ITS and its Applications of GNSS in Thailand

Sorawit Narupiti
Associate Professor of Civil Engineering, Chulalongkorn University
President, ITS Thailand
Contents

• Thailand
• Thai Transport Conditions
• ITS Applications in Thailand – Overview
• GNSS Applications in Transport
• Traffic Information Services
• Conclusion
Facts about Thailand

- **Population:** 66,720,153 (July 2011 est.)
- **Land area:** 513,120 sq km
- **GDP per capita (2008):** 136,921 Baht/year ($4,560)
- **# of registered vehicles (2010):** 28.5M (Car+Pickup 9.4M, motorbike 17M)
- **# of accident (2009):** 85,000 (Killed 11,000, Injured 115,000)
• Smart phone in Thailand
  – 1.2 million phones this year (40% of new sales)
  – Accounts for 15% of total mobile phones
• GPS tracking system
  – Vehicle Tracking grows 10-30% per year
  – Especially logistics business as basic equipment
ITS Applications in Thailand

- Traffic Information
- Traffic Management
- Public Transport
- Commercial Vehicle
- Safety
- Electronic Payment
Traffic Information

- Much progress on traffic information services
- More raw traffic data in the past 3 years

Traffic Management

- Many projects are underway such as ATC, Expressway Management
- Some low-cost solutions
**Public Transport**

- Demonstration of Bus Management system (tracking) – BMTA
- BRT with comprehensive ITS
- Plan for introducing public transport monitoring (GPS tracking)
- Demo – Railway crossing

**Commercial Vehicle**

- Popular vehicle tracking system
- Not yet enforcement by ITS
Safety

- Running red light enforcement
- Research and Development such as V2V (CarTalk by NECTEC)

Electronic Payment

- Re-introducing Electronic Toll Collection (Expressway) in 2010
- Plan to introduce Common Ticket (public transport)
GNSS Applications in Transport

- **Vehicle Tracking**
- **Probe Vehicles**
- **Road Management**
Vehicle Tracking
# Energy Saving Project in Thailand

The system helps company use less fuel and manage fleet resources with greater efficiency.

<table>
<thead>
<tr>
<th>No.</th>
<th>Company</th>
<th>Type</th>
<th>Number of Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mechoc Transport, Ltd.,</td>
<td>Truck</td>
<td>132</td>
</tr>
<tr>
<td>2</td>
<td>Tanakorn, Ltd.,</td>
<td>Truck</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Saha Oil Transport, Ltd.,</td>
<td>Truck</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Peenong Transport, Ltd.,</td>
<td>Truck</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Chaipathana Transport, Ltd.,</td>
<td>Bus</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td>Lima Logistic, Ltd.,</td>
<td>Truck</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Nakornborikan Transport, Ltd.</td>
<td>Van</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Company</th>
<th>Type</th>
<th>Number of Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mechoc Transport, Ltd.,</td>
<td>Truck</td>
<td>132</td>
</tr>
<tr>
<td>2</td>
<td>Tanakorn, Ltd.,</td>
<td>Truck</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Saha Oil Transport, Ltd.,</td>
<td>Truck</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Peenong Transport, Ltd.,</td>
<td>Truck</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Chaipathana Transport, Ltd.,</td>
<td>Bus</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td>Lima Logistic, Ltd.,</td>
<td>Truck</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Nakornborikan Transport, Ltd.</td>
<td>Van</td>
<td>20</td>
</tr>
</tbody>
</table>

## Test Before and After

<table>
<thead>
<tr>
<th>No.</th>
<th>Company</th>
<th>Type</th>
<th>Number of Vehicle</th>
<th>Oil (km)</th>
<th>NGV (km)</th>
<th>(Oil) Ltr/100km</th>
<th>(NGV) KK/100km</th>
<th>The percentage of savings.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mechoc Transport, Ltd.,</td>
<td>Truck</td>
<td>132</td>
<td>315,459</td>
<td>408,217</td>
<td>48.98</td>
<td>41.59</td>
<td>4.21%</td>
</tr>
<tr>
<td>2</td>
<td>Tanakorn, Ltd.,</td>
<td>Truck</td>
<td>16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>13.23%</td>
</tr>
<tr>
<td>3</td>
<td>Saha Oil Transport, Ltd.,</td>
<td>Truck</td>
<td>23</td>
<td>46,902</td>
<td>-</td>
<td>25.66</td>
<td>-</td>
<td>2.00%</td>
</tr>
<tr>
<td>4</td>
<td>Peenong Transport, Ltd.,</td>
<td>Truck</td>
<td>14</td>
<td>84,082</td>
<td>-</td>
<td>22.15</td>
<td>-</td>
<td>4.12%</td>
</tr>
<tr>
<td>5</td>
<td>Chaipathana Transport, Ltd.,</td>
<td>Bus</td>
<td>86</td>
<td>526,789</td>
<td>27.06</td>
<td>27.06</td>
<td>25.96</td>
<td>4.00%</td>
</tr>
<tr>
<td>6</td>
<td>Lima Logistic, Ltd.,</td>
<td>Truck</td>
<td>10</td>
<td>10,263</td>
<td>3,248</td>
<td>31.65</td>
<td>30.50</td>
<td>10.81%</td>
</tr>
<tr>
<td>7</td>
<td>Nakornborikan Transport, Ltd.</td>
<td>Van</td>
<td>20</td>
<td>59,789</td>
<td>-</td>
<td>10.67</td>
<td>-</td>
<td>5.23%</td>
</tr>
</tbody>
</table>

## GPS Tracking

The GPS tracking system provides real-time monitoring of vehicles, ensuring optimal routes and reducing unnecessary travel.
Taxi Probe Car

Police Report
Lat: 100.55
Lon: 13.79
Type: Accident
Code: 216
Description: จุดติดกันรถยนต์ชนกันที่แยก สามารถคาดการณ์ 100 เมตร

Probe Car
Car ID T18720
Lat: 100.54
Lon: 13.77
Type: Queue
Speed: 60 Km/H

Probe Car
Car ID T18720
Lat: 100.54
Lon: 13.77
Type: Queue
Speed: 10 Km/H
Road Management and etc.

- Road condition survey
- Map Making
- Research

DGPS/OmniStar
+/- 2 meter
Various organizations offer the service

With the introduction of probe vehicles, traffic information services have been much advanced recently

Vehicles providing traffic data
  – 3,000 vehicles (iTIC) to be 10,000 vehicles in 2012
  – 10,000 vehicles (TTET) soon

Mobile probes are available (Traffy, Longdo, iTIC)
Notable Traffic Information Services in Thailand

- TIC
- Traffy
- Longdo
- Toyota Tsusho Electronics (Thailand) Co., Ltd.
1. Set up standard of distribution. 2. Distribute traffic information.

**Tier 1 = iTIC**

1. Collect traffic raw data. 2. Process the data.

**Tier 2**

1. Set up standard of distribution. 2. Distribute traffic information.

**Receivers**


**Navigators**


**Government**

- CCTV
- Traffic police (137) Bangkok city (150)

**Private source**

- Taxi probe (Howa, DTC)
- Bus probe (Metro bus)
- Logistic probe (PTT, TTT, TTK)
- Mobile phone probe

**Technical support**

1. Nectec
   (National Electronics and Computer Technology Center)
2. MetaMedia
3. Thai Engineers and Professors

**Company X**

1. Collect traffic raw data. 2. Process the data.

**Company Y**

1. Collect traffic raw data. 2. Process the data.

**Company Z**

1. Collect traffic raw data. 2. Process the data.

**Website**

- iTIC Website
- RDS-TMC (FM 100.5)

**Personal Navigation Device**

- Company X
- Company Y
- Company Z

**iTIC Foundation and Radio Station**

- Company X
- Company Y
- Company Z

**GPRS**

- Company X
- Company Y
- Company Z

**Website**

- Company X
- Company Y
- Company Z
2. Current Source of Traffic Data:

2.1 CCTV (287 Cameras)
- Bangkok Metropolitan Area (BMA) 150 cameras
- Thai Traffic Police 137 cameras

2.2 Vehicle Probe (3,300 units)
- Logistic 2,700 units
- Taxi 600 units

2.3 Mobile phone probes
- Start operation at March 2011
Traffic Data Covering Thailand

Analyzing from 130 million example data
Conclusion

- Much ITS activities have been progressed in Thailand, by several organizations—public, private, non-profit, academic
- GNSS enables many applications:
  - Vehicle tracking
  - Probe vehicles
  - Road Management, Map production
  - Research and Development
- Notable Extensive use of GNSS is probe vehicles and traffic information services
Thank you very much for your attention

What do you see on this road?
Let technology guide your answers