



Present Status and Evaluation of Infrastructure in Japan

~ Infrastructure Census and Diagnosis ~

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Japan Society of Civil Engineers

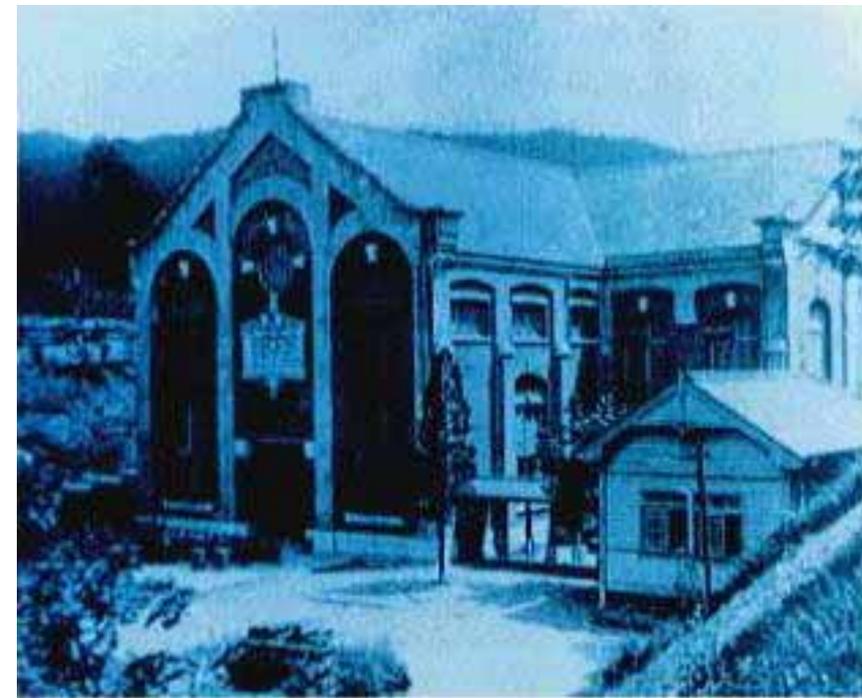
Sept. 12, 2007

Reference: Geographical Survey Institute

1/25000 topographical maps of [Sakurai-city] & [the Mount of Unebi]

Operative Inherited Assets from before WW

- **Transportation**
 - Railways, Roads, Ports
- **Energy**
 - Water Power Stations
- **Water (River)**
 - Flood Control Works,
 - Water Supply, Sewage
- **“Civil Works in Colony”**



The First Water Power Station at Kyoto
Reference: Waterworks and Sewerage Bureau, Kyoto City HP

Post-War Reconstruction, Disaster Recovery

■ Dams

- Water supply Ogouchi Dam
- Irrigation Ishibuchi Dam
- Power Generation Sakuma Dam
- Flood Control Ikari Dam

■ Construction of Road Network

- Five-Year Plan
for Road Construction

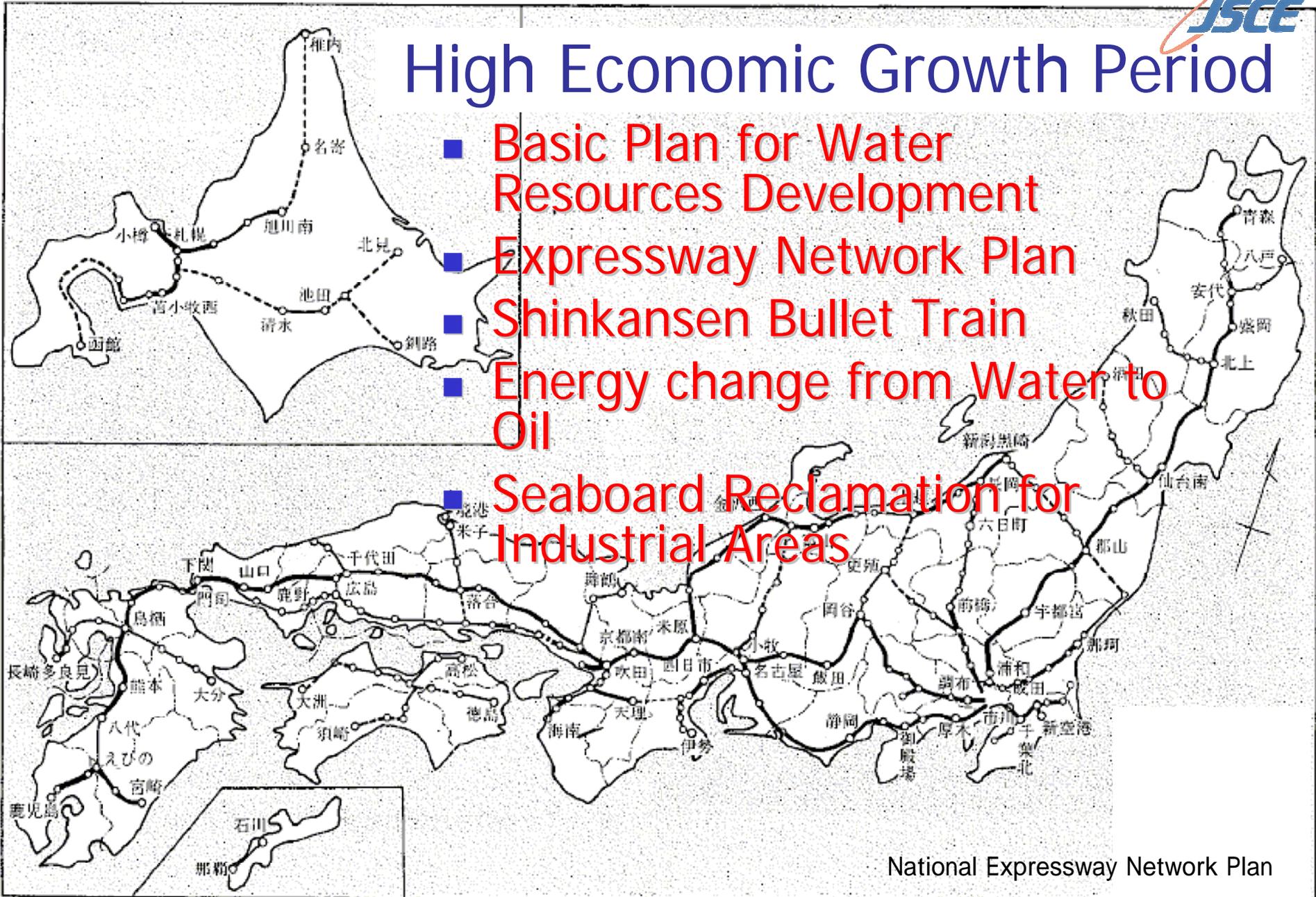


Ogouchi Dam

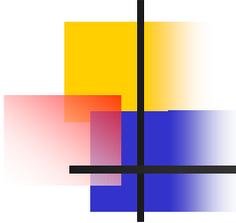
Reference : “100 selections of modern water system in Japan”
issued by Japan Chronicle on Community Improvement

High Economic Growth Period

- Basic Plan for Water Resources Development
- Expressway Network Plan
- Shinkansen Bullet Train
- Energy change from Water to Oil
- Seaboard Reclamation for Industrial Areas



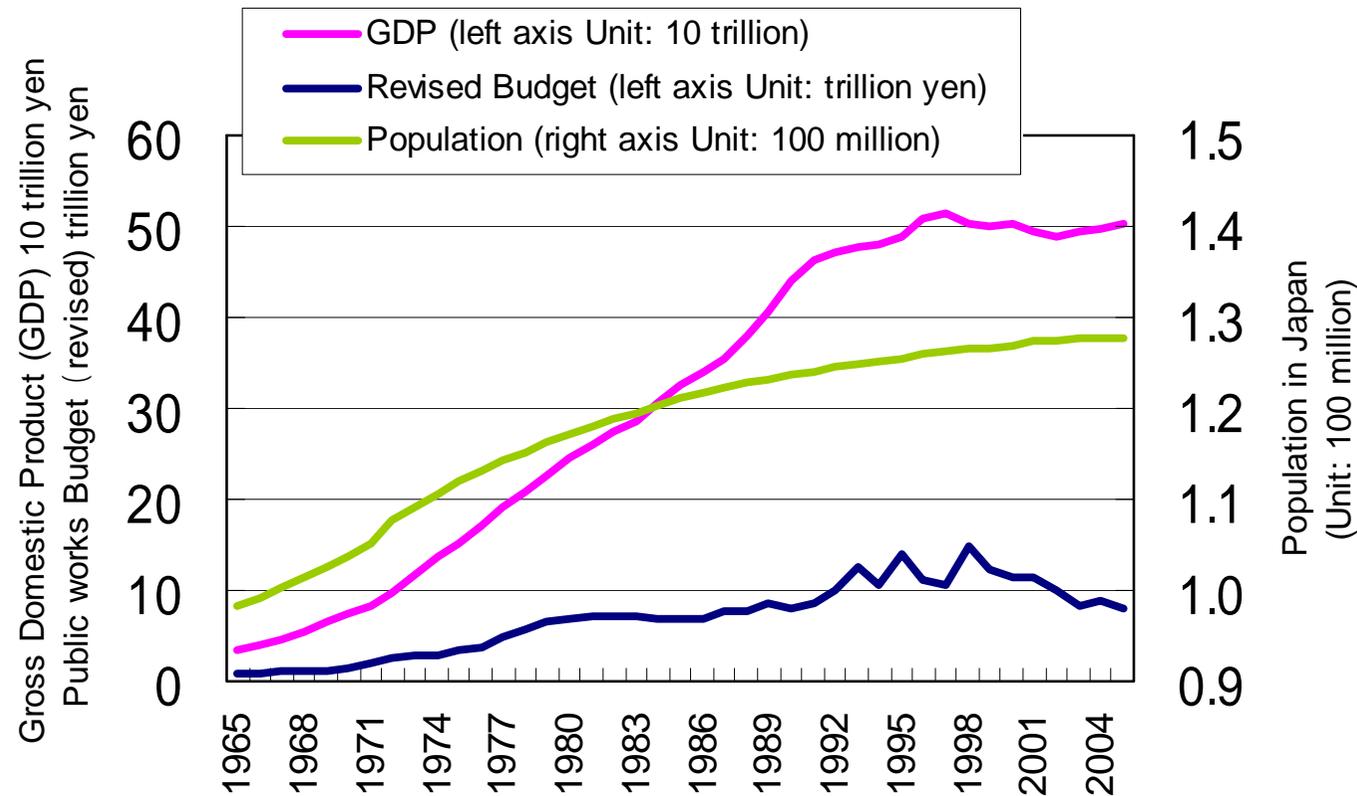
National Expressway Network Plan

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High Economic Growth to Moderate Growth

- Environmental Degradation
- Pollution-related Diseases
- Oil Shocks in 1970's
- Infrastructure Investment increased to the peak in 1998

Transition in GDP, Population & Infrastructure Investment



Reference: GDP Annual Report on National Accounts, Cabinet Office

Population Japan Statistical Yearbook

Budget for public works (revised) "Public Works and Budget", Taisei Publishing Co., Ltd

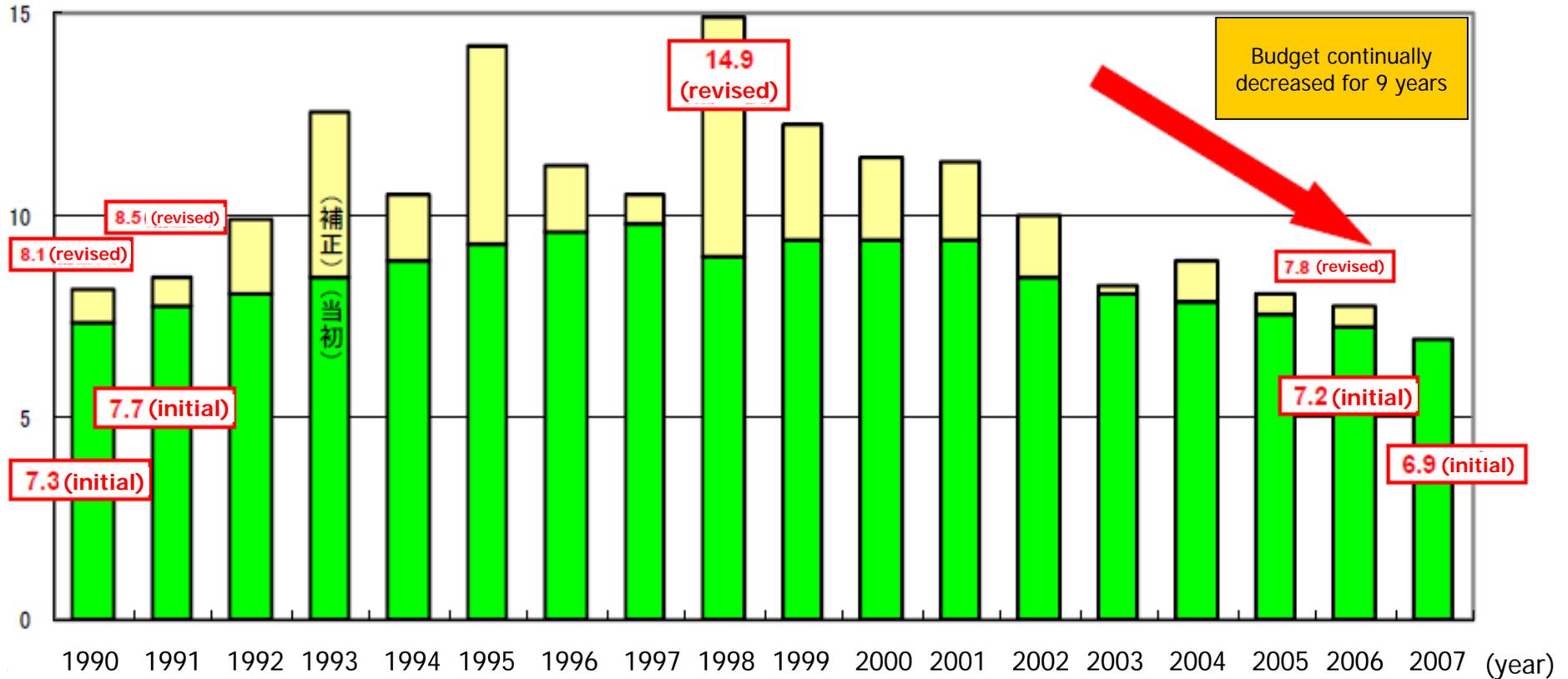
"Highlights of Public Works Budget in 2007(Government plan)" 6

Public Works Expenditure



(National Expenditure base)

(trillion yen)



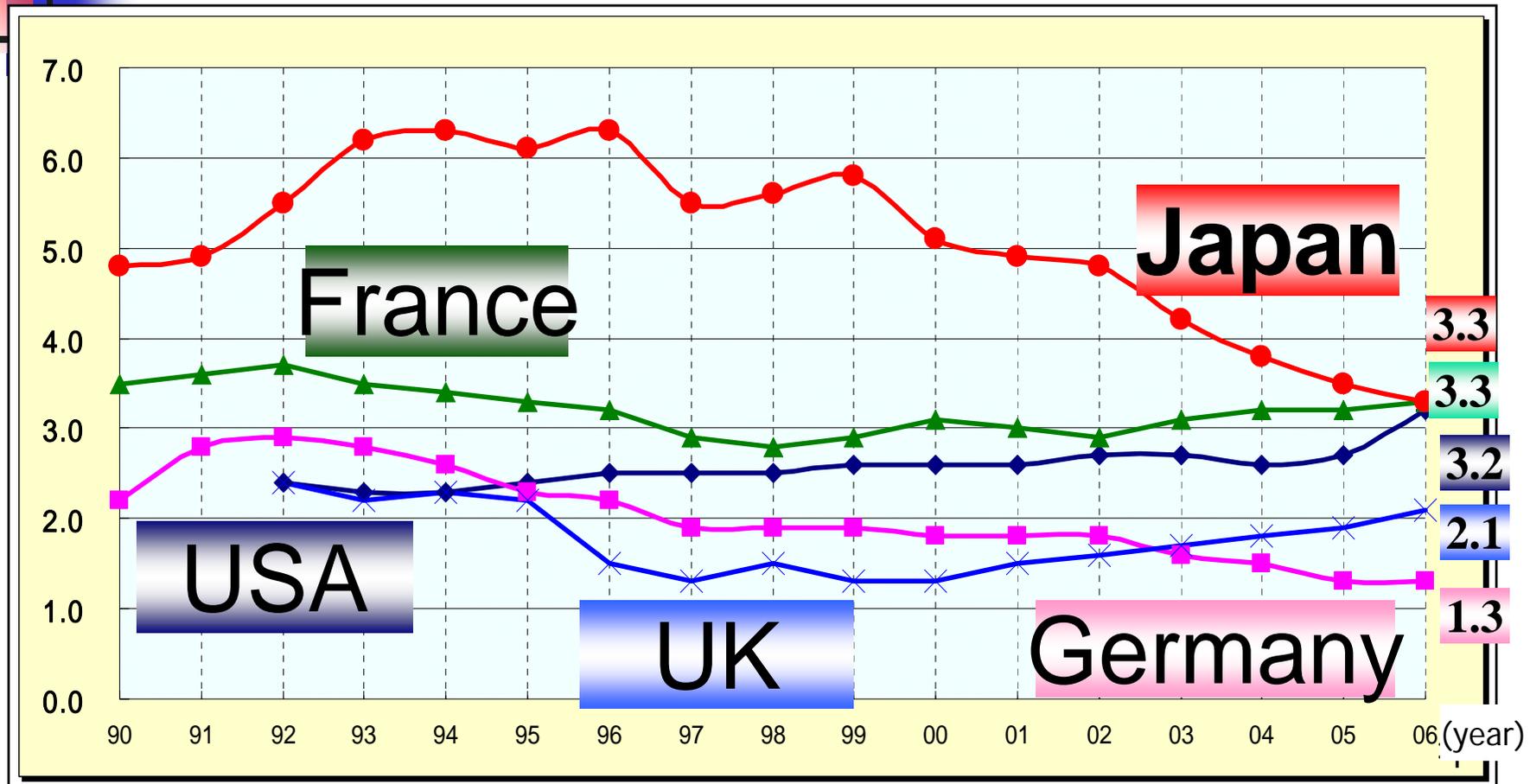
Basic Plan for Public Investment
 Initial(1991~2000): 430 trillion yen, Final (1999~2007): 630 trillion yen
 Discontinued after "Reform and Perspectives" (Jan 2002)

Subject to "Reform and Perspectives"
 Expenditure at the level before substantial increase
 in expenditure as economic measure
 Discontinued after "Course and Strategy" (Jan 2007)

Reference: The policy of Construction Industry in 2007
 (Final report of Construction Industry Workshop)

Infrastructure Investment vs GDP in Developed Countries

Fixed Capital Formation of Government (% GDP)



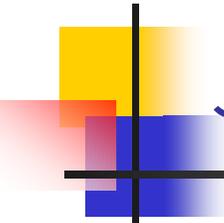
Japan : 1990 – 2004 Actual (by OECD National Account from 1990 to 2003, Annual Report on National Accounts in 2004 (single year basis))

2005 - 2006 Estimates (Information from Cabinet Office and government economic outlook (single year basis))

Other Countries: 1990-2004 Actual (OECD National Account)

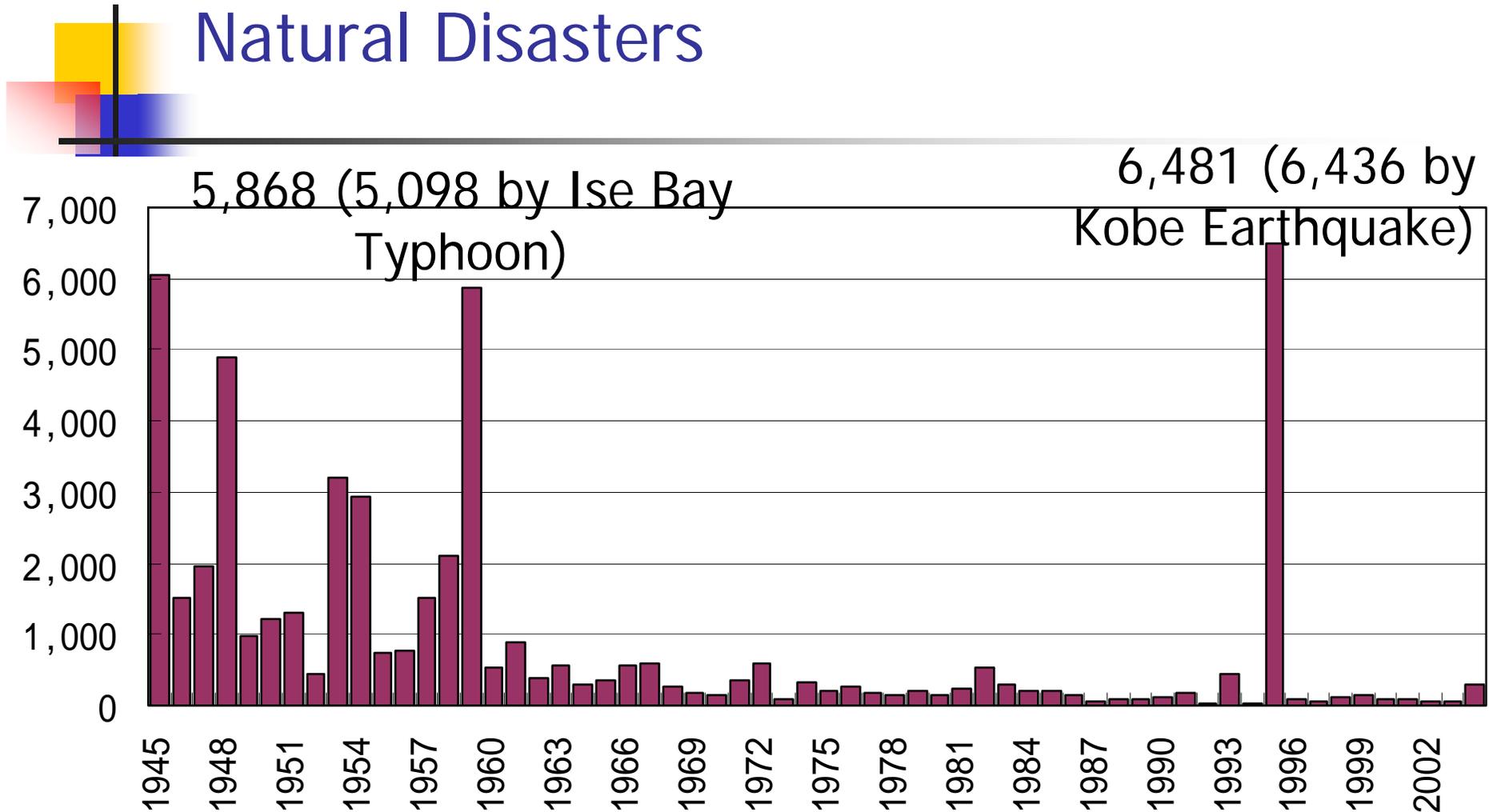
2005 and 2006 (from documents issued by EU Economic and Financial Committee)

Is Current Infrastructure in Japan Good Enough?

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- **Frequent Natural Disasters ,Hilly Land and High Population Density**
 - Simple comparison with other developed countries is not reasonable
- **Insufficient Infrastructure Stocks**
 - National Minimum is not achieved
- **Neglecting maintenance and renewal**
 - Fear of “Japan in Ruins”

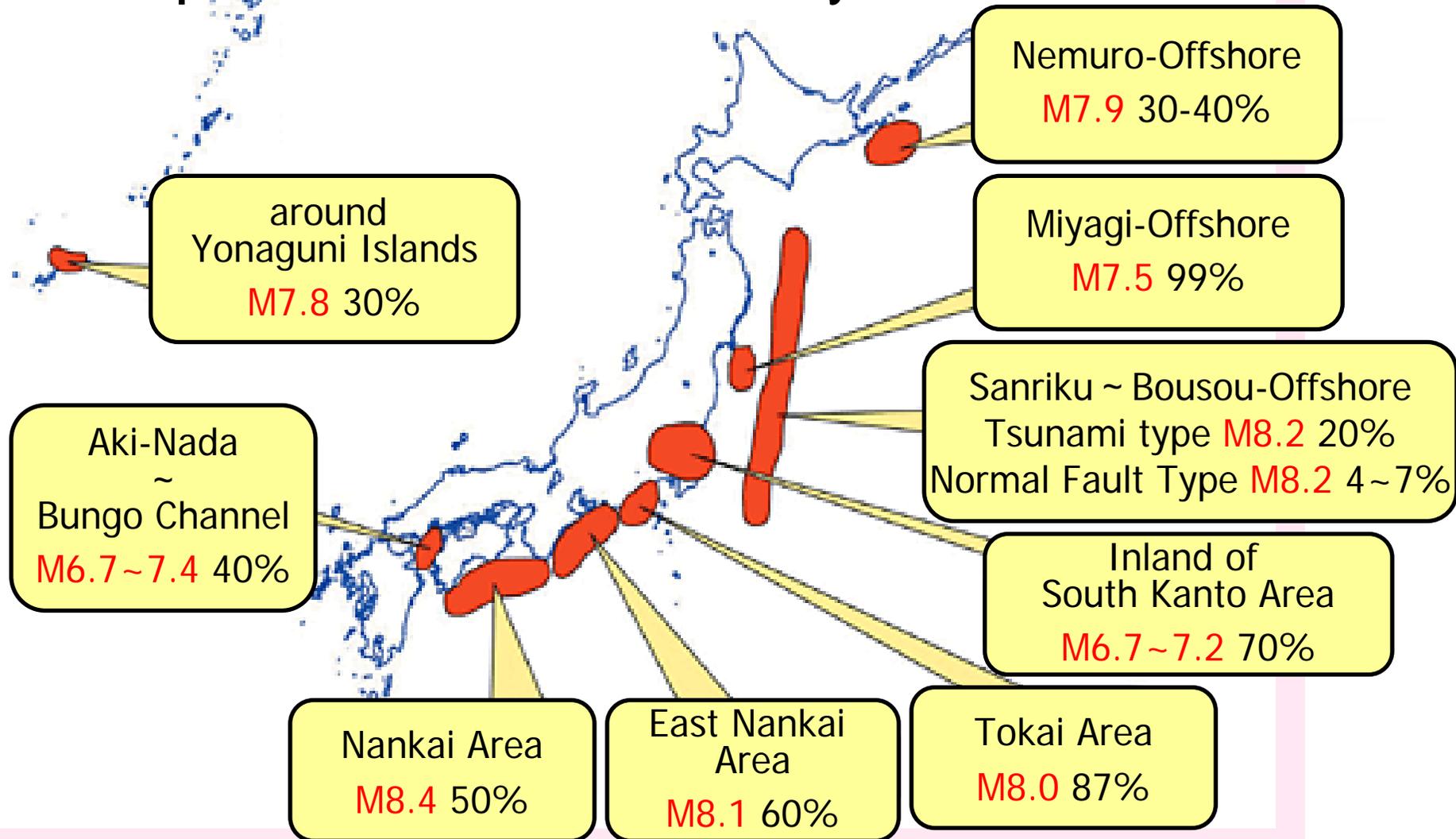
Number of Fatalities and Missing due to Natural Disasters

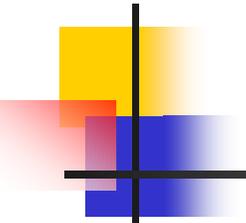


- Note:
- 1 The total number for Kobe earthquake in 1995 includes 912 related fatalities.
 - 2 The number of fatalities and missing persons of Kobe Earthquake is as of Dec 25, 2005

Reference) 'White Paper on Disaster Management', 2005

Occurrence Probability of Large Earthquakes in the next 30 years

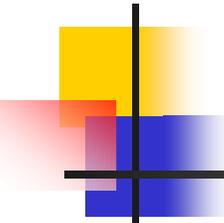


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Factors responsible for Decreasing Public Support to Infrastructure

- Frequent media exposure of opposing arguments against dams, highways, etc
- Anti-compliance activities in Construction Industry
- Public Misperception infrastructure in Japan has already reached a certain level
- Civil engineers would not speak out on their works

Significance of Infrastructure Census and Diagnosis by Civil Engineers

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- **Evaluation from Objective Standpoint**
 - What is the real situation of infrastructure?
 - What is the result of public works reduction ?
- **Clarification of Societal Contribution of Civil Engineers**

Census in Other Countries



ASCE "Report Card"

- Report Card 2003 of Minnesota indicated 16% of bridges in the state had structural defects or had become degraded.
- USDOT "Government Performance Project" admits Minnesota does not have a formal bridge preventive maintenance program
- ICE "The State of the Nation"
- South Africa ICE "Report Card"
- Engineers Australia "Report Card"
- Swedish Road Administration "Bridge and Tunnel Management"

I-35W bridge collapse in Minneapolis on Aug. 1



Photo by Tom Ruen

Purpose of JSCE to Conduct Infrastructure Census and Diagnosis

- Examine from Academic and Objective Standpoint
- Raise problems regarding to Infrastructure
- Trigger Discussions on Appropriate Standards of Infrastructure Investment

Infrastructure Assessment Indicators (Road)

■ Livelihood

- Barrier-free access coverage
- % power lines installed underground, etc

■ Safety

- Bridge antiseismic reinforcement coverage
- Fatal and injury accident rates
- Pavement installation coverage, etc

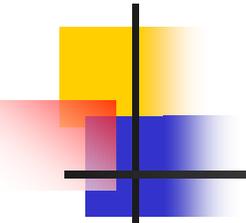
■ Environment

- Gasoline Consumption, etc

■ Social

Dynamism

- High standard high-way utilization rate
- Time loss by traffic jam
- Road improvement coverage, etc



Infrastructure Assessment Indicators (River)

■ Livelihood

- Frequency of drought occurrence, etc

■ Safety

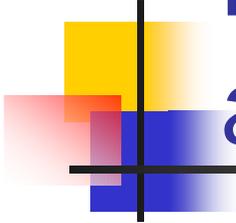
- % areas protected from flood inundation
- % communities with flood hazard maps, etc

■ Environment

- Number of recreational users in the summer
- Rate of environmental standard achievement, etc

■ Social Dynamism

- Number of river space users
- “River Report Card” scores, etc

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Principles of Infrastructure Census and Diagnosis by JSCE

- **Wide** coverage of roads, rivers, water supply and sewage systems, railways, airports, harbors, coasts, cities, energy, etc
- **Outcome** indicators
- **Aging** indicators
- System and organization for **continuous** assessment
- **Transparent** Evaluation process

Thank you very much !