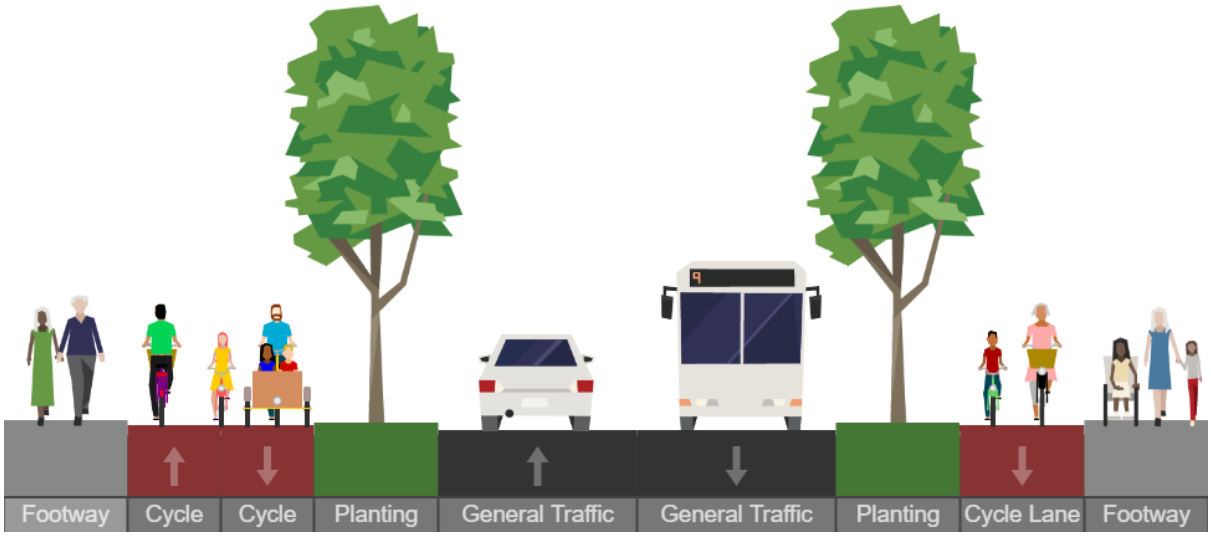
The 'Do-Optimum' Alternative



The 'Do-Optimum' scheme has been developed by a working party from Milton Road Residents' Association, Hurst Park Estate Residents' Association and the Cambridge Cycling Campaign. The conceptual diagrams which follow address City Deal objectives in the following ways:

Bus priority is addressed not by the provision of continuous bus-lanes but by focusing on key junctions and other root cause issues, for example:

a. a bus-lane is provided on the outbound approach to the guided busway and the inbound approach to the Kings Hedges Road junction.

b. a central bus-priority (early-release) lane (doubling as a right-turn filter outside peak hours) has been incorporated as an example inbound at the Arbury Road junction. A similar result could be achieved using a kerb-side bus-priority lane with a part-time right filter in the centre lane.

c. a central bus-priority lane is shown as another option for outbound buses entering from the busy Elizabeth Way arm to the Highworth/Elizabeth Way roundabout. Although in this case the crossing for people walking and cycling gives priority instead to motor traffic, the low-speed geometry and the setback of the crossing is a very safe design that will be a major improvement over the existing conditions.

d. the degree to which more bus-lanes and their locations may or may not be required is very dependent on other developments and mitigation measures which are likely to have significant effects on travel patterns. Cambridge

North station, the likely Addenbrookes station, city-centre congestion plans, bus routes into or around the centre and city-wide parking controls are just a few factors which need to be modelled and understood.

In the meantime it seems obvious that non-stopping buses should preferably be routed via Elizabeth Way rather than south of the roundabout down to Mitcham's Corner where their presence in large numbers would be incompatible with the city's redevelopment plan for an urban neighbourhood.

e. multi-door buses, step-free boarding from bus-stops as described in the following section, and cashless payment systems that are designed to keep dwell-times short and predictable will transform the customer experience and improve journey times and reliability. These all form part of a true bus priority plan.

Better cycling and walking journeys are catered for:

f. by provision of continuous cycleways and footpaths of appropriate widths segregated from motor traffic by verges and trees. Provision for two-way cycling is made in those sections or sides of the road where there is a high demand from the local community for safe travel to and from the many schools and community hubs in the area.

g. by the creation of additional walking and cycle crossings along Milton Road to make crossing the street easier and safer, especially near shops, schools and bus stops; and by placing zebra crossings on cycle lanes at the points where people walking need to cross them, such as at bus stops and junctions.

h. by reconfiguration of the Highworth/Elizabeth Way roundabout to a continental-style design which incorporates parallel zebra/cycle crossings enabling safe negotiation by people walking and cycling through a lower speed, traffic-calmed junction.

i. by having a similar roundabout treatment at the Kings Hedges road junction. An alternative signal-controlled layout is also illustrated which incorporates similar segregated, safe, signal-controlled crossings.

Enhancing the environment, streetscape and air quality are catered for:

j. by committing to an avenue of trees and verges

k. by providing for new pockets of greenery at junctions

l. by having verges wide enough to enable limited waiting zones to be inserted into the scheme to accommodate delivery vehicles, trade vehicles, and fully protected bus-stops with enough space for queueing and boarding passengers

m. by introducing junctions with slower turning radii designed to calm traffic speeds

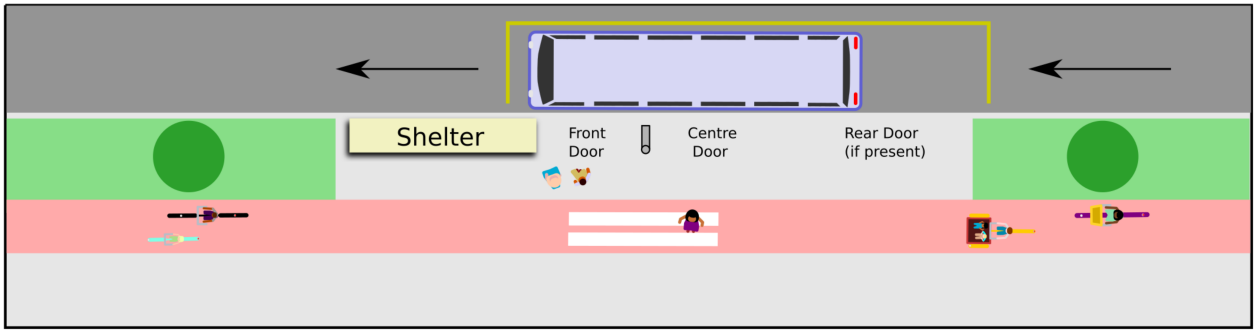
n. by having an overall scheme which is likely to give confidence to users to make the switch to more sustainable, healthier and safer modes of travel.

Bus Priority Measures

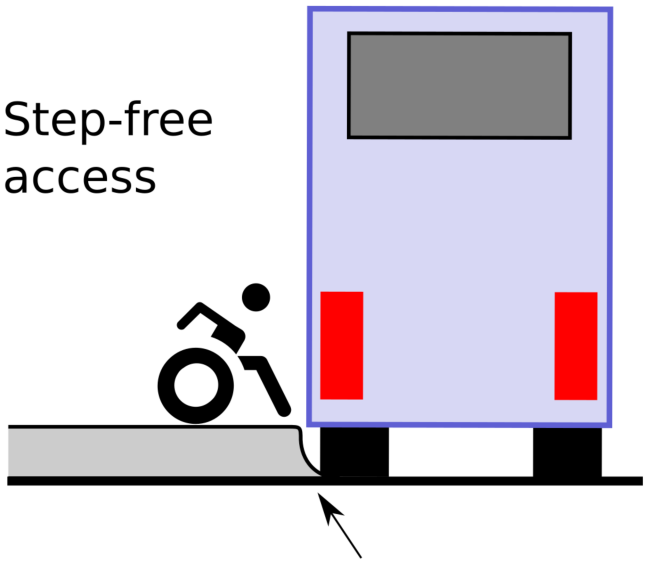
Based on the *Accessible Bus Stop Design Guide* (ABSDG) from Transport for London.

- Improve access to buses for people of all ages and abilities.
- Engineer reliable methods of bus boarding and alighting to decrease dwell times.
- Allow people to flow in and out of multiple doors on the vehicle.
- Enable the use of smart card payment (such as Oyster) by all operators within the greater region.
- Coordinate fares and scheduling between multiple operators and different modes.
- Simplify and subsidise fares to attract more passengers.

Designing Priority into Bus Stops



- Use the Bus Boarder Design (see Chapter 7, ABSDG) to make bus stops as efficient, reliable and accessible as possible. Never use lay-bys, as they cause delays and hinder step-free boarding.
- Arrange the passenger waiting area (Chapter 4) for clear passenger flow to and from multiple doors.
- Provide a Zebra crossing on any protected, separate cycle lane that is adjacent to the bus stop.

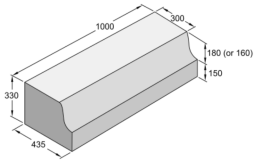


A "Kassel Kerb"

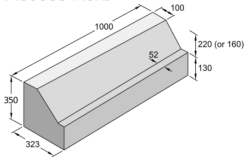
Various kerb designs are available that make it easy and simple for bus drivers to pull their vehicle up to a bus boarder-style bus stop with minimal gap and provide a flush, step-free interface for passengers waiting on the platform.

Flush, step-free boarding lowers dwell times and makes bus operation much more reliable, as well as vastly improving the bus riding experience for people with disabilities.

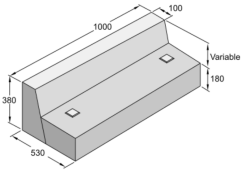
Brett Landscaping
'Kassel' Kerb



Camas (Charcon)
Access Kerb

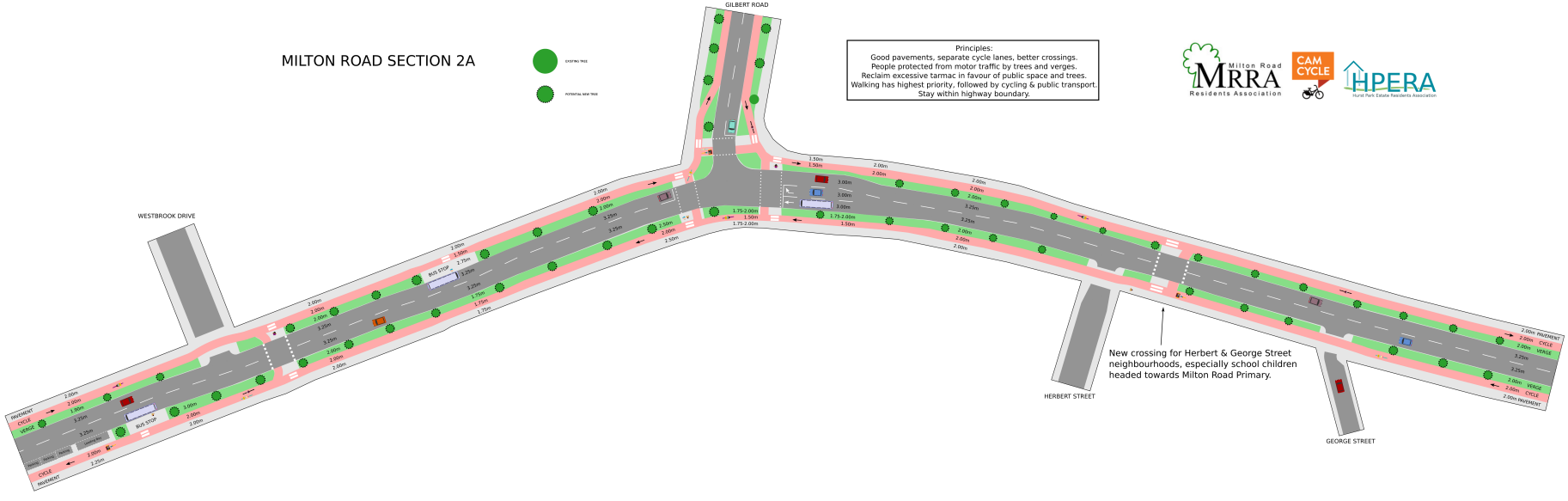


Marshalls
Bus Stop Kerb



Special kerbs (from Chapter 9, ABSDG), designed to enable step-free boarding.

MILTON ROAD SECTION 2A



Principles:
Good pavements, separate cycle lanes, better crossings.
People protected from motor traffic by trees and verges.
Reclaim excessive tarmac in favour of public space and trees.
Walking has highest priority, followed by cycling & public transport.
Stay within highway boundary.

MILTON ROAD SECTION 2B

(with bus entry lane to roundabout)

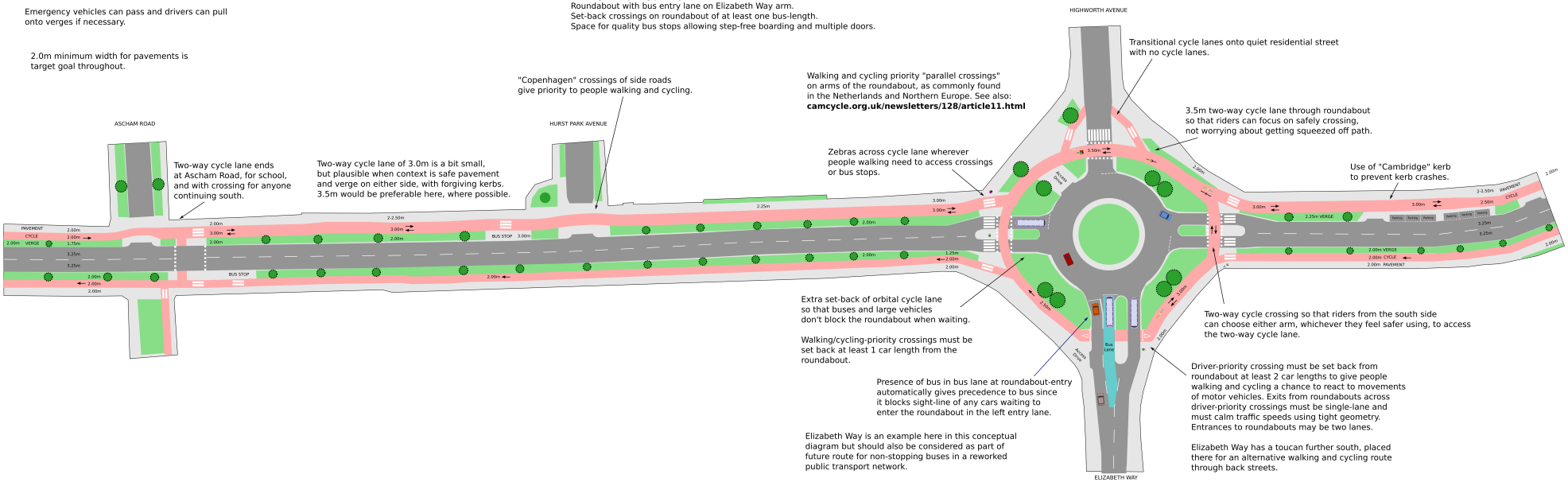
Features:
Separate walking and cycling paths protected by trees and verges.
Walking and cycling priority roundabout on three arms.
Roundabout with bus entry lane on Elizabeth Way arm.
Set-back crossings on roundabout of at least one bus-length.
Space for quality bus stops allowing step-free boarding and multiple doors.

Principles:
Good pavements, separate cycle lanes, better crossings.
People protected from motor traffic by trees and verges.
Reclaim excessive tarmac in favour of public space and trees.
Walking has highest priority, followed by cycling & public transport.
Stay within highway boundary.

3.25m width for carriageway lanes is more than sufficient for large vehicles like buses and lorries, and enables passing when clear.

Emergency vehicles can pass and drivers can pull onto verges if necessary.

2.0m minimum width for pavements is target goal throughout.



MILTON ROAD SECTION 3A

with "Simultaneous Green"-junction and peak-time "Queue Jump" bus lane.

Principles:
Good pavements, separate cycle lanes, better crossings.
People protected from motor traffic by trees and verges.
Reclaim excessive tarmac in favour of public space and trees.
Walking has highest priority, followed by cycling & public transport.
Stay within highway boundary.

Rough sketch of possible idea for reconfiguring Arbury Road junction that reclaims a great deal of open public space. First, expand pavements until there are only 2 carriageway lanes. Then, realign Union Lane so that it is squared-off, even if that means a staggered junction. All movements are still possible, but now the amount of tarmac is significantly smaller.

On top of newly expanded pavements, place separate and protected cycle lanes that continue all the way up to the junction. The crossings will be controlled by the usual traffic signals but there will also be low-level signals that tell people cycling when it is safe for them to proceed through the junction.

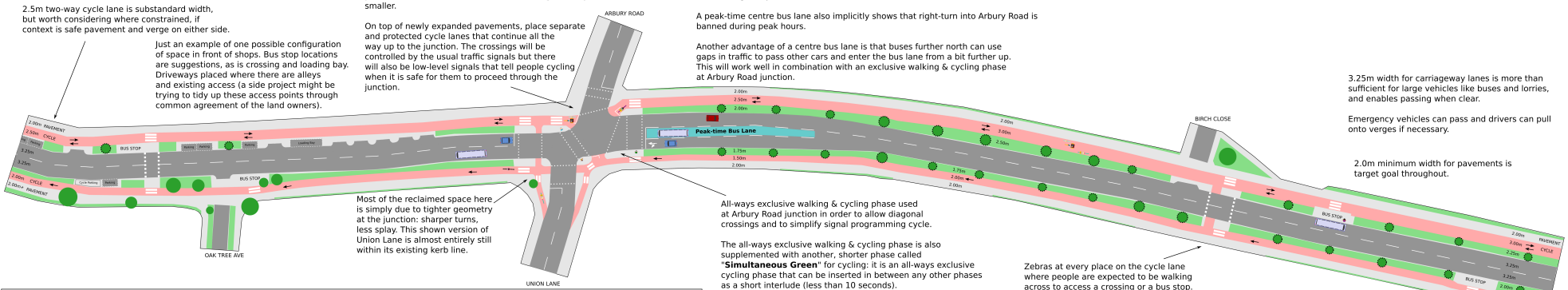
2.5m two-way cycle lane is substandard width, but worth considering where constrained, if context is safe pavement and verge on either side.

Just an example of one possible configuration of space in front of shops. Bus stop locations are suggestions, as is crossing and loading bay. Driveways placed where there are alleys and existing access (a side project might be trying to tidy up these access points through common agreement of the land owners).

Peak-time centre bus "queue jump" lane can be used as a right-turn lane off-peak. When bus is detected the traffic signal controller will schedule a bus early "headstart" at its next green phase.

A peak-time centre bus lane also implicitly shows that right-turn into Arbury Road is banned during peak hours.

Another advantage of a centre bus lane is that buses further north can use gaps in traffic to pass other cars and enter the bus lane from a bit further up. This will work well in combination with an exclusive walking & cycling phase at Arbury Road junction.



3.25m width for carriageway lanes is more than sufficient for large vehicles like buses and lorries, and enables passing when clear.

Emergency vehicles can pass and drivers can pull onto verges if necessary.

2.0m minimum width for pavements is target goal throughout.

Most of the reclaimed space here is simply due to tighter geometry at the junction: sharper turns, less splay. This shown version of Union Lane is almost entirely still within its existing kerb line.

All-ways exclusive walking & cycling phase used at Arbury Road junction in order to allow diagonal crossings and to simplify signal programming cycle.

The all-ways exclusive walking & cycling phase is also supplemented with another, shorter phase called "**Simultaneous Green**" for cycling: it is an all-ways exclusive cycling phase that can be inserted in between any other phases as a short interlude (less than 10 seconds).

Because people cycling clear junctions quickly, and negotiate crossing paths naturally (e.g. on Midsummer Common), this short interlude "Simultaneous Green" can be used more than once each signal cycle in order to separate people cycling from motor vehicles entirely while still providing moderate waiting times.

"Simultaneous Green" is effectively a shorter version of the all-ways exclusive walking & cycling phase that can be used when there is nobody waiting to walk across the junction.

Zebras at every place on the cycle lane where people are expected to be walking across to access a crossing or a bus stop.

Cycle lane can be narrower (down to 1.5m for one-way) for short sections such as behind bus stops, where there should also always be a Zebra.

Examples of what different phases might look like. Actual selection of durations and signal programming plan would depend upon traffic study and modelling.

MILTON ROAD SECTION 3B

EXISTING TREE

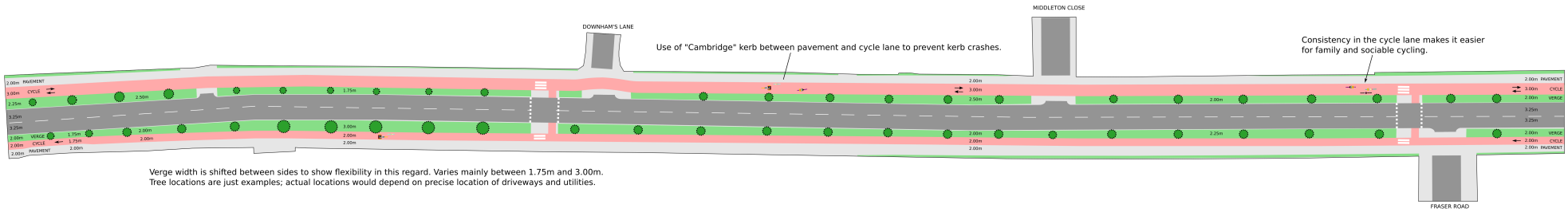
POTENTIAL NEW TREE

Principles:
Good pavements, separate cycle lanes, better crossings.
People protected from motor traffic by trees and verges.
Reclaim excessive tarmac in favour of public space and trees.
Walking has highest priority, followed by cycling & public transport.
Stay within highway boundary.

Milton Road Residents Association MRRA

CAM CYCLE

HPERA Hurst Park Estate Residents Association



Verge width is shifted between sides to show flexibility in this regard. Varies mainly between 1.75m and 3.00m.
Tree locations are just examples; actual locations would depend on precise location of driveways and utilities.

Milton Road MRRA Residents Association

CAM CYCLE

HPERA Hurst Park Estate Residents Association

Principles:
Good pavements, separate cycle lanes, better crossings.
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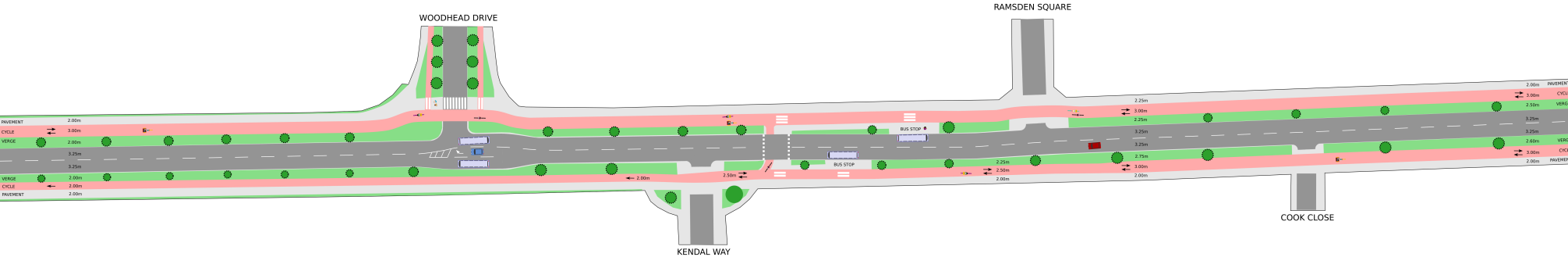
Stay within highway boundary.

MILTON ROAD SECTION 4A

EXISTING TREE

POTENTIAL NEW TREE



Milton Road Residents Association

CAM CYCLE

HPERA
Hurst Park Estate Residents Association

Principles:
Good pavements, separate cycle lanes, better crossings.
People protected from motor traffic by trees and verges.
Reclaim excessive tarmac in favour of public space and trees.
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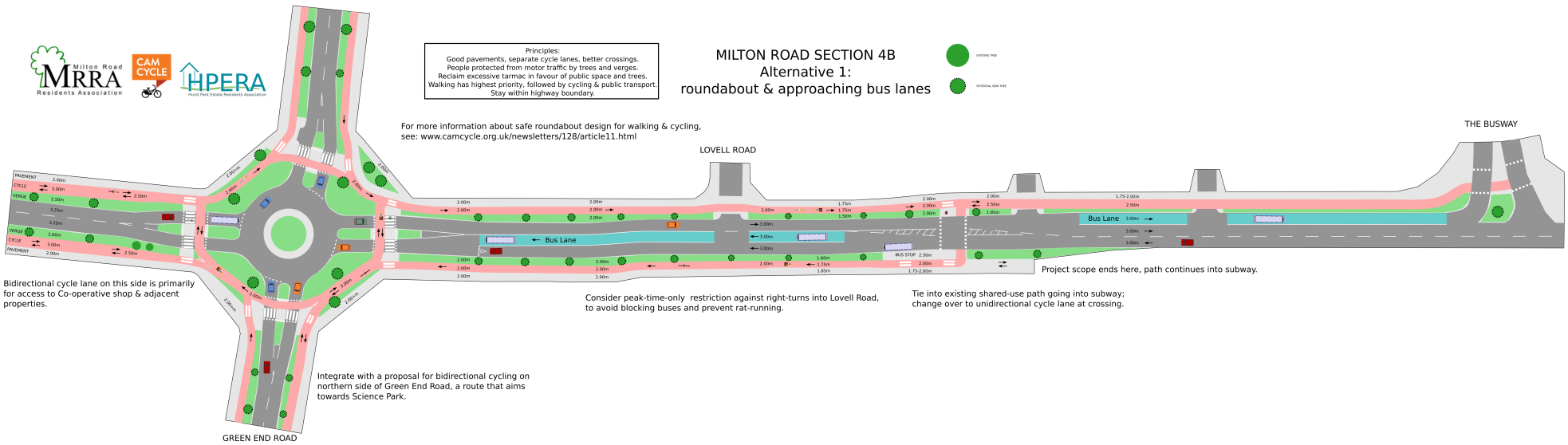
Stay within highway boundary.

MILTON ROAD SECTION 4B
Alternative 1:
roundabout & approaching bus lanes

EXISTING TREE

POTENTIAL NEW TREE

For more information about safe roundabout design for walking & cycling, see: www.camcycle.org.uk/newsletters/128/article11.html



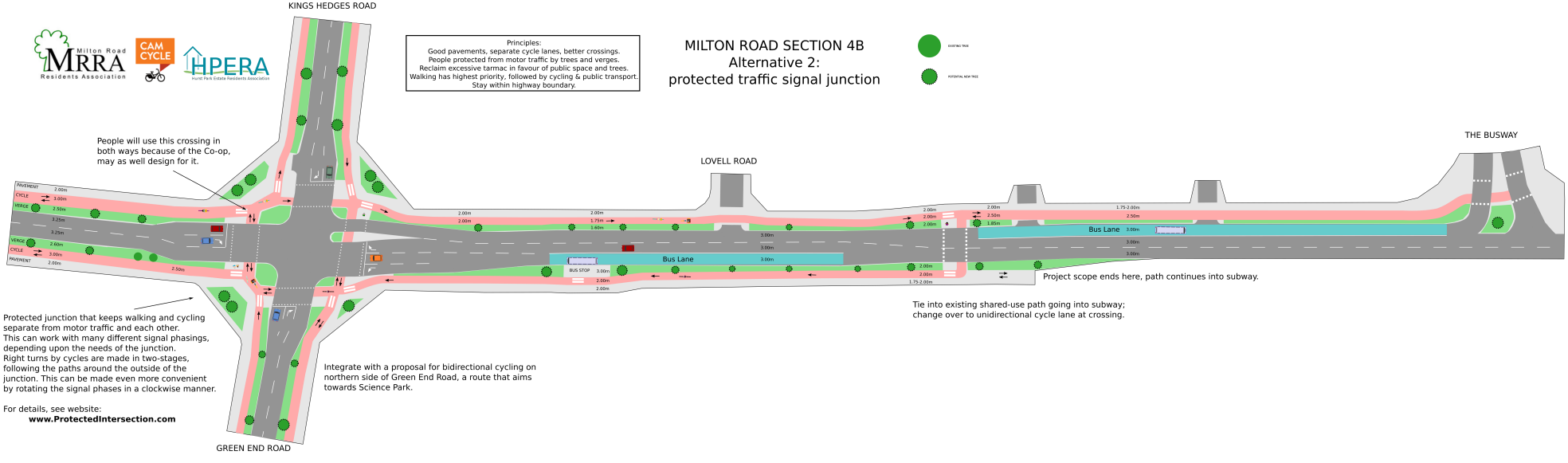
Bidirectional cycle lane on this side is primarily for access to Co-operative shop & adjacent properties.

Integrate with a proposal for bidirectional cycling on northern side of Green End Road, a route that aims towards Science Park.

Consider peak-time-only restriction against right-turns into Lovell Road, to avoid blocking buses and prevent rat-running.

Tie into existing shared-use path going into subway; change over to unidirectional cycle lane at crossing.

Project scope ends here, path continues into subway.


KINGS HEDGES ROAD
Principles:
Good pavements, separate cycle lanes, better crossings.
People protected from motor traffic by trees and verges.
Reclaim excessive tarmac in favour of public space and trees.
Walking has highest priority, followed by cycling & public transport.
Stay within highway boundary.
MILTON ROAD SECTION 4B
Alternative 2:
protected traffic signal junction
EXISTING TREE
POTENTIAL NEW TREE
People will use this crossing in both ways because of the Co-op, may as well design for it.
LOVELL ROAD
THE BUSWAY
PAVEMENT 2.00m
CYCLE 3.00m
VERGE 2.50m
3.25m
3.25m
VERGE 2.60m
CYCLE 3.00m
PAVEMENT 2.00m
2.50m
2.00m
2.00m
1.75m
1.60m
3.00m
3.00m
BUS STOP 3.00m
Bus Lane 3.00m
2.00m
2.00m
2.00m
2.00m
2.00m
2.50m
1.60m
1.75-2.00m
2.50m
Bus Lane 3.00m
3.00m
3.00m
3.00m
2.00m
2.00m
1.75-2.00m
Project scope ends here, path continues into subway.
Tie into existing shared-use path going into subway; change over to unidirectional cycle lane at crossing.
Protected junction that keeps walking and cycling separate from motor traffic and each other.
This can work with many different signal phasings, depending upon the needs of the junction.
Right turns by cycles are made in two-stages, following the paths around the outside of the junction. This can be made even more convenient by rotating the signal phases in a clockwise manner.
For details, see website:
www.ProtectedIntersection.com
Integrate with a proposal for bidirectional cycling on northern side of Green End Road, a route that aims towards Science Park.
GREEN END ROAD