

Designing for pedestrians

Improving the quality of the pedestrian environment

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Contents

Presentation contents

- Safety moment
- Why?
- Who are pedestrians
- Design principles
- Design
- User characteristics
- Reallocating space
- Crossings

Consider this an introduction only to the topic

What's not covered

- Tactile paving
- Network planning
- Pedestrian modelling
- Shared space

Why do we need to reconsider how we design for walking and pedestrians?

Chart 8: "Comparing now to before there was a confirmed case of coronavirus in the UK, how much are you using the following modes:"

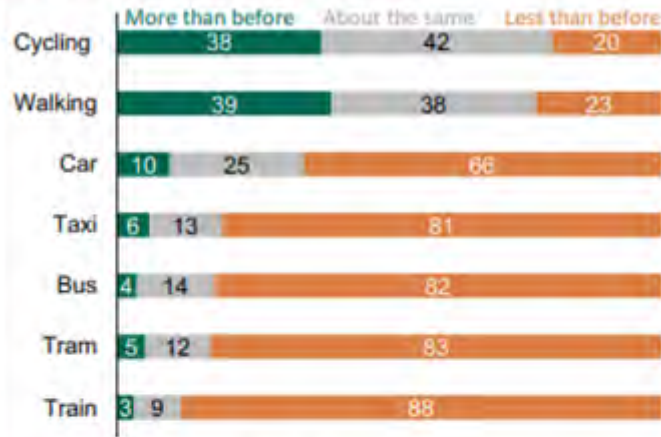
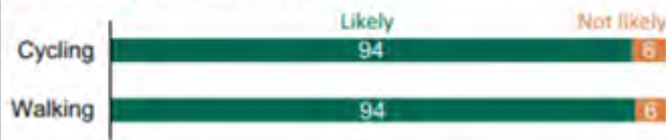


Chart 9: "How likely, if at all, will you continue walking or cycling more after travel restrictions and social distancing are removed?"



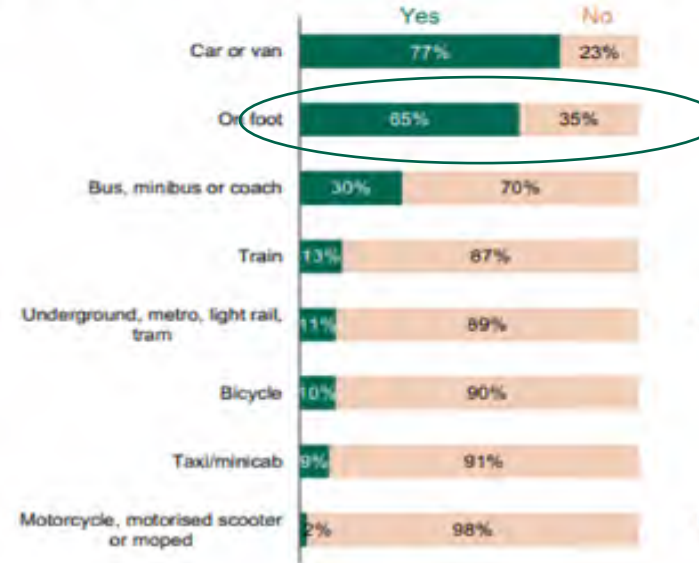
National Travel Attitudes
Study: Wave 4 (OCT 2020)
National Travel Attitudes
Study: Wave 4 (OCT 2020)

- **NetZero**; the most carbon neutral form of transport
- **COVID19**; increase in walking and highlighted lack of space for social distancing
- **Gear change**; policy driver
- **LTN 1/20**; potential impact on pedestrians from giving more space to cyclists
- **New Inclusive Mobility guidance**; new design requirements
- **New Highway Code**; changes in hierarchy/rules
- **Crashes**; stagnation in reducing casualty numbers
- **Health**; lack of physical activity and obesity
- **Liveable Neighbourhoods/Low Traffic Neighbourhoods**; streets as places and reducing car dominance

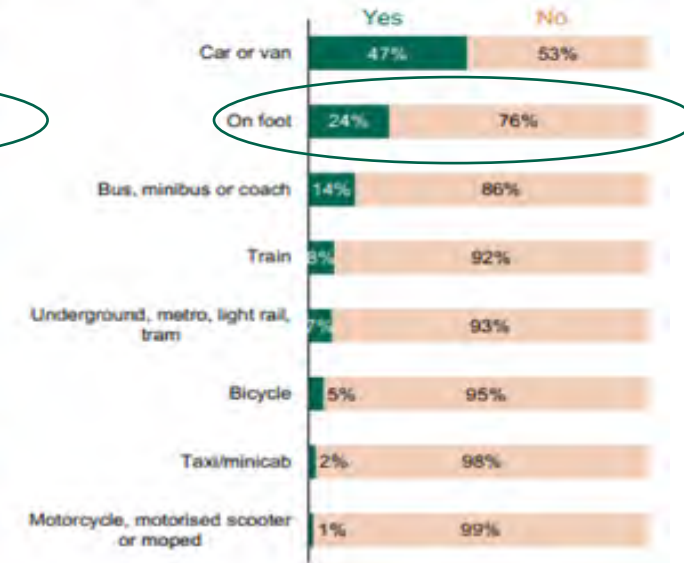
Walking is fundamental to transport

- Walking is more popular and more important than is generally understood
- Reminder to all that the various duties/responsibilities under Traffic Management Act 2004 that refer to “traffic” includes pedestrians as per legal definition in Act.

“Which of the following ways do you usually travel during an average week?”



“Thinking about your travel to and from work during an average week, which ways do you travel?”



Proportion of respondents using walking as a mode of travel in an average week, by type of area



Source: National Travel Attitudes Study: Wave 2 (Jan 20)

Walking is fundamental to transport

- Walking is not only a mode in itself but a component of other trips
- The walk from the house or place of work to the bus stop or train station
- The walk to and from the car park to the destination
- The walk from the bike hoop to the shop
- Failure to address weaknesses and flaws in the pedestrian aspect of a trip can compromise outcomes
- Designers should consider the whole trip experience – door to door



HIGHWAY CODE CHANGES 2022

RULE H1 – NEW HIERARCHCY OF ROAD USERS



RESPONSIBILITY INCREASES TO TAKE
CARE AND REDUCE DANGER TO OTHERS

Rule H1 - DRIVERS of vehicles that can cause the greatest harm in the event of a collision bear the greatest responsibility to take care and reduce the danger to others. This principle applies most strongly to drivers of HGVs, LGVs, cars/taxis and motorcycles. Cyclists and horse riders have a responsibility to reduce danger to pedestrians.

Walking is more than a transport mode



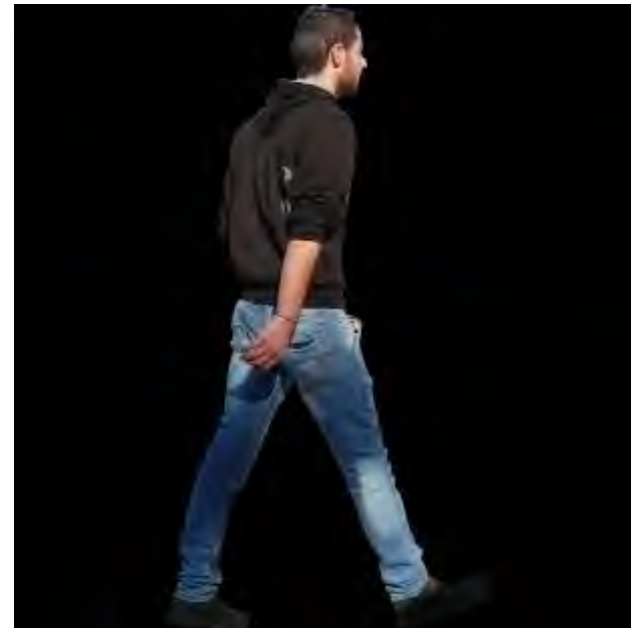
- Walking has an important role outside of transport
- Important indicator in ideas of Place
- As a leisure activity both as a “walk/ramble” and jogging/running
- Supports social interaction at a family, group and community level
- Health benefits both physical and mental health

Source: Living Streets

Who are pedestrians?

The “traditional” viewpoint....

- Single solitary person
- Male figure
- Able bodied
- Walk speed 1.2 m/s



Who are pedestrians in reality?



Walking for everyone

Making walking and wheeling more inclusive



- Pedestrians come in all shapes, sizes and numbers
- *The terms **pedestrian** and **walking** include people using mobility aids such as wheelchairs and mobility scooters designed for use on the footway, and people with physical, sensory or cognitive impairments (LTN 1/20)*

However

- Good pedestrian design is not about disability or the mobility impaired - it's a people issue
- Consider parents with children, those carrying shopping/luggage, couples, pushchairs...

Network Design Principles

Table 2.1 Pedestrian Network Design Principles	
Safe	The public realm should be safe to use at all times of day and for people to feel safe to spend time in
Inclusive	All walking environments should adhere to the principles of inclusive design by ensuring that they are accessible to, and usable by, as many people as reasonably possible without the need for special adaptation or specialised design
Comfortable	Designated walking areas should allow unhindered movement for pedestrians by providing sufficient space
Direct	Facilities should be positioned to provide convenient links between major walking trip attractions
Legible	Features should be consistent and easy to understand for all pedestrians to know intuitively how to navigate within a space
Connected	Walking networks should have a high density of route options to suit pedestrians' needs
Attractive	Walking environments should be enjoyable for pedestrians to pass through or spend time in

- Various documents establish principles for pedestrian planning
- General ideas align
- Principles apply to direct design considerations at a practical level

Table 2.1.2 Core design principles for walking, cycling and horse-riding

Coherence	Link up origins and destinations, including public transport access points. Routes are continuous and easy to navigate
Directness	Serve all the main destinations and seek to offer an advantage in terms of distance and journey time.
Comfort	Infrastructure meets design standards and caters for all types of user, including children and disabled persons.
Attractiveness	Aesthetics, noise reduction and integration with surrounding areas are important.
Safety	Dedicated networks and facilities not only improve pedestrian, cyclist and equestrian safety, but also their feeling of how safe the environment is. This includes access to adjacent areas, sightlines, fencing, lighting, landscaping and surveillance. It also includes avoiding opportunities for assailants to conceal themselves.

Design Principles – Coherence and Legibility

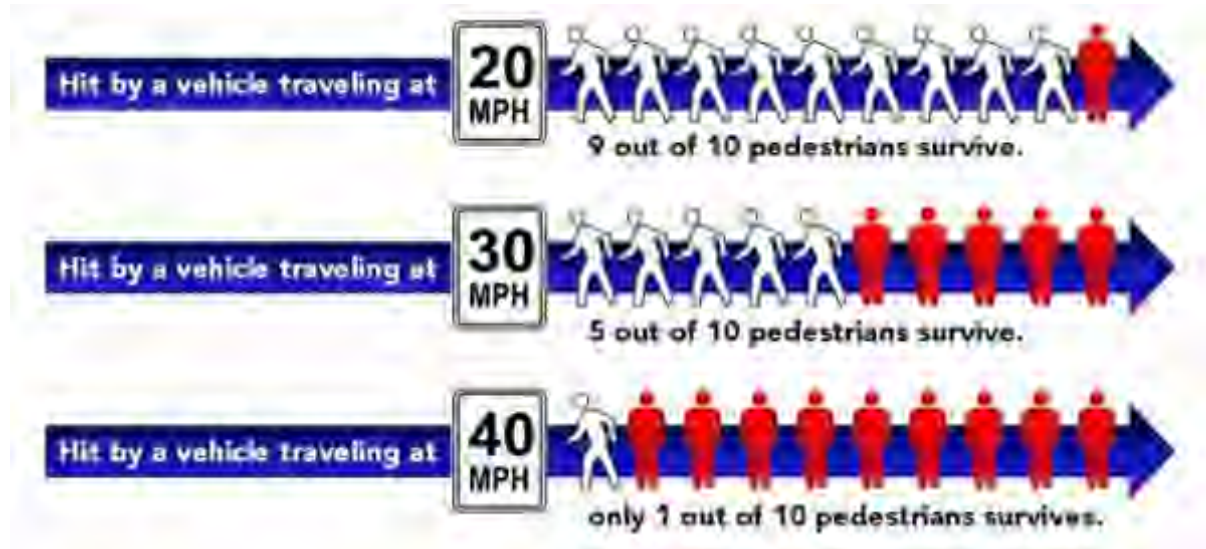
- Routes and pathways should be logical and easily understood
- They should be clearly defined and identifiable by all
- They should link to key destinations and locations
- Consistency in materials and appearance should be provided
- *Poor design just rigidly applies pavement provision without considering route choice*

Design Principles – Directness

- Pedestrian route choice is influenced by a number of factors
- Primary drivers tend to be:
 - **Distance** – how far do I need to walk?
 - **Time** – how long will it take?
- Many responses to poor design such as goat tracks are due to a lack of thought about pedestrian route choice and behaviour
- Routes should therefore be direct and minimise diversions supporting line of sight movement
- Diversions can expose pedestrians to greater risk



Design Principles – Safety (Road)



- Safety of route is important
- Users should not feel threatened by other modes or vehicles
(including cyclists/e-scooters)
- Conflicts should be minimised
- Where roads need to be crossed routes providing safe and easily used options should be provided
- Speed is the greatest threat to pedestrian safety and survivability

- We know the risks and have many tools and systems in place for this

Design Principles – Safety



Poor forward visibility and blindspot

Personal safety and security

- Perceptions of personal safety and security – fear of crime i.e. fear of assault or harassment are important in pedestrian design
- Pedestrians need to feel safe particularly women, elderly and children
- Good design considers CPTED (Crime Prevention through environmental design)
 - Surveillance both passive (e.g. over looking) and active (i.e. CCTV) are important
 - Limiting blindspots and dark/hidden areas
 - Good lighting and forward visibility
 - Providing escape routes not caging people in
 - Routes and locations that have increased activity and other users improves the safety for all
- Consider how places change over the day and some routes may be less safe at night e.g. parks, cut throughs, or areas with drunk



Research from Victoria Walks in Australia

Design Principles – Quality

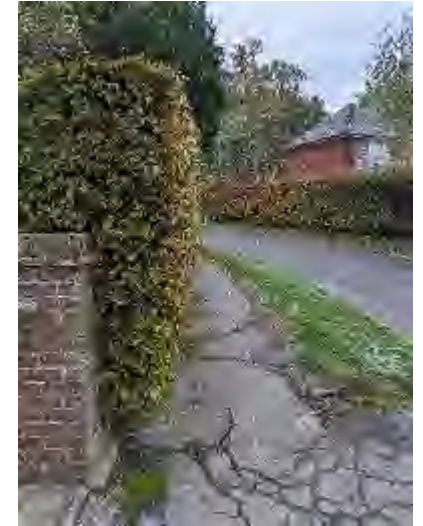
- Ideas of attractiveness, comfort and route quality support pedestrian activity
- Surfaces should be smooth and free of holes and uneven surfaces.
- Gradients should be considered (less than 1:20)
- Routes and provision should consider the quality of materials and ongoing maintenance and cleanliness
- Maintenance is a key issue for pedestrians as Councils tend to neglect this
- Designs should try to reduce the maintenance burden

Challenges Facing Pedestrians

Pedestrians' common concerns can be judged from research, undertaken for Living Streets in 2012, which asked Welsh adults which, if any, of the following problems they had encountered on their local streets.

Table 4.1 – Challenges facing pedestrians – YouGov poll for Living Streets

Problem	Percentage (%)
Litter or dog fouling	76
Broken or cracked pavements	66
People parking on the pavement	62
Potholes in pavements	58
Pavements which have been badly patched up after street works	54
People cycling on the pavement	53
Fly tipping, graffiti or abandoned cars	41
Street clutter and obstructions on the pavement	39
Badly managed street works	32
Street lighting not working/not enough street lighting or street lighting being turned off or removed	23



Routes Assessments

- Different tools exist that can support the assessment of pedestrian routes and identification of issues and scoring of a route
- **Healthy Streets**; an approach that uses a series of indicators to understand how a street operates and suggest/indicate areas of improvements
- **Neighbourhood scale mapping and analysis**
- Series of tools and techniques to understand different components of the network
- **Pedestrian Environment Review System (PERS)** an auditing system for pedestrian environments
- Visit sites at different times of day as pedestrians peaks not the same as vehicle peaks
- Get different perspectives e.g. from women, those with children, pushchairs, etc

Example of Healthy Streets Check for Designers applied to the Archway proposal



Design

Range of guidance and advice documents

- Spread over various documents by different agencies



- Manual for Streets (1 and 2)
- CD 143 Designing for walking, cycling and horse-riding (Highways England)
- Pedestrian Comfort Guidance for London (TfL 2010)
- Design Guidance Active Travel (Wales) Act 2013
- Streetscape guidance (TfL 2019)
- Designing for walking (CIHT 2015)
- Planning for Walking Toolkit (TfL 2020)
- Inclusive Mobility : A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure (DfT 2021)

Rethinking the design mindset and equality of treatment

Consider how we design road carriageways – typical approach

- Design vehicles – lorries of size x (% of vehicles)
- Swept paths
- Sight lines
- Vertical clearance from objects
- Demand, flows and congestions – number of lanes
- Junctions/conflict points

How does this translate to pedestrians?

The simple Do Minimum approach

- Tendency to just look at application of a standard width on at least one side of the road
- Provide a few crossing places

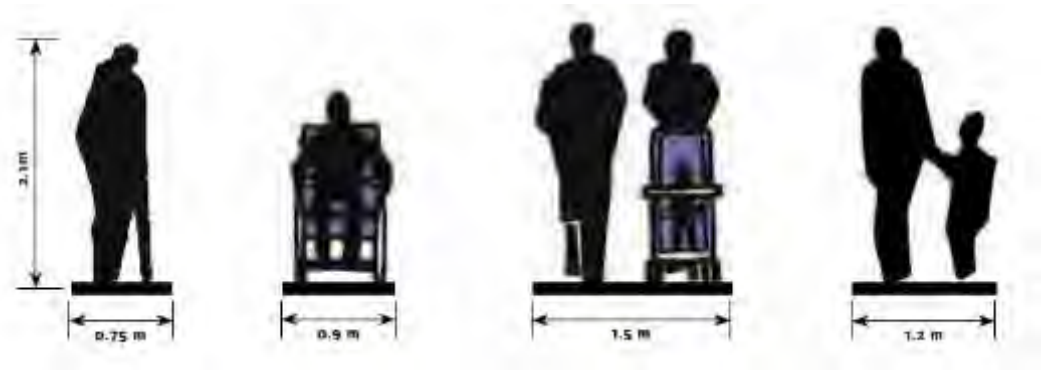
- **Absolute minimum width: 1.8m**
- **Desirable minimum width: 2.0m**
- **Preferred width 2.6m (especially adjacent to high-speed roads)**

Desirable minimum width	2.6 metres
Absolute minimum width	2.0 metres

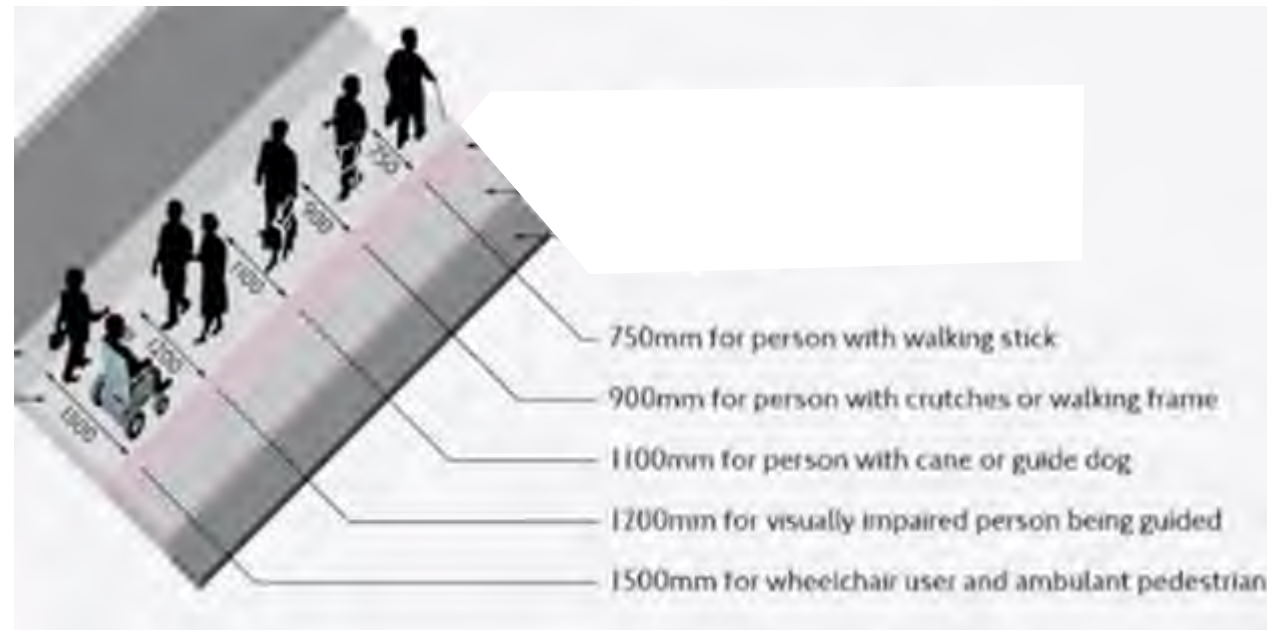


Pedestrian design “vehicle” or envelope

- Design should be user focused
- A single pedestrian dimensions 600-700mm
- Pedestrian with a stick 750mm
- Pedestrian with a cane/assistance dog 1100mm
- Pedestrian with a cane/assistance dog 1100mm
- Consider more than the single pedestrian
- Can people walk together?
- Can people pass each other?
- DDA requirements of two wheelchairs passing (1.8m)
- Consider role and function of a street

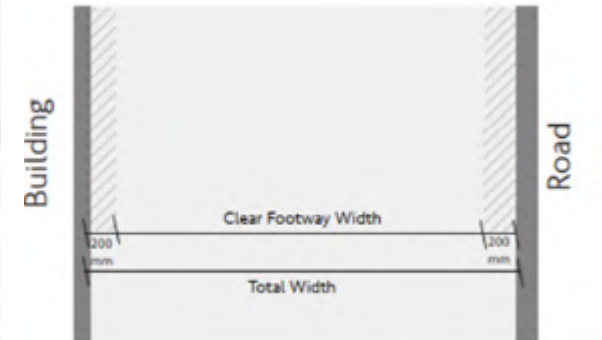
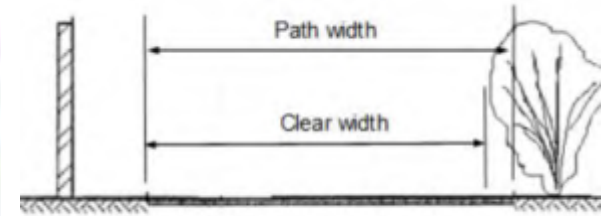


Source: Manual for Streets



Widths and clearances

- As with other modes pedestrians “shy” from vertical objects, road edges and other pedestrians
- Difference in actual/physical width and effective/clear width
- **Actual/physical width** – the space edge to edge on a pavement
- **Effective/clear width** – the actual space pedestrians can use due to clearances and other issues
- TfL recommend 200mm clearance from buildings, kerb edge, street furniture, etc
- DMRB 250mm+ (CD 143)
- Speed on road may increase separation requirements



Vertical feature on one side and < 1.2 metres height	Vertical feature on one side and ≥ 1.2 metres height	Vertical features on both sides (distance per side)
+ 0,25 metres	+ 0,5 metres	0,25 metres for < 1,2 metres height 0,5 metres for ≥ 1,2 metres height

Footway / pavement width

Inclusive mobility guidance (2021)

- Make footways as wide as possible
- a width of 2000mm is the minimum that should be provided
- Only if due to physical constraints min 1500mm

- As noted have you considered shying?
- What is role/function of street?
- Do you want free two way movements?
- Will there be couples/groups/families, etc



Maximising space - decluttering

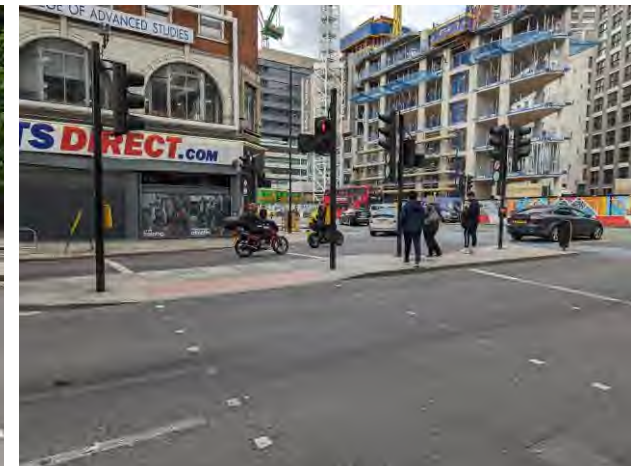
- Street furniture major obstruction to clear widths for pedestrians
- Consider rationalisation and integration of signs and other street furniture
- Align in a street furniture area / zone
- Can easily boost effective space for pedestrians without widening
- Review need for guardrail



- Pedestrian guardrail provides visual and physical barrier
- Asphalt road surface in poor condition
- Pedestrian realm poorly defined
- Street furniture and equipment causes clutter and uses inconsistent colours



- Pedestrian realm consistently defined with Yorkstone paving
- Clear views to Brockwell Park enhanced
- Granite kerbs provide a high quality finish
- New tree planting



Maximising space – kerbside activity



- Where pedestrian volumes are high we tend to have competing needs for vehicles and other activities
- Flexible spaces that maximise use for multiple activities
- Loading bays when pedestrian flows are low e.g. early AM / night
- Consider use of different materials/colours
- Hostile vehicle / encroachment considerations

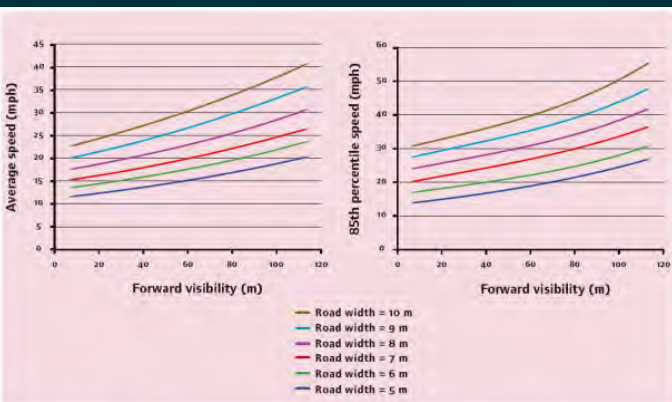
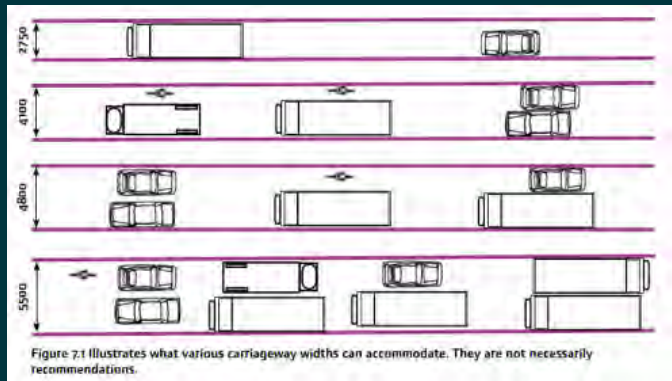
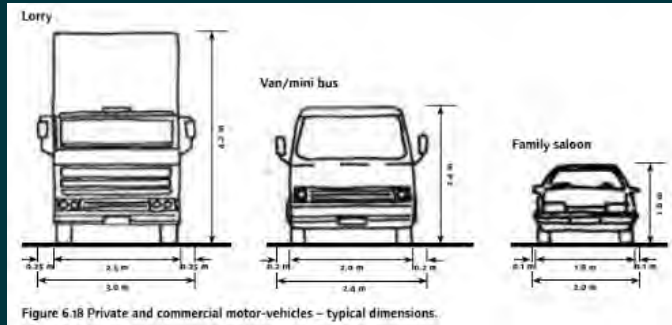
LTN 1/20 and pedestrians

- 2) Cycles must be treated as vehicles and not as pedestrians. On urban streets, cyclists must be physically separated from pedestrians and should not share space with pedestrians. Where cycle routes cross pavements, a physically segregated track should always be provided. At crossings and junctions, cyclists should not share the space used by pedestrians but should be provided with a separate parallel route.

Shared use routes in streets with high pedestrian or cyclist flows should not be used. Instead, in these sorts of spaces distinct tracks for cyclists should be made, using sloping, pedestrian-friendly kerbs and/or different surfacing. Shared use routes away from streets may be appropriate in locations such as canal towpaths, paths through housing estates, parks and other green spaces, including in cities. Where cycle routes use such paths in built-up areas, you should try to separate them from pedestrians, perhaps with levels or a kerb.

- Shared paths are an area of concern for pedestrians particularly elderly
- Perception issue
- Also an issue for cyclists with errant children and dog leads...
- LTN 1/20 does not “ban” use of shared paths but reinforces need to think very carefully about their use
- Need to ensure where shared adequate space is provided for co-existence
- **Don't just look to squeeze the pedestrians into a 1.2m footway**

Giving more space to pedestrians



- Scope to get more space from carriageways
- Should reconsider how wide carriageway lanes really need to be
- Manual for Streets provides useful base information
- DMRB has standards relating to higher speed roads generally 3.65m lane widths
- Common 7.3m wide roads general standard on roads in various environments
- Slower speeds can accommodate narrower widths
- Narrower lanes encourage slower speeds
- COVID 19 emergency measures showed we can do more

Spatial analysis

- Tools exist to assess suitability of space for pedestrians
- Generally use a Level of Service approach
- Fruin LoS common reference based on person per metre or person per metre per second
- TfL Pedestrian Comfort Level approach provide good analytical method to assess spatial performance
- Other options include:
 - Simple spatial spreadsheet analysis
 - Microsimulation pedestrian modelling

Note: Capability to do all levels of analysis exists in AECOM (Urban Space team)



Figure 8 Pedestrian Comfort Levels on Footways

Crossing / junctions

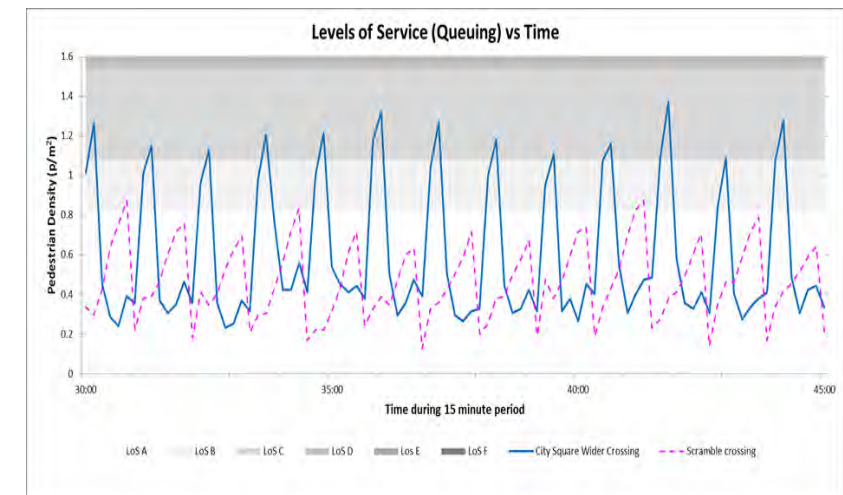
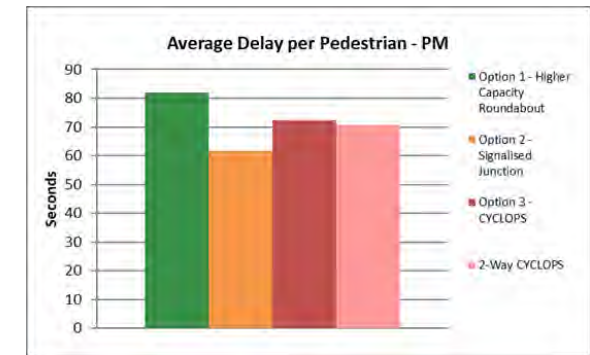
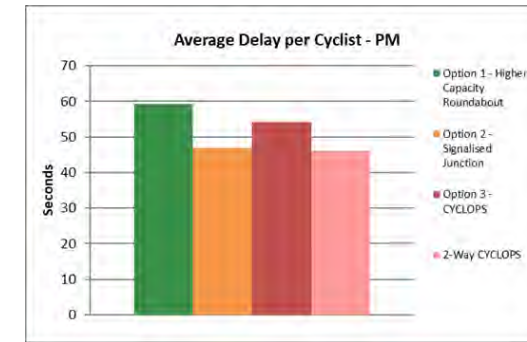
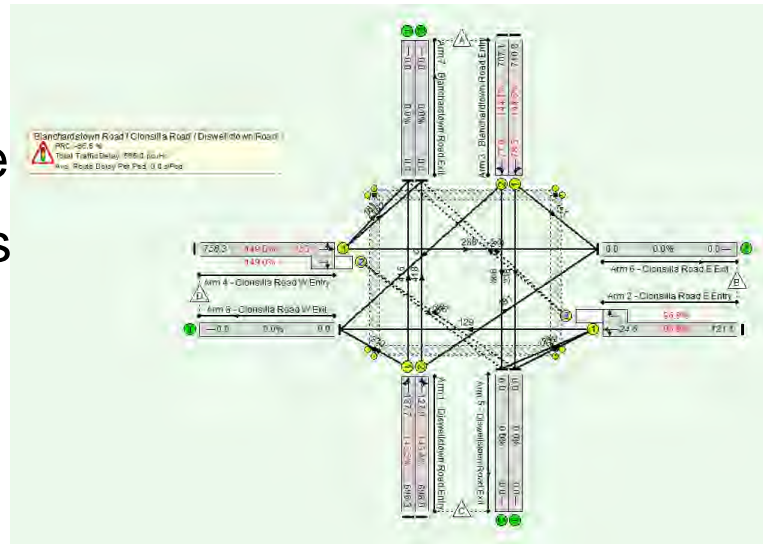
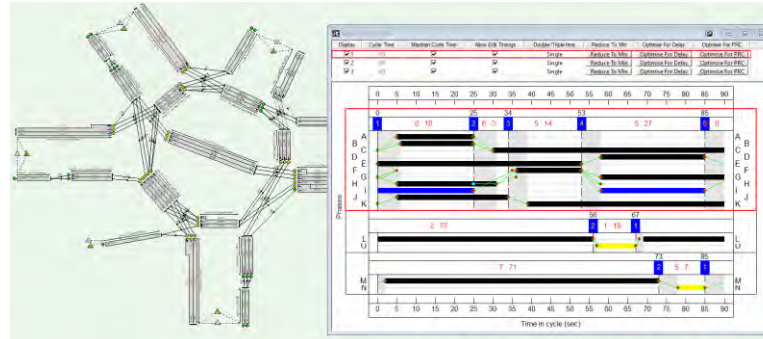
- Crossing/junctions point of conflict with other modes
- Need to support safety
- Range of tools and assessment approaches
- Most are biased towards a particular mode e.g. vehicles or cycles
- Need for greater consideration of the pedestrian side of junction performance
 - How long do you wait to cross?
 - How many movements are there?
 - How long does the crossing take?
 - Is their space to wait?
- Don't currently have an agreed approach to assessing performance for pedestrians to allow comparison between modes

14.1.3. The following factors are most likely to have a bearing on the choice of pedestrian crossing type:

- a) difficulty in crossing,
- b) vehicle delays during peak periods,
- c) carriageway capacity,
- d) local representations,
- e) cost (including maintenance), and
- f) vehicle speeds.

Holistic assessment of junction performance

- Junction critical part of our networks
- Modelling general focus on vehicles and public transport
- Limited consideration of pedestrians/cyclists in performance metrics
- Limited industry standards to assess junctions for active travel
- Comparison across modes in its infancy
- Where done challenges pre-conceived ideas
- AECOM integrating this into our junction assessment work



Junctions and crossings – Highway Code changes Rule H2



Rule H2: For drivers, motorcyclists, horse drawn vehicles, horse riders and cyclists

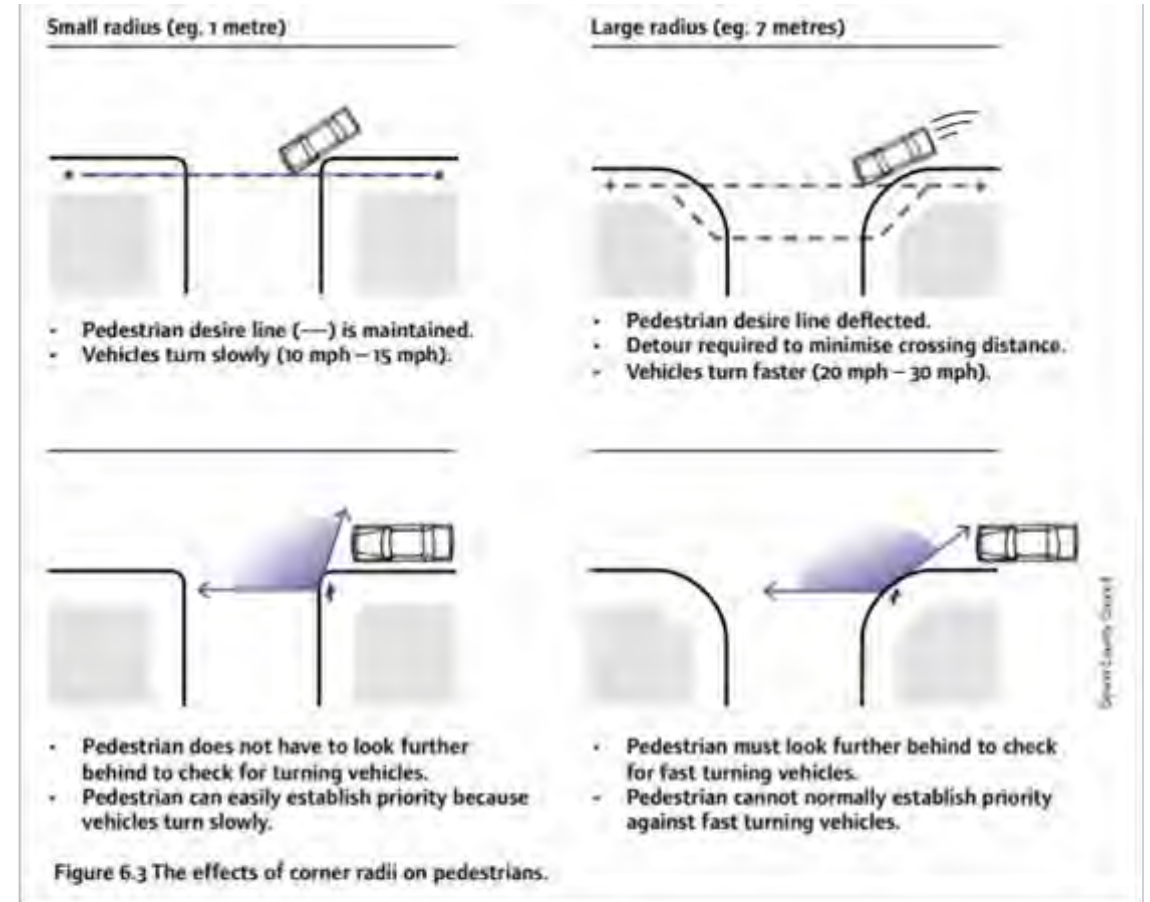
- At a junction you should give way to pedestrians **crossing or waiting to cross** a road into which or from which you are turning.
- You **MUST** give way to pedestrians on a zebra crossing, and to pedestrians and cyclists on a parallel crossing (see Rule 195).
- Pedestrians have priority when on a zebra crossing, on a parallel crossing or at light controlled crossings when they have a green signal.
- You should give way to pedestrians **waiting to cross** a zebra crossing, and to pedestrians and cyclists waiting to cross a parallel crossing.
- Horse riders should also give way to pedestrians on a zebra crossing, and to pedestrians and cyclists on a parallel crossing.
- Cyclists should give way to pedestrians on shared use cycle tracks and to horse riders on bridleways.
- Only pedestrians may use the pavement. Pedestrians include wheelchair and mobility scooter users.
- Pedestrians may use any part of the road and use cycle tracks as well as the pavement, unless there are signs prohibiting pedestrians.

Side road junctions – pedestrian perspective

- Tighter radii
- reduces vehicle turning speed (and severity of potential crashes)
- Reduces diversion or crossing distance
- Easier look back
- Supports Highway Code compliance

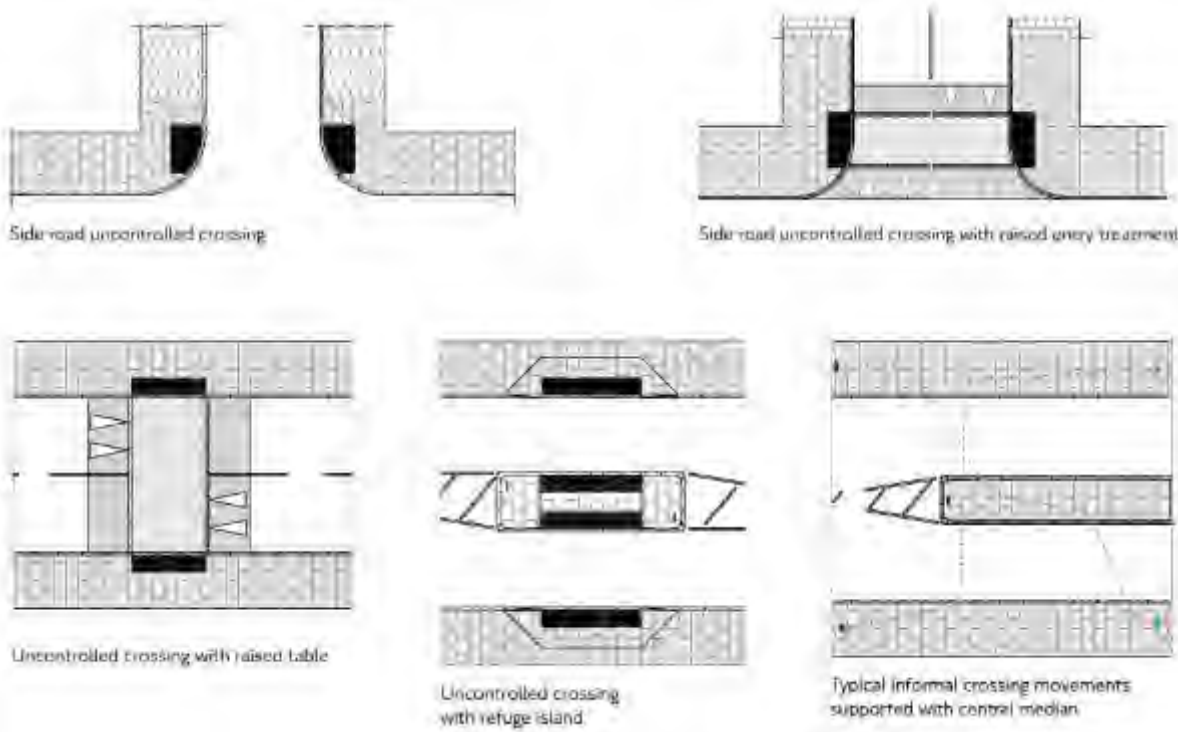
- Beware of over designing for infrequent HGV movements

- Overrun areas can slow vehicles but don't reduce pedestrian disbenefits
- Central island can provide improved crossing experience if correct size



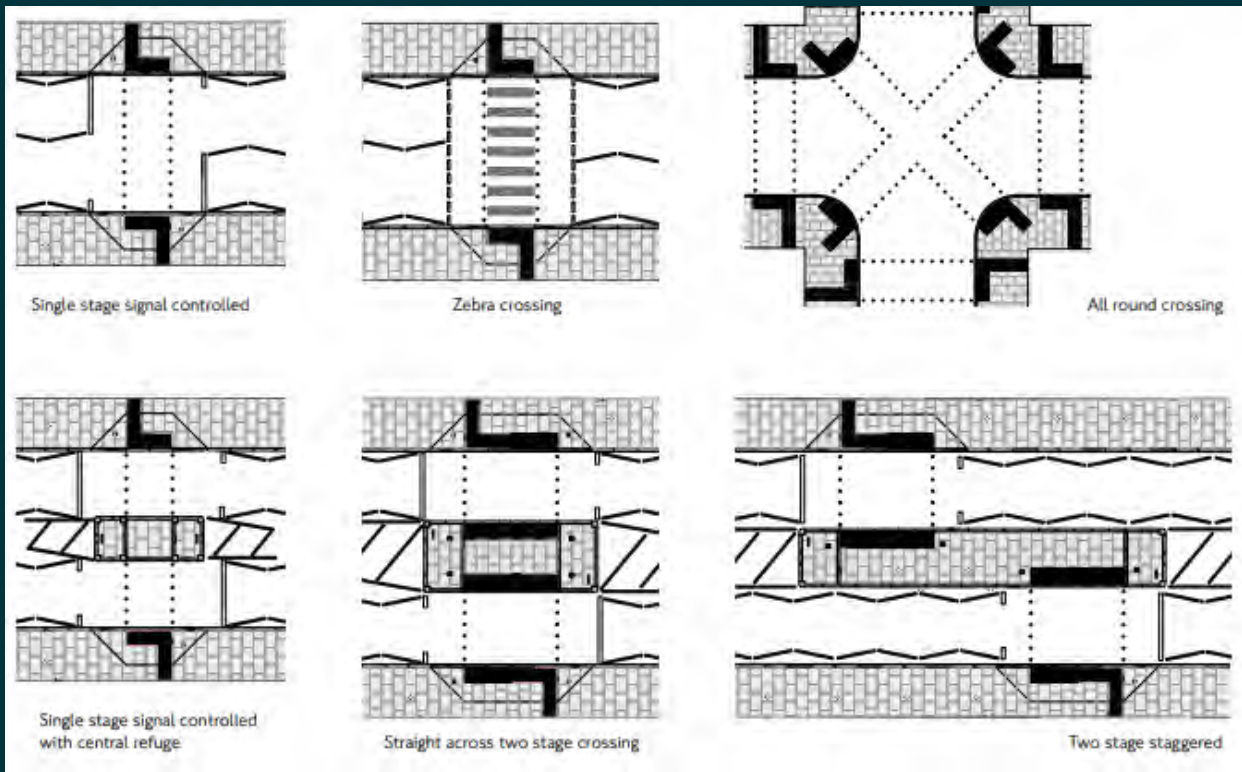
- Manual for Streets p66

Uncontrolled crossing options



- Locations where formal control is not felt appropriate
- Raised side entry treatments / continuous footways slow vehicles and support priority for pedestrians
- Can have drainage issues so be careful
- Matter of giving choice and safe options to pedestrians of different abilities
- Suitability will also depend on speed limits

Controlled crossing



Key additional design considerations

- Flows of all modes
- Widths for waiting and crossing
- Space
- Movements and desire lines
- Passing movements and friction
- Don't just provide minimums i.e. 2.4m wide
- Consider delay/wait times

Think creatively

All red scramble crossing make a big statement

But you can get creative in other ways



Think creatively



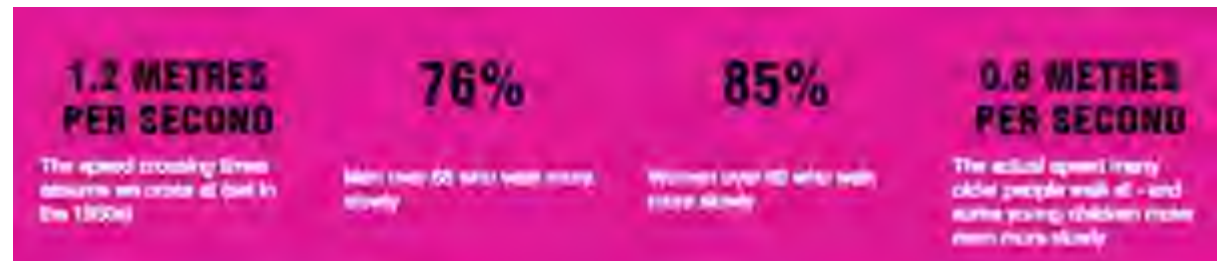
- Crossing restricted to 10m max
- Set back stop lines create informal crossing area
- Raised crossing area
- Use of different materials



Traffic signals crossing times



- Crossing times are based on standard speed of 1.2 m/s (Or 1.0m/s)
- Concerns this does not give sufficient time for some users
- Use of Puffins and Countdown timers can mitigate
- Consider use of “rest on red” for pedestrian/cycle crossings i.e. on red for vehicles unless demanded for priority areas



Pedestrians and roundabouts

- Roundabouts seen as pedestrian unfriendly
- Particular difficulty for pedestrians to negotiate uncontrolled
- Crossing can be provided to mitigate
- Crossings (zebra / pelican) should be located as close to roundabout as possible:
 - Vehicles are slowing on approach reducing speed and severity of potential crashes
 - Vehicles exiting are accelerating
 - Reduces diversion for pedestrians and potential crossing away from designated location



Photo 3.11.3: Zebra crossing close to mini-roundabout



Roundabouts

- Adapted zebra crossing have potential to provide more priority for pedestrians
- Use of “Dutch style” roundabouts
- Reducing zig zags key issue
- Examples from Melbourne, Australia
- TRL/TfGM currently researching side road zebra crossings



Conclusions

Pedestrians do not get the attention they deserve based on mode share or position in road hierarchy

Things are changing and our approach needs to change

Industry lacks level of insight due to limited research compared to vehicles

Don't apply car based thinking e.g. only x many pedestrians an hour/day therefore...

Try to take a user perspective and consider outcomes and use

Should involve multi-disciplinary approach

Taster only for a very broad topic

AECOM Delivering a
better world