Port & Airport Department, Shikoku Regional Development BureauOutline of Work

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Shikoku and Nature









Shikoku surrounded by Sea

Coasts of Shikoku are surrounded by Seto Inland Sea, Pacific Ocean, Kii Channel and Bungo Channel, and all of the four prefectures are on the seafront. These features are big merits for Shikoku playing pivotal roles in maritime physical distribution.

The Seto Inland Sea side with many islands, above all, and the ria coasts in the west part of Shikoku are blessed with gentle sea surface, where good natural ports are formulated. Shikoku as a whole has as many as 149 ports, accounting for a high ratio of 14.9% of the whole country.



Rich Nature and Culture in Shikoku

Shikoku with rich nature is blessed with sightseeing resources, and surrounded by Seto Inland Sea with many islands, Pacific Ocean feeding corals, and natural coastal lines full of marine lives such as whale and turtle, and of the beauty of white sand and blue pine.

The history and culture of Shikoku have developed together with the sea. The development of port towns in Shikoku, as seen today, has been supported by Seto Inland Sea which has thrived from early days as strategic spot in maritime transportation, and the coasts of Pacific Ocean known as a site of whale catching leading the country till Meiji Era.

Shikoku susceptive to Disasters

Shikoku faces natural severity occasionally. Damages were often caused by high tide in typhoon on the coasts of Seto Inland Sea, and by tsunami in earthquake in addition to high tide on the coasts of Pacific Ocean.

Tonankai/Nankai earthquakes are feared to occur in near future. So, we must be well prepared for any large-scale natural disasters by learning lessons in our experiences of suffering damages in the past.



▲Wind and waves exceeding any of our imagination will attack the coasts of Pacific Ocean in time of typhoon.

Social Condition in Shikoku

Social Condition in Shikoku

Occupying 5% of the area of Japan, Shikoku has no government decreed city. Population ratio is as low as 3.1%, and the social economic index is also around 3% of the nation.

Though not large as compared with the whole nation, the economic force of Shikoku of four prefectures facing sea in all sides has big merits in the aspect of maritime physical distribution. The amount of handled cargos at ports accounts for a high ratio of 6.9% nationally, and this means that ports play an important role in the economy of Shikoku.

"Decreasing Birthrate and Aging Population" being accelerated

Population decreases, in Shikoku faster than other parts of the nation, due to the drop of birthrate and the outflow of population to big city areas. Decreasing birthrate and aging population also advance remarkably. According to the compositions of the people of 65 yeas old or older, aging rate in Shikoku is found to advance faster than national average by 10 years.

Barrier-free facilities are being constructed at ports and airports in the age when full-scale aged society comes into being. Creation of charming Shikoku is essential to stop the decrease of population and encourage the young generation supporting the future of Shikoku make a breakthrough.

Differences between Nation and Shikoku

Shikoku small in economic scale is different from national average in various aspects. Average income per capita shows a difference of 500,000 yen annually in the year 2008.

Areas are making efforts as a whole in the assistance of industries and the invitation of sightseeing to break such situations and expand the scale of economy.



Development of decreasing birthrate and aging population



"2005 and later" National Institute of Population and Social Security Research "Estimated Populations of Prefectures in Future" (2007)

Income differences from national averages



Source: Prefectural Resident Economic Calculations

Situations around Ports in Shikoku

Features of Industries

Industries on the coastal areas, such as pulp/paper manufacturing and petroleum product manufacturing, have developed in Shikoku, and the ratios of the work categories of basic material type and regional resources type are higher than national averages in the compositions of manufactured item delivery amounts per work category.

In these industries on the coastal areas, it is necessary to transport by sea the raw materials and products, and so, industries have developed on the coastal areas around important ports.

If the industries in the coastal areas of Shikoku are to increase international competitiveness, industrial costs should be suppressed by efficient transportation, and the port functions supporting physical distribution should be consolidated.

Distribution of main industries in the coastal areas in



Source: "Information on Shikoku's Industrial Sites" 2001 Shikoku Electric Power Company, Inc.

"Invitation/Siting Shikoku" Shikoku Trade and Industry (Mar. 2000) "Industry/Culture Map of Shikoku" Shikoku Electric Power Company, Inc. (May 2001)



×1 Work category of basic material type --- Chemicals, iron and steel, nonferrous metal manufacturing, petroleum product manufacturing Х2 Work category of regional resources type --- Food manufacturing, pottery/

earth/stone product manufacturing, timber/wood product manufacturing, beverage/feedstuff manufacturing, pulp/paper manufacturing, textile industry

Ж3 Work category of processing/assembly type --- Metal product manufacturing, general machine/device manufacturing, transport machine/device manufacturing, precision machine/device manufacturing

×4 Work category of miscellaneous goods type --- Plastic product manufacturing, publishing/printing, furniture manufacturing, other manufacturing, clothes manufacturing, rubber product manufacturing, leather product manufacturing

Features of Ports

Ratios of cargos handled at ports in Shikoku are not so high. However, the amount of handled cargos per capita is the largest across the nation, which indicates a feature that ports are strongly connected with the people in Shikoku.

Changes in the amounts of cargos handled at ports in Shikoku Amounts of cargos handled at ports per region





Trade Amounts in Shikoku

Following the financial crisis started by the socalled "Lehman Shock" around the autumn of 2008, the trade amounts in Shikoku, similar to the whole nation, decreased in 2009.

Trade amounts in Shikoku up to the year 2008, on the other hand, are seen to have increased continuously. These trends are seen nationwide, but the growth rates of trade amounts in Shikoku exceed national averages.

In the trade amounts, not only the amount of export but also the amount of import increased greatly, which makes Shikoku a very charming site for the companies to produce goods for foreign markets, and as a place of consumption.

Globalization of Economy

Social situations around Japan's economy have changed greatly in these 30 years so far. The largest change, above all, is the shift of the biggest trade partner of Japan from the U.S. to China.

East Asian Region rapidly developing economically is close to Japan, and comes to be connected with Japan more strongly in economy. While economy is globalized more and more, the number of companies gaining ground in the East Asian Region including China increases in Shikoku, too.

Connections with East Asia

Look at the places overseas the Shikoku's companies have advanced to, and you will see 50% of the companies have advanced to China and 80% of the companies have advanced to the Asian regions, which means the connections with East Asian Region have been strengthened. Shikoku shows such trends more remarkably than national average.

The economy of East Asian Region developing rapidly affects Japan more. In Shikoku closer to East Asian Region, among Japan, one of the problems is how to introduce the economic growth in East Asian Region as an energy for Shikoku Region.



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Changes and growth rates of trade amounts in Shikoku

Nation wide growth rate — Growth rate in Shikoku Source: "Information by Kobe Customs" "Statistics on Trades by Ministry of Finance"

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Economic globalization as seen in Shikoku's companies gaining ground overseas





Source: "Overview of Shikoku's Economy"



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Import

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Export

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Places overseas Japan's company have advanced to



Source: "40th Overseas Business Activity Basic Survey" (data as of Jun. 2009)

Disaster Prevention Measures

[measures for earthquake/tsunami]

Earthquakes and tsunamis which hit Shikoku Region

Japanese archipelago is surrounded by the plates of Pacific Ocean, Philippine Sea, North America and Eurasia, and has been hit, from early days, by trench-type earthquakes and the damages by tsunami caused by such earthquakes. In recent times, the Pacific coast line in Kochi Prefecture was damaged badly by Showa Nankai Earthquake and Chile Tsunami which occurred off the coast of distant Chile, South America.

Condition of earthquake and tsunami in Suzaki City, Kochi Pref.



Damages by Showa Nankai Earthquake and Tsunami Attacking large-scale earthquake

Trench-type earthquakes have occurred around Japanese archipelago in the period of tens to hundreds of years. Trench-type earthquake badly Tonankai/Nankai Earthquake occurs affecting Shikoku will occur in a high probability of 60% to 70% within the 30 years from now according to the earthquake investigation research promotion headquarters, while the central disaster prevention meeting*1 predicts that tsunami of the sizes exceeding the heights of wave prevention embankment of existing coast maintenance facilities will attack in case such an earthquake occurs.

Probabilities of main earthquakes predicted in Shikoku Region



Great earthquakes/tsunamis which brought about huge damages so far

Showa Nankai Earthquake (Nankaido Earthquake) (M8.0) [Dec. 21, 1946] O Deaths/missing persons: 1,443 O Max tsunami height: 6 m Chile Earthquake and Tsunami [May 23, 1960] O Deaths/missing persons: 142 O Max tsunami height: 6 m

[Source] Prepared by Shikoku Regional Development Bureau from homepage of Japan Meteorological Agency



▲ Damage situation of Chile Tsunami (Kirima bank was damaged)

Predicted max tsunami height and present coast facility height when



[[]Source] Information by Central Disaster Prevention Meeting / Earthquake Investigation Research Promotion Headquarters

*1 One of the meetings related to the Cabinet's important policies, consisted of Prime Minister, all cabinet members, representatives of designated public organs, and academic experts, which prepares disaster prevention plan and reviews important items related to disaster prevention.

Provision for large scale natural disaster

In order to reduce the damages by big earthquake and tsunami predicted to occur, Shikoku Regional Development Bureau continues maintenance projects such as the consolidation of earthquakeresistant reinforced pier^{*1} indispensable for the transportation of rescue materials at ports after disaster, consolidation of embankment for tsunami at Suzaki Port of Kochi Prefecture, and seismic reinforcement of embankment/seawall as well as the increase of wave prevention height at the coast of Muya Port of Tokushima Prefecture.

*1. Pier to be constructed by increasing the earthquake resistance at a specified port to maintain maritime transportation of emergency goods and evacuating people immediately after suffering damages in case large-scale earthquake occurs.

 Maintenance of earthquake-resistant reinforced piers/embankments



Measures against earthquake and tsunami

Tsunami embankment at Suzaki Port (Suzaki City, Kochi Pref.) [mainly sponsored by Central Government] Consolidation of embankment mainly sponsored by Kochi Prefecture was started at Suzaki Port, Kochi Prefecture which had actually been damaged, to alleviate the damages by water invading the city area, and the construction of tsunami embankment at the mouth of port is continued mainly by the central government in coordination.



Embankment at coast of Muya Port (Naruto City, Tokushima Pref.) [mainly sponsored by central government]

Consolidation work of reinforcing the earthquake resistance of embankment on the coast and increasing wave prevention height is continued at the coast of Muya Port in Naruto City, Tokushima Prefecture, to prevent the damages by tsunami attacking the city area and various







Damages by high tide on Shikoku Region so far

Coasts of Shikoku have suffered damages by high waves and tides caused by many typhoons from early days. Recently, areas along the coasts of Seto Inland Sea were damaged by high tide caused by Typhoon No. 16 which hit the areas around Shikoku on Aug.30, 2004. In Shikoku, tidal levels exceeding the max level by tens of centimeter were recorded at coastal areas in Kagawa and Ehime Prefectures, and the central part of Takamatsu City, above all, was flooded for a long time. 16,000 houses were flooded, and the civil life was badly affected.

Damages by high tide caused by Typhoon No. 16 (Takamatsu City, Kagawa Pref.)



Flooded areas

[Source] "Tsunami/High Tide Countermeasure Promotion Action Program" Kagawa Pref.



▲ Flooded underground road in Nishikimachi, Takamatsu City



▲ Flooded Fukuoka-cho, Takamatsu City

 Claw mark left by high tide General condition of damages (houses)

	Total in prefecture	Takamatsu City	Marugame City	Sakaide City	Kanonji City	Sanuki City	Higashi kagawa City	Uchinomi Cho	Tonosho Cho	Mure Cho	Aji Cho	Naoshima Cho	Tadotsu Cho	Takuma Cho	Others
床下浸水 (戸)	5,872	3,538	208	135	90	288	195	180	523	87	109	270	93	87	69
床下浸水 (戸)	16,088	12,023	749	254	250	558	280	349	523	141	192	143	237	136	253

* Disaster Relief Act was applied to the above cities and towns (6 cities and 7 towns).

* Takamatsu City requested for the dispatch of Self Defense Force in disaster.

Promotion of Measures against High Tide/Waves

At Takamatsu Port, mainly the central government continues the improvement of embankment to maintain earthquake resistance around Sunport Takamatsu being developed currently and at the Hamano-cho construction area densely populated, for the purpose of preventing damages by flood caused by high tide. Also at each area of Takamatsu Port, mainly Kagawa Prefectural Government continues the work of raising the height of embankment and parapet.

Tamamo Area (Sunport Takamatsu / Hamano Cho) [mainly sponsored by central government]





▲ Sunport construction area Service started in July 2008

Whole coast of Takamatsu Port (mainly sponsored by Kagawa prefectural government) Improvement of embankment around Kitahama, Takamatsu City





Waki Area on the coast of Matsuyama Port (mainly sponsored by central government) At Waki Area at Matsuyama Port, Ehime Pref., mainly central government improved walls, and consolidated breakwaters and beaches^{*1} in consideration of the restoration of beaches and the scenery around, for the purpose of preventing damages by flood caused by high tide.



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Full-scale service started in July 2008

▲ Facility in Wakihama side being used

*1. Eroded beaches are consolidated by supplying earth and sand artificially.

Overview of Shikoku's coastlines



Source: Statistics on Coastlines, 2010 (River Bureau, Ministry of Land, Infrastructure, Transport and Tourism)



Land, Infrastructure, Transport and Tourism)

Maintenance of Ports [situations around physical distribution]

Forms of Physical Distribution Cargos in Shikoku

Form of cargos transported by sea can be classified into two types. One is the container cargo transported by using a holder called Container. The other is a form called Bulk Cargo directly loaded on ship, and transported, such as liquids and raw wood.

Bulk cargo accounts for the most part of foreign trade cargos in Shikoku, and its handling tends to increase recently.



▲Wood chip ship (Komatsujima Port, Tokushima)



Source: Statistics on Ports (annual report) (1994 to 2009)





Details of handled foreign trade cargos



Source: Statistics on Ports (annual report) (2009)

Cargo ships in Shikoku



▲Container ship (Komatsushima Port, ▲Container ship (Kochi Port) Tokushima)



▲Lime stone carrying ship (Kochi Port)





▲Coal carrying ship (Tachibana Port)



▲Bulk cargo ship (cereal) (Tadotsu Port)



▲Ship only for timber (Komatsushima Port, Tokushima) Tokushima)



▲RORO ship (Mishimakawanoe Port)



▲Ferry (Komatsushima Port,

Forms of Shikoku's Physical Distribution Cargos

Amounts of foreign trade container cargos handled in Shikoku continue to increase recently. This is mainly because the amounts of cargos to East Asia have increased as the economy in East Asian Region developed rapidly.

As the economy and society are globalized more and more, international physical distribution becomes more important.

*1. Container cargos among the incoming/outgoing cargos directly traded between domestic ports and foreign ports

Amounts handled by foreign trade cargo containers at Shikoku's ports (import/export total: including empty container)

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Cargo transportation to East Asia in container cargos produced/consumed in Shikoku



Using other ports --- Cargo transportation arriving at/departing from Shikoku by way of domestic transportation, in case foreign countries are directly connected with the ports in other regions

Source: Nationwide Import/Export Container Cargo Flow Survey (1-month survey)

Source: Survey by Shikoku Regional Development Bureau

East Asian physical distribution becoming more domestic

As the economy of East Asia expands rapidly, the exchange between Japanese companies and East Asian Region continues to expand, including the Japanese companies penetrating into China. In the meantime, there is a shift from the conventional domestically completed physical distribution to a physical distribution system even involving East Asian Region, and regular services are being opened between East Asia and Japan.

In the event the physical distribution of East Asia becomes more domestic, it is necessary to extract the factors (bottle necks) obstructing efficient physical distribution and take required actions to solve the problems if any efficient physical distribution is to be established.

Shikoku Regional Development Bureau installed "Shikoku International Physical Distribution Strategy Team" consisted of the personnel from the industrial, academic and official communities in June 2006, and makes an attempt to create an efficient system of physical distribution by merging international physical distribution and domestic physical distribution.



Region with Shikoku

Opened regular services connecting East Asian

Maintenance of Ports [ships becoming bigger]

Ships becoming bigger

Cargo ship comprises container*1 ship, bulk carrier*2, ferry*3 and RORO ship*4 in type. In recent years, these ships tend to become bigger. Big ships are able to transport a larger amount of cargos at once, and make the physical distribution more efficient by reducing costs. Piers for bigger ships should be constructed in such situations of physical distribution. Large pier of water depth of 12 m or more is essential for the ships of 40,000 tons or more to come alongside. It is requested to construct such piers.



Average gross tonnage per ship in foreign ships coming into important ports in Shikoku



Source: Statistics on Ports (annual report) Important ports in Shikoku are covered (excluding Sukumo Port)

*1. Box-shaped object to carry cargos efficiently, available in the sizes of 20 (approx 6 m) feet and 40 (approx 12 m) feet by international standard. One 20-feet container is defined as TEU.

*2. Ship designed only to transport cargos loaded in bulk without package, which mainly transports ore, coal and cereal.

*3. Common name for ship to transport, by sea, the cars as licensed or permitted by Maritime Transportation Act.

*4. Short name of Roll on Roll off ship; ship with a gate aft or in side to load/unload cargos like truck and forklift.

Coastal shipping liners becoming bigger, which come into ports in Shikoku



*5. Container ships come into specified main ports only to improve transportation efficiency, and so re-ship at said ports, and branch-transport to other ports.

*6. Abbreviation of Gross Ton, showing the size of ship.

*7. Abbreviation of Twenty feet Equivalent Unit, an international unit showing the amount of cargo handled by container. One 20-feet container = 1 TEU Maritime physical distribution gentle to environment

CO² emission per transported amount in each transportation means of cargos makes us recognize that transportation by ships emits less CO² than the transportation by trucks. If transportation means is switched to ship from truck, approx 75% of CO² can be reduced.

Source: Japanese Greenhouse Effect Gas Emission Data (1990 to 2008) "National Institute for Environmental Studies Greenhouse Effect Gas Inventory Office"

Annual Statute for Linnormienta Judies Orden induse Line Cas inventory Onde Annual Statute for Transport (2006) "Information & Research Dept., Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism" Annual Statistics on Cars (2006) "Information & Research Dept., Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism"

Annual Statistics on Coastal Shipping (2006) "Information & Research Dept., Policy Bureau, Ministry of Land,

Infrastructure, Transport and Touris Annual Statistics on Railway Transport (2006) "Information & Research Dept., Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism"



CO₂ emissions per amount of cargo transportation

[Ferry Boasts supporting Shikoku]

Ferry services supporting Shikoku

The number of ferry services and the amounts of cargos were found to decrease whe three Honshu-Shikoku bridges were completed However, ferry services connecting Honshu wit Shikoku and the isolated island seaways connecting islands are indispensable for Shikol In recent years, the amounts of ferry cargos a stabilized. Maintaining a certain level of ratio nationally, ferry boats remain to be an importar means of maritime transportation for Shikoku.

Ferry services starting from/arriving in Shikoku



Changes in ferry cargos in Shikoku







Company name	Fairway
Ocean Trans Co., Ltd.	Tokyo – Tokushima – Kitakyushu

* Excluding cargo ferry and RORO ship

Source: Homepage of Japan Maritime Public Relations Center

Maintenance of Ports [maintenance of terminals]

Maintenance of international physical distribution terminals

Industry of basic material type developed along the coasts of Shikoku, and the required materials and fuels are mainly imported as bulk cargos (loaded in bulk). As ships become bigger recently, shortage of appropriate piers chronically causes demurrage, making it inevitable to switch long-distance transportation to land transportation. Such situations not only make physical distribution inefficient but also cause big problems in the costs. In the event of demurrage, for example, loss of 3 million yen is said to be caused per ship every day if it is forced to wait for cargo handling off the coast.

In order to realize efficient international physical distribution activities, efforts are continued to construct sites of international physical distribution terminals appropriate for large ships.



Construction of international physical distribution/complex and through transportation terminals

In order to promote the use of domestic sea transportation of high energy efficiency with less load on environment, a modal shift policy^{*1} is encouraged to shift mode to sea transportation from truck transportation by land. Also in order to promote efficient physical distribution utilizing the smoothness in connecting sea and land, domestic physical distribution/complex and through transportation^{*2} terminals are under construction with a view to establishing a sea highway network. • Arrangement of domestic physical distribution/complex and through transportation terminals in Shikoku (important ports)



^{*1.} Conversion to efficient transport institution in cargo transportation; normally referring to the conversion to railway/sea transportation to truck transportation.
*2. When a certain cargo is transported in relay of more than one means of transportation, packed cargo is delivered to the recipient without being unpacked at the relay point. This is popularized the prevalence of containers.

Developed/Maintained Fairways [sea highway Seto Inland Sea]

Ship traffic concentrated in narrow channels

Seto Inland Sea is a still sea area, and has been used, from early days, as a center of maritime transportation. In recent years, industries were located on the coasts of Se Inland Sea, when container services were opened, and the ports and fairways are constructed. Therefore, the role of Seto Inla Sea becomes more important as a trunk seaway. Number of passing ships increase and such ships become bigger. The ship trais congested in Seto Inland Sea with many narrow channels.



 Bisan Seto(west part)
 261
 127
 33
 10

 Seto (east part)
 291
 65
 90
 90

 Source: Operating Ship Factual Investigation Results 2010

Ship traffic concentrated in narrow channels

Seto Inland Sea is a still sea area, and has been used, from early days, as a center of maritime transportation. In recent years, industries were located on the coasts of Seto Inland Sea, when container services were opened, and the ports and fairways are constructed. Therefore, the role of Seto Inland Sea becomes more important as a trunk seaway. Number of passing ships increases, and such ships become bigger. The ship traffic is congested in Seto Inland Sea with many narrow channels.

Developed/maintained fairways

The width and depth of existing fairways are increased as required to maintain a safe and smooth traffic of ships.

In the work of maintenance, it is necessary to take into account the marine environment, fishing adjustment and traffic control of ships.

Traffic of controlled ships

	Giai			
Fairway	Loading dangerous substances	Other giant ship	Total	
Bisan Seto, East	248ships	1064ships	1312ships	
Bisan Seto, North	164ships	438ships	602ships	
Bisan Seto, South	39ships	514ships	553ships	
Mizushima	197ships	531ships	728ships	
Kurushima Strait	4ships	267ships	271ships	

Source: "Maritime Security Statistics Annual Report" 2009

Actual shipwrecks at narrow channels



Issues in Seto Inland Sea Fairways



Maintenance of Airports [entrance airport where everybody feels safe]

Air passengers in Shikoku

In the numbers of passengers per route at the four airports in Shikoku, Tokyo Route stabilizes, though the numbers of passengers decrease in the domestic routes to Osaka and Kansai. In the international routes, on the other hand, the periodical routes to Seoul and Shanghai were opened at Katsuyama Airport and Takamatsu Airport. So, the numbers of passengers are expected to increase from now on.

Maintaining safe operation of airplanes Update/improvement of facilities =

Airport facilities must always be maintained in good condition for the safe operation of airplanes using the airport. So, at the airports controlled, the facilities at the runway, taxiway and parking apron are updated and improved effectively and efficiently. Efforts are also made to reduce costs by using imagination and ingenuity.



Changes in the numbers of air passengers in Shikoku







Kochi Airport

Matsuyama Airport Responding to increasing demands = all airports controlled to be 2,500 in length =

In April 2010, the runway of Tokushima Aerodrome was extended to 2,500 m, and its service was started in the year. Then, all the airports controlled were able to accept large jet planes. It is requested, from now on, to open new routes, promote international services, and take necessary actions to do with passenger demands ever increasing.



Tokushima Aerodrome

Airports/airfields in Shikoku

Takamatsu Airport

Takamatsu Airport was moved, newly built and opened as an airport of 2,500 m runway after demolishing the old airport of 1,200 m runway in 1989.



In the year 1992, the service of Seoul Route was started as the first regular international service in Shikoku, and the service of the international route passenger terminal was started at the same time. In July 2011, Shanghai Route

Kagashima Naha									
Route name	Number of services	Require time							
Tokyo	24services/day	1:15							
Naha	2services/day	1:55							
Shanghai	4services/day	1:30							
Seoul	6services/day	1:45							

Matsuyama Airport Sappor Runway was extended to 2,500 in 1991, and its service was started in the Seoul vear. Shanghai International charter Itami Tokyo Chubu service started its Fukuoka operation in 1979, and the international route terminal was opened in Kagoshima 1994. Seoul Route started service in 1995, and Shanghai Route started service in 2004.

Port & Airport Department

Route name	Number of services	Require time	Route name	Number of services	Require time
Tokyo	24services/day	1:25	Kagoshima	2services/day	1:00
Chubu	6services/day	1:05	Sapporo	2services/day	2:10
Itami	22services/day	1:00	Seoul	6services/day	1:40
Fukuoka	14services/day	0:50	Shanghai	4services/day	1:40



Takamatsu Airport photographed Apr. 2008

Kochi Airport

Runway was extended to 2,500 m in 2004, and the service was started in the vear.

It is requested to do with the increase of air demands in the future.

Kochi Airport is familiar to people by the name "Kochi Ryoma Airport" named after a historic person for



Kochi Airport photographed Nov. 2009



Matsuyama Airport photographed Mar. 2011

Tokushima Aerodrome

Tokushima Aerodrome is an airport shared by private air service companies and Air Self Defense Force.

In April 2010, runway was extended to 2,500 m, and the service was started in the year. Fukuoká The terminal building and cargo building were also moved to the sea side and constructed newly at the same time. Under the familiar name of "Tokushima Awaodori

ł	08	20 / 5 · · ·							
	Route name	Number of services	Require time						
	Tokyo	18services/day	1:10						
	Fukuoka	4services/dav	1:15						

Tokvo

Airport," it is requested to respond to the increase of air demands



Tokushima Aerodrome photographed Mar. 2009 Route date: as of Apr. 2011

Actions taken to Protect Natural Environment [environment inherited to next generation]

Ocean environment maintenance ships

Timbers and garbage flowing on the sea surface could cause ships to collide with each other, or threaten the safety of passing ships, for example, when entangled with propellers. Oil leaked in accident, etc. could damage the lives of fish and sea birds. Therefore, such garbage and oil should be removed from sea to protect the safe and beautiful sea. This is why the ocean environment maintenance ships "Mizuki," "Bisan" and "Ishizuchi" are used to recover garbage to preserve ocean environment.

 Ocean environment maintenance ships in Shikoku; responsible waters





Sea surface cleaning/oilrecovering ship "Ishizuchi" (Matsuyama Port)



Sea surface cleaning/oilrecovering ship "Bisan" (Sakaide Port)



Sea surface cleaning/oilrecovering ship "Mizuki" (Tokushimakomatsushima Port)

Recovery of environment by covering with sand

Being surrounded by land in all sides, Seto Inland Sea is a closed sea with water hard to be mixed up with outer sea water. Sludge accumulated on the bottom of sea contributes to deteriorate the ocean environment. Sea bottom should be covered with sand of good quality using dredged^{*1} earth and sand to suppress the elution of nutrient salt from the sludge, such as phosphorus and nitrogen.

*1. Sea bottom shall be deepened by digging earth and sand so that ships can go and stop safely.

Before being covered with sand





▲ Tsuda Bay covered with sand (Sanuki City, Kagawa Pref.)



Covered with sand of good quality using dredged earth and sand

Formulation of circulation-type society by recycle ports^{*1}

If limited resources are to be utilized effectively by recycling, it is necessary to establish a "Vein physical distribution system" to transport recycled resources in addition to an "Artery physical distribution system" to transport resources and products.

In Japan, in the meantime, 22 ports are designated as the general vein physical distribution site ports (recycle ports). In Shikoku, Mishimakawanoe Port (Shikokuchuo City) thriving by paper manufacturing was so designated, and recycle projects are promoted to realize a circulation-type society.

*1. This means a port acting as a site of vein physical distribution network for recycling facilities sited in wide area. The port is designated as a general vein physical distribution site port (recycle port) by the central government at the application by the port administrator, for the purpose of realizing a circulation-type society.

Image of facility supporting the handling of circulating resources



▲ Eco caisson introduced into Mishimakawanoe Port (Shikokuchuo City, Ehime Pref.))



Ecosystem-type sea waters environment maintenance work method

Structures at port such as pier and embankment generally come down to deep water vertically. Shellfishes living on the vertical surface, their wastes and dead bodies are accumulated on the sea bottom, and oxygen is consumed when these things are decomposed by microbes. This makes it hard for living things to live near sea bottom, and such a tendency is intensified especially at the depth of port where sea water flows slowly. At deep water, on the other hand, oxygen is produced by photosynthesis of phytoplankton, making the area an environment easier for living things to live in.

In this work method, shelf-like spaces are created at shallow water, and stones are placed on the bottom surface to promote living things to live in a porous environment. This work method is highly expected as a technology with no running (maintenance) cost because it prevents the environmental deterioration of sea bottom by an autonomous material circulation of these living things.



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Creation of Prosperity [making Shikoku jointly with regions]

"Minato (port)" supporting life and industry as a site in the region from early days has grown the history and culture unique to the region.

"Minato" is now required, which contributes to the creation of local merits including the creation of prosperity and the transmission of local information.

"Minato Oasis" is to utilize "Minato" as the socalled "Oasis" where many people including local residents and tourists casually gather for intercommunication.

Port & Airport Department, Shikoku Regional Development Bureau, jointly with other regional development bureaus, promotes the "Minato and Oasis" system as a continuous project of resident participation type. In this system started in Nov. 2003, core areas of creation-ofprosperity activities were registered as "Minato Oasis" to encourage the activities by such Concept of "Minato and Oasis"

Activating local areas from port and sea

Prosperity shall be created by local activation utilizing facilities and scenery including backland as well as waterfront.

Utilizing existing

Realization of resident participation and operation Charming places of

Charming places of intercommunication shall be created by planning and operating with local residents.

activation Utilizing local individuality Areas of rich individuality

facilities and projects New energies shall be generated by an organic coordination utilizing existing things in imagination and ingenuity. Areas of rich individuality shall be created by enhancing the local history and culture and by adding net ideas.





Port & Airport Department

Seto Inland/Seaway Network Promotion Committee (Umi Net)

The region of Seto Inland Sea has thrived from early days as a place of marine transportation, and formulated unique society, and economic and cultural zones historically.

"Umi Net" committee is an organization to practice the creation of local areas in Seto Inland Sea as a block, where the gravity of history and the natural blessings are fully reflected. Established in May 1991, now consisted of 107 cities, towns and villages along the coasts of Seto Inland Sea, 9 regional organs in Ministry of Land, Infrastructure, Transport and Tourism (Kinki, Chugoku, Shikoku, Kyushu Regional Development Bureaus and Transport Bureaus, Kobe District Transport Bureau), "Umi Net" committee carries out the intercommunication/coordination activities for the areas of Seto Inland Sea.

Shikoku Regional Development Bureau carries out the committee's activities and the activities to enhance the merits of Seto Inland Region by utilizing the cruises and local intercommunication events.

Refresh Seto Inland Region

Coast cleaning activity named "Refresh Seto Inland Region" by volunteers is the mainly project by "Umi Net." It is appealed that beautiful Seto Inland Sea should be protected through such "activities easy for everyone to join."

For 18 years from 1993 through 2010, approx 16,200 tons of garbage was recovered under the cooperation by volunteers including 1.63 million local residents in total from all coastal areas of Seto Inland Sea.

Provision of "Place of learning" to youth

Shikoku Regional Development Bureau introduces the projects and actions taken, and holds "Dispatched Lecture" and "Site Tour" as opportunities to listen to your live voices.

In "Dispatched Lecture," new information on the creation of the country is told in easy-to-understand way by using the findings held by staff, and at the same time, the opinions and requests from participants are reflected in the policies by Ministry of Land, Infrastructure, Transport and Tourism.

At "Site Tour," you are guided to the dynamic sites of port, airport maintenance, ocean environment maintenance in an introduction of project.

If you request for dispatched lecture or site tour, you should make application previously. Please, look at the homepage, etc. showing the information.



▲ Introduction of actual recovery of garbage from sea surface, on sea surface cleaning/oil recovery ship



Map of "Umi Net" member cities, towns and villages



Cities, towns and villages registered in "Umi Net" Committee



▲ "Refresh Setouchi" cleaning activity at coast north to Anan City, Tokushima Pref.

Dispatched Lecture / Site Tour



▲Children in touch with sea lives in environmental learning



▲Site of installing giant caisson with grate impact

Port Security Measures

Port security measures

In the event of the U.S. synchronized terrorists attack, International Convention for the Safety of Life at Sea (SOLAS treaty) was revised, and it was obliged to intensify the security measures at internationally seafaring ships and international port facilities. If any port is insufficient in its security measures, therefore, ships departing from the port could be restricted from entering the port of destination, or forced to give up the entry to the port.

In Japan, "International Ship/Port Security Law" was instituted, and the security measures such as monitoring in and out of the port facilities are taken by installing limited areas to prevent suspected terrorist attacks on international port facilities.

Shikoku Regional Development Bureau reviews and approves the port facility security plan prepared by the administrator of international port facilities, and tries to maintain and improve the reliability and stability of international marine transportation such as by conducting witness inspections periodically on the execution of appropriate security measures.



Measures for deserted boats

Measures for deserted boats More pleasure boats^{*1} are owned per population in Shikoku, and mooring facilities are in short, leaving a number of deserted boats and sunk/discarded ships. At the result, safe seafaring is obstructed, and the sceneries are badly affected by them. Mooring facilities are maintained, and deserted and sunk/discarded ships

are disposed to solve these problems. *1. General name for boats such as yacht and motorboat used in sports and recreation. *2. Simple mooring facility for small pleasure boats utilizing the existing still waters and facilities as an

emergency measure against deserted boats.

Ownership of pleasure boats

Effects by construction of boat park*2



▲ Deserted boats before constructing boat parks

AStorage after constructing boat rks parks (Kochi Port, Niida Area) Mooring/storage condition

	Tokushim a Pref.	Kagawa Pref.	Ehime Pref.	Kochi Pref.	Whole nation			Tokushim a Pref.	Kagawa Pref.	Ehime Pref.	Kochi Pref.
Registered pleasure boats	4,075	6,286	8,147	4,609	197,018		Storage at marina	312	1,779	1,184	815
Total population	789	999	1 436	766	128 710		Storage at others	133	1,604	624	1,295
Number of	705	555	1,400	700	120,710		Deserted boats	3,630	2,903	6,339	2,499
Number of boats/population	5.16	6.29	5.67	6.02	1.53		Total	4.075	6.286	8,147	4.609

Source: Pleasure Boat Nationwide Factual Investigation 2010 (Fisheries Agency, Ministry of Land, Infrastructure, Transport and Tourism) "Basic Resident Register" (as of Oct. 1, 2009)

Port & Airport Department

Subsidy System activating Regions

A mechanism for the region to use flexibly in dealing with the problems by exercising wisdom and ingenuity is required to activate ports and areas around. "Minato Restoration Subsidy" is a system to promote regional activation by assisting the city, town and village with ports trying to restore "Minato."

Consolidation of conventional port facilities is to be assisted as a basic project, and a wide variety of projects proposed by regions are newly covered by the subsidy. Targets are the projects of total operating expenses of 100 million yen and more and planned term within 5 years.

Minato New Port Subsidy is sanctioned by the nation's recognition of "Minato restoration plan" prepared by the city, town or village with ports. This system enables a project in "Minato restoration plan" to be enforced more flexibly.

Projects to be assisted newly (proposed project)

Conventional construction of port facilities (basic project)

around passenger

terminal

Construction of port facilities



Green promenade





Facility storing deserted pleasure boats

Assisted more widely by the new subsidy system !



Construction of waiting shee (待合上屋)





learning/observation hut



Construction of Minato information guide board



Barrier free in port space

Port Construction Subsidy

"Local regeneration" by the activation of local economy and the creation of employment opportunities is required. This will require the implementation of construction project for port facilities and fishing port facilities by the region planning in free idea. "Port Construction Subsidy" is a system to assist the implementation of such local regeneration plans (authorized by the Cabinet).

This system gives subsidy money to the plan authorized by the Cabinet from among the "Local Regeneration Plans" prepared by local public bodies in the coordination by regional ports and the Class I fishing port contributing to the regeneration of the regions. This enables budgets to be enforced more flexibly for the execution of project in "Local regeneration plan" prepared in the region's flexible idea.

Example of port construction subsidy



Construction of green belt





List of Contacts

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General Office of Part & Airport (health & welfare)	087-811-8307						
General Affairs Center	<mark>087-811-8326</mark>						
Port Administration Section	087-811-8329	811-8426					
Port Planning Section	<mark>087-811-8330</mark>						
Port Project Planning Section	087-811-8331		= 700 0554				
Port & Airport Construction/Compensation Section	<mark>087-811-8332</mark>	811-8431	T 700-8554 3-33 Sunport, Takamatsu City (Takamatsu Sunport Joint Government Building 8F)				
Ocean Environment/Engineering Section	087-811-8334						
Port & Airport Disaster Prevention/Risk Management Section	<mark>087-811-8333</mark>	811-8144					
Quality Maintenance Center	087-811-8328	811-8431					
Port Security Countermeasure Center	087-811-8327	811-8144					
Komatsujima Port/Airport Construction Office	0885-32-3356	35-0010	〒773-0001 9−14, Shinko, Matsushima−Cho, Komatsujima city				
Takamatsu Port/Airport Construction Office	087-851-5522	826-1210	〒760−0011 72−9, Hamanocho, Takamatsu City				
Matsuyama Port/Airport Construction Office	087-951-0161	946-8019	〒791−8058 2426−1, Kaigan Dori, Matsuyama City				
Kochi Port/Airport Construction Office	088-847-3511	837-3001	〒781-0113 874, Tanezaki, Kochi City				
Takamatsu Port & Airport Technical Investigation Office	087-811-5660	811-5670	〒760-0017 1−6−1 Bancho, Takamatsu City 2F				

Public Relations Information

□ Homepage of Port & Airport Department, Shikoku Regional Development Bureau

Homepage of Port & Airport Department, Shikoku Regional Development Bureau is updated according to the following three points in basic concept.

- ① Portal site related to "Ports & airports" in Shikoku
- 2 Information arrangement with sorted themes by clarifying information to be transmitted
- (3) Homepage in consideration of the convenience of viewers $_{\circ}$

URL http://www.pa.skr.mlit.go.jp/

□ Mail Magazine "Shikoku Minato Dayori"

In the mail magazine of Port & Airport Department, Shikoku Regional Development Bureau, event information and announcements related to ports and airports are transmitted "Timely and Concisely as Useful Information."

URL http://www.pa.skr.mlit.go.jp/magazine/main.htm