

Sustainable City Policies in Japan I: Perceptual Changes to Urban Policies¹

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Introduction

In recent times the Japanese national government and local governments (hereafter known as “the government”) have been facing a need to implement an agenda for regional revitalization. Considering Japanese experiences of late, the most significant concept in the context of Japanese regional policy-making is sustainability, since it addresses social changes in Japan, such as rapid population decline, a rapidly aging society, and finite natural resources.

In this context, the concepts of Sustainable Development Goals³ (hereafter known as “SDGs”) have tremendous impact on Japanese society and administration; SDG policies are aligned with the government’s regional policies. It is worth noting that the government and institutions⁴ are significant leaders in the implementation of SDGs.

While the SDGs cover a lot of ground, this paper focuses on Goal 11: *Sustainable Cities and Communities*. The cities have enabled people to advance socially and economically; it’s important that efficient urban planning and management practices are in place to deal with the challenges brought by urbanization. Many challenges exist to maintain cities in a way that continues to create jobs and prosperity without straining land and resources. Common urban challenges include congestion, declining infrastructure and rising air pollution within cities.

Japan has characteristic circumstances; the cities are facing the challenge of shrinking society. However they have to stand up against the agendas of the sustainable urban progression. Under those situations, the government’s sustainable city policies have entered the spotlight in Japan. This paper asks the question, *what is the key idea for planning effective sustainable city policies based on past Japanese experiences?* A consideration of this question will contribute to the discussion of the policies aligned with SDGs.

1 Peer-reviewed paper

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3 The Goals were adopted by all UN Member States in 2015, as part of the 2030 Agenda for Sustainable Development which set out a 15-year plan to achieve the Goals.

4 Representative institutions are the organizations of public-private partnership; hereafter known as “PPP.”

I. The concept of sustainable city policies

Current major sustainable city policies are Compact city policies and Smart city policies in Japan. The first task of this paper is to define those concepts. Currently both of those policies are planned and carried out partly redundantly by some local governments.

A. Compact city

The concept of Compact city is forming urban structure with the following three key characters⁵ ;

- (a) Dense and proximate development patterns; density involves how intensively urban land is utilized, and proximity particularly concerns the location of urban agglomerations in a metropolitan area.
- (b) Urban areas linked by public transport systems; these indicate how effectively urban land is utilized. Public transport systems facilitate mobility in urban areas and enable urban areas to function effectively.
- (c) Accessibility to local services and jobs; this concerns how easily residents can reach local services such as grocery stores, restaurants and clinics as well as neighborhood jobs.

B. Smart city

Another concept of sustainable city policies is “smart city” policy in Japan. Neckermann (2017⁶) defines smart city as a city that “combines its data, resources, infrastructure and people to continually focus on improving livability. A smart city is an aggregation of power and creativity, but also a body of data and live analysis. [...] A smart city, in combination with smart mobility, offers residents, visitors, and stakeholders a quality of life and an ease of experience that pre-emptively address their needs, desires, and transportation requirements.”

This definition is adequately flexible for use in this paper in reference to the current situation and agendas under consideration. Smart cities involve a combination of urban policies that prioritize the quality of life through information integration technology. It is vital to pay attention to Neckermann’s suggestion that power, creativity, and a body of data and live analysis are significant in making plans for smart cities because the policy has a direct impact on social phenomena such as population, industrial activities, transportation conditions, and land prices.

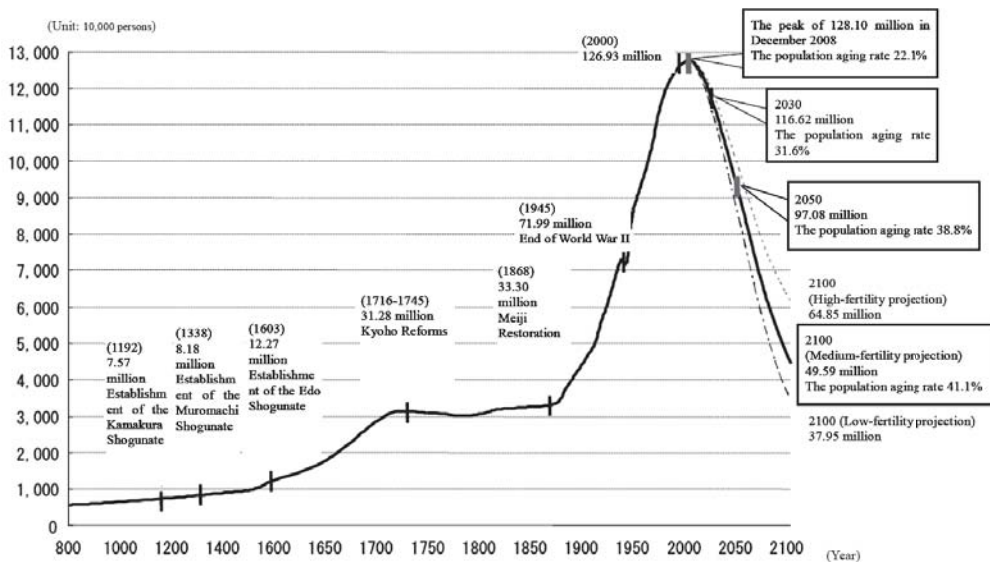
5 Source: “*Compact City Policies: A Comparative Assessment, OECD Green Growth Studies*”, OECD, 2012 (hereafter known as “OECD (2012)”), pp.27-28.

6 Source: Neckermann, Luis. *Smart Cities, Smart Mobility –Transforming the way we live and walk*, Neckermann Ltd., 2018, p.7.

II. Background

The population of Japan was on a consistent upward trend through the first postwar baby boom (in the 1940s) and the second baby boom (in the 1970s), but it has been declining sharply after peaking at one hundred and twenty eight million in 2008. According to the *Population Projections for Japan* by the National Institute of Population and Social Security Research (IPSS), the medium fertility variant projection assuming the total fertility rate (TFR) is approximately 1.35, showing that the Japanese population will fall below 100 million in 2050 and decline further, dipping under 50 million by 2100 (see Figure 1).

Figure 1. Population Projections for Japan



Source: The Interim Summary of the “Long-Term Vision for National Land” (February 21, 2011, Long-Term Forecast Study Group, Policy Subcommittee, National Land Council).

Under these circumstances, areas in the country with no public transportation services (outside a range of 600 meters from bus stops and a range of one kilometer from railway stations) occupied 36,433 km², or an area equal to Kyushu Island. In addition, the inhabitation ratio in areas with no public transportation services was higher for the elderly, at 2.7%, than for the total population, at 1.9% (see Table 1).

Table 1. Areas with No Public Transportation Services

	Japan (Total area: 377,915 km ²)	Areas with no public transportation services (Outside a range of 600 meters from bus stops and outside a range of one kilometer from railway stations)	Ratio of areas with no public transportation services
Inhabitable area	117,600 km ²	36,433 km ²	30.9% (9.6%)
Population	127,768,000 (1,086/km ²)	2,423,000 (67/km ²)	1.9%
Elderly population	27,470,000	731,000	2.7%

Source: Materials provided by the Ministry of Land, Infrastructure, Transport and Tourism (January 2013)

The government has begun taking measures to counteract this shrinking society; thus, the national government determined the following long-term goals⁷ :

- a) Creating three hundred thousand new jobs for the younger generation by 2020.
- b) Attaining equilibrium between the number of people moving into, and those moving out of, the capital region.
- c) Developing conditions that promote marriage among the younger generation.
- d) Promoting inter-communal cooperation.

Under the policy that drives this vision, all local governments set various comprehensive strategies for regional revitalization, with sustainable city policies making up part of those regional revitalization measures. The decrease in the Japanese population since 2010 has been so sharp that relevant countermeasures are urgently needed. Thus, the creation of sustainable cities constitutes a pressing issue in Japan today for regional revitalization; accordingly, local governments have planned and promoted various policies.

III. Structure of Japanese Sustainable City Policies

From the standpoint of the contents of the policies, the main sustainable city policies mentioned above are composed of three measures: (a) location optimization, (b) urban traffic networks, and (c) ICT (High-tech Sharing for Urban Spaces).

⁷ Ref. The Cabinet Decision on 27th of Dec. in the year of 2014: the Comprehensive Strategy for Construction of Machi, Hito and Shigoto (Town, People and Job).

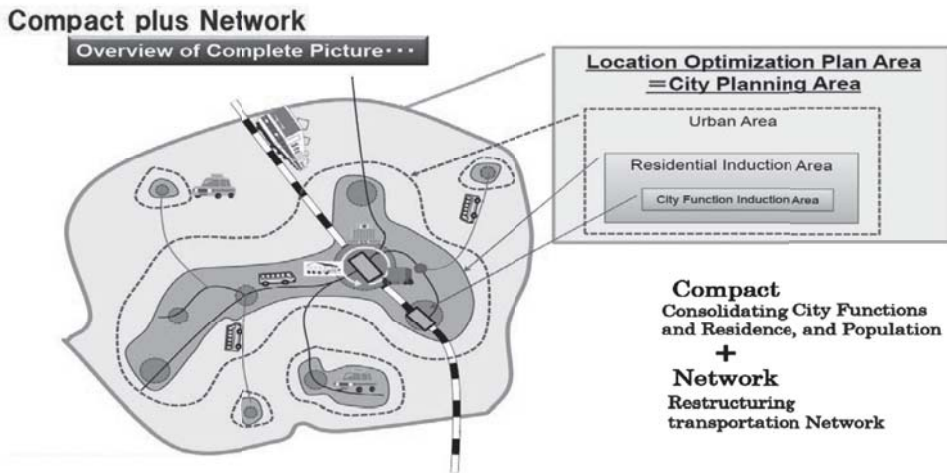
A. Location Optimization

1. Linkage between two plans

The first measure is location optimization policy. The *Urban Renaissance Special Measures Law*, which was enacted in 2014, aims to consolidate dwellings in a compact area through legal advice and financial assistance⁸. Residences are planned in a way that ensures their proximity to railway lines and accessibility to daily necessities. The goal of the policy is not only to enhance daily conveniences but also to reduce the costs of public services and reduce the burden on the environment.

The local optimization plan and regional transportation restructuring plan are established by municipalities that aim to adopt this policy (see Reference 1). In this concept, a *Residential Induction Area* is established, within which lies a *City Functions Induction Area*. Cities and large towns have the authority to formulate the plans, which are submitted to the Prefecture. When a city has plans for certain projects, it also submits the plans to the Ministry of Land, Infrastructure, Transport, and Tourism (hereafter known as the “MLIT”) in order to apply for national grants. National grants may be given to corporations that plan to invest in the development of land in the area (see Figure 2).

Figure 2. Location Optimization

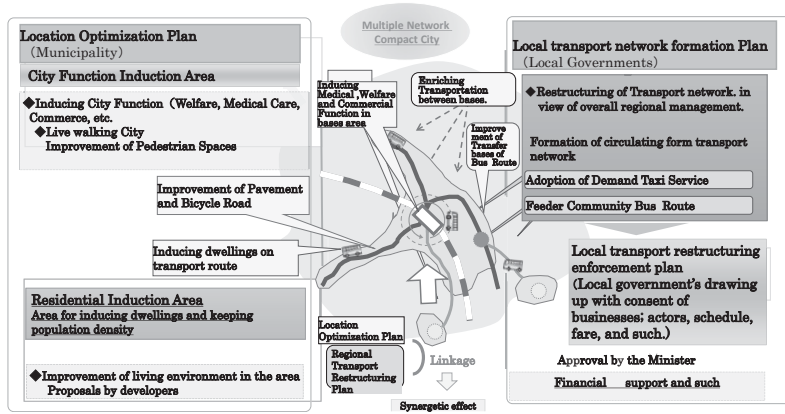


Source: Created by the author based on materials from the MLIT.

⁸ Japanese government is not given the authority of populating the people in certain districts of residence. Instead local governments, prefectures and municipalities, are responsible for urban planning on the basis of national laws. The National City Planning Law sets the framework for city planning, decisions on city plans, and restrictions on city planning.

Another characteristic is the concept of a *linkage* between the *location optimization plan* and the *local transportation network formation plan*. The former is the plan for improving city functions in residential induction areas, while the latter is the plan for enriching transportation between those areas, including measures like improving transfer bases along bus routes. To counteract depopulation, the linkage of both policies is necessary (see Figure 3).

Figure 3. Location Optimization Plan Area



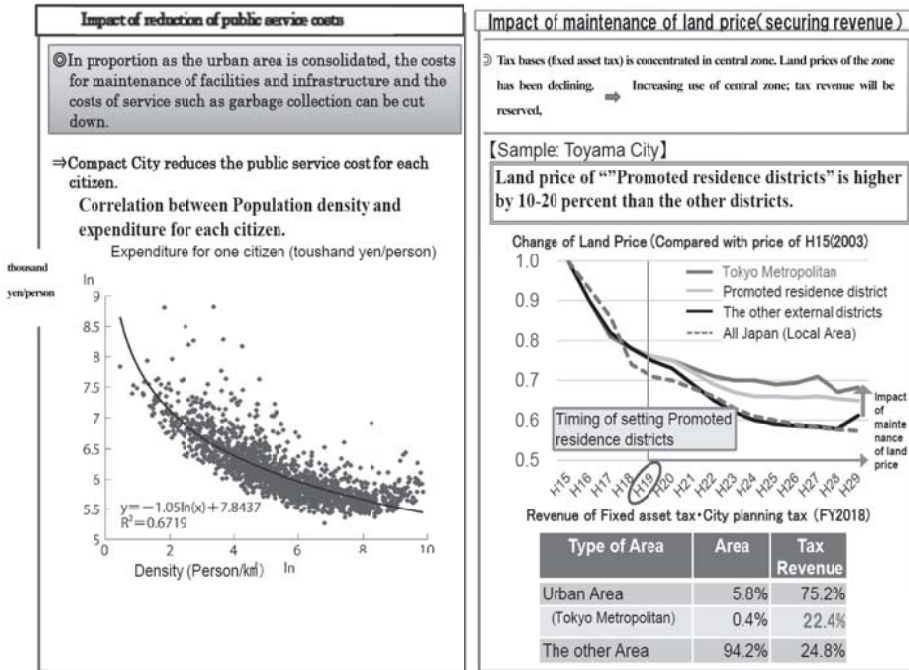
Source: Created by the author based on materials from the MLIT.

2. Impact of the Compact City Policy

Several data show the effects of Compact city policies on sustainable development. The higher the density of a residential area, the lower the public cost. The negative correlation between population density and expenditure per citizen is shown by data from the Ministry of Land, Infrastructure, Transport and Tourism (hereafter known as “MLIT”); R^2 is equal to 0.6719.

- a) Concerning the relationship between population and land price, the price of land in depopulated areas generally decreases. However, a compact city policy (that of Toyama City, in this case) will increase the use of the central zone. Thus, this policy has the effect of securing fixed asset taxes and maintaining the city’s revenue. This suggests that the smart city policy is effective for improving the city’s financial management (see Figure 4).

Figure 4. Impact of Smart City Policies (1)



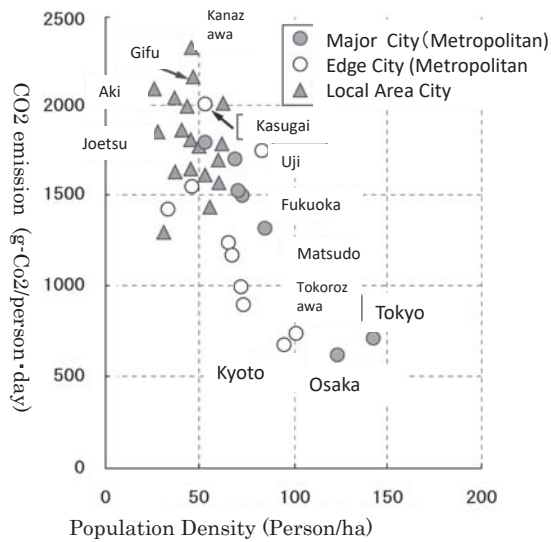
Source: Created by the author based on materials from the MLIT.

b) The higher the population density, the lower the carbon dioxide emissions. The data show that Kochi city had fewer emissions of carbon dioxide (0.87 ton/year) than Maebashi city (1.21 ton/year) even though Kochi city has a higher population density. This suggests that the people in a city with more compact residential and industrial areas tend to make use of public transportation instead of private cars and cause less damage to the regional environment (see Figure 5)⁹.

⁹ OECD (2012) (pp.251) reports as follows; In Japan, it is estimated that the sum of greenhouse gas emissions from the residential and business sectors and the transport and logistics sector represent approximately half of the total amount. Compact city policies not only prevent urban sprawl but also help reduce greenhouse gas emissions and global warming by reducing travel distances, a shift in the main means of travel to public transport and improved energy efficiency through the use of district heating and cooling systems. For example, Maebashi City and Kochi City are similar in terms of population and land, but the higher dependency on vehicles in Maebashi City, where the density of urban facilities is lower than in Kochi City, results in 40% higher annual CO₂ emissions per capita in the transport and logistics sector. This shows the need to rebuild urban structures to reduce emissions through the concentration of urban facilities.

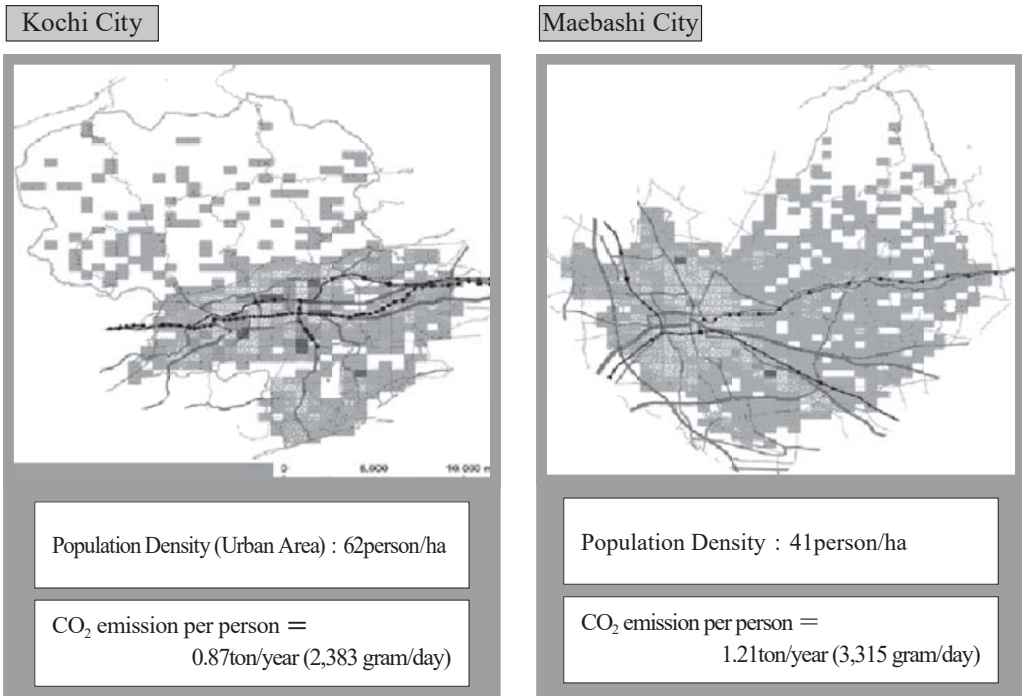
Figure 5. Impact of Smart City Policies (2)

< Correlation between population density and emission of CO2 from automobiles >



Source; Mamoru Taniguchi “Analysis of emission of CO2 from automobiles in view of urban structure”

< Comparison between Kochi City and Maebashi City >



Source: Created by the author based on materials from the MLIT.

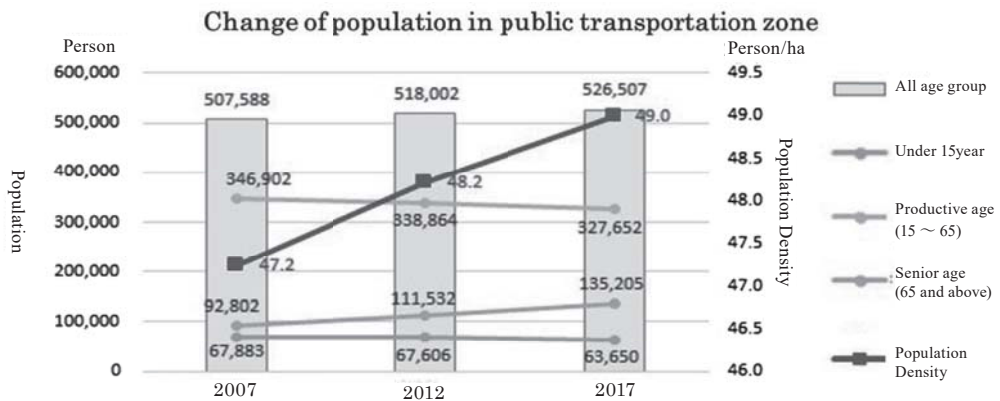
B. Urban Traffic Networks in Community Renovation

1. Situation

The second measure refers to urban traffic network policies. Data from Hachioji city show that the density of the public transportation zone is increasing, since the number of senior citizens in the zone is growing and many elderly people do not use private cars. This implies that the dependence of elderly people on public transportation is growing (see Figure 6).

Figure 6. Population in Public Transportation Zone (Hachioji City)

◆ Population on public transportation route (public transportation zone) is increasing.
Average population density of public transportation zone : 49.0 person/ha



Source: Created by the author based on materials from Hachioji City.

Therefore, the reconstruction of public bus routes is essential; furthermore, establishing a “linkage” between the location optimization plan and the local transportation restructuring enforcement plan is a particularly important strategy. To alleviate this situation, many cities are currently operating *community buses* within their boundaries. The number of municipalities that operate community buses has increased consistently from 1,130 in 2009 to 1,290 in 2016¹⁰ (see Reference 2).

2. Change of concepts of bus network (Case Study: Aomori City and Toyama City)

It may become more difficult to secure a means of transportation in regions where the population density has declined. Therefore, particularly in smaller cities, it has

¹⁰ Source: ‘Outline of Survey of Community Bus’, MLIT, 2016. <https://www.mlit.go.jp/common/001193362.pdf>

become a pressing issue to realize an intensive urban structure by maintaining population density and deploying the urban amenities of medical care, welfare offices, and educational and commercial facilities in a planned manner to provide residents with healthy and comfortable livelihoods, maintain economic activities, and ensure sustainable city management.

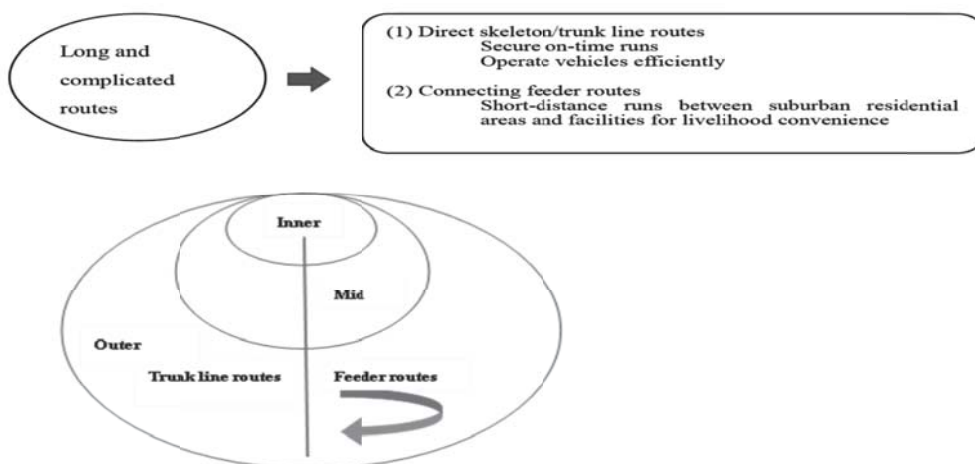
However, in the face of the sharp population decline, community development and local public transportation systems now require a comprehensive review across Japan. The following two points can be broadly stated regarding the direction of that review.

The first is the “restructuring of local public transportation systems corresponding to compactification.” As the decline in population density raises the cost of maintaining and upgrading the urban foundation, the downsizing of cities is required. Thus, various cities are striving to develop compact communities, as represented by the efforts of Aomori City and Toyama City. Meanwhile, local public transportation systems, regardless of whether they are motor vehicle or railway transportation systems, were previously required to comprehensively cover the service area, inevitably resulting in long and complex routes.

A revision of ideas is required to respond to the formation of compact urban districts, and it is necessary to clearly distinguish between trunk line routes going directly to major facilities (for example, bus routes that connect to major railway stations) and feeder routes (branch lines) making connections to these trunk line routes.

In other words, the most important requirement for trunk line routes is the securing of on-time runs and efficient operation of vehicles. In contrast, for feeder routes with the purpose of connecting to trunk lines and moving to neighboring districts, it is important to operate the transportation service with high frequency over short distances from suburban residential areas to facilities for convenience and easy access to amenities and trunk line railway stations. In addition, in providing public transportation services, it is extremely important to organize timetables that enable smooth connections between the trunk line and feeder routes (see Figure 7).

Figure 7. Concept change: Bus network



Source: Created by the author.

3. Zoning and Transportation Network (Case Study: Aomori City)

In Aomori City, the urban areas expanded in tandem with an increase in population. This was exacerbated by the progress of motorization and the increased number of suburban commercial facilities, causing the diffusion of urban areas and the hollowing-out of the city center. For this reason, Aomori City adopted the “Aomori City Urban Master Plan” in 1999, which centers around the ideas of restraining the disorderly expansion of urban areas and revitalizing the city center, and it set forth the “formation of a compact city”¹¹ as a guiding principle for the next 20 years. To demarcate the basic plan for the urban structure of the compact city, the Aomori City Urban Master Plan committee mapped out three areas of “Inner,” “Mid,” and “Outer” in a circular pattern radiating from the city center, set forth land utilization layout plans corresponding to the characteristics of each area, and designed community development plans from the two perspectives of “restraints on the disorderly expansion of urban areas” and “downtown renewal” (revitalization of the city center).

More specifically, the following development policy has been enacted for each area.

a) Inner-City

(1) Feature

- Urban areas that have existed since around 1970, aging dense urban areas, and the city center.

¹¹ The “Compact city” policy has also been closely related with the “Smart city” policy in Japan. A smart city is an urban area that uses different types of electronic Internet of things (IoT) sensors to collect data and then use insights gained from that data to manage assets, resources and services efficiently.

- Areas of concentrated urban development where urban zones must be restructured.

(2) Policy

- ◆ Seek to develop transportation systems, focusing on public transportation systems.
- Seek to enhance the convenience of bus use through the review of existing routes and introduction of small loop-line buses.
- Seek to enhance the convenience of railway use through the review of timetables and improvements to station facilities.
- Seek to enhance the convenience of access on foot to public transportation systems as well as the convenience of bicycle transportation and vehicle transportation.
- ◆ In the city center, seek to enhance the convenience of accessing downtown through various means of transportation and develop a pedestrian and bicycle transportation environment for touring within the district.

b) Mid-City

(1) Feature

- Areas between the Inner-City and Outer-City with low-rise residential districts, or prospective areas for supplying high-quality housing lots.
- Concentrated urban zones with narrow community roads where there are many housing and commercial districts developed in a disorderly manner during the period of high growth.
- Implementation of land readjustment projects, which promote surface development with good living environments resistant to snow, district plans, and other methods of inducing desirable land use.

(2) Policy

- ◆ Seek to develop transportation systems that promote the shift from private vehicle transportation to public transportation.
- Seek to enhance the convenience of bus use in various districts by developing branch bus routes in addition to trunk line routes.
- Seek to introduce a “cycle & bus ride system” by enhancing the convenience of access to buses by bicycle.
- In areas surrounding railway stations, seek to utilize a “bus & ride system” by operating buses in cooperation with railway services.
- Proceed with the development of skeletal roads, including an inner circumferential line under construction, for efficient bus operations.

c) Outer-City

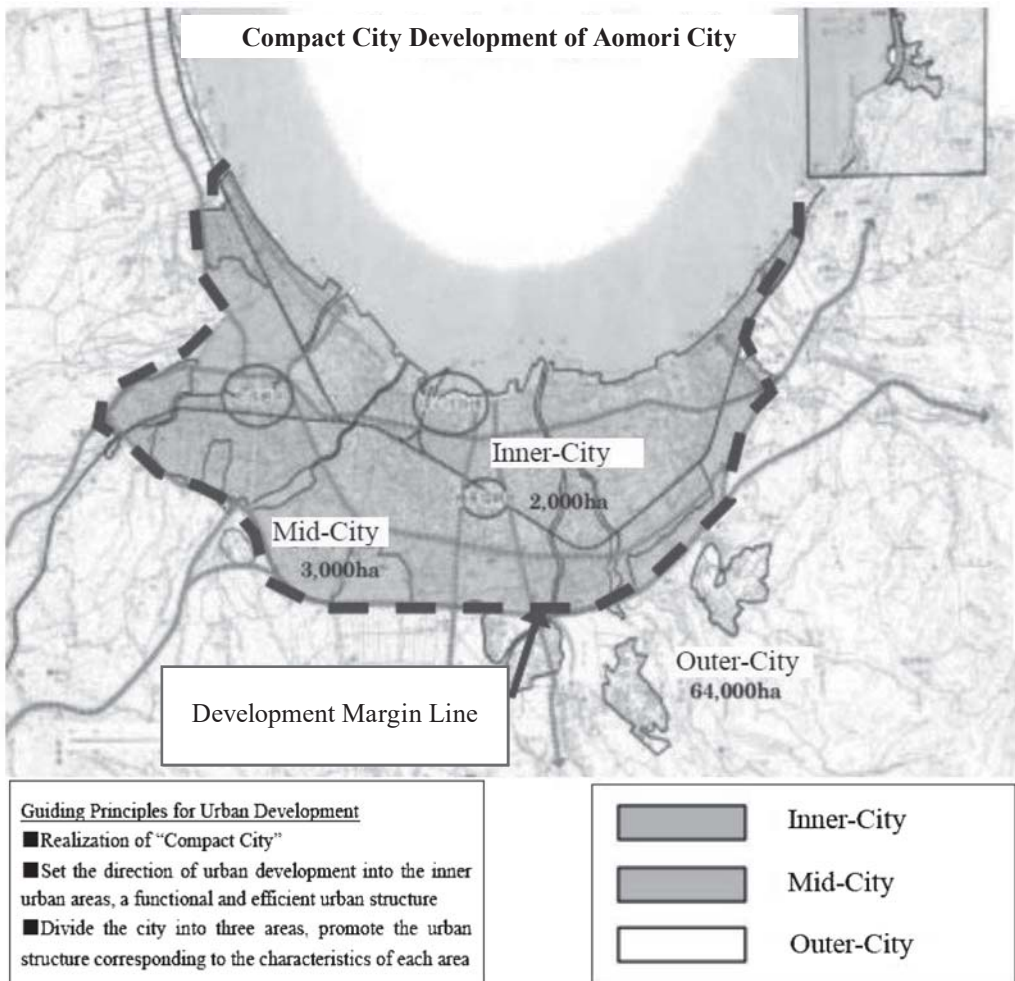
(1) Feature

- Areas outside the outer circumferential line, which mainly coincide with the Aomori Expressway, where development is not allowed in principle, with efforts to be made to restrain urbanization and preserve the natural and farming environment.

(2) Policy

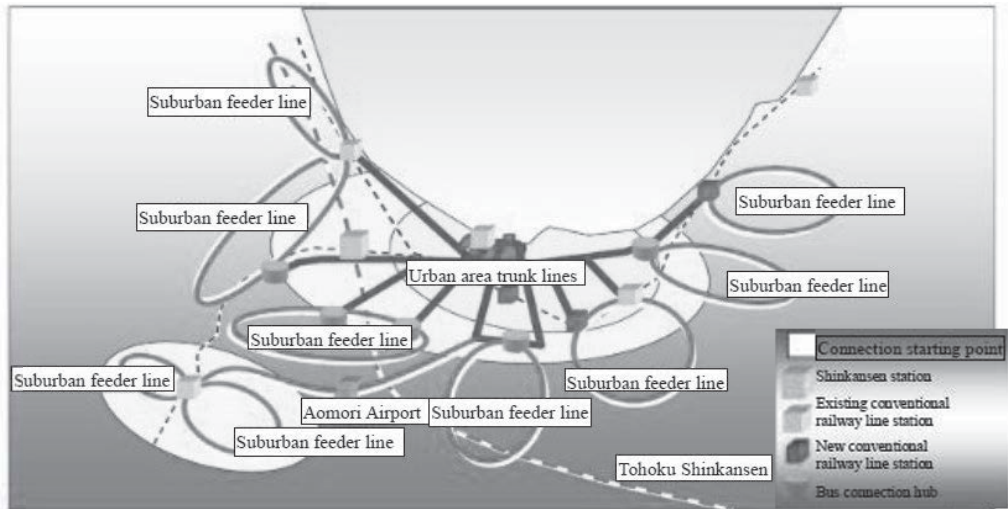
- ◆ Seek to develop transportation systems that enhance the convenience of transferring between vehicle transportation and public transportation systems.
- Seek to utilize trunk line bus routes for major suburban spots (such as the Aomori Airport and key housing complexes).
- Seek to ensure the services of supplementary bus routes that connect to trunk line bus routes for other districts.
- Seek to utilize “park & ride systems” by making good use of existing parking spaces and developing new bus routes for districts where it is currently difficult to use buses.
- Proceed with the development of radial ring roads to promote the coexistence of vehicles and public transportation systems (see Figure 8-1 and Figure 8-2).

Figure 8-1. Aomori City: Compact City Policy



Source: Created by the author based on materials from Aomori City.

Figure 8-2. Aomori City: Trunk line and Feeder line



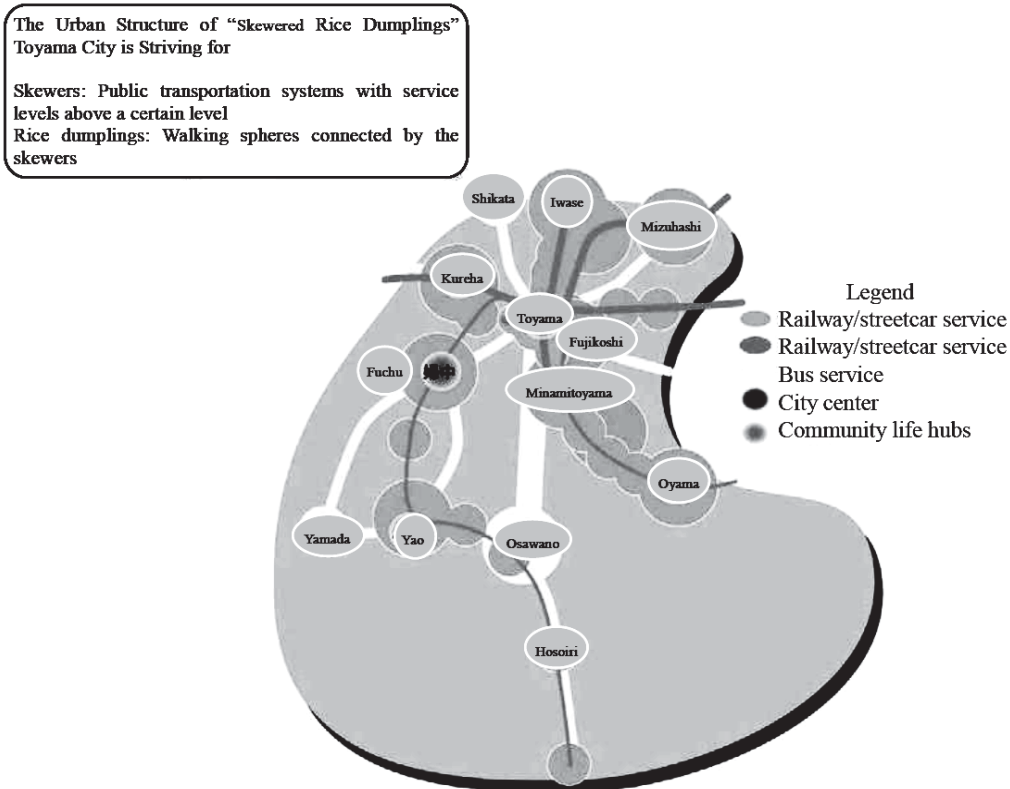
Source: Created by the author based on materials from Aomori City.

4. Inducing dwellings on transport routes (Case Study: Toyama City)

In Toyama City, the population decline in the city center and the decrease in population density in urban areas are expected to progress. At the same time, the number of users of public transportation systems has continued to decrease and dependence on private vehicles remains high among citizens, with the ratio of private vehicles in the share of transportation standing at the highest level among Japan's major urban areas.

Faced with these problems, Toyama City decided to realize “the hub-centralized development of a compact city centered around public transportation by revitalizing railway tracks and other public transportation systems and concentrating a variety of urban functions, including residence and commerce, along the routes.” The guiding principle of this development policy is the idea of the “urban structure of skewered rice dumplings,” which seeks to realize an urban lifestyle based on walking and public transportation systems via clustered urban structures, with walking spheres described as “rice dumplings” and public transportation systems that connect the rice dumplings as “skewers” (see Figure 9).

Figure 9. Toyama City: Compact City Policy



Source: Created by the author based on materials from Toyama City.

a) Portram

Toyama City launched the Toyama Light Rail in April 2006. The continuation of the former JR Toyamakou Line was endangered because of a falling number of users. The JR line’s future was discussed in the course of the development of areas around Toyama Station in association with the opening of Hokuriku Shinkansen, and it was later revived as Light Rail Transit (hereafter known as “LRT”).

Toyama City decided to transform the Toyamakou Line into a streetcar line. Subsequently, after considering technological aspects, demand, and financial prospects, the city set up a third-sector entity that launched the streetcar service as “Portram” in April 2006. Using the pre-existing tracks of the Toyamakou Line, Portram also constructed 1.1 kilometers of tracks around Toyama Station and upgraded all vehicles, including the introduction of seven cars with new low-floor vehicles. The Toyama Light Rail was established by the public sector and is operated by the private sector, with around ¥5.8 billion spent on the purchase of vehicles and development of tracks and stations subsidized by Toyama City, Toyama Prefecture, and the State.

b) Centram

Toyama City extended and circularized a part of the intra-city track lines of the Toyama Chiho Railway and began as a loop line, or “Centram,” in December 2009. As the number of passengers using the intra-city track lines had been declining each year, Toyama City implemented projects to extend and circularize the intra-city track lines to revitalize the core urban areas and enhance the accessibility of the city center. Centram created a new loop line of 3.4 kilometers by extending the existing tracks, and it introduced three cars with new low-floor vehicles. Centram used a two-tiered system for the first time in Japan under the 2007 Revitalization Act.

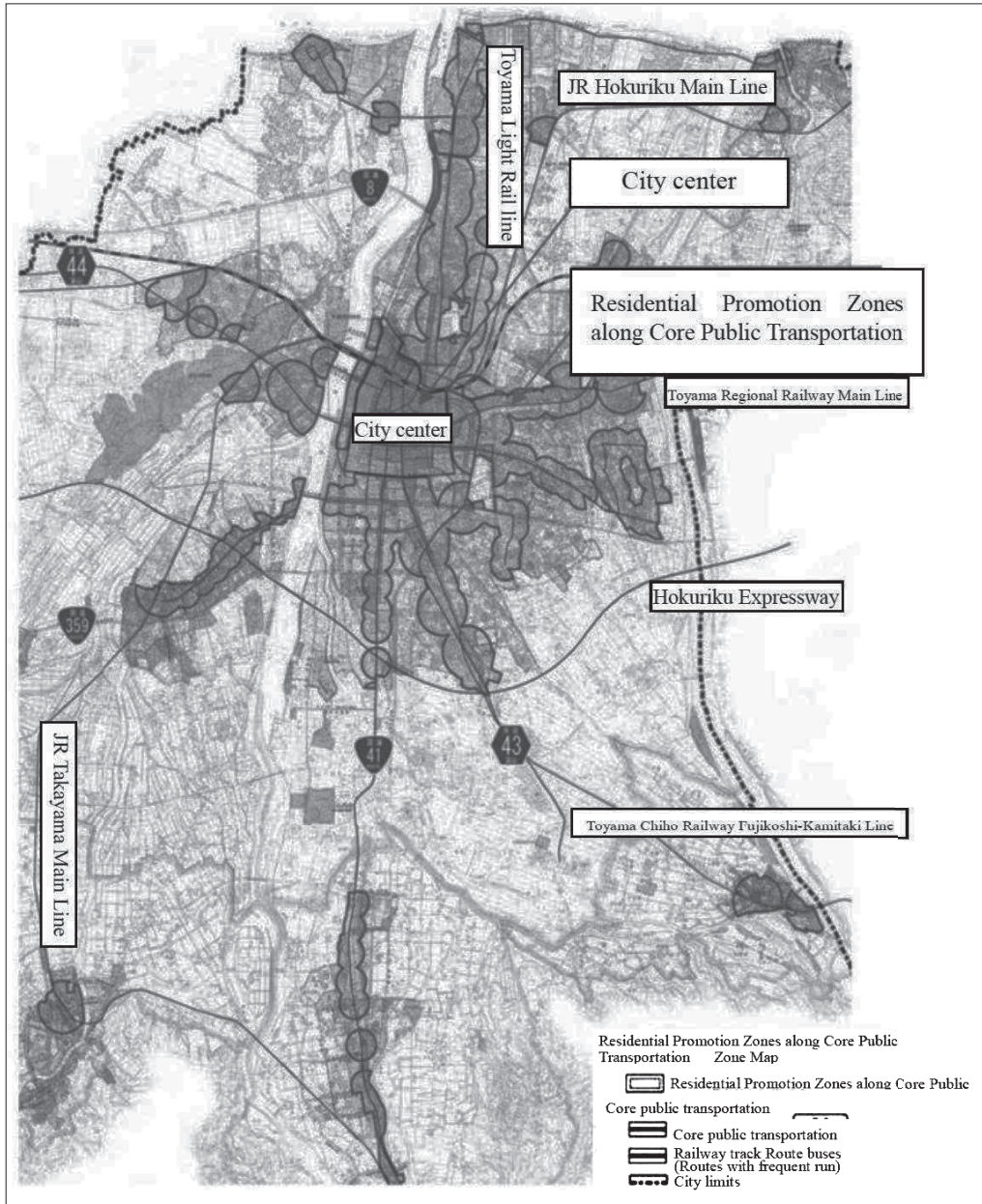
c) Zoning for promotion of residential housing

Toyama City has been promoting residential housing to realize the development of a compact city. In residential promotion zones along core public transportation systems, the city has been providing support to promote the construction of apartments and housing units. In addition, it has been supporting and subsidizing housing construction, housing acquisitions, and rents in the city center as “downtown residential housing promotion projects” (see Figure 10).

These projects are designed to promote residency in the city center and along local public transportation routes with public subsidies; their policy intentions are remarkably clear. Such projects may be affected by fiscal limitations and other conditions, but they are believed to present one means of developing a compact city and maintaining the added value of urban areas.

In such arrangements, the city provides a grant to the person who purchases a house along a bus route. The amount of the grant is three percent of the amount of the private loan that the buyer has taken out from the bank (see Figure 11).

Figure 10. Toyama City: Residential Promotion Zones



Source: Created by the author based on materials from Toyama City.

Figure 11. Toyama City: Housing Funded by Grant (Sample)



Source: Photo taken by the author in Toyama City.

C. ICT (High-Tech Sharing for Urban Spaces)

The third measure involves the strategic application of ICT. McLaren (2017)¹² stated that “smart cities invest in high-tech information and communication strategies to wire-up the city and enhance its efficiency and boost the ICT sector as a motor of growth and property development.” He also indicates that “a successful city needs good governance and collective civic structures to facilitate and regulate the interface between the shared public realm and private interests, and to enable effective and fair sharing of resources and opportunities.”

As McLaren suggests, ICT is a driver of city growth. The more significant point, however, is that ICT can be an *interface* between the public and private sectors or between government departments; this is why ICT can lead to a shared economy or lead to cross-departmental policies. McLaren illustrates the example of San Francisco¹³ : “another project of the Office of Civic Innovation is the Living Innovation Zone (LIZ) program, which improves and enlivens public spaces through

12 Source: Duncan McLaren and Julian Agyeman, “*Sharing Cities*”, The MIT Press, 2017, pp.1-2.

13 Op.cit., pp.22-23.

creative projects and technologies. [...] In these zones, innovators, artists, and designers are provided with real-world opportunities to test the impact of new ideas and technologies. For example, parabolic acoustic amplifiers have been installed at Market Street and Yerba Buena Lane. These have been adopted [by street performers who quietly strum a banjo on one, while hundreds of pedestrians are strolling past on the other side]. More broadly, San Francisco provides opportunities at the interface of design and implementation, in which high-tech sharing companies can showcase their innovations. The community participation, enhanced social interaction, and sociocultural development that these projects create provide insight into the potential that high-tech sharing holds for urban spaces.”

At the same time, we should pay attention to Hong’s (2001)¹⁴ statement that “economic and environmental sustainability are two interacting attributes of urban systems. Economic sustainability, in a normative sense, supports a level of environmental sustainability chosen by society.” As Hong suggests, the economic phase and environmental phase are two wheels of a car, so high-tech sharing for both phases is in high demand in smart city policies.

As described above, ICT can put high-tech sharing for urban spaces into practice. In this respect, the government has been attempting to ensure more effective and environment-serving city management through ICT. Among various trials, this paper focuses on two types of high-tech sharing. One is the case of establishing an independent distributed energy system, and the others is the case of finding new regional “spots” by recording confluences of the people on the streets.

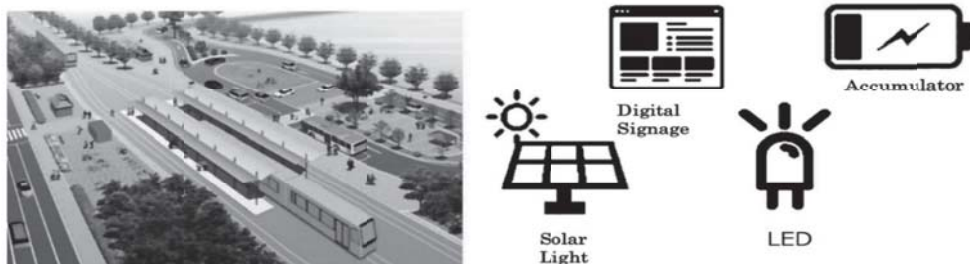
1. Establishing an Independent Distributed Energy System

Below is an image of a transit center in Utsunomiya City; this city is building LRT according to the following framework:

- a) The transit center serves as a park-and-ride location (passengers will transit from automobiles, buses, and bicycles).
- b) LRT is supplied with regenerated energy (solar energy).
- c) The transit center is operated by an accumulator and solar light. During disasters, the energy is used as an alternative for electricity and digital signage (see Figure 12).

14 Source: Sung Woong Hong, ‘FDI in Asia in boom and bust: Sustainability of cities and economies in Asia’, *Globalization and the sustainability of Cities in the Asia Pacific Region*, United Nations University Press, 2001, p.68.

Figure 12. Utsunomiya City: LRT and energy system



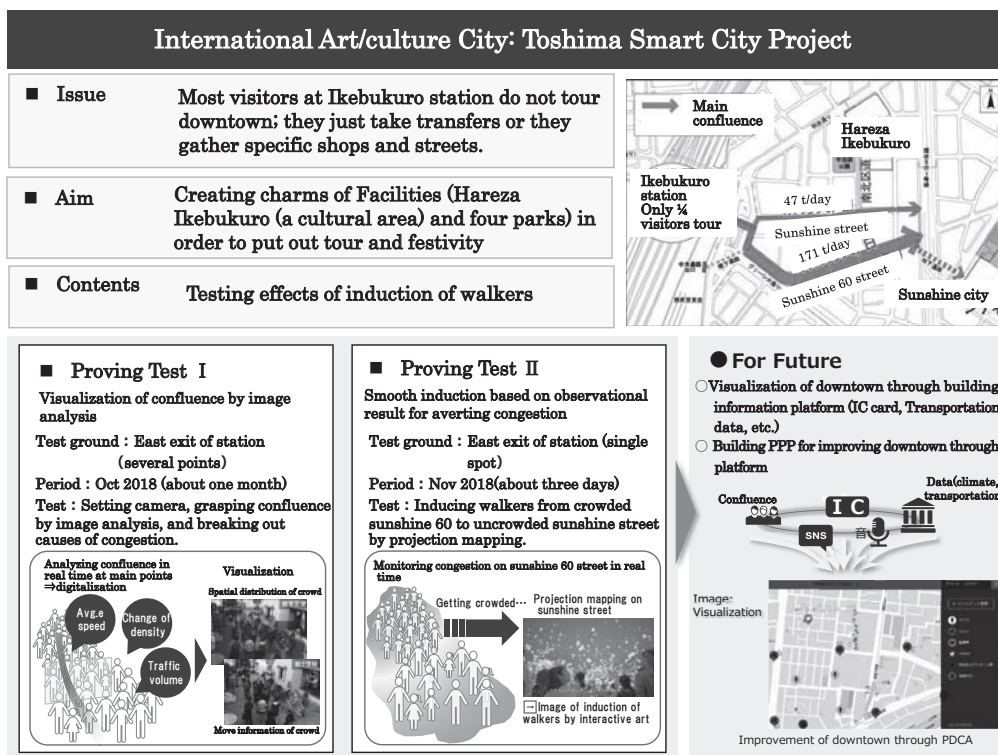
Source: Created by the author based on materials from Utsunomiya City.

These projects are based on the concept of harmony with the environment and their methods are based on PPP; these are typical cases of high-tech sharing for urban transportation spaces.

2. Identifying Regional Resources

In Toshima ward, tests have been conducted to create charming areas and change city-dwellers' use of the streets by recording their movement. The outcome of these tests may show the locations (such as public spaces and shops) to which people gravitate. Through this analysis, the ward is expecting to find out regional resources which are not only new but also substantial and practical. (Ref.Figure13)

Figure 13. Toshima Ward: Visualization of confluence

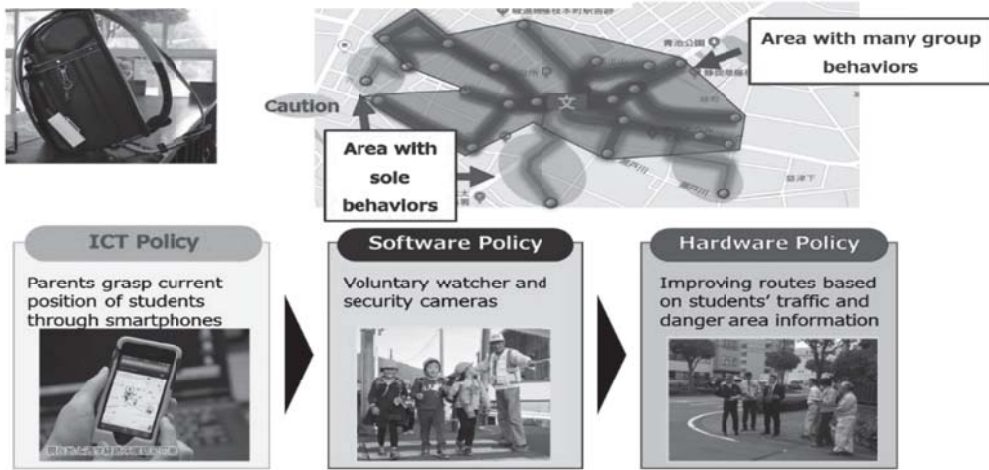


Source: Created by the author based on materials from the MLIT.

3. Progression in Security for Students

In Matsuyama City, parents use smartphones to track the current position of their children, mainly to ensure their safety. Through an analysis of this data, the city defines areas with sole behaviors (individual students) and those with group behaviors. This information is valuable for determining the distribution of voluntary student guardians and security cameras as well as for improving school routes in accordance with safety risks. This policy involves high-tech cooperation among several actors related to spaces in which students attend school, such as parents, the education committee, and the road-building division, with the ultimate goal of progression in school education. This case shows that ICT has the potential to improve public services on multiple levels (see Figure 14).

Figure 14. Matsuyama City: Progression in Security for Students



Source: Created by the author based on materials from MLIT.

IV. Conclusion

This paper set the question; *what is the key idea for planning effective sustainable city policies based on the past Japanese experiences?* In considering this question, we should pay attention to the fact that Japan is in a specific situation; Japan has reached to the full-scale decrease in population and this is a clear difference with the other Asian countries.

Based on this point, we are able to understand that the persons involved in the urban policies come under pressure to have *perceptual changes* for administration in order to go ahead with the sustainable development in the face of this reality. Therefore I can indicate that the change in thinking for urban policy is the key for effective sustainable city policies and those changes have begun in the front lines. Then what is the perceptual changes for administration in the context of sustainability? This paper shall illustrate three samples.

First, in the field of urban policy, expanding the area of DID¹⁵ was a desired policy corresponding to economic development. However today *making compact civil life area* is the goal in a falling population society. We should depart from the size of DID and instead we should pursue the quality of urban life in compact area. This is an essential shifting of priorities.

Second, in the field of transportation network, the bus routes should be designed to run where people live. However today, some city like Toyama City has adopted the idea that *people should live where the bus runs*. This is also an current fresh idea of the urban policy but this case shows that the necessary countermeasures to shrinking society is required in a true sense in the forefront.

¹⁵ DID refers to a Density Inhabited District, which is a main index for urban policy.

Third in the field of ICT for effective everyday life, the government was expected to *make* the spots which have the ability to pull in more customers; they were generally thought to be the magnets for tourists or to upgrade the value of areas. And the government has been trying to increase name recognition of them as a regional development policy or a tourism policy. However today, the institutions are trying to find out the spots in confluence of the people through ICT monitoring; not making spots but discovering them through ICT. This is one of the practical change of thinking in urban and industrial policy.

As already stated, Neckermann (2017) pointed that a smart city combined not only its data, resources, and infrastructure but also *people* to continually focus on improving livability. One of the practical ways of this theory are the above perceptual changes of the peoples' way of thinking about the urban policies. Those changes of the perception of the people stated above can be the prospect for the solution of sustainable development challenges.

In addition a sustainable city is an aggregation of power and creativity, but also *a body of data and live analysis*. And sharing the perceptual changes based on data and analysis among the institution actors such as the government and PPP leaders is prerequisite for departing from rigid and old bureaucratic urban policies. If such conditions are met, the society can steadily move ahead on sustainable city policies.

<Reference 1> The local transport network formation plan.

In 2007, given that the conditions surrounding local public transportation systems grew increasingly severe following the deregulation of entries into, and exits from, service routes, the *Act on Revitalization and Rehabilitation of Local Public Transportation Systems* (hereinafter referred to as “the Revitalization Act”) was enacted. On the basis of the Revitalization Act, municipalities can prepare a *comprehensive cooperation plan* for local public transportation systems after consultations with statutory councils comprising relevant public transportation operators, road administrators, public safety commissions, and users. Municipalities then submit the plan to the MLIT. Preferential support measures under relevant laws are given to public transportation businesses positioned in the comprehensive cooperation plan certified by the ministry. Amid population decline, the progression of the aging population, and the dwindling birthrate, there are concerns over business contraction and service degradation due to the falling number of passengers carried by public transportation systems, particularly in rural regions. Since it is important to enhance local public transportation systems to maintain the dynamism of local communities under these circumstances, the Revitalization Act was partially amended in May 2014. In the amended Revitalization Act, the comprehensive cooperation plan is transformed into a *local public transportation network formation plan*, and cooperation with community development policies is positioned as one of the items in the plan. In addition, the plan involves the reorganization of local public transportation systems to set specific details of the surface restructuring of public transportation networks (for example, the review of existing routes and operating timetables and the introduction of new services), and the amendment is designed to address the reorganization of public transportation systems and community development in an integrated manner. The legal systems related to local public transportation have undergone major changes since the 2000s (see Table 2).

Table 2. Trends of Main Legal Systems

Time	Trends of Main Legal Systems
February 2000	Deregulation of chartered bus business (the Road Transportation Act), domestic air transportation business (the Civil Aeronautics Act)
March 2000	Deregulation of domestic passenger railway business (the Railway Business Act)
October 2000	Deregulation of domestic passenger ship business (the Marine Transportation Act)
February 2002	Deregulation of bus business, taxi business (the Road Transportation Act)
October 2006	Establishment of the registration system for personal-use paid passenger transportation (the Road Transportation Act)
October 2007	Enforcement of the Act on Revitalization and Rehabilitation of Local Public Transportation Systems
December 2013	Enforcement of the Basic Act on Transportation Policy
December 2014	Enforcement of the amended Act on Revitalization and Rehabilitation of Local Public Transportation Systems

Source; Made by Author.

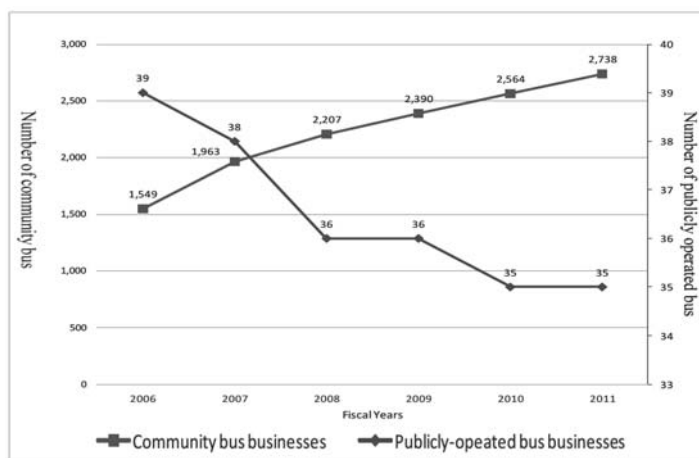
The two significant characteristics of these changes are (1) the clear-cut and important legal positioning of local governments and (2) the legal linkage between transportation policies and community development policies. In this case, local governments are expected to make maximum use of their planning functions related to transportation networks and community development as well as their coordination functions to develop consensus among local residents and draw up a future map of local public transportation systems.

<Reference 2> Community Bus

- a) The appearance of community buses is one of the key measures of the state of regional transportation system in Japan. Community buses are a means of shared transportation or private vehicle transportation for on-time, fixed-route operations. Although there is no legal definition of community buses, their characteristics can be summarized as follows:
- b) Local governments are involved either directly or indirectly in the management of or funding for their operations;
- c) They cover small-scale demand for transportation of communities that existing means of transportation cannot cover sufficiently;
- d) In many cases, fares are low and the source of funds are composed of fare revenues, subsidies by public funds and beneficiary charges;
- e) They are granted positions (evaluation, image) as the public-interest means of transportation for communities.

While the number of publicly-operated bus businesses has been on the gradual decline in recent years, the number of community bus businesses (the number of routes served) has continued to significantly increase from 1,549 businesses in 2006 to 3,063 businesses in 2013. It shows that local governments have to keep means of transportation by using tax revenues. (Ref. Figure 15).

Figure 15. Changes in numbers: Public operated buses and community buses



Source; Made by Author.

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