

Recent Developments in Local Railways in Japan

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Introduction

Japan has well-developed inter-city railway transport, as exemplified by the shinkansen, as well as many commuter railways in major urban areas. For these reasons, the overall number of railway passengers is large and many railway companies are managed as private-sector businesses integrated with infrastructure. However, it will be no easy task for private-sector operators to continue to run local railways sustainably into the future.

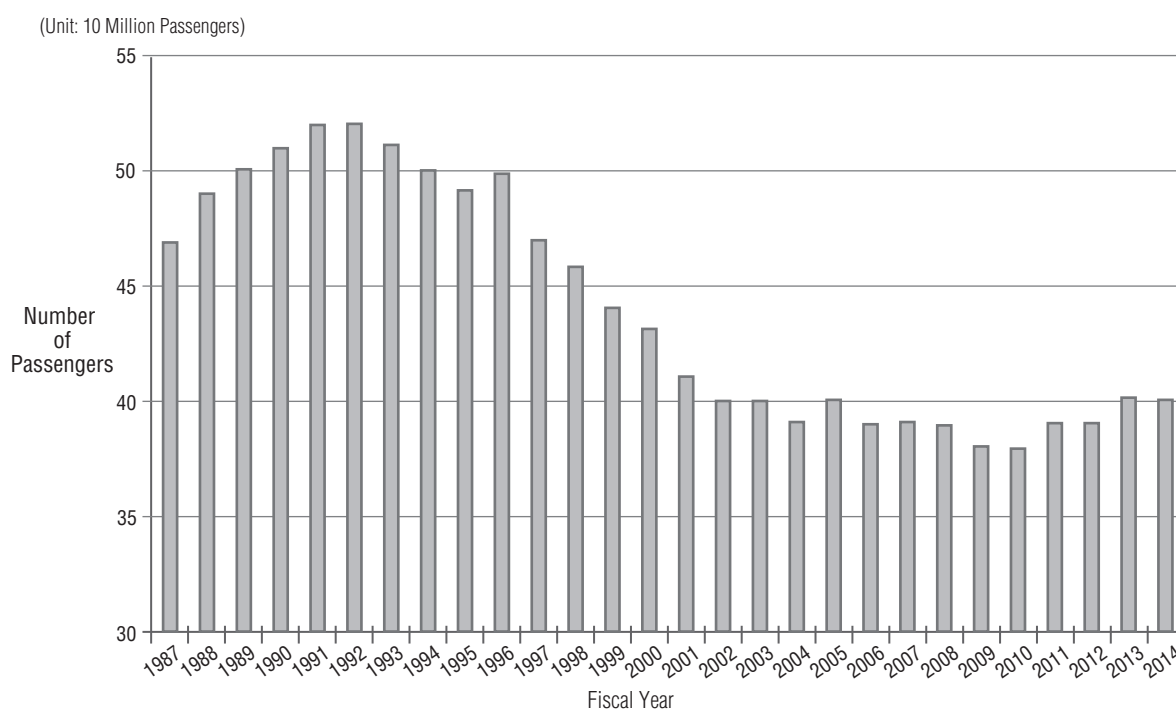
Outside major urban areas, the number of railway users is steadily decreasing in Japan amidst structural changes, such as accelerating private vehicle ownership and accompanying suburbanization, declining population, and declining birth rate. Local lines spun off from Japanese

National Railways (JNR) and its successor group of railway operators (the so-called JRs) in the late 1980s often became quasi-public railways funded in part by local government, and those railways also faced management issues. As a result, approximately 670 km of track was closed between 2000 and 2013.

However, a change in this trend has occurred in recent years. Many lines still face closure, but the number of cases where public support has rejuvenated local railways is rising and the drop in local railway users too is coming to a halt (Fig. 1).

The next part of this article explains the system and recent policy changes in Japan's local railways, while the third part introduces specific railways where new developments are being seen; the fourth part is a summary.

Figure 1 Change in Local Railway Passenger Volumes



Note: 70 companies excluding operators starting after FY1988
Source: Annual Report of Railway Statistics and Investigation by Railway Bureau

Recent System Changes in Local Railways

Transportation policy in 2000s

The transportation market has experienced 'market failure' in economic terms. For this reason some level of local monopoly is recognized and fares are set based on the full-cost principle corresponding to supplier costs instead of according to the principle of supply and demand. Moreover, items such as safety must be done thoroughly under the instruction of government authorities for transport projects, requiring special technologies.

However, public transport in Japan is for the most part provided by private-sector operators, and generally run without public subsidies. Following the successful JNR division and privatization, the Railway Business Act and Road Traffic Law were revised in 2000 and 2002, respectively, eliminating regulation of supply and demand for railways and public buses and enabling operators to enter and exit the market freely. This created a transport system based to an even greater extent on market mechanisms.

Under such policies, closure and downsizing of unprofitable local railway lines accelerated. Although deregulation policies were only one factor behind such closure and reduction, the vicious circle of cost cuts and drops in service levels due to falling profitability led to further drops in users continuing into the 2000s, furthering the decline in local cities and regions amidst structural changes of declining population.

Change in transportation policy

While deregulation was a basic framework for transportation policy in the 2000s, regional governments in Japan, faced with problems in local transportation, have started to actively intervene in its management. Attempts to convert to quasi-public operators have been made by injecting public capital along with vertical separation of infrastructure, such as track and facilities, from operations. In the 1990s, some areas adopted 'deemed vertical separation' removing the accounting burden of infrastructure, but since the late 2000s, the idea of abandoning past railway management and working to continue or rehabilitate railways using a new form of management has gradually gained prominence.

At the national level, the Act on Revitalization and Rehabilitation of Local Public Transportation Systems was passed in 2007, and a system was established for the national government to provide support for 'general partnership plans for local public transportation' based on agreements with local governments. Moreover, the law enabled separation of track ownership and operations (vertical separation) of tramways not envisioned in previous laws.

Establishment of Basic Act on Transport Policy and 'compact and networked structure' strategy

Further developments started in Toyama City and some regional railways under the new law, but this has not halted the decline in local railways as a whole. As mentioned earlier, the drop in the number of railway users and closure of lines continues as reliance on private automobiles increases, and public transport as a whole is in crisis. For example, mobility-impaired people having no means of getting around due to closures has become a social issue.

In these circumstances, the idea of passing a basic law on transport similar to France's Domestic Transport Act (la loi d'organisation des transports intérieurs, LOTI) became popular and the Cabinet approved the bill for a Basic Act on Transport in 2011. The bill was dropped temporarily as a result of the chaos caused by the Great East Japan Earthquake and subsequent change of government. Eventually, the 2013 Basic Act on Transport Policy was enacted with added elements, such as response during disasters and sound management of transport operators. It expresses a fundamental principle of satisfying basic demand for transport (Article 2), followed by articles on securing and improving functions of transport (Article 3), reducing the environmental load (Article 4), appropriate role-sharing and coordination (Article 5 and 6), and securing traffic safety (Article 7). A Basic Plan on Transport Policy was established on this basis. In line with the principles of the Basic Act on Transport Policy, revisions were made to the Revitalization and Rehabilitation of Local Public Transportation Systems and Act on Special Measures concerning Urban Reconstruction. Taking into account these laws, resilient 'compact and networked structure' became the catchphrase for land development in the 2015 National Spatial Strategy. Local public transportation including railways has come to play a key role in national land development. See Saito (2015) for details on Japan's railway policy and the Basic Act on Transport Policy.

Recent New Developments

This section covers new developments in local railways in the past 10 years. It introduces three examples each for building LRTs and trams in provincial cities with some population concentration, and for rejuvenating regional railways with lines in fairly broad areas, including rural land near provincial city suburban areas.

Trends towards LRTs in provincial cities

Japan currently has 19 tram operations in 17 cities. Due to the negative impact of increased ownership of private automobiles, most are just managing to stay afloat by



Toyama Chiho Railway opened loop line in December 2009

(Author)

shortening lines and running small single cars. There are no LRT lines constructed anew; Toyama Light Rail, which opened in 2006 by completely renovating the former JR West Toyamako Line with some on-street running, being the only LRT. Some recent developments in Toyama City, Sapporo City, and Fukui City, are explained here.

Toyama City

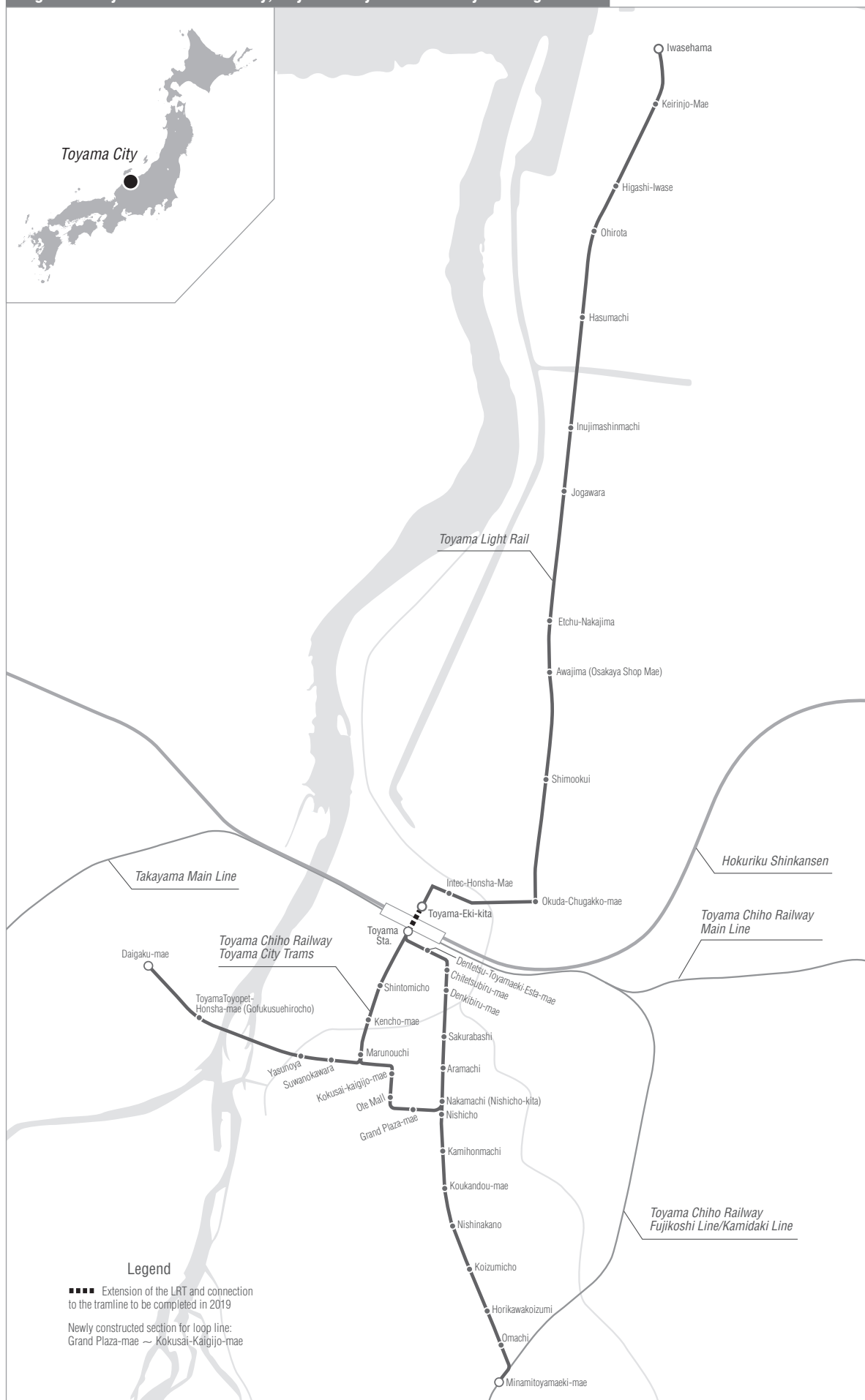
Toyama Prefecture on the Sea of Japan has the second highest average number of automobiles per household at 1.71 cars, making it very reliant on automobiles. Toyama City, the prefectural capital, is a typical regional city with a population of 420,000. In order to reverse urban sprawl, it proposed a compact city strategy in 2006 based on the revised Act on Vitalization of City Centres.

Although reliance on private cars is high in Toyama City, it had (in 2006) a well-developed network of railway lines with the Hokuriku main line connecting cities along the Sea of Japan, the Takayama main line connecting Toyama and Gifu, the Toyamako Line connecting Toyama to the outer

port of Iwasehama, the Toyama Chiho Railway connecting Toyama with Unazuki Onsen and Tateyama, and the Toyama City Tram Line operated by Toyama Chiho Railway. The Toyamako Line, which was up for closure, was converted to an LRT, and the 7.6-km Toyama Light Rail (Portram) quasi-public railway, funded in part by Toyama City, was opened in April 2006. To connect with the existing Toyama City Tram Line, the city bore the cost of building 0.9 km of track and opened a loop line (Centram) in December 2009 (Fig. 2). It was opened under the vertical separation enabled by the Act on Revitalization and Rehabilitation of Local Public Transportation Systems.

Additionally, Toyama City released the *Odekake* (outing) commuter ticket bus pass for an unprecedentedly low fare of ¥100, allowing city-centre access for older citizens. Use of these tickets has been expanded to Toyama Chiho Railway's lines, the Toyama City Tram Line, and Toyama Light Rail. One unique programme allows free travel on Toyama City Tram Line and Toyama Light Rail when purchasing flowers at specified flower shops. Also, foreign tourists are given

Figure 2 Toyama Chiho Railway, Toyama City Tram and Toyama Light Rail



discount tickets for free travel on the light rail and loop line when staying at city hotels. In addition to transportation itself, urban planning was promoted by linking with transportation policy using subsidies for construction of condominiums as a measure to motivate people to live in the city centre, subsidies for people purchasing homes, and for construction of facilities for the elderly alongside public transport lines.

The number of services on Toyama Light Rail was greatly increased from about one per hour in the JR era to one every 15 minutes, with longer operation hours, more stations, and better barrier-free accessibility. The better overall service convenience more than doubled the number of users. In the 10 years since opening in FY2015, the number of users increased by 2.1 times on weekdays and by 3.4 times on holidays compared to before opening, and a remarkable increase in daytime use by older citizens has been seen on weekdays. According to a Toyama City survey, 20% of weekday users are new customers who avoided moving about previously. Toyama Light Rail helps the elderly to get out more and further broadens people's social networks. See Utsunomiya (2016) for the effect of Toyama Light Rail on residents along the line.

The loop line has also had a large effect. Use of existing Toyama Chiho Railway trams also increased as moving about the city centre has become easier, resulting in 13% growth in

2012 compared to 2009 when the loop line opened.

As a result, city centre business has grown as more people go there. The number of pedestrians in the city centre in 2012 increased by 32% compared to 2006. And the number of vacant shops dropped from 20.9% in 2009 to 19.4%. The city centre had seen a greater outflow of population than inflow previously, but began seeing greater numbers moving in from 2008, and the outflow of population served by public transport lines is gradually decreasing. This demonstrates that results are starting to be seen from using public transportation and forming a compact city.

Fukui City

Fukui City is the capital of Fukui Prefecture in the Hokuriku region on the Sea of Japan (Fig. 3). It has Japan's highest number of automobiles per household, making it indisputably over-reliant on automobile transportation. However, Fukui Prefecture, like Toyama Prefecture, historically has had a well-developed railway network. The Hokuriku main line runs north-south, and it also has the Etsumi-Hoku Line running east from Fukui City, the Echizen Railway Katsuyama Eiheiji Line, the Echizen Railway Mikuni Awara Line running along the coast from the northwest part of Fukui City, and Fukui Railway running almost parallel to the Hokuriku main line, connecting Fukui City with the nearby cities of Sabae and



Ceremony marking 27 March 2016 start of through services between Echizen Railway's Mikuni Awara Line and Fukui Railway

(Author)

Figure 3 Fukui Railway Tramline and Echizen Railway

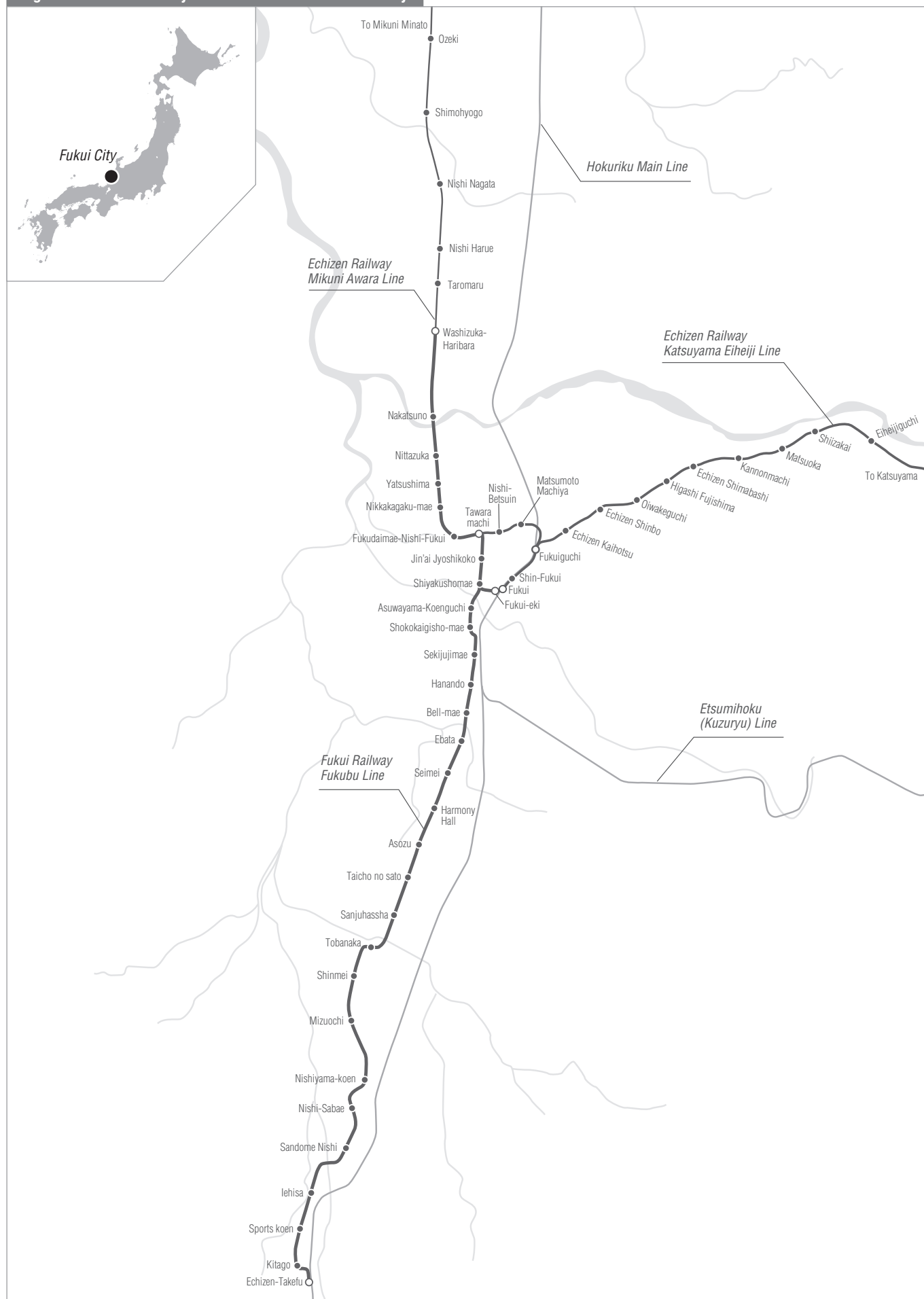


Figure 4 Phoenix Tawaramachi Line Poster



Echizen and also operating an on-street section in the city centre in front of Fukui Station.

Echizen Railway and Fukui Railway have undergone major changes since 2000. The Echizen Railway lines were previously operated by a different company, Keifuku Electric Railroad. Operation was stopped after two head-on collisions in 2000 and 2001, with Keifuku submitting notice that it would close its lines in Fukui. Local governments along the lines worked to continue operation, funding establishment of the quasi-public Echizen Railway in 2002, and restarted operations in 2003.

Fukui Railway was a private railway whose major shareholder was Nagoya Railroad, a big railway company based in Nagoya, but it ran into financial problems and was rehabilitated as a new company funded by entities such as local governments and chambers of commerce along the lines. This was the first application of a railway restructuring project under the Act on Revitalization and Rehabilitation of Local Public Transportation Systems.

No new lines were built in Fukui City, unlike Toyama City, but the revolutionary event was the March 2016 start of through services between Echizen Railway's Mikuni Awara Line and Fukui Railway. Previously, trains from these railways would pass at Tawaramachi Station, but few people

Figure 5 Change in Number of Passengers at Echizen and Fukui Railways



changed trains between the two railways, and the network was not used effectively. With the support of Fukui Prefecture and other local governments along the lines, both railways built new low-floor cars respectively, and established related facilities by renovating the junction at Tawaramachi and adding new platforms for low-floor cars at Echizen Railways' stations. Japan's first 'tram-train' line subsequently started with through service between a railway and a tramway of two companies. The line was dubbed the 'Phoenix Tawaramachi Line' as the connection generated a rebirth for the two companies (Fig. 4). The previous terminus for the Fukui Railway tramway section that fed Fukui-Ekimae Station was extended slightly to form a transit centre joined with the bus terminal in front of JR West Fukui Station.

It is too early to evaluate the success of through services in Fukui, but the number of train users on both railways has been increasing over the past few years (Fig. 5), and the number of passengers passing between the two railways each month is 2.9 times that before through services started. The case of Echizen and Fukui Railway shows that the rehabilitation of railways by assertive investment by local government is leading to more users.

Sapporo City

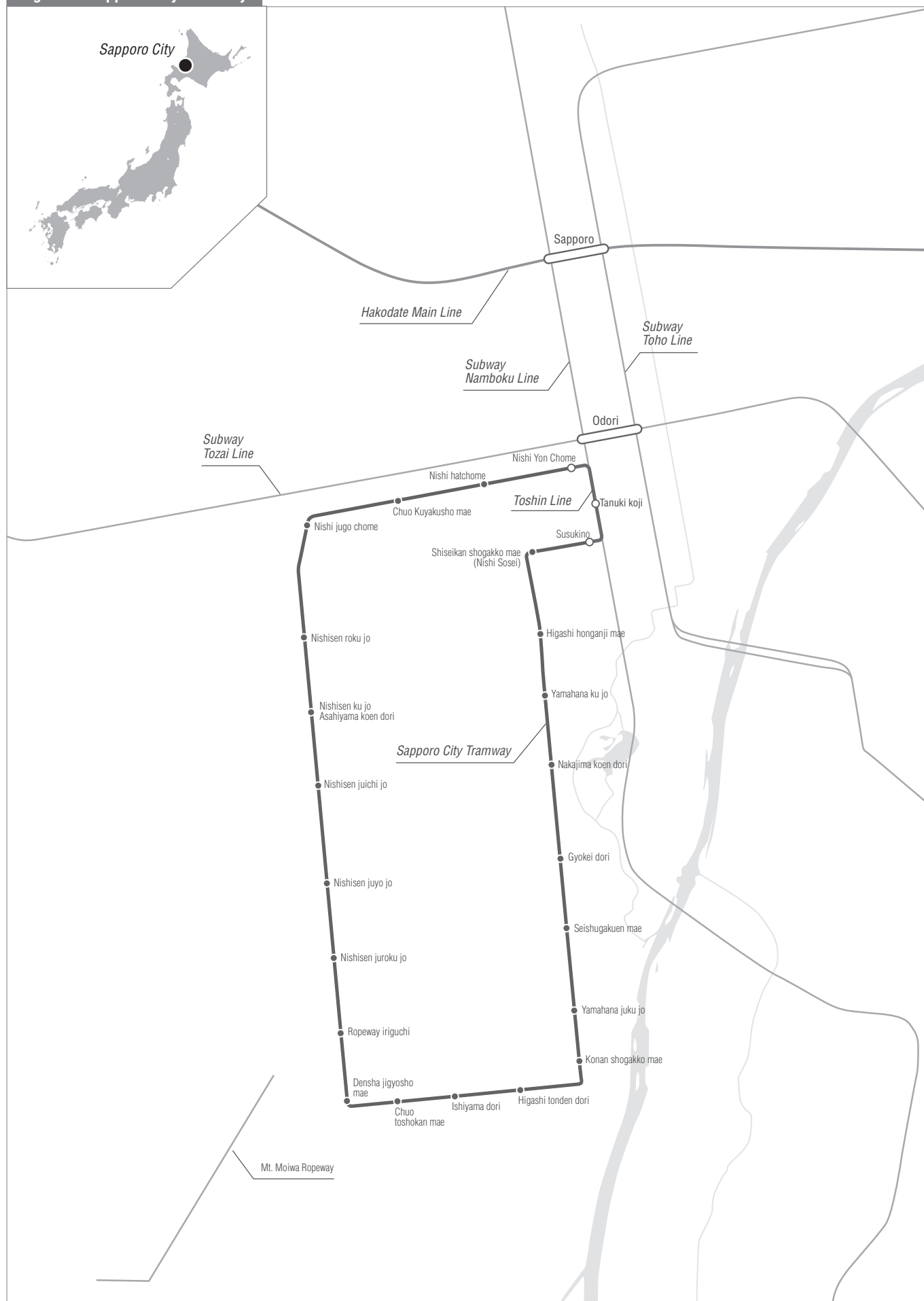
Sapporo City is the capital of Hokkaido Prefecture and has a population of more than 1.9 million, making it one of Japan's major urban areas. It is different from provincial cities suffering from decline due to city centre hollowing out, because it has various public transport modes, including 48 km of track for three lines of the Sapporo Municipal Subway as well as JR Hokkaido lines that form an urban transportation network. Meanwhile, tramways have been gradually closed with construction of subway lines, and only a single line with 8.5-km double track is operated today by Sapporo City Transportation Bureau. Unprofitability had led to closure talks since 2000, but a decision was made in 2005 to continue operation and start new developments. Low-floor cars were introduced in 2013, and loop line operation started in 2015 by building two 400-m tracks between the two downtown terminals at Nishi Yon Chome and Susukino (Fig. 6). While the length of the extension is short, it passes through the city centre, resulting in more users. In the 6 months since the start of loop line operation, the number of users has increased by 9% over the previous year. To commemorate the loop formation, a special live concert was



Sapporo City tram line loop line opening ceremony

(Author)

Figure 6 Sapporo City Tramway



held in March 2016 on a tram making trips around the city.

Side reserves have been introduced for the extended track, enabling users to board/alight from/to the sidewalk directly, increasing convenience. Side reserves have difficulties such as coordination with trackside shops and taxi companies, but Sapporo City overcame these difficulties to achieve Japan's first side-reserve tram tracks.

Sapporo also has a programme allowing anyone to book a tram for exclusive use to take a 1-hour loop of the city for ¥15,740, or ¥18,880 in the case of new low-floor cars. Tables and karaoke sets can be rented, and the trams are used as venues for local parties.

More than half the trams in Sapporo are old bogie cars built in the 1950s and early 1960s, and unlike other LRTs in the world, they are old-fashioned trams. However, the success of the line extension has boosted plans for new lines, such as an extension to the front of JR Hokkaido Sapporo Station.

Developments in local railway rehabilitation

Many railways in Japan are managed by private-sector companies other than operators in the JR group of

companies. The 16 major private railways in large urban areas have particular significance. Although other traditional local railways are being closed gradually, there are still more than 100 operators including quasi-public railways and excluding tramways. As previously mentioned, there have been some developments in rehabilitation of local railways by public intervention in recent years. A pioneering example is Wakayama Electric Railway that took over Nankai Electric Railway's Kishigawa Line—a branch line—and adopted vertical separation to start operations in 2006. It is a fairly small railway in Wakayama Prefecture spanning just 14.3 km, but thanks to novel ideas of 'appointing' local stray cat *Tama* as stationmaster at the terminus and running cat-themed trains, it has become a mecca for tourists from around the world.

The following covers three typical examples other than Wakayama Electric Railway.

Hitachinaka Seaside Railway

Hitachinaka Seaside Railway is a 14.3-km non-electrified railway connecting Katsuta Station in Hitachinaka City of Ibaraki Prefecture, about 100-km northeast of Tokyo, with Ajigaura on the Pacific coast (Fig. 7). Before



Hitachinaka Seaside Railway attracted railway fans with old style diesel motor cars

(Author)

Figure 7 Hitachinaka Seaside Railway



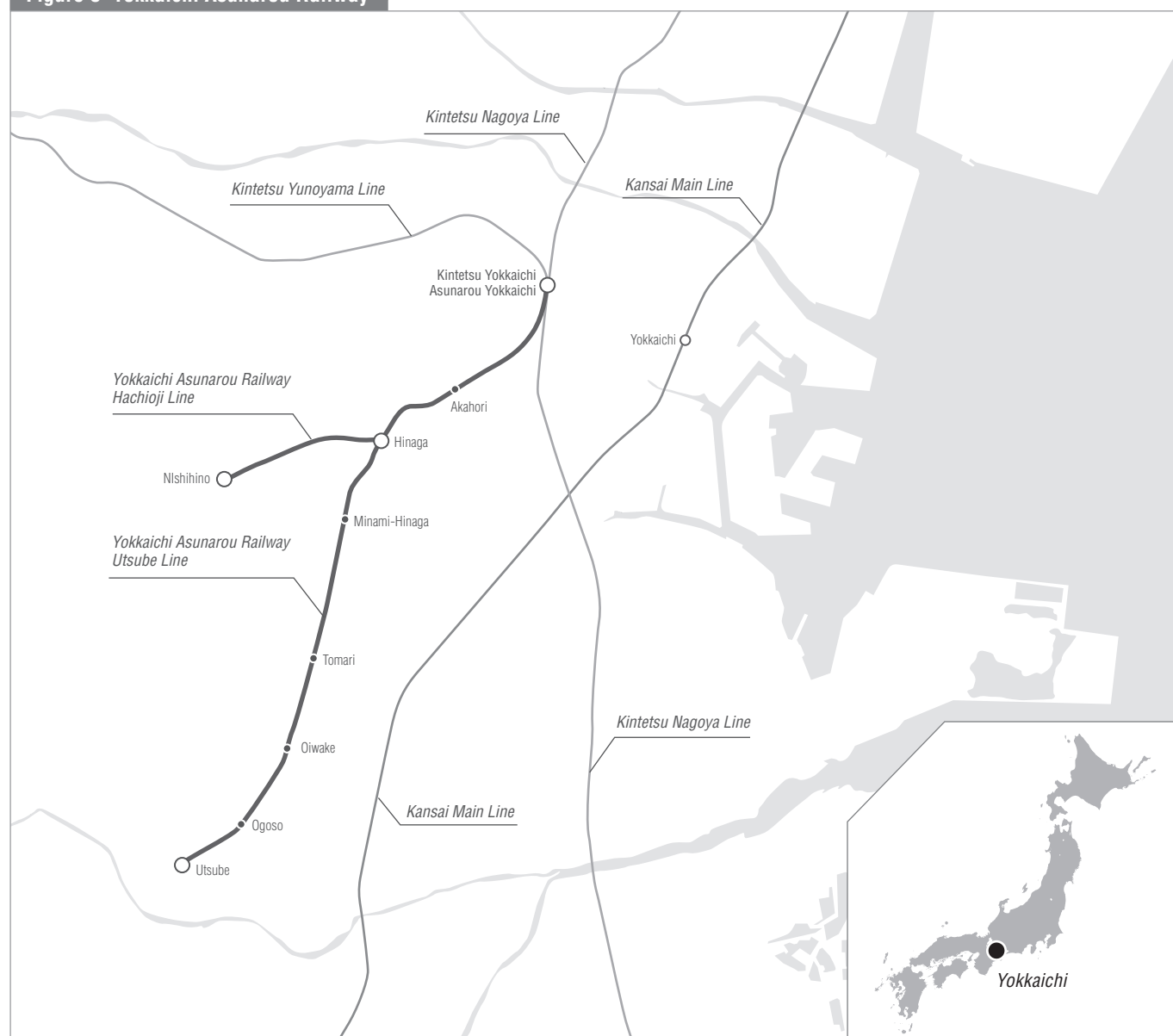
1994, Hitachinaka City was separated into Katsuta and Nakaminato cities, and the railway was an intercity service carrying residents of Nakaminato City to Katsuta Station to connect with the Joban Line. It was operated by Ibaraki Transport, which also runs buses in Ibaraki Prefecture. Hitachinaka City is home to a factory of the major electrical manufacturer Hitachi and has some population concentration, but Ibaraki Transport intended to close the line as part of efforts to streamline its business. Hitachinaka City thus funded a quasi-public railway to keep the line running after 2008. The city made an unprecedented public invitation for candidates for the post of president of the railway company and ended up appointing President Chiaki Yoshida, who had demonstrated his abilities in rehabilitating the Man'yo Line in the Hokuiku region.

Hitachinaka Seaside Railway attracted railway fans with old-style diesel motorcars, which is popular among fans, held sales events for local vegetables at Nakaminato where the head office is located, and otherwise carried out events using local produce. When an amateur comic book sales event was held in nearby Mito City, the railway ran a

'maid train' with waitresses dressed up as maids, as seen in Japanese manga, creating a buzz amongst animation fans. It also built a train passing loop at the mid-line station in 2010. Being able to increase the number of train runs by providing additional investment also spurred more users.

The Great East Japan Earthquake in March 2011 caused a pond adjacent to the track to burst its banks, flooding the roadbed and cracking a tunnel. The recovery cost of ¥300 million was more than 20% of the railway's annual income, but Hitachinaka City and residents along the line gave their full support to enable the line to reopen fully in July, 4 months after the earthquake. The number of passengers continued increasing afterwards, and the highest number since the start of the new company was recorded in FY2015. In 2013, Hitachinaka City Mayor Motoki Honma revealed plans for an approximately 3-km extension of the line from the present terminus at Aji-gaura to Hitachinaka Seaside Park, with a formal proposal being made in 2016. If a local railway once in danger of closure can build the extension, it will be an unprecedented development in the history of Japan's local railways.

Figure 8 Yokkaichi Asunarou Railway



Yokkaichi Asunarou Railway

Yokkaichi City is an industrial city of 310,000 in Mie Prefecture near the centre of Japan. It has been a petrochemical centre since the post-war high-economic-growth period. JR Central as well as the major private Kintetsu Railway handle main line transport in Yokkaichi City. There are also two branch lines running from Kintetsu Yokkaichi Station in the city centre—the Kintetsu Yunoyama Line and Yokkaichi Asunarou Railway introduced here (Fig. 8). Yokkaichi Asunarou Railway started in April 2015 with a total of 7 km of track running in two directions from Yokkaichi City to Nishihino and Utsube. It was previously a Kintetsu branch line. Kintetsu is the largest railway company in Japan, in terms of track length, second only to the JR group of companies, and links Osaka, Nagoya, Kyoto, and Nara, as well as providing urban transport

services. Its Yokkaichi branch was unprofitable as a 762-mm gauge light railway with no promise for modernization. As an aside, there are currently only three 762-mm gauge passenger lines in Japan: Yokkaichi Asunarou Railway, Sangi Railway Hokusei Line (also in Mie Prefecture), and Kurobe Gorge Railway in Toyama.

With annual losses of about ¥300 million, Kintetsu proposed line closure in 2012 with conversion to bus rapid transit (BRT) on the former roadbed. However, Yokkaichi City asked Kintetsu not to close the line and the two parties continued discussions. They were divided by Kintetsu's belief that demand could be covered at low cost using a BRT and Yokkaichi City's concern over ability to handle peak demand and the positive value for the city in having a railway link. The transport density was not low at 3.6



Yokkaichi Asunarou Railway started operation in April 2015

(Author)

million passengers per year on a 7-km line. Yokkaichi City was hesitant to inject public funds into a private-sector railway and it seemed that rehabilitation using a BRT would result. However, in the end it was decided to adopt vertical separation where the railway would be publicly owned and privately operated. In other words, Yokkaichi City would own the stations, track, rolling stock, and other railway facilities, and Yokkaichi Asunarou Railway funded 75% by Kintetsu and 25% by the city would run train operations. A scheme was devised where railway rolling stock and facilities would be transferred without compensation from Kintetsu to Yokkaichi City with the railway property loaned for free, and Yokkaichi City would subsequently loan those for free to Yokkaichi Asunarou Railway.

Yokkaichi City prepared the first 'Master plan for a local public transportation network' to be approved under the revised Act on Revitalization and Rehabilitation of Local Public Transportation Systems, clarifying the urban planning policies of 'promotion of compact city planning and maintenance of suburban areas' and 'efforts in becoming an environmentally advanced city'. The decision to take over the line of a major private railway under the precondition of support by public funds and making use of railway assets is symbolic as a new development in Japanese local railways.

Yokkaichi Asunarou Railway started modernizing rolling stock quickly in 2015, introducing the line's first air-conditioned cars, and it plans to modernize further rolling stock in the future.

Kyoto Tango Railway

In Japan, there are also cases of former JNR regional branch lines continuing as quasi-public railways using funding by local government. They differ from ordinary Japanese private-sector railways based on the system of being financially self-sustaining, but there are more and more cases where their operation must be reconsidered due to greatly deteriorating profitability. More than a few of the railways closed since 2000 have been old JNR branch lines that continued as quasi-public railways but could not prevent the drop in passengers.

Kyoto Tango Railway started as a former JNR line. It is a 114-km line running on the Sea of Japan in Kyoto Prefecture in an area about 2 hours by limited express train from Kyoto City (Fig. 9). The plan to reorganize its management and revitalize the surrounding area was approved at about the same time as Yokkaichi Asunarou Railway was approved. Previously, the line was operated by the quasi-public Kitakinki Tango Railway (KTR), established by Kyoto

Figure 9 Kyoto Tango Railway



prefecture and other local governments in the trackside area, took over operations from JNR.

Amanohashidate, one of Japan's top three scenic views, is located on the line but the area is depopulated with just a few small cities unlike Yokkaichi and Hitachinaka. KTR was known as Japan's most unprofitable railway due to the drop in passengers.

As a result, vertical separation was adopted with the quasi-public KTR owning the infrastructure and a new company was solicited to operate the railway, resulting in

the start of a new operating company managed by Willer Express, an expressway bus company with no experience in railways. Willer Express got its start in inter-urban bus transport using chartered tour buses following deregulation in the early 2000s and later became an expressway bus operator.

Willer Express established Willer Trains as the railway operating company, and started operation as Kyoto Tango Railway in April 2015. While it inherited rolling stock and other infrastructure, it quickly started to sell a variety of special



Exterior of *Kuromatsu* sightseeing and restaurant train



Interior of *Kuromatsu* sightseeing and restaurant train

tickets to spur use. For example, it ordinarily costs ¥1800 each way to ride the 89 km from Fukuchiyama to Toyooka, but family tickets for unlimited travel for up to two adults and two children are offered online for ¥2000. Its website states that the company aims to 'increase community value'; the *Dai-tantetsu Matsuri* festival to promote interaction between Kyoto Prefectural cities on the Sea of Japan that previously did not see much intercity travel quickly became a local hit as a result. It also held a 'railway business school' series of lectures to support local entrepreneurs in 2016 and a scheme was launched to invest in new railway business ideas using the Tantetsu Fund established at the same time as Japan's first investment-type railway fund. Many lecture attendees were locals from along the line. Results are still unknown, but it is a completely new development in Japan's local railways.

Kyoto Tango Railway also runs the *Akamatsu* (Japanese red pine), *Aomatsu* (Japanese blue/green pine), and *Kuromatsu* (Japanese black pine) sightseeing trains. All the interiors were designed by famous industrial designer Eiji Mitooka, and the *Kuromatsu* operates as a restaurant train. Such sightseeing trains are becoming increasingly popular on many of Japan's local railways and might be another way to aid their survival.

Conclusion

This article covers the recent system and policy changes in Japan's local railways and introduces specific railways where new developments are occurring. These examples are just a few such developments, and rehabilitation of railways using vertical separation schemes and novel ideas from publicly invited presidents is spreading. The concept of sightseeing trains is becoming popular, helping compensate for the decline in primary commuting demand. One feature of recent restaurant trains is use of local foods, such as fresh fish and vegetables based on the idea of 'local production for local consumption', which also helps revitalize local economies and communities.

The strong calls for profitability on Japan's local railways remain unchanged. However, a new LRT system in Utsunomiya City located north of Tokyo is now set to open in FY2019 after decades of discussions. More and more cities facing depopulation are forming their own 'Master plan for local public transportation network', and are carrying out those plans to revitalize local public transportation and society. In fact, no railway line has been closed since 2013. The situation is obviously changing. In addition, inbound tourism by foreign visitors has been increasing in recent years. This trend is surely a new chance to revive local regional railways. ■

Further Reading

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