



**Sustainable Community Development  
based on Safety utilizing Motorcycle Culture  
in the ASEAN Region**

To promote the "Honda Model" as a meta-design

**Kenji Doi, Project Leader**

# Project Members

## Utilizing Motorcycle Culture



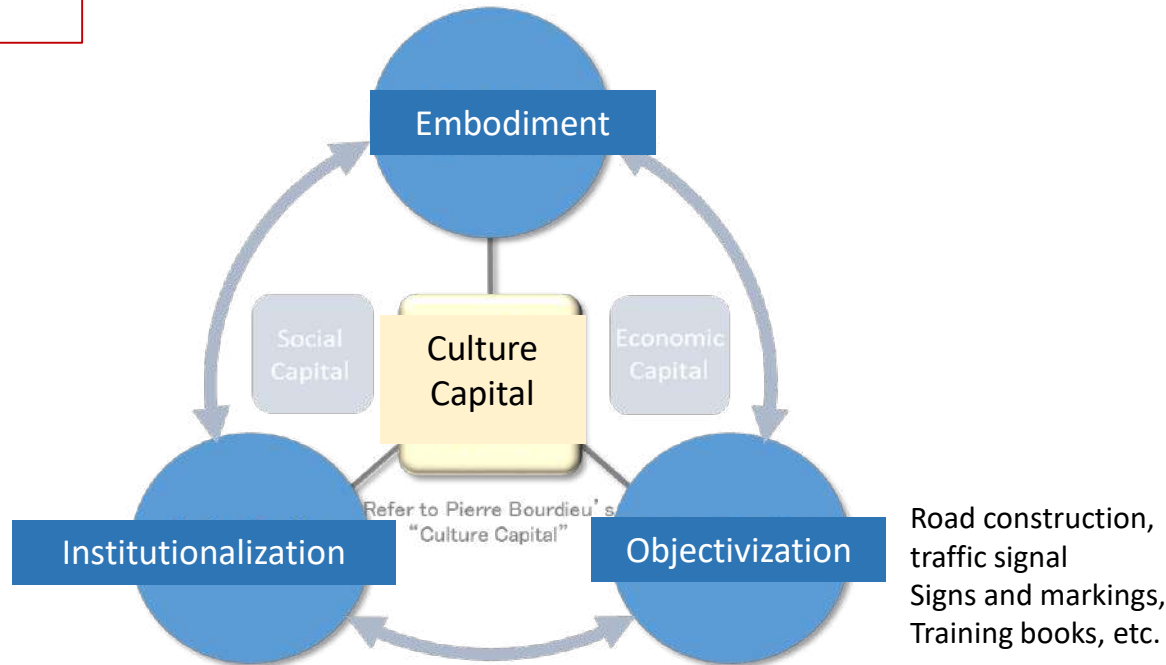
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# How to understand the Traffic and Safety Culture in the Project

Sociologist and Philosopher  
Pierre Bourdieu

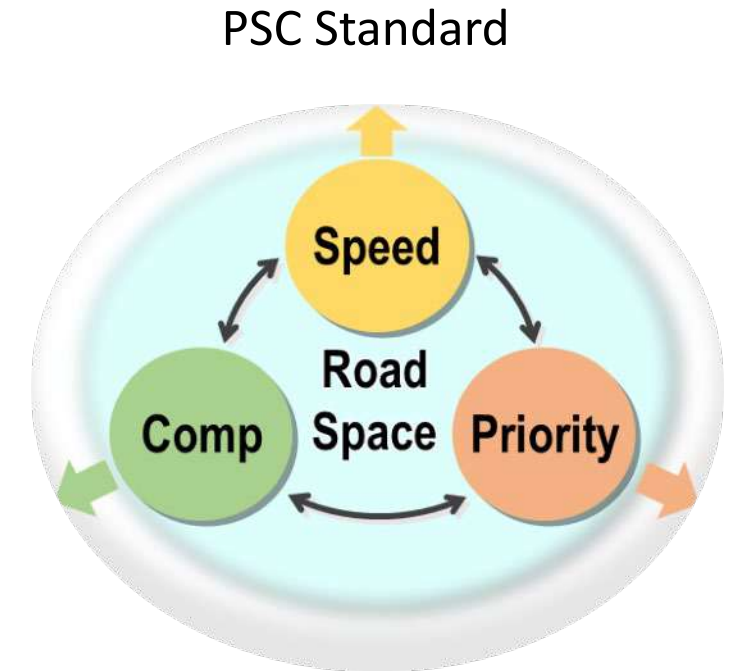
Driving habits and customs  
Traffic violation behavior

Habit: Continued on an individual basis  
Custom: Shared and continued in a group

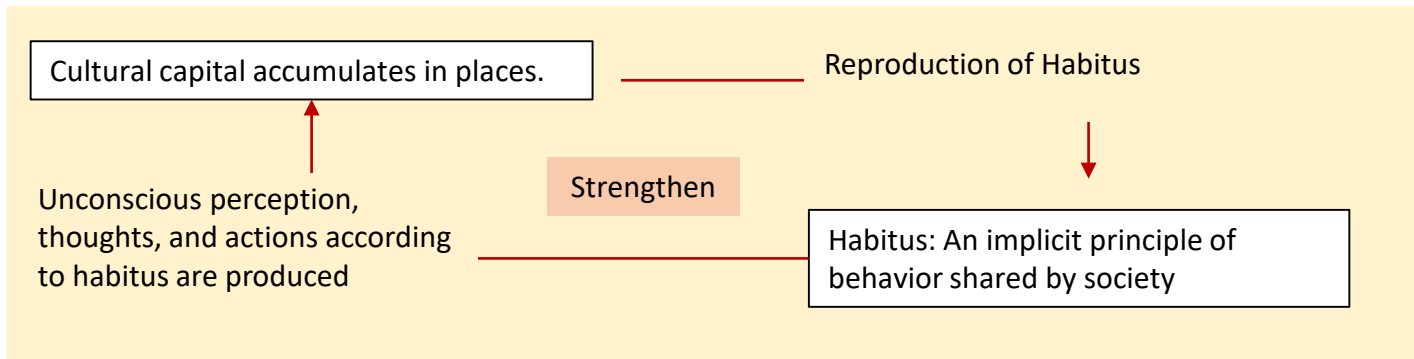


Traffic rules, Control,  
Traffic Safety Education,  
Driver's License System

Road construction,  
traffic signal  
Signs and markings,  
Training books, etc.



- Priority: Awareness of priority in road space
- Speed: Awareness of the dangers of excessive speed
- Compactness: Compactness of intersections, etc.
- Comprehension: How easy to understand the rules

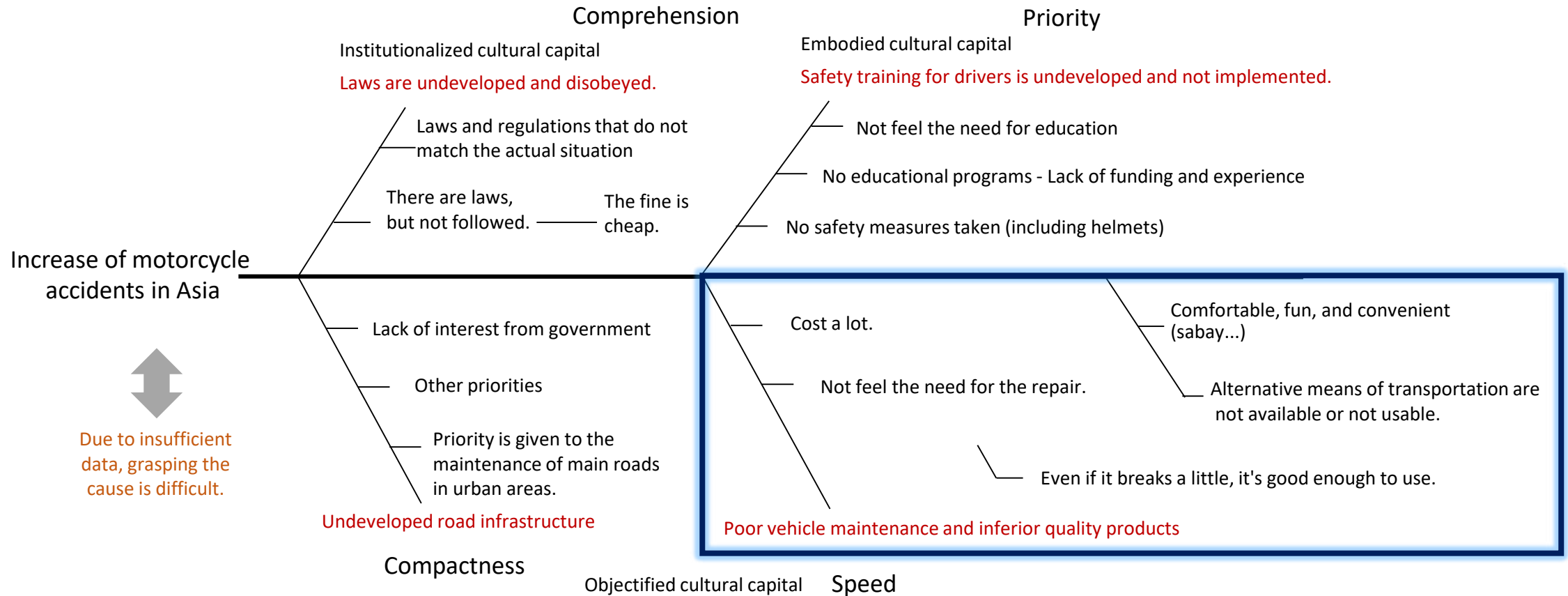


# Project Background and Aims

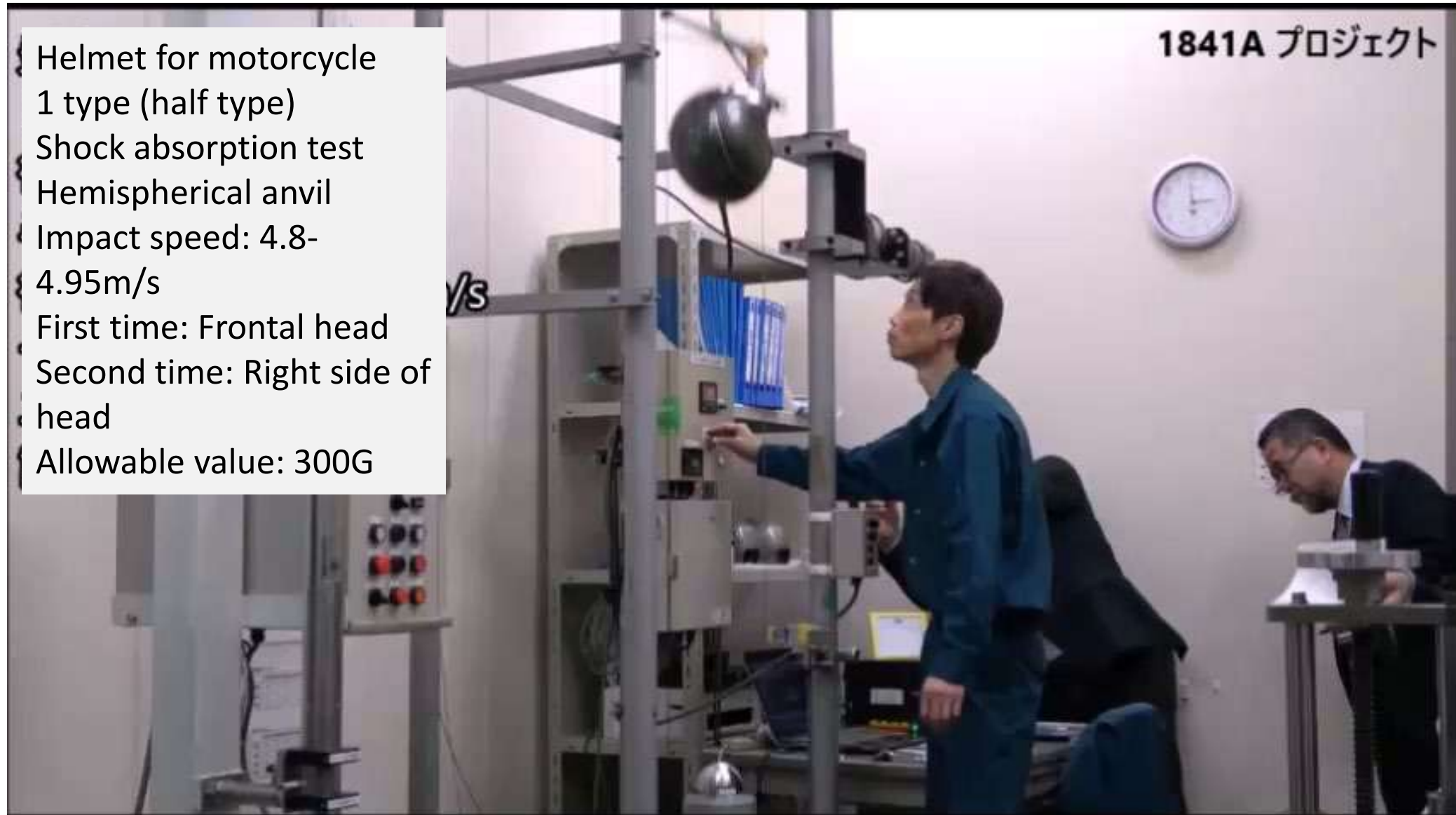
Accidents involving motorcycles in almost all ASEAN countries are the main cause of fatalities (WHO).

In particular, 74% in Thailand, 62% in Malaysia, 74% in Cambodia, etc.

On the other hand, systematic understanding of the causes of motorcycle accidents is lagging.

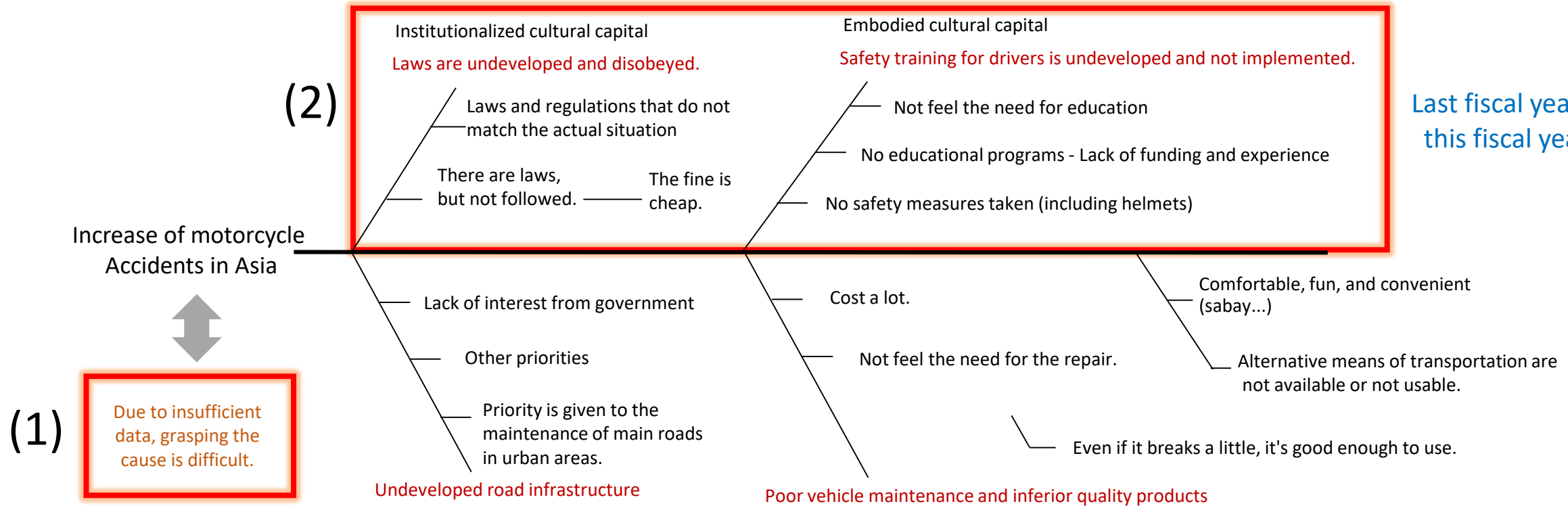


# Verification of Safety of Local Helmets ⇒ Impact in Also Japan



Helmet for motorcycle  
1 type (half type)  
Shock absorption test  
Hemispherical anvil  
Impact speed: 4.8-  
4.95m/s  
First time: Frontal head  
Second time: Right side of  
head  
Allowable value: 300G

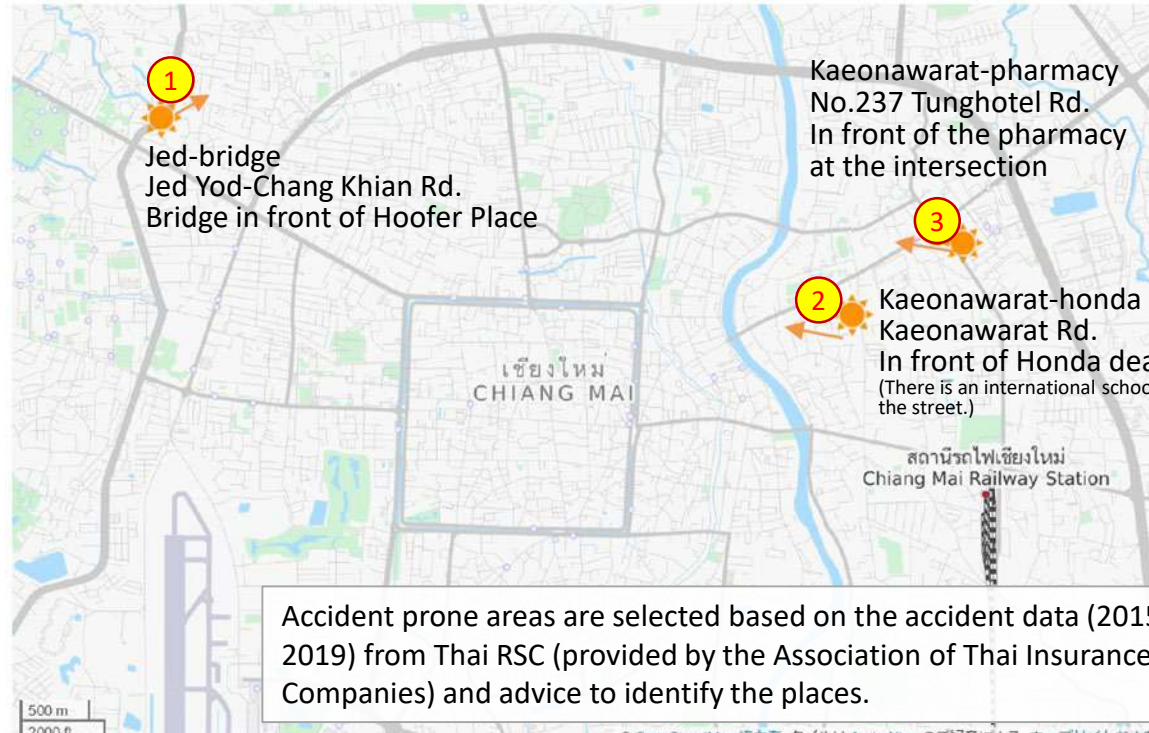
# Implementation in 2041C



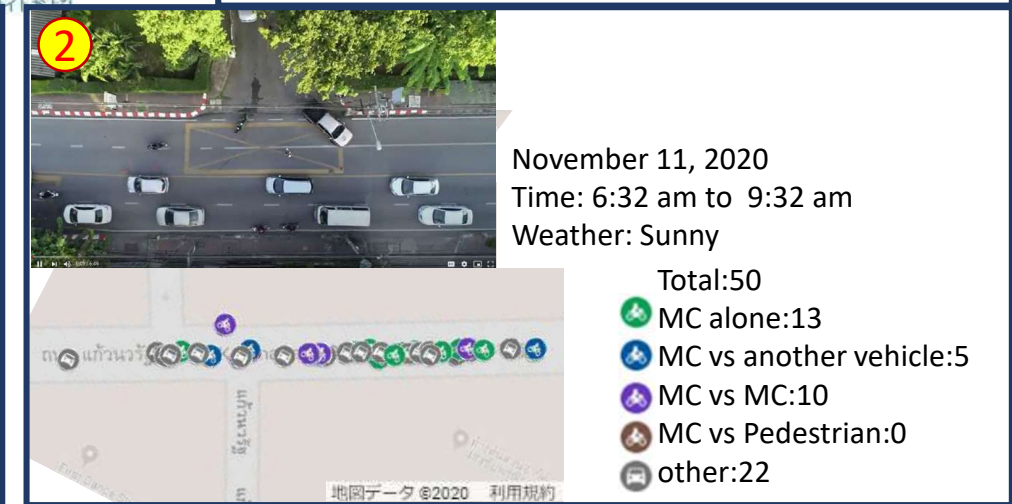
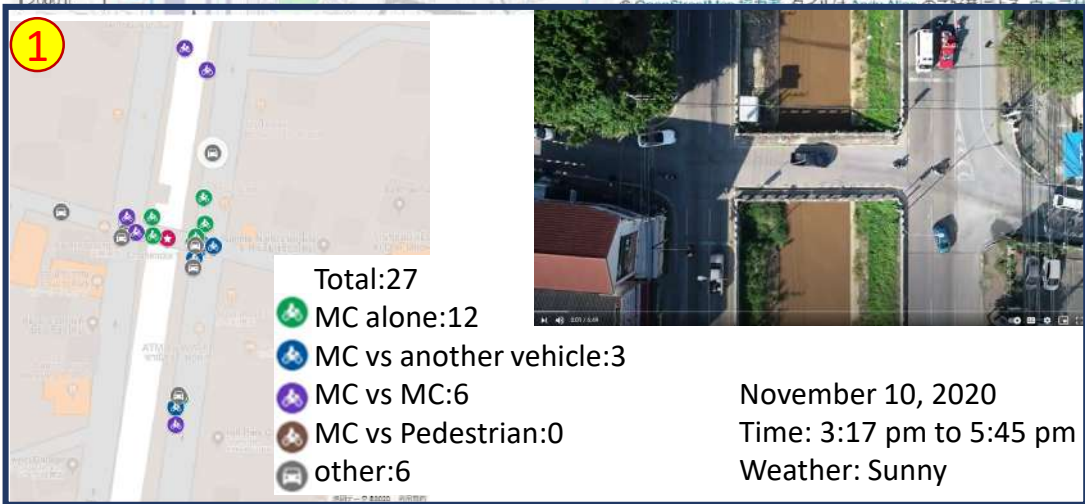
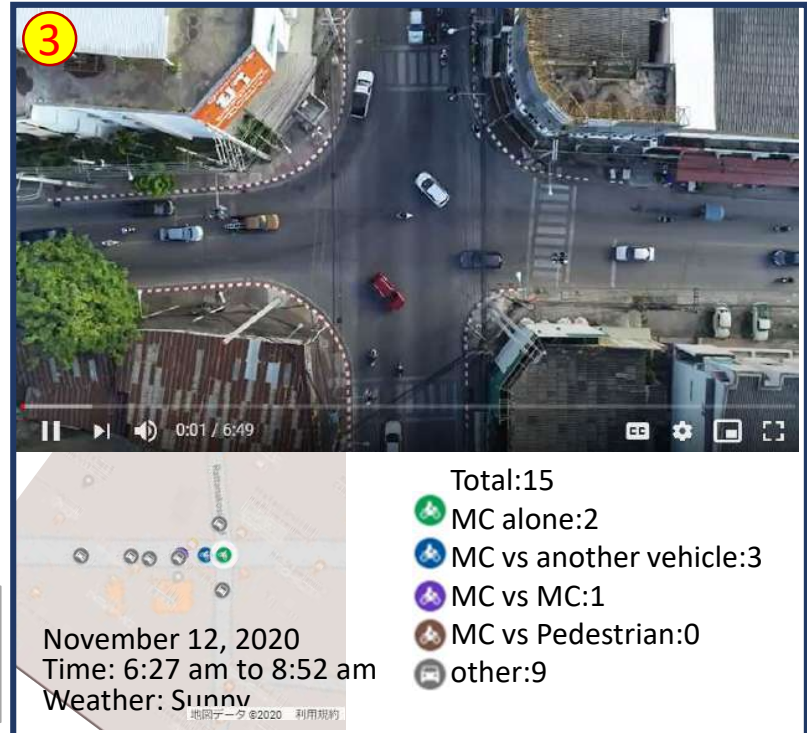
- (1) Collision risk analysis based on motion pattern learning using drone aerial photography and AI analysis
- (2) Verification of the effect of safety education and the structure of social impact by Honda, a motorcycle manufacturer



# Target areas for Drone Aerial Photography and AI Analysis



Accident prone areas are selected based on the accident data (2015 to 2019) from Thai RSC (provided by the Association of Thai Insurance Companies) and advice to identify the places.



# Collision Prediction based on Aerial Images and AI Analysis

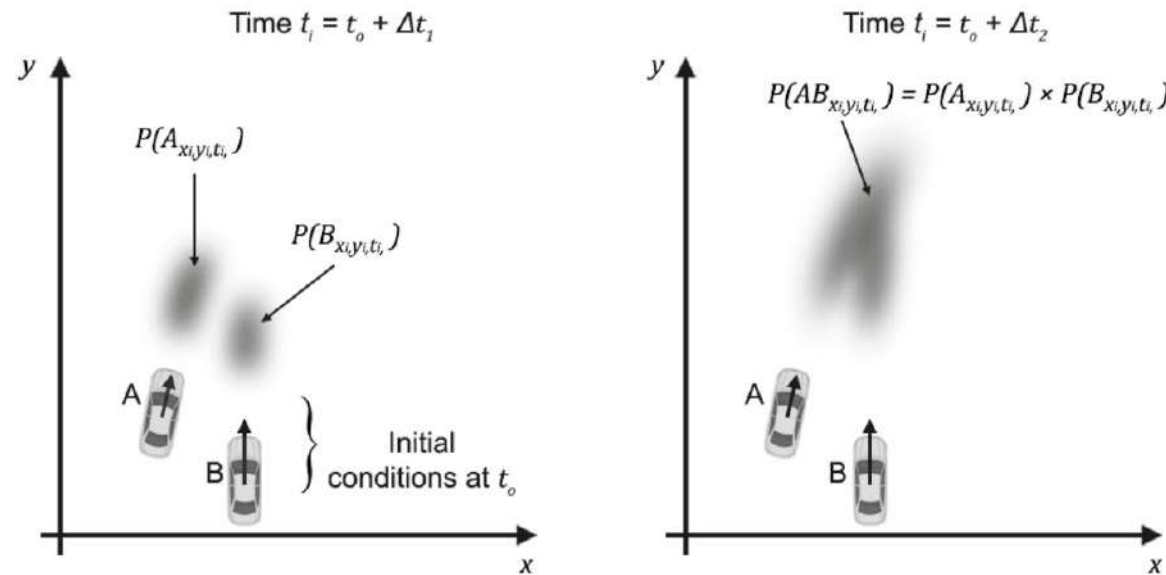


Collision Prediction Using Motion Patterns Learning

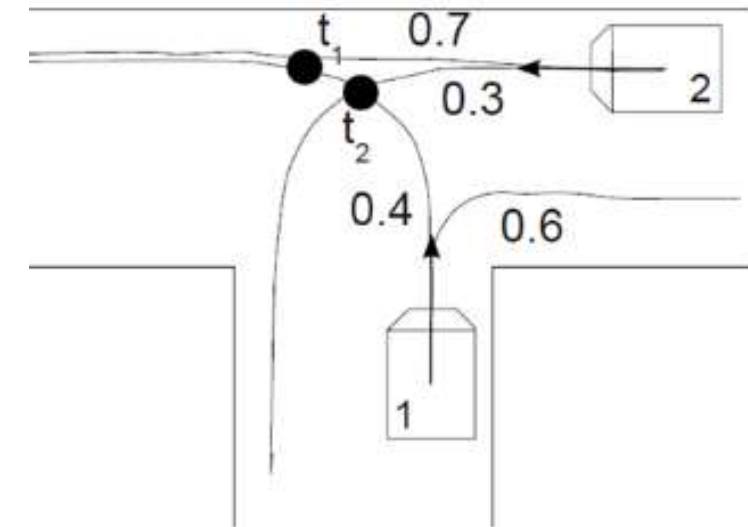
By Prof. Nicolas Saunier, IATSS Research Overseas Editor, Ecole Polytechnique of Montreal



Object Recognition and Vehicle Motion Pattern Learning



Motion pattern map with probability representation of position after  $\Delta t$



Risk diagrams that enable estimation of accident occurrence patterns and their probabilities without collecting actual accident cases



# Visualization of Potential Collisions



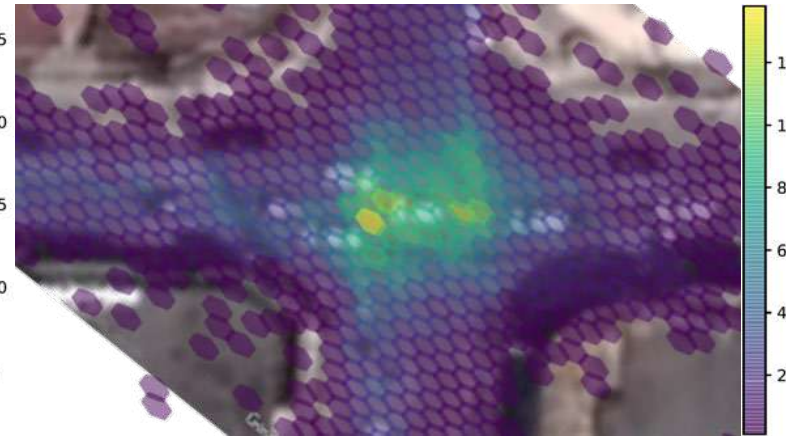
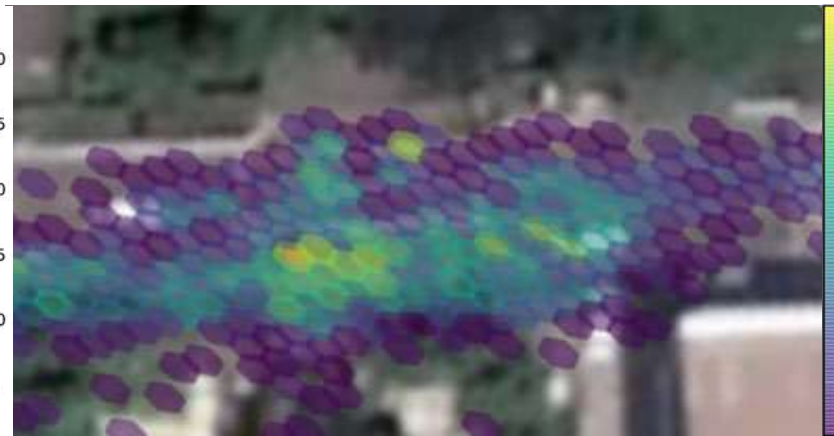
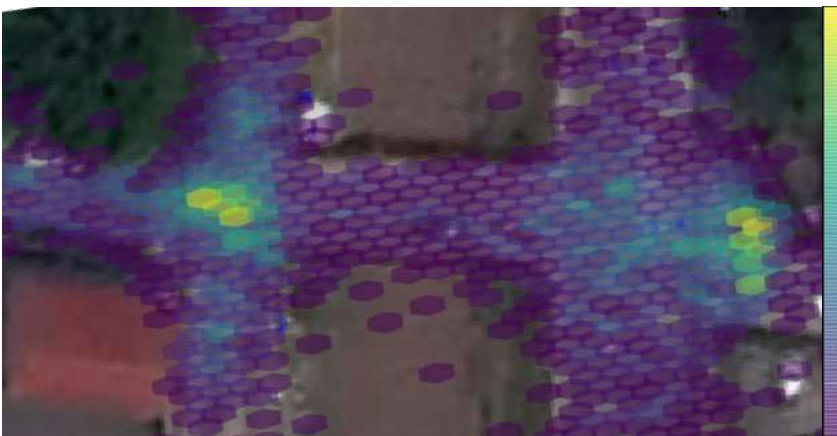
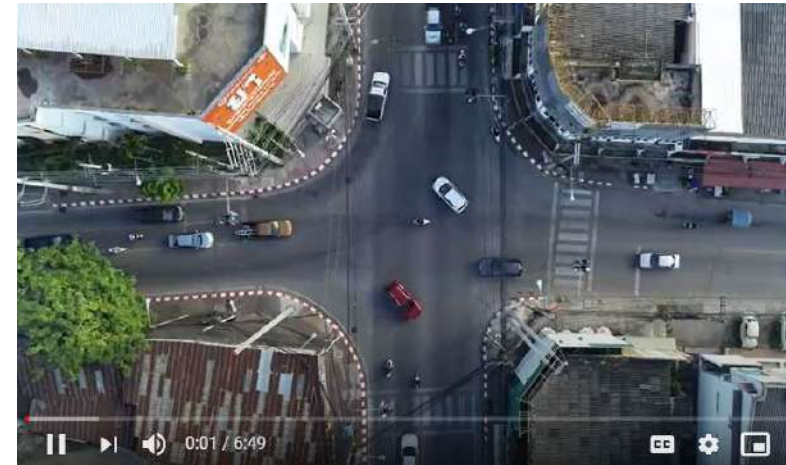
1 Jed-bridge



2 Kaeonawarat-honda



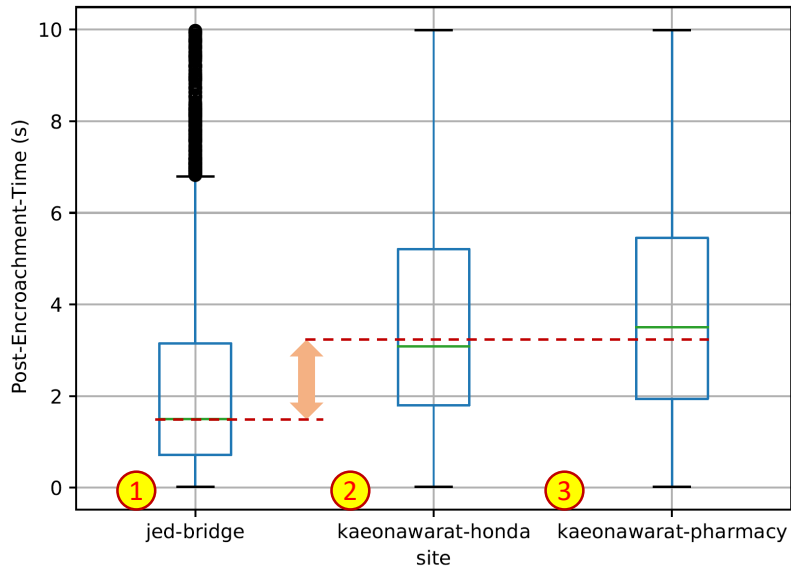
3 Kaeonawarat-pharmacy



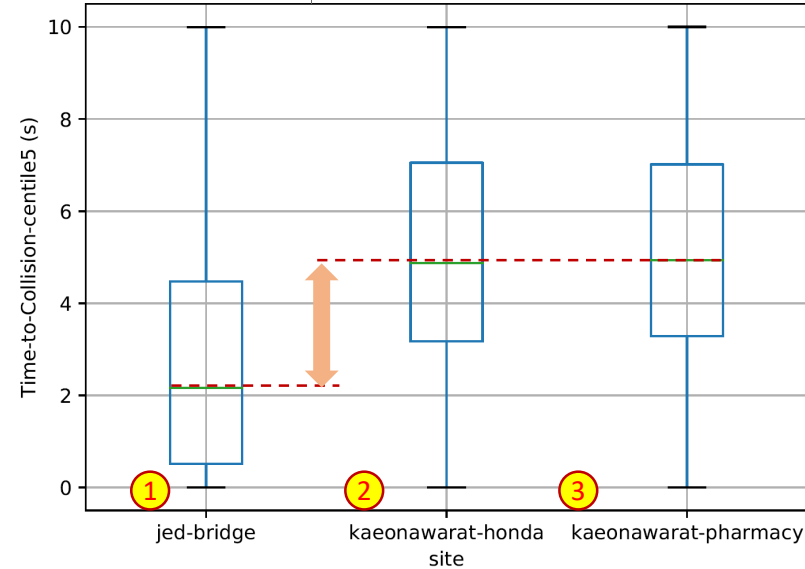
Legend: numbers of potential collisions with TTC below 10 s.

# Intersection Risk Assessment

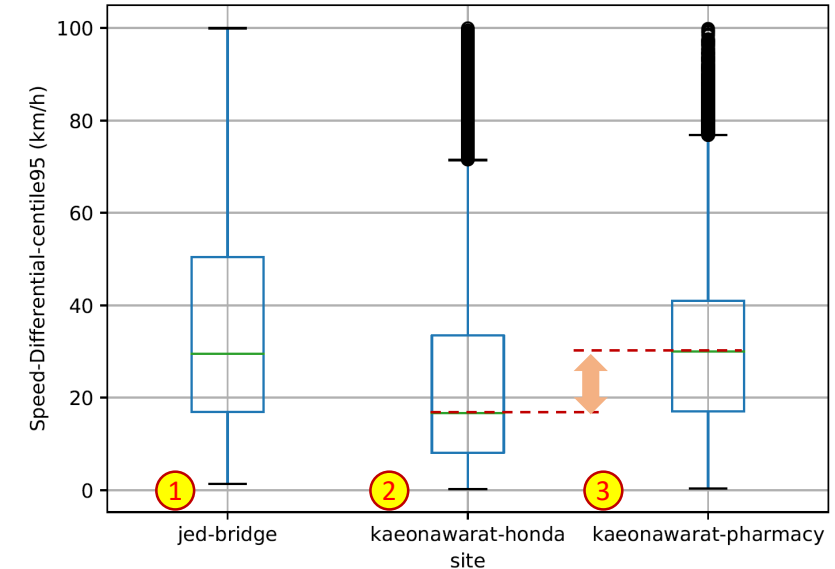
PET (Post encroachment time):  
Time to reach after action



TTC (Time to Collision-centile5):  
Collision margin time (5% value)



Speed difference at risk of collision (95%):  
Speed difference-centile95



In terms of the probability of traffic accidents, point (1) poses a greater risk than points (2) and (3).  
In terms of the magnitude of damage in the event of an accident, point (3) has a greater risk than point (2).

⇒ Colegion diagram ⇒ Grasping typical risk situations ⇒ To risk prediction

# Future Challenges for Safe Motorcycle Driving Education in Thailand and Vietnam

## 1. Wearing a helmet

Helmet use has been continuously advocated as a countermeasure against motorcycle accidents in the emerging countries in Asia, and the current rate of helmet use has improved significantly due to legal regulations and the provision of free helmets. Motorcycle safety education, which should be proposed by developed countries, has **already moved to the next stage, which includes not only helmet recommendation but also helmet quality and proper helmet wear (chin strap tightening and proper size).**

## 2. About braking

Braking is the basis for avoiding danger on a motorcycle, and it is important to apply the front brake more strongly than the rear brake in order to obtain effective braking power on asphalt surfaces. It takes a lot of courage to apply the front brake strongly, and it is only possible with advanced riding techniques. **In the future, as the traffic environment improves, the speed of motorcycles is expected to increase, so it is necessary to practice braking so that the front brake can be used more effectively than the rear.**

## 3. Risk prediction education

Education that emphasizes the **acquisition of other viewpoints** is required to **promote awareness of not only the dangers that appear in front of us, but also the serious dangers that lurk unseen.** This acquisition of other viewpoints is not merely a way of perceiving objects but is also a way of **understanding the relationships involved in inferring the intentions and mental states of others** ⇒ accurately inferring what others think of one's existence.

# Examining the Effectiveness and Social Impact of Safety Education by Honda Vietnam

1. HVN's activities to promote safe driving
2. Overview of the survey
3. Profile of subjects
  - Incl.
    - Use of motorcycles and participation in HVN initiatives
    - Experience of traffic accidents in the past year
    - Effectiveness of HVN safe driving promotion activities
    - Impact of the Covid-19 Pandemic
4. Driver's awareness and attitude
5. Driver's behavior
6. Understanding cause-and-effect relationships - awareness, behavior, accidents
7. Social impact of HVN's activities to promote safe driving
8. Effects of safe driving programs by driving experience

# Honda Vietnam 2030 Statement

## HVN 2030 Statement

- Dedicated to the "freedom, security, and comfortable life" of all people.
- Expanding enjoyment, driving the development of a healthy mobility society, and pursuing QOL improvement.

**Target by 2030**

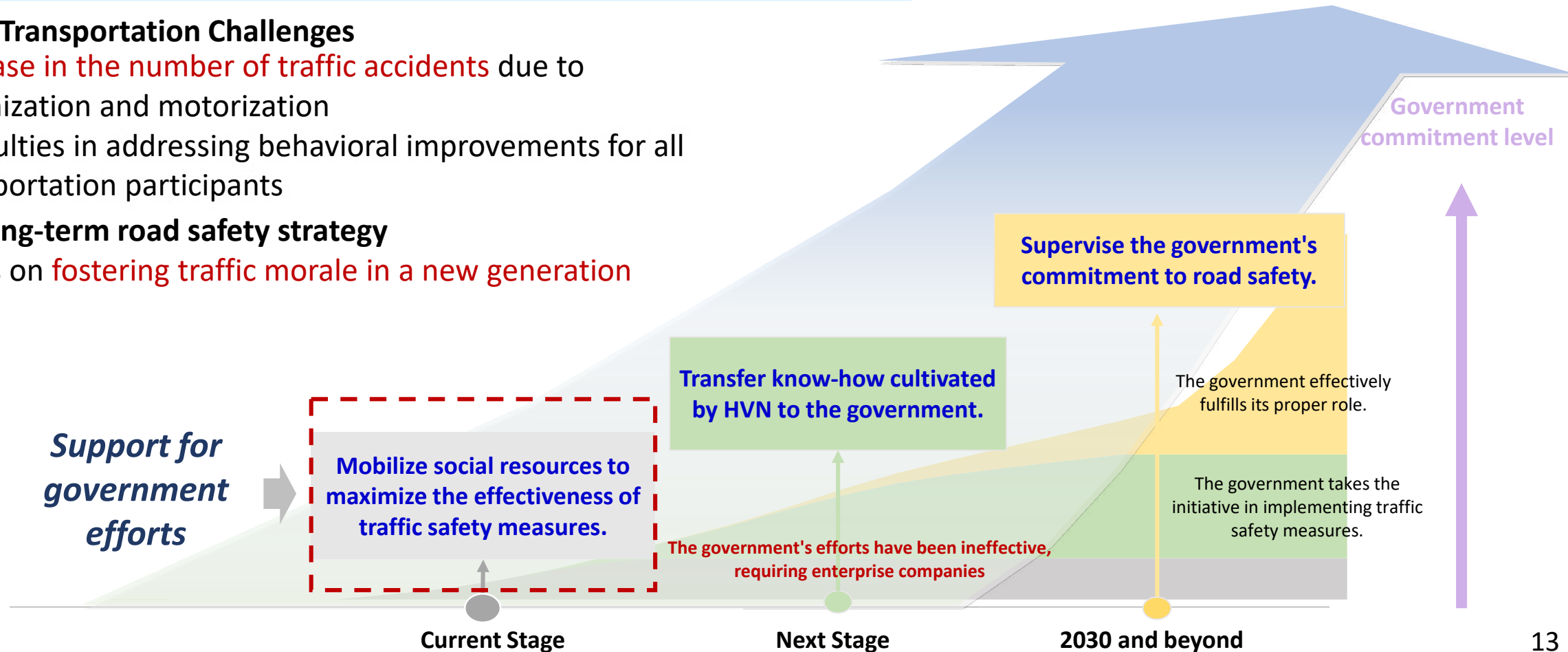
**A Collision-free  
Mobile Society**

## Looming Transportation Challenges

- Increase in the number of traffic accidents due to urbanization and motorization
- Difficulties in addressing behavioral improvements for all transportation participants

## HVN's long-term road safety strategy

- Focus on fostering traffic morale in a new generation

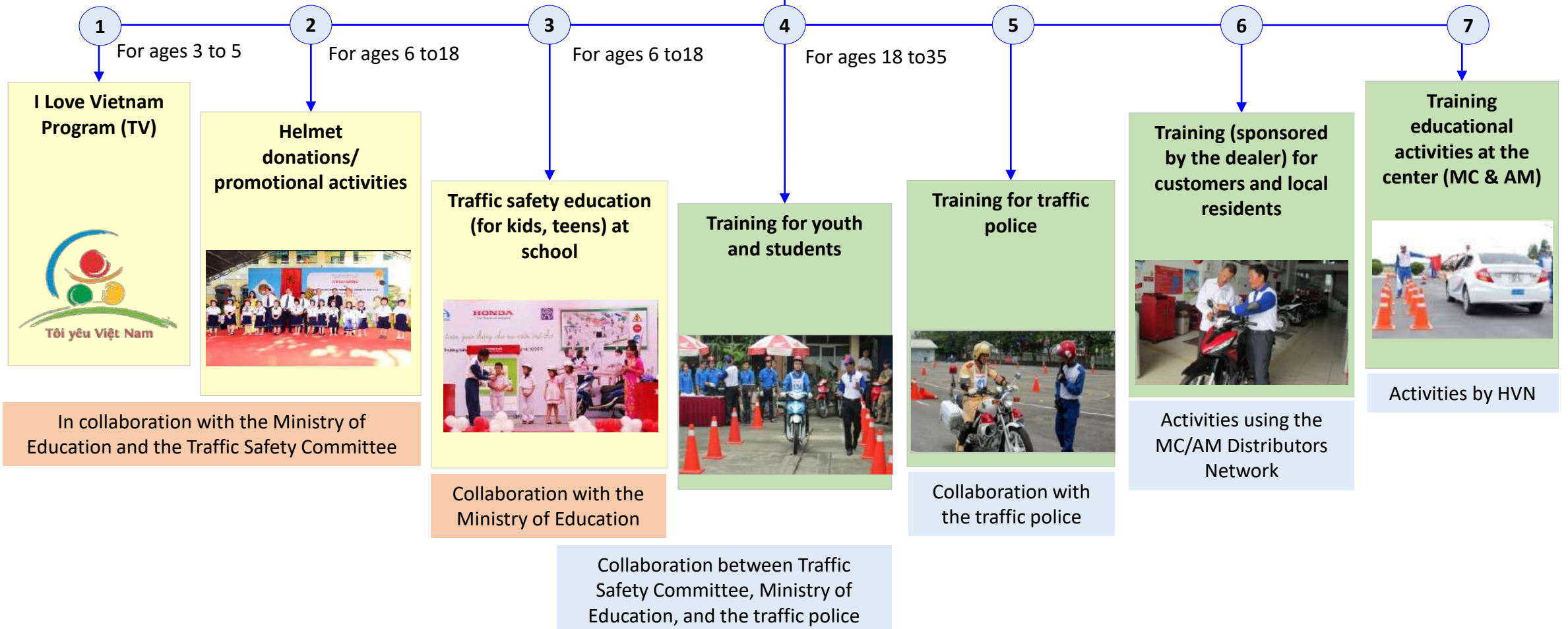


# Honda Vietnam's Comprehensive Approach

Promote road safety activities to minimize the number of traffic accidents in Vietnam and aim to establish sustainable management and expand the management as HVN company.

*Fostering the morals of the new generation that will bear the future*  
*Building up moral for new generation*

*Improving traffic safety knowledge and skills in society*  
*Strengthen TS knowledge & skill for society*



# Overview of the Research in Vietnam

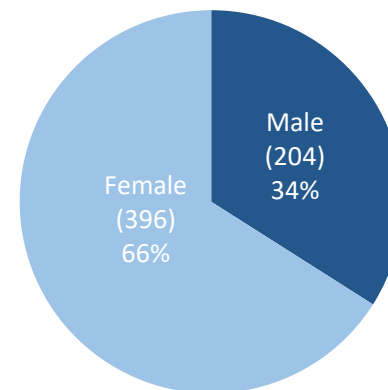
- Survey period: July 29 to August 3, 2020
- Survey method: Web online
- Subjects: Registrants to/panels of partner companies of Asmarq Co., Ltd.
- Language: Vietnamese (translated from English)
- Number of valid responses: 600

## Jul 29: Vietnam braces for 2<sup>nd</sup> waves of infection

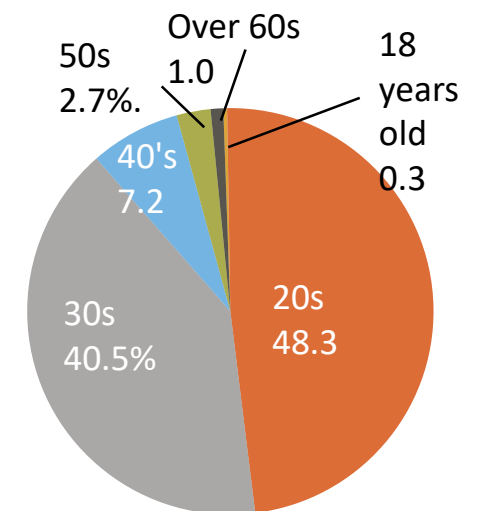


	Classification	Number of Respondents (%)	
		Count	Percentage
Gender	Male	204	34.0
	Female	396	66.0
Age	<20 years old	2	0.3
	20 -29	290	48.3
	30 -39	243	40.5
	40 -49	43	7.2
	50 -50	16	2.7
	60 -69	5	0.8
	70 -79	0	0
	≥80 years old	1	0.2

Gender

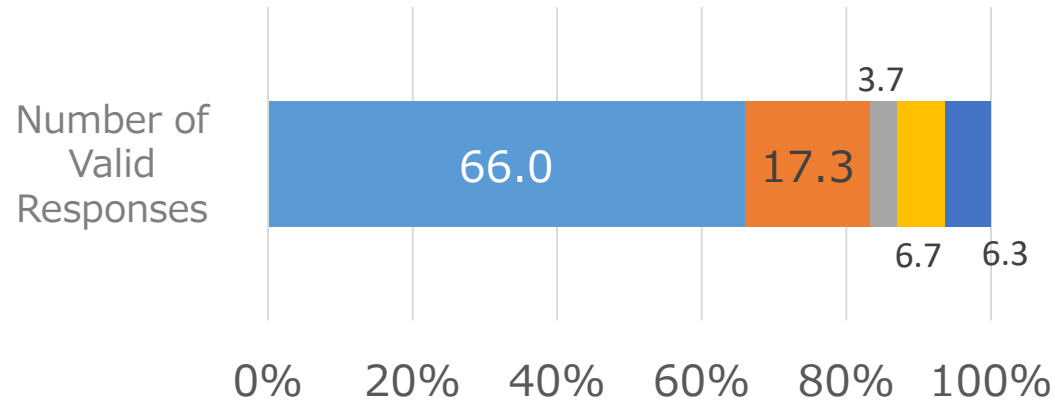


Age



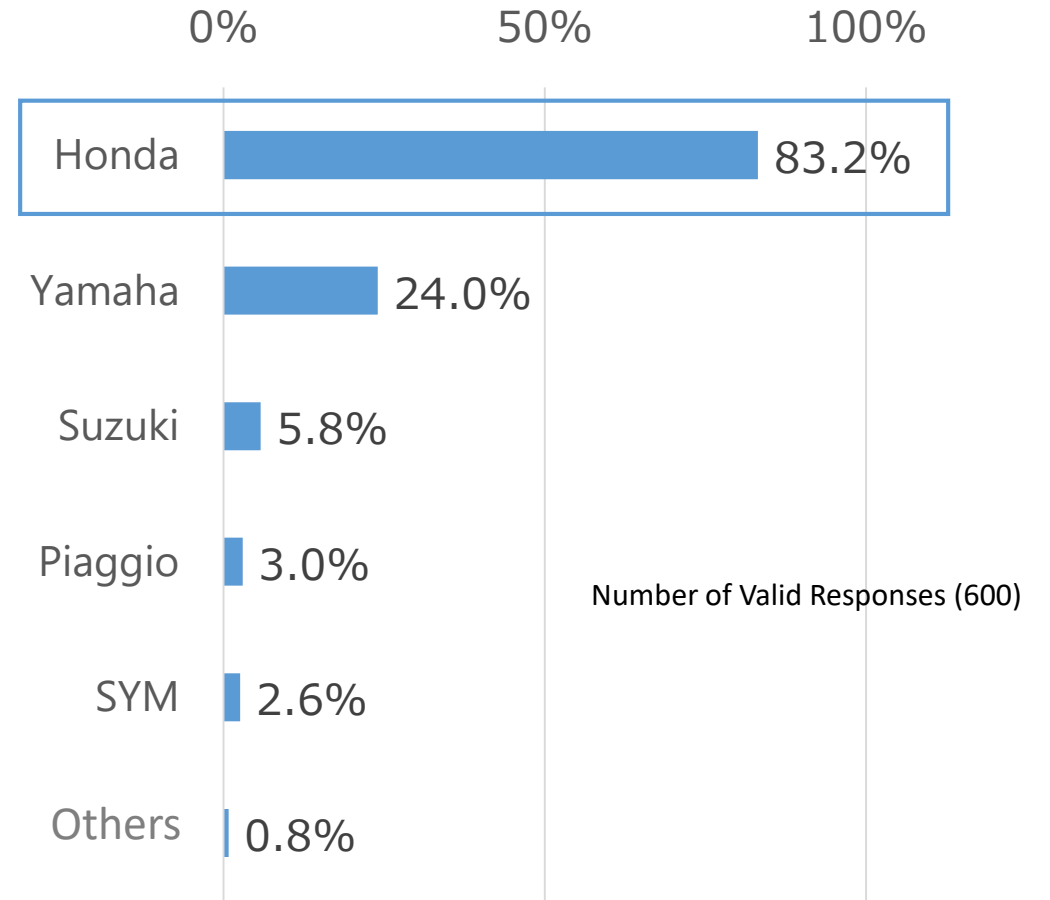
# Actual Use of Motorcycles

Q1. Do you ride a motorcycle?



- Compact motorcycle (51cc to less than 175cc)
- Medium and large motorcycle (175cc or more)
- Used to ride a motorcycle, but not anymore
- Have never ridden a motorcycle
- Ride a 50cc scooter, not a motorcycle

Q2. Manufacturer of Motorcycle (Multiple Choice)

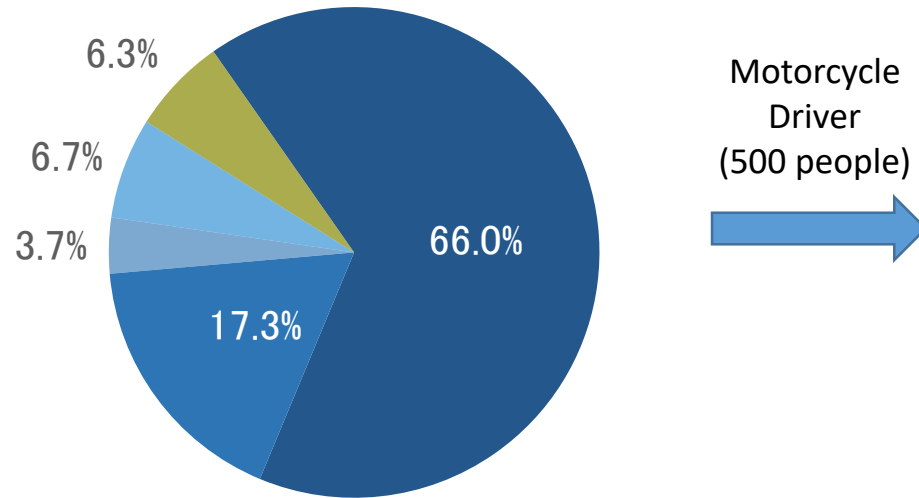


\*Honda's market share in 2018:75.9%



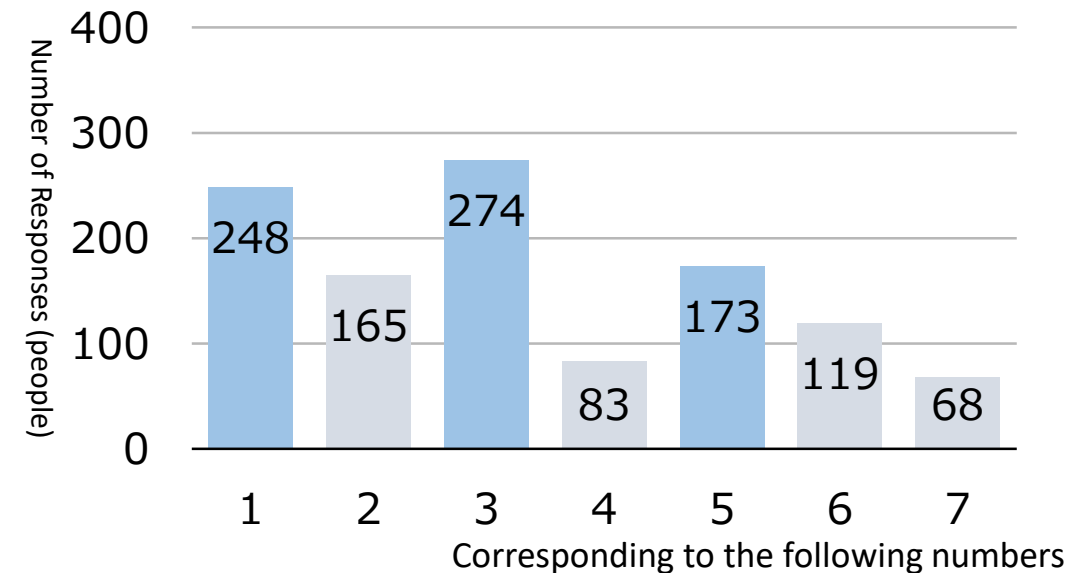
# High participation rate in HVN initiatives

Q1: Do you ride a motorcycle?



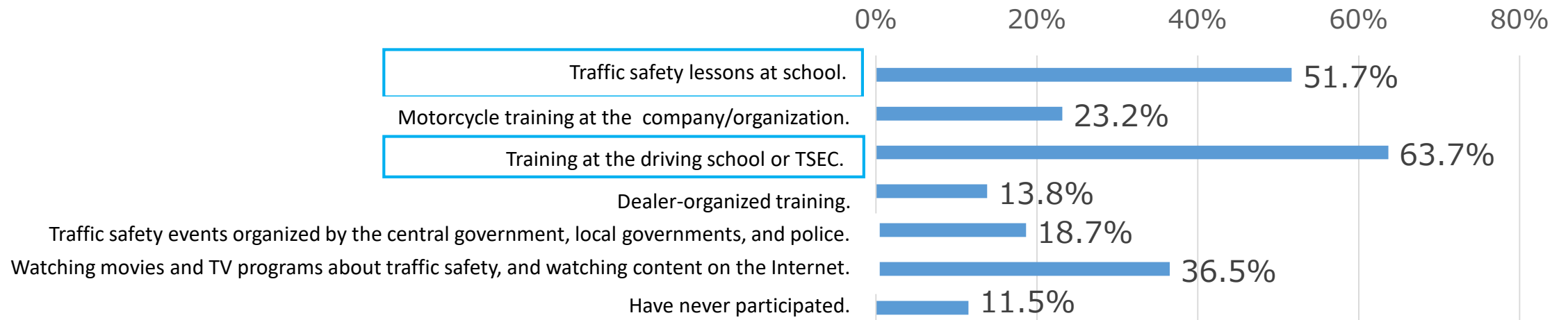
- 1. Compact motorcycle (51cc to less than 175cc)
- 2. Medium and large motorcycle (175cc or more)
- 3. Used to ride a motorcycle, but not anymore
- 4. Have never ridden a motorcycle
- 5. Ride a 50cc scooter, not a motorcycle

Q5: Select all applicable HVN initiatives in which you have participated. (Multiple selections are allowed.)

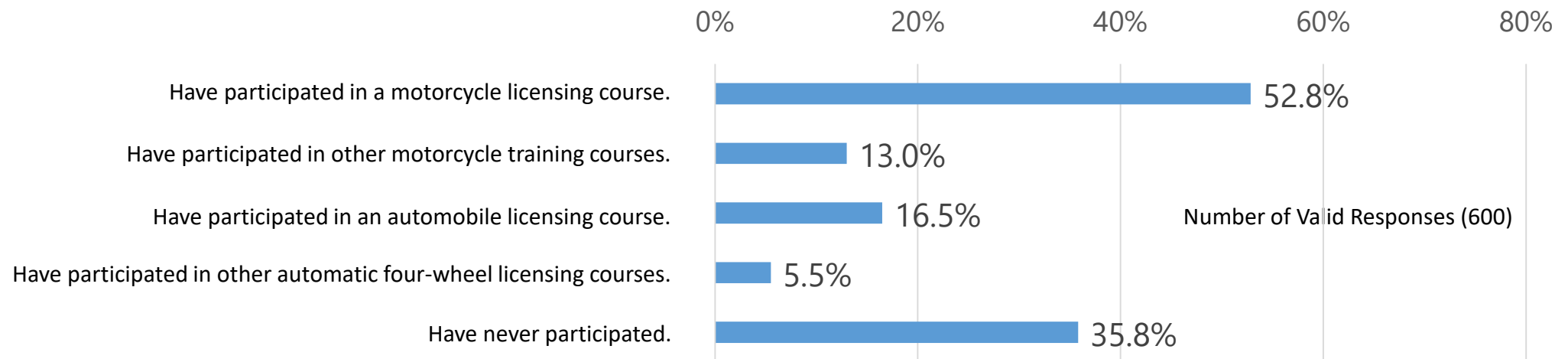


- 1. Traffic safety education using HVN textbooks in elementary, middle, and high schools
- 2. Helmet donation campaign by NTSC, MoET, HVN
- 3. Viewing "I love Vietnam" and other contents produced by HVN
- 4. Traffic safety classes held by HVN at kindergartens and nursery schools
- 5. HVN safe driving courses for universities, colleges, and youth
- 6. Safe driving training for customers of HVN motorcycle dealers and local residents
- 7. Have never participated

# High Participation Rate in HVN Activities

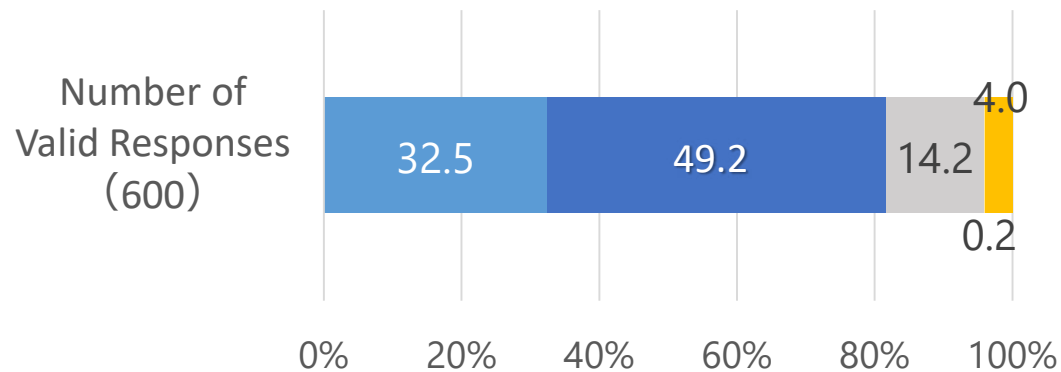


## Q4: Have you ever participated in a course at TSEC (Traffic Safety Education Center)?



# Effectiveness of Activities (1)

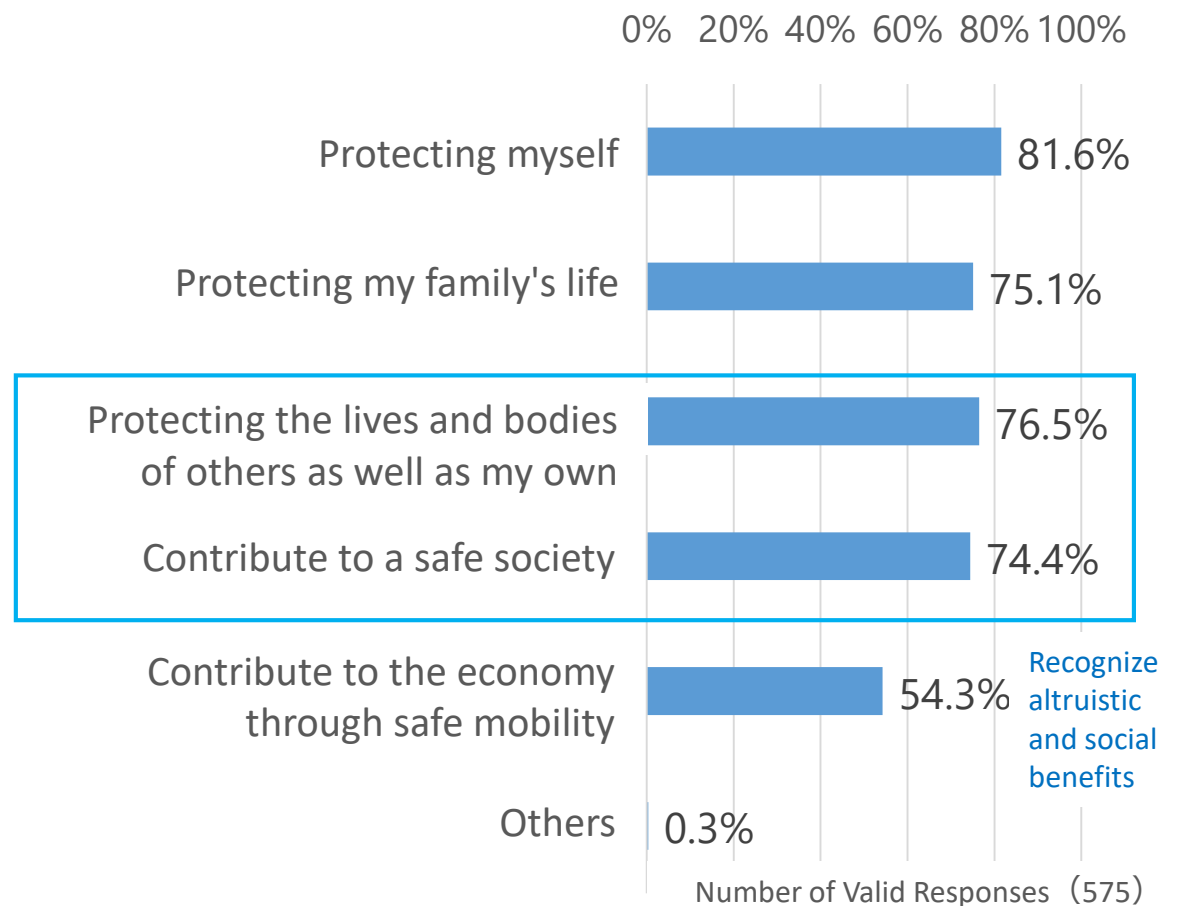
Q46. How effective are the activities related to road safety at HVN?



81.7% evaluated it as "very effective" or "highly effective"

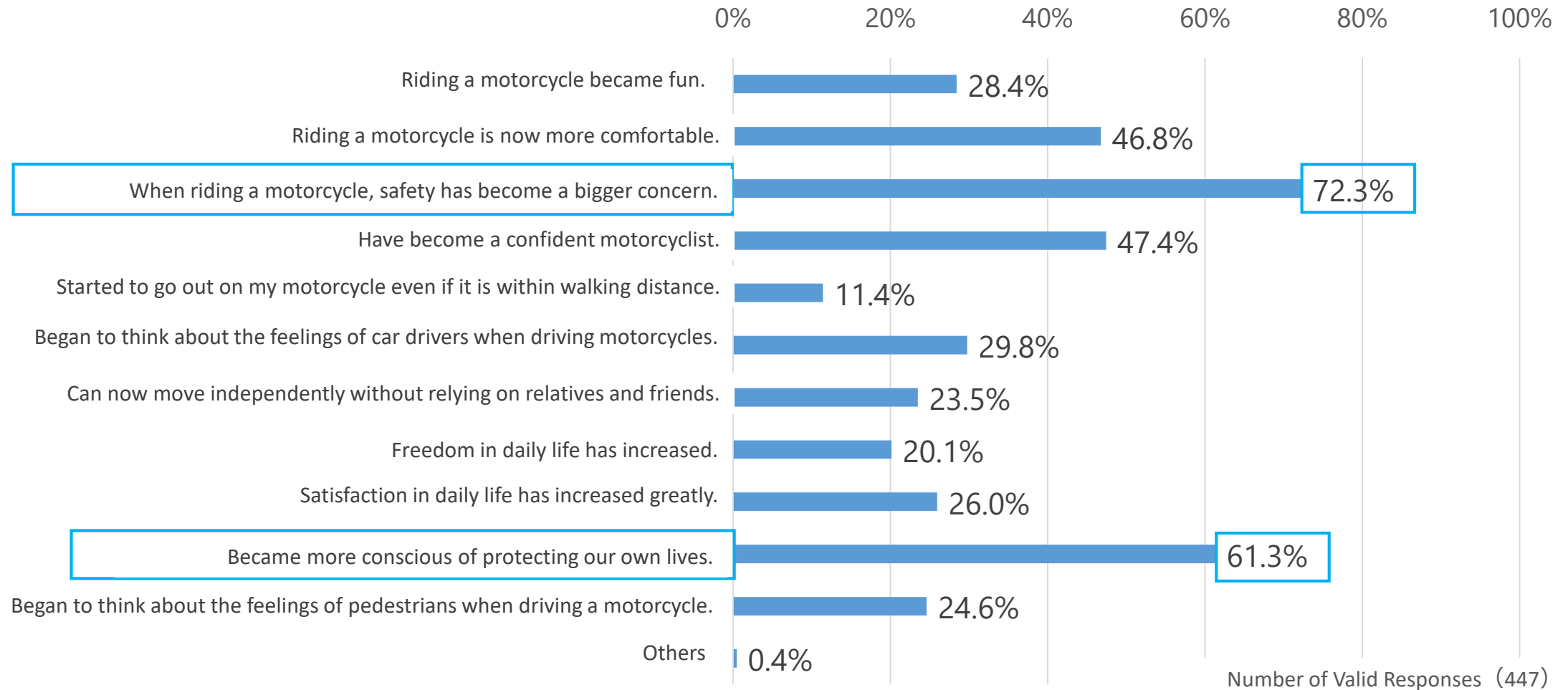
- Very effective
- Highly effective
- Not very effective
- No effect
- Do not know because did not know about the HVN activities

Q47. What are the effects?



# Effectiveness of Activities (2)

## Q48. Changes in mindset through HVN activities

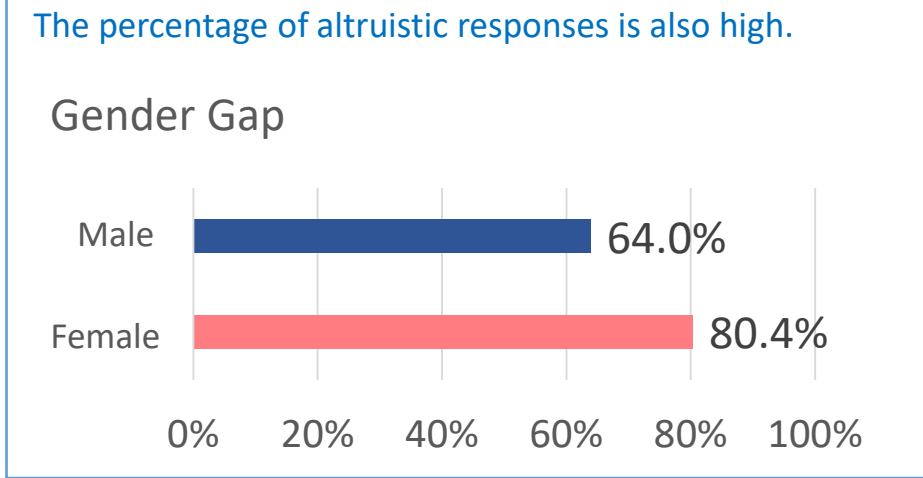
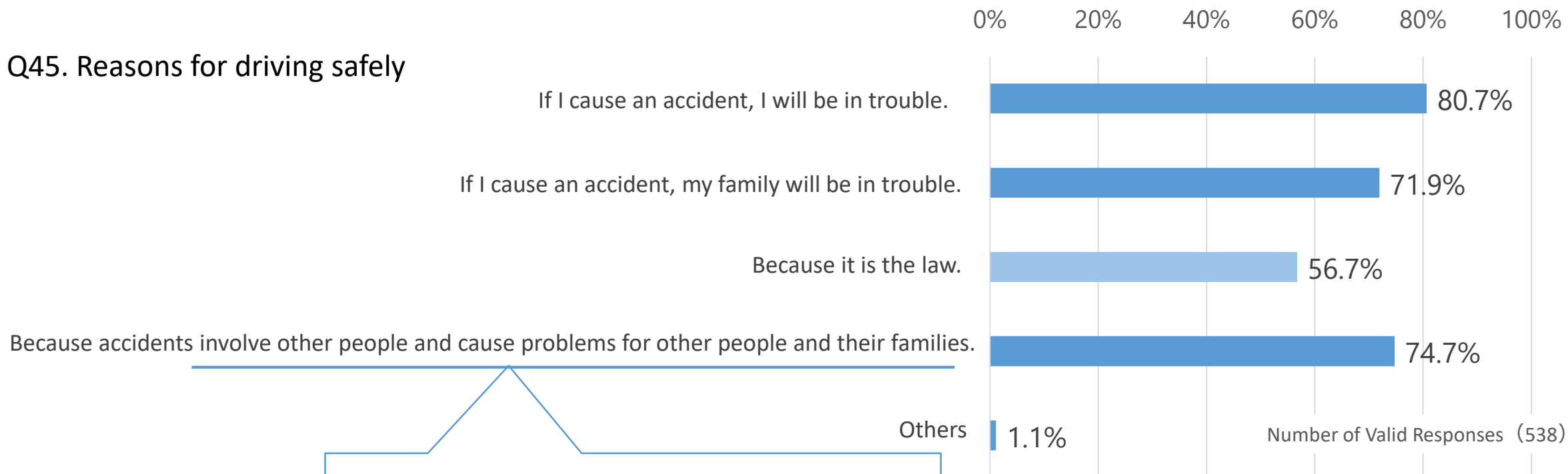




# Safe Driving and Altruistic Motivation



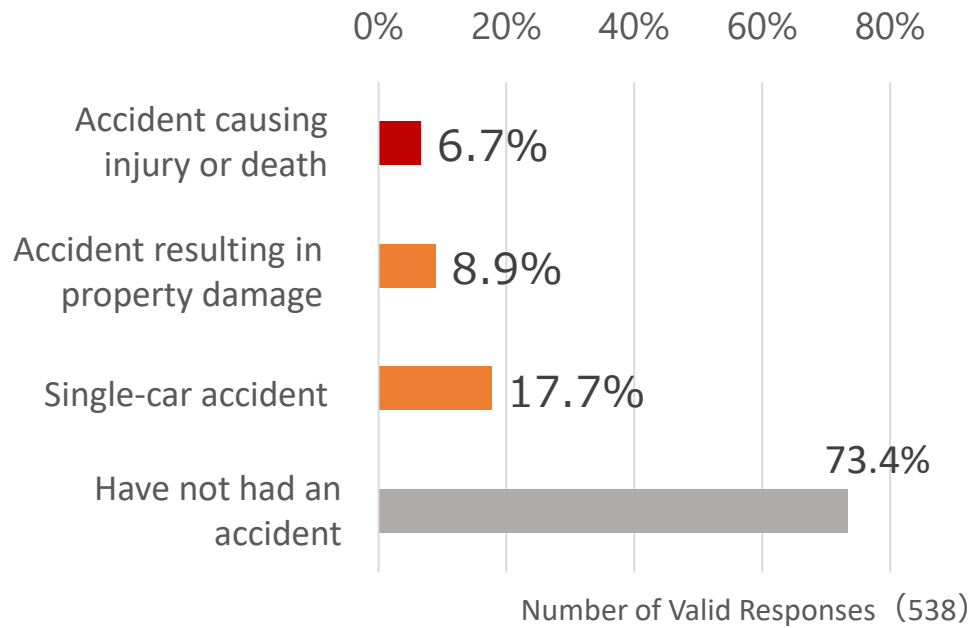
## Q45. Reasons for driving safely



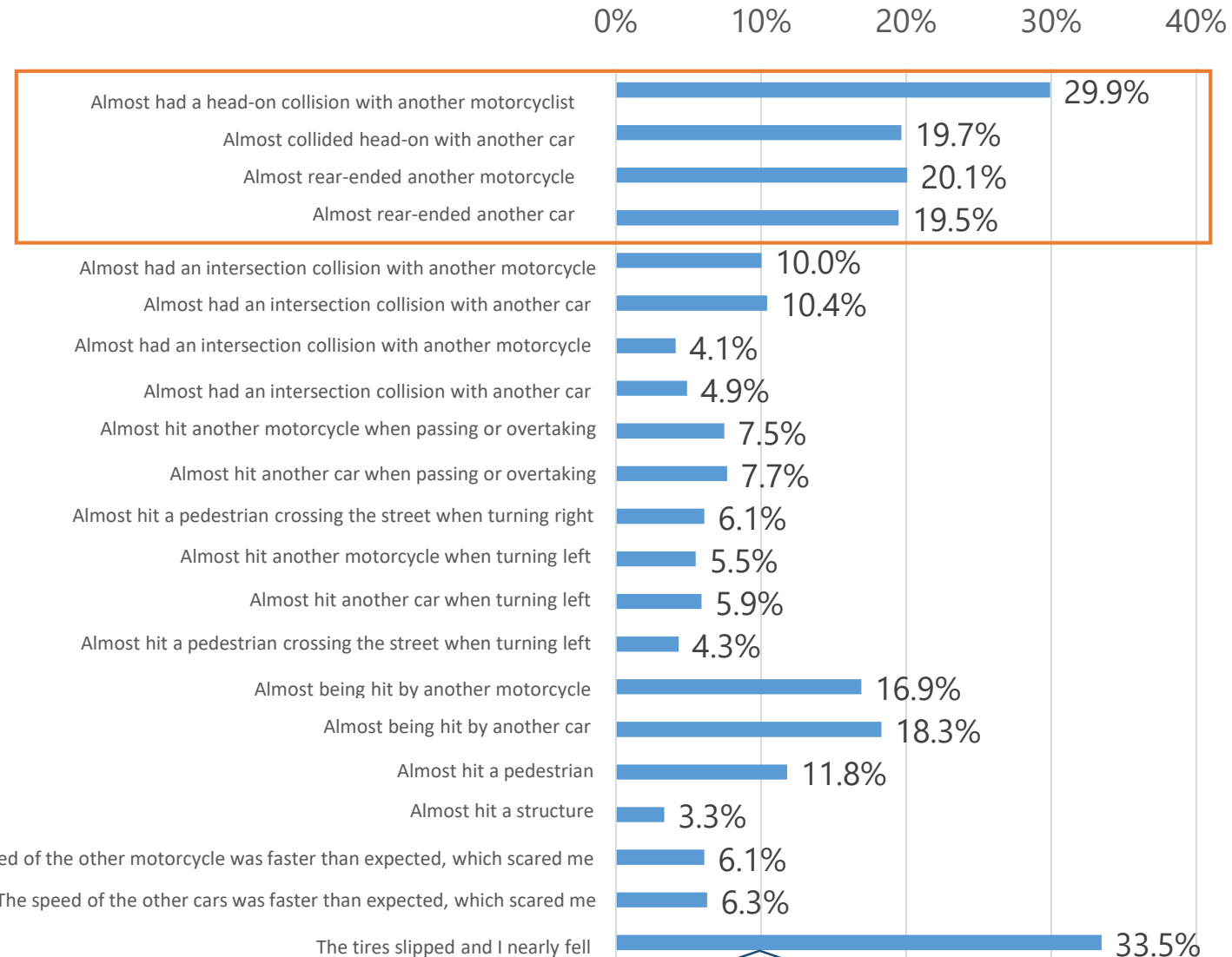
# Experience of traffic accidents and near-misses

## Q43. Near-miss experiences in the last year

### Q42: Accident experience in the last year



**26.6% of subjects had at least one accident per year**



HVN/TSEC: Most trainees have no knowledge of brakes before taking the course, nor they understand how to brake on wet or unpaved roads. As a mere habit, they tend to use rear wheel brakes a lot.

Number of Valid Responses (508)

# Effects of Safe Driving Programs by Driving Experience

## Safe Driving Program

- Training for driving schools and TSEC (Traffic Safety Education Center)
- Safe driving training by HVN for college and vocational school students and other young people
- Training for customers and local residents held by HVN motorcycle dealers

### Less than 3 years of motorcycle driving experience

- Percentage of non-participants who have experienced an accident: **0.50**
- Percentage of participants who have experienced an accident: **0.38**

↓ Accident  
experience in  
the past 1 year

Effective in reducing the number of accidents involving drivers with limited driving experience

### At least 3 years of driving experience

- Percentage of non-participants who have experienced an accident: 0.23
- Percentage of participants who have experienced an accident: 0.25

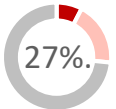
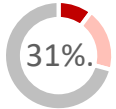
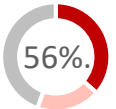
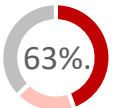
**24% decrease**

# Understanding Cause-and-effect Relationships

N = 400 (Those who have participated in the HVN safe driving program)  
 CFI: 0.937, TLI: 0.926  
 RMSEA: 0.052

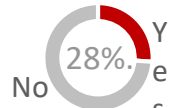
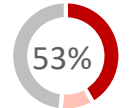
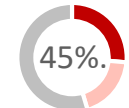
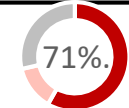
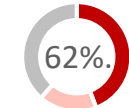
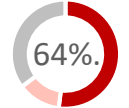
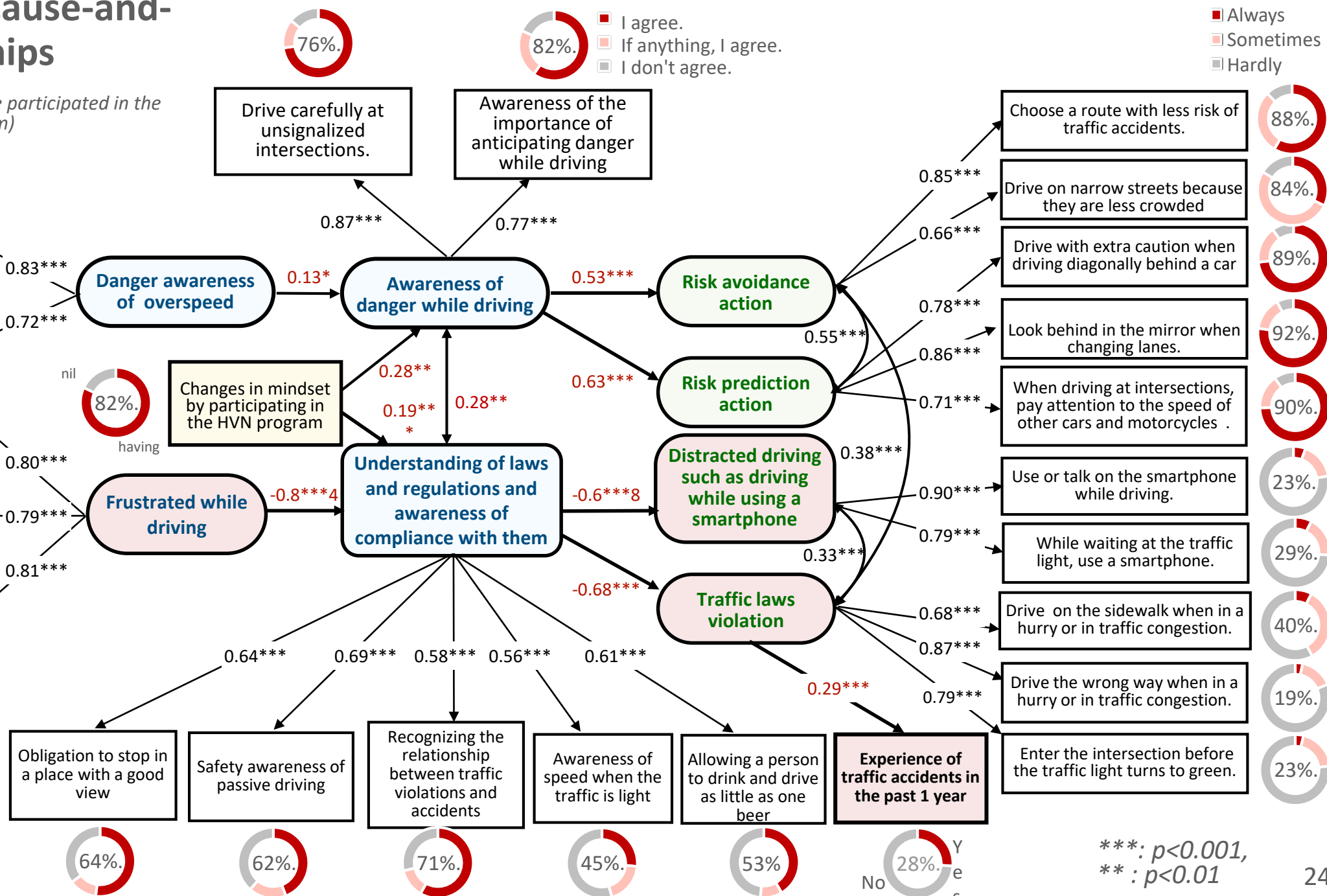
■ I agree.  
■ If anything, I agree.  
■ I don't agree.

■ Always  
■ Sometimes  
■ Hardly



The pie chart shows the actual responses of the subjects to each question (percentage).

- Speed awareness on main roads
- Speed awareness on residential roads
- Get frustrated on crowded roads
- Get frustrated when a frontward car is running slowly
- Get frustrated when the light turns red when in a hurry.

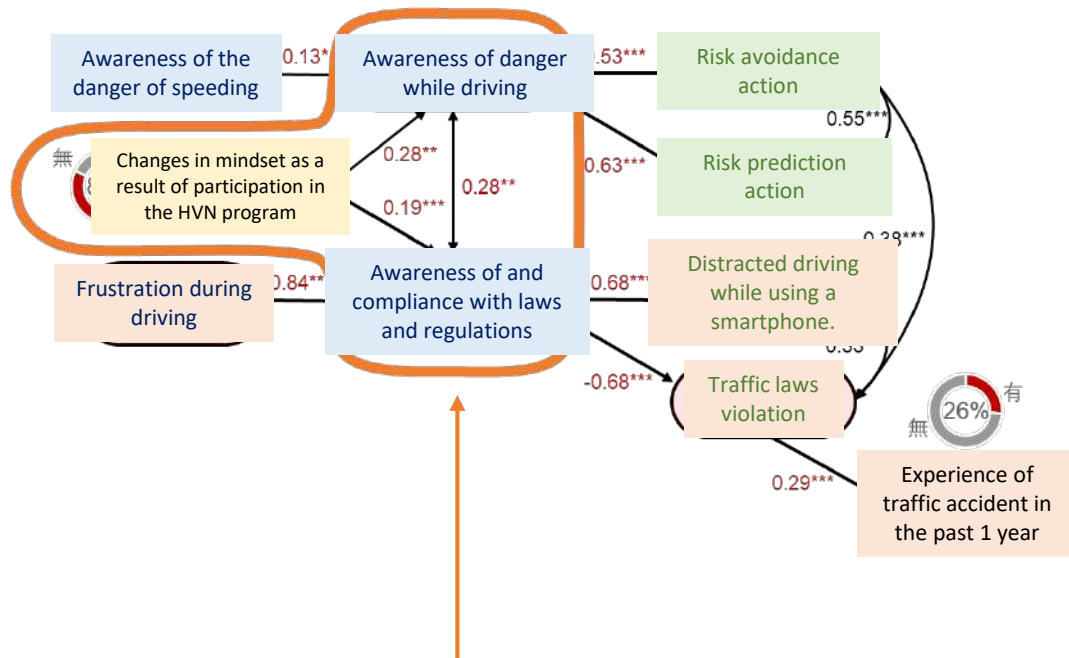


\*\*\*: p < 0.001,  
 \*\*: p < 0.01

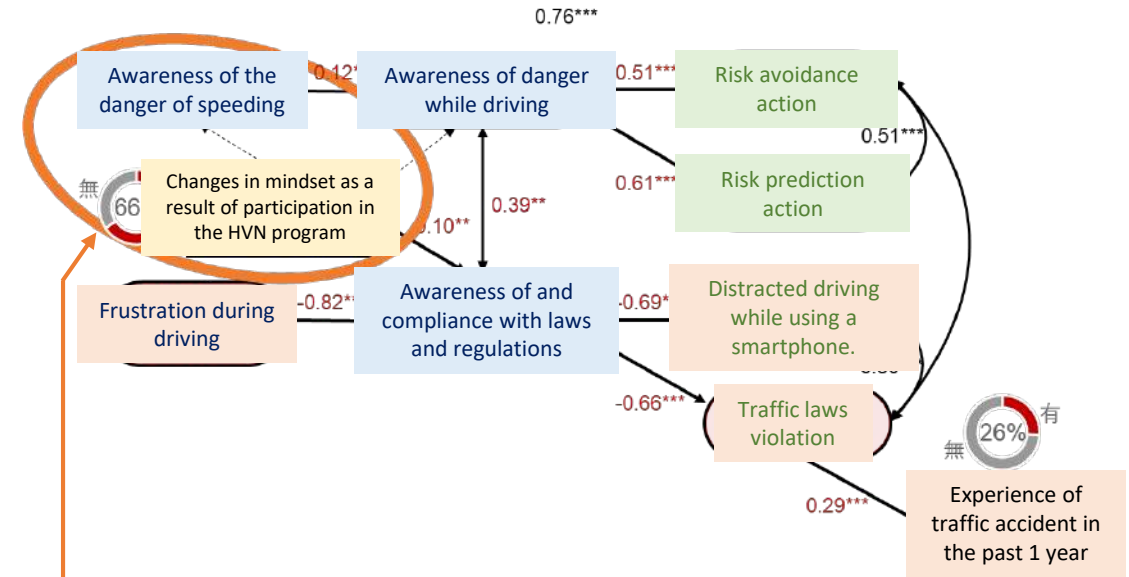


# Findings from Structural Analysis

Subjects: 400 program participants



Subject: 500 Name of motorcycle driver



More than 80% of the participants in the HVN safe driving program experienced a change in their mindset of driving, with a significant increase in "awareness of danger while driving" and "understanding of laws and regulations and awareness of compliance with them."

Compared to non-participants, participants in the HVN safe driving program shows significant improvement in "understanding of laws and regulations and awareness of compliance with them." However, there was **no significant difference** in "awareness of danger of speeding" and "awareness of danger while driving."

# Social Impact of Safe Driving Promotion Activities

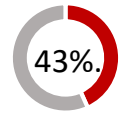
The pie chart shows the actual responses of the subjects to each question (percentage).

■ Yes  
■ No

Participated Activities



Direct training at TSEC Q3-3



Training for youth and students Q5-5



Training for customers and local residents Q5-6

0.17\*\*

0.14\*\*

0.20\*\*\*

Can drive with confidence.  
Q48-4

0.30\*\*\*

0.42\*\*\*

Livability

Safety and Awareness of Protecting Lives

Independence and Freedom of living

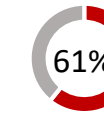
Consideration for other road users



Q48-3

Safety awareness when driving

0.48\*\*



Q48-10

Awareness of safety and the need to protect lives

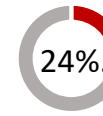
0.72\*\*\*

0.40\*\*\*

0.29\*\*

0.69\*\*\*

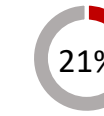
Independent mobility without relying on others



Q48-7

0.73\*\*\*

Freedom in daily life



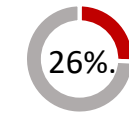
Q48-8

N = 400  
CFI: 0.924  
TLI: 0.875  
RMSEA: 0.069  
\*\*\* : p<0.001  
\*\* : p<0.01

0.69\*\*\*

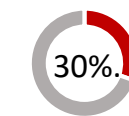
Pedestrian

Q48-11



0.61\*\*\*

Car-drivers



Q48-6

The HVN safe driving program was found to have the following significant effects on participants.

- a) Confidence in driving
- b) Safety awareness and awareness of protecting one's own life
- c) Increased independence in mobility and freedom of living
- d) Understanding the feelings of pedestrians and four-wheeled drivers.

Q48-7. Move independently without relying on relatives or friends  
Q48-8. Increased freedom in daily life

# Organizing Findings

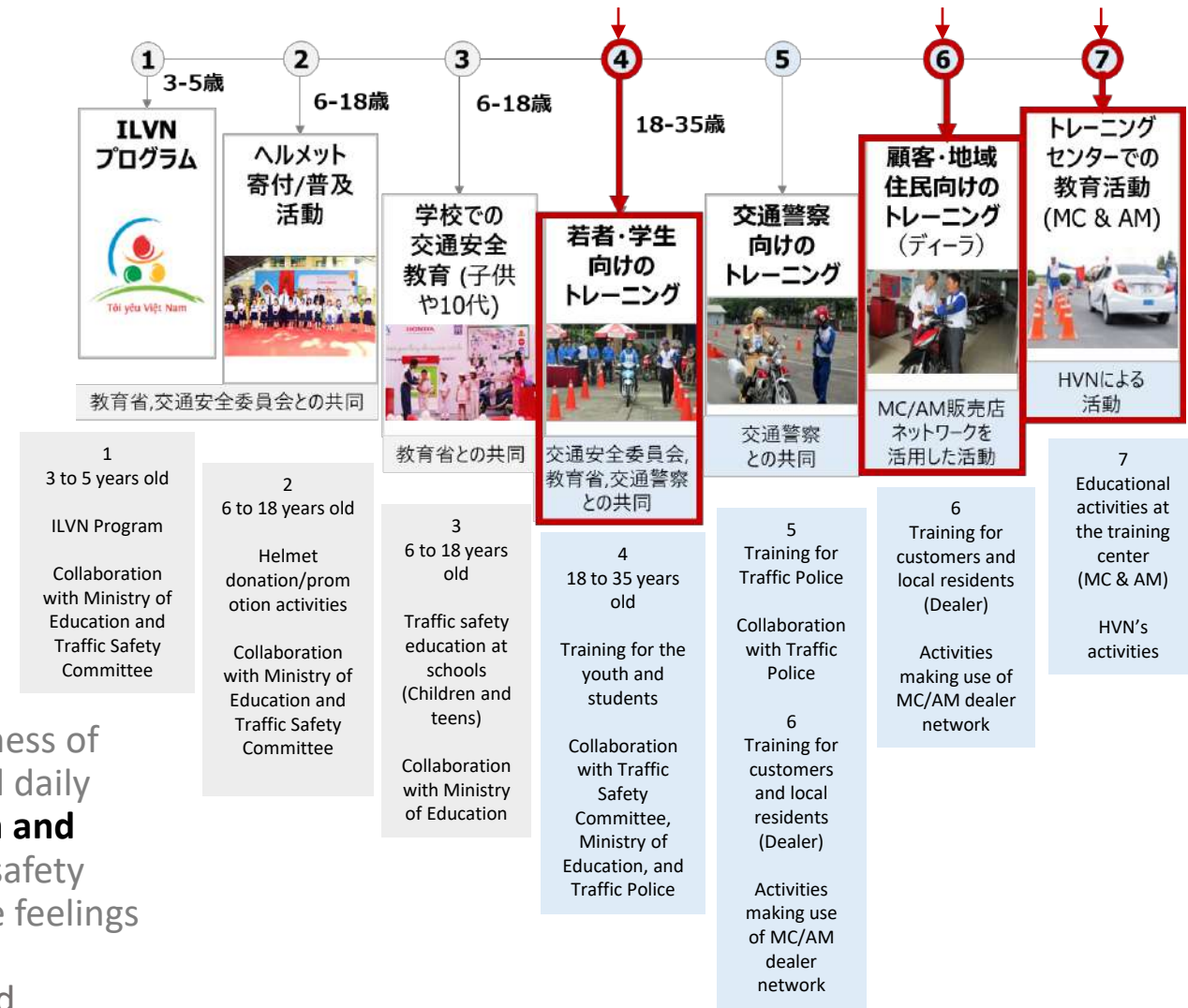
- The HVN safe driving program contributes to the reduction of traffic accidents through the following two factors.

1) Awareness and attitude toward danger while driving  
→ Promote risk avoidance and predictive behavior

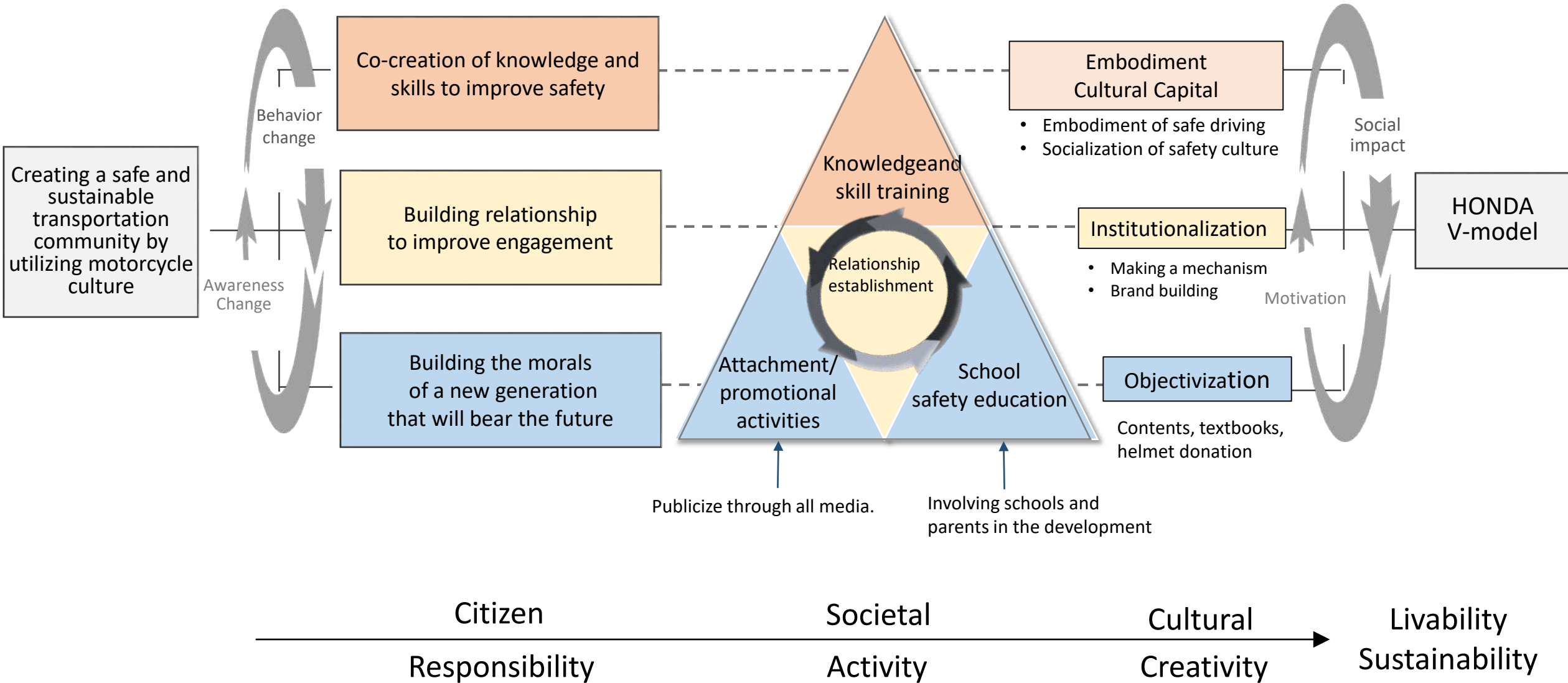
2) Understanding of traffic laws and awareness of compliance with them.  
→ Reduce violations of laws and regulations and driving while using a smartphone, etc.

Significantly contribute to the reduction of traffic accidents

- The safe driving program affects not only the individual's awareness of driving, but also his or her awareness of daily transportation and daily life, **resulting in an increase in "independence in transportation and freedom in life."** These effects, together with the awareness of safety and protection of one's own life, lead to an understanding of the feelings of pedestrians and four-wheel drivers (other road users), i.e., **consideration for others (acquisition of other perspectives)**, and contribute to the realization of a safe traffic society.



# The HONDA\_V Model as a Meta-design



# Achievement for This Year

**Understanding traffic accident risk** using drone aerial photography and AI to make up for the lack of data  
⇒ Reflecting the results in risk prediction education programs for motorcycle drivers that are locally appropriate in the future

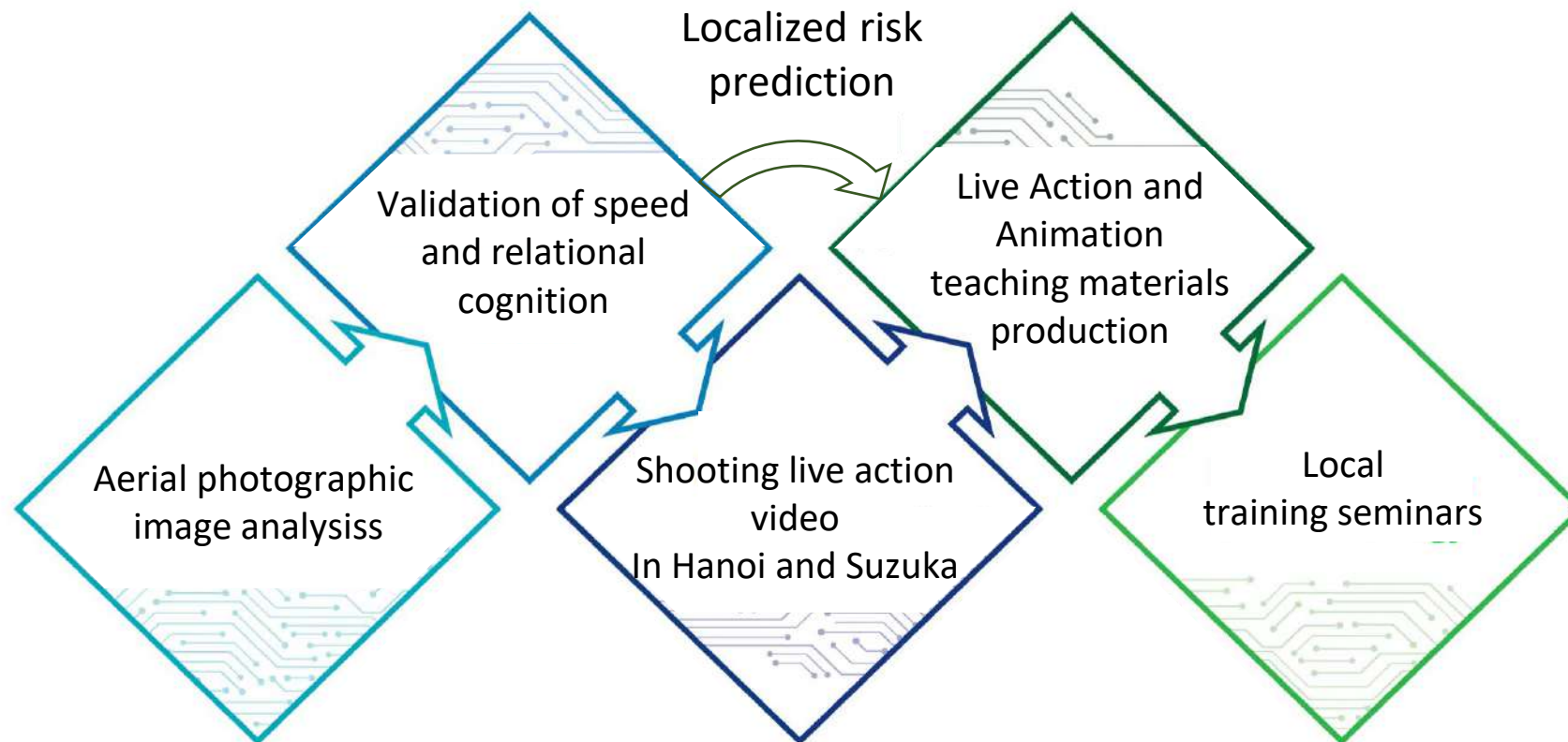
**Traffic safety culture co-creation model** led by motorcycle manufacturers involving the government, communities, and households  
⇒ The role to complement the challenges (enforcement) of road safety measures in the ASEAN region

Verification of the effect of safety education by Honda, a motorcycle manufacturer, and the structure of its social impact

- Based on the nationwide web-based survey in Vietnam, verify traffic accident reduction effect, social impact, and the realization structure created by Honda Vietnam's traffic safety.
- Contribution to a safe traffic society and improvement of livability through the safe driving program education

# For the coming year

Development of risk prediction program for motorcyclists focusing on speed perception in the ASEAN region





公益財団法人 国際交通安全学会

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