration of NNR, TOYOTA and JR Kyushu

**On-demand Bus**

- APP to request a bus ride
- AI to organize a route to serve ride requests
- Pick up at meeting points
- Collaboration of NNR and Mitsubishi Corporation

My Route website: [https://global.toyota/jp/newsroom/corporate/25094536.html](https://global.toyota/jp/newsroom/corporate/25094536.html), Aug 2022

On-demand Bus "Noruuto" website: [https://knowroute.jp/index.html](https://knowroute.jp/index.html), Aug 2022
Applicability of Japan-type TOD in Middle Income Countries

- Japan-type TOD: functioned well in Japan in times of rapid expansion of urban areas and strong demand for housing

- MICs: ongoing rapid urbanization, strong demand for public transport and affordable housing, severe lack of public funds → Japan-type TOD applicable?

- Integrate railroad business and real estate dev. → capture land value appreciation + recover railroad investment → mobilize funds from private sector in lieu of public funds

- Govt. to create environment for private sector to operate effectively; adjustment required in different socio-economic situation
Conclusion

- **Japan-type TOD**: integrated development of railroad network and housing and urban development in suburban area; functioned well during Japan’s rapid urbanization

- **Sustainable business model** through internalizing positive externality of land value appreciation to recover long-term investment of railroad construction

- **Innovative and sustainable business model** required to address **depopulating and shrinking urban areas**; enabling smooth shrinking of areas away from railroad

- Applicability of **Japan-type TOD in Middle Income Countries**; addressing strong demand for public transport and affordable housing, ensuring land value capturing
Reference

TOD Practice in Japan

Tokyo – A Global City Created by Railways

Written / edited by Takashi YAJIMA and Hitoshi IEDA, et. al., 2014

- Historical overview
- Various types of Japan’s TOD practices in urban development
轨道创造的世界都市——东京

Transit Oriented Development

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Thank you

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