

Child Safety Assessment in ASEAN NCAP

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Agenda

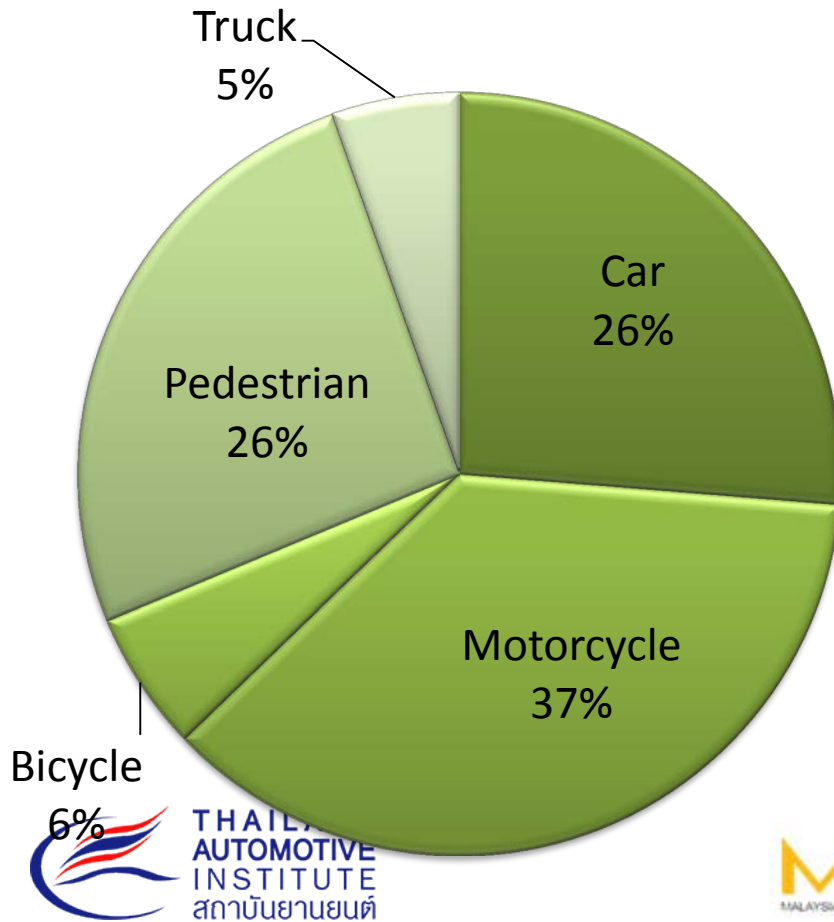
- Magnitude of the Problem
- ASEAN NCAP Test, Assessment and Results
- Case Study

Agenda 1:

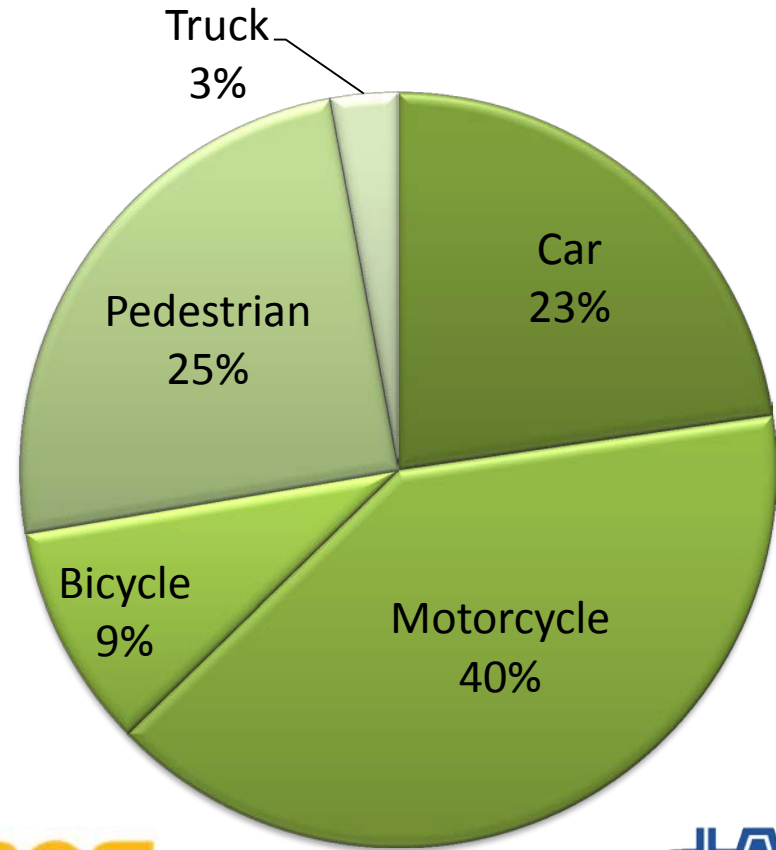
Magnitude of the problem

Statistic in Malaysia

Traffic fatalities by vehicle type involving children aged 0-14 years-old



Traffic non-fatalities by vehicle type involving children aged 0-14 years-old



Statistic in Malaysia

	2008				
	Fatal	Serious	Slight	Damage Only	Total
0-3 years old	53	23	22	0	98
4-6 years old	51	23	32	1	107
7-12 years old	73	61	58	1	193
Total	177	107	112	2	398

	2009				
	Fatal	Serious	Slight	Damage Only	Total
0-3 years old	78	33	23	1	135
4-6 years old	54	25	28	1	108
7-12 years old	85	56	51	0	192
Total	217	114	102	2	435

	2010				
	Fatal	Serious	Slight	Damage Only	Total
0-3 years old	47	27	19	315	408
4-6 years old	49	20	18	142	229
7-12 years old	75	51	37	796	959
Total	171	98	74	1253	1596

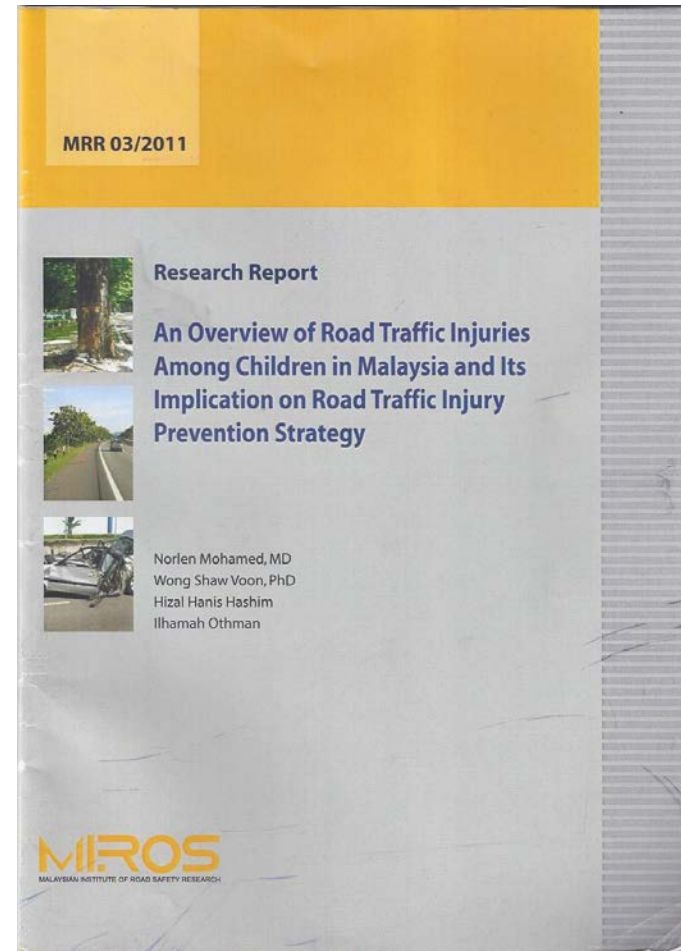
RTA among Children in Malaysia

5.1 Key Findings for Preventive Actions

5.1.1 Children transported in private vehicles (car, van, 4WD) are the first and the second leading groups of casualties among children aged 1–4 years old (43.8%) and 5–9 years old (30.2%) respectively.

This finding highlights the need to implement child restraint systems as a priority for the counter measures in preventing road traffic injuries in this age group. Child restraint systems are effective at preventing fatalities, and are the most important safety measure for children (WHO 2008). In the event of a crash, if restraint systems are properly installed and used, they can;

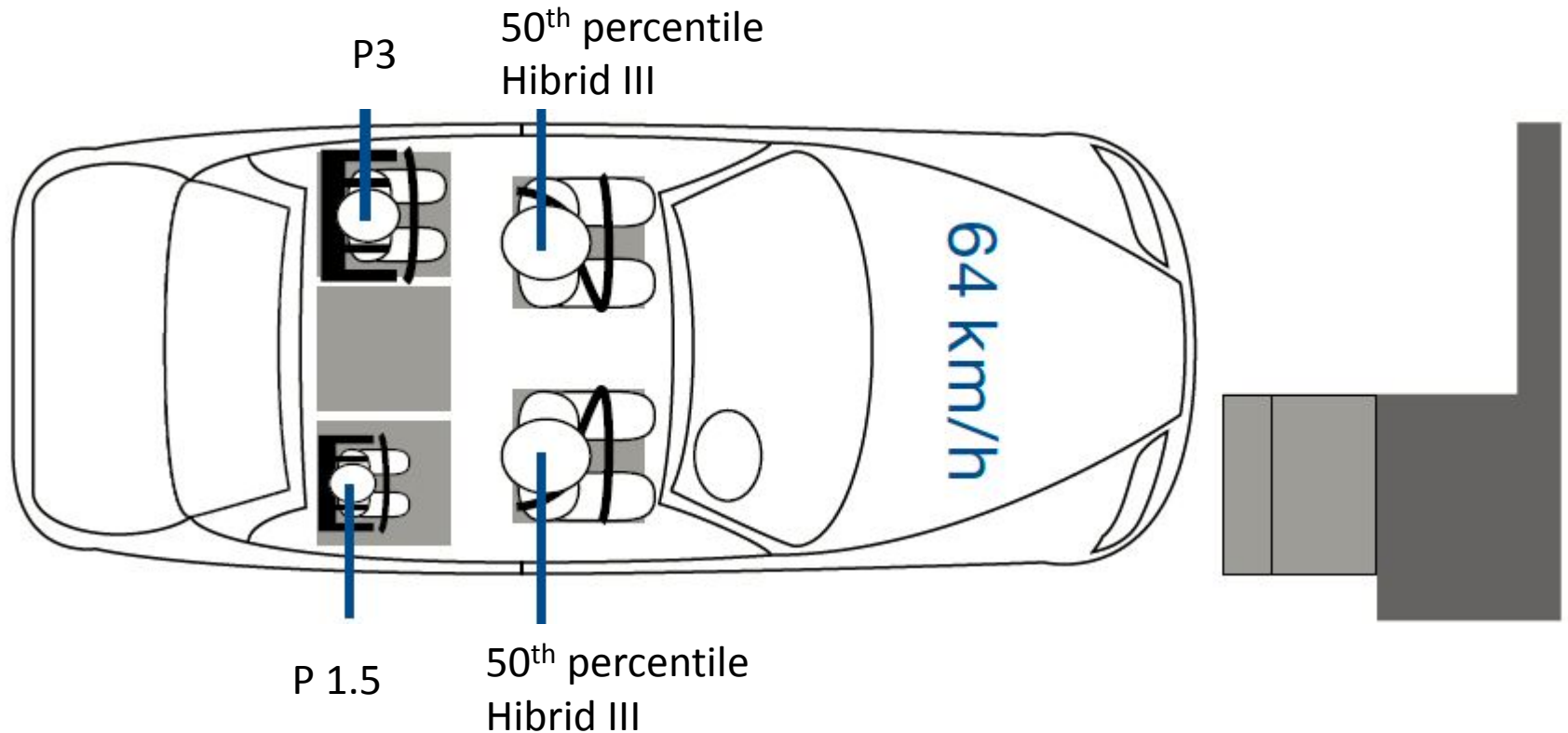
- reduce deaths among infants by around 70% (Zaza *et. al* 2001; Anund *et. al* 2003);
- reduce deaths among children aged 1–4 years, by 54% (Zaza *et. al* 2001; Anund *et. al* 2003); and
- reduce the chances of sustaining clinical injuries by 59% among children aged 4–7 years who are strapped in booster seats.



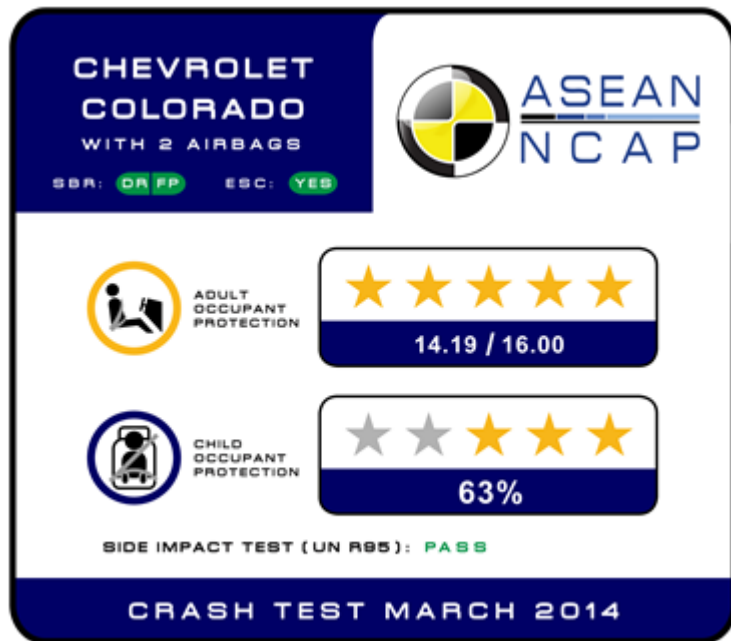
Agenda 2:

ASEAN NCAP Test, Assessment and Results

Crash Configuration



Child Safety Rating System



SCORE (Points)	Percentage (%)	Rating
43.00 – 49.00	88-100	★★★★★
34.00 – 42.99	69-87	★★★★
25.00 – 33.99	51-68	★★★
15.00 – 24.99	31-50	★★
0.01 – 14.99	0 -30	★
0.00		

Assessment Method

Requirements	Score
Dynamic Assessment Pre requisites - no partial or full ejection of child dummy out of CRS / CRS must not be partially or wholly unrestrained by any of the vehicle interfaces	24
CRS Based Assessment •CRS marking - 8 points •CRS to Vehicle Interface - 4 points	12
Vehicle Based Assessment •Use of CRS on the Front Seat - 5 points •Provision of three-points seat belts (Passengers) - 1 points •Gabarit assessment (outboard Rear) - 1 points •Gabarit assessment (other passenger seats) - 1 points •ISOFIX - 3 points •Integrated CRS - 2 points	13
Total	49

Result Compilation

	★★★★★	★★★★	★★★	★★	★
Phase 1		Honda City 81.2 %	Ford Fiesta 66.1 % Proton Saga 57.6 % Perodua MyVi 53.5 %	Nissan March 48.0 % Hyundai i10 48.4 % Toyota Vios 41.6 %	
Phase 2		Toyota Prius 86.1 % Honda Civic 82.0 % Mazda 2 78.0 % Suzuki Swift 77.0 %	Subaru XV 67.0 % Nissan Almera 52.0 %	Perodua Alza 46.0 % Mit. Mirage 43.0 % Mit. Pajero 40.0 % Toy. Avanza 38.0 % Daihatsu Xenia 33.0 %	
Phase 3		Honda CRV 85.9 % Toyota Altis 78.0 % VW Polo 84.5 % Chev. Sonic 77.7 % Isuzu Dmax 71.2 %	Kia Picanto 73.3 % Peugeot 208 72.1 %	Ch. Colorado 63.1 % Prot. Preve 67.1 %	Kia Picanto 28.5 %
2014	Nissan Teana 87.7 %	Proton IRIS 82.0 % Honda City 83.0 %	Perodua Axia 71.0 % Honda Jazz 71.0 %	TATA Vista 53.0 %	ISOFIX + Top Tether ISOFIX + Seat Belt Seat Belt

Dynamic Assessment

	★★★★★	★★★★	★★★	★★	★
Phase 1		Honda City 21.79	Ford Fiesta 17.39 Proton Saga 13.23 Perodua MyVi 10.23	Nissan March 6.55 Hyundai i10 8.72 Toyota Vios 8.36	
Phase 2		Toyota Prius 22.2 Honda Civic 22.09 Mazda 2 22.06 Suzuki Swift 19.68	Subaru XV 13.95 Nissan Almera 10.56	Perodua Alza 7.76 Mit. Mirage 5.98 Mit. Pajero 4.56 Toy. Avanza 3.47 Daihatsu Xenia 0.95	
Phase 3		Honda CRV 23.09 VW Polo 23.41 Toyota Altis 20.22 Chev. Sonic 20.08 Peugeot 208 15.31 Isuzu Dmax 17.89	Kia Picanto 16.9	Ch. Colorado 11.94 Prot. Preve 14.86	Kia Picanto 0.97
2014	Nissan Teana 24	Proton IRIS 21.06 Perodua Axia 17.62 Honda Jazz 15.80 Honda City 23.53	TATA Vista 9.02	ISOFIX + Top Tether ISOFIX + Seat Belt Seat Belt	

Agenda 3: Case Study

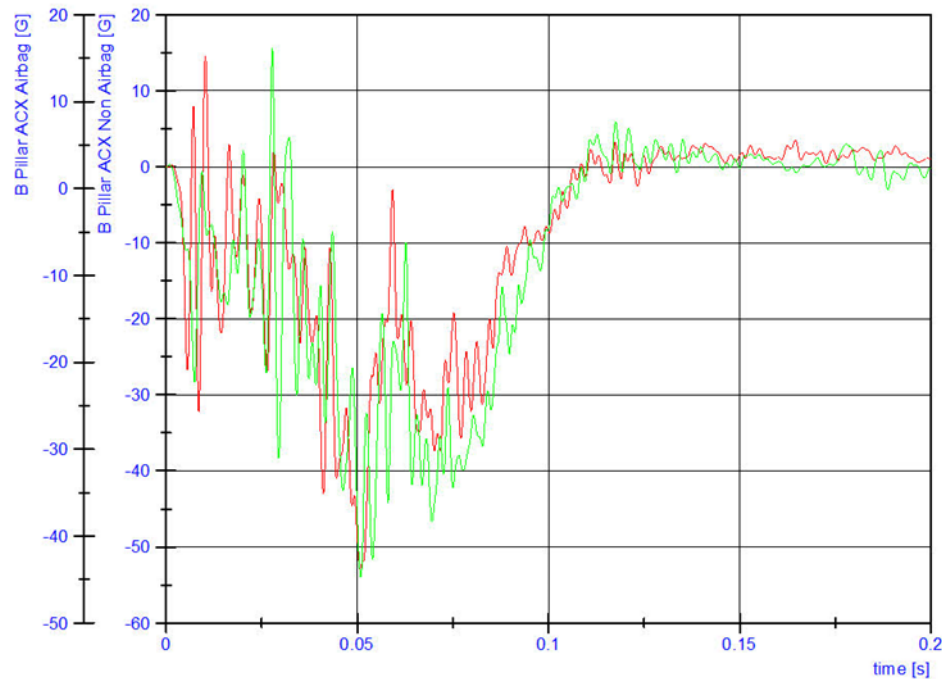
Crash test Configuration

- Crash Test on the same vehicle with the different attachment between seat and child seat

Dummy	Vehicle A	Vehicle B
3 years old	ISOFIX and Top Tether	Adult Seat Belt
1.5 years old	ISOFIX	Adult Seat Belt

Crash Pulse comparison

- Same energy absorption (crash pulse) – same structure



Result Comparisons

- Different results

Criterion	Child SP 4 (P1.5)			Child SP 6 (P3)		
Head	5.121 ★			4.324 ★		
Head						
Acceleration Resultant	46.19 g	3.000 ★		111.40 g		
HIC 36	254.24			1178.52		
3ms cumulative	44.91 g			76.47 g	4.324 ★	
Neck						
Tension (based on head 3ms Z)	-25.86 g	2.121 ★				
Chest	6.000 ★			0.309 ★		
Accelerations						
Resultant	33.40 g			51.23 g		
X (abs)	27.58 g			40.94 g		
Y (abs)	12.60 g			14.27 g		
Z (abs)	19.85 g			32.67 g		
3ms cumulative						
Resultant	32.98 g	6.000 ★		49.96 g	2.160 ★	
Z	18.82 g	6.000 ★		-29.64 g	0.309 ★	
Sum	11.121			4.633		
						

Criterion	Child SP 4 (P1.5)			Child SP 6 (P3)		
Head	3.000 ★			0.000 ★		
Head						
Acceleration Resultant	54.89 g	3.000 ★		197.64 g		
HIC 36	522.46			1650.77		
3ms cumulative	50.83 g			97.96 g	0.000 ★	
Neck						
Tension (based on head 3ms Z)	40.52 g	0.000 ★				
Chest	0.973 ★			0.000 ★		
Accelerations						
Resultant	53.67 g			60.64 g		
X (abs)	44.30 g			60.13 g		
Y (abs)	19.49 g			19.67 g		
Z (abs)	28.39 g			37.75 g		
3ms cumulative						
Resultant	52.73 g	0.973 ★		58.51 g	0.000 ★	
Z	25.73 g	3.660 ★		31.88 g	0.000 ★	
Sum	3.973			0.000		
						

Thank you for your attention.

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