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Designing for cyclists with the Street Design Manual for Urban Areas in Kenya

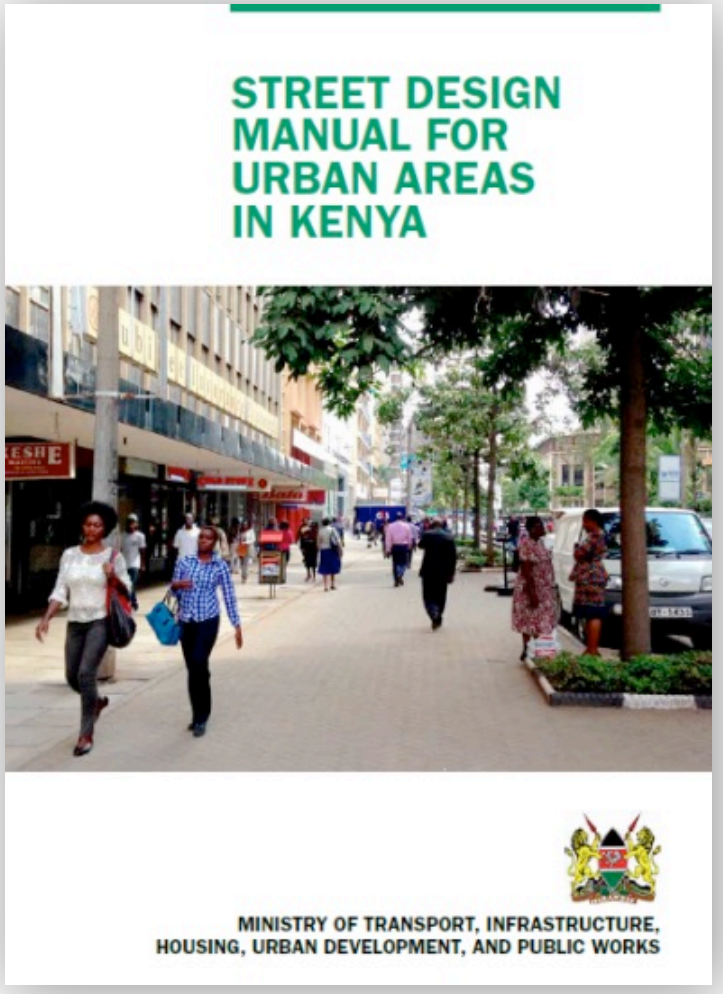
September 2020

HARAMBEE

ITDP

Promoting equitable and sustainable transport worldwide

Introducing the SDMUAK



PREPARED BY

ITDP | Institute for Transportation & Development Policy

SUPPORT FROM

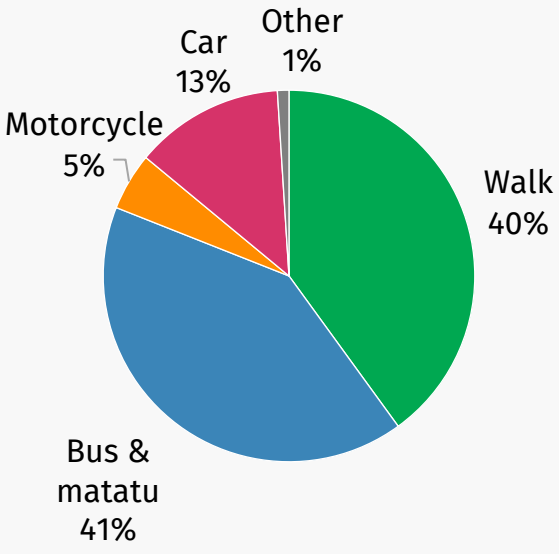
GRSF Global Road Safety Facility

WORLD BANK GROUP

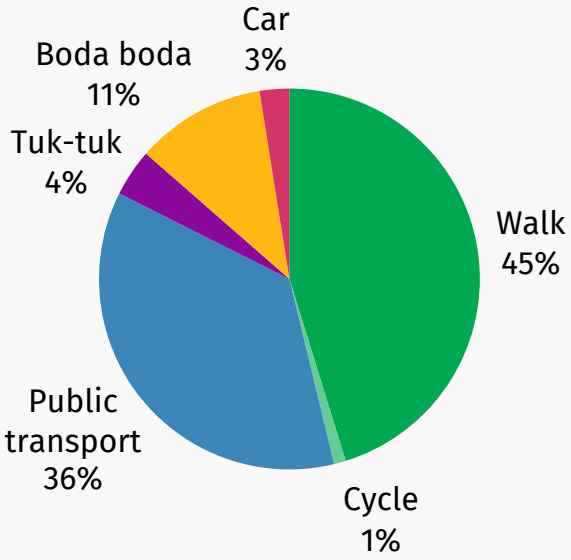
INTERNATIONAL CLIMATE INITIATIVE (IKI)

Why do we need street design standards?

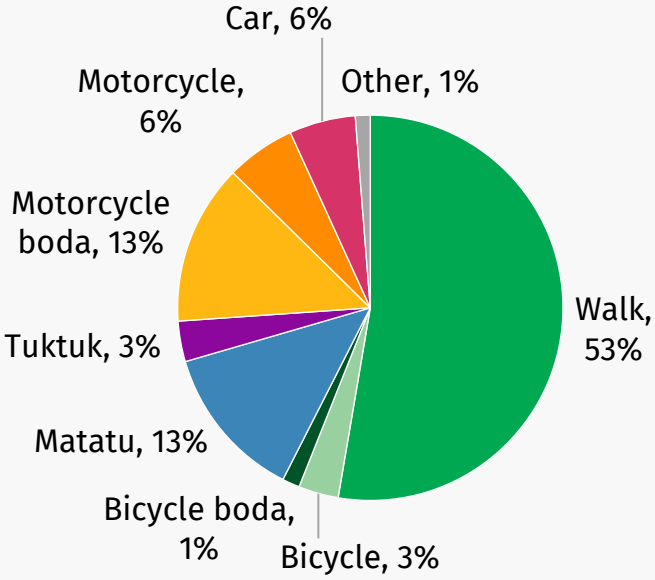
How people travel



Nairobi



Mombasa



Kisumu

JICA 2014; 2017; ITDP 2020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Vehicle movement
Parking
Walking?
Cycling?
Spaces to meet your friends?
Organised street vending?
Nairobi


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TOTAL
Embassava Pacco
Nairobi


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Kisumu

Mombasa


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Kisumu


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Nairobi

Can we just widen the roads?

- Short-term benefits
- Attract more vehicles, making congestion worse
- Compete with public transport

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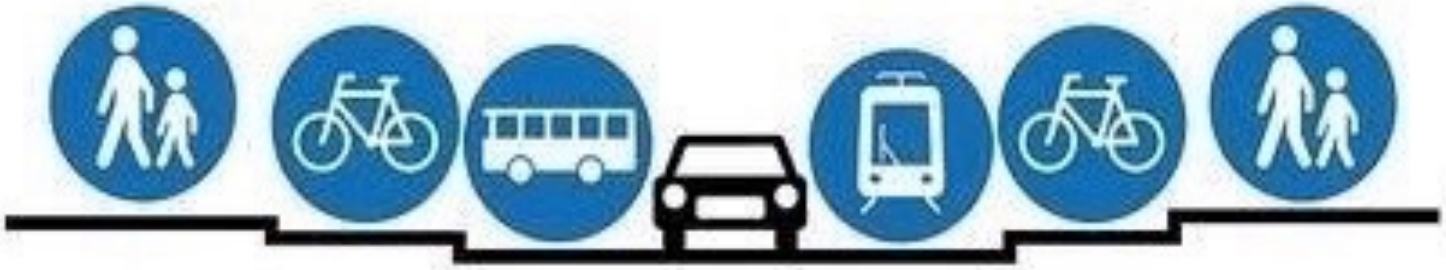
How we usually plan streets



A more equitable approach


ITDP
Dar es Salaam

COVID-19 response

Pop-up bike lanes & shared streets

Berlin
22 km

Bogota
35 km

Oakland, USA
119 km

Paris
50 km

Barcelona
21 km

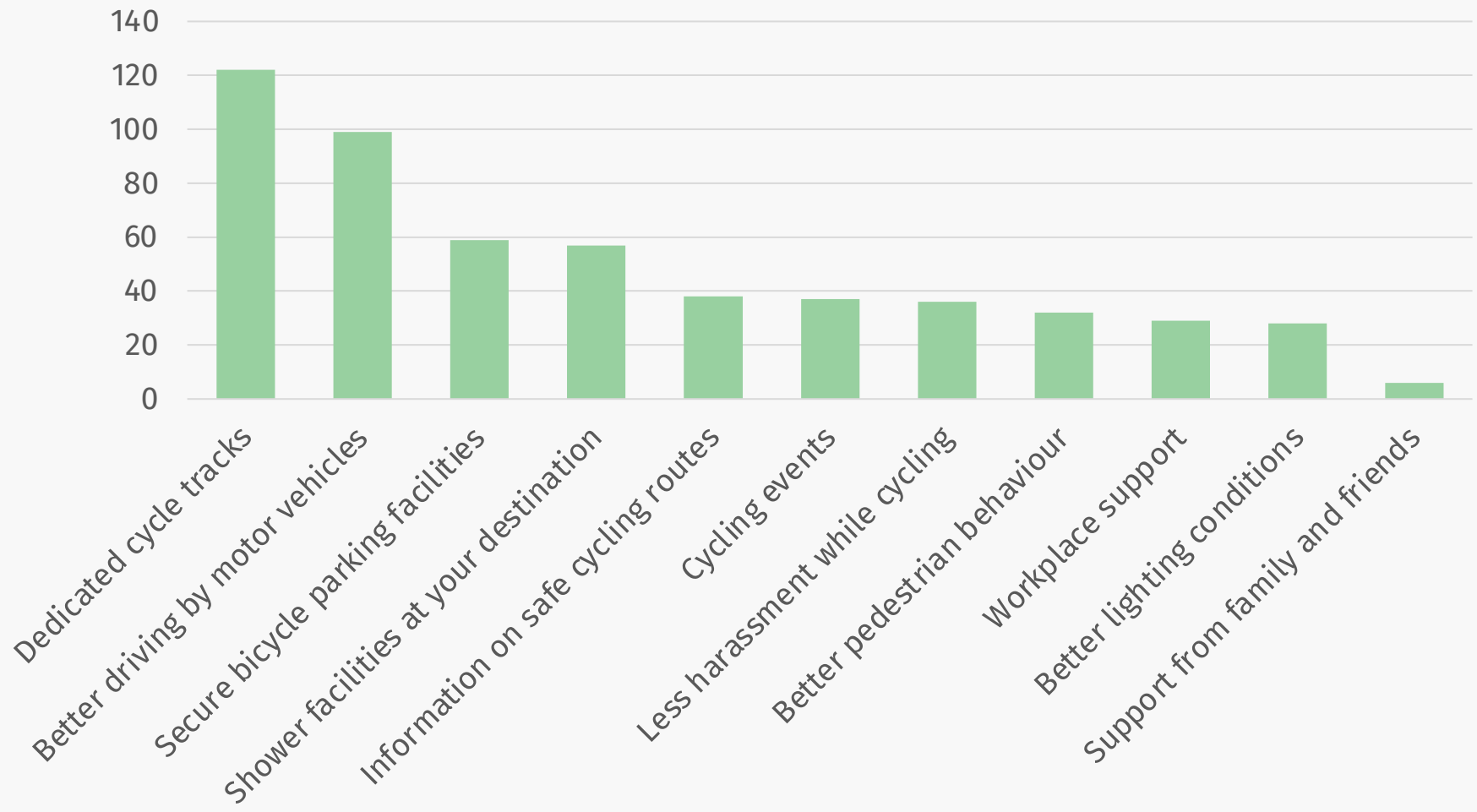
Paris

Paris

Oakland

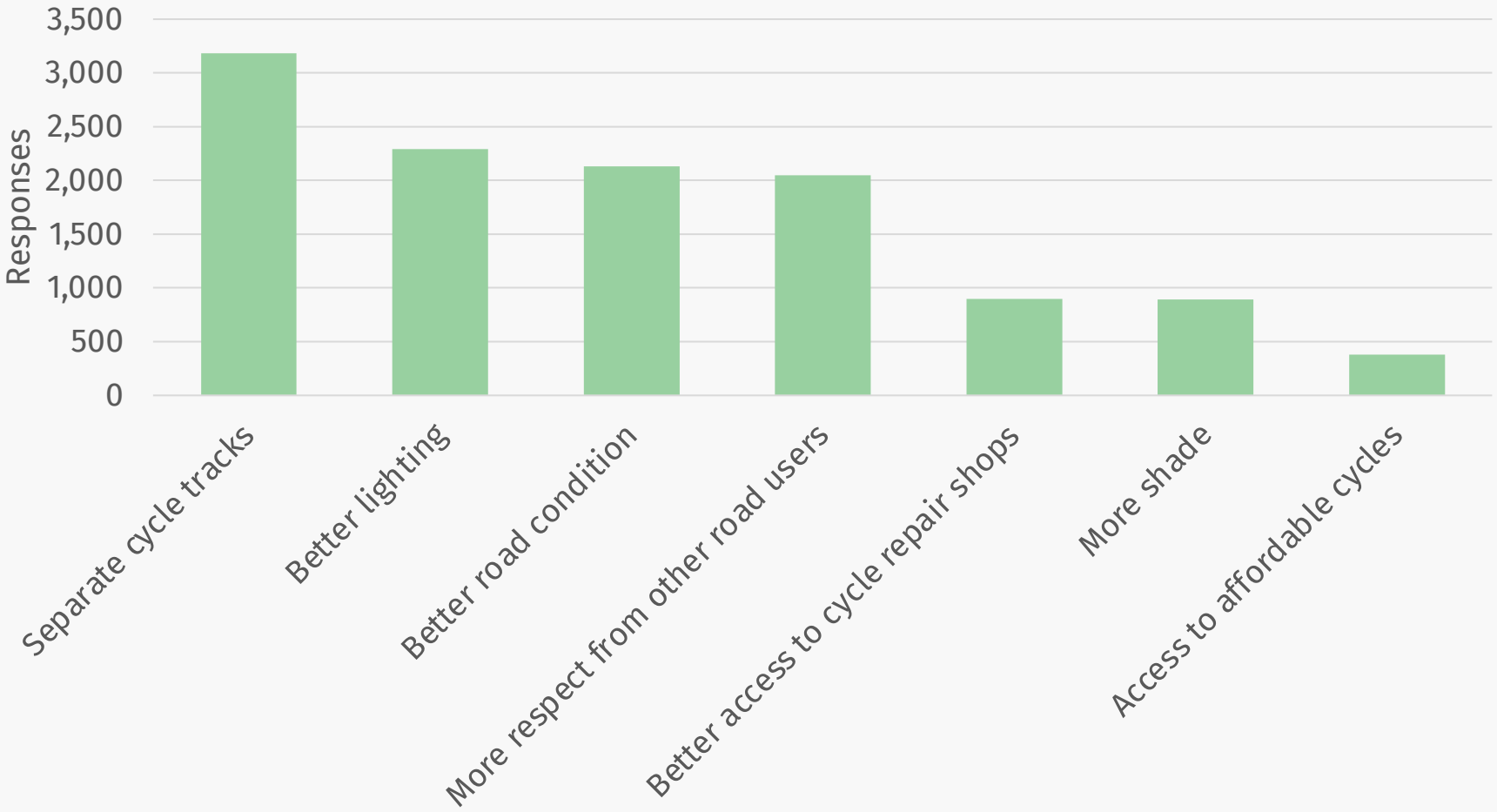

Berlin

How to make it easier to cycle? - Nairobi residents



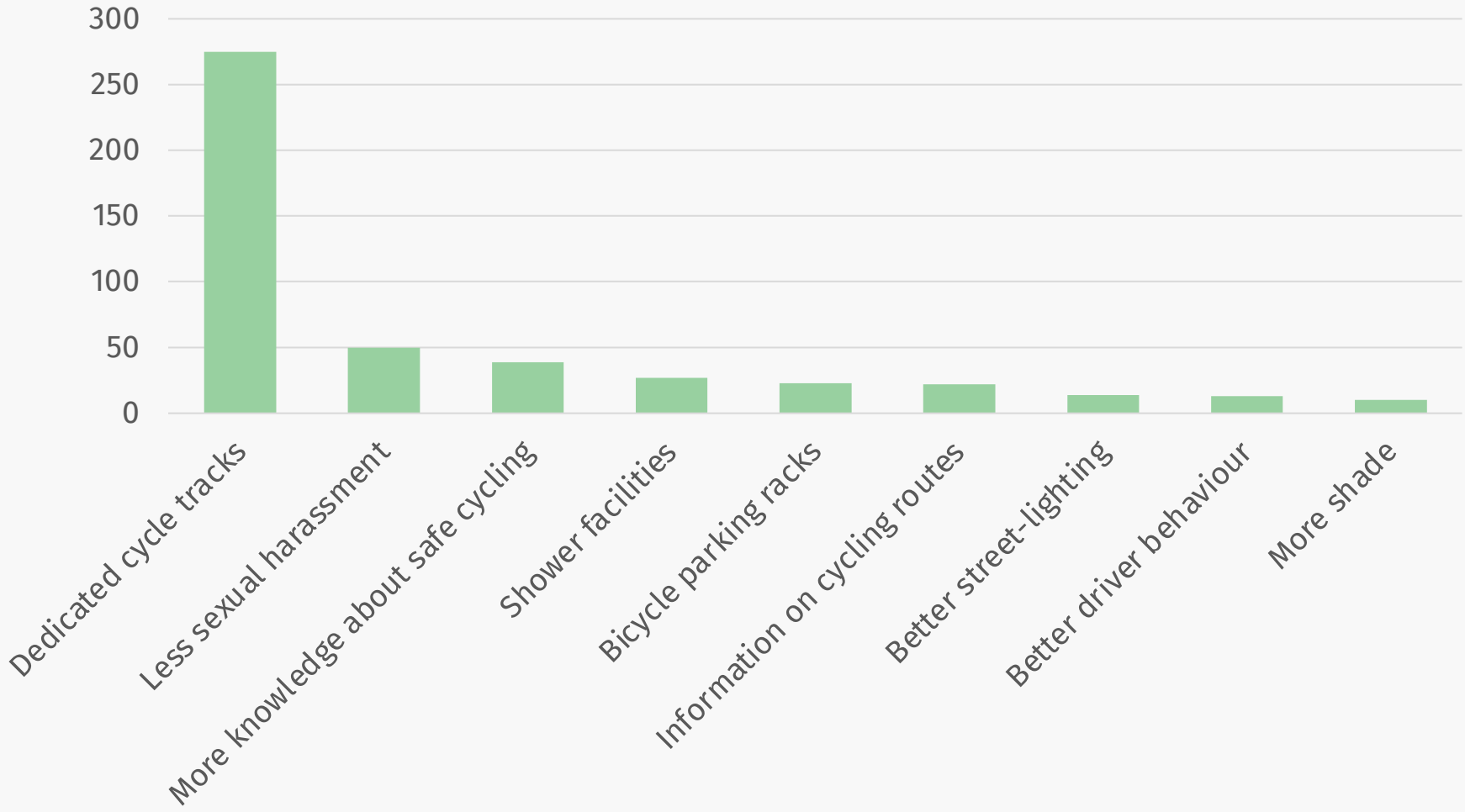
Source: ITDP online survey of cyclists

How to make it easier to cycle? - Kisumu residents



Source: ITDP household survey

How to make it easier to cycle? - Mombasa residents



Source: ITDP interview survey

Highways & urban streets

Highway

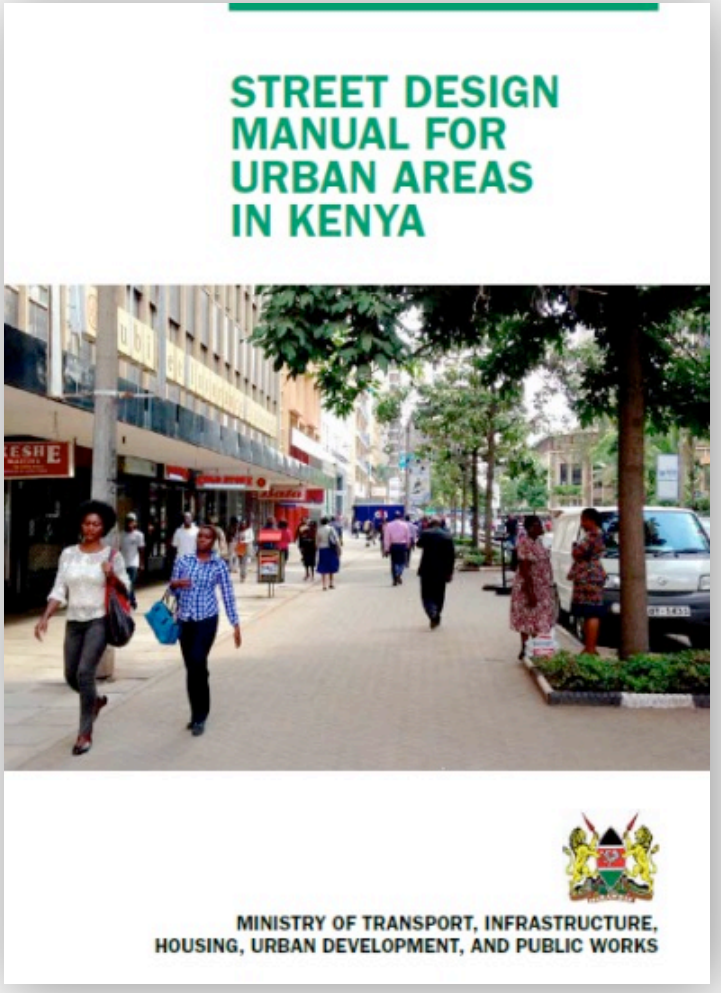
- Focus on uninterrupted vehicle movement at high speeds
- Pedestrians cross on footbridges
- No provision for public transport
- NMT users in the carriageway

Urban street

- Vehicle movement at moderate speeds (up to 50 km/h)
- At-grade pedestrian crossings
- Dedicated lanes for public transport
- Separate space for NMT

SDMUAK contents

1. Introduction
2. Complete street design principles
3. Priority networks
4. Street elements
5. Street templates
6. Intersections
7. Design process
8. Design checklist



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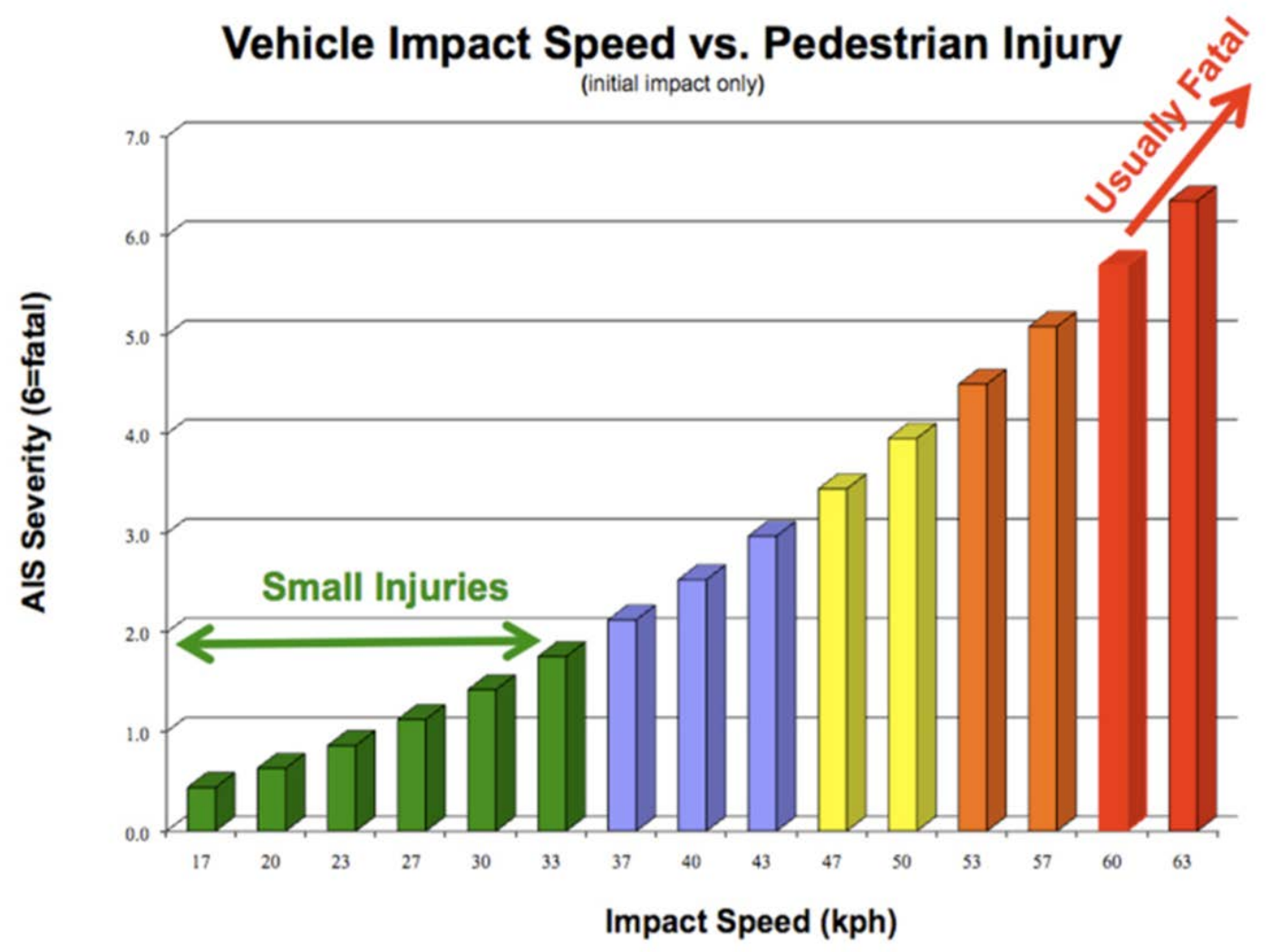
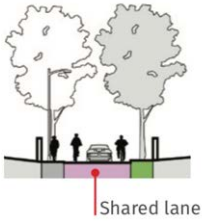
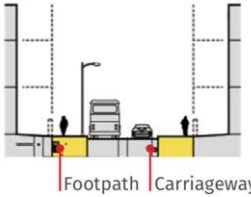
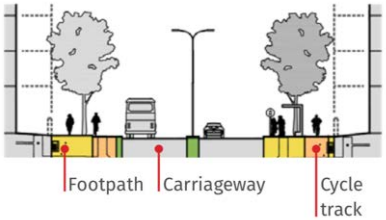
Complete street design principles

Designing for safety



Speed management

Street typology	Speed limit for motor vehicles	Sample cross section
Local streets with shared space. At speeds of up to 15 km/h, motor vehicles, pedestrians, and cyclists can safely mix. Traffic calming is needed to minimise vehicle speeds	15	
Local and collector streets. Streets with speeds of 30 km/h require separate footpaths. With traffic calming, cyclists can share the carriageway with mixed traffic.	30	
Arterial streets. Streets with speed limits of 40-50 km/h require physically separated cycle tracks and footpaths. Traffic calming or signalisation is required at pedestrian crossings.	50	

All modes can share space

Separate footpath needed

Separate footpath & cycle track needed

- Speeds should be managed through physical traffic calming—not just posted speed limits

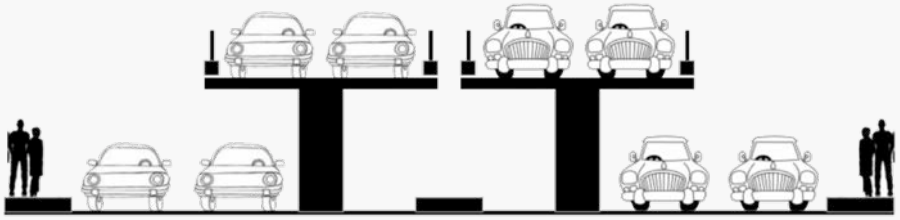
Efficient use of road space

Passenger capacity:

3-lane carriageway

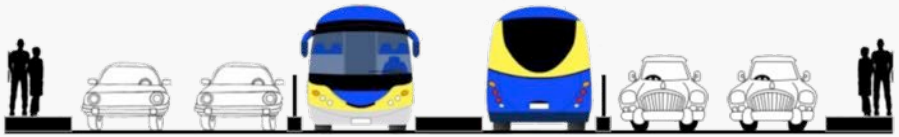
3,000 passengers per hour per direction

2 lanes + elevated road



4,700

Dedicated lanes for bus rapid transit



12,000-
45,000+

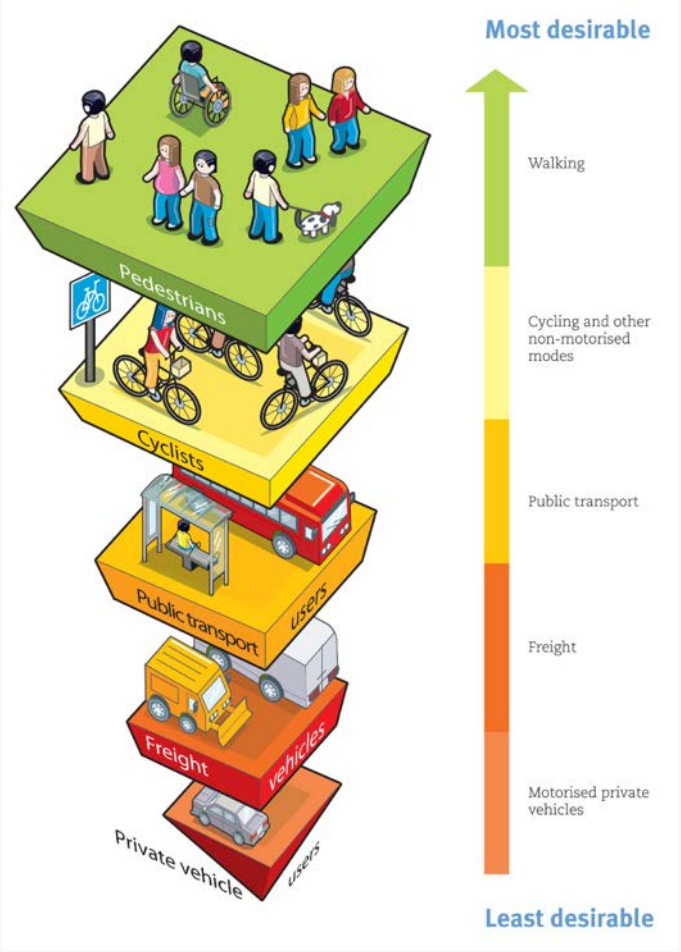
Universal access

- Accommodate assistive devices for persons with disabilities
- Persons with disabilities are entitled to reasonable access to places and transport services
- Barrier-free and disability-friendly environment to enable people access to buildings, roads, and other social amenities

Gender sensitive design

- Women and men travel differently
- Different expectations from a transport system
- Different perceptions of safety and security
- Improve experience of women and girls while walking, cycling, or using public transport

Modal hierarchy



In order of priority:

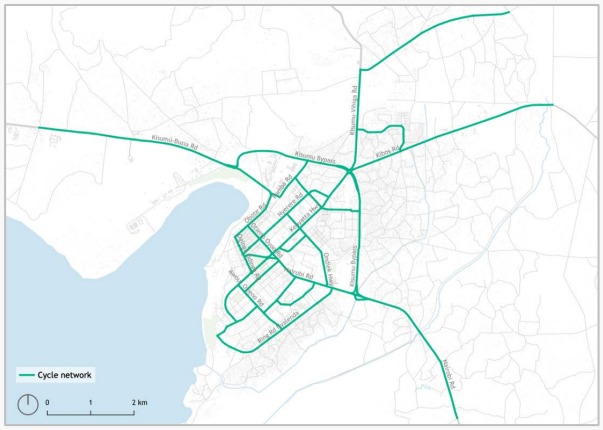
- Pedestrians
- Cyclists
- Public transport
- Freight
- Moving cars
- Parked cars

Priority networks

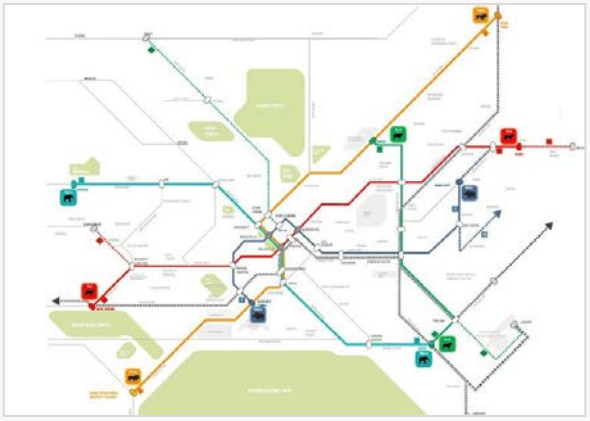
Priority networks

Walking

Cycling



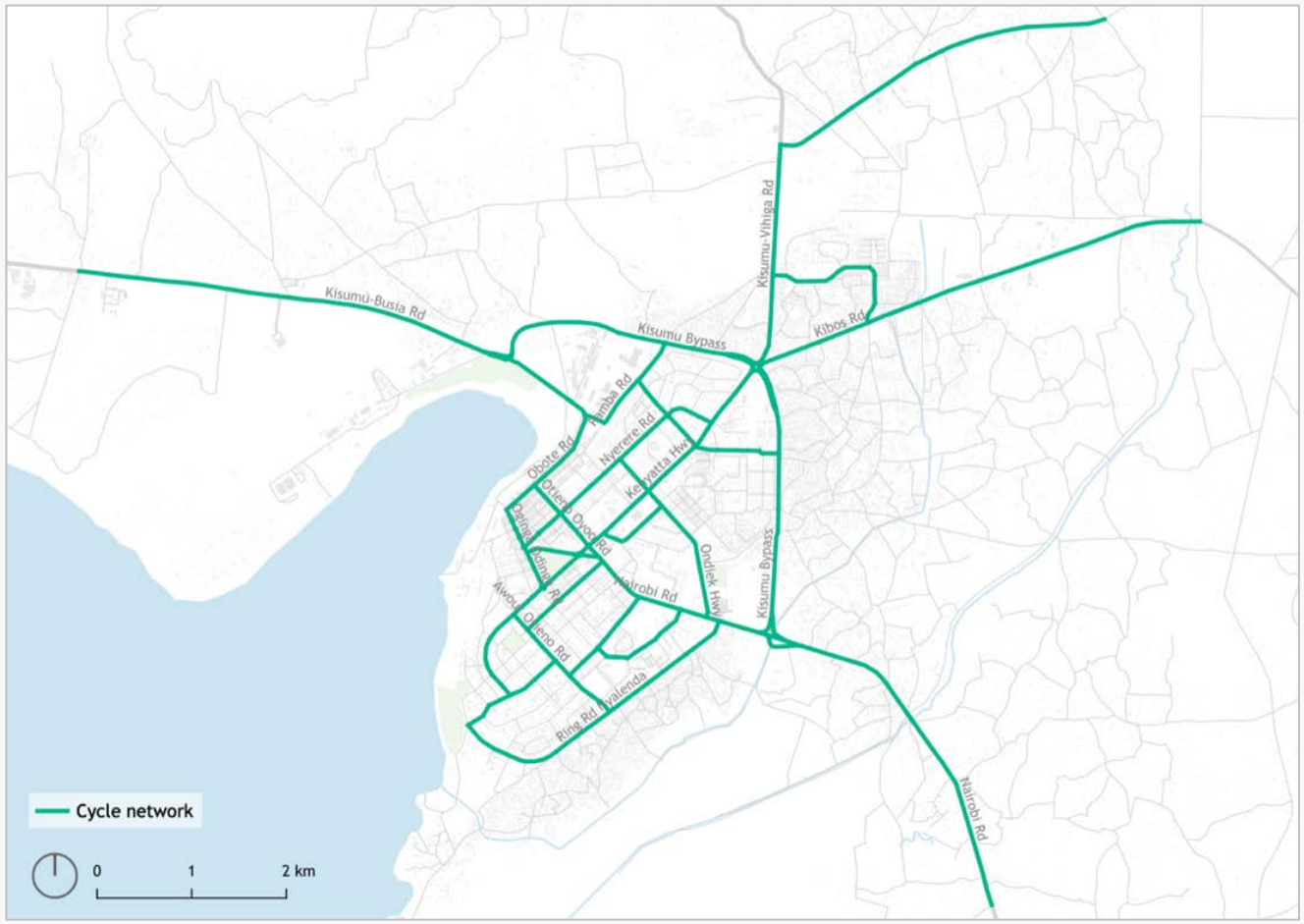
Public transport



Mixed traffic

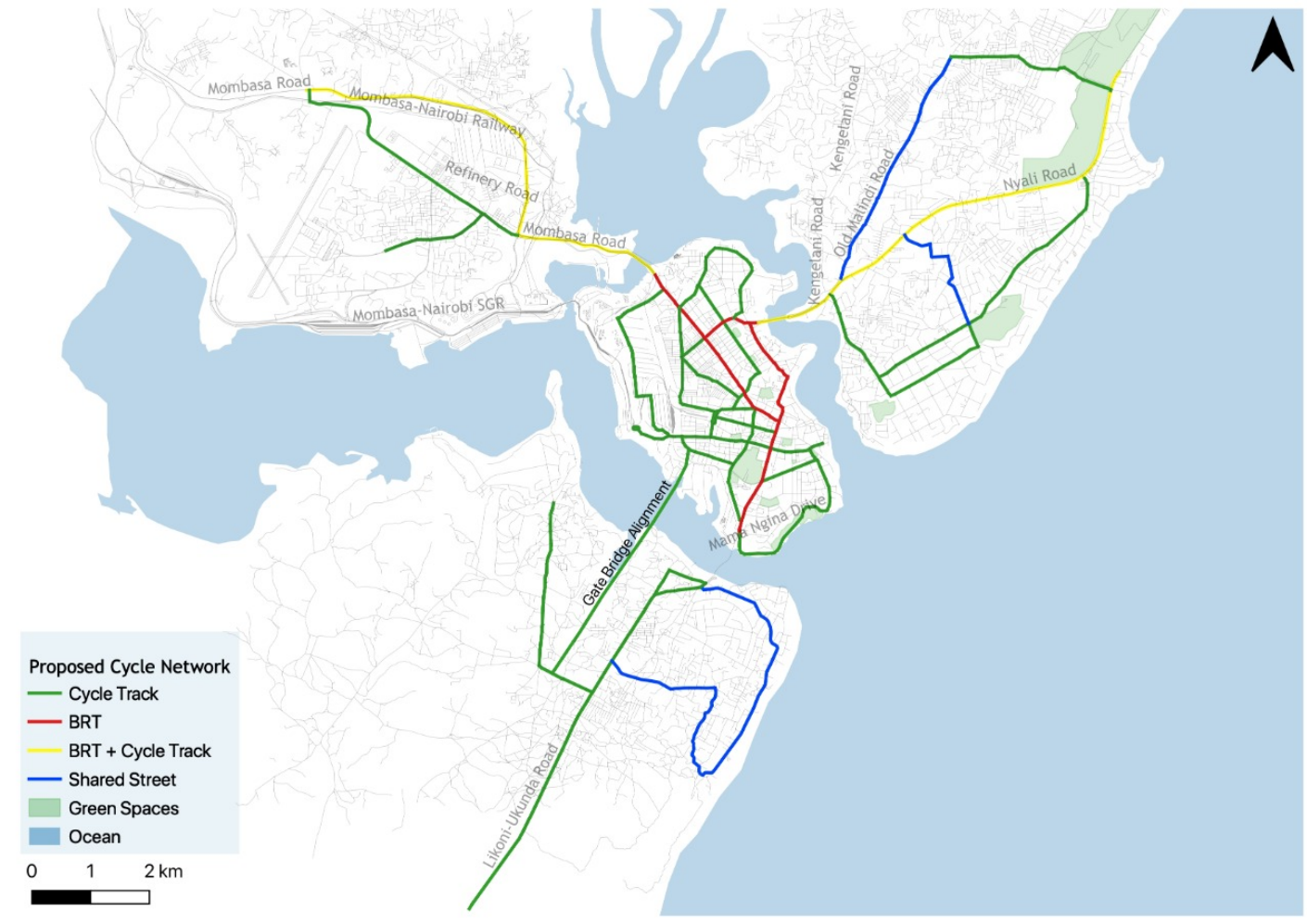
- Provide access while ensuring safety and efficient movement for walking, cycling, public transport
- Ensure moderate travel speeds
- Complete the network to reduce bottlenecks
- Manage congestion through user fees

Kisumu cycle network plan

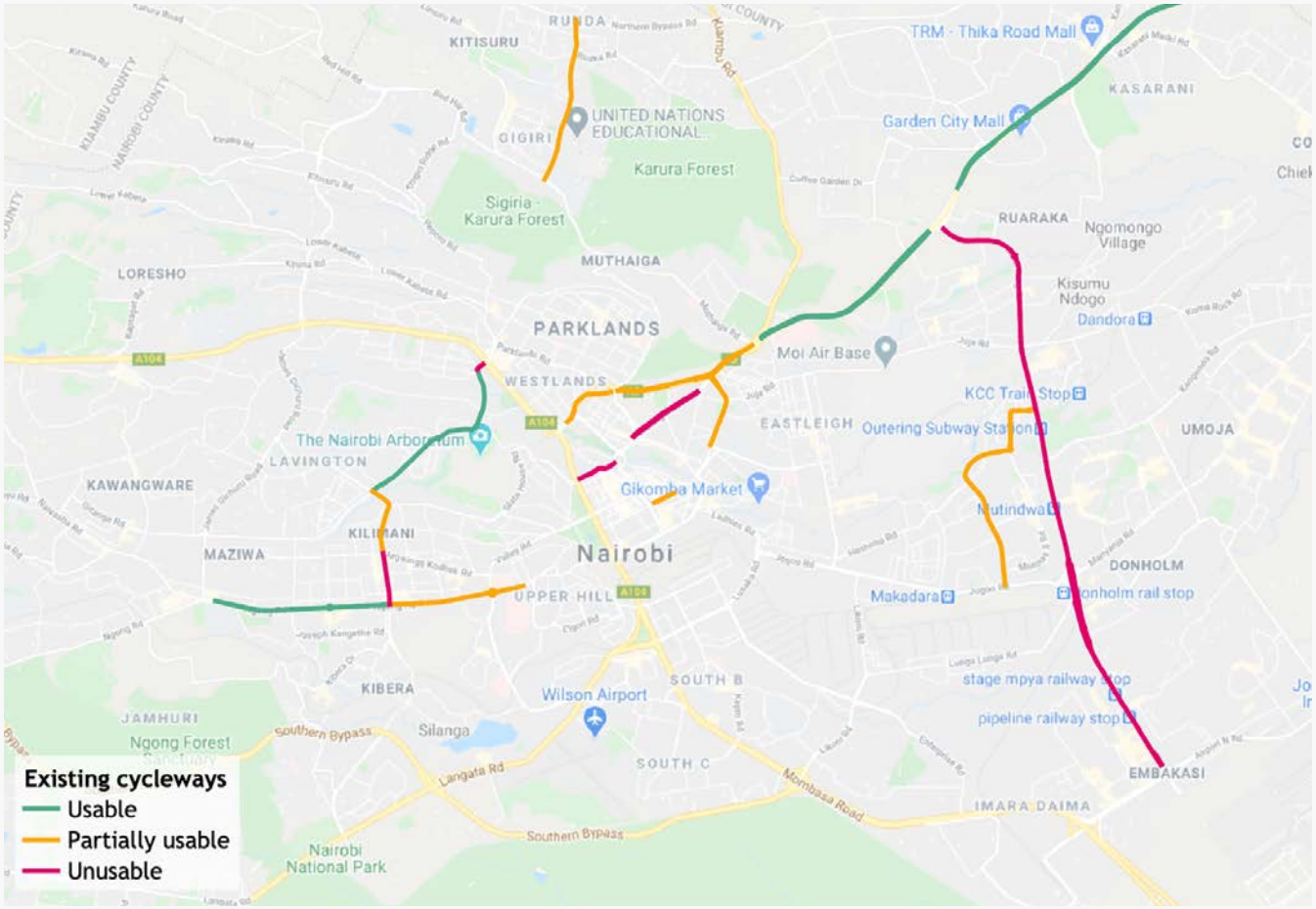


Source: Kisumu Sustainable Mobility Plan

Mombasa cycle network plan



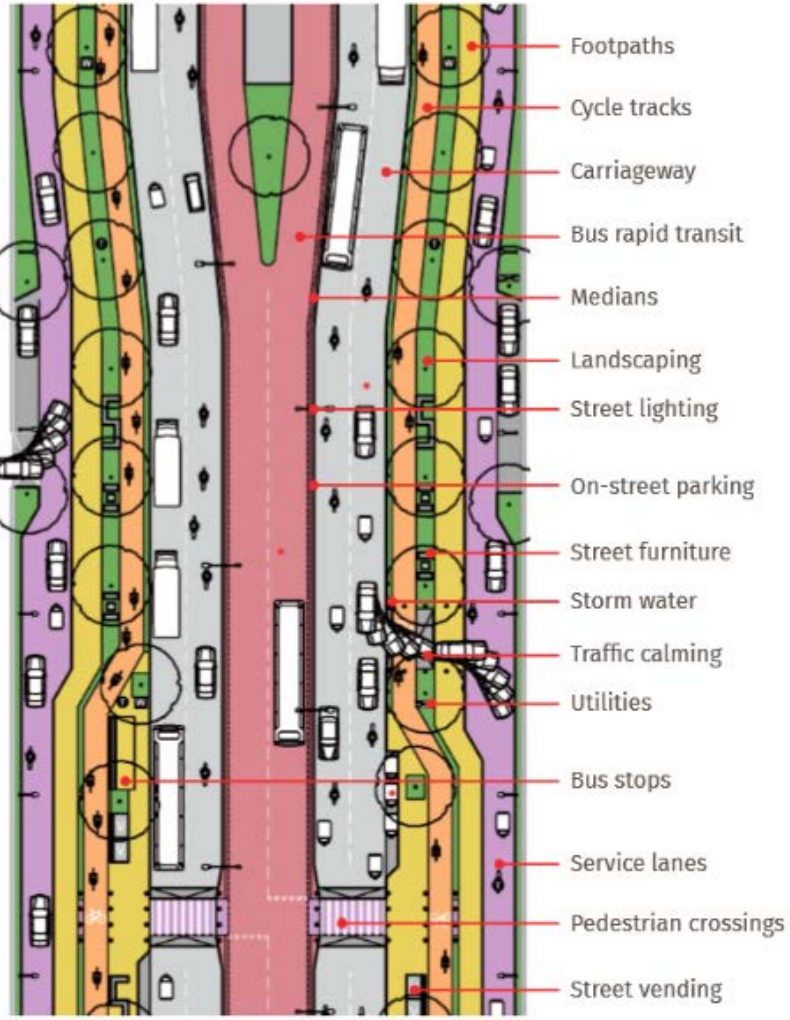
Existing cycle tracks in Nairobi



>> Urgent need to create a cycle network plan for Nairobi

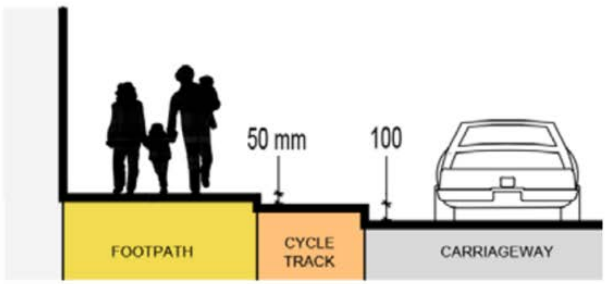
Street elements

Street elements



Cycle track design standards

- Positioned between the footpath and carriageway
- Minimum width of 2 m for one-way movement, and 2.5 m for two-way movement
- Elevated +150 mm above the carriageway
- Physically separated from the carriageway—not just paint
- Buffer of 0.5 m next to the carriageway
- For a 2 m cycle track, one bollard in the middle, to allow for cyclists to pass on either side
- Smooth surface material—asphalt or concrete. Paver blocks are to be avoided

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Nairobi

Mombasa

Mombasa


ITDP
Lipa Smart, Lipa Bila Stress
na KCB Pepea Card
BLESSING
EASTLEIGH SACCO

Nairobi

Cycle track design standards


ITDP
KSH
12.95M
KINGS
Eden Gardens
Ngong Rd Phase 2

Fast & simple retrofits can improve safety for cyclists

Kisumu

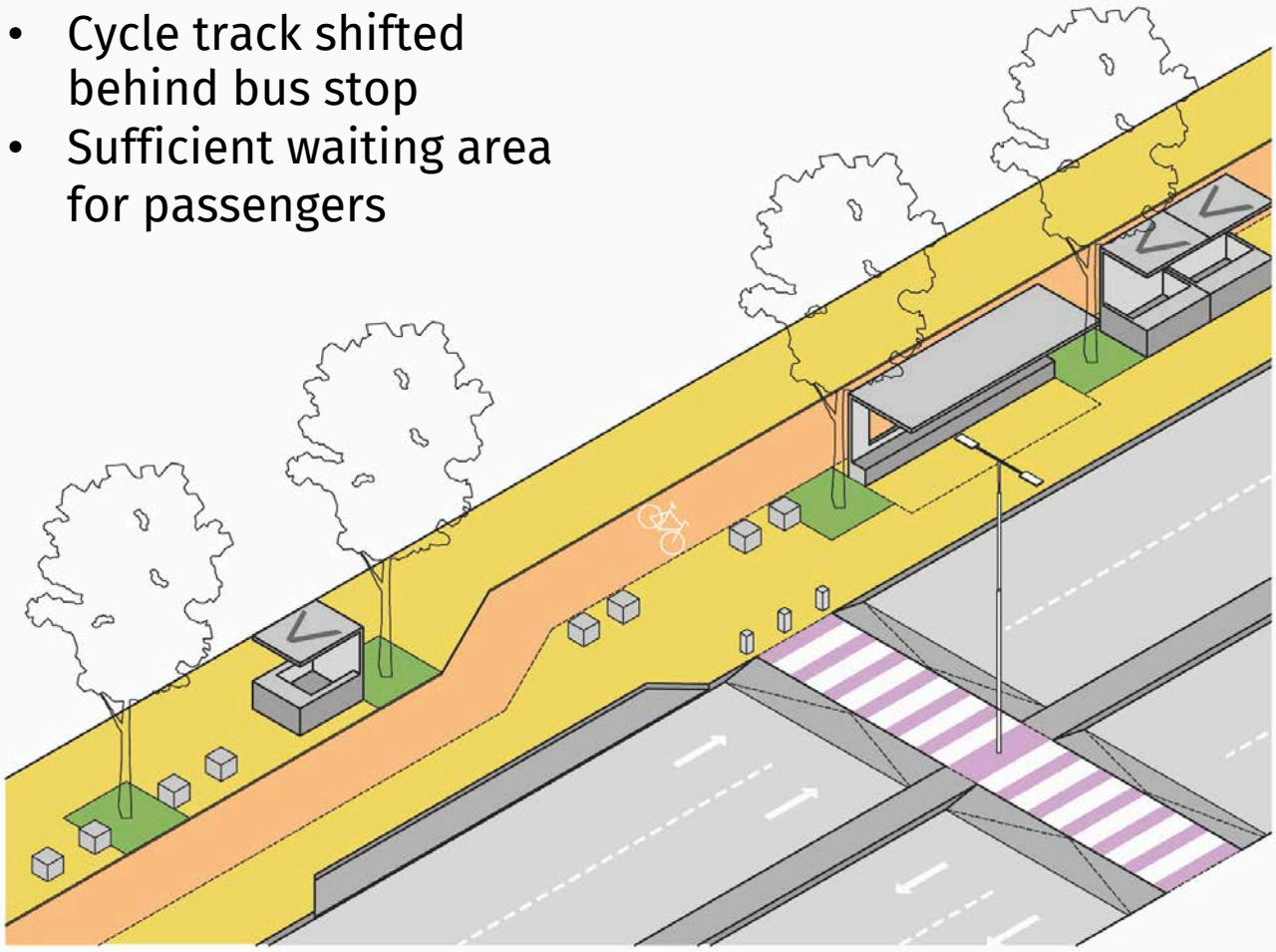
Planter boxes removed from carrriageway

Paver blocks = Uneven surface.
Use asphalt or concrete

Cycle tracks & bus stops

Cycle tracks & bus stops

- Cycle track shifted behind bus stop
- Sufficient waiting area for passengers



Clear space behind bus shelter

Karl Fjellstrom, itdp-china.org

Barcelona

Crossings

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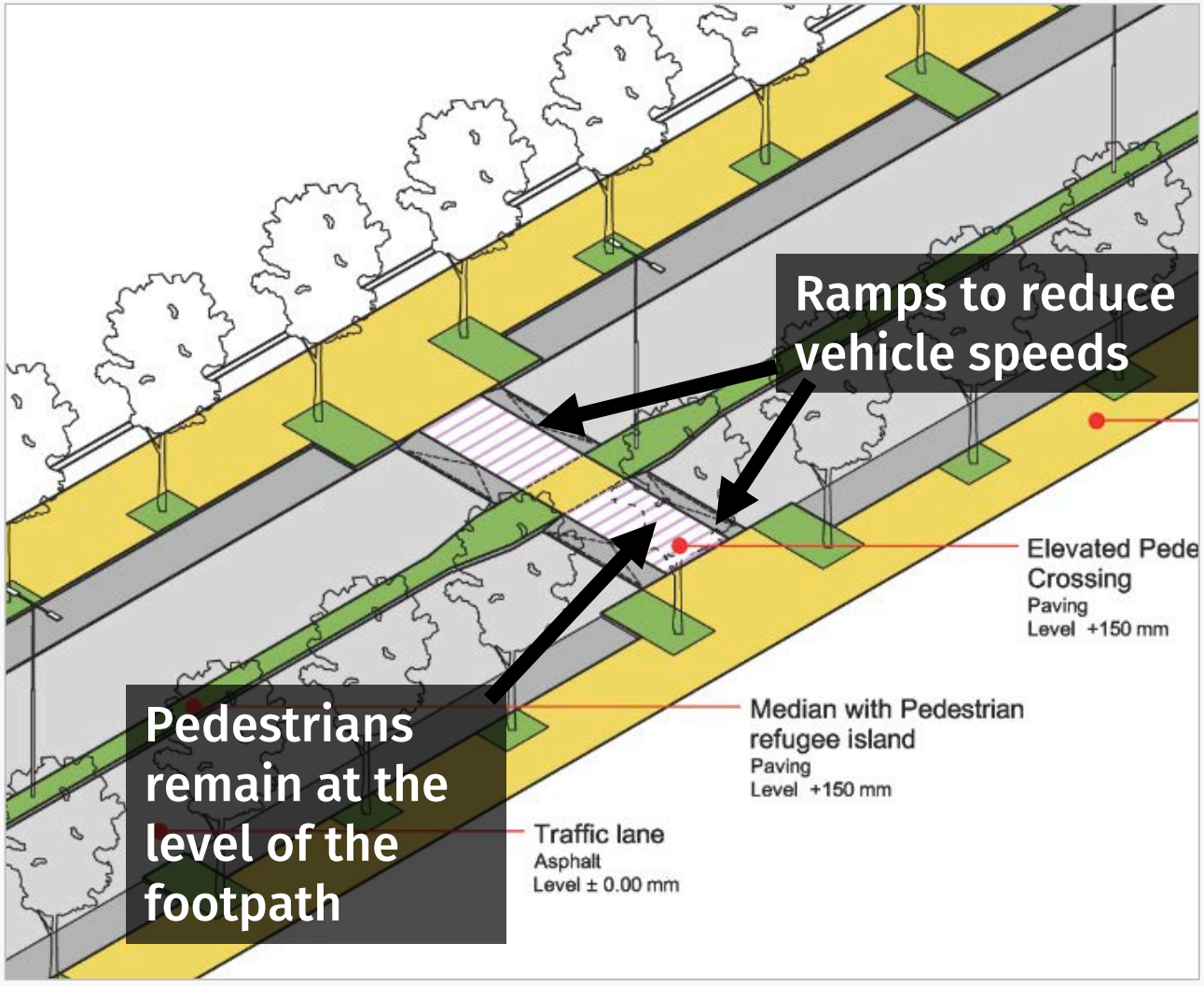
- Increase travel time and distance
- Not accessible to persons with disabilities
- Dangerous at night (and maybe during the daytime too!)
- Elevators and escalators are expensive and break
- They usually obstruct the footpath

Raised zebra crossing



Raised zebra crossing

Dar es Salaam

Raised zebra crossing

Ngong Rd, Nairobi

Nairobi's disappearing tree canopy

Incorporate existing trees in street designs

Delhi

Utility management


ITDP
Utility management

Smooth finishing of utility covers

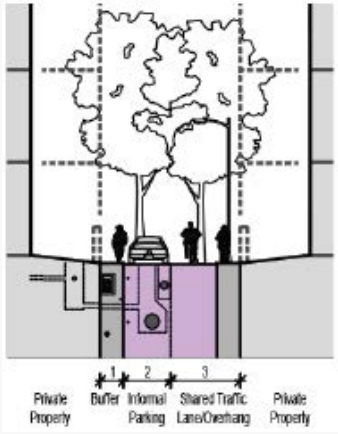
Delhi

Street templates

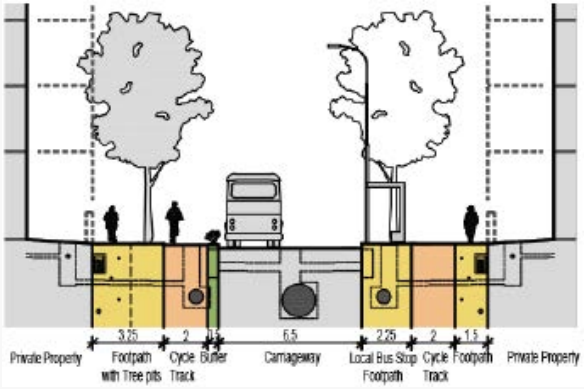
Guide to the templates

Template	Shared space	Footpath	Cycle track	Dual carriage-way	BRT
6	●				
9	●				
12a		●			
12b		●			
18a		●	●	●	
18b		●	●	●	
18c		●		●	
18d		●			●
24a		●	●	●	
24b		●		●	
30		●		●	●
36		●	●	●	●
50		●	●	●	●
60		●	●	●	●

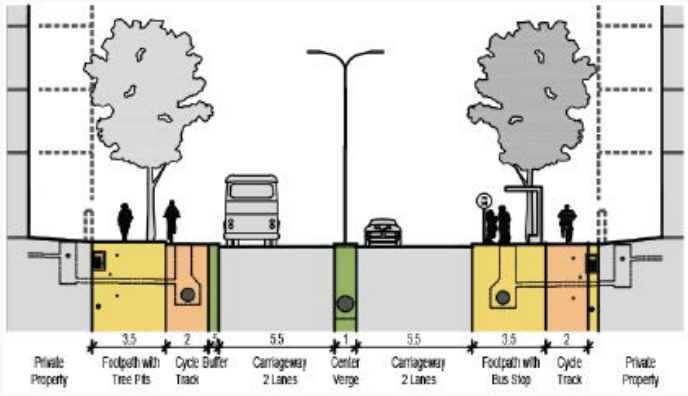
Cross section templates



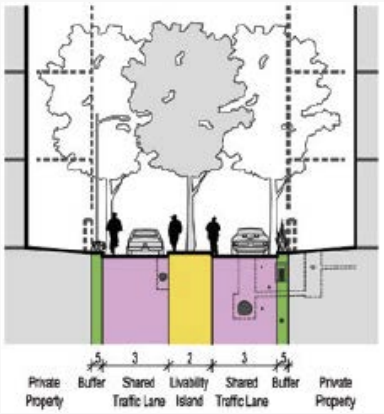
6 m



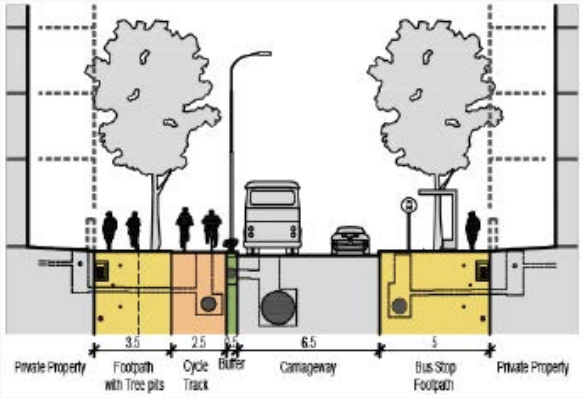
18 m



24 m

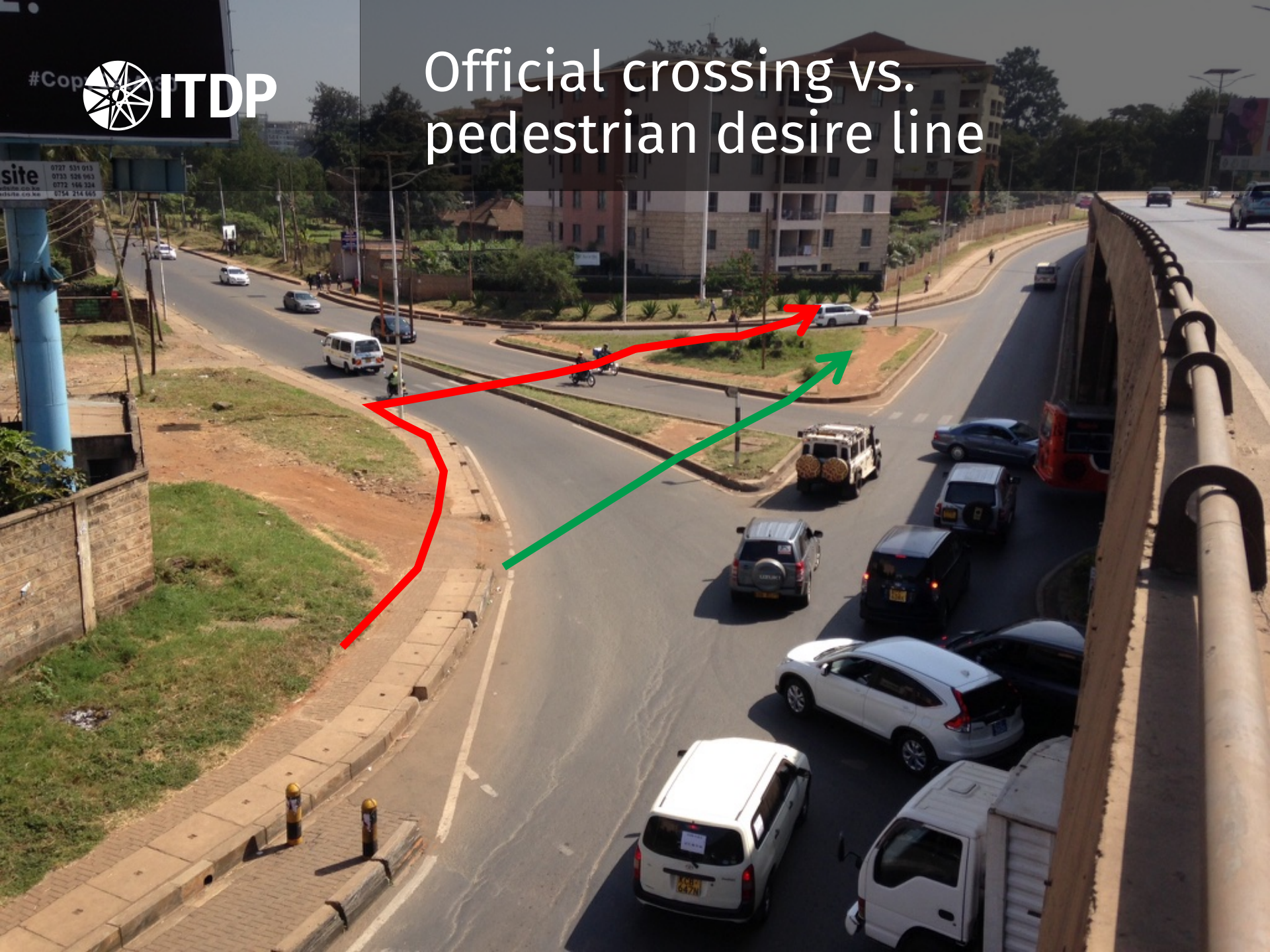


9 m



18 m

Intersections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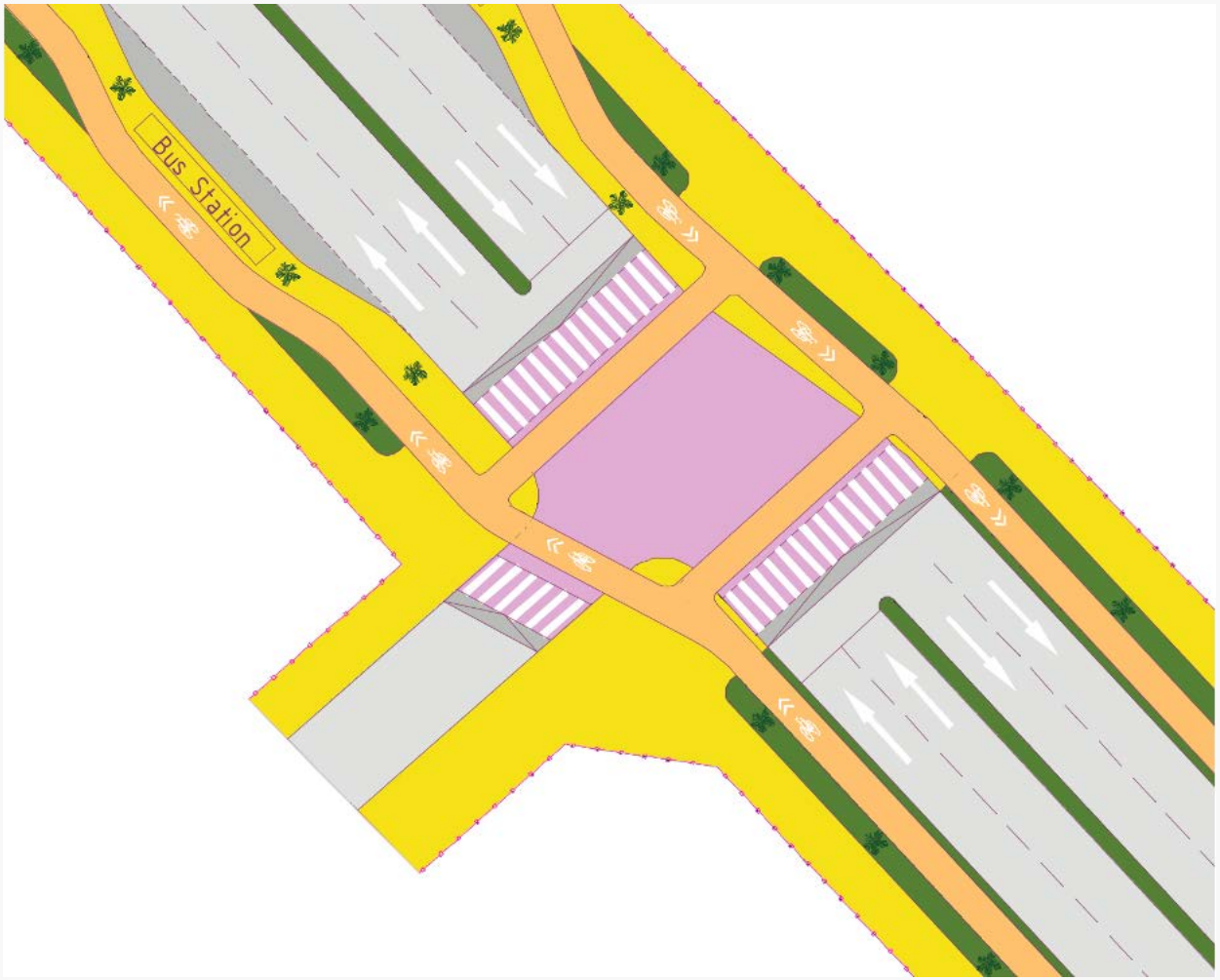
Official crossing vs.
pedestrian desire line

The detour for cyclists is even more extreme

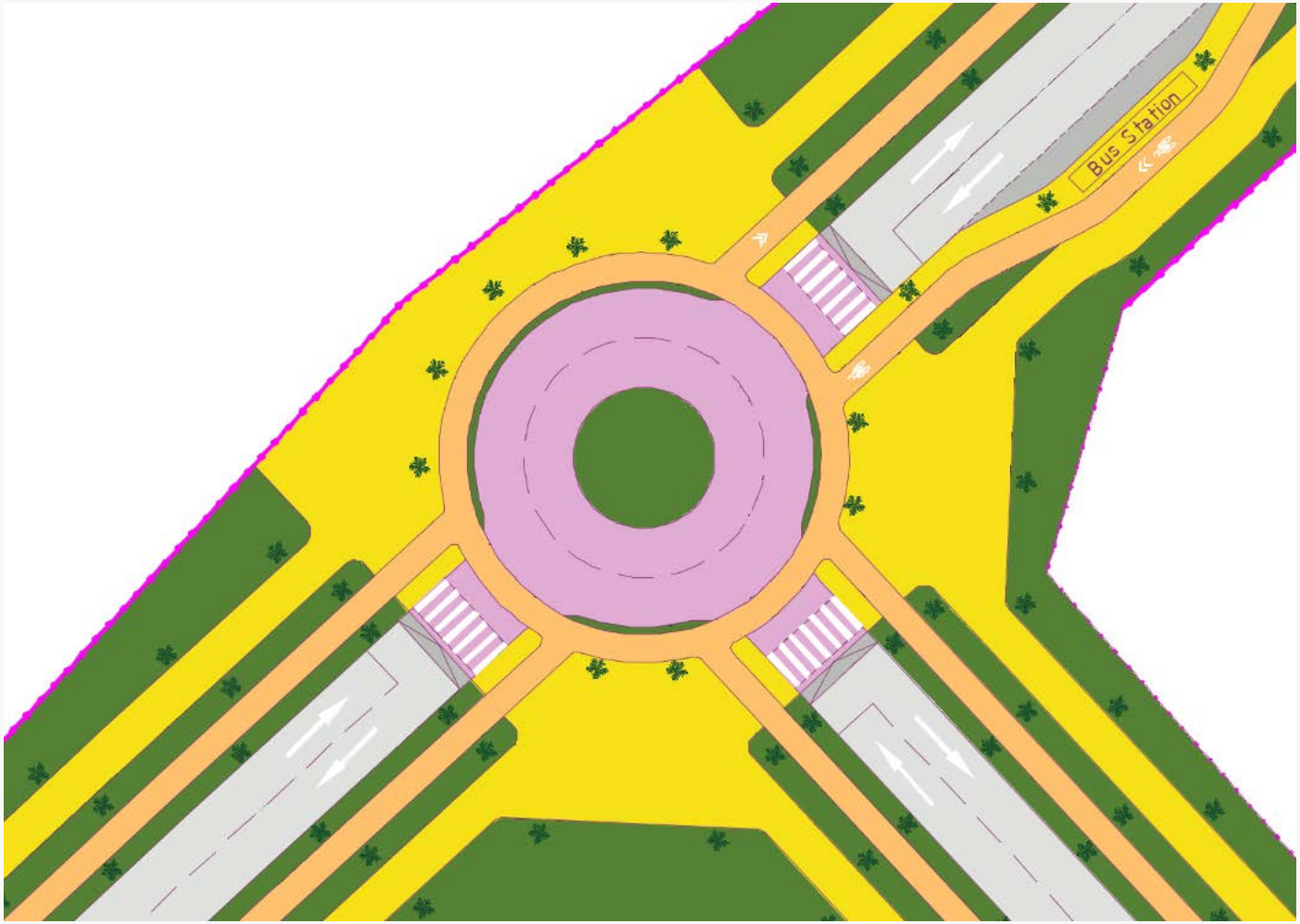
Intersection design principles

- Ideal junctions are compact & rectilinear
- Reduce vehicle speeds at points of conflict
- Minimise crossing distances
- Assume drivers are distracted
- 3-6 m typical corner radius, max 8 m
- Centerline turning radius of WB-15 (largest truck to be accommodated in city) is 12.5 m. No need for larger radii

Protected intersection design to improve cyclist safety



Cycle access at roundabouts

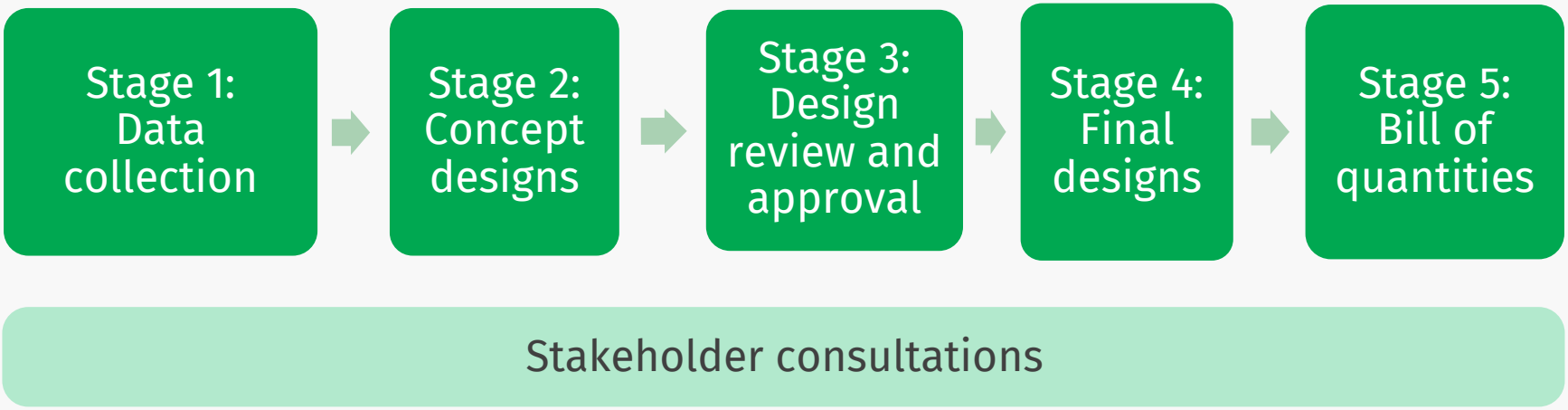


Intersection detailing

Dar es Salaam

Design process

Street design process



Data collection

- **Existing plans and policies:** Check existing city, town and County plans
- **NMT facility audit:** Footpath and cycle track presence and condition, pedestrian crossing, shade, street furniture
- **NMT user counts:** Pedestrian & cycle volumes
- **Parking survey:** Parking supply, occupancy & turnover
- **Street vending:** Type of structure, type of goods sold, relationship with government
- **Street lighting survey:** presence and performance of street lights
- **Public transport:** Saccos, routes, bus stops
- **Taxis (boda bodas, tuk tuks):** stops, shelter, numbers
- **Topographic survey**

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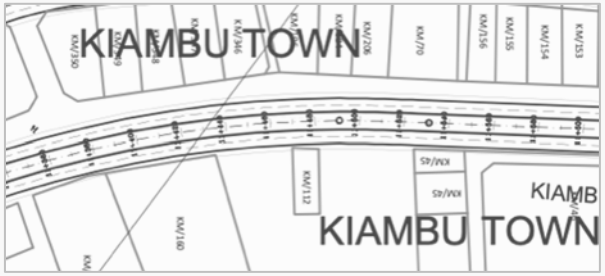
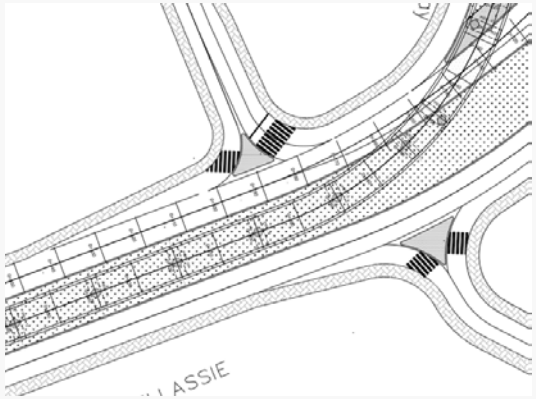
Transformations

Ongoing projects should incorporate cycle facilities

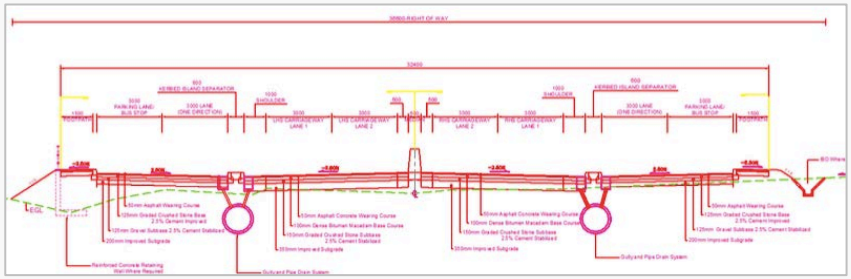
Nairobi Expressway



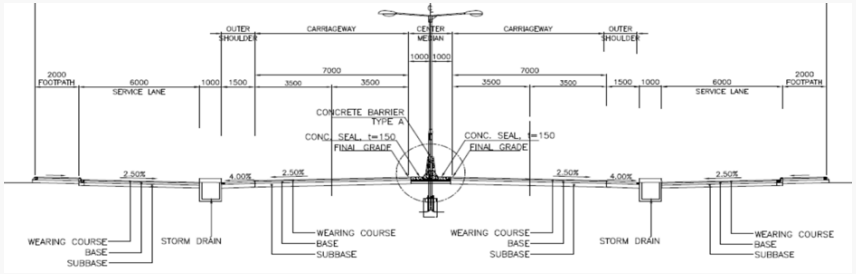
Kiambu Rd



Upper Hill
flyover project



Magadi Rd



Mombasa-Malindi Rd

Moi Ave, Nairobi - existing

Moi Ave, Nairobi - proposed

Jogoo Rd: Existing

Jogoo Rd: Proposed

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Thank you

africa@itdp.org

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