ATKINS
Member of the SNC-Lavalin Group

The benefits of active travel evidence base

Document 2: Scheme specific investment

1. Introduction

Surrey County Council has commissioned Atkins to collate national and local policy documents to understand the ambitions for active travel, and to undertake a review of academic literature and best practice evidence to identify the reported benefits of active travel scheme investment. Active travel is a term that covers modes of travel that involve activity, such as walking, cycling and wheeling, which includes trips made by wheelchairs and scooters (Department for Transport, 2022). Surrey County Council requested this piece of work to provide an independent, rapid review of the evidence to be presented in an easy to digest manner and completed in a short amount of time to coincide with wider active travel programmes.

It must be noted that this document was commissioned to be written for a technical audience, intended for use by officers of Surrey County Council. The points made in this paper are taken directly from the policy documents and papers reviewed and are independent from Atkins' views. The project brief was not intended to seek advice or guidance from Atkins, and as such, this document simply presents a collation of evidence from which the reader may choose to read up and look into in further detail. This is with the exception of Section 6, where Atkins has drawn some high level conclusions for future schemes based on the review of the literature presented in this paper.

This paper is the second of two documents that set out the potential benefits of active travel investment. The objective is to provide information in a succinct way to enable Surrey County Council with the development of schemes that seek to increase active travel across the county. It is recognised that Surrey and its towns and villages are unique and may not be directly relatable to the examples in the literature, however the intention is to provide a range of evidence from schemes that demonstrate active travel benefits.

Building on the first paper that looked at the benefits of active travel more generally, this paper focuses on active travel schemes and the benefits they can bring to justify investment.

1.1. Purpose

This paper is designed to be a concise collation of the headlines of evidence, signposting to other documents and research where more details can be found. It is not intended to be a full technical report. There is a large amount of evidence that makes the case for active travel scheme investment; this paper cannot cover it all, but instead provides an insight into the range of active travel schemes and their outcomes to demonstrate the benefits of

investment. All sources that have been reviewed are provided in full in Section 7 of this paper, to allow further, more detailed investigation, if required.

1.2. Method

National and local policy documents were reviewed on topics relating to transport, decarbonisation, public health, air quality and climate change and technical and academic papers on the benefits of investing in active travel schemes were reviewed. These papers were derived from the Active Travel Online Portal (Active Travel Online Portal | Active Travel Information) and Google Scholar. Papers that were identified by Surrey County Council and Atkins were also reviewed. Atkins has written a report called *Boosting the local economy through active travel* (Atkins, 2020), from which links to documents were also taken.

1.3. Structure

This paper is structured as follows:

Section 2 Making the case for active travel scheme investment: This section gives a high level overview of the need to make a case to justify investment in active travel schemes and presents the case made for an active travel scheme for London Road, Burpham in Surrey.

Section 3 Policy ambitions for walking and cycling infrastructure investment: This section presents the national and local policy that sets out intentions to invest in active travel.

Section 4 Benefits of investing in active travel infrastructure schemes: This section presents the headlines from the literature for active travel scheme investment in general, and the resulting benefits from investment.

Section 5 Case studies of active travel infrastructure schemes: Moving from the general active travel scheme investment in the previous section, this section presents a variety of specific case studies of active travel schemes and the reported outcomes from investment.

Section 6 Conclusions and considerations for future schemes to help demonstrate benefits: This section concludes with insights from literature and practice to inform future successful scheme investment and delivery, including considerations for detailed monitoring and evaluation.

Section 7 References for further detail: This section provides the details of the sources of information referred to in this paper for further investigation, if required.

2. Making the case for active travel scheme investment

As will be presented in following sections, examples from the literature review demonstrate how active travel schemes can meet wide ranging benefits and outcomes. Whilst this evidence exists for a range of schemes, each active travel scheme needs to demonstrate the outcomes it is intended to achieve to justify investment in it.

Increasingly, cases made for active travel schemes are looking more holistically at the benefits that schemes can bring. The literature review in the previous paper and the evidence presented in this paper show that active travel investment can overcome challenges and support policy outcomes in the following topics:

- Physical health
- Mental health and wellbeing
- Local economy
- Environment and air quality
- Climate change
- Addressing inequalities

Making the case for future active travel investment needs to consider the strength of evidence of the positive impacts active travel schemes can make in these topics to justify investment and garner support from communities and stakeholders.

Surrey County Council has been developing an active travel scheme in Guildford that seeks to contribute towards achieving the benefits and outcomes that have been reported in the previous paper and are presented in the following sections of this paper.

The next section looks at the case that has been made for the scheme so far and is based purely on a review of information that has already been produced.

2.1. London Road, Burpham Active Travel Scheme

Taken from information published on the Surrey County Council website, the London Road, Burpham Active Travel Scheme seeks to upgrade existing shared use facilities to provide a segregated one-way cycle track on both sides of London Road to connect the centre of Burpham and Stoke Park. London Road is a main corridor in the north east of the town that leads to the centre of Guildford. In addition, improvements are proposed at major junctions to improve safety for pedestrians and cyclists.

In addition to the policy documents that have been highlighted in this and the previous paper that set out the ambition for active travel in Surrey, there are several location specific policy documents for Guildford that identify and prioritise this route for active travel improvements, such as the Guildford Cycle Plan and the Guildford Cycle Routes Assessment. A Local Cycling and Walking Investment Plan (LCWIP) is in development for Guildford, which will set

out ambitions for walking and cycling infrastructure investment and the routes prioritised for investment.

In Surrey, a third of work journeys are three miles or less, however, only 2-3% of these journeys are carried out by cycle. The borough of Guildford experiences high levels of congestion and is a designated air quality management area. Improving this corridor for active travel contributes to a wider aspiration to build a network of sustainable transport routes around Guildford for walking and cycling. The aim is to encourage a shift to active modes to minimise car traffic to reduce congestion and promote low impact ways to travel that are less harmful to the environment.

The case for prioritising this particular route for improvement is because it is identified as a 'missing link' of active travel infrastructure. In addition, the high levels of current use of this corridor indicates propensity for mode switches to active modes for various journey purposes. Figures reported on Surrey County Council's website state that there are currently around 230 daily cycling trips on this corridor and the proposed improvements could uplift this figure to 378 daily cycling trips, which is around a 60% increase.

The scheme is intended to be monitored using automated cycle counters to capture data on the numbers of people using the new infrastructure, to understand the contribution to wider benefits and policy outcomes.

3. Policy ambitions for walking and cycling infrastructure investment

From the review of the policy documents for the previous paper, which highlighted the ambition and intention to invest in active travel in general, there are also ambitions to invest in high quality, transformative active travel infrastructure to encourage more people to cycle.

Locally, the Surrey Local Transport Plan 4 sets out the many ambitions and measures for walking and cycling infrastructure. It also recognises that this type of investment will meet wider objectives of net zero carbon emissions, sustainable growth, well connected communities, clean air and excellent quality of life:

The following ambitions and measures for active travel infrastructure…

'Segregated or low speed roads with traffic calming measures to reduce traffic alongside walking routes.'

'Separate routes for pedestrians and cyclists.'

'Widened and high-quality footways, including surface quality, width and continuity.'

'Better lighting.'

'Convenient crossing facilities for pedestrians at the most appropriate locations.'

'New, extended and improved cycling routes.'

'…an integrated and high-quality network of cycle routes and footpaths across the county, separated from general traffic wherever possible.'

'…more space to pedestrians and cyclists and lowering speed limits where appropriate.'

'…new cycle lanes will be built. In some cases, we will reallocate existing road space from cars and goods vehicles to active travel choices, such as cycling, designing schemes carefully to minimise the impacts of any additional congestion.'

'…safe, attractive, high-quality routes, directly serving journeys that people want to make, designed in accordance with the latest design standards and guidance, such as LTN 1/20.'

Surrey County Council, 2022

…will meet the following wider objectives:

'…reduces the number of car vehicle kilometres travelled, reducing carbon emissions from transport.'

'…people tend to stay longer, visit more shops and destinations, and spend more when arriving by active travel modes.'

'…improved walking and cycling facilities attract more visitors to economic centres.'

'…increase opportunities for people to access their everyday needs locally using affordable transport and improve social mobility.'

'…improves health and wellbeing whilst reducing the impacts of traffic on communities.'

'…leads to improved air and noise quality and more attractive local environments that support residents to live, work, play, socialise and move within their neighbourhood.'

Surrey County Council, 2022

Here are some headlines from national policy on the intention to invest in active travel infrastructure:

'Cycle infrastructure should be accessible to everyone from 8 to 80 and beyond.'

'Largely cosmetic interventions will not be funded.'

Gear Change: A bold vision for cycling and walking, Department for Transport 2020a

'We will deliver a world class cycling and walking network in England by 2040'

Decarbonising Transport: A better, greener Britain, Department for Transport, 2021

Having established the policy ambitions for walking and cycling investment at a national and local level, the next section looks at evidence that demonstrates the benefits of investing in active travel schemes.

4. Benefits of investing in active travel infrastructure schemes

The previous paper demonstrates the benefits of ***the activity of active travel*** by showing how it can overcome challenges and support policy outcomes. By comparison, this paper focuses on how ***active travel schemes*** can deliver the benefits described in the previous paper, demonstrating the case for investment. The review of the literature for this paper found many studies and systematic reviews that provide evidence that investment in active travel schemes result in a wide range of benefits. This section presents the headlines from the literature review of active travel scheme investment in general, and the resulting benefits from investment, before moving on to Section 5 that looks at specific case studies and their outcomes.

Table 1 presents the headlines of the evidence that report on schemes that increase active travel levels and the resulting benefits. The source of the evidence is also provided, which is provided in full in Section 7.

Table 1 Reported benefits of investing in active travel schemes

Reported benefits of investing in active travel schemes	Source
Improved cycling infrastructure leads to **reduced air pollution, improved general health, improved economy** and play a part in **tackling climate crisis**.	We Are Cycling UK, 2020, 2022.
Built environment interventions can lead to **more walking or cycling.**	Aldred, 2019; Brook Lyndhurst, 2016; Modijefsky, 2021; Molenberg et al., 2019; Sport England, 2019.
Separated bike lanes can **lower car use.**	Kuss and Nicholas, 2022.
Interventions that lead to more walking and cycling **increased physical activity and health outcomes**.	Smith et al, 2017; Sport England, 2019.
Providing high quality walking and cycling infrastructure has **positive impacts on local shops,** and creates **thriving high streets** where people want to **stop and socialise**.	Aldred, 2014; Arancibia, 2013; Hall et al, 2017; Leyden, 2005; NYC DoT, 2012; Rowe, 2013; Sztabuinski, 2009; Transport for London, 2023.

Reported benefits of investing in active travel schemes	Source
Improving the public realm (often a result of walking and cycling investment) encourages **longer dwell times leads to improved local economies.**	Biggar, 2015; Carmona et al, 2018; Howard, 1993.
Walking and cycling schemes enable **more people to move around in a smaller space than that needed for motorised traffic.**	Aldred, 2014; Bracewell, 2018; We Are Cycling UK, 2020, 2022.
From reviewing 70 case studies, **it is rare that schemes that reallocate road space from vehicles to walking and cycling create substantial congestion or disruption**.	Cairns et al, 1998.
Walking and wheeling schemes need to have more focus this is at the top of road user hierarchy and is **available to all in society**.	Living Streets, Arup, Sustrans, 2022.
Separated cycle lanes **reduce number of fatalities** and enable people to **feel safe**.	Björklund and Isacsson, 2013; Caulfield and Brick, 2012; Steer Davies Gleave, 2012; Sustrans, 2017; Wang et al, 2012; Winters et al, 2012; Winters and Teschke, 2010; University of Colorado Denver, 2019.

5. Case studies of active travel infrastructure schemes

The previous section set out the findings from the literature review for this paper on the evidence of benefits achieved through active travel scheme investment. This section looks at specific case study examples of active travel scheme investment and specified outcomes, reinforcing the findings in the previous section that active travel investment leads to wide ranging benefits.

Table 2 below summarises the nature and outcomes of a number of specific active travel infrastructure schemes.

Table 2 Case studies of active travel infrastructure schemes

Where was the scheme?	What was the scheme?	What was the outcome?	Source
Active travel corridor schemes			
London	'Superhighways' now Cycleways. Physical segregation, 1.5-metre-wide barrier-free cycling paths designed to connect outer and central London.	Significant **increase in cycling- up to 200%** in some places. Moving 5**% more people per hour** within 2 weeks of opening. **84%** of users **felt safe** during their journeys. **Perception of journey quality has improved** in almost all locations.	Department for Transport, 2020c; Sustrans, 2019; Transport for London, 2023.
Lewes Road, Brighton	Cycle route connecting the city centre with major employers, universities, a medical school and a football stadium. Re-allocated road space in both directions for the creation	Increase in **daily cyclists** from 2086 to 2806, a **34% increase**. **50% reduction** in the number of people **killed or seriously injured**. **Severity of accidents declined**.	Department for Transport, 2016.

Where was the scheme?	What was the scheme?	What was the outcome?	Source
	of a dedicated bus and cycle lane. Cycle bypass at traffic lights and 'floating' bus stops.		
Hills Road Bridge, Cambridge	Reshape a dual carriageway bridge, with a new design involving 2 cycle lanes and 3 traffic lanes.	Recorded **accidents** on the bridge **fell by around 50%** in the 2 years following the scheme implementation.	Department for Transport (2016b).
Manchester – Wilmslow / Oxford Road	Cycle lanes over a 3 mile stretch of the corridor on both sides of the road. 63% of the route is full physical segregation from traffic. Several cycle bypass lane at bus stops.	An 11 week count 1 year after implementation showed southbound flow was **up by 38%.** A further count carried out 6 months later showed a **continued increase** in cycle volumes. Total 2018 journeys topping 1 million, the **equivalent of 621,000 car journeys.** Road collisions **have not increased**.	Department for Transport, 2020b.
8 cities across the UK	Capital grants of Cycle City Ambition Programme, including: Cycle superhighways Mixed strategic cycle routes through quiet roads and green space City centre schemes Junction treatment	**Increases in levels of cycling**, with mode switches reported, saving **CO2 emissions**. **Demographic** profiles started to **change** of cyclists after intervention. More than **half** and **80% new cyclists** felt new infrastructure had enabled them to be more **physically active**.	Sloman et al., 2019.
Cities across the UK	12 Local Sustainable Transport Fund large projects.	Generally, **traffic volumes initially reduced** compared with comparator group. **CO2 reduced**.	Sloman et al., 2017, 2018;

Where was the scheme?	What was the scheme?	What was the outcome?	Source
	Several have a corridor approach with improvements to cycling and walking infrastructure.	The proportion of **adults who cycled increased by 6.6pp** in the LSTF Large Project areas relative to the comparator group.	Department for Transport, 2017.
Cities across the UK	155.3 miles of segregated cycle routes. 463.9 miles of unsegregated routes. 200.7 new footpaths. 3,786 pedestrian crossings.	Overall, **increase in number and length of walking and cycling trips** across 10 project areas and **reduced car use** in 4.	Iyer et al., 2019.
Pedestrian improvement schemes			
Stoke-on-Trent	Widened footways. Replaced surfaces,	Planting and seating. **30% more footfall** and new businesses and cafes setting up.	City of Stoke-on-Trent Council, 2017.
Public realm improvement schemes			
Kelso, Scotland	Traffic management and public realm improvements.	**Increased footfall by 28%.**	Living Streets, 2018.
Coventry	Public realm improvements of a new civic square. Better placement of street furniture. Improved wayfinding.	**25% increase in footfall. a**	NWDA/RENEW Northwest, 2007.

Where was the scheme?	What was the scheme?	What was the outcome?	Source
Altrincham	£15m investment in public realm: Improved footways. Improved crossing points.	**25% increase in footfall.**	Trafford Council, 2017.
Stockton on Tees	New public square.	**increased numbers of visitors** and **retail unit vacancy rates dropping by 6%.**	Stockton on Tees Council, 2016.
Exeter	Public realm investment: Increasing pedestrian and shared spaces. Seating, public art, high quality materials.	30% increase in footfall.	Sinnett et al, 2011.

6. Conclusions and considerations for future schemes to help demonstrate benefits

The review of the literature and evidence for the previous paper and this paper has highlighted several opportunities to fully capture the benefits and maximise the case for investing in active travel schemes. This section seeks to conclude the findings with suggestions on how future schemes can capture the benefits of active travel schemes to understand their impacts on overcoming challenges and supporting policy outcomes.

6.1. Early, detailed, holistic data collection

From reviewing the literature it is clear that, whilst there is a lot of evidence that separately reports on individual benefits of active travel schemes, however, there is a lack of evidence on all of the types of benefits that have been identified here. There is evidence that active travel helps to overcome many challenges in terms of health, environmental, economic and social aspects, but the review did not identify any studies that captured the outcomes across all benefits from a particular scheme. This suggests that data collection to fully understand the holistic benefits of active travel schemes is lacking.

Therefore, it is thought that early, detailed and holistic data collection is required to improve how the benefits of active travel schemes can be captured and evaluated. In addition, early and detailed data collections will also enable scheme developers to develop a deeper understanding of how people use their neighbourhoods to learn about people's needs, and therefore the type of scheme that would respond to these needs and bring benefits.

6.2. Meaningful communication

Atkins has recently developed a discussion paper: *Increasing choices, not limiting them: Understanding the needs of everyone to establish better liveable neighbourhoods* (Atkins, 2023) that discusses garnering greater support for local active travel schemes and recommends meaningful communication as a crucial step for developing successful schemes. As demonstrated, active travel schemes can meet many cross-cutting health, environmental, economic, and social objectives; however, the benefits need to resonate with people within communities that the scheme is proposed by understanding the impact on their daily lives. After understanding the complexities of movement carried out by people in the area through early and detailed data collection, this enriched data can enable the creation of 'personas' that reflect the characteristics and behaviours of people and how the schemes may impact them. This can better communicate the benefits of the schemes in a meaningful way and make it personal to people who can identify with a particular persona type.

6.3. Infrastructure to increase active travel should be accompanied by behaviour change activities

Active travel schemes that provide new or improved infrastructure have increased outcomes when accompanied with measures that encourage behaviour change to active modes (Brook Lyndhurst, 2016; Department for Transport, 2017; Solman et al., 2017). During the development and implementation of an infrastructure scheme, measures such as cycle training, journey planning and initiatives to increase active travel trips can enable greater use and therefore develop greater benefits.

6.4. Need for better monitoring and evaluation of schemes

It is often reported in the literature that data on the outcomes of schemes is unclear, therefore some benefits cannot be fully attributed to the scheme (Aldred, 2019; Brook Lyndhurst, 2016; Department for Transport, 2017; Sloman et al., 2017). In addition, outcomes of schemes often do not report the holistic benefits that have been identified separately in this and the previous paper. As such, continued data collection is required to fully monitor and evaluate schemes to understand the impacts and be able to feed into future schemes, by understanding what works well and what can be better developed next time.

7. References for further detail

Aldred, R. (2014); British Cycling, Benefits of Investing in Cycling https://www.britishcycling.org.uk/zuvvi/media/bc_files/campaigning/BENEFITS_OF_INVESTING_IN_CYCLING_DIGI_FINAL.pdf Accessed 2020

Aldred, R (2019): Built Environment Interventions to Increase Active Travel: a Critical Review and Discussion. Current Environmental Health Reports volume 6, pages309–315 Built Environment Interventions to Increase Active Travel: a Critical Review and Discussion - PubMed (nih.gov)

Arancibia, D. (2013) Cyclists, Bike Lanes, and On-Street Parking: Economic Impacts Toronto University of Toronto daniel_arancibia_ce_report_bike_lanes_december_10.pdf (torontocycling.org)

Arup. (2016) Cities Alive: towards a walking world https://www.arup.com/publications/research/section/cities-alive-towards-a-walking-world

Atkins (2023) Increasing choices, not limiting them: Understanding the needs of everyone to establish better liveable neighbourhoods. Available on request.

Biggar, J. (2015). Investing in the Public Realm. MITACS & ERA Architects

Bracewell, D. (2018) "Vancouver's Mobility Future: Automating Policy into Sustainable Results" https://council.vancouver.ca/20180130/documents/rr3presentation.pdf

Björklund, G. and Isacsson, G. (2013) Forecasting the impact of infrastructure on Swedish commuters' cycling behaviour Stockholm Centre for Transport Studies, KTH [PDF] Forecasting the impact of infrastructure on Swedish commuters' cycling behaviour | Semantic Scholar

Brook Lyndhurst (2016) Investing in Cycling & Walking: Rapid Evidence Assessment A report for the Department for Transport Investing in cycling and walking: rapid evidence assessment (publishing.service.gov.uk)

Cairns, S; Hass-Klau, C; Goodwin, PB; (1998) Traffic impact of highway capacity reductions: assessment of the evidence. [Book]. Landor Publishing: London.

Carmona, M; Gabrieli, T; Hickman, R; Laopoulou, T; Livingstone, N (2018) Street appeal. UCL for Transport for London. Street Appeal: The value of street improvements (tfl.gov.uk)

Caulfield, B., Brick, R. and McCarthy, T. (2012) Determining bicycle infrastructure preferences – A case study of Dublin Transportation Research Part D: Transport and Environment 17(5): 413–417 Determining bicycle infrastructure preferences – A case study of Dublin - ScienceDirect

City of Stoke-on-Trent Council (2017), City News, Winter 2017

Department for Transport (2016a) Improving Lewes Road in Brighton for buses, cyclists and pedestrians Improving Lewes Road in Brighton for buses, cyclists and pedestrians - Case study - GOV.UK (www.gov.uk)

Department for Transport (2016b) Wide cycle lanes on Hills Road bridge, Cambridge Wide cycle lanes on Hills Road bridge, Cambridge - Case study - GOV.UK (www.gov.uk)

Department for Transport (2017) Impact of the Local Sustainable Transport Fund Summary Report Impact of the Local Sustainable Transport Fund Summary Report (publishing.service.gov.uk)

Department for Transport (2020a): Gear Change: A bold vision for cycling and walking. Gear change: a bold vision for cycling and walking (publishing.service.gov.uk)

Department for Transport (2020b) Building cycle infrastructure in Manchester Building cycle infrastructure in Manchester - Case study - GOV.UK (www.gov.uk)

Department for Transport (2020c) Developing London's cycle infrastructure Developing London's cycle infrastructure - Case study - GOV.UK (www.gov.uk)

Department for Transport (2021): Decarbonising Transport: A better, greener Britain. Decarbonising Transport – A Better, Greener Britain (publishing.service.gov.uk)

Department for Transport (2022) Active travel: local authority toolkit Active travel: local authority toolkit - GOV.UK (www.gov.uk)

Hall, S; King, J; Sajjad, F; Morris, C; Mehra, R; Lewis, H; Martin, H; Meyer, M; Seguin, P; Worrall, M (2017) High streets for all. We Made That and LSE Cities for Greater London Authority. high-streets-for-all-report-web-final.pdf (lse.ac.uk)

Howard, E.B. (1993), Assessing the impact of shopping-centre development: the Meadowhall case, Journal of Property Research, Vol. 10, pp. 97-119 Assessing the impact of shopping-centre development: The Meadowhall case: Journal of Property Research: Vol 10, No 2 (tandfonline.com)

Iyer, P; Morgan, H; Lynch-Huggins, S; Gilbert, A; Phillips, D (2019): Cycling & Walking Evidence Review Outputs and outcomes from a portfolio of projects Full Report (2004 – 2019) Cycling and Walking evidence review (activetravel.org.uk)

Kuss, P; Nicholas, K (2022): A dozen effective interventions to reduce car use in European cities: Lessons learned from a meta-analysis and transition management Case Studies on Transport Policy
Volume 10, Issue 3 A dozen effective interventions to reduce car use in European cities: Lessons learned from a meta-analysis and transition management - ScienceDirect

Living Streets (2018), The Pedestrian Pound: the business case for better streets and places Updated by Moira Tasker for Living Streets 2018 Editing and additional case study material Rachel Lee and Stuart Hay pedestrian-pound-2018.pdf (livingstreets.org.uk)

Living Streets, Arup, Sustrans (2022) Walking for everyone: Making walking and wheeling more inclusive. Walking for Everyone: A guide for inclusive walking in cities and towns (activetravel.org.uk)

Leyden, K. (2005) Social capital and the built environment: The importance of walkable neighbourhoods, American Journal of Public Health, 93: (9): 1546-1551. Social Capital and the Built Environment: The Importance of Walkable Neighborhoods | AJPH | Vol. 93 Issue 9 (aphapublications.org)

Manchester City Council (2017) Wilmslow Road Cycleway Monitoring Report Wilmslow Road Monitoring Report to the meeting of the Neighbourhoods and Environment Scrutiny Committee of 28 February 2017 (manchester.gov.uk)

Modijefsky, M (2021): Additional bike lanes induce large increases in cycling Additional bike lanes induce large increases in cycling | Eltis

Mölenberg, F; Panter, J; Burdorf, A; van Lenthe, F (2019): A systematic review of the effect of infrastructural interventions to promote cycling: strengthening causal inference from observational data. International Journal of Behavioral Nutrition and Physical Activity volume 16, Article number: 93 A systematic review of the effect of infrastructural interventions to promote cycling: strengthening causal inference from observational data | International Journal of Behavioral Nutrition and Physical Activity | Full Text (biomedcentral.com)

New York City Department of Transport (2012) Measuring the Street: New Metrics for 21st Century Streets 2012-10-measuring-the-street.pdf (nyc.gov)

NWDA/RENEW Northwest. (2007). Economic Value of Urban Design Final Report. Places Matter: The Economic Value of Good Design. Good Design 2009.pdf (urbanpollinators.co.uk)

Rowe, K. (2013) BIKENOMICS: Measuring the Economic Impact of Bicycle Facilities on Neighborhood Business Districts. Washington, DC University of Washington Bikenomics_v4.pdf (bikewalkkc.org)

Sinnett, D., Williams, K., Chatterjee, K. and Cavill, N. (2011) Making the case for investment in the walking environment: A review of the evidence. Technical Report. Living Streets, London. Making the case.pdf (oxpa.org.uk)

Sloman, L; Cairns, S; Goodman, A; Hopkin, J; Taylor, I; Hopkinson, L; Ricketts, O; Hiblin, B; Dillon, M (2017) Meta-analysis of Outcomes of Investment in the 12 Local Sustainable Transport Fund Large Projects: Final Report. Meta-analysis of outcomes of investment in the 12 Local Sustainable Transport Fund large projects: final report (publishing.service.gov.uk)

Sloman, L; Cairns, S; Goodman, A; Hopkin, J; Taylor, I; Hopkinson, L; Ricketts, O; Hiblin, B; Dillon, M (2018) Impact of the Local Sustainable Transport Fund: Synthesis of Evidence Impact of the Local Sustainable Transport Fund: synthesis of evidence (publishing.service.gov.uk)

Sloman, L; Dennis, S; Hopkinson, L; Goodman, A; Farla, K; Hiblin, B; Turner, J (2019): Cycle City Ambition programme: 2013 to 2018 evaluation Evaluation of the Cycle City Ambition programme between 2013 and 2018. Summary and Synthesis of Evidence: Cycle City Ambition Programme 2013-2018 (publishing.service.gov.uk)

Smith, M; Hosking, J; Woodward, A; Witten, K; MacMillan, A; Field, A; Baas, P; Mackie, H (2017): Systematic literature review of built environment effects on physical activity and active transport – an update and new findings on health equity. International Journal of Behavioral Nutrition and Physical Activity volume 14, Article number: 158 Systematic literature review of built environment effects on physical activity and active transport - an update and new findings on health equity - PubMed (nih.gov)

Sport England (2019) Active Travel & Physical Activity Evidence Review Summary and Key Findings. active-travel-summary-evidence-review.pdf (sportengland-production-files.s3.eu-west-2.amazonaws.com)

Steer Davies Gleave (2012) Cycle route choice: Final survey and model report. London: Transport for London/Steer Davies Gleave Cycle route choice (tfl.gov.uk)

Stockton-on-Tees Town Centre uses Study (2016) Plans unveiled for Stockton town centre after "massive response" to public consultation - Stockton-on-Tees Borough Council Accessed 2023

Surrey County Council (2022) Surrey Local Transport Plan 4 Local Transport Plan (LTP4) - Surrey County Council (surreycc.gov.uk)

Sustrans (2017) Bike Life Report

Sustrans (2019) Common Misconceptions of Active Travel Investment A Review of the Evidence. https://www.sustrans.org.uk/media/5224/common-misconceptions-of-active-travel-investment.pdf

Sztabinski, F. (2009) Bike Lanes, On-Street Parking and Business: A Study of Bloor Street in Toronto's Annex Neighbourhood Toronto Clean Air Partnership Bike lanes, on-street parking and business: a study of Bloor Street in Toronto's Annex neighborhood (trb.org)

Trafford Council. (2017). Altrincham Town Centre Neighbourhood Business Plan. Adopted November 2017 Altrincham Town Centre Neighbourhood Business Plan (trafford.gov.uk)

Transport for London (2023) Three new low traffic Cycleways, connecting even more of London's communities
Three new low traffic Cycleways, connecting even more of London's communities - Transport for London (tfl.gov.uk)

Transport for London, Walking and cycling: the economic benefits http://content.tfl.gov.uk/walking-cycling-economic-benefits-summary-pack.pdf Accessed 2023

University of Colorado Denver (2019) Cycling lanes reduce fatalities for all road users, study shows: Roads are safer for motorists, pedestrians and cyclists in cities with robust bike facilities. Cycling lanes reduce fatalities for all road users, study shows: Roads are safer for motorists, pedestrians and cyclists in cities with robust bike facilities -- ScienceDaily

Wang, J.Y.T., Mirza, L., Cheung, A.K.L and Moradi, S. (2012) Transforming Auckland into a bicycle-friendly city: Understanding factors influencing choices of cyclists and potential cyclists. Australasian Transport Research Forum Understanding factors influencing choices of cyclists and potential cyclists: A case study at the University of Auckland | Request PDF (researchgate.net)

Winters, M., Babul, I., Becker, H.J.E.H, Brubacher, J.R., Chipman, M., Cripton, P., Cusimano, M.D., Friedman, S.M., Harris, M.A., Hunte, G., Monro, M., Reynolds, C.C.O., Shen, H. and Teschke, K. (2012) Safe Cycling: How Do Risk Perceptions Compare With Observed Risk? Canadian Journal of Public Health 103 (Suppl. 3): S42-S47 Safe Cycling: How Do Risk Perceptions Compare With Observed Risk? - PMC (nih.gov)

Winters, M. and Teschke, K. (2010) Route preferences among adults in the near market for bicycling: findings of the Cycling in Cities study. American Journal of Health Promotion 25(1): 40-7) Route Preferences among Adults in the near Market for Bicycling: Findings of the Cycling in Cities Study - Meghan Winters, Kay Teschke, 2010 (sagepub.com)

We Are Cycling UK (2020) Six reasons to build cycle lanes Six reasons to build cycle lanes | Cycling UK

We Are Cycling UK (2022) Getting there with cycling… safer streets, clean air, health, equality, active lifestyles, climate change The strong case for building cycling infrastructure | Cycling UK