

Infrastructure Commission for Scotland  
Call for Evidence  
Submission from Spokes, the Lothians Cycle Campaign

## Summary

The consequences of recent housing and transport policies, due largely to the availability of cheap oil, have left us, as a country, heavily dependent on the private car, and in a poor state of health both physically and mentally as a nation. In poor shape, too, to manage the withdrawal from cheap oil, now a paramount necessity to avoid climate breakdown.

The urgent need to decarbonise the economy means new and existing infrastructure must be dedicated to that purpose: housing, land use and transport will all be affected.

*Housing:* City sprawl must be ended, and new communities built on (preferably) brownfield land, close to existing communities with good public transport and cycling links, and at higher levels of density - on the model of Scottish 19thC 4-storey tenements;

Re-use: Existing car parks, especially in urban areas, can be converted to housing.

### *Transport:*

1 Reduce the need to travel, by for example building compact, high-density housing with amenities within walking and cycling distance;

2 Replace existing energy-inefficient modes with energy-efficient ones: rail not road, public transport not private car; make active travel the norm in towns and cities. Note the private car is extremely inefficient in energy use (1 ton of vehicle to move 70kg of person);

3 Electric vehicles may reduce carbon use, but half the emissions in any vehicle's lifetime are created in its manufacture; electric vehicles are heavier (batteries); until more efficient vehicles are available, rail-based public transport (heavy or light) should be the norm;

4 Rail is 8 times more efficient in energy use than road; *re-use* the road network by replacing *partly* with rail and/or light rail to connect all towns and cities in Scotland; for example, a much-needed direct rail link from Edinburgh to Perth could possibly be built on one carriageway of the M90, given that modern electric locomotives can cope with heavier gradients than previously;

5 Within cities, build light rail networks (again by re-use of roads);

6 As the bicycle requires much less carbon in manufacture than any vehicle, build cycle networks to reduce the number of vehicles, with the additional benefits of health and better quality of our towns and cities;

7 Smooth, well-maintained roads offer greater energy efficiency, so better road *maintenance* is essential; make Transport Scotland responsible for maintenance of all main roads in towns and cities (as well as the trunk network); this will also enable TS to use its skills to *build quality cycle networks*.

## Main text

### *Introduction*

Spokes acknowledges that the current overriding peril faced by Scotland, Britain, and indeed globally, is *climate breakdown*. Infrastructure built over the next few years can

make or break our future. Decarbonisation of the economy is the number 1 priority.

This Call for Evidence seeks broad parameters for the next 30 years. By that time, decarbonisation will have to have been completed. We welcome the Government's announcement, today 2<sup>nd</sup> May, that a new target of net zero emissions by 2045 will be adopted.

We have taken a 'broad brush' approach. We shall also aim to be “credible, objective, and evidence-based” (Remit, 2.1), and “outward looking, forward thinking, and innovative (ibid.). We've done our best to be *brief* (3.2) but there are many issues. Our contribution “is shaped according to our field of interest and concerns, recognising the 30-year horizon ...” (para 1.3); these interests are *transport, land use and housing*, which are intimately interconnected.

For the past 20 years or more the Scottish Government's mantra has been 'sustainable economic growth'. Unfortunately, most of the infrastructure projects built in that period have in fact *not* been sustainable. One of the successes has been renewable energy, where Scotland has done really well. But housing and transport have largely been a disaster (see below).

#### *Vetting of projects*

First, all project proposals must be carefully vetted to see how they perform in relation to the decarbonising objective. Only those which make a substantial contribution will be accepted; any that work in the opposite direction will be rejected.

Subsidiary objective: the re-distribution of wealth within the economy. It is shocking that after 50 or more years of our focus on growing the economy, we seem to have achieved little more than a polarising of wealth, in favour of the “1%”.

It is equally shocking that a growing proportion of the population are relegated to the 'gig' economy, that an increasing number of people are dependent on food banks, and that, according to recent newspaper reports, many children are coming to school hungry. This is an indictment on society as a whole; it reflects on infrastructure to the extent that the latter (especially road-building) soaks up a substantial proportion of the Government budget.

#### *Construction of infrastructure is carbon-hungry*

Infrastructure projects, such as road building, are in themselves heavily dependent on carbon - especially for steel and cement. Assess any project to ensure that its emissions would be more than compensated by subsequent carbon savings; in most cases this could probably be best achieved by *re-use*.

#### *Re-use of existing infrastructure*

On the principle of re-use as a form of recycling, existing structures must be examined for better use. For transport, this could be done by *re-allocation of road space* to less carbon-hungry modes, such as rail, light rail and cycling, or by more intensive use of the railways.

#### *Housing*

Traditional housing in Scotland's cities was remarkably sustainable. The typical 4-storey tenements brought high-density housing but still with spaciousness. Over the past 30 years, unfortunately we have witnessed urban sprawl, using mainly greenfield land, and relying for movement mainly on the private car, as public transport lines become ever more

stretched.

This sprawl was made possible by the availability of cheap oil. Individual homes, each with its own garden, are not just a very wasteful use of land but also fail to create communities, and require transport for access to all amenities - shops, leisure etc.

The great advantage of tenement-style housing is that amenities can be close by, within walking or at least cycling distance, making them highly sustainable. And being high-density means that communities are quickly formed, where residents benefit from a sense of belonging. Travel to the amenities by active-travel modes also has the benefit of health, more especially mental health.

### *The future*

Projects to 'undo' urban sprawl by building high-density housing, especially on brownfield land, should be promoted, while low-density and/or greenfield will be prohibited. The aim is to create compact communities *where basic amenities can be accessed on foot or by bike*; communities with limited car parking, and where, Dutch-style, cars are made to go a long way round whereas people go direct, will become the norm.

### *Car parks converted to housing*

Many brownfield sites could become available for housing if existing car parks at shopping centres, leisure centres, offices and businesses were removed (compulsory purchase if necessary) and made available for housing. This would have a double benefit, reducing car use and increasing the housing supply.

A prime example of this is Edinburgh Park; a vast area consisting mainly of car park, punctuated by the occasional office block. The area is well served by public transport - trains, tram and buses - and has a limited cycle network (which could be enhanced when space is re-allocated). The benefits: more housing becomes available, residents could live near where they work, thus *reducing the need to travel*, and *creating close-knit communities*.

### *Transport*

Priority: *reduce the need to travel* in the first place. Infrastructure projects over the past 30 years have taken no account of this; by concentrating on road building, they have done exactly the opposite.

Transport strategies have set up a hierarchy of modes of travel, with active travel at the 'top', ie most preferred, and the private car at the 'bottom', with public transport in between.

The reality of Scottish Government spending over successive administrations totally reverses the hierarchy; the prominence of road-building is reflected in the institutions themselves, the agency Transport Scotland having evolved from the former Roads Division, and in practice having little involvement with, or interest in, public transport (the successful Borders railway is a notable exception) or active travel; the latter has received a bare 1% of transport funding.

### *Rail vs road: energy efficiency, land-take, power supply*

In the early 1960s the rail network was in decline; too many lines, too little traffic; re-organisation, and pruning, was necessary. But the Beeching Report of 1963 took a chain saw where a pruning-saw was needed. It later emerged that the Report was commissioned by a dodgy Transport Minister with a vested interest in road building.

Roads have dominated ever since; powerful support lobbies have grown up around them. Rail has been unfairly eclipsed: yet it has many advantages in terms of energy economy.

Consider this: a horse can pull just 1 tonne on a tarmac road, but 8 tonnes on rail (and 50 tonnes by water) . And a typical private car weighs one tonne or more - just to move (usually) one person weighing perhaps 70kg. This is an incredible waste of valuable energy resources.

Roads are not only energy-inefficient but also consume vast tracts of land - a dual carriageway is at least twice the width of a dual rail line, for instance. Land is already valuable, and will become more so. There is no case for wasting it on more roads.

Further, road transport moves *individual* vehicles, where rail travel is *collective*; one train could remove hundreds of vehicles from the roads.

And with electrified rail the power is supplied *direct*; no heavy batteries, as road transport would require.

Rail thus scores over road in terms of *efficiency* (steel vs rubber wheels), *land-take*, *passengers (or freight) per vehicle*, and *direct power*. It's a no-brainer; the main problem will be the powerful vested interests who will oppose any change from the status quo.

### *The future:*

#### *Electric vehicles*

It seems widely assumed that electric vehicles will take over from fossil-fuelled vehicles and that this will solve the decarbonising problem, enabling us to 'carry on much as usual'.

Nothing could be further from the truth. First, around half of the carbon impact of a vehicle over its lifetime is created in the manufacture of the vehicle itself; the implication of this is a) that even with electric, the necessary decarbonisation is still not achieved; and b) that the number of vehicles must be reduced, through measures such as modal shift to active travel - especially cycling - and public transport. This would have subsidiary benefits, such as reducing congestion, and better health.

There is also the issue of how, with inefficient electric vehicles, the extra demands for electric power would be met, and how it is to be supplied where it is needed.

If rail is 8 times more efficient than road in terms of energy input, then from now on rail travel must be allowed to increase its capacity to something like the levels last seen in the 19th Century, when most of Scotland's cities, towns and even some villages were on the rail network.

It would be unrealistic to try to recover all of that, but at the least, infrastructure projects over the next 30 years should ensure that the main cities and most towns are connected by electrified rail links (dual-track for the main cities). It is extraordinary that we have not achieved this already, due mainly, one suspects, to powerful road lobbies and cheap oil-based fuels.

#### *Freight*

Rail is efficient not just for moving people but mainly for moving goods. Thus, we'd argue that the highly expensive, and damaging (to the sensitive landscape) project to dual the A9 should be stopped immediately, and replaced with a parallel project to dual and electrify

the rail line.

Similarly, the A96 road project (also expensive, and damaging) should be replaced with an upgrading of the rail link, Inverness to Aberdeen, dualled and electrified.

Beyond that, potential rail projects which are already being demanded by local communities (and nationally) - such as the link to Levenmouth; rail to St Andrews; a direct link between Edinburgh and Perth - can form the basis of *sustainable* infrastructure requirements.

#### *Road transport: 'Fix it First'*

There is hardly a case for building any new roads, except purely local.

There is however one quite big roads infrastructure requirement, which is to bring existing (non-trunk) roads up to standard, re-surfaced and properly maintained. Excellent standards of surface and maintenance as found on the trunk roads are desperately needed for towns and cities, which carry far more traffic and cover far greater distances.

It is known that 'rough' roads require more energy to traverse than smooth ones. *Fixing the existing roads* is a major infrastructure priority which will not only improve the quality of life for millions of local residents, but will also save energy.

In turn, smoother roads will encourage *cycling*, with the consequent virtuous circle of rising levels of activity and better health. It is worth noting this direct connection between good road maintenance and healthier lifestyles.

*We would suggest that the maintenance remit of Transport Scotland (TS) should be widened to include all (or most) main roads and thoroughfares in our cities and towns.*

In addition, a take-over of main roads by TS would enable TS and its engineers to build cycle super-highways and other *quality cycle routes*, in a way that Local Authorities do not have the capacity to achieve (see below).

#### *Value of cycling*

Cycling, long neglected, has a great role to play in a decarbonised transport system. In use it's emission-free; emissions created in *the manufacture of the vehicle* are very much smaller than those of a powered vehicle.

Cycling is the most benign and sustainable travel mode of all, but Scotland has never so far invested in it. Spending has been minimal, except in Edinburgh where the budget for it has now risen to 10%. Cycle-friendly policies by the Council, partly as a result of a strong advocacy group, have had some impact; more cycling is done in Edinburgh than anywhere else in Scotland.

There is no doubt that cycling is popular nation-wide, as evidenced by the take-up of off-road cycling (no cars), and of gyms - similarly car-free; likewise, organised events like Pedal for Scotland or Pedal on Parliament, where the roads become protected for the day, attract thousands of participants.

For too long, our decision-makers have been blind to the benefits of cycling for *congestion*, for *air quality*, and for *health*. Governments work in 'silos'; transport is one, health is another.

For goods, electric cargo bikes can carry loads of up to 50kg, and are ideal for in-town deliveries. City traffic could be significantly reduced by opening depots to which bulk deliveries are made by vehicle, but the final (last 2-3 miles) stage is made by cargo bike, and goods vehicles banned from town and city centres. This would also create significant employment opportunities. Health, air quality, and congestion would all be improved, and cities become more attractive as places to live and to visit.

Cycling as a transport mode is well established in cities like Amsterdam and Copenhagen. Below are a couple of examples of how it can also work in Britain:

*“If you build them they will come” (Guardian blog, see ref. below)*

### *1 Leeds to Bradford cycle superhighway*

Paid for by the government’s Cycle City Ambition Fund, the 14-mile (23km) route was opened in July 2016. It was designed to offer one of the region’s most deprived communities a cheap, healthy means of transport.

Before construction, just 136 cycle trips per weekday were made on the Leeds-Bradford route. In the first year that increased by 51%, in 2018 by a further 26%.

By January 2019, it had clocked up 870,764 cycle trips. Of users, 30% describe themselves as new or returning cyclists, and 80% use it between three and five days per week.

The lane is 1.8m wide for much of the route and there’s priority over turning traffic on 166 junctions, according to the West Yorkshire Combined Authority.

A further 2.5 miles of protected cycle superhighway is planned through the centre of Leeds, linking the existing Leeds-Bradford and Leeds-Seacroft routes.

*Note the mention of a high proportion of new cyclists (see below).*

### *2 London*

The country’s big hitter for cycling, problems with data collection have hampered publication of digital counts on its two major cycle superhighways, which opened in April 2016. In February 2018, digital counters were installed and soon started displaying prodigious numbers.

By August, 574,304 cycle trips had been logged on CS6, the north-south cycle superhighway, and by October 1,654,441 trips on CS3, the east-west route. Using [manual counts](#), Transport for London has recorded up to a 200% increase in cycling on the east-west route, and 124% on the north-south route, compared with numbers pre-construction.

*Closure of streets* to through motor traffic – filtering – also boosts cycling. Goldsmiths Row in Hackney, where more people commute by bike than by car, was filtered in 2013. The cycle counter has logged [6.28m rides](#) so far – an average of 3,917 on weekdays and 1,854 on weekends. It is estimated 1.4 million people used the route in 2018; in 2017 it was 1.1 million.

*These are impressive numbers, and show that cycle increases/traffic reduction can be achieved by methods other than provision of lanes, such as filtering.*

### *3 Manchester*

Protected cycle routes on Manchester’s Oxford Road and Wilmslow Road opened in 2016. In 2018, Oxford Road counters logged almost 1.1m cycling trips, up on 929,610 in 2017 – an increase of 11%.

On Wilmslow Road, between Didsbury and Rusholme, manual counts logged post-construction increases of 86% after 12 months and 103% after two years.

In 2018, the professional cyclist turned active travel campaigner Chris Boardman was appointed the city's cycling and walking commissioner, and is working with the city's borough leaders to introduce a cycling network across Manchester to get more people on bikes and on foot. Monitoring will include automatic counters on 14 major routes, along with manual counts and user surveys.

As Rachel Aldred, a reader in transport at Westminster University, put it, looking at the story behind the headline figures is crucial, because although existing cyclists re-routing to new cycle infrastructure is good, *new cycling trips generate the greatest benefits*.

Further examples in the reference (below) come from Cambridge and Brighton.

Reference: [https://amp.theguardian.com/environment/bike-blog/2019/apr/26/if-you-build-them-they-will-come-record-year-for-cycle-counters?\\_twitter\\_impression=true](https://amp.theguardian.com/environment/bike-blog/2019/apr/26/if-you-build-them-they-will-come-record-year-for-cycle-counters?_twitter_impression=true)

The above examples show that, given the right infrastructure and the political will, cycling can be revived as a transport mode, bringing significant benefits, including reductions in vehicular traffic. With climate catastrophe looming, cycling offers a carbon-free future for local transport; less congestion, less noise, and a more benign environment.

#### *Conclusion*

The era of cheap oil is over. It has been a disaster; it has brought us to where we are, facing climate calamity; it has created great inequalities of wealth, plus levels of pollution on a global scale (not just air quality, but also plastics).

Adapting to the new demands will not be easy, but offers great opportunities for employment as we 'undo' the damage that has been done, and re-build communities to create healthier rather than wealthier lives, focussing on the quality of life instead of its quantity.

Reference: Rockstroem, Johan, et al: *A Roadmap for Rapid Decarbonization*: Science, 24 Mar. 2017

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May 2019