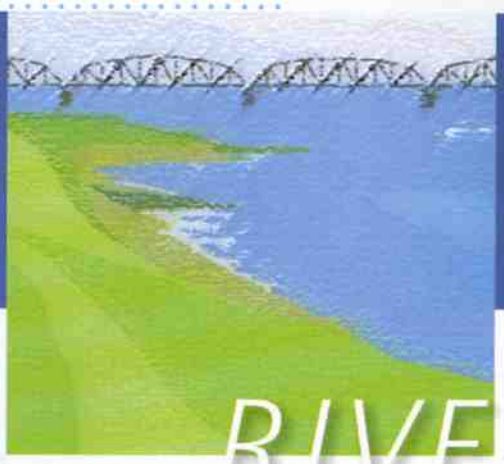
OUTLINE OF THE PROJECTS

TOKUSHIMA OFFICE



RIVER

ROAD

Tokushima Office of River and National Highway
Ministry of Land, Infrastructure and Transport
http://www.toku-mlit.go.jp

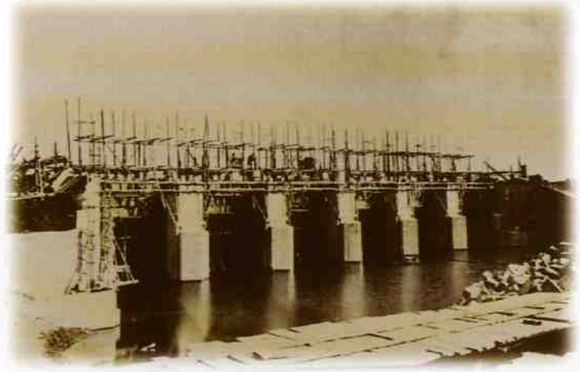
RIVER

Overview of the Yoshino River basin

The Yoshino River has its origin Kamegamori (elevation: 1,897 m) in Hongawa Village, Kochi Prefecture, which is located in the midwestern part of the Shikoku Region. It runs east along the Shikoku mountains through the central part of the Shikoku island, changes its direction to the north when it enters Tokushima Prefecture, crosses the Shikoku mountains joined by the Iya River and the Dozan River and turns east again at Ikeda Town, Tokushima Prefecture. It flows through Iwazu and the Tokushima Plain joined by a number of tributaries, separates into the Kyuyoshino River and the Yoshino River at the Daiju Weir and flows into the Kii Strait. Since ancient times, it has been nicknamed "Shikoku Saburo" and has been counted among the "three naughty brother" rivers in Japan together with "Bando Taro" (the Tone River) in the Mainland and "Tsukushi Jiro" (the Chikugo River) in the Kyushu island for their frequent flooding. These three rivers have benefited people in the basins but have also caused floods and destroyed people's lives because of levee breaks.

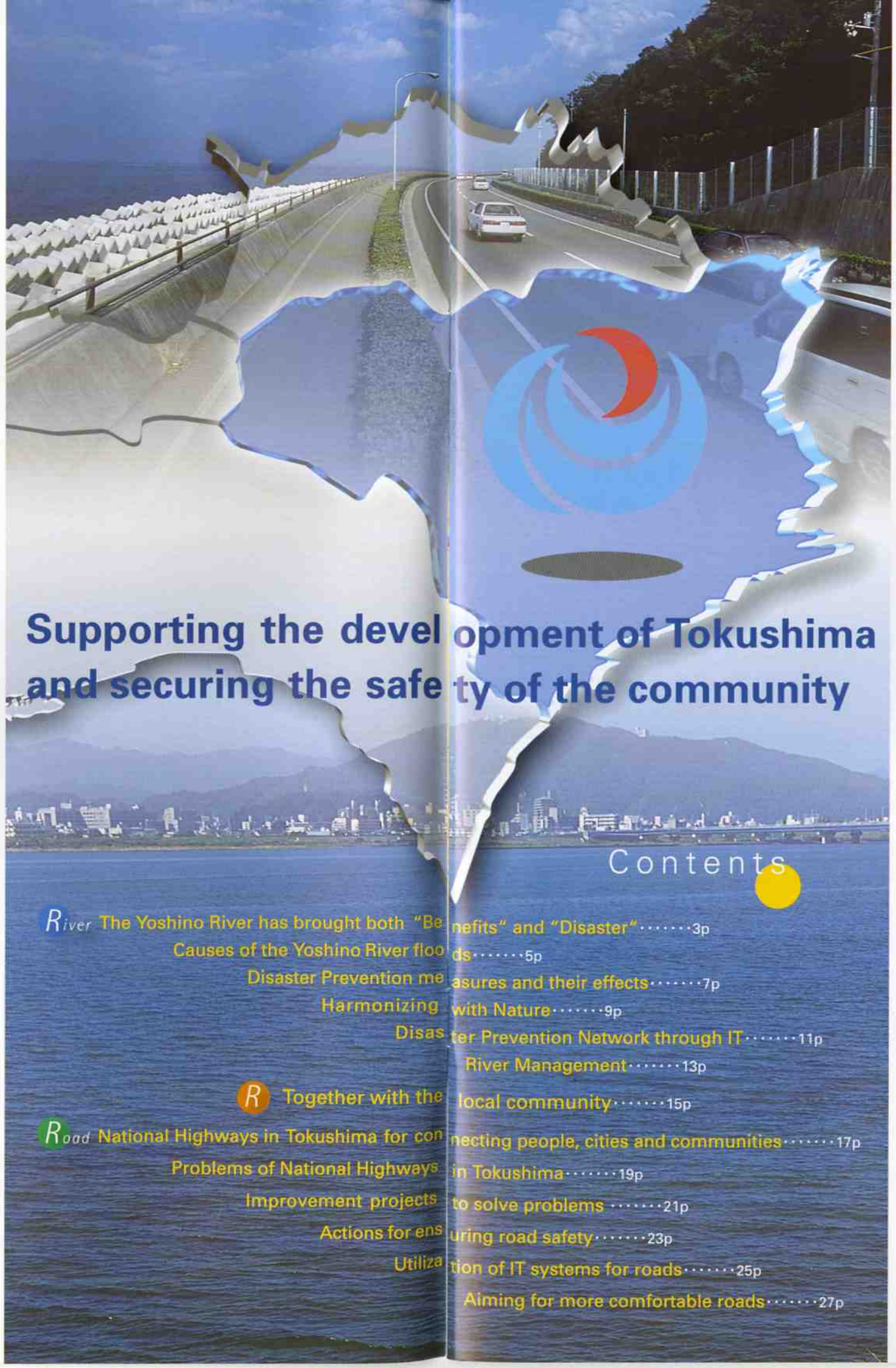
History of the Yoshino River

1884 Johannis de Rjke submitted an inspection report of the Yoshino River.
1907 The first improvement project of the Yoshino River started.
1923 The Daiju water gate was completed.
1927 The first improvement project of the Yoshino River was completed (the section from Iwazu to the river mouth).
1928 The Yoshinogawa Bridge was completed.
1932 The Bekku River was renamed the Yoshino River. The Yoshino River was renamed the Kyuyoshino River.
1949 The second improvement project of the Yoshino River started.
1953 The Yanase Dam was completed.
1964 The Kawashima Pump Station, the first drainage pump station in the Shikoku Region, was completed.
1965 The New River Act was enacted. The Yoshino River was designated a Class A river.
The Master Plan for the Yoshino River System was formulated.
The section between Ikeda and Iwazu (approximately 40 km), upstream of the Yoshino River, came under the direct control of the Tokushima Work Office.
1975 The Sameura Dam and the Ikeda Dam were completed.
1976 The Shingu Dam was completed. The Kyuyoshino River and the Imagire River came under the direct control of the Tokushima Work Office.
1982 The Master Plan for the Yoshino River System was revised.
1997 The Ishii River Flood Fighting Station, the first one in the Shikoku Region, was completed.
2001 The Tomisato Dam was completed.



Construction of the Daiju water gate

In the first improvement project of the Yoshino River (from 1907 to 1927), the Bekku River (the section of the present Yoshino River downstream of the Daiju Weir) was modified into a discharge channel so that the whole volume of floodwater was channeled off. To intake the water necessary for irrigation, the Daiju water gate was constructed approximately 1 km upstream of the Daiju Weir.



Contents

ROAD

History of National Highways in Tokushima Region

The first improvement projects
Route 11 (from 1958 to 1963)
Route 32 (from 1959 to 1967)
Route 55 (from 1963 to 1972)
Route 192 (from 1966 to 1978)
The second Improvement projects
1961 Naruto improvement
1963 Yoshinogawa Bypass
1966 Hanoura Bypass
1969 Ikeda Bypass
1970 Tokushima Minami Bypass
1973 Mugi Highway
Anan Highway
1986 Tokushima Southern Ring Road
Aiba-cho Common Utility Duct Improvement
1989 Naruto Disaster Prevention Project
1990 Expansion project of the Ikawa
Mugi Bridge
1995 Hiwasa Highway
Sako Bridge
1998 Muya Bridge
2002 The improvement projects of Tokushima IC
2003 Inohana Highway

National Highways before Improvements

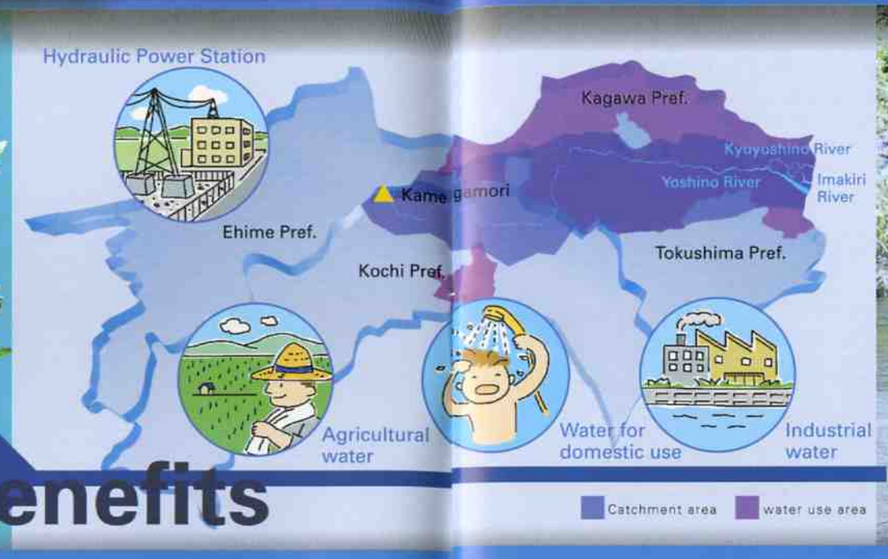
National highways in Tokushima Prefecture have been rapidly improved during the first and second improvement projects (the first improvement: from 1958, the second improvement: from 1961). Before the improvement projects, most highways were narrow and unpaved. They were completely different from today's highways.
The Shikoku island, including Tokushima Prefecture, is divided by steep mountains into the northern and southern areas. Before the Meiji Period, a little exchange between feudal regions and this delayed the development of overland transportation systems. Because of this historical background and the severe natural conditions, road construction had not easily proceeded in Tokushima Prefecture, especially in its mountainous areas.

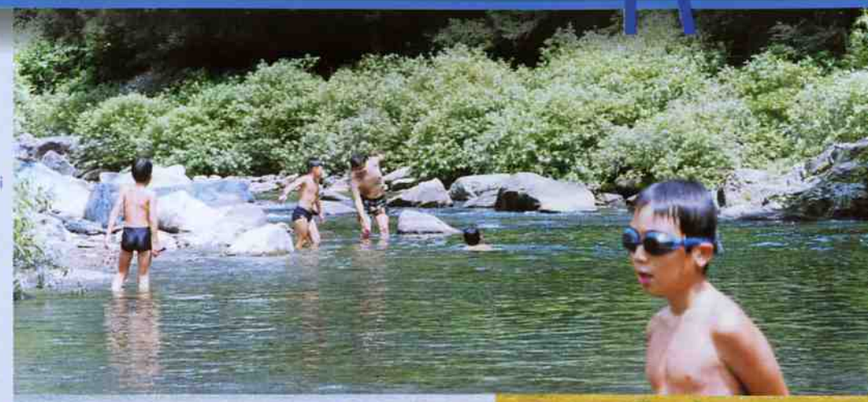
View of Shiroyama from Route 192 (Sako gobancho) in May 1959
(Photograph provided by Tokushima Prefecture Library)

The Yoshino River has brought both "Benefits"and "Disaster"

"Shikoku Saburo", the Yo shino River, is the largest river in the Shikoku Region. The water has irrigated the land and has provided us with rich benefits. However, once heavy rain pours down, the Yoshino River turns into an unruly river, and riverside re sidents have been suffered from floods almost every year.

River





Benefits

"Shikoku Saburo", the Yoshino River, is 194 km long

The Yoshino River runs through 5 cities, 32 towns and 10 villages of four prefectures in the Shikoku Region. The length of the main river course is 194 km, and the catchment area is 3,750 km², which accounts for almost 20% of the entire Shikoku Region. The Yoshino River has 356 tributaries, including the Iya River, which is famous for Kazura Bridge, and the Dozan River, which is known for the abandoned Besshi copper mine. Of all the rivers in Japan, the Yoshino River is the 12th longest, the 17th largest in the catchment area, and the first in unregulated peak discharge, which is the basis for drawing up flood control plans.

2.5 million people use the water of the Yoshino River

In the Edo Period, Japanese indigo plants wa re widely cultivated along the Yosh- ino River. It is said that this partly due to the fertile soil brought by the Yoshino River. Before overland transportation systems were developed, people depended on shipping along the river. Today, the Yoshino River irrigates fields and provides water for domestic and industrial use to Toku hima City, Takamatsu City and other municipalities in the four prefectures of the Shikoku Region. The river supports the lives of approximately 2.5 million people, who account for about 60% of the population of the Shikoku Region.

1.17 million people enjoy the Yoshino River

Approximately 1.17 million people enjoy the river's beauty, fishing and sports along the Yoshino River (estimated from the 2000 survey). The river is an important tourist resource and attracts a number of tourists every year. The riverbed is widely used as a place for recreation and refreshment. Recently, an effort to protect and restore the natural environment has started.

History of floods

During floods, the Yoshino River is dangerous and threatens our security.

Disaster

1. Flood in 1866 ("Tora no mizu")

Shibahara, Tokushima city

A consequence of the "Tora-no-Mizu" flood of 1866 remains at Zoshuin Temple. A pole was built to hand down the fear of the "Tora-no-Mizu" flood for posterity. It is said that the riverside paddy fields and upland fields were flooded to an approximate 3 m depth.

2. Flood in September 1954 (Typhoon June)

Iwazu, Awa town

A peak discharge of approximately 15,000 m³/s was recorded at Iwazu.

3. Flood in September 1974 (Typhoon NO.18)

Inoziri, Waki town

A peak discharge of approximately 14,470 m³/s was recorded at Iwazu, which caused a major flood in Waki Town.

4. Flood in July 1993 (Typhoon NO.5)

Aihata, Ishii town

The Typhoon No.5 caused levee leakage in Ishii Town.

List of distinguished floods in the Yoshino River

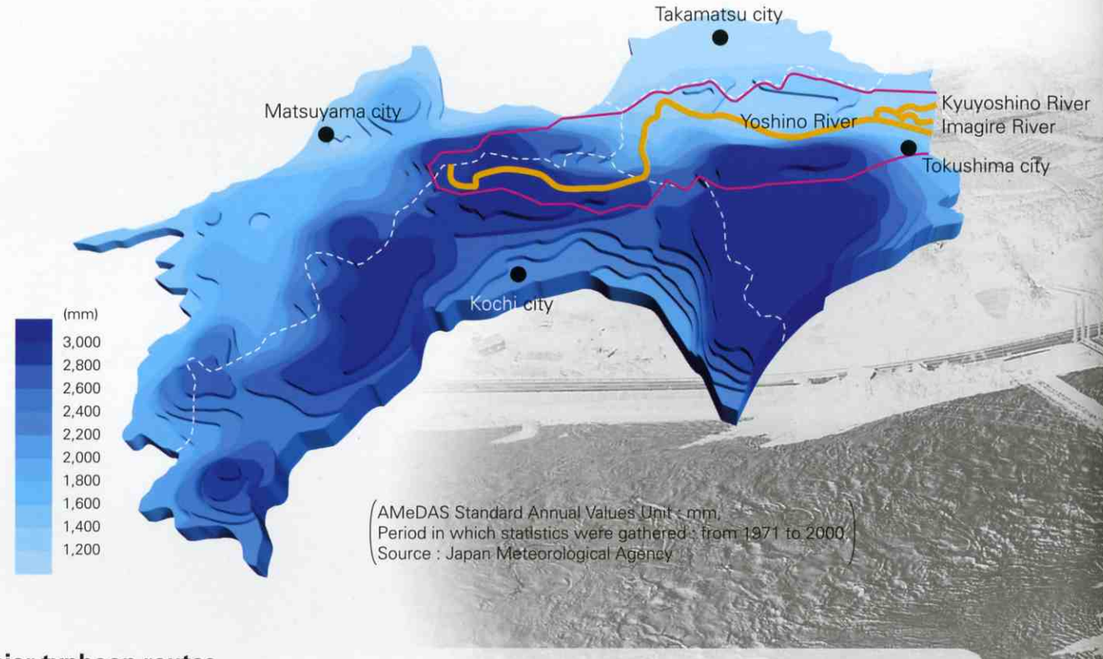
Date	Cause	Peak discharge (Iwazu) m³/s
1866	"Tora no mizu"	–
Jul.1888	–	–
Aug.1911	"Tosa no mizu"	–
Sep.1912	–	–
Sep.1945	Typhoon Makurazaki	14,700
Sep.1954	Typhoon June	15,000
Sep.1961	Typhoon the second Muroto	11,960
Aug.1970	Typhoon NO.9	12,820
Sep.1974	Typhoon NO.18	14,470
Aug.1975	Typhoon NO.5	10,480
Aug.1975	Typhoon NO.6	13,870
Sep.1976	Typhoon NO.17	11,450
Aug.1982	Typhoon NO.13	11,070
Sep.1990	Typhoon NO.19	11,190
Jul.1993	Typhoon NO.5	12,080
Aug.1993	Typhoon NO.7	10,650
Sep.1997	Typhoon NO.19	10,020

"Causes of the Yoshino River floods"

The Yoshino River basin is one of the rainiest areas in Japan. The majority of precipitation falls in June, the rainy season in Japan, and July to September, when Japan is hit by frequent typhoons. Since the river is steep, large amounts of water run down very fast, causing large-scale floods, which could result in levee failures or destroyed bridges.

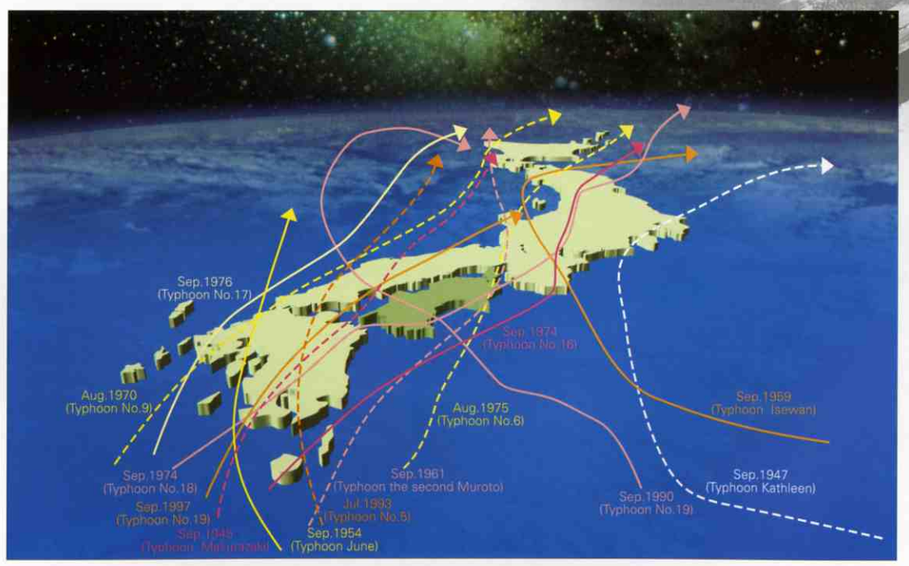
◆ Mean annual precipitation of the Shikoku Region

The Sanuki Mountains lie in the north-eastern area of Shikoku Island, and the Shikoku Mountains lie in the south, both ranges of which extend east to west. The Yoshino River runs west to east through the Tokushima Plain, which spreads between these mountain ranges. The river's source is located at Mt.Kamegamori, on the border of Kochi Prefecture and Ehime Prefecture. The most upstream area receives over 3,000 mm of precipitation a year, and is known for being one of the regions with most abundant rainfall in Japan.



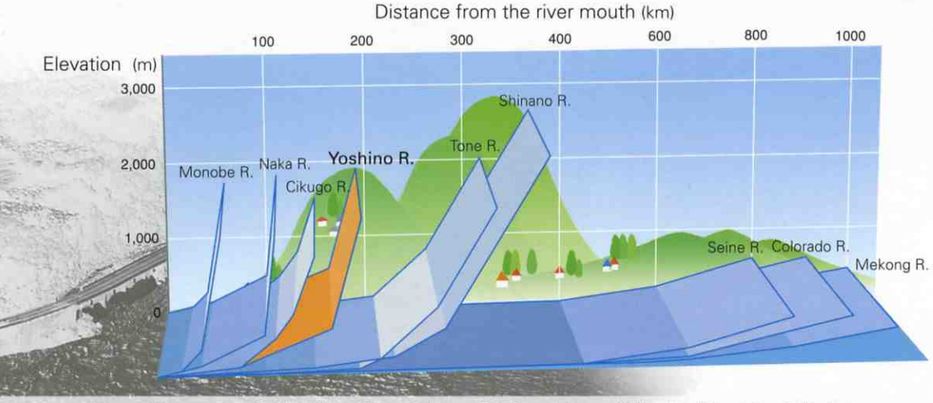
◆ Major typhoon routes

During the past 30 years (1971 to 2000), there have been generated, on average, 27 typhoons a year. Typhoons tend to approach Japan, Particularly in August and September, with many of them hitting the Shikoku island. Typhoons that stimulate fronts bring heavy rain and cause serious damage.



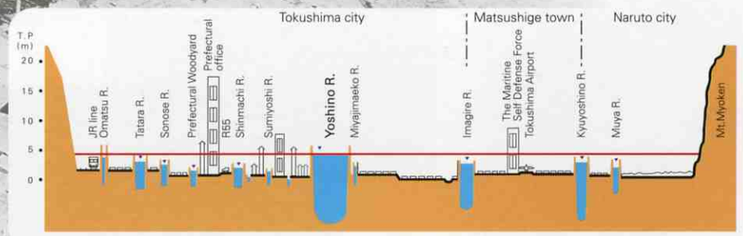
◆ Gradient of the Yoshino River and other major rivers in the world

Rivers in Japan are characterized by steep inclination. As shown in the following figure, they are significantly steeper than the Seine, the Colorado or the Mekong Rivers. The Yoshino River is steeper than the Shinano River and the Tone River, which are representative rivers of Japan. It means that once heavy rain occurs, water in the Yoshino River rushes down more violently.



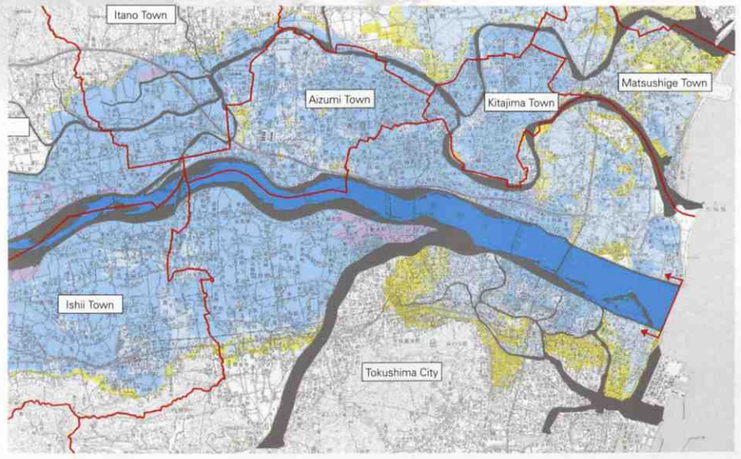
◆ Cross section diagram of the Yoshino River (Tokushima City to Naruto City)

During floods, the water level is higher than the roofs of houses. Levee failures will cause severe damage.



◆ What if the embankment breaks?

The following diagram shows areas along the lower reaches of the Yoshino River that are assumed to be seriously inudated in a case of levee breaks during floods. The diagram is the result of a simulation of inundation which may be caused by a heavy rain that may occur once every 150 years.



Map of Estimated Area of Inundation

Estimated water depth when the area is inundated

- Below 0.5m
- 0.5~1.0m
- 1.0~2.0m
- 2.0~5.0m
- Over 5.0m

Flooding due to overflow or levee failures

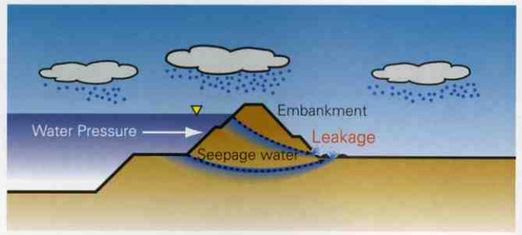
The flood of 1974 caused serious damage because there were no embankments along Waki Town.

Levee Leakage

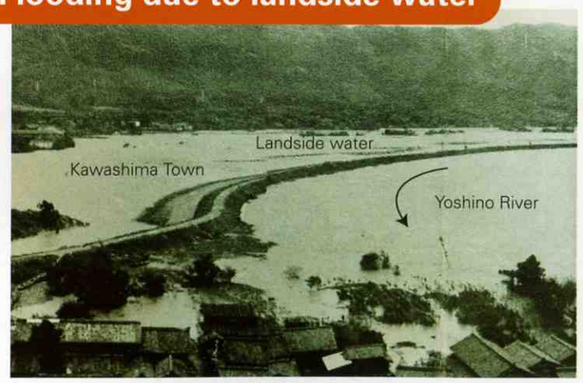
During the flood of 1954, water leaked from the embankment, producing a hole as big as a fist. (Ishii Town)

Generation mechanism of level leakage

Levee leakage occurs during floods due to 1) permeation of river water into the embankment and 2) permeation of water into the foundation ground. Levee leakage is more likely to occur as the water level rises and is kept at a high level for a long period.



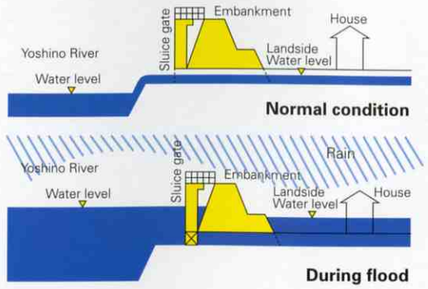
Flooding due to landside water



Inundation by landside water during the flood of 1961.

Generation mechanism of level leakage

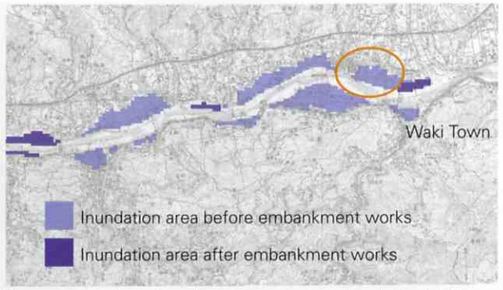
Inundation by landside water occurs when a large amount of rain falls on the land, and the water cannot be drained into the Yoshino River since the water level of the river is higher than the landside water level. Water overflows from tributaries and channels, and inundates houses and agricultural fields.



Measures

Embankment Works

Effects

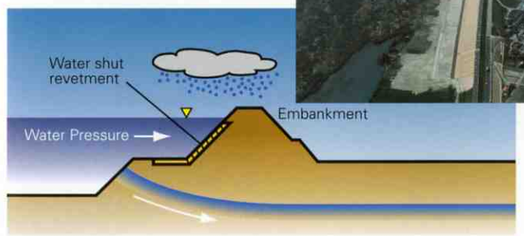


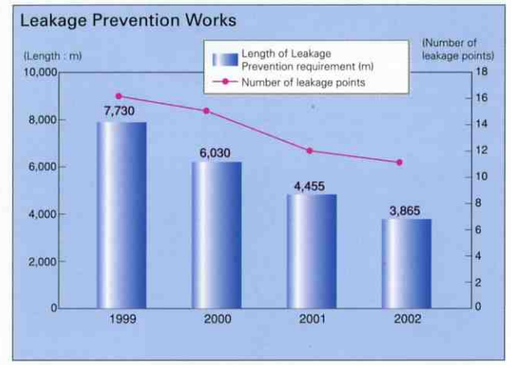
The construction of embankments has reduced the total area prone to inundation. (The flood simulation in upstream areas is based on the data of the flood of September 1974.)

Leakage Prevention Works

Water shutoff revetments are constructed to prevent river water from permeating the embankment.

Leakage Prevention Works in Kamiita Town (2000)

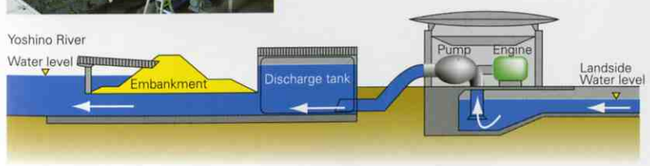




Progress of leakage prevention works has reduced the number of leakage points.

Drainage pump station

Construction of drainage pump stations started in 1964, and 16 stations have been built so far. At the stations, water is pumped up from tributaries and is discharged into the Yoshino River.



Flooding due to high landside water levels decreased after the construction of Kawashima Drainage Pump Station in 1964, and more houses began to be constructed in the district.

Harmonizing with Nature

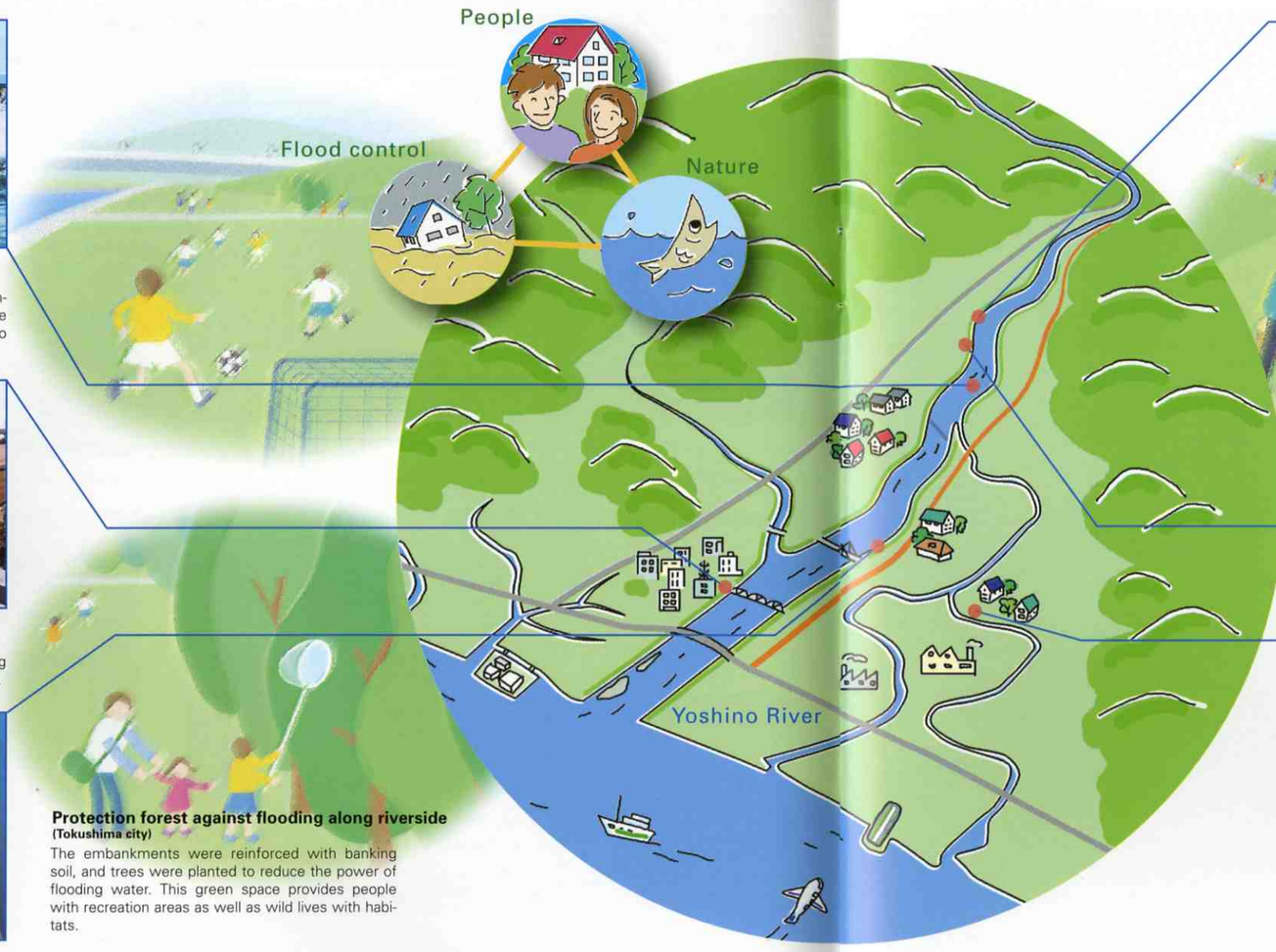
Along the Yoshino River, flood control projects are executed to harmonize with the landscape and nature. The Tokushima office aims at flood control measures through which people can live in harmony with the nature, such as river works that facilitate the ascent of fish, nature-oriented river works, and cherry-planted embankments to provide places for relaxation.

River works to facilitate the ascent of fish (Yoshino Town)

As a part of a project for constructing an environment in which fish can live easily, fish paths have been constructed at Kakihara Weir to allow fish to pass both upstream and downstream of the weir.

Gently sloped levee covered with green (Tokushima City)

Embankments were improved with gently sloping lawns, providing recreation areas for local residents.



Protection forest against flooding along riverside (Tokushima city)

The embankments were reinforced with banking soil, and trees were planted to reduce the power of flooding water. This green space provides people with recreation areas as well as wild lives with habitats.

Cherry-planted embankments (Sadamitsu Town)

Municipal governments planted cherry trees on the reinforced embankments to create beautiful waterside spaces.

Waterfront joyful school (Yamakawa Town)

The riverside was reformed into a place where children can experience and study nature. The Tokushima office is promoting systems for supporting children's waterside activities with the cooperation of residents.

Nature-oriented river works (Kitajima Town)

The riversides are to be improved as biodiverse habitats in addition to the enhancement of safety against floods.

Species that live in and around the Yoshino River

A survey that began in 1991 revealed that various species inhabit the Yoshino River. A survey in 2000 confirmed that 2,644 species (as shown at the bottom right) live in and around the Yoshino River, with 622 plant species.

Celtis sinensis of the Ulmaceae family grows on the muddy soil along the midstream and downstream river sections. This is a deciduous tree and reaches 20 m in height.

Takydronum tachdromoides of the Lacertidae family lives on banks, in bushes and gardens on flatlands and in low mountains. The lizard climbs trees up to a height of 2 m. It lays eggs from May to September.

Upper reach

Cisticola juncidis of the Muscicapidae family of the Passeriformes order live in riversides, paddy fields and fields covered by the grass species of the Poaceae family, such as Imperata cylindrica and Phragmites communis.

Graphium sarpedon of the Papilionidae family eats Cinnamomum camphora, which grows abundantly in parks and shrines. The butterflies are commonly seen even in urban districts, sometimes flying fast over high trees.

Middle reach

Nyctereutes procyonoides of the Canidae family of the Carnivora order has various habitats, ranging from suburban districts near human residences to mountains, but few in subalpine zone and above. The animal preys on birds, rats and other small animals, insects and wild fruit.

Plecoglossus altivelis of the Plecoglossidae family of the Salmoniformes order lay eggs on the sandy and gravelly riverbed midstream in autumn. In winter, the young fish live in the coastal zones eating animal plankton. In spring, the fish grows eating moss on the stones of the river.

Zacco platypus of the Cyprinidae family of the Cypriniformes order, lives in lakes and the midstream and downstream river sections. The fish lays eggs from May to August.

Lower reach

Uca lactea of the Decapoda order of the Crustacea class lives in tidal wetlands, burying in shallow holes. The crabs come out of their holes at low tide and wave their claws. Mature males build conical banks. This is regarded as scarce species since the number is limited, but widely seen along the Yoshino River.

Lateolabrax japonicus of the Percichthyidae family of the Perciformes order lives the river mouths of large rivers and tidal zones when it is young, and it is about 15 cm in length. The mature fish of this species live in gulfs and may swim up rivers in summer and autumn. It lays eggs from November to late December.

Benthos species identified by a survey in 2001: 333 species
Insect species identified by a survey in 1999: 2,113 species
Bird species identified by a survey in 1997: 91 species
Fish species identified by a survey in 2001: 77 species

Amphibian species identified by a survey in 1998: 7 species
Reptile species identified by a survey in 1998: 10 species
Mammal species identified by a survey in 1998: 13 species

Disaster Prevention Network through IT

The Tokushima Office is constructing an optical fiber network for large-volume, fast communication. It is enhancing information collection through the IT network to quickly obtain information on floods and other potential disasters, and to monitor river flow and the state of river management facilities.

Optical Fiber System

◆ Ishii River Flood Fighting Station : "Saburo Hiroba"

The Ishii River Flood Fighting Station is the first river flood fighting station established in the Shikoku Region. It is used to store flood control materials and is equipped with a heliport and a disaster-prevention center to support flood fighting activites during floods. Usually, the station is used by local residents as a community center. The Yoshino River Information Museum has 1) a multi-vision system, which shows river information and films on the history of flood control in the Yoshino River and the natural environment of the river, 2) a rainfall data display, which shows rainfall data from the major radar stations located in West Japan, and 3) a library corner with books and video tapes on the Yoshino River.

- Saburo Hiroba is open from 9:00 am to 5:00 pm every day. Yoshino River Information Museum is open from 9:00 am to 5:00 pm on Sundays and holidays.

◆ Integrated disaster-prevention center (in the Tokushima Office)

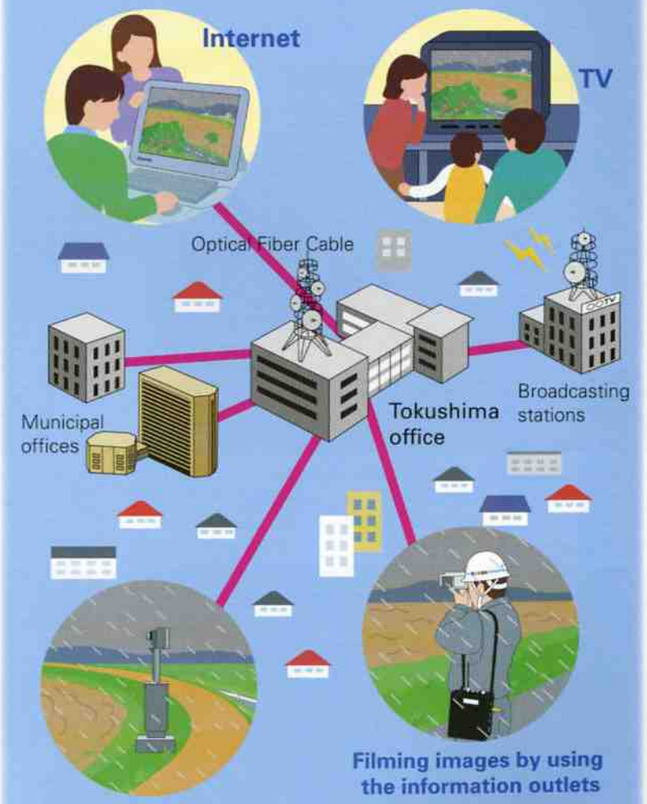
The center accumulates information on the district that is under the jurisdiction of the Tokushima Office during abnormal weather conditions and disasters. The center monitors the state of rivers and highways and takes urgently required measures.

Real-Time provision of information

River information is collected by the IT network in addition to the conventional measures such as patrolling and data transmission (water level data, etc.). Besides data gathering on site, information is collected by using cameras (CCTV) and information outlets installed along the Yoshino River to transmit real-time image information. Image information from several cameras is available at the Ishii River Flood Fighting Station and on the website of the Tokushima Office.

Information provision to regional communities

During a flood, the river images are provided to regional communities through TV stations. Precipitation and water levels are also available through the Internet and portable phones on a real-time basis.



Space monitoring cameras (CCTV)

Monitoring cameras are established on the embankment along the Yoshino River. The cameras monitor the spatial utilization of the river and help gather information on floods.

Filming images by using the information outlets

An optical fiber network is being constructed along the Yoshino River to collect and transmit information. Information outlets are connected to the network to transmit graphic data that are collected with a portable digital camera from sites at which no CCTV is installed

Homepage http://www.river.go.jp
Portable phone (i-mode) http://i.river.go.jp

Now the Yoshino River is in poor condition.
It is everyone's responsibility
to make it better.

Patrol

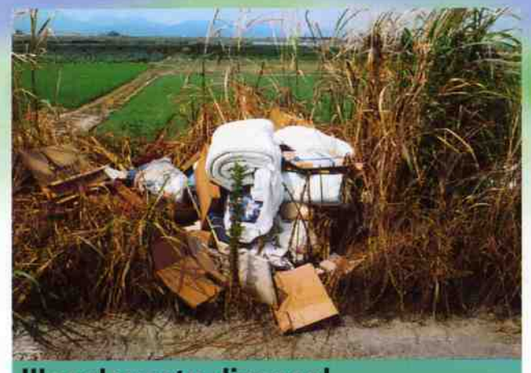
River embankments, water gates, water drainage pumping stations, weirs and other river management facilities are daily patrolled to check that the river environment is satisfactorily kept.

Facility Management

River managemnet facilities are inspected to identify parts that are not functioning properly, or are in need of repair due to aging or other causes, to ensure that the facilities always function safely.

Oil Spill Recovery

Patrol boats collect the oil on the river surface using oil-absorbing materials.



Illegal waste disposal

Some people illegally dispose of waste along the Yoshino River. The Tokushima Office remotes this waste to keep the river beautiful.

Weed cut on the embankments

When the embankments are covered by weeds, which may hinder the inspection and maintenance of the banks, the weeds are mowed (approximately twice a year).

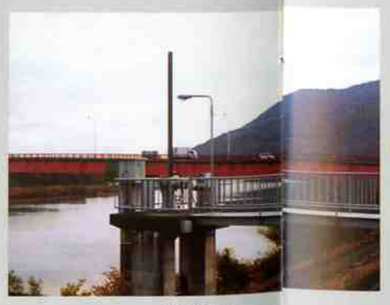
Repairs

The Office repairs malfunctioning and aging parts identified during inspection.

Before

After

Improvement of the hoists of the sluice gate



Before

After

Sluice house building

Together with the local community

Information

Yoshino River Fan Bulletin

Fleuve

The Yoshino River embraces us, and many people live along its streams. The bulletin reports the lives of people, cities, nature, history, scenery and various other aspects of the Yoshino River.

Aiming for the better Yoshino River

The Tokushima Office wish to improve the Yoshino River based on the opinions and proposals of as many people as possible. Thus, the Office is engaged in arrangement of holding meetings to discuss the shape of the river's future, collecting the opinions and proposals of the regional communities from the very beginning. The Office also aims to share information through the Yoshino River field lectures, the Yoshino River Basin lectures and the River information office for the better Yoshino River.

Basic stance

1. Discuss general topics of the Yoshino River
2. Open the process to reach mutual agreement
3. Ensure the participation of regional communities

Procedure

Public Involvement (Jan 2002~)

Questionnaire surveys — Symposiums

Establishment of the framework to discuss the better Yoshino River

Nominating Committee

River Basin committee

Actions

- River Field lectures
- River Basin lectures

River Information office

Better Yoshino River (River Improvement Plan)

Yoshino River Adopt Program

CLEAN UP YOSHINOGAWA ADOPT-PROGRAM-吉野川

Volunteer activities for cleaning the Yoshino River

A program started to improve the environment of the Yoshino River, in which people adopt different sections of the river.

The Yoshino River, also called "Shikoku Saburo," is one of the greatest rivers in Japan. The beautiful, never-ceasing flow greatly benefits us. However, there are still people who litter the Yoshino River with used cans and garbage although it is our beautiful asset. The Yoshino River Adopt Program is a new attempt to make the Yoshino River clean and beautiful by our own effort.

Holding symposiums -For the better regional development-

A symposium was held in Yuki Town, in August 2001, when the construction of the National Highway Route 55 started, in which regional communities gathered to discuss about construction of roads and communities. Another symposium was held in Ikeda Town, in February 2003, when the Ikawa-Ikeda Interchange access roads were opened.

Over 300 people participated in each of the symposiums, including regional residents and representatives of private entities and administrative bodies. Valuable advice was given by the keynote speakers and through panel discussions, and constructive opinions on community construction were offered from the general participants. There was active and beneficial discussion from various viewpoints.

Volunteer support program

-Natural desire to keep our environment neat and clean-

A volunteer support program was devised to realize people's natural desire to keep their own town and roads neat and clean. In the program, people clean sidewalks and flowerbeds along national highways, which is under the direct jurisdiction of the Ministry of Land, Infrastructure and Transport.

Volunteers decide the areas to be cleaned, and these areas are cleaned at least several times a year. Road managers and related municipal governments support the volunteers in carrying out the cleaning safely and smoothly.

Road sign BOX

-Aiming for road signs that are easy to see and recognize-

The Traffic administrator (police) and the road administrator (Ministry of Land, Infrastructure and Transport and the Tokushima Prefecture) jointly established road sign BOXes at police stations and national highway branch offices of the Ministry to collect criticism of the public on road signs, such as "Road sign A shows an incorrect direction," "Road sign B is difficult to see due to an obstacle," and "there are no signs showing the route number or address, and it is difficult to identify the present location." There is also a consultation window for answering questions and consultations concerning roads.

Committee for constructing the Sako Highways and the committee for discussing Hiwasa Roadside Station

-Share and discuss problems with regional communities-

In 2000, a committee for the construction of the Sako Highways began, and has held workshop-style meetings in which regional residents participate, and has investigated methods for improving the roadside environment. Several meetings have been held to hear various opinions from residents and to create comfortable roadside spaces.

In Hiwasa Town, a roadside station will be built next to Hiwasa Train Station of the JR Mugi Line to enhance the liaison between roads and railways, taking advantage of the merit of the integration of ministries concerned. The committee for discussing Hiwasa Roadside Station was established to actively discuss the functions of the roadside rest area and the problems of construction, and it has held workshop-style meetings sponsored by the municipal government of Hiwasa Town. It has also investigated and summarized the actual methods of using the roadside rest area.

"National Highways in Tokushima for conecting people, cities and communities"

The roles of roads

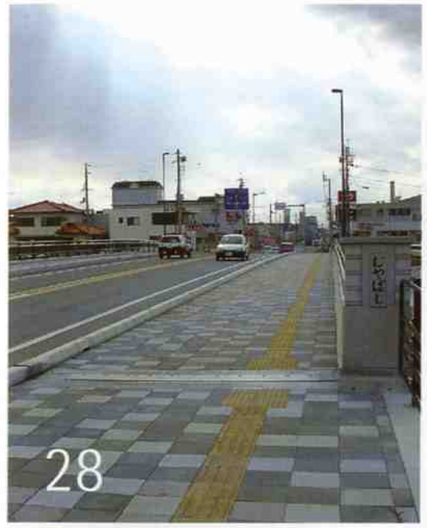
In the event of fire or accident people evacuate areas by road and fire engines and ambulances rush to the site concerned using roads. In the case of fire, roads become sites of fire fighting and rescue activities. Wide roads also prevent the spread of fire. Roads are used not only to smoothly transport people and goods, but also to protect lives and property.

Lifelines, essential to our lives, such as electric cables, gas pipes, water pipes and information communication cables, are installed in the space beneath and above roads and connect to our homes. Information BOX is buried beneath roads to contain optical fibers that establish an information highway that covers all of Japan. The network will be open to private entities that will promote its use, reducing the costs of telephone and internet communication. Thus roads accommodate infrastructures that are of vital importance to our lives.

The10th of August is "Road Day"

The "Road Day" emblem

National highways, which are the principal trunk roads in Tokushima, are used by many people every day for going to work, school and home, for shopping, tourism and transporting goods. The national highways in Tokushima connect people and cities, supporting the basis of our lives.



R32

National Highway Route 32 is 137.3 km long and connects Takamatsu City of Kagawa Prefecture, Ikeda Town, Yamashiro Town, and other towns in the western part of Tokushima Prefecture, and Kochi City of Kochi Prefecture. Of this highway, a 41.4 km section is under the jurisdiction of the Tokushima Office, the majority of which is under precautionary road closure (in three sections for 29.1 km).

R192

National Highway Route 192 is 91.8 km long and connects Saijyo City of Ehime Prefecture, Ikeda Town, Anabuki Town, Kamojima Town, and other towns along the Yoshino River and Tokushima City. Of this highway, an 82.2 km section is under the jurisdiction of the Tokushima Office.

R28

National Highway Route 28 is approximately 113 km long and connects Kobe City of Hyogo Prefecture, Awaji Island, and Tokushima City. Of this highway, an 8.3 km section is under the jurisdiction of the Tokushima Office.

R11

National Highway Route 11 is 230.9 km long and connects Tokushima City, Naruto City, Takamatsu City, and Matsuyama City of Ehime Prefecture. Of this highway, a 30.7 km section is under the jurisdiction of the Tokushima Office. Along the highway, there is Kachidoki Bridge, which has the largest traffic volume in the Shikoku Region, and the three largest bridges of the Ministry of Land, Infrastructure and Transport in the Shikoku Region (Yoshinogawa Ohashi Bridge: 1,137 m, Shin Kagasuno Bridge: 871 m and Naruto Kokakyo Bridge: 765 m).

R55

National Highway Route 55 is 200.9 km long and connects Tokushima City, Komatsushima City, Anan City, and Kochi City of Kochi Prefecture. Of this highway, a 101.9 km section is under the jurisdiction of the Tokushima Office. The highway is the only route that connects the southern area of the prefecture and Tokushima City, but there is a precautionary traffic closure of 10.1 km.

Problems of National Highways in Tokushima

The national highways in Tokushima have long been improved and now ensure safe and comfortable driving. However, traffic may stop during storms and other calamities in mountainous areas, and is almost constantly congested in cities. There are still a number of problems that must be solved.

The three bridges of the Honshu-Shikoku Island to the main island. However, on the Shikoku Island, improved, to provide easier and pressways, in order to achieve network.

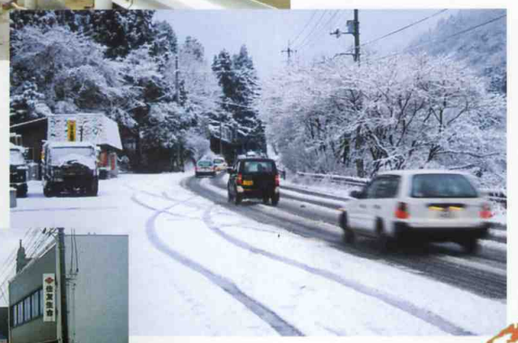
Shikoku expressways now link the

The National Highways must be more efficient access to the ex- optimal benefits from the road

Precautionary traffic closure during storms and abnormal weather

A large-scale debris flow occurred in November 2000 near Oboke, Yamashiro Town. Luckily, the debris flow killed no people, but R 32 was closed for three days (72 hours). R5, which passes through the southern part of the prefecture, is frequently closed during storms brought by typhoons. The national highways in Tokushima Prefecture always face such severe natural conditions, 50 measures must be taken against damage caused by abnormal meteorological conditions.

Nov. 2000
Debris flow
(Yamashiro Town, R32)



Jan.2002 Snowfall (R32)

Sep.2001 Inundation by the typhoon (R55)

Precautionary traffic closure

Section of roads which are prone to damage caused by avalanches, storms, earthquakes, or other abnormal meteorological conditions are subject to precautionary traffic closures. For each of these sections, rainfall standards are established for closing the sections to prevent injury to road users.

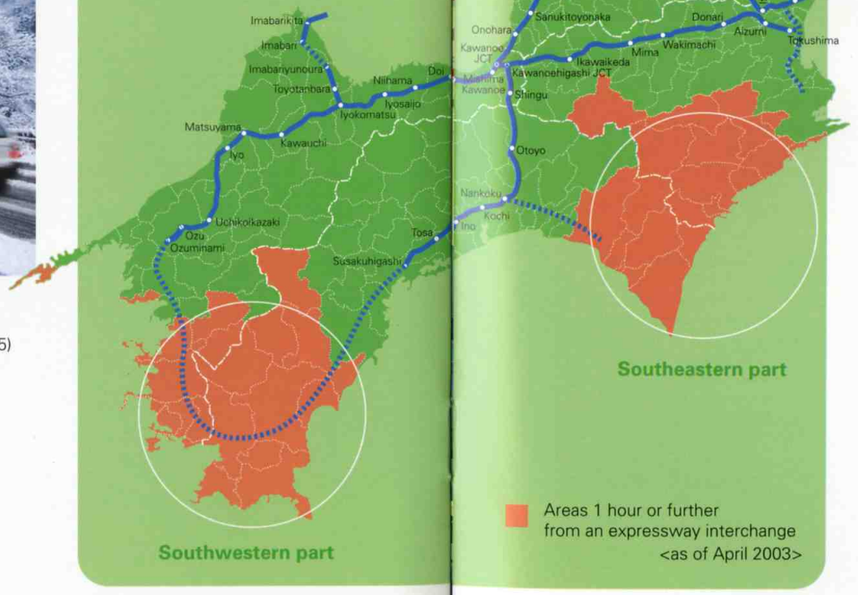
Conditions of traffic closure

R 32 (three sections)
- When continuous rainfall exceeds 250 mm
- When the sections look dangerous while patrolling

R 55 (one section)
- When continuous rainfall exceeds 300 mm
- When the section looks dangerous while patrolling

Areas with no exp ressways

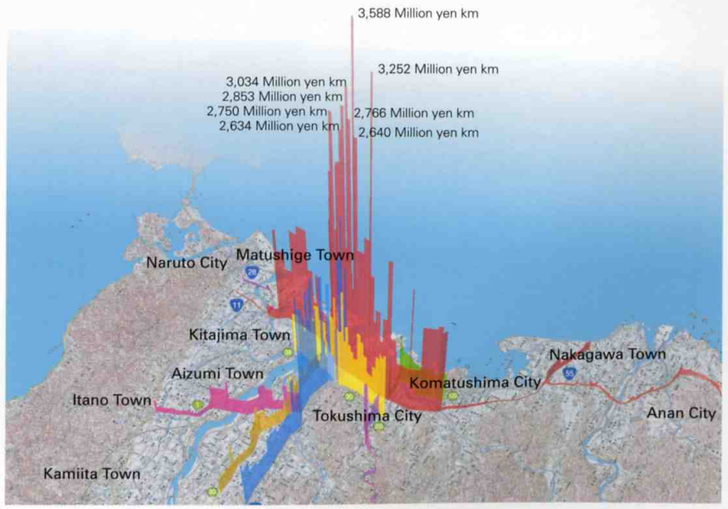
Expressways in the Shikoku Region will cover the entire Shikoku Island in a figure of "8." Today, there are no expressways in the southeastern and southwestern areas of Shikoku. In particular, the southeastern area is outside the planned expressway routes.



Economic losses due to traffic congestion

The number of vehicles in Tokushima Prefecture has been increasing, and the number of people who use public transportation systems has been steadily decreasing. Privately owned cars, which connect door to door, are convenient but cause an increase in traffic volume and thus traffic congestion. R11 and other highways in Tokushima Prefecture have larger traffic volumes than other highways in the Shikoku Region and are constantly congested. One kilometer of road congestion causes an economic loss of 40 million yen per year.

Traffic congestion at Tokushima Honcho Intersection(R11)



Three-dimensional map of traffic congestion near Tokushima City

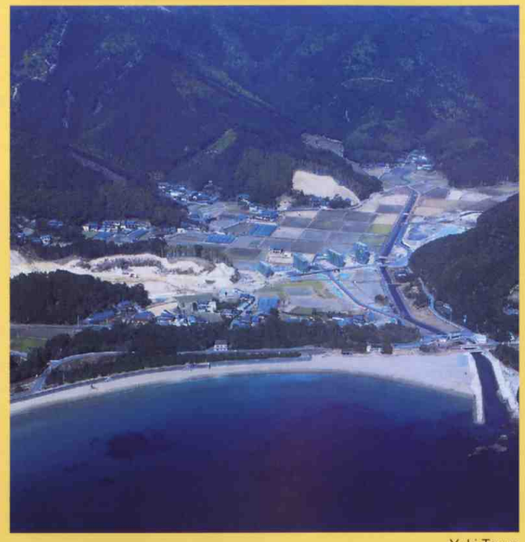
Improvement Projects to solve problems

The Hiwasa Highway Project is being carried out to prevent highways from closure during disasters and abnormal weather, and to reduce areas with no expressways. The Tokushima Southern Ring Road Project and the Honcho Intersection Improvement Project are being carried out to mitigate traffic congestion and improve city functions. Various other construction and improvement projects are being planned and executed to solve these problems.

Hiwasa Highway

55 ROUTE

Aiming to eliminate areas with no expressways and to revitalize regional industries.



Yuki Town

The Hiwasa Highway is a freeway that connects Anan City, Yuki Town, and Hiwasa Town. It is a part of the local high-standard highway "Anan-Aki Highway". The highway will revitalize the economy of the regions along the highway and actualize free and active interchange among these and other regions. The highway will also serve as a bypass during abnormal weather, and will be used for rescue and medical activities during emergencies. It will ensure the safe, smooth flow of people and help people to maintain social and economic activities.

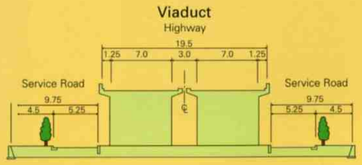
Local High-Standard Highway		Section opened to traffic
		Section under construction
		Section in planning
Arterial High-Standard Highway		Section opened to traffic,or under construction
		Section in planning

Tokushima Southern Ring Road

192 ROUTE

The Tokushima Southern Ring Road will form a part of the Tokushima Circular Highway and connect R192 and R55.

To satisfy increasing traffic demands, the 35 km long Tokushima Circular Highway is being constructed, connecting Tokushima City, Kitajima Town and Aizumi Town. Part of the circular highway, which is the 9.5 km section from Kannonji (Tokushima City) to Ono (Tokushima City), is the Tokushima Southern Ring Road. The highway will mitigate the traffic congestion at the center of Tokushima City and improve the regional environments and city functions.



	Tokushima circlar Highway (Local High-Standard Highway)	solid line	open to traffic
	National Development Arterial Expressway	broken line	under construction
	National Highway		principal Regional Road

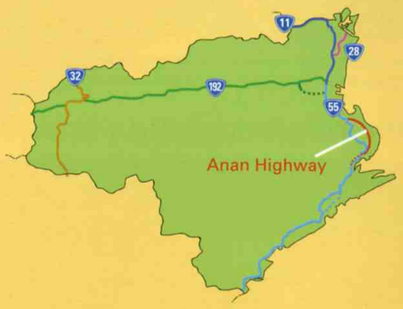
Anan Highway

55 ROUTE

The Anan Highway will constitute part of a wide-area highway network together with the Honshu-Shikoku Expressway and the Hiwasa Highway.

Tachibana-cho, Anan City

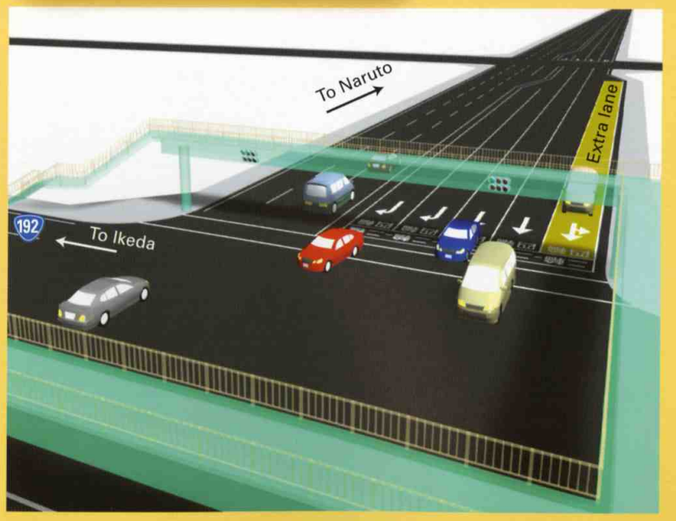
The Anan Highway is a 21 km national highway that connects Obayashi-cho of Komatsu City and Fukui-cho of Anan City. In November 2000, a 14.3 km section from Obayashi to Nagahama (Tsunomine-cho, Anan City) was opened. The highway is expected to soon produce spill-over effects, such as potential economic growth as well as the improvement of traffic problems and the living environment. The construction project is steadily being carried out with the aim of opening the entire section.



Honcho Intersection Improvement Project

11 ROUTE

The project aims to eliminate the bottleneck of R11.



The Tokushima Honcho Intersection, where R11 crosses R192, is a major point of traffic congestion. One of the primary causes is that R11 has only two lanes at this section for advancing straight from the Naruto direction. Construction of more lanes for vehicles going straight will eliminate traffic congestion and ensure smooth traffic.

Actions for ensuring road safety

The Tokushima Office patrols highways to ensure safe, smooth traffic flow. It maintains the good condition of the highways, regulating traffic during typhoons and abnormal weather and the illegal exclusive use of roads.

◆ Repairing road surface

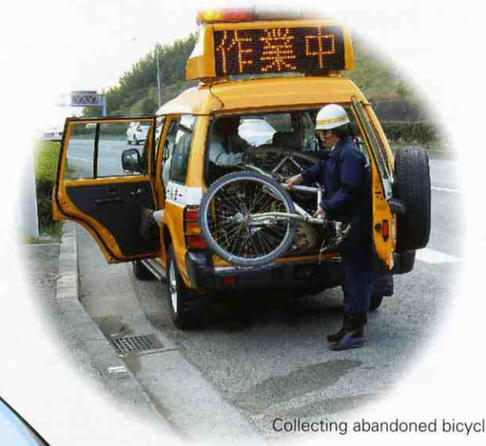
Road surface unevenness, which is caused by the deterioration and exfoliation of the asphalt pavement, not only hinders comfortable driving, but also tires drivers and reduces safety. The Tokushima Office identifies and repairs such damaged road sections.

◆ Repairing or painting bridges

Iron and concrete, which are the main constituents of bridges, deteriorate over time and suffer rusting and cracking. The Tokushima Office conducts periodical inspections, followed by repairing or painting deteriorated parts.

◎ Patrolling

To guarantee the safety of highways the Tokushima Office patrols highways everyday to identify highway abnormalities and to deal with fallen objects and bicycles left on roads or at roadsides. Moreover, bridges and road surfaces are periodically inspected using special machines to examine both concrete exfoliation from the bottom of bridges, and road surface unevenness.



Collecting abandoned bicycles

◆ Repainting center and roadside lines

The Tokushima Office periodically repaints centerlines and roadside lines which wear off through road deterioration and abrasion.

◆ Changing light bulbs of illumination lamps

The Tokushima Office checks illumination lamps along its highways and changes the light bulbs of the lamps that were not illuminated during the nighttime patrol.

◆ Road management using TV cameras (CCTV)

Actual road states are monitored for efficient and advanced highway management, such as the early detection of road abnormalities, and the start and end of preliminary traffic closure at appropriate times.

CCTV installed in Kitanada-cho, Naruto City, to mainly monitor surcharges (R11)

◆ Providing information

Aiming for safe, smoothly flowing traffic, the Tokushima Office collects and analyes data obtained from rainfall radar gauges, meteorological data monitoring systems and weather stations, and dispatches the information through roadside information boards, VICS, its website and other communication mediums.

◆ Precautionary

During abnormal weather, such
when it is likely to be dangerous
ma Office closes highways bas
dards.

◆ Traffic closure

as storms and earthquakes,
to use highways, the Tokushi-
ed on accident-prevention stan-

◆ Predicting the freezing of road surfaces

To prevent accidents caused by the freezing of road surfaces in winter time, the Tokushima Office forecasts freezing at seven points within the jurisdiction and uses the data to decide when to spread road salt.

◆ Giving permission

道路占用許可済証
国土交通省

Upon submission, the Tokushima Office gives permission for the following acts:

- **Approved construction works under the provisions of Article 24**
  Construction of a guard rail(s) or a sidewalk(s) that is necessary to build a house in front of a national highway.
- **Occupation of road sections**
  Establishing a billboard or a shade occupying part of a road or a sidewalk (charged).
- **Restoration of road accessories under the provisions of Article 22**
  Restoration of a road accessories (guard rail, illumination lamp, pedestrian bridge, etc.) damaged by accident.
- **Special vehicles**
  Driving a vehicle that is larger or heavier than the limits or exceeds other limits.

Utilization of IT systems for roads

Various attempts are being made to exploit road IT systems based on ITS, which is a national project. As part of it, the Vehicle Information and Communication System (VICS) and the Electronic Toll Collection System (ETC) are already widely used.

Information BOX to connect throughout Japan

The Ministry of Land, Infrastructure and Transport aims to construct an optical fiber network throughout Japan, consisting of approximately 150,000 kilometers of fiber, by 2010 for the construction of a future information highway. The ministry promotes active construction of information BOXes, in which optical fibers are to be installed, and optical fibers for road management. The information BOXes are open to private organizations to promote the early establishment of private nationwide optical fiber networks and to reduce communication costs.

Image of Information Box

Optical fiber cable

Integrated Disaster-prevention center

What is an information BOX ?

An information BOX is a simple structure installed beneath roads to accommodate optical fibers for road management. The construction of an optical fiber network will enable road managers to use advanced road management systems to monitor road states using CCTVs, ensuring an information communication network during disasters. In Tokushima Prefecture, information BOXes began to be laid under the ground in 1997, and work is now under way along Route 192.

Road Information service

Internet

Portable phone

Checking road information through the Internet and portable phones

Real-time road information is provided 24 hours a day through the Internet and portable phones. Information on roads is available, such as information on traffic regulation, road-repair sites and precipitation. Roadside TV cameras have been installed to monitor traffic congestion caused by road-repair works, traffic accidents and damage during typhoons, etc. More detailed information will be provided, including transmission of images.

Common Cable Duct Improvement (C.C.BOX)

Many problems are pointed out about overhead power cables, such as hindering traffic and fire-fighting activities, causing secondary damage by cutting of cables during typhoons or earthquakes, as well as impairing the sight of cities. Common ducts, which are to be constructed beneath sidewalks to contain power cables and optical fibers are expected to create high-performance road spaces and beautiful city spaces. The ducts are compact and easy to lay down, reducing both the costs and period of construction, and are also easy to construct, maintain and manage.

The first C of C.C.BOX stands for "Community", "Communication" and "Compact". The second C is for "Cable"; thus, C.C.BOX means Community (communication, compact) cable box.

R192 Sakorokubancho ~ Minamidekijimacho

R11 Kachidoki Bridge ~ Tokushima Honcho Intersection

Car navigation

VICS Image

Car navigation (VICS)

The Vehicle Information and Communication System (VICS) is deployed nationwide to provide real-time road and traffic information to moving vehicles. The system transmits real-time information, such as traffic congestion news, traffic regulations availability of parking areas and driving guides, from roadside beacons and FM radio broadcasting systems to on-board car navigation systems. The Tokushima Office has established three systems in total along R 32 in Ikeda Town and Yamashiro Town.

Aiming for more comfortable roads

The Transportation Demand Manageme
include the construction of a roadside
cial low noise pavement reduces traffic
ures so that highways become more co
nt (TDM) program aims to mitigate traffic congestion through various means. The programs
rest area, "Michi-no-Eki," for drivers to rest and for regional residents to communicate. Spe-
noise and improves vision on rainy days. The Tokushima Office takes these and other meas-
mfortable for travel.

◆ TDM

Mitigating traffic congestion by staggering commuting hours and using public transportation systems

The Transportation Demand Management (TDM) programs promote efficient use of vehicles to control transportation demands, mitigate road traffic congestion on both a city and regional scale, and to improve city environments.

■ Park and Bus Ride

In 1981, a park-and-ride service started in Matsushige Town, in which a parking area was constructed under the Hiroshima Interchange. Users are always welcome. This service intends to mitigate traffic congestion by reducing the number of vehicles entering the city.

Parking lot
under the Hiroshima ramp

Tokushima
TOKUTOKU Terminal

■ Bus location information

From March 2002 to March 2003, information on the location of a "non-step" bus was provided through the Internet. The Office is investigating the effects of improving the convenience of using buses and a full-scale introduction of the information provision system.

TDM programs in Tokushima

Encouraging staggered commuting hours
1. Using the staggered office hours
2. Publicizing the staggered commuting hours

Encouraging the use of different routes
1. Providing traffic information

Encouraging the use of other transportation media
1. Promoting the use of public transportation systems
2. Supporting people in changing to public transportation systems
3. Constructing transportation centers

■ One-day trip "Bus Adventures"

To promote the use of buses, route maps of different bus companies were summarized into a single route book. Various events are held to provide people with opportunities to enjoy buses, think about and to understand the conditions and needs of public transportation systems, such as programs in which children ride buses along routes they themselves have planned.

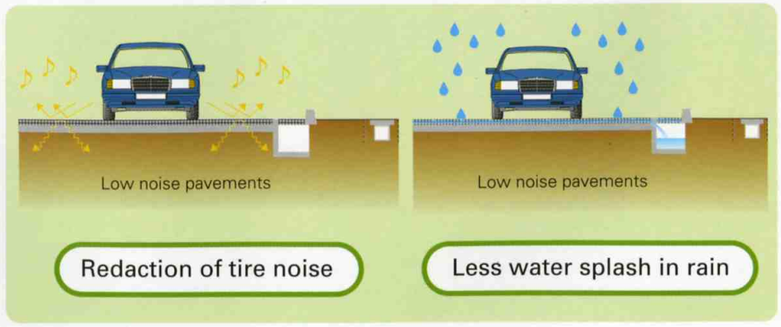
■ No Car Day (at offices)

The Office is participating in the "No Car Day (20th of every months)" project of the Tokushima Environmental Conference.

◆ Low noise pavements

Low Noise pavements enable safe driving in the rain and reduce noise.

Low noise pavements drain rainwater by allowing it to pass through the paving materials. Low noise pavements have small amounts of water on the surface, minimizing water splash, maintaining good vision and preventing hydroplaning. On rainy nights, road markings are easy to see thanks to low noise pavements. The pavement absorbs the noise of tires reducing roadside noise.



◆ Roadside Station, "Michi-no-Eki"

"Michi-no-Eki" transmits information and provides a space in which people can get in touch with the region.

The spread of privately owned vehicles has promoted sightseeing and driving long distances. Rest spaces, which are easy to access and safe, are required along highways. These spaces will be also useful for regional residents to exchange information and provide services special to the region. "Michi-no-Eki" is a facility constructed to meet these demands. There are 11 "Michi-no-Eki" in Tokushima Prefecture, and they are used by many drivers who use Tokushima's roads and highways.

1 Sadamitsu yuyu kan
2 Washinosato
3 Shishikui onsen
4 Donari
5 Nishiiya
6 Wajiki
7 Kubounosato nakagawa
8 Momijigawa onsen
9 Onsennosato Kamiyama
10 AilandoUdatu
11 Mino

···Operation by the ministry and municipal government
···Operation by the Tokushima prefecture and municipal

1 Sadamitsu yuyu kan

3 Shishikui onsen

7 Kubounosato nakagawa

◆ Constructing barrier-free walking spaces

Installing elevators on pedestrian bridges

The elevator towers are designed to resemble "Takahari Chochin" of Awa Odori.

The aging of Japanese society will rapidly advance in the 21st Century. The Ministry of Land, Infrastructure and Transport has carried out various projects to construct a road and traffic environment in which the elderly, disabled and all other people will feel safe and comfortable. The ministry is also constructing barrier-free pedestrian spaces. Barrier-free projects include the construction of wide flat pedestrian paths, sidewalks with no steps or inclinations, and easy-to-use grade-separated crossing facilities. There are 45 pedestrian bridges along the national highways that are under the jurisdiction of the Tokushima Office. Elevators were installed at the Motomachi Pedestrian Bridge, which is located in the city center and used by a number of people, and at the Yaoya-machi Nishi Pedestrian Bridge.

Yoshinogawa-Kamiita branch office
267-2,Toriya-aza,Sebe,Kamiita-cho,Itano-gun,Tokushima,771-1350

Yoshinogawa-Kamojima branch office
529-5,Norishima-aza,Kirai,Kamojima-cho, Oe-gun,Tokushima,776-0005

KyuYoshinogawa branch office
126-32,Inui-aza,Okuno,Aizumi-cho,Itano-gun,Tokushima,771-1201

Yoshinogawa-Mima branch office
65-3,Kiraiichi-aza,Mima-cho,Mima-gun,Tokushima,771-2126

Yoshinogawa-Sadamitsu branch office
91-1,Umadashi-aza,Sadamitsu-cho,Mima-gun,Tokuishima,779-4101

Ikeda highway maintenance branch office
3110-1,Ueno-aza,Ikeda-cho,Miyoshi-gun,Tokushima,778-0001

Tokushima highway branch office
35-7,Minamikawamukai-aza,Hiroshima,
Matsushige-cho,Itano-gun,Tokushima,771-0220

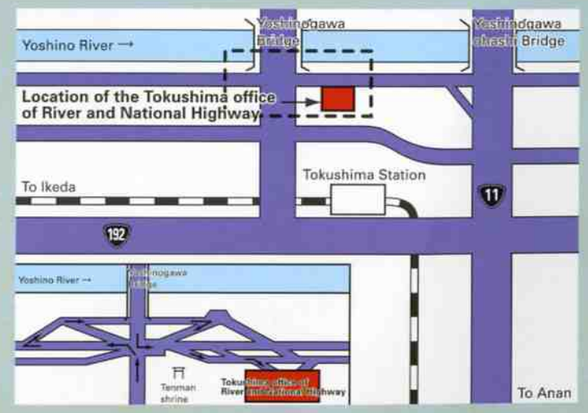
Tokushima office of river and national highway
3-35,Kamiyoshino-cho,Tokushima,770-0803

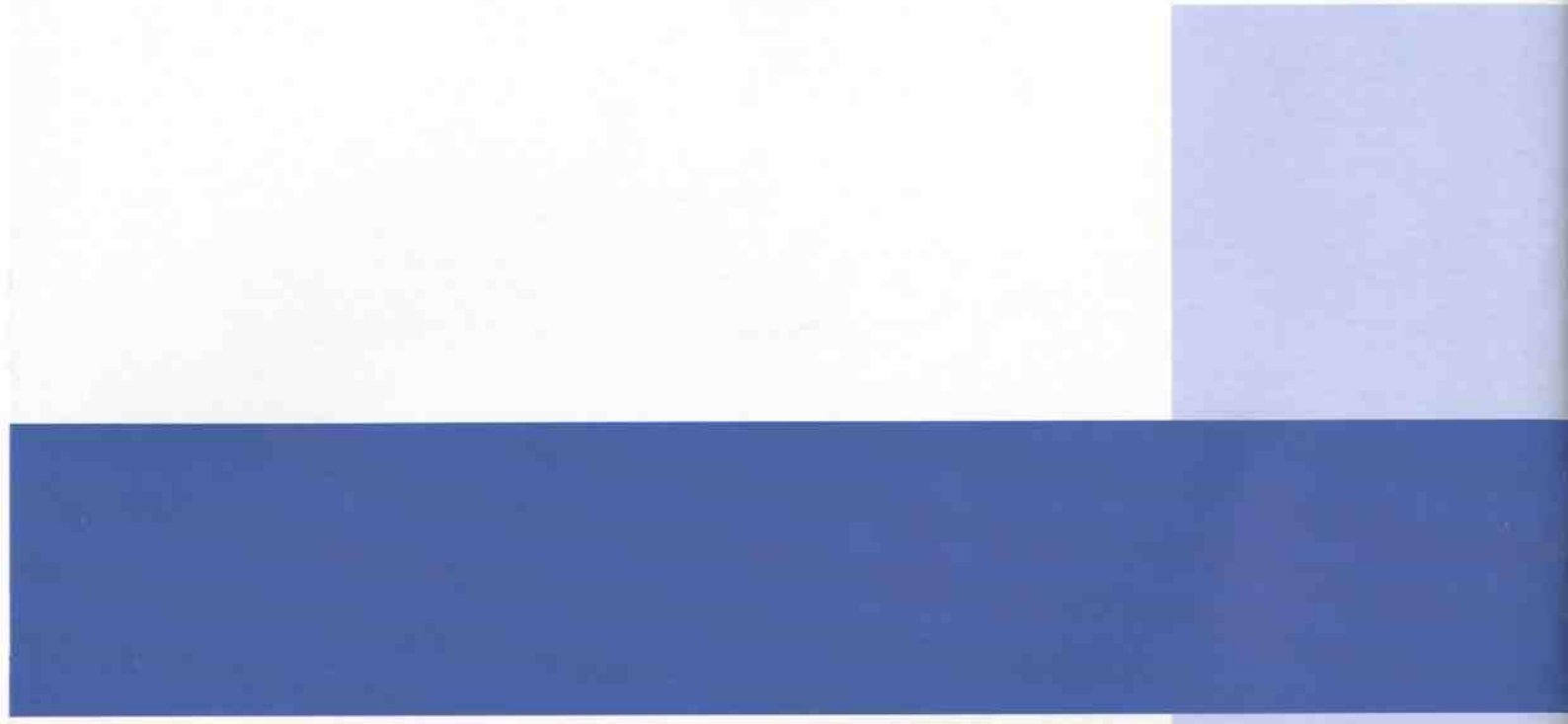
Hiwasa highway branch office
41-1,Benzaiten,Okugawachi-aza,
Hiwasa-cho,Kaifu-gun,Tokushima,779-2305

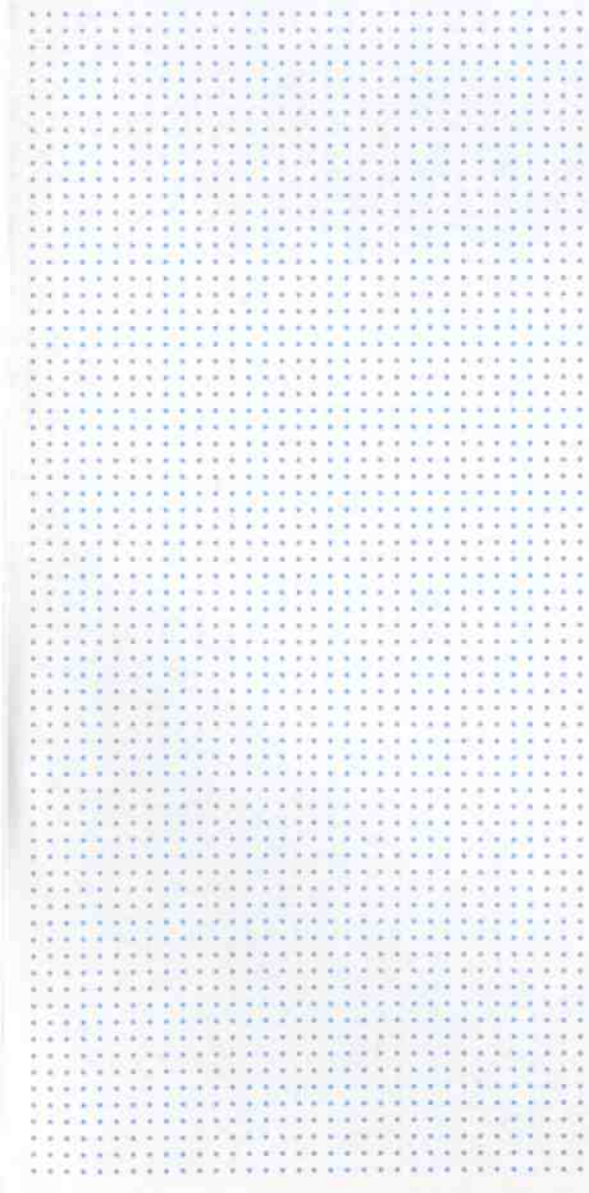
Naruto-kita IC
Kobe-Awaji-Naruto Expersway
Naruto IC
Itano IC
KyuYoshino river
Soedani river
Donari IC
Aizumi IC
Tokushima IC
Tokushima Expressway
Imagire river
Wakimachi IC
Iwazu
Yoshino River
Mima IC
Ikeda Dam
Yoshino river
Igawa-Ikeda IC
Kamodani river
Kawanoe JCT
Sadamitsu river
Akui river
Ishii River Flood Fighting station "Saburo Hiroba"
"Road side Sration Kubounosato Nakagawa"
Naka river
Shingu IC
Iya river
Kuwano river
Naka river
"Road side Station Shishikui-Onsen"

Branch office	Administrative section
Tokushima Highway	
Ikeda Highway Maintenance	
Hiwasa Highway	

Tokushima office of River and National Highway
Phone : (088)654-2211
URL : http://www.toku-mlit.go.jp







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