



EVALUATION BRIEFING

THE PEDESTRIAN POUND UPDATE (3RD EDITION)



transport for quality of life

**paths
for all**
FOR A HAPPIER,
HEALTHIER SCOTLAND



LIVING

STREETS



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ABBREVIATIONS

ABBREVIATION	MEANING
AMAT	Active Modes Appraisal Toolkit
BNG	Biodiversity Net Gain
CBA	Cost Benefit Analysis
CEA	Cost Effectiveness Analysis
EqIA	Equality Impact Assessment
GHG	Greenhouse Gas
HEAT	Health Economic Assessment Tool
ONS	Office for National Statistics
PERS	Pedestrian Environment Review System
STAG	Scottish Transport Appraisal Guidance
SuDS	Sustainable Drainage Systems
TAG	Transport Analysis Guidance
TfL	Transport for London
VURT	Valuing Urban Realm Toolkit
WelTAG	Welsh Transport Appraisal Guidance
WHO	World Health Organisation
WLC	Whole Life Carbon

INTRODUCTION

This briefing on the evaluation of public realm interventions is part of the research for The Pedestrian Pound (third edition).

In this briefing, the term **appraisal** is used to describe the assessment of an investment before it is implemented to understand its likely impacts and whether it demonstrates value for money (also known as *ex ante* appraisal or evaluation).

The term **evaluation** is used to describe all monitoring activities undertaken before and after an intervention to understand the outcomes and impacts of that investment (also known as *ex post* evaluation).

Appraisal and evaluation are inherently linked, and there is much to be gained from conducting evaluation studies. Evaluations enable policy makers and stakeholders (including funding agencies) to know whether an intervention has delivered what is intended, and to learn whether it might have broader application. The knowledge gained from evaluations can subsequently be used in appraisals to assess whether interventions are worthwhile in other contexts.

The evidence for greater investment in walkable high streets can be found in the main report.

PURPOSE OF THIS NOTE

Public realm investment sits across professional disciplines and departmental silos, including transport planning, economic development, town centre management and green space management.

These professional fields have different practices in terms of appraisal and evaluation, resulting from the varying requirements and expectations of funding bodies.

This briefing seeks to encourage joined-up thinking on public realm interventions across these professional silos and across economic, health, community and environmental sectors. This note provides general advice on which metrics to measure for different types of intervention and points practitioners in the direction of a range of relevant appraisal and evaluation tools. It outlines some of the challenges in the evaluation of public realm interventions and provides examples of best practice and recommendations.

The remaining sections of this briefing are structured as follows:

- Broad types of public realm intervention and the approaches and key metrics used in appraisal and evaluation.
- Recommendations with reference to good practice examples and emerging approaches.
- **Appendix 1:** Detailed tables signposting the approaches and tools used for estimating or measuring changes for a range of outcomes and related themes.
- **Appendix 2:** Summary of key tools.
- **Appendix 3:** Appraisal and evaluation challenges.

TYPES OF PUBLIC REALMS INTERVENTIONS



Photo credit: Swansea Bay Street Markets Limited

The different types of public realm interventions, as defined by the typologies developed for this report (see typologies here), can broadly be grouped into three types for appraisal and evaluation purposes.

These types use similar approaches and metrics and encounter common issues. The metrics typically measured for each of the three types is described below, with more details given in the tables in Appendix 1. For many interventions of all typologies, changes in

public realm quality (see Table 8 in Appendix 1), public/business attitudes (Table 9) and the impact on equality, diversity and inclusion (Table 15) will form part of the evaluation. Note that, in practice, a public realm intervention may cover more than one typology.

1. Safer, more comfortable and more attractive public realm

This intervention group aims to encourage people to spend more time in a place by creating a **safer, more comfortable and more attractive** public realm.

It covers the following types of public realm schemes:

- New or refurbished open and/or green space (typology number 3)
- Improvements to pedestrian comfort, convenience and personal safety (typology number 4)
- Improvements to route appearance (typology number 5)
- Improvements to wayfinding (typology number 6)
- Reduction of traffic speeds (typology number 7)
- Healthy streets and placemaking (typology number 15).

Appraisal

Business cases for regeneration and place-based investment funds tend to focus on a strategic narrative with a strong commercial focus and should be clear on the assumptions made about new economic activity generated locally.

By contrast, when bidding for transport funding streams, the business case usually focuses more heavily on quantifying the benefit to users of the improved public realm and needs to be clear on the assumptions about existing and new users and the time they spend there.

Traditionally, the economic case for transport investment has needed to focus on net benefits to the UK as a whole, while many funding streams are now targeting place-based impacts in communities where a need is identified. Project sponsors should have the confidence to quantify the local economic impacts that really matter in the main narrative of the strategic case, even where they are not included in the economic case.

Evaluation

Core evaluation activities include measuring changes in footfall (see Table 1 in Appendix 1), dwell time (Table 2) and retail spend (Table 4) in the area receiving the investment. To demonstrate the impact of an intervention, practitioners need to consider if and where to monitor the impact on other nearby places (e.g., footfall control counts (Table 3) on parallel streets or monitoring changes in retail catchments).

Other economic impacts that can be monitored include jobs created (Table 5), vacancy rates or property prices (Table 6), investment attracted or productivity effects, using public data or data collected by a local organisation such as a Business Improvement District. All of these economic impacts should be viewed through the lens of additionality, i.e., whether they have occurred as a result of the intervention (Table 7).

There may also be wider social and health co-benefits resulting from higher footfall. But monitoring these impacts robustly requires other forms of evaluation focused on behavioural changes in specific target populations (see recommendations in the section on ‘evaluation approaches to demonstrate causality’).

2. Improving access to destinations for pedestrians

This group of interventions aims to encourage people to walk more by **improving access to destinations** for pedestrians and **re-balancing transport modes**.

Appraisal

These interventions will generally require a transport business case including a forecast of the change in walking (Table 1) and, where relevant, the mode shift from other transport modes (Table 11). For smaller interventions, project sponsors should refer to the Active Mode Appraisal Tool (AMAT) (see Appendix 2) for a range of default values and parameters.

Evaluation

Simply measuring a change in footfall is generally not enough to evaluate the full impact of getting people to walk more. The level of evidence (‘burden of proof’) that is required to evaluate the impacts of more walking varies as follows:

- To demonstrate public health benefits requires measuring the change in walking as a form of physical activity (Table 12) across target population groups if possible, i.e., the extra time or distance walked per person.¹ Note that, for smaller schemes, it may be sufficient to simply measure the change in walking trips at the intervention location to meet funding body requirements. To demonstrate a range of environmental and social benefits, such as greenhouse gas emissions (Table 18), resulting from people walking if they travel less by other modes or to closer destinations (or travel when they would otherwise have stayed at home), may require measuring mode shift and changes in wider travel behaviour (Table 10).
- To demonstrate air quality (Table 17), crime (Table 14) and road danger reduction benefits (Table 13) requires measuring the change in risk and exposure to that risk, e.g., measuring the change in the number of people crossing the street and the collision rate (per million crossings) at that location. Measuring perceptions of the change in risk may also be relevant.

¹ Although there is little or no evidence that an observed increase in walking (or cycling) replaces other forms of physical activity, the WHO recommend that analysis of active travel accounts for activity substitution as far as possible (WHO, 2017). This would require measuring changes in total physical activity amongst a target population, not just changes in active travel. But this is rarely feasible given the resources, tools needed and other constraints on evaluation.

3. Engaging with events/initiatives and more community connection

This group of interventions aims to encourage people to spend more time in a place by getting them to **engage with events/initiatives** and **feel more connected** to the community.

It covers the following types of public realm schemes:

- Cultural, community and local business engagement (typology number 10)
- Digital engagement (typology number 11)
- Temporary interventions and tactical urbanism (typology number 12)

- Policy development and awareness raising (typology number 13)

Evaluation and appraisal of these types of intervention is similar to the first group. However, there is the additional challenge of establishing whether temporary engagement with a place, such as attendance at an event or digital interaction with a campaign, translates into spending more time in a place in the longer term.

RECOMMENDATIONS AND EXAMPLES OF GOOD PRACTICE



Photo credit: Shrewsbury Business Improvement District

Rigorous appraisal and evaluation of walking schemes is rarely carried out in practice.

Appendix 3 on 'Appraisal and evaluation challenges' outlines the issues in more detail. For those commissioning or planning schemes, key points to note are as follows:

- Evaluation or appraisal requirements need to be proportional to the scale of the project (not least as many walking schemes are small-scale).
- Economic or social impacts may take several years to materialise, so may be difficult to capture in standard post-implementation evaluation.
- Resources for evaluation need to be factored into project costs, if evaluation is considered important, since local authorities lack the resources to prioritise evaluation activities.
- Use of Transport Analysis Guidance (TAG) (see Appendix 2) and benefit-cost ratio can result in a somewhat reductive approach, which does not properly incorporate consideration of wider benefits (and has also been criticised for other limitations). Consideration of a wide range of scheme options at an early stage, and qualitative assessment of their impacts against a wider range of criteria, may help to achieve more balanced decision-making.

Key recommendations to meet these challenges include the following (and are discussed further in the following paragraphs):

- Modelling potential future uplifts in walking can be expensive and complex, so estimating increases in walking from comparison with similar schemes may be a cost-effective way forward.
- Demonstrating causality is challenging but can be achieved by use of a theory of change and/or comparison groups.
- Location-specific counts or population-based surveys can be used to estimate levels of walking.
- Defining those impacted by schemes needs to include consideration of those impacted in locations other than the scheme, and marginalised or vulnerable groups.
- Walking schemes often have multiple objectives and can be assessed against a wide variety of criteria, with different tools or techniques used for each topic.

Appraisal evidence of walking forecasts

Two examples of appraisals for public realm investment schemes show how forecasts can be generated of increased walking activity and used with a selection of appraisal tools to quantify a range of scheme benefits.

The 2022 Thornbury High Street business case was successful in securing funding for permanent pedestrianisation of the high street in a market town in South Gloucestershire (Atkins, 2022). The business case involved movement surveys for the area around Thornbury High Street and, after reference to experience elsewhere from case studies, scenarios of marginal increases in pedestrian numbers of 8%, 10% and 12% on the high street (see Table 1) were used to generate estimates of physical activity, decongestion, safety, greenhouse gases, local air quality and noise benefits (see Tables 12, 13, 17, 18). The business case also took account of changes in the amenity value of land brought about by the scheme and local economic impacts in terms of Gross Value Added (GVA) through safeguarding jobs (see Table 5).

The West Hove Seafront ('Kingsway to the Sea') business case was prepared for improvements to parkland on the seafront in West Hove, East Sussex, including new leisure and business facilities (Mott Macdonald, 2020). The business case involved the following elements:

- Pedestrian movement analysis and estimation of benefits using the Department for Transport's AMAT model (see Tables 1 and 12, and Appendix 2).
- Public realm improvement analysis using the Valuing Urban Realm Toolkit (VURT) (see Table 8 and Appendix 2).
- Labour supply benefits from the creation of new employment in the visitor economy, by bringing unemployed people into employment (see Table 5).
- Wider land value uplift (LVU) through residential property value increases (see Table 6).
- Cultural and sport participation wellbeing benefits, both for local residents and visitors (see Table 16).

For many walking investments, the appropriate tool for estimating generated walking activity is through comparison with similar schemes (see Table 1). TAG Unit A5.1 (Department for Transport, 2022a) cites two other methods:

- Disaggregate mode choice models – these models are used to determine mode choice from user preferences. There are examples of such models for cycling but they are generally not used for walking.
- Sketch plan methods – use of nationally available data sources along with rule-of-thumb calculations (such as elasticity estimates of change in demand for walking for a change in the percentage of walking routes that is traffic-free).

Looking forward, a range of walking-specific forecasting methods are emerging internationally. An international research seminar in 2023 brought together state-of-the-art approaches (City Form Lab, 2023) including:

- Several network analysis tools that can be employed for pedestrian demand models including Urban Network Analysis from Massachusetts Institute of Technology (Sevtsuk and Kalvo, 2024)
- and Spatial Design Network Analysis (sDNA) from University of Cardiff (Cooper and Chiaradia, 2020).
- Pedestrian flow model calibration examples (Sevtsuk et al., 2021) with similar tools under development in the UK.
- Model of Pedestrian Demand (MoPed) developed by the University of Columbia (Clifton et al., 2015).

Evaluation approaches to demonstrate causality

Experimental and quasi-experimental methods are used to measure the effect size of an intervention. Typically, they involve obtaining observations for the target group of participants receiving the intervention as well as those not receiving the intervention. It is rare that the decision to implement a public realm intervention is randomly assigned to one place over another so pure experimental methods are not feasible.

With quasi-experimental methods, a control or comparison group is identified that is as similar as possible to the group receiving the intervention so that the counterfactual (what would have happened to the target group in the absence of the intervention) can be estimated. The difference in difference between the before and after outcomes for the target group and comparison group will represent the intervention effect.

A variation of this method has been shown to be effective in a number of evaluations of street interventions. In these cases, study participants have been chosen based not simply on whether they

received the intervention but the 'dose' size of the intervention. For example, Curl et al. (2018) report on a longitudinal study of deprived communities in Glasgow, which identified the change in walkability (dose) resulting from regeneration for participants in their study and obtained data on their change in walking frequency (response). They then estimated the 'dose-response' effect of exposure to the intervention. The iConnect study involved a controlled longitudinal cohort survey design to assess the impact of walking and cycling infrastructure on travel behaviour and greenhouse gas emissions from motorised travel (Brand et al., 2014). Exposure to the intervention was defined using measures of proximity to and use of the new walking and cycling routes.

Theory-based methods are not only concerned with the extent of change due to an intervention but also why the change occurs. Typically, a theory of change is put forward for the intervention and evidence is sought to see whether it supports the theory (or whether alternative explanations are supported).

This may still involve collecting data for a comparison group, but contextual differences may mean simple statistical comparisons between target and comparison groups are not justified. Carmona et al.'s (2018) analysis of five improved and five unimproved streets in

London has features of a theory-based method in its 'mixed comparative' method based on detailed case studies and a mix of qualitative and quantitative data.

Reference can be made to the Magenta Book for more information about evaluation methods (HM Treasury, 2020).

Location-specific walking activity data

Walking activity data can be collected through manual counts or automatic counts (see Table 1). It is essential that counts are conducted in the same way at different time points. Traditionally, it has been difficult to accurately measure pedestrian volumes but the combination of camera and AI technology is now offering better options to monitor walking activity at fixed locations. One example is the use of VivaCity traffic monitoring sensors at 11 school streets in Westminster, London (VivaCity, 2022). Where data is wanted not only on walking movement but other street activity such as standing and sitting, then street life observations can be carried out such as the street activity beat surveys carried out on ten streets in London by UCL researchers (Carmona et al., 2018).

Walking counts can be accompanied by route user intercept surveys, where a sample of people observed walking are invited to complete a questionnaire and provide details about the journey they are making (such as origin/destination, purpose and how they would have travelled if the scheme improvement had not been carried out) and details about their travel more generally. For many smaller public realm schemes where

before-and-after monitoring of the travel behaviour of a target population is not possible, a combination of counts and intercept surveys can be the basis for estimating the mode shift from other modes (or non-travel) to walking and the increase in time spent walking per week (see Table 10). In turn, this data can be used as inputs to the AMAT or HEAT tool to estimate reduced mortality from the intervention (see Appendix 2).

Data from mobile devices is increasingly being used to measure location-based walking activity, with big data used to estimate trends in pedestrian volumes and, in some cases, to infer pedestrian route choice (Basu and Sevtsuk, 2022; Hahm et al., 2019; Kim and Woo, 2023). Government organisations, including funding bodies, can procure large datasets centrally to reduce costs and ensure comparability of outputs. For example, the High Streets Data Service (GLA, 2024) procures mobility and spend data on behalf of partnering local authorities and Business Improvement Districts (BIDs).

Population-based walking behaviour data and associated sampling and recruitment issues

Population-based walking data usually requires a survey of the population of interest (which may be residents, workers, students or visitors). A number of academic studies in the UK and worldwide have assessed whether changes in walking have occurred as a result of street improvement schemes using this method (Aldred et al., 2024; Curl et al., 2018; and Ogilvie et al., 2012). Typically, these have involved cohort (panel) studies with repeated surveys of the same sample of the population before and after scheme introduction (see Table 10).

These surveys have included travel diaries where participants have been asked to self-report walking and other travel. In some cases, these have been simplified travel diaries where participants were asked to indicate their use of different modes on each day of the week but not asked to provide trip records (Aldred et al., 2024). Passive methods of collecting travel behaviour data via mobile phones are seen as a promising alternative to traditional 'paper-and-pen' travel diaries. A 2018 review of the use of smartphone data in travel behaviour studies found that a large number of 'proof-of-concept' studies had been carried out, but the data was yet to be used in full-scale travel surveys (Gadzin'ski, 2018). Important barriers include sampling problems, limitations in big data analyses and technological issues. Gadzin'ski concluded that the use of this form of data in population-wide travel surveys was still some way ahead.

A probability-based sample involving randomly selecting a sample of the population of interest is desirable since it allows sampling error to be estimated and a judgement made about how far the sample differs from the population. It requires a list of the population, from which

a randomised process is used to select the sample. The iConnect study used the 'open register' of the electoral register to randomly select 22,500 adults living within 5 km road network distance of three different walking and cycling infrastructure schemes (Ogilvie et al., 2012). For each scheme, it identified four sampling buffers, defined based on road network distance from the schemes, to ensure the selected sample contained people with different levels of exposure to the schemes. The selected adults were invited by post to participate in a cohort study with 3,516 responding initially in the baseline survey (Goodman et al., 2014).

It may, however, not be possible to obtain a probability-based sample. Convenience sampling involves obtaining a sample from those people that can be approached and are willing to participate in a survey. A convenience sample will differ from the population in ways that cannot be fully identified. Another non-probability based sampling approach is quota sampling which involves seeking a specified number of survey respondents of different characteristics (in proportion to what is known about the distribution of those characteristics in the overall population). It enables population estimates to be made but, as with convenience sampling, does not allow sampling error to be estimated with confidence.

After the sample is determined, the sample needs to be recruited to participate. See Box 1 for recommendations on sample recruitment. Both the size of the sample and the response rate are key factors determining the robustness of the results.

Sample recruitment

Response rates are decreasing, but personalized recruitment or recruitment via trusted agents (e.g., employers) increases participation. Goodman et al. (2014) report a 16% response rate from paper-based survey packs sent to named individuals from the electoral register in Cardiff, Kenilworth and Southampton. Aldred et al. (2019) report a 1% response rate from London households selected through random household sampling and sent a postcard with a survey URL. To increase participation, they were able to utilise two Transport for London databases including people who had agreed to be contacted for future research with emails yielding a response rate of just over 2%.

Experience has shown that after recruiting participants through direct contact (face-to-face, phone, mail) at the initial stage (i.e., baseline survey), they are willing to participate subsequently by self-completion of online questionnaires when requested. For example, 47% of employees who participated in the Bristol area travel to work survey in 2014 who were contacted by email to

participate in a follow-up survey then provided responses (Bartle and Chatterjee, 2018).

A high response rate is required in follow-ups of a cohort study to minimise attrition (drop-off) bias and achieve required sample sizes for analysis. This can be helped by keeping in touch with cohort study participants (without providing information that could bias subsequent responses).

Where a follow-up survey takes places a considerable time after the baseline survey (more than one year, for example), it will be desirable to recruit new members of the population (i.e., who have moved into the area) to compare whether outcomes reported by cohort participants are similar to those of new residents. It is possible that new residents may be self-selecting and have made the choice to live, work or study in the area, or visit it, partly because of the improvement. This does not undermine the value of the improvement – it is just a matter that needs to be kept in mind when comparing longstanding members of the population with new members.

Secondary data for economic impacts

It will be valuable to improve the evidence base on the economic impacts of public realm improvement schemes beyond that which has been reported in *The Pedestrian Pound* at this time. There is an increasing amount of economic data at the small area level which could be used for monitoring and evaluation purposes.

A variety of economic data (from sources such as the Labour Force Survey and Business Register and Employment Survey) is available from the Office for National Statistics at different levels of geography and is freely downloadable or can be requested (see Table 5). There is

also relevant data collected commercially. One example is the retail and leisure vacancy data held by the Local Data Company (Local Data Company, 2024).

Carmona et al.'s (2018) analysis of five improved and five unimproved streets in London considered the impact on rental prices (sourced from CoStar, a real estate data provider) in the commercial office and retail sectors, occupancy rates (sourced from GOAD, a retail property database provide by Experian) in the retail sector and house prices in the residential sector (using data from Land Registry House Price Index) (see Table 6).

Measuring other impacts

There are a range of other approaches and tools for measuring other aspects of walking and public realm schemes which are described in detail in Appendix 1.

APPENDIX 1 METHODS AND TOOLS



Photo credit: Ivon Bartholomew for Living Streets

The following tables signpost project sponsors and practitioners to the approaches and tools used in appraisal and evaluation for estimating or measuring changes for the following range of outcomes and related cross-cutting themes:

1 Footfall

2 Dwell time

3 New footfall vs diversion

4 Retail spend

5 Employment

6 Other economic impacts

7 Additionality

8 Public realm quality

9 Public and business attitudes

10 Travel behaviour

11 Mode shift

12 Physical activity

13 Road danger reduction

14 Crime

15 Equality, diversity and inclusion

16 Wellbeing

17 Air quality

18 Greenhouse gas emissions

19 Biodiversity and climate resilience

TABLE 1
Approaches and tools for measuring footfall

APPRAISAL	EVALUATION
<p>A key challenge in appraisal is forecasting footfall changes.</p> <p>Chapter 2 of TAG Unit A5.1 Active Mode Appraisal summarises potential forecasting approaches (DfT, 2022). For most walking investments, it proposes simply estimating levels of walking through comparisons with similar schemes.</p> <p>For wider town centre regeneration activities, new forecasting approaches are increasingly available. An international research seminar in 2023 brought together state-of-the-art approaches (City Form Lab, 2023).</p>	<p>There are a range of technologies used for footfall measurement:</p> <ul style="list-style-type: none"> • Automatic counters can be installed to monitor footfall over time. They include camera-based systems (in some cases offering movement tracking as well as counting), sensor-based capturing mobile devices, or systems using a combination of both. Note that there are varying procurement models with higher capital costs or data as a service (revenue) costs. • Alternatively, periodic manual surveys can be commissioned at a selection of points. • Aggregated mobile phone data can also be used to measure footfall trends over a wider area. <p>Sources of independent guidance on footfall measurement:</p> <ul style="list-style-type: none"> • Towns Fund (2021) Monitoring and Evaluation Guidance (Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing & Communities, 2021). • Transport for London (2020) The Planning for Walking Toolkit - Part C contains measurement guidance.

TABLE 2
Approaches and tools for measuring dwell time

APPRAISAL	EVALUATION
<p>There is no standard methodology for forecasting changes in dwell time and/or activity in public space. Hence, comparison with similar schemes is generally the best approach.</p>	<p>There are standard survey methodologies for monitoring the volume and nature of activity in public space.</p> <p>Sources of independent guidance on dwell activity measurement include Gehl and Svarre (2013) and Transport for London (2020).</p>

TABLE 3**Approaches and tools for measuring new footfall versus diversion**

APPRAISAL	EVALUATION
<p>Comparative studies do not generally split out new footfall and walking trips diverted from other streets.</p> <p>More advanced forecasting methods for larger regeneration projects will generally provide estimates for a wider network of streets and spaces.</p>	<p>Where public realm improvements may lead to diversion from other streets, it is recommended that this is captured in evaluation.</p> <p>A sample of control counts can be undertaken in neighbouring streets and spaces. Alternatively, if intercept surveys are used to understand wider travel behaviour impacts, they can also identify if people have diverted from other routes.</p>

TABLE 4**Approaches and tools for measuring retail spend**

APPRAISAL	EVALUATION
<p>The term <i>retail spend</i> is an umbrella term covering all visitor spend in a place (including hospitality, leisure and culture).</p> <p>Economic forecasts of changes in retail spend can be based on expected changes in overall footfall, land use mix and vacancy rates, or sector-specific changes in the number of visitors and their spend.</p>	<p>Aggregated credit card sales data can be used to monitor trends in retail spend and the relative catchments of competing retail destinations.</p> <p>This data can be costly. The alternative is to rely on manual shopper surveys (with robust before-and-after sampling, and preferably additional control area surveys). It is good practice to measure spend by mode of arrival and frequency of visit, to determine the weekly spend of people arriving by different modes.</p>

TABLE 5
Approaches and tools for measuring employment

APPRAISAL	EVALUATION
<p>The number of jobs generated by public realm investment includes some temporary effects through construction and the lasting job creation from increased investment. The forecast change in employment should reflect the predicted change in overall economic activity, changes in uses and sectors and (if relevant) employment generated by any change in non-commercial and community activities.</p> <p>TAG Unit A2-4 Productivity Impacts provides guidance on productivity and agglomeration effects through transport (DfT, 2024a). In knowledge-intensive industries, agglomeration results from high-capacity public transport (access to a larger and more specialised labour force) and walkability (formal and informal networks between companies). Agglomeration is calculated using two measures of <i>effective density</i>, essentially how many people live within commuting distance of businesses and how many other jobs are clustered around these businesses. For larger regeneration schemes, improvements to connectivity that make it easier to walk between workplaces can be quantified and converted to changes in effective density and thus to an uplift in productivity. TAG Unit A2-4 specifically states that the UK methodology is not designed to capture the impacts of pedestrian and public schemes, and practitioners seeking to estimate these impacts should refer to international examples such as this study in Auckland, NZ (Rohani and Lawrence, 2017).</p>	<p>Monitoring localised job impacts generally requires direct surveys of the businesses in the area affected by the public realm improvements.</p> <p>There are also published statistics on employment (ONS, 2021) although the most detailed record is only collected every 10 years in the Census. Estimates for intermediate years, based on a sample of surveyed businesses, are available for wider spatial areas and are therefore less suited to monitoring localised impacts.</p> <p>Data are also available on claimant counts (which give some indication of unemployment) and are released for local areas on a monthly basis (Nomis, undated).</p>

TABLE 6
Approaches and tools for measuring other economic impacts

APPRAISAL	EVALUATION
<p>The business case for a public realm scheme may emphasise key inward investment that decision makers are seeking to attract – development partners for specific sites or specific tenants for vacant units.</p> <p>This form of narrative should not be treated as an absolute forecast. The purpose is to demonstrate what level of investment could be unlocked, recognising that public realm improvements may be one of several factors.</p>	<p>It is good practice to monitor vacancy rates at periodic intervals before, during and after any public realm investment.</p> <p>It is also possible to monitor property prices through HM Land Registry data (HM Land Registry, 2024). Note that this data is based on sales transactions and thus the ability to infer trends depends on the volume and representativeness of sales occurring in the timeframe of interest.</p>

TABLE 7
Approaches and tools for measuring additionality

APPRAISAL	EVALUATION
<p>All estimates of economic effects (sales, employment, investment) should be evaluated through the lens of <i>additionality</i>.</p> <p>The English Partnerships Additionality Guide provides a standard approach for this (English Partnerships, 2008). The key concepts to consider are:</p> <p>Leakage effects – benefits occurring outside the immediate study area, e.g. increased demand for employment space located just outside a town centre.</p> <p>Displacement – shifts in economic activity from one part of the town centre to another (see also new footfall versus diversion).</p> <p>Substitution effects – shifts in the economic activity of firms, e.g. a shift from car-focused to pedestrian-focused retail models.</p> <p>Economic multiplier effects – further local economic activity generated by the targeted benefits, e.g. retail spend of new employees.</p>	<p>The principles of additionality apply equally to evaluation. If it is possible to determine additionality effects through evaluation surveys, this provides a useful evidence base for future business cases.</p>

TABLE 8**Approaches and tools for measuring public realm quality**

APPRAISAL	EVALUATION
<p>Transport business cases can include an estimate of the value that users place on public realm improvements that can be applied on a per km walked (or time spent) basis.</p> <p>TAG Unit A4.1 Social Impacts (DfT, 2022b) contains monetary values to reflect user preferences, originally developed for the London Strategic Walk Network. They are based on identifying the presence or absence of particular features (street lighting, step-free kerb levels, crowding, surface quality, benches, directional signage, information panels).</p> <p>The Valuing Urban Realm Toolkit (VURT) is linked to the Pedestrian Environment Review System (PERS) audit tool that generates numerical scores for a range of criteria, and thus provides a more nuanced assessment method (see Appendix 2 for references).</p>	<p>There are a wide range of audits tools for measuring and scoring different aspects of public realm quality. Audits are frequently carried out as part of the design process for public realm improvements, and a follow-up audit can be undertaken as part of scheme evaluation (see Appendix 2 for references).</p> <ul style="list-style-type: none"> • Living Streets Community Street Audits. • Place Standard Tool - community audit tool used in Scotland. • Pedestrian Environment Review System (PERS) – professional audit tool used in VURT. • Healthy Streets Assessments.

TABLE 9**Approaches and tools for measuring public and business attitudes**

APPRAISAL	EVALUATION
<p>Outputs from surveys with consumers and businesses are frequently used to inform the business case for public realm investment. Surveys provide an opportunity to collect both factual data (travel modes, frequency of visits) to support the evidence base, as well as information about attitudes and perceptions of place. While a change in attitudes towards a place does not necessarily represent a benefit in itself, measuring public and business attitudes before and after a scheme has been introduced can be indicative of whether a scheme has the potential to bring benefits and delivers them.</p>	<p>The level of surveys that can be undertaken depends on what is proportionate to the scale of the investment.</p> <p>It is good practice to undertake surveys before and after an intervention. An interim survey during the construction period may be advisable if this is protracted. And if some changes are expected to take time to settle in, more than one round of after surveys may be appropriate.</p> <p>Surveys can be set up as a cohort (panel) survey that seeks to interview the same households / businesses at two or more points in time. Where this is not possible, a robust sampling framework should ensure that changes can be measured across comparable samples of visitors and businesses.</p> <p>There are situations where it is not possible to collect baseline information because of funding timelines, or if the political context means that surveys can only be carried out for customer and business engagement. Instead, a post-intervention survey can ask respondents about perceptions of changes to the pedestrian environment to see whether intended changes in attitudes have materialised.</p>

TABLE 10
Approches and tools for measuring travel behaviour

APPRAISAL	EVALUATION
<p>While many public realm business cases require only estimates of the impact on footfall, transport business cases can require an estimation of changes in travel behaviour among those affected by a scheme. Travel behaviour dimensions include trip frequency, choice of trip destinations, mode choice, time of day and route choice.</p> <p>If a transport model is available, this can be used to predict changes in travel behaviour due to a scheme - see DfT guidance on modelling (DfT, 2024e). As a general rule, local transport models for specific schemes will often only estimate changes in route choice. Strategic transport models held by the transport authority will estimate wider travel behaviour dimensions but at a less granular level.</p> <p>Otherwise, data on existing travel behaviour can be estimated from published travel surveys or locally commissioned travel surveys.</p>	<p>It can be onerous but the best way to assess changes in travel behaviour is by carrying out travel surveys of the target population of the scheme (e.g., residents/workers/visitors). Ideally this should be done via a cohort (panel) study with measurements made before and after the scheme is implemented. A cohort study involves repeated surveys over time of the same sample. Obtaining data from people with different levels of exposure to the intervention is recommended (for example, samples living different distances from the scheme) in order to be able to attribute impacts to the intervention (see evaluation approaches to demonstrate causality). The International Walking Data Standard published by Walk21 provides guidance on the collection of data on walking in travel surveys (Sauter et al., 2016).</p> <p>If population-based travel surveys are not possible, then an alternative is to combine counts of overall walking activity with route user intercept surveys to identify what changes in behaviour have been made by users. This gives a partial picture as it does not cover non-users (who may be former users or may have been affected in other ways). A population-based approach enables studying both users and non-users but requires larger recruitment efforts (and costs).</p>

TABLE 11
Approaches and tools for measuring mode shift

APPRAISAL	EVALUATION
<p>For large transport schemes, changes in mode choice are sometimes estimated explicitly. (For an overview, refer to TAG Unit M1 Principles of Modelling and Forecasting, DfT, 2024b).</p> <p>Yet it is common practice for many smaller schemes to use standard diversion factors. These are values derived from surveys to state how people using one mode of transport would have otherwise travelled or whether they would have made the trip at all. TAG Unit A5.1 Active Mode Appraisal (DfT, 2022a) states that users can apply cycling diversion factors for walking since no walking factors are included in the TAG default factors (and this is the default applied in TAG tools).</p>	<p>Drawing conclusions on mode shift effects solely from observed counts is challenging because the aggregate outcome (i.e., the flow in a given location) is the result of a range of travel behaviour changes.</p> <p>Mode shift effects are better captured through travel surveys with the target population (see Table 10).</p>

TABLE 12
Approaches and tools for measuring physical activity

APPRAISAL	EVALUATION
<p>For most public realm schemes, the Active Modes Appraisal Tool (AMAT) is the standardised method for calculating the change in all-cause mortality resulting from changes in physical activity (see chapter 3 of TAG Unit 4.1 Social Impact Appraisal). AMAT includes UK-specific age and gender profiles for calculation of the health benefits.</p> <p>AMAT is designed to convert data on the number of estimated new walking trips to estimates of physical activity and thus can be used with footfall counts for smaller schemes. Estimates of daily or weekly physical activity from local travel surveys can be used instead where available.</p> <p>For international comparisons, a similar methodology is used in the World Health Organisation HEAT tool (WHO, 2023).</p> <p>The health-related reduction in absenteeism resulting from increased physical activity is also calculated in AMAT.</p>	<p>Monitoring of changes in physical activity can be derived from footfall counts, travel surveys or other self-reported activity surveys, e.g., by including standardised physical activity questions such as the International Physical Activity Questionnaire (IPAQ, 2024).</p> <p>Changes in physical activity can also be inferred from user responses to intercept surveys (see Table 10).</p>

TABLE 13**Approaches and tools for measuring road danger reduction**

APPRAISAL	EVALUATION
<p>It is good practice to assess patterns of collisions in and around the study area as part of the design process. Police records of fatal, serious and slight collisions can be analysed, and typically a 5-year period is used.</p> <p>Where road danger reduction is a key objective of the scheme, a project-specific prediction of the change in collisions should be calculated. The monetary valuation of collision reductions is set out in chapter 2 of TAG Unit 4.1 Social Impact Appraisal (DfT, 2022b).</p> <p>Alternatively, predictions of mode shift can be translated to marginal changes in collision risk using the marginal costs approach in TAG Unit A5.4 Marginal External Costs. (DfT, 2023a).</p>	<p>Post-scheme evaluation on collisions can be undertaken using police records (DfT, 2024), although this may require a longer evaluation time period (5 years).</p> <p>Evidence on changes in road danger reduction is statistically most reliable when assessing multiple similar interventions at a programme level.</p> <p>Higher footfall can mean higher exposure, so it is good practice to measure the change in pedestrian volumes and estimate relative risk as well as absolute collision numbers.</p>

TABLE 14**Approaches and tools for measuring crime**

APPRAISAL	EVALUATION
<p>TAG Unit 4.1 Social Impact Appraisal recommends a qualitative assessment of the security impacts of transport interventions, and this is generally proportionate for smaller schemes.</p> <p>Where security is a major factor, note that other fields of public policy do sometimes use quantitative methods for the assessment and valuation of crime reduction measures, using the Home Office research on The Economic and Social Costs of Crime (Heeks et al., 2018).</p>	<p>Public data on crime and anti-social behaviour can be used to monitor local trends in recorded crime (Police UK, 2024).</p>

TABLE 15**Approaches and tools for measuring equality, diversity and inclusion**

APPRAISAL	EVALUATION
<p>Equality, diversity and inclusion issues cut across many of the above themes because the design of the public realm is intrinsically linked to whether people can access places they want to go, whether they are safe and feel safe, and whether they have a say in how the space is designed and used.</p> <p>An Equality Impact Assessment (EqIA) for changes to the public realm is carried out to understand how the measures may affect people with protected characteristics.</p>	<p>It is good practice to re-visit the EqIA after a scheme has been completed, and has settled in, to learn lessons for future scheme designs.</p>

TABLE 16**Approaches and tools for measuring wellbeing**

APPRAISAL	EVALUATION
<p>The use of wellbeing-based appraisal methods has considerable potential for place-based analysis of the impact of public realm investment. The Treasury has issued supplementary guidance to the Green Book on wellbeing (HM Treasury 2021), using a wellbeing-based appraisal metric (WELLBY) for evaluating certain types of impacts. These metrics make use of four subjective wellbeing scores (sometimes known as the ONS4 measures) derived from four standard questions with a 0-10 scale, which are about life satisfaction, life being worthwhile, happiness and anxiety (Tinkler and Hicks, 2011). A standard value of £13,000 (2019 prices and values) has been identified for a one-unit improvement in life satisfaction (a 'WELLBY') measured using the ONS4 life satisfaction question.</p> <p>The practical application of this appraisal method requires evidence of the impact of interventions on people's life satisfaction scores. Areas where the wellbeing evidence base is strong include extensive research on loneliness and long-term unemployment.</p>	<p>The ONS4 subjective wellbeing questions have been included in a range of government surveys conducted periodically over the last 10-15 years. The Office for National Statistics (ONS) has published a list of all of the surveys that have used the four personal wellbeing questions over the last years (ONS, 2018).</p> <p>This evidence base can be used in research and evaluation studies to monitor trends in subjective wellbeing over time. However, these surveys are generally not designed to be analysed at a very localised level for individual schemes and are more suited to programme-level evaluation over wider geographic areas.</p> <p>In Scotland, the Place and Wellbeing Outcomes tool can be used to monitor a range of wellbeing indicators over time (Improvement Service, 2024).</p>

TABLE 17**Approaches and tools for measuring air quality**

APPRAISAL	EVALUATION
<p>Chapter 3 of TAG Unit A3 Environmental Impact Appraisal sets out established approaches for the appraisal of air quality impacts in the UK (DfT, 2024c).</p> <p>For most public realm schemes that are expected to have some mode shift impacts, the air quality impacts can be assessed using TAG Unit A5.4 Marginal External Costs (DfT, 2023).</p> <p>For some larger schemes resulting in significant mode shift impacts, or in areas where proposals could breach legal air quality limits, a more detailed impact pathways approach may be stipulated.</p>	<p>To achieve valid evaluation results of measured air quality outcomes, it is preferable to commission local air quality sensors at a programme level across multiple intervention sites.</p> <p>Alternatively, changes in vehicle emissions can be estimated from measured changes in traffic volumes or travel surveys.</p>

TABLE 18**Approaches and tools for measuring greenhouse gas emissions**

APPRAISAL	EVALUATION
<p>The Whole Life Carbon (WLC) impact of a public realm intervention includes three elements:</p> <ul style="list-style-type: none"> • Embodied emissions (materials, construction, disposal). • Changes in operational emissions (lighting, maintenance). • Changes in user emissions through mode shift impacts. • Responsible designers should produce an estimate of embodied emissions and changes to operational emissions as an integral part of the design process. • User emissions from mode shift impacts can be assessed using values contained in the TAG data Book and the TAG Greenhouse Gases Workbook. For most public realm schemes, the greenhouse gas impacts can be assessed using TAG Unit A5.4 Marginal External Costs. • Users should be aware that the TAG analytical scenarios are based on scenario-based forecasts, all of which have much higher transport-related emissions than the policy-led trajectories set out in adopted UK policy decarbonisation policy, such as the Transport Decarbonisation Plan (DfT, 2021). 	<p>Monitoring the Whole Life Carbon (WLC) impact of a public realm intervention requires</p> <ul style="list-style-type: none"> Recording of the outturn embodied emissions during construction. Monitoring of ongoing operational emissions post-completion. Monitoring the resulting change in user emissions, which can be estimated from the monitoring of travel patterns (see travel behaviour) and the application of distance-based unit rates for greenhouse gas emissions by mode.

TABLE 19**Approaches and tools for measuring biodiversity and climate resilience**

APPRAISAL	EVALUATION
<p>The design and management of the public realm plays a major role in environmental and climate resilience.</p> <p>The concept of Biodiversity net gain (BNG) is principally used as a development management tool but is also suited to evaluating the positive and negative impacts of changes to smaller areas of the public realm. The Statutory Biodiversity Metric categorises all habitat areas by their size and three quality components – distinctiveness, condition and strategic significance (Defra, 2024).</p> <p>The contribution of Sustainable Drainage Systems (SuDS) measures to alleviating flood risk can be quantified through Cost Effectiveness Analysis (see TfL SuDS guidance) (TfL, 2016). In essence, this method benchmarks SuDS measures against the cost of providing equivalent attenuation using ‘conventional’ drainage capacity.</p>	<p>The contribution of green spaces to biodiversity can be monitored over time with periodic habitat surveys, in a manner consistent with the Statutory Biodiversity Metric.</p> <p>The performance of Sustainable Drainage Systems is typically defined in two ways:</p> <ul style="list-style-type: none"> • Hydrologic performance, i.e the ability to retain water and slow down water runoff rates, is frequently modelled rather than evaluated on-site. • Decontamination performance, i.e. monitoring of samples of water cleanliness from retained surface runoff, where grey water is to be used for other purposes. <p>The contribution of different materials and landscaping features to urban cooling can be evaluated through controlled measurements of ambient temperature at times of varying temperature and sun exposure, including control measurements in nearby spaces.</p>

APPENDIX 2 SUMMARY OF KEY TOOLS



UK-wide

Active Mode Appraisal Toolkit (AMAT): is a tool within TAG designed to assess the overall benefits and costs of proposed cycling and walking interventions (DfT, 2022c). The physical activity component of AMAT is not directly comparable to HEAT but is recommended for use in the UK since it includes UK-specific age and gender profiles of physical activity and health benefits. AMAT also includes a spreadsheet tool for calculating the impacts associated with modal shift away from cars and taxis (congestion reduction, infrastructure maintenance, collisions, local air quality, noise, greenhouse gases) that is consistent with other TAG tools. Finally, AMAT includes a methodology for estimating the value that users place on certain features of the public realm (such as journey ambiance).

Health Economic Assessment Tool (HEAT) for walking and cycling is a web-based tool developed by the World Health Organisation which estimates the mortality rate reduction and number of deaths prevented each year by walking or cycling (WHO, 2023). The HEAT tool is used internationally and assumes a reduction in mortality risk for an exposure to walking (and cycling). It uses a value of a statistical life to monetise the number of deaths per year prevented by active travel participation. It estimates the impacts for the age group 20-65 only because the evidence base for the health effects of physical activity on young people is not as large as that for adults, while older age groups are excluded because countries often lack mobility data for older age groups.

Healthy Streets Assessment: Transport for London has adopted the Healthy Streets approach as a key element of its transport planning policy. TfL have published several resources to assist in evaluating street design projects (TfL, 2024), including a guide with questions for each of the Healthy Streets indicators, a Healthy Streets check for designers and a Healthy Streets on-street questionnaire.

Living Streets Community Streets Audits: Community Street Audits (CSAs) and School Route Audits (SRAs) engage local people and stakeholders in assessing and evaluating the quality of streets and public spaces using their lived experience (Living Streets, 2024). CSAs and SRAs bring together residents' local knowledge with Living Streets expertise to look at ways of overcoming physical and attitudinal barriers to walking.

Pedestrian Environment Review System (PERS): was developed for Transport for London as a consistent and systematic framework to review and assess pedestrian infrastructure including links and crossings. PERS audits are carried out by assessors to attribute scores on a seven-point scale against a range of criteria (TRL, 2024).

Transport Analysis Guidance (TAG): is the Department for Transport's collection of information for conducting transport studies to assist transport scheme decisions (DfT, 2024d). It provides guidance to support the development of a business case for an intervention, in line with the Treasury's 'five case model' for decision making. TAG is the principal source of appraisal guidance in England. The equivalent guidance documents in Wales and Scotland (see below) reference specific TAG tools.

UK Sharing Prosperity Fund Evaluation Strategy: sets out the methods and data sources that will be used to enable evaluation of the Sharing Prosperity Fund at a programme, place and intervention level (Department for Levelling Up, Housing and Communities, 2024). Evaluation is not compulsory for local authorities but those that opt in can access additional funding. Interventions are expected to be evaluated using randomised controlled trials and quasi-experimental approaches with treatment and control groups.

Valuing Urban Realm Toolkit (VURT): VURT was developed by Transport for London to create an evidence-based tool for estimating the local economic impacts of public realm investment and was subsequently integrated into the Business Case Development Manual (TfL, 2017). It includes a standard method for quantifying the uplift in the rateable value of businesses affected by public realm improvements. The VURT assessment method uses the Pedestrian Environment Review System (PERS) to measure changes in public realm quality.

Scotland

Scottish-specific evaluation tools for active travel and public realm schemes and town centres include the following:

Place and Wellbeing Outcomes tool: developed by the Improvement Service, a national improvement organisation for local government in Scotland (Improvement Service, 2024). The tool has a set of 'place and wellbeing outcomes' and indicators which can be monitored, and associated data sources.

Place Framework: a consistent appraisal framework for all local capital investments to ensure that decision makers are provided with a good understanding of the place in which investment is being proposed (Place Standard Partners, 2024). The framework is an initiative of Architecture & Design Scotland, Public Health Scotland, Glasgow City Council, Improvement Service and the Scottish Government.

Place Standard Tool: a simple framework with 14 themes to structure conversations about places (Place Standard Partners, 2023). This is more of a discussion tool than an evaluation tool.

STAG (Scottish Transport Appraisal Guidance): Transport Scotland's framework to identify and appraise transport interventions, based on TAG with some differences (Scottish Government, 2024a; Transport Scotland, 2022). It is used to develop a transport related business case. It aligns with the Place Framework.

Town Centre Health Checks (Scottish Government, 2024b) and Town Centre Masterplanning Toolkit developed by Scotland's Towns Partnership.

USP Your Town Audit: a web-based tool to measure and monitor the performance of Scotland's towns using a series of economic and social Key Performance Indicators (KPIs) (Scotland's Town Partnership, 2017). Scotland's Towns Partnership's website has a number of case studies of towns that have used the USP Your Town Audit tool (Scotland's Towns Partnership, 2024).

Wales

The main Welsh-specific evaluation tool for active travel and public realm schemes is the following:

WeITAG (Welsh Transport Appraisal Guidance): the Welsh Government's framework to assess the strategic case for proposed changes to the transport system (Welsh Government, 2018). It contains best practice for the development, appraisal and evaluation of proposed transport interventions in Wales. Updated guidance was put out for consultation in 2022 to align it with the new Wales Transport Strategy: Llwybr Newydd (Welsh Government, 2022). The updated version of the guidance places less emphasis on the use of cost-benefit ratios, and more emphasis on well-being and wider social, economic, environmental and cultural factors (Welsh Government, 2024).

APPENDIX 3 APPRAISAL AND EVALUATION CHALLENGES



Photo credit: Alexander Williamson Photography

In research for this project, it was clear that evaluation of public realm interventions, particularly the smaller schemes, is rarely done in practice.

This is due to a lack of requirement, funding and prioritisation for evaluation as well as various methodological challenges. Some of the key challenges encountered when evaluating public realm investments, both for *ex ante* appraisals and *ex post* evaluations, are outlined below.

Recommendations on how to address some of the methodological challenges, with reference to good practice examples and emerging approaches, are provided in the earlier recommendations section of this report.

Proportionality

Appraisal and evaluation should be proportionate to the scale of the project. Public realm schemes are often relatively small scale, with multiple objectives. Many of the impacts are often hard to capture and there is often no requirement or funding for evaluation.

For many schemes, the geographic scale of impacts will largely be limited to the streets / neighbourhoods that are directly

affected. This means that forecasting and evaluation methods need to be suitably granular in scale.

In term of monitoring timeframes, changes to the way public spaces are used can materialise very quickly but some of the economic (and wider) impacts of public realm investment may only emerge over several years.

Funding and resources for monitoring and evaluation

Undertaking or procuring monitoring and evaluation activities requires both funding and capacity within the responsible organisation. In practice, local government bodies often do not have dedicated officers in place for monitoring and evaluation activities, and project delivery often needs to be prioritised over monitoring and evaluation.

Where projects are financed through competitive grants, project and funding timelines can limit what evaluation can realistically take place. Financial and human resources need to be available before and after the implementation phase if robust evaluation is to take place, and this needs careful planning. Funders can enable this to happen by commissioning evaluation activities through a separate contract with different timelines from the project implementation.

Issues with Transport Analysis/Appraisal Guidance

Transport business cases are typically prepared within a standardised framework of Transport Analysis Guidance (TAG in England, or STAG or WelTAG in Scotland and Wales respectively, see Appendix 2 and Annexes to the main report)² (Department for Transport, 2024; Transport Scotland, 2022; Welsh Government, 2024) while regeneration funding bids are frequently prepared in a less standardised manner to respond to the specific aims of the funding stream.

The core arguments and justification for investment are set out in the strategic case for a project. The economic case, which includes a benefit-cost ratio (BCR) of monetised impacts, is often a supporting document and the BCR is usually presented as one element of the strategic case along with other supporting evidence.

The application of transport appraisal guidance in transport business cases is the subject of much debate and frequent criticism by transport planning practitioners. Criticisms include questioning the high importance given to time savings (Metz, 2008), potential double-counting of time savings (Buchan, 2014), underestimation of carbon impacts (Goodwin, 2021), general complexity and lack of transparency (Baldwin and Shuttleworth, 2021), and the conflation of fiscal impacts and social benefits in the treatment of fuel duty. There is also the issue that decision makers place a lot of weight on the headline BCR, which leads to the searching out of more speculative benefits³. Although the Treasury's updated

guidance de-emphasises the role of BCR, and WelTAG has moved away from a simple BCR, the tendency to place high emphasis on BCR persists, at the risk of ignoring uncosted wider benefits.

Key points to be aware of when using the TAG guidance and associated tools include the following:

- The appraisal compares the proposed intervention to a future 'do minimum' scenario (the reference case). In many cases, both the intervention and the reference case may represent a deterioration against the present situation for key policy targets. In other words, while the investment represents a theoretical benefit, it may not actually represent a step towards achieving current policy aims.
- This risk should be avoided by a robust multi-criteria sifting assessment in the early stages of the appraisal process. However, in practice, many projects do not follow the guidance to rigorously assess a wide range of multi-modal and demand management options, and instead focus on assessing a narrow selection of infrastructure options. When the option assessment guidance is applied to active travel projects, practitioners should consider accessibility (land use) planning and demand restraint on other transport modes alongside infrastructure options and demonstrate that short-listed options fit with wider sustainable transport policy objectives.

² This briefing references key TAG guidance, notably Unit A5.1 on Active Mode Appraisal, the associated AMAT tool, and Unit A4.1 on Social Impact Appraisal. Please note that the guidance, tools and data in TAG are regularly updated, and practitioners are recommended to refer to the online resources to ensure they have access to the latest versions.

³ Transport Scotland have introduced a method in STAG for placing a monetary value on "removing driver frustration" as part of the A9 dualling project which is separate from and additional to the values for reduced journey times and collisions.

- TAG contains a range of forecasting tools derived from the National Trip End Model (NTEM) (Department for Transport, 2023b). Rather than a single future scenario, these tools now use a series of core analytical scenarios to reflect uncertainty about the future. In practice, these advances in uncertainty are rarely carried through to appraisal

(Goodwin, 2021). Furthermore, it should be noted that while the monetary values for greenhouse gas emissions reduction in TAG reflect the pathway defined by UK policy commitments, the core analytical scenarios used for forecasting do not include any policy-led scenarios that reflect current UK decarbonisation policy.

Forecasting the impact of walking in appraisal

A key challenge in the appraisal of public realm investment is to forecast the impact of schemes on walking activity and wider travel behaviour which then plays an important part in estimating economic, social, health and economic impacts. TAG Unit A5.1 acknowledges that different modelling approaches may be required for forecasting the impact of walking and cycling schemes than other transport investment (DfT, 2022a). It puts forward three options, and for most walking investments, it proposes simply estimating levels of walking through comparative studies, drawing on the

results of similar schemes implemented elsewhere. Reference can be made to the studies included in the main report of this edition of *The Pedestrian Pound* and other sources. The earlier recommendations section in this report includes examples of these methods, and a discussion of potential alternative methods.

Given that the scale of impact from walking and cycling schemes may be small and the cost of schemes may be relatively low, TAG Unit A5.1 recommends carrying out sensitivity tests to consider the role of uncertainty in forecasts.

Demonstrating causality

Probably the biggest challenge in any impact evaluation of a public realm intervention is to be able to attribute any observed changes to the scheme rather than other factors. The Magenta Book (Central Government guidance on evaluation) highlights two different approaches that can be used (HM Treasury, 2020):

- Experimental and quasi-experimental impact evaluation methods; and

- Theory-based impact evaluation methods.

The recommendations section provides examples of how these methods can be applied to public realm scheme evaluation.

Difficulties of measuring walking

The challenge of obtaining good quality data on walking has traditionally presented a major obstacle to evaluation. Walking is inherently difficult to measure compared to other modes of transport because (i) the walking network is more fine-grained and difficult to monitor, (ii) walking trips are shorter than trips using other modes and people may struggle to recall them when reporting their travel, and (iii) lots of walking trip stages are invisible since they are part of other main mode trips.

Where the focus is on whether an investment has attracted more walking activity to a particular location then **location-specific walking activity data**

needs to be obtained. Walking activity data can be collected through manual counts or automatic counts. It is essential that counts are conducted in the same way at different time points.

Where the focus is on whether an investment has encouraged more individual-level walking amongst a wider, target population then **population-based walking behaviour data** needs to be obtained. This requires a survey to be undertaken of the population of interest (which may be residents, workers, students or visitors). See Table 10 in Appendix 2 for more details.

Capturing impacts from a representative population sample

Another challenge is identifying the population impacted by an intervention and capturing the impacts from a representative sample. If any surveys are conducted it is important to be clear about the target population of the intervention. The target group can be considered in terms of key trip generators (e.g., residential areas) or key trip attractors (e.g., workplaces). As well as potential users, consideration should be given to include in the study population those people who may not use a scheme but who are affected by it (for example, who experience a change in travel conditions elsewhere in the transport network).

It will also be important that the target population is defined in such a way to include marginalised and vulnerable groups who may have more limited transport options and greater potential to benefit from investment in the public realm. This can be addressed by making sure the geographical scope of the study is such that it includes areas (e.g., neighbourhoods) with higher than average representation of such groups.

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