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Innovation in Transport Systems for Green Growth

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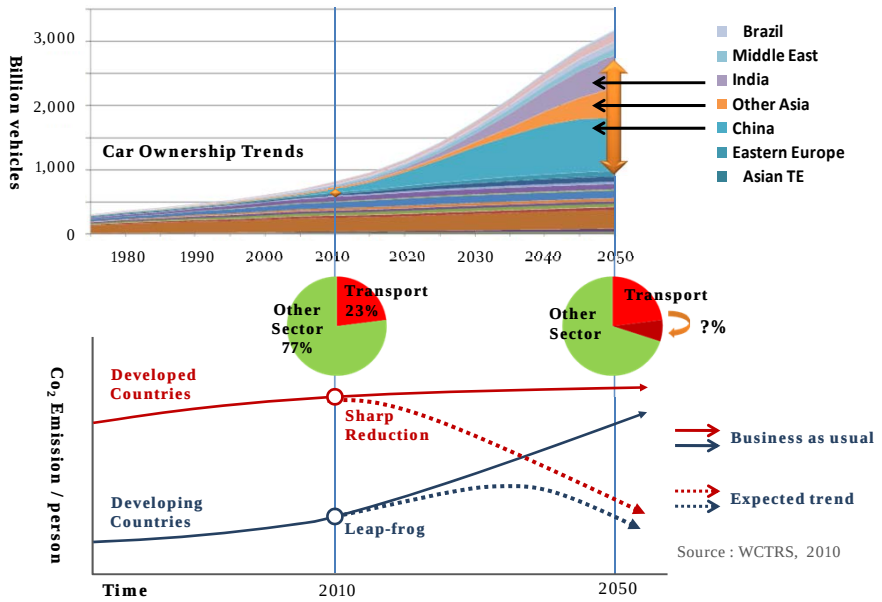
I. Green Growth and Transport

- **The Goal of Green Growth**
- **GHG Emissions in Transport**
- **Reduction Measures : ASI**
- **Prioritization of Measures**

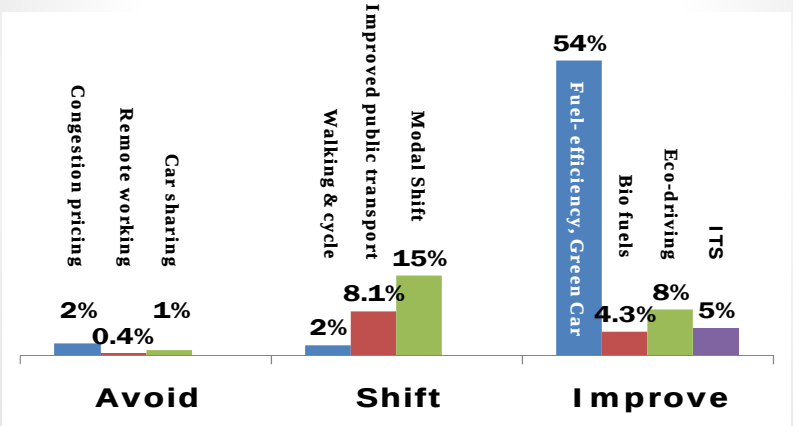
The Goal of Green Growth

- Promoting economic growth and environmental conservation
- Creating new growth engines :
  Green technologies and industries
- Contributing to global GHG reduction efforts

GHG Emissions in Transport



Reduction Measures : ASI



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Prioritization of Measures

- Technology assisted measures -> high compliance

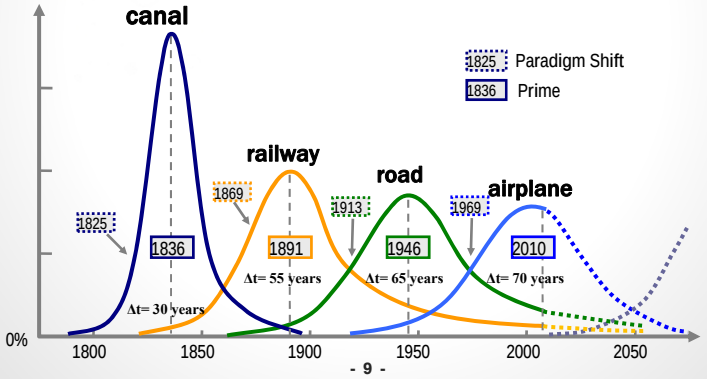
		Low cost, High efficiency	Low cost, Low efficiency	High cost, High efficiency	High cost, Low efficiency
Public Compliance	High	Eco-driving	ITS	Improving fuel-efficiency Promoting green vehicles	Biofuels
	Moderate	Pay-as-you-drive insurance	Encourage walking & cycling Modal shift Car sharing	Express railways	Remote working Public service improvements
	Low	Congestion pricing			

II. Future Trend

- **Technology Evolution**
- **Major changes that lead to the future**

Technology Evolution

- Rapid evolution of technology post-Industrial Revolution
  - 50-year cycles
  - What modes and technologies of transport for the future?



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Major changes that lead to the Future

Energy system : Energy crisis and climate change

- Use of renewable energy sources, efficient energy utilization
- Climate change and GHG reduction

Urban structure : High-density land use

- Rapid urbanization
- High density urban redevelopment

Convergence : IT-Vehicle-SOC

- Smart mobility with smart vehicles and telematics
- Remodeling existing road network with ICT
- Innovative traffic demand management

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III. Innovative Technologies

- **KOTI's Research Initiatives for Green Transport**

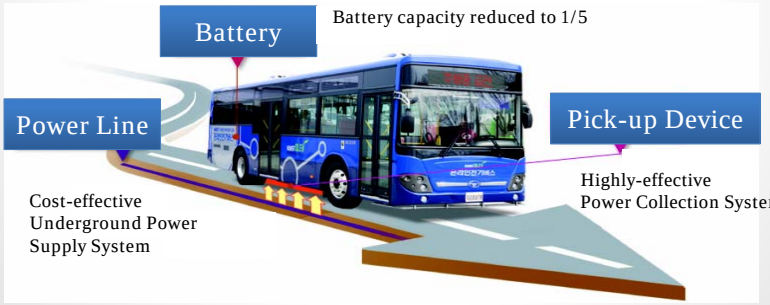
Innovative Transport Technologies

KOTI's Research Initiatives for Green Transport

1. BRT with Online Electric Vehicle
2. Bike Rapid Transit
3. Cloud Transport System
4. Intermodal Connectivity Center
5. Technology driven Eco Driving
6. Expressway Reservation System
7. Automated Container Transport

1. BRT with Online Electric Vehicle

- Online Electric Vehicles (OLEV) with underground power supply lines
  - Powered from underground power line
  - Charges at start and end sections (20%) of BRT route



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2. Bike Rapid Transit (BIRT)

- Elevated structure
- Non-stop Bikeways
- Faster than bus in peak-hour
- Travel mid to long distance with low energy (Gradient is not critical)
- Unaffected by temperature and rainfall

Green transport system where bikes move faster on elevated structure without stopping

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3. Cloud Transport System

- Sharing transport modes
  - EV, Bicycle,
    Public transport, etc
- Creating new business model for EV

CTS
Own Less Share More

- Intermodal journey planner and reservation service
- User customized service

Benefits

- Reduction of GHG emissions
- Reduction of user cost
- Mitigation of traffic congestion

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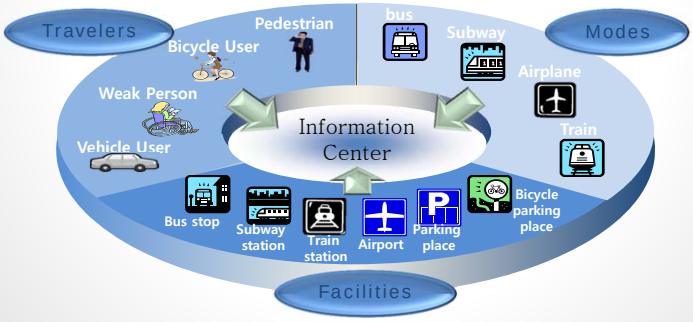
4. Intermodal Connectivity Center

- Upgrading Intermodal Connectivity System
  - Remodeling layout of transfer facilities
  - Smartphone based travel information
  - Efficient management of transfer facilities



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5. Technology driven Eco Driving

Driving Patterns

- Quick start & acceleration
- Quick stop & deceleration
- Lane-change, quick right & left turns

- Eco-driving saves 63% of additional fuel compared to quick start & acceleration
- Eco-driving saves 13% (fuel, CO_2) compared to usual driving

Eco-Indicators

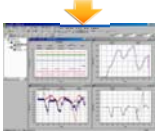
Eco-Navigators

Eco-Driving Monitoring System


Smart-sensor equipped


Collecting driving patterns


Tolling fee discount


Eco-Driving Analysis using driving patterns

6. Expressway Reservation System

- Tackling extraordinary peak traffic demand for roads with limited capacity
- Introduces pre-reservation system as with public transport
- Maximized traffic throughput and reduced congestion
- Combine with flexible road tolling policy

7. Automated Container Transport (AutoCon®)

- Container flow on Seoul–Busan : approx. 9,000 TEU/day
- Conveyor system using Linear Induction Motor (LIM)
- AutoCon infrastructure cost is 1/3 of railway
- High efficiency non-stop system
- Unmanned automated cargo handling system

(Fuel saving) US$ 200 million/yr
(GHG Saving) 1.1% of roads, 11.2% of railways

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IV. Discussion

Discussion

- Innovative combined technology measures contribute to CO_2 reduction
  - To account for more than 50% of target reduction (in Korea)
  - Eco-driving to be evaluated as high compliance, low cost and high efficiency measure
- Improve investment through innovation in transport
  - Promoting operational efficiency with intermodal and ICT technology
  - Expanding BRT network which is low cost and high efficiency compared to railway investment

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Discussion

- Convergence of technology and policy
  - Understanding users' behavioral patterns
  - Better public acceptance and co-operation
- Creating new technologies and policies beyond transport border
  - Convergence with ICT, energy and psychology

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Thank you