Disaster prevention and mitigation, national resilience policy
- Protecting people’s lives and livelihoods from disasters -
People’s lives and livelihoods must be protected from major earthquakes that can occur at any time, and increasingly severe and frequent weather disasters. With the goal of securing the passage of emergency vehicles within approximately one day, and of general vehicles within approximately one week after a disaster strikes, we will work to build a disaster-resilient road network, and promote efforts to support evacuation, lifesaving emergency and recovery activities, and to strengthen crisis management measures.

Increasingly severe and frequent weather disasters
■ Annual incidence of precipitation of 50 mm/hour or greater
■ Probability of experiencing an earthquake of intensity 6 or greater in the next 30 years

Major earthquakes that can occur at any time
■ Probability of experiencing an earthquake of intensity 6 or greater in the next 30 years

Disaster-Resilient Road Network Proves Effective (Case Study of heavy rain in 2021)
■ Early reopening of four-lane sections to traffic
The Chuo Expressway (Okaya JCT to Itoiku IC) was closed to traffic due to a mudslide, but since it was a four-lane section, the undamaged lanes were used and traffic was opened as soon as possible.

■ Securing transportation functions through a redundant network
National Highway 9 (Izumo City, Shimane Prefecture) was closed due to a landslide, but the Sanin Expressway, which forms a redundant network, was used to secure traffic functions.

Comprehensive advance disaster prevention and mitigation measures
Based on the “Five-Year Road Program for Disaster Prevention, Mitigation and National Resilience” formulated in April 2021, we are working to build a national arterial road network that is resilient to disasters by eliminating missing links on high-standard roads, converting temporary two-lane sections to four lanes, and strengthening the redundant network of high-standard roads and national highways under jurisdiction of MLIT that can function as alternatives.

Background / data
To ensure the functioning of a disaster-resilient national arterial road network, we aim to secure passage for emergency vehicles within approximately one day after a disaster occurs, and for general vehicles within approximately one week.

Based on the targets and scale of projects set in the “Five-Year Acceleration Measures”[1], each regional infrastructure bureau formulates a “Five-Year Road Program for Disaster Prevention, Mitigation and National Resilience”[2] showing the expected progress of specific projects in each prefecture over the five-year period.

Eliminating missing links
(national highway 42 Susami-Kushimoto Road)
A tsunami resulting from a Nankai Trough earthquake is expected to inundate* about 60% of the sections of Route 42. The construction of the Susami-Kushimoto Road eliminates a missing link and secure routes for emergency transportation to avoid tsunami-inundated areas.

Converting temporary 2-lane sections to 4-lane
(Joban Expressway)
In February 2021, an earthquake off the coast of Fukushima Prefecture caused a slope collapse on a provisional two-lane section of the Joban Expressway, which led to a total closure of the road. The four-laning of the Joban Expressway is expected to secure traffic functions by utilizing the undamaged lanes in the event of a disaster.

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* Rate of improvement of missing links on high-standard roads (2019 -> 2025): 0% -> approx. 30%
* Start rate of four-lane conversion projects on high-standard (toll) roads in priority development sections (2019 -> 2025): approx. 13% -> approx. 47%

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Comprehensive advance disaster prevention and mitigation measures

In order to build a resilient road network, disaster prevention and mitigation measures will be promoted in response to increasingly severe recent disasters and disaster risks that have been newly identified through advances in inspection methods.

**Background / data**

* The average annual incidence of precipitation of 50 mm/hour or greater has increased by about 1.5 times [1].
* In heavy rains in July, 2020, 10 bridges along the Kuma River in Kumamoto Prefecture were washed away, with roads adjacent to the river also washed away and suffering major landslides, causing long-term road closures.

**Measures to prevent the loss of bridges at road structures adjacent to rivers**

In response to risks of disasters leading to long-term road closures including scouring and washing out of bridges and roads, promote countermeasures such as anti-scouring and loss prevention works, and bridge replacement.

* Rate of construction work at locations on emergency transport roads that require countermeasures against scouring and loss of bridges on river crossings and structures adjacent to rivers (2019 -> 2025): approx. 28% -> approx. 100%

**Countermeasures against scouring and loss of bridges at river crossings and embankments**

* In heavy rains in July, 2020, 10 bridges along the Kuma River in Kumamoto Prefecture were washed away, with roads adjacent to the river also washed away and suffering major landslides, causing long-term road closures.

**Use of elevated sections of roads as inundation evacuation measures against tsunamis and floods.**

* About 1,800 km of road sections nationwide are higher than the submergence depth of tsunamis and floods. [Ref. 1]
* In the aftermath of the Great East Japan Earthquake, roads were used as emergency evacuation sites, demonstrating their secondary disaster prevention function. [Ref. 2]

**Use of Roadside rest area (Michi-no-Eki) and other facilities as bases for recovery and reconstruction activities**

* In the aftermath of major disasters such as the 2016 Kumamoto earthquakes and the 2018 Hokkaido Eastern Iburi earthquake, Roadside rest area (Michi-no-Eki) functioned as bases for recovery and reconstruction activities.

**Disaster response routes and Information**

* In the event of a disaster, we will provide a “passible route map” that consolidates information on passability to support the transport of goods.
* In preparation for an imminent large-scale earthquake, formulate and review Disaster response routes plan and conduct training programs.

**Example of road recovery plan: Chubu version “Operation Teeth of the Comb”**

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Note: [1] Comparison between 1976-1985 and 2011-2020 averages of annual incidence of precipitation of 50 mm/hour or greater per 1900 AMeDAS locations.
Comprehensive advance disaster prevention and mitigation measures

In the event of a disaster, such as heavy rains, heavy snowfalls, or earthquakes, we will take measures to minimize the impact on socioeconomic activities, while giving top priority to people’s lives and livelihoods.

Improvement of disaster preparedness in cooperation with other organizations during heavy rains and snowstorms.

Background / data

- The average annual frequency of precipitation of 50 mm or more per hour has increased by about 1.5 times. (Ref1)
- In recent years, heavy snowfall has occurred locally, including in areas where there has been little snow in the past. (In the past 10 years, 30% of all observation points in Japan have set new records for snow depth.)
- Heavy snowfall in 2020 caused large-scale vehicle blockage on the Kanetsu Expressway and other roads.

In order to minimize the impact of road closures, when abnormal weather conditions such as heavy rain and snow are forecast, we repeatedly announce road closure forecasts and make emergency announcements in cooperation with the Japan Meteorological Agency, calling on people to refrain from going outside.

Reinforcement of measures to secure road traffic during heavy snowfall, in light of the large vehicle blockage caused by heavy snowfall in 2020. (Ref2)

Principal measures to be undertaken

- Create a timeline and conduct trainings to respond to short-term, concentrated snowfall, including systematic and preventive road closures without hesitation.
- To prepare for the unavoidable occurrence of vehicle blockage, a support plan to protect passengers was developed, and training was conducted.
- Increase the amount of snow removal equipment, install more cameras, and improve snow removal and melting facilities.
- Upgrade snow removal equipment and introduce automatic detection of traffic obstacles using AI.

In preparation for rapid recovery in the event of a large-scale electric outage due to a disaster, an information system will be established in advance with the Ministry of Economy, Trade and Industry (METI) and electric power companies, and priority routes will be coordinated.

■ Announcement of road closure forecasts and calls for wide area detours

- Forecast of road closure (during heavy rain: July, 2021) - Clearly indicate wide area detour

■ Measures to secure road traffic during heavy snow

- Forecast of road closures (during heavy rain: July, 2021) - Updated and announced every 4 hours

- Passenger protection seminars against large-scale vehicle blockage on the Kanetsu Expressway (Ref. 2) (January 29, 2021)

Recovery and restoration from large-scale natural disasters

We will promote disaster recovery projects for roads and other facilities in order to achieve the earliest possible recovery and restoration of disaster-stricken areas that were severely damaged by natural disasters.

Background / data

Recovery from the Great East Japan Earthquake

- Reconstruction road and Reconstruction support road (550km) for the Great East Japan Earthquake in 2011 fully opened on December 18, 2021.
- Sections started after an earthquake will be open in about 8 years on average.
- Construction started in 6 years at the earliest.
- The opening of the entire line has greatly reduced travel time between cities.

(Before the earthquake (Mar. 2011) - After the line was fully opened (Dec. 2021))

- Sendai - Mihonoseki: From approx. 320 min. to approx. 320 min.
- Sendai - Miyako: From approx. 330 min. to approx. 210 min.
- Before the earthquake, we used National Highway 45 and the three roads that had already been opened.
- Soma - Fukushima: From approx. 80 min. to approx. 50 min.

Promote disaster recovery projects on the behalf of local governments, such as the Kawashima Bridge in Gifu Prefecture and National Highway 279 in Aomori Prefecture, which were damaged by heavy rain in 2021.

Promote disaster recovery projects on the behalf of local governments for National Highway 219 and prefectoral roads, including 10 bridges along the Kuma River in Kumamoto prefecture.

■ Kawashima Bridge (Gifu Prefecture)

■ National Route 279 (Aomori Prefecture)

Recovery from the Kumamoto Earthquake

- Restoration of National Highway 57, Highway 325, and prefectoral roads damaged by the Kumamoto Earthquake in 2016 will be completed by March 2021.
- In the same time as the opening of the New Aso Bridge, a viewing platform was completed.
- The number of visitors to nearby tourist facilities more than the level before the earthquake.

“Michino-Eki Asobono Sato Kugino”

Pre-earquake: 28,430 people/month
Post-opening: 30,800 people/month

■ Floods in the region of Kyusyu in July 2020

(National Highway 219, Kumamoto Prefectural Road)