

# Railway Operators in Japan 3

## Tohoku and Niigata Region

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### Overview

#### General description of Tohoku region

The Tohoku region of Japan is comprised of six prefectures in the northern part of the main island of Honshu: Aomori, Akita, Iwate, Miyagi, Fukushima and Yamagata. Tohoku is the rice basket of Japan, producing more rice than any other region. Even so, Tohoku is often viewed as 'the boonies' as its old name of *Michinoku* (end of the road) implies. Of course, the old name springs partly from prejudice, but it is true that the topography is noted for its uplands and high, steep mountain ranges. These conditions combined with heavy winter snows make transport difficult and have created a poor regional economy. Even today, average incomes in the region are lower than in other parts of Japan. Reliable transport is an important part of overcoming these disadvantages and development of transport networks is closely linked to regional development. The neighbouring Niigata Prefecture is really part of Japan's Chubu central region, but since eastern Niigata Prefecture is tied closely to Tohoku's transport network, I include it in this discussion. Niigata Prefecture is also a large rice producer.

The seven prefectures have a total area of about 80,000 km<sup>2</sup> and a total population of some 12 million.

#### Outline of railways

Many of Tohoku's high mountain ranges run north-south, so east-west traffic is forced to cross rugged highlands. Due to the topography, the transport corridors generally have a north-south alignment. We get a better idea of the transport network if we visualize it as three north-south trunk lines (Tohoku, Ou and Uetsu main lines), and a number of east-west branch lines crossing the region.

The 739.2-km Tohoku main line (Tokyo-Aomori) runs mostly between Tohoku's eastern highlands and the Ou Range forming the central spine of the Tohoku region. The main line passes through the prefectural capitals of Fukushima, Sendai and Morioka to terminate in Aomori.

The 484.5-km Ou main line (Fukushima-Aomori) branches from the Tohoku main line at Fukushima, crosses the mountains to the west and then turns north, hemmed in by mountains on both sides. It passes through the prefectural capitals of Yamagata and Akita to terminate at Aomori.

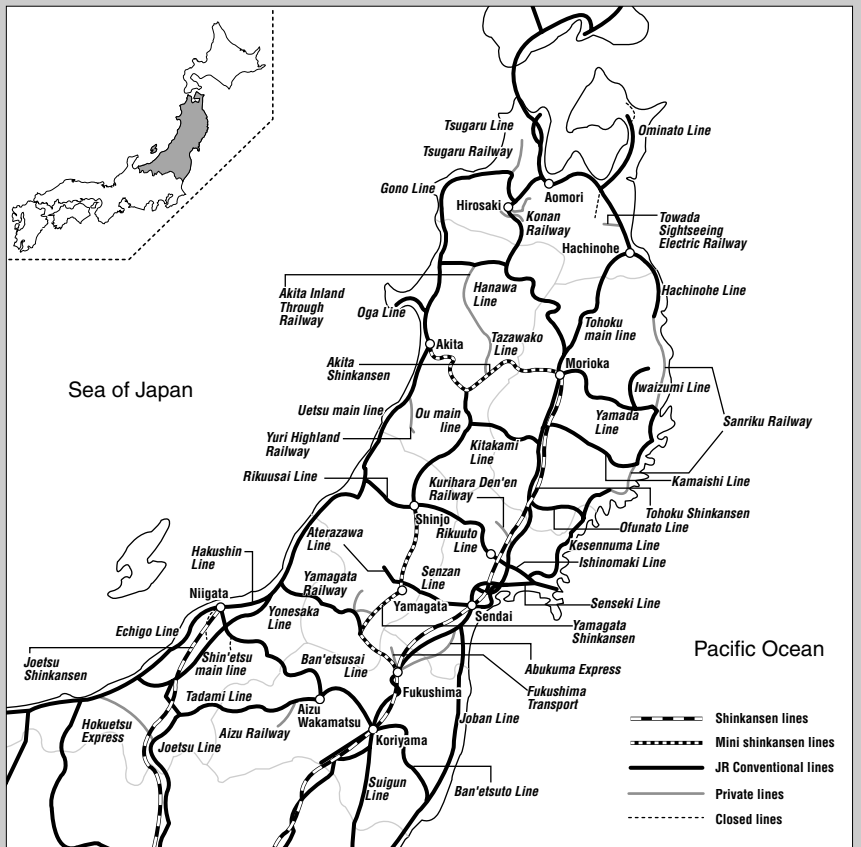
The 271.7-km Uetsu main line follows the Sea-of-Japan coast, avoiding the steep inland mountains. It runs from Niitsu

Station in Niigata Prefecture to Akita, passing through several large cities.

Several north-south lines serve the Pacific coast but the most important is the 343.1-km Joban Line linking Nippori Station in Tokyo and Iwanuma Station near Sendai. Other lines serve the sparsely populated Pacific coastal district but face severe financial difficulties.

As mentioned, the north-south lines form the basic traffic corridors and connect with a number of east-west branch lines. Niigata is linked to Tokyo via the Takasaki and Joetsu lines, and the Shin'etsu main line. Steep, high mountains separate Niigata from Tokyo, so the first line between the two cities made a wide detour to the west through Nagano. Later

Railway Lines in Tohoku and Niigata Regions



construction of long mountain tunnels solved this problem. After the Tohoku and Joetsu shinkansen were opened in 1982, they took much of the intercity passenger traffic that had been carried by the non-shinkansen lines. However, since shinkansen trains do not carry freight, freight trains now play a greater role on these lines.

This article on urban transport focuses on Sendai, the largest city in the Tohoku region and the prefectural capital of Miyagi Prefecture. Sendai has extensive suburbs and benefits from frequent railway services. It also has a subway. Railways play a very minor role in local transport outside the major population centres with most residents depending on cars. In the Tohoku region, passengers using public transport (including buses) are mostly young or elderly—in other words, people without driving licences. Trains are at an advantage only when a motor vehicle is inconvenient, such as when travelling long distances or in large cities where roads are often very congested. Consequently, railways in sparsely populated regions are in extreme financial difficulties.

### Railway operators

The majority of railway lines in the Tohoku region are operated by JR East, which took over the region's rail network from Japanese National Railways (JNR) at the 1987 privatization. JR East also serves the Tokyo metropolitan area where it enjoys a huge and stable captive market. The shinkansen and other intercity operations are doing relatively well in Tohoku as are services in the Sendai area. Even so, JR East's Tohoku operations are a huge financial burden because of the many long, hardly used lines. JR East cannot abandon these unprofitable lines easily because of their important social role, so it continues to operate them while trying to rationalize services as much as possible.



Series E2 for *Yamabiko* services on Tohoku Shinkansen and *Asahi* services on Joetsu Shinkansen (JR East)

Tohoku is also served by 11 small and medium private railways. The City Transportation Bureau operates the Sendai subway.

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## Interurban Transport

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### Tohoku and Joetsu shinkansen

The Tohoku and Joetsu shinkansen both opened in 1982. Right from the start, JNR knew these shinkansen would not be profitable because of the relatively minor economic role played by the areas they serve. The motive behind their construction was to establish closer ties with Tokyo and promote regional development. Consequently, the two shinkansen stand in stark contrast to the Tokaido (Tokyo–Osaka) and San'yo (Osaka–Fukuoka) shinkansen, which were built to serve areas of high economic activity.

The Tohoku and Joetsu shinkansen will soon have been in operation for two decades and we should ask whether they have achieved their original goals.

In 1980, Sendai's population was 664,000 but had risen to more than 1 million by 1999. (However, it should be noted that Sendai absorbed several neighbouring towns and small cities during this period.) In 1989, Sendai was the first city in the Tohoku region to be named an 'ordinance-designated city.' Under this designation, Sendai has greater administrative powers and enjoys the status of 'metropolis' (only 12 cities in Japan have this designation). In 1980, Niigata's population was 145,000 but had risen to 195,000 in 2000. Elsewhere, too, the fast shinkansen trains have developed tourism and contributed to local economies. Many skiers take the trains from Tokyo to Niigata Prefecture and ski resorts and hotels have sprung up near Echigo Yuzawa Station on the Joetsu Shinkansen.

Therefore, it is true to say that the economies of the Tohoku region and Niigata have been stimulated to some extent by almost 20 years of shinkansen operations. Of course, during this same period highways and open roads also

saw development, so we cannot give the shinkansen all the credit for the upturn. Even so, the overall development of the region's transport network has forged stronger links with Tokyo and improved the local economies.

The shinkansen trains have also changed over the same 20-year period. When the two shinkansen lines opened, the maximum speed was 210 km/h but the maximum speed increased to 275 km/h due to development of new rolling stock. The fastest trains now travel between Tokyo and Morioka in about 2 hours 25 minutes, and between Tokyo and Niigata in about 1 hour 40 minutes.

The original Series-200 shinkansen rolling stock is being replaced gradually. In the early days, the goal was to construct all shinkansen rolling stock to uniform standards whenever possible, but recent designs emphasize function over uniformity. For example, rolling stock for high-speed operations is now designed with the lowest possible profile to reduce air resistance. In contrast, double-decker shinkansen are being introduced in the Tokyo area to increase seating for

commuters. Today's shinkansen rolling stock can be roughly divided into six types, including trains that can run on both shinkansen and conventional lines.

**Through services on both shinkansen and conventional lines**

When the Tohoku Shinkansen began operation in 1982, most through services on conventional lines from Tohoku to Tokyo's Ueno Station were stopped and replaced by connections to some of the new shinkansen stations. For many passengers this meant an inconvenient transfer and wait at a shinkansen station with the result that travel to the final destination could take longer. The shinkansen did not pass through Yamagata and Akita prefectures and no definite plan had been announced to bring the new line to Aomori Prefecture. This led to strident calls for better connections so that people in these prefectures could also benefit from the new train.

Passengers travelling from Tokyo to Yamagata (the capital of Yamagata

Prefecture) would take the Tohoku Shinkansen to Fukushima where they transferred to the conventional Ou main line. It was soon realized that this inconvenient transfer could be eliminated if a train could be developed for use on both the shinkansen line and the Ou main line to Yamagata; planning based on this concept began in earnest in 1986. To offer through services, major track modifications would be required due to the different track gauges—1435 mm for the shinkansen track and 1067 mm for the narrow-gauge track to Yamagata.

Infrastructure modifications and manufacture of rolling stock were entrusted to a new company established and funded by JR East and Yamagata Prefecture; ownership of the modified facilities and new carriages was transferred to the new company. This arrangement reduced JR East's financial burden and ensured that a fair share of the cost was borne by the locality benefiting from the project. JR East now leases the track section from the new company.

Through services began in 1992 with the launch of *Tsubasa* (Wing), a limited express that is coupled to the *Yamabiko* shinkansen for the high-speed run on the Tohoku Shinkansen. When the coupled trains arrive at Fukushima, the *Tsubasa* is uncoupled so that it can proceed on the Ou main line on its own. Coupling and uncoupling occur on a regular basis at Fukushima Station.

The train's nickname for the Fukushima–Yamagata part of the journey is the Yamagata Shinkansen. But this does not mean that the Yamagata–Fukushima run can be equated with shinkansen services because the only major change is a wider track. Shinkansen track has very gradual gradients and gentle curves to accommodate high-speed travel, whereas the Fukushima–Yamagata track maintains the standards of a conventional line but has a gauge of 1435 mm. The



Series 400 for Yamagata-bound *Tsubasa* service with shorter body and smaller loading gauge (JR East)

maximum speed is only 130 km/h, far lower than speeds on the shinkansen track, which regularly exceed 200 km/h. In addition, genuine shinkansen tracks and facilities are grade separated. The Yamagata Shinkansen certainly does not meet these standards; it has level crossings; the grade is not separated; stock and structures must be kept small; train controls and signalling systems are different from the shinkansen; and local trains use the track during intervals between *Tsubasa* services. In other words, the Yamagata Shinkansen is not a shinkansen at all.

Even so, the elimination of the Fukushima transfer had a very positive effect. The fastest travel time between Tokyo and Yamagata is now less than 2 hours 30 minutes, a reduction between of 20 and 40 minutes. Another important result, although a psychological one, is the common impression that the people in the two cities enjoy closer contact than before. The transport industries, hotels, ski resorts and other enterprises near the stations have enjoyed increased revenues and ridership is up throughout the year. The *Tsubasa* services were extended from Yamagata to Shinjo in 2000. There are now plans to extend services to Sakata, an important centre on the Sea of Japan. The so-called Akita Shinkansen offers a similar through service. It leaves the shinkansen track at Morioka and runs on the Tazawako Line and Ou main line to Akita, the seat of the prefectural government. Planning for this project began in 1987, and operations commenced in 1997. Funding for the project was also raised locally.

The Akita Shinkansen has been named *Komachi* (Beautiful Woman—alluding to the beauty that Akita women are famed for). The fastest travel time between Tokyo and Akita is now about 3 hours 50 minutes although some trains take about 4 hours 20 minutes. This reduction of almost 1 hour is due to speeds being

raised from 110 to 130 km/h on the Morioka–Akita section and from 240 to 275 km/h on the shinkansen line.

These two projects have left the Ou main line with sections of different gauges, meaning that limited expresses that used to offer through services between Fukushima and Akita can no longer do so. This is a good example of how intercity rail transport in the region is being reorganized to accommodate the new shinkansen infrastructure.

### **Debate over shinkansen development standards**

In the 1970s, the government took the lead in promoting construction of the Tohoku and Joetsu shinkansen, as part of its Shinkansen Development Plan, which proposed extending the bullet train network throughout the country. The plan was based on the 1970 Nationwide Shinkansen Development Law. The new Ministry of Land, Infrastructure and Transport (MLIT) is now of the opinion that completed sections of the Tohoku and Joetsu shinkansen are not part of the shinkansen system developed under this plan. However, this opinion is influenced by a variety of political interests and it is a fact that the two lines were part of the original plan. Efforts to promote the plan were suspended temporarily in 1982 due to lack of funds but were restarted in 1987 when JNR was broken up and privatized. The shinkansen has had a very positive effect on local economies and lobbyists are eager to influence the choice of route and construction schedule. This has slowed down promotion of the plan's aims as has the tremendous amount of investment required.

When the plan was given new life in 1987, to reduce construction costs, the former Ministry of Transport proposed two construction methods that would be cheaper than building under the full shinkansen standard.

The first method, embodied in the mini-

shinkansen concept, involves widening existing narrow-gauge track to permit through services from shinkansen track. (This method was later used for the Yamagata and Akita shinkansen).

The second method, embodied in the limited-express concept, involves construction of basic infrastructure to shinkansen standards. Narrow-gauge track is used during an interim period, so it is not connected to existing shinkansen track. Narrow-gauge trains can run at about 160 km/h on this track. Later, the infrastructure can be used for full shinkansen services after the tracks have been widened and connected to existing shinkansen tracks. The tracks through the undersea Seikan Tunnel between Honshu and Hokkaido were laid according to this concept.

The Tohoku Shinkansen will soon be extended northward from Morioka to Hachinohe (Aomori Prefecture), and there was considerable debate on whether the full or mini standard should be adopted. One might expect that all local parties would want the full-standard shinkansen, but this is not necessarily true—communities served by limited express trains tended to favour the mini standard when they realize that full-standard shinkansen will not stop at their stations. For a while, mini-standard proponents were in the majority along the southern half of the proposed route, but the full standard was finally chosen for the entire section. Plans call for the Tohoku Shinkansen to begin services to Hachinohe in December 2002 with the line being extended to Aomori after that. Another question is the future of conventional lines paralleling the new lines. After a shinkansen line is opened, narrow-gauge trains serving the same corridor no longer attract intercity travellers, and they end up catering only to sparsely populated areas along the track. Fearing a serious drain on financial resources, the JR companies have urged



that they be allowed to relinquish responsibility for parallel conventional lines as a condition for operating a new shinkansen line. When the Nagano Shinkansen began operating between Takasaki and Nagano, JR East relinquished control of part of the parallel Shin'etsu main line, and a similar measure will be adopted for the narrow-gauge Morioka–Aomori line. Two other examples are the Iwate Galaxy Railroad (IGR) in Iwate Prefecture (the name comes from the novel *Ginga tetsudo no yoru* (Night of the Milky Way Railway) by Iwate-born writer Kenji Miyazawa (1896–1933), and the Aoi Mori Railway in Aomori Prefecture (the name comes from another reading of the two Chinese characters for Aomori). Both railways were established in cooperation with their respective prefectures. However, there is some doubt about whether these lines will be able to make profits. Rail freight is another contentious issue. Shinkansen only carry passengers, so freight trains will continue to play an important role on conventional lines for some time to come. JR Freight pays JR

East track fees for operating on JR East tracks, but a fee increase is unavoidable after shinkansen services are extended north from Morioka and a new company takes over the parallel narrow-gauge line. JR Freight has asked for subsidies, pointing out that its transportation costs will increase due to circumstances beyond its control and plans call for public money to be used to cover the increase.

**Narrow-gauge limited express trains and shinkansen**

The Series 485 *Hatsukari* (First Wild Geese) and Series E751 *Super Hatsukari* connect Hakodate in Hokkaido and Aomori to the Tohoku Shinkansen terminus in Morioka, but when Hachinohe becomes the new terminus, both trains will probably terminate there. The Series 485 *Kamoshika* (Antelope) from Aomori to Akita links a number of cities in western Aomori Prefecture and connects with the Akita Shinkansen. The Series 485 *Viva Aizu* connects Koriyama on the Tohoku Shinkansen with Aizu Wakamatsu, a fairly large city in the interior of Fukushima Prefecture.

Many narrow-gauge trains offer connections to stations on the Joetsu Shinkansen. One Niigata–Tohoku train is the Series 485 *Inaho* (Rice Ear) limited express, which uses the Hakushin Line and Uetsu main line. *Inaho* links Niigata with Sakata and other cities on the Sea of Japan and terminates in Akita. I should also mention two limited express night trains with sleeping cars, each of which makes one return trip per day between Aomori and Ueno (Tokyo terminus). These are the Series 24 *Hakutsuru* (White Crane) on the Tohoku main line and the Series 24 *Akebono* (Dawn) on the Joetsu and Uetsu main lines.

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**Urban Transport**

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**Sendai stands out in rail ridership**

The average daily passenger at JR East Sendai Station was approximately 95,000 in 1999. It shows that Sendai stands far above the rest in numbers of rail passengers. Sendai's metropolitan area has a radius of about 15 km, and most commuter travel occurs within this range. Plans are moving ahead to construct a railway line to Sendai International Airport.

**JR East's transit operations in Sendai**

JR East transit passengers use three lines in the Sendai metropolitan area—the Senseki and Senzan lines, and Tohoku main line. The 50.2-km Senseki Line stretches from Aoba Dori in downtown Sendai to Ishinomaki in the northeast. The western 12.6-km section between Aoba Dori and Tagajo supports frequent rail services with trains running about every 5 minutes during the morning commute. The section near Sendai Station was greatly improved recently. The western terminus was situated just east of Sendai Station, but redevelopment included a plan to



Series E751 *Super Hatsukari* limited express on Tohoku main line between Ken'yoshi and Suwanotaira (JR East)



Subway platform at Sendai Station

(Sendai City Transportation Bureau)

relocate part of the line underground and extend it to a new terminus west of the station. Completed in 2000, the project has eliminated a number of crossings and extended services by 0.5 km to Aoba Dori in the downtown core. Commuter cars used previously in Tokyo with four doors per side and long seats now run on this line, providing an unusual sight for a regional centre.

The 62.8-km Senzan Line links Sendai to Tomizawa and some stations connect with JR stations and bus routes. The population has increased along the line. There are plans for another subway line to traverse the city in an east–west direction and the municipal government is pushing to start construction in 2004. To keep costs low, it intends to construct a small cross-section tunnel similar to the Oedo Line already operating in Tokyo.

Frequencies are high on the 41-km Iwanuma–Matsushima section of the Tohoku main line straddling Sendai. Trains from other lines offer through services to the Tohoku main line and the older cars have been replaced.

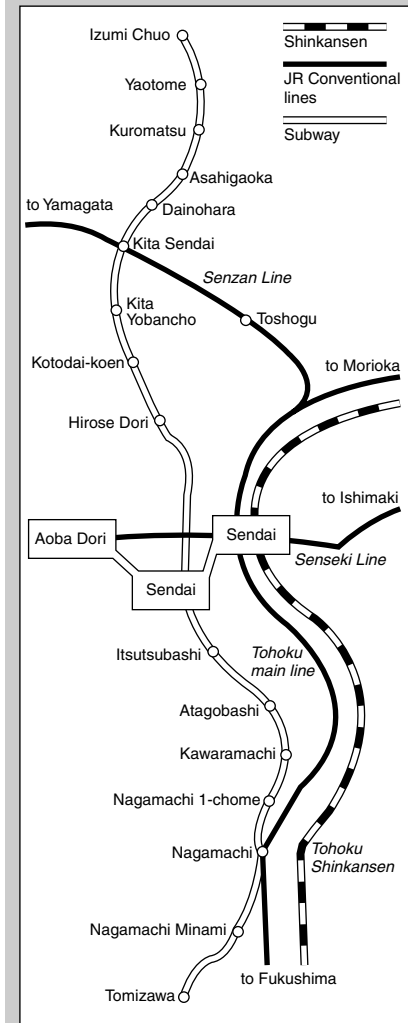
### Sendai City Transportation Bureau (subway)

Sendai used to have trams but the last ones were retired in 1976. From then on, the Transportation Bureau offered only bus services until it opened a north–south subway in 1987. The 14.8-km subway traverses the city and the line has been extended to one new station since it opened. Trains run from Izumi Chuo to Tomizawa and some stations connect with JR stations and bus routes. The population has increased along the line. There are plans for another subway line to traverse the city in an east–west direction and the municipal government is pushing to start construction in 2004. To keep costs low, it intends to construct a small cross-section tunnel similar to the Oedo Line already operating in Tokyo.

### Future airport access

Sendai International Airport is located south-east of the city beyond the municipal boundary. The travel time from central Sendai is about 40 minutes by car, but a planned rail link will reduce this. In 2000, local governments and

### Railway Network in Sendai



corporations joined JR East to establish Sendai Airport Transit Co., Ltd., the company that will operate the railway. Plans call for the construction of a single electrified 7.1-km track to link Natori Station on the Tohoku main line to the airport. Trains from Sendai Station will provide through services to the airport in about 20 minutes. The opening is scheduled for 2006.



Series Kiha 58 Gurutto Sanriku Train on Yamada Line between Kuzakai and Matsukusa (JR East)

## Local Lines

### JR East

With the exception of Sendai, rail ridership is not high in major Tohoku cities, so it is easy to imagine the difficult situation facing lines in sparsely populated areas. The situation is especially critical for all the east–west lines—the vast majority have just a single, non-electrified track and offer infrequent services. Many of these lines run long distances through depopulated areas.

Let's look at a few examples. To travel by train from Morioka to Hirosaki, a fairly large centre in western Aomori Prefecture, the railway map suggests that the best route would be the Hanawa Line from Morioka to Odate, and then the Ou main line to Hirosaki. But most travellers avoid this route—the Hanawa Line offers only seven return runs each day, and the 128.2-km trip from Morioka to Odate takes about 3 hours. The trip from Odate to Hirosaki takes another 30 minutes.

On the other hand, convenient highway buses link Morioka and Hirosaki in just 2 hours 20 minutes, with almost hourly services from around 07:00 to 20:00. Buses also offer about 14 daily return runs between Morioka and Odate, paralleling the railway's Hanawa Line, and the fastest

buses cover the distance in exactly 2 hours. The bus and train fares are similar, so the bus is obviously far more competitive. Although introduction of faster trains might be an answer, the many sharp curves and steep gradients make this a difficult challenge.

The 102.2-km Yamada Line links Morioka and Miyako, the most important city on the Pacific coast of Iwate Prefecture. This line is also in severe financial straits and there are only four daily return runs. Buses on the road paralleling the line make the Morioka–Miyako return journey more than 20 times a day, robbing the Yamada Line of any reason to exist. The 38.4-km Iwaizumi Line branches from the Yamada Line at Moichi, a short distance inland from Miyako. It offers only four return runs each day. JR East has stated its desire to abandon the Iwaizumi Line and local residents fear that this could one day lead to closure of the Yamada Line as well.

The Tadami Line links Aizu Wakamatsu (Fukushima Prefecture) with Niigata Prefecture and is said to have some of the best scenery in Japan, partly because there are few houses. The section straddling the Fukushima–Niigata border has the lowest train frequency with only three runs in each direction each day. During the worst winters, 50 cm of snow

can fall in one night and expensive snowploughs must be used to ensure uninterrupted service. The line is very unprofitable for JR East and traffic volumes are so low that it easily meets the abandonment criteria established by JNR just before privatization. But the road paralleling the line is in poor shape so the line is still in operation.

On some lines, JR East is trying novel ways to attract more tourists and boost ridership. An example is a steam loco-hauled train running on the 111-km section between Niitsu (Niigata Prefecture) and Aizu Wakamatsu (Fukushima Prefecture) at the western end of the Ban'etsusai Line.

### Private railways

Eleven other private railways also offer rail services in the Tohoku region. (There are also seven freight-only railways.) All these private passenger railways are extremely small compared to the private railway companies serving large urban centres in Japan.

Tohoku's private railways can be separated into two groups based on funding: private railways financed by private capital—they have a long history and many were constructed before WW II; and Private railways established by local governments—some were existing lines abandoned during JNR's last days and others were partially constructed by JNR and then abandoned because of poor finances. These private railways have launched intensive restructuring programmes to maintain operations at a time when ridership is slumping but some have been forced to close in the last few years. First, let's look at several railways financed by private capital. The Konan Railway serves Hirosaki (a major centre in western Aomori Prefecture) and its environs. The company operates two lines. The 16.8-km Kuroishi Line links Hirosaki and Kuroishi to serve an area not covered by JR East's Ou main line. It





Konan Railway's Series 7000 EMU standing at Chuo Hirosaki Station

(Author)

offers far more frequent services at intervals of about 30 minutes than the JR line. The Owani Line stretches from Chuo Hirosaki Station, which is close to JR East's Hirosaki Station in downtown Hirosaki, to Owani, a neighbouring municipality. It runs close to JR East's Ou main line, but is far more competitive because it has many more stations and operates much more frequently. JR East's trains from Hirosaki to Owani Onsen take about 12 minutes with only one stop and the service is very infrequent. Trains on the private Owani Line take 30 minutes to cover the 13.9-km distance but offer 11 stops and run at intervals of about 30 minutes during the day.

We might get the impression that the Konan Railway is similar to private railways in large Japanese cities but this is not the case. Its two lines serve a sparsely populated area with high levels of private-car ownership. Rail ridership is falling, partly because there are fewer children (a tendency seen throughout Japan). Another feature of the trains that sets them apart from metropolitan trains is the small number of cars—usually two and four at most. The company can offer frequent services by running short trains and it boosts demand by stopping at many stations.

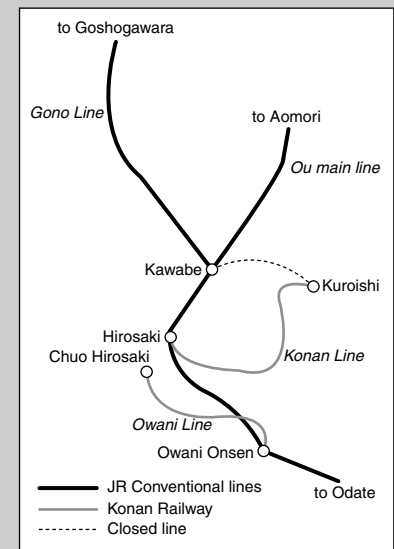
Similarly, Fukushima Transportation

operates a 9.2-km line between Fukushima and Iizaka Onsen. Although the company's main business is running bus services, it maintains ridership on its railway line by using Konan Railway's tactic of frequent services with short trains. In order to keep costs down, both Konan Railway and Fukushima Transportation bought used rolling stock from Tokyu Corporation (a major private railway in Tokyo).

Tsugaru Railway operates a 20.7-km line from Tsugaru Goshogawara to Tsugaru Nakazato near the northwestern tip of Honshu in Aomori Prefecture. The line runs northwards into an area where there is no JR line. It is very remote with no population centre so it faces a tough financial situation. The line was featured in the novel *Tsugaru* by Osamu Dazai (1909–48) but the few literature buffs who ride the train are certainly insufficient to keep the line in profit. To keep the railway running, the company sometimes organizes media events that attract users. For example, it installed an old coal-burning stove to heat the cars in order to give passengers an experience of Tohoku travel from years gone by.

What of the second group of private railways established by a local government? A good example is Sanriku Railway which operates the 71-km Kita

### Railway Network in Hirosaki



Rias Line from Miyako to Kuji, and the 36.6-km Minami Rias Line from Kamaishi to Sakari, both on the Pacific coast of Iwate Prefecture. These lines were taken over from JNR when it froze construction in 1980 under the Law for Special Measures to Promote JNR Rehabilitation. JNR started construction of the Kita Rias Line from the north and south ends but the middle 32.2-km section was left unfinished because of lack of funds so the north and south sections were closed. The reaction of the Iwate prefectural government and municipalities located along the line was to establish the Sanriku Railway Co., Ltd., acquire ownership of the entire line, and promote construction of the incomplete section. The line opened in 1984. This was the first case of a private company being formed to assume control of an abandoned JNR line. The new company's financial position was favourable at first, partly because of restructuring policies that included staff downsizing and an increase in fares, and partly because passengers were attracted by the excitement of the new venture. It appeared that the company had found the key to success and a number of other closed JNR lines were taken over under the initiative of local governments in different parts of Japan and then placed



in the hands of newly established companies. Therefore, in some sense, Sanriku Railway played an influential role

in Japan's railway industry. However, the new company has not attracted growing numbers of passengers.

Ridership has declined year-on-year and is now only half of what it was 17 years ago. The decline is becoming more

### Statistics for Railways in Tohoku

	Route-km	Number of Employees	Capital (¥1,000)	Operating Revenues (¥1,000)		Operating Expenses (¥1,000)		Operating Profits/Losses (¥1,000)		Ordinary Profits/ Losses (¥1,000)
				Railway	Non-railway	Railway	Non-railway	Railway	Non-railway	
Tsugaru Railway	20.7	40	50,000	197,683	—	198,991	—	-1,308	—	-421
Konan Railway	30.7	81	175,000	730,549	7,544	775,582	3,849	-45,033	3,694	-48,290
Towada Sightseeing Electric Railway	14.7	24	679,800	179,978	5,658,534	250,107	7,797,080	-70,129	-138,546	-442,107
Sanriku Railway	107.6	83	300,000	509,463	43,197	535,164	36,176	-25,701	7,019	-15,558
Kurihara Den'en Railway	25.7	24	246,000	88,011	6,278	152,452	5,203	-64,441	1,075	-60,944
Sendai City Transportation Bureau	14.8	323	—	12,373,933	11,099,455	12,121,301	13,357,049	252,632	-2,257,594	-10,367,644
Abukuma Express	54.9	93	1,500,000	923,588	20,989	956,568	25,071	-32,980	-4,082	-30,164
Fukushima Transport	9.2	63	2,700,000	657,628	8,778,456	580,633	8,826,242	76,995	-47,786	-82,431
Aizu Railway	57.4	56	1,500,000	549,088	57,159	759,125	48,471	-210,037	8,688	-191,601
Akita Inland Through Railway	23.0	86	300,000	259,229	74,463	552,850	77,079	-293,621	-2,611	-290,413
Yuri Highland Railway	94.2	25	100,000	107,927	—	165,958	—	-58,031	—	-58,348
Yamagata Railway	30.5	30	478,450	210,157	5,787	290,280	4,797	-80,123	990	-63,687

### Passenger Volume and Density by Railway Company

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Tsugaru Railway	No. of Passengers (1,000)	1,142	1,096	1,007	958	932	904	808	730	688	638
	Passenger Density*	1,304	1,246	1,155	1,103	1,132	1,116	1,057	967	931	857
Konan Railway	Volume	5,193	5,115	5,161	6,972	4,774	4,663	4,474	4,032	3,708	3,494
	Density	3,198	3,168	3,192	3,102	3,015	2,945	2,865	2,622	2,933	2,794
Towada Sightseeing Electric Railway	Volume	966	967	934	953	924	899	870	810	771	744
	Density	1,880	1,899	1,874	1,905	1,826	1,765	1,687	1,541	1,505	1,477
Sanriku Railway	Volume	2,307	2,259	2,227	2,070	1,926	1,805	1,771	1,688	1,553	1,438
	Density	942	930	919	849	775	726	705	686	623	577
Kurihara Den'en Railway	Volume	342	354	336	327	348	324	306	276	277	261
	Density	320	348	356	360	398	369	340	309	304	284
Sendai City Transportation Bureau	Volume	46,901	51,035	52,771	54,428	55,519	56,962	57,667	58,293	56,963	56,851
	Density	41,572	45,109	47,007	47,444	48,315	51,849	52,942	54,758	54,477	54,942
Abukuma Express	Volume	2,797	3,069	3,189	3,192	3,163	3,251	3,231	3,169	3,108	3,050
	Density	2,049	2,266	2,350	2,351	2,304	2,322	2,315	2,270	2,245	2,190
Fukushima Transport	Volume	4,378	4,521	4,504	4,407	4,275	4,242	4,033	3,994	3,843	3,612
	Density	6,521	6,721	6,747	6,603	6,416	6,340	6,020	5,937	5,716	5,418
Aizu Railway	Volume	1,115	1,209	1,208	1,164	1,147	1,143	1,051	1,029	958	976
	Density	1,258	1,372	1,399	1,313	1,291	1,267	1,165	1,153	1,073	1,114
Akita Inland Through Railway	Volume	1,023	1,052	1,032	1,012	1,016	981	942	903	861	841
	Density	515	524	510	498	494	478	453	469	496	458
Yuri Highland Railway	Volume	573	564	586	589	600	617	595	538	485	477
	Density	869	862	921	978	996	1,049	1,000	916	809	811
Yamagata Railway	Volume	1,442	1,378	1,372	1,320	1,374	1,307	1,321	1,173	1,141	1,068
	Density	1,298	1,249	1,254	1,209	1,249	1,188	1,212	1,085	1,054	988

Note: Passenger Density = Daily Passenger-km/Route-km



Sanriku Railway's Series 36 running on Kita Rias Line

(Author)



Kurihara Den'en Railway's Series KD95 running on non-electrified section

(Author)

precipitous, residents of communities along the line are slowly losing enthusiasm for 'their' railway and the company is sinking into trouble.

Some private lines taken over from JNR after the Sanriku Railway have been closed because of similar changes in fortunes. One example is the 6.2-km Kuroishi Line formerly operated by Konan Railway. The railway tookover the track in 1984 without asking for local-government funding. After it became clear that the low level of ridership would not improve, the company abandoned operations in 1998.

In a similar instance in 1985, the 18-km line between Shimokita and Ohata in northernmost Honshu was taken over by Shimokita Transportation, a local bus company, only to be abandoned in 2000. The company has gone back to operating only buses.

However, there are a few success stories; Abukuma Express assumed control of a line that JNR had planned to link Sendai and Fukushima but only the Sendai end of the line had been finished. Ridership increased after the line was completed to Fukushima and fully electrified. The new management is doing its best to turn a profit and although not many users ride the entire line, the cities at each end have

many commuting workers and students. Four other railways that tookover JNR lines in Tohoku are: Akita Inland Through Railway in Akita Prefecture (94.2-km line from Kakunodate to Takanosu); Yuri Highland Railway in Akita Prefecture (23-km line from Ugohonjo to Yashima); Yamagata Railway in Yamagata Prefecture (30.5-km line from Akayu to Arato); and Aizu Railway in Fukushima Prefecture (57.4-km line from Nishi Wakamatsu to Aizu Kogen).

In the last few years, some private railways that were operated exclusively with private capital have received support from local governments. The Kurihara Den'en Railway, which operated a 25.7-km line from Ishikoshi to Hosokura Mine Park Mae in Miyagi Prefecture, realized that it would not be able to continue independently and transferred its management to municipalities served by the line in 1992.

In an effort to cut costs, diesel railcars have replaced electric trains since 1995. The Towada Sightseeing Electric Railway in Aomori Prefecture used profits from its bus operations to subsidize its non-profitable 14.7-km line from Misawa to Towada-shi. But declining bus ridership over the last few years induced the local municipalities to provide financial assistance for rail operations. However, local governments do not have unlimited funds and there are questions about how long residents of rural areas will tolerate spending taxes on railway lines with few users. ■



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