Chapter 5 Reconstruction of Homes and Cities

Section 9 Regional Public Transportation

1. Overview of damage

Regarding the damage to bus operators in the three prefectures of Iwate, Miyagi, and Fukushima, when it came to human casualties (not including passengers), there were 10 deaths (two in Iwate Prefecture and eight in Miyagi Prefecture) and three people were missing (two in Iwate Prefecture and one in Miyagi Prefecture). A total of 219 buses were damaged, including 208 badly damaged or submerged buses (50 in Iwate Prefecture, 132 in Miyagi Prefecture, and 26 in Fukushima Prefecture) and 11 missing buses (11 in Miyagi Prefecture), with Miyagi Prefecture suffering the most damage as a result of the tsunami. There was damage to a total of 115 sales offices, office buildings and other such buildings, including 30 completely destroyed buildings (13 in Iwate Prefecture, 14 in Miyagi Prefecture, and three in Fukushima Prefecture) and 85 partially destroyed buildings (seven in Iwate Prefecture, 44 in Miyagi Prefecture, and 34 in Fukushima Prefecture).

Figure 5-9-1 Damaged Kesennuma Sales Office of Miyagi Kotsu Co., Ltd. (left) and damaged vehicle of Iwatekenkotsu Co., Ltd. (right)

Source) Tohoku District Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, "Records of Tohoku District Transport Bureau Activities After the Great East Japan Earthquake: Steps Toward Reconstruction" (March 2012)

Figure 5-9-2 Damage situation in terms of bus operators (as of the end of May 2011)

		人的損害（人）			バス車両の損害（台）			社屋等の損害（棟）		
		死亡	行方不明	合計	大破水没	行方不明	合計	全壊	一部損壊	合計
岩手県	乗合・貸切	2	1	3	27	0	27	7	3	6
	貸切専業	0	1	1	23	0	23	6	4	7
	小計	2	2	4	50	0	50	13	7	20
宮城県	乗合・貸切	5	0	5	46	8	54	5	20	25
	貸切専業	3	1	4	86	3	89	9	24	33
	小計	8	1	9	132	11	143	14	44	58
福島県	乗合・貸切	0	0	0	3	0	3	1	10	11
	貸切専業	0	0	0	23	0	23	2	24	26
	小計	0	0	0	26	0	26	3	34	37
合計		10	3	13	208	11	219	30	85	115

Source) Tohoku District Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, "Records of Tohoku District Transport Bureau Activities After the Great East Japan Earthquake [Follow-up]: Steps Toward Reconstruction" (March 2013)

2. Urgent responses

As previously mentioned, the Tohoku District Transport Bureau of the Ministry of Land, Infrastructure, Transport and Tourism, took the following urgent measures to secure means of transportation as soon as possible since bus operators experienced severe damage as a result of the Great East Japan Earthquake.

(1) Collecting information and publicizing information on bus operation conditions

Since March 14, the Tohoku District Transport Bureau had announced bus service information on its website and updated the information daily, including on days when the bureau was closed.

Information on operation was displayed separately for expressway bus routes (within the Tohoku region and between the Tokyo Metropolitan Area, etc. and the Tohoku region) and route buses, etc. The addresses of bus operators were shown alongside that information so that users can jump from the Tohoku District Transport Bureau website to the website (for operation information) of the bus operators, so that disaster victims and reconstruction supporters could easily make reservations and confirm the operation hours of expressway buses, and so on.

On March 11, the day of the earthquake, the Tohoku District Transport Bureau tried to contact bus operators in each prefecture using desktop landline telephones, but they were only able to reach about five companies (two in Aomori Prefecture, two in Akita Prefecture and one in Miyagi Prefecture). Bus operators were supposed to report any suspensions or damage caused by natural disasters to the Transport Bureau's disaster prevention e-mail address. However, after the Great East Japan Earthquake, information was not received from operators in the prefectures of Aomori, Iwate, Miyagi, and Fukushima, although emails were received from operators in the prefectures of Akita and Yamagata, which suffered relatively little damage.

(2) Issuing official notices of large-scale disasters, etc.

On March 12, the day after the earthquake, the Road Transport Bureau (at that time) of the Ministry of Land, Infrastructure, Transport and Tourism, issued a notice to the heads of the regional transport bureaus, entitled "Concerning the Securing of Bus Transportation in Response to the Great East Japan Earthquake."

The specific content of the notice included items necessary in order to secure the means of transportation for residents and other such individuals, such as the following: ① when a request is made by a local government or a bus operator for the establishment of a detour system for a bus, measures should be taken in accordance with the purport of Article 17 of the Road Traffic Act (Act No. 183 of 1951) so that detour operations can be carried out quickly by omitting various procedures as necessary, and ② when a chartered bus is required as an alternative means of transportation to railways and transportation capacity of local chartered bus operators is not sufficient to handle the needs, legal procedures should be flexibly handled so that the transportation capacity of the chartered bus operator in the neighboring prefecture can be promptly applied.

An urgent response-related notice was also issued afterwards, which was promptly disseminated to the people concerned with measures being taken based on that notice.

(3) Designation of emergency vehicles for expressway buses

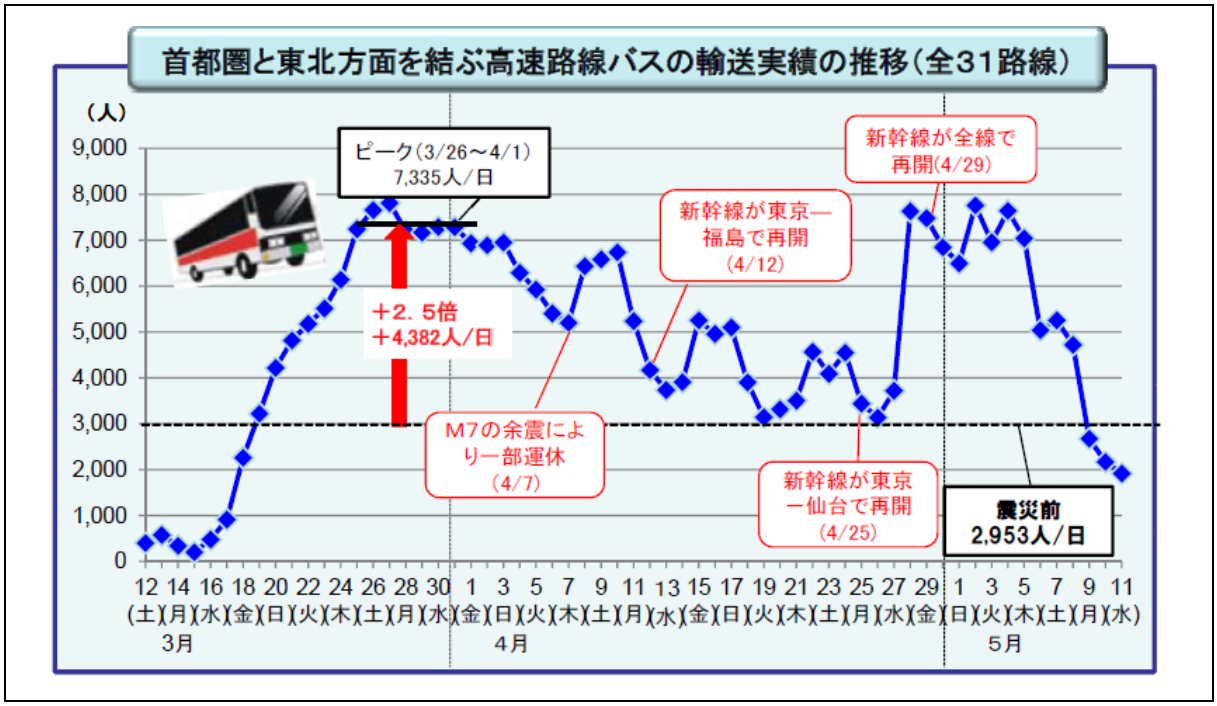
After the earthquake, some sections of the Tohoku Expressway and Joban Expressway were designated as emergency traffic routes, so vehicles could not use them unless they were verified as emergency vehicles by the Public Safety Commission and displayed emergency vehicle identification stickers. Vehicles approved as emergency vehicles were limited to emergency automobiles (ambulances, fire engines, etc.) and vehicles used for emergency transportation of persons engaged in emergency disaster control measures or for goods necessary for emergency disaster control measures. For this reason, expressway buses had to use local roads, so they were either suspended or traveled long hours on local roads.

Under these circumstances, the Ministry of Land, Infrastructure, Transport and Tourism issued a request to the National Police Agency to the effect that action be taken to ensure the operation of expressway buses, which play an important role as a means of transportation serving as an alternative to the suspended Tohoku Shinkansen and other trains. Thus, emergency vehicle identification stickers were issued to expressway buses starting from March 14. After receiving the identification stickers, the expressway bus companies switched their routes between Sendai and Niigata to routes via expressways on March 15, with the operation of all routes then resuming with the usage of

expressways taking place. Since March 22, transit has been possible without an emergency vehicle identification sticker with the exception of some sections.

As a result of these efforts, in the two months after the earthquake (up to May 11), approximately 300,000 people were transported on 31 routes running between the Tokyo Metropolitan Area and the Tohoku region, and expressway buses played an important role as alternative modes of transport to the suspended Tohoku Shinkansen trains and other such transport services.

Figure 5-9-3 Track record in terms of transporting by expressway buses (between the Tokyo Metropolitan Area and Tohoku Region) (two months after the earthquake)



Source) Ministry of Land, Infrastructure, Transport and Tourism, “State of Responses of the Road Transport Bureau to the 2011 off the Pacific coast of Tohoku Earthquake: Response of the Automobile Sector to the Great East Japan Earthquake (Summary)”

(4) Securing airport access

1) Securing alternative functions for Sendai Airport access

Sendai Airport was closed due to extensive damage inflicted upon air safety facilities and the terminal building by the tsunami. At the same time, Sendai Airport Transit, the only mass transport public transportation system connecting Sendai Airport with the central part of Sendai City, was also severely damaged owing to occurrences such as the submergence of underground tunnels and had no prospect of resuming operation. It was expected to take several months before service would be resumed.

Under such circumstances, Sendai Airport began to move toward partial reopening. Given that, an investigative committee called the “Investigative Committee for Securing Access for the Reopening of Sendai Airport,” was set up to secure a route which connected the airport with the central part of Sendai City, with the committee being comprised of the Tohoku District Transport Bureau, the Sendai Airport Office of the Tokyo Regional Civil Aviation Bureau, Miyagi Prefecture, the Miyagi Bus Association, Sendai Airport Transit Co., Ltd. and Sendai Airport Building Co., Ltd.

As a result of the investigation, it was decided that the best solution would be to operate a direct access bus between the airport and Sendai Station. Thus, a request was issued to the Miyagi Bus Association for the operation of access buses and the securing of a bus stop at the Sendai Station East Exit Bus Pool. In response to the request, the association called on its members to undertake bus operation with 18 operators (with the managing company setting the timetable), and the Sendai Station East Exit Bus Pool also becoming available.

Sendai Airport partially reopened on April 13 and convenience for airport users and staff was improved thanks to

access buses being operated as planned. Separate from that, a bus company, at the request of Sendai Airport Railway Co., Ltd., operated a railway replacement bus service along the railway line between Sendai Airport and JR Natori Station. The Tohoku District Transport Bureau also released bus schedules and disseminated information to facilitate smooth bus connections.

When the airport was reopened, the bus schedule was initially set according to the departure and arrival times of the flights since the flights were being operated on special schedules (with six round trips a day). Given that it would have been difficult to predict the number of bus passengers, buses were kept on standby so that situations where more buses were needed could always be handled. After that, the number of flights increased several times, and since July 25, there were 41 round-trip flights operating per day as regular flights, which meant a return to the levels of operation seen before the earthquake. As a result, the timetable for access bus service was changed from one bus running for each flight to a regular timetable (33 to 38 buses a day) in accordance with the start of regular flight operation. After that, buses continued to be on standby for situations where more buses might be needed.

Since operation of the Sendai Airport Transit was fully restored on October 1, the access bus service was terminated on September 30. Over this five-and-a-half-month period, access buses carried about 190,000 passengers.

2) Response to the utilization of nearby airports

Immediately after the earthquake, Sendai Airport was closed due to the damage caused by the earthquake, so special flights (Tokyo, Osaka, Sapporo, and Nagoya) to Yamagata Airport in the neighboring prefecture were operated. Before the earthquake, the only public transportation between Yamagata Airport (Higashine City) and Yamagata City had been reservation-only shared taxis due to the small number of users. Therefore, it was decided to ensure the convenience of transportation running between the airport and Yamagata City by having shared buses (by the same operator as the one operating the existing shared taxi service) operated within the same section. Access to Sendai was secured as a result of having passengers transfer to the existing expressway bus running between Yamagata and Sendai within Yamagata City. On March 27, the operation of expressway buses began which directly connected Yamagata Airport and Sendai Station, thereby improving upon convenience for passengers going to Sendai.

(5) Sendai City free bus (subway replacement)

Due to the damage caused by the earthquake, some sections of the Sendai Subway (Namboku Line) were suspended (4.3 km between Dainohara Station and Izumi-Chuo Station). For this reason, Sendai City operated free buses that anyone could use within the suspended sections to ensure convenience for passengers.

However, because Izumi-chuo Station, the northern terminus of the subway, was a terminal station for a route spanning from a bedroom town in the northern part of Sendai City to the center of Sendai City, there was a long line of people waiting for the bus every morning, with waiting times being up to 90 minutes long. In response, the Tohoku District Transport Bureau requested Sendai City to the effect that bus stops be decentralized, that the number of buses be increased, and so on. Sendai City tried to shorten waiting times through such measures as increasing the number of buses and assigning station coordinators together with measures such as the opening of another fare-free bus route in the middle of the suspended section (between Dainohara Station and Kuromatsu Station).

On April 29, the Sendai Subway resumed operation in the suspended section and the fare-free bus service was ended.

Figure 5-9-4 Free bus users (Izumi Chuo Bus Terminal) lined up in an orderly fashion as guided by staff after the number of buses was increased

Source) Tohoku District Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, "Records of Tohoku District Transport Bureau Activities After the Great East Japan Earthquake: Steps Toward Reconstruction" (March 2012)

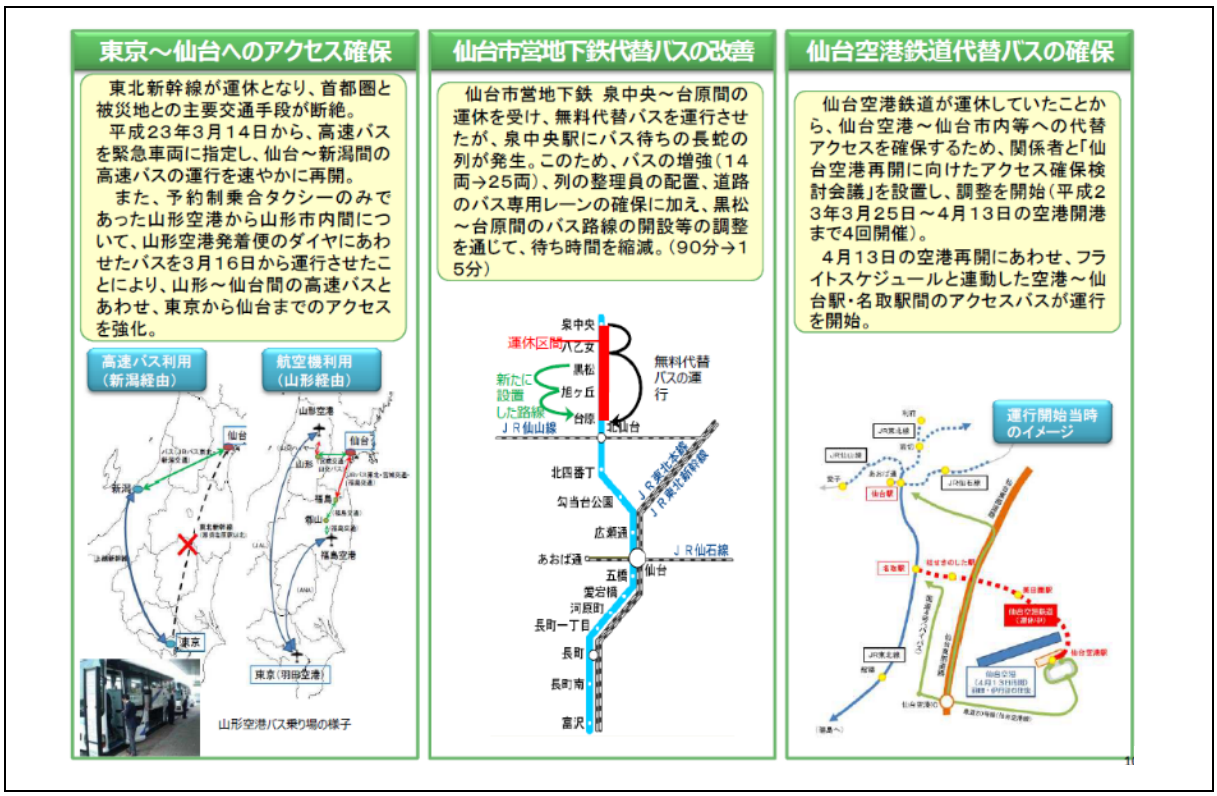
(6) Operation of railway replacement buses

Given that the Tohoku Shinkansen Line, the JR lines, the Sanriku Railway, and other lines were suspended due to the earthquake, bus companies operated railway replacement buses on a total of 105 routes in order to deal with the suspended railway sections. Depending on the section for which buses were being operated, there were cases wherein passengers were being left behind, and thus, the local residents and municipalities requested increase in the number of buses and setting of new routes. At that time, the Tohoku District Transport Bureau provided guidance, requests, and other such directions to relevant companies to improve things as much as possible.

Figure 5-9-5 Rail replacement buses, etc. (JR Senseki Line) running in Higashi-Matsushima City (Miyagi Kotsu Co., Ltd.)

Source) Tohoku District Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, "Records of Tohoku District Transport Bureau Activities After the Great East Japan Earthquake: Steps Toward Reconstruction" (March 2012)

Figure 5-9-6 Efforts to secure alternative transportation using buses immediately after the Great East Japan Earthquake



Source) Tohoku District Transport Bureau, the Ministry of Land, Infrastructure, Transport and Tourism, "Supplementary Explanatory Materials for the Partial Revision of the Tohoku Public Transport Action Plan"

3. Restoring and reconstructing

(1) Development policy based on the Great East Japan Earthquake

1) Implementing special measures for disaster-affected areas of subsidized projects

After the earthquake, Iwate, Miyagi, and Fukushima prefectures began construction of emergency temporary housing for disaster victims, and residents gradually began moving in starting in April 2011.

However, due to the difficulty involved in securing land, some temporary housing had to be built in locations where public transportation facilities were not available or which made it difficult to use. This meant that issues were faced in terms of securing the means of transportation for people to travel to work, school, the hospital, to go shopping, and to go about handling procedures at government offices and other such places.

Under the "Maintenance and Improvement Project for Local Public Transport" (a subsidy program) established in FY2011, the Ministry of Land, Infrastructure, Transport and Tourism decided to support bus operators and other such entities in securing and maintaining community transport in the disaster-affected areas by making special exceptions for the three prefectures of Iwate, Miyagi and Fukushima. In addition, from May to July, when the need for community transportation was growing, staff from the ministry visited municipalities subject to the special measures to provide with explanations on the program and tried to understand the transportation condition and the situations being faced by municipalities.

2) Expediting processing of approval procedures, etc.

In order to ensure the convenience of transportation in the disaster-affected areas including temporary housing,

the Ministry of Land, Infrastructure, Transport and Tourism worked to respond to the ever-changing needs of the disaster-affected areas by responding swiftly and flexibly to various applications submitted by bus operators under the Road Traffic Act, such as those for the extending of routes, the establishing of new service routes and bus stops, the changing of routes for community buses, for the allowing use of chartered buses, and for the new introduction of taxi sharing services.

3) "Reconstruction operation of transportation in the disaster-affected areas"

In the municipalities affected by the disaster, it was important to secure and maintain elements such as buses and on-demand transportation which connected things such as temporary housing to destinations such as schools, hospitals, and shops, for the purpose of ensuring the convenience of transportation for the disaster victims living in temporary housing and in surviving hamlets.

When it came to the maintenance of this kind of transportation for daily life, support through subsidies was provided for the operating costs of regional public transportation under the "Maintenance and Improvement Project for Local Public Transport," as mentioned previously. In addition, investigation costs were also subsidized through the project in question because it became necessary to develop and review new bus routes based on elements such as the locations of hospitals and shops in towns, which changed by the day in conjunction with the progress of reconstruction, and the needs of the disaster victims. In addition, persons in charge at the Tohoku District Transport Bureau of the Ministry of Land, Infrastructure, Transport and Tourism conducted tasks such as on-site inspections as necessary and provided advice to local governments and transport operators in cooperation with academic experts, such as proposing the operation of shared taxis from temporary housing.

Through these efforts, public transportation connecting temporary housing to hospitals and stores was operated efficiently and effectively, and a sustainable and highly convenient transportation system was thus created in line with the new town development taking place after reconstruction (after relocation to higher ground).

(2) Maintenance and Improvement Project for Local Public Transport

1) Project overview

As mentioned above, since FY2011, the Ministry of Land, Infrastructure, Transport and Tourism has implemented special measures for the Maintenance and Improvement Project for Local Public Transport in the disaster-affected areas of the Great East Japan Earthquake and has supported the operation of transportation such as trunk line bus transportation involving stopovers at emergency temporary housing and local bus transportation.

In addition, in the areas affected by the nuclear disaster in Fukushima Prefecture, in order to facilitate action such as the return and settlement of evacuees in areas where evacuation orders were lifted and the maintenance community transportation, support was provided for the operation of trunk bus transportation involving stopovers at disaster public housing and local bus transportation involving stopovers at emergency temporary housing.

Figure 5-9-7 Overview of the Maintenance and Improvement Project for Local Public Transport (Special Measures for Disaster-affected Areas)

Source) Ministry of Land, Infrastructure, Transport and Tourism, "16th Assembly of the Great East Japan Earthquake Reconstruction Headquarters: Material 1" (March 10, 2020)

2) Implementation period

From FY 2011 onward

3) Project costs

Details are as shown in "Figure 5-9-8: State of application for the Maintenance and Improvement Project for Local Public Transport (Special Measures for Disaster-affected Areas)."

Figure 5-9-8 State of application for the Maintenance and Improvement Project for Local Public Transport (Special Measures for Disaster-affected Areas)

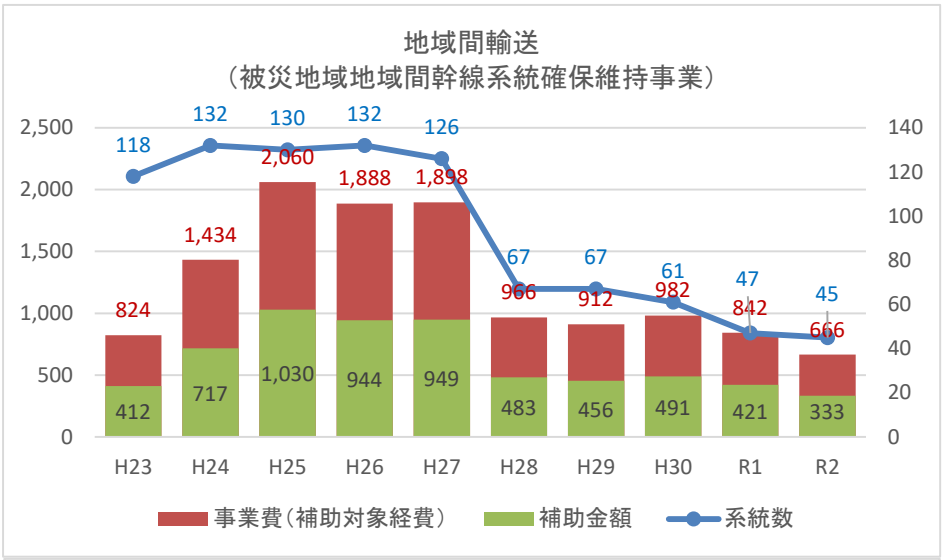
◆地域間輸送（被災地域地域間幹線系統確保維持事業）

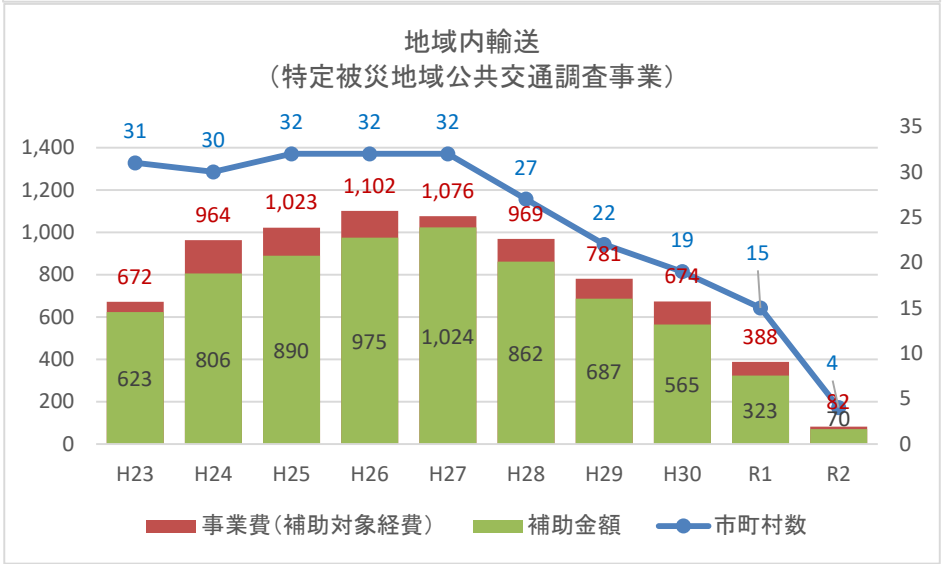
年度	H23	H24	H25	H26	H27	H28	H29	H30	R1	R2
系統数	118	132	130	132	126	67	67	61	47	45
事業費（補助対象経費）	824	1,434	2,060	1,888	1,898	966	912	982	842	666
補助金額	412	717	1,030	944	949	483	456	491	421	333

◆地域内輸送（特定被災地域公共交通調査事業）

年度	H23	H24	H25	H26	H27	H28	H29	H30	R1	R2
市町村数	31	30	32	32	32	27	22	19	15	4
事業費（補助対象経費）	672	964	1,023	1,102	1,076	969	781	674	388	82
補助金額	623	806	890	975	1,024	862	687	565	323	70

※事業費、補助金額の単位は百万円





Source) Provided by the Ministry of Land, Infrastructure, Transport and Tourism

4) Improvement effects

- Project to Secure and Maintain Interregional Trunk Lines in Disaster-Affected Areas
  Maintenance rate for community transportation bus routes based on plans formulated by the disaster-affected areas: 100%
- Project for Research of Public Transportation in Specific Disaster-affected Areas
  Percentage of temporary housing with a bus stop within a 1 km radius out of those housing requiring public transportation (public transportation coverage): 100%

4. Issues that arose in project implementation and responses, etc.

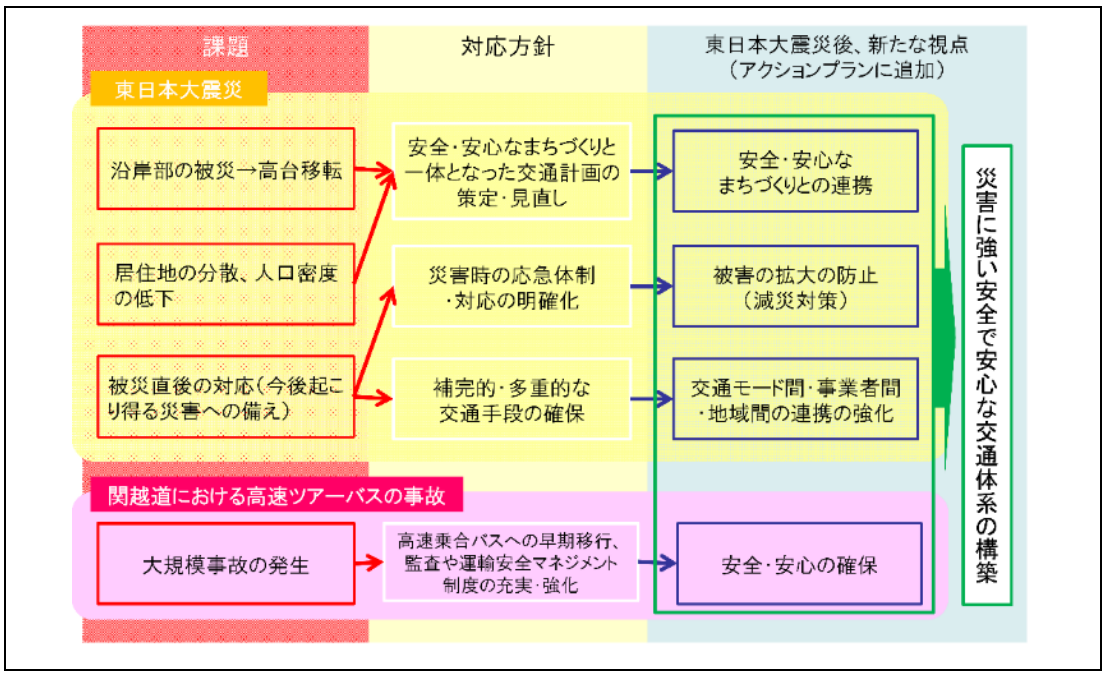
(1) Issues that arose in project implementation and responses

1) Partially revising the Tohoku Public Transport Action Plan (March 2013)

In March 2005, the Tohoku Regional Transportation Council, an advisory body to the Director-General of the Tohoku District Transport Bureau, submitted a report entitled "Ideal Transportation in the Tohoku Region." In order to further promote the measures described in the report, the "Tohoku Public Transportation Action Plan" was formulated in March 2010 as a guideline not only for the Tohoku District Transport Bureau, but also for local governments, local residents, transport operators, and other entities involved in public transportation.

As a result of occurrences such as the Great East Japan Earthquake in March 2011, the need to promote disaster prevention and mitigation, as well as the need to ensure safety and security, had become even higher. Accordingly, the Tohoku Public Transport Action Plan was partially revised, and new perspectives were set in terms of ① coordination with safe and secure community development, ② prevention of damage expansion (disaster mitigation measures), and ③ strengthening of cooperation among transport modes, operators, and regions. In terms of concrete efforts, the "construction of a safe and secure transport system that is resilient against disasters" was added.

Figure 5-9-9 Partial revision of the Tohoku Public Transport Action Plan



Source) Tohoku District Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, "15th Meeting of the Tohoku Regional Transportation Council: Material 2-1" (March 12, 2013)

2) Researching ideal regional public transportation in response to the Great East Japan Earthquake (March 2012, Tohoku District Transport Bureau)

Since the occurrence of the Great East Japan Earthquake, the regional public transportation necessary for disaster victims to travel to work, school, the hospital, to go shopping, and to travel to other regions, has been gradually restored. Although the disaster-affected areas were beginning to move toward reconstruction, many disaster victims still had no choice but to live in temporary housing, and it was necessary to secure daily transportation for the victims.

Under these circumstances, the Tohoku District Transport Bureau of the Ministry of Land, Infrastructure, Transport and Tourism, conducted surveys, evaluations, and analyses of the current state of regional public transportation in the disaster-stricken areas, and examined the ideal form of regional public transportation in the disaster-affected areas in the future. During the surveys, efforts to maintain and secure regional public transportation in the disaster-affected areas were organized according to three time axes: "immediately after the earthquake and during the urgent response phase," "during life in evacuation shelters and during the emergency response phase," and "during life in temporary housing and during the recovery phase." The overview is as follows.

a. Immediately after the earthquake and during the urgent response phase (Step 1: one to two weeks after the disaster)

ア) Ascertaining elements such as the disaster situation and the implementing mobility support immediately after the earthquake in accordance with objectives

- Identify the disaster situation in terms of elements such as road networks and transportation operators, as well as the evacuation situation of local residents, and then provide mobility support in areas between evacuation shelters and bathing facilities, morgues, etc., according to the purpose such as support to enable bathing, safety confirmation, etc.

イ) Building a system for coordination and cooperation with transportation companies, volunteer organizations, and other mobility support groups

- Given that the JSDF, volunteer organizations, and transportation companies will operate local public transportation in accordance with their respective objectives, establish a system whereby the status of activities and operational details of relevant organizations are ascertained and shared, and which enables coordination and cooperation to take place.

b. During life in evacuation shelters and during the emergency response phase (Step 2: two weeks to one month after the disaster)

ア) Re-examining regional public transportation and starting improvements

- It is necessary to review and improve local public transport in accordance with the recovery and reconstruction situation of the region, such as in terms of moving from evacuation shelters into emergency temporary housing and the restoration of road networks. However, given that local transport operators may also have suffered damage, it is necessary to ascertain and sort out the parts that can and cannot be dealt with by the existing public transportation system.
- On top of that, municipalities and transport operators will work together to set up operation routes, timetables, etc. in a flexible manner according to local conditions.

イ) Providing information on operation details

- It is assumed that after the earthquake, residents of emergency temporary housing and disaster victims who used their own cars before the earthquake would be using public transportation after the earthquake, and that frequent re-examinations and improvements of elements such as service routes and timetables would be conducted according to the recovery situation. For this reason, it is necessary to improve the provision of information on the details of transport service to disaster victims, users, and other such individuals by posting information at bus stops that are frequently used and by utilizing bulletin boards at evacuation shelters and emergency temporary housing, the Internet, etc.

c. During life in temporary housing and during the recovery phase (Step 3: one month after the disaster and beyond)

ア） Supporting areas where route bus operation is difficult

- When it comes to re-examining and improving regional public transportation, it is assumed that there will be regions where route buses cannot operate. Therefore, the introduction of shared taxis and buses, on-demand (reservation-only) buses, and other such means of transport, will also be examined after having taken into account the supply capacity of both buses and taxis.

イ） Ascertaining the needs of users and residents of emergency temporary housing

- Municipalities and transport operators will take the lead in conducting questionnaire-based surveys for users and residents of emergency temporary housing, and continuously re-examine and improve local public transportation based on needs.

ウ） Linking town planning and transportation

- In the construction of emergency temporary housing, elements such as placement which takes into consideration the operation of regional public transportation and the improvement of surrounding roads will be required.
- As the construction of reconstruction-based housing progresses, it is assumed that people will move out of emergency temporary housing. It is necessary to coordinate both community planning and transportation measures so that the daily transportation of residents is properly secured.

エ） Evaluating and analyzing efforts undertaken immediately after the earthquake

- It would be desirable for each municipality to evaluate and analyze the efforts made immediately after the earthquake, and to review and improve regional public transportation through the PDCA cycles even when disasters occur.

(2) Lessons learned and know-how gained

1) Securing means of collecting information

Information on elements such as the damage situation in terms of operators and the status of bus service is expected to be collected by similar means used during normal times, which means by telephone (landlines and mobiles), facsimile, and personal computer-based e-mail. The Tohoku District Transport Bureau set up a “disaster prevention email address” for personal computers and instructed operators to voluntarily provide reports on elements such as damage sustained and service-related information in the event of a disaster to that email address.

However, the Great East Japan Earthquake caused a series of problems, such as power outages and the congestion of communications, as well as damage to the buildings of business establishments themselves due to the earthquake and tsunami. Only operators in Akita and Yamagata prefectures, which suffered relatively little damage, provided reports to the disaster prevention email address. No operators in Aomori, Iwate, Miyagi, or Fukushima prefectures provided reports.

In the immediate aftermath of the disaster, it was extremely difficult to gather information because telephone lines, including emergency priority phones, were not readily available. Bus operators were too busy doing things like assessing damage, checking on the status of operations, and issuing instructions. As such, there was a continued situation where information on the daily operation statuses could not be obtained unless the Tohoku District Transport Bureau make an inquiry on each such occasion. In addition, in order to confirm the status of the shared bus operators that could not be contacted, personnel of the Transport Bureau had to be dispatched to the bus centers of the operators to obtain information directly.

In light of this, securing means of communication is essential not only for information collection but also for business execution. Therefore, developing communication infrastructure that is resilient against disasters and other such occurrences, constitutes a matter of urgency.

2) Examining alternative means of transportation with the assumption of damage occurring

It would be desirable for the parties concerned to examine, during normal circumstances, elements such as alternative transportation assuming that there would be a situation where extensive damage occurs over a wide area and where trunk line transport is disrupted due to the interruption of railways such as the Shinkansen and conventional lines or due to the closure of airports.

If an airport is closed due to a disaster, it is assumed that a nearby airport will serve as an alternative airport and operate temporary flights. At that time, it is necessary to ascertain the current status of access between the airport and surrounding cities and to examine how to operate temporary flights. In addition, when special facilities such as railways are used for access during normal times, it is necessary to assume that things such as railway facilities will sustain damage and be subject to suspension over a long period of time.

If civil engineering facilities such as tunnels and bridges are damaged by a disaster, it is assumed that railways will be suspended for a long period of time or that shuttle service would be implemented. It is very difficult to ensure punctuality and speed of delivery and to implement mass transportation with the same level of service as that provided by railways when buses are used to replace sections where railway operation has been interrupted. Moreover, in the event of a disaster, it is assumed that in addition to the occurrence of traffic jams, elements such as damage inflicted upon roads and bridges will lead to situations such as those where people are forced to take long-distance detours. Therefore, it is also necessary to analyze the actual situation of each railway section (trends in terms of passenger segments and usage sections) and consider means of transport such as expressway buses, intercity buses, and buses operating along railway lines according to the demand which exists in relation thereto.

Since it is very difficult to predict which sections of railway lines will be affected by a disaster, it is necessary to take prompt action by taking advantage of the mobility of buses in accordance with the disaster situation.

3) Securing fuel

Fuel shortages constitute one of the characteristics of the Great East Japan Earthquake. The causes of those fuel shortages were occurrences such as oil-related facilities having been damaged by the earthquake and tsunami, supply routes having been cut off by damage to railways and ports, and the loss of a large number of tanker trucks due to the tsunami.

Immediately after the occurrence of the Great East Japan Earthquake, in addition to the shortage of fuel for the buses themselves, many bus crew members and other workers had difficulty commuting, which greatly hindered bus operations. In addition, long lines of cars formed with drivers waiting to fill up their gas tanks at gas stations. Those lines occupied parts of the roadways and caused heavy traffic jams. As a result, bus service was severely affected such as bus lanes not functioning.

In order to secure priority fuel for public transportation in the event of a disaster, it is necessary to inform people across the whole nation of the importance of public transportation and to establish a system for cooperation to take place.

Figure 5-9-10 Closed gas station due to stock shortages (Sendai City)

Source) Tohoku District Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, "Records of Tohoku District Transport Bureau Activities After the Great East Japan Earthquake: Steps Toward Reconstruction" (March 2012)

Figure 5-9-11 Long line at an open gas station (Sendai City)

Source) Tohoku District Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, "Records of Tohoku District Transport Bureau Activities After the Great East Japan Earthquake: Steps Toward Reconstruction" (March 2012)

4) Knowledge Bag for Securing Regional Mobility

In "2012 Knowledge Bag for Securing Regional Mobility," the Policy Bureau of the Ministry of Land, Infrastructure, Transport and Tourism, organized important matters as basic concepts and efforts necessary to ensure mobility in the event of a disaster into seven items and five time classifications based on knowledge gained from the efforts undertaken in the disaster-affected areas of the Great East Japan Earthquake. Those were further subdivided into 25 items according to content and an attempt was made to present specific details on efforts and procedures for each item.

In addition, in "2013 Knowledge Bag for Securing Regional Mobility," examples of efforts to prepare for disasters after the Great East Japan Earthquake were investigated, and the ideas and know-how which serve to contribute to putting things into practice were compiled as efforts to be undertaken in each region considering "times of disaster" during normal circumstances.

In this document, the processes involved in prior efforts to ensure mobility in the event of a disaster are described as follows.

a. Establishing a framework

- Since the types and timing of disasters to be addressed and outcomes of the efforts are diverse, it is important to establish a framework of targets and desired outcomes prior to specific efforts.

b. Creating scenarios for regional mobility in the event of a disaster

- Next, in order to examine elements such as measures to be taken in the event of a disaster, it is important to assume the mobility needs that are expected to arise in the event of a disaster and obstacles to implementing various responses.
- Having done that, the situation in terms of mobility in the assumed region is arranged in chronological order.

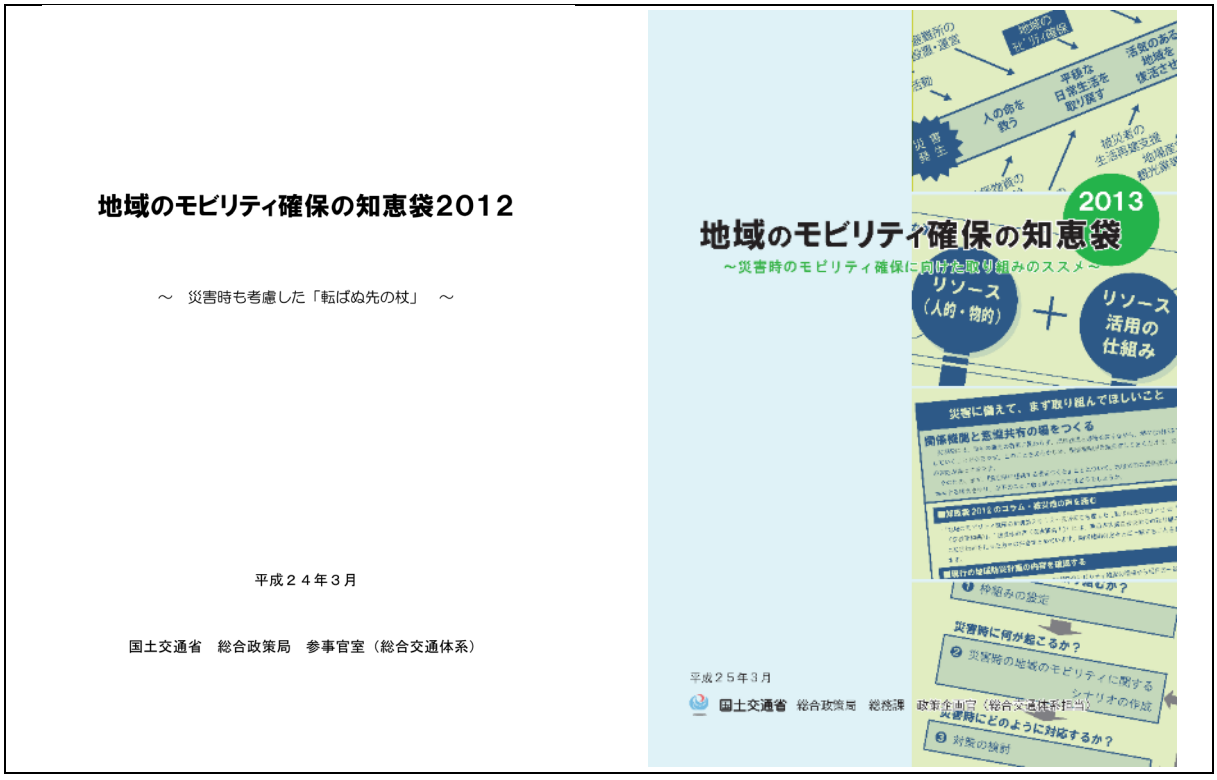
c. Examining countermeasures

- In order to ensure a smooth response in the event of a disaster, after having clarified the responses that will be required in the region based on the scenarios prepared in item b, it is important to confirm the resources that will be required in the event of a disaster and examine the arrangements for responses to take place in the event of a disaster.

d. Establishing and improving countermeasures

- In order to implement appropriate responses when a disaster actually occurs, it is important to undertake continuous efforts, which includes ensuring the establishment of countermeasures which have been examined and working to make improvements to those countermeasures.

Figure 5-9-12 Knowledge Bag for Securing Regional Mobility



Source) Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism, “2012 Knowledge Bag for Securing Regional Mobility”
“2013 Knowledge Bag for Securing Regional Mobility” (Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism)