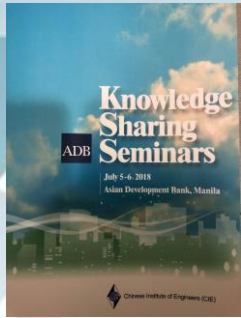


Knowledge Sharing Seminars
Asia Development Bank



Integrated Transport System Development in Taipei

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Agenda

- Background Information
- Challenges
- Integrated Transport Policy
- ITS Applications
- Concluding Remarks

Background

- Taipei: 3,000 sq km, Population 7 mi

Car- 2.5 mi, Motorcycle-3.2 mi

MRT 136 km + BRT 60 km (3.2 mi pax/day)

Bus 6,200 Vehicles + 136 Routes (1.9 mi pax/day)

Taxi 54,000 vehicles (1.1~1.3 mi pax/day)

Bike Sharing: 28,000 bikes w/ 820 stations



- Taiwan: 36,000 sq km, Population 23 mi

Freeway 989 km, Provincial Hwy 5,154 km

Inter-City Rail: 1,100 km

Car- 7.2 mi, Motorcycle- 13.8 mi

- Mobile phone penetration: 113.2% (Smart Phone: 80.2%)

- 100% e-Bus; 94% e-tag car; 75% GPS-Taxi

- 6.5 mi Smart Card Issued; 92% e-payment Public Transit

- 18/22 Cities with Traffic Control Center

- 17/22 Cities being selected by ICF Smart City Award

- ETC- All MLFF Distance-based Charge (94% e-tag)

- High Speed Rail: b/w Taipei and Kaohsiung (345km) 90 min

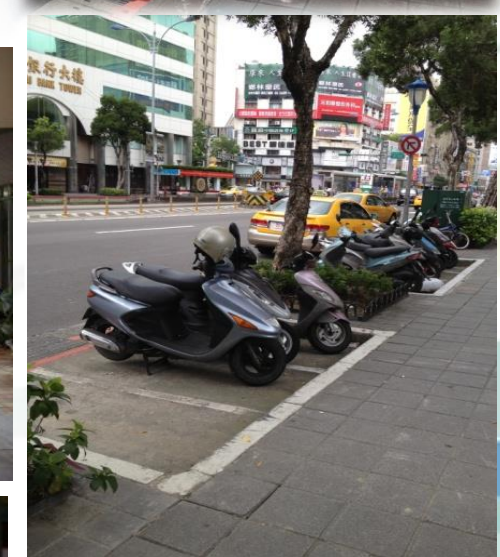


Our Cities and Challenges

- High Motorization
- Diversity of Land Use
- High Density of Population
- Mixed Traffic Flow Characteristics
- High Fatality in Traffic Accidents
- Enforcement vs. Efficiency
- Reforms being proposed:
 - Low Carbon City, TOD City, Smart & Livable City, Active Mobility, Public Transport, Public Bike, ...



Policies for Managing Motorized Vehicles



But, motorized vehicles are still the majority in cities while pedestrian and cyclist spaces are usually ignored.



Source:
<http://michaelturton.blogspot.com>

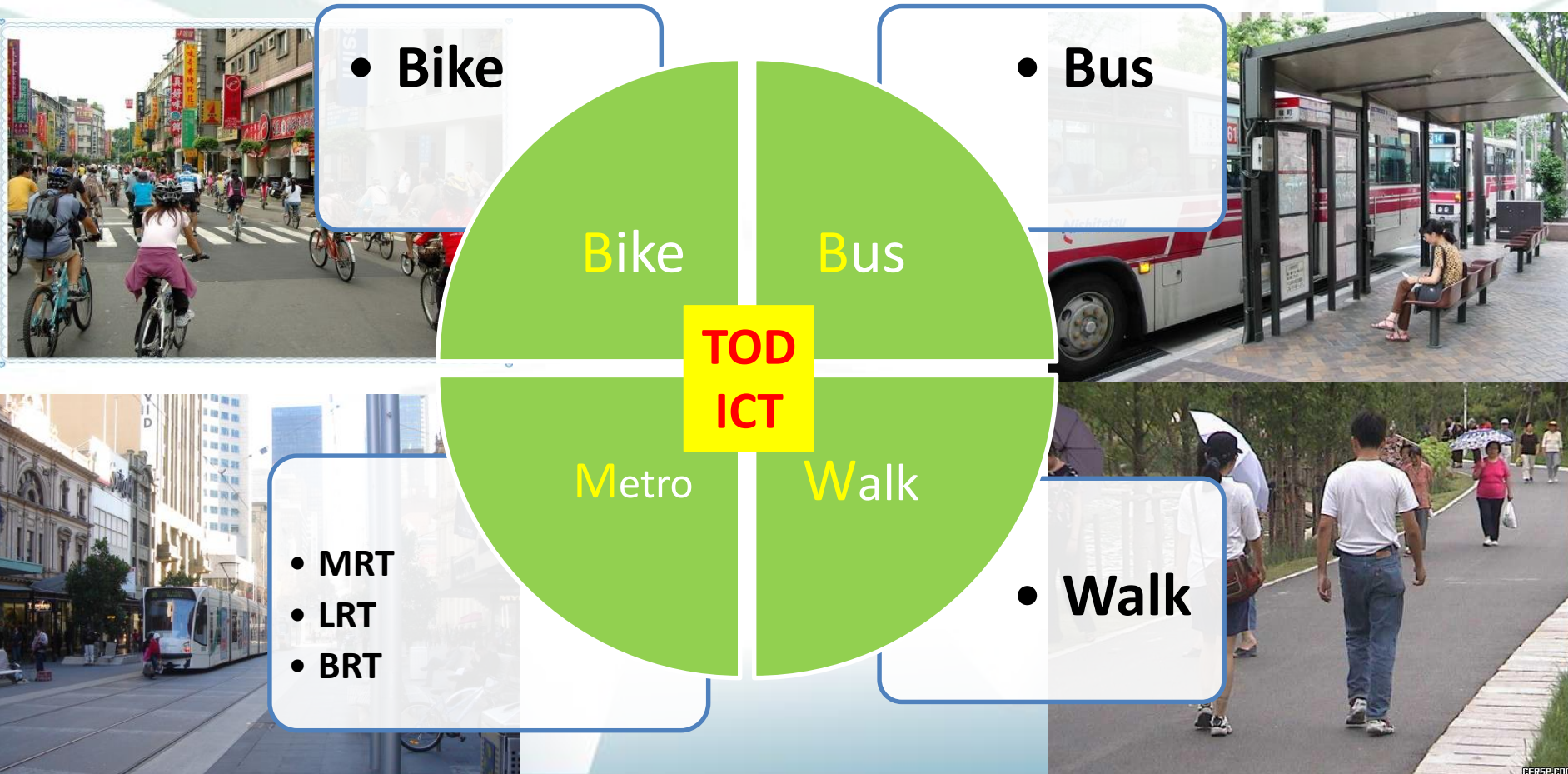
Integrated Urban Transport Policy

- Sustainable Development (Environmental, Social, Economic/Financial and Governance)
- Integration of Land Use/Development and Transportation Planning
- Excellent Public Transport Services
- Friendly Environment for Active Mobility
- Safe & Integrated Expressway and Road Network
- Efficient Travel Demand Management

Policy of Green Mobility for Livable City

BBMW Integration Policy (TOD + ICT)

- Integration of **B**ike, **B**us, **M**etro, and **W**alk through land use, urban planning, urban design, and urban re-generation as well as ICT



Excellent Public Transport Services

- Public Transport Oriented Development TOD
- World Class Metro
- High Quality Bus Services
- Friendly Environment for Cycling and Walk
- Safe, Reliable Taxi and DRT Services
- ITS for PT & Active Mobility



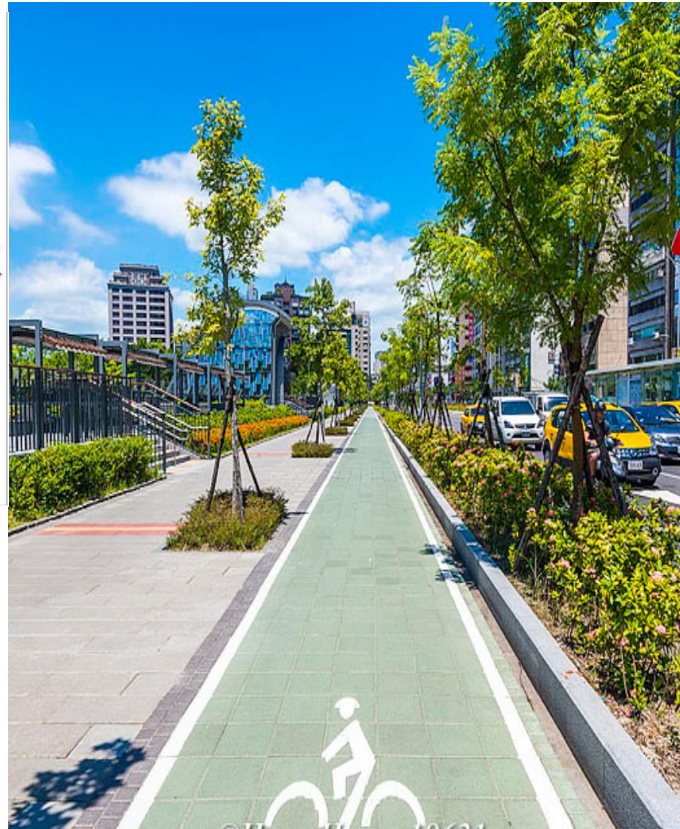
Advanced Public Transport Systems: Excellent Services

- Passenger Information System
- Operation Management System
- Safety and Security System
- E-Payment/Ticketing System
- Smart Terminals
- Taxi, DRTS, Ride Sharing



Taipei: Livable TOD Corridor

1. Re-allocation of road space in Metro Corridor; 2. Active Mobility on Streets with 40+ m; 3. 192 km bike tracks will be added within 3 Years.



Smart Design of Multimodal Terminals



- City-Bus + Intercity-Bus
MRT + Taxi + Bike + Walk + Parking
- Office + Shopping Mall + Hotel
- Transit-Oriented Development
- PPP Projects



e-Payment/ Ticketing System

+ Security + e purse

Ferry

Curb Parking



Off-street Parking

Urban Rail w/ Mobile Phone



Railways



Bus



Taxi



Cable Car

Multi-media Payment System



Smart Card Ticketing System: Public Private Partnership Approach

● Taipei PPP Approach (2002.06)

● Public Sector (48%)

- MRTTC: 28%

- Transport Bureau: 15%

- Parking Administration

- Public Bus Corp.

- Taipei Bank: 5%

● Private Sector (52%)

- Bus Operators (9): 27%

- Partner: 25% (Through an Open Bid Process)



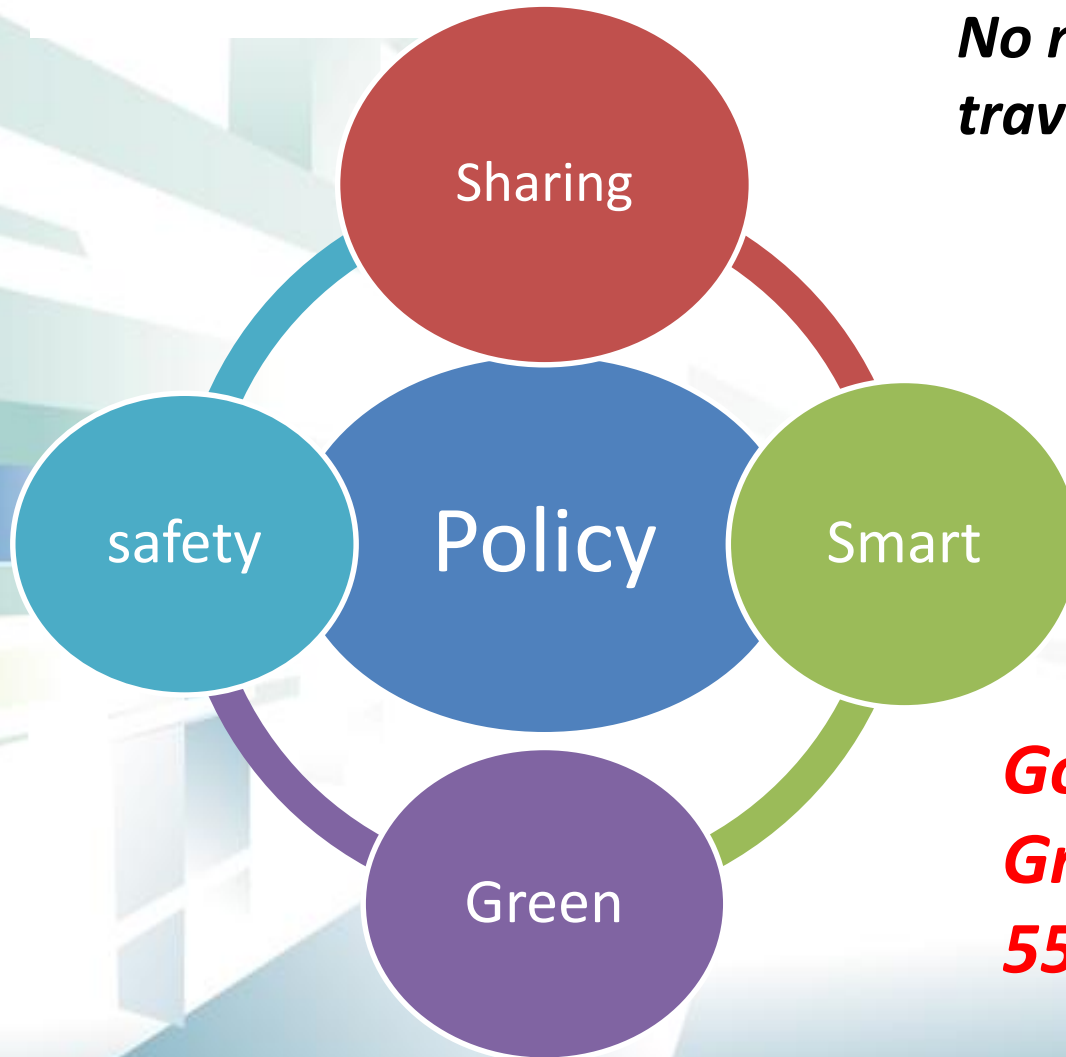
Push & Pull Policy

Clear Policy and Management:

- No Free Parking
- Engineering
- Education
- Enforcement
- Innovative Services



Transport Policy in Taipei 2017~2025



No need to buy cars to satisfy travel needs for citizens

Vision: Sharing transport as the core and smart management as the base to realize a safe and harmony green living

***Goal:
Green Mobility from
55% to 70% by 2025***

Sharing Mobility in Taipei



Bike sharing

- YouBike
- oBike

Bus

- Rehab Bus

Scooter sharing

- WeMo

Car sharing

- EV sharing

Taxi

- Wheelchair-accessible Taxi
- Uber

Smart Sharing Systems of Bike, Motorcycle and Car



U-Motor

YouBike



U-Car



source: Zipcar



source: car2go



gogoro



gogoro 能源網路™

- Priority : Poor MRT coverage area and parking supply shortage districts
- Electric motorcycles
- gogoro and WeMo

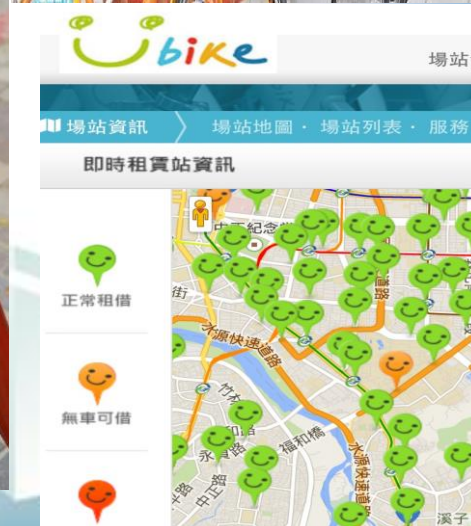
- Coordinate with car purchasing limitation and public housing
- Rental stations at public housing and public parking lots
- Electric vehicles/ Personal Mobility Devices

Public Bike Sharing Systems

- ➔ Taipei Core City: 400 Stations + 13,072 Bikes
- ➔ Metropolitan: 820 Stations + 28,000 Bikes
- ➔ Turn over Rate: 6.2 /bike/day (City 8.3)
- ➔ Public Health Benefits: US\$4.0 Mi
- ➔ PPP Approach

Fare strategy:
No Annual Fee

Easy to Register
in 3 min in Kiosk



YouBike PPP Model

➤ A Successful PPP Model for Taipei



Public-Private Partnerships

WeMo Motorcycle Sharing System



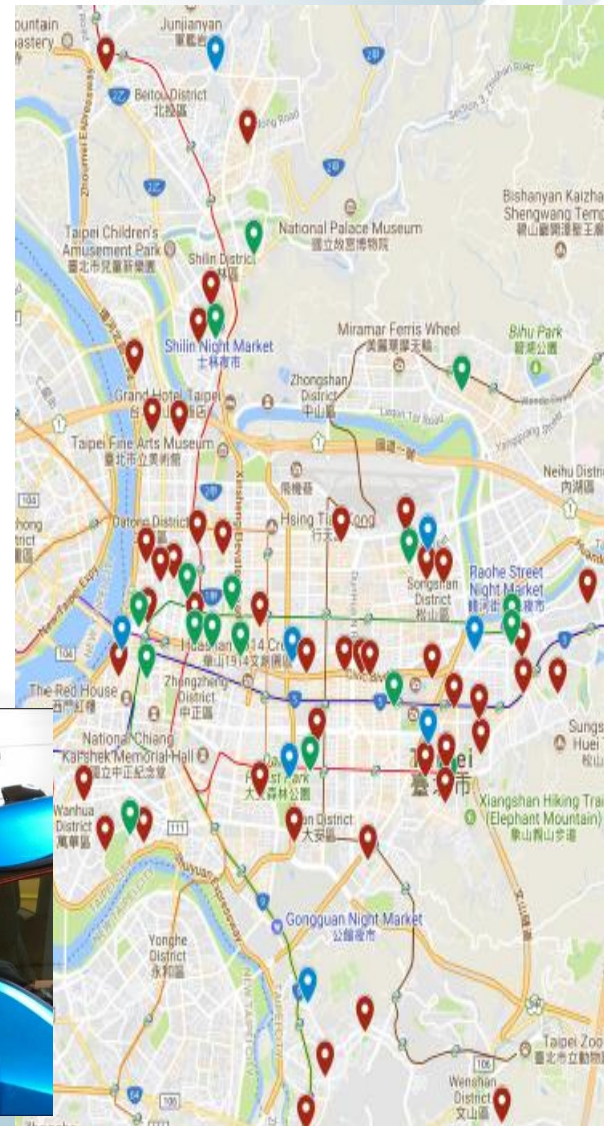
- Launched October 2016
- Battery exchangeable E-scooter
- 1,000 scooters in Taipei
- 44,320 Registered Users
- NT\$15 for the first 6 minutes , than NT\$2.5 for every additional minute.
- Extra discount for 18 – 24 years old.

WeMo believes an service-oriented business model is best to accelerate green mobility's influence



Friendly Environment for EV Sharing and E-Bus

- Installed 128 EV chargers in 79 public parking lots
- 400 Electric Buses by 2020
- 4,000 E-Bus by 2030



EasyCard e-Payment System

All Pass Ticket



Monthly travel pass for Metro,
Bus, and Public Bike



雙北全區 30日
ALL PASS TICKET
NT\$1,280

一張定期票
雙北任走跳

臺北捷運+雙北公車

吃到飽

臺北市 YouBike

前30分鐘

免費

新北市YouBike維持既有前30分鐘免費

3/13起 開放預購
4/16 開通使用



詳情請上官網

專線 1999 臺北市民服務專線
1999 臺北市民服務專線



臺北市政府交通局



臺北捷運有限公司



臺北市民公共運輸處

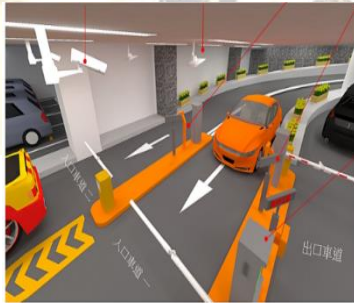


臺北YouBike

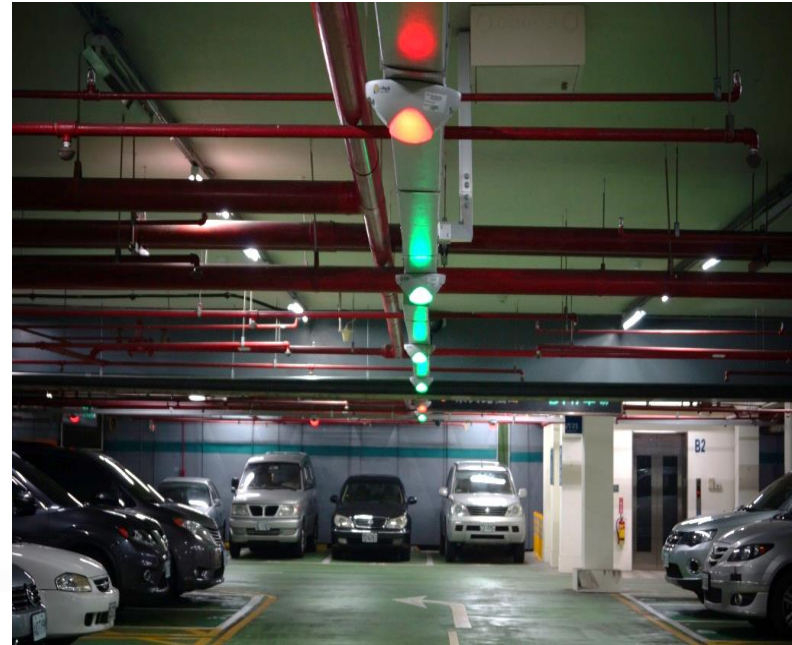


悠遊卡

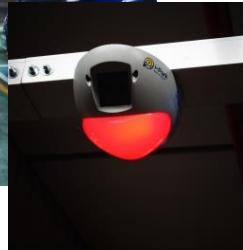
Taipei Smart Station



Smart Parking Management



Parking Meter



No
Vacancy



Vacancy



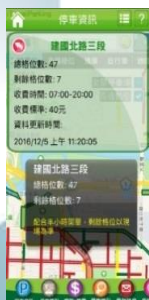
Special parking
space



APP



Parking guide



Smart Street Light in Taipei

- Three Year Smart Street Light Project: NT\$4.3 Mi
- 2019: 12,000 Street Lights
- 2020: 9,000 Street Lights
- 2021: 16,000 Street Lights

Thursday, 31 May 2018 18:16

Smart Street Light Will Be Deployed Widely in Taipei



Taipei City Government announced that an investment of NT\$1.3 billion will be taken for the construction of smart street light within 3 years since 2019. 12 thousand smart street light are scheduled to be set up in 2019, and over 9 thousand in 2020. The goal is to make 160 thousand street lights smart in Taipei by 2021.

Management of New Mobility

- To draw up “Autonomy Regulation for the Operation and Management of Sharing System Operator”
- Set a Line group for authorities and bike company as a platform for immediate contact and communication
- Have incentive for service providers
- Enhance the enforcement and regulation of bike illegal parking



The 3rd ITS National Plan 2017-2020

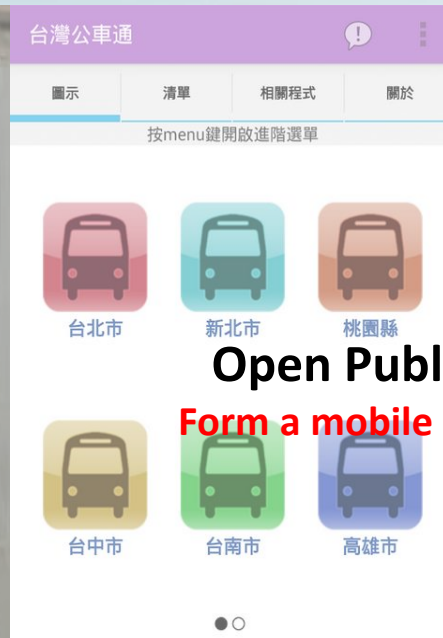
ITS⁵- Safe, Smooth, Seamless, Sharing, Sustainable
ITS⁵⁺¹- Integrated Transport System

- US\$100 million for investing and leveraging ITS development
 - Smart Traffic Safety Program
 - Smart Integrated Corridor Management Program(ICM)
 - Rural Area ITS Application
 - MaaS (Mobility as a Service)
 - Connected vehicles and automated vehicles
 - ITS R&D



ITS Deployment

Multi-Smartcard Integration
Island-wide tour one card in hands



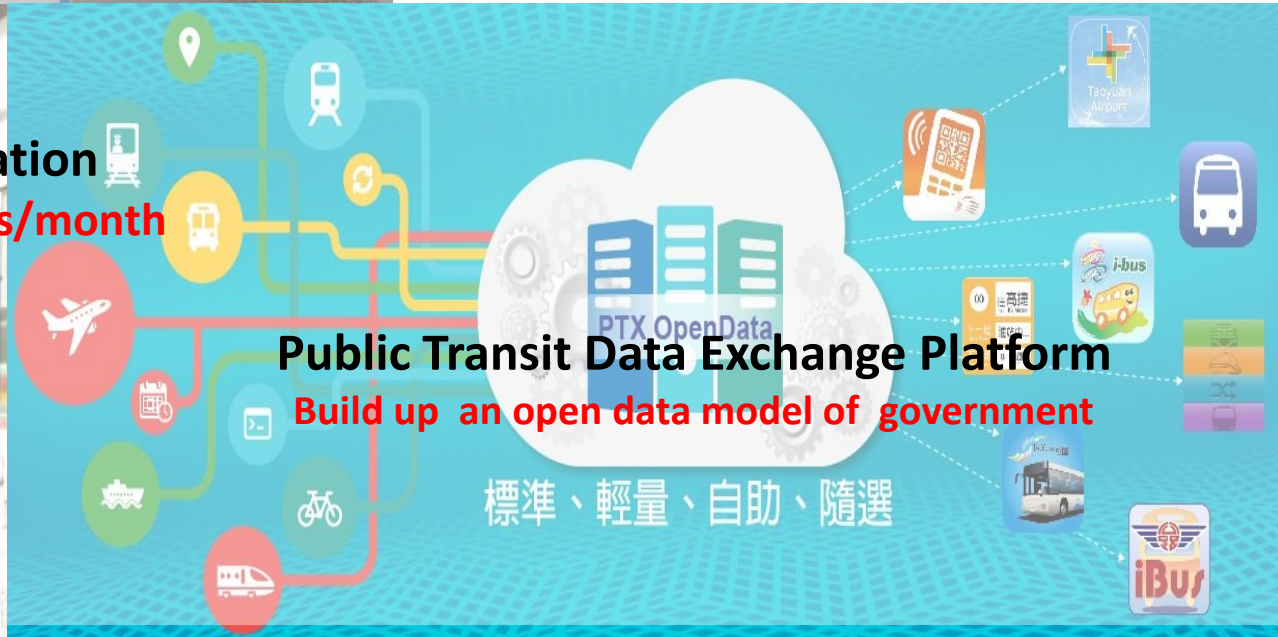
307	
往 新海抽水站	往 莊敬里
員山派出所	837-FR 即將進站 低地板
中和高中	即將進站
連城路	即將進站
海外公司	2分
大同公司	4分
台貿一村	4分
連城板南路	5分
連城景平路	6分
華中橋	8分
果菜市場	831-FR 即將進站 低地板 3分

Open Public Transit Data
Form a mobile phone APP upsurge

Bus Real-time Information
More than 30 million queries/month for Taipei City



Public Transit Data Exchange Platform
Build up an open data model of government



ITS Traffic Safety and CV

Two-wheeler Safety

On Motorcycle

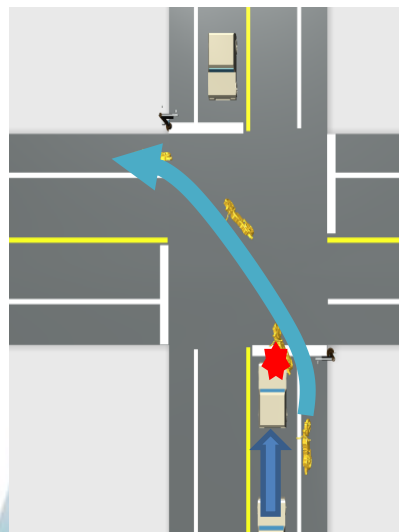
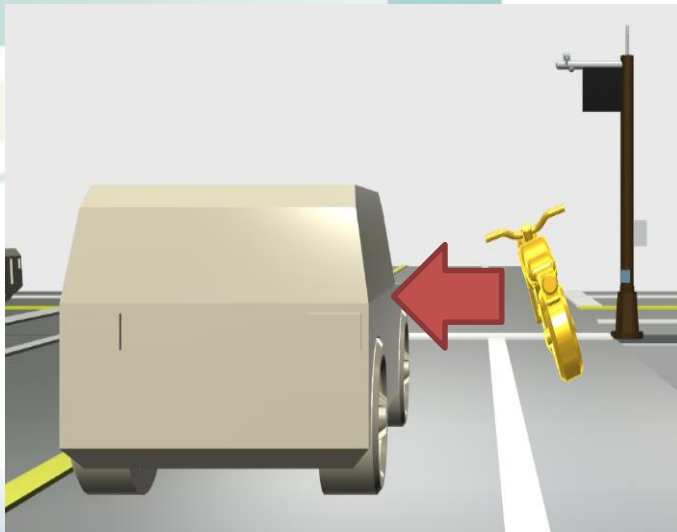
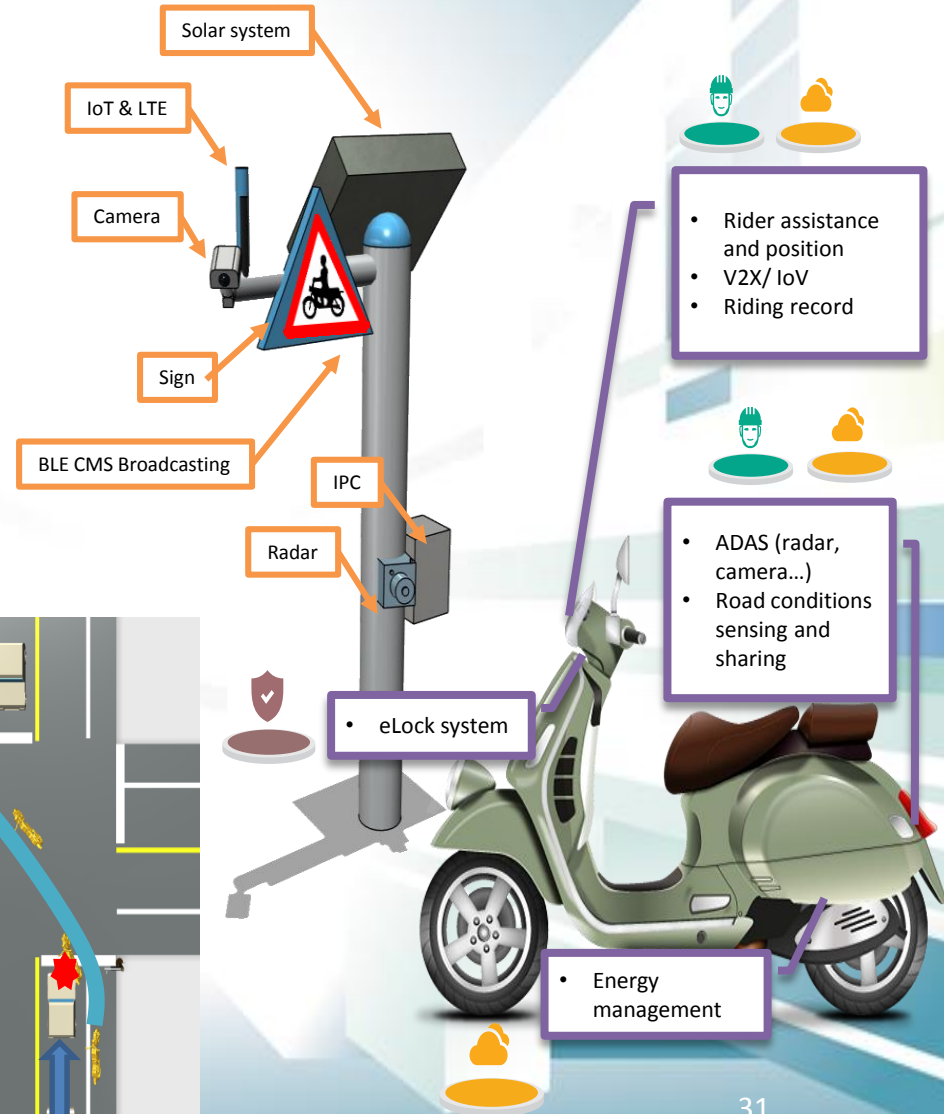
- Use sensor and active RFID to broadcast the position

On Car

- Receive the advise from roadside smart pillar
- Predict the motorcycle behavior (Intelligent ADAS)

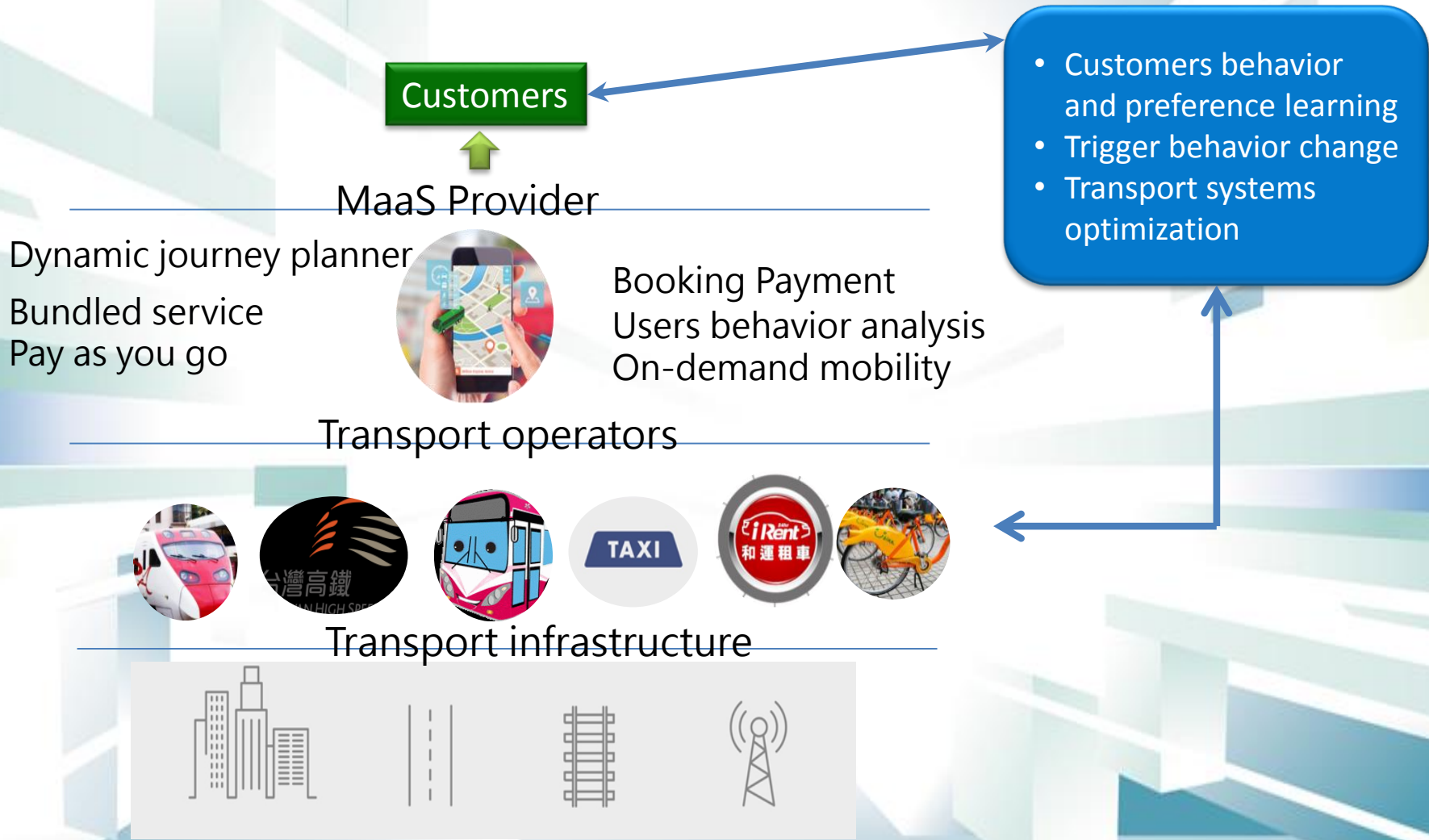
Roadside

- Sensor fusion technology to detect motorcycle behavior (not only detect the object)
- Use Edge computing to estimate the dangerous case
- Report traffic condition for traffic management



MaaS

Taipei-Yilan Corridor & Kaohsiung City



MaaS Journey Planner

Seamless Mobility Service

Value-added Services

First Mile

Taipei-Yilan Corridor

Last Mile

Attractions

MRT/Bus

Highway
shuttle bus

Local Bus

Restaurant &
Cuisine

Taxi

Train

Taiwan Tour
Bus

Scenic Spots

Chartered
Vehicle

Chartered
Vehicle

Chartered
Vehicle

Gift & Souvenir

Shared

Ride Sharing

Taxi

Accommodation

Alternative time
or route choice

Shared

Parking
Reservation

Car Rental

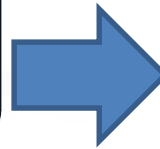


ACE Center Automated, Connected and Electric Vehicles Research Center

Subsidies driverless pilot projects in
Taipei, Kaohsiung & Taoyuan Cities

Draw regulatory sandbox for applying
autonomous vehicle tests

Build up Autonomous vehicle testbed
in Taipei, Taoyuan and Tainan



Driverless Bus Trials



Autonomous Bus Testbed

Taipei City Government
Actively Built the Test Field
for Autonomous Cars

Trials in BRT Corridor



Taoyuan Demo



next

1. Technical experiment (V2V · V2I)
2. Regulatory adjustment
3. Public Service/ Business model

Concluding Remarks

- Vision, Policy, Strategies and Action Plan for Implementation of ITS
- Financial and Governance Sustainability
- Cooperation and Coordination among Different Departments
- Role and Teamwork of NGOs, Academia, Industry and Public Sector
- Needs for Research and Planning
- Impacts of Digital Tsunami
- International Collaborations





Trade Show

Taipei Smart City Summit & Expo

"Building Smart City on IoT"

Taipei, Taiwan

26-29 Mar 2019

2018 TSCSE

30,847 Visitors

1,050 Booths

365 Speakers

65 Forums

62 Mayors/Deputy Mayors

50 Countries/ 120 Cities

Thanks

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