

grade-separated crossings

Barton Park and the A40

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a cautionary tale

This is mostly about Barton Park and its crossing over the A40, but if you've never heard of that or been there don't worry, I will provide background.

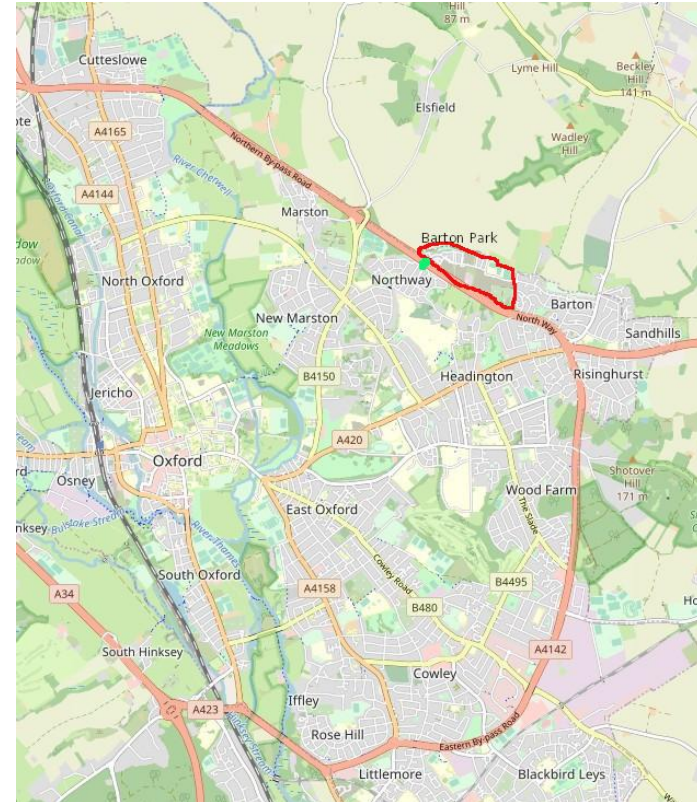
I hope we can improve things for the residents of Barton Park and Northway, but this is meant as a cautionary tale, which I hope will help in making decisions elsewhere.

the Barton Park crossing - an introduction

Barton Park is a new development east of Oxford, just outside the ring road, north-west of Barton. It will have nearly 900 homes when complete.

Its spine road connects to Barton and this junction with the ring-road (the A40). The Headington roundabout is 1.8 km southeast; the Marsh Lane junction 0.8 km northwest.

The junction allows car traffic in and out of Barton Park, but only (with camera enforcement) buses and taxis in and out of Northway on the other side.

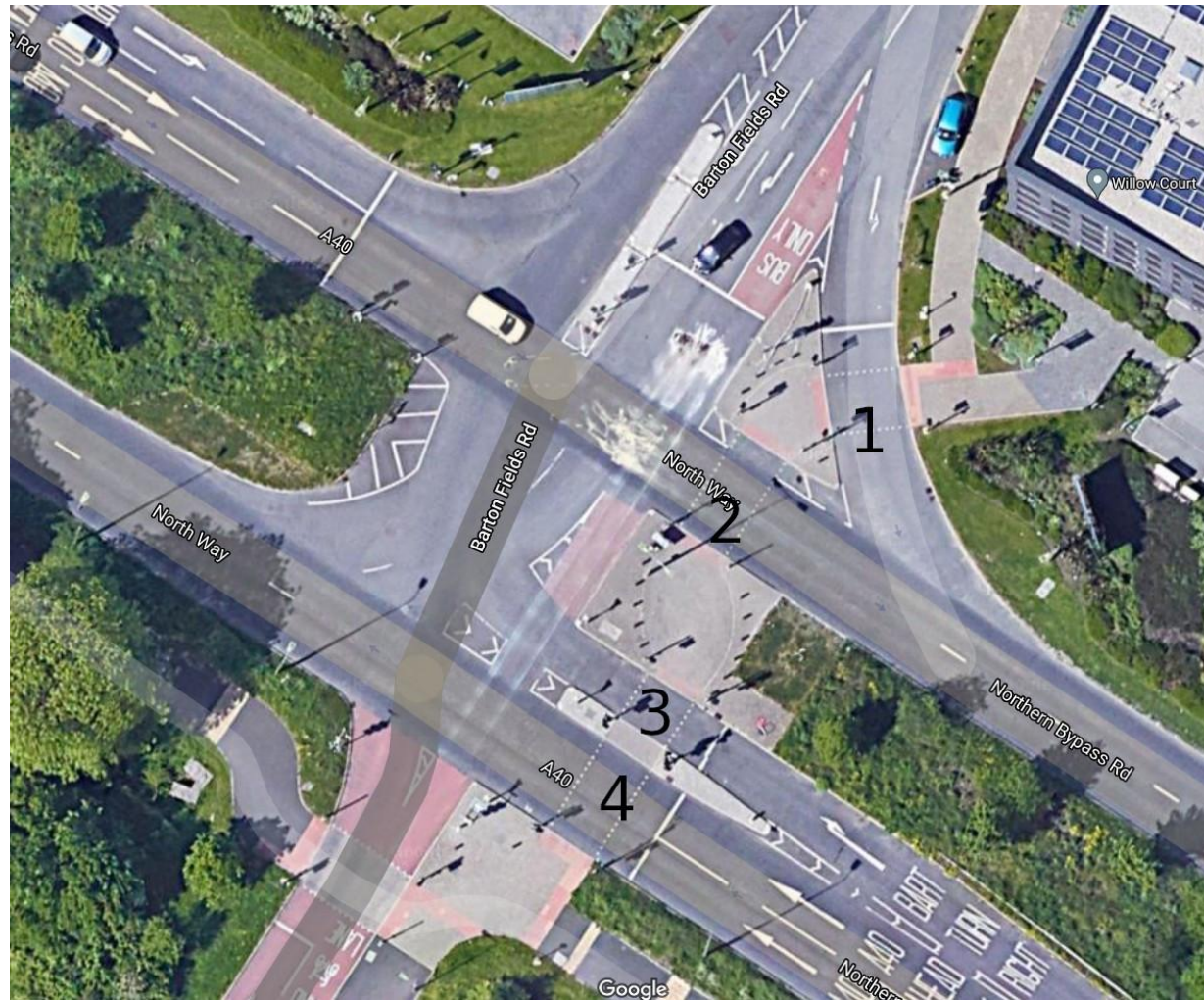


the crossing

from Barton Park

1. 5m
2. 8m
3. 3.5m
4. 7.5m

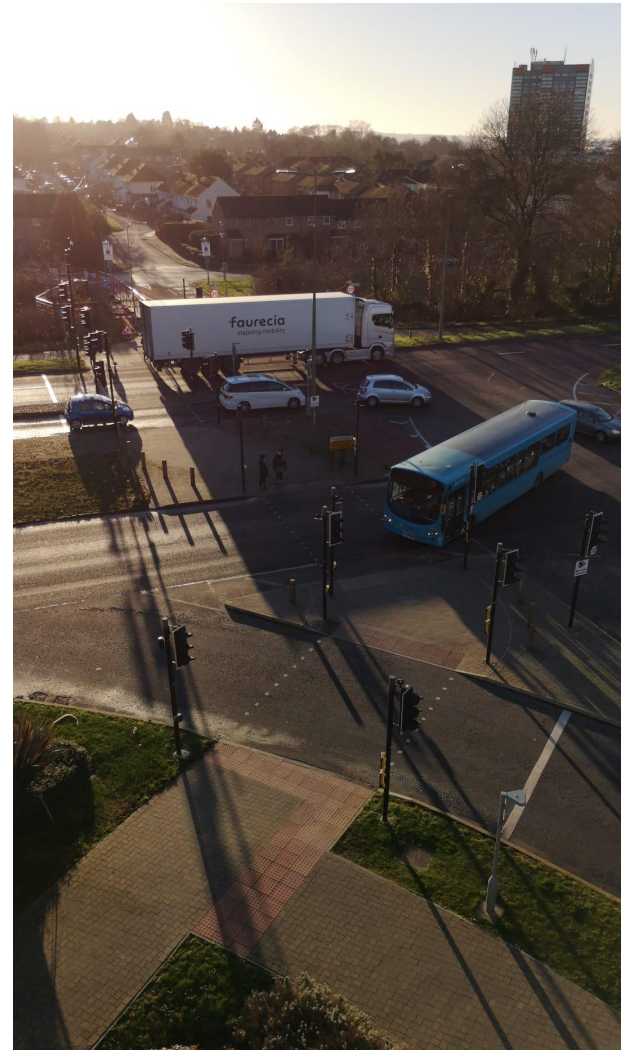
The last two can be done in one signal phase.



another view

This is a resident photo taken from one of the Barton Park apartment blocks.

It shows a bus illegally u-turning, stopping two people from crossing on a green phase. The HGV is staying on the A40, the cars are turning into Barton Park.



a typology of failure

We have

- Demand
- Directness

But

- Danger
- Delay
- Discomfort
- Dinginess

The last four are an inversion of the principles of Dutch cycle design.

demand

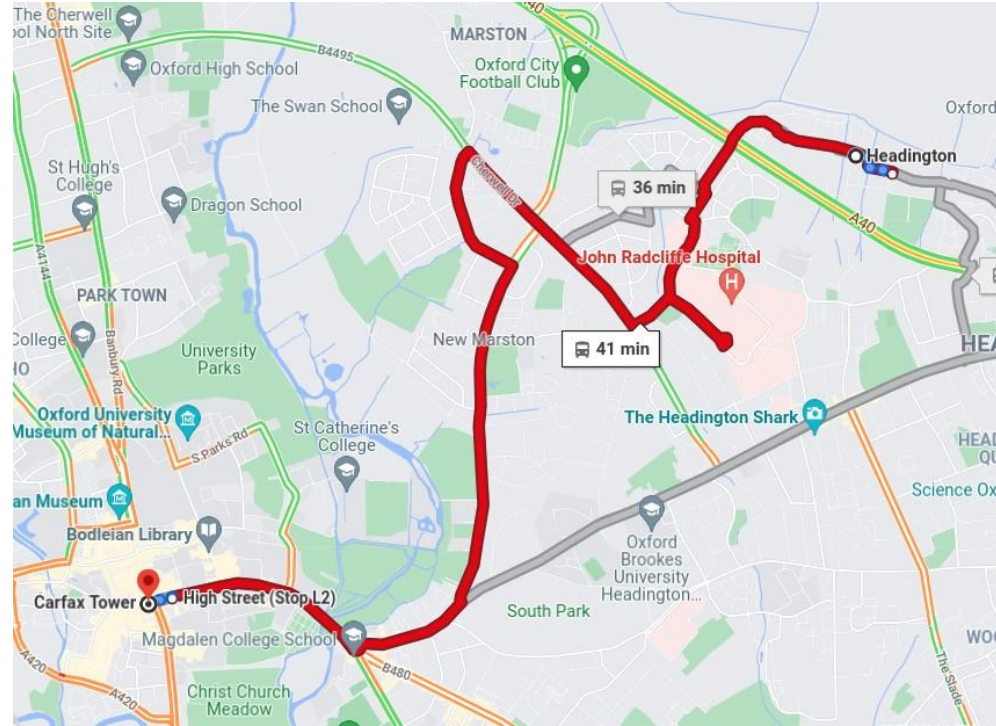
When complete, Barton Park will house nearly 3000 people, but it will have very limited shops and services. There are some in Barton, but most access to employment, shopping, high schools, etc. requires crossing the A40. Even getting to Oxford Parkway for rail connections does, as that requires using the cycle track on the inner side of the A40.

There is also some demand the other way, from children in Northway attending Barton Park primary.

walk, cycle, bus

There is a bus service running through Barton Park, connecting to the JR, Marston, and High St (and then to Abingdon). But this runs every twenty minutes during the weekday and is circuitous.

Cycling is much faster to Summertown or the science area – and even to the JR, the Swan school, or Carfax. The JR is within walking distance, around a mile away.



directness

The Barton Park crossing is on the desire line for many trips. Alternative routes are so indirect as to be effectively non-existent.

There is no alternative crossing to the north - the Marsh Lane bridge is 800m away, but there is no route to it on the outside of the ring-road.

There is an underpass of the A40 1.3km to the south, but that is a 1.6km walk from the Barton Park crossing (as there is, again, no direct track along the outside of the ring-road). It is also unusable by larger cycles – Pedal & Post don't serve Barton.

danger

Looking at the STATS19 database, there have been just three injuries at or near the crossing, one serious pedestrian injury in 2018, and car occupant injuries in 2018 and 2020. But there were at least two more ambulance callouts to the junction in 2021 (not in the database yet).

In any event, we need to avoid a "no one dies swimming in this shark-infested river" approach to road danger. This crossing is so hostile some people will try to avoid using it. And less than half the housing in Barton Park has been built yet.

As so often in the UK, danger has been reduced by compromising on everything else, by imposing delays and discomfort on anyone walking or cycling.

red light running

The most obvious risk is someone running a red light, quite likely at 70mph despite the 50mph limit, and hitting a pedestrian. An informal and incomplete resident log of incidents includes regular entries like this:

"Went through red lights nearly killing me. Didn't have time to film as was busy jumping back but made an effort to remember the plate. Didn't even try to brake and red was on long not just switched. I was already stepping onto the crossing as it was green and then realised that the car on the far lane kept going full speed."

"Can we report cars going at 70mph through red lights? and who do we speak to. Grey Bmw. Just now. Didn't get number plate as too fast. If it wasn't for the fact that I saw they were never gonna stop, I might be dead. Cause it was green pedestrian lights and they went over at full speed."

speed and size

This is the kind of location that may produce relatively few collisions but will kill people. In a 50mph zone where 70mph feels natural, any kind of collision is likely to produce a serious injury, likely a fatality for anyone walking or cycling.

Even if it is not part of the strategic road network, the A40 is a major trunk route and carries a lot of HGVs, which adds to the potential dangers.

The one pedestrian collision so far resulted in a serious injury, when on roads inside Oxford slight injuries outnumber serious ones by maybe 10-to-1.

if it looks like a 70mph dual carriageway...

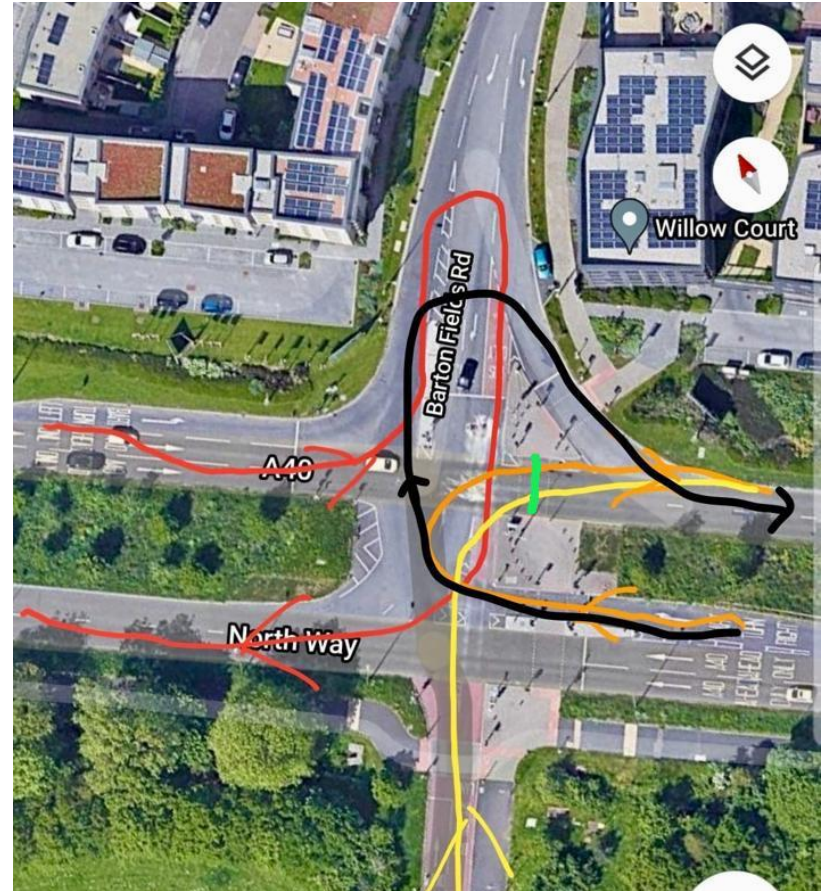


This is what the A40 looks like a hundred metres southeast of the Barton Park crossing. (It is 50mph here, but northwest of the junction it is 70mph.)

u-turns

The prohibited yellow right-turns (by taxis and sometimes buses) and orange u-turns bring motor vehicles into direct conflict with a pedestrian green phase.

The black and red u-turns are not prohibited, but probably should be. They pose risks to other vehicles and people cycling, and potentially to pedestrians crossing the slip road.



cycling

Cycling from Barton Park to Northway, the signals are timed to let a queue of cars exit. But cycling the other way, on the "bus only" route out of Northway, the timing seems to be set to get one bus across the junction. I get across just as the lights go amber for southbound motor traffic, so anyone slower than me - maybe half the people currently cycling - is likely to be inside the junction when motor traffic starts moving through it.

This is not accessible for children, either accompanied primary pupils or independent secondary school students, or for slower adults. My limited observations suggest most people cycling use the pedestrian crossing.

delay

I have timed a complete crossing at 2 to 3 minutes, but that was off-peak. Residents report crossing times up to 8 or 9 minutes.

The signals are set to "rest on red", where traffic lights remain red unless cars approach. This is used elsewhere on low traffic streets to minimise delays for pedestrians, but here it has the opposite effect, given the high traffic flows: the pedestrian phase is delayed until there's a gap in the traffic. That avoids vehicles having to slow abruptly, and so reduces the number running red lights, but it also works to prioritise motor traffic at the expense of pedestrians.

Buses and cycles going across the junction still face delays, but can at least get across in one phase.

not active travel friendly

The worst delays happen in peak hour, when the largest number of people want to cross and when work or school trips are likely to be time-sensitive. An 8 minute delay is a complete killer for active travel, but even a 3 minute delay decreases the 15-minute walkable or cycleable area by a third.

And unpredictability negates the consistent trip times which are one of the big advantages of walking or cycling: I'm told the head teacher at Barton Park primary gives kids from Northway leeway in being late because of this.

discomfort

The wide, multi-stage crossing feels hostile.

Waiting to cross is not pleasant. There are bollards protecting a central space on the main central island, where children are apparently kept in a protective huddle. There is no shade and no shelter from rain. It's noisy, smelly, and there's barely enough distance to avoid spray from vehicles when it's wet. And the common confusion about clearance phases and green walk symbols means people sometimes end up stuck on the 1.2m wide "island", directly adjacent to HGVs.

Note the advice in LTN 1/20 that cycle tracks have a 2m buffer from 50mph traffic.

resident quotes

"Every time I stand by the crossing - like just now, I want to move house when lorries and cars speed by at 70+. I hate it."

"The pedestrian push buttons are far too close to the road, you can feel the suction when cars drive at 60/70mph."

"I feel very unsafe myself. I don't think it is safe at all. Probably one adult on their own or with a child in a pram/pushchair is the least dangerous but they have to manoeuvre so the pushchair is behind them when they press the button."

dinginess

Even on a clear sunny day at noon, with relatively little traffic, this is not an attractive place to stand around for up to eight minutes. It's basically a sea of tarmac, with any vegetation cleared to ensure open sight lines.

There's not necessarily that much traffic at night, and drivers are not so likely to stop when doing 60mph. And, while the junction is at least notionally overlooked by some of the blocks in Barton Park, the Northway side of the crossing is a good 60 metres from the nearest housing. So there may be some personal safety concerns, exacerbated by delays to crossing.

effects

The problems with this crossing cripple Barton Park as a fifteen-minute neighbourhood. They will be generating otherwise avoidable car trips to shops, schools, employment, etc. And residents without access to cars are left with compromised mobility and/or quality of life.

Barton Park gets a mention in Transport for New Homes' just released report ["Building Car Dependency"](#), as an example of "severed community".

To my mind, this undoes the entire justification for building housing in Barton Park.

what can be done?

Part 6 moving traffic powers could be used to enforce bans on u-turns and right-turns out of Northway with cameras. This should be fairly easy, and indeed the Barton Park crossing is in the priority list. Additional restrictions could prohibit immediate u-turns inside Barton Park itself.

The signals could be changed to give pedestrians more time to cross (and avoid people getting stuck on the micro-island).

The "rest on red" timing could be abandoned and replaced by much longer amber phases to ensure faster traffic has time to slow down. Complete crossing times could be capped at (say) three minutes.

engineering

The "beg buttons" could be rotated to face away from the carriageway.

The left-turn slip road out of Barton Park could be narrowed.

A kerbed median could be put into Barton Fields Rd to stop immediate u-turns on entry to Barton Park .

speed limits

The speed limit at Barton Park could be dropped to 30mph or even 20mph and enforced with speed cameras.

This would need funding, but more problematically would need Thames Valley Police to agree to putting in cameras.

Lowering speed limits that far without that enforcement might be dangerous – the signal timing would still have to be arranged to cope with drivers doing 60mph or more, either with a "long amber" giving them time to clear the junction or a delay between their red and the pedestrian green.

a trade-off

There is an unavoidable trade-off between pedestrian safety, pedestrian accessibility, and motor traffic speed and throughput.

The more time provided for pedestrians to cross and the shorter the delay between pedestrian phases, the longer the delays to people driving. And using the signals to reduce the incidence of red-light running and improve safety – either with "rest on red" or with longer red or amber phases – also creates delays, either for pedestrians or drivers.

With 50,000 motor vehicles a day, speed reduction alone is always going to have a limited effect (cf LTNs).

signal changes

Without speed limit or red-light cameras, some signal changes could still be useful:

- "rest on red" should be abandoned, and instead a long amber or long red phase be used to reduce the risk of red-light running - a full crossing should be capped at (say) three minutes
- five seconds should be added to the time allowed for buses, taxis and cycles to get from Northway to Barton Park
- the green man phase on the southwest crossing should be lengthened, to make it less likely for pedestrians to get stuck between the turning lane and the northwest-bound A40

grade separation

The obvious solution at Barton Park is grade-separation. And the earliest plans had an underpass, for buses as well as pedestrians and cycles.

- no delay – advantaging active travel and public transport over car use
- next to no danger - 10yos could walk from Northway to Barton Park primary + 12yos cycle from Barton Park to the Swan school (barring other barriers)
- could be made attractive – look at [Dutch models](#) for underpasses, not examples from elsewhere in Oxford
- an underpass rather than a bridge minimises elevation changes (the plans had the foot and cycle tracks elevated above the bus lanes)

grade separation - recommended

The police objected to making the A40 at Barton Park 40mph because that would be too dangerous. From [an Oxford Mail article](#) in July 2012:

Darren Humphries, traffic management officer with Thames Valley Police, warned: “Considering that almost all the amenities – school, hospitals and the like – will be located on the other side of the ring road from the development, there is likely to be a large vulnerable road user footfall across the road.

It would be dangerous to introduce a potential conflict between these vulnerable road users and the main traffic flow. Crossing points should be in the form of overbridges or subways to minimise the chance of collision.”

The A40 is a Class 2a: Strategic Primary Route in the proposed LTCP Draft Freight and Logistics Strategy, which brings with it "a presumption against at-grade pedestrian crossings".

what went wrong?

But somehow the Barton Park ended up going ahead with a 50mph speed limit and an at-grade crossing.

I don't know the details of what happened. I've heard that there were dreams of making the A40 a boulevard, but also that the underpass was traded away for the primary school. But what matters is that this mistake not be made again.

when to grade-separate

Barton Park is a pretty clear example, but it's hard to generalise and there are no hard guidelines, except on motorways. LTN 1/20, for example, just says that grade separation "may be desirable". In theory grade-separation could be used almost anywhere, but with lower traffic volumes people walking or cycling may prefer even a slightly dangerous or uncomfortable at-grade crossing to avoid elevation change.

The "push" is how dangerous the alternatives to grade separation are – how much motor traffic there is, how much of it is HGVs, and how fast it's moving.

The "pull" is how many people are – or will be, or could be – using the route to walk or cycle.

elsewhere on the ring-road: an unprotected crossing

On the Eastern Bypass: a warning sign and a speed camera sign; then a "check your speed" and a gap-in-the-median "crossing". But very low demand.



elsewhere on the roundabout: east

There are two underpasses at Barton and one at Risinghurst, though they are low quality, narrow, shared-space ones.

There are at-grade signalled junctions at Kiln Lane, the Horspath Driftway, and Horspath Rd. The last two don't connect to large residential areas, but the Kiln Lane crossing does, and is perhaps the closest parallel to Barton Park. It has a nasty cluster of collisions: a fatality, four serious injuries, and five slight ones.

elsewhere on the ring-road: the north

The Wolvercote and Cutteslowe roundabouts are 30mph, but they are complex (the Wolvercote roundabout has six entries) and neither safe nor accessible, for walking or for cycling. Even most adults dismount rather than cycling through the roundabouts, and one would hardly cycle here with an 8yo, or let a 12yo walk or cycle by themselves. The collision record is horrible.

The Cutteslowe Bridge is vital for keeping Cutteslowe connected, but is way off the desire line for most trips.

elsewhere on the ring road: south

The southern arc of the ring-road is well-provided with grade-separated crossings:

- the Kennington roundabout three-way underpass
- the Thames towpath
- the Sainsburys bridge
- the Littlemore roundabout underpass
- Long Lane underpass
- the Tesco underpass
- the BMW underpass

There are also three grade-separated road crossings usable for walking and cycling:

- Kennington Rd
- Cowley Rd Littlemore
- The B480 (not terribly accessible)

funding and prioritisation

In practice provision of grade-separated crossings will be determined as much by the availability of funding as much as by planning and prioritisation.

But the county should develop guidelines for grade-separation, to help guide new housing developments. Such guidelines could also be used to construct a priority list and perhaps even outline plans, ready for use in the event of funding becoming available, possibly specifically for improving crossings.

new developments

A key opportunity to get grade-separated crossings comes with new developments.

If it's not too late, the "Oxford North" development should be required to put in an underpass or bridge across the A40. This is also essential for active connectivity towards Yarnton/Begbroke and Kidlington, and could perhaps be required as part of the expansion at Begbroke Science Park.

The "Salt Cross" Garden Village must include an underpass connecting it to Eynsham. There should also be an underpass either at the A40-B4449-Lower Rd roundabout or 250m to its west, connecting Hanborough Rd to Mill Lane.

Land North of Bayswater Brook

Bayswater is the next development planned outside Oxford's ring-road, adjoining Barton Park to the northwest. It is still in the preliminary stages, but the current plans include a foot-cycle bridge. Apart from being necessary for Bayswater residents, this would potentially help residents of Barton Park as well. It would be 300 metres away from the Barton Park crossing, so would be used by most people cycling and some pedestrians.

The county should insist on the bridge being part of the development, help sort out connectivity at the Northway end (to Borrowmead Rd), and try to make sure that the bridge goes in at the beginning of the project.