INTELLIGENT TRANSPORTATION SYSTEMS
TOWARD SAFER HIGHWAYS:
AN IMPLEMENTATION OF VARIABLE MESSAGE SIGNS (VMS)

By Dr. Songrit Chayanan

Bureau of Highway Safety
Department of Highways
Ministry of Transport
Thailand
OVERVIEW

- Thailand Road Safety Master Plan 2013 - 2016
- Pilot Project on National Route 304
- System Design
  - Concepts
  - Equipment Installation
- Outcome
Focuses specifically on
- Motorcycle Safety
- Enforcement of speed limit
- Increase collaboration among local agencies
  - Create more involvement in public relations
  - More knowledge transferring and sharing
- Utilize advanced technologies for road safety
- Better system for accident data collection
PILOT PROJECT: WHERE AND HOW?

- Find proper location:
  - Identify black spot through HAIMS (Highway Accident Information Management System)
PROJECT LOCATION: NATIONAL ROUTE 304

- Khao Yai National Park
- Tublan National Park
- Laem Chabang Deep Sea Port
- Bangkok
NR304 BETWEEN KM 43 - 48

Geometry & Traffic

- High percent truck 25%
- AADT 10,000 veh/day
- 2 lane road in mountainous area
- 6 - 8 % Grade

Road surface: Asphaltic concrete.

Shoulders: One side of the shoulders is used for a path to a truck emergency ramp

Types of accidents: Run off the road, side-swipe, multi-collision, secondary crashes
ACCIDENT CAUSES

- Disobeying traffic laws
- Mixture of slow and fast vehicles
- Breaking system malfunction
- Road slippery when wet
- Limited sight distance

Results: severe accidents involved with trucks or buses. Once happened, traffic congestion led to another crash following.
EMERGENCY ESCAPE RAMP
200 METERS
PURPOSES OF THE PILOT PROJECT

- As a tool for better cooperation among local authority workforce
- Alternative approach while waiting for EIA approval and budget to widen the road
- To manage incidents, control speeds, and warn motorists about dangerous situations
- Minimize delays that could cause secondary crashes
CONCEPT OF SYSTEM DESIGN

Incident Warning System

- Normal Event
- Warning Event
- Incident Event
CONCEPT OF SYSTEM DESIGN (CONT.)

- Normal Event: speed limit
- Warning Event: Sharp curve ahead
- Incident Event: Steep slope ahead
CONCEPT OF SYSTEM DESIGN (CONT.)

Incident Warning System

- Normal Event
- Warning Event
- Incident Event
  - Alert “Your speed”
  - Alert “Look out for oncoming vehicle ahead”
CONCEPT OF SYSTEM DESIGN (CONT.)

Incident Warning System

- Normal Event
- Warning Event
- Incident Event

Warn “Slow traffic ahead”
Warn “Accident ahead”
CONCEPT OF SYSTEM DESIGN (CONT.)

Incident Warning System

Automatic Detection

Normal Event

Warning Event

Incident Event

Verification Required

Warn “Slow traffic ahead”

Warn “Accident ahead”

“Slow traffic ahead”

“Accident ahead”

Warn
CONCEPT OF SYSTEM DESIGN (CONT.)

Detect
- Microwave
- VIP

Analyze
- Server
- Program

Display
- VMS
  - Alert Local Officers
    - Email
    - SMS
    - Receivers
Example of email alert

[int.incident@gmail.com]
Incident [Accident] at km.44+800 Mon Aug 12 23:51:21 ICT 2013 [Last Available...]

Aug 12 ★

[int.incident@gmail.com]
Incident [Accident] at km.44+800 Tue Aug 13 00:59:49 ICT 2013 [Last Available...]

Aug 13 ★

[int.incident@gmail.com]
Incident [Accident] at km.44+800 Tue Aug 13 01:29:49 ICT 2013 [Last Available...]

Aug 13 ★

to me
t

Incident [Accident] at km.44+800 Tue Aug 13 01:30:30 ICT 2013
[Last Available Image]
PILOT PROJECT OF NR 304
EQUIPMENT INSTALLATION ON SPECIFIC SITES
LOCATION 1 (KM 47+700)

- Police check point
- Variable Massage Sign (VMS)
LOCATION 2 (KM 45+400)

- Speed check point
- Variable Message Sign (VMS)
LOCATION 3 (KM 44+800)

- Video Image Processing
- Microwave Radar
LOCATION 4 (KM 44+600)

- Variable Message Sign (VMS)
LOCATION 5 (KM 43+950)

- Microwave Radar
- CCTV
LOCATION 6 (KM 43+000)

- Microwave Radar
- CCTV
Variable Message sign (VMS) for motorists going uphill
OUTCOME

- Provide faster response to stranded motorists
- Number of accidents is reduced
- Stronger communication among local officers

<table>
<thead>
<tr>
<th></th>
<th>May 1- Sep 30, 2013</th>
<th>May 1- Sep 30, 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Accidents</td>
<td>15</td>
<td>39</td>
</tr>
<tr>
<td>Fatal cases</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Death (persons)</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Injure (persons)</td>
<td>54</td>
<td>95</td>
</tr>
</tbody>
</table>
Motorists can view live images through our Mobile Application (on smartphone)

Better trip planning
THANK YOU