

Sendai airport line: New railway construction for easy access to Sendai airport and local development

Sendai Airport Transit Co., Ltd
Japan Railway Construction, Transport and Technology Agency

1. Outline of the project

Sendai airport, where the annual passengers exceed 3,300,000, is the biggest international airport in Japanese Tohoku area. The runway of the airport was expanded to 3,000m in 1998, for the purpose of accommodating to the increase of domestic and international passengers, and the airport will play a more important role as a hub airport of Tohoku area. On the other hand, Sendai city with a population of 1,000,000 people is a central city of Tohoku area, where traffic congestion frequently occurs by the increase in

population and the expansion of a commutable area.

Transportation to Sendai airport from Sendai city has been dependent on only road traffic such as privately-owned car and the limousine so far. Therefore it was difficult to keep punctuality in case traffic congestion occurred. In order to solve this problem, "Sendai airport line" was planned as a new access rail transit to the airport from the viewpoint of "punctuality", "rapidity", and "mass transportation", which branches from Natori station in JR Tohoku line,

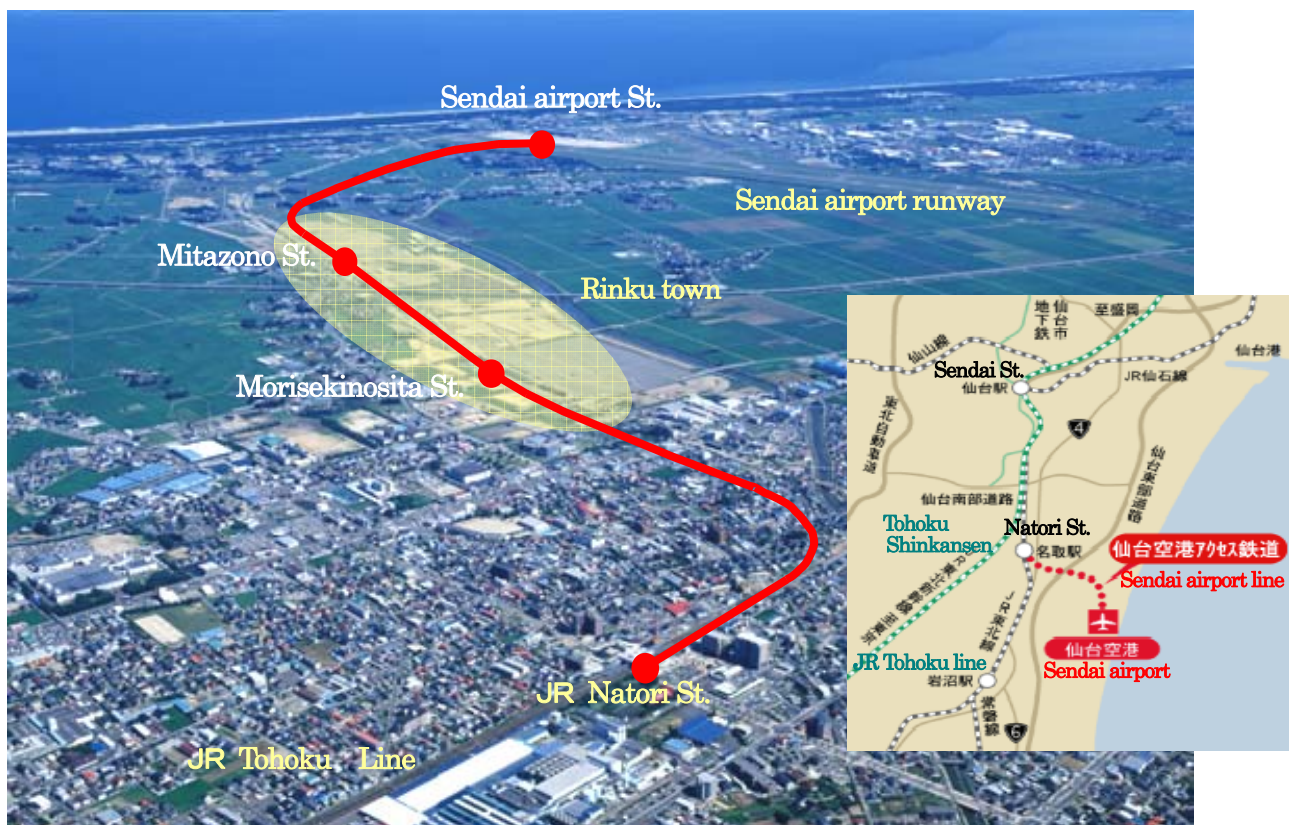


Photo 1: Routes of Sendai airport line

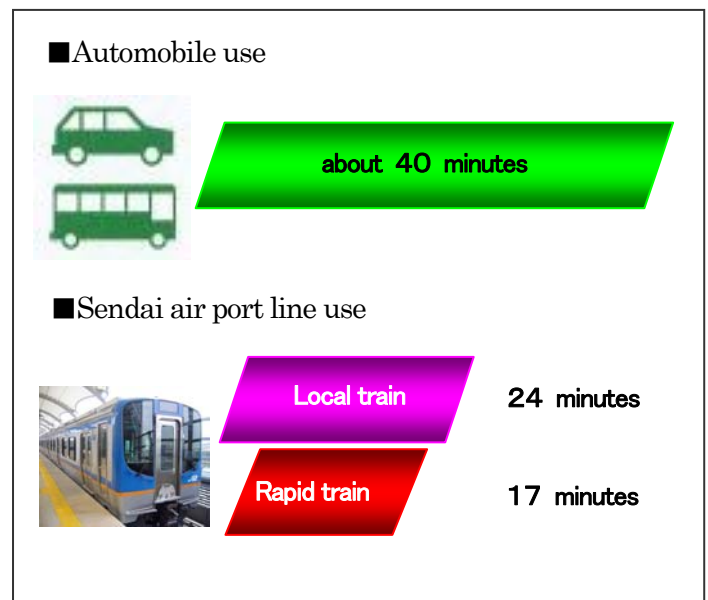
and links to the airport. "Sendai Airport Transit Co, Ltd.(SAT)" which is semi-public sector and manages the railway was founded in April 2000 by the initiative of Miyagi prefecture government. Moreover, Japan Railway Construction, Transport and Technology Agency (JRJT) was entrusted with the construction management over the whole line by SAT in October of the same year.

The total length of Sendai airport line is 7.1km, which leads to "Sendai airport station" from "Natori station" in JR Tohoku line via "Morisekinosita station" and "Mitazono station" in "Rinku town" where land readjustment was implemented together with the railway construction. This railway was inaugurated in March 2007, and the fastest trains run in 17 minutes between Sendai station and Sendai airport station by the through service with JR East. As compared with automobile, the travel time was shortened by about 20 minutes, therefore this line contributes to the improvement in passenger convenience, the expansion of the airport accessible area and the development of the area along the line.

2. Effect of inauguration of Sendai airport line

(1) Great improvement in accessibility to the airport

By the through service with JR Tohoku line, Sendai airport line has realized large shortening of travel time from JR Sendai station to Sendai airport, and now it takes 24 minutes by local train and 17 minutes by rapid train as contrasted with 40 minutes by automobile. Thereby, almost all the limousine users and many of the privately-owned car users have converted to the railway users.



*Fig-1: Comparison of arrival time
(From JR Sendai St. to Sendai airport)*

In addition to this through service, the wide-area network of traffic was built by using Tohoku Shinkansen and the conventional lines at JR Sendai station. Thereby, the accessibility to this international airport was improved greatly not only from Miyagi prefecture but from the farther parts of Tohoku area. The expansion of the accessible area by the inauguration of Sendai airport line promotes globalization and

development of tourist resources within Tohoku area. As a result, this line contributes to the growth of local economy greatly.

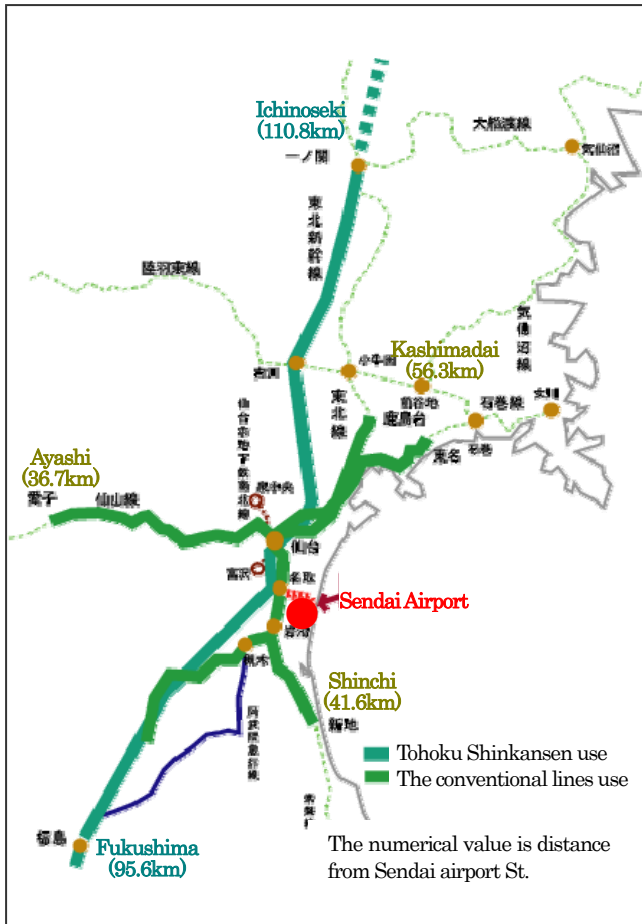


Fig-2: One hour access zone from Sendai airport

(2)Promotion of new urban development

"Rinku town" (Area: about 185 ha., Planed population: 6,500) was planed to create a vital and attractive urban area, which is suitable for the gateway of the sky in Tohoku area and a center of international exchange of people, goods, and information, by making full use of the potential of Sendai airport which is a hub airport

of Tohoku area.

The land readjustment project of "Morisekinosita" and "Mitazono" areas which constitute Rinku town has been implemented together with the construction of Sendai airport line, and this town was opened simultaneously with the inauguration of the line on March 18, 2007.



Photo 2: Rinku town that the construction of the house goes ahead through

Construction of a sightseeing product exchange facility will be started soon, and Miyagi prefecture is planning construction of educational and welfare facilities around Mitazono station. Moreover, a large-scale shopping center opened at the end of February in this year is crowded with the customers every day, and construction of isolated and apartment houses is also promoted around Morisekinosita station. Both stations serve as the gateway of new town at present. Thus, Sendai airport line functions as not only an access transit to the airport but also a main transportation of Rinku town. Therefore the line plays an important role

in promoting development of the new town, and the urban development will be urged more and more with the railway inauguration as an opportunity.



Photo 3: Morisekinosita St. (the left) and large-scale shopping center (the right)

3. User-friendly station

(1) Universal design

We realized safety, comfort and ease in use of railway facilities for everyone including elderly and handicapped people, by adoption of universal design in which user's opinion was reflected, showing the installed facilities to some institutions for handicapped persons and exchanging opinions with them in all stages. Some of the adopted universal designs are as follows.

(a) Line of flow without up-and-down movements (Sendai airport station).

Sendai airport station is directly linked with the check-in counter and the departure lounge on the second floor of the airport terminal, and it enables to transfer to airplanes easily without a

movement to an upper or lower floor.

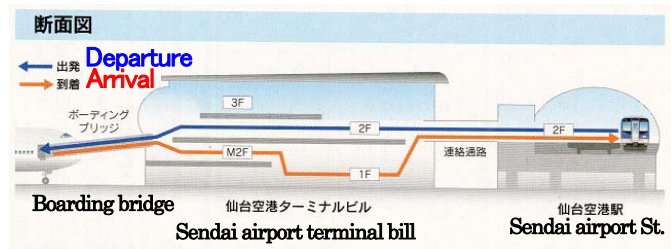


Fig 3: The section sketch of Sendai Airport terminal building and Sendai Airport St.

(b) The ticket vending machine and automatic faregate



Photo 4: The train ticket vending machine that considered height and a slant

As for the ticket vending machine, its screen is visible enough even from the low angle for children and wheelchair-users and large space is taken up under the machine for wheelchair-users. As for the automatic faregate, its width of 100cm is set to enable travelers with suitcases and wheelchair-users to pass through with clearance. In addition, for the through service with JR line, the automatic faregate accepts the contactless card tickets of JR East (Suica), aiming at improvement in user's convenience.

(c) Less differences in level between platforms and vehicle's floors

The new vehicles was innovated, the floors of which have less differences in level with platforms, for the purpose of making wheelchair users and elderly people able to get on and off easily.



Photo 5: Less difference in level between platforms and floors of vehicles

(d) Intelligible guidance



Photo 6: The electric signboard

Arrival time and departure time of trains are announced intelligibly in four languages and displayed on electrical sign boards. And for visually impaired people, sound guidance and Braille-points direction boards are installed near

the entrances, and textured paving blocks and chimes are installed for the purpose of guidance inside the stations.

(2) Characteristic station design

The station design of Sendai airport line, the basic concept of which was “simple and light”, was expected to be suitable for the airport access railway.

(a) Sendai airport station

Platform shed of the Sendai airport station, which is made of spiral frame and Teflon film, creates dynamic, open, and lively space and gets good visibility on the platform, in harmony with design of the airport terminal.



Photo 7: The appearance of Sendai airport Station



Photo 8: The platform shed of Sendai airport St.

(b) Mitazono station and Morisekinosita station

Mitazono station and Morisekinosita station serve as the entrance in Rinku town. The designs of both stations are given lightness and a feeling of floating by adopting slender pillars and arched roofs which remind people of the former rural landscape.



Photo 9: The appearance of Mitazono St.



Photo 10: The platform of Morisekinosita St.

4. Approach to reduction of construction cost

The construction cost of Sendai airport line was estimated at US\$ 253 million at first. Afterward, we tackled reduction of construction cost and laborsaving for maintenance actively by some means such as adoption of arch slab-type

elevated track developed for other railway. As a result, the final total cost including additional cost (US\$ 24 million) for work concerned with one-person operation, etc. changed to about US\$ 210 million, and large cost reduction (about 17% of reduction rate) was attained. (US\$ 1=JPY115)

The arch slab-type elevated track has been developed as a new type in consideration of a landscape and laborsaving on the basis of the beam slab-type elevated track which is generally adopted on railways. It was adopted over the whole line because of the design suitable for a new town and the economical efficiency.



Photo 11: The arch slab-type elevated track that considered as landscape

5. Conclusion

The accessibility to Sendai airport was improved greatly by the inauguration of Sendai airport line so that the minimum travel time was shortened to 17 minutes from the center of Sendai city to Sendai airport and the airport was

connected with Shinkansen and the conventional lines. The expansion of airport accessible area contributes to globalization and development of tourism resources within Tohoku area. As a result it contributes to the growth of local economy greatly.

Moreover, Sendai airport line functions as a main transportation of the new town called “Rinku town”, and play an important role in promoting the development of the area along the line. Furthermore, we adopted universal design to Sendai airport line positively and realized safety, reliability and comfort of railway transportation.

The average daily ridership during a month after the inauguration in March was 11,300 passengers (including 4,000 passengers who visited the airport), and many people use the line

to visit the large-scale shopping center opened in front of Morisekinoshita station. The line got off a good start with the ridership that exceeds the estimate. The recent ridership is stable with the average of 8,000 (including 4,000 who visited the airport), although the number changes on weekend. The ridership of the line is expected to increase certainly hereafter as the development of Rinku town progresses and the airport users increase.

Contact

Kenji HUKUNAGA

Director of 1st Construction Division, Construction Department, Tokyo Regional Bureau, Railway Construction Headquarters,

Japan Railway Construction, Transport and Technology Agency

Tel: +81-03-5403-8742 FAX: +81-03-5403-8773

E-mail: k.fukunaga@jrct.go.jp



Photo 12: Sendai Airport terminal building and Sendai Airport St.