

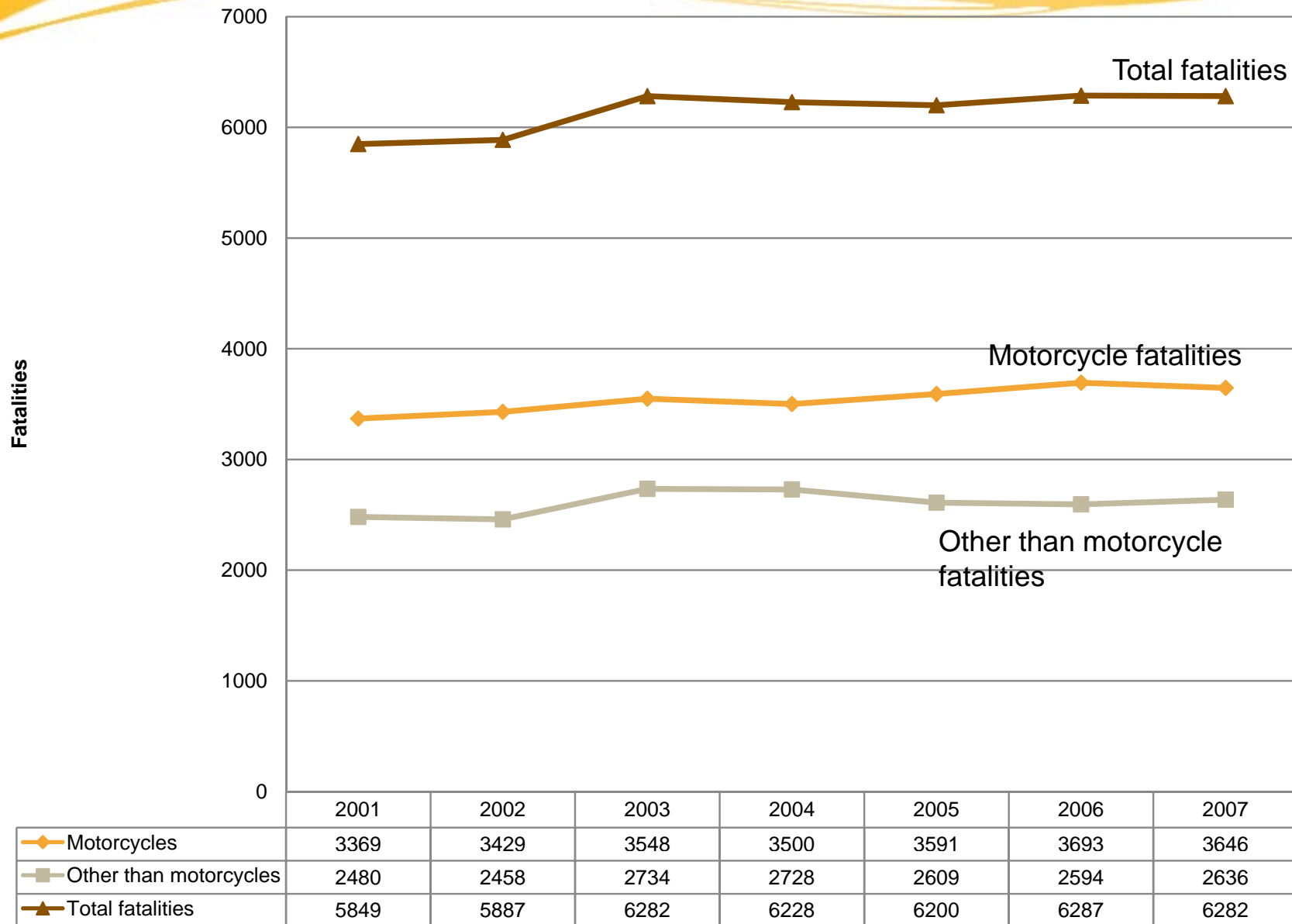


Motorcycle Safety: Best Practices and Promising Interventions in Malaysia

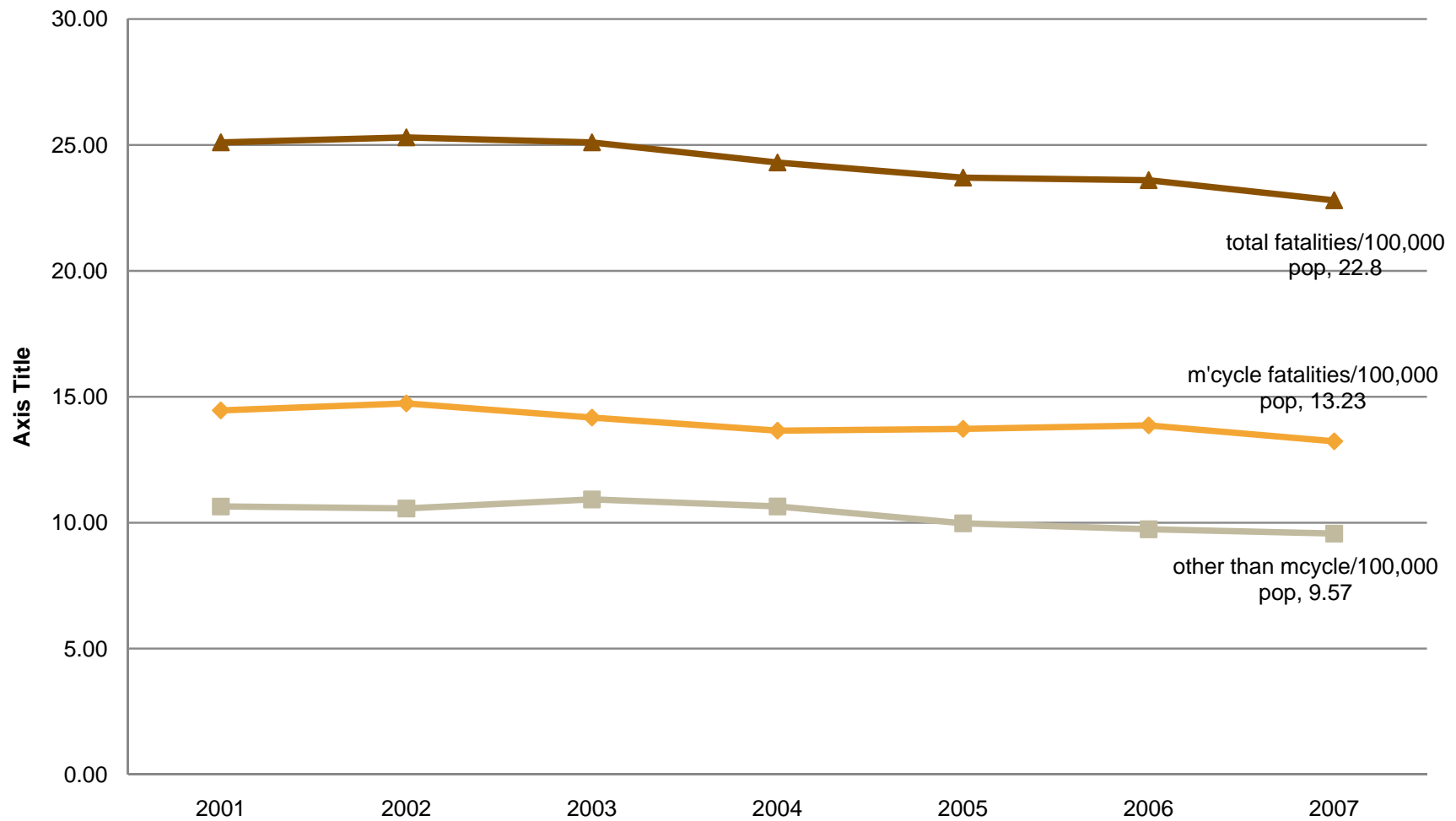
Prof Dr Ahmad Farhan Sadullah
Malaysian Institute of Road Safety
Research (MIROS)

June 2009

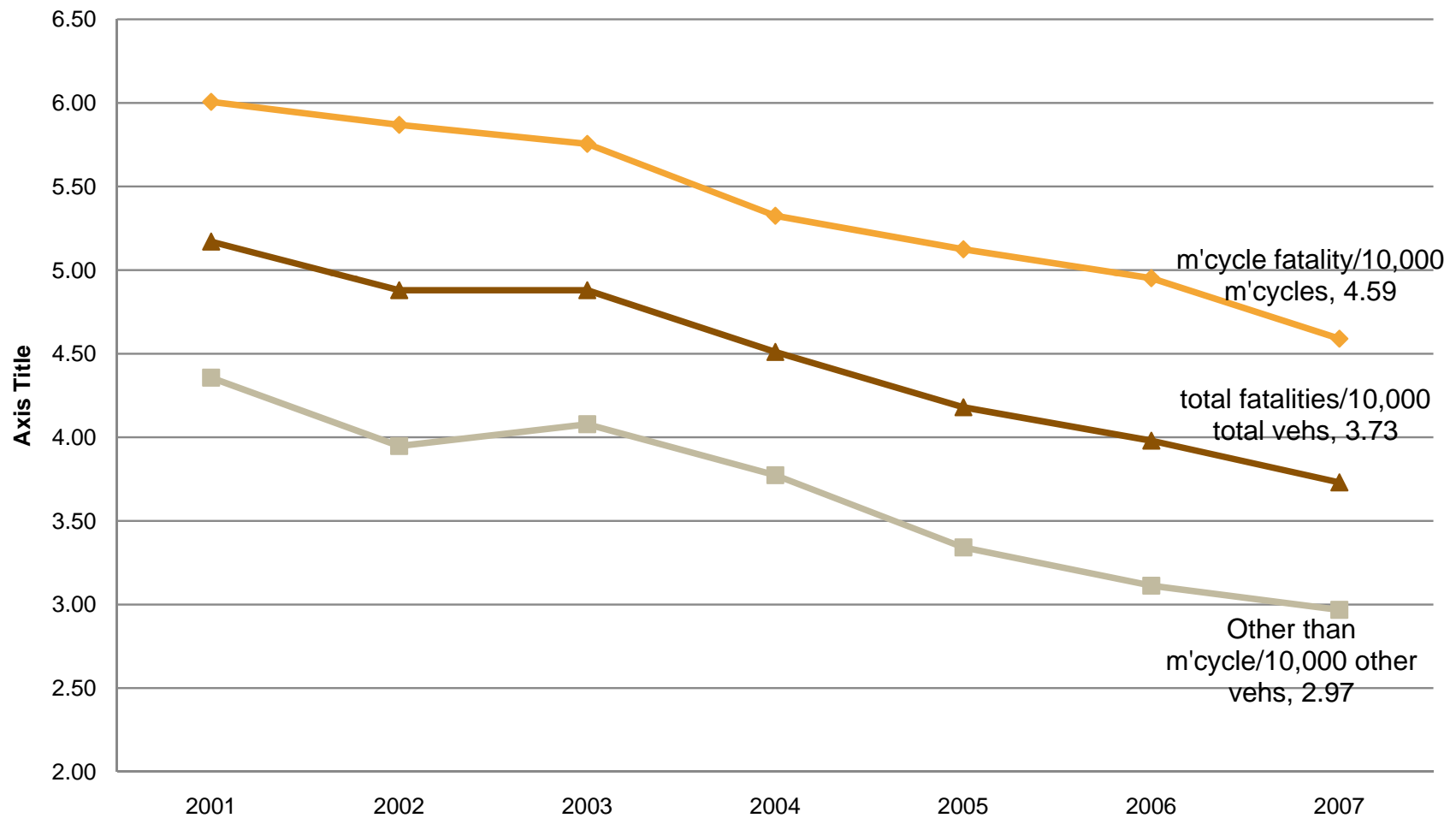
Road Fatalities in Malaysia



Fatality Rates (per 100,000 population) for Malaysia



Fatality Rates (per 10,000 vehicle type)



Accident Data (2006 and 2008)

Motorcycle Accidents

Severity	2006	2008
Fatal	3,115 (4.54%)	3,476 (4.51%)
Serious	4,836 (7.05%)	4,683 (6.08%)
Slight	9,411 (13.1%)	8,955 (11.63%)
Damage only	51,280 (74.71%)	59,887 (77.77%)
TOTAL	68,642	77,001

Strategic Road Safety Intervention and Potential Fatality Reduction 2007 - 2010

Programs	% Intervention Coverage				Potential Reduction %	No of Deaths Involved/yr	Expected No. of Fatality Reduction			
	2007	2008	2009	2010			2007	2008	2009	2010
AES										
Speed Cameras	20	60	100	100	30	1400	84	252	420	420
Red Light Cameras	20	60	90	90	40	150	12	36	54	54
Lane Discipline	0	20	60	80	20	450	0	18	54	72
Helmet Program	30	65	100	100	50	1500	225	488	750	750
Rear Seatbelts	20	40	60	80	30	350	21	42	63	84
Airbags	10	20	40	60	30	400	12	24	48	72
Driver Training	10	30	50	60	10	300	3	9	15	18
RSE and CBP	10	20	50	80	20	400	8	16	40	64
M'cycle Lanes	10	20	30	40	80	500	40	80	120	160
Blackspots	10	20	30	40	30	500	15	30	45	60
Others	10	20	30	40	20	350	7	14	21	28
						6300	427	1009	1630	1782
						Deaths/10,000 Vehicles	3.45	2.94	2.45	2.21

Motorcycle Related Initiatives

- Safety helmets standards
 - Child helmet efficacy
- Community based programs (CBP)
 - Safety helmet
 - Visibility Enhancement Material (VEM)
- Motorcycle lane programs



Child Helmet Efficacy

SAFETY HELMET STANDARDIZATION

Head Injuries (1500 fatalities/year)

- ❑ Principal Cause of Death: 56.5 %
- ❑ Skull Fractures: 27.9 %
- ❑ Brain Injuries: 38.1 %
- ❑ Skull & Brain Injuries: 34.0 %
- ❑ ↓ Head Injuries by 2.7-fold
- ❑ ↓ 50 % Potential Reduction



Accident Data (2006 and 2008)

Motorcycle Accidents Involving Kids (age 1-10)

Severity	2006	2008
Fatal	68 (11.31%)	63 (22.99%)
Serious	197 (32.78%)	95 (34.67%)
Slight	316 (52.58%)	109 (39.78%)
Damage only	20 (3.33%)	7 (2.55%)
TOTAL	601	274

Motorcycle accidents involving kids is 1 % of total no. of accidents,
however > 44% resulted in serious or fatal

Fatalities due to Head Injury (Motorcycles) in 2008

Age Group	Fatalities
General population	1638
Children (1-10)	15

Children at Risk



Children at Risk



Children sitting
in front of rider



Children at Risk



Helmets are not designed for children

Helmet size on the vertical are big until it's resting on the shoulders



Typical Child Helmet Design Requirements

- Size(cm) - 50 – 57
 - Outer Shell Thickness(mm) – 5
 - Inner Shell Thickness(mm) -25
 - Mass(g) – 500 – 1000
 - Impact test performance – More than 200 g
-
- (Patent Appl. No. : full reference PI 20031295)

Specifications

- MS1: 1996 Addresses general helmet construction and minimum performance criteria, similar to ECE R22
- Size available: min 50 ~ max 62 cm of head circumference
- Current Child helmet test with the same spec with adult

Helmet Specifications Comparison

	Snell STD (Child Motorsport)	Malaysian	Vietnam
Size (cm)	49 - 59	50 - 62	<50, 50-52, >52
Mass (g)	1000 - 1300	No mention (random check result) Child OF 800-900 Adult OF 1200-1400	<u>Full face</u> L <1500 M& S <1200 <u>Open and ½ shell</u> L, <1000 M&S <800
Performance			
i. Impact test, m/s	6.0 - 7.75	5.8 – 6.5	4.8 - 6
HIC	< 290g	< 300g	<225g (for <50cm circ) <300g (for ≥50cm circ)
ii. penetration	3000	2000	2500
drop height, mm	3.0	4.5	3.0
mass of striker, kg			

Standard Child Helmet



Approval sticker

Size 54cm



Approval sticker, behind comfort liner

Toy/Game Helmet (Non-standard)



Child Helmet Campaign Malaysian Effort

Direct

- Paper media
- Soft media, i.e. www.panducermat.gov.my
- Advertisement and TV commercials

Indirect

- Addressing children to wear helmets
- Instill safety habits from young age, carry over to adulthood

Child Helmet Campaign Malaysian Effort

Advertisement and TV commercials



Child Helmet Campaign Malaysian Effort

Advertisement and TV commercials



Child Helmet Campaign Malaysian Effort

TV News



Child Helmet Campaign Malaysian Effort

Poster





Safety Helmets

COMMUNITY BASED PROGRAM

Safety Helmet: Community Based Program (CBP)

Key Players

- Political leaders
- Local authority and agencies
- NGOs
- Private sectors
- Community leaders
- Religious leaders
- Individuals

The Programs

- Give away helmets
- Crash prevention advocacy
- Injury control advocacy
- Sermons/talks/seminars
- Youth activities
- Campaigns
- Ops *Nasihah* (Advice)



***Minister of Transport Popularizing the Motorcycle
Child Helmet***



Advocacy of SIRIM Approved Helmets

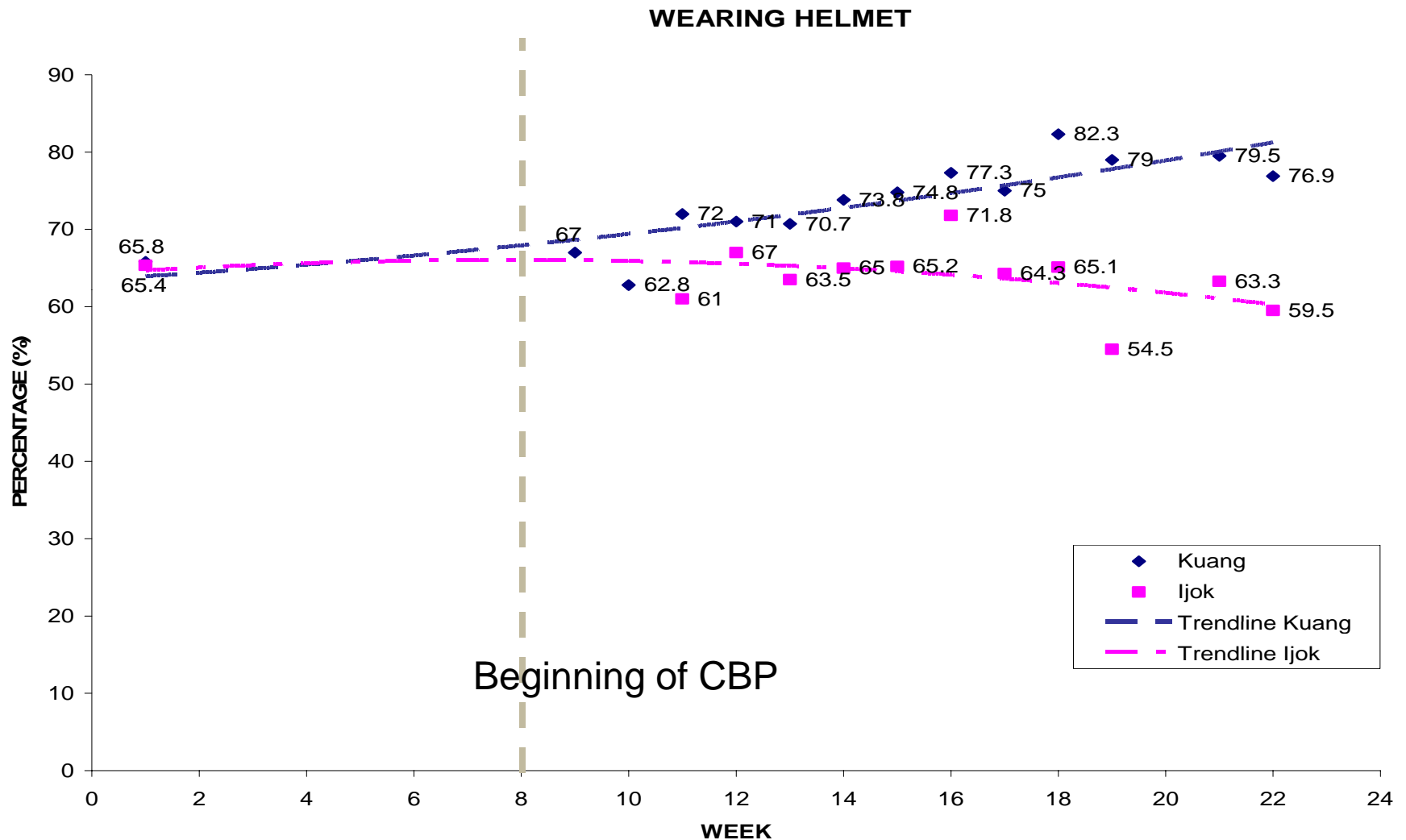


Safety Demonstration to School Children in Progress



Roadside Advocacy

Kuang & Ijok Helmet Wearing Compliance



Kuang & Ijok: Results

All Motorcycle
Accidents

Kuang

Ijok

Before

14

29

After

5

36

Kuang & Ijok: Results

All Motorcycle
Casualties

Kuang

Ijok

Before

6

4

After

2

4



Visibility Enhancement Material (VEM)

COMMUNITY BASED PROGRAM

Visibility Enhancement Material CBP: Why?

1. Luminance contrast
2. Position in other driver's field of vision
3. Other factors affecting perceptual processes

Luminance Contrast

How Many Lines?

Line 1

Line 2

Line 3

Line 4

Line 5

Line 6

Luminance Contrast

How Many Lines?

Line 1

Line 2

Line 3

Line 4

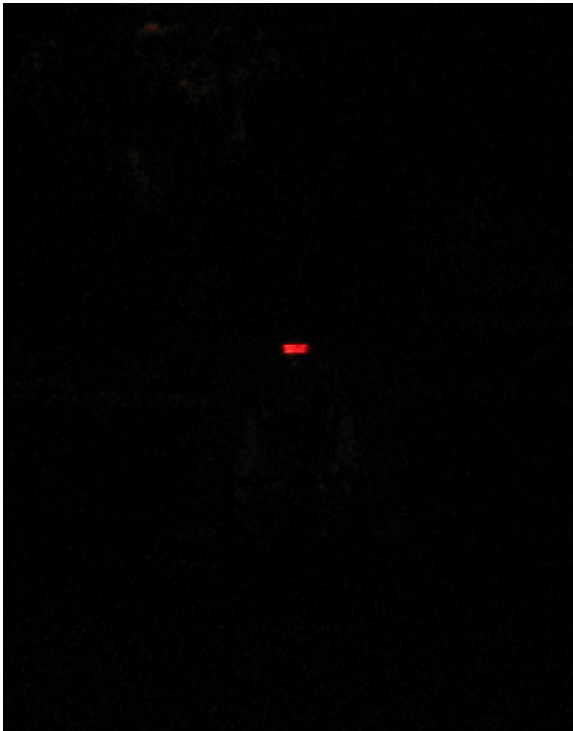
Line 5

Line 6

Line 7

How do VEMs work?

No VEM



VEM



The Programs

- Coordination and Management
- Distribution:
 - Friday prayers
 - Night markets
 - Factories
 - Repair workshops/outlets
- Advocacy
- Seminar/talks
- Youth Activities
- Ops *Nasihat* (Advice)



VEM Distributions



Ops Nasihat PDRM

Police have also participated by using routine road blocks to distribute VEMS

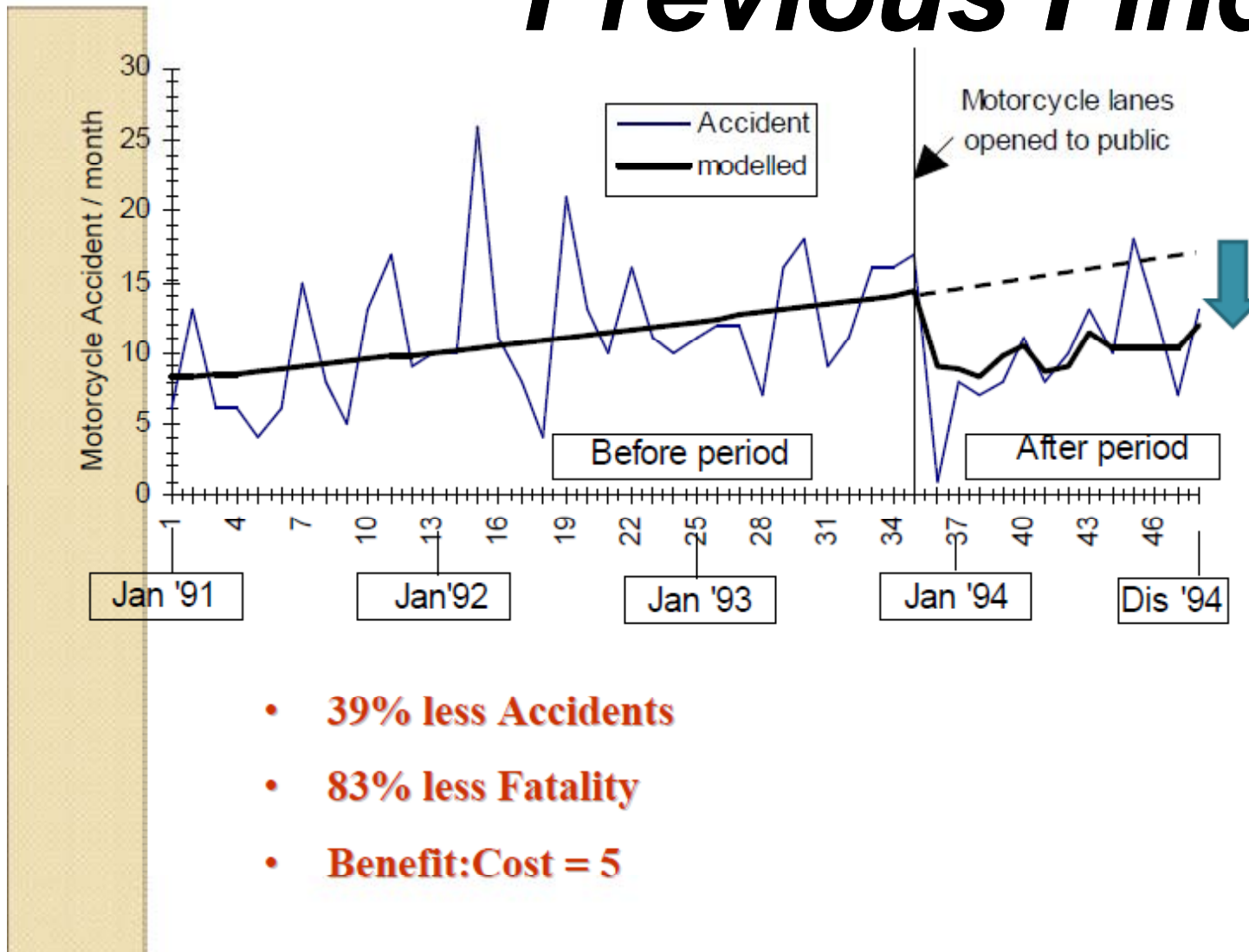


MOTORCYCLE LANE PROGRAMS

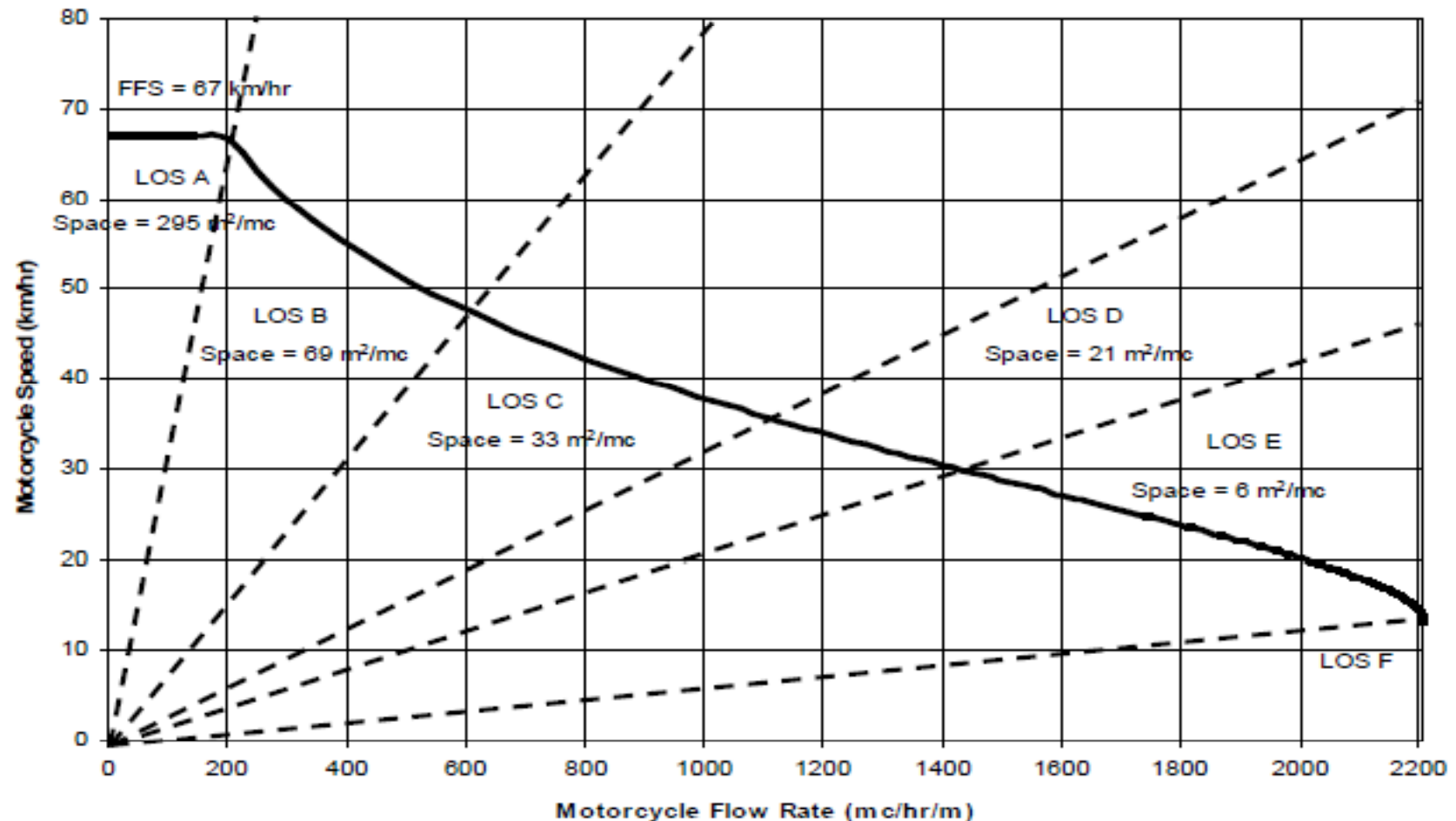
Malaysian Motorcycle Lanes

- Basis
 - Segregation
 - Conflicts
- Features
 - Special standards
 - Capacity and level of service
 - Special warrants

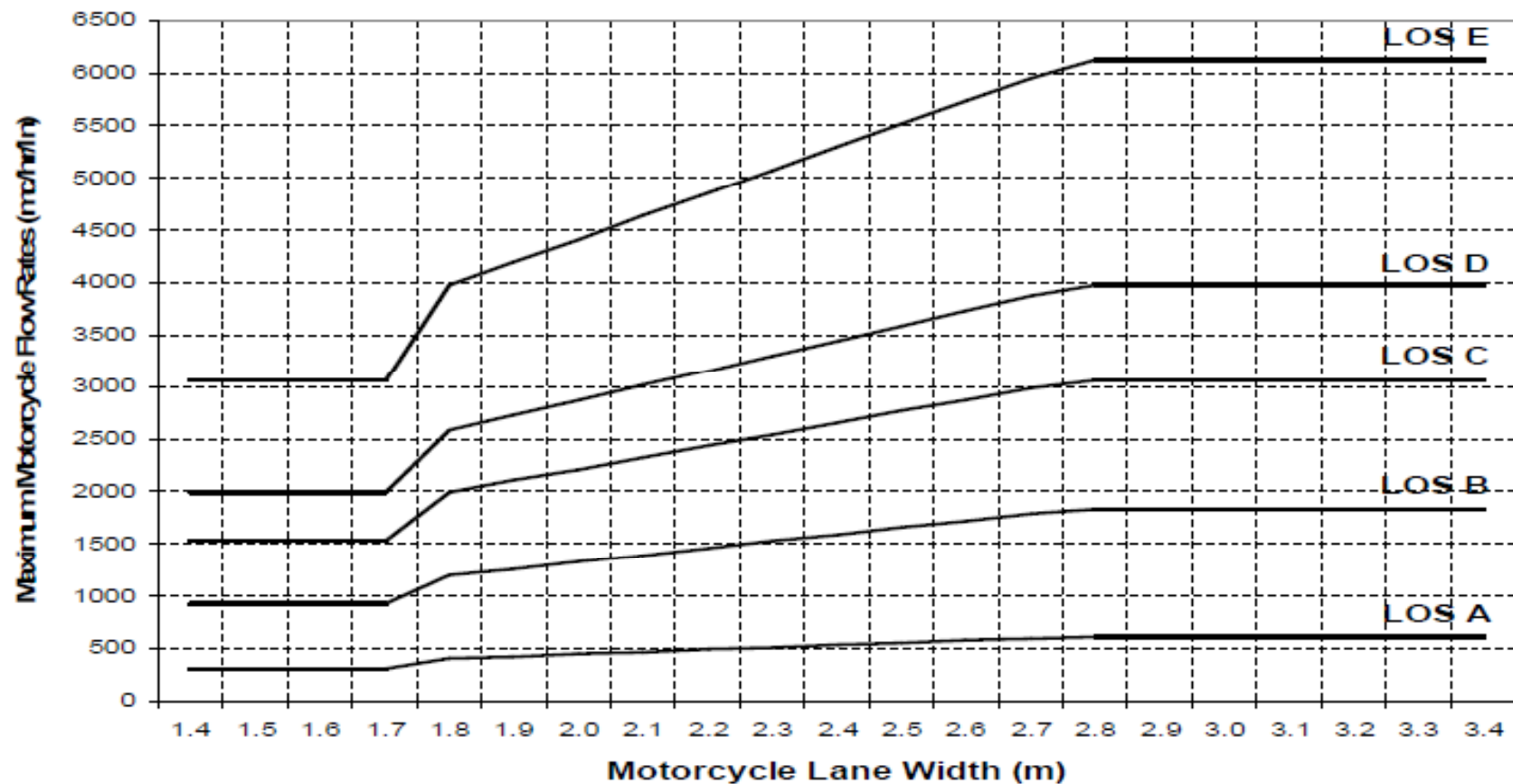
Previous Findings



Motorcycle Speed-Flow Curve (Space Concept)



Flow Rate, Lane Width and Level of Service





Motorcycle Lane Programs

- Exclusive motorcycle lanes
- Non-exclusive motorcycle lanes
 - Marked
 - Unmarked



Exclusive motorcycle lane in Putrajaya



Exclusive motorcycle lane along Federal Highway



Exclusive motorcycle lane along Federal Highway

Non-exclusive Motorcycle Lanes

- Paved shoulder programs
- Motorcycle accident models at junctions and link
- Junction treatment measures



Marked non-exclusive motorcycle lane



Marked non-exclusive motorcycle lane

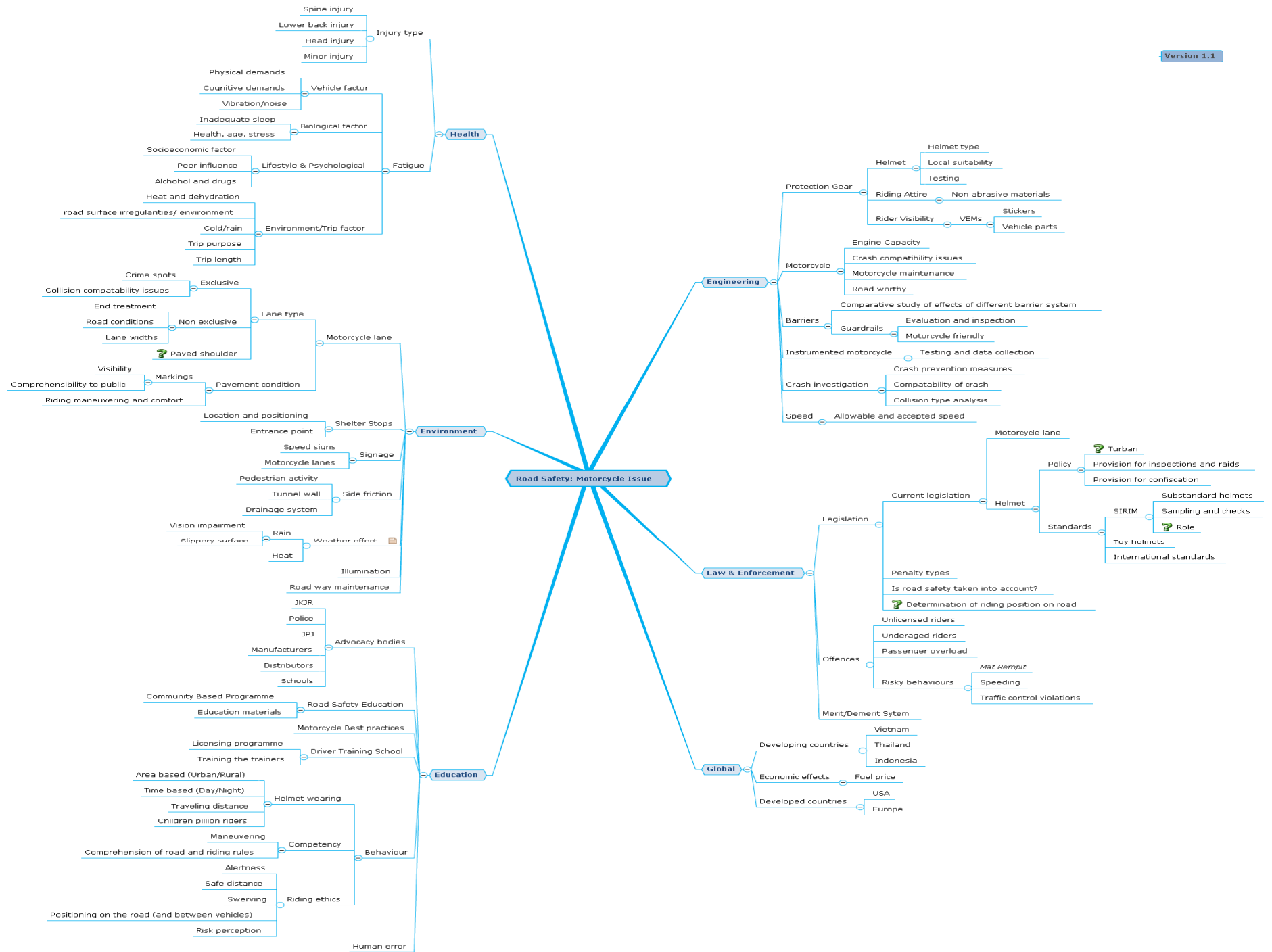


Terminal treatment of non-exclusive motorcycle lanes



IS IT WORKING?

- Not really?
- We need a safe system approach
- MIROS is tackling it through a safe system approach and through research cluster approach



THE CLUSTER APPROACH

- Law and enforcement
 - Legislation
 - Enforcement
- Engineering
 - Vehicle
 - Protection gear
 - Performance
 - Crash reconstruction
- Environment
 - Riding environment
 - Visibility
 - Protection
- Education
 - Road safety education
 - Community based programmes
 - Advocacy programmes
 - Riding training
 - Behavioural analysis
- Health
 - Injury
 - fatigue
- Global perspectives



THANK YOU

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