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JAPANESE APPROACH FOR SUSTAINABLE ROAD TRANSPORT SYSTEM

Kunihiko OKA

- MLIT(Ministry of Land, Infrastructure, Transport and Tourism), Japan
- Director of Road Environment Planning Office,
Environment and Safety Division, Road Bureau
- oka-k87da@milt.go.jp



Ministry of Land, Infrastructure, Transport and Tourism

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1. INTRODUCTION

World GHG emissions

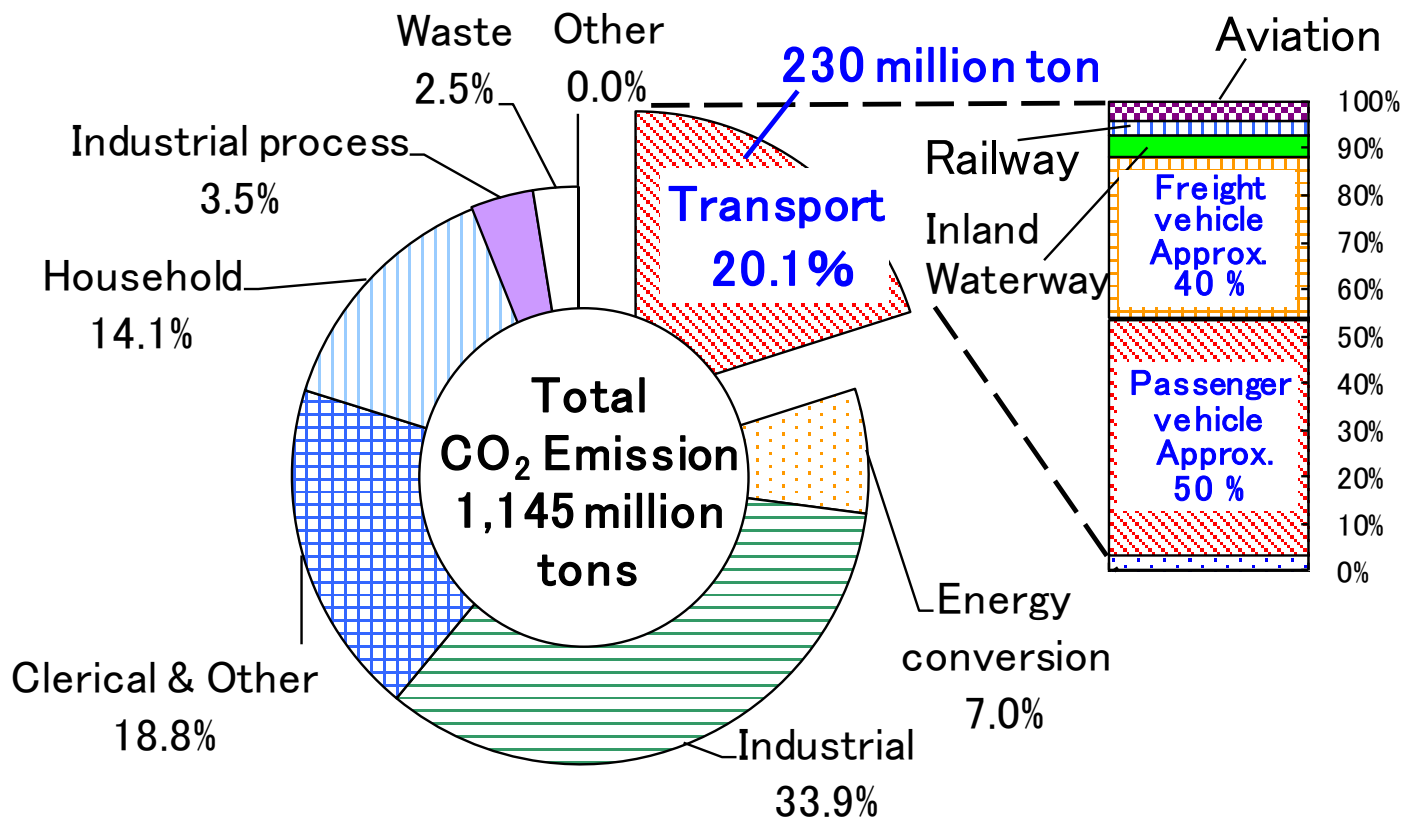
Developed countries: Large per capita. Efforts toward reduction under the Kyoto Protocol.

Emerging and Developing countries: Anticipated to rise every year with economic growth.

- **It is important to reduce CO₂ emissions with economic growth.**
- **Japan is the few countries to success it.**
- **To success it, Japan has promoted various countermeasures under the Kyoto Protocol.**



2. JAPAN'S CO₂ EMISSIONS AND ECONOMIC GROWTH

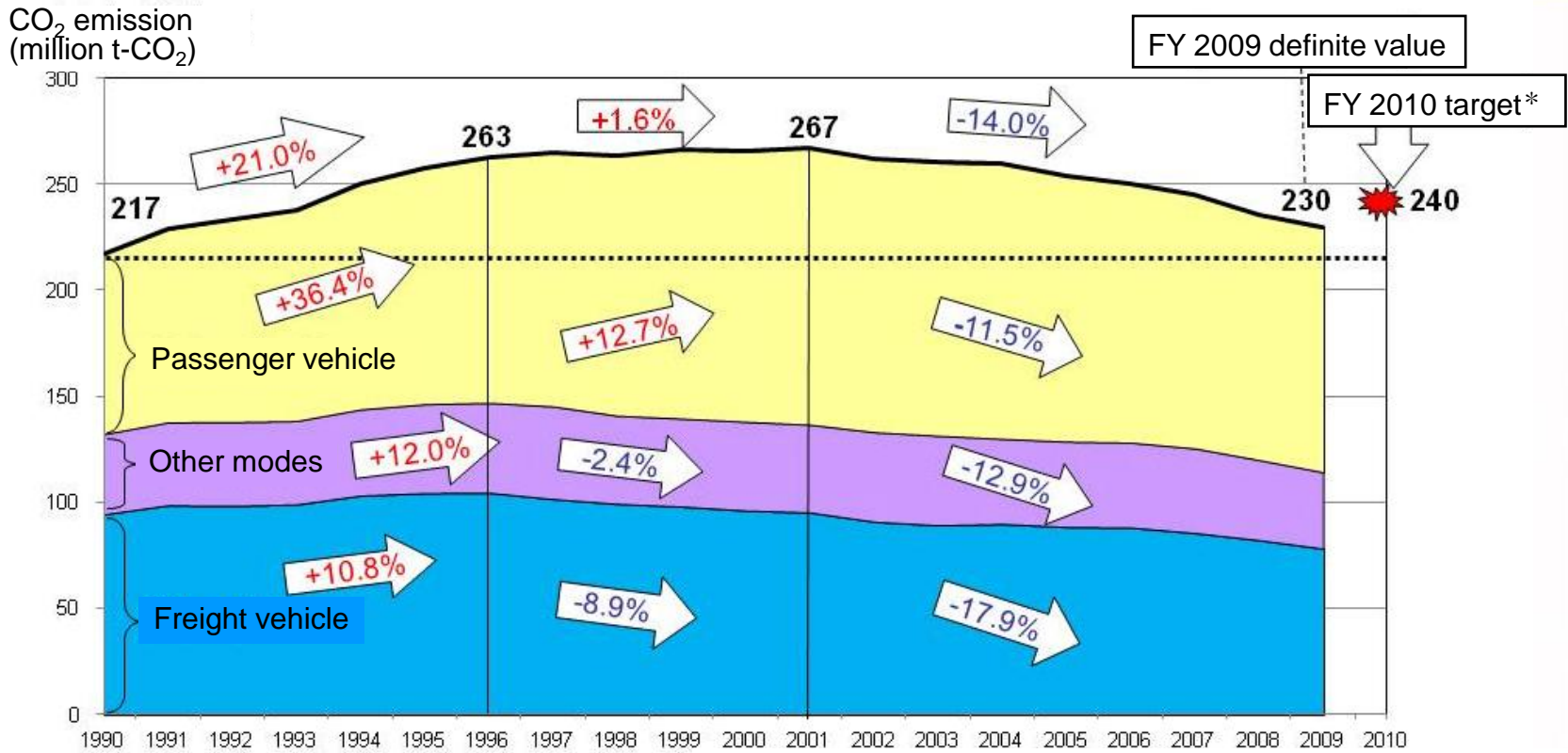


Japan's CO₂ emissions by sector (FY 2009)

Compiled based on figures by the Greenhouse Gas Inventory Office of Japan



2. JAPAN'S CO₂ EMISSIONS AND ECONOMIC GROWTH



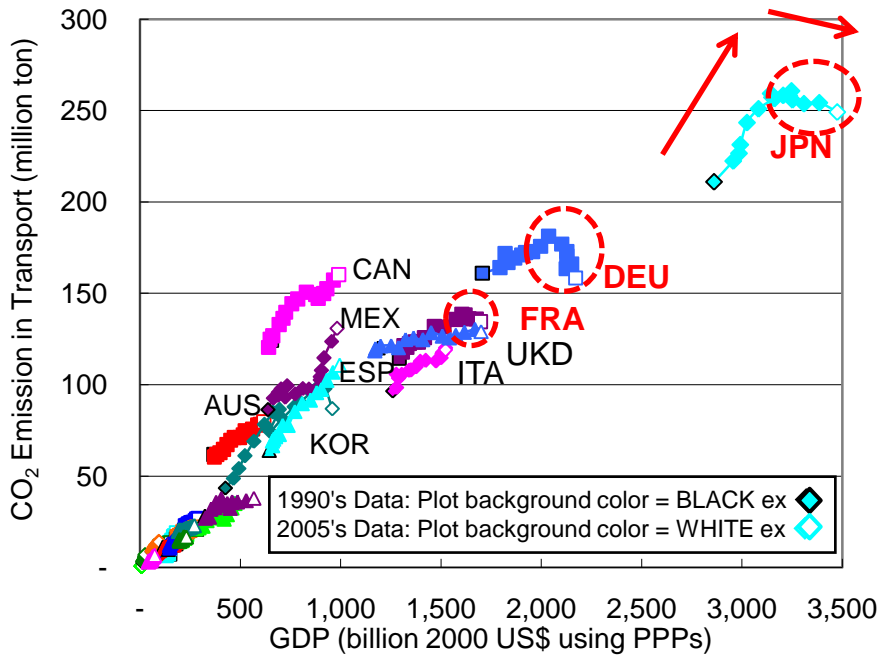
* FY 2010 target, the best-case figure under the Kyoto Protocol Target Achievement Plan (March 28, 2008 by cabinet resolution).

Changes in CO₂ emissions in Japan's transport sector (1990 - 2009)

Source : MLIT website

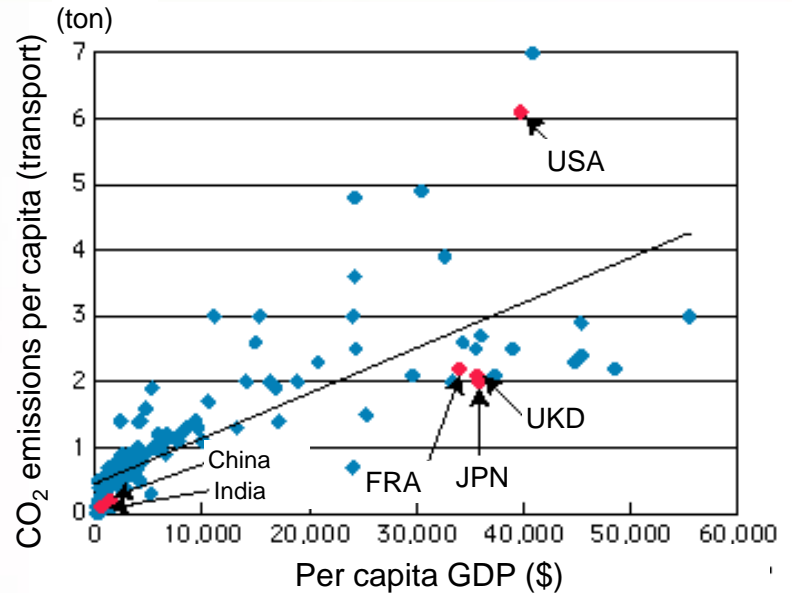


2. JAPAN'S CO₂ EMISSIONS AND ECONOMIC GROWTH



Relationship between GDP growth and CO₂ emission in various countries (1990–2005)

Sources: Created from IEA, "CO₂ Emissions from Fuel Combustion 2007" and OECD, "OECD Environmental Data 2006-2007."



Relationship between per capita GDP and CO₂ emission (transport sector) in various countries (2004)

Sources: Created from IEA, "CO₂ Emissions from Fuel Combustion" and WORLD BANK, "World Development Indicators Database."

There are countries with both economic growth and decreasing CO₂ emissions in transportation sector



3. FRAMEWORK FOR CO₂ EMISSIONS-REDUCTION

1998 : Enacted the Law Concerning the Promotion of Measures to Cope with Global Warming.

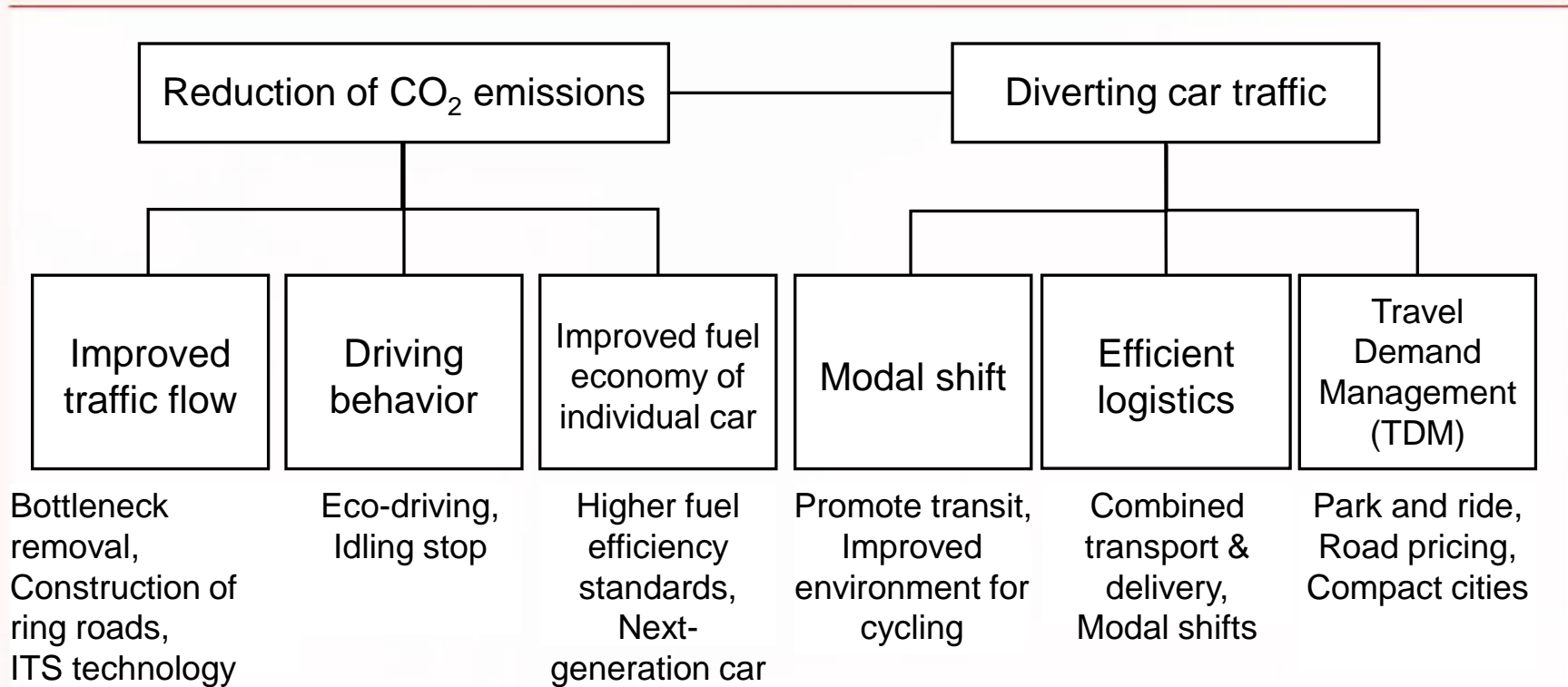
2005 : Set Kyoto Protocol Goal Achievement Plan by Cabinet resolution. It sets reduction targets for FY 2010 emissions for each sector.

Targets for greenhouse gas emission suppression and absorption under the Kyoto Protocol Target Achievement Plan

	Base Year	FY 2010 emission yardstick	
	Million t-CO ₂	Million t-CO ₂	Total emissions vs. base year
Energy CO ₂ emissions	1,059	1,076 ~ 1,089	+1.3 % ~ +2.3 %
<u>Transport</u>	<u>217</u>	<u>240 ~ 243</u>	<u>+1.8 % ~ +2.0 %</u>
Total greenhouse gas emissions	1,261	1,239 ~ 1,252	-1.8 % ~ -0.8 %



4. SPECIFIC MEASURES IN INTEGRATED APPROACH

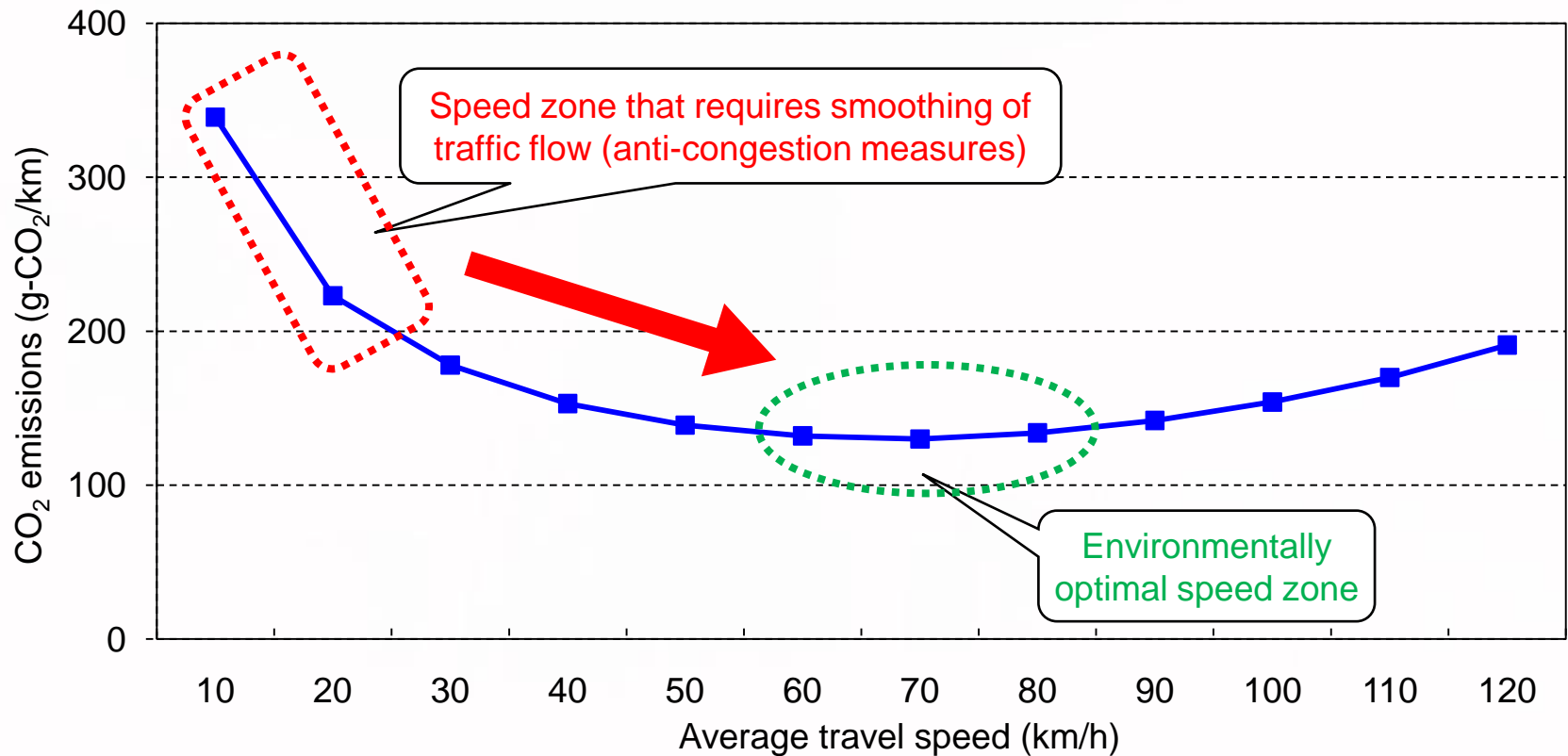


System of measures to reduce automobile-source CO₂ emissions



4.1. Traffic Flow Improvement

- Less CO₂ Emissions from optimal travel speed-



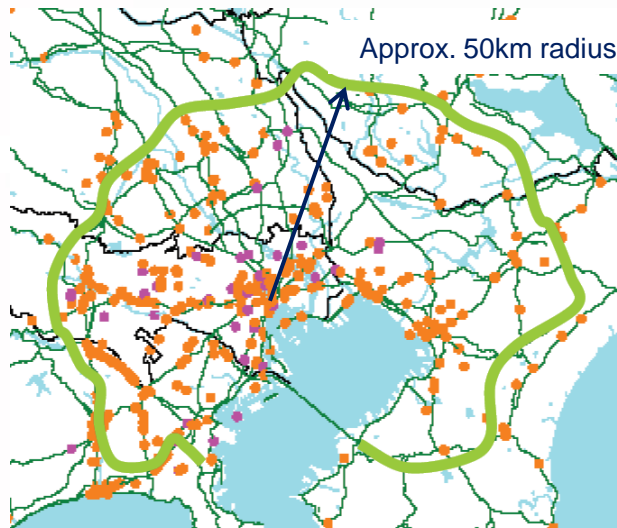
The relationship between travel speed and CO₂ emissions

Smother traffic leads to optimal travel speed, contributing to reducing CO₂ emissions.

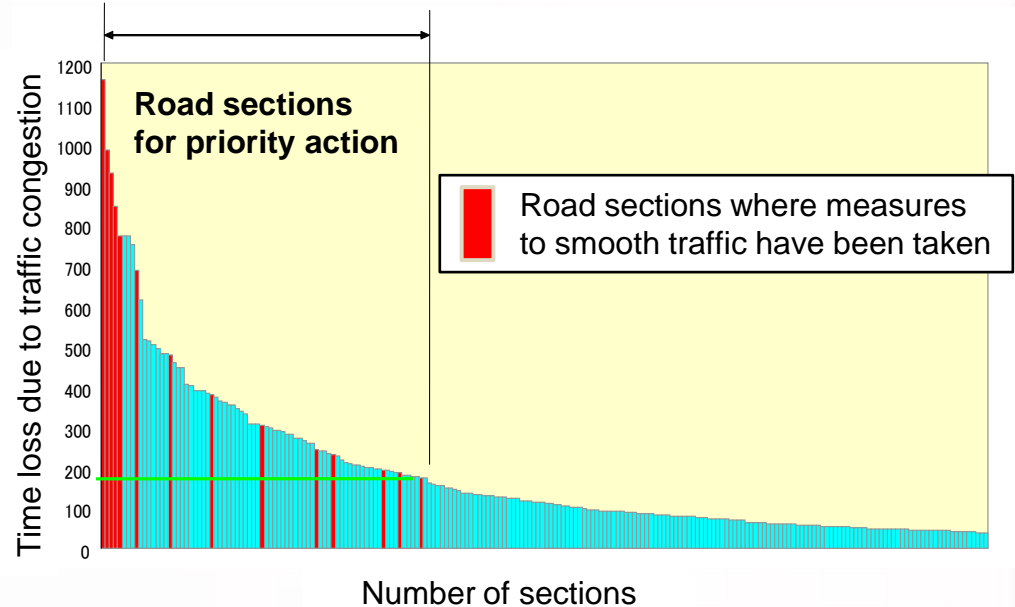


4.1. Traffic Flow Improvement - Bottlenecks Elimination-

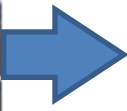
Status of major traffic congestion points in Tokyo Metropolitan area



High Priority sections due to time loss by traffic congestion



Japan's thinking on major traffic congestion points

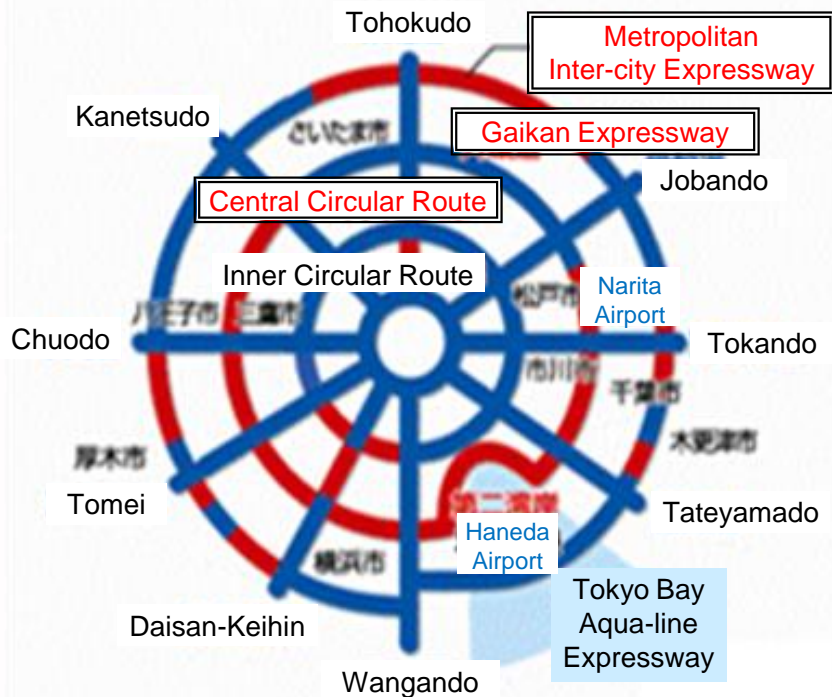


Grade separation project of intersection



Measures for bottleneck railroad crossings

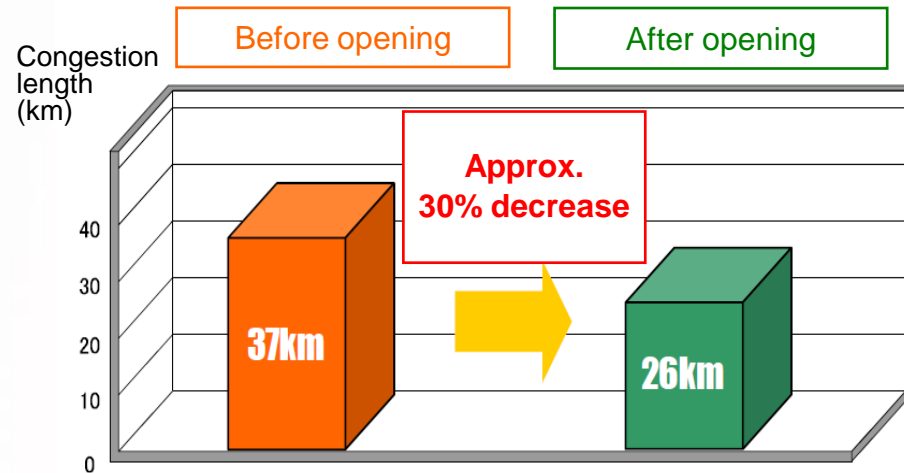
4.1. Traffic Flow Improvement - Construction of Ring Roads in Urban Areas -



Blue Lines : Opened by April 2010

Red Lines : not yet completed

Status of construction of the three ring roads in Tokyo metropolitan area



* congestion length : length of section 20km/h and under in interurban expressway & entire Tokyo line. (peak-hour: 11:00~11:59AM weekdays)

CO₂ approx. 34,000 tons/year Reduction

Estimate for expressways and ordinary roads in Tokyo Capital Region (4 prefectures)

Effects of constructing the part of Central Circular Route

Sources : Metropolitan Expressway Co., Ltd., Website

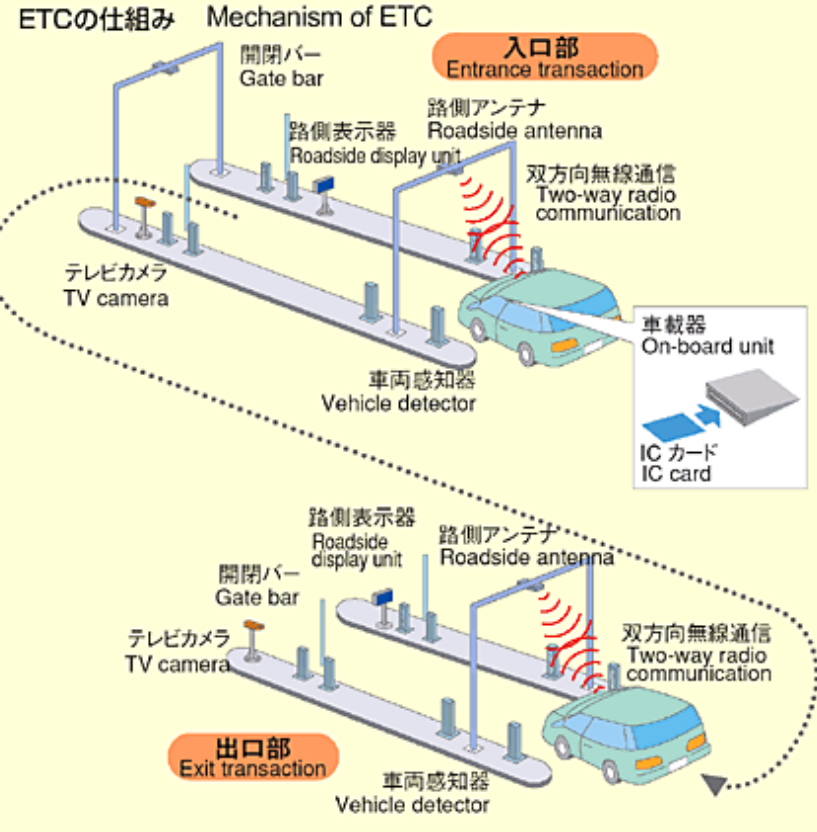


4.1. Traffic Flow Improvement - USE of ITS technology -

Car Navigation System Display
(red : congestion)



Traffic congestion guidance using VICS
(Vehicle Information and Communication System)



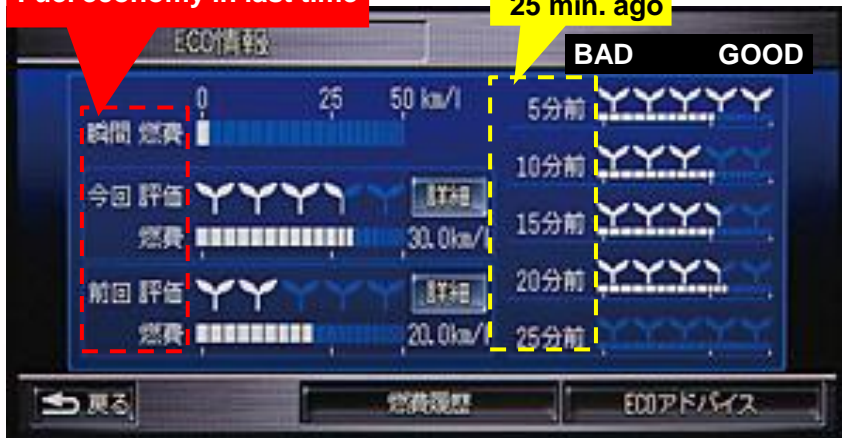
ETC mechanism
(Electronic Toll Collection system)



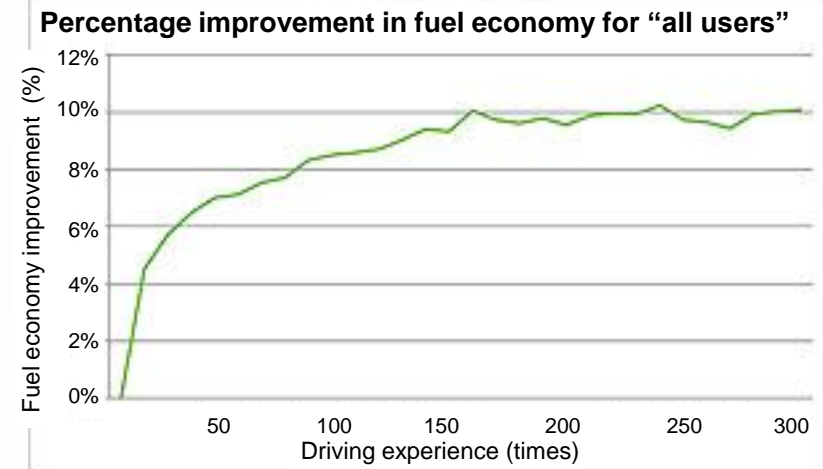
4.2. Eco-driving and other driving behaviour

Level of eco-driving is analyzed by accelerator and brake operation. Speedometer's background color changes to feed back fuel consumption status in real-time.

Momentary fuel economy
Fuel economy in this time
Fuel economy in last time



<Display for the Eco Assist>



<Average fuel economy improvement for all drivers>

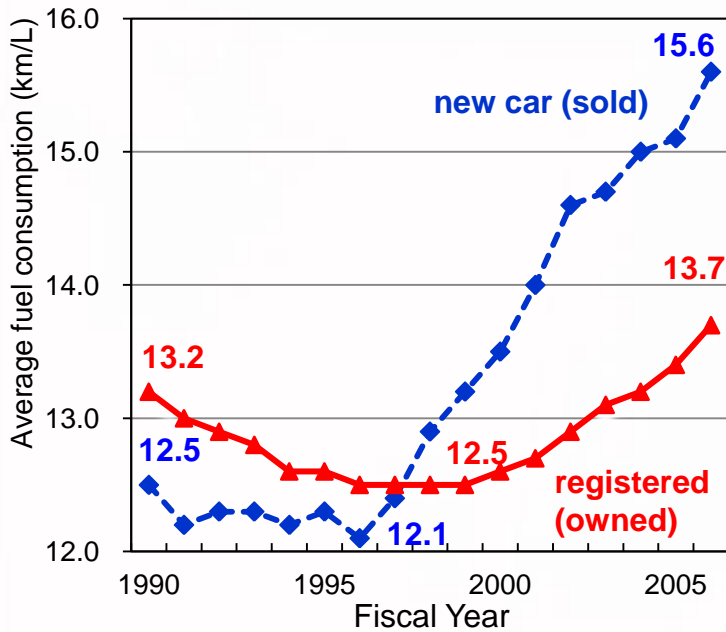
Reduced fuel consumption through eco-driving

Sources : Honda Motor Co., Ltd., Website



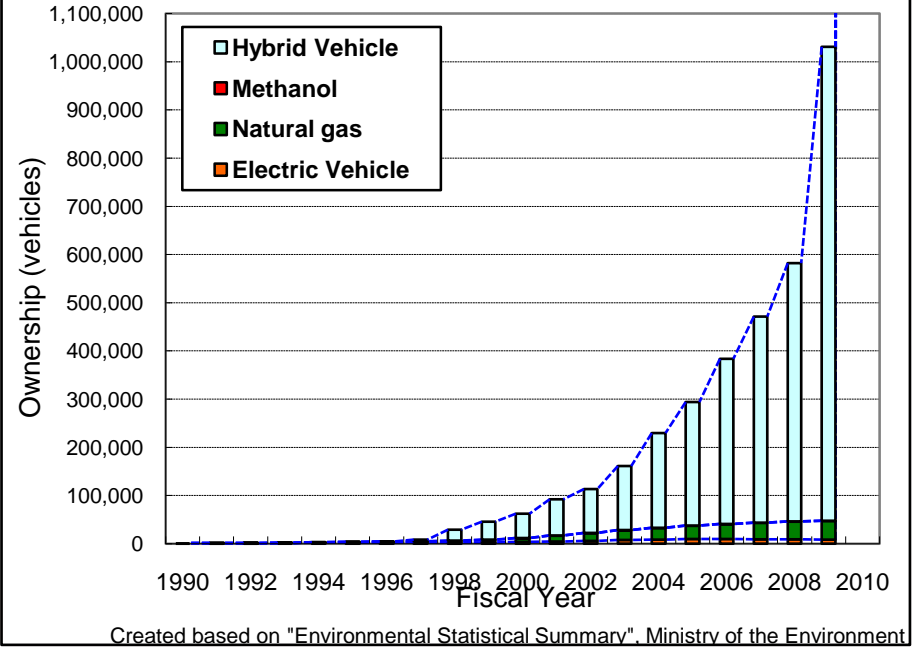
4.3. Fuel Efficiency improvement of Individual Vehicles

Average fuel economy is improving for cars registered since 2000.



Average fuel economy of Japanese automobiles (1990-2006)

Lately, Hybrid vehicles have spread rapidly.



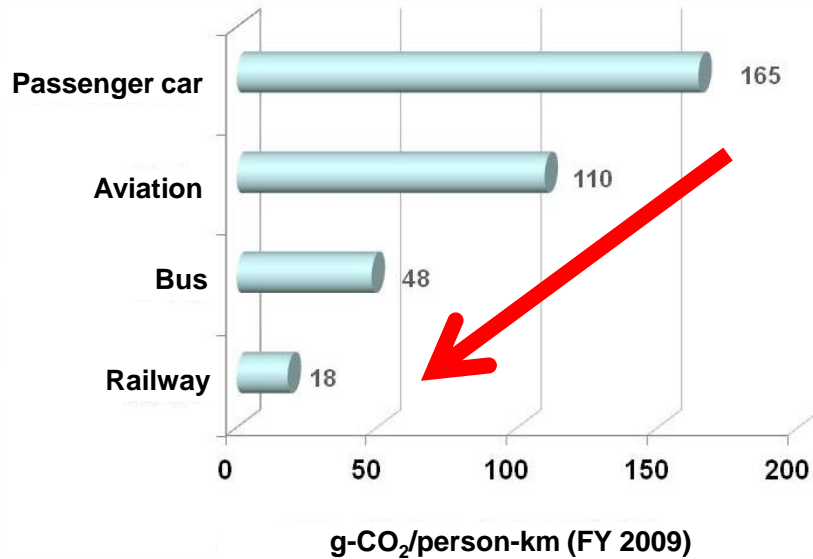
Dissemination of low-emission vehicles in Japan



4.4. Modal Shift

- Promotion of Public Transportation Use -

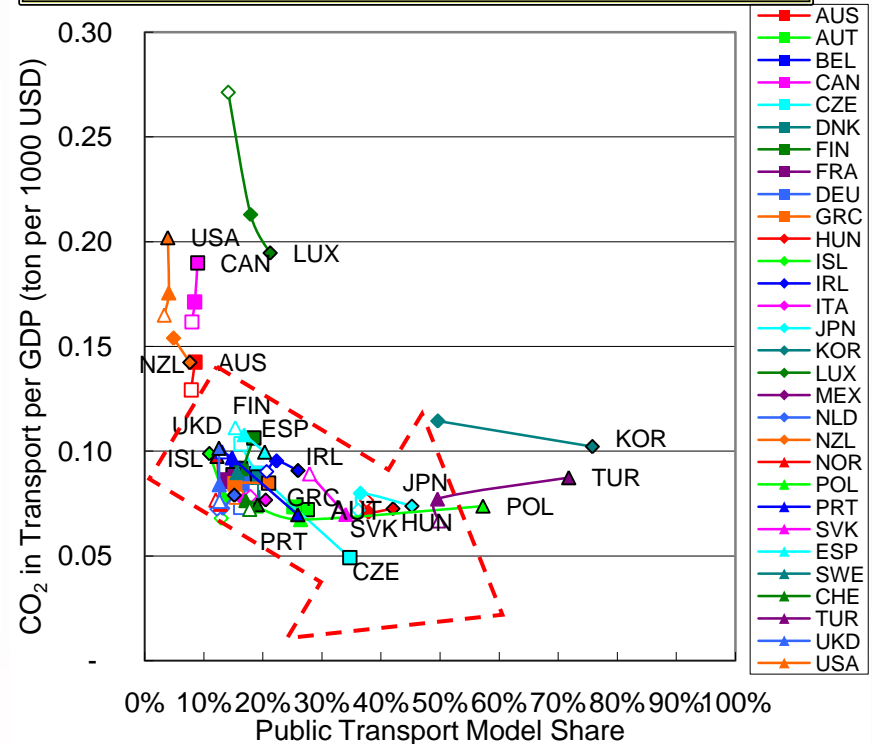
Buses and railways emit less CO₂ per person-km than passenger cars.



CO₂ emissions per person by transport mode

Source : MLIT website

As share of public transport increases, CO₂ emissions tend to decrease.



Relationship between the share of public transportation and CO₂ emission in transportation sector (1990, 2000, 2005)

Sources: Created from IEA, "CO₂ Emissions from Fuel Combustion 2007" and OECD, "OECD Environmental Data 2006-2007."

4.4. Modal Shift

- Improvement of Cycling Environment-

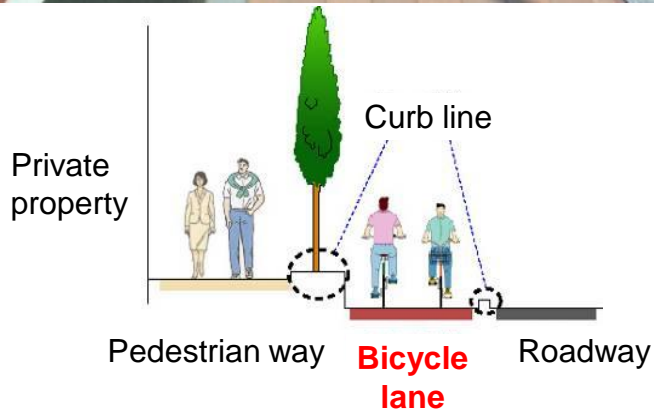
Bicycle lane



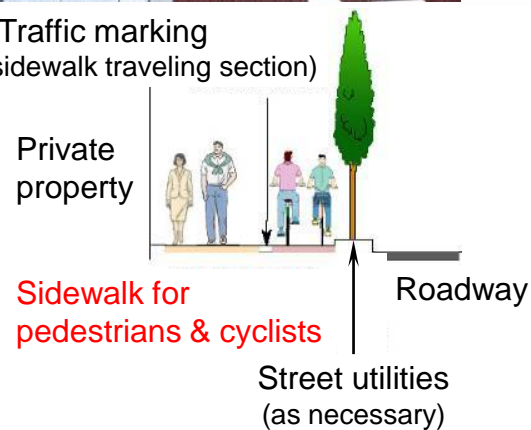
Sidewalk for pedestrians and cyclists



Underground parking lot for cyclists

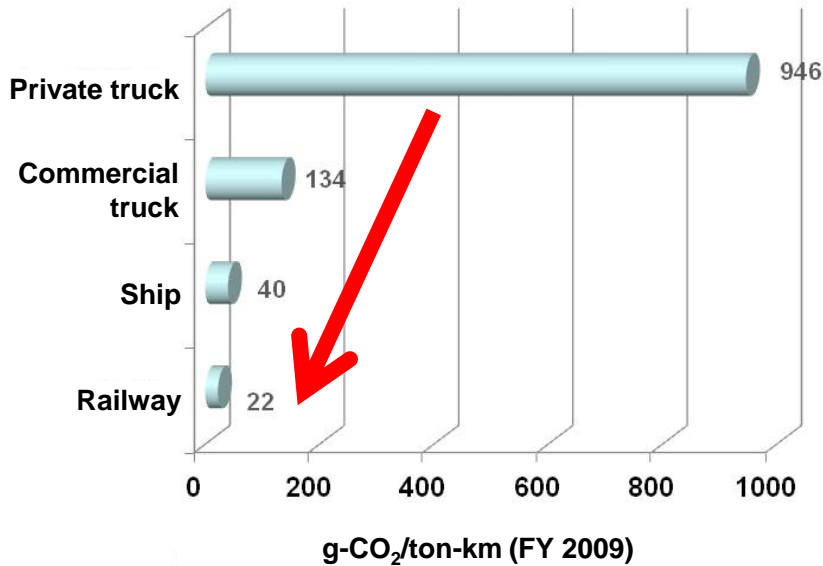


Traffic marking (bicycle sidewalk traveling section)



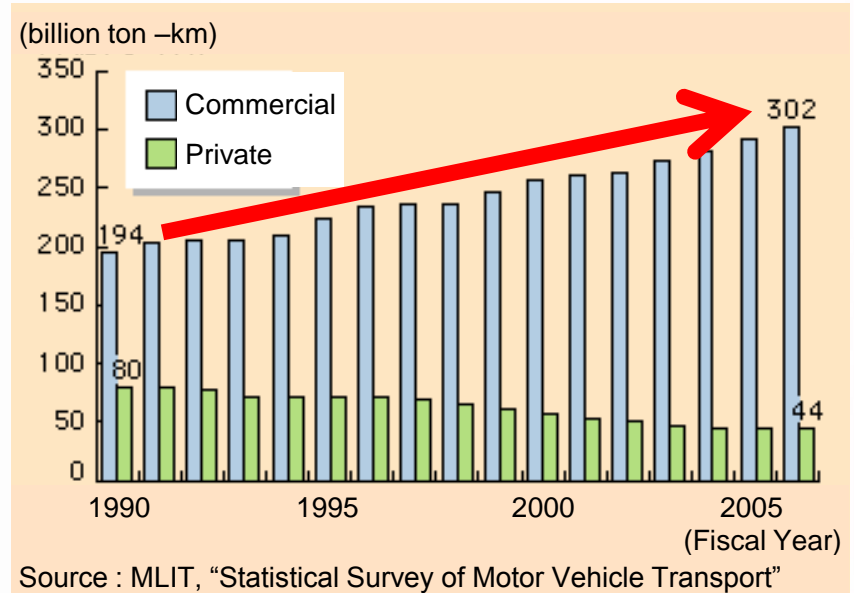
4.5. Streamlining Logistics

Commercial trucks emit fewer CO₂ per ton-km than personal truck; ship and railway emit even less.



CO₂ emissions per cargo volume by transport mode

Source : MLIT website



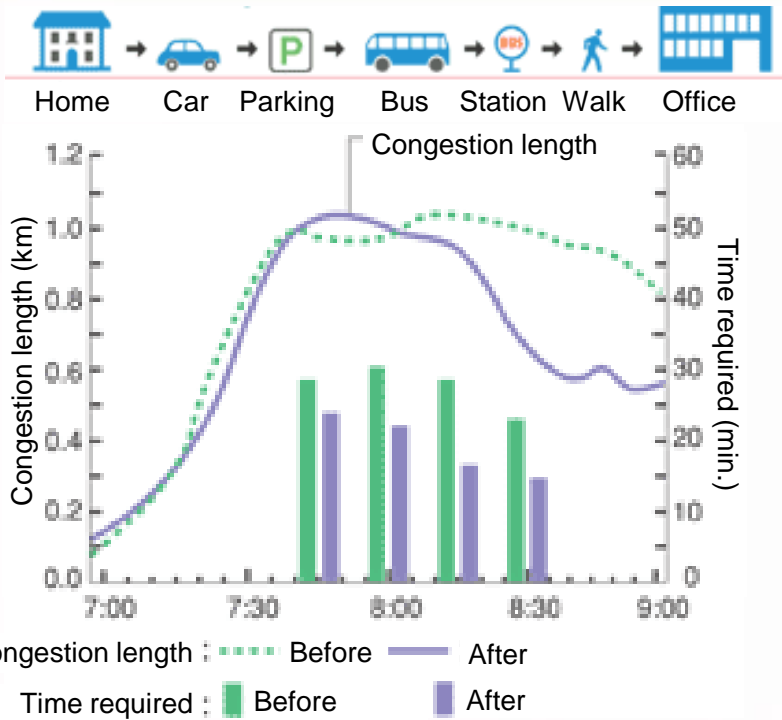
Changes in independent conversion of trucks (1990-2006)

Sources: White Paper on Land, Infrastructure Transport and Tourism in Japan, 2008



4.6. Traffic Demand Management (TDM)

- Traffic Conversion Measures to Eliminate Congestion -



Traffic congestion reduction effect by adoption of "Park & Ride" in Kanazawa City

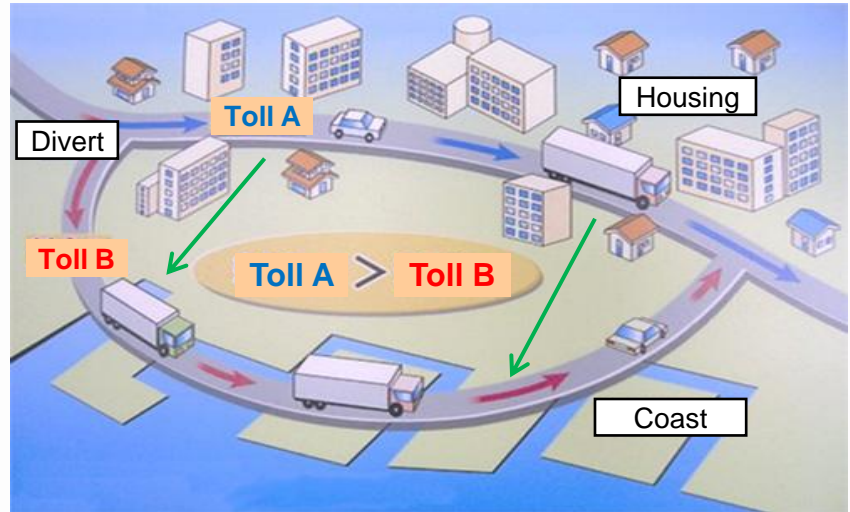


Image of "Environmental Road Pricing"
 Source : Hanshin Expressway Company Limited website



5. CONCLUSION

- Balancing economic growth with reducing CO₂ emissions from the transportation sector is possible.
- Road development to smooth traffic flow is effective in reducing CO₂ emissions from transportation sector.
- It is important to take integrated approach that promoted the countermeasures to contribute to CO₂ emissions reduction in various fields, such as roads, automobiles, transport planning, logistics etc.
- Emerging and developing nations may use experiences of successful countries in reducing CO₂ emissions from transport sector.