Environmentally Sustainable Transport Initiative in Japan

August 23, 2010
Japan:
Ministry of the Environment
Ministry of Land, Infrastructure, Transport and Tourism
# Table of Contents

1. Air pollution measures

2. Road Traffic Safety

3. Promotion of utilization of public transportation

4. Cycle Sharing System

5. Mobility Management

6. ITS (Intelligent Transport System)

7. Greenhouse Gas Emission Reduction
1. Air Pollution Measures
In Japan, air pollution levels are constantly measured at the 1,987 nationwide monitoring stations managed by prefectures in accordance with the Air Pollution Control Law.

Although air pollution levels have improved in most regions, some areas (mainly in the Tokyo metropolitan area) need further improvement.
Automotive NOx and PM Law

- Measures
  - Formulation of each local government’s master plan to reduce exhaust fumes
  - Restriction of registration renewal of old model vehicles
  - Formulation of each company’s vehicle management plan.

Target regions

(Reference) Guidance for Automotive NOx and PM Law: Ministry of the Environment Ministry of Land, Infrastructure, Transport and Tourism
Revision of Automotive NOx and PM Law

New measures

(1) Municipal anti-pollution measures
   • Designation of priority regions for anti-pollution measures by each prefectural governor
   • Implementation of mandating measures against new construction of particular buildings.

(2) Measures against incoming vehicles
   • Implementation of mandatory measures for freight-forwarding companies in surrounding areas
   • Effort obligations by companies

Target areas regulated by the existing laws

Newly expanded target areas for measures (“Surrounding areas”)

Designation process of surrounding areas

1. Priority regions for anti-pollution measures against incoming vehicles are designated.

2. Surrounding areas with many incoming vehicles within the above priority regions are designated.

Aim to achieve the goal for EQS by 2010 (by the earliest possible time)
Framework for Vehicle Exhaust Emission Standard

**Air Pollution Control Law**

Ministry of the Environment

Permissible limit of vehicle exhaust emissions

**Road Transport and Motor Vehicle Law**

Ministry of Land, Infrastructure, Transport and Tourism

Establishment of exhaust emission standard based on the vehicle safety standards

No vehicle can be newly registered unless the standards are met.
Vehicle Exhaust Emission Control

Changes in NOx emission control in Japan

Comparison of emission controls among Japan, USA, and EU

The permissible limit of exhaust emission based on the Air Pollution Control Law applied after 2009 was renewed in December 2007.
**Environmental Standards on PM$_{2.5}$**

PM$_{2.5}$ refers to suspended particulates in the air that are smaller than 2.5μm. There are concerns about the health effects of PM$_{2.5}$ due to the fact that it can be easily inhaled deeply into the respiratory system and that various harmful substances are absorbed into and attached to the surfaces of those particulates.

**Sources**

- **Fixed sources**
  - Large fixed sources, medium and small companies, small incinerator, people’s livelihood etc.
  - (Smoke from plants, Dust generating facilities etc.)

- **Mobile sources**
  - Vehicles, Ships, planes
  - Construction, industry, agricultural machinery etc.

- **Human-induced causes**
  - Soil particles, sea salt particle, volcanic fume

- **Natural causes**
  - Yellow dust is one of the major examples of trans-boundary movement of particulates,

**Japanese environmental standards for PM$_{2.5}$**

- Annual average: Less than 15 μg/m$^3$
- Daily average: Less than 35 μg/m$^3$

Established in September 2009
2. Road Traffic Safety
Changes in Traffic Accident Statistics in Japan

- The number of traffic-related fatalities in 2009 was 4,914, falling below 5,000 for the first time in 57 years, and the number decreased for nine consecutive years.
- Aim to achieve further reductions in traffic-related fatalities to become the country with the safest roads in the world.
- The number of traffic accidents and casualties remains high.

Diagram:

- Fasten Seatbelts
- Eradication of drinking and driving
- Promotion of eco driving (Green driving)
- Road improvements
- Other measures Roads and vehicles

Source: Data from the National Police Agency
Decrease of fatality rates by fasten seatbelt

Decrease of fatality rates as the percentage of persons who fasten seatbelts increases

1. Source of information: the National Police Agency
2. Percentage of persons who fasten seatbelts = Number of persons killed/injured when fastening seatbelts (while driving) / Number of persons killed/injured (while driving) x 100
3. Fatality rate (while driving) = Number of persons killed (while driving) / Number of persons killed/injured (while driving) x 100

Road Traffic Safety Measures

- 71% of fatal and injury accidents are concentrated in the 22% of the sections of arterial roads.
- Implement countermeasures from higher priority areas depending on traffic accident rate.

**Accident occurrence on arterial roads**

Nationwide incidence of death or injury accidents (on arterial roads)

| Incidence of death or injury accidents (Number of accidents/100 million vehicle km) |
|---------------------------------|-----------------|-----------------|-----------------|
| 0                               | 500              | 1,000           | 1,500           | 2,000           |
| Incidence of 100 or over        | Incidence of less than 100 |

**Priority action sections**: Approx. 150,000 sections

(71% of all death and injury accidents occur in 22% of these sections.)

Sections where accidents have occurred: 50%
Sections where accidents have not occurred: 50%

**Example of measures in high accident section**

- Establishing a bicycle zone
- Placing road lighting
- Marking a right turn waiting area
- Designating a right turn lane
- Placing a right turn arrow signal
- Anti-slip pavement
- Colored pavement
- Changing the location of a pedestrian crosswalk
- Changing the location of a corner curb
- Drainage pavement
3. Promotion of utilization of public transport
The number of public transport users are declining due to an increase in the rate of use of private vehicles with the progress in motorization. However, the tendency has been recovering in recent years.

In particular, as the number of bus users has been significantly decreasing, the future of local public transport is endangered.
Act on Promotion and Restoration of Regional Public Transport

Basic Guidelines

Formulation and Implementation of Coordinative Plan

- Statutory Committee
  - Municipality
  - Public Transport business operator
  - Inhabitant
  - Administrator of Roads and Ports
  - Public Safety Commission
  - etc.

Comprehensive Coordinative Plan of Regional Public Transport

- Improvement of Transfers
- Local Railroads
- BRT
- Improvement of Transport by Sea
- LRT
- Community Bus

Support by the Government

- Budget
- Legal Measures

Necessities for Promotion and Restoration of Regional Public Transport

- Maintenance of the transport
- Promotion of Sightseeing
- Environmental Problems

Duty of the consent for the request of the participation to the committee

Public comments

Suggested system

Obligation of the respect of the discussion result
Comprehensive Subsidiary System for Infrastructure Improvement

- Provision of comprehensive and integrated support for core infrastructure improvement projects and related infrastructure improvement and content-focused projects (so-called “soft projects”).
- Introduction of a comprehensive subsidiary system that is highly flexible for local governments so that they can take advantage of their own creative approaches.

**Illustrations of the urban development project as a core project**

**Core projects**
- Improvement of various mutually cooperated urban transportation facilities
- Improvement of connection points of various means of transport
- Introduction of Bicycle Sharing System
- Improvement of bus stops etc.
- Improvement of walkways

**Projects to promote efficacy**
- Enhancing the attractiveness of public transport
- Introduction of LRT trains
- Pilot Program of a transit mall

Realizing “a city where convenience of walking is effectively utilized” by properly dividing the roles of various transportation methods including walking, bicycles, vehicles, and public transport.

(Reference) the Ministry of Land, Infrastructure, Transport and Tourism
Efforts for Winning Back Public Transport Users (Toyama City)

- Implemented efforts to improve dead tram tracks and created Japan’s first full scale LRT.
- Facilitated the connection between LRT and buses to improve the overall convenience of public transportation.
- The number of users increased 2.1 times for weekdays and 3.8 times for weekends compared to before the operations started.

### Improvement of operation services

<table>
<thead>
<tr>
<th>Schedule:</th>
<th>Every 30 to 60 minutes</th>
<th>every 10 to 15 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Time</td>
<td>From 5 AM to 10 PM</td>
<td>From 5 AM to 11 PM</td>
</tr>
<tr>
<td>Number of stations</td>
<td>9 stations</td>
<td>13 stations</td>
</tr>
<tr>
<td>Train vehicle:</td>
<td>Rolling stock</td>
<td>all low floor trams</td>
</tr>
</tbody>
</table>

- Fixed fare system: 200 yen

- Enhancement of migration in an urban area by arranging tracks in loop route.

- Introduction of low floor trams and barrier-free stations

- Smooth connection between bus and LRT

---

Route map: Reference from the Ministry of Land, Infrastructure, Transport and Tourism
Images: Taken from Toyama Press release
4. Cycle Sharing System
What is Cycle Sharing System?

- Bicycles can be rented from and returned to any designated rental station.
- Bicycles can be returned to a station different from where they are rented.
- Multiple designated rental stations tend to be closely located to each other.
- Establish a station as an unattended, 24/7 system by utilizing IC cards (Smart cards) etc.
Bicycle Sharing system has been introduced in various places throughout Japan on a trial basis.

Cities where Bicycle Sharing system was introduced on a trial basis:
- Sapporo
- Hiroshima
- Chigasaki
- Kita Kyushu
- Yokohama
- Chiyoda-Ku
- Nagoya
- Matsuyama
- Nagoya
Cycle Sharing System in Toyama City

- First attempt in Japan as a standing facility
- Started operation in the City of Toyama in March, 2010
- 15 rental stations distributed
- 150 bicycles provided
- Basic Rate: JPY 500 per month
- For every rental:
  - No fee required for up to 30 minutes of use
  - JPY 200 for use between 30 and 60 minutes
  - JPY 500 for 60 minutes and longer

(Picture, Reference) Citizens’ Bicycle Shared Use System Project, March 2010, Toyama municipal environmental policy division
5. Mobility Management
What is Mobility Management?

- Mobility management is a communication-oriented transport policy to create a favorable transport environment for both society and individuals by promoting voluntary changes in mobility (attitude and behavior) such as facilitating the moderate use of public transport and bicycles to avoid excessive use of vehicles.

Eco Commuting

- One form of mobility management and an effort to promote changes in the means of transportation from private vehicles to public transport and bicycles.
- Appoint a person from each office in charge of considering the ideal means of transport for commuting and provide timetables and route maps for busses and trains and review commuting allowances.

In 2008, 840 companies nationwide implemented Eco Commuting projects. As a result, CO₂ emission was reduced by 11%.

Means of transport used instead of vehicles

- One out of every two eco commuters used a bus or train for commuting
- One out of every three eco commuters used a bicycle for commuting

* The above figures are taken from a survey of 5,188 eco commuters who answered “yes” when asked if they used a means of transportation other than vehicles as a part of eco commuting.

Reference: Ministry of Land, Infrastructure, Transport and Tourism
Trend Towards Bicycle Commuting

- In Japan, many companies permit employees to commute by private vehicles despite a short commute distance.
- On the other hand, environmentally-aware private companies promote their employees to switch from private vehicles to bicycles in commuting.

![Graph showing trend towards bicycle commuting](image)

[Source] “Status of automobile management for commuting and work” (Labour Relations Report No. 3698)
6. ITS (Intelligent Transport System)
ITS (“Smart way” Service)

- Integrated on-board system of car navigation system, VICS and ETC called “ITS” offers road-to-vehicle two-way communication.

- Various media
  - Voice and image
  - Telematics (Vendor-provided services)

- ITS on-board units
  - VICS
    - One-way communication 24 million units
    - Provision of information
  - ETC
    - Two-way communication 26 million units
    - Payment service

- Car navigation
  - Two-way communication increases transmission volume

- Car navigation-linked ITS on-board unit
  - Voice + image service

- Diverse applications
  - Provision of wide-range road traffic information (dynamic route search)
  - Provision of road traffic information via voice for ease of understanding
  - Provision of safe driving support information
  - Internet connection at SAs, PAs and roadside rest areas

- Private services
  - On-demand information provision
  - Cashless payment
ITS ("Smart way" Service)

- ITS provides drivers behind the wheel with information on traffic congestion and blockages to improve safety and driving efficiency.
- Field experiment testing started in 2007 and the service started in 2009.

Dedicated Short Range Communication service (DSRC service)

- Provision of wide-range road traffic information
- Comprehensible road traffic information by voice
- Safe driving support information
- Internet connection for obtaining information at SAs, PAs, or roadside rest areas

Nation-wide deployment under way

- Payment at parking lots, etc.
- Uplink
- Supporting efficient logistics operations

* Demonstrations in progress using multiple-application platform

* Demonstrations in progress at SAs, PAs and roadside rest areas, among others.
* Standards, etc., have been already formulated.
7. Greenhouse Gas Emission Reduction
Changes in CO₂ Emissions In the Transportation Sector

- CO₂ emissions in transportation sector have been continuously reduced after peaking in 2001

![Graph showing changes in CO₂ emissions in the transportation sector](image)

- **Energy-origin CO₂ emissions**
  - (million tons)
  - 270
  - Actual emissions in transportation sector
  - 267
  - 254
  - 251
  - 245
  - 235

- **Kyoto Protocol Target Achievement Plan**
  - Transportation sector programs to reduce emissions
  - Enhancement of individual vehicles and promotion of eco-driving practices
  - Improvement of traffic flow
  - Improvement of logistics efficiency
  - Promotion of the use of public transportation, etc.

- **Base year determined in the Kyoto Protocol**
- **2007: 245 million tons**
- **2008: 235 million tons**
- (Reduction of approximately 10 million tons)

- **Rough target (FY2010)**
  - 240-243 million tons
  - *The target was achieved in FY2008.*
Popularization of Environmentally Friendly Vehicles

- Low-pollution and fuel-efficient vehicles, mainly the hybrid vehicles, have been rapidly disseminated.

Changes in the number of environmentally-friendly vehicles

(Reference) Japan Automobile Research Institute, The Japan Gas Association, Automobile Inspection & Registration Information Association, Organization for the promotion of low emission vehicles
Promotion of Environmentally Friendly Vehicles

In order to realize a low carbon society while stimulating demand for replacing and purchasing vehicles, taxes for environmentally efficient vehicles are exempted or reduced for a limited time; in addition, a subsidiary system has been introduced for purchasing environmentally friendly vehicles.

### Exemption and reduction of vehicle weight tax and vehicle acquisition tax (2009 -2012)

| Electric vehicles (including fuel cell powered vehicles), plug-in hybrid vehicles, clean diesel vehicles, natural gas vehicles, hybrid vehicles | Exemption |
| Vehcles with a four-star rating in emission standard and vehicles with fuel efficiency 25% above the standard | 75% Reduction |
| Vehcles that complies with new long term regulations and vehicles achieving fuel efficiency standard for heavy-duty vehicles |  |
| Vehicles with a four-star rating in emission standard and vehicles achieving fuel efficiency 15% above the standard | 50% Reduction |
| Heavy-duty vehicles with a one-star rating in emission standard and vehicles achieving the fuel efficiency standard for heavy-duty vehicles |  |

### Subsidiaries for replacing and purchasing environmentally friendly vehicles (2009 -2010)

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Registered vehicles</th>
<th>Light–duty vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidiaries provided for purchasing new vehicles including discarding old vehicles. (When replacing vehicles of 13 years and older with vehicles achieving 2010 fuel efficiency standard.)</td>
<td>25,000 yen</td>
<td>125,000 yen</td>
</tr>
<tr>
<td>Subsidiaries provided for purchasing new vehicles without discarding old vehicles. (Vehicles with a four-star rating emission standard and a fuel efficiency 15% above the 2010 fuel efficiency standard)</td>
<td>100,000 yen</td>
<td>50,000 yen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Small sized vehicles (3.5 ton ranges)</th>
<th>Medium sized vehicles (8 ton ranges)</th>
<th>Large sized vehicles (12 tons ranges)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidiaries provided for purchasing new vehicles including discarding old vehicles. (When replacing vehicles 13 years old and older with vehicles achieving the new long term standard.)</td>
<td>400,000 yen</td>
<td>800,000 yen</td>
<td>1,800,000 yen</td>
</tr>
<tr>
<td>Subsidiaries provided for purchasing new vehicles without discarding old vehicles. (vehicles achieving 2015 fuel efficiency standard and heavy vehicles with a one-star rating in emission standard )</td>
<td>200,000 yen</td>
<td>400,000 yen</td>
<td>900,000 yen</td>
</tr>
</tbody>
</table>
Promotion of Eco Driving (Green Driving)

**Action Plan for the Diffusion and Promotion of Eco Drive**

Eco Drive Diffusion Network June 2006

- Position November as “Eco Drive Promotion Month” and aggressively work to diffuse and promote Eco Driving.
- Formulate a new “10 Eco Driving Tips” and use it commonly for the diffusion and promotion of Eco Driving.

1. Softly depress the accelerator “e Start”
2. Drive with less acceleration and deceleration
3. Release the accelerator early
4. Use the air conditioner moderately
5. Stop idling
6. Properly perform warm-up.
7. Utilize traffic information
8. Frequently check the air pressure of the tires
9. Leave unnecessary items
10. Don’t park the car illegally

**Case example 1**

Fuel consumption improved by approx. + 15%

**Case example 2**

Reduce Accidents -31% per year

[Source] “Eco Driving contest in Japan”
Case Example Of Eco Driving (Green Driving) Measures

Outline of Eco Driving (EMS)

- Introduce the device
  - Device on board

- Start driving
  - Excess the acceleration speed limit
  - Prevent sudden starting/sudden acceleration
- Clean Emission
  - Thoroughly ban idling

- Seminar
- Driving
  - Set up driving-related targets (controlling sudden acceleration, thoroughly ban idling, etc)

- Device for companies
  - Company A
  - Data

- Evaluate a series of driving conditions
  - Instructions issued by the Eco Driving manager

- Organize Eco Driving Seminars, etc
- Driving instruction
Challenge 25

Speech by former P.M. Yukio Hatoyama
UN Summit on Climate Change

- Mitigation -

“Emission reduction by 25% by 2020 compared to the 1990 level premised on establishment of a fair and effective international framework in which all major economies participate and agreement of ambitious targets”

<table>
<thead>
<tr>
<th>Year</th>
<th>Manufacturing</th>
<th>Home</th>
<th>Industrial</th>
<th>Transport</th>
<th>Non-energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>482</td>
<td>127</td>
<td>164</td>
<td>217</td>
<td>68</td>
</tr>
<tr>
<td>2008 (preliminary estimates)</td>
<td>420</td>
<td>172</td>
<td>232</td>
<td>236</td>
<td>78</td>
</tr>
<tr>
<td>2020 (variable case¹)</td>
<td>374~ (▲11%)³</td>
<td>90~ (▲48%)</td>
<td>133~ (▲35%)</td>
<td>153~ (▲46%)</td>
<td>42~ (▲46%)</td>
</tr>
<tr>
<td>2020 (static case²)</td>
<td>385~ (▲8%)³</td>
<td>81~ (▲53%)</td>
<td>120~ (▲33%)</td>
<td>158~ (▲47%)</td>
<td>41~ (▲47%)</td>
</tr>
<tr>
<td>2050</td>
<td>252</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

-25% emission reduction by 2020 compared to the 1990 level.

*1: An “All-sector Variable Macro-frame Case” premised on a set price for carbon.
*2: An “Static Industrial Macro-frame Case” where the operation levels in the industrial sector are static.
*3: Emission reduction levels compared to 2008.

Choose an environmentally-friendly lifestyle
Choose energy-saving products
Choose natural energies
Choose environmentally-friendly buildings and houses
Support activities and products that lead to the reduction of CO₂ emissions
Participate in community activities to prevent global warming

±0% compared to 1990
Thank you for your kind attention!

Please visit the following websites for further details.

Ministry of the Environment

Ministry of Land, Infrastructure, Transport and Tourism