Public Works Environmental Technology in Japan

~ from Today's Technologies to Tomorrow's Policies

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Presentation Preview

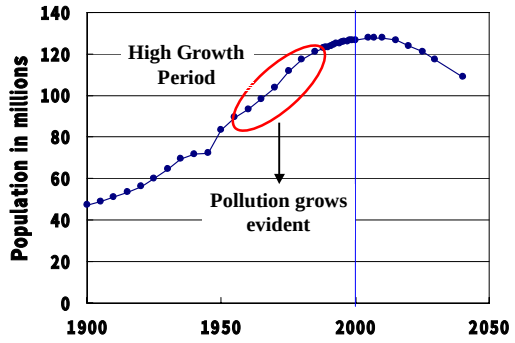
Part I. The Background of Japan's Environmental Issues

Part II. Environmental Conditions and Conservation Today

Part III. Environmental Policy and the Future

PART I:
The Background of Japan's Environmental Issues

Japan's Demographic Changes

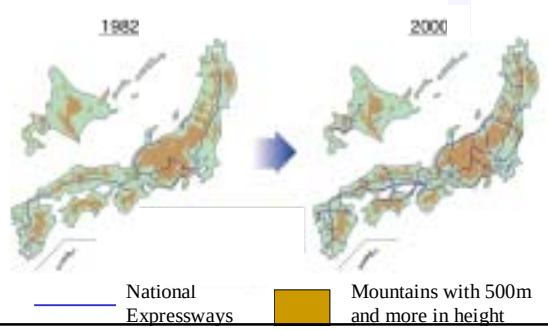


Industrial Pollution

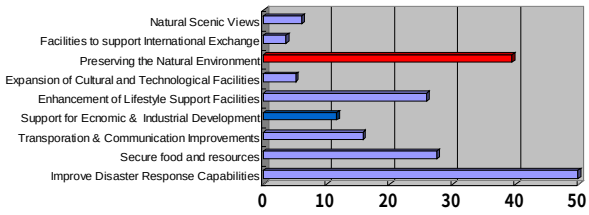
Red Tide Outbreaks in coastal waters

Industrial Discharges

The National Expressway System

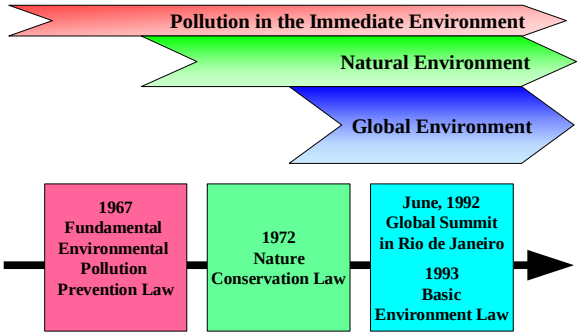


Growing Public Awareness of Environmental Issues



Results of Survey on National Development by the Prime Minister's Office

The Diversification & Globalization of Environmental Issues



PART II:

Environmental Conditions and Conservation Today

- The Immediate Environment
- The Natural Environment
- The Global Environment

Issues of the Immediate Environment

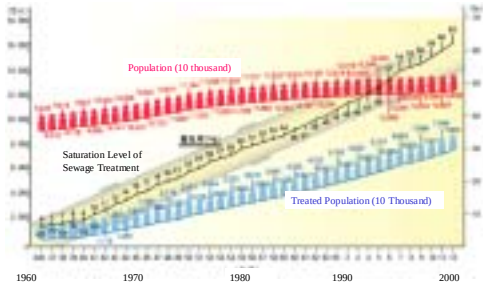
(Water Quality, Air and Noise Pollution)

Compliance with Environmental Standards

(BOD/COD)

- Compliance Rate high for Rivers, low in Lakes

Improving Sewage Treatment



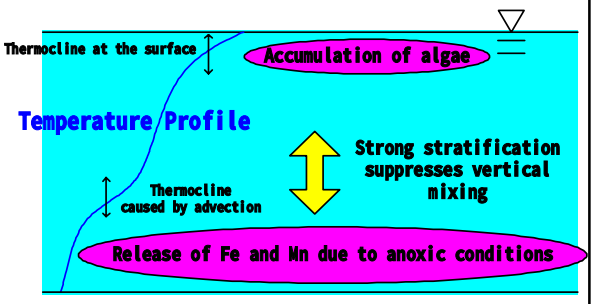
Water Quality Conservation Techniques in Lakes

Appearance of bubbles from a submerged aerator

Deployment of an aerator

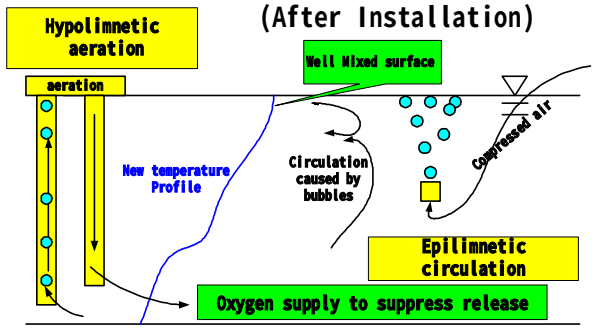
Effects of aeration/circulation

(Before installation)



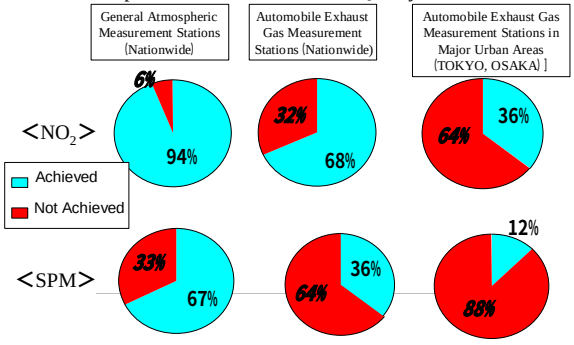
Effects of aeration/circulation

(After Installation)

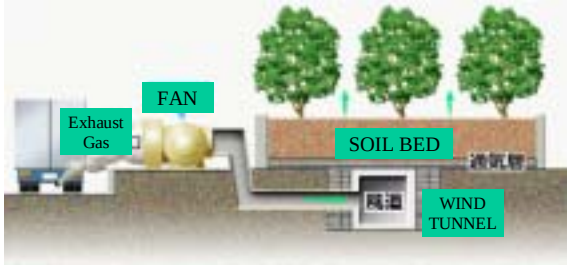


Air Pollution in Japan (1998)

Compliance with Environmental Quality Standards

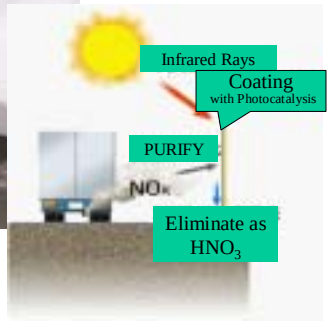


NOx Removal by Soil

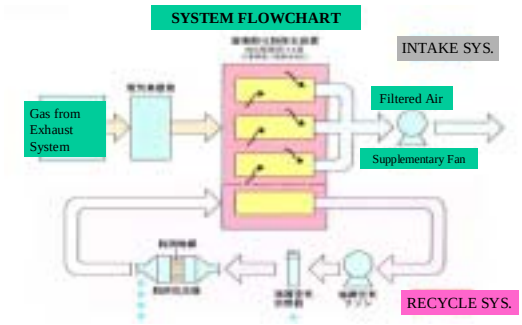


NOx Removal by Photocatalysis

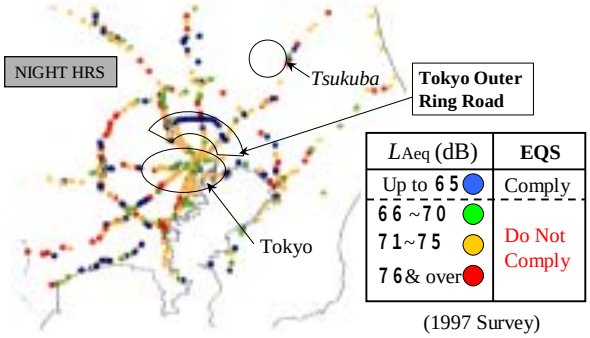
Sample Construction



NOx Removal by Absorbents



Road Traffic Noise in the Tokyo Metropolitan Area



L_{Aeq} (dB)	EQS
Up to 65	Comply
66~70	Do Not Comply
71~75	
76& over	

(1997 Survey)

Countermeasures along the Tokyo Outer Ring Road(1)

8 meter high Noise Barriers

Countermeasures along the Tokyo Outer Ring Road (2)

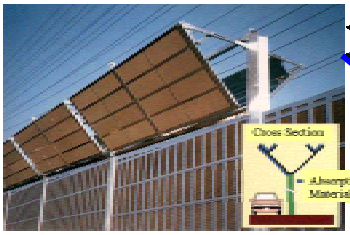
New Barrier Edge Design

Countermeasures along the Tokyo Outer Ring Road (3)

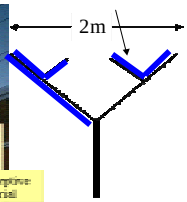
Absorption Panels

Advances in Noise Barrier Designs (1)

Barrier with Branches

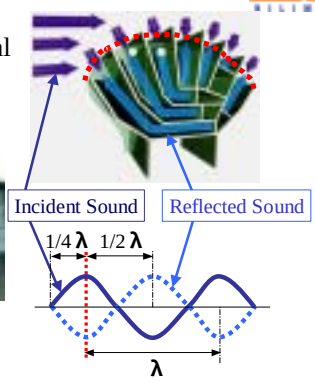


Absorptive Material



Advances in Noise Barrier Designs (2)

Barrier with Acoustical Cubic Soft Edge



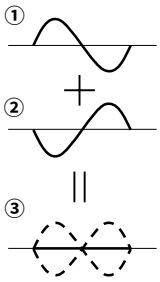
Active Soft Edge (ASE) Barriers

At the NILIM testing course
(March 1999)

Height: 3 m
Length: 40 m

Inside the ASE

Noise Cancellation



Measures to Control Noise at Source

Noise Dampening Pavements

Widely used

Dense asphalt pavement

↓

Porous asphalt pavement −3dB

Under development

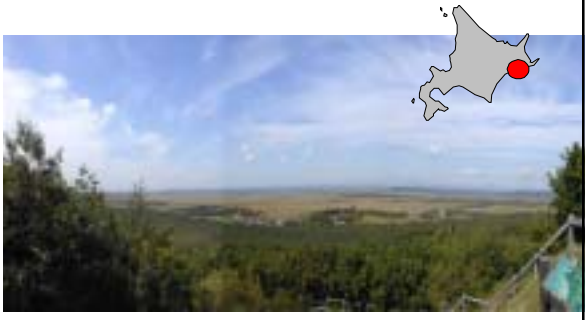
Double layer porous asphalt pavement −5dB

Porous elastic road surface −10dB

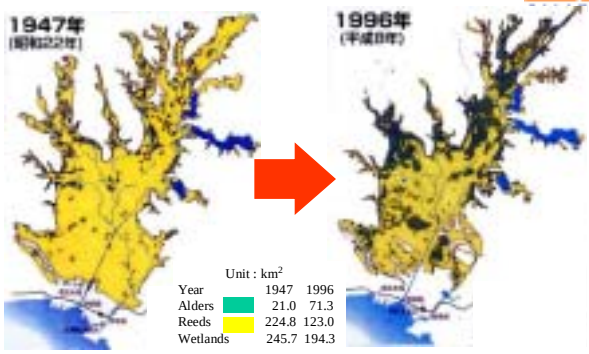
Japan's Natural Environment

Vegetation Topography of Japan

The Kushiro Wetlands



Wetland Loss



Alder Intrusion into Reed Dominated Wetlands

Restoration of straightened channel to originally meandering river

Wetland Restoration
(Case of Ara River)

Before Restoration

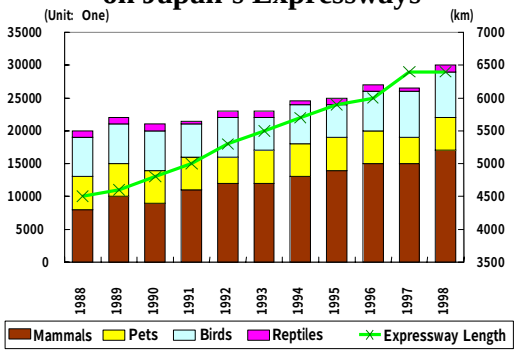
Wetland Restoration
(Case of Ara River)

Beginning of Restoration

Wetland Restration
(Case of Ara River)

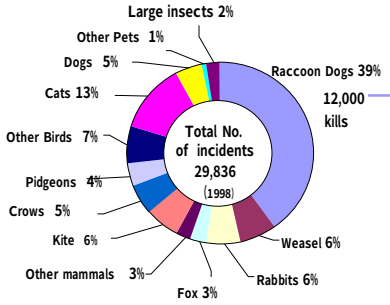
3.5 Years after the Restoration Works

Road-kill Incidents on Japan's Expressways



SOURCE: Highway Technology No. 14 (Oct., 1999)

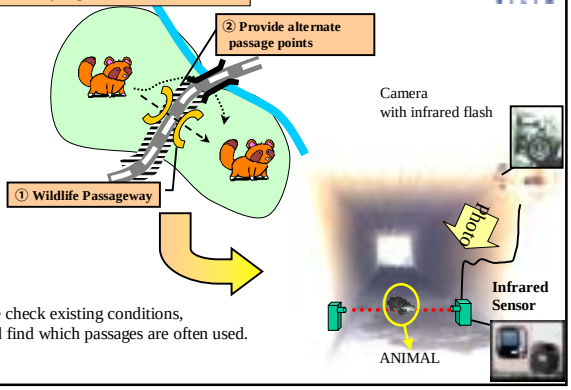
Road-kill Rates by Species



SOURCE: Highway Technology No. 14 (Oct., 1999)

STUDY EX.: Preventing Roadkill (Habitat Defragmentation)

As a way to prevent road kills….



We check existing conditions, and find which passages are often used.

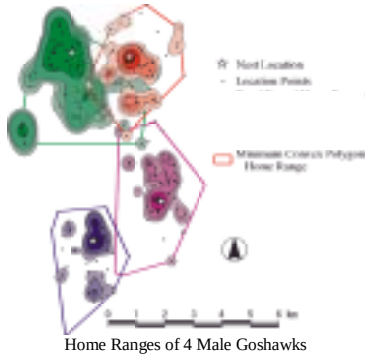
Ecology Study: Rare Raptors(1)

Northern Goshawk with a radio transmitters on the back

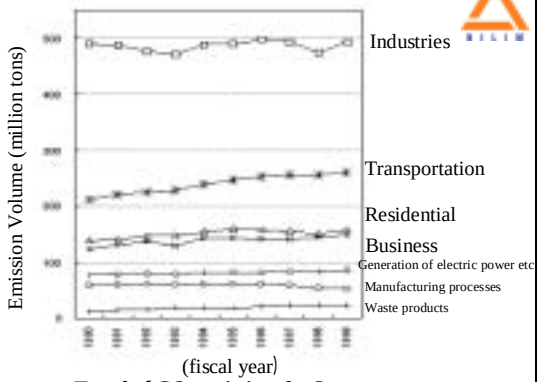
Rare Raptors(2) Tracking Hawks

Tracking the location of the hawk using an antennae and a receiver.

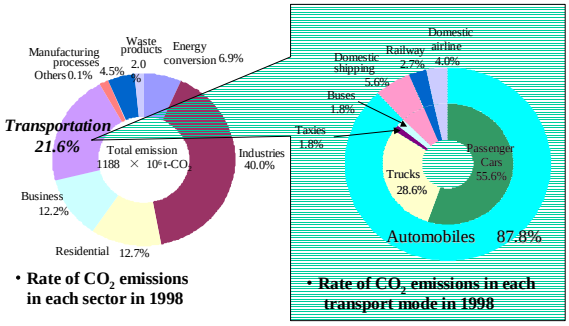
Rare raptors(3) Results of Sampling



Home Ranges of 4 Male Goshawks



Trend of CO_2 emissions by Sector



• **Rate of CO_2 emissions in each sector in 1998**

• **Rate of CO_2 emissions in each transport mode in 1998**

Low Emission Vehicles

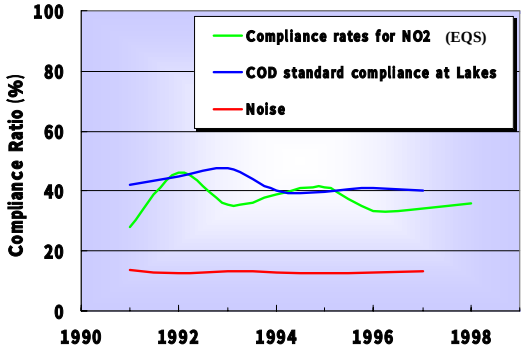
Electric Vehicles | Compressed Natural Gas (CNG) Vehicles | Hybrid Vehicles

• *Development of Fuel Cell Vehicles*

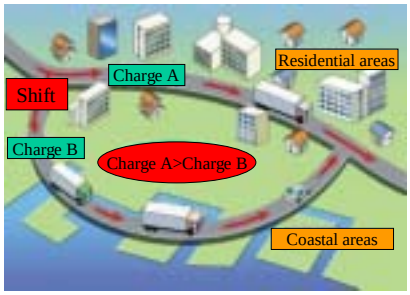
PART III:

The Limitations of Existing Technologies & Environmental Policy and the Future

Changing Rates of Compliance

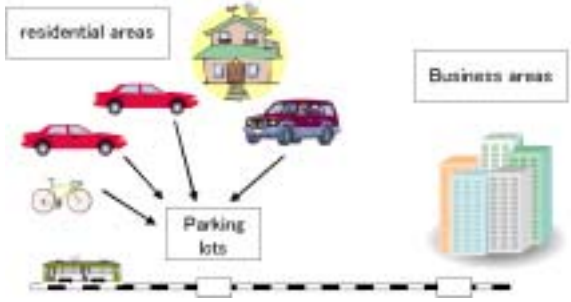


Combating Air Pollution & Global Warming (I)



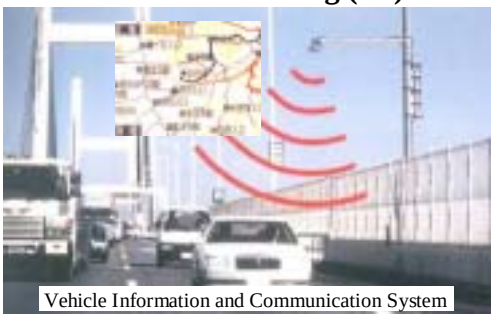
Environmental Road Pricing

Combating Air Pollution & Global Warming (II)



Example for Traffic Demand Management

Combating Air Pollution & Global Warming (III)



Intelligent Transport System

Combating Air Pollution & Global Warming (Ⅳ)

Intelligent Transport System

Comfortable, Attractive Cities in Harmony with Nature(1)

Cities, poor in green

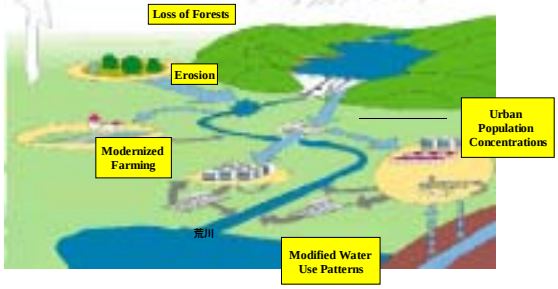
Greening on top of buildings

Comfortable, Attractive Cities in Harmony with Nature(2)

Road without tree

Road with wide green belt in the medium strip and the sides.

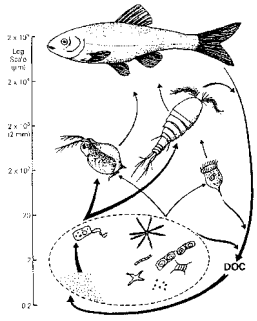
Comprehensive Watershed Restoration Initiatives



Fishable and Swimmable Water

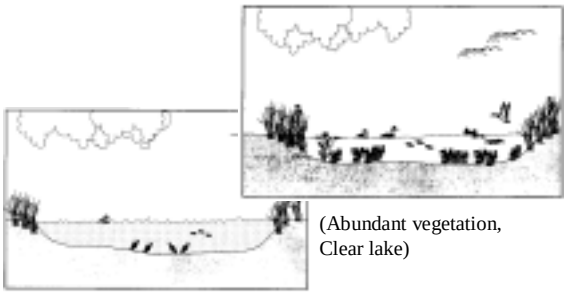
Fishable and Swimmable Water

Required further research in aquatic environment



Food web and material flow

Habitat restoration (e.g. littoral vegetation)



(Abundant vegetation, Clear lake)

(Less vegetation, turbid lake)

Conclusion:

Future Direction of Environmental Policy and its Supporting Technology

- **Set goals for broad based environmental benefit and implement comprehensive measures**
- **Integrate technology and support systems**
- **Collaborate with other technology fields**