#### SCS-010-005

Comparing the Performance of Wearing Helmet Behavior Model While Driving Motorcycle by Binary Logistic Regression Analysis Method and Learning Vector Quantization of Artificial Neural Network

#### ::AUTHORS::

Ms.Phattarasuda Witchayaphong Ms.Napat Lekhawattana Ms.Kedsadaporn Chaiwong

M5242122 M5242214 M5242238

INSTITUTE OF TRANSPORTATION ENGINEERING

## Presentation Outline

• Problem Statements

- Research Objectives
- Research Methodology
- Conclusion
- Advantages and limitations

## Problem Statements







#### Source : Prof. Pichai Tanerananon

STITUTE OF TRANSPORTATION ENGINEERING

## Research Objectives



## Research Methodology

70%

6,045

#### **Data** – Questionnaire

2,590

"Awareness campaigns on traffic accidents, knowledge, attitude and acceptance of traffic law enforcement"

Data

8,635

>8,635 Data from Random Sampling 26 Provinces>Scope Area in Thailand

30%

## Binary Logistic Regression Analysis



# Result of Binary Logistic Regression Analysis $Y = -1.036 - 1.080x_1 + 1.964x_2 - 0.404x_3 + 0.245x_4 + 0.431x_5$ = Motorcyclist helmet-wearing behavior(sometimes/always) Y $X_1$ = Awareness of traffic accident campaigns $X_2$ = Acceptance of traffic laws $X_3 = Sex$ $X_4 = Age$ $X_5$ = Level of knowledge of traffic laws. *R* Square= 0.254, Percentage Correct = 71.35% POR





ISTITUTE OF TRANSPORTATION ENGINEER

### Result of Learning Vector Quantization

		<b>v</b>		
Network	Enocha	Training	Testing	%
Architecture	Lpoens	(MSE)	(MSE)	Correct
8-10-2	20	0.2873	0.2919	70.81%
8-10-2	50	0.2868	0.2876	71.24%
8-10-2	70	0.2873	0.2876	71.24%
8-10-2	100	0.2868	0.2876	71.24%
8-10-2	200	0.2868	0.2876	71.24%
8-20-2	20	0.2870	0.2876	71.24%
8-20-2	50	0.2863	0.2876	71.24%
8-20-2	70	0.2868	0.2876	71.24%
8-20-2	100	0.2868	0.2876	71.24%
8-20-2	200	0.2868	0.2876	71.24%

**Percentage Correct = 71.24%** 

Results of Accuracy Estimation on Factors Influencing Model Using Artificial Neural Network Method





Graph showing Result of Effectiveness Test from LVQ Artificial Neural Network

TITUTE OF TRANSPORTATION ENGINEERING



## Advantages & Limitations

POR

- Generated a utility function
- The results were merely prediction on each

individual(Probability)

- Not explain significance
- Clearly classified each
  - individual's decision
- Learn and remember

Binary Logistic Regression



Thank You !

Transportation Engineering Suranaree University of Technology

#### INSTITUTE OF TRANSPORTATION ENGINEERING