

Traffic Safety in Japan

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2. Current Efforts to Make Roads Safer

1. History of Road Safety in Japan

- 1) Changes in Road Traffic Accident
- 2) Laws and Action Programs for Road Safety
- 3) Results of Past Efforts

1) Changes in Road Traffic Accident --- Fatalities

- “Traffic war” led by motorization became a social problem in the 1960s.
- Fatalities reached a record high of 16,765 in 1970.
- In 2016, the number decreased down to 25 % of the 1970-level.

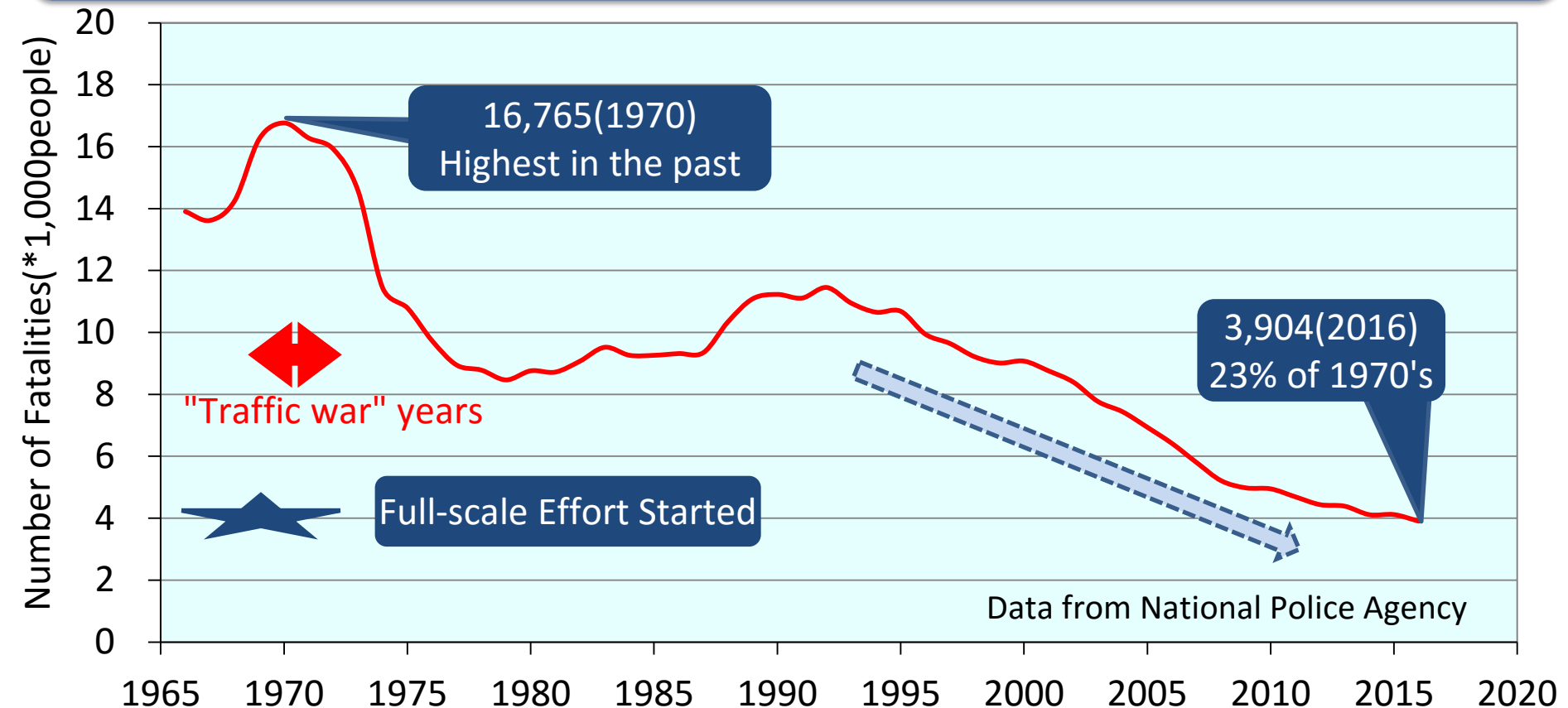


Fig-1 Changes in Road Traffic Accident Fatalities within 24 hours*

*"Fatalities within 24 hours" means those who, died within 24 hours due to an accident that was caused by the traffic of trains and vehicles.

1) Changes in Road Traffic Accident

--- Accidents, Fatalities, Casualties, Cars Ownership

- Accidents and injuries in around 2000 were more than in “Traffic way” years.
- Number of cars is about 4.5 times the 1970-level.

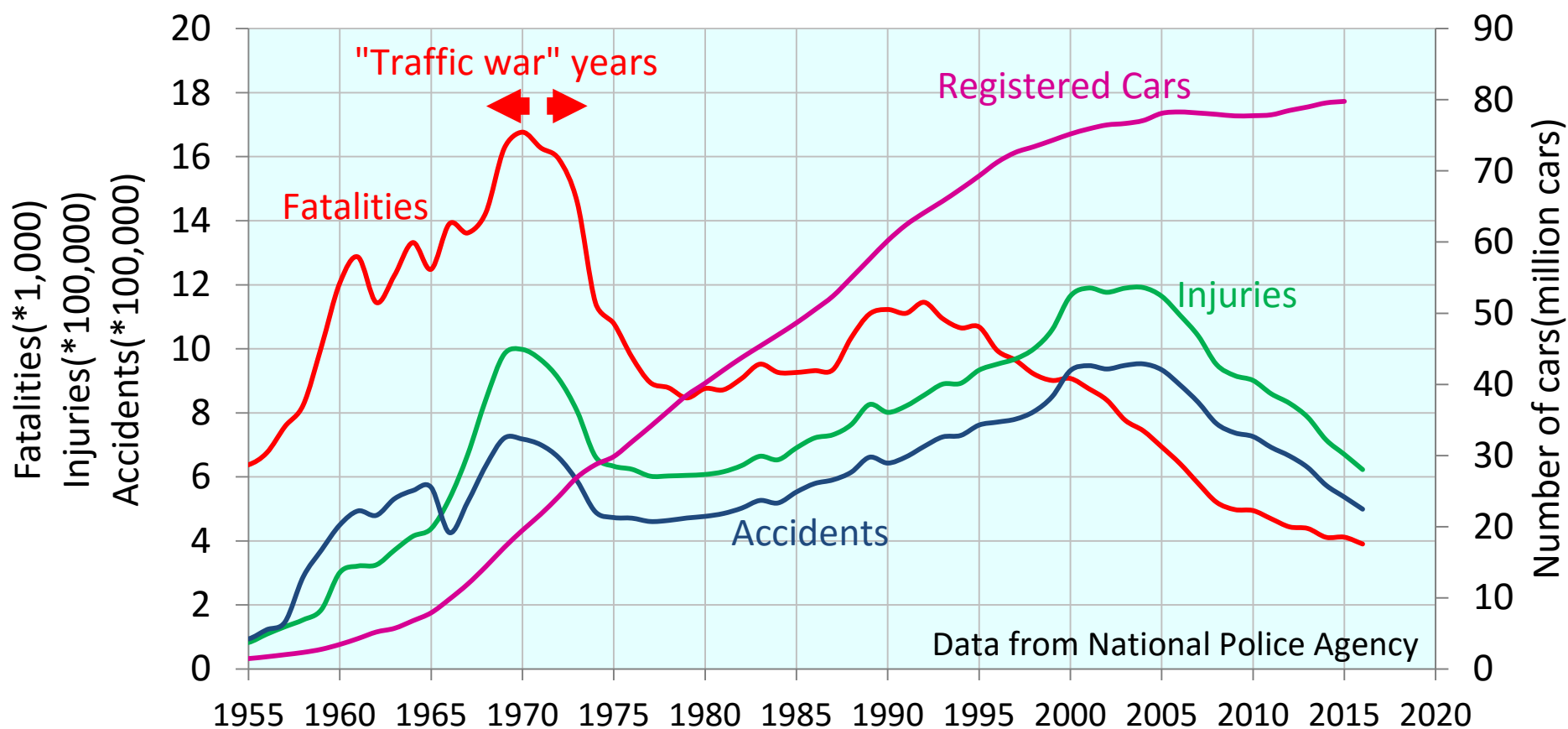


Fig-2 Changes in Road Traffic Accidents and Number of Cars, etc.

1) Changes in Road Traffic Accident --- Accident Rate

- Current accident rate is less than one third of the 1970's rate, although the number of accidents is same level with the 1970's.

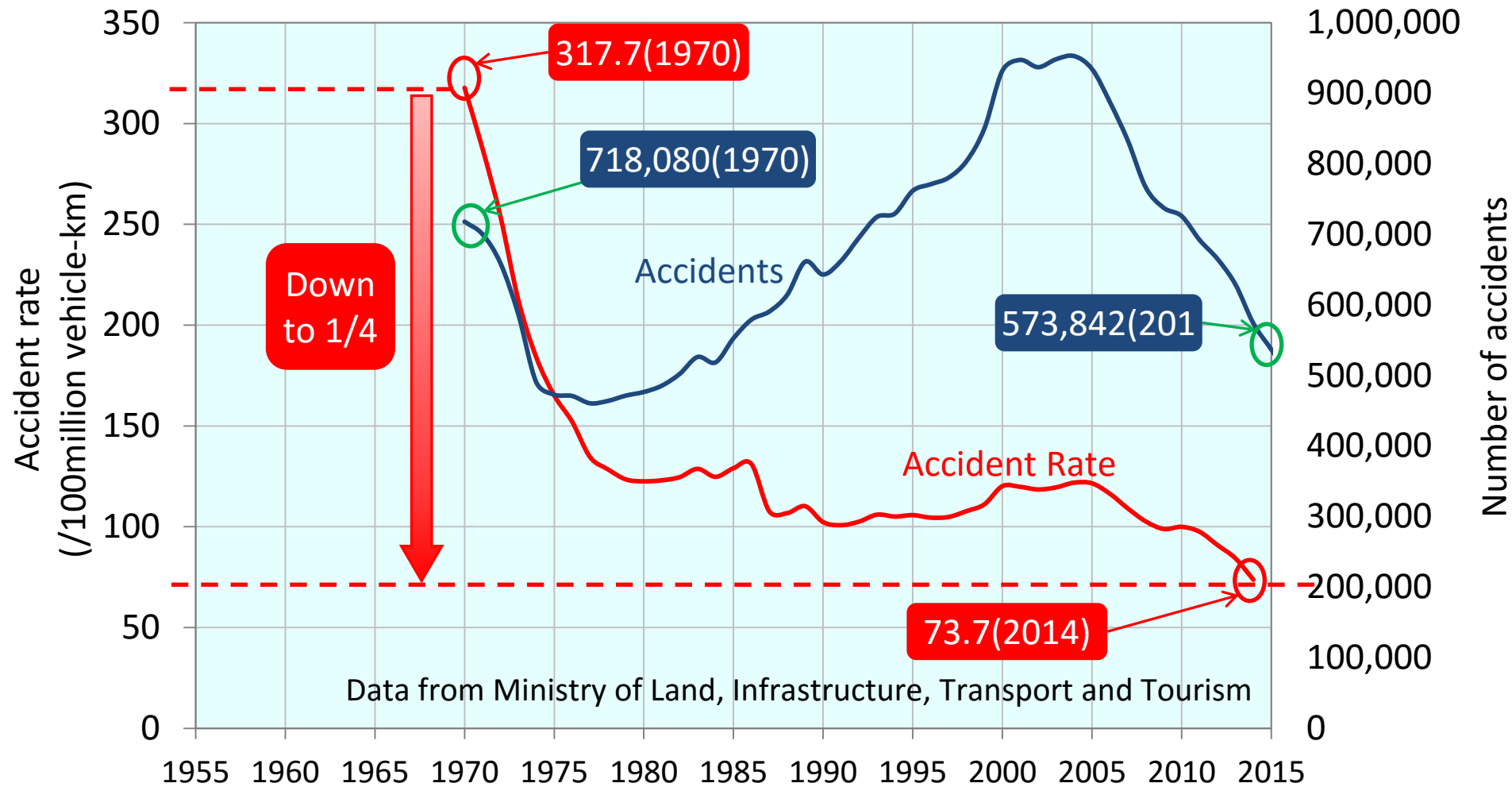



Fig-3 Accident Rate and Road Traffic Accidents

2) Laws and Action Programs for Road Safety

- Laws and action programs were established from the view points of all traffics and road traffic.

	Law			Action Program
1960	<u>Road Traffic Law</u>			
1966	Emergency Measures Law on Provision of <u>Traffic Safety Facilities</u>	➡	1966	The 1st three-year plan of <u>Traffic Safety Facilities</u> Improvement Program
1970	Traffic Safety <u>Policies</u> Law	➡	1971	The 1 st <u>Fundamental</u> Traffic Safety Program
				
			2011	The 9 th <u>Fundamental</u> Traffic Safety Program
			2012	Priority Policy Plan on <u>Infrastructure</u> Development

3) Results of Past Efforts

➤ The results were introduced by cooperative implementation among related fields

Engineering

- Increased road safety facilities
(Sidewalk, Pedestrian overpass, Guardrail, Center strip, Lighting, Traffic signal, ..)
- Development of expressway
- Enhancement of vehicle safety

Enforcement

- Decline in drunk driving
- Increased use of seatbelts

Education

- Increased awareness to traffic rules



Decrease of
Road
Accidents

3) Results of Past Efforts --- e.g. Sidewalks

- The construction of sidewalks introduced safety for especially children.

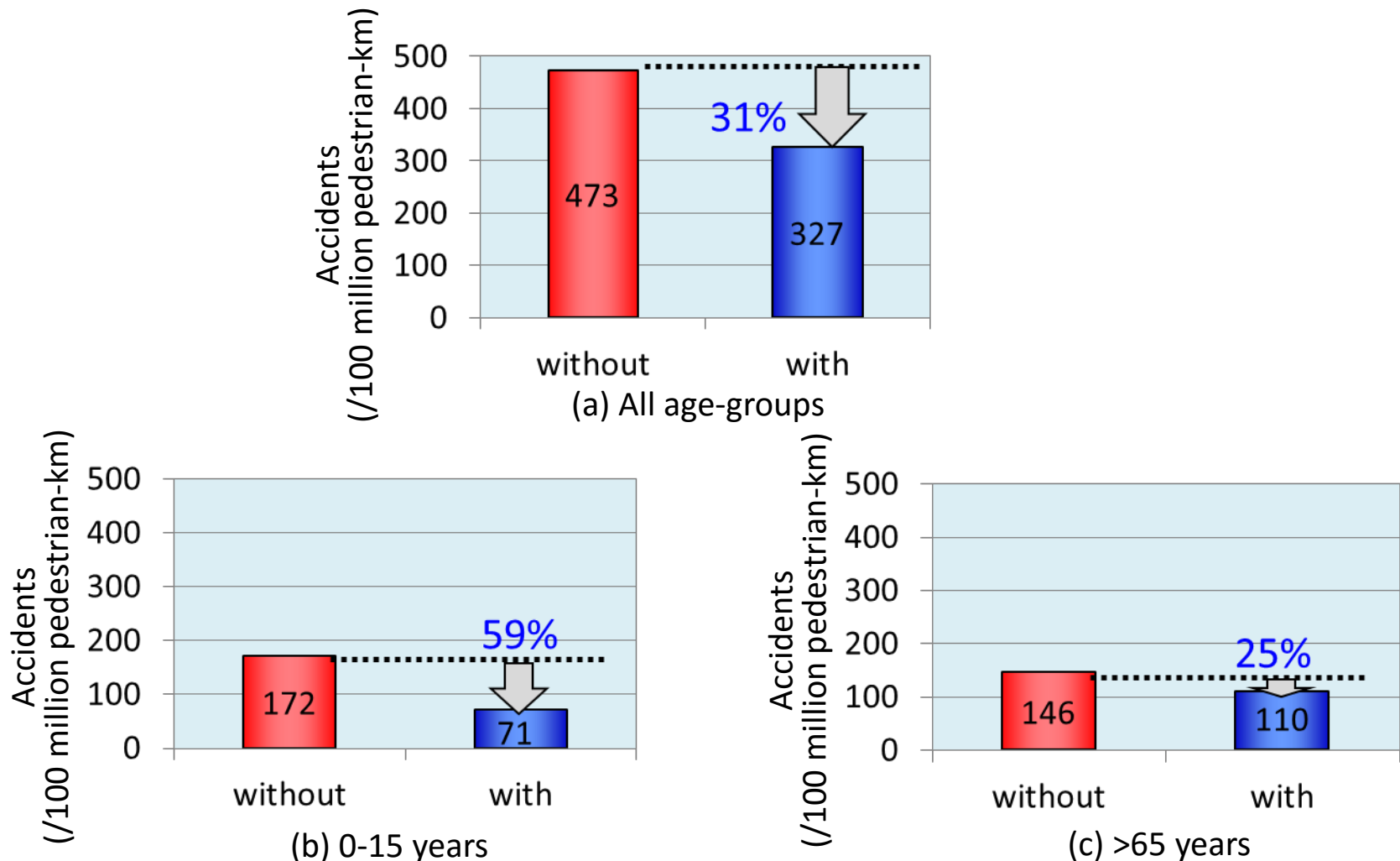


Fig.- 4 The Effectiveness of Sidewalk Construction on 2-lane roads (Accident data : 2000-2003)

3) Results of Past Efforts --- e.g. Road Lightings

- The installation of road lightings were more effective against vehicle-pedestrian and head-on collisions.

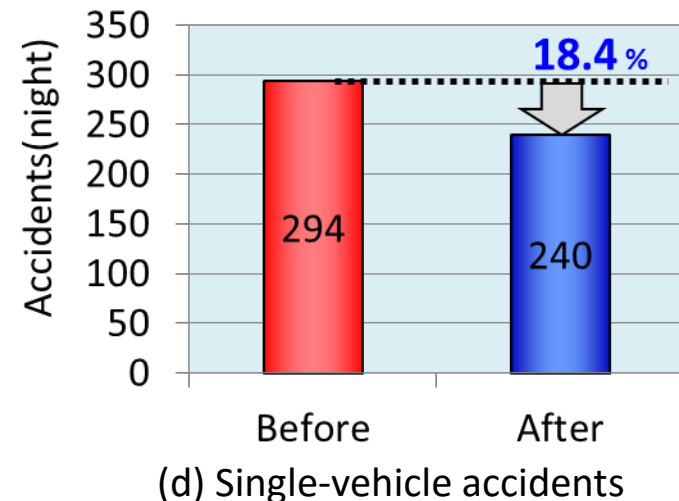
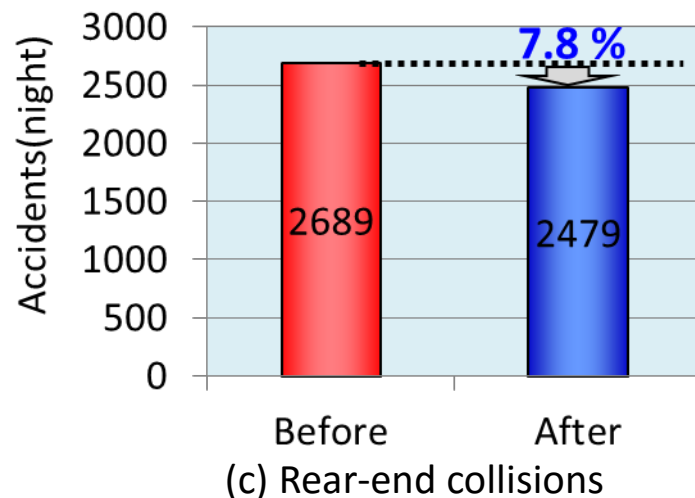
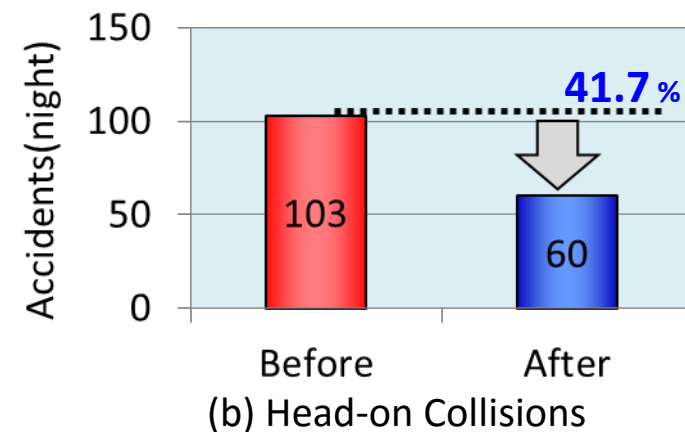
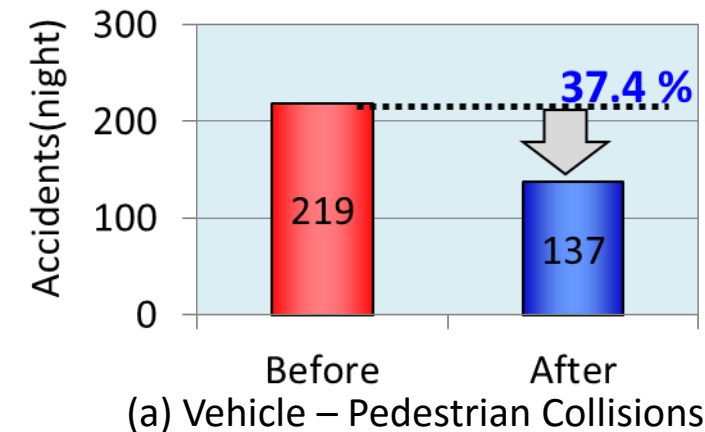


Fig.-5 The Effectiveness of Road Lighting Installation on Non-intersections

3) Results of Past Efforts

--- e.g. Expressways and Arterial Roads

- The construction of expressways and arterial roads contributed improvement of road safety.

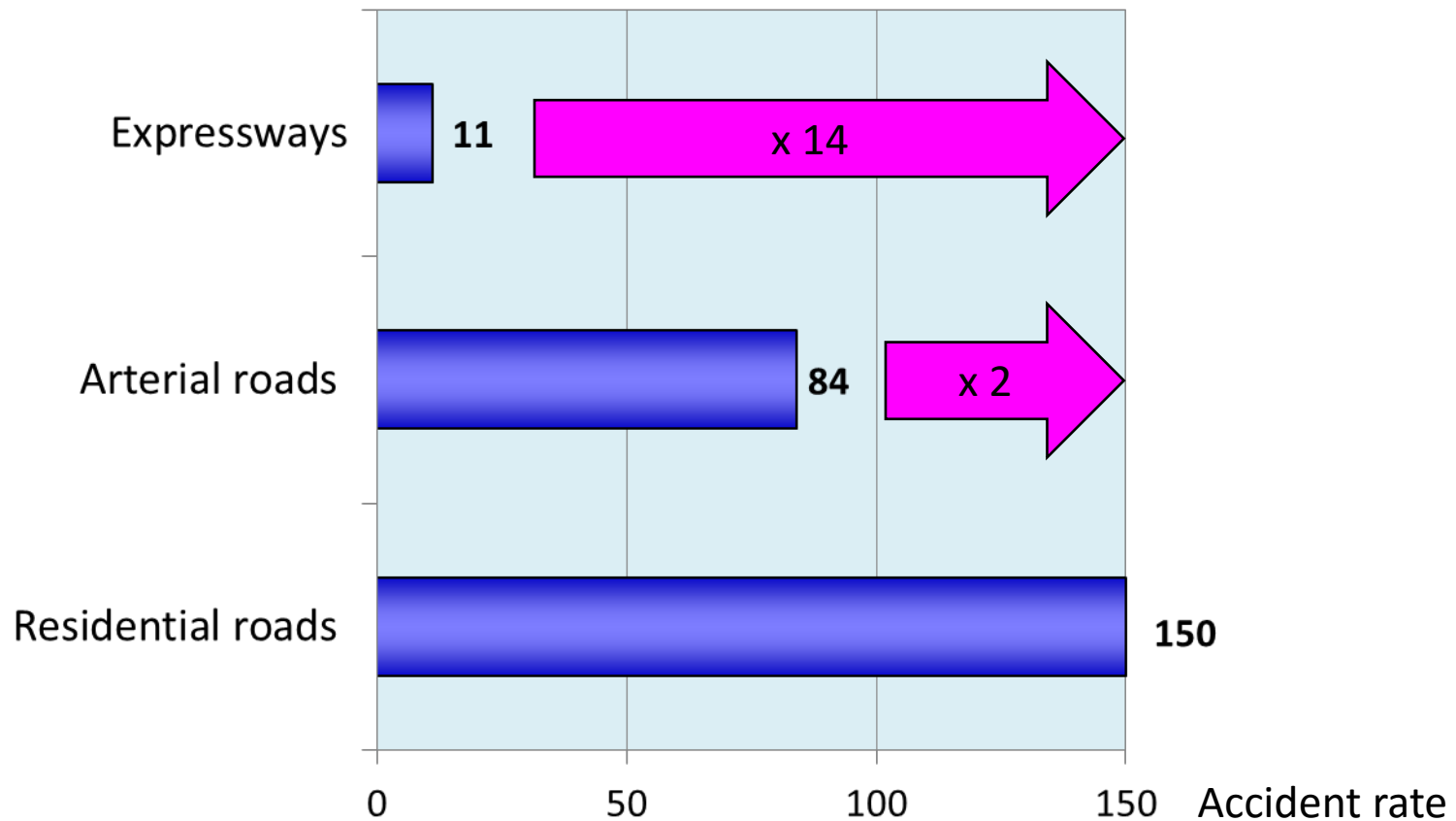


Fig. -6 Accident Rates by Road Types (Accident data : 2011)

3) Results of Past Efforts --- e.g. Drunk Driving

➤ The penal regulations for the drunk driving

The penal regulations for the drunk driving from 2007

		Penalty
Driver	Drunken Driver	Imprisonment with work for not more than 5 years or a fine of not more than 1,000,000 yen
	Driving under the influence of alcohol	Imprisonment with work for not more than 3 years or a fine of not more than 500,000 yen
	Refusal to take a breath test	Imprisonment with work for not more than 3 months or a fine of not more than 50,000 yen
Person who provided a vehicle	Drunken Driver (Driver)	Imprisonment with work for not more than 5 years or a fine of not more than 1,000,000 yen
	Driving under the influence of alcohol (Driver)	Imprisonment with work for not more than 3 years or a fine of not more than 500,000 yen
Person who provided alcohol, Person who recommended drinking,	Drunken Driver (Driver)	Imprisonment with work for not more than 3 years or a fine of not more than 500,000 yen
	Driving under the influence of alcohol (Driver)	Imprisonment with work for not more than 2 years or a fine of not more than 300,000 yen
Passenger	Drunken Driver (Driver)	Imprisonment with work for not more than 3 years or a fine of not more than 500,000 yen
	Driving under the influence of alcohol (Driver)	Imprisonment with work for not more than 2 years or a fine of not more than 300,000 yen

▪ Drunken Driver :

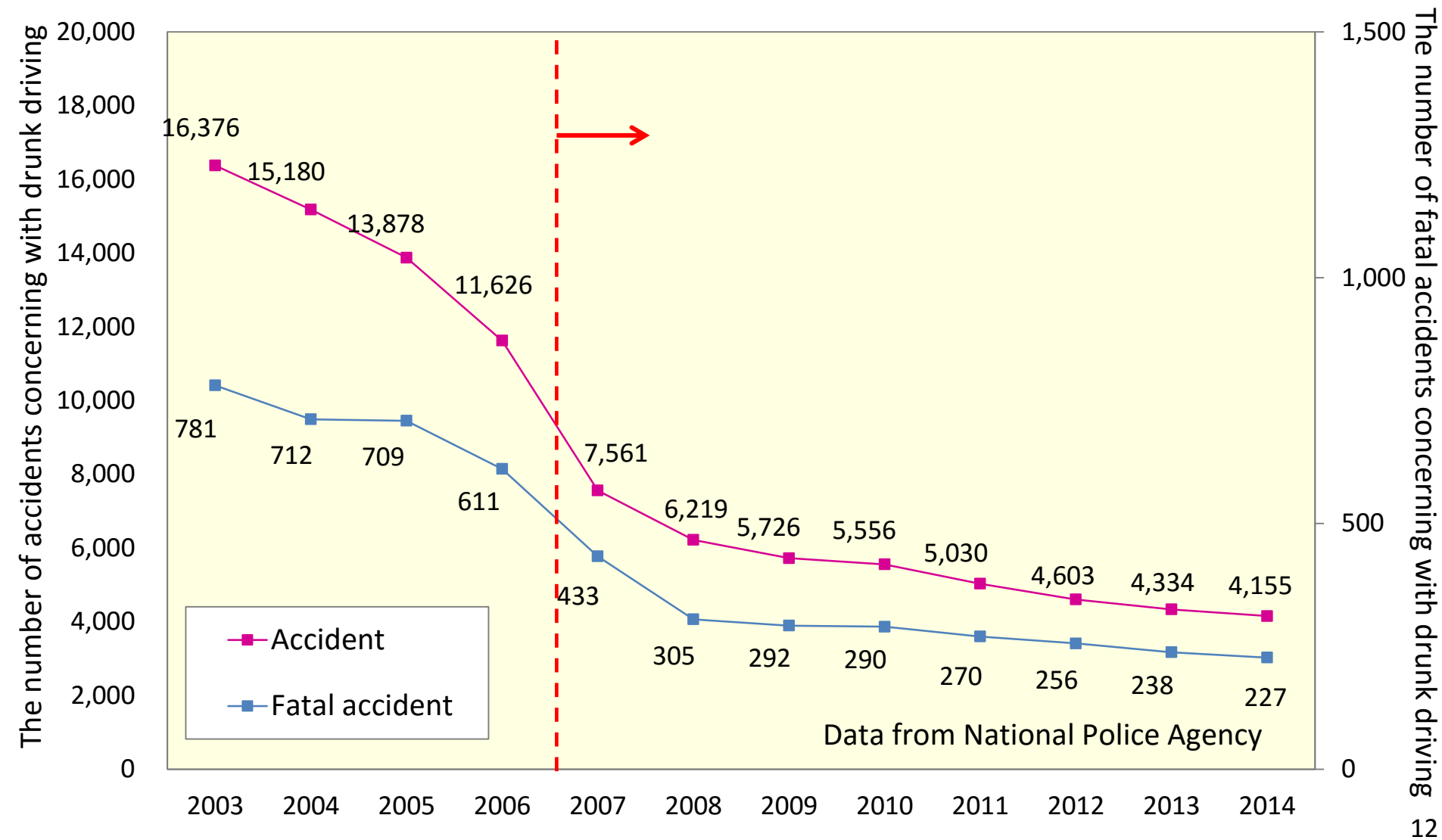
The driver clearly appears to be intoxicated in the opinion of the police officer enforcing the law.

▪ Driving under the influence of alcohol :

The driver's breath alcohol content exceeds 0.15mg/l.

3) Results of Past Efforts --- e.g. Drunk Driving

➤ The penal regulations for the drunk driving



2. Current Efforts to Make Roads Safer

2.1 Targets in 2020 and Future Priority Policies

- *in The 10th Fundamental Traffic Safety Program*

2.2 Efforts to Improve the Effectiveness of Road Improvements

---- The 10th Fundamental Traffic Safety Program ----

Target in 2020

- (1) Fatalities is less than 2,500.**
- (2) Injuries is less than 0.5 million.**

Future Priority Policies

- (1) Ensure safety of the elderly and, pedestrians and cyclists, on community Roads.**
- (2) Priority issues to create an environment with fewer accidents.**
 - a. Promoting the use of advanced technologies**
 - b. Promoting carefully planned measures based on actual traffic conditions, etc.**
 - c. Promoting traffic safety measures encompassing entire regions.**

- 69% of all accidents on arterial roads are concentrated on 20% of all arterial road sections.

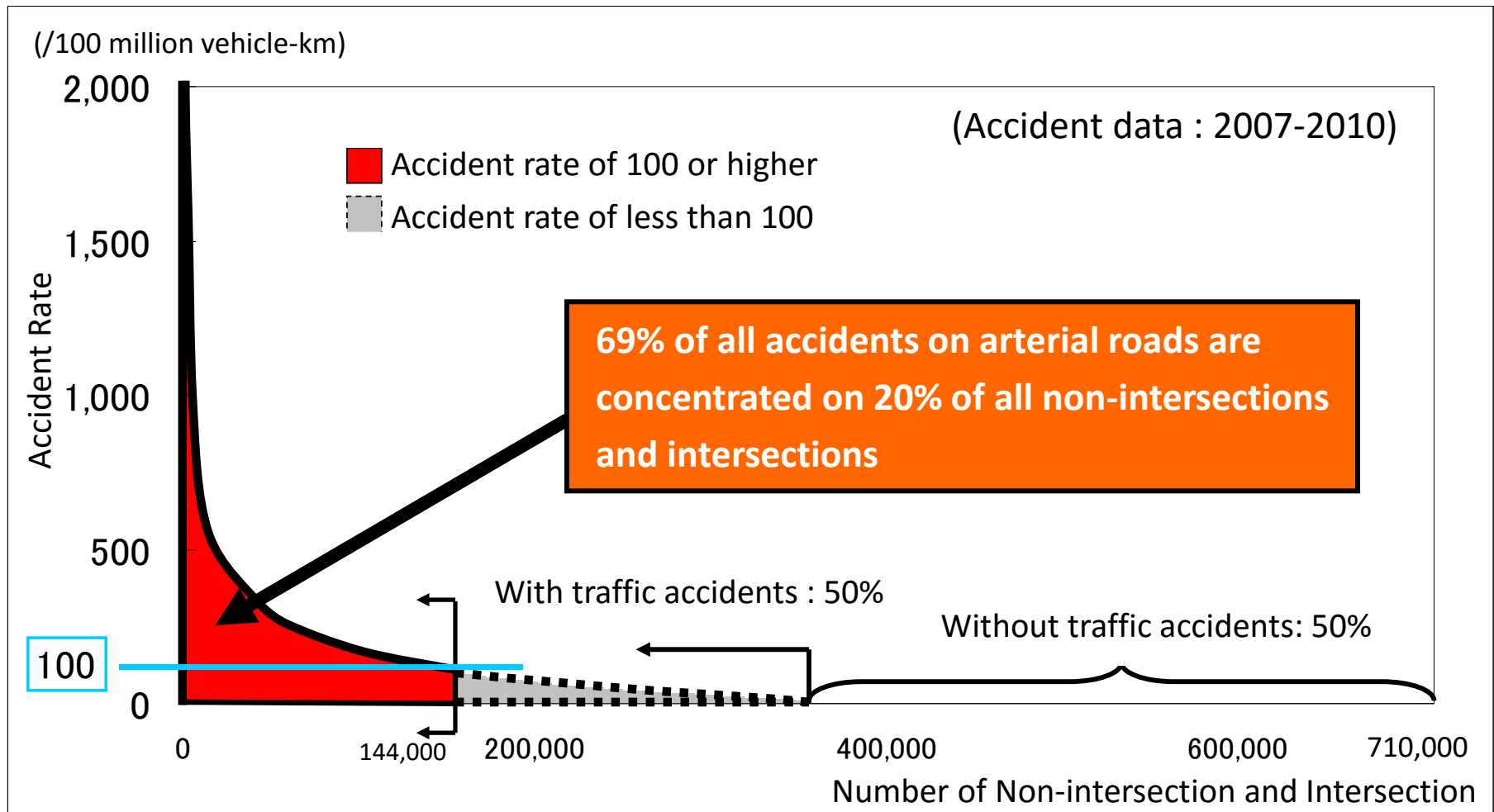


Fig.-7 Ranking Curve of Sections based on Accident Rate

- The 65 or more years age-group fatalities per population is more than other age-groups, furthermore this group is high compared with other countries.

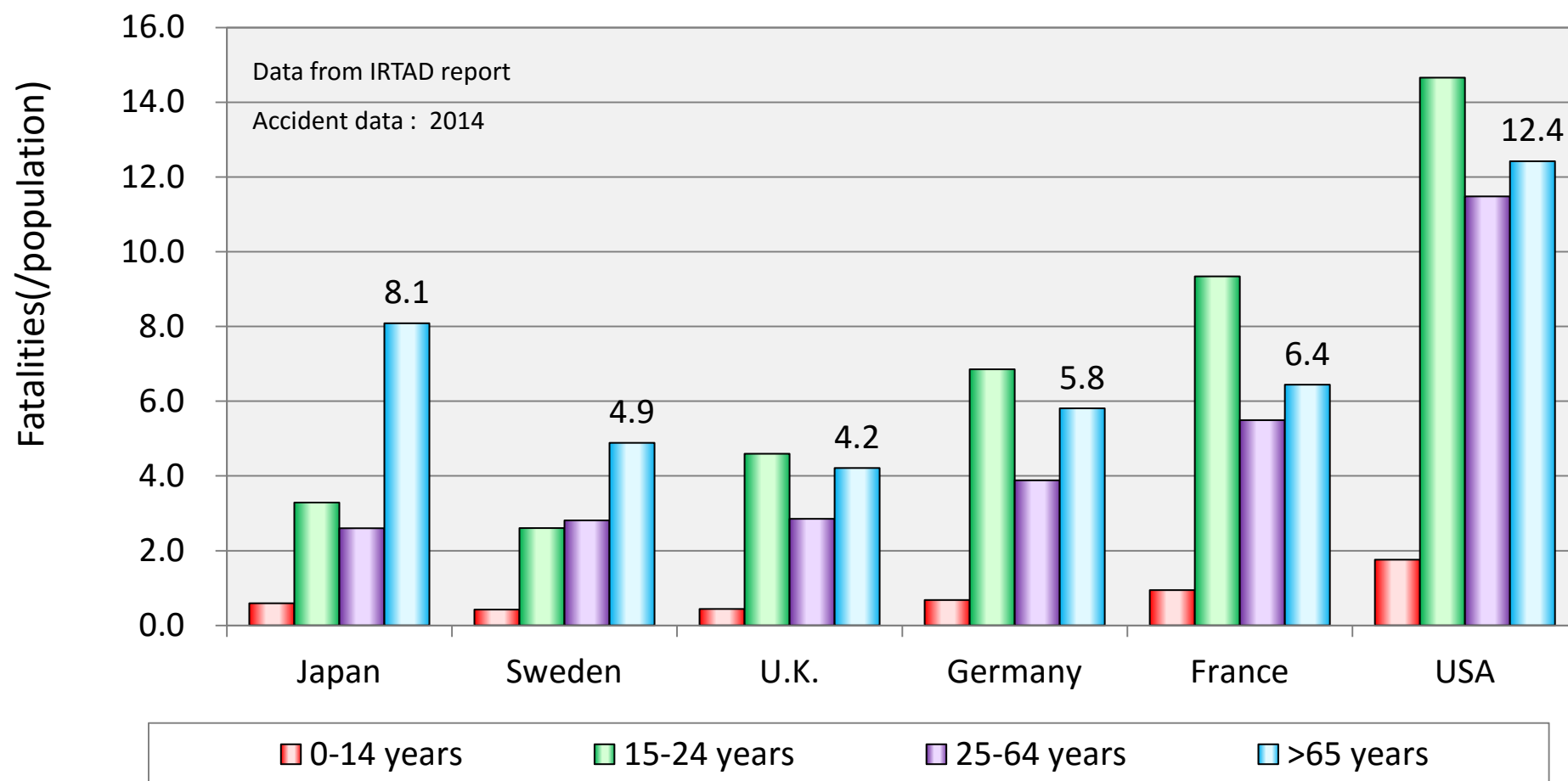


Fig. -8 Fatalities by Age-group per Population

- The proportion of pedestrian and cyclist fatalities is about half, this is very high compared to other countries.

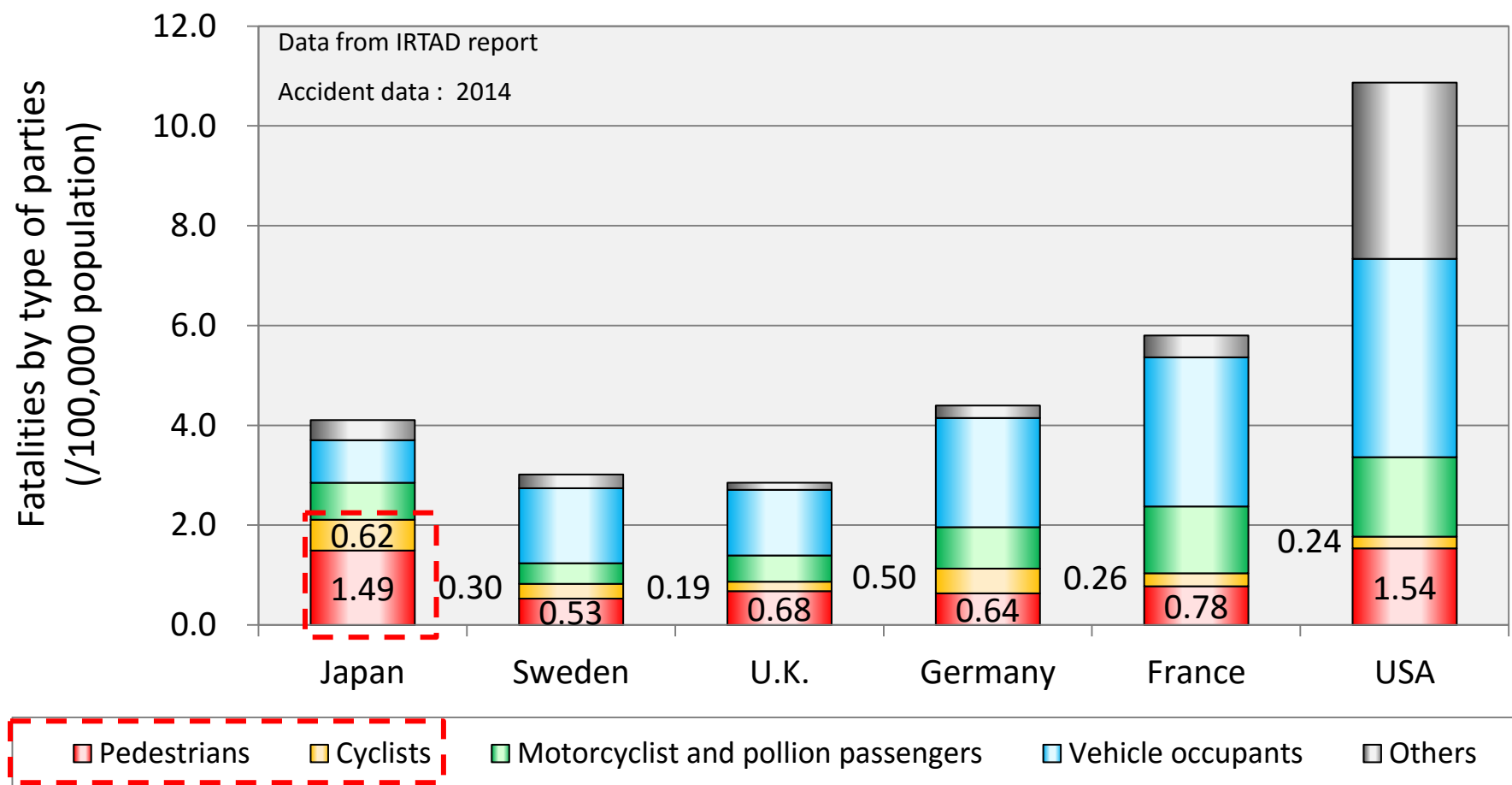
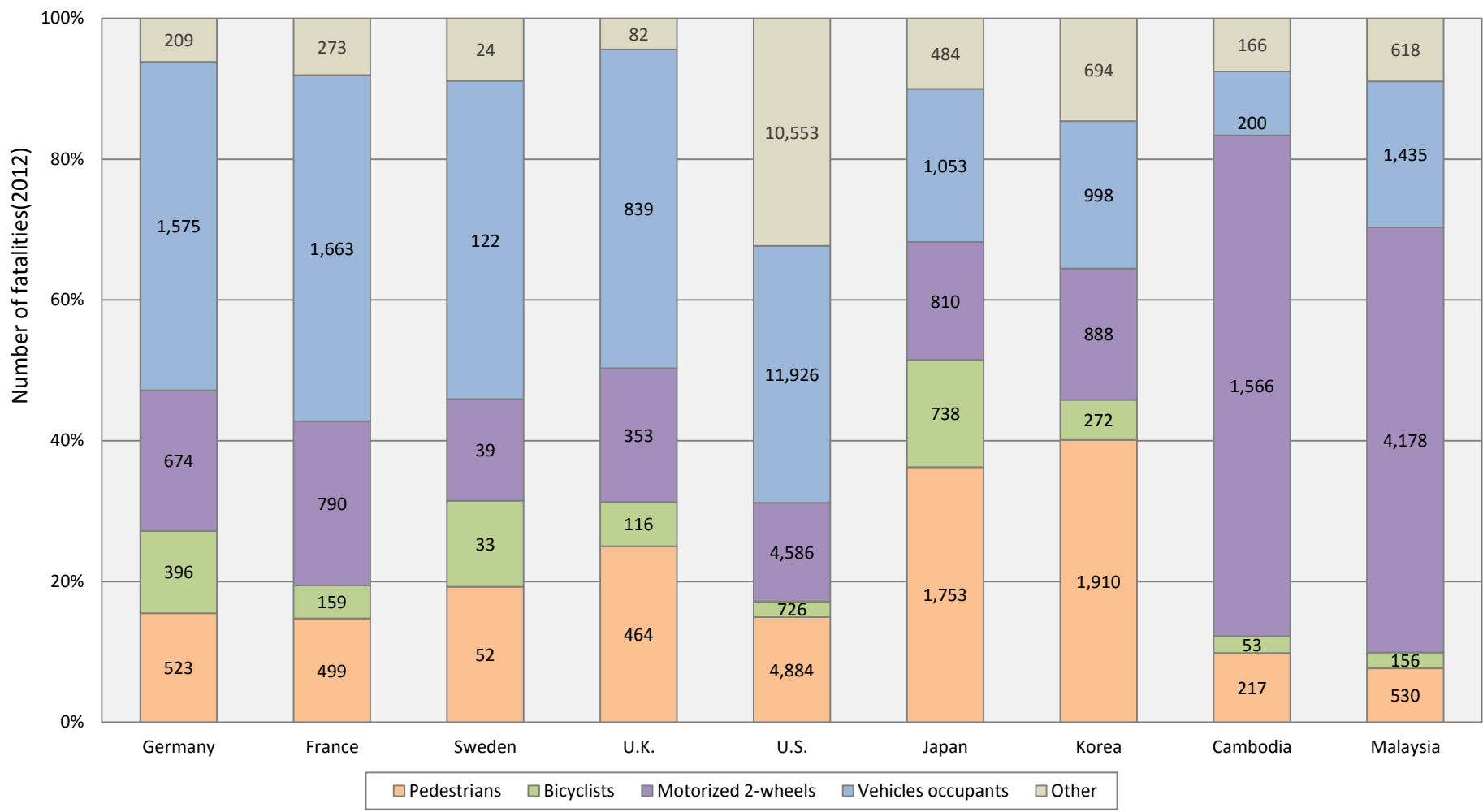


Fig. -9 Fatalities by Type of Parties per Population

➤ The proportion of pedestrian and cyclist fatalities is about half, this is very high compared to other countries.



- Bicycle-bicycle and bicycle-pedestrian accidents only in 2011 increased compared to 2001, they are about 1.5 times.

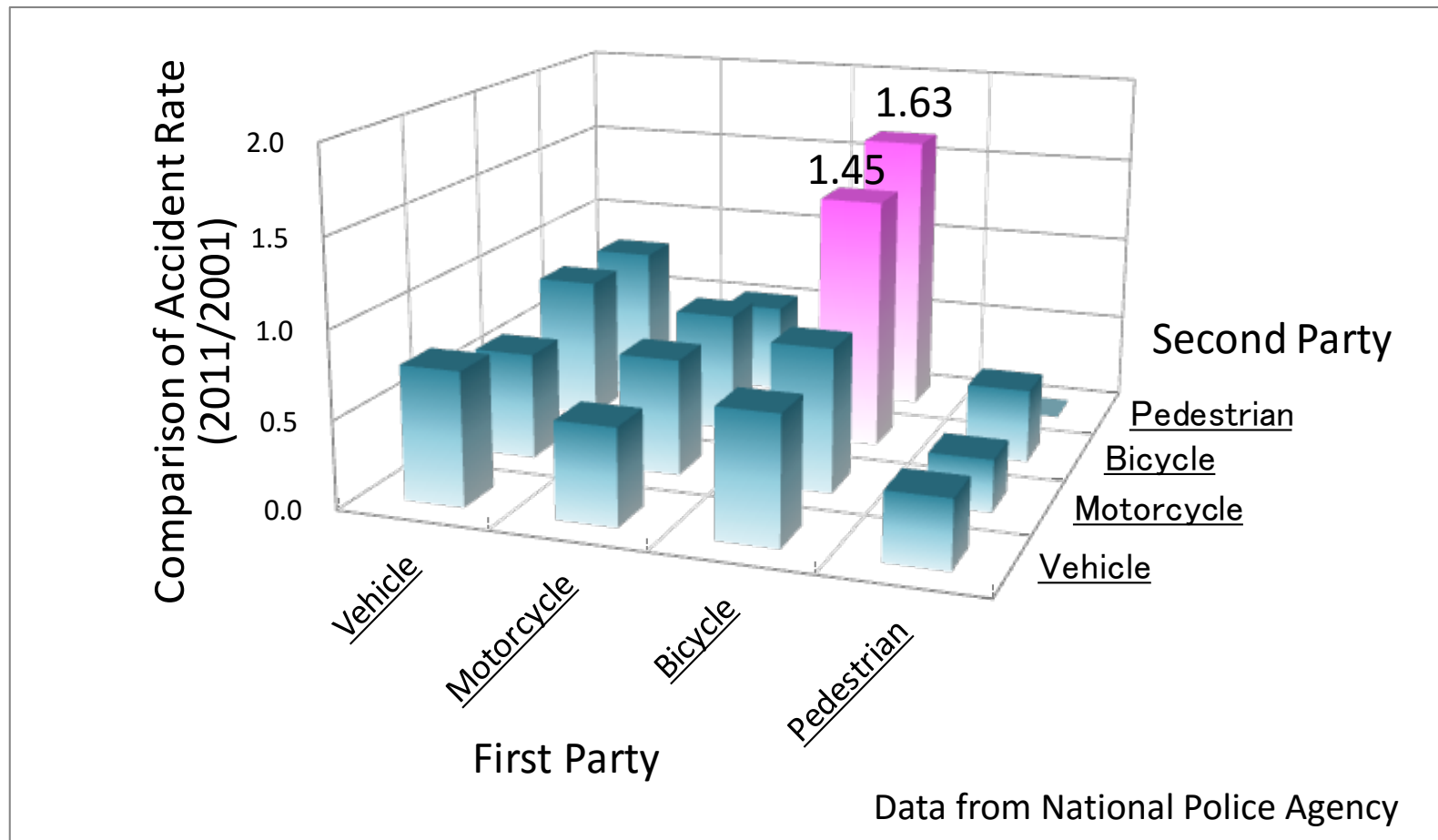


Fig. -10 Rate of Change of Accidents by Type of Parties

2.2 Efforts to Improve the Effectiveness of Road Improvements

- 1) Designation of Hazardous Spots to be Improved by Priority based on Data
- 2) Management Cycle for Effective Implementation of Hazardous Spot Countermeasures
- 3) Improvement of Bicycle Travelling Space

1) Designation of Hazardous Spots to be Improved by Priority based on Data

1) Designation of Hazardous Spots to be Improved by Priority based on Data

Hazardous Spots		
Year	Designated spot number	Effectiveness
1996	3200	-32.9%
2003	3956	-32.1%
2008	3396	
2013	3490	
2016	3125	

«Criteria in 2016»

- 1,000 or more accidents/billion vehicle km
- 100 or more serious accidents/billion vehicle-km
- 10 or more fatal accidents/billion vehicle-km

All of the three above are satisfied.

Identify the spots

Integrated Database of Road Traffic Census and Accident

1) Designation of Hazardous Spots to be Improved by Priority based on Data

Integrated Database of Road Traffic Census and Accident

Traffic Accident Data

- Incident date and time
- Age, Sex (1st party, 2nd party)
- Num. of fatalities, serious injuries, slight injuries
- Type of accident
- Road surface condition
- Road alignment
- Law violation etc.

Road Traffic Census Data

- Route number
- Section Length
- Num. of lanes, Carriage way width
- Length of sidewalk, center strip
- Traffic volume
- Average travel speed
- Roadside condition etc.

Integrate

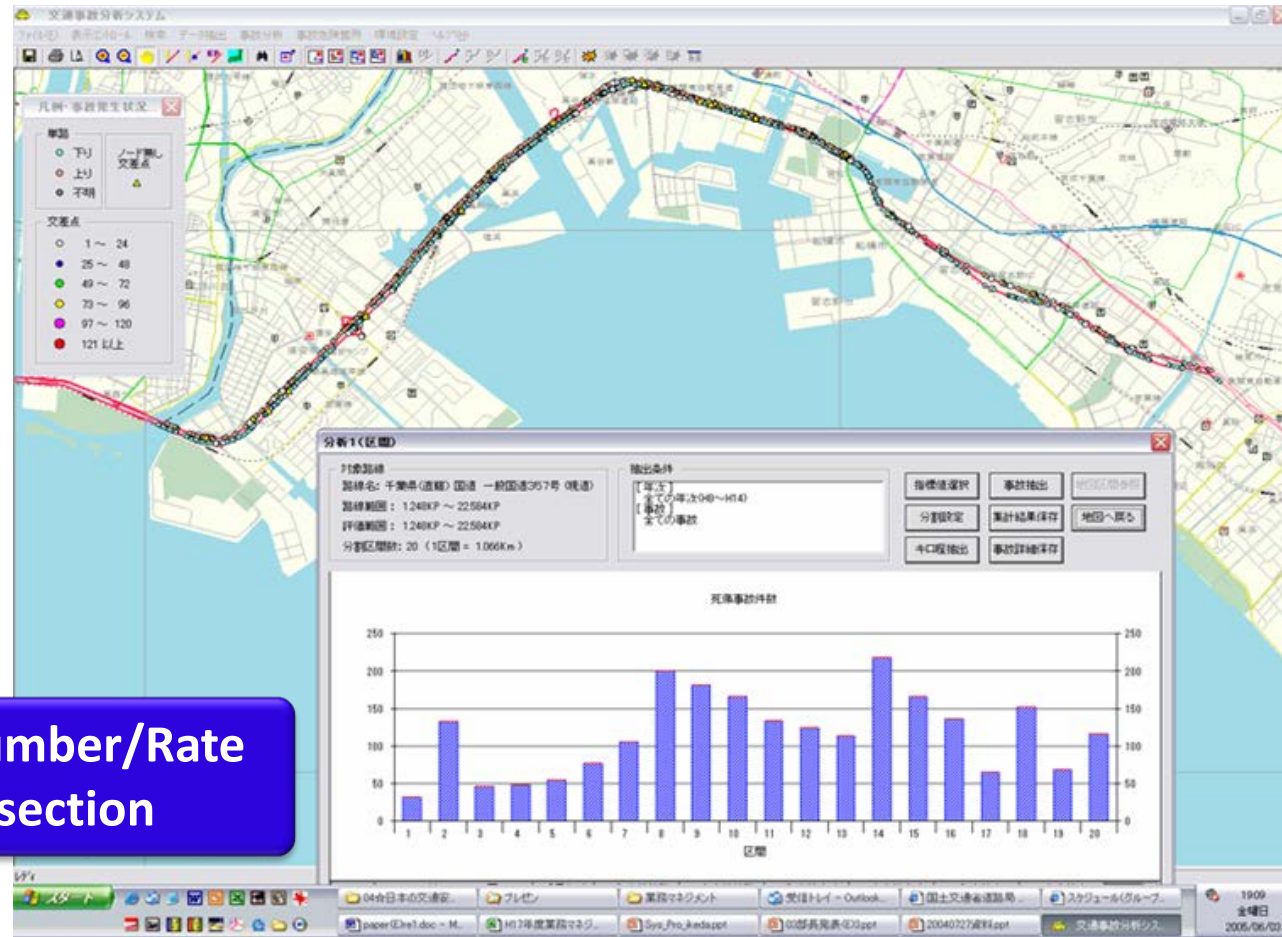
Integrated Database of Road Traffic Census and Accident

Accident Occurrence Characteristics on Each Intersection/Each Section with Specific Length

- Num. of accidents
- Accident rate
- Composition ratio of accident type
- Before-after/with-without effects of sidewalk/road safety facilities
- Ranking the section according to the accident rate
- Identify the spots over some criteria etc.

1) Designation of Hazardous Spots to be Improved by Priority based on Data

Use of Integrated Database

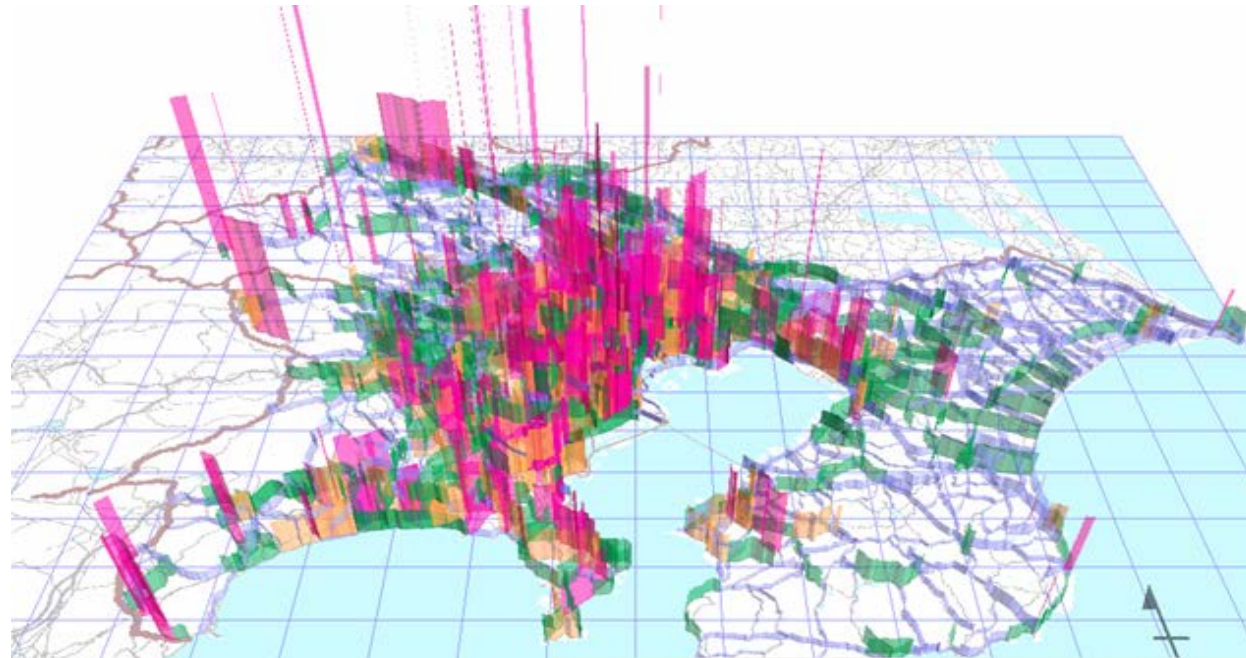


**Accident Number/Rate
in each section**

Fig.-12 Accident Number in Each Section of a National Highway

1) Designation of Hazardous Spots to be Improved by Priority based on Data

Use of Integrated Database



Concentration at specific locations

Legend

■	300 - (cases/100 million vehicle-km)
■	200 - 300 (cases/100 million vehicle-km)
■	100 - 200 (cases/100 million vehicle-km)
■	- 100 (cases/100 million vehicle-km)

Fig.- 13 Distribution of Accident Rate on Road Network

2) Management Cycle for Effective Implementation of Hazardous Spot Countermeasures

2) Management Cycle for Effective Implementation of Hazardous Spot Countermeasures --- PDCA-cycle

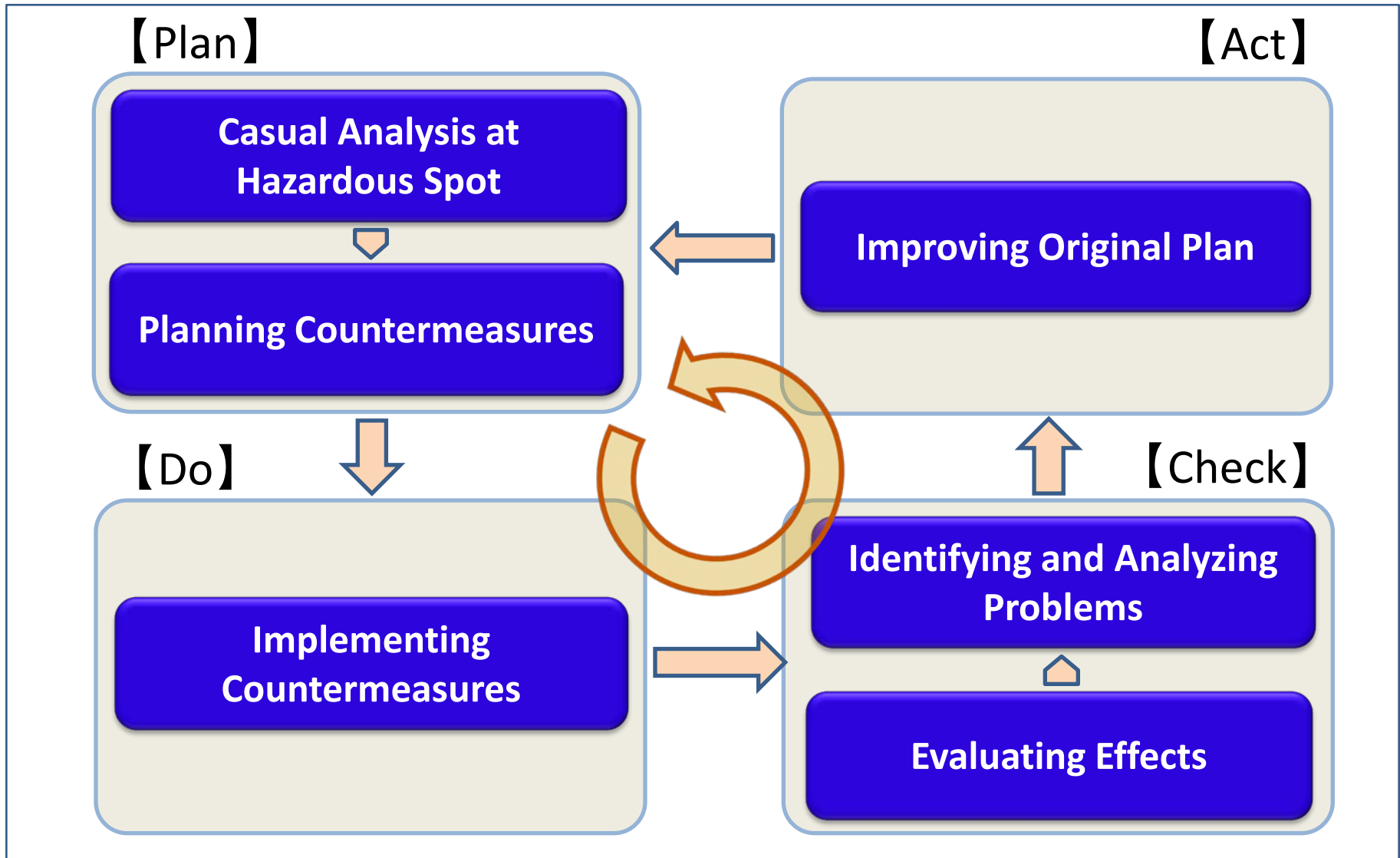
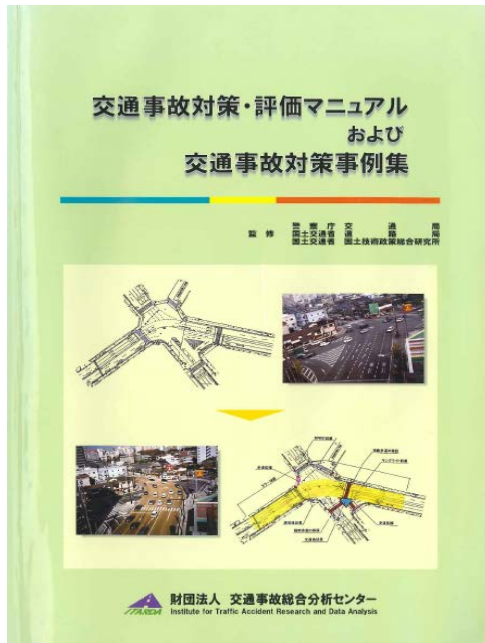


Fig.- 14 PDCA-cycle

Traffic Safety Measures and Evaluation Manual Guideline for Improving Road Safety at Hazardous Spots



“Traffic Safety Measures and
Evaluation Manual”

and

“Guideline for Improving Road
Safety at Hazardous Spots”

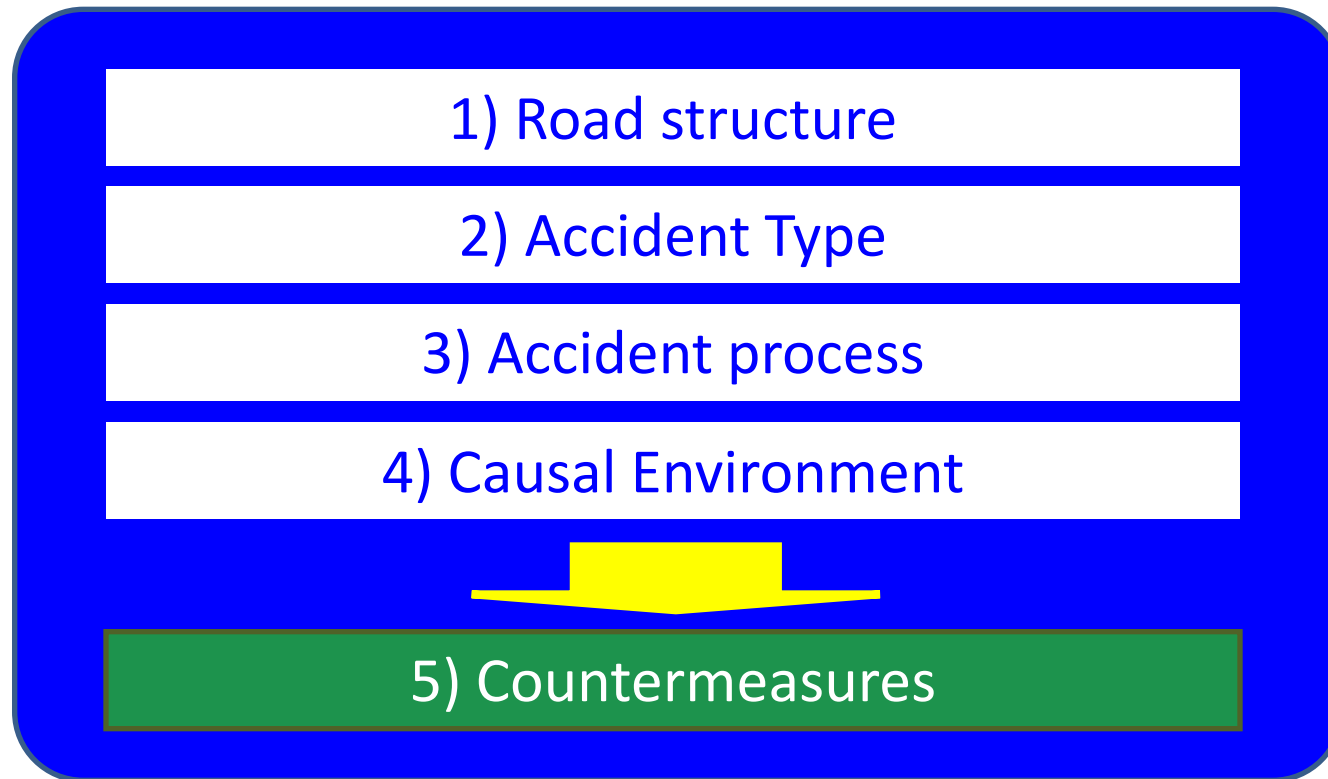
“Traffic Safety Measures and Evaluation Manual”

Systematically organizing the procedures and the points of from planning to action.

“Guideline for Improving Road Safety at Hazardous Spots”

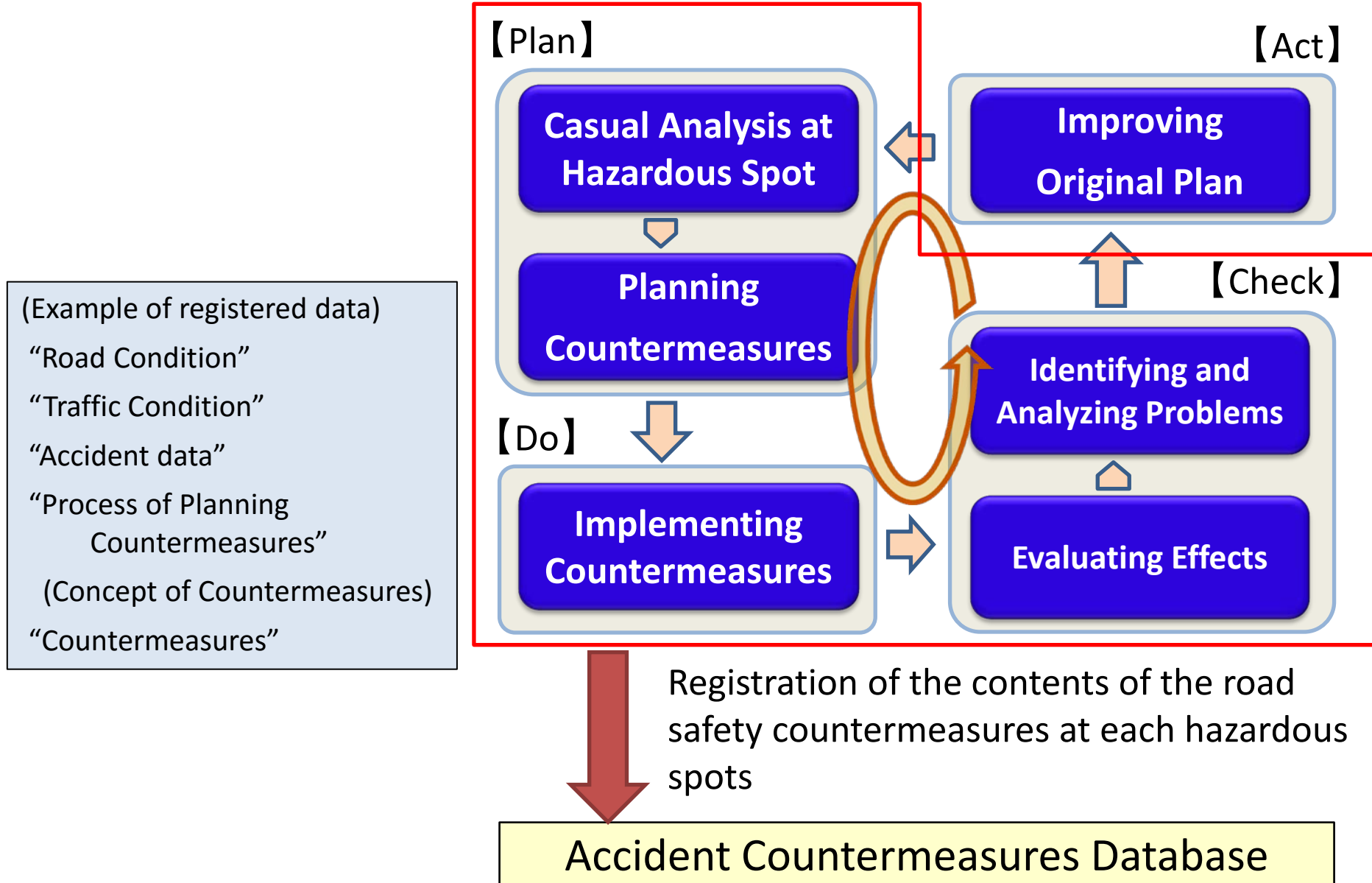
Organizing the methods of site observation, causal factor analysis, and countermeasure planning.

Consideration steps in the Guideline

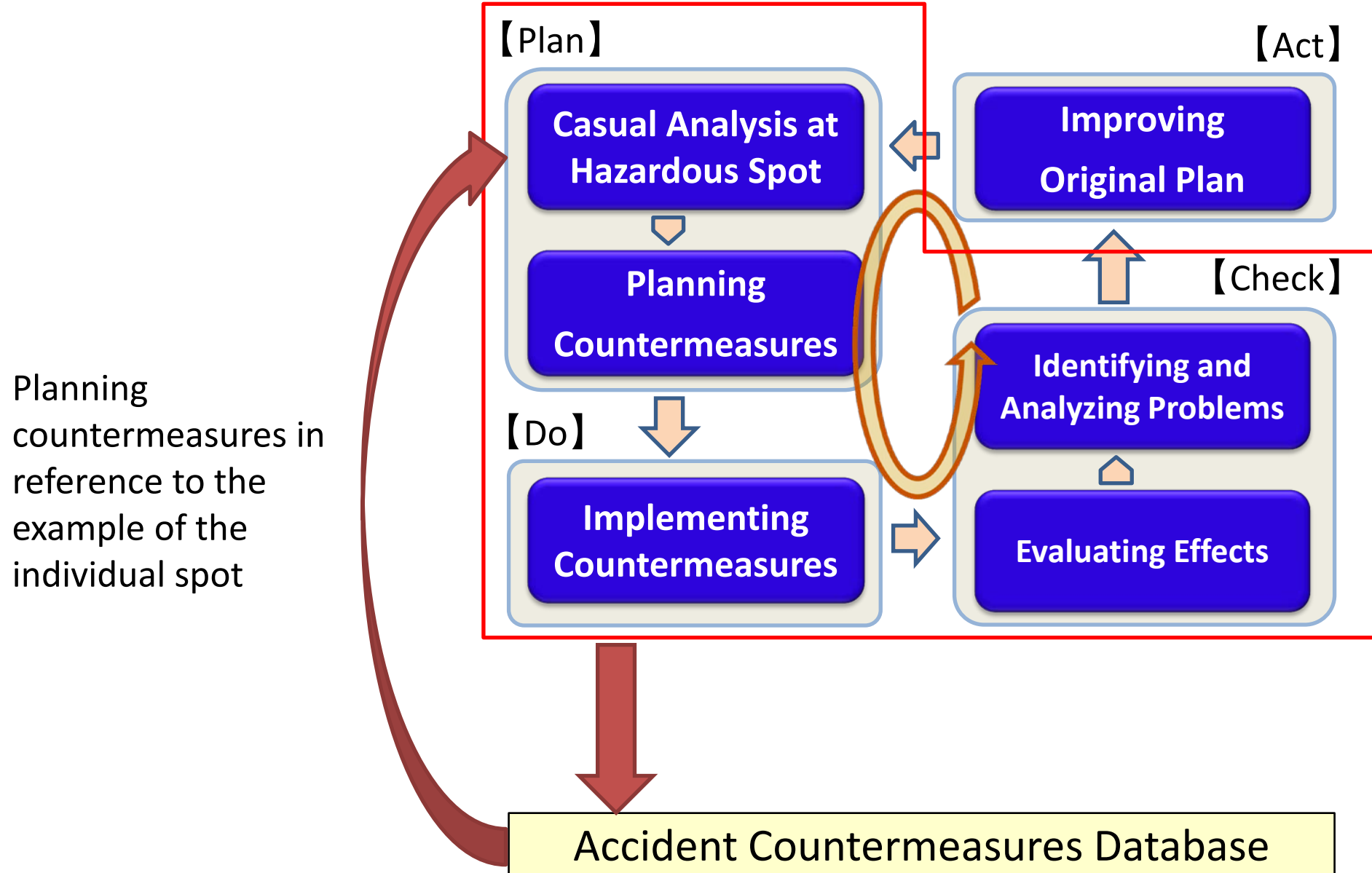


Improvement of Road Safety at Hazardous Spots

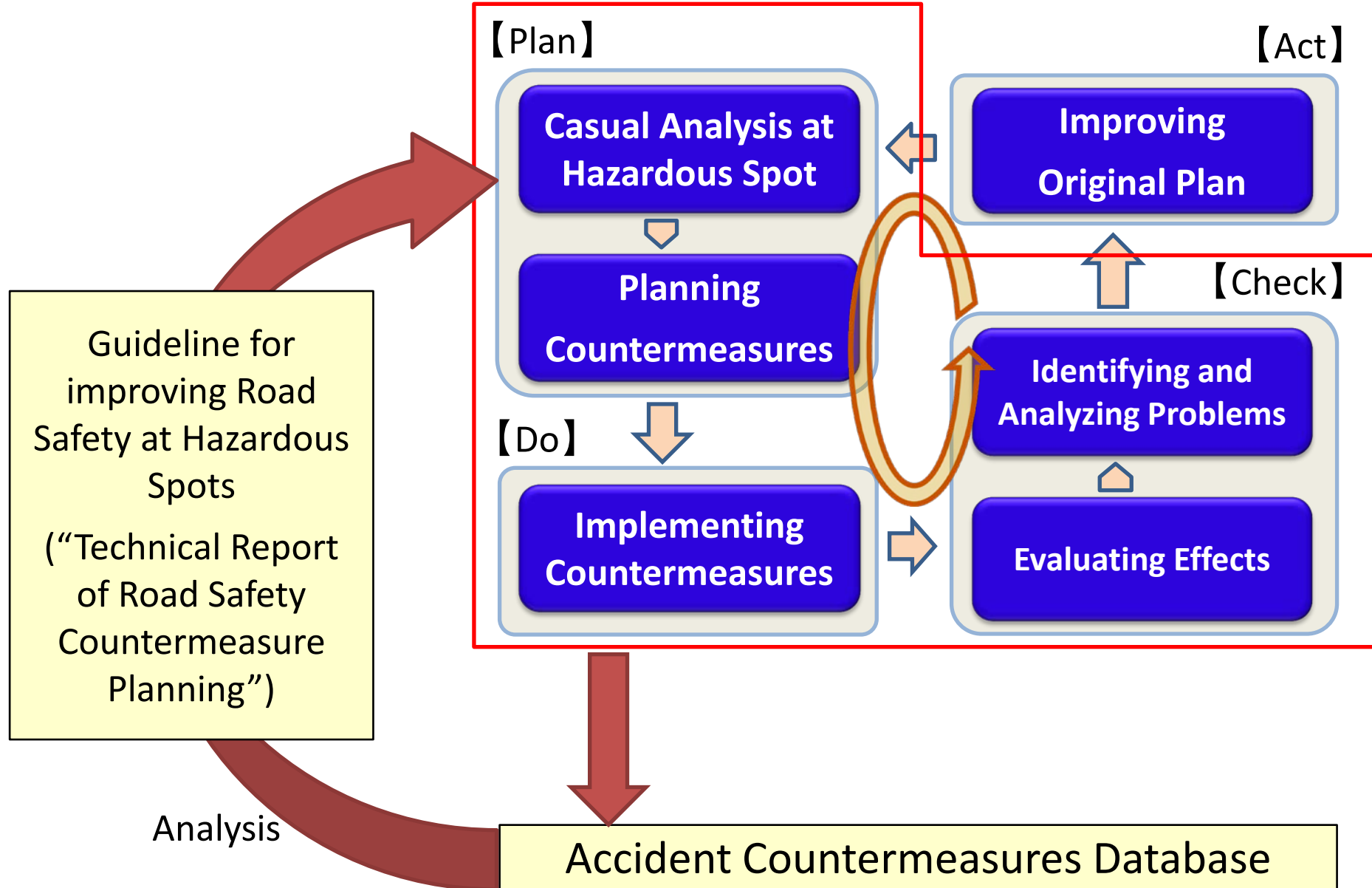
2) Management Cycle for Effective Implementation of Hazardous Spot Countermeasures --- PDCA-cycle



2) Management Cycle for Effective Implementation of Hazardous Spot Countermeasures --- PDCA-cycle



2) Management Cycle for Effective Implementation of Hazardous Spot Countermeasures --- PDCA-cycle



3) Improvement of Bicycle Travelling Space

4) Improvement of Bicycle Travelling Space



(a) Bicycle Path



(b) Bicycle Lane



(c) Bicycle Space in Vehicle Lane (Bicycle travel mixed with automobile)



Photo-7 Types of bicycle space

- All types of bicycle travelling space reduced the accidents bicycle involved.
- Accidents bicycle involved decreased particularly on roads where bicycle paths or bicycle lanes were provided.

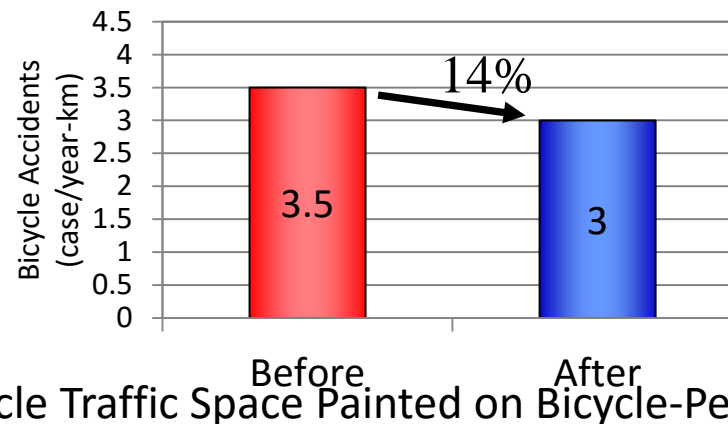
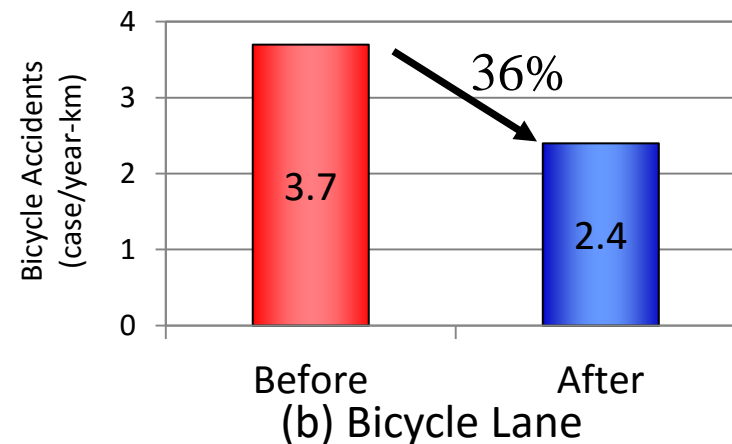
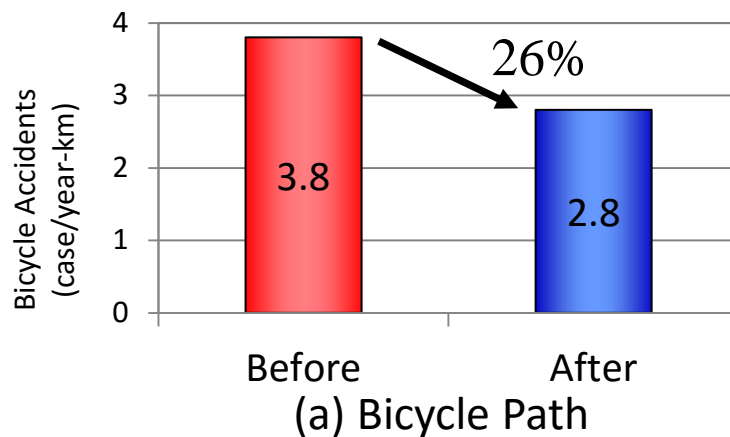


Fig.-21 Decrease of Number of Accidents from to after Improvement

Data from Ministry of Land, Infrastructure, Transport and Tourism

Summary

In order to improve road safety more effectively and efficiently, important things are as follows:

- 1. Set of nation's targets, and efforts by all related organizations to achieve the target.**
- 2. Promotion of appropriate measures based on the characteristics of road accidents. In order to do so,**
 - 1) Identification of national/regional serious road safety problems based on analysis of accident data, and challenge to solve those problems by strategic programs decided by related organizations**

(from the viewpoint of road improvement)

 - 2) Identification of hazardous spots and implementation of countermeasures at those spots**
 - 3) Establishment of consideration methods of countermeasures**