Better Streets Better Cities

Street Design Guidelines

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ITDP
Institute for Transportation & Development Policy

Why do we need guidelines?

When all activities take place on the carriageway, the result is inconvenient and unsafe for all users

Designs often fail to take the practical needs of users into account

Good street design is central to maintaining quality of life in our cities

- As the growing urban population puts increasing pressure on transport infrastructure, it is becoming essential to use existing road space more efficiently
- Cities are investing in high quality public transport systems, including Metro and BRT, but little attention has been paid to how their passengers access transit stations
- To think from a human/user perspective and not from the perspective of vehicles or other inanimate objects

What is a “complete street”?

When all activities take place on the carriageway, the result is inconvenient and unsafe for all users

What is a complete street?

- A complete street is safe, comfortable and convenient for all users

Public Transport

Cycling

Walking

Private vehicles

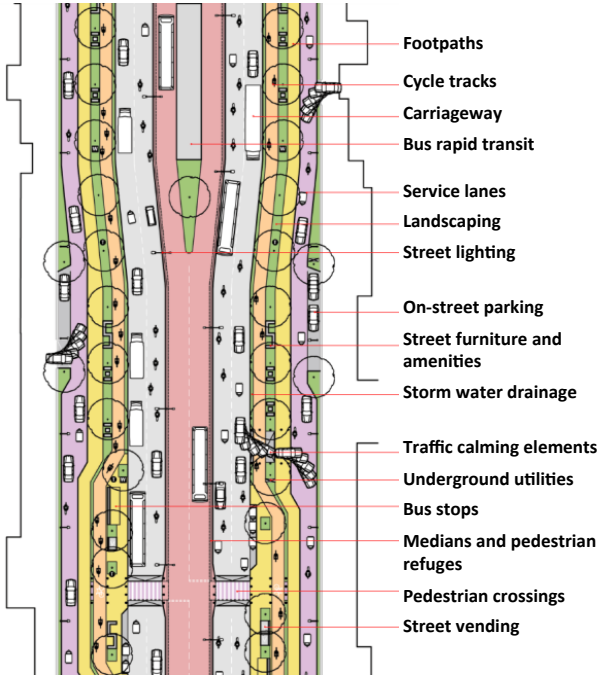
Vending

Gathering

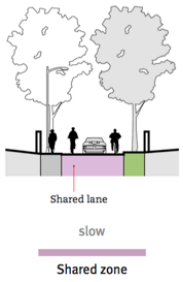
Parking

Many streets are not designed

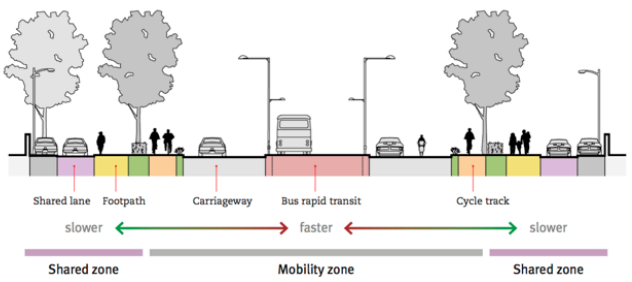
Street design elements



All streets need slow zones



For narrow ROWs, the entire width should be designed as a slow zone

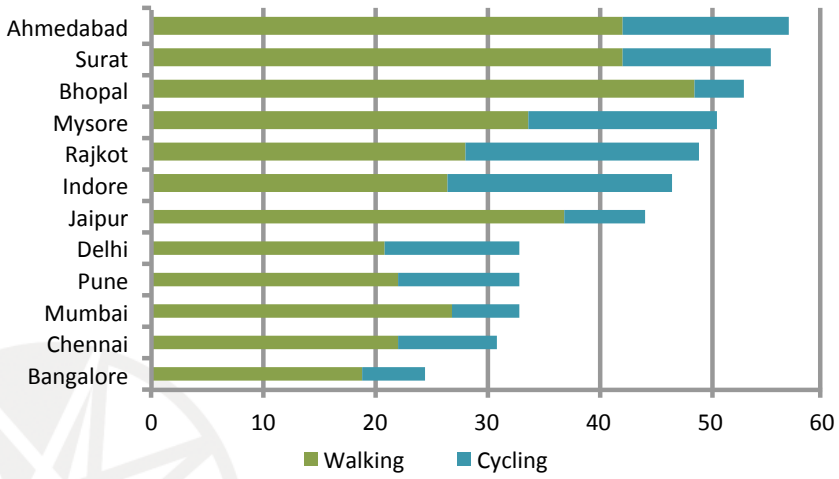


On wider streets, a separate slow zone is necessary

Why do we need complete streets?

- Many pedestrians and cyclists are **captive**. If we don't provide better infrastructure, they will switch to motorised modes. The results:
  - More congestion
  - More air pollution
  - Higher expenditure of public funds on roads & flyovers

Predominance of cycling and walking

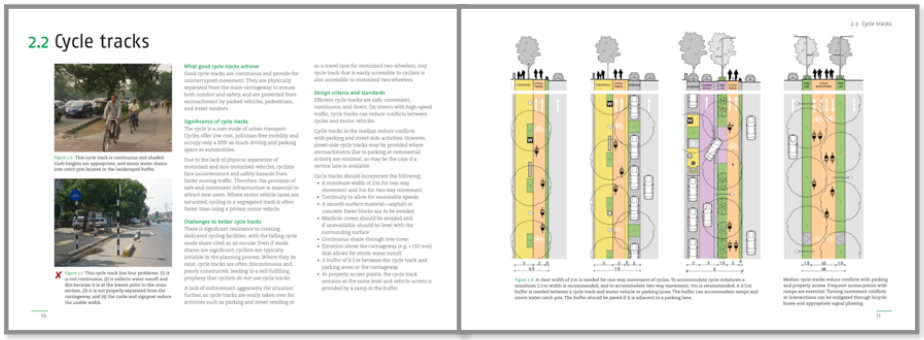


Embarq 2009 + ITDP

Why do we need complete streets?

- Public health benefits of healthy lifestyles:
  - Lower premature mortality
  - Lower rates of obesity
  - Lower absenteeism due to sickness

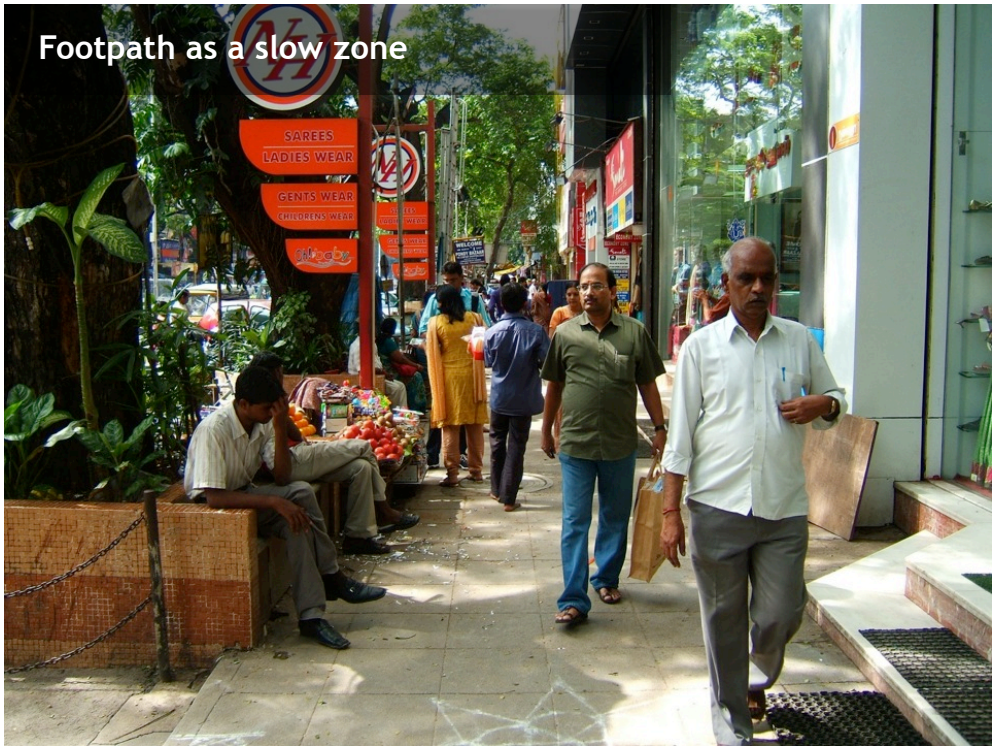
Street design elements



Each element is addressed under the following heads:

- *What it achieves*
- *Significance*
- *Challenges*
- *Design criteria and standards*

Additionally, all the elements are appropriately elucidated with photographs, diagrams and technical drawings as required.

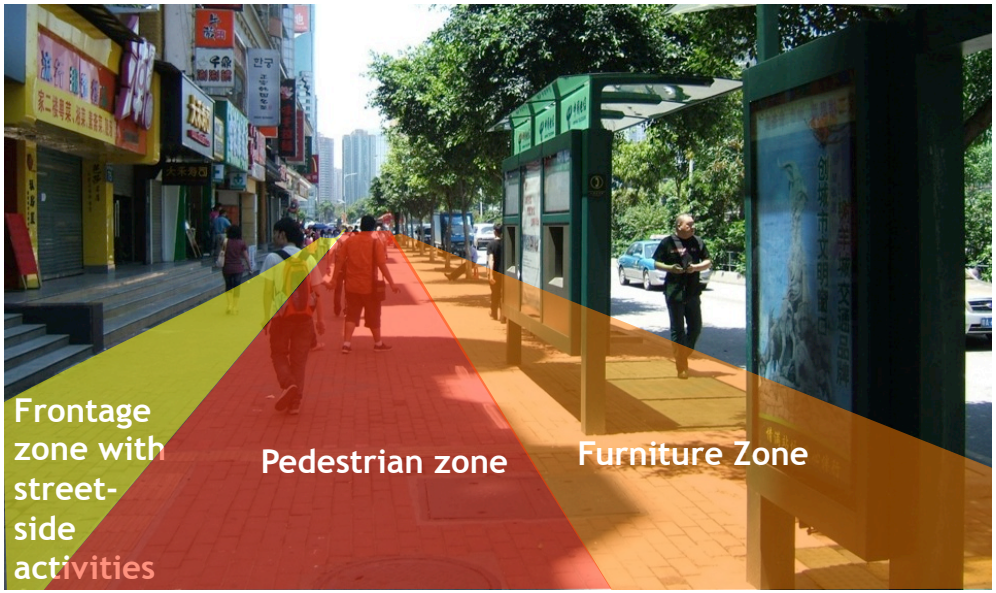


Service lane too wide to be a slow zone

Service lane as a slow zone

Design criteria

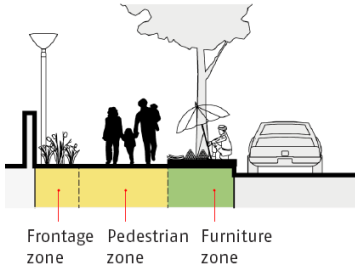
Footpaths

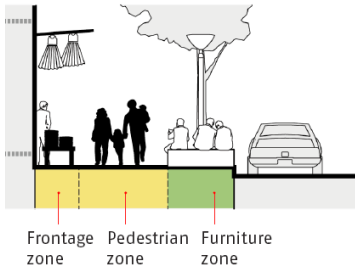


Footpaths

Clear demarcation of 3 zones:

1. **Pedestrian zone:** continuous space for walking, at least 2 m wide
2. **Frontage zone:** buffer between street-side activities and the pedestrian zone
3. **Furniture zone:** space for landscaping, furniture, lights, bus stops, signs and private property access ramps

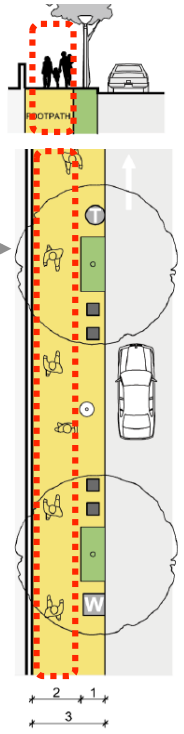




Footpaths

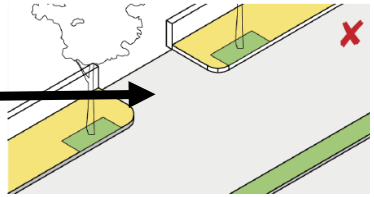
Design criteria and standards:

1) A continuous unobstructed *minimum width of 2 m*
2) No breaks /obstructions at property entrances and side streets
3) Continuous shade through tree cover
4) No railings or barriers that prevent sideways movement on and off the footpath
5) Elevation over the carriageway (e.g. +150 mm) and adequate cross slope for storm water runoff
6) Surmountable gratings over tree pits to increase the effective width of the footpath

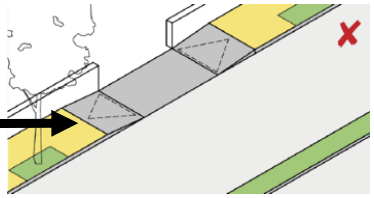


Footpaths

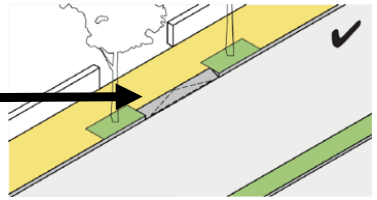
1. Ending the footpath with abrupt curbs is not acceptable



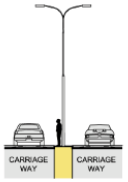
2. Lowering the entire footpath to the level of the carriageway is unacceptable as property entrances may become waterlogged

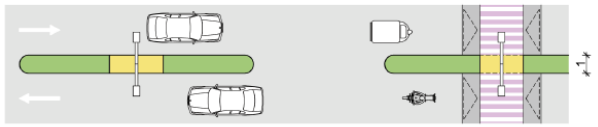


3. Vehicle ramps should be provided in the 'furniture zone' and not in the 'pedestrian zone'

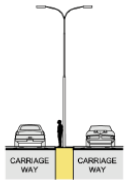


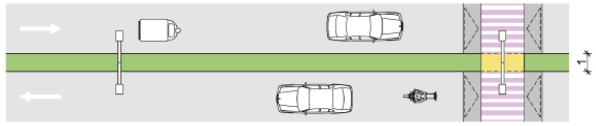
Medians





On a collector street, periodic median segments between formal crossings function as pedestrian refuge islands.





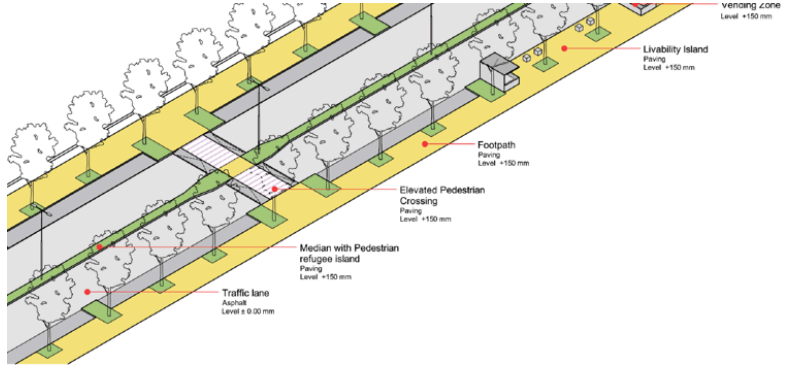
On an artery with higher traffic volumes, a continuous landscaped median is provided. Periodic hardscaped sections function as pedestrian refuges.

Medians

Figure 2.19 This opening in a median allows pedestrians to cross without climbing over the fence and waiting on the carriageway.

✘ Figure 2.20 This median fence is continuous, forcing pedestrians to climb over. There is no safe refuge, so pedestrians often stand in the carriageway while waiting for a break in the traffic.

Pedestrian crossings



Raised pedestrian crossing slows vehicle speeds and keeps pedestrians at the same level

Traffic calming elements

Figure 2.47 This left-turn pocket is raised and textured, helping to reduce car speeds and improving safety for cyclists who must merge with the left-turning cars if they wish to continue straight through the intersection.

Figure 2.48 This stone block in an alley shuts out cars and trucks and slows other vehicles by narrowing the space through which they can pass.

Cycle tracks

Design criteria and standards:

1. A minimum width of 2 m for one-way movement
2. Continuity to allow for reasonable speeds
3. A smooth surface material—asphalt or concrete. Paver blocks are to be avoided
4. Manhole covers should be avoided and, if unavoidable, should be level with the surrounding surface
5. Continuous shade through tree cover
6. Elevation above the carriageway (e.g. +150 mm) that allows for storm water runoff
7. A buffer of 0.5 m between the cycle track and parking areas or the carriageway

Cycle tracks

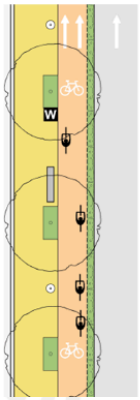
Efficient cycle tracks are safe, convenient, continuous, and direct. On streets with high-speed traffic, cycle tracks can reduce conflicts between cycles and motor vehicle

Figure 2.6 This cycle track is continuous and shaded. Curb heights are appropriate, and storm water drains into catch pits located in the landscaped buffer.

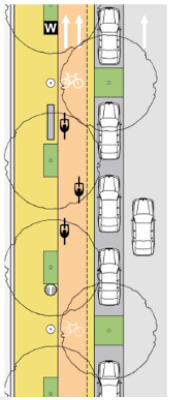
✘ Figure 2.7 This cycle track has four problems: (1) it is not continuous, (2) it collects water runoff and dirt because it is at the lowest point in the cross section, (3) it is not properly separated from the carriageway, and (4) the curbs and signpost reduce the usable width.

Cycle tracks

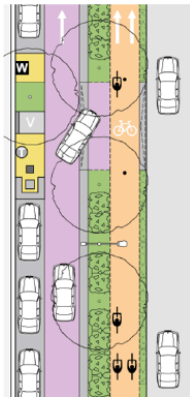
Sample designs:



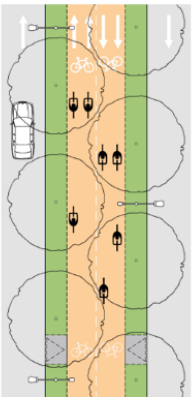
Next to footpath



Next to parking



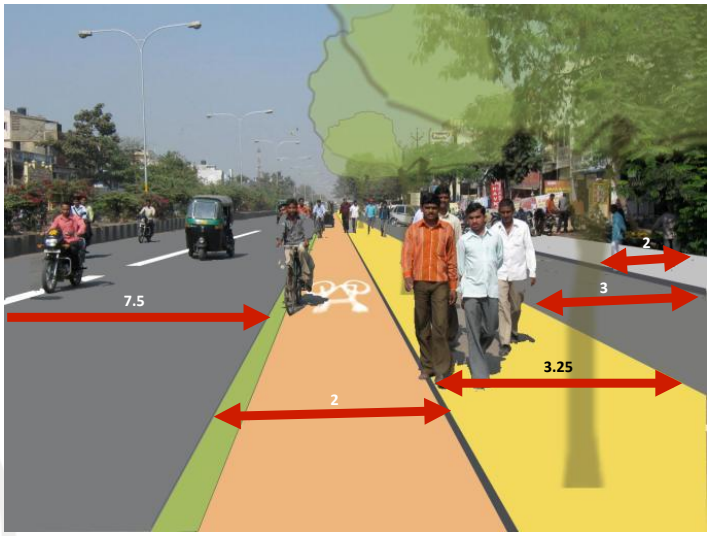
Next to service lane



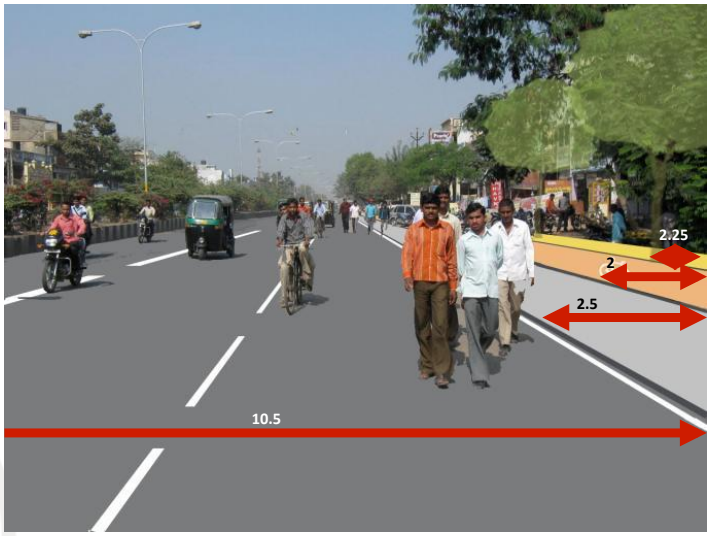
Median cycle track

EXISTING CONDITION

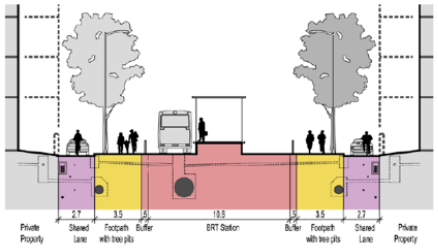
A PRAGMATIC APPROACH



TRADITIONAL PLANNING



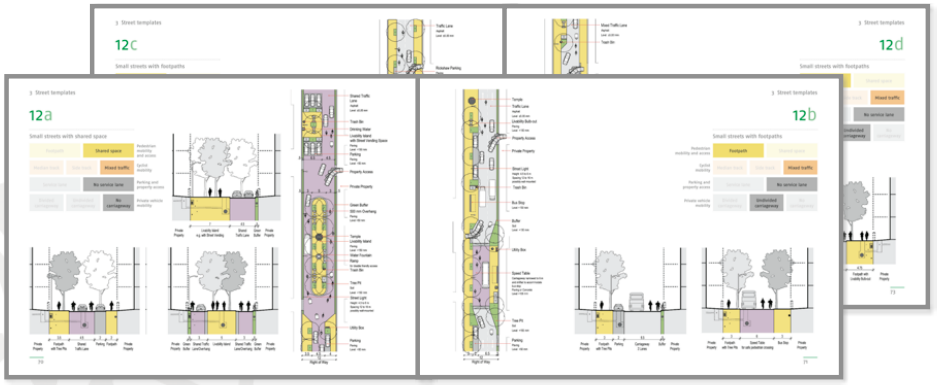
Street Templates



Street templates

Templates are provided for standard street widths:
6m, 7.5m, 9m, 12m, 18m, 24m, 30m, 36m and 42 m

For each width, alternatives are presented, showing how the design can respond to differing uses and edge conditions



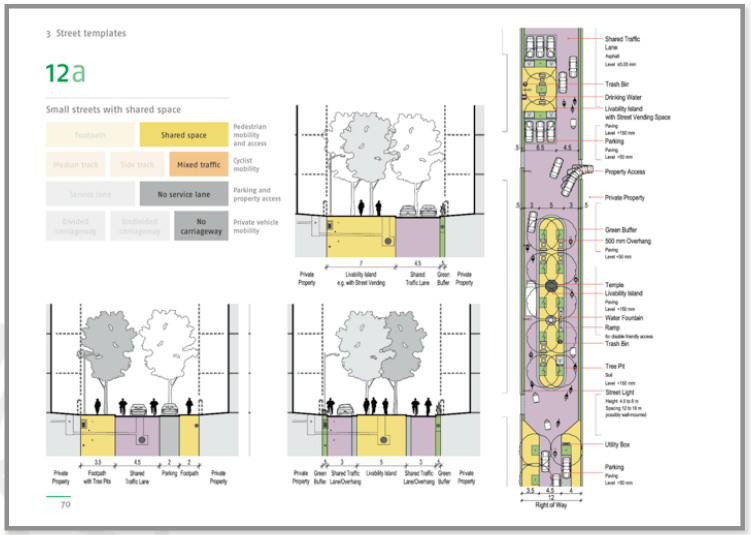
Street template sorter

Each template is classified according to the following parameters:

Parameter	Options		
Pedestrian mobility and access	Dedicated footpath	Shared space	
Cyclist mobility	Median track	Side track	Mixed traffic
Parking and property access	Service lane	No service lane	
Private vehicle mobility	Divided carriageway	Undivided carriageway	No carriageway

Street templates

Each template is shown in plan and section.

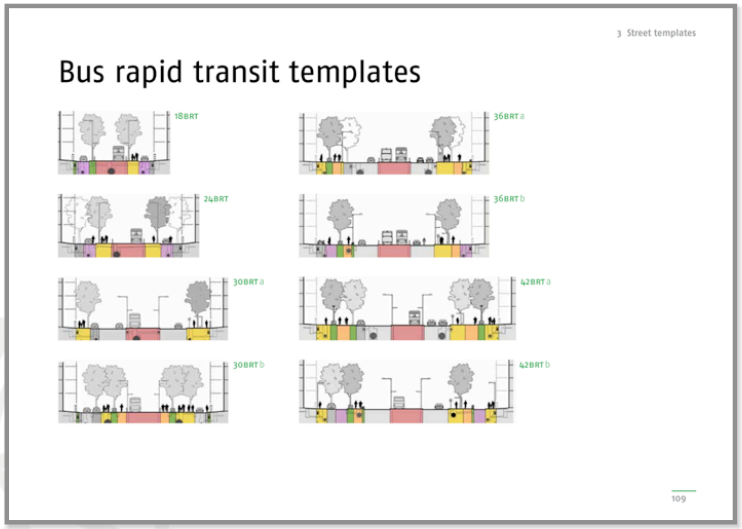


Classification

Street templates are also classified according character:
- Small streets with shared space
- Small streets with footpaths
- Small streets with cycle tracks
- Divided carriageways without cycle tracks
- Forest streets
- Large streets with median cycle tracks
- Large streets with service lanes
- Large streets with side cycle tracks
- Streets with bus rapid transit

BRT templates

BRT templates are presented for widths ranging from 18–42 m.



Design process

Design process

1) Developing a vision
2) Surveys:
   - Topographic and landscape
   - Pedestrian and activity
   - Parking
   - Traffic
3) Right-of-way overlay
4) Street design: plan and section
5) Intersection design

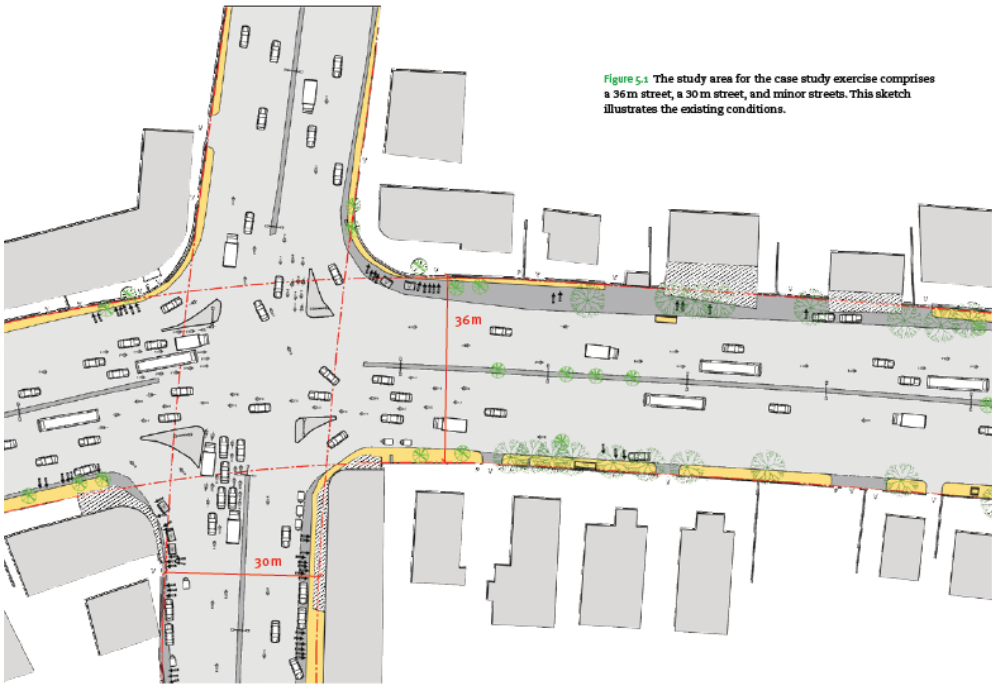
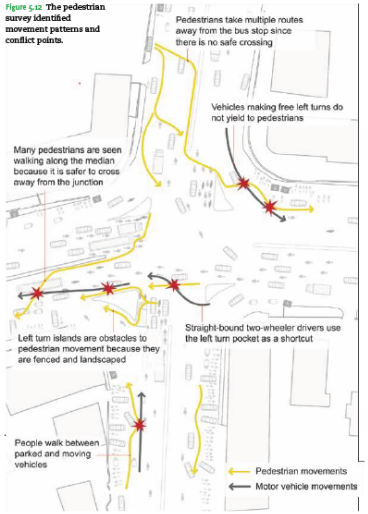


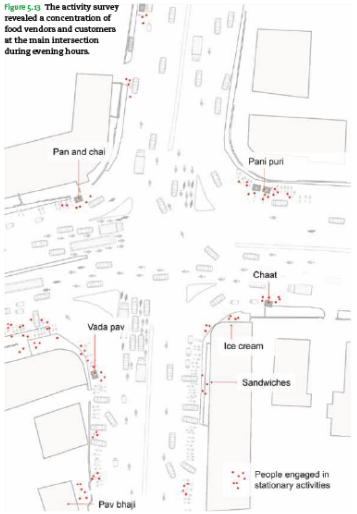
Figure 5.1 The study area for the case study exercise comprises a 36m street, a 30m street, and minor streets. This sketch illustrates the existing conditions.

1. Develop a Vision

"A people-oriented street providing high quality infrastructure for walking, cycling and other activities"

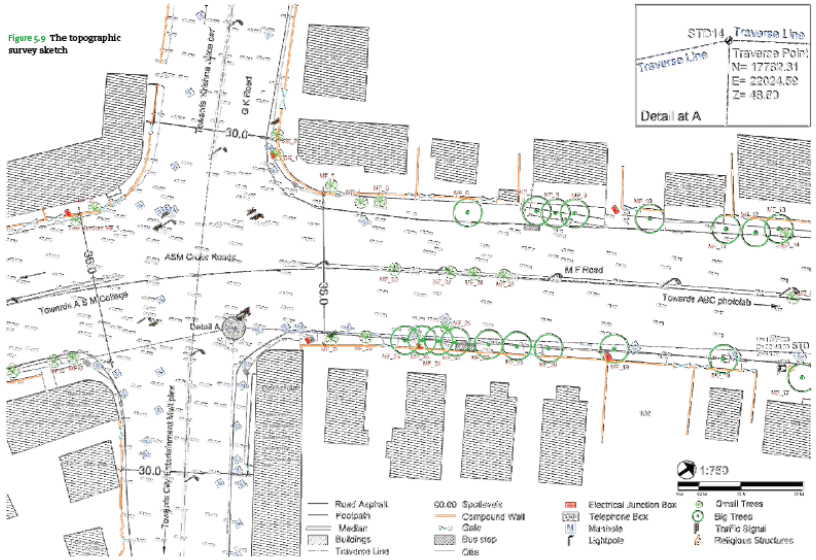
2. Surveys: pedestrian and activity mapping





Map pedestrian movements and street activities to inform improvement of pedestrian facilities

2. Surveys: topographic



To locate natural and man made features in the R.O.W

2. Surveys: parking

To identify pedestrian-parking conflicts and assess demand for on street parking

2. Surveys: traffic counts

Arm	Direction	Cycle	Pedal rickshaw	Animal-drawn vehicle	Two wheeler	Four wheeler	Auto rickshaw	Tempo	Minibus	Bus	Light truck	Heavy truck	Total
A	left	7	0	0	37	48	14	0	0	30	0	0	136
	straight	40	3	0	130	117	104	9	3	33	0	0	439
	right	3	3	0	5	15	8	7	0	0	0	0	41
	U-turn	0	0	0	2	8	2	0	0	0	0	0	12
B	left	1	3	0	16	53	17	4	0	10	0	0	103
	straight	8	5	0	111	206	90	4	12	13	3	5	456
	right	1	6	0	22	44	16	0	0	20	0	0	108
	U-turn	0	0	0	4	5	4	0	0	0	0	0	12
C	left	3	2	0	34	101	14	4	0	0	0	0	157
	straight	28	3	0	261	464	89	11	0	23	0	0	879
	right	9	0	0	25	84	24	0	0	7	0	0	148
	U-turn	0	0	0	0	8	8	0	0	0	0	0	16
D	left	5	2	0	21	36	12	0	0	3	0	0	79
	straight	32	3	0	151	195	109	16	0	20	9	0	535
	right	10	0	0	71	188	50	4	0	0	0	0	323
	U-turn	1	0	0	0	5	0	0	0	0	0	0	5
PCU factor: IRC		0.4	1.5	1.5	0.5	1.0	1.2	1.4	–	2.2	1.4	2.2	
PCU factor: preferred		0.2	1.0	1.5	0.2	1.0	0.8	1.2	2.0	2.2	2.0	3.0	

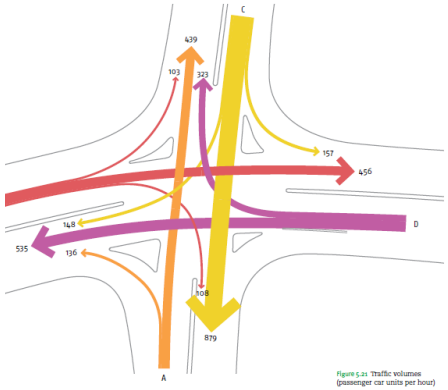
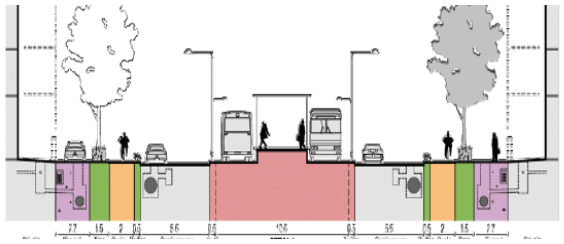


Figure 5.21 Traffic volumes (passenger car units per hour)

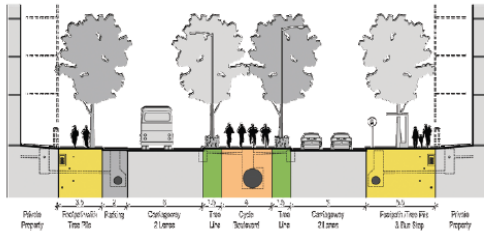
Peak hour traffic volumes on streets to determine intersection capacity and inform R.O.W design and signal design

4. Choose standard sections

36 M



30 M



Use information collected from the surveys to design the section in accordance with the people-oriented vision

3. R.O.W Overlay

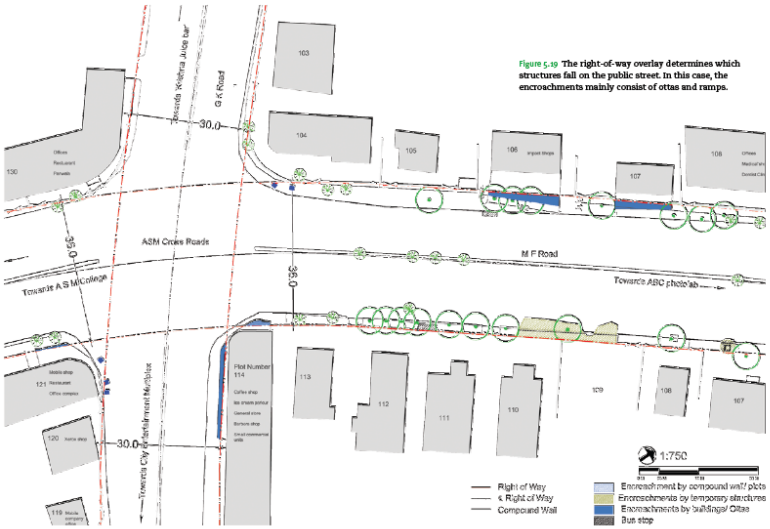
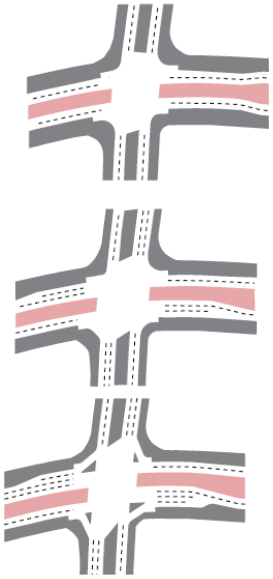


Figure 5.19 **The right-of-way overlay determines which structures fall on the public street. In this case, the encroachments mainly consist of ottas and ramps.**

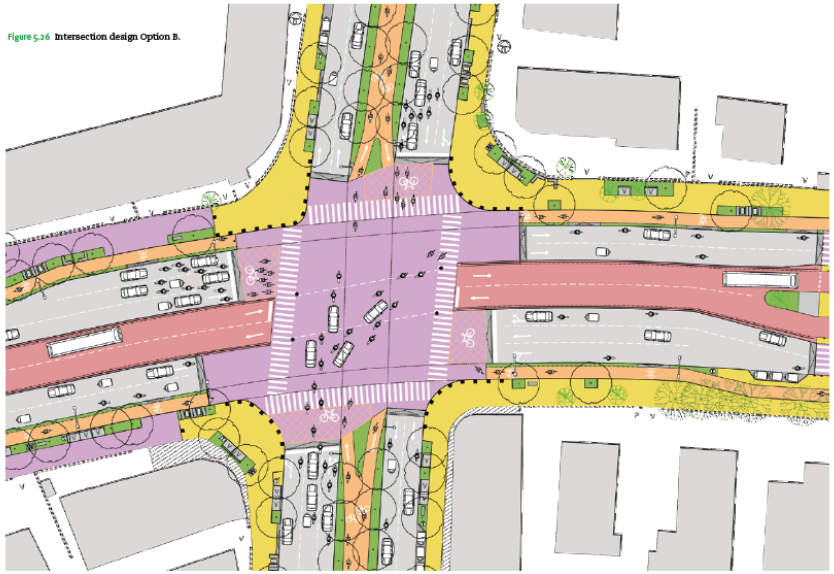
Public Right of Way must be defined and marked

4. Intersection design



Explore options for intersection design, prioritizing pedestrian and cyclist safety. Optimize the signal cycle.

5. Adopt the design and facilitate implementation



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