

Preliminary Recommendations for a sustainable Traffic management plan for ADDU CITY



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Produced by

Adnan Ali, Transport Consultant, on behalf of Transport Authority of Maldives

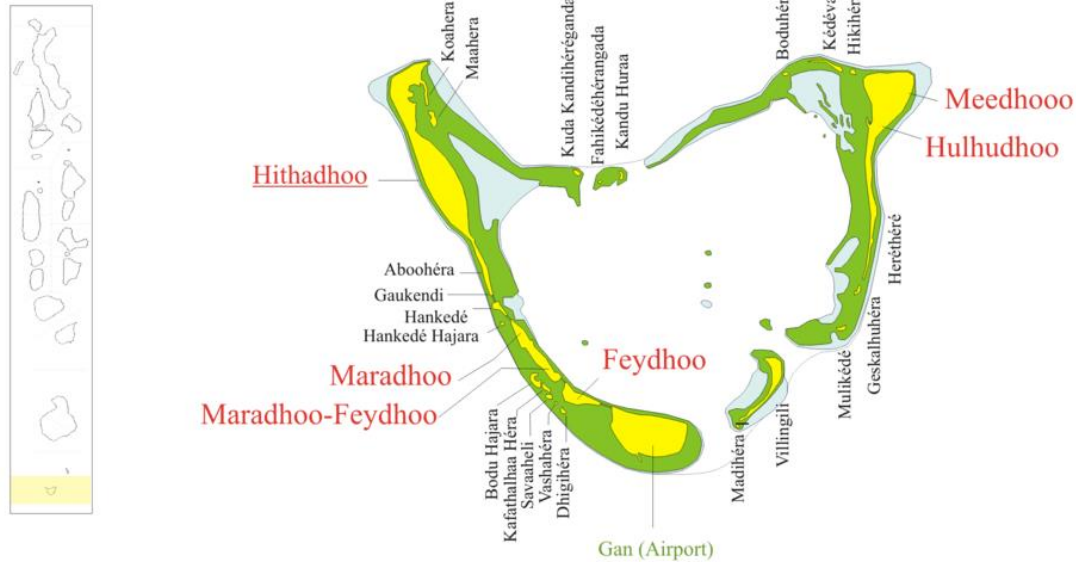


Introduction



- This preliminary report has been produced in a joint effort of Transport Authority and Addu City Council members. Due to the rapid economic and social development of the city the number vehicles imported is increasing at an alarming rate.
- Addu City is second largest city of the Maldives, with an international airport, international sea port developing at much faster pace than rest of the country. A well educated community with high quality of life in mind, with recent developments of good quality road network, the community is moving towards more motorization.
- With rich cultural heritage, distributed within the city, there is much benefit of having an appropriate connectivity within the city to give access to all such rich historical places. This definitely have high potential for tourism and maritime development activities within the city
- The link road which connects the islands of main land has experienced number fatal accidents leading to death of the victims in the history of the road. It is paramount to take actions to reduce number of such accidents.
- A sustainable transportation system is the key towards development, and a well thought traffic management plan must be in place and continuously updated along with land use plan, for short, medium and longer term.

Configuration of districts



- There are five islands or districts of Addu City, namely, Hithadhoo, Maradhoo, Maradhoo-Feydhoo, Feydhoo, Hulhudhoo and Meedhoo. Hithadhoo to Feydhoo is connected via a link road of length 14 kilometres and extends to Gan international airport island.
- There are three distinct land masses with two being inhabited. A registered population of more than 30,000 people, not less than 18,000 people lives in the city with a population density of 2900 per square kilometres.
- Internal main roads have been paved and with changing land-use is increasing demand for parking spaces within the city.

Road traffic accidents in Addu City (2014)

Island	Number of Accidents
Hithadhoo	77
Maradhoo	6
Maradhoo Feydhoo	11
Feydhoo	10
Gan	3
Hulhudhoo/Meedhoo	1
Connected uninhabited islands	4
Total recorded accidents	112

- 5 deaths in accidents
- 5 Fatal injuries
- 104 Minor Injuries
- Comparing WHO, safety standards, the number deaths, normalizing to basis of 100,000 population, it gives 25 deaths per year.
- If fatal injuries added the values goes to **50 per every 100,000**.

Source: Police records

Registered vehicle population of Addu City by March 2015

Island	4-wheelers	Motor cycles	Others	Totals
Hithadhoo	753	2213	68	3034
Maradhoo	115	429	0	544
Maradhoo-Feydhoo	78	185	4	267
Feydhoo	230	896	9	1135
Gan	28	16	0	44
Hulhudhoo	44	282	0	326
Meedhoo	49	320	0	369
Total	1297	4341	81	5719

- The statistics shows that there is a vehicle or motor cycle for every 3 persons living in the city, assumed 18,000 living in the city.
- Total registered vehicles in Addu City is 5719 and that is more than 8% of the registered vehicles are in the Maldives.



Preliminary suggestions for Traffic Management & Traffic Calming Plan

Critical 12 points on the Link Road



Location L1- Bend at BML

Location L2- Bend at Stadium

Location L3, L4- Convention_Centre, north and south road intersections

Location L5- South of Port, long bend

Location L6- long bend at Solid waste collection point

Location L7- Gaukedi bridge, picnic area

Location L8 – Maradhoo – Hankede junction bridge

Location L9- Slipway S bend

Location L10- Maradhoo School bend

Location L11- Maradhoo-feydhoo 4-way junction

Location L12 – Feydhoo-Gan, bridge and junctions

Main roads of Hithadhoo, Maradhoo, Maradhoo-Feydhoo and Feydhoo

- Access to facilities such as Café, Restaurants, Shops, Residential buildings



- Hithadhoo main road,
- No markings for vehicle parking, parking bay provided

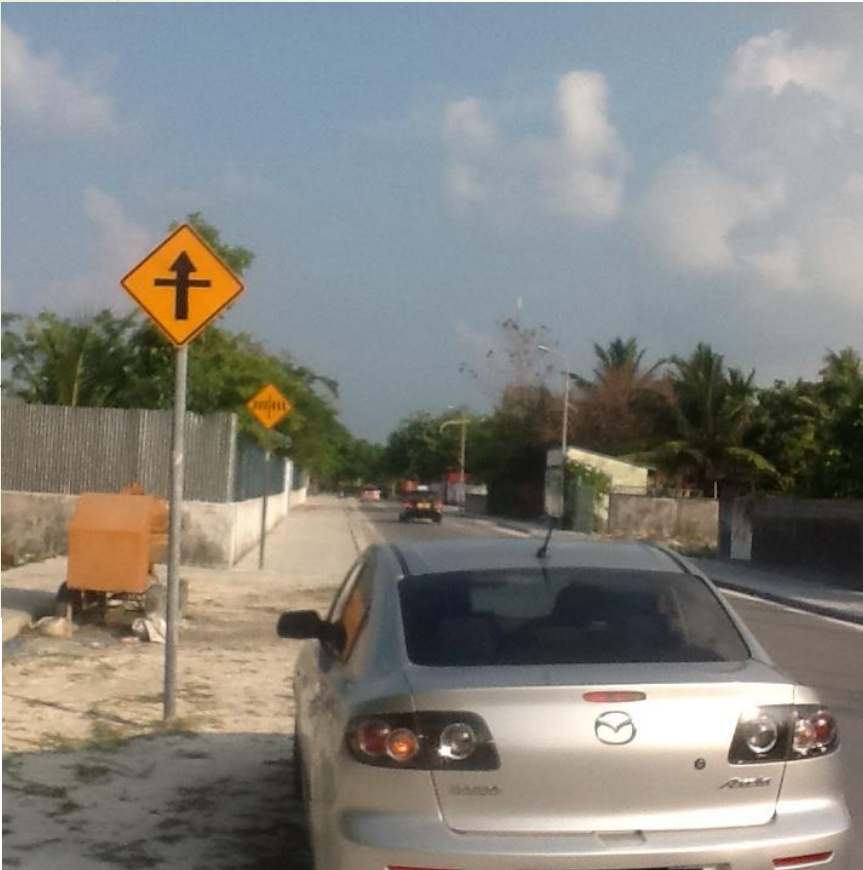


- Maradhoo-Feydhoo, Feydhoo Main road (Typical)

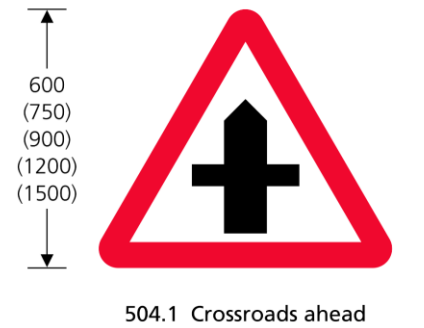
Traffic signs used in the city- comparison



© Can Stock Photo



- Incorrect signs as per current regulations



- Other Road crossing ahead




- Pedestrian crossing, ahead



- Pedestrian crossing

- Correct signs



Traffic calming warning signs, markings and devices

- Warning signs
- Road markings to indicate allowable speeds
- Road edge markers and centreline markings and devices
- Speed breakers
- Pedestrian crossings

Feydhoo football ground bend



- Rumble strips
- Reduce speed to 30
- Chevron signs to indicate sharp turning bend



Traffic calming devices – rumble strips



- Rumble strips- very strong type- installed separately

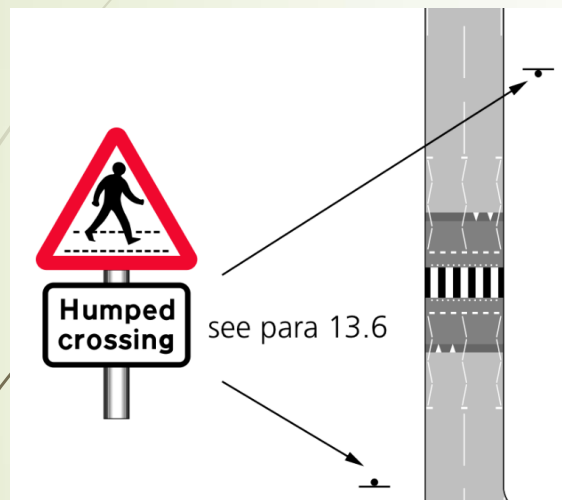


- Rumble strips- very strong type, modified pavement

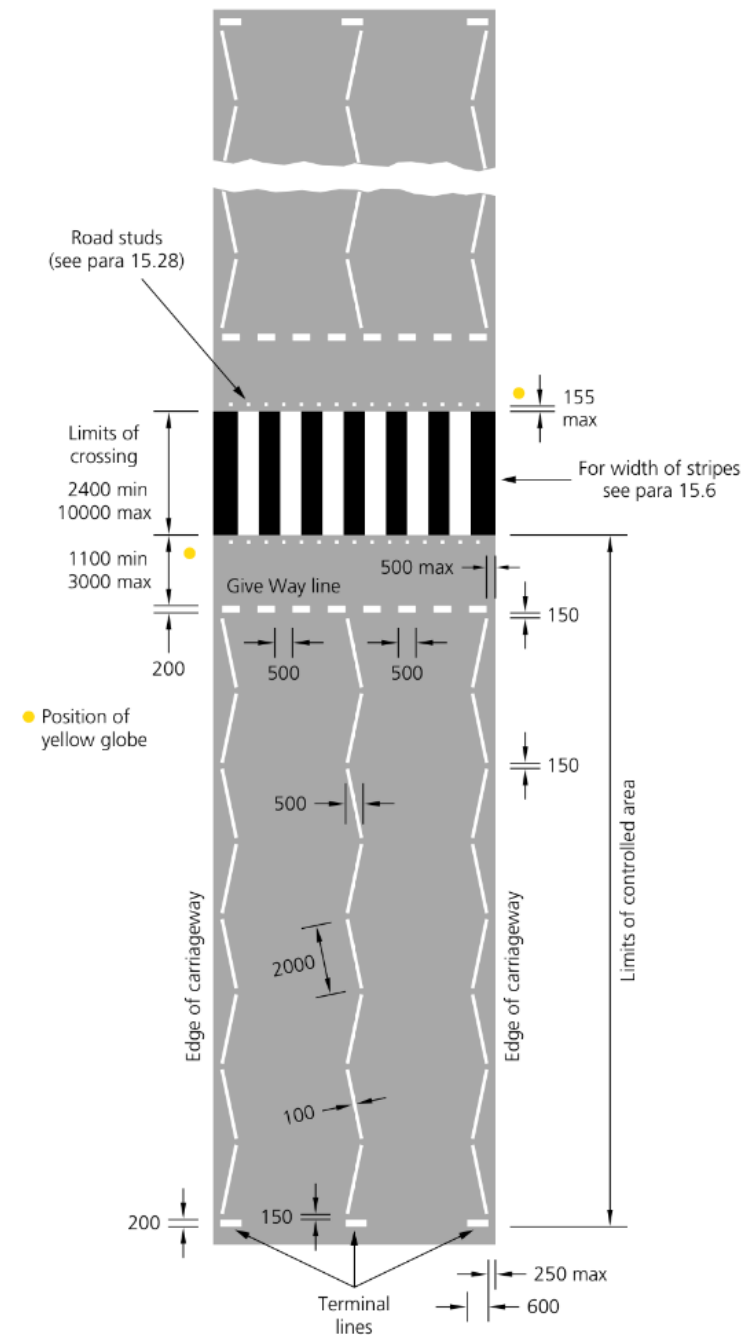
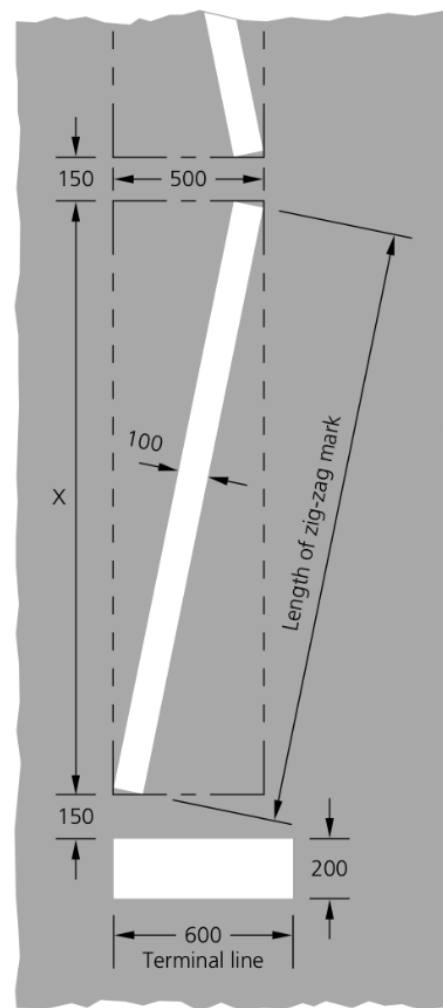


- Rumble strips- medium impact, currently used in main roads of Maradhoo, Maradhoo-Feydhoo and Feydhoo

Pedestrian crossing – Road markings



➤ All dimensions are in millimeters



Slow speed and turning road markings

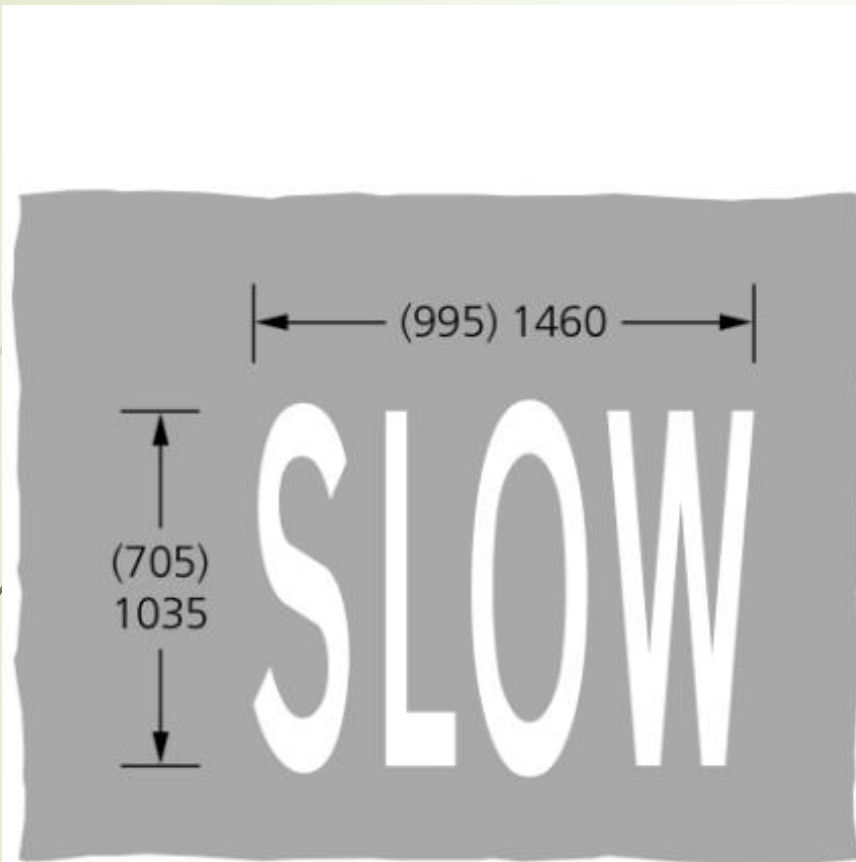


Diagram 1058.1

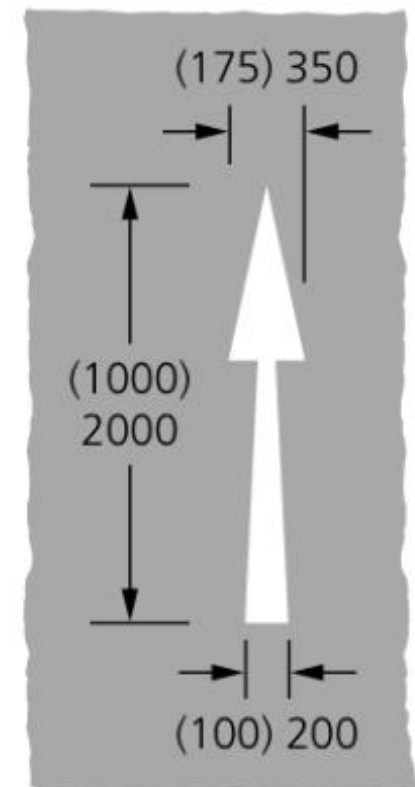
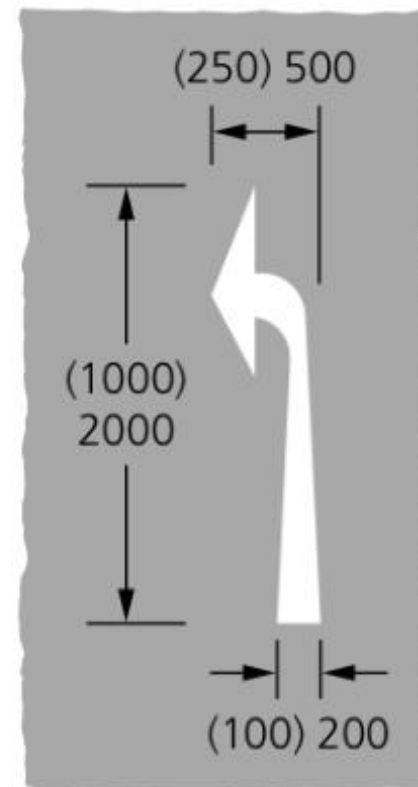
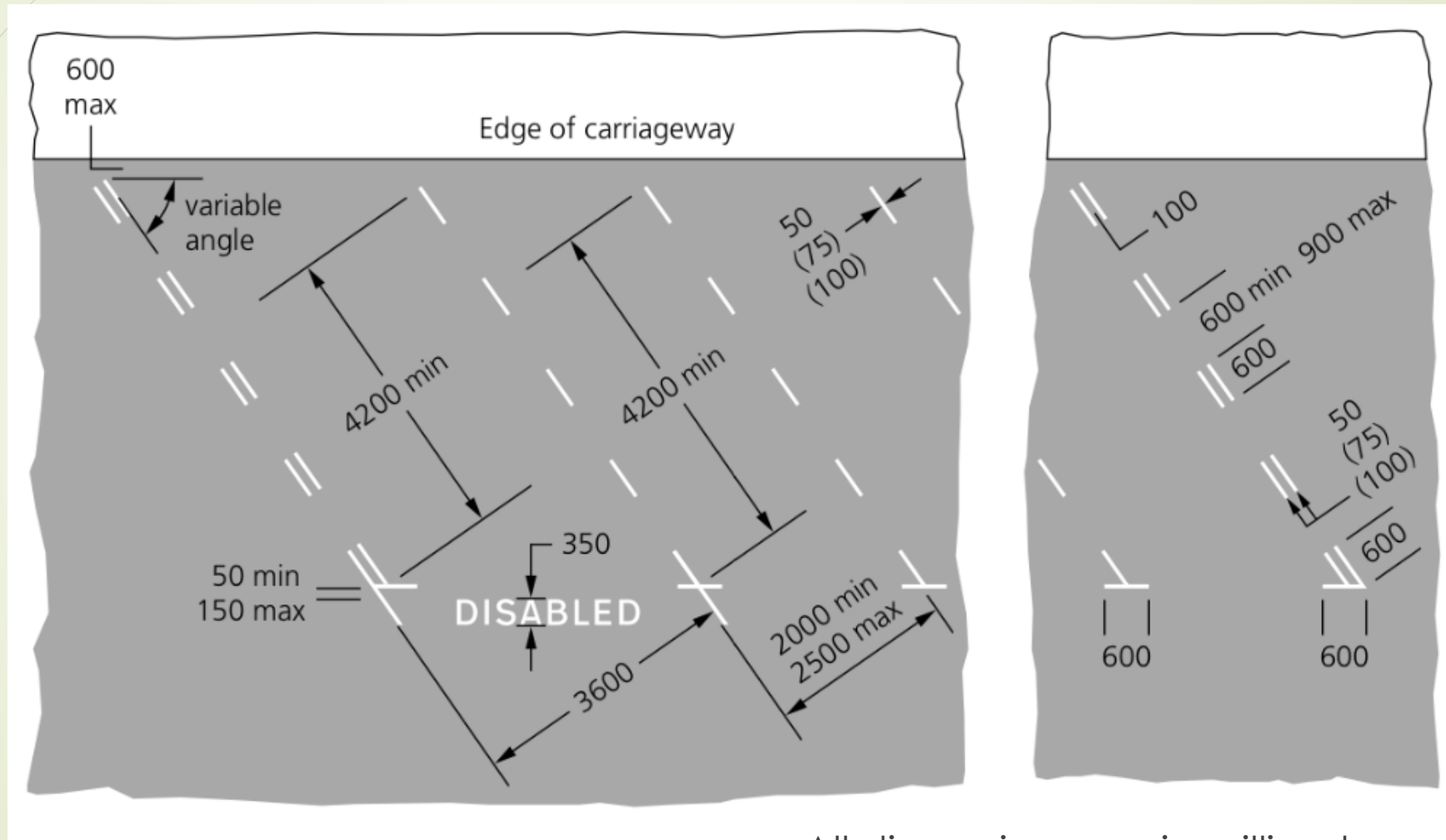


Diagram 1059

➤ All dimensions are in millimeters

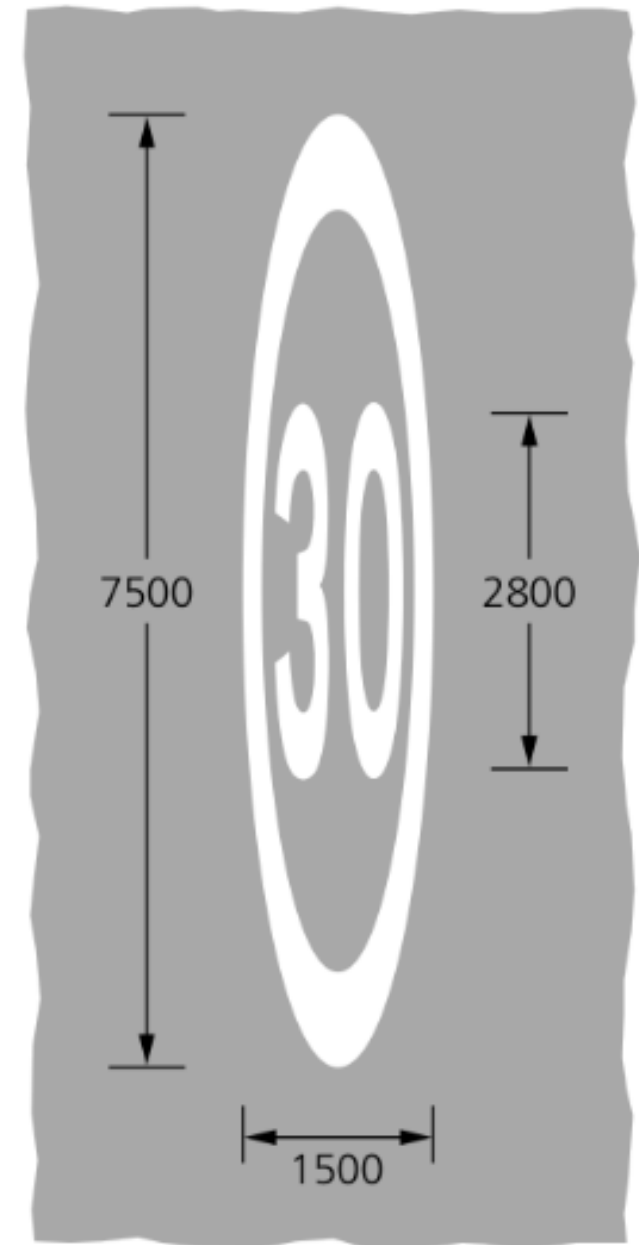
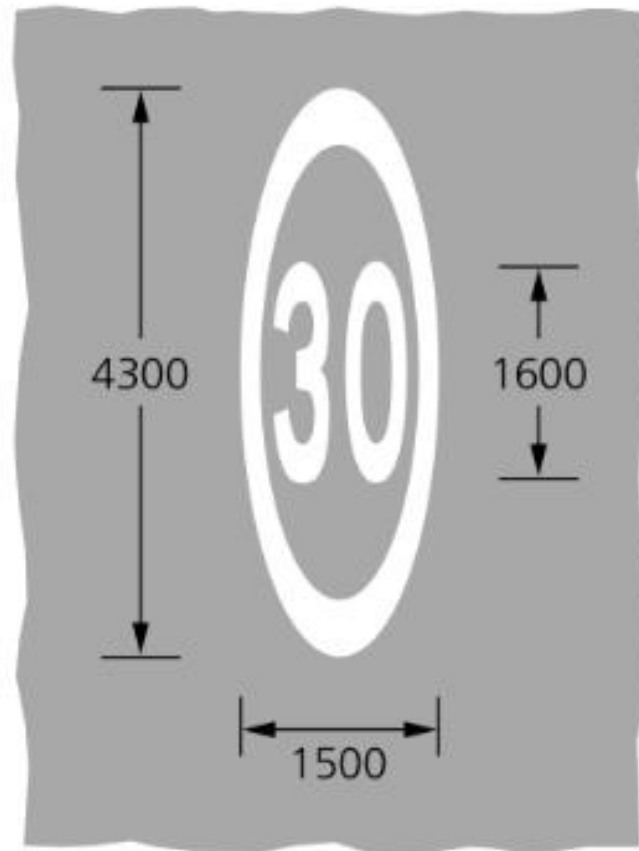
Road side, parking bay markings



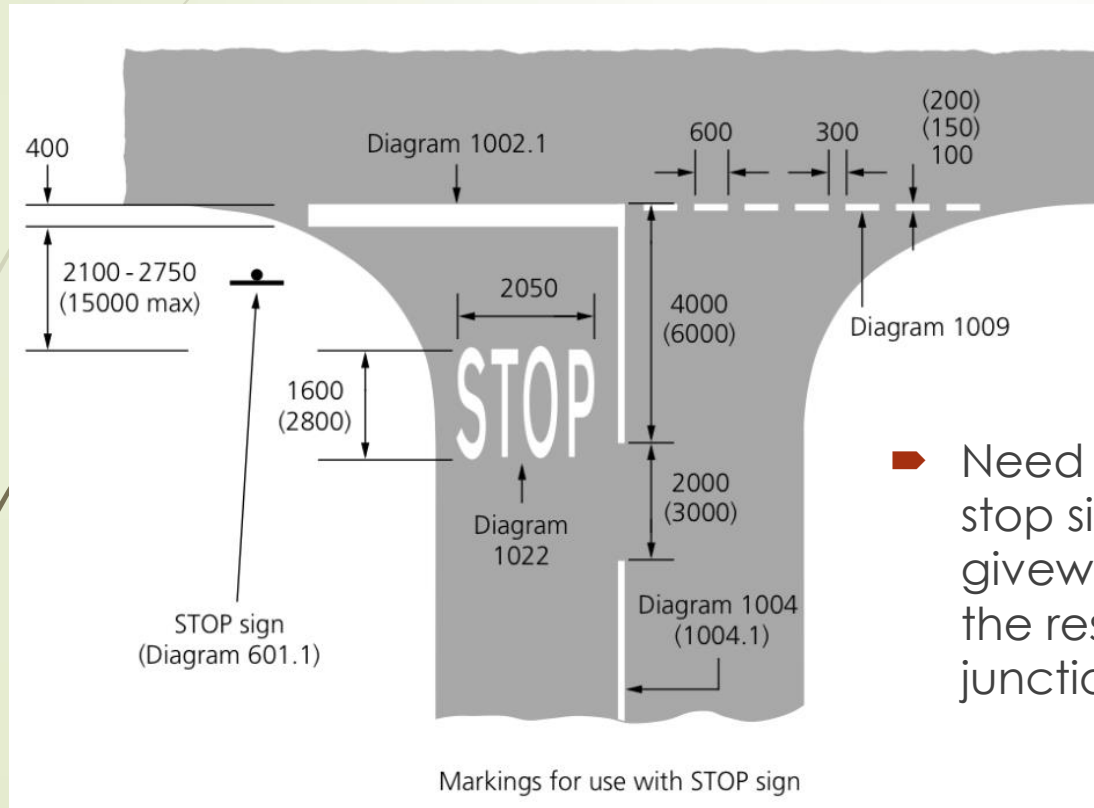
➤ All dimensions are in millimeters

Speed marking on the road for traffic calming

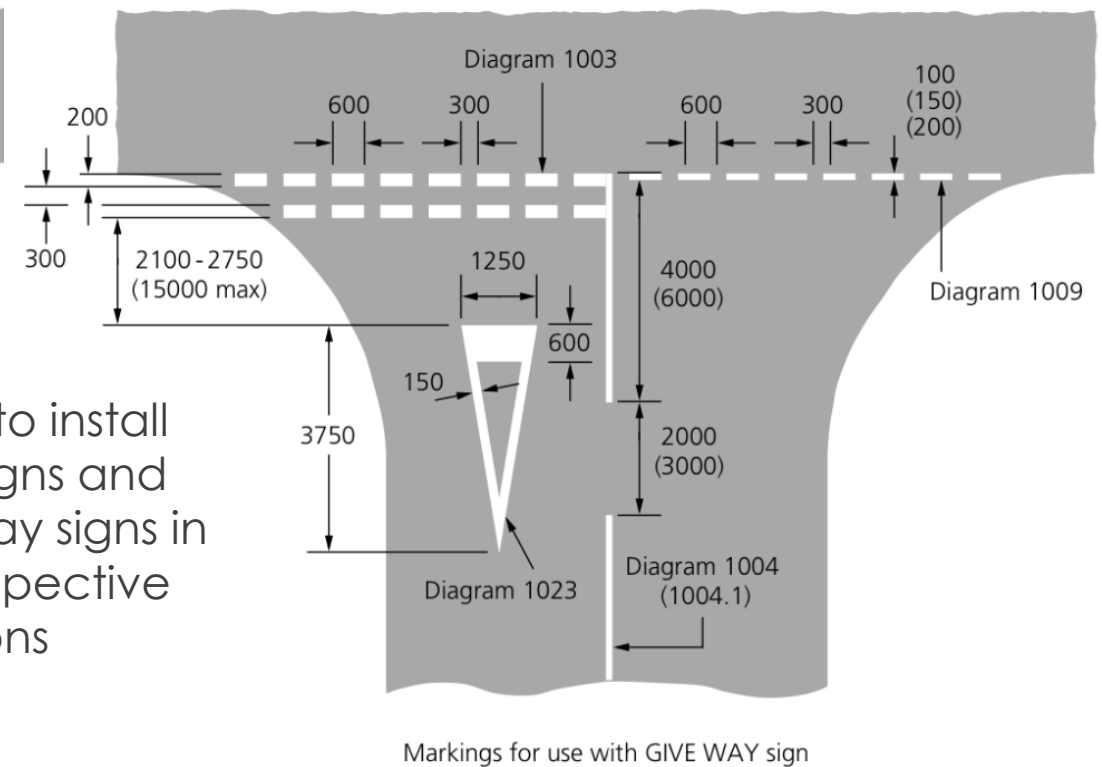
➤ All dimensions are in millimeters



Stop or giveaway, marking for cross roads entering to main roads



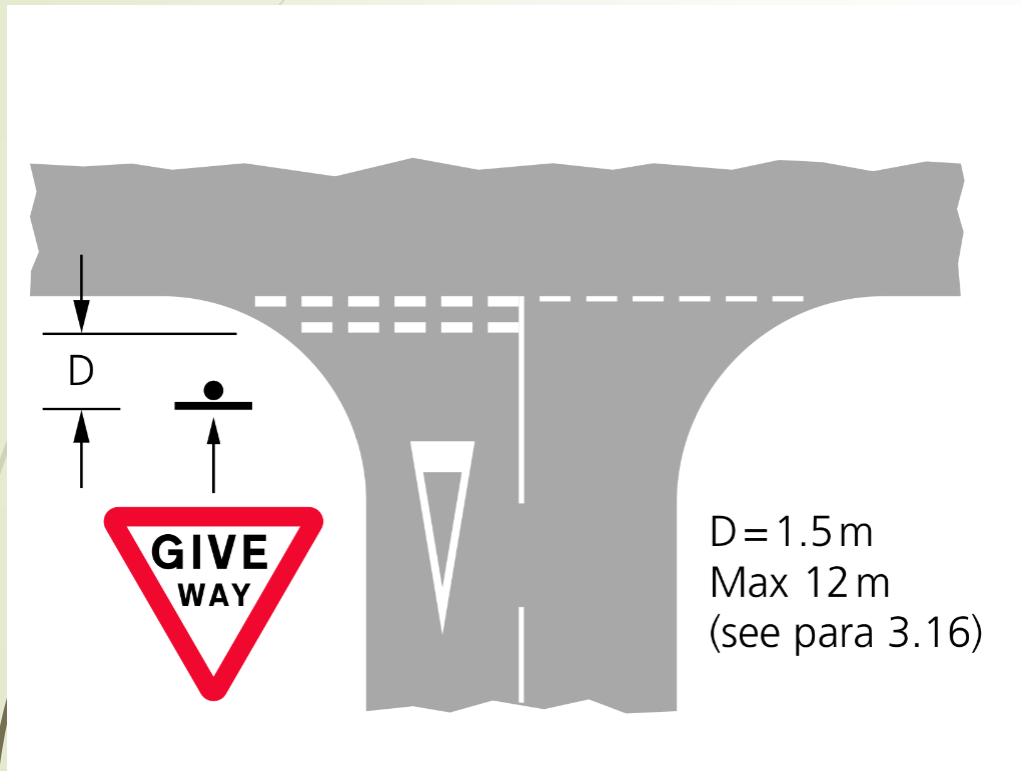
➤ Need to install stop signs and giveaway signs in the respective junctions



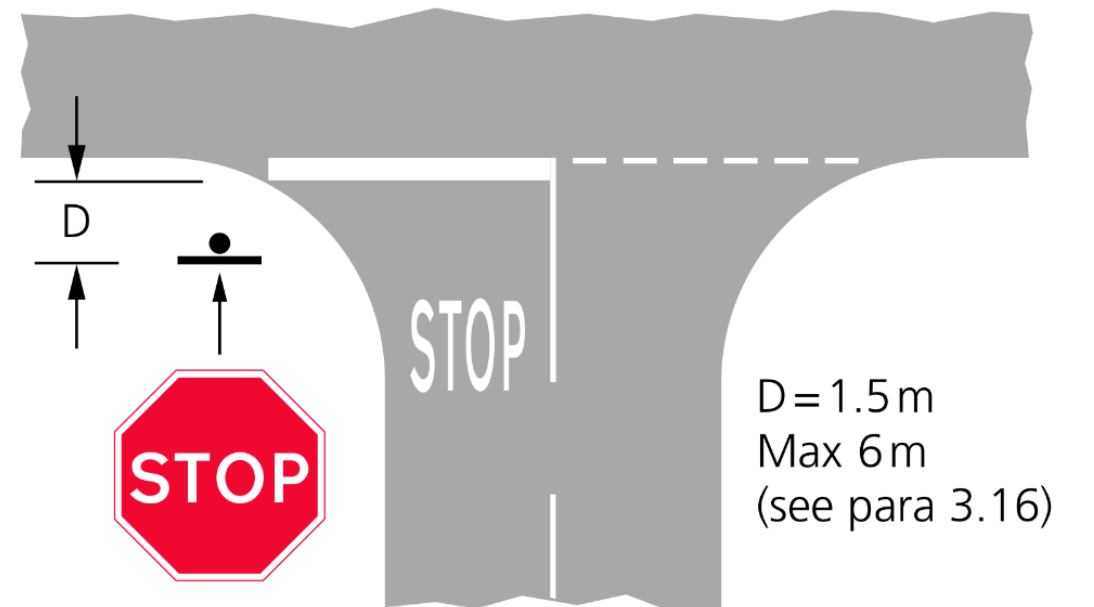
➤ Install at medium to low traffic junctions

➤ Install at very risky traffic junctions

Stop or Giveway, road sign for cross roads entering to main roads



- Install at very risky traffic junctions



- Install at medium to low traffic junctions

Stop or giveway, road sign for cross roads entering to main roads

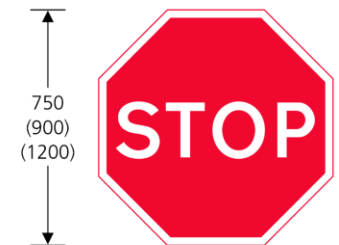
Table 3-3 Size of GIVE WAY sign

85th percentile speed of private cars approaching on minor road (mph)	Size of GIVE WAY sign (mm)
Up to 30	600
31 to 40	750 (600)
41 to 50	900 (750)
51 to 60	1200 (900)
Over 60	1200 (1500)



Table 3-2 Size of STOP sign

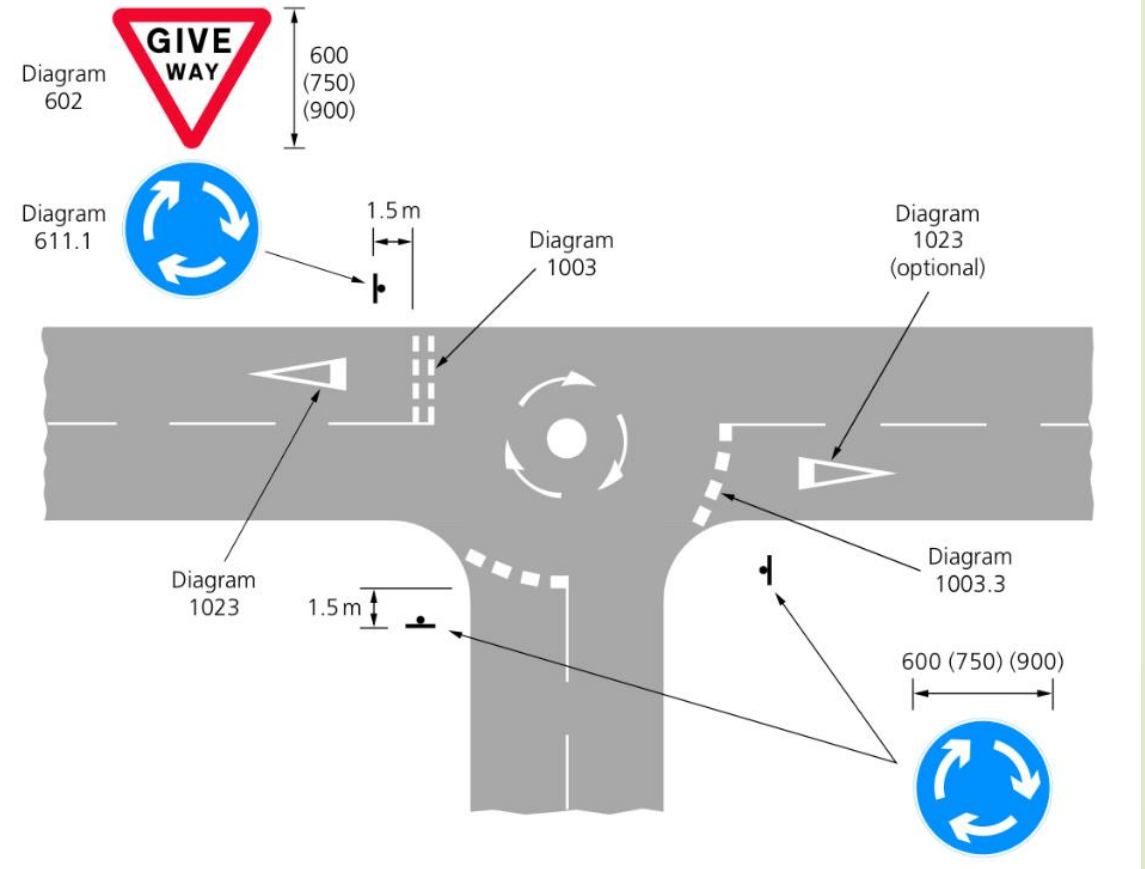
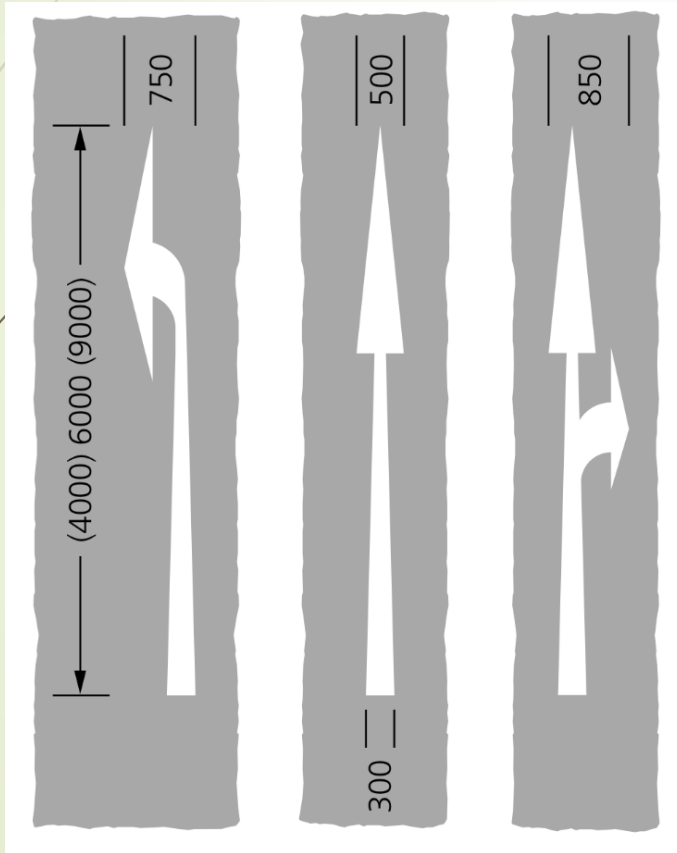
85th percentile speed of private cars approaching on minor road (mph)	Size of STOP sign (mm)
Up to 30	750
31 to 40	900 (750)
41 to 50	1200 (900)
Over 50	1200



➤ All dimensions are in millimeters

601.1 Junction controlled by a STOP sign

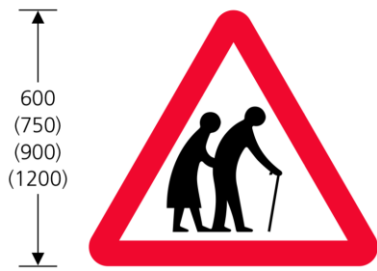
Road arrow markings and giveaway and roundabout signs before roundabouts



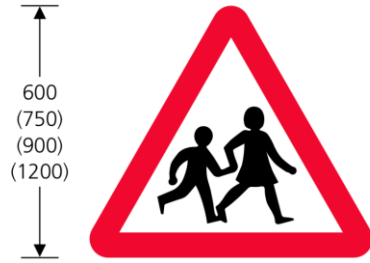
➤ All dimensions are in millimeters

➤ **Note: negotiation speed around the round about at south end of Hithadhoo main road is maximum 25km/h**

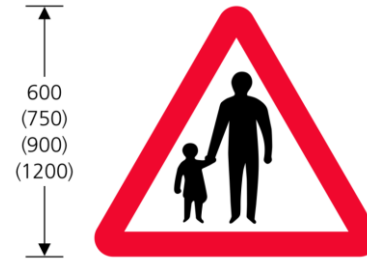
Traffic warning signs for road users



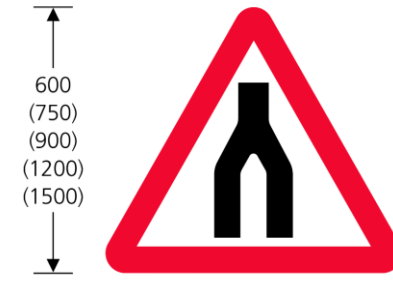
544.2 Frail or disabled pedestrians likely to cross road ahead



545 Children going to school or playground



544.1 Pedestrians in road ahead



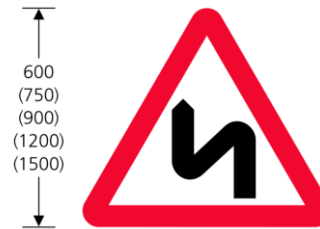
520 Dual carriageway ends ahead



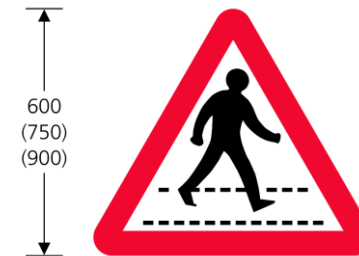
557.1 Road hump or series of road humps



510 Roundabout ahead



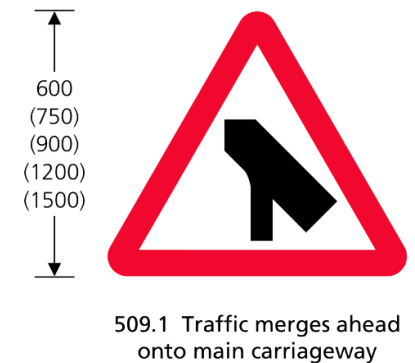
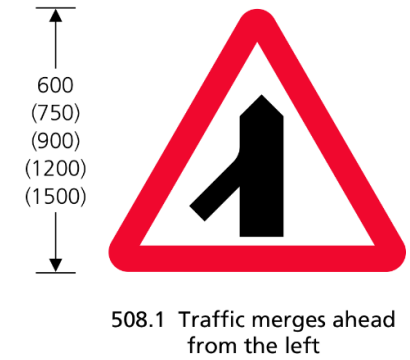
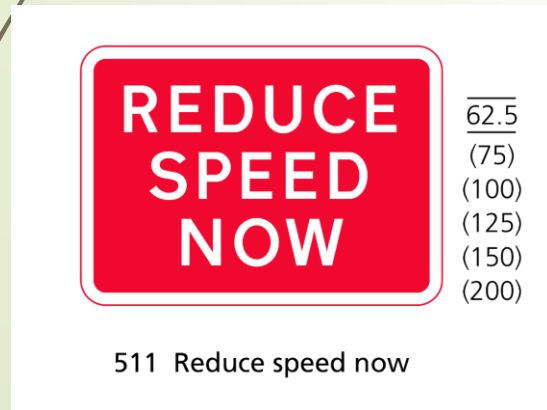
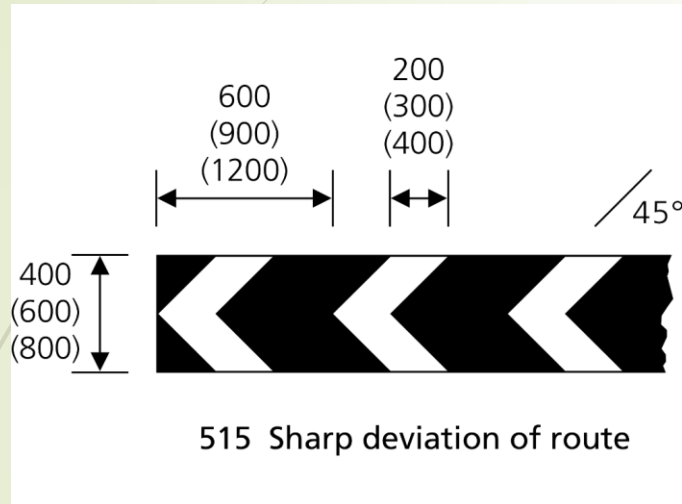
513 Double bend ahead



544 Zebra crossing ahead

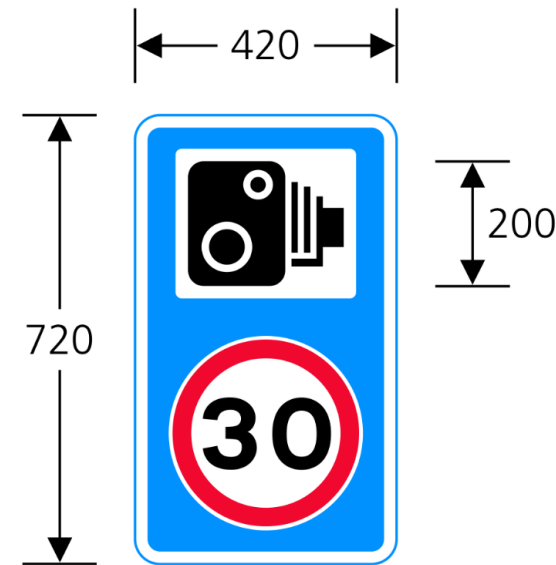
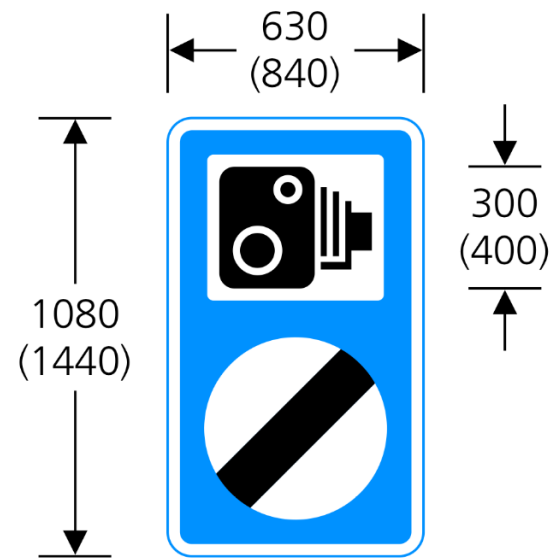
➤ All dimensions are in millimeters

Traffic signs and markings



➤ All dimensions are in millimeters

Road sign for speed camera ahead,
also indicate allowable speed ahead



➤ All dimensions are in millimeters



Recommendations 1

- Speed breakers, sleeper lines, or rumble strips before all bends, in FULL width of road on both entry points
- Make speed breakers on the link road more visible, markings strips
- Slow speed markings on the road and sign on the road side before all critical bends
- Street lights at appropriate locations
- Change reflectors currently installed on the road shoulder to cat eye type reflectors.
- Dedicate and pave shoulders for a dedicated bicycle lane
- Make pavement for pedestrians

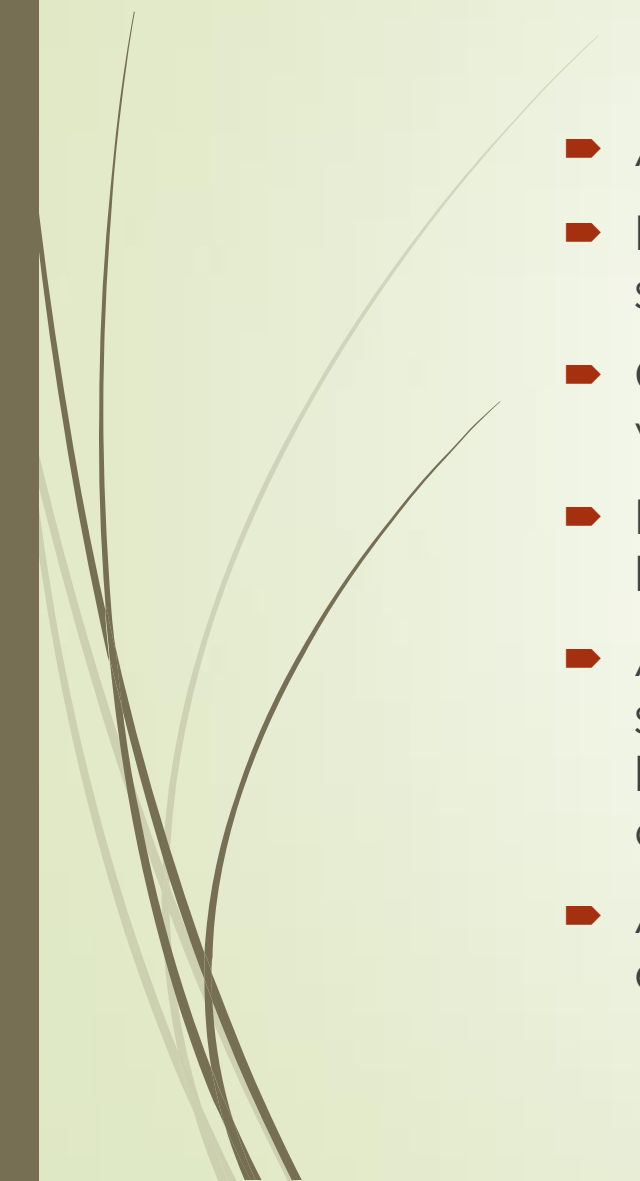


Recommendations 2

- Enforcement of proper helmet for all motor cycle users all the time
- Enforcement of seat-belt for occupants of vehicles at the front seat
- Enforcement of child-restraints for taking small children on motor bikes
- Install stop signs at cross roads entering to Link Road, Main Road of Hithadhoo, Maradhoo, Maradhoo-Feydhoo and Feydhoo.
- Special speed breakers at the entry of cross bridges
- Remove bushes/trees near all bends and increase visual distance
- Introduce one way system to the main roads of Maradhoo, Maradhoo-Feydhoo and Feydhoo and install street side parking on one side.
- Install slow speed sign before roundabout at Hithadhoo Main Road at south end



Recommendations 3

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- Allocate parking areas near business area instead of street side parking
 - Provide parking space near all schools and also provide safe paths for school children to walk from busses to school
 - Control loading unloading time for heavy vehicles to avoid use of such vehicles during peak traffic hours
 - For registration all new 4wheeled vehicles a dedicate garage space must be owned by the owner of the vehicle
 - As a long term solution, all traffic generator type land-uses, such as school, stadium, playgrounds, shopping malls, theatres, café and restaurants shall have dedicate, appropriate number of parking lots near such facility for its customers.
 - As a long term solution, the total number of vehicles shall be limited for each island



Recommendations 4

- Strictly prohibit any damaged or un-registered vehicles to be kept on the road
- Strictly prohibit any repair and maintenance works of vehicles to be carried on the road side.
- Encourage use of public transport, school bus rather than having own vehicles.
- Encourage use of bicycles within each island to reduce the demand for number of motor vehicles
- Run awareness programs minimum of three times in a year, with concerned authorities participating school children, mass media and social media