TRAVEL-WELL

Health, wellbeing and new cycling infrastructure: A mixed methods study of health, wellbeing, and health economic impacts of large-scale new cycling infrastructure in three English regions outside London

Study details

Funder: National Institute for Health Research

Funding Stream: Public Health Research

Funder Reference: NIHR167654

Dates: 1st April 2025-31st March 2030

Study team

Principal Investigators: Professor Rachel Aldred and Dr Ersilia Verlinghieri, University of Westminster.

Co-Investigators: Dr Jamie Furlong (Westminster), Ms Patrice Ajai-Ajagbe (Westminster), Dr Harrie Larrington-Spencer (Westminster), Dr David Fevyer (Westminster), Dr Anna Goodman (LSHTM), Professor Philip Edwards (LSHTM), Dr Luiz Flavio Andrade de Oliveira (Birmingham), Mrs Mariam Draaijer (JoyRiders), Dr Kay Inckle (Wheels for Wellbeing)

Copyright Statement

Abstract

Under 1% of passenger distance in Britain is cycled, but in 1952, this figure was 11% (or 1/4 of trips). In other European countries and cities, cycling has partially rebounded, and there would be large health gains if England can follow suit. London has recently built higher-quality dedicated cycling infrastructure, and the city now makes up 17% of km cycled in Britain (from 10% in 1993). New national design guidance is based on London's approach, and other city regions are creating major funding packages from devolved budgets.

This research will evaluate new high-quality cycling infrastructure across three English regions (Greater Manchester, West Midlands, West Yorkshire). In the quantitative component, a longitudinal survey with three follow-up waves will generate evidence from across the regions. Regions have ambitious five-year plans, but not all schemes will happen, so our method does not rely on implementation of any specific scheme. At baseline we will recruit individuals in households within a buffer zone of all planned schemes, achieving 15,000 repeat respondents allowing us to identify a plausible short-term rise (+1.8 min/wk) in population cycling. This design can incorporate other policy changes potentially affecting travel behaviour, such as new Low Emission Zones. We will study health and health economic outcomes from changes in travel behaviour including via physical activity, emissions, injuries, and subjective wellbeing pathways. Equity analysis of scheme planning and implementation will cover diversity and small-area deprivation.

A substantial qualitative component responds to (i) the need for more evidence about new cyclists' experiences and how cycling shapes subjective wellbeing, and (ii) a lack of in-depth research into inequalities in cycling uptake and experiences, and how new infrastructure affects marginalised communities. For (i) we will interview 75 new cyclists (25 per region) using photo- and map-based prompts. For (ii), co- led by our PPI co-applicants, we will collaborate with local partners to iteratively co-design research with specific communities of interest, selected in Year 1 (Region 1), Year 2 (Region 2), and Year 3 (Region 3) from ethnic minority communities and disabled residents likely to be differentially affected by new infrastructure. In-depth qualitative research with up to 60 participants (cyclists and non-cyclists) from the locally selected groups will allow us to explore community experiences.

Methods

Starting in February 2025 for 60 months, this mixed-methods study will assess impacts on health and health inequalities of new high-quality cycling infrastructure in three diverse city regions outside London. The study design treats introduction of this infrastructure as a natural experiment. It builds on the design used in our successful longitudinal study of travel behaviour change in London's 'mini-Hollands' (TfL-funded, 2016-21, PI Prof Aldred). Supplementing qualitative and quantitative analyses and drawing on the approach successfully followed in our current NIHR study of Low Traffic Neighbourhoods, we will conduct mixed-methods analysis. This will involve early on developing a triangulation protocol which we will use to guide integrated analysis of (mostly) separately collected qualitative and quantitative data as the project continues.

The project's quantitative component comprises a large controlled before-after longitudinal study, assessing how new cycling infrastructure affects travel behaviour (predominantly via a past-week travel diary) and hence health and wellbeing, health inequalities, and health economic impacts. The survey involves making postal contact with 300,000 households for the baseline survey, seeking a sample of 30,000 which will likely reduce to 15,000 in subsequent years. The design addresses a major problem for active travel infrastructure evaluation: any one scheme has a non-trivial chance of delay, major changes, or cancellation. We mitigate this through four annual data collection waves based on a sample of households selected at baseline to live close to planned cycle infrastructure. The design is robust to only some schemes going forward, important given well-recognised implementation challenges.

This quantitative component will be accompanied by targeted qualitative work in two parts. Strand 1 will use a mix of qualitative methods (interviews, photo-elicitation, mapping) to study a diverse group of new cyclists and how taking up cycling has affected their lives and wellbeing. Strand 2 is co-led with PPI partners expert in working with ethnic minority and disabled communities. Selecting specific communities to study in each region (for instance, a Somali community located near a new route), we will conduct co-designed participatory action research to explore how new cycle infrastructure affects those groups. This may include, for instance, community-appropriate events enabling members to try out cycling on new infrastructure, with follow-up interviews and workshops to explore further experiences, perceptions, and reflections.

Research Questions

What are the impacts on travel behaviour, health and wellbeing of new, high quality cycling infrastructure schemes in three English regions? What are the implications for transport and health policy?

Sub-questions

1. What are the impacts of new, high quality cycling infrastructure schemes on cycling and total active travel, and hence associated health and health economic benefits associated with increased physical activity (primary quantitative outcomes)?
2. What are its impacts on injuries and near-misses (primary quantitative outcomes)?
3. What are its impacts on car ownership, and on car driving and hence emissions of CO_2 and local air pollutants? (secondary quantitative outcomes)
4. How do the above outcomes vary spatially and socially (via testing for interactions)?
5. How equitable are local cycling environments (by deprivation and diversity) across the regions, and how does new infrastructure affect any disparities? (secondary quant outcome)
6. How does the new infrastructure affect wellbeing - both individual subjective wellbeing and community wellbeing? (primary qual outcomes (a), secondary quant outcomes)
7. What are its impacts on experiences of disabled people and those from ethnic minority groups that are less likely to cycle? (primary qualitative outcomes)
8. What implications do (1)-(7) have for transport and health policy?

Research Plan – Quantitative Component

Our three English regions provide a range of settings, all primarily urban (Greater Manchester and the West Midlands have 99% urban populations, West Yorkshire has 90%). Thus, the results will be transferable to much of the English context (83% of the population urban and rising). Over 8 million people live in our regions, nearly as many as in London, but these regions are much more socio-spatially typical of urban England. Their population densities are 1,159/km^2 (West Yorkshire), 2,311/km^2 (Greater Manchester) and 3,237/km^2 (West Midlands), against London's 5,640/km^2. The three regions are demographically diverse and different from each other. While the West Midlands city region is highly dense, largely comprising Birmingham and adjacent towns, West Yorkshire has three times lower population density, with many smaller settlements, and 24% living outside an urban major conurbation. Greater Manchester's population density lies in between but almost all residents (96.9%) are classed as living in an urban major conurbation.

The study population is adults living in our three English regions. At the start of the project, we will update data provided by our authorities on locations of routes planned to be built between 2026-30. We will use this to identify sampling corridors (addresses within a 1km crow-fly buffer of routes). Based on current plans provided, this will be around 300,000-500,000 households. For example, West Yorkshire has planned 85.4km of in-scope cycle routes, mainly protected cycle tracks on main roads and new or substantially upgraded Greenways, in all five districts. Other regions' plans are similar scale, and although not all will be built during the study period, many will.

We will use the Postcode Address File to sample adults living at all 300,000-500,000 addresses to represent a population living at various distances from new infrastructure. Our online questionnaire will use validated and established measures successfully used in similar studies. We will send our postal invitations (twice) to fill in the questionnaire using evidence-based methods to maximise response, e.g. incentives. We will translate the survey into community languages and offer phone and postal alternatives. Conservatively, we assume a 10% response rate, or at least 30,000 respondents at baseline, with around half (15,000) expected to remain at follow-up waves. Three follow-up waves (W1, W2, W3) will happen at the same time of year (early Autumn) via email and postal reminders (twice each) with £5 incentives for completion annually.

This design is based on knowing that some planned routes will be built earlier and some later during the study period, and some not at all. However, when we sample, we will not know confidently which planned routes will be built during the study timeframe. Our approach to sampling means that some of our participants sample will be in a 'control' group throughout (never living close to new infrastructure), while others will 'flip' earlier or later to an intervention group as routes are built close to their homes. This approach allows us to control for likely uncertainty over implementation of any individual route (e.g., a change in ward councillors along a route may affect its political viability, or unrelated planning issues cause unexpected delays).

Our central assumption is that around half the planned routes will be open during at least two study waves, a realistic assumption given substantial local funding and political support for active travel (our power calculation below makes a more conservative assumption). Thus, the control group, likely to be 50% of the sample at W3, is those who do not (yet) live near a new cycle track (e.g. over 2km or over 5km away) but live within 1km of planned infrastructure. Additionally, our intervention group will vary in level of exposure to infrastructure.

In modelling our outcome variables, we need to measure how exposed our participants are to new cycle infrastructure. Traditionally, studies use distance-to-infrastructure. This means analysing whether participants living close to new routes increase their cycling more than those living further away. Our first way of measuring exposure will use this approach, measuring the shortest distance each person would travel (along any route where cycling is permitted) from their home to new high-quality cycle infrastructure. This variable will be zero for all participants at baseline, and then will vary, based on our annually measuring how far everyone lives from a new route. Change in this distance-to-infrastructure variable will be used as a predictor in models with outcome variables including change in cycling. Our second measure looks not just at new routes in isolation, but how these routes affect what we are calling the 'cyclability' (cycle-friendliness) of people's immediate neighbourhoods.

Measuring the cyclability of the local environment will involve categorising the quality of all routes where cycling is permitted. This will be done for each section of route (typically around 80m) and will be based on whether each section meets our criteria for being sufficiently high-quality. Specifically, this entails using route section-level data to assess (i) presence of high-quality cycling infrastructure (on- or off-road) and (ii) speed and volume of motor traffic (on route sections without such infrastructure). Our cyclability metric will also incorporate (iii) access to key services such as schools, green spaces and shops; and (iv) other cycling facilities (e.g. bicycle shops), which were independently associated with cycling levels in our London work.

For each respondent, we will use GIS (Geographical Information Systems)-based analysis to measure the cyclability of their neighbourhood at baseline and each follow-up year. The primary annual change we expect in this measure is due to change in characteristic (i) presence of high-quality cycling infrastructure, which we will test for while controlling for changes in characteristics (ii)-(iv). A respondent's neighbourhood will be defined as the area within a 10-minute cycle ride (for a typical cyclist, assuming 18kmph on most route sections) of their postcode. Analysis will examine if this more sophisticated measure of change in local cyclability has a stronger connection with outcome variables than distance-to-infrastructure.

We will also use our cyclability metric to explore regional disparities in cycling environment. To do this we will calculate cyclability scores at Output Area level across all regions. We will conduct an equity analysis for each region using small-area data on deprivation and ethnic diversity at baseline, repeating this incorporating ongoing and planned changes to cycling infrastructure. This will give partners data on the initial situation alongside equity impacts of investments, allowing them to judge whether they need to amend intervention planning and/or prioritisation. To explore socio-demographic inequalities, we will run models at each wave cross-sectionally to test what area-level characteristics (e.g. IMD) predict higher cyclability, and test whether this changes over time.

Key Outcomes – Quantitative Component

We will measure the following outcomes. All feed into RQ8 and our overall research aim.

1. Change in cycling, walking, and active travel (RQ1)

We will measure minutes spent cycling, walking, and in all active travel via our past-week travel diary, included within our annual longitudinal survey questionnaire. We will also capture change in non-active travel physical activity (PA) to check that (as evidence suggests) active travel does not displace other sources of PA (and adjust accordingly if it does).

2. Change in car driving, car use and car ownership (RQ3)

Our past-week travel diary will measure change in minutes driving or passengering in a car, while we will ask annually about car ownership. Driving data will be used to estimate emissions of local air pollutants and greenhouse gases.

3. Change in subjective well-being (RQ6)

We will measure individual subjective well-being annually using the EuroQol short Health and Wellbeing Questionnaire (EQ-HWB-S, https://euroqol.org/research-at-euroqol/eq-hwb/) developed for use in economic evaluation of the effects of interventions on subjective wellbeing.

4. Change in experiences of road injuries and near-misses (RQ2)

We will ask annually about near-misses in our survey and measure road injuries through DfT injury data (Stats19). We will work with stakeholders to explore how near-misses could be economically quantified as a cost, as are injuries.

5. Change in quality and perceived quality of local cycling environment (RQ4, RQ5)

Using (i) our spatial analyses of cyclability and (ii) questions developed investigating impacts of TfL's mini-Holland schemes, we will measure both quality and perceived quality of participants' local neighbourhood for cycling.

We will use a controlled before-and-after design, running analyses after each follow-up survey Wave that use all data gathered so far in a combined model. Our outcome measures are primary and secondary outcomes of interest for the Wave in question, e.g. ‘any past-week cycling’. Descriptive statistics will initially be used to explore the relationships between the outcomes listed above and socio-demographic characteristics at baseline.

We will use multivariate linear and logistic regression analyses to evaluate the effect of exposure to interventions on outcome measures after controlling for covariates. Our analyses will a) adjust for the corresponding measure at baseline, b) adjust for the Wave in question (i.e. equivalent to adjusting for calendar year) and c) adjust for a Wave-specific exposure variable of ‘time since infrastructure implemented’. This will be 0 for infrastructure not yet implemented (control group), or <1 year/1 year/2 years where infrastructure has been built.

We know that cycling infrastructure is not the only intervention likely to affect travel behaviour. For instance, cities may amend existing Low Emission Zones (LEZ) or create new ones. Our longitudinal study allows for incorporating new policies into analysis. For example, if Leeds introduces a LEZ, we can include a dummy modelling variable for its temporal and spatial extent. Authorities often accompany infrastructure with ‘behaviour change’ measures like cycle training. We will also explore incorporating analysis of impacts of ‘behaviour change’ schemes in modelling (e.g. if an authority offers an access to cycling programme in only some areas).

Developed with the Centre for Economics of Obesity, University of Birmingham, the health economic analysis will measure the effects of cycleways on travel and cycling behaviours, and subsequent impact on overall physical activity levels, health and wellbeing. It will incorporate both Cost Benefit and Cost Effectiveness analysis and will permit stakeholders to consider more impacts than is typical for transport appraisal, while also presenting more familiar outcomes. In stakeholder meetings and public events, we will encourage communities and authorities to explore how we value and assess a range of relevant outcomes.

A cost-benefit analysis (CBA) will be conducted to estimate the economic value of cycling structures. We will use regional National Travel Survey data from 2002-19 and 2022-24 to adjust for seasonality and hence estimate annual change in active travel behaviour. The Department for Transport’s Active Mode Appraisal Tool (AMAT, which the team helped develop) will then be used to assess the economic impact based on change in active travel behaviour, rate of injury, and local air pollution, due to change in travel modes. The model will also capture changes in greenhouse gas emissions. A monetary value for the combined benefits will then be offset by the costs, to estimate the return in investment. Policymakers can then compare this to alternative transport appraisals. A societal perspective will be taken, including outcomes and costs relevant to the public sector and associated with productivity losses due to lack of physical activity. A discounting rate of 3.5% will be used with different time horizons modelled to account for the effect of time on the cost-benefit ratio of the intervention.

Capital costs, including construction, material and lend acquisition costs will be estimated combined with other costs related to maintenance (e.g. cleaning and repair) or administration (managing and enforcing infrastructure). Where possible, indirect costs associated with road space reallocation such as increased journey time for car or bus users will be included. Most such costs will be based on local authority data, as they typically collate this information, but if not, policy documents and evidence reviews can be used (e.g. to estimate typical repair costs). Since this is a before and after study, the comparator will be the baseline time point, with typical travel behaviour captured through the past-week travel diary administered each year in Autumn (a period seen as relatively ‘normal’ for active and other travel). Probabilistic and deterministic sensitivity analysis will be performed to assess uncertainties in the model.

While transport appraisal and policy-making rely heavily on CBA, health policy and research often use CEA (Cost-Effectiveness Analysis) and/or CUA (Cost-Utility Analysis), which compare health-related outcomes to the costs of different interventions. Specifically, CEA uses health-related measures (specific improvements in mental and/or physical wellbeing, physical activity changes or change in marginal MET hours, for instance), while CUA converts health measures into QALYs, with cost per QALY the typical outcome measure. Our plans constitute a CUA which will be led by Dr. Andrade and conducted by a post-doc working with Dr. Andrade in the final project year. While CEA/CUA are still unusual in assessing

transport and built environment interventions, they are congruent with increasing interest in wellbeing and public health. Their use facilitates comparisons of such interventions in relation to standardised health outcomes, in this case cost per QALY.

Dr. Andrade will lead the CUA, conducted primarily in the final project year by the Birmingham post-doc researcher and drawing on CBA results (principally reduced mortality and input costs) and on earlier analyses of our EQ-HWB-S data. The CUA will compare the intervention costs with the change in QALYs associated with it, the latter based upon inputs from AMAT (change in mortality associated with intervention proximity) and from EQ-HWB-S (change in wellbeing associated with intervention proximity converted to change in Quality of Life Weights).

Research Plan - Qualitative Component

We will use qualitative methods to study processes that cannot easily be reached by quantitative analysis. For instance, the quantitative research will use EuroQoL to measure psychological wellbeing impacts of new active travel infrastructure and uptake. Complementing those measures, the qualitative research digs deeper into wellbeing related to cycling practices and experiential disparities. Strand 1 will explore with new cyclists how and why cycling uptake affects individual wellbeing, while Strand 2 will co-design research exploring 'community wellbeing', shared senses of wellbeing related to specific built environments and active travel.

We will use different methods for the two qualitative research strands, in line with the different samples, research questions and foci. Through this we will answer RQ6 and RQ7, developing our understanding of variation and resilience in cycling practices, differential impacts of routes, and how infrastructure planning and implementation affect community as well as individual wellbeing. Collecting and analysing a large and targeted qualitative dataset (at least 135 participants) will allow us to better understand cycling practices and uptake from a transport and health equity perspective and contribute to improving design and implementation of cycling infrastructure in case study areas and elsewhere.

Strand 2, in particular, builds in-depth knowledge about demographically and geographically specific groups (e.g. the Pakistani community in Longsight, South-East Manchester) to draw broader theoretical lessons about how marginalised and under-represented communities may be affected, and may respond to, new active travel infrastructure local to them. While specific experiences may not be generalisable, our analysis can draw conclusions about issues like the possible unintended consequences of cycling infrastructure on community wellbeing, and ways in which authorities could maximise the breadth of communities benefitting from new schemes.

Strand 1. New Cyclists

The study population for Strand 1 is those who have started cycling during the past year, and who live near new or recently built routes. The aim is to examine their cycling practices, and how cycling uptake has affected their wellbeing directly and indirectly (RQ6). Our survey will include a question about whether people have started cycling in the past year, and if so, if they would agree to participate in an interview. Selecting from these respondents based on proximity to new or recently built infrastructure and to achieve demographic diversity, we will directly contact potential participants who have agreed to re-contact for this purpose in Spring 2026 (from the baseline survey), Spring 2027 (from Wave 1), and Spring 2028 (from Wave 2). We will recruit 25 new cyclists per region (=75), each year studying a different region, in which we are also conducting Strand 2. While not seeking statistical representativeness, we aim to capture a range of experiences, with at least 33% from ethnic minority groups and at least 33% women, from a mix of areas (e.g. not only large urban areas).

Strand 2. Disabled and ethnic minority communities

Strand 2 (RQ6&7) digs deeper into specific community experiences, with iterative, place-based research. The aim is to learn from populations likely to have differential (and potentially inequitable) experiences, having lower cycling take-up and often lower involvement in consultation. Working with our PPI co-applicants and in dialogue with local partners (community groups already working with partner authorities),

we will select two specific communities of interest per region, one based on ethnicity and one on disability (e.g. members of a centre that services a specific community, located on a new route). We will co-create and conduct in-depth qualitative research with the identified communities, using an innovative mix of action research methods (see below). This will reach:

- At least 10 ethnic minority participants per region (=30) living near new infrastructure, who are new to cycling or do not currently cycle. Note each region will have a specific community- and location-based focus selected as per above, from which these 10 participants will be drawn.
- At least 10 disabled participants per region (=30) living near new infrastructure; again, both new to cycling and non-cyclists. Again, each region will have a focus (e.g. neurodivergent people using a community centre located on a new route).

Key Outcomes – Qualitative Component

1. Impacts of new infrastructure on individual subjective wellbeing (RQ6)

This will be assessed through our interviews with a diverse group of new cyclists, where we will explore pathways to changes in wellbeing related to cycling uptake, including through the experience of cycling itself, and changed practices such as around choice of destination.

2. Impacts of new infrastructure on the experiences of disabled residents and ethnic minority communities, as cyclists or non-cyclists (RQ7)

This will be assessed through in-depth engagement with residents, exploring experiences and co-created action research with local and national partners.

3. Impacts of new infrastructure on community wellbeing (RQ6)

This will be assessed through in-depth engagement with disabled and ethnic minority residents, developing concepts of community wellbeing with local and national partners.

For Strand 1, research conducted by the academic team will explore participants' experiences of cycling take-up on and off newly provided infrastructure, and its impacts on their lives and wellbeing (e.g. through mental health impacts of outdoor physical activity or changing access to services). We will explore how new cyclists assemble meanings, skills, and stuff to cycle. How did these elements of a marginalised practice come together to enable cycling for our participants? How stable is this practice and where is it threatened? How does wellbeing feature in meanings of cycling, both in the practice itself and in how it affects other practices (such as access to parks)?

To explore nuances of new cyclists' practice and experience, we will use individual interviews with participatory activities – mapping and photo-elicitation. Asking new cyclists to draw a route they take that includes the new infrastructure, and, prior to the interview, take photos of relevant things, infrastructure, and places, we will interview them using these prompts. For instance, they might take photos of 'stuff' they use to cycle (helmet, rucksack, high-vis jacket), the (lack of) cycle parking at work, or a high street they now visit by bike. We will encourage them to include where relevant photos of new infrastructure that they use, but highlight we are interested in all aspects of their journeys and activities involving cycling. This will enable a wider understanding of changes in practices, wellbeing, and experience than just focusing on infrastructure.

For Strand 2, research will be intensively and iteratively co-designed with our PPI partners and local community organisations. This means that for instance, rather than individual-based photo-elicitation, we will use collective methods to allow communities to co-create shared meanings of how new infrastructure affects their communities and peer networks. Our PPI partners will recruit participants through co-organised events (e.g. group try-outs of infrastructure using provided bikes, walking or wheeling groups to discuss new infrastructure). Follow-up co-organised events will include community workshops where members collectively produce and reflect on drawings, photos, and maps, alongside other ideas (e.g. local exhibitions, workshops with local policymakers) co-developed with and facilitated by local and national PPI partners. While this means full details of specific plans cannot be provided now, co-design permits this

strand to be flexible, responding to different community needs and interests.

Our national PPI partners have much experience running events that can be used for action research, including in our regions. While both partners are cycling-focused, they work with local organisations like mosques and local disability groups to provide services and ensure engagement across a community. JoyRiders (JR, set up in East London with a now-national presence) have run many community rides with Muslim and ethnic minority women, groups with very low rates of cycling in the UK. Wheels for Wellbeing (WfW) has run many sessions in London and nationwide facilitating access to cycling by disabled people, using a range of adapted cycles, and has experience in conducting and collaborating in research. Both organisations will work with and support locally specific organisations in running community events, while the research team will attend, conduct in-situ interviews and gather data during events and workshops. PPI partners and local organisations will co-design throughout, following the identification of specific routes and communities in each region (a process involving our PPI partners, local partners and the academic team).

Specifically, we will focus on one region per year, largely corresponding to project Years 2-4. In each case we will (i) work with JR, WfW, and local partners to identify the focus of this work, for instance a Chinese community living near a recently implemented cycle route, or people with learning disabilities attending a centre now adjacent to a planned route, (ii) involve and fund local involvement alongside the funded involvement of JR and WfW, in co-designing a research programme involving community members, and (iii) set up and run a series of facilitated events, with JR and WfW leading with local and academic partners, and academic partners leading data collection and analysis. All participants will be compensated for their attendance.

Interview and workshop data from will be recorded, transcribed, and fully anonymised. They will be analysed using NVivo, also including anonymised visual material, maps, and fieldnotes. Data will be analysed using deductive and inductive coding. Initial themes will be derived from existing literature, previous research by the team and learning from workshops and co-analysis sessions with PPI partners. Additional themes will emerge from the transcripts and field notes, and data will also be analysed in an integrated, iterative way alongside quantitative data, for instance in exploring how impacts of active travel infrastructure on individual wellbeing (measured qualitative and quantitatively) relate to impacts on community wellbeing. We will minimise coding error and maximise analysis validity by using double coding and repeated checking on coding consistency.

Dissemination, outputs and anticipated impact

The team's reputation in research impact is world leading. RA's work formed a REF2021 impact case study about changing London's cycling policy, including to take more account of diversity. The Active Travel Academy (ATA) is the UK's only active travel-focused research centre, working with organisations including DfT, Active Travel England and the Local Government Association. ATA and partners are well placed to shape academic fields, policy and practice (around impacts of cycle infrastructure, and centring experiences of marginalised groups). We have successfully used blogs, podcasts, infographics, and other alternative formats and will do so for this project. We are regularly invited to speak to practitioners, policymakers, community groups, students, and academics and we will organise our own events.

Building on previous experience, we will ensure the results of this project feed into timely policy action. Our current project on LTNs in London attracts considerable attention from planners and policy makers, shown by the success of our project event in Birmingham in 2023, requests to present preliminary findings to DfT and ATE and high attendance at our Stakeholder Advisory Board (SAB, which continues to attract new members). This project will have a similar SAB (members will include ATE and DfT, as with our other major projects), advising on the project and helping disseminate lessons and findings throughout. We will regularly communicate findings to policymakers in case study areas, who have already contributed to the project design including how they see findings contributing to policy and practice. We will use diverse formats, such as bulletins, policy- and public-focused events, reports and articles highlighting key findings, as well as academic journal articles. We will disseminate via local newspapers, community venues, and events run by our PPI co-applicants and local partners. We will present results to DfT/ATE, feeding into further development of Active Mode Appraisal Tool (co-developed by JW), wider Transport Appraisal

Guidance incorporating further health economic benefits, and local, regional, and national decision-making.

Key outcomes of this research will be:

1. Transferable knowledge about health and health economic impacts of new cycling infrastructure in England and socio-spatial variation in its provision.

2. Transferable knowledge about diverse experiences of new cycling infrastructure among residents, and how implementation could be more successful and equitable.

Project/research timetable

Table 1: Project plan

Project Year	Month	Key Stage/Milestone	Duration
1	Apr 2025	Questionnaire development and piloting, translation	6 months
	Apr 2025	Liaison with local authorities, sampling, recruitment	7 months
	Jun 2025	Ethical approval, quantitative (submitted March)	N/A
	Sep 2025	Baseline survey wave conducted	1 month
	Oct 2025	Analysis of survey data	9 months
	Nov 2025	Region 1 (GM) select communities of interest based on emerging survey findings and stakeholder/ PPI liaison; planning with PPI and local partners	4 months
	Feb 2026	Ethical approval, qualitative (submitted Dec)	N/A
	Mar 2026	Recruit new cyclists, Qualitative Strand 1 (Greater Manchester)	1 months
	Mar 2026	Recruitment for Qualitative Strand 2 (Greater Manchester)	2 months
2	Apr 2026	Interviews with new cyclists for Qualitative Strand 1 (Greater Manchester)	3 months
	Jun 2026	Co-created action research for Qualitative Strand 2 (Greater Manchester)	5 months
	Jun 2026	Preparation for first survey wave (e.g. address lists, postcards)	3 months
	Jul 2026	Qualitative analysis	36 months
	Sep 2026	Survey wave 1 conducted	1 month
	Oct 2026	Analysis of survey data	9 months
	Nov 2025	Region 2 (WM/WY) select communities of interest based on emerging survey findings and stakeholder/ PPI liaison; planning with PPI and local partners	4 months
	Mar 2027	Recruit new cyclists, Qualitative Strand 1 (Region 2)	1 month
	Mar 2027	Recruitment for Qualitative Strand 2 (Region 2)	2 months
3	Apr 2027	Interviews with new cyclists for Qualitative Strand 1 (Region 2)	3 months
	Jun 2027	Co-created action research for Qualitative Strand 2	5 months

		(Region 2)	
	Jun 2027	Preparation for second survey wave (e.g. address lists)	3 months
	Sep 2027	Survey wave 2 conducted	1 month
	Oct 2027	Analysis of survey data	9 months
	Nov 2025	Region 3 (WY/WM) select communities of interest based on emerging survey findings and stakeholder/ PPI liaison; planning with PPI and local partners	4 months
	Mar 2028	Recruit new cyclists, Qualitative Strand 1 (Region 3)	1 month
	Mar 2028	Recruitment for Qualitative Strand 2 (Region 3)	2 months
4	Apr 2028	Interviews with new cyclists for Qualitative Strand 1 (Region 3)	3 months
	Jun 2028	Co-created action research for Qualitative Strand 2 (Region 3)	5 months
	Jun 2028	Preparation for third survey wave (e.g. address lists)	3 months
	Sep 2028	Survey wave 3 conducted	1 month
	Oct 2028	Analysis of survey data	9 months
	Feb 2029	First set of publications submitted	N/A
5	Apr 2029	Health impact and health economic assessment	9 months
	Oct 2029	Second set of publications submitted; first set published	N/A
	Nov 2029	Dissemination events in study regions	4 months
	Mar 2030	Project ends; outputs, activities and impact continue	N/A