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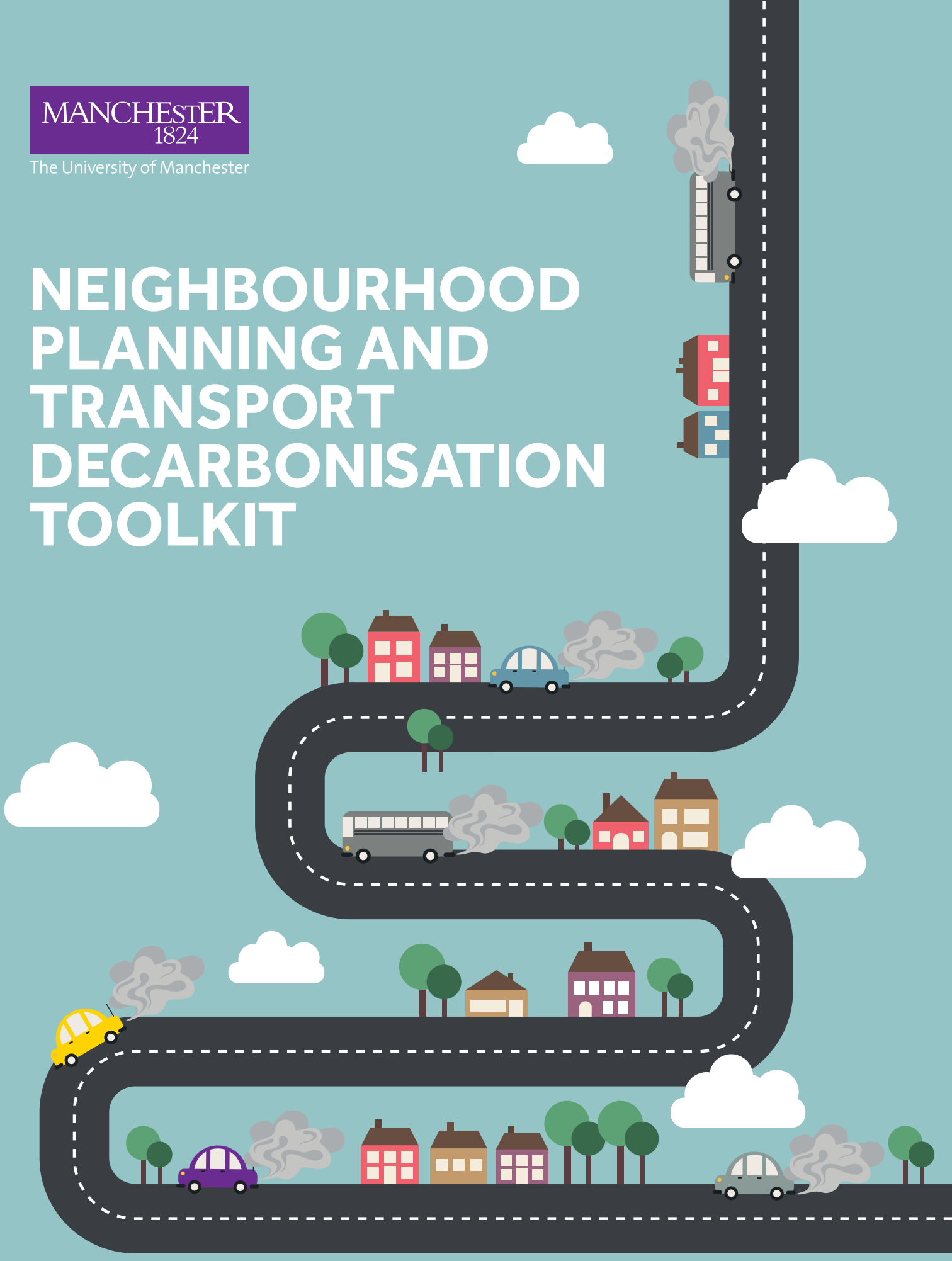
NEIGHBOURHOOD PLANNING AND TRANSPORT DECARBONISATION TOOLKIT



DecarboN8

UKRI Engineering and Physical Sciences Research Council

DOCUMENT INFORMATION

FUNDING INFORMATION AND ACKNOWLEDGEMENTS

The Neighbourhood Planning and Transport Decarbonisation project from which this toolkit developed was funded by DecarboN8. DecarboN8 is funded by the EPSRC Energy Programme, grant agreement EP/S032002/1.

Authors also thank Carnforth Town Council, Troy Planning + Design, Lancashire County Council, and Lancaster City Council for their support during this project.

CONTACTS AND CITATION

Please cite this toolkit as: Koksal, C. and Baker, M. (2022) Neighbourhood Planning and Transport Decarbonisation Toolkit. Spatial Policy and Analysis Laboratory, Manchester Urban Institute, University of Manchester.

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UPDATES TO THE REPORT

This toolkit is regularly updated to reflect the changes to the planning system and good practices across England. This version of the toolkit was published on March 2022 and you can always check the latest version from our website https://www.mui.manchester.ac.uk/spal/research/projects/np-decarbonise-transport.

CONTENTS

AIM OF THE TOOLKIT

Since 2016, surface transport has been the largest emitter of greenhouse gases in the UK, with the large majority coming from road transport, in particular passenger cars. While total CO2 emissions in the UK have fallen by almost 50% between 1990 and 2018, the emissions from road transport have continued growing despite more energy efficient cars are available (because motor vehicle traffic volumes have generally increased throughout this period). Road transport plays a significant part in air pollution in urban environments and contributes to traffic congestion, which is estimated to cost approximately £8 billion per year to the UK's economy due to productivity losses and fuel wastage.

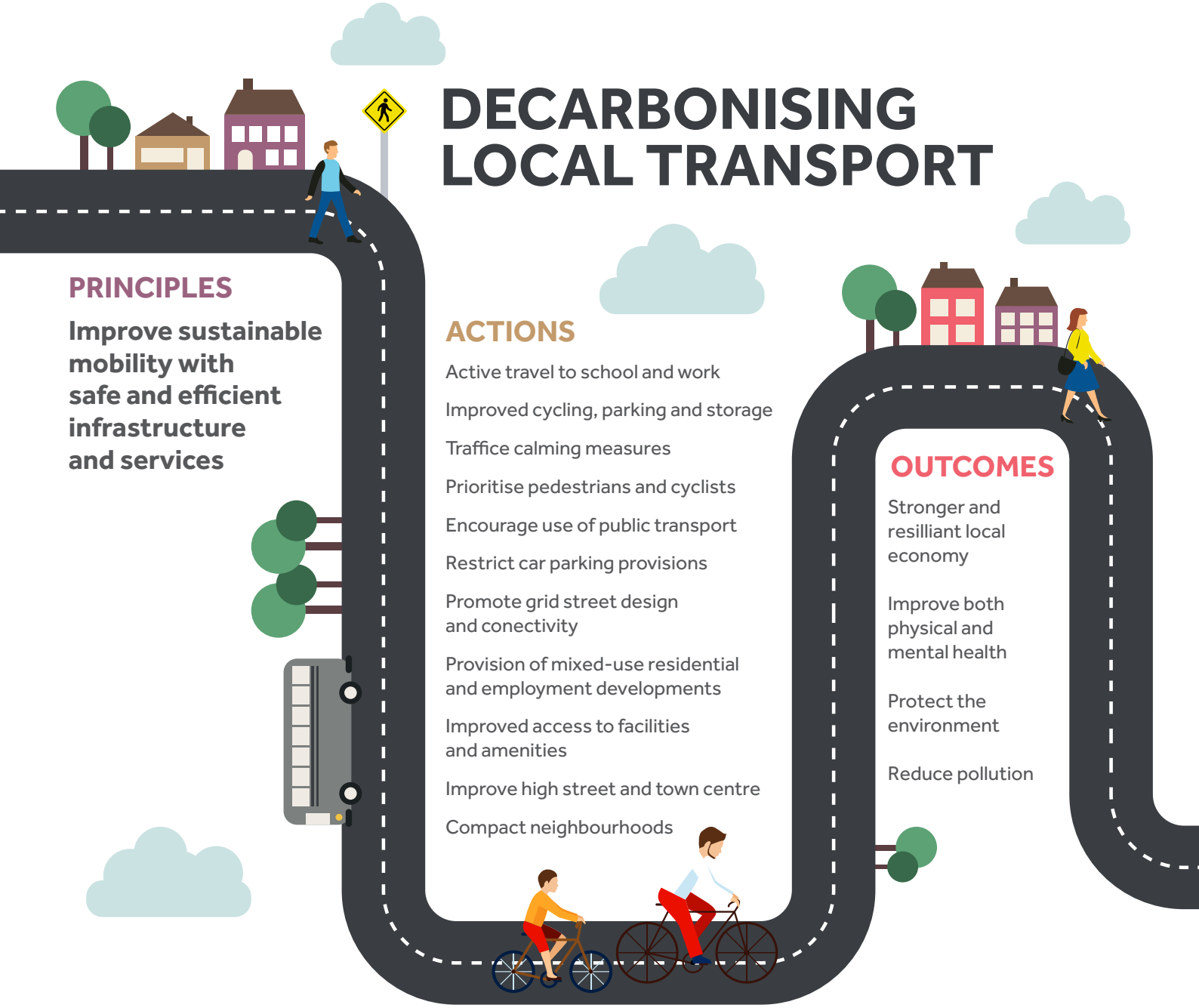
By focusing on Neighbourhood Planning, this toolkit provides a practical and accessible route map to help communities to create neighbourhood planning policies and community actions and projects to decarbonise their travel choices and local transport infrastructure. Neighbourhood planning was introduced by the Localism Act 2011 as a development plan to give communities power over the development and growth of their neighbourhood area. Since its introduction, neighbourhood planning has been proved to be very popular: with over 2882 neighbourhood areas designated and more than 1292 plans passed local referenda to become part of statutory development plans for their local area (as of December 2021).

Neighbourhood plans are legally required to contribute to sustainable development and to consider the need to mitigate climate change implications. The toolkit provides detailed strategies to adopt sustainable transport policies in neighbourhood plans and good examples. The toolkit's intended audience are neighbourhood forums and parish and town councils in England who are producing, or planning to produce, a neighbourhood plan, as well as Local Planning Authorities and Local Transport Authorities, who are helping communities in the development of neighbourhood plans within their boundaries.

This toolkit advocates a community-led, place-based approach to decarbonise local transport. This means that appropriate strategies and plans must come from the community and be tailored to the unique opportunities and challenges of the neighbourhood area. Therefore, this toolkit is designed in such a way to provide generic principles and methods of thinking that underpin a transport decarbonisation strategy, as well as provide recent good examples from adopted neighbourhood plans to demonstrate how generic principles can be applied in real life. Some policies and examples in this toolkit might more relevant to dense, urban cores, whereas others are more appropriate for small market towns in shire counties. Accepting there isn't one perfect solution for any area, we listed all relevant policies here together to provoke imagination as well as show what is possible. It is up to neighbourhood forums and parish and town councils to decide to adopt and change policy wording to create the most appropriate strategy to decarbonise local transport in their own areas.

We hope that this toolkit will help your community to create a healthier and greener local transport. Please tell us your experiences of using this toolkit, and whether there are good examples that we should be aware of. This toolkit will be 'alive' and adopt and change as the national policy changes and new examples of good practices emerge.

DECARBONISING LOCAL TRANSPORT



PRINCIPLES

Improve sustainable mobility with safe and efficient infrastructure and services

ACTIONS

Active travel to school and work

Improved cycling, parking and storage

Traffice calming measures

Prioritise pedestrians and cyclists

Encourage use of public transport

Restrict car parking provisions

Promote grid street design and conectivity

Provision of mixed-use residential and employment developments

Improved access to facilities and amenities

Improve high street and town centre

Compact neighbourhoods

OUTCOMES

Stronger and resilliant local economy

Improve both physical and mental health

Protect the environment

Reduce pollution

ABOUT THE SPATIAL POLICY AND ANALYSIS LABORATORY AT THE UNIVERSITY OF MANCHESTER

The Spa-Lab, formerly the Centre for Urban Policy Studies and now part of the Manchester Urban Institute at the University of Manchester, has a long established reputation for monitoring and evaluation of area-based policy initiatives, spatial planning and regional development, housing and infrastructure planning, and sustainable and healthy urban environmental research over the last three decades.

The Lab has a long track record of attracting significant research funding from a wide variety of sources, including DLUHC and its predecessors, the Economic & Social Research Council, Medical Research Council, the Joseph Rowntree Foundation, the Royal Town Planning Institute, the Welsh Assembly, the European Commission, OECD and regional bodies and local authorities (e.g. Manchester City Council, Bolton MBC, Halton BC, Liverpool City Council).

HOW DO YOU USE THIS TOOLKIT?

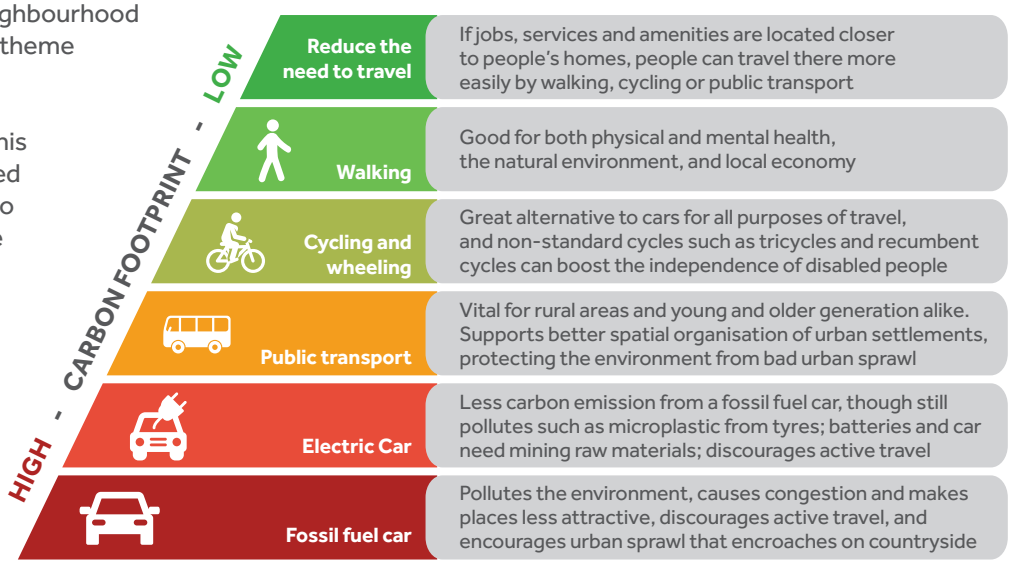
THIS TOOLKIT IS DIVIDED INTO FOUR MAIN SECTIONS.

SECTION 1 **BENEFITS**	**Benefits** of low-carbon transport summarises the current scientific evidence base for the impact of low-carbon transport on health and wellbeing, local economy, and natural environment.	This evidence can be used to justify neighbourhood planning policies as well as make more informed choices on which strategies to pursue to decarbonise local transport. Full bibliographic references and other useful resources are listed at the end of this toolkit.
SECTION 2 **PLANNING**	Planning policies lists good strategies for **neighbourhood planning policy** writing, with good policy wording examples from adopted neighbourhood plans.	Once the neighbourhood plan is adopted, these policies guide and shape the development and growth for the area. Policies are grouped under several themes: **housing, walking and cycling, car parking, traffic, public realm improvements and community facilities, employment, and improving air quality.**
SECTION 3 **COMMUNITY**	Community actions and projects lists good actions and projects that are outside the remit of neighbourhood plans, but yet engender **behaviour change in the community for low-carbon lifestyles.**	Delivering tangible results with assistance from developer contributions or in partnership with local authority such as paying costs towards a fixed asset (e.g. bridge over a canal, new cycle lanes).
SECTION 4 **PARTNERSHIP**	**Partnership** outlines good strategies about making allies and establishing collaboration with stakeholders.	To help deliver the policies and aspirations in neighbourhood plans and the wider policy context.

Although each policy package and community strategy works better together, neighbourhood forums can choose to use only one theme and ignore the rest.

The main strategy that underpins this toolkit is to integrate a carbon-based hierarchy of transport principles into neighbourhood plan, starting at the top with ultra-low carbon options such as reducing the need to travel and walking and cycling, and then low-carbon options such as public transport, and at the bottom high-carbon options such as private cars running on fossil fuels.

A carbon-based hierarchy of transport principles



This approach is also strongly supported by the national planning policies. Paragraph 105 in the National Planning Policy Framework (2021) says that

"... development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes".

Therefore, planning policies in a neighbourhood plan are expected to proactively and effectively manage patterns of growth and use of land to make the fullest possible use of public transport, walking and cycling. Underpinning this approach is designing around the idea of complete neighbourhoods.

WHAT IS A COMPLETE NEIGHBOURHOOD?

(From The Portland Plan, www.pdxplan.com)

The term "complete neighbourhood" refers to a neighbourhood where one has safe and convenient access to the goods and services needed in daily life.

This includes a variety of housing options, grocery stores and other commercial services, quality public schools, public open spaces and recreational facilities, affordable active transportation options and civic amenities. An important element of a complete neighbourhood is that it is built at a walkable and cycleable human scale, and meets the needs of people of all ages and abilities.

Neighbourhood forums can use the below question checklist to identify the priority areas for intervention in their neighbourhood, and create a route map to decarbonise local transport by reviewing policy examples and strategies in the next sections.

1. Is there any area in your neighbourhood that suffers from bad air pollution from motorised vehicle traffic? Is there a robust system to monitor air pollution levels against legal standards?
2. Are pedestrians and cyclists prioritised over car traffic in your neighbourhood?
3. Is walking and cycling to work and school encouraged, safe, and secure? Is infrastructure well-maintained? Does it provide good access to key facilities and amenities?
4. Do new residential and business developments in the area make the fullest possible use of walking, cycling and public transport? Do they invest in such infrastructure for improvements and expansion?
5. Does walking and cycling routes in your neighbourhood join up to form a network within the neighbourhood and with the national walking and cycling networks?
6. Are there enough, safe and secure cycling parking and storage both on key destinations and in residential areas?
7. Are there any traffic calming measures such as physical and psychological design interventions to increase cycling and walking (for example crossings, lighting, signage, cycle lanes, etc.)?
8. How well does public transport work? Is it integrated into other types of sustainable transport such as cycling and walking routes?
9. Does high street or town centre create a sense of place and encourage social interactions and active travel?
10. Is there a good range of shops, services and jobs in your local area to reduce outward commuting?
11. Is car parking a problem?

SECTION 1:

BENEFITS OF LOW-CARBON TRANSPORT

Low-carbon travel and transport systems improve health and quality of life, contribute very positively to local economy and services, and protect and improve the natural environment. Below is a short list of recent research summarising the benefits of low-carbon transport for communities. This can help communities to prioritise intervention areas based on local needs. The research presented below can also be used for evidence base to be included in the plans to strengthen policies. The full list of bibliographic entries is presented at the end of the toolkit.

HEALTH AND QUALITY OF LIFE

The health benefits of walking and cycling are well reported, with research showing that keeping physically active can reduce the risk of heart and circulatory disease by as much as 35% and risk of early death by as much as 30% [1,2].

A rapid evidence review undertaken by the Public Health England, for example, found that walking and cycling also have positive effects on mental health and general well-being [2]. The mental health and neurological benefits include reduced risk of dementia, improved sleep quality, and a greater sense of wellbeing. Another research investigating the links between walking and mental health report that for depression and anxiety, the evidence is robust and reliable, and there are consistent beneficial effects [3].

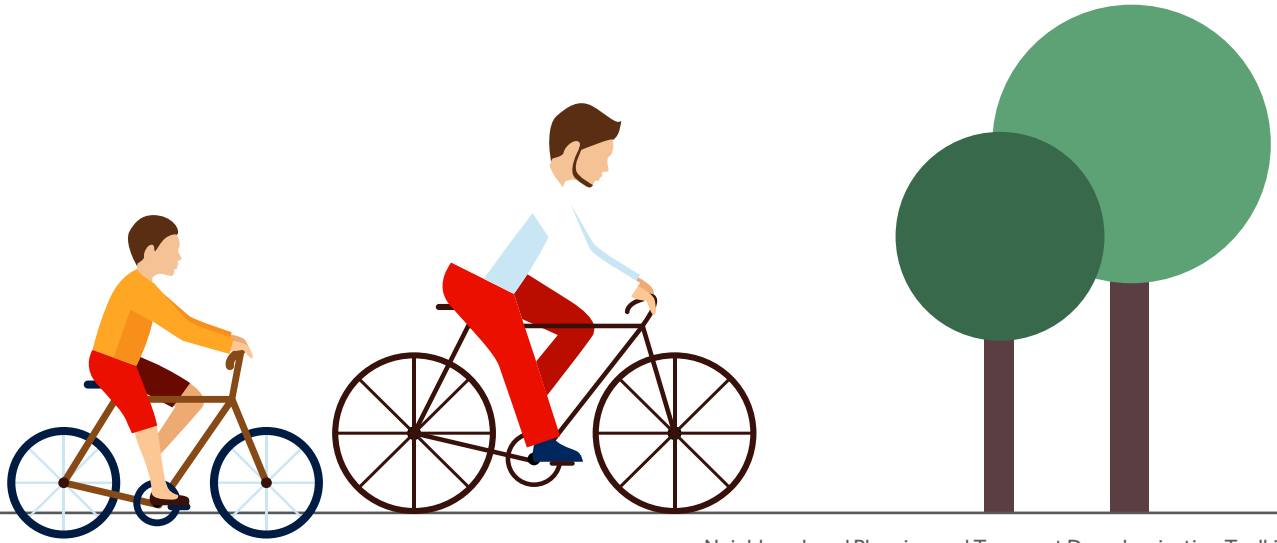
Researchers investigating the impact of cycling on mental functions found that people scored higher on tests of memory, reasoning, and planning after 30 minutes of spinning on a stationary bike than they did before they rode [4].

In their report evaluating health benefits of public transport, the American Public Transportation Association found that traffic casualty rates tend to decline as public transit travel increases in an area [5]. Moreover, areas with high public transit movement tend to have better overall security and reduced crime rates.

In urban contexts excessive noise from car traffic is responsible for the increase of stress level and disturbances to sleep [6]. Cutting both air and noise pollution levels by promoting sustainable transport modes (such as active travel and public transport) will result in a better quality of life.

The studies of European car-free developments showed that residents of car-free projects had more friends within their neighbourhood and generally happier compared to car-dominated places, mainly due to the impact of walking and cycling on social interaction and cohesion [7]. Moreover, these studies reported that car-free developments helped children feel safer from road traffic and be more independent.

Although exposure to air pollution as a result of active travel is a potential health risk, the health benefits of the physical activity outweigh the risks [8,9]. Modelling studies suggest that, amongst adult population, disease risks are much greater than injury risks associated with active travel, especially at older ages. For example, a study of the London cycle hire scheme estimated much bigger benefits from cycling in central London for older people [10].



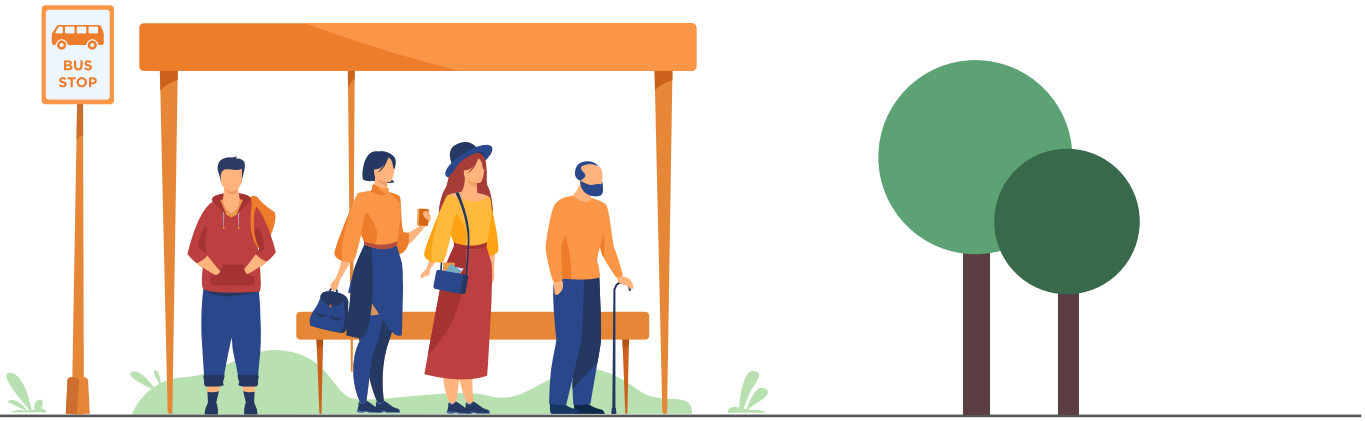
LOCAL ECONOMY AND SERVICES

Local economy and services can benefit hugely from low-carbon travel and transport systems. In addition to the net positive impact on traffic congestion, strong evidence shows the positive impact of walking and cycling on high streets, town centres and other shopping areas.

For example, the Living Streets campaign group found through their research that walking and cycling improvements can increase retail spend up to 30% [11]. This was attributed to two factors: an increase in average number of visitors as neighbourhoods that encourage walking and cycling tend to be more attractive, and an increase in average spending per visits as people who walk to the high street tend to spend more time shopping and for leisure and 'pop in' unplanned when passing by a shop than people who drive. Also, people who walk or cycle to the high street are more local to the area, and more likely to care about the businesses in the area than people who drive from far.

To help policymakers, local communities, and business networks, the Transport for London has prepared a dedicated website that outlines the economic benefits of encouraging walking and cycling in cities [12]. Their research found that town centre improvements including the provision of walking and cycling infrastructure can reduce retail vacancy by up to 17% and can increase retail rental values by up to 7.5%. Furthermore, London Borough of Waltham Forest found that businesses may overestimate their customers' car use by almost 43%.

A report by the Institute for Transport Studies examining 56,000 properties sold across Greater London in 2015 found that pedestrian-orientated public-realm interventions such as 'low traffic neighbourhoods' displayed a positive and statistically significant relationship [13]. In addition, there are several evaluations of various pedestrian-orientated interventions in the UK which have noted a rise in land values ranging from 20-300% [12].



NATURAL ENVIRONMENT

The evidence base is clear that by far the largest benefits arising from increases in low-carbon travel modes accrue in terms of the environment. There is also good evidence directly linking active travel interventions to positive environmental outcomes such as reducing air and noise pollution, as well as creating more green spaces because of the reduced need for car parking provisions.

A study investigating replacing short car trips with walking and cycling found that walking or cycling can realistically substitute for 41% of short car trips (less than 3 miles), saving nearly 5% of CO_2 emissions from car travel. This is on top of 5% of avoided emissions from cars due to existing walking and cycling [14]. Similarly, public transport (including buses running on fossil fuel) can help improve urban air quality by replacing trips made by private cars. For example, a recent study concluded that for every 1% increase in the number of buses serving the population, the level of air quality index in urban areas can drop by 0.1% [15].

Too much faith is placed in the electrification of fossil fuel vehicles to reduce air pollution in cities. This is very misguided as until their mass adoption, air pollution will contribute to premature deaths. Environmental damage associated with mining raw materials for EV cars will continue damaging the environment. Tyre-wear particles, which account for some proportion of microplastic pollution in cities and are washed off the road surface into drains and waterways, are the focus of a recent review of studies [16]. But the most importantly, cardiovascular diseases associated with car-dependence and sedentary lifestyle will continue causing thousands of premature deaths in the UK.

SECTION 2:

PLANNING POLICIES

These are grouped under several themes that can be included in neighbourhood plans with good policy wording examples from adopted neighbourhood plans.

Where possible, policies that are tested at appeal and thus more robust will be marked. Neighbourhood forums and parish and town councils who are undertaking the development of a neighbourhood plan can use the policy wordings below and adopt into their plans as appropriate, taking into account of the local characteristics and needs.

HOUSING

Housing covers all types of residential development required throughout an area, to meet the needs of the current population and the needs of the growing population. Providing for new housing also means considering the amount of land required to build new housing on and the locations where it should be provided.

By designing around the idea of complete neighbourhoods, housing policy in a neighbourhood plan can significantly contribute to reducing carbon emissions from surface transport, support local economy, encourage active travel and healthier lifestyles and sustain environmental quality.

Policies that encourage high housing density in locations with good public transport can make public transport more cost effective and provide more convenient (and often cheaper) alternative to private car use. High density and mixed-used developments also create more vibrant and resilient high street and favour shorter journeys which can be made on foot or by cycling. NPPF (2021) paragraphs 110 and 125 support this strategy.

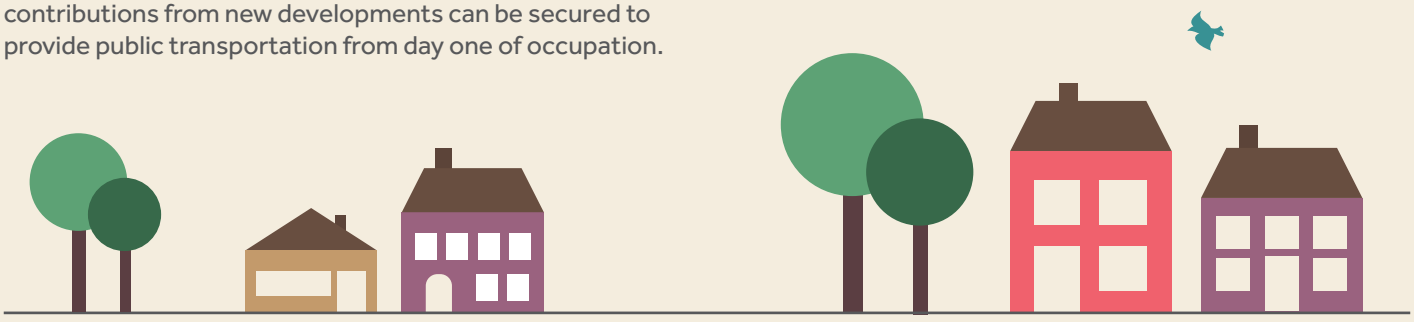
In locations with poor public transport, new developments should be built around the idea of a walkable neighbourhood with integrated adequate walking and cycling routes directly connecting to the centre of the neighbourhood. Developer contributions from new developments can be secured to provide public transportation from day one of occupation.

New developments should also provide links with safe walking and cycling routes to and around the neighbourhood centre and provide a secure and convenient cycle storage per bedroom, either on-site or off-site. Some storage space should accommodate non-standard cycles such as tricycles and recumbent cycles which can be used by disabled people as mobility aids.

Good quality housing precludes traditional models of urban extensions which have seen isolated, inward looking housing estates built around a series of culs-de-sac and thus promoting car journeys, and instead promotes connectivity within and to the surrounding built environment which facilitate more active travel and social exchange and easier access to local shops. It also supports local economy and home working to reduce the need to travel.

For further information see:

- Transport checklist for new housing developments by Transport for New Homes (link)
- A housing design audit for England by Place Alliance (link)



Recent examples of good housing policy from made neighbourhood plans are listed below:

WYE NEIGHBOURHOOD PLAN
(2016, PAGE 41): POLICY WNP10 DENSITY AND LAYOUT

Densities should reflect the existing pattern of housing at 20-30 dwellings per hectare (outside the higher densities at the core of the village). Densities of below 20dph will be acceptable in developments on the edge of the village.

Development will be encouraged to provide links with safe walking and cycling routes to the village centre, facilitating access to schools, the surrounding countryside and station - minimising the need for car use.

The loss of existing footpaths and cycleways will be resisted. New development should be built round the idea of a walkable village with integrated adequate pathways directly connecting to the centre of the village.

Major developments should be designed to provide new green amenity spaces, reflecting and extending the existing network of accessible green space running through the village.

PRESTON PARISH NEIGHBOURHOOD PLAN
(2019, PAGE 30): POLICY AF3 HOME-BASED AND SMALL BUSINESSES

Insofar as planning permission is required, proposals for the change of use of all or part of a dwelling for home office use or a craft/artisan workshop, will be supported, subject to satisfying considerations in relation to design and car parking and other policies in this plan which protect the amenities of neighbours.

HARVINGTON NEIGHBOURHOOD PLAN
(2019, PAGE 62): POLICY IH3 PARKING PROVISION

1. All new flats, apartments or maisonettes must provide a cycle storage unit assigned to that dwelling, with capacity for at least one bicycle for each bedroom.
2. The cycle storage unit assigned to each dwelling is to be in or immediately adjacent to the property, fully-enclosed, secure and at ground-level.
3. All new houses must provide at least one parking space per bedroom of the property up to a maximum of four spaces per property.
4. Car parking spaces should preferably be within the grounds of the related property. Where a design-led approach supports the provision of parking areas or garage blocks, these must be specifically assigned to the property.

MALPAS AND OVERTON NEIGHBOURHOOD PLAN
(2015, PAGE 25): POLICY H4 HOUSING CHARACTER AND DESIGN

The character of new housing developments should reflect the organic growth of Malpas to date and not result in large 'estate' type areas of similar appearance. Instead, new developments should contribute to creating sociable and inclusive neighbourhoods that respond to the village character and strengthen the existing community.

New residential development should therefore ideally be delivered as schemes with a maximum of 30 houses.

Where a scheme exceeds this number then different areas of distinct and discernible character, each no larger than 30 homes, must be designed into the scheme.

All new developments should be designed with an outward-looking housing layout that positively addresses existing roads and have good pedestrian connections that promote integration into the existing settlement. Developments should conserve and enhance the historic environment, including the setting of heritage assets, where appropriate.

WALKING AND CYCLING

The easiest, cheapest, and fastest way to decarbonise local transport is replace as many short and medium journeys done by private cars with walking and cycling as possible. To achieve this, improvements and new investment in high-quality and safe walking and cycling infrastructure, and promoting the use of walking and cycling routes are necessary. Neighbourhood forums and Town Councils can set sustainable mobility targets for their own neighbourhood area and request new developments to demonstrate how the proposal will help the community achieve the target.

Proposals for residential and business developments should improve and extend the existing walking and cycling routes to create an active travel network, allowing safer, easier, and greater access to new housing, the neighbourhood centre, green spaces, employment sites as well as to the national walking and cycling network. The reduction in the visual or physical quality of existing walking and cycling routes must be resisted. If the loss of part of the active travel network is inevitable, it must be replaced by equivalent or better provision in terms of quantity and quality in a suitable location.

Improvements and new investment in the active travel network must be designed in such a way to prevent conflicts between pedestrians / walkers and cyclists and thus incorporate protected lanes and other engineering and design measures as necessary. Cycling infrastructure should also be inclusive and designed for non-standard cycles such as tricycles and recumbent cycles which can be used by disabled people as mobility aids.

Cycle parking should be as convenient as car parking, safe, and designed around the principles of inclusivity for non-standard cycles. All key facilities and amenities in the neighbourhood area should have secure and easily accessible cycle parking facilities such as shelters or racks to encourage cycling as an alternative to driving.

Funds can be raised from the community infrastructure levy or developer contributions to pay towards the costs of maintaining and improving the walking and cycling network (see page 23 for more information on developer contributions).

For further information see:

- Guidance by the Department for Transport on delivering high quality, safe cycle infrastructure (link)

Recent examples of good walking and cycling policy from made neighbourhood plans are listed below:

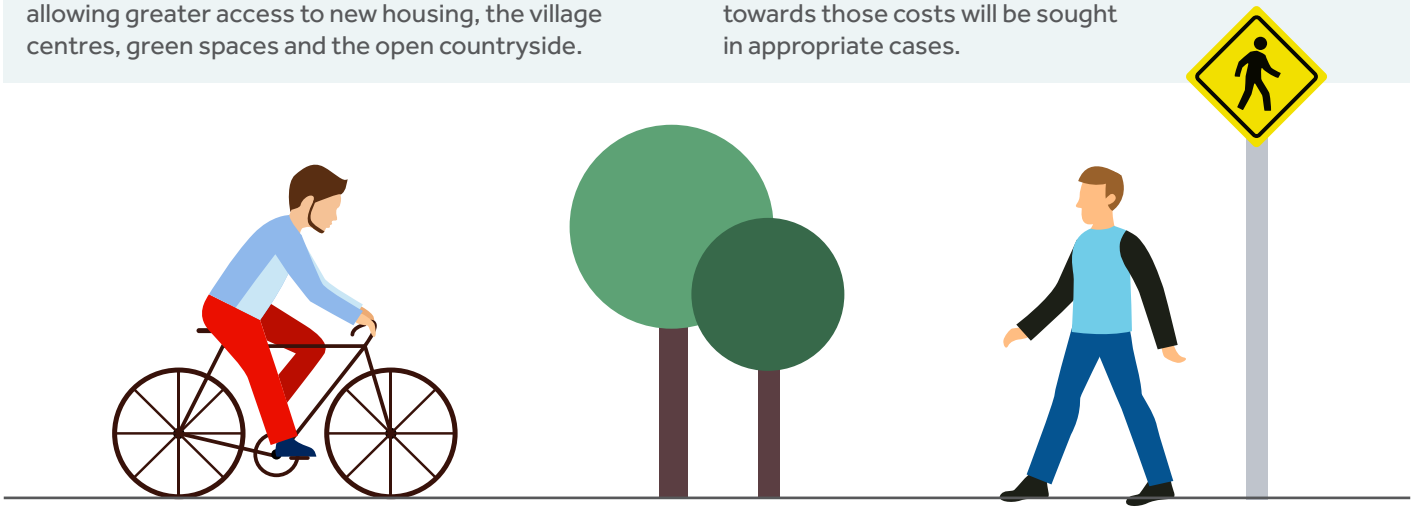
BARNHAM & EASTERGATE NEIGHBOURHOOD PLAN
(2014, PAGE 28-29) POLICY GA1, GA2 AND GA3

New developments should integrate with the current green infrastructure network and provide access to public and community transport, to connect with the social, community and retail facilities of the villages.

Support will be given to proposals that improve and extend the existing footpath and cycle path network, allowing greater access to new housing, the village centres, green spaces and the open countryside.

The loss of existing footpaths and cycle paths will be resisted.

Funds raised from the Community Infrastructure Levy (CIL) will be put towards the costs of maintaining and improving the network of footpaths and cycle paths. Developer contributions towards those costs will be sought in appropriate cases.



HAILSHAM NEIGHBOURHOOD PLAN

(2021, PAGE 34): POLICY HAIL AT2 THE CUCKOO TRAIL

Proposals for development that enhance the quality of the Cuckoo Trail (a green walking and cycle route running north south through Hailsham) will be supported. Improvements may include:

1. Incorporation of new links to and from the Cuckoo Trail for pedestrians and cyclists, integrating with an enhanced walking and cycle network across Hailsham.
2. Creation of new active fronts within development along the route of the Cuckoo Trail which enhances safety and security through natural surveillance.
3. Provision of unobtrusive lighting along the Cuckoo Trail.
4. Enhancing the environmental quality of the habitat, biodiversity and tress along the Cuckoo Trail.

Longer-term development opportunities that provide scope to reconnect missing links along the Cuckoo Trail, creating a seamless route, will be welcome.

WITCHFORD NEIGHBOURHOOD PLAN

(2020, PAGE 40): POLICY WNP GI1 PUBLIC RIGHTS OF WAY

Development proposals that will enhance or extend an existing public right of way or that will deliver a new public right of way in a suitable location will be viewed favourably. Development proposals shall maintain or enhance the amenity value of any public right of way involved in the development.

(2020, PAGE 63): POLICY WNP C1 CONNECTING WITCHFORD AND ELY THROUGH SUSTAINABLE AND SAFE CYCLE AND PEDESTRIAN ROUTES

The creation of a sustainable and safe segregated cycle and pedestrian route towards Ely within the Neighbourhood Area is strongly encouraged.

It should feature as part of any future upgrade to the A142 highway network. Where necessary to deliver sustainable development and where directly, fairly and reasonably related in scale and kind to the proposed development, off-site contributions will be secured to achieve the pedestrian and cycle route from Witchford towards Ely.

CAR PARKING

Private cars are responsible for most of the greenhouse gas emissions from surface transport, and the amount of land dedicated for parking is a lost opportunity for housing, green space, and employment sites. Whilst in complete neighbourhoods or areas well served by public transport there is little need for extensive car parking provisions that already dominate much of the built environment in England, a car remains a necessity in many new developments that have poor public transport connections and lack of public amenities in walking and cycling distances – even if it is only used for occasional trips once per week.

Parking provision that is well designed and is built on the principles of pedestrian priority can contribute to a high-quality environment conducive to walking and cycling. Parking should be provided on-plot in the first instance and where this is not possible, on specially allocated parking bays. New developments should also make adequate provision for parking and access for deliveries and service vehicles.

In areas well serviced by public transport, NPPF (2021) paragraph 108 allows planning policies to include maximum parking standards to resist car dependent development and encourage more sustainable modes of transport.

For further information see:

- Greenhouse gas emissions by transport mode in the United Kingdom (link)
- Road traffic statistics by local authority in Great Britain including annual traffic by vehicle type (link)

Recent examples of good parking policy from made neighbourhood plans are listed below:

ASCOT, SUNNINGHILL AND SUNNINGDALE NEIGHBOURHOOD PLAN
(2014, PAGE 47): POLICY T1 PARKING AND ACCESS

1. Development proposals must make adequate provision for parking and access for deliveries, service vehicles, tradesmen working on-site and social visitors as well as for residents or workers.
2. Development proposals must, wherever possible, provide adequate parking on-site and not rely on on-street parking. Development that includes a reliance on parking on existing streets shall not be permitted where the streets are narrow, already heavily trafficked, have identified parking issues, or where such on-street parking would impact on the safety of road users or adversely impact the character of the area.

HAILSHAM NEIGHBOURHOOD PLAN
(2021, PAGE 30): POLICY HAIL D5 RESIDENTIAL CAR PARKING DESIGN

Parking within new residential development will be designed such that it is conveniently located and overlooked so that it can be used in the way it is intended for, avoiding informal parking that undermines the quality of the street environment.

Parking should be unobtrusive, with garages (where proposed) set back from the building line and street trees used to soften the visual impact of parked cars, particularly on street. Proposals for rear or separate parking courts will not be permitted, unless alternative provision is impracticable.

TRAFFIC

Whilst mitigation of traffic impacts is not a land-use planning issue, traffic impacts heavily on the quality of place and is a critical factor in the success of low or zero-carbon transport alternatives. A neighbourhood plan can include policies and projects to manage and mitigate the impact of car parking in the neighbourhood and provide placemaking strategies for safer and more convenient experience for pedestrians and cyclists.

NPPF paragraph 113 asks all developments that will generate significant amounts of movement to provide a travel plan, supported by a transport assessment or transport statement, to assess the likely impacts of the proposal. Local thresholds for 'significant levels' to trigger the NPPF paragraph 111 can be set up by the local highway authority, in partnership with the neighbourhood forum, at key road junctions.

By adopting traffic calming measures in the design of roads and streets, new developments can introduce design cues such as visual narrowing, better signage, addition of sheltered parking bays to create gentle chicanes and break up sight lines, removal of centre line markings and other road improvements to encourage drivers to reduce their speed and alter the way that vehicular traffic behaves, and thus radically improve the environment for walking and cycling. Similar design improvements can also be incorporated off-site such as in the town centre through securing funds from development contributions.

Neighbourhood planning policies can also ask new employment developments that will generate additional heavy goods vehicle trips need to submit a transport assessment, which would need to demonstrate how the supply and distribution routes will use the most appropriate routes and reduce the impact on local residents and the minor road network.

For further information see:

- 'Traffic in Villages Toolkit' by the Dorset AONB Partnership in conjunction with Hamilton-Baillie Associates to guide design for rural roads within communities. The guidance builds on a number of successful pilot projects and is informed by best practice from the UK and elsewhere in mainland Europe.

Recent examples of good traffic management policy from made neighbourhood plans are listed below:

CHURCHDOWN & INNSWORTH NEIGHBOURHOOD PLAN
(2020, PAGE 67): POLICY CHIN16 HIGHWAY CAPACITY AT KEY ROAD JUNCTIONS

All Transport Assessments (for larger sites) or Transport Statements (for smaller sites) - as required by Para 111 of the National Planning Policy Framework - should address to the satisfaction of the highway authority the cumulative transport impact on road junctions, in particular including the following, identified on the Policies Map:

- B4063 Cheltenham Road East with Innsworth Lane and Parton Road
- Pirton Lane and Cheltenham Road East
- Pirton Lane and Station Road d. Albemarle Road and Brookfield Road
- Pirton Lane and Winston Road

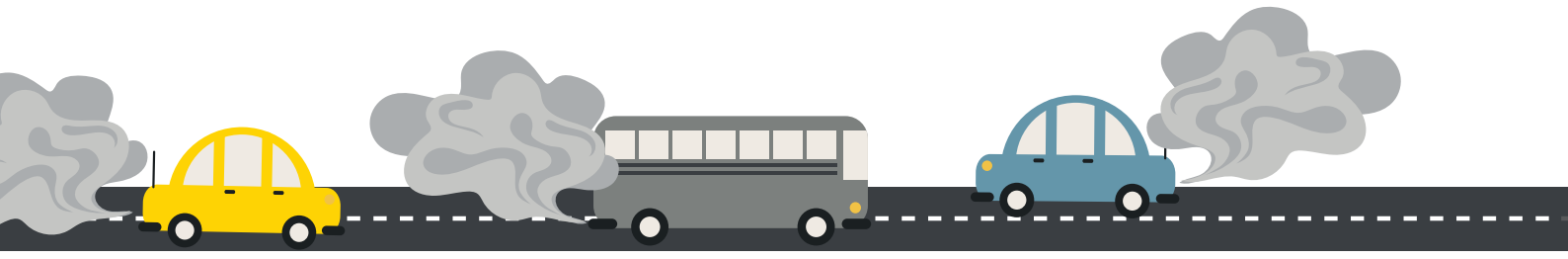
GILSTON AREA NEIGHBOURHOOD PLAN
(2021, PAGE 57): POLICY AG8 MINIMISING THE IMPACT OF TRAFFIC AND NEW TRANSPORT INFRASTRUCTURE ON EXISTING COMMUNITIES

Infrastructure design proposals will be supported where it can be demonstrated that the following criteria are satisfied:

- The design of new road infrastructure minimises impacts on existing communities and incorporates mitigation measures to minimise severance within existing settlements.
- Impacts from traffic and road infrastructure on existing communities in terms of safety, traffic speed, pollution, environmental and visual impacts are adequately controlled and mitigated.
- Measures have been taken to mitigate visual and noise impacts on the landscape character of the Stort Valley and the setting of local heritage assets.
- Measures have been put in place to minimise the risk of potential pollutants entering the River Stort or any of the other watercourses (main river or ordinary) as a result of surface water run-off from new transport infrastructure or increase in traffic volumes resulting from the development.
- The design of the new bridge crossings over the River Stort should minimise impacts on the character and environment of the river and provide good connections for walking and cycling, including provision for wayfinding.
- New vehicular access arrangements are designed to minimise any increase in traffic on existing roads and lanes and to retain convenient access for existing communities.
- No significant additional heavy vehicle movements through the existing communities as a result of the development or of new highway and access arrangements associated with the development.

A Construction and Environmental Management Plan (CEMP) will be prepared to limit the impact of construction traffic in agreement with the community.

A monitoring and management regime will be implemented to ensure appropriate measures will be introduced to address any issues which may arise during the construction or operation of the development.



PUBLIC REALM IMPROVEMENTS AND COMMUNITY FACILITIES

Well-designed and accessible high streets can create successful and prosperous places that prioritise the needs and comfort of people over vehicles and engender a strong local economy. Public realm is also a space for social experience and thus is important for supporting both physical and mental wellbeing. Supporting the priority of pedestrians at the top of the road user hierarchy also strongly contributes to decarbonising local transport by removing traffic and air and noise pollution from the public realm.

Highway improvements, landscaping and street rationalisation can be sought, encouraged and supported by a neighbourhood plan. This can either be done via area-specific policies such as bespoke design guides for new development in the town centre, or off-site contributions from new developments elsewhere in the neighbourhood towards regenerating town centre. Further improvements in the public realm can be sought to remove street clutter such as unused public phone boxes and similar items, improved signage throughout the area, and improvements to pavements crossings and road surfaces.

In addition to design interventions, the public realm of high streets can also be strengthened by encouraging or discouraging certain use classes such as commercial, business and service (class E) and local community (class F.2).

Any development resulting in a reduction in the overall provision of commercial, retail, cultural, or community facilities (including allotments) should demonstrate that it contributes to the vitality and viability of the high street and that the original use or alternative community use is no longer viable and sustained vacancy period of over 12 months (or longer to take account of the Covid-19 pandemic).

Policies regulating use classes on high streets and around the neighbourhood can also be used to preclude the loss of community facilities unless an equivalent or better community facility is provided. In conservation areas or areas with particular heritage concerns, neighbourhood forums can also work with their local planning authority to issue an article 4 direction to restrict the scope of permitted development rights either in relation to a particular area (such as high street), or a particular type of development anywhere in the authority's area. This will ensure communities retain and where necessary enhances these facilities, which will in turn help create a sense of place in their surroundings and help reduce the need to travel.

For further information see:

- Please see the government's planning guidance on when permission is required. Particularly paragraphs 9a and 9b for what uses are included in Class E and Class F.2 and paragraph 38 for when it is appropriate to use article 4 directions (link).

Recent examples of good public realm improvements and community facility from made neighbourhood plans are listed below:

HAILSHAM NEIGHBOURHOOD PLAN
(2021, PAGE 77): POLICY HAIL TC6 STREETS AND SPACES IN THE TOWN CENTRE

Applications will be supported which contribute to an enhanced movement network by all modes, providing a comfortable and safe environment for pedestrians and cyclists, and improving access by public transport. Applications should help provide a network of well- designed social and civic spaces that support the cultural and economic life of the town.

Where appropriate, all proposed developments should contribute to an improved movement network and enhance the quality of public realm.

The placing of tables and chairs in the street will be acceptable (subject to license) where it does not prejudice highway or public safety, the movement of pedestrian and cyclists, the operation of street events or markets, the character of the conservation area or result in activities that cause harm to residential amenity.

PRESTON PARISH NEIGHBOURHOOD PLAN
(2020, PAGE 30): POLICY AF2 COMMUNITY FACILITY CHANGE OF USE

Proposals for a change of use of an existing community facility to a non-community use will not be supported unless either:

- The facility will be (or has been) replaced by an equivalent or better community facility; or
- It can be shown that the existing community use is not viable and no alternative community use is viable.

Proposals for a change of use of part of an existing dwelling to provide a community facility or village shop will be supported providing it is consistent with the other policies.

EMPLOYMENT

Through allocating land for new business development and regulating change of business and commercial uses on high street, planning policies can engender an environment in which the local economy can flourish. Neighbourhood planning policies can also secure funds and provide support for necessary facilities for companies to prosper such as land, a skilled and adaptable workforce, utilities and infrastructure, and so on. A healthy local economy help decarbonising local transport by developing local jobs and reduce outward commuting and by creating an attractive environment which brings in improved public transport and better urban regeneration opportunities. In any case development proposals that result in a reduction in local employment should be resisted.

Whilst employment policies can be site specific such as an existing or proposed business park, they can also apply to the whole area, to promote housing design that facilitates home working and mixed-use developments suitable for micro or small business that are appropriate for the area.

NPPF chapters 7 and 9 can be used to apply a sequential test to planning applications like shopping centres or offices in out of town locations, to ensure that town centre or edge of centre locations are considered as a priority and that a proper impact assessment of the development is carried out including traffic impacts.

Recent examples of good employment policy from made neighbourhood plans are listed below:

WITCHFORD NEIGHBOURHOOD PLAN
(2020, PAGE 65): POLICY WNP E1 SUPPORT FOR SMALL BUSINESS DEVELOPMENT

Development proposals that help to encourage and support small businesses in the village will be viewed favourably where they are consistent with other priorities in this plan and where they do not trigger or contribute to problems associated with on- street parking.

This could include:
- housing design that facilitates home working; and
- new accommodation, including serviced offices, that is suitable for micro businesses

ACTON, EDLESTON AND HENHULL NEIGHBOURHOOD PLAN
(2020, PAGE 46): POLICY DEV5 WORKING FROM HOME

Proposals to provide facilities for home working either by conversion, extension or new build within the curtilage of existing homes, will be supported provided that it is subservient in scale to the existing building. Where planning permission is required to facilitate home working this will be supported subject to ensuring that the final use proposed does not impinge on the amenity of the existing property or neighbouring properties, including consideration of any increase in vehicular comings and goings from the property.

Care should be taken to ensure that the intensification of use over time does not result in unacceptable impacts on nearby amenity. Appropriate conditions may be used to ensure that this is achieved through limiting the approved use, the number of vehicular comings and goings or the hours of operation.

IMPROVING AIR QUALITY

Air pollution, particularly from traffic, has become a major problem in city regions and small towns alike and decarbonising local transport can reduce air pollution particularly in and around the key public facilities and amenities such as busy road junctions, schools, nurseries, and health facilities.

New developments can be challenged on the grounds of its impact on air quality and be required to provide clear and actionable plan to mitigate the impact, taking into account the presence of Air Quality Management Areas and Clean Air Zones. A monitoring and management regime can be implemented to ensure appropriate measured will be introduced to address any issues which may arise during the construction or operation of the development. For example, NP can promote policies requiring installation of sensors for air quality monitoring.

Recent examples of good traffic management policy from made neighbourhood plans are listed below:

ALSAGER NEIGHBOURHOOD PLAN
(2020, PAGE 50): TTS8 IMPROVING AIR QUALITY

To protect air quality where it is of a high standard and to improve it elsewhere, particularly in areas close to the M6 and busy road junctions, development proposals will only be supported provided they meet the following conditions:

1. Proposals that are likely to have a significantly harmful impact on local air quality will be required to provide an Air Quality Assessment (AQA). Where the AQA shows that constructional or operational characteristics of the development would cause harm to air quality, including cumulatively with other planned or committed development, planning permission will be refused unless measures are adopted to acceptably mitigate the impact. Similarly developments that introduce sensitive receptors (such as housing, schools, care homes and hospitals) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.
2. Development that is likely to produce an odour should demonstrate that there will be no negative effect on residential development in the area.
3. Consideration should be given to the role of tree planting in improving and maintaining air quality.

SECTION 3:

COMMUNITY ACTIONS AND PROJECTS

Whilst neighbourhood planning policies are to regulate form and function of the land in the neighbourhood area, a neighbourhood plan can include a list of actions and projects that are ordinarily outside the remit of neighbourhood plans, to engender behaviour change in community for low-carbon lifestyles and deliver tangible results with assistance from developer contributions or in partnership with local authority such as paying costs towards a fixed asset (e.g. bridge over a canal, new bike lanes).

Similar to planning policies, there is no one-size-fits-all rule that will make an action or project more deliverable than another. Challenges and opportunities for each place are unique. However, there are some general principles that can be followed to transform aspirations to reality.

Policies in a neighbourhood plan are subject to the basic conditions test and thus carry weight in decision-making, whereas actions and projects are aspirations of the community and not tested as robustly as policies, yet can still carry some weight to help development management officers reach a decision favourable to the community. Therefore, it is important to clearly separate policies from actions and projects in the plan.

COMMUNITY ACTIONS

To decarbonise local transport, community actions need to engender a substantial and sustainable change in habits across the community. These habit disruptors should be designed around the idea of replacing high-carbon-dependent habits with low-carbon alternatives such as walking or cycling to work one day a week instead of driving. Whilst research is inconclusive in the extent to when and what habit disruptors should be introduced to have the maximum impact, it is unanimous that, small or big, any positive change in habits towards low-carbon lifestyles is favoured and can pave the way to the transformation in our social environment needed for net-zero, regardless of whether these habit disruptors focus on small incentives such as rewarding employees for choosing sustainable transport over driving alone, or moments of big change such as installing temporary cycle lanes to meet the great cycling boom and encourage socially distanced transport during Covid-19.

One of the most established models of behaviour change is the COM-B model, which proposes that an effective and long-lasting behaviour change are driven by motivation to change, capability to make a change and the opportunity to change.

Any pathway to behaviour change should first identify the barriers to change, whether real or perceived.

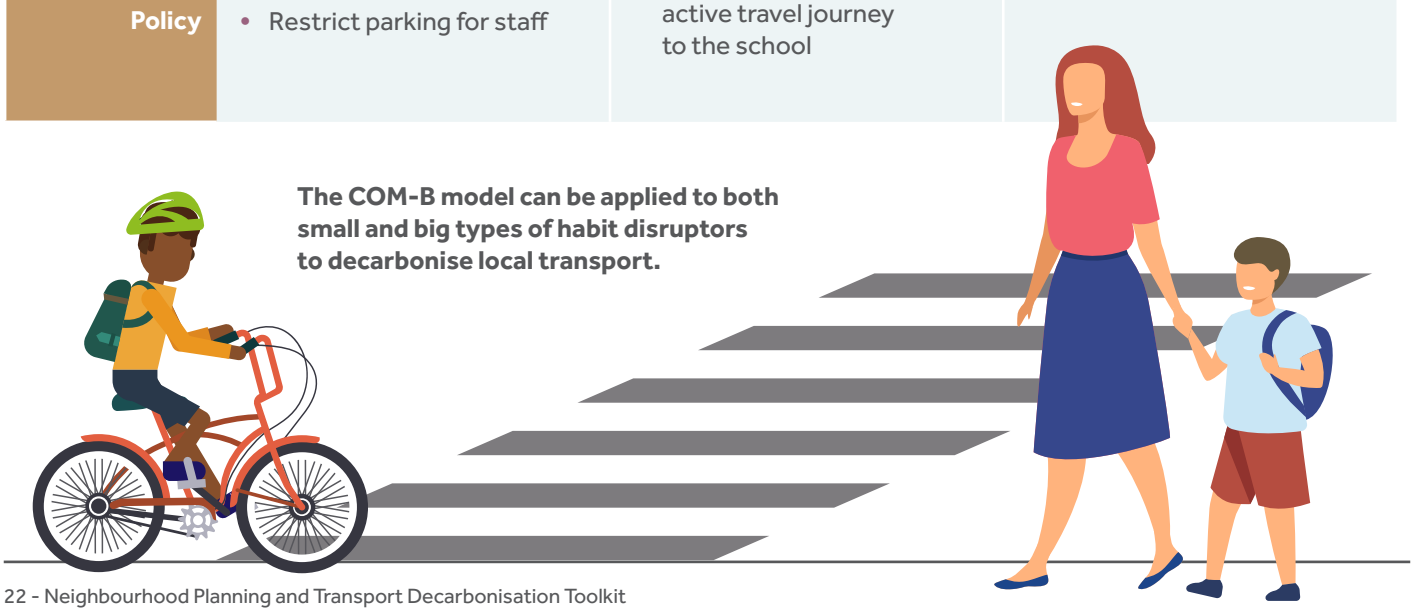
Second, interventions to remove barriers and provide opportunities for change should be mapped and actioned.

Lastly, regulatory policies should be introduced to make the changes long-lasting and prevent relapse.

As an example, below table applies the COM-B model to an imaginary school and shows how the model can help identify a pathway to change and thus result in a school car exclusion zone, walking buses, travel planning and a range of other sustainability initiatives.

	Capability	Opportunity	Motivation
Barriers	• lack of cycle and scooter parking provisions on school	• fragmented organisational structure governing delivery of necessary infrastructure / change	• significant traffic problems
Intervention	• Increase cycle and scooter provisions on schools • Council to provide free scooting and biking training to the children	• Close engagement with councillors, parents, and planning officers	• Newly established and proactive board of governors
Policy	• Restrict park and drop off / pick up around the school • Restrict parking for staff	• Parents submit a description of their active travel journey to the school	• Walking bus to school

The COM-B model can be applied to both small and big types of habit disruptors to decarbonise local transport.



DEVELOPER CONTRIBUTIONS

These are some generic policies that can be included in the plan to signpost the aspirations and projects that the community want to be funded. All new development above a certain size should be required to make adequate provisions for any infrastructure requirements which arise directly as a consequence of the development such as on-site facilities directly related to the development or off-site facilities or financial contribution towards such facilities to avoid placing an undue burden on existing infrastructure.

THE HIGHAMS PARK NEIGHBOURHOOD PLAN
(2020, PAGE 32): POLICY DCO1 DEVELOPER CONTRIBUTIONS

- Community Infrastructure Levy funds to be expended in the Plan Area should be focused on the projects listed in Table 1. "HPPG Projects" in Annex 1.
- Where appropriate, developer contributions should be directed to mitigating impacts on the Plan Area.
- Where appropriate, funding for maintenance of landscaping or other facilities, should be secured as an up-front capital contribution.

CAR CLUBS

THE HIGHAMS PARK NEIGHBOURHOOD PLAN
(2020, PAGE 21)

Development shall aim to support and contribute towards enhancing the provision of sustainable modes of transport - as well as improving movement around the Area and where appropriate will include the provision of

- Car Club spaces
- Charging point stations for electric cars
- Loading bays where regular deliveries are required for commercial use
- Secure cycle parking

PUBLIC TRANSPORT

BALSALL PARISH NEIGHBOURHOOD PLAN
(2018, PAGE 126): COMMUNITY ASPIRATION CA9 IMPROVED PUBLIC TRANSPORT

It is an ambition of this Plan for more people to walk and cycle to the station, and for train and bus services to be improved. This can be achieved through a number of ways including:

- Introduce a regular bus service to Kenilworth and improve services to Balsall Common centre, Coventry and Solihull between homes in Balsall Common (Balsall parish), Fen End, Oakley and Meer End;
- More reliable and frequent regularly spaced services, using smaller vehicles if appropriate;
- Services operating in the evenings and Sundays in addition to Monday to Saturday;
- Electronic indicator information boards should be provided at bus stops; and
- Enclosed shelters should be provided where appropriate.

For further information see the recent Campaign for Rural England report on how to advocate for a comprehensive bus network for rural England, including undertaking feasibility studies and other helpful tips.

- Hinchliff C and Taylor I (2021) Every village, every hour: a comprehensive bus network for rural England. Report for CPRE based on research and modelling by Transport for Quality of Life (link).

WALKING AND CYCLING TO SCHOOL

These are some generic policies that can be included in the plan to signpost the aspirations and projects that the community want to be funded. All new development above a certain size should be required to make adequate provisions for any infrastructure requirements which arise directly as a consequence of the development such as on-site facilities directly related to the development or off-site facilities or financial contribution towards such facilities to avoid placing an undue burden on existing infrastructure.

WOODFORD NEIGHBOURHOOD PLAN ASPIRATIONS

(2018, PAGE 5): ASPIRATION 1 & 2 WALKING AND CYCLING PROVISIONS

The Community will work with SMBC, Cheshire East and developers (who will be expected to contribute financially to enable this provision) to create a safe and secure network of walking and cycling routes around and within the Neighbourhood Area and improve links with surrounding areas.

This will provide direct links between homes and health, education, employment, retail and other important amenities, and aesthetic walking routes, away from main roads, typically with greenery, and providing access to informal recreation opportunities. This network includes existing footways associated with roads and a number of existing public rights of way across the Neighbourhood Area. See footpath map in the plan.

TRAFFIC CALMING

WOODFORD NEIGHBOURHOOD PLAN ASPIRATIONS

(2018, PAGE 5): ASPIRATION 4 TRAFFIC CALMING

The Community will work with SMBC, the LHA, TfGM, Cheshire East and others to produce a programme of schemes designed to improve safety for all road users, and to encourage increased levels of walking and cycling. This will include speed reduction schemes where appropriate. **Some suggestions for potential specific road and traffic improvements:**

1. Improved pedestrian crossing facilities on Woodford Road Incorporating tactile paving.
2. Improved pedestrian crossing facilities in Chester Road (between Moor Lane and Church Lane), including additional pedestrian refuges, particularly related to bus stopping points.
3. Junction improvements at Chester Road/Woodford Road roundabout, including enhanced pedestrian crossing points.
4. Junction improvements at Chester Road/Church Lane (bus turn-round) Measures to provide traffic calming and a 'gateway' to the village.
5. Village "entrance feature" at village boundaries on Wilmslow Road, Chester Road, Woodford Road and Hall Moss Lane.
6. Speed limit reduction from 40 mph to 30 mph from Deanwater Hotel to Moor Lane potentially associated with the introduction of central refuges (as 2) and cycle lanes (as 7).
7. Introduction of cycle lanes to Chester Road between Old Hall lane and Moor Lane.
8. Where possible extend the existing road restrictions on heavy vehicles.

HASSOCKS NEIGHBOURHOOD PLAN

(2020, PAGE 58): AIM 7 TRAFFIC AND ACCESSIBILITY

Support will be offered for proposals to minimise the impact of traffic and enhance traffic safety within the Parish. **This includes, but is not limited to:**

1. Reduction in traffic congestion, association pollution and highway safety problems at Stonepound Crossroads, Dale Avenue and Keymer Road;
2. Introduction of 20mph zones within the Parish's existing and proposed residential areas;
3. Introduction of roundabouts at the junctions of Keymer Road/ Grand Avenue, and Lodge Lane/ New Road;
4. Routing HGVs away from the A273 in proximity to the Stonepound Crossroads; and
5. Promotion of, or contribution towards, infrastructure to enable use of non- carbon fuelled vehicles within the Parish, including from new development.

SECTION 4:

PARTNERSHIPS

In addition to planning policies and community actions and projects, the third and perhaps most underutilised tool in neighbourhood plans to decarbonise local transport is to make allies in the right places. Although the policies in a neighbourhood plan carry significant legal weight when decisions on planning applications are made, the delivery of policies on the ground is contingent upon external partners such as local planning authority as the decision-maker or developer as the delivery agent.

Whilst most transport matters are dealt in the regional scale by local transport authorities, policies and projects neighbourhoods plans can support both planning and delivery stages of transport provisions, and help regional bodies secure community buy-in through feedback, evidence base and community actions. For example, a neighbourhood plan policy favouring an enhanced and extended local walking and cycling provisions can support a regional network of active travel, further bringing benefits both to the neighbourhood area and the region.

Such partnerships between neighbourhood forums and local authorities can also foster a better coordination of local transport knowledge and needs at a regional level to ensure good practice and data is shared, and voice their needs together and lobby for support. An effective and sustainable transport network is only as strong as its weakest part – for example the effectiveness of strategic road network could easily be hampered by problems in local roads or access roads from residential areas. Most transport modes are complementary of each other – therefore it is crucial for all parts to be working as efficiently and sustainably as possible.

This sections provides a non-exhaustive list of organisations with which a neighbourhood forum may wish to positively engage, to help support their plans to decarbonise local transport.

LOCAL AUTHORITIES

Often the first and most important strategy with engagement is to identify the right allies. Local Planning Authorities (district, borough, or unitary) are a key partner in the production of a neighbourhood plan and can support neighbourhood forums with policy writing, evidence gathering, and compliance checks against the national and local plans. In regard to transport, in two-tier areas the county council is the responsible body to coordinate the wider transport strategy across neighbouring local districts. In unitary authorities the powers are merged within the same council, though very often in different departments. Combined authorities have their own bespoke approaches to transport, often with a strategic transport plan covering the combined authority area.

There are more powers and funding available to both local planning and transport and highways authorities than neighbourhood forums, so the right partnership and collaboration with them can lead to much bigger transformational changes in local transport.
One such power that is not available to neighbourhood forums but can be supported by neighbourhood plans is banning pavement parking on individual streets or by area, by making a traffic regulation order (TRO). Although a TRO is a time consuming process and can possibly shift the problem elsewhere, if planned carefully with support from appropriate policies and actions from a neighbourhood plan, it can make pavements safer for people to walk on and use a wheelchair, encouraging more active travel and supporting the independence of many disabled people.

PRIVATE AND VSCE SECTORS

Early and positive engagement between neighbourhood forum and developers can take local growth forward whilst bringing many benefits in local transport systems. A neighbourhood plan can advocate a strong partnership approach with the community in matters related to the design quality of new development and the stewardship of open space and community facilities. This ensures community views are fed into the masterplanning and secures necessary provisions to decarbonise local transport.

Further engagement is also necessary with local business networks, major employers and community services such as schools and GP surgeries in the local area to work with and produce sustainable travel plans, which can also be supported by policies and projects in a neighbourhood plan. Safe and secure alternatives to driving to access these services and innovative solutions such as walking schools buses can also be supported by policies and projects in a neighbourhood plan, to decarbonise local transport.

Recent examples of good partnership policies from made neighbourhood plans are listed below:

GILSTON AREA NEIGHBOURHOOD PLAN

PLAN (2021, PAGE 87): POLICY D1 ESTABLISHING A PARTNERSHIP WITH THE COMMUNITY

Development proposals will be supported which have been developed in partnership with the community and meet the following criteria:

1. Local communities (existing and new) have been fully, meaningfully and collaboratively engaged with at each stage of the development process; this will include evidence of how community views have been taken account in the development proposals.
2. Involvement of the community in briefing the design teams responsible for the preparation of Masterplans about the local area and the perspective of the community.
3. Collaborative Design Charrettes / Co-Design workshops will be held to facilitate the active engagement of the community at each stage in the preparation of the Strategic Landscape Masterplan and individual Village Masterplans and to ensure they respond to local aspirations and are grounded in an understanding and evaluation of the area's defining characteristics.

Funding may be made available through legal agreements to support the local community to enable full engagement and participation, including professional support where required.

REFERENCES AND USEFUL RESOURCES

General guidance on neighbourhood planning and decarbonising transport

- A good place to start is the government's own guidance (link).
- Locality produced a very useful guide on all parts of neighbourhood planning (link).
- Centre for Sustainable Energy's excellent guide to neighbourhood planning in a climate emergency (link).
- Experts from the DecarboN8 project developed a series of policy briefing notes that laid out the scale of the problem and the practical actions that can be taken by local authorities (link).

Benefits of low-carbon transport evidence base reference list

1. Department of Health and Social Care Physical Activity Guidelines: UK Chief Medical Officers' Report; Department of Health and Social Care: London, UK, 2019;
2. Laird, Y.; Kelly, P.; Brage, S.; Woodcock, J. Cycling and Walking for Individual and Population Health Benefits: A Rapid Evidence Review; Public Health England: London, UK, 2018; p. 56;.
3. Kelly, P.; Williamson, C.; Niven, A.G.; Hunter, R.; Mutrie, N.; Richards, J. Walking on Sunshine: Scoping Review of the Evidence for Walking and Mental Health. Br. J. Sports Med. 2018, 52, 800–806, doi:10/gdntm8.
4. Manjunatha, S. The Acute Effects of a Single Bout of Moderate-Intensity Aerobic Exercise on Cognitive Functions in Healthy Adult Males. J. Clin. Diagn. Res. 2013, doi:10/gpqfw8.
5. Todd Litman The Hidden Traffic Safety Solution: Public Transportation; American Public Transportation Association, 2016; p. 72;.
6. Evandt, J.; Oftedal, B.; Hjertager Krog, N.; Nafstad, P.; Schwarze, P.E.; Marit Aasvang, G. A Population-Based Study on Nighttime Road Traffic Noise and Insomnia. Sleep 2017, 40, doi:10/f9wwfr.
7. Selzer, S. Car-Reduced Neighborhoods as Blueprints for the Transition toward an Environmentally Friendly Urban Transport System? A Comparison of Narratives and Mobility-Related Practices in Two Case Studies. J. Transp. Geogr. 2021, 96, 103126, doi:10/gpqfw9.
8. Gotschi, T. Costs and Benefits of Bicycling Investments in Portland, Oregon. J. Phys. Act. Health 2011, 8, S49–S58, doi:10/gg9m7t.
9. Mueller, N.; Rojas-Rueda, D.; Cole-Hunter, T.; de Nazelle, A.; Dons, E.; Gerike, R.; Götschi, T.; Int Panis, L.; Kahlmeier, S.; Nieuwenhuijsen, M. Health Impact Assessment of Active Transportation: A Systematic Review. Prev. Med. 2015, 76, 103–114, doi:10/f7kk2s.
10. Woodcock, J.; Tainio, M.; Cheshire, J.; O'Brien, O.; Goodman, A. Health Effects of the London Bicycle Sharing System: Health Impact Modelling Study. BMJ 2014, 348, g425–g425, doi:10/f6ssq5.
11. Living Streets The Pedestrian Pound; Living Streets: London, UK, 2018;
12. Transport for London Economic Benefits of Walking and Cycling Available online: https://www.tfl.gov.uk/corporate/publications-and-reports/economic-benefits-of-walking-and-cycling.
13. Millard, T.; Nellthorp, J.; Ojeda-Cabra, M. What Is the Value of Urban-Realm? – A Cross-Sectional Analysis in London; University of Leeds Institute for Transport Studies: Leeds, 2018;
14. Neves, A.; Brand, C. Assessing the Potential for Carbon Emissions Savings from Replacing Short Car Trips with Walking and Cycling Using a Mixed GPS-Travel Diary Approach. Transp. Res. Part Policy Pract. 2019, 123, 130–146, doi:10.1016/j.tra.2018.08.022.
15. Sun, C.; Zhang, W.; Fang, X.; Gao, X.; Xu, M. Urban Public Transport and Air Quality: Empirical Study of China Cities. Energy Policy 2019, 135, 110998, doi:10.1016/j.enpol.2019.110998.
16. Kole, P.J.; Löhr, A.J.; Van Belleghem, F.; Ragas, A. Wear and Tear of Tyres: A Stealthy Source of Microplastics in the Environment. Int. J. Environ. Res. Public. Health 2017, 14, 1265, doi:10.3390/ijerph14101265.

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