智慧交通與永續發展
ITS and Sustainability

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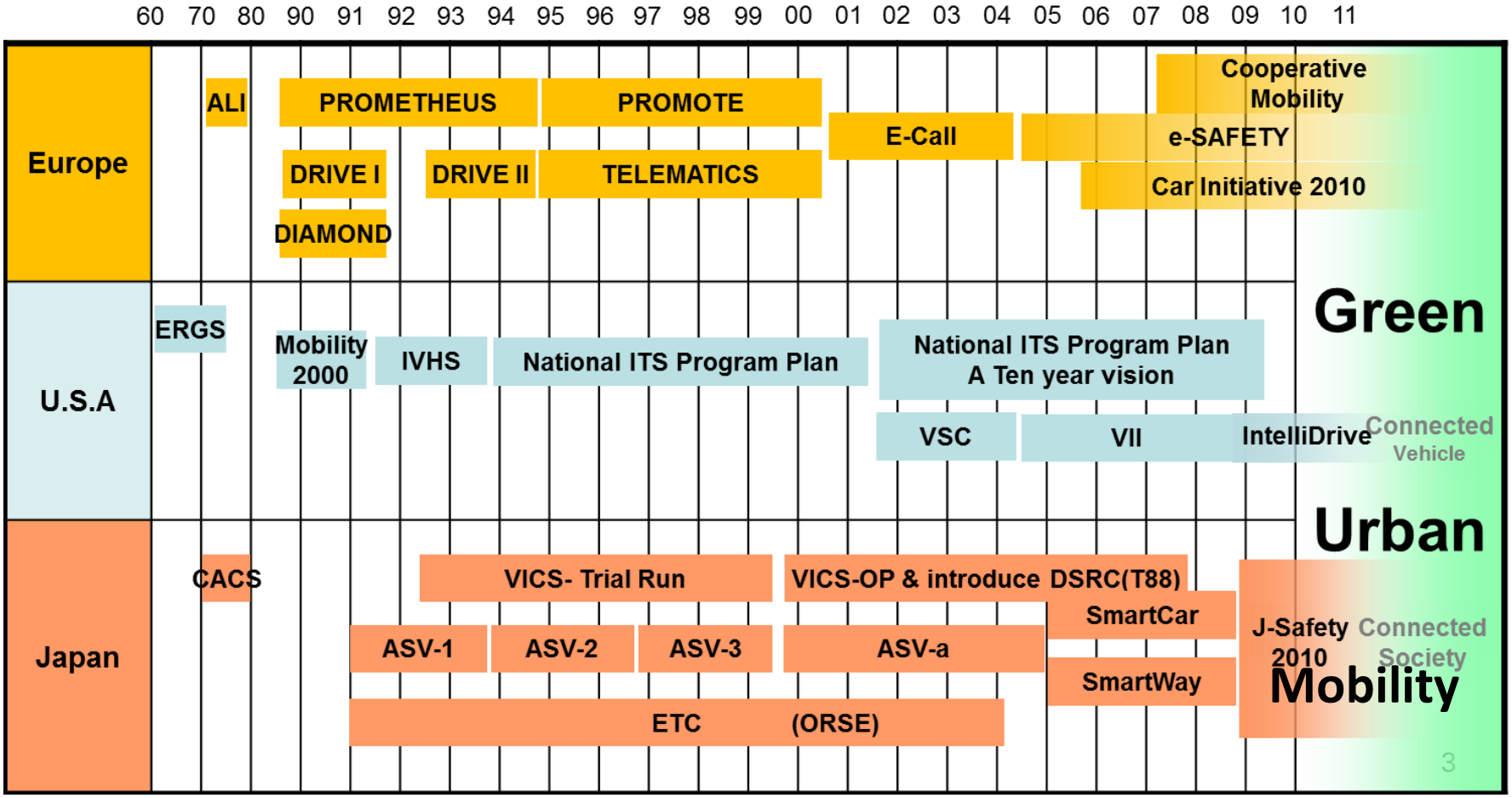
大綱 Agenda

- 國際趨勢 International Trends
- 智慧城市與創新科技
  Smart City and Innovative Technologies
- ITS²: 智慧旅運與永續機動力
  ITS²: Smart Travel and Sustainable Mobility
- 結語 Concluding Remarks

世界智慧運輸發展 ITS Development Roadmap

Safe, Sustainable, and Seamless Services

國際趨勢運用ITS技術從過去「效率」目標，
逐漸演變將「永續」列為目標



智慧城市 Smart Cities

Real-world test environment: Singapore

Singapore: Jurong Lake District was nominated in June 2014 as a test and demonstration platform bed for innovative technologies, systems and services: *"a mini version of a 'smart city' - with more than 1,000 sensors deployed to control and monitor everything from traffic to street lights, and crowded buses..."*

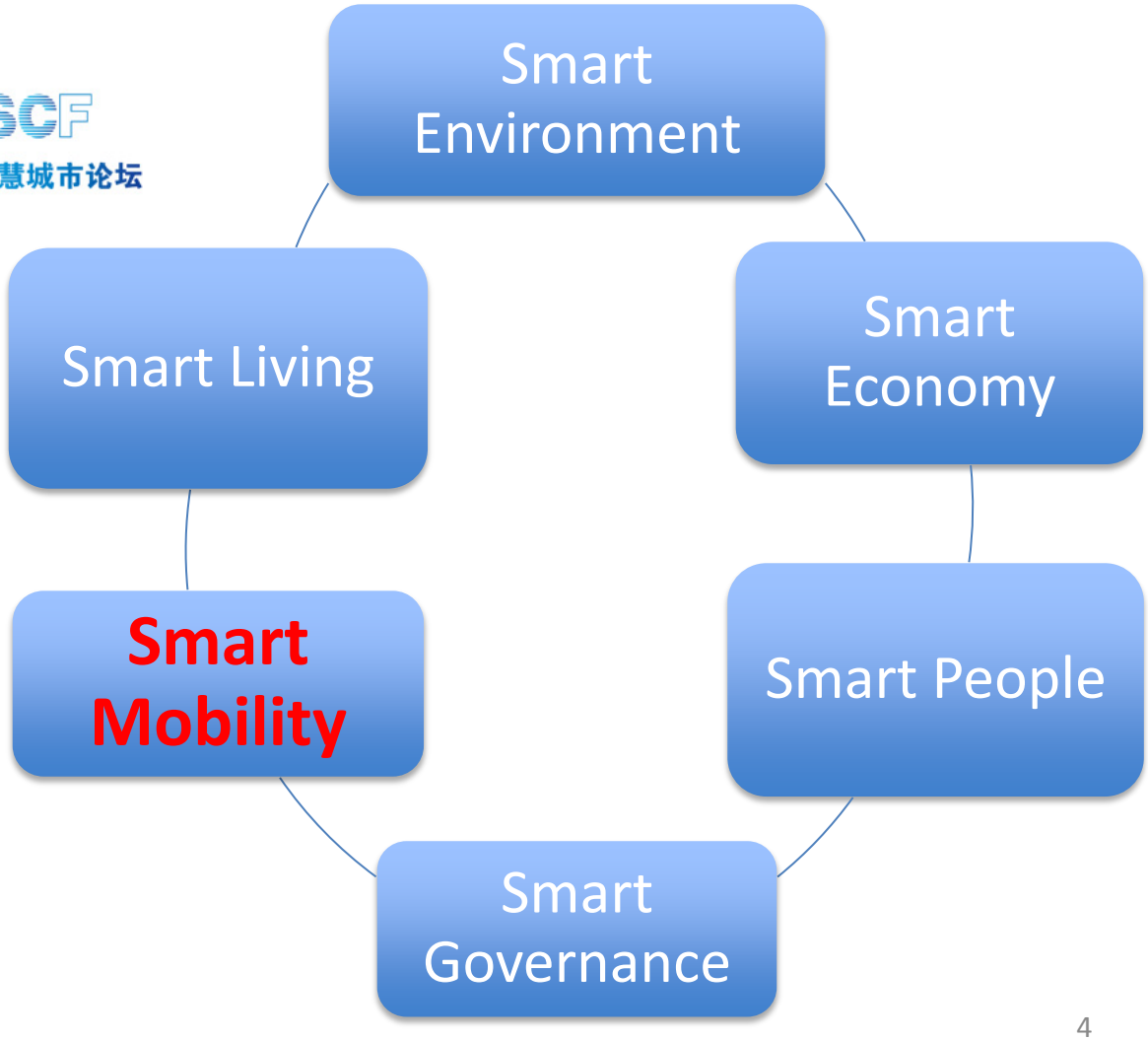
Asiaone, 18 June 2014

- India: 100 Smart Cities
- China: 3 00 Smart Cities
- EU: Smart City Initiatives 2010~2020
- Japan: Smart Community

CSCF 中国智慧城市论坛

Japan Smart Community Alliance

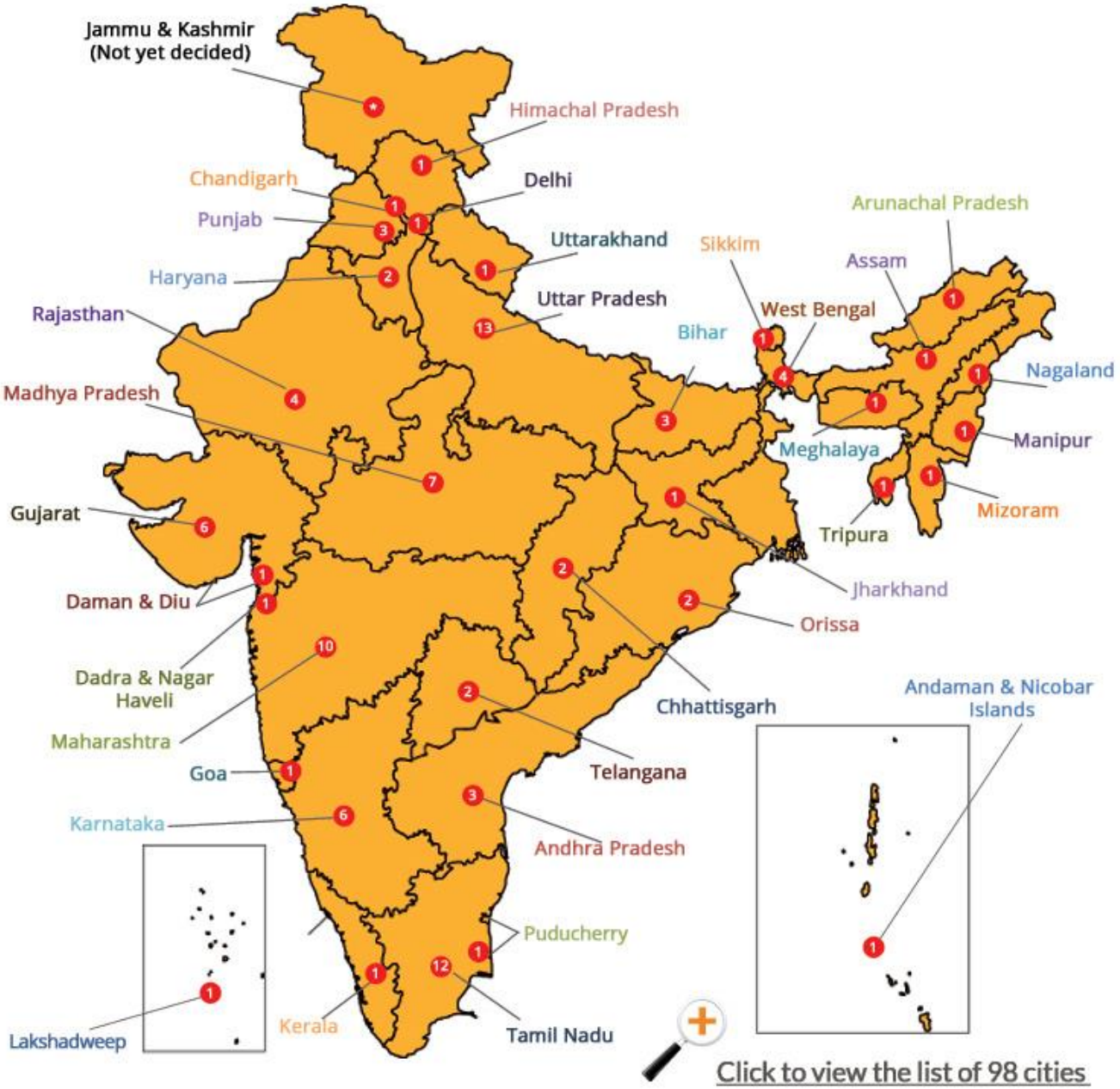
- Taiwan: Smart Village Program



2nd Smart Cities India 2016 Expo

Smarter Solutions for a Better Tomorrow

11-13 May 2016
Pragati Maidan, New Delhi



http://www.smartcitiesindia.com/

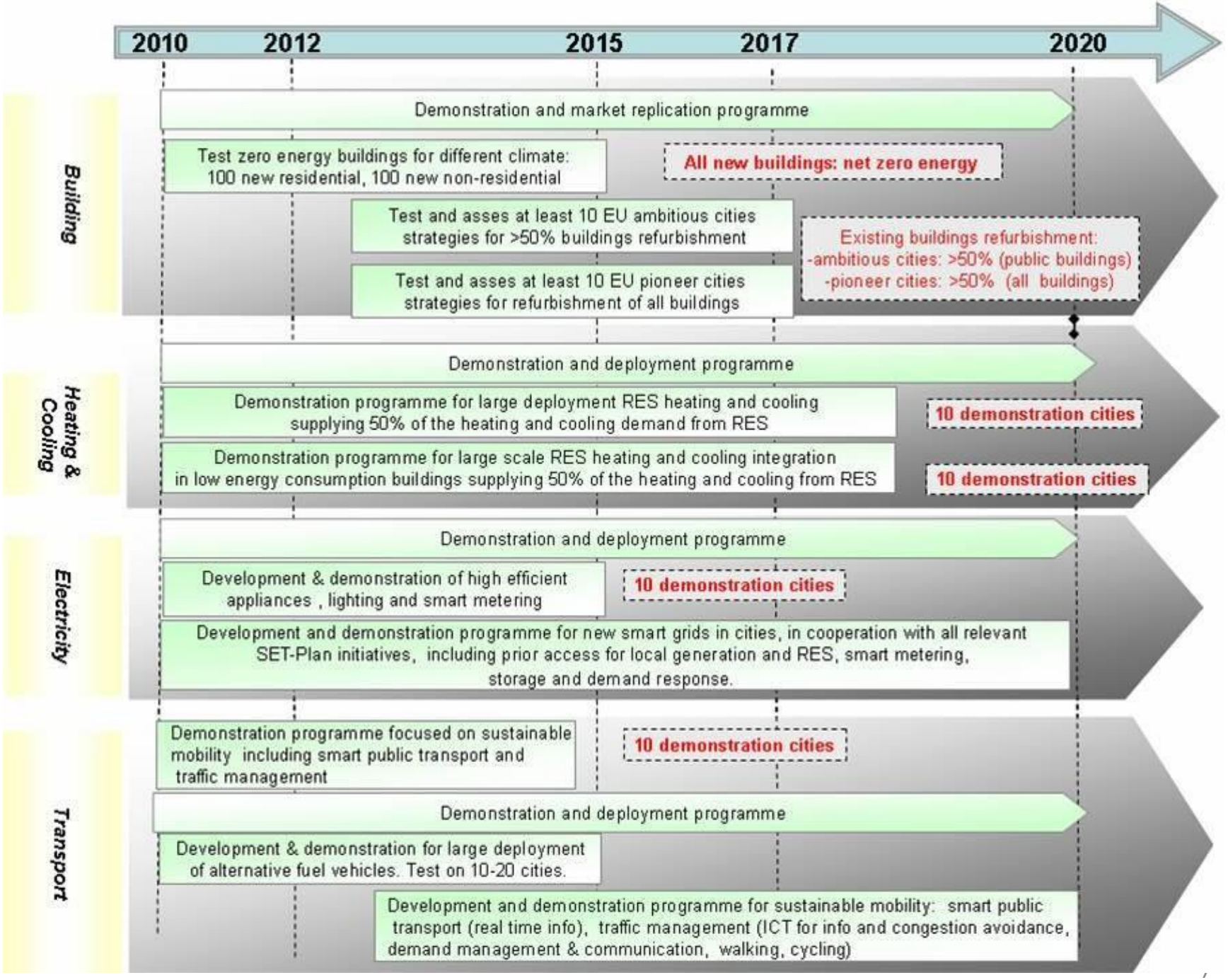
綠色智慧城市 Green and Smart Cities

歐盟示範計畫 European Initiative on Smart Cities (2010~2020)

Strategic objective

To demonstrate the feasibility of **rapidly progressing towards our energy and climate objectives** at a local level while proving to citizens that their **quality of life and local economies** can be improved through investments in energy efficiency and reduction of carbon emissions. This Initiative will foster the dissemination throughout Europe of the most efficient models and strategies to progress **towards a low carbon future**.

Building, Heating and Cooling, Electricity and Transport



https://setis.ec.europa.eu/set-plan-implementation/technology-roadmaps/european-initiative-smart-cities

英國策略規劃 UK: Foresight

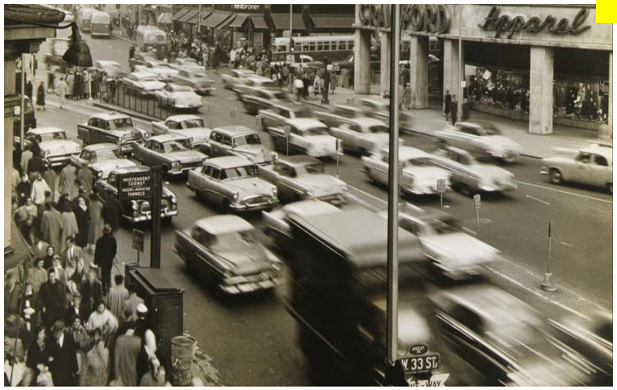
- "***How might science and technology be applied over the next 50 years to the design and implementation of intelligent infrastructure for transport and its alternatives that are robust, sustainable and safe?***"
(The UK-based Foresight team was led by Sir David King)

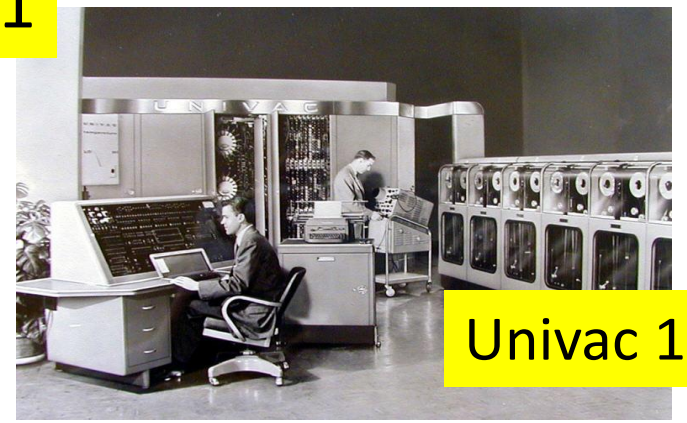
  - **Smart Design of Cities**
  - **Smart Decision-Making Process**
  - **Efficiency of Available Network**
  - **Innovation on Urban Mobility**
  - **Behavior Change**

Policy Priority: Avoid > Shift > Change

科技創新與城市交通進展
Technology Innovation vs. Urban Mobility
Some strange things going on in the world since 1950

1951





Univac 1

2011

資通訊技術創新將衝擊運輸服務與產業

ICT for Innovative Transport Service and Industry

- Cloud
- Big Data
- GIS, SIS
- IoT/ IoX
- Connected Vehicle
- Connected Society
- Sharing Transport

Digital Tsunami is Hitting Transport Sector !!

運輸部門與整合創新服務

Transport Systems Become Consumer Business

Aim is here

Ser

•Coo

•Comb

•Differe

•Clearing for transportation; [illegible] services

ility as a ce, MaaS

Transportation providers

•Vehicles, public transport, rentals, parking, taxis, DRTS, ride shares, etc.

Transport as a Service, TaaS

Network providers

•Planning, design, investments, maintenance

Infrastructur e as a Service, IaaS

小汽車可以合理擁有與有效使用：
觀光、休閒、離峰、共享……

Cars can be reasonably owned and used for recreation and in off-peak, for tourists, or sharing

交通部門面對氣候變遷與環境議題

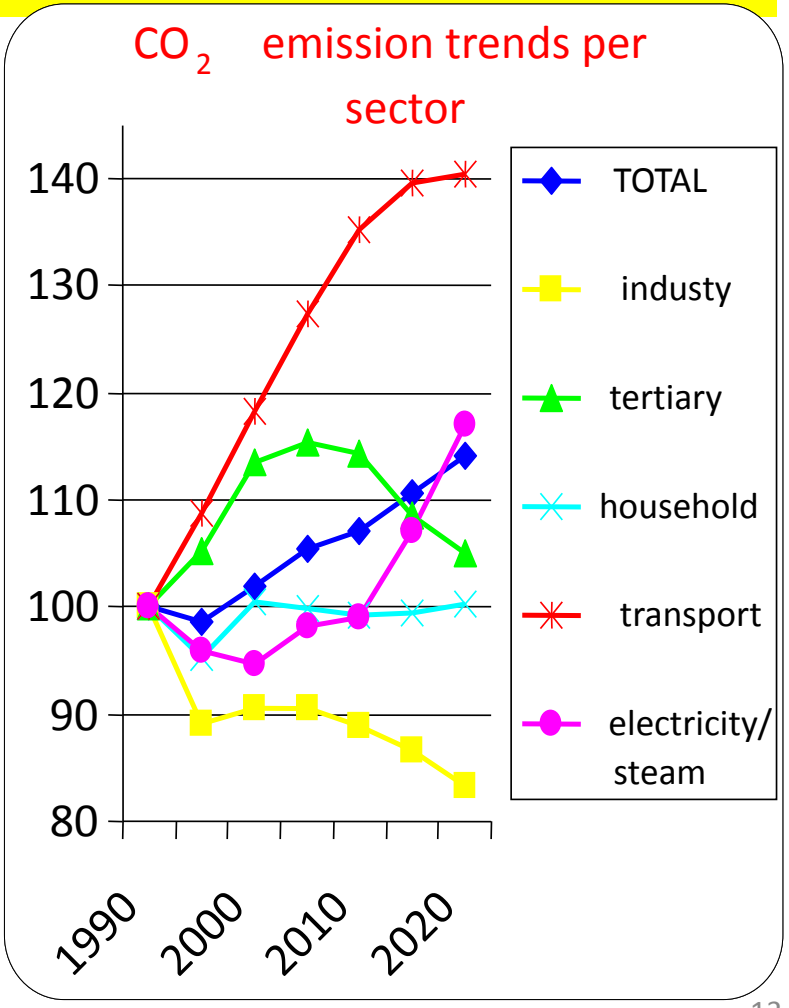
Recognize Challenges: Transport Sector Energy and Climate Change

- Transport Sector: GHG 25%
- EU: **"If present trends continue, transportation will be the main factor in our failing to fulfil the Kyoto commitment of -8%."**

COP21:

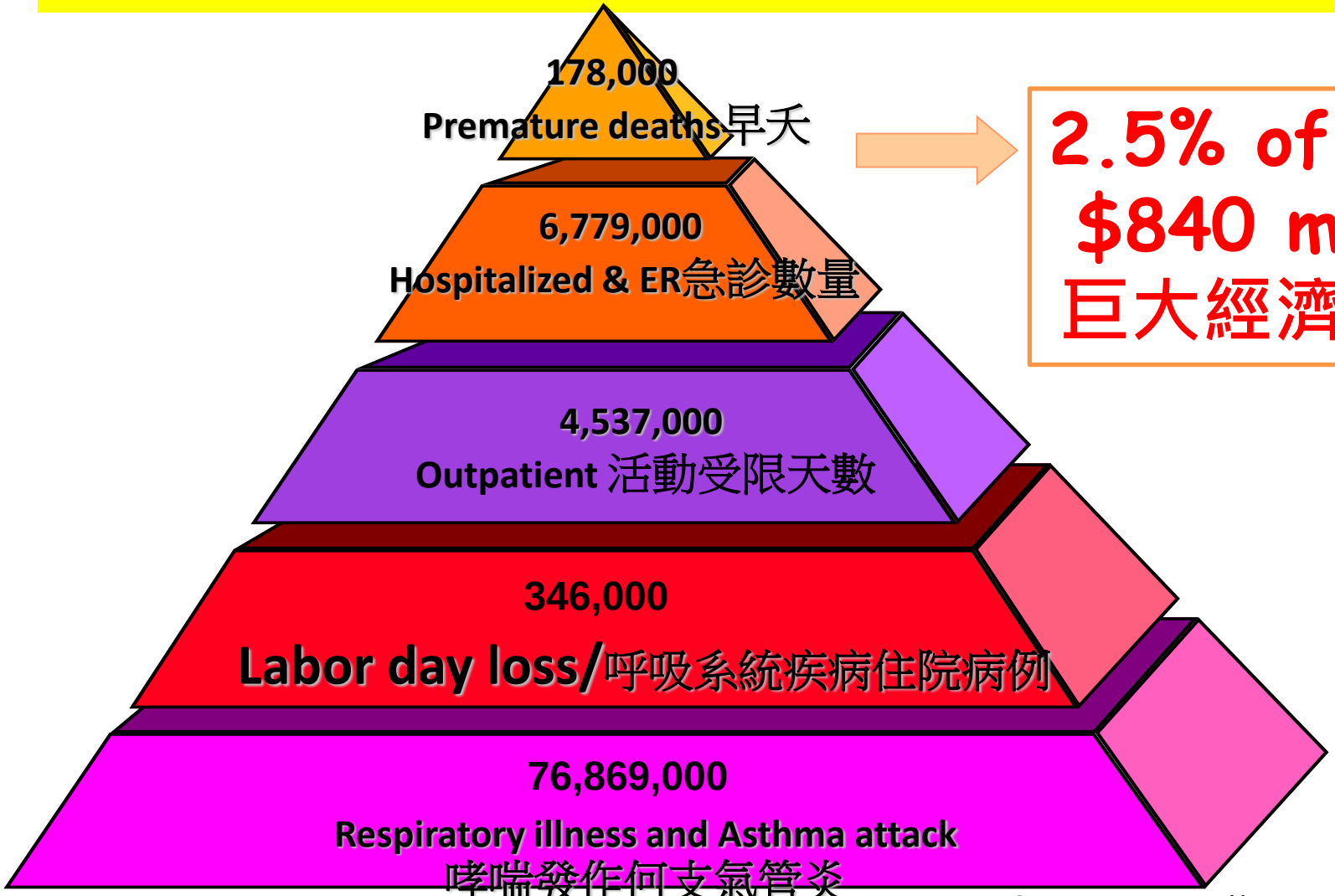
Actions for Transport Sector

Avoid- Shift- Improve



公共健康議題

Pollution generated by cars & motorcycles have contributed BIG impact on public health.



2.5% of GDP
$840 mi/yr
巨大經濟損失

Source: Harvard/Energy Foundation

道路交通安全議題

2%~3% GDP Loss

Road Safety: Leading causes of death & disability

2004			2030		
Rank	LEADING CAUSE	%	Rank	LEADING CAUSE	%
1	Ischaemic heart disease	12	1	Ischaemic heart disease	12
2	Cerebrovascular disease	10	2	Cerebrovascular disease	10
3	Lower respiratory infections	7.0	3	Chronic obstructive pulmonary disease	7.0
4	Chronic obstructive pulmonary disease	5	4	Lower respiratory infections	5
5	Diarrhoeal diseases	4	5	Road traffic injuries	4
6	HIV/AIDS	4	6	Trachea, bronshus, lung cancers	4
7	Tuberculosis	3	7	Diabetes mellitus	3
8	Trachea, bronshus, lung cancers	2	8	Hypertensive heart disease	2
9	Road traffic injuries	2	9	Stomach cancer	2
10	Prematurity and low birth weight	2.0	10	HIV/AIDS	2.0

1.3 million

2.4 million?

Source：GLOBAL STATUS REPORT ON ROAD SAFETY, World Health Organization (WHO) 2009

TWN: 3.12% of GDP $15 Bi/yr

Marginal Benefit of shifting from M/C to Bike?

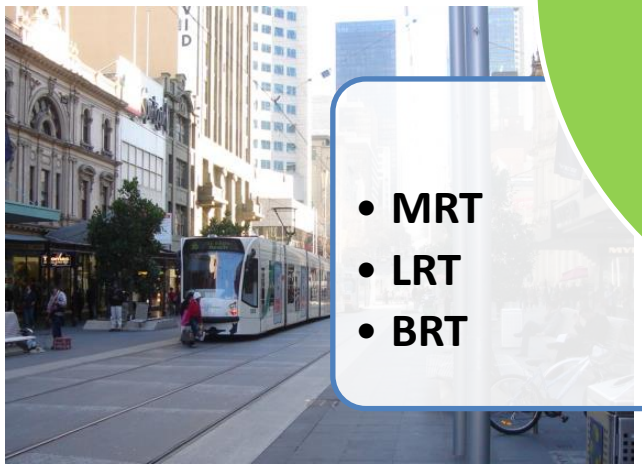
綠色交通政策 Policy: BBMW

Integration for Green Mobility and Livable City

- Integration of Bike, Bus, Metro, and Walk through land use, urban planning, urban design, and urban re-generation as well as ICT

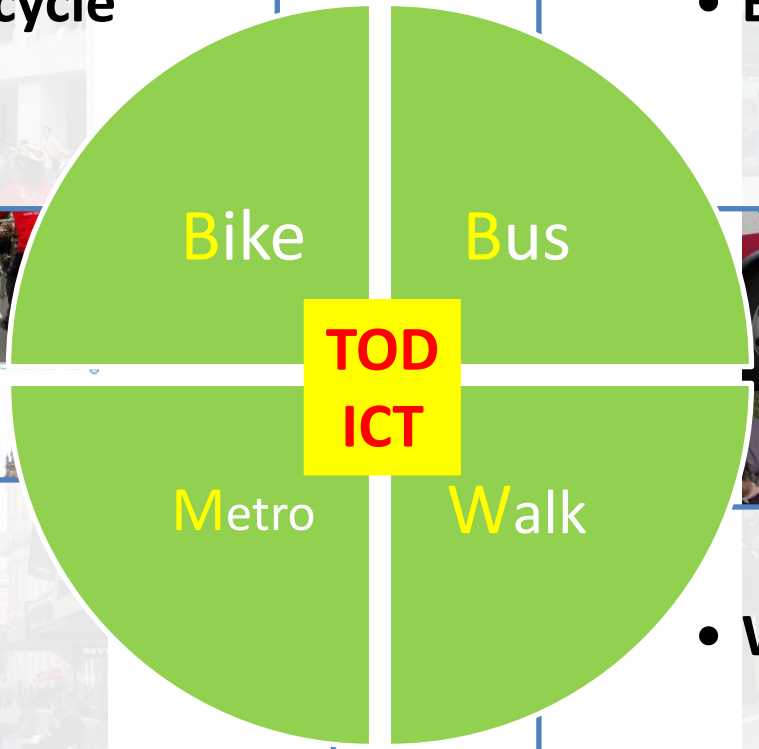
- Bicycle

- Bus



- MRT
- LRT
- BRT

- Walk



卓越公共運輸政策
Policy: Excellent Public Transport Services

- Public Transport Oriented Development TOD
- World Class Metro
- High Quality Bus Services
- Friendly Environment for Cycling and Walk
- Comfort Taxi and DRT Services
- Show Window of ITS

ITS的角色：
應用智慧運輸技術追求永續發展
整合運輸方案

Role of Technology & Innovative Service

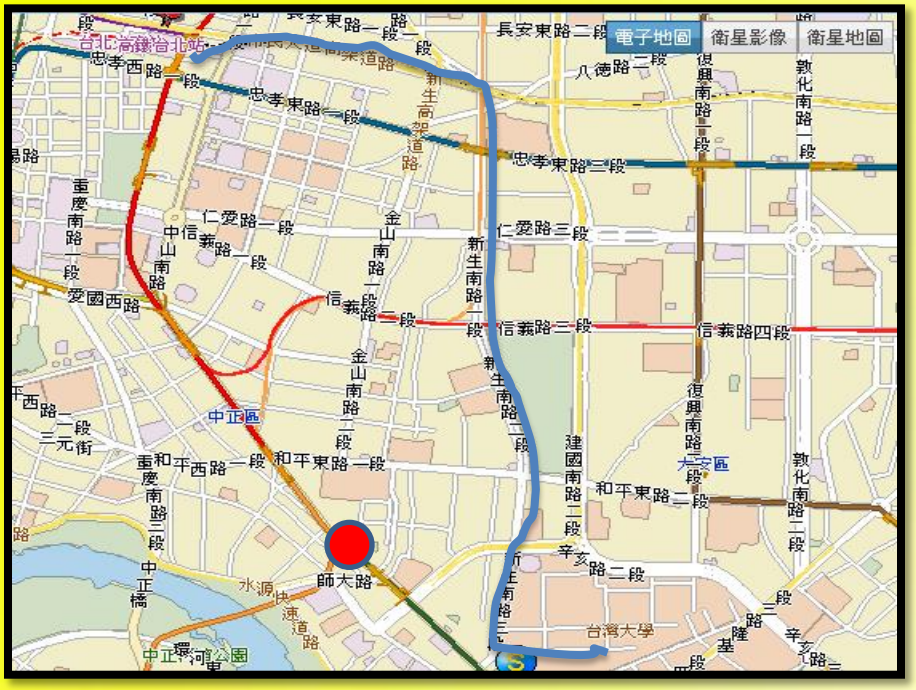
Intelligent Transport Sustainability + Integrated Transport Solution

ITS^2

以車輛導航為例說明智慧運輸與永續發展
Navigation and Sustainable Mobility

最短路徑：靜態與動態資訊

The Shortest Path for ODs based on Historical or Real Time Information

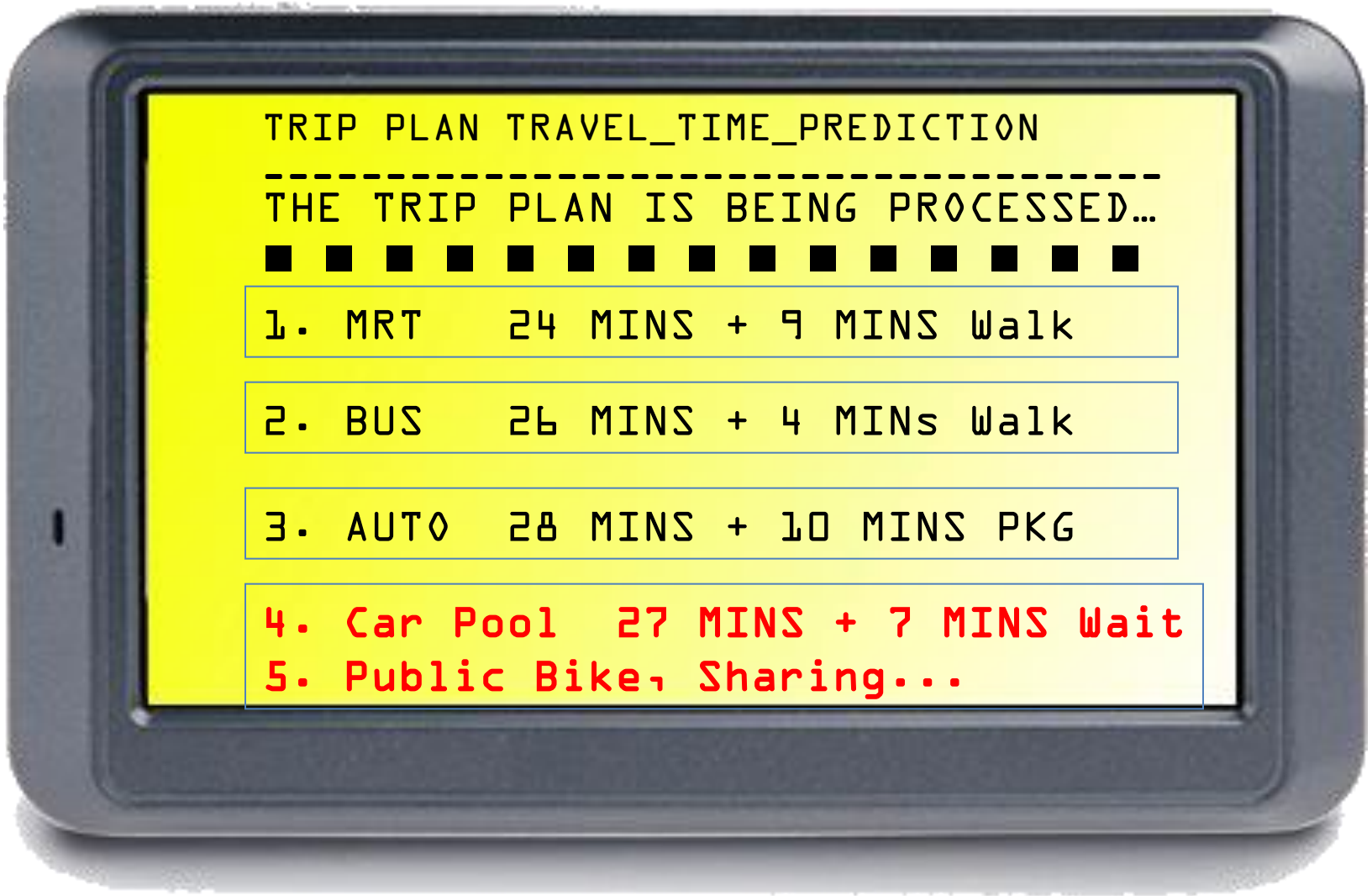


1. Travel Time:
   35 MINS
   + 2 MIN WALK
   Parking Lot:
   A12 $6/hr

2. Travel Time:
   33 MIN
   + 6 MIN WALK
   Parking Lot:
   A10 $5/hr

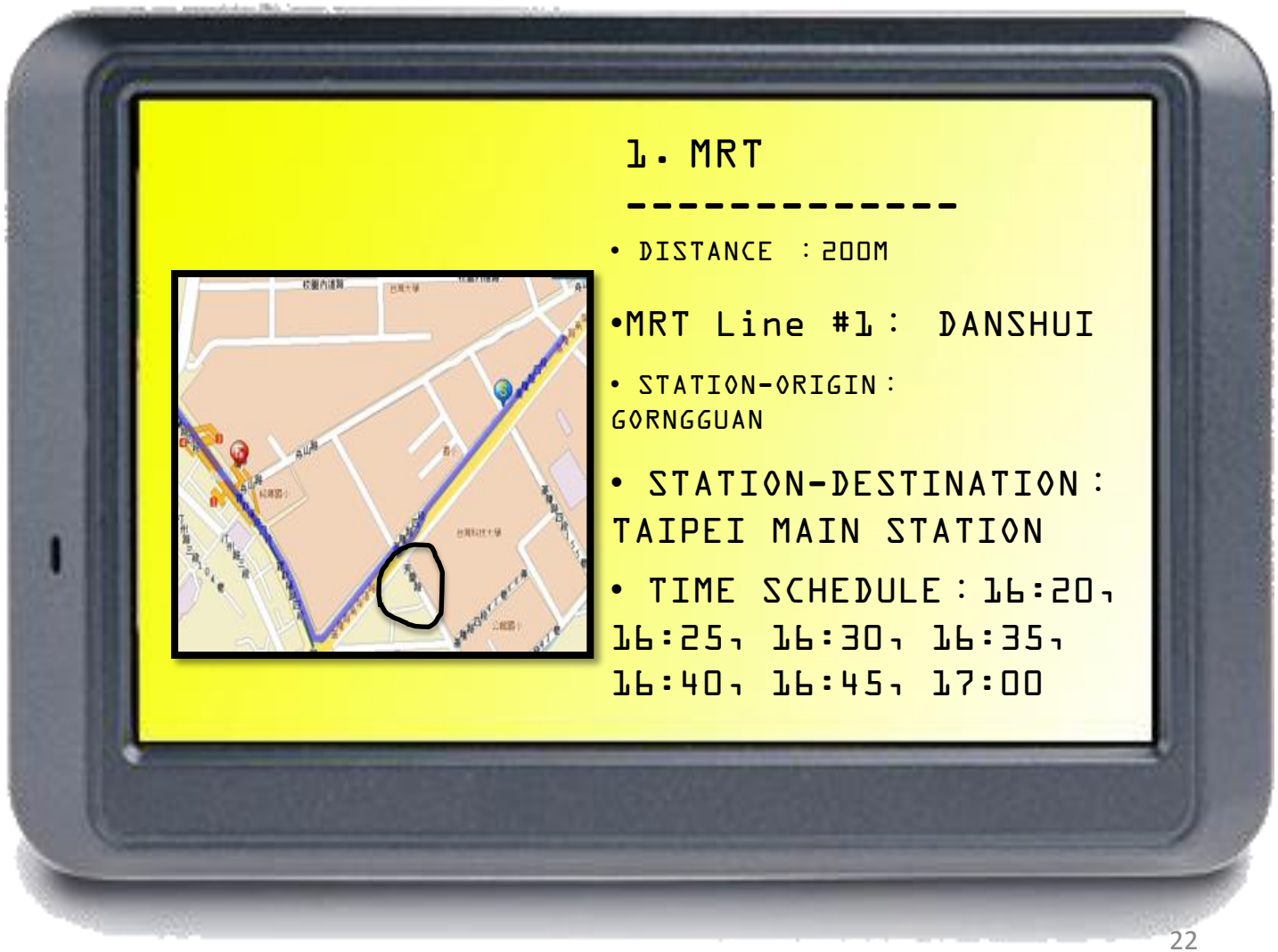
智慧運輸技術讓我們有更多聰明選擇

We have other smart choices with ITS technologies

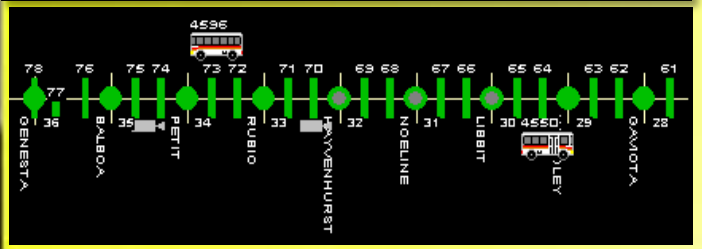


捷運

There is subway station ……



公共汽車
There are bus stops ……



2. BUS

- RT 284：100M
  16:25、16:35、16:45
- RT 617： 90M
  16:28、16:38、16:46

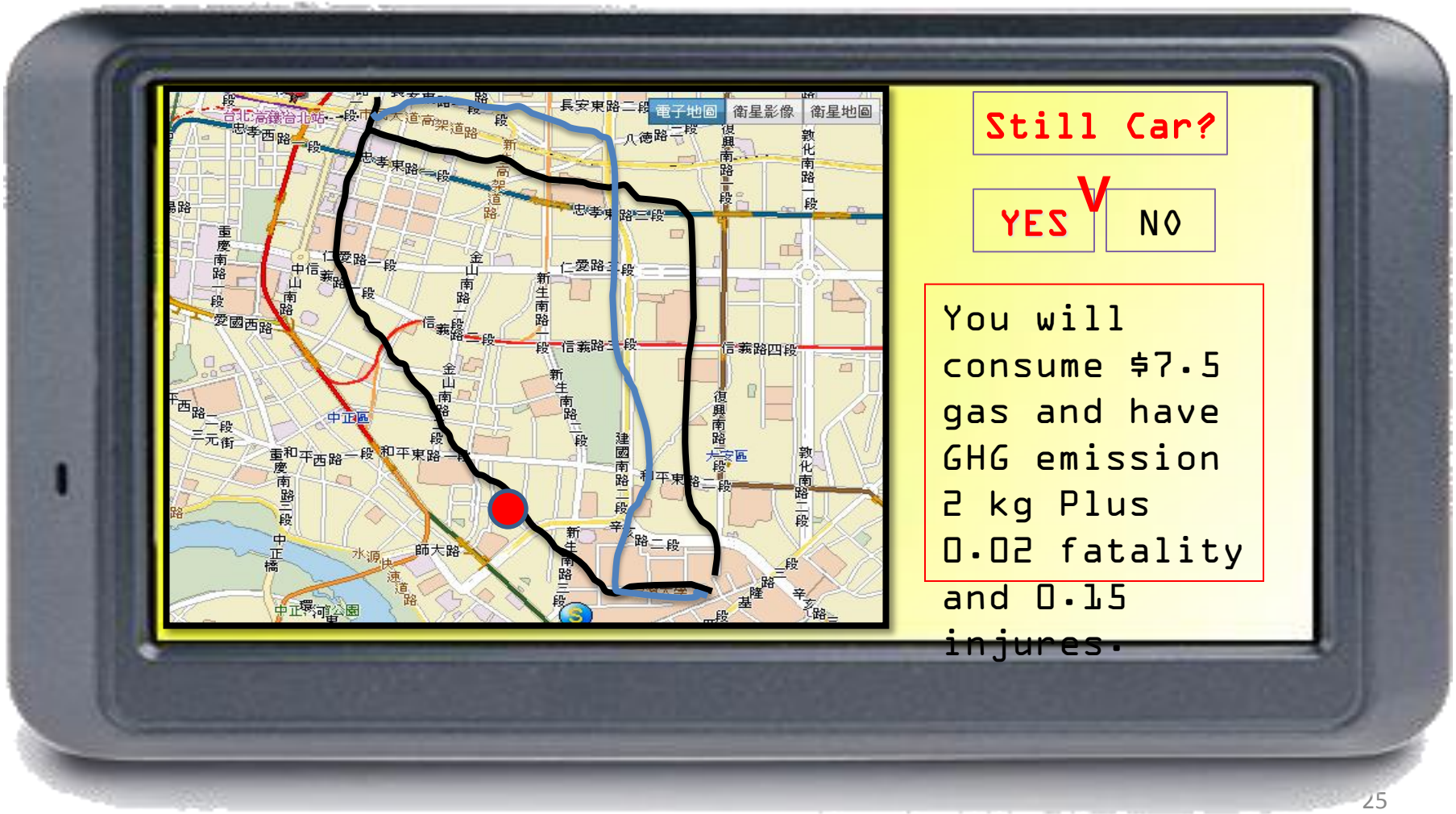
- BUS STOP-ORIGIN：
GORNGGUAN (KEELUNG.ST)
Roosevelt Road

- BUS STOP: Every 5~10 min
- DESTINATION：
  TAIPEI MAIN STATION

計程車OR, you may select a taxi

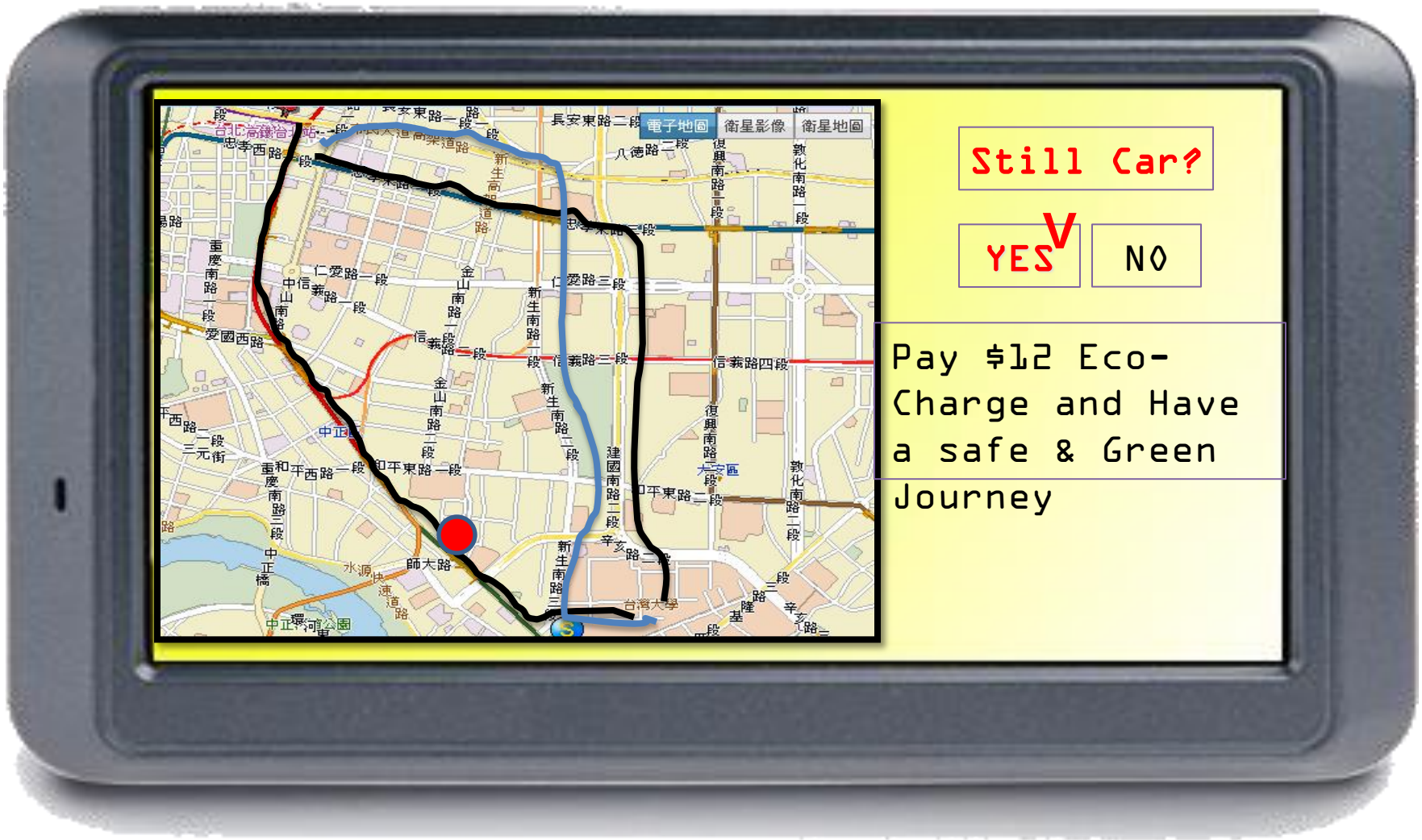
Web Taxi or Cloud Taxi……

雖然有其他選擇，今天還是得開車！
NO, I would like to have my car!



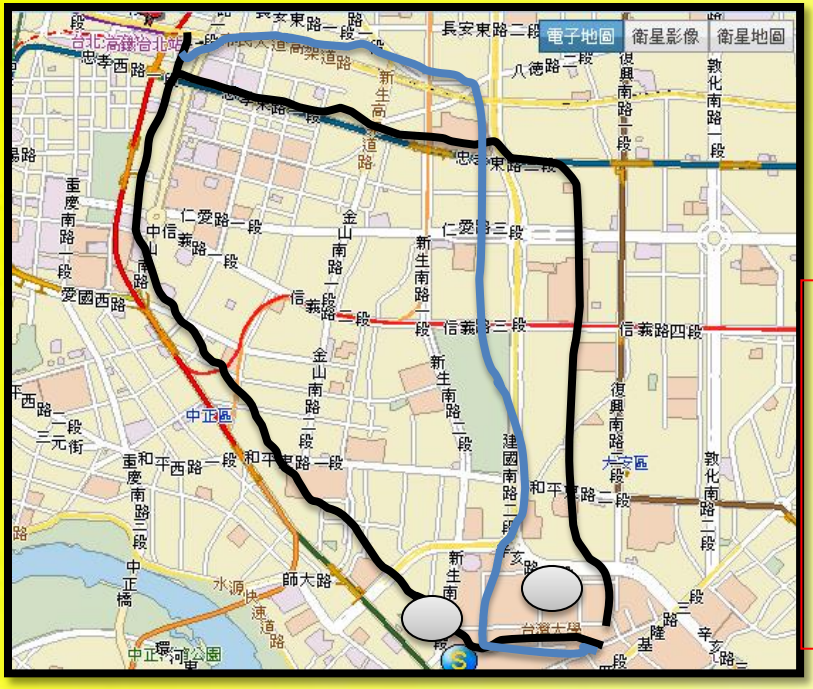
付出應付代價：安全綠色出行

Have a Safe and Green Journey



或者，決定改變！

OR, I have changed my mind…



Still Car?

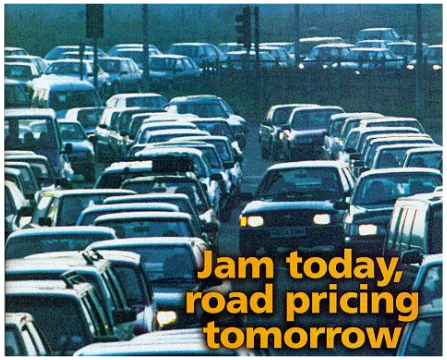
YES　NO

Great! Have a discount:
28% for Public Transport
25% for DRTS
20% for Car Sharing
Free for Public Bike
Enter your eCard No…..

應用智慧交通技術達到永續發展目標
Intelligent Transport for Sustainability

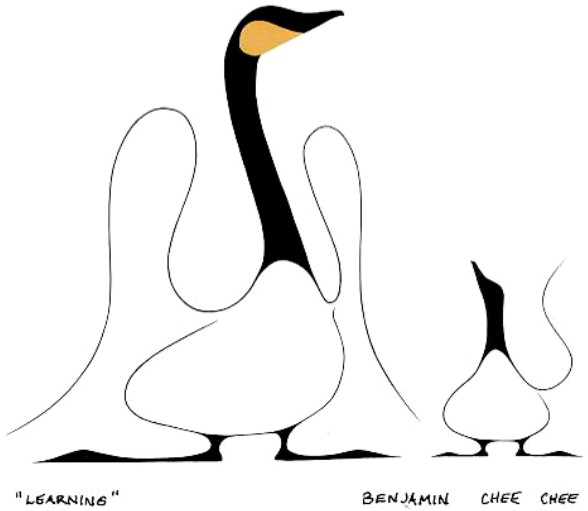
- **聰明出行/智慧選擇 Smart Choice**
  在即時多元資訊與合理稅費機制下，對於時間、空間、運輸工具做最聰明的選擇

  Travelers make the best choices on departure times, modes, routes, and destination with the real time and intermodal information as well as appropriate tax/pricing schemes.
- **符合永續理念的行動力**
  Smart Traveler and Sustainable Mobility



總結 Concluding Remarks

- ITS^2 for Green Smart City: Smart Travel and Sustainable Mobility
- Mobility as a Service Ecosystem
- Innovative Technologies and Services: ITS & Telematics Industry
- Needs for Research and Planning
- International Collaboration



Thank You

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