



# How **SUSTAINABLE** is the 21st century Mass Transit Railway?

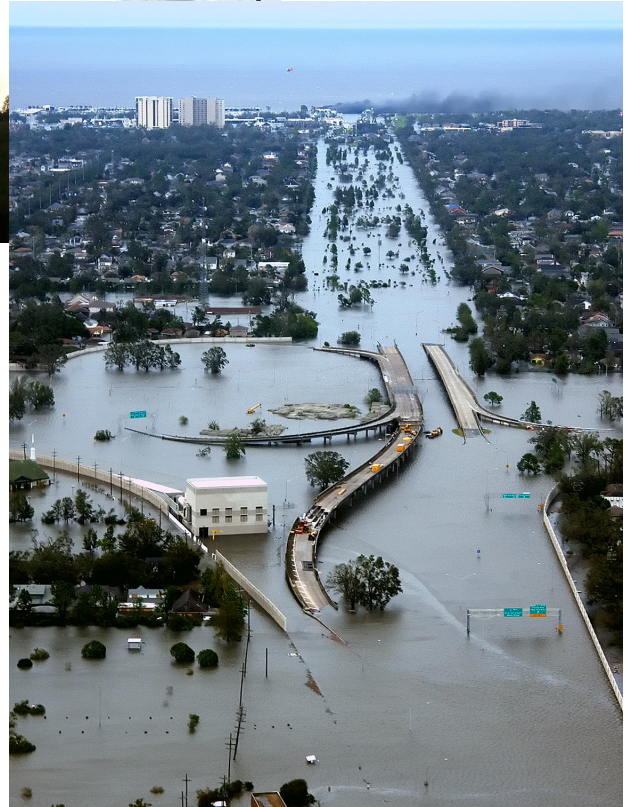
**TC Chew**

*Projects Director, MTR Corporation*

# Agenda

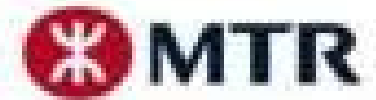
- **Carbon-Credit Transport**
- **Sustainability through Asset Life Cycle Management**
- **Carbon Footprint Control**
- **The Challenges**





# The 21st century





# Carbon-crediting Transport?

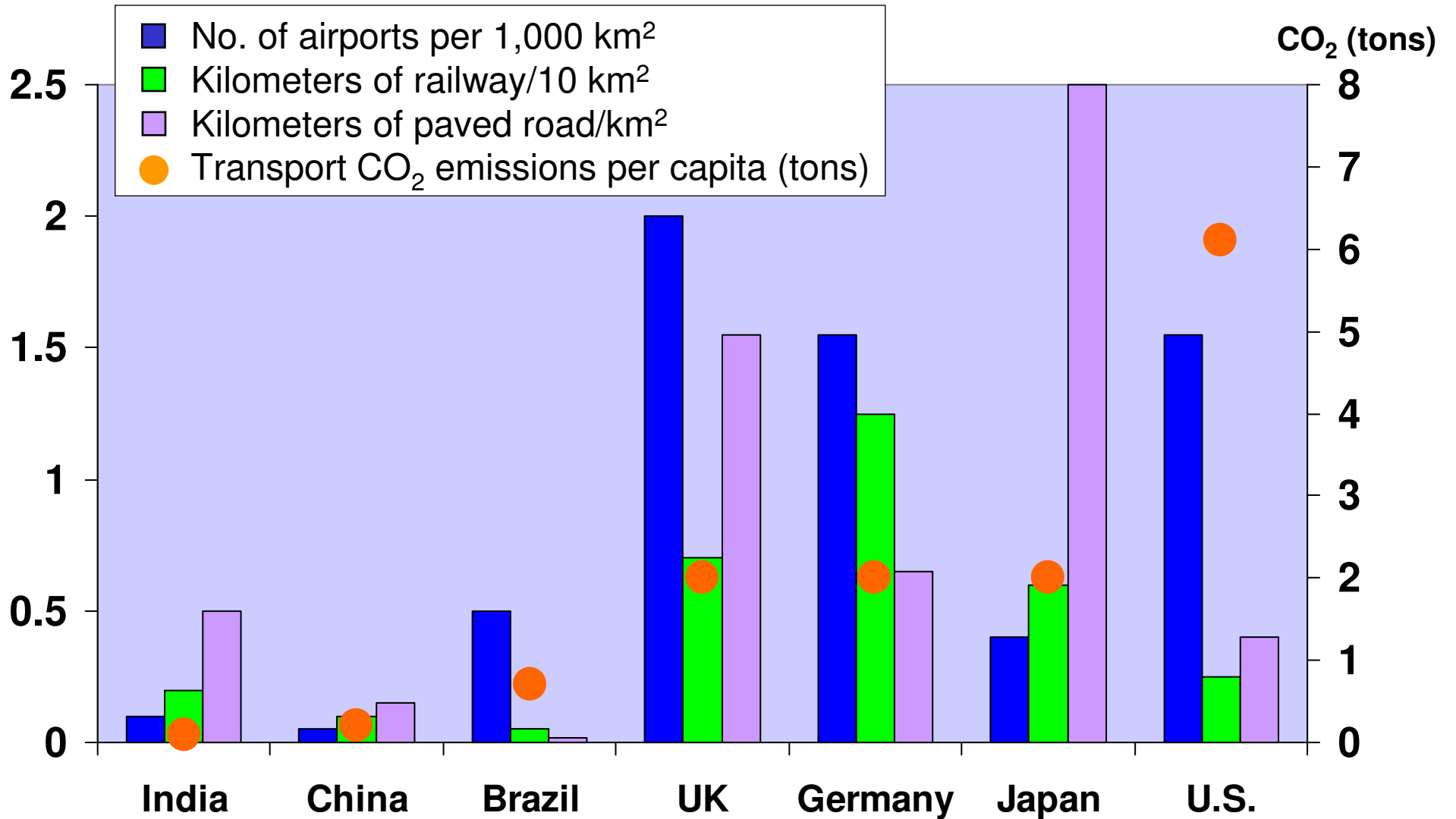


# Sustainability

**“Meeting the needs of the present without compromising the ability of future generations to meet their needs”**



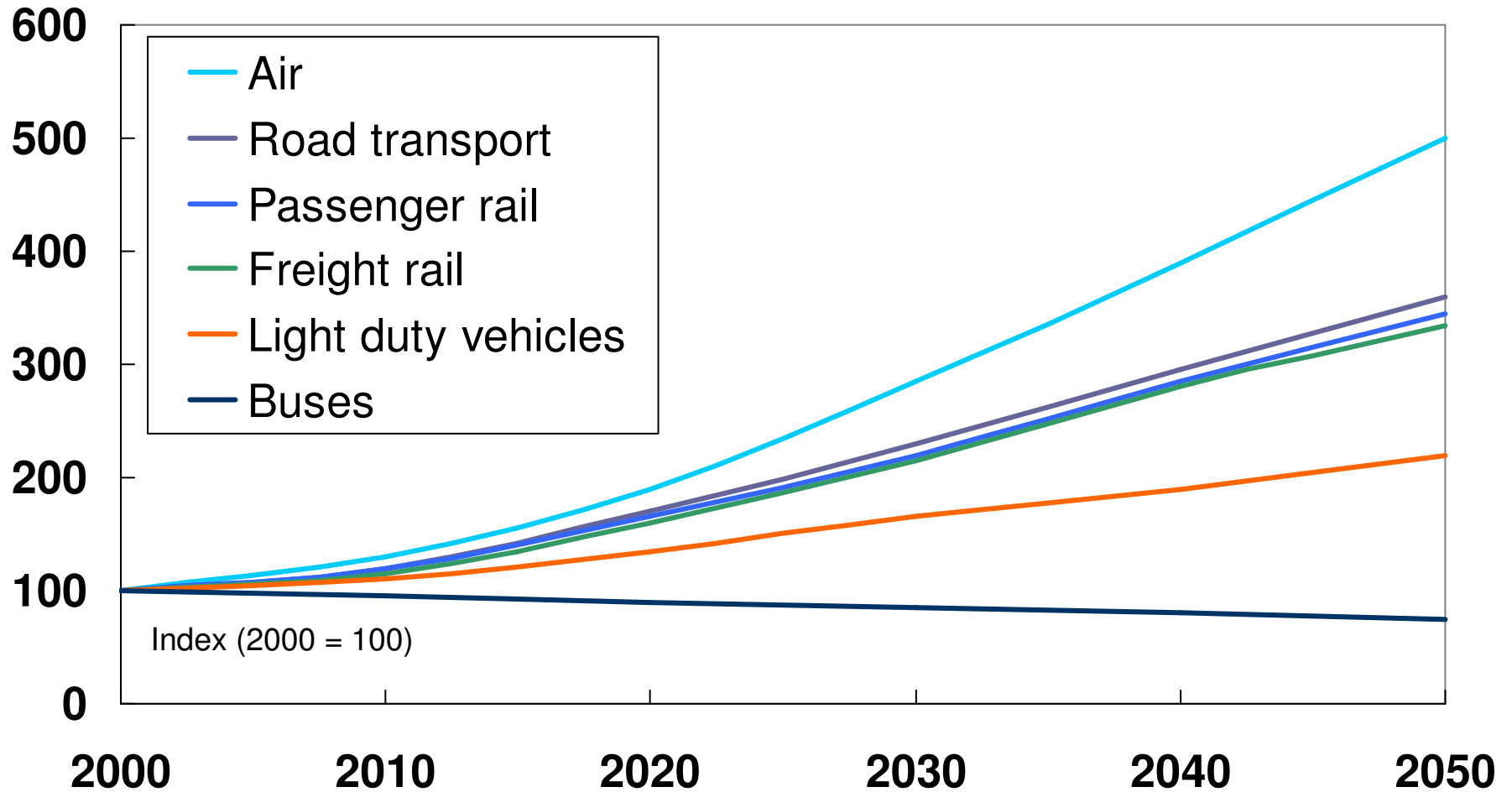
# Transport Infrastructures by Country



Source: CIA – World Factbook 2007

# Comparative Mileage by Modality

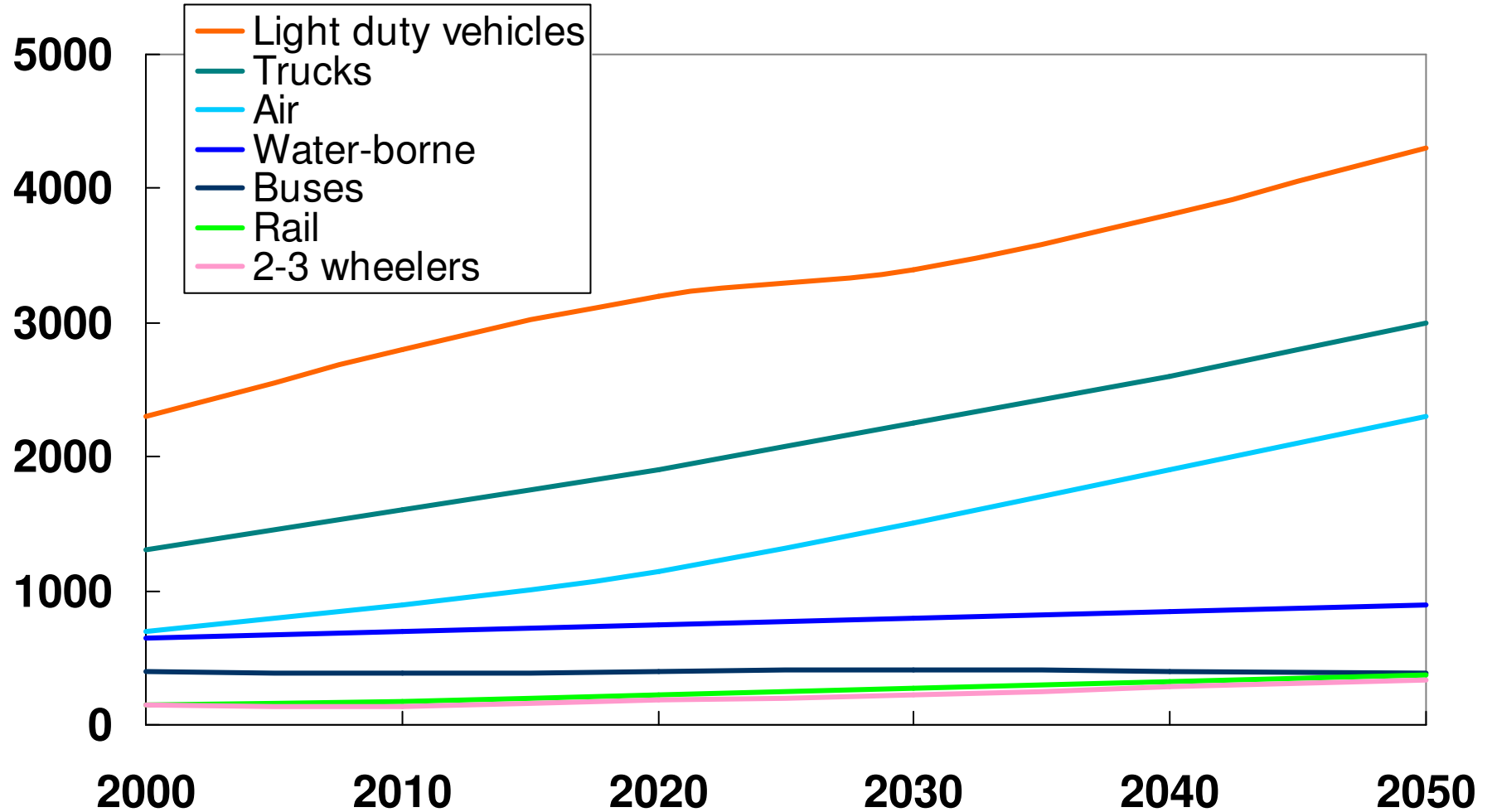
Worldwide passenger/ton-kilometers



Source: 2008 version of the IEA/ETP's MoMo model

# Comparative Emissions by Modality

CO<sub>2</sub> emissions in millions of tons per year



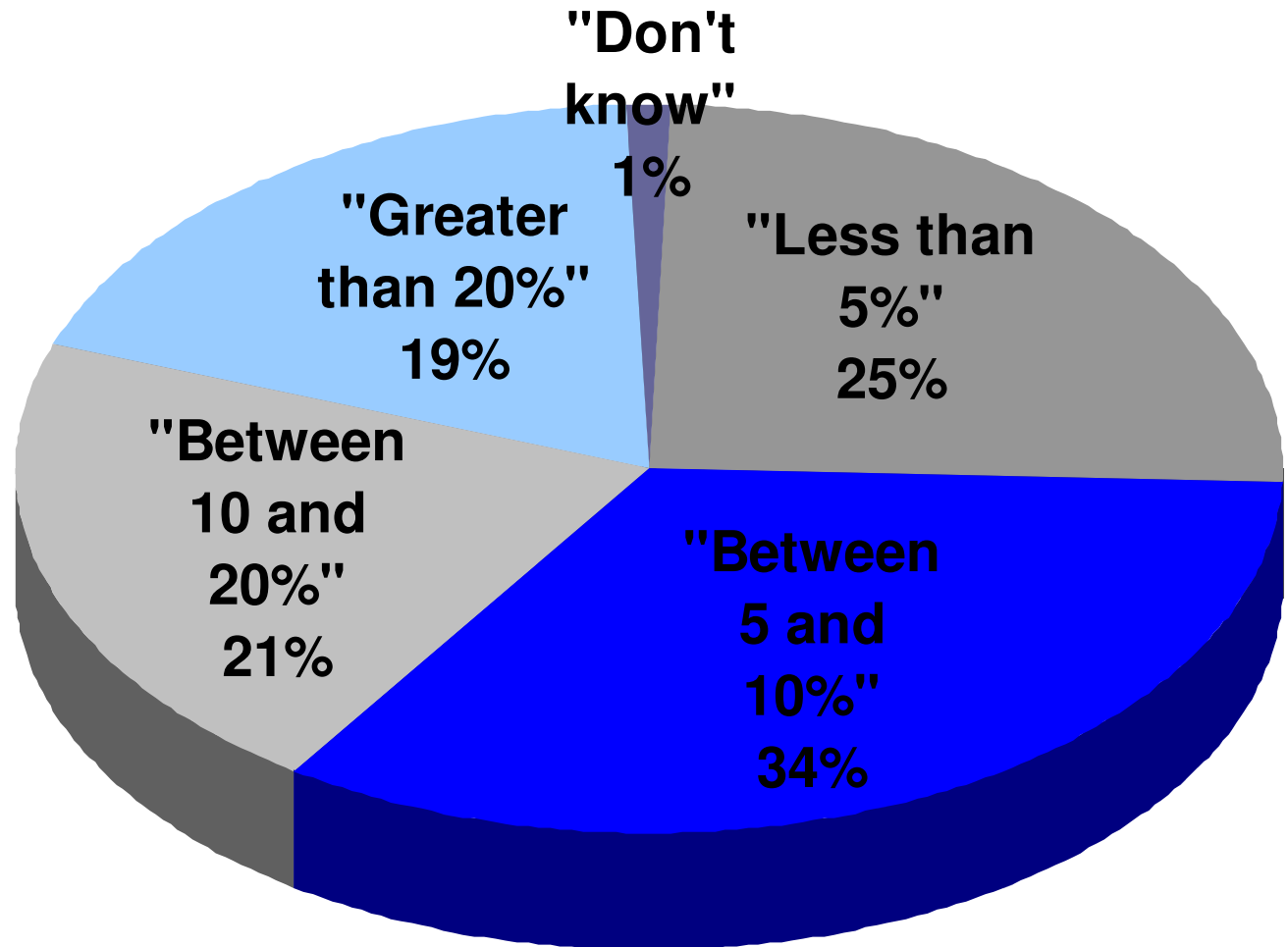
Source: ITF based on 2008 version of the IEA/ETP's MoMo model



# Percentage of Electric Cars Expected

**Survey of participants at the 2010 International Transport Forum:**

In 2010, the share of electric vehicles in new car sales in OECD countries will be:

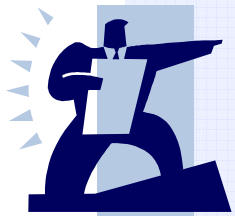


Source: [www.internationaltransportforum.org](http://www.internationaltransportforum.org)

# Climate Change Policy

## Climate Change Policy of MTR (issued in 2006)

Commits to adapting and mitigating risks presented by climate change and to **becoming one of the most resource efficient and ecologically sustainable railways** and property-service providers in the world



**One of the key actions:  
Reduce direct carbon emissions in  
a targeted and continuous fashion**

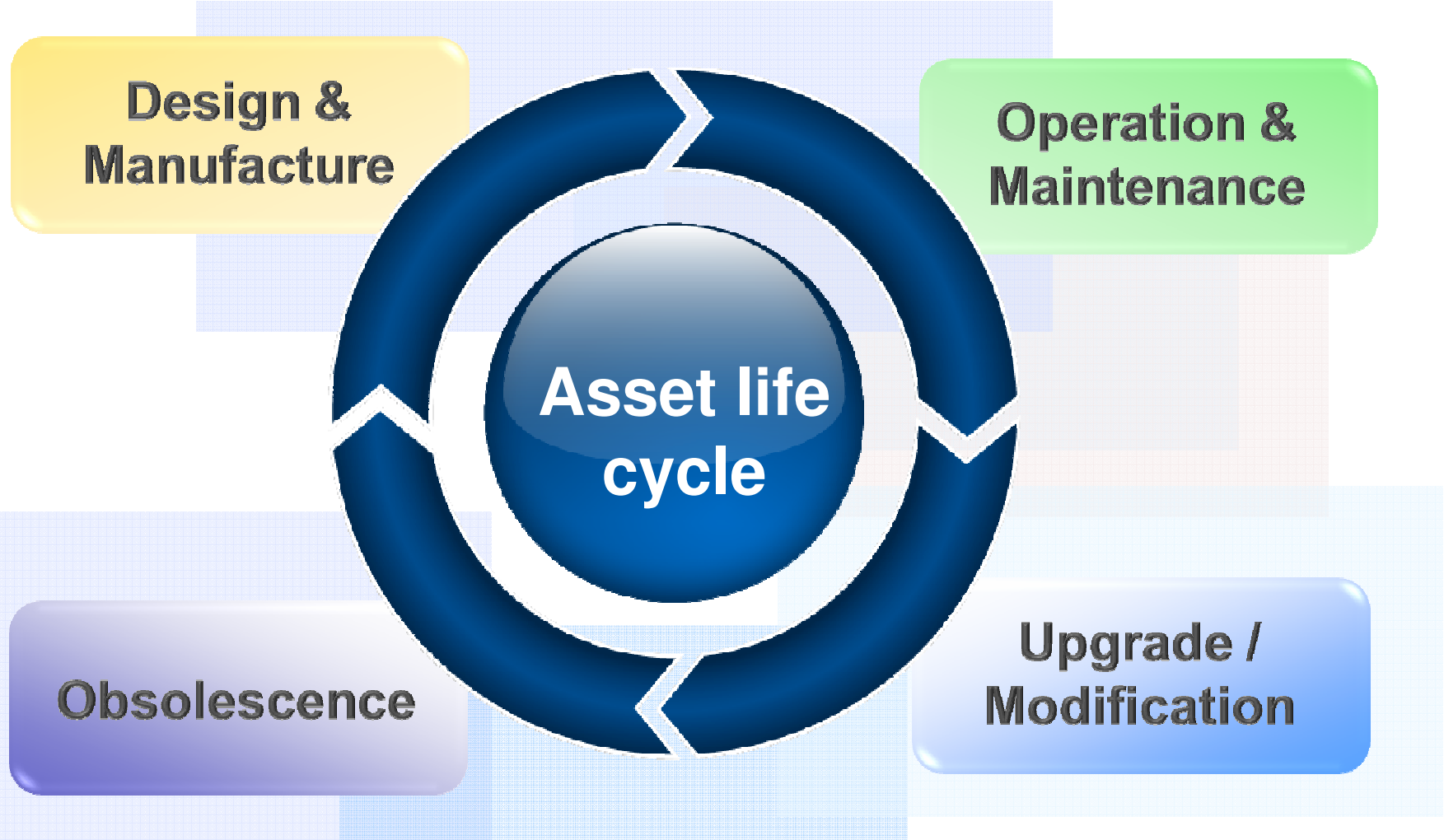




# Sustainability through Asset Life Cycle Management



# Asset Life Cycle Management



# Asset Life Cycle Management

**Design &  
Manufacture**

**Partnering with Suppliers for best  
technology solutions**

E.g. - Improvement in traction system  
- Light weight design



**Obsolescence**

**Upgrade /  
Modification**

**Materials –  
Reusable? Recyclable?**



# Asset Life Cycle Management

**Reduce resource consumption through operational means**

E.g. – Regulate trains and allow more coasting

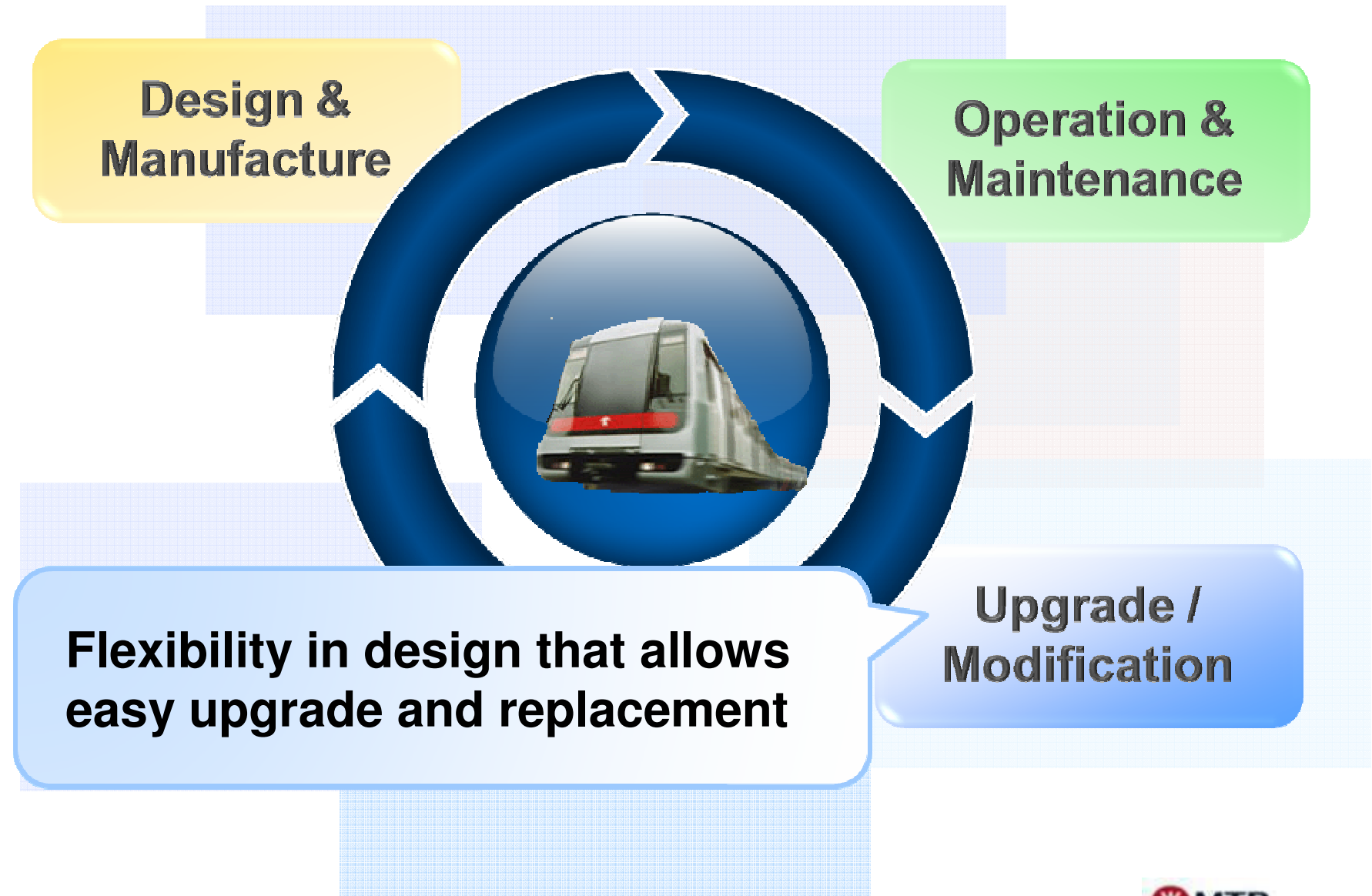
**Operation & Maintenance**

**Upgrade / Modification**

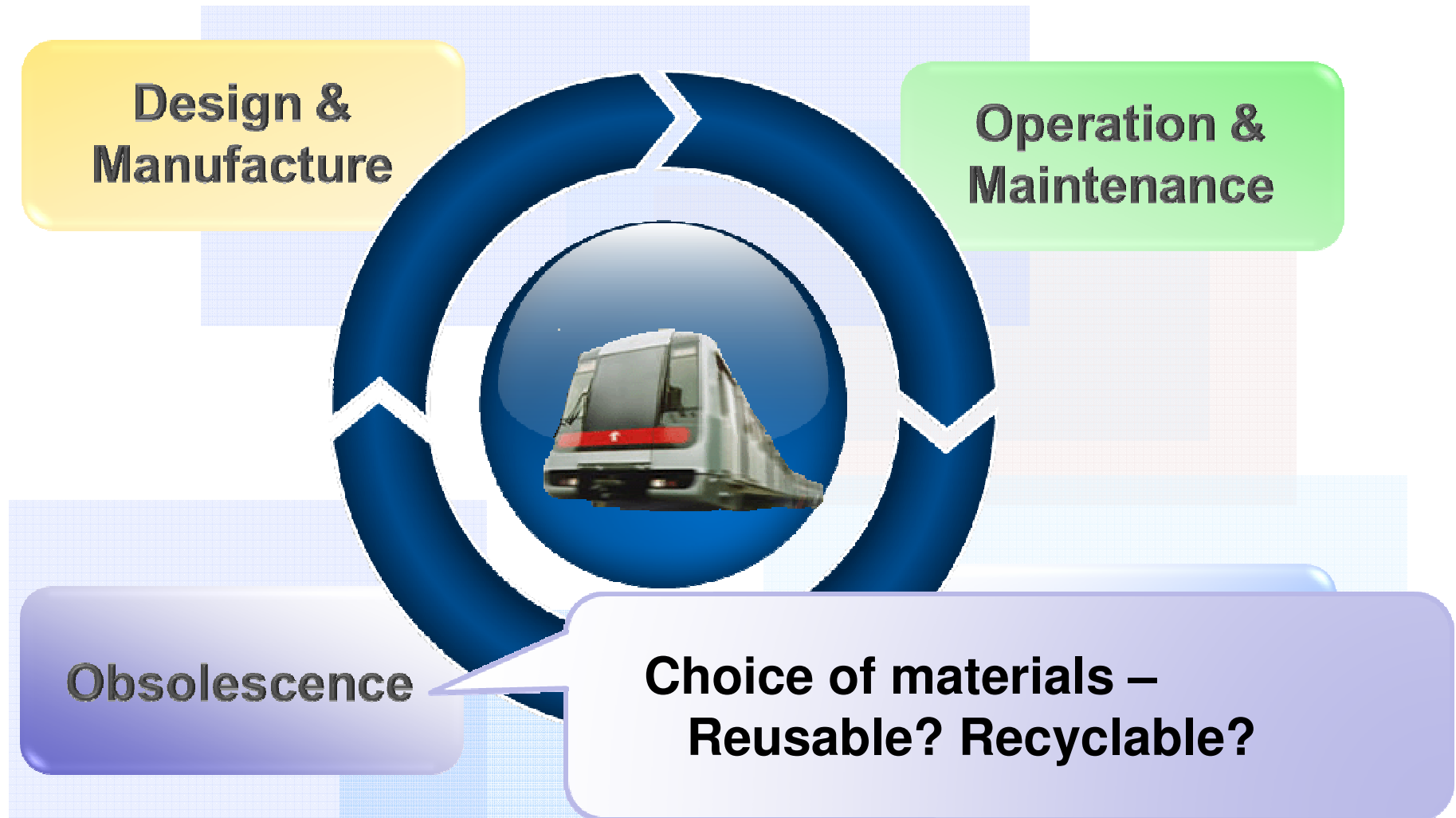
**Obsolescence**



# Asset Life Cycle Management



# Asset Life Cycle Management



# Initiatives to reduce Resources Consumption

## Environmental Control System

- Water-cooled air conditioning system
- Direct cooling system
- Energy saving free cooling mode

## Lighting System

- LED lighting
- Lighting control
- Solar photovoltaic panels



## Main Control System

- Time scheduling

# Initiatives to reduce Resources Consumption

## Lifts & Escalators

- Elimination of home landing of lifts
- Automatic control of car lights and ventilation fans
- Standby mode for group control of lift bank
- Lift power generation feature
- Variable frequency drive
- Traction lifts



## Power Supply System

- Single high voltage transmission and distribution system
- Wayside traction energy storage



# Initiatives to reduce Resources Consumption

## Overhead Line System

- Overhead rigid conductor rail
- Silver copper contact wire

## Signalling System

- Automatic door open/close
- Automatic train regulation



# Initiatives to reduce Resources Consumption

## Rolling Stock

- Regenerative brake
- Weight management
- Power electronics equipment
- Permanent magnet motor



# Carbon Footprint Control

## Carbon footprint tracking system

Cover entire life cycle of railway projects

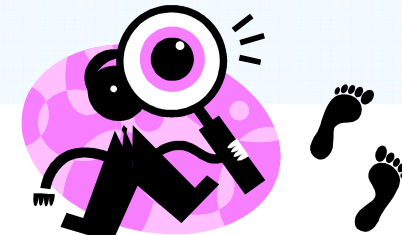
- Embodied carbon
- Carbon emitted during provision of service

Model of carbon footprint to be developed based on actual data from railway projects when completed

Identify de-carbonisation opportunities



MTR Corporation





# The Challenges





# Challenges

- **Various constraints, especially financial implication**
- **Strong determination needed for implementation and follow through**





# How **SUSTAINABLE** is the 21st century Mass Transit Railway?





**THANK YOU**