ITS Development and Perspective In Taipei City

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Outline

1. Background
2. ITS Vision
3. What We have Implemented
4. What We will Implement
5. Conclusion
1. Background

Taiwan has high population density, many motorcycles, and diverse transport modes. It's a multimodal island with extensive ICT networks.
### Fast Facts about Taipei

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Taipei</th>
<th>Greater Taipei</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population ( million persons )</td>
<td>2.7</td>
<td>6.7</td>
<td>23.4</td>
</tr>
<tr>
<td>Area ( km² )</td>
<td>272</td>
<td>2,324</td>
<td>36,193</td>
</tr>
<tr>
<td>Population Density ( persons/km² )</td>
<td>9,942</td>
<td>2,869</td>
<td>647</td>
</tr>
<tr>
<td>Numbers of Registered automobile</td>
<td>787,676</td>
<td>987,361</td>
<td>7,554,319</td>
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<tr>
<td>Numbers of Registered motorcycle</td>
<td>980,577</td>
<td>2,191,138</td>
<td>13,735,994</td>
</tr>
</tbody>
</table>
Perspective of City Transportation

Sustainable & Humanistic

Green Transportation

Traffic Safety

Quality Service

Intelligent Transportation

Barrier-free Environment
In Search of Sustainability & Humanity

Mode Share of Taipei City in 2013

- Green Transportation: 57.3%
- Motorcycle: 27.5%
- Automobile: 15.0%
- Other Private Vehicle: 0.2%
- Metro Rapid Transit: 25.2%
- City Bus: 31.1%
- Others Public Transit: 9.3%
- Bike: 9.1%
- Walk: 25.3%

Target mode share of Green Transport is 70% in 2020
Traffic Characteristic of Taipei

Number of Registered Motor Vehicles

(Thousand veh.)

Average Daily Public Transit Volume

(Million persons/day)

<table>
<thead>
<tr>
<th>Year</th>
<th>Bus</th>
<th>Motorcycle</th>
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</thead>
<tbody>
<tr>
<td>2003</td>
<td>1.68</td>
<td>1.68</td>
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<tr>
<td>2004</td>
<td>1.71</td>
<td>1.69</td>
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<tr>
<td>2005</td>
<td>1.69</td>
<td>1.71</td>
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<tr>
<td>2006</td>
<td>1.71</td>
<td>1.70</td>
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<td>2007</td>
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<tr>
<td>2008</td>
<td>1.76</td>
<td>1.72</td>
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<tr>
<td>2009</td>
<td>1.74</td>
<td>1.68</td>
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<tr>
<td>2010</td>
<td>1.65</td>
<td>1.70</td>
</tr>
<tr>
<td>2011</td>
<td>1.74</td>
<td>1.65</td>
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<tr>
<td>2012</td>
<td>1.74</td>
<td>1.65</td>
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<tr>
<td>2013</td>
<td>1.74</td>
<td>1.65</td>
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</table>
2. ITS Vision

i-Taiwan - create an intelligent and sustainable environment for all to live and visit in Taiwan.

People Oriented - NOT Technology Oriented.
All public transport riders can get reliable real-time information - any time, any where, any information, any service, any connection, any device!

Advanced Public Transport Services (APTS)
All drivers can get reliable and applicable real-time traffic and parking information – when needed, where needed!
All traffic signals are dynamically and efficiently managed for all road users as one network – well coordinated and integrated!
All commercially operated vehicles: trucks, taxis and buses, can be reliably tracked, traced and dispatched in real-time!
All people can use just one single smart card / phone to pay for all passenger transport services – bus, rail, metro, taxi, ferry, parking, public bike, and more!
Whole View

i-Information
- Road, Park, Bike, Metro, Bus, Taxi, Ferry

i-Management
- Road, Vehicle, Sign, Station, Terminal

i-Payment
- IC card, eTag, Mobile Phone

Open Data + Laboratory Site

i-Application
- Value Adding by Private Sector

i-Decision Support
- Planning, Policy, Communication
3. What we have implemented

Established Intelligent Transportation since 1993.

<table>
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<tr>
<td>Signals</td>
<td>2,486</td>
<td>260</td>
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<tr>
<td>CCTV</td>
<td>697</td>
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<tr>
<td>VD</td>
<td>151</td>
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<tr>
<td>Other Equipment</td>
<td>12</td>
<td></td>
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<tr>
<td>TOTAL</td>
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<td>1.683 bil</td>
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<td>269 mil</td>
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<td>CCTV</td>
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<td>412.51 mil</td>
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<td>VD</td>
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<td></td>
<td>20.83 mil</td>
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<tr>
<td>CMS</td>
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<td>6.25 mil</td>
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<td>CVOS</td>
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<td>113 mol.</td>
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<tr>
<td>Other Equipment</td>
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<td>EPS</td>
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<td>2.751 bil.</td>
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</table>
i-Road
Core is Traffic Control Center

- functions of Traffic Control Center
  - Data collection and analysis
  - Signs and lanes control
  - Expressway traffic control
  - Vehicle detection management
  - Real-time traffic information supply
i-Road Traffic Monitoring System
Architecture, features and benefits

Transmission system:
Fiber optic, ADSL, Wireless

Roadside Equipment
(CCTV)
(VD)
(CMS)

The central Computer system
• Road side equipment control
• Data processing
• Traffic performance
• Image control platform

Function

• Traffic control
• Data collection & analysis

Efficiency

Publishing road conditions
Guide for road user
Choose a better path

Signal management
Shorten the time of events

• Data collection & analysis

Efficiency

Develop a traffic strategy
Data exchange for organs

Guide for road user
Choose a better path

Shorten the time of events

Enhance the efficiency of road

Develop a traffic strategy
Data exchange for organs

Guide for road user
Choose a better path

Shorten the time of events

Enhance the efficiency of road

Develop a traffic strategy
Data exchange for organs
Main monitor system

- Expressway monitor system, 2000
- Shin-yee Project Zone, 2005
- Neihu technology Park, 2006
- Nangang Sofeware Park. Glossary, 2009
- Yuanshan Area, 2010
- All equipment replace, 2011
- Main road accident monitor system, 2013

Easy congestion or Accident Intersection

Expressway Monitor system

Yuanshan area Monitor system

Neihu, Nangang and Sin-Yi Monitor system
Publishing Traffic Service on Road

- CMS
  - Usage Rate: High

- Data Exchange

- Web

- Voice & Fax
  - Usage Rate: Low

- Congestion
- Road Regulation
- Estimated Travel time
- Visualization
- Road Performance
- Accident
- Road construction

CMS Data Exchange Web Voice & Fax

19
i-PARK Parking Information and Guidance System

Pre-Travel
- Web site
- Voice Inquiry

Traveling
- Parking Information and Guidance Signs

Parking Lot
- Information & Guidance Signs inside Parking lot
- To find car location by Scanning QR Code
Efficiency of Parking Information and Guidance System

Survey
- 90% Positive Benefit
- Time saving for looking for a parking space- 9mins
- 92% users “LIKE”

Users
- Knowing the available spaces in advance.
- Reduce the time for searching and parking.

Management
- Efficient use of parking cell.
- Upgrade the level of road service.

5.35 million persons are benefit of searching time estimation by an average of 9 minutes with this system. It adds up to 48.23 million minutes of searching parking spaces, and it cut down by close to 5.35 million kilos of Carbon.
i-Bus

- The system has been implemented since 2009
- 1.7 million passengers/day
- More than 300 bus routes and 4,000 buses
- In 2013, there are 60.5 million accesses of bus information
- Accuracy rate = 93%
- In 2014, 92.5% of users are satisfied with i-Bus service
Travel Planning for Public Transportation -- Provide planning services to people to take public transport interchange
i-Bus

- No-pass-by message
  - After being informed traffic regulation, Bus diversions can be released within 10 minutes

- The last bus had passed
  - Avoiding citizens waiting at night

- Publishing channels: Web, telephone voice, intelligent stop, operator interface
i-Bus

- Proactive coordination with NTC before opening the data
- Combined with NTC bus routes in Jan. 2012
- Combined with NTC intercity routes in Dec. 2012

Information about New Taipei City (NTC) Bus routes and intercity routes

Cross cities
i-Terminal

Smart Terminal Management: Intercity Bus Station

- RFID-based intelligent management systems
- 24-hour control center
- Highly-efficient operation
i-Terminal
Taipei City Hall Bus Station
CTV Monitoring
AVI System
Passenger-Counting System
i-Taxi

- Planning in 2001, deployment in 2002
- Fleet of 10,000 taxis in Taipei City
- **Technical Contents:**
  - GPS positioning
  - GPRS wireless communication
  - GIS electronic mapping
  - Taxi on-board unit and antenna
  - Taxi IC-card and credit-card reader
  - Service call center
  - Taxi dispatching module
  - Taxi tracking and logging modules
  - Fleet management modules
  - Customer billing and records modules
i-BIKE
Public Bike Sharing System - YouBike

Today: 196 stations, 6,054 bikes

- Easy to apply for membership
- Convenient to pay the fees
- Real-time info. about bikes and spaces available
- RFID smart management
- Over 30 million cumulative trips
- 70,000 trips/day
- 12 turnovers/day per bike
- 94% of users are satisfied with YouBike service
i-App
Fun Travel in Taipei (FTiT)

Smart Phone Apps

Making your travel in Taipei easier!

- Bus
- Road
- Parking Lots
- Metro
- Public Bike
- Taxi
- River Cruise
- Intercity Transport Info.
- News

Over 14 million/month
Functions of FTiT — Traffic info.
Functions of FTiT - Parking

Taipei City Hall Plaza Underground Car Park

- Total number of parking spaces: 2027
- Available spaces: 770
- Motorcycle: 1137
  - Available: 160
  - Bike: 31

Open hours: 00:00:00 to 23:59:59...

Phone number: 2723-6456

Timing:
- 30 NT$ (9-18), night timing of 10 NT$ (18-9)
- Locomotive meter times 20 full sun
- and the moon ticket 4,800 NT$ (original price $7,200), small car at night promotions monthly pass $1,000 (limited to Monday to Friday 19, and Saturday, the anniversary of the day...
Functions of FTiT — Bus info.
Functions of FTiT — YouBike & News
Functions of FTiT - MRT

MRT
Functions of FTiT - Taxi & River Cruise

Taxi
- FU An Taxi
- Chihiyin Taxi
- Da Ai Taxi
- TaipeiStart Taxi
- Fu Xie Taxi
- Ju Yi Taxi
- Lan Tian Shi Taxi

River Cruise
- Dajia Wharf
Functions of FTiT - Intercity Info.
Functions of FTiT — Alert & My Favorite
Achievements of FTiT

Inquire times/month

WinPhone
WinMobile
Android ENG
Android
iOS ENG
iOS

14.96M
Achievements of FTiT

No.3 of hot free App, No.1 of Travel App in Apple App Store

Reported on TV and Magazines
i-Payment
EASY CARD

The most popular Electronic Payment Service (EPS) in Taiwan

A ‘touch-and-go’ IC ticketing system

- 5.2 million transaction times/day
- 43 million cards launched
- Market share is over 70% in Taiwan.
Other Services
Open Data — Cooperate with Private Section

TCG has opened data since 2009, and it is the first in Taiwan.
Led to the development of smart phones’ App and others.
Other Services
Channels of Open Data

Main achievements

- **102** data exchange
- **73** Products of APP

**App**
- Bus: 轉乘通, 台北公車, Speedbus, 台北等公車, MyBus, i84
- Navi: 轉乘通, naviking, 遠傳行動導航, 威寶電信, Mr. Navi, 行動導遊
- Bank: 玉山, 土地, 臺灣, 聯邦, 第一, 永豐

**Map**
- Google Maps
- Urmap

**OBD**
- Fly Vision
- Luxgen

**Research unit**
- Academia Sinica, Institute of Transportation, Institute for Info. Industry, universities
Other Services
Open Data: Real-time Transportation Info.

- More value-added services
- A motivation to innovate

70 million /month
Achievements of Open Data

- According to ITRI industrial economy and trend Research Center survey, open data in traffic information on Taipei City Leading United States major cities, second only to United Kingdom, London.

- Mutual-help to disseminate traffic information or promotion of municipal information
Other Services
A Citywide Free WI-Fi Network

- Over 6,000 hotspots set up in the indoor and outdoor public areas
- More than 2.7 million account applications
- More than 3.8 million users every month
Achievements of ITS

Outstanding Transportation Project Award granted by the Eastern Asia Society for Transportation Studies, 2013.

4. What we will implement

Mobile Payment

Integrated Full Service

Focus on I-Decision & I-Management for Government

Open Data to Private for Value Adding

Open Communication by web
Mobile payment
Integrated car on-board unit. (Bus, Taxi, MRT)
Integrated Full Service

- Integrated Traffic System
- More Cross-Domain
- Traffic Control
- Bus
- Parking
- GIS
Focus on I-Decision & I-Management for Government

- Integrated Multimode Traffic System
- Bus Demand- Supply service
- Taxi-Dispatching, Demand- Supply service
- Motorcycle-Safety
- Others-Tour bus, Trunk, and Evaluate
Open Data to Private for Value Adding

More creativity
Open Communication by web

公館慢行徒步區民意徵詢票選

為了瞭解各界對「公館慢行徒步區」的看法，臺北市政府交通局透過 i-voting 讓您將意見表達出來，只要您曾經經過「公館慢行徒步區」，或對「公館慢行徒步區」是否有建議或想法，都可以在 104 年 1 月 14 日(三) 0 時至 20 時登記參加「公館慢行徒步區」票選，並在 1 月 15 日(四) 0 時至 16 時參與投票，您的意見將作為當地店家及住戶表達意見時的參考。更詳細的資訊請點選 公館慢行徒步區。
5. Conclusions

Easy Travel, Smart Management, Creative Application are the Goals.

Information and Communication Technologies Induce Unlimited Imagination

One card and one phone on hand, Smart and Easy Travel in Taipei.
Thanks For Your Attention!