

Forming a Compact City with Light Rail Transit

The case of Toyama City

Japan Project Brief

Background and Objectives

Toyama has developed as one of the main capital cities along the coastal region of the Japan Sea. The city area of 1,242 km² with about 420,000 residents accounts for approximately 30% of the prefectural land. However, the prefectural capital experienced both a shrinking population, having reached a peak in 2010, and also aging, with a high proportion of elderly residents estimated to reach about 30% by 2020 (Figure 1 and 2). Due to the shrinking and aging population trends within its large municipal boundary, the city marked the lowest urban density among all prefectural capitals in Japan. Similar to many American cities, Toyama's spacious and flat land market, strong demand for home ownership, and extended road network has accelerated urban sprawl and exacerbated downtown decay over the past decades. Accordingly, Toyama's lifestyle became heavily car dependent with the second highest private vehicle ownership in the country (1.72 cars per household in 2010 (Figure 3 and 4)). In response to increased social concern over these demographic and urban declining issues, the city planned to produce transit-oriented, compact township by reinvesting in public transit systems and consolidating a wide range of city functions along the modernized transit corridors.

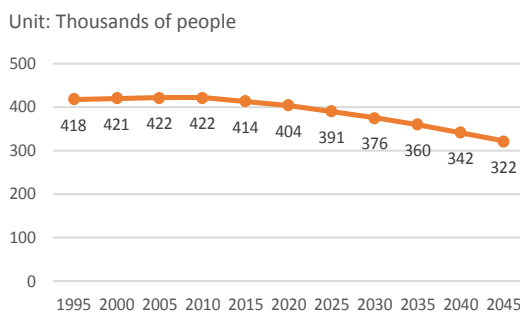


Figure 1: Total population forecast in Toyama City

Source: Produced by author based on Report on Future Population Forecast in Toyama City, 2010

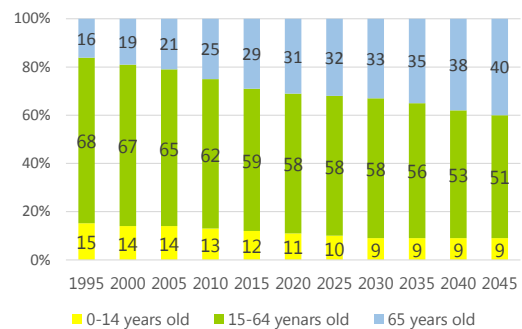


Figure 2: Population forecast by three age groups

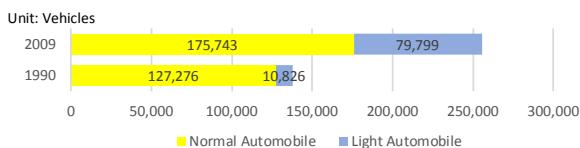


Figure 3: Increase in car ownership in Toyama

Source: Based on statistics in Toyama City, 2010, White Paper 2009, Ministry of Land, Infrastructure, Transport and Tourism

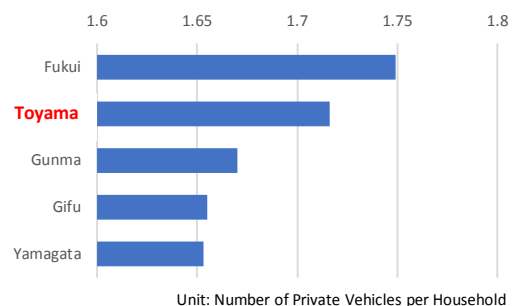


Figure 4: Top five private vehicle ownership per households

Source: Automobile Inspection & Registration Information Association (Data as of March 2010)

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Project Overview

Toyama has embodied the idea of a transit-oriented compact city on the unique visual image of a “skewer & dumpling form” – a metaphor for public transit corridors and nodes (Figure 5). To realize such a visionary plan, both political and organizational actions were critical. Politically, the mayor took on a leadership role in holding a number of open dialogues with citizens for social agreements and arranging a variety of funds for capital-intensive projects. Organizationally, the city set up three policy pillars: reinvestment in public transit; promotion of new township along the modernized transit corridors; and city core revitalization.

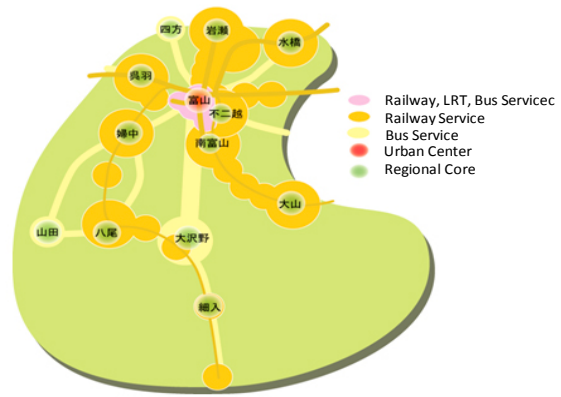


Figure 5: Image of “skewer & dumpling form”
 Source: Kanda, M. 20 November, 2014. Progress and prospects of a compact city in the City of Toyama (in Japanese).
<http://hokuriku.mof.go.jp/content/000101404.pdf>

Reinvestment in Public Transit

The city introduced Japan’s first light rail transit (LRT), called PORTRAM, by utilizing the former JR Toyama-port line’s right of way accompanied by the extension of bullet train services to Toyama Station. The PORTRAM system with barrier-free stations and low-floor vehicles over the operation length of 7.6 km can smoothly carry elderly and disabled passengers to a variety of city destinations and

bring wider environmental benefits, such as reduction in noise, air pollution, and CO₂ emissions, to the whole city. Moreover, a circle line of the existing transit network was completed with the extension of 0.9 km. Importantly, innovative project finance schemes were applied to split the roles of railway construction and system operation between public and private partners for the Toyama LRT. The public sector covers all the construction cost of the LRT system, including vehicles, railways, and depots, and the maintenance cost of these facilities, whereas the transit operator founded by several local governments and private companies recovers operation costs from fare revenues. The city filled the capital funding gap by arranging the national government’s road improvement programs and contributions from transit companies and by saving land acquisition costs with the former JR railway’s right of way (Figure 6). The design of vehicles, stations, road

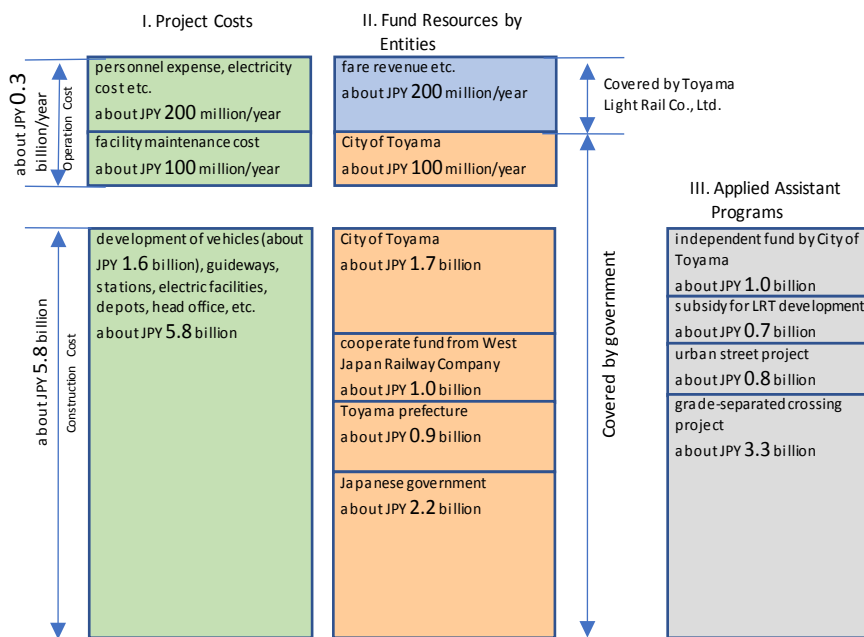


Figure 6: Cost breakdowns and allocation of Toyama LRT project
 Source: Urban development department, City of Toyama

spaces, sidewalks, and fare payment systems along the public transit lines were well-integrated to create attractive urban places.

Promotion of New Township along the Public Transit Corridors

The city designated 436 hectares for an urban core district, 19 public transit corridors (including both light rail transit and bus lines), and 3,489 hectares for residential promotion areas along the corridors, for which special subsidies became available for qualified home builders, new housing owners, and multi-family apartment residents (Figure 7). Consequently, the number of new residential properties along the promoted transit lines increased 1.32 times for the period of 2004 to 2009¹.



Figure 7: Promotion of new township along the public transit corridors

Source: Produced by author based on White paper in fiscal year of 2014 by Ministry of Land, Infrastructure, Transport and Tourism

City Core Revitalization

The city applied a variety of capital improvement projects and urban operation schemes for city core revitalization. A centerpiece of the revitalization package is the development of Grand Plaza – a major social open space equipped with audio-visual amenities for various events and covered by a high-ceiling glass roof under all-weather conditions, in particular to deal with Toyama’s heavy snowfall climate (Photo 1). The city also established a 24-hour bicycle-sharing system by placing 17 bike stations with a private operator in the city core district (Photo 2). As part of the revitalization package, a central marketplace was built by the City of Toyama and operated by a private commercial association to promote product sales in Toyama’s agriculture and fishery industries. Moreover, local community facilities, such as a public library, art museum, and urban laboratory, were jointly constructed and managed by private developers and academic



Photo 1: Social open space “Grand Plaza”

Source: Kanda, M. 20 November, 2014. Progress and prospects of a compact city in the City of Toyama (in Japanese). <http://hokuriku.mof.go.jp/content/000101404.pdf>



Photo 2: A 24-hour bicycle-sharing system in the city center

Source: Kanda, M. 20 November, 2014. Progress and prospects of a compact city in the City of Toyama (in Japanese). <http://hokuriku.mof.go.jp/content/000101404.pdf>

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partners through unique redevelopment schemes and incentive arrangements.

Project Impacts

Economic Impact:

The city's local economy was largely revitalized by the extended transit access. A number of commercial and tourist facilities along the corridor attracted more visitors after the LRT line started operation (e.g., a national important cultural site saw a 3.5 times increase in the number of visitors). Moreover, the average land price in the city and its commercial districts increased 0.2% and 0.8% for the period of July 2013 to July 2014, respectively, despite the fact that the entire prefecture continuously dropped its average land price over the past two decades².

Social Impact:

The reinvested public transit (or light rail transit) system resulted in a 2.1 times increase to its ridership in weekdays and a 3.4 times increase at the weekends. In particular, Toyama's elderly people went out more frequently during the daytime. More households began to live in the city core district and the promoted residential areas along the public transit corridors.

Environmental Impact:

Approximately 12% of the rail transit users had switched from private cars, thus contributing to Toyama's CO₂ emission reduction at the rate of 74 tons per year. Consequently, Toyama was listed as one of the locations with the best practices of building compact cities in 2012, together with Melbourne, Vancouver, Paris, and Portland, by the Organizations for Economic Co-operation and Development (OECD) for the successful implementations and achievements of these policy measures.

Lessons Learned

Population shrinkage and aging, accompanied with auto dependency, urban sprawl, and city center decay, are not limited to Japan but are issues that need serious consideration for small towns and peripheral areas in both developed and developing countries. The case of Toyama presents the application of a compact city concept and a set of policy programs to be initiated by municipal governments. Key lessons from Toyama are summarized below:

Visionary Plan:

Holding one iconic vision with all citizens is essential to make long-term efforts in reforming a city structure and synchronizing a variety of individual capital projects and operation programs delivered by several public-private stakeholders.

Capital Projects with Multiple Funding Sources:

The vision of forming a compact city inevitably calls for major capital projects, such as public transit reinvestments and social infrastructure improvements. Small cities and peripheral towns under severe budget constraints need to combine multiple funding sources efficiently and consistently into a project finance scheme.

Successive Operation Programs:

The provision of modern infrastructure alone does not automatically lead to urban regeneration. "Placemaking" efforts need to be made for inducing value-added social interactions in the long run. Individual business owners and local commercial associations play a vital role in successively implementing a variety of urban operation and district management programs together with municipal governments and transit agencies.

Land Use Incentives:

Under a market freehold system, it is not always easy for local planning departments to curb large shopping mall projects and gain control over individual land uses by zoning. When and where traditional planning and regulatory systems are insufficiently weak to manage land, generous incentives (e.g., direct subsidies, tax reductions, and expedited reviews) can be offered to move new residents to the target districts and corridors.

Future Challenges

As it takes a long time to change people's travel behavior and lifestyles from private car dependent to transit-oriented (especially in rural and suburban areas), local governments are required to make persistent efforts and assess incremental effects. Also, it is critical for local governments to identify major property owners and involve powerful private developers in both capital projects and operation programs that aim to materialize the public vision of building a compact city in a profitable way.

¹ Environment Policy Department, City of Toyama. City of Toyama Eco-Model City Action Plan

² Kanda, M. 20 November, 2014. Progress and prospects of a compact city in the City of Toyama (in Japanese). <http://hokuriku.mof.go.jp/content/000101404.pdf>

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Contact:

World Bank Group
Social, Urban, Rural and Resilience Global Practice
Tokyo Development Learning Center (TDLC) Program
Fukoku Seimei Bldg. 10F,
2-2-2 Uchisaiwai-cho, Chiyoda-ku,
Tokyo 100-0011 Japan
Phone: +81 (3) 3597-1333
Fax: +81 (3) 3597-1311
Web: <http://www.jointokyo.org>