

Road Safety Characteristics in an Urban and Suburban Environment – the Case of Hong Kong



Woo Ka Kin Micah

Kwong Tse Hin Glenn Julian

Community for Road Safety, Hong Kong
croadsafety.org.hk

HONG KONG

Population (2014) : 7,234,800

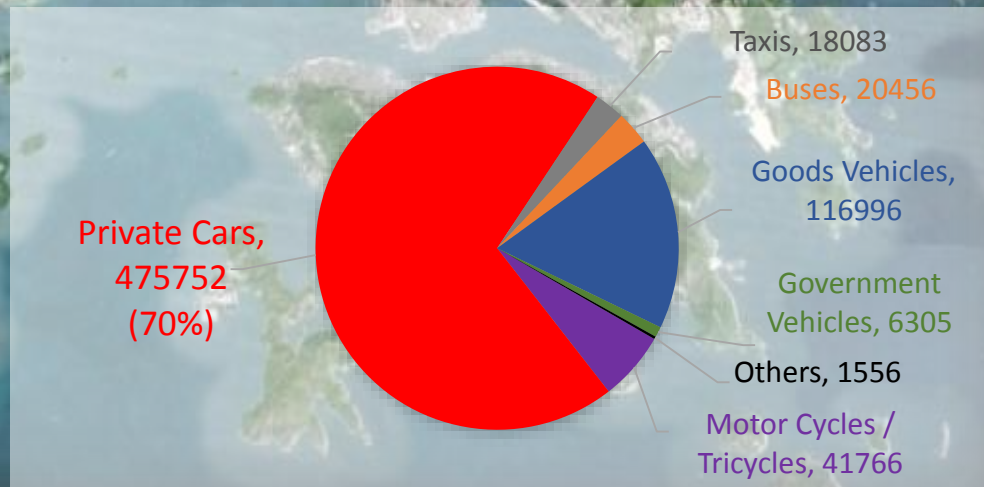
Area : 1104 km²

Total Length of Roads : 2094 km

Total Length of Expressway and Trunk Road : ~ 300 km

Licensed Motor Vehicles : 680,914 (2013)

Vehicles Composition :



Road types and Speed Limits

- Design Speed 50 – 80 – 100 km/h



Rural Expressway
(speed limit 100, 110)



Urban Trunk Roads
(speed limit 70, 80)



Rural Road
(speed limit 50, 70)



Primary Distributor



District Distributor
(Urban speed limit : 50km/h)



Local Distributor

Heavy Space and Terrain Constraints

- Older main roads on viaduct between buildings



- More recent trunk roads in tunnels with stringent environmental considerations

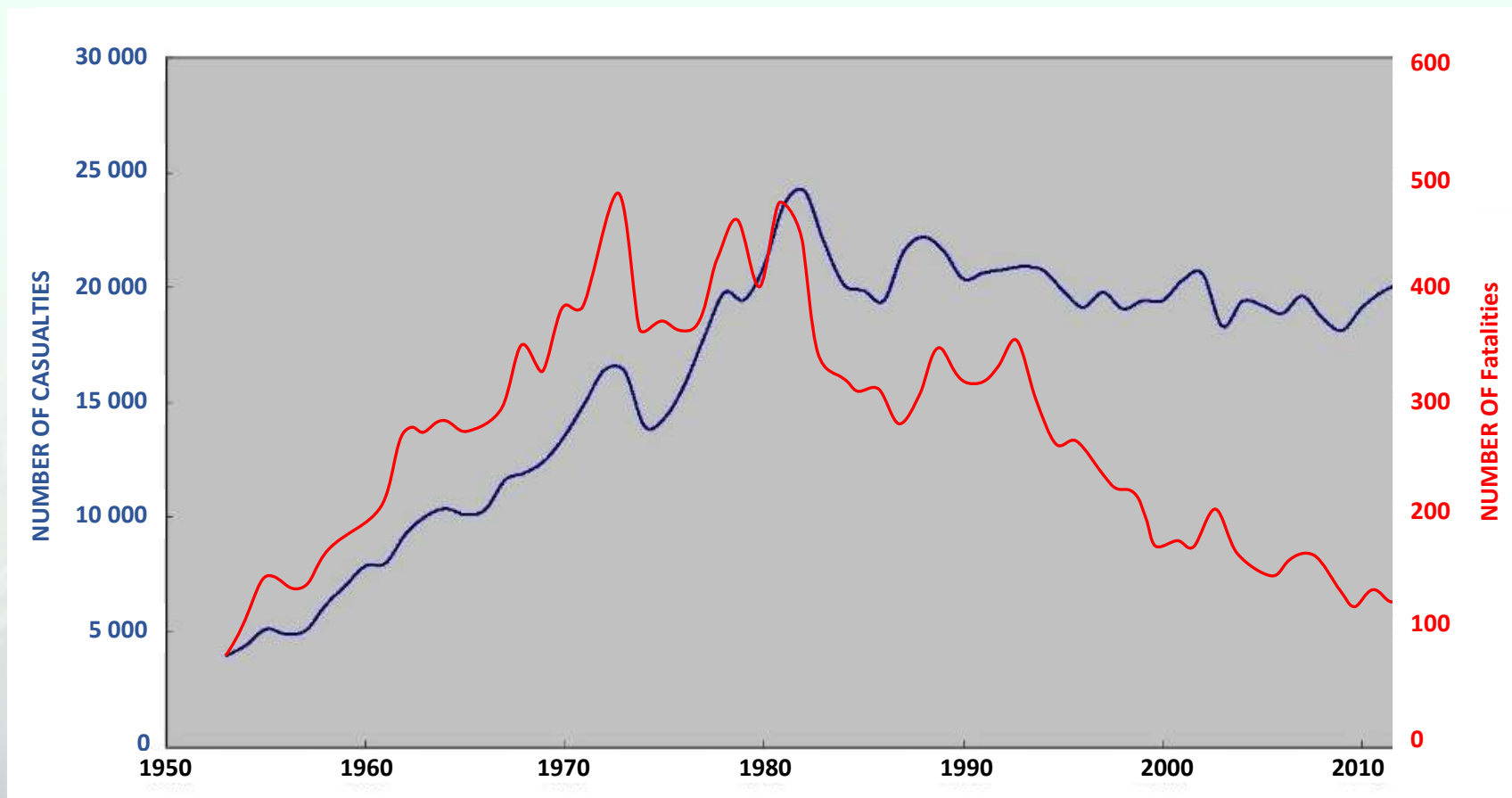


- Substantial noise enclosures are common scenes



Trend of Road Fatalities and Casualties in HK

No. of casualties and fatalities in HK (1953 – 2013)



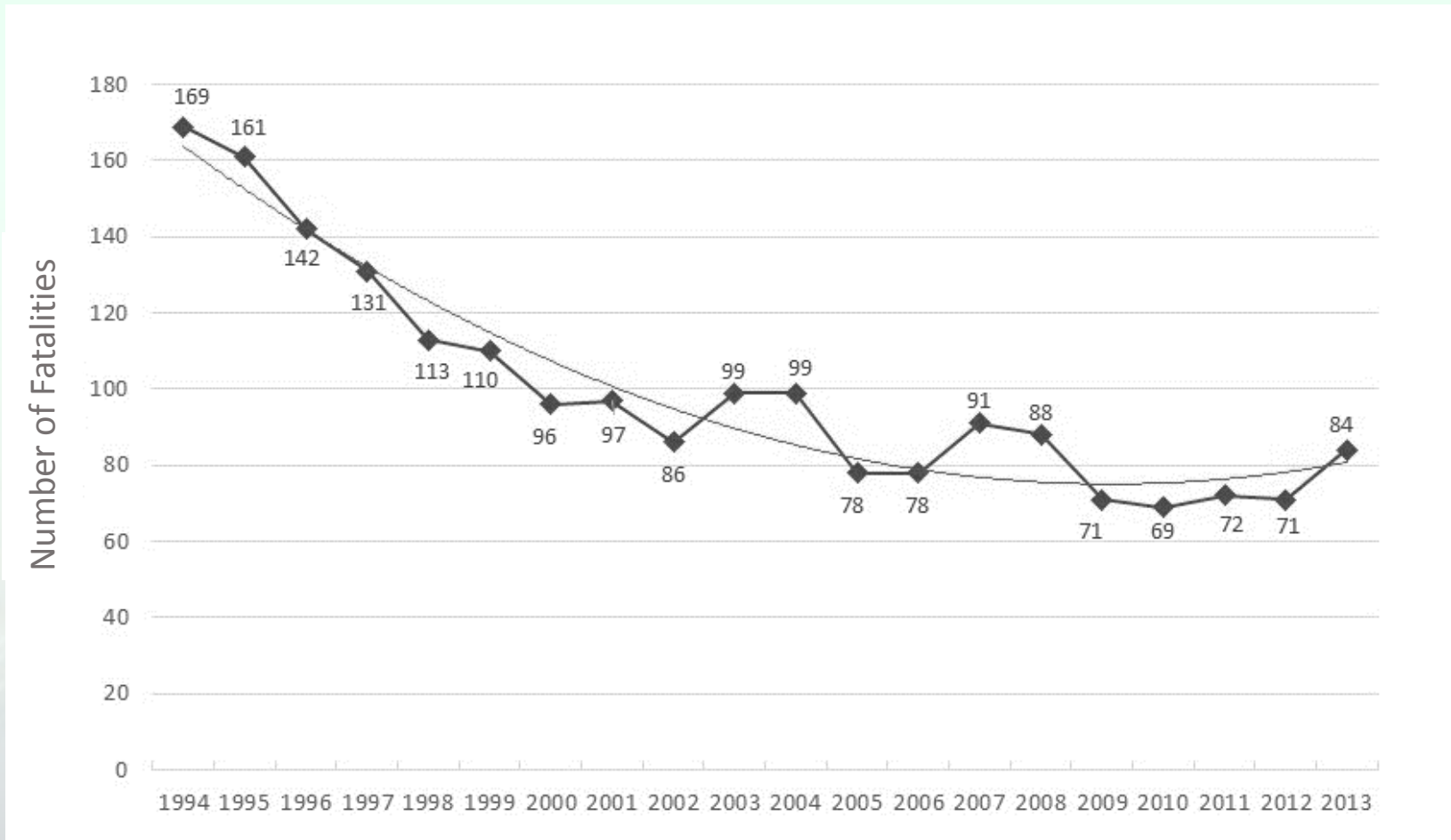
Trend of Road Fatalities and Casualties in HK

Road Traffic Fatality Rate Compared with other major cities (2013)



Trend of Pedestrian fatalities and Casualties

- Trend of pedestrian fatalities (1994 – 2013)



Early Experience with Dual Carriageway Highways in the 1970s

- Low design speeds (60-70km/h) with frequent bends (150m min) and grades (8.8% max) leading to safety problems
- In 1985, Consultant advised that “It is quite clear that **operating speed on major inter-urban dual carriageway with limited access and grade-separated junctions, frequently approach 100km/h or more, almost regardless of geometry and mandatory speed limit.**” and that “There is a real danger that, so long as the design speed is considered to be low because of low order geometry, ... (safety) features are not provided at a suitable level for the high speeds that actually occur:” (Kerman)
- New expressway designed with 80-85km/h (urban) and 100km/h (rural)



Roundabout Usage

- Roundabouts are extensively used in Hong Kong with generally good safety performance, yet experience shows that great caution needs to be given to high speed approach on dual carriageway roads.
- Accident on a dual carriageway roundabout at the end of a long steep grade in 2008 resulted in 19 fatalities.



Pedestrian facilities

- Segregated Pedestrian Corridor – e.g. Footbridge System



Footbridges



Shopping Mall



Mid-level Escalators

Low-cost Measures and Blacksite Treatment

- Blacksite definition in Hong Kong
 - ≥ 6 pedestrian injury accidents in 1 year; or
 - ≥ 9 injury accidents in 1 year
 - ≥ 2 fatal accidents in 5 years
- Low-cost measures extensively deployed
 - Signs and markings
 - Widened centreline
 - Footpath widening at crossings
 - Signalization for pedestrians
 - Mini-roundabouts
 - Anti-skid surfacing

Typical Low-cost Measures

- Bend signing, widened centreline



- Mini-roundabout



- Pedestrian crossing with mid-block island and reduction to single lane traffic



- High Skid-resistant Surfacing on steep grade, bends and junction approaches



Traffic signals

- Traffic signals for pedestrian crossings



- But we need still more intelligent traffic signals to take better care of the needs and behaviour of pedestrians

Passive Safety Equipment on highways

- Crash cushion

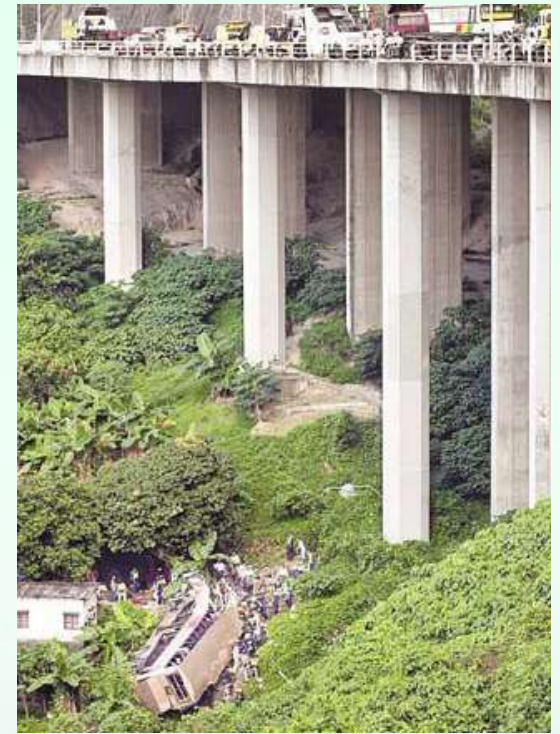


- Median opening gate



Bridge Parapets

- Accident in 2003 prompted a review of design standard for buses

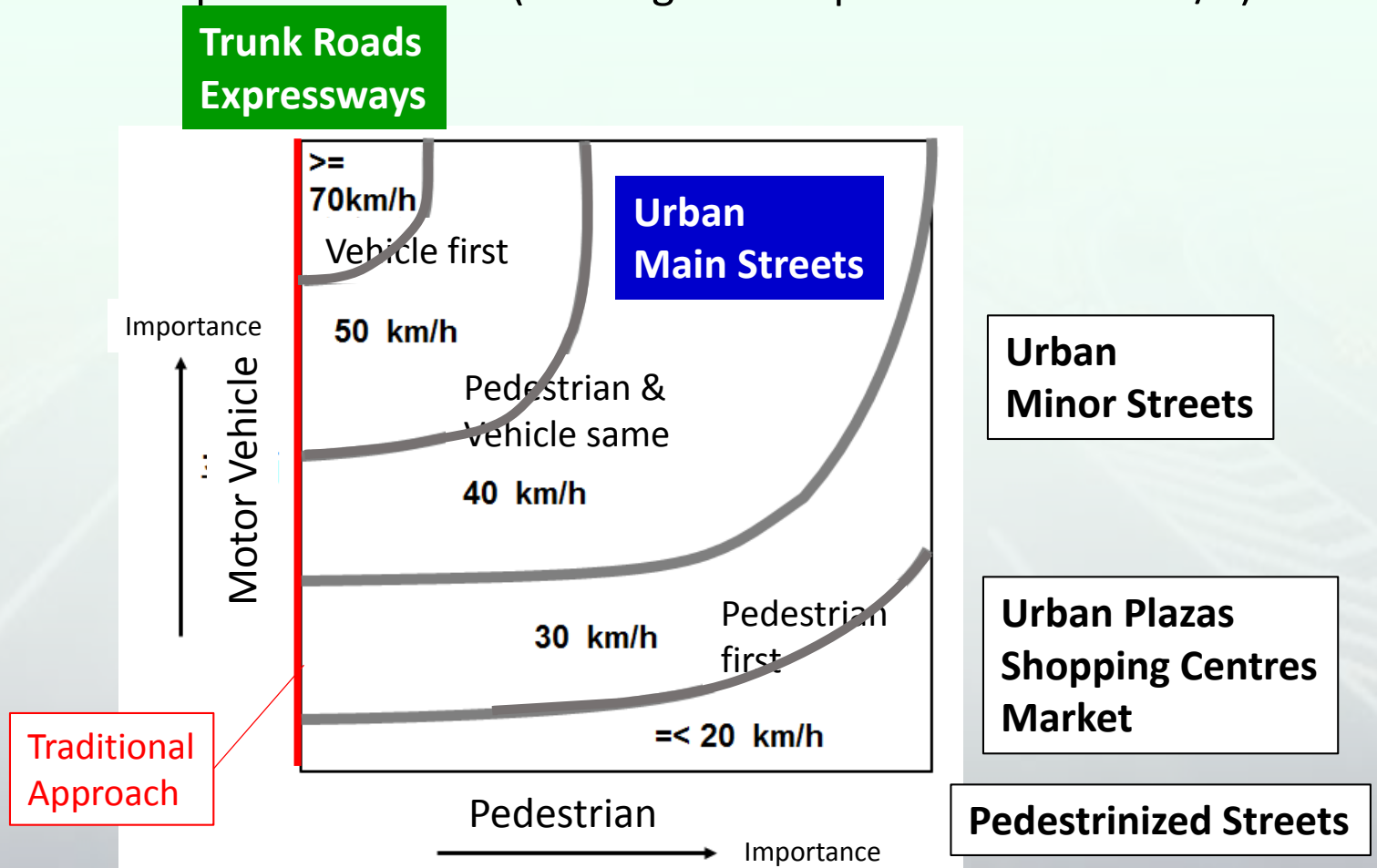


- New high containment barrier – 24t Double Decker, 50km/h at 20 degrees to be used with a risk-based scoring system



Our Recommendations

- A new Urban Road Hierarchy system with increasing emphasis on Pedestrians, similar to the concept as introduced in “The Vision and Direction for London’s Streets and Roads.” (2013)
- Introduce lower speed limit zone (Existing urban speed limit is 50km/h)



Urban Minor Streets



30km/h Zones



One-way Streets



Two-way Streets



Multi-lane One-way Local Distributors



Public/Private Housing Estates/Institutions



Urban Major Streets



40km/h Zones



Wide Single Carriageway District/Local Distributors



Multi-lane Dual Carriageway Primary/District Distributors



Multi-lane Single Carriageway Primary/District Distributors



Multi-lane One-way Primary/District Distributors



Automatic Enforcement for Major Streets

- Red Light Camera to be enhanced with speed enforcement function



Better Visibility at Pedestrian Crossings

- Poor visibility towards waiting areas of crossings due to railings with vertical bars

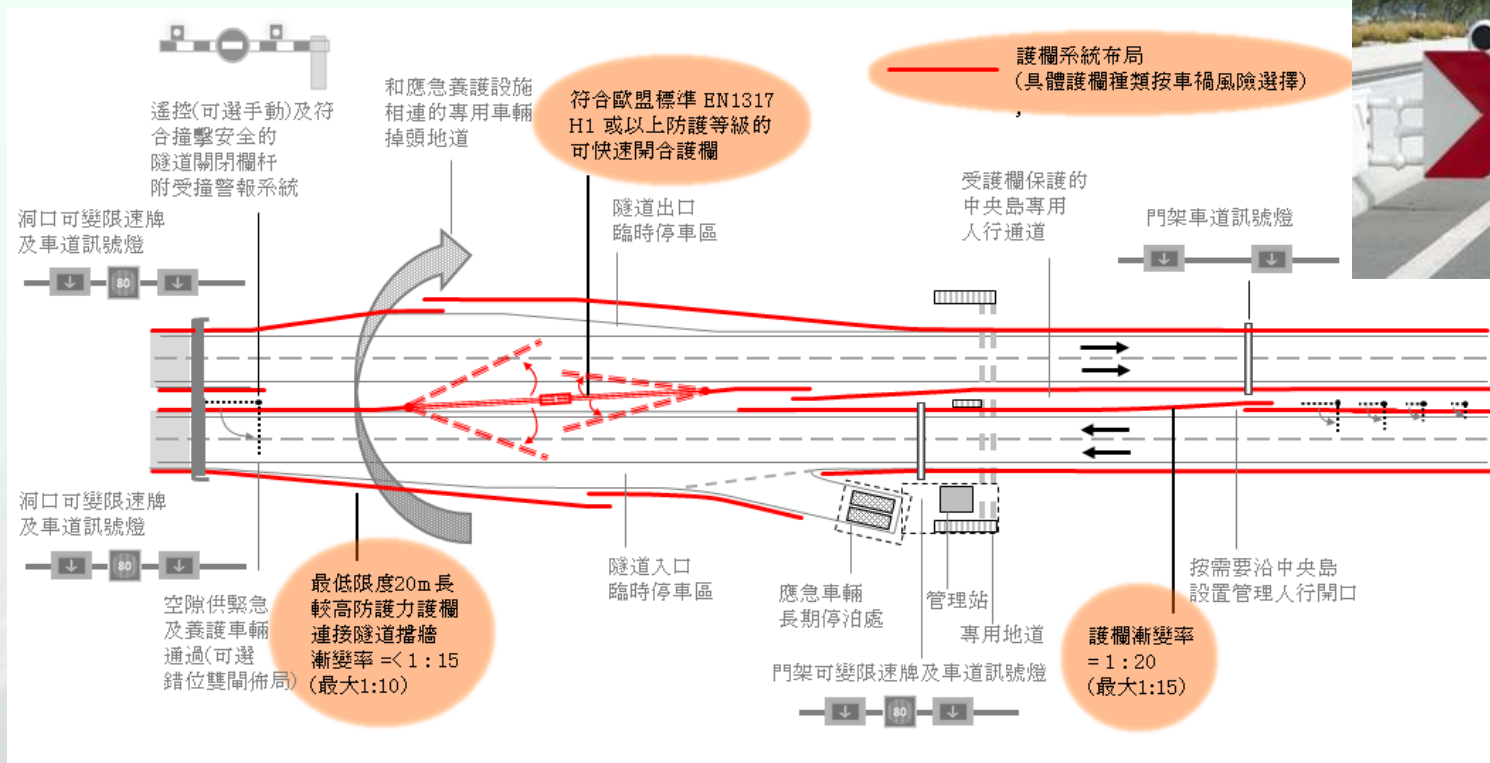


- Wider use of horizontal bar railings around crossings



Investment into Roadside Passive Safety

- Solutions integrating passive safety with signage, ITS-based incident management, operation and maintenance.



Our proposed safety barrier layout at busy urban expressway tunnel portals conforming to safety barrier layout requirements while limiting exposure of tunnel staff and stranded motorists to high speed traffic

Vehicle Fleet Management

- ISO39001 Road Traffic Safety Management
- GPS monitoring linked to road types and hazards for buses
- blind spot camera system for heavy vehicles



Conclusion

- Road safety in HK is considered in a relatively good position.
- Hong Kong experienced various stages of developments, and lessons are often learnt from major incidents.
- As an independent road safety organization, we believe that focus should be placed on reasonably preventable fatalities and casualties and a proactive approach is needed.
- Lessons need not necessarily be learnt from major mishaps.
- Applying Road Safety Audit to all road projects

Central Kowloon Route, Hong Kong

