

complete street development

guide to a phased approach

SGArchitects

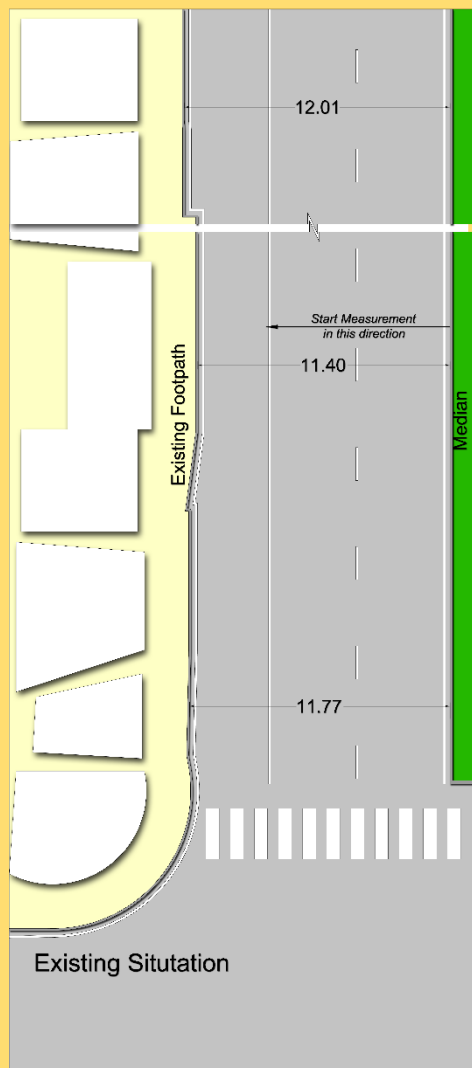


TRIPP



development phases

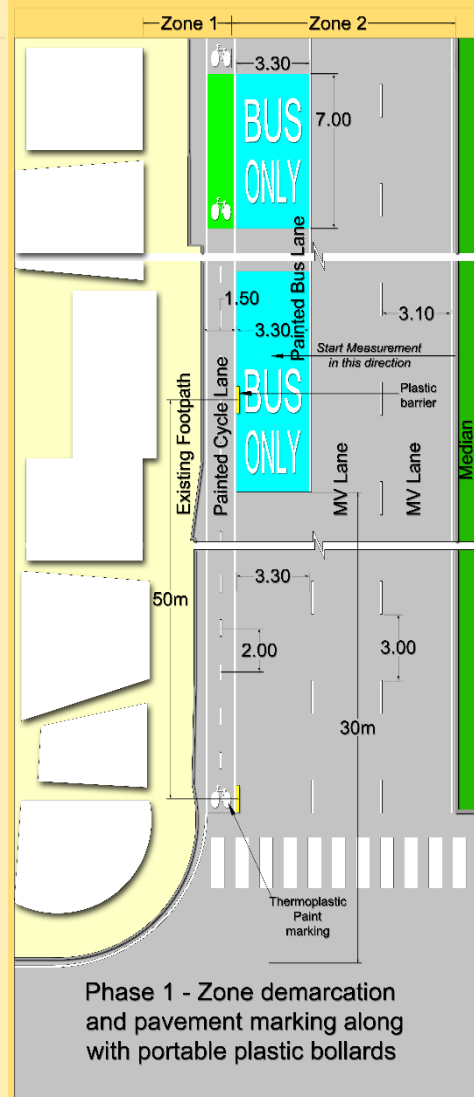
Existing
00 months
00 crores/km



all dimensions in m

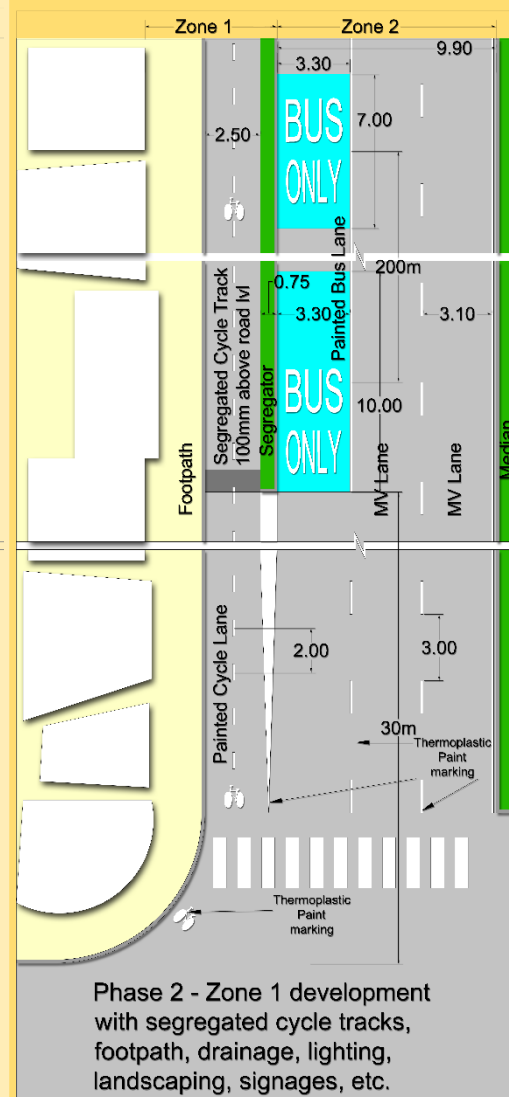
Each one way carriageway on existing arterial roads have three lanes with equal widths, of which left most lane is designated for use by buses and heavy vehicles. One side carriageway width on arterial roads is usually in excess of 10.0m.

Phase 1
03 months
01 crores/km



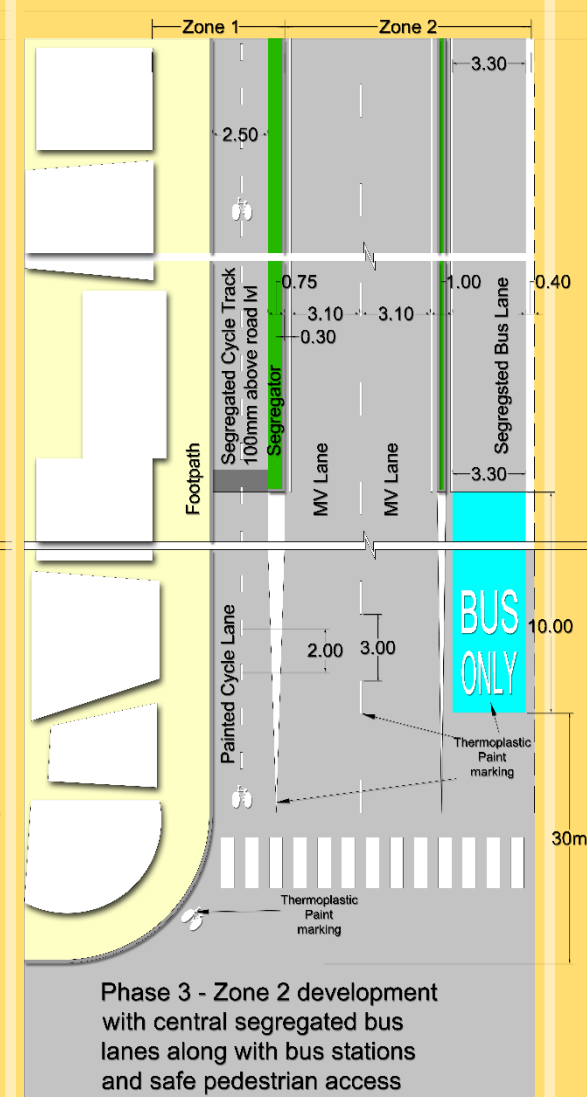
Lane widths are re-assigned in order to carve out space for cyclists and edge friction such as parking. Dedicated space for such functions removes obstacles from bus lanes, ensuring that they remain usable. This defines two zones on the ROW – Zone 1 for slow functions and Zone 2 for motor vehicles. This phase should be used to evaluate the impact and performance of painted bus lanes in terms of increased bus speed as well obstruction to or conflict with left turning vehicle.

Phase 2
09 months
05 to 08 crores/km



Part of the carriageway assigned to cyclists and other slow functions is included in Zone 1. This Zone, which includes width from the bus lane to property edge, is redesigned to designate space for cycle tracks, footpath, service lane, services (such as lighting and drainage), signboards, IPT parking, landscaping, etc. Bus lane may remain painted in zone 2, subject to transition in to segregated bus lanes for arterial roads in subsequent phase. Four lane collector roads may retain painted bus lanes.

Phase 3
15 months
07 to 11 crores/km



Curb side painted bus lanes cannot be designated for exclusive bus use, as they need to accommodate, access for IPT parking, properties and left lanes. Zone 2, which is designated for motor vehicles, including buses, is developed to include segregated central bus ways with bus stations and commuter access infrastructure. Phase 1, 2 and 3 development should be based on recommendations included in guidelines and standards such as those included in the last plate.



phase 1 development cross section design options

10.0 to 10.5 m carriageway
Minimum 1.4 to 1.9m width cycle lane, protected by plastic barriers, is required for a bicyclist to overtake a cycle rickshaw. 3.1m width bus lane and 2 x 2.5m width motor vehicle lanes, are good for vehicular speeds to less than 30km/h

10.5 to 11.0 m carriageway
Minimum 1.4 to 1.9m width cycle lane, protected by plastic barriers, is required for a bicyclist to overtake a cycle rickshaw. 3.1m width bus lane and 2 x 2.75m width motor vehicle lanes, are good for vehicular speeds less than 30km/h

11.0 to 11.5 m carriageway
Minimum 1.4 to 1.9m width cycle lane, protected by plastic barriers, is required for a bicyclist to overtake a cycle rickshaw. 3.1m width bus lane and 2 x 3.0m width motor vehicle lanes, are good for vehicular speeds of less than 50km/h

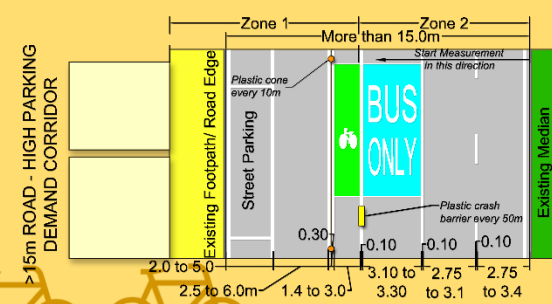
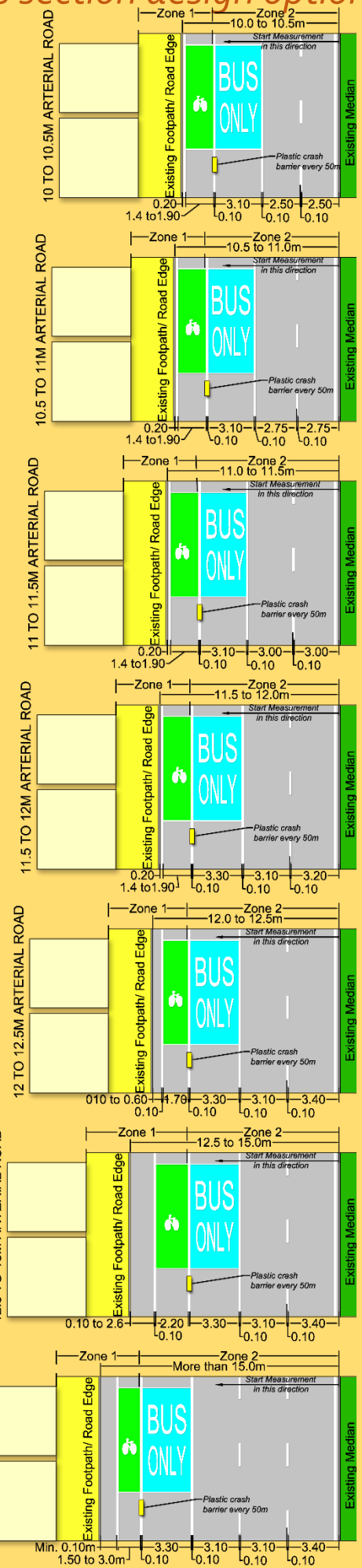
11.5 to 12.0 m carriageway
Minimum 1.4 to 1.9m width cycle lane, protected by plastic barriers, is required for a bicyclist to overtake a cycle rickshaw. 3.3m width bus lane and 2 x 3.1m width motor vehicle lanes, are good for vehicular speeds of 50km/h

12.0 to 12.5 m carriageway
1.7m width cycle lane, protected by plastic barriers, is required for a bicyclist to overtake a cycle rickshaw. 3.3m width bus lane and 2 x 3.1m width motor vehicle lanes, are good for vehicular speeds of 50km/h

12.5 to 15.0 m carriageway
2.2m width cycle lane, protected by plastic barriers, allow two rickshaws to cross. 3.3m width bus lane and 2 x 3.1m width motor vehicle lanes, are good for vehicular speeds of 50km/h. Up to 2.6m shy away accommodates vendors and IPT parking.

> 15m carriageway on Ring Road
Parts of Ring Road and selected arterial roads have a 8 lane divided carriageway. Here, up to 3.0m width cycle lane, protected by plastic barriers, allow two rickshaws to cross. 3.3m width bus lane and 3 x 3.1m width motor vehicle lanes, are good for vehicular speeds of 50km/h. Shy away width higher than 1.5m, accommodates vendors and IPT parking.

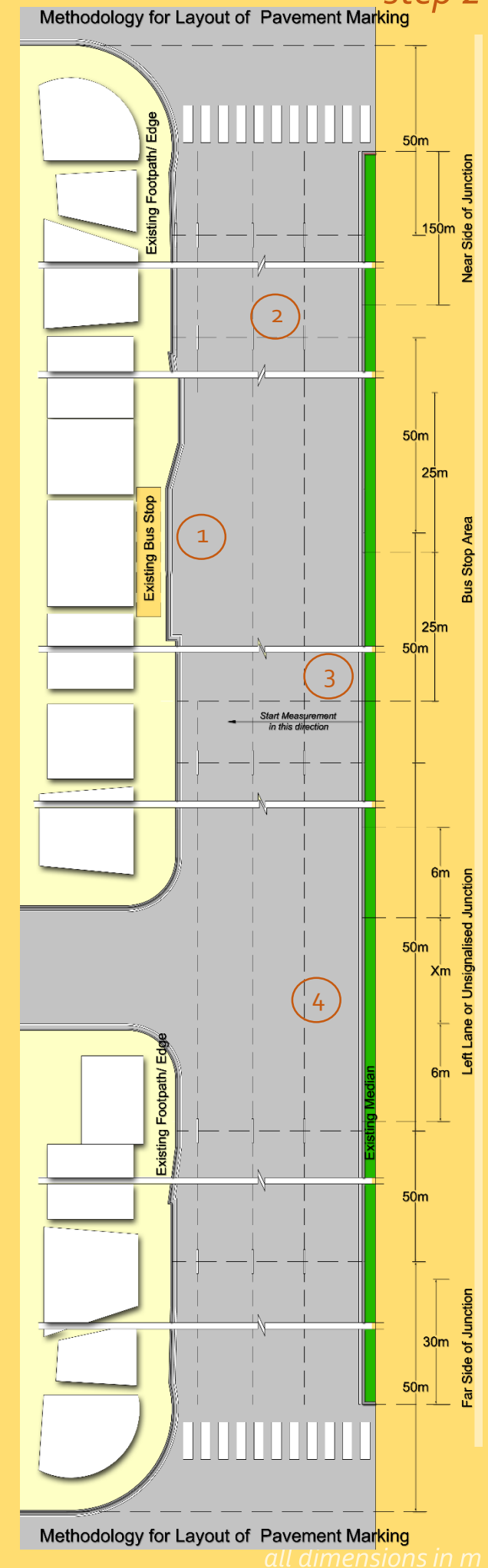
> 15m Carriageway with High parking demand
Some arterial roads have a wide carriageway which accommodates high on street parking demand. Here parking bays and a parking lane is provided between curb edge and painted cycle lane. Cycle lane is segregated from parking using plastic bollards/cone and chain. 1.4 to 3.0m width cycle lane, protected by plastic barriers, allows cyclist to overtake. 3.1 to 3.3m width bus lane and 2 x 2.75 to 3.3m width motor vehicle lanes, are good for vehicular speeds of 30 to 50km/h



all dimensions in m

phase 1 development *step 2*

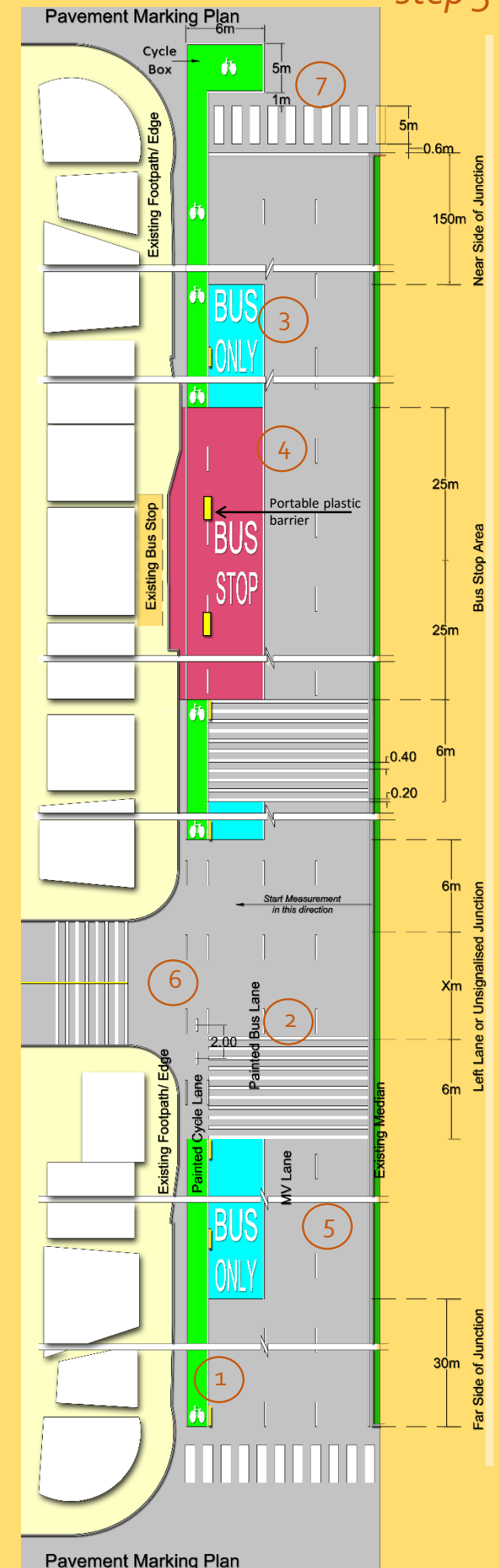
- ① Ignore measurement lines and widths recorded at planned road widening such as those at bus bays or planned street parking bays.
- ② For all other measurement lines, mark lane widths based on design for carriageway width category* at each of the accepted measurement lines
- ③ Because median edge is regular and uniform, all measurements for marking designed cross section, should be initiated from this side.
- ④ Draw guide lines for lane marking by joining lane measurement marks on each consecutive measurement line, using the horizontal median profile.



*Refer the previous plate for cross section details



phase 1 development step 3



1 Define cycle lane using 100mm wide solid thermoplastic lane marking, connecting marked cycle lane widths (every 50m). Do not mark on the bus stop area or through intersections. Demarcated cycle lane shall be painted with retroreflective thermoplastic pavement marking in selected shade of green (or any designated colour). Alternately, 8m long (cycle lane width) green colour cycle boxes may be provided with a white cycle logo*. This box may be repeated every 100m on the cycle lane.

2 200mm wide rumble strips (across the carriageway) developed using single layer of mastic asphalt (painted white) or multilayer of white thermoplastic paint (15mm thick) at 400mm interval for a minimum length of 6.0m, before any unsignalised intersection, major left lane or the start of a bus stop area. Do not apply rumble strip across cycle lane.

3 Define bus lane using 100mm wide solid thermoplastic lane marking connecting marked bus lane width every 50m. Do not mark across rumble strips or intersections. Mark, 8m long (and bus lane width) bus only boxes using blue retroreflective thermoplastic pavement marking. Label the bus only boxes with 'BUS ONLY' text in white retroreflective thermoplastic marking*. Mark bus only boxes at the end and beginning of a continuous defined bus lane. If bus lane is discontinued for bus stop marking or at left lanes, its ends should be marked using bus only boxes. These boxes should be repeated at approximately every 200m on a continuous bus lane.

4 Demarcate, 50m long (identified) bus stop area using dark red thermoplastic pavement marking between curb and bus lane inner edge. Label bus stop area with white retro reflective thermoplastic paint over dark red area marking. Demarcate continuity of cycle lane and shy away space (including bus bay area) using dashed and/or continuous marking.

5 Define motor vehicle lanes using 1.5m long broken lane marking (3.0m spacing) connecting motor vehicle lane width markings every 50m, parallel to or along the horizontal median profile. Do not mark across rumble strips

6 Cycle lane demarcation across unsignalised junctions or major left lanes using broken thermoplastic paint marking (1.0m long at 2.0m interval)

7 Mark 5m wide zebra crossings, 6m from the intersection edge. Stop line should be located 1m before the zebra crossing (or 12m from intersection edge) on the near side of the junction. On the near side of intersection a minimum 5m x 6m cycle box shall be demarcated 1m after the zebra crossing using green thermoplastic marking with white cycle logo

*Refer the following plate for details



all dimensions in m

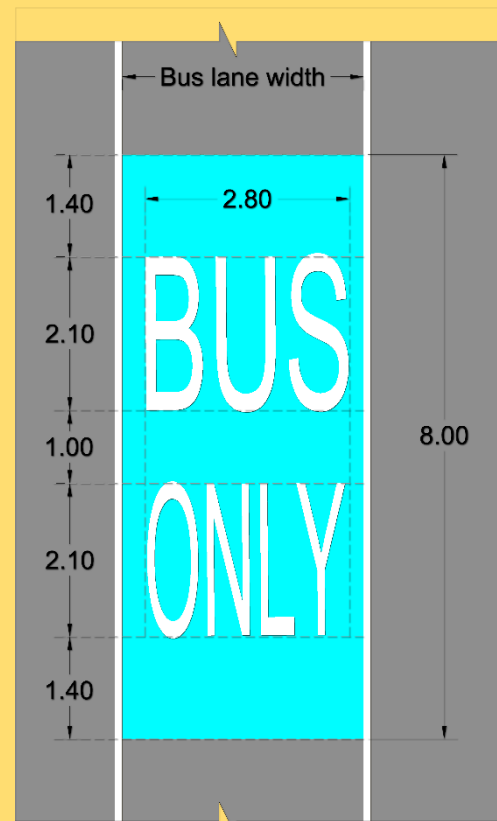
phase 1 development marking and signage details



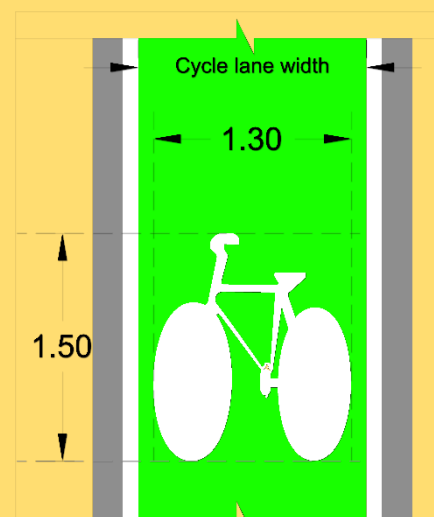
Plastic barrier for protecting cyclists from bus traffic. Should be placed on the edge between cycle and bus lane at a frequency of 30 to 50m. Do not place at major left lanes or unsignalised intersections



Plastic bollards (every 5 to 10m) with chain or rod link, to segregate cycle track from street parking lane on > 15m wide carriageway



Bus lane marking detail. 'BUS ONLY' text in white thermoplastic paint over blue thermoplastic paint box. To be repeated at ends and beginning and at every 200m on a continuous bus lane.



Cycle lane marking detail. Cycle logo in white thermoplastic paint over green thermoplastic base. To be repeated at end and beginning and at every 100m on a continuous cycle lane.

Following resource material may be referred to, for planning, designing and developing complete streets:

- Recommendations for traffic provisions in built-up area (ASVV), CROW record 15
- Planning and Design Guideline for Cycle Infrastructure, TRIPP IIT Delhi and Shakti Sustainable Energy Foundation
- Street Design Guideline, UTTIPEC, Delhi Development Authority
- Guidelines for Pedestrian Facilities, IRC: 103 – 2012 Ministry of Road Transport and Highway, Government of India
- Code of Practice for Road Markings, IRC: 35-2015 Ministry of Road Transport and Highway, Government of India
- Recommended Practice for the Design and Layout of Cycle Tracks, IRC: 11-2015 Ministry of Road Transport and Highway, Government of India
- Design of Urban Roads – Code of Practice (Part I to Part V), Ministry of Urban Development, Government of India
- Bus Rapid Transit System Design Guideline, TRIP Indian Institute of Technology, Delhi

