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& Lifelines

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Back cover photograph: The "Miraculous Solitary Pine" in the town of Rikuzen-Takata in Iwate Prefecture, which survived the great tsunami of the 2011 Tohoku earthquake. As the only survivor of an estimated 70,000 trees that had formed the Takata pine groves, it soon became a celebrated symbol of the recovery wished for by the Japanese population. [Sept. 7, 2011 photo]









Foreword



President of the Japan Trucking Association

Yoshimi Hoshino

The Tohoku earthquake of March 11, 2011 (known in Japan as the Great East Japan earthquake), and the tsunami that it generated represented an unparalleled natural disaster for our country. As many as 470,000 evacuees were forced to live in very difficult conditions, beset by the cold and anxiety. This meant that while there was a pressing need to implement rescue and relief operations, at the same time the transportation of emergency supplies to the evacuee shelters became a matter of great urgency for the whole country.

Answering the call, a large number of trucks loaded with emergency supplies demonstrated their quick response and mobility, wasting no time in reaching the affected areas. These trucks literally performed that role of a lifeline for the survivors of the disaster.

Every day the trucks of Japan perform a vital role in nationwide physical distribution. But in times of emergency, following a disaster of this kind, they serve an essential role in the lives of evacuees and relief workers, providing flexible, point-to-point transport where it is needed.

This document is a summary of the activities of Japan's trucking industry following the 2011 Tohoku earthquake & tsunami. It has been compiled in the hope that the valuable experience and lessons learned at the time will be of use in devising measures to deal with future disasters.

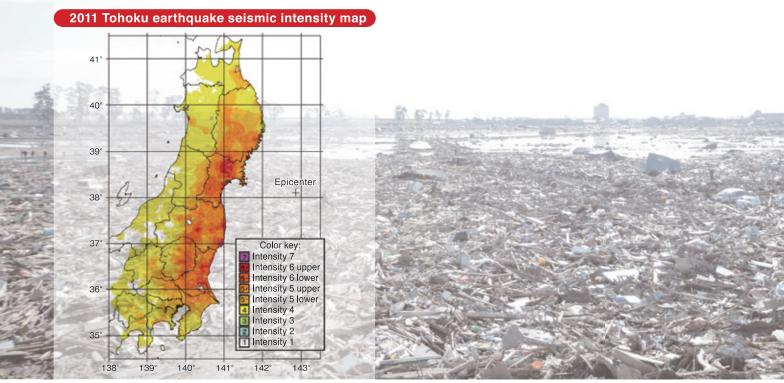
Today the Japanese people face the very real possibility that similar massive quakes will strike the country in the near future. One such predicted earthquake is centered directly below Tokyo, but there are others such as the Tokai and Tonankai/Nankai earthquakes. Those of us connected with the trucking industry believe that further strides need to be made to enhance preparedness and disaster-prevention measures.

Lastly, I would like to offer on behalf of all those in the JTA our sincere condolences to the families of those who passed away in the 2011 Tohoku earthquake and tsunami. We pray that recovery efforts are completed as soon as possible.



It happened in an instant – eastern Japan struck by a colossal earthquake

2:46pm on March 11, 2011 – Magnitude 9.0 with a maximum seismic intensity of 7



Source: Earthquake/tsunami disaster bulletin (Japan Meteorological Agency)

Overview of the Disaster

Massive Earthquake

At 2:46pm on March 11, 2011, a magnitude 9.0 earth-quake – the most powerful of its kind ever to have been recorded in Japan – struck off the Sanriku coast at a depth of 24 km.

This earthquake triggered a massive tsunami, which struck along a large swathe of the Pacific coast of Honshu island, centered on the Sanriku district. Pushing inland, it brought death and destruction to a wide area. But there was more to come: the tsunami damaged the Fukushima Daiichi Nuclear Power Plant, leading to a cascade of problems, including radioactive contamination. The 2011 Tohoku earthquake & tsunami thus became the greatest and most complex disaster to affect post-war Japan.

Scale of the Damage

The damage to life and property caused by the 2011 Tohoku earthquake & tsunami was suffered mainly by 4 prefectures in the Tohoku region – Aomori, Iwate, Miyagi and Fukushima – but it also extended as far as the Kanto

plain, affecting Ibaraki and Chiba prefectures. As of March 2012, the number of dead stood at 18,131, with 3,276 persons unaccounted for, and another 6,023 people injured.

Damage to Public Infrastructure & Lifelines

The massive earthquake simultaneously caused a giant

tsunami, ground subsidence, soil liquefaction and other problems, resulting in damage to public infrastructure such as roads, railways, and ports. The three prefectures of Iwate, Miyagi and Fukushima were



Ports, railroads and other infrastructure suffered enormous damage. (above) Sendai Port ferry terminal; (right) Sendai Port rail station operated by Sendai

(above) Sendai Port Terry terminal; (right) Sendai Port rail station operated by Sendai Rinkai Railway [Sendai, Miyagi; April 8, 2011 photo]



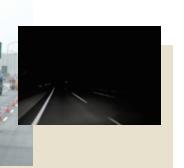




The town of Miyako in Iwate Prefecture suffered serious damage as a result of the giant tsunami, and fishing boats were left stranded in the streets. Local government offices were located close to the shore and as a result were flooded up to the second floor. With no electrical power for over one week, police had to resort to using hand signals to manage the traffic on the trunk road. [Miyako, Iwate; March 19, 2011 photo]







At Sendai Port, the harbor facilities had been put out of action by the giant tsunami. Since many physical distribution facilities were located in the vicinity, a large number of trucks were also lost. [Sendai, Miyagi; April 8, 2011 photo]

The Tohoku Expressway was temporarily restored to use early on the morning of March 12. It served a vital role as a key transport route for emergency supplies. Owing to power shortages, there were no street lights at night (right). In addition, the earthquake had created uneven road surfaces that prevented the smooth flow of traffic, so no time was lost in making the necessary repairs (left). [Taiwa, Miyagi; March 19, 2011 photo]

especially affected; many roads, rail lines and port facilities were ruined. Along the Sanriku coast there was horrific destruction. At the same time, the lifelines on which communities normally depend - electricity, gas, water, sewerage, communications, etc. - were knocked out, dealing a heavy blow to the population and their economic activities.

Damage to the Road Network

Of the infrastructure used for physical distribution, damage was found to have occurred to roads of all types over a wide area. As well as cracks in the road surface, there was also some subsidence. According to a report drawn up by the National Land and Transportation Ministry, the roads that were impassable directly following the disaster were as follows: 15 expressways, 69 sections of directly administered national roads, 109 sections of locally administered roads, and 540 sections of prefectural roads.

Damage to Other **Transport Infrastructure**

All port facilities on the Pacific side of Honshu were affected by the disaster from Hachinohe Port in Aomori Prefecture to Kashima Port in Ibaraki Prefecture. Many breakwaters and quays were lost. Immediately following the earthquake, service was suspended on 177 rail lines operated by 42 companies nationwide, and of these 76 lines were directly damaged by the earthquake & tsunami.

JR container freight cars in transit when the tsunami hit were swept off the rails. On the Ishinomaki port line, tremendous damage was inflicted on the tracks, station facilities, locomotives and freight cars.

No fewer than four airports were affected: Sendai, Hanamaki, Fukushima and Ibaraki. Of these, Sendai Airport was submerged by the tsunami; inestimable damage resulted from the flooding - to machinery and equipment, as well as to electrical generating equipment, etc.



Transportation of Emergency Supplies

Emergency Transportation of Unprecedented Scale

The damage caused by the 2011 Tohoku earthquake & tsunami was vast both in terms of its severity and the area affected. The number of refugees peaked at 470,000, there were more than 2,400 evacuee shelters, and the number of meals provided reached a maximum of 1.13 million per day. In fact, the volume of emergency supplies has been greater than anything in the past. Nevertheless, immediately following the disaster there was such confusion that it was difficult to deliver water and food to the refugees at the end of the supply chain. As well as the immediate need to provide rescue and evacuation services, it was clear that the transportation of emergency supplies to the evacuee shelters was an issue of great urgency.

The Advantage of Trucks

From the moment they were mobilized, the trucks demonstrated their outstanding mobility, transporting emergency supplies such as food and water. While the transport aircraft of the Self-Defense Forces, trains, ships and planes all played a part, it was truck transportation – which did not require the transshipment of freight before it reached its final destination – that accounted for 72% of food and 58% of beverages delivered.

Procurement and transport of supplies (March 11 to April 20)

(Cabinet Office Team for the Life Support of Victims)

	Road	Rail	Sea	Air
	Cumulative total	Cumulative total	Cumulative total	Cumulative total
Food	18.977 million meals	118 containers		
Beverages	4.602 million bottles	114 containers		
Blankets	458,000	33 containers		
Fuel oil	n/a	177.974 kl	7.233 million kl	
Crude oil			137,000 kl	
LPG, etc.			39,000 tons	
Other		117 containers		252 tons
No. of trucks/ trains/ ships/ flights	1,927 trucks	232 trains	2,277 ships	663 flights

Volume of supplies transported bytruck as percentage of total

Food: approx. 70%

Beverages: approx. 60%

Source: "Commission to Investigate Disaster Emergency Measures for the Great East Japan Earthquake" (Ministry of Land, Infrastructure and Transport)



Response of the JTA

Immediately following the earthquake, the Japan Trucking Association set up an Emergency Transportation Headquarters. JTA executives and employees were assigned tasks, and preparations were made to respond to emergency transportation requests on a 24/7 basis. Similarly, trucking associations nationwide set up their own taskforces, coordinating with local government agencies and their member companies. An emergency transportation system was thus born.

In response to requests by the central government for the transportation of emergency supplies, the Japan Trucking Association made necessary arrangements and secured the active cooperation of major transport companies – Yamato Transport, Sagawa Express, Seino Transportation and Fukuyama Transporting, including Nippon Express in a central role – aided by some smaller transport companies.

Throughout Japan, city and prefectural trucking associations geared up to meet the challenge, and the drivers started their engines.

How Trucks Served as a Lifeline

The first contingent of emergency vehicles organized by the Japan Trucking Association set off before dawn on March 12. Over the 59-day period between then and May 9, a cumulative total of 1,925 trucks delivered supplies to 2.032 locations.

Up till June 30 as many as 8,702 vehicles were mobilized by truck associations throughout Japan in response to requests received from public bodies. Looking at a breakdown of what was transported, there were 4.6 million bottles of drinking water, 18.98 million meals, 460,000 blankets, and a huge array and volume of clothes and household supplies. In the initial stages of this relief effort most of the supplies were items considered to be especially urgent – water, rice balls, bread and other foodstuffs as well as blankets – and it was the trucks that served as a lifeline to deliver them.



Transportation of Emergency Supplies

Delivery to the Final Destination

The emergency relief supplies procured by the central government's headquarters for emergency disaster measures were – except for petroleum products and large items such as portaloos – transported to key depots in each prefecture. Transportation from these depots to more than 2,000 evacuee shelters was arranged by local trucking associations and implemented by their members. However, there was a deal of confusion in many locations which meant that shelters either had too few supplies or too many.

This confusion resulted from a number of factors. In addition to the unparalleled severity and scope of the disaster, following the earthquake there were power outages and the telecommunications infrastructure was disrupted. This was a very difficult situation for relief workers, and it was not possible to immediately organize the logistics for receiving supplies in the areas affected by the disaster. There were also delays in finding suitable depot locations, and not enough people to handle and sort the supplies.

Physical Distribution Specialists

Seeing how this confusion was impacting the physical distribution of emergency supplies, the Ministry of Land, Infrastructure and Transport urged the dispatch of specialists to local government bodies in each of the prefectures affected by the disaster so that they could ensure the smooth and efficient transportation of supplies from depots to shelters. In response to this, trucking and warehouse associations dispatched their logistics specialists: 1 to Iwate Prefecture (March 11), 2~3 to Fukushima Prefecture (March 13), 1~3 to Miyagi Prefecture (March 14), and 2 to Ibaraki Prefecture (March 24).

These specialists could make full use of their expertise and experience to shoulder a wide range of responsibilities, ranging from accurately grasping local needs to organizing load handling, sorting and storing, and finally delivery of the emergency supplies to the evacuee shelters.

■ Major Home-delivery Companies

Home-delivery companies familiar with this region played a conspicuous role. Their drivers are thoroughly familiar with the roads and local conditions, and many know the families in the houses they deliver to, including whether or not there are any senior citizens at a particular address. These home-delivery companies also suffered losses of staff and vehicles as a result of the tsunami, but their drivers were able to make use of the experience and



A home-delivery truck carrying relief supplies in Onagawa, Miyagi.

knowledge gained from their regular work activities to serve a very important role on the frontlines in the regions affected by the disaster.

A delivery truck carrying supplies in Minami-Sanriku, Miyagi.

Radioactive Contamination from the Nuclear Power Plant

In Fukushima Prefecture there was massive damage caused by the earthquake and tsunami, crippling the Fukushima Daiichi Nuclear Power Plant. This led to even greater problems and made the disaster much more difficult to handle: a no-go area was set up around the plant and this was steadily expanded, creating many difficulties for those involved in rescue and relief activities as well as transportation operations.

Fuel Shortages

Many oil refineries and storage tanks were destroyed by the March 11 earthquake and tsunami, and as a result they were forced to suspend operations. Moreover, filling stations along the Sanriku coast were devastated by the tsunami. And, even if there were reserves of gasoline, it was often impossible to pump it as there was no electrical power. What is more, many of the companies and tankers that transported petroleum products had also suffered damage. And because there was increased demand for the kerosene used for generators and heating, as well as for the gasoline needed for cars, shortages soon developed in the affected areas. Consequently, there was a significant lack of fuel available to local government agencies and hospitals in these areas for first responders and ambulances. It was urgent that gasoline be delivered to them. Before long virtually all of eastern Japan began to suffer from such shortages, and this began to impact physical distribution because the trucks too could not get enough fuel.

In view of this dire situation, on March 14 the JTA presented the government with a formal request for securing and supplying fuel for transportation use. In response, the government quickly implemented measures for ensuring emergency fuel supplies from public and commercial reserves. It also designated transport routes in the eastern Japan region and filling stations that were to give priority to vehicles involved in delivering emergency relief supplies. Gradually the fuel supply situation began to improve.



A convoy of tankers involved in emergency transportation respond to fuel shortages in areas affected by the disaster. [Tohoku Expressway northbound lanes; March 20, 2011 photo]



Apio (Iwate Industry Culture & Convention Center) became a hub depot for Iwate Prefecture. [April 8, 2011 photo]



Outside Apio, a security team kept watch on arriving and departing vehicles on a 24-hour basis. [April 8, 2011 photo]

Local Trucking Associations' Response in the Affected Region

In the affected prefectures, local trucking associations took the lead in managing the depots and delivering the supplies to the evacuee shelters. In Iwate, adopting a proposal made by the prefectural trucking association, Apio (Iwate Industry Culture & Convention Center) – which has a large capacity for the handling of relief supplies - was chosen to serve a key depot, from which the distribution of emergency supplies was managed. This approach came to be called the Iwate Method. Apio is seen as a model case for physical distribution following a disaster.

In Miyagi, the number of refugees exceeded 300,000, and as a result the volume of emergency relief supplies was



Outdoor facilities were mainly used for temporary storage of large items. [April 8, 2011 photo]

immense. Immediately after the disaster several depots were set up. The transportation of emergency supplies requested by the prefecture was organized by the prefectural trucking association and carried out by its members. On April 1, the head office of the prefectural government HQ was reorganized to concentrate its functions, and the handling of emergency transportation was overhauled.

In Fukushima Prefecture, the Fukushima Daiichi Nuclear Power Plant accident had a severe impact on emergency transportation. Relief supplies from all over Japan were transported to 7 depots in 3 cities – Fukushima, Koriyama, and Aizuwakamatsu – and from there the prefectural trucking association took charge of deliveries to the various evacuee shelters.



Emergency Supply Transportation Issues

Making Use of Depots

When a large-scale disaster occurs, there immediately arises a demand for logistics expertise to handle the high volume of emergency relief supplies. In parallel with the rescue activities of first responders who are focused on saving lives, there is thus an urgent need to establish a system for the efficient delivery of supplies to survivors. Especially important is the securing of physical distribution facilities.

In the case of the 2011 Tohoku earthquake & tsunami, at the onset it was not possible to secure a sufficient number of facilities for storing supplies in the prefectures affected by the disaster; this led to a great deal of confusion. In some of the existing warehouses there was not enough space for emergency supplies owing to the fact that they were already storing goods, and in some cases these had collapsed in the earthquake, hampering their removal. Conditions like these were a major obstacle to transporting and delivering emergency supplies.

Furthermore, if different types of supplies are stored separately in different depots, then the trucks charged with making deliveries to the evacuee shelters are forced to collect cargo from several different sites, leading to greater complexity in logistics. Greater distances have to be covered and more time consumed, leading to reduced efficiency. It was for this reason that separating emergency supplies by type in different locations was avoided as much as possible. Instead, the goal was to concentrate mixed supplies in large-scale facilities. This is an important point for anyone involved in planning the physical distribution of emergency supplies, where speed is of the essence.



Several trucks can operate in a large arena-like facility like this, whether they are arriving, loading/offloading supplies, or leaving. [Apio in Takizawa, Iwate; Sept. 8, 2011 photo]



The same arena when it is empty. [Apio in Takizawa, Iwate; Feb. 20, 2013 photo]

Damage Suffered by Trucking Companies

As a result of the 2011 Tohoku earthquake & tsunami disaster, an immense amount of damage was inflicted on the facilities and equipment of trucking companies. This was especially the case in coastal areas in the three prefectures affected by the disaster – Iwate, Miyagi, Fukushima – where the tsunami washed away or destroyed a large number of buildings, warehouses and trucks. Inland too, buildings were damaged over a wide area. Physical distribution facilities and equipment were severely impacted.

Serious losses were also suffered by the industries and individual companies who had been clients of these trucking companies. This was especially the case in the fishing and seafood processing industries; the incalculable damage suffered all along the coast meant that the demand for trucking collapsed overnight. Indeed, not a few of these clients and trucking companies have still to set a date for resuming operations.

Naturally, the effect of this disaster was even more keenly felt in Fukushima Prefecture as a result of the nuclear plant accident.



So widespread was the damage that several trucks in the fishing harbor of Hachinohe, Aomori, were destroyed. [Hachinohe, Aomori; March 14, 2011 photo]



The Ofunato Training Center operated by the Iwate Trucking Association was completely destroyed. [Ofunato, Iwate; May 12, 2011 photo]



One of the tankers lost to the tsunami. [Natori, Miyagi; Apr. 8, 2011 photo]

Activities of the JTA

Commendations

The emergency transportation activities undertaken by the trucking industry were widely praised. In September 2012, the Japan Trucking Association was awarded the 2012 Prime Minister's Commendation for meritorious service (below).

Also, letters of thanks were received from the Minister of Land, Infrastructure and Transport, the Minister of Health, Labour and Welfare, and from the governors of the affected prefectures.



Overseas the JTA was presented with the Grand Prix d'Honneur by the IRU (International Road Transportation Union): the IRU praised the JTA's work following the 2011 Tohoku earthquake &



tsunami, saying that it had resolutely tackled the challenges of emergency transportation with all of the resources at its disposal, and that it had played a prominent role in the relief effort (left).

Commendations, etc. received by the JTA for its work following the 2011 Tohoku earthquake & tsunami

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Feb 2012	Letter of gratitude from the Governor of Iwate Prefecture for assistance to those affected by the 2011 Tohoku earthquake & tsunami	
Feb 2012	Letter of gratitude from the Governor of Miyagi Prefecture for assistance to those affected by the 2011 Tohoku earthquake & tsunami	
Jun 2012	Letter of gratitude from the Governor of Fukushima Prefecture for contributions made to rebuilding the lives of victims of the 2011 Tohoku earthquake & tsunami and of the Fukushima nuclear plant accident	
Jul 2012	Letter of gratitude from the Minister of Land, Infrastructure and Transport in recognition of meritorious service following the 2011 Tohoku earthquake & tsunami	
Sep 2012	2012 Prime Minister's Commendation for meritorious service in the cause of disaster prevention	
Mar 2013	Letter of gratitude from the Minister of Health, Labour and Welfare for assisting victims of the 2011 Tohoku earthquake & tsunami	
Jun 2013	IRU (International Road Transportation Union) Grand Prix d'Honneur	

Donations

The sum of 322 million yen was collected from trucking companies nationwide to donate to the prefectures affected by the disaster, and 34.5 million yen was donated to local governments in Iwate, Miyagi and Fukushima prefectures that had suffered the most severe damage. To assist in the recovery of those trucking companies that had suffered in the disaster, a contribution of 218.5 million yen was made to trucking associations in Hokkaido and in the prefectures of Aomori, Ibaraki, Iwate, Miyagi and Fukushima.

■ Financial Support for Trucking Companies

For those trucking companies that suffered the most in the disaster, the JTA has arranged a special loan facility of approximately 3.1 billion yen through the Serious Disaster Financing system of the Central Modernization Fund, and also a 34 million yen grant to ensure a fixed rate of interest.

Also, with the objective of speeding recovery and reconstruction, the JTA has provided an aid grant of 300 million yen to trucking associations in the affected areas which contributed to replacing or repairing damaged vehicles, business premises and equipment, paying guarantee fees to support emergency recovery following the 2011 Tohoku earthquake & tsunami.

Youth Activities

Following this disaster, the Japan Trucking Association Youth Division, made up of young business owners in



Japan's trucking industry, conducted their own campaign to raise donations. In July 2011 they were able to donate 950 solar-powered fans to kindergartens, primary and junior high schools in the coastal areas affected by the disaster. In October of the following year, they donated school supplies (industrial fans, volleyball posts, iPads, electronic whiteboards, etc.) to primary and junior high schools in the towns of Namie and Okuma in Fukushima.

In order to boost the morale of children from primary and junior high schools in the affected areas and to encourage them to think positively about their future education, in March 2013 162 children and parents were invited to attend the opening game at the Tokyo Dome (photograph) and to visit Tokyo Disneyland.

JTA Disaster Prevention Center

In order to enhance preparedness for the large-scale earthquakes predicted to strike Japan in future (including one centered directly below Tokyo), the JTA is constructing a Disaster Prevention Center (photograph) featuring the latest technology. Scheduled for completion in July 2014, it is located on the site of the previous JTA Hall at Yotsuya, in Tokyo's Shinjuku district.

The building's seismic-isolation structure will enable it to withstand a major quake while minimizing damage to facilities and equipment. Electrical power failures are

expected in a disaster, so the building is provided with two separate circuits and emergency generators that can operate continuously for 72 hours. It will also feature solar panels for power generation.

This Center will serve a key role in disaster prevention for the trucking industry. In addition to the JTA offices, it will feature a room for managing emergency operations and also training facilities.



Setting off with a Sense of Mission

Personal stories of those involved in emergency supply transport

Sumidagawa Container Depot, Tokyo Container Branch, Nippon Express Co., Ltd.

Hiroyuki Yamada

Express took part in emergency relief transport as a government-designated public organization. On Monday, March 14, just days after the disaster the decision was made for Hiroyuki Yamada to set off from Tokyo that night. After loading up at a Kasumigaseki warehouse in downtown Tokyo, he drove northwards using the city highways and the Tohoku Expressway. With his cargo of protective clothing and masks, he made for the disaster prevention center in Fukushima Prefecture. After this first mission, he made many more trips to deliver emergency supplies and also materials needed for recovery and reconstruction work. Looking back, he says that it was a keen awareness of how eagerly people were awaiting his cargo that brought home to him just how much difference such deliveries could make.

Assistant Manager, Shipping Dept., Tokyo Office, Wise Tsusho Co., Ltd.

Michitaro Kimura

On the evening of Sunday, March 13, Michitaro Kimura received orders from his head office in Nagoya. He set off from Tokyo the following day for Natori in Miyagi Prefecture. He was transporting 3 generators that had been requested by the city hall, but on his own initiative he also loaded up with drinking water, rice, blankets and other supplies that would be needed by the evacuees. Since only a few days had passed since the disaster struck, he carried extra fuel and food for the return journey. It was a very difficult mission, and the frequent aftershocks only added to the stress. However, he says that he felt a strong sense of responsibility — "Come what may, these supplies have to be delivered!" — and he is proud that he was able to make a contribution at such a time of need.





Japan Trucking Association

19th Floor, Shinjuku L Tower, 1-6-1, Nishi-Shinjuku, Shinjuku-ku, Tokyo 163-1519 Tel: +81 (0) 3-5323-7109 http://www.jta.or.jp