Oxford transport: the big picture

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meta

This is

- not comprehensive
- not novel or original
- mostly not Oxford-specific

three kinds of transport problems

- the climate emergency + sustainability more broadly
- peak-hour congestion + hot-spot air pollution + road violence
- invisible (or much less visible) problems

These are interconnected, but they offer quite different perspectives.

the climate emergency

- road transport accounts for about a quarter of UK carbon emissions, and private cars for most of that; transport emissions are also increasing, unlike other areas

- electric vehicles are important, but are not a solution in themselves

> "Globally, only one in 50 new cars were fully electric in 2020, and one in 14 in the UK. Sounds impressive, but even if all new cars sold were electric, it would still take 15-20 years to replace the world's fossil fuel car fleet." (Oxford University Transport Studies Unit, 2021)

resource use

- manufacturing cars is carbon-intensive - EVs are worse (batteries, weight)
- the amount of embedded carbon in cars will reduce as the broader economy decarbonises - with greener steel, for example - but that won't happen fast
- manufacturing multi-ton vehicles will remain resource-intensive in other ways - mining and processing iron, nickel, lithium, etc.
- the UK has one private motor vehicle for every two people, but the world has one for every nine people. Can we insist on more than our share, or accept the manufacture of three billion additional motor vehicles?

reiterating

"In the long-term, widespread personal vehicle ownership does not appear to be compatible with significant decarbonisation. The Government should not aim to achieve emissions reductions simply by replacing existing vehicles with lower-emissions versions." (Parliamentary report "Technologies for meeting the UK's emissions reduction targets", 2019)

"Bangladesh is considered especially vulnerable to climate change, with one-third of the population at risk of displacement because of rising sea levels." (IMF)

For decarbonising Oxfordshire, see "Pathways to a Zero Carbon Oxfordshire"

congestion + hot-spot air pollution + road violence

These are the problems the councils have paid by far the most attention to:

- congestion is very visible, and affects commuters from the broader county as well as city residents
- air pollution measurements (on some of the few fixed monitoring stations) reached levels that are illegal, leaving the city council with potential liability
- the county has committed to Vision Zero, to eliminating fatalities and serious injuries from road violence

A broader approach is needed in tackling these.

congestion

- 46,000 people commute into Oxford on weekdays, 30,000 of them driving (2011 census, more now)

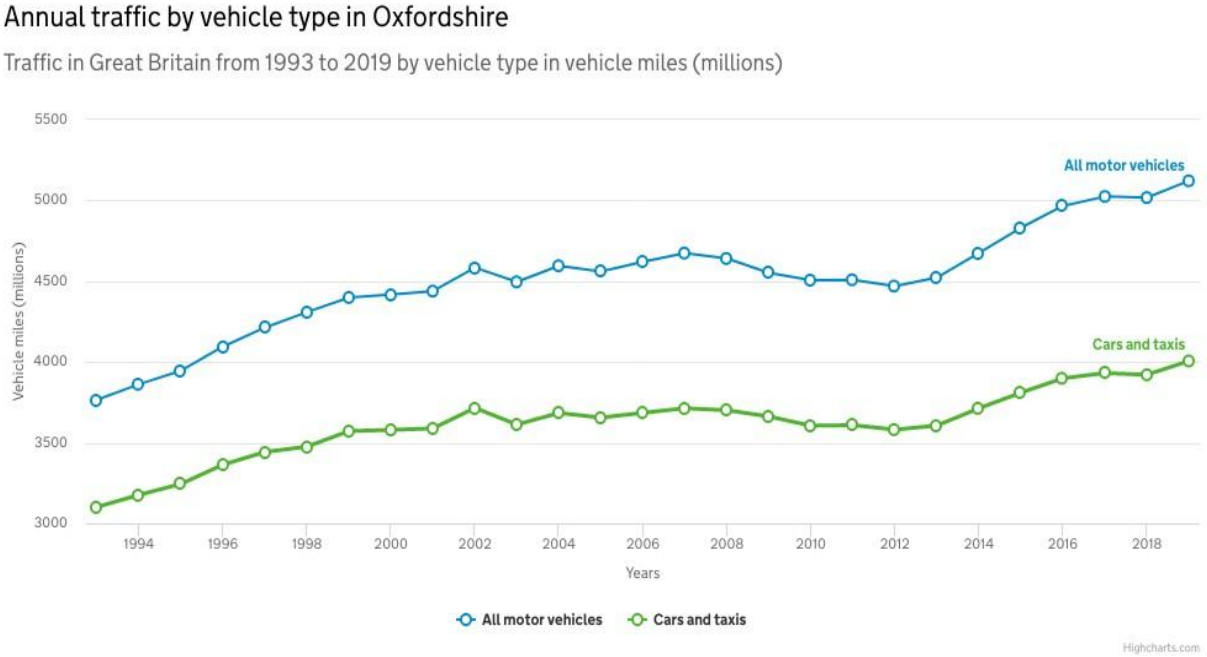
- housing growth and employment growth - inside Oxford, on its perimeter, and in its commuter-belt - have been steadily increasing the number of people needing to move around, both within and into the city

- there isn't any more road space now than there was fifty years ago

- the only solution is a shift from the least space-efficient mode - fewer cars

going the wrong way

5.12 billion vehicle miles were travelled on roads in Oxfordshire in 2019.



congestion cripples the buses

The Oxford Bus Company in 2020: "Fixing congestion is just as important as technology in decarbonising our transport system":

> "Over the last 10 years, our buses have been getting slower as traffic levels in our city from private cars and vans has increased. This has meant that our journey times have become longer, making each bus and driver less productive. This increases the costs of running our services, and also makes them less attractive for customers to use - reducing our revenue."

If buses average 15km/hr it will take two hours to complete a 30km loop and 12 buses will be needed to provide an "every ten minute" service. If the buses average 10km/hr, then 18 buses will be needed. That means more drivers and more fuel, so higher operating costs, but also more buses, so higher capital costs.

the harms done by attempts to reduce congestion

- every main road junction in Oxford has been designed to maximise motor traffic throughput, at the expense of safe and accessible walking and cycling

- extra lanes for right-turning motor traffic, or for buses, have been prioritised over adequate footways and cycle lanes or tracks

- motor traffic has been allowed to take over side streets that are unsuited for high volumes of traffic, inhibiting walking and cycling of even short local trips

Attempts to reduce congestion that cripple alternative modes are not the way forward, even if they worked (which they clearly haven't).

junctions

It is quite typical for pedestrians to face four- or even five-stage crossings taking four minutes or more, while people cycling have almost no support.

The Warneford Lane-Old Rd junction was rebuilt in 2016-2017, with changes to improve motor traffic throughput: "road alignment amended to accommodate two lane approach out of Roosevelt Drive" and "two lane approach storage increased" (on Old Rd). As well as longer pedestrian crossings, this shunted the cycle lane on Old Rd onto the pavement, for example, with sideways "hops" required to get onto and off it.

congestion is self-limiting

- if we make changes to reduce congestion (by adding lanes or optimising junctions) then some people will switch to driving from other modes, undoing some of the gain - "induced demand"

- conversely, if congestion gets worse then some people will change routes, or switch to working different hours, or working from home, or cycle or bus instead

- in the longer-term, congestion is in a kind of balance with housing and employment, via rents or house prices and salaries

air pollution

- some stretches of Oxford roads have measurements above legal air pollution limits; this is the motivation for the Zero Emission Zone

- electric vehicles will help but while they remove exhaust emissions they still produce particulate pollution from tyre and brake wear and road dust resuspension: "total PM10 emissions from EVs were found to be equal to those of modern ICEVs. PM2.5 emissions were only 1–3% lower"

- the goal should be to improve public health, not just to meet arbitrary legal limits in hot-spots where we happen to have monitoring

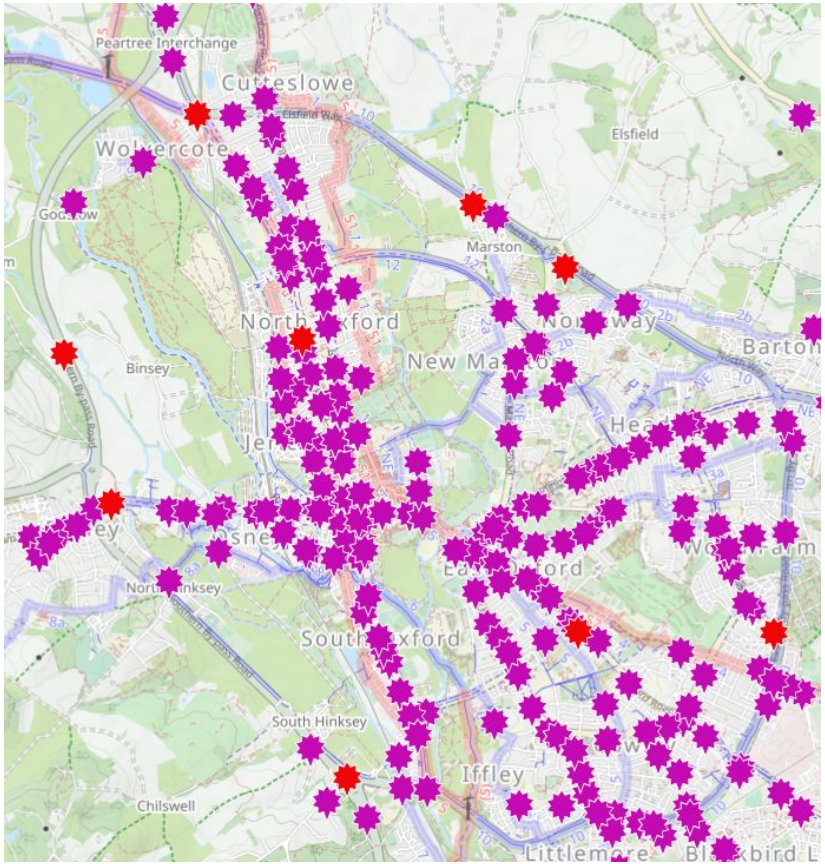
there is no safe level of air pollution

- air pollution affects many aspects of health
- there is no safe level: even PM2.5 (fine inhalable particle) concentrations below 12 mg/m³ significantly increase death rates
- the World Health Organisation recommended air pollution limits are 5µg/m³ for PM2.5 and 10µg/m³ for NO2 - 20% and 25% of the UK legal limits
- short periods passing through pollution hotspots may be less significant than "all-day" pollution: streets, homes, playgrounds, workplaces, etc.

road violence

In the last decade Oxford had roughly 20 fatalities and 500 serious injuries resulting from collisions. (Right: cycle + pedestrian KSIs, 2011-2020)

People cycling are heavily over-represented in these numbers - half of all injuries.



the iceberg of road violence

Deaths and serious injuries are just the tip of a much larger iceberg of harm.

There were also 2800 slight injuries in Oxford in the last decade, and many more minor injuries and collisions which aren't reported at all. Following Ling Felce's death at the Plain, I heard several comments like "Oh yes, I've been knocked off my bike twice at the Plain - no, I didn't report it either time."

And this level of road danger means that maybe half the population either will not cycle at all or will do so only in restricted places and times; many people are even deterred from walking, or letting their children walk.

invisible transport problems

- there are things people don't do, perhaps even can't do - trips they don't make at all, transport modes they don't have access to, and so forth. Basically forms of **transport poverty**.

- these are invisible because they are things that aren't happening - and even the people involved often don't realise things could be otherwise

- this is mostly about public transport and active travel, but…

cars

Consider the problems faced by people without access to a motor vehicle:

- many services assume access to a car. Some covid testing and/or vaccination sites were hard to get to without a car, or were drive-in only.

- in the 2021 census 32% of Oxford households had no car or van - and some people in those that do may not have access to the vehicle. 25% of UK adults don't have a driving license.

- car-centric planning and services curtail independent child mobility, and exclude many adults. Women, disabled people, black and Asian people, and poorer people are all less likely to have either a driving license or access to a car.

buses

Oxford has a decent bus network. But often:

- there is no suitable bus service
- service frequencies are too low or trips take too long
- getting to or from bus stops is hard - they are too far away or getting to them involves hostile streets (frailer adults, people with children)
- there's no room for the buggy or wheelchair on the bus
- the fares are too expensive

cycling

For a lot of cases, cycling is the best way to get around Oxford.

- fast - cycle freight company Pedal & Post has halved the times for getting critical medical supplies from manufacturing sites to the Churchill and JR
- reliable - very low variation in journey times
- cheap - you don't need a fancy bike for short get-around-town trips
- sustainable - energetically it's the most efficient of any form of transport (even e-bike batteries are a hundred times smaller than EV ones)

but people aren't cycling

- Oxford cycling rates are perhaps one third of what they could be. Few children and older/frailer adults cycle. Many people only cycle a few safe and familiar routes, or only on Sundays.

- Even with young adults, only half of Oxford University students have bicycles, and a much smaller fraction of Brookes students. Why not ~90% as in the Netherlands?

- The roads in Oxford are hostile. There are no safe and accessible routes between many areas of the city.

  "Despite the huge numbers of cyclists using them, Oxford's main roads and junctions are still laid out almost entirely for the benefit of the motor vehicle." (*Running out of Road*)

walking

At least we can still walk everywhere?

- crossing main roads is often stressful, even dangerous; smaller streets with high volumes of traffic but no formal crossings can be worse
- the main road junctions in Oxford are anti-pedestrian, often requiring long multi-stage crossings; some don't even have pedestrian phases
- footways are often too narrow, or parked on, or shared with people cycling
- all of this is worse for children and their carers, and for slower or frailer adults

walking examples

- there are children who live less than 500 metres away who are driven to my daughter's school - but what might be a 6 minute walk can be nearly 10 minutes once the junction crossing time is included, and that extra 3 to 4 minutes (x4x5 = an hour a week for parents) is pretty unpleasant

- people can find even getting across the street outside their house hard

  > "One of the worst points for us [pre-LTN] was actually crossing the road just outside our house on Cowley Road Littlemore – this could take a good 5mins to get a safe gap in the traffic (which included HGVs regularly)."

- the street I live on has no coordinated dropped kerbs for a wheelchair or buggy; also nowhere to sit for anyone who finds walking 700 metres tiring

a multi-modal example: getting into town

Central Oxford has free museums and other great resources for families with children. But how do they get there from Cowley?

- it's too far to walk, at least with most younger children

- if the parents are confident then cycling with infants or small children is relatively easy - child bike seats are cheap and accessible - but moving older children involves either expensive cycles (tandems, cargo bikes, trailers) or having them cycle their own bikes on hostile roads

- a family day bus pass is £8.50, which is a significant constraint for some families - the ones least likely to have cars

physical and social inactivity - community severance

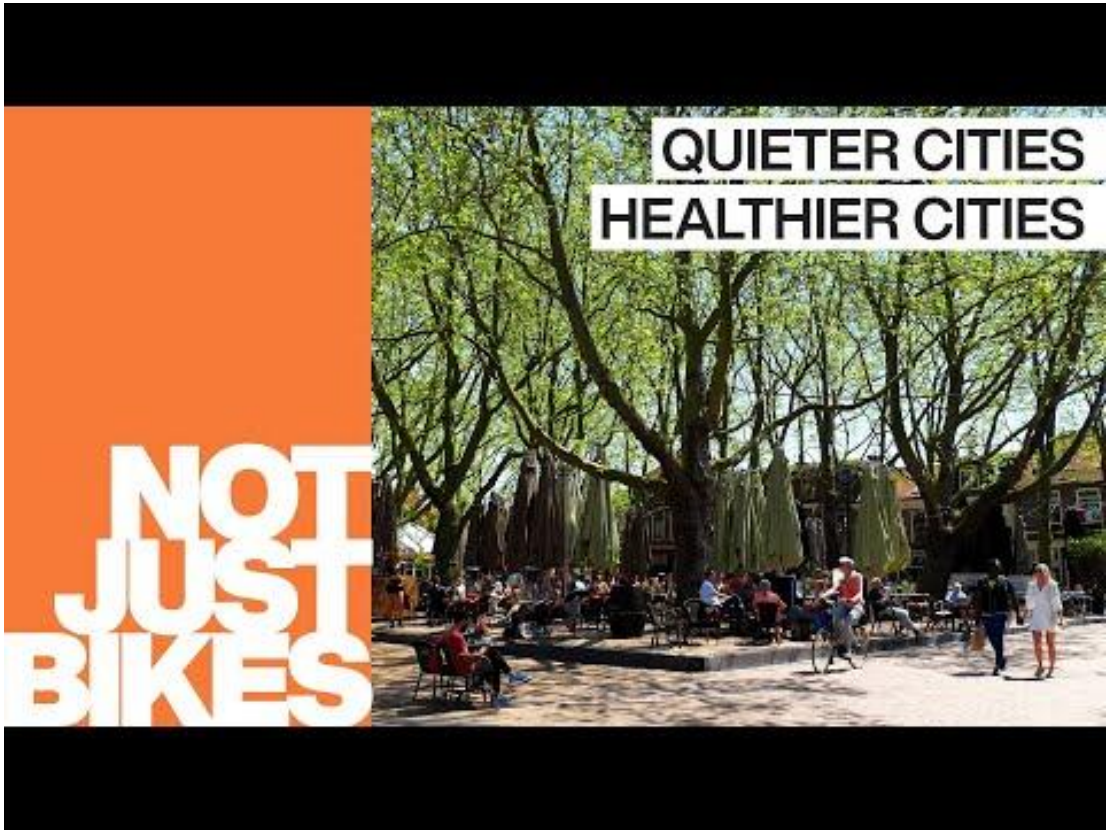
Physical inactivity is a huge contributor to health problems. Preaching exercise has very limited success; embedding exercise in everyday life actually works, and active travel offers the easiest way to do that.

Social inactivity is often a concomitant: hostile main roads and junctions, side streets carrying too much traffic, etc. all contribute to community severance. There's a famous study by Donald Appleyard, showing that people had more friends if they lived on streets with less traffic, which has been repeated recently in Bristol.

noise pollution

High levels of noise induce stress and disrupt sleep, and contribute to a range of health problems.

"Noise can pose a serious threat to a child's physical and psychological health, including learning and behavior." (US Environmental Protection Agency)



https://www.youtube.com/watch?v=CTV-wwszGw8

motor traffic is a problem in different ways

A 500m school-run may be worse than 50 km driven on a motorway.

- for road danger and short-range pollution, car trips in areas where people walk and cycle and spend time are the worst - outside schools, the Cowley Rd shops, the city centre, local streets, etc.

- for greenhouse emissions, long and/or regular trips are the worst - long commutes and school-runs, car-touring holidays

- for congestion, trips on particular roads at particular times are the problem - most obviously commute and school-run trips, but also Westgate traffic

- for resource use and storage space, cars themselves are the problem

what do we need?

- looking at the challenges, Oxford needs to aim for maybe 25% of current car numbers and maybe 50% of current car-miles

- why are these numbers different? The people who drive most are the ones least likely to give up car ownership, and those who use their cars only occasionally will continue driving using car-clubs, car sharing, taxis, and car-hire.

- in Oxford, a 30% reduction in peak traffic would reduce congestion enough for both free bus flow and a major reallocation of space and time to active travel

- this would also significantly reduce air pollution and noise pollution, free up space for public realm improvements, and so forth

how do we achieve this

- a shift from driving to walking, cycling and public transport
- a shift from car ownership to use of car sharing (hiyacar), car-clubs (Co Wheels, Zipcar), taxis, and hire-cars
- some rebalancing of employment and housing, and of people and services more generally; a shift to local business and a "fifteen-minute" city
- a broad range of different tools, including sticks as well as carrots. It can't be done just by improving public transport and active travel - especially in Oxford, where space is limited and private motor traffic takes more than its share of that.

"demand management" - deterring car use

- parking controls - Workplace Parking Levy, Controlled Parking Zones
- mode priority - traffic filters, low traffic neighbourhoods
- road pricing or congestion charging
- rationing (e.g. only odd numbered plates allowed to drive on Mondays)

The councils have opted, in backing traffic filters, low traffic neighbourhoods, CPZs and a Workplace Parking Levy, for mode priority and parking controls - and the ZEZ can be seen as a kind of congestion charge.

Central Oxfordshire Travel Plan

COTP envisages a complete reworking of Oxford transport. Its core schemes:

- traffic filters prioritising buses on key routes and reducing through motor traffic: covering all routes through the city centre and also Hollow Way and Marston Ferry Rd

- a Zero Emission Zone to reduce pollution and deter cars in the city centre

- a Workplace Parking Levy to deter commuter driving and raise money for active travel and public transport improvements

Ghent as a model

This is ten minutes long, so I won't play it now, but I recommend it. Ghent achieved a massive shift to active travel and public transport. They reached their 2030 cycling target (35% of trips) in 2019!

There's a second video looking at the political challenges involved.

low traffic neighbourhoods

To fully enable active travel, everyone has to be able to walk and cycle around local streets, safely and easily and directly and comfortably: 2-100 walking and 8-80 cycling, people in wheelchairs and pushing buggies, the visually impaired, and so forth.

This is not compatible with high volumes of motor traffic, even with traffic calming: Rymer's Lane was my favourite example of this, with its fourteen sets of chicanes and speed humps.

These streets are too narrow to reclassify as B-roads and provide cycle lanes, signals, crossings, etc. And we need to reduce motor traffic, not encourage it.

main roads and junctions

We need to rebuild main roads and junctions within Oxford to prioritise safe and accessible walking and cycling rather than motor traffic throughput. This means more pedestrian crossings, longer pedestrian phases, proper cycle lanes or tracks, support for cycle turning movements, removal of separate right-turn lanes, etc.

Inside Oxford, bus priority needs to be achieved by traffic filters - there isn't room for dedicated bus lanes in most places, given we need adequate pavements and cycle tracks.

speed limits

The default speed limit in urban areas should be 20mph, raised only where that doesn't create dangers for people walking and cycling - the only real candidate inside the ring-road would be Marston Ferry Rd.

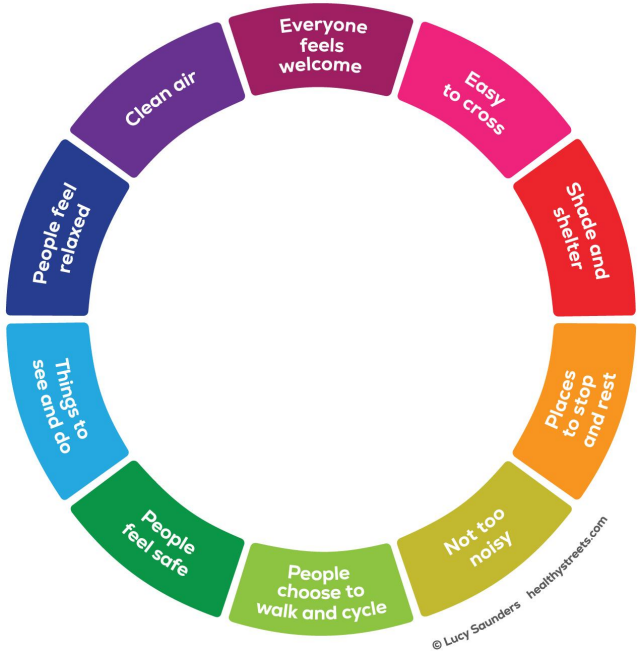
Advisory 15mph speed limits could be used inside parts of LTNs, possibly made legal if that is ever authorised.

A 40mph speed limit on the ring-road, enforced with average speed cameras, would reduce air pollution, noise pollution, road danger, and collision-induced congestion.

Healthy Streets

In addition to the big changes, we need lots of little ones: more dropped kerbs, more trees, better bus stops, places to sit, wider pavements and narrower carriageways, cycle parking, continuous footways across side-roads, places to shelter from sun or rain, and so forth.

Lambeth's Kerbside Strategy is an attempt to address some of these concerns.



public transport options

Alternatives to improving the bus system are impractical or limited.

- **rail expansion** options are limited (an extra platform at the railway station, the Cowley branch line) or expensive and medium-long term (a Witney line)

- Oxford is too small to justify an underground **metro system**, which would be fabulously expensive; **bus tunnels** were a simply farcical idea

- **trams** might be useful, but would need main roads cleared of motor traffic as there are few options for separation; tram lines would be trialled by **bus rapid transit**

- **cable cars** might be useful, but only on a few specific routes

free buses?

Making buses cheaper would be good, but fares are only one obstacle to bus use. Free public transport in Tallinn failed to shift people from driving.

Operating subsidies are expensive. Providing a 50% discount (25% for season tickets) just to Oxfordshire under-19s would cost ~£1 million a year.

If Oxfordshire can get funding for public transport, it might be best targeted at bootstrapping new routes and new services (such as the PickMeUp bus), infrastructure (better bus stops and active travel links to them), and so forth. And it is rural areas which most need transport subsidies, not denser urban areas.

electrification

We need to concentrate on electrifying essential vehicles, and the ones that do the most mileage.

- buses and trains
- car-club vehicles, taxis, hire cars, etc.
- delivery and service vehicles
- vans for tradespeople
- cars for people with disabilities, in locations where alternatives aren't available, etc.
- HGVs are going to be a challenge

People who are already walking, cycling and using public transport as much as possible, and who don't use their cars much, should try to switch to car-club and taxi use, or keep old cars running until they can, rather than getting electric cars.

moving forward, fast

We can't do a city-wide circulation plan incrementally, so it requires a big jump, into some uncertainty. We need to prepare as much as we can, then move forward fast while maintaining the flexibility to mitigate any problems - and take advantage of opportunities - as they arise.

We don't have time to make small changes - rework a junction here, put in a cycle lane there, add a pedestrian crossing here - and do detailed evaluations of them, or worry that they might cause congestion.

We have a pretty good idea what the goal is and we're in a hurry, so problems have to be addressed by additional forward movements, not by going backwards.

the climate emergency again

- it will be cheaper and faster to rebuild for active travel and public transport than to electrify and provide charging infrastructure for all existing vehicles

- the personal changes are harder - EVs offer the mirage of "business as usual"

- in contrast, decarbonising heating will require huge infrastructure investment - in insulation and heat pumps - but little behavioural change. And decarbonising industry remains a huge challenge, but one where changes are likely to be almost completely invisible to most people.

a fair transition

How do we make the transition to a sustainable transport system fair and equitable?

We need to support people adversely affected by changes, providing them with the best possible range of options.

But we should also consider gains that can accompany the transition: enabling walking and cycling and public transport not just for people shifting from driving, but for people for whom those may currently be inaccessible. The big challenges are also opportunities to address transport poverty and transport inequality.

Oxford

Oxford is in many ways better placed than other cities, and certainly than most rural areas. It is relatively compact, has relatively high levels of cycling, has a better bus system than most UK cities, and is relatively affluent (even if its wealth is very unevenly distributed). It is also a centre of technical innovation. We need to do more than our share.

Special challenges: being an employment hub and a tourist destination on top of a services/retail centre; heritage concerns; constraints from the geography.

envisioning something different

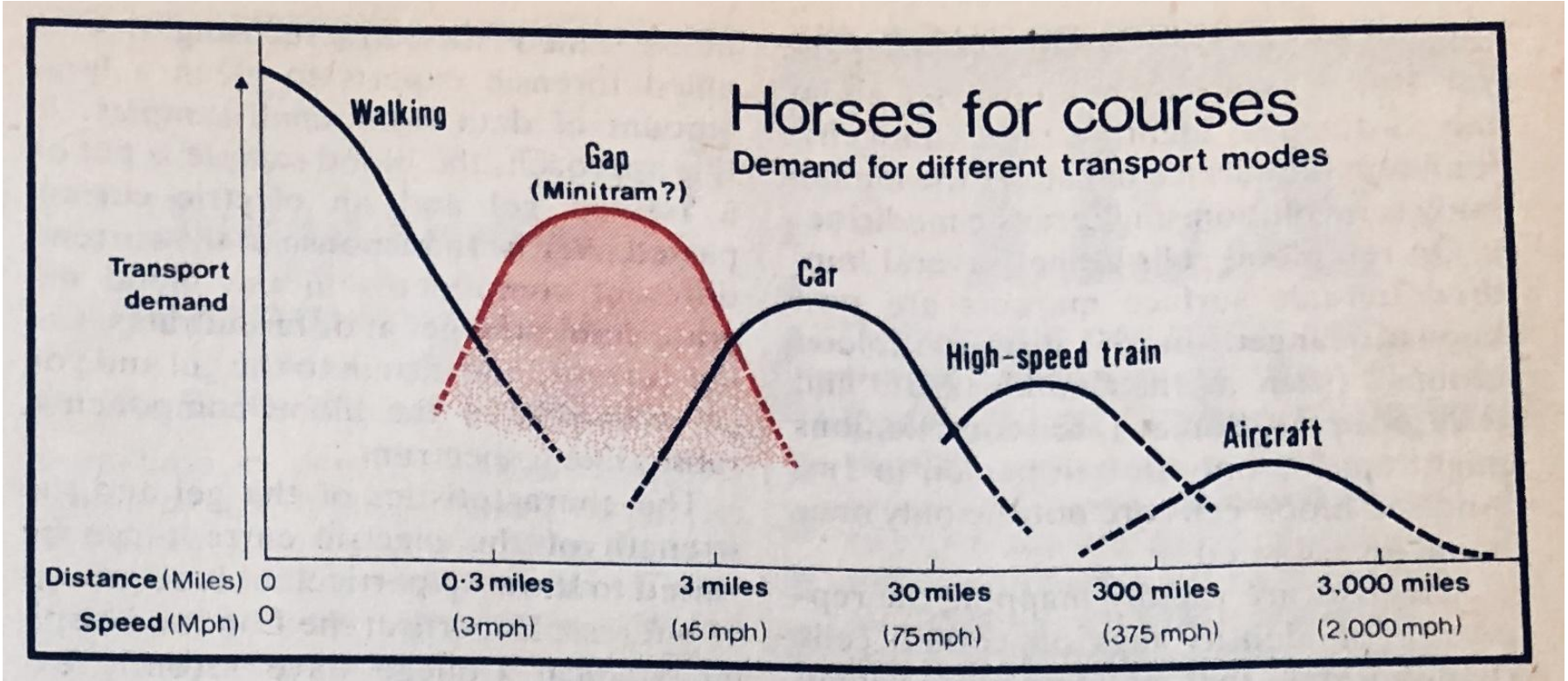
It's very hard to imagine alternatives when one has lived one's whole life in a car-dominated environment.

In the UK in 1950 more miles were cycled than driven, and in 1960 factory workers cycling home for lunch could still take over the Cowley Rd.

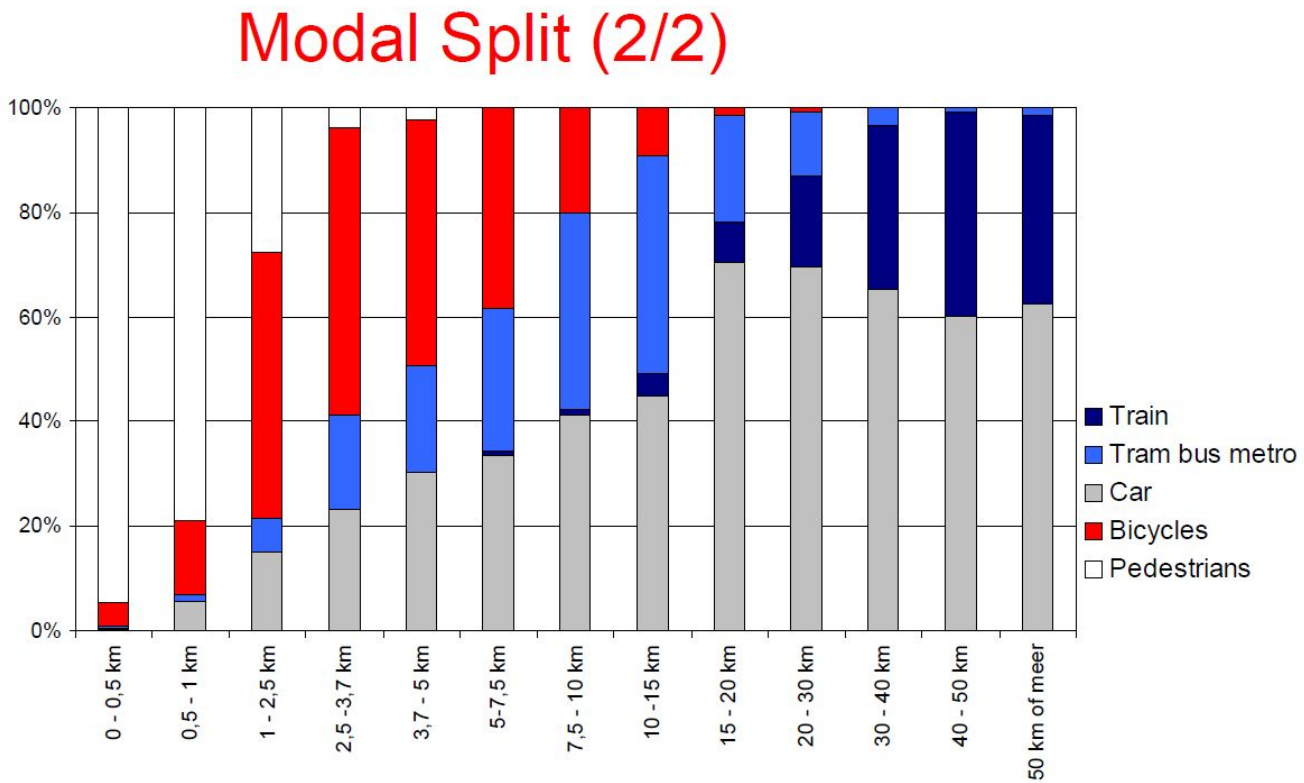
https://www.oxfordmail.co.uk/news/10412798.factory-workers-dash-home/

the nadir of British utility cycling

From a 1981 article in The Economist on the future of transport



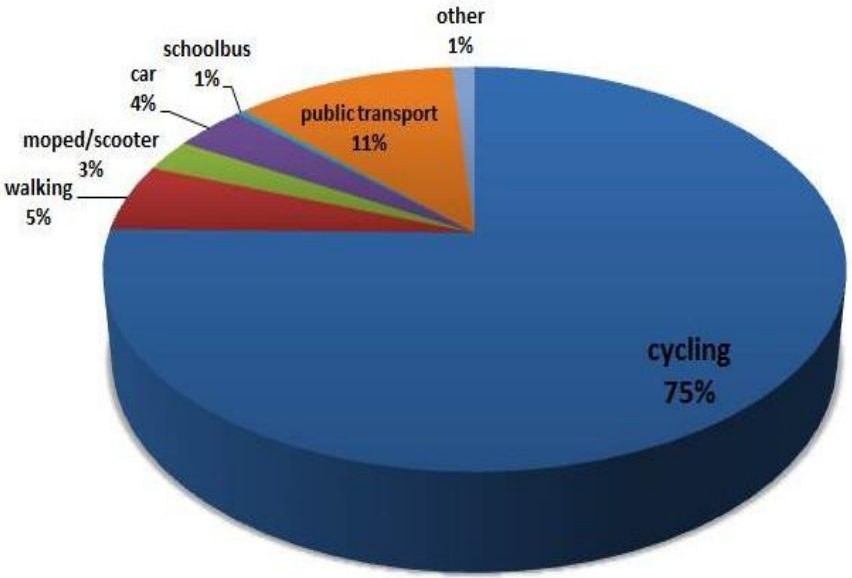
Amsterdam modal share by distance (2012)



Amsterdam has further prioritised walking and cycling in the last decade, and e-bikes have really taken off. There will be even more cycle use now, at longer distances. (And cities such as Utrecht have even higher cycle modal share.)

8km (5 miles) covers almost all trips inside Oxford's ring road - and from Carfax reaches as far as Radley, Cumnor, Farmoor, Yarnton, south Kidlington, and almost to Wheatley.

Dutch secondary schools: how children get to school (2013)



46% of these children were travelling over 5km (3 miles).

Children cycle rather than walk so they can go out with their friends after school. The Netherlands has probably the most independently mobile children in Europe.

From Mark Wagenbuur's BicycleDutch blog https://bicycledutch.wordpress.com/2013/12/05/arriving-at-school-by-bicycle/

parking in Japan

In Japan, not only do you need proof you have a parking place in order to register a car, but there's a ban on overnight on-street parking. (And no tolerance for "ten minute" parking.)

So Tokyo side-streets look like this. (And yes, that's a one-car off-street parking place on the left - ~£20/day.)

https://www.reinventingparking.org/2014/06/japans-proof-of-parking-rule-has.html

Get involved

Set up in 2018, Oxfordshire Liveable Streets works for liveable streets, a better built environment, and sustainable transport. We have been inspired by cities Groningen and Ghent and Utrecht, but also by Waltham Forest and Hackney in London.

Other members of Oxfordshire's Coalition for Healthy Streets and Active Travel

- Oxford Pedestrians Association
- Cyclox
- Oxford Civic Society
- Oxford Friends of the Earth
- Oxfordshire Cycling Network
- Headington Liveable Streets
- the Low Carbon Oxford groups
- Oxon4Buses

- Liveable Cowley
- residents associations, student groups, etc.

Contact your councillors (city and county) and tell them you support measures to restrict motor traffic and improve walking and cycling provision and bus services. Look at consultations on transport schemes.

Botley Rd: brand new provision

Built in 2020-21, this provides just 1.45m for walking and 1.25m for cycling - the latter with no separation from 30mph cars.

But four lanes and central hatching are provided for motor traffic!