

Work Order T0043

**Local Authority Major
Schemes
Meta-evaluation**

**Delivery and outcomes of
Local Major Schemes:
meta-evaluation of schemes
funded 2011-2016**

**Specialist Professional & Technical Services 2 (SPaTS 2)
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Glossary

Abbreviation	Explanation
AQMA	Air Quality Management Area
BCR	Benefit Cost Ratio
BRT	Bus Rapid Transit
BSIP	Bus Service Improvement Plan
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DSDA	Darlaston Strategic Development Area
EFT	Emissions Factors Toolkit
FYA	Five Years After
GHGs	Greenhouse Gases
GVA	Gross Value Added
HGV	Heavy Goods Vehicle
JCS	Joint Core Strategy
JSA	Jobseeker's Allowance
kT	Kiloton
MSBC	Major Scheme Business Case
NCC	Norfolk County Council
NDR	Northern Distributor Road
NET	Nottingham Express Transit
NO ₂	Nitrogen dioxide
OA	Output Area
ORR	Office of Road and Rail
OYA	One Year After
PVB	Present Value Benefits
P&R	Park and Ride
RQ	Research Question
SDLR	South Devon Link Road
SME	Small and Medium-sized Enterprises
TAG	Transport Analysis Guidance
TEE	Transport Economic Efficiency
VfM	Value for Money

1. Executive Summary

This meta-evaluation reviews the outcomes of 43 local major transport schemes funded by the Department for Transport (DfT), approved for construction between 2011 and 2016, and accounting for approximately £1.3 billion of investment. Overall, 23 schemes aimed to deliver highway improvements, 8 are public transport schemes and 12 are integrated schemes that aim to create better linkages between modes of transport.

The report is based on DfT financial monitoring data and the individual scheme evaluations undertaken mostly one year after a scheme's opening by the Local Authority who developed the scheme. The expectations and requirements for the analysis in these reports are outlined in the Department's 2012 *Monitoring and Evaluation Framework for Local Authority Major Schemes*¹. All Local Authorities covered in this document have been subject to this framework for the monitoring and evaluation of their Local Authority Major Schemes.

Differences in the quality of, and the approaches used, in scheme evaluations limit the ability of this meta-evaluation to draw reliable conclusions about the effectiveness of schemes. However, there is evidence of an improvement in the quality of the analysis and reporting in some areas, including economic evaluation, following the earlier meta-evaluations undertaken by DfT in 2014² and 2018³.

The key findings from this meta-evaluation are set out below.

Delivery of objectives

The scheme evaluations generally reported an improvement in metrics relating to the stated objective or outcomes of the scheme:

- Highway schemes generally improved journey times, congestion and traffic flow.
- Public transport schemes generally improved journey times, reliability and passenger satisfaction.
- Integrated transport schemes generally improved journey times and reduced traffic volumes.



However, the reports do not provide sufficient information to determine the extent to which the forecast benefits have been achieved to date across the sample of schemes considered.

Delivering local transport schemes

On average, **scheme construction lasted 5 months longer than forecast**. Overall, 15% of schemes were delivered ahead of schedule or on time. The most common reasons for delay were adverse weather conditions and unforeseen ground conditions.



Schemes cost on average 4% more than predicted. The larger the scheme, the greater the average overspend. Where cost overruns occurred, the most common reason was unforeseen ground conditions.



Value for Money

Achieving value for money means delivering more benefits than costs. For all schemes being considered for funding by DfT, a 'benefit-cost-ratio'⁴ (BCR) is calculated that compares the forecast benefits with the expected costs. A benefit-cost-ratio can also be calculated at the evaluation stage, replacing input and output assumptions with actual measurements.



¹ [Monitoring and Evaluation Framework for Local Authority Major Schemes, Department for Transport, September 2012](#)

² [Local major schemes: meta evaluation 2007 to 2012 - GOV.UK \(www.gov.uk\)](#)

³ [Delivery and outcomes of Local Major Schemes: meta-evaluation of schemes funded 2006-2010, Department for Transport, August 2018](#)

⁴ A benefit-cost-ratio of 2 would mean that for every £1 invested, a benefit of £2 would be achieved.

Half of the schemes expected to calculate an outturn BCR did so. **For schemes which undertook the calculation, 11 out of 13 achieved high or very high value for money⁵.** In seven cases the evaluation BCR was broadly in line with the appraisal BCR, and in six cases it was lower.



Public transport impacts

Of the 12 bus improvement schemes with reported patronage data, eight schemes reported an increase in bus patronage, indicating the value of these schemes in encouraging the use of public transport.



Public transport and integrated transport schemes improved passenger experience in several ways including improved perceptions of security, improved cleanliness, and improved journey times and reliability of services.



Of the nine schemes with an objective related to sustainable transport choices, seven provided evidence to suggest that there has been an increase in trips by sustainable modes, although it is difficult to determine whether this was modal shift from private vehicles, or new trips.



Environmental impacts

Many of the evaluations that considered **air quality** impacts presented some evidence of improvements. Others found it difficult to draw firm conclusions regarding the contribution of the scheme to any observed air quality changes.



Noise impacts were measured using actual noise readings or undertaking an assessment based on changes in traffic flows. There is some evidence of noise benefits and disbenefits, but most scheme evaluations were unable to draw a firm conclusion in relation to the impact of the scheme.



Most evaluations did not consider carbon impacts, despite this being a requirement of the guidance. For those schemes that did consider carbon, a variety of methods were used and there were a range of results with some schemes showing an improvement, others showing a worsening and many presenting inconclusive evidence.

Schemes rarely presented evidence on other potential environmental impacts, such as effects on landscape, biodiversity, heritage and water. When these impacts were considered, it was normally in terms of mitigation measures, for example, noise barriers or flooding protection through use of attenuation ponds.



Impact on local economies

Evaluating the impacts of schemes on local economies is challenging, particularly at the one year after opening stage. Most of the evidence presented is based around changing levels of employment, new housing and employment development, and business activity. However, attribution of impacts to schemes is difficult. Business surveys were used for some evaluations which were effective at demonstrating the perceived and actual impact of the scheme on the local economy.




Lessons Learnt for DfT


Most of the evaluations considered in this meta-evaluation were undertaken following publication of the 2012 evaluation framework guidance, which aimed to make the evaluation process as consistent and proportionate as possible. There has been an improvement in the quality of evaluations, however, the list below contains several findings which suggests that the desired consistency in evaluations has not yet been fully achieved:

⁵ 'High' value for money is equivalent to a BCR of 2 or higher. 'Very high' value for money has a BCR of 4 or higher.

Consistency of scheme evaluations

- The structure, content and detail of evaluation reports varies significantly, despite DfT evaluation guidance which specifies the requirements for each type of evaluation. 
- Very few evaluations followed the guidance that up to three main objectives of the scheme should be identified and appropriate metrics used to assess whether they have been achieved.
- Over half of the reports in the sample did not refer to the logic maps / theory of change which should have been undertaken as part of the development of the monitoring and evaluation plans.
- There is evidence to show that scheme promoters find it very difficult to assess the impact of Local Major Schemes on carbon.
- There is little evidence of comparison of forecast vs outturn impacts, which makes it difficult for DfT to build up an evidence base on the accuracy of forecasting methods.
- To improve the quantitative evidence on achieved value for money, relevant scheme evaluations should calculate an outturn benefit to cost ratio using observed data.
- Many reports were completed significantly later than their One or Five Year After opening anniversary.
- Many aspects of transport schemes (such as carbon and passenger satisfaction) were measured in different ways or not measured at all, which made comparisons across schemes difficult.

Data Collection

- There was evidence of variations in the quality of data or missing data which impacted on the quality of evaluations. 
- Baseline data collection that relies on data used to inform the appraisal often has limitations, due to the time lag between the appraisal and construction starting.

Evaluation good practice

- Stakeholder / user surveys were particularly useful for estimating the extent to which observed changes in key metrics can be attributed to the scheme in question.
- A small number of reports use counterfactual or comparator analysis to demonstrate attribution of impacts, but in general this is an area for improvement.

Lessons Learnt for Scheme Promoters

The list below contains a summary of the key lessons relevant for scheme promoters, based on a review of the collective findings of the evaluation reports included in this meta-evaluation.

- Scheme delivery timescales can slip. Scheme promoters should take account of the common reasons for delays and incorporate them into their risk management and scheme programmes.
- Schemes often cost more than anticipated. Scheme promoters should take account of the common reasons for overspend and incorporate these into their risk management and forecasts.
- It is important to plan ahead so that appropriate data is collected on a timely basis, that will meet the requirements of the evaluation.

Some evaluation reports presented scheme specific lessons learnt. The list below contains a summary of some of the key lessons identified that may benefit other scheme promoters:

- Early engagement with contractors during the scheme development and design phase is often seen as beneficial to ensure that a realistic programme is developed and delivery risks are identified and mitigated as early as possible.
- The public and stakeholders do not always fully understand the scheme development process i.e. when they can comment and when it's too late.

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- For schemes which involve rail possessions or working near railways, early engagement and clear communication with Network Rail is seen as crucial to reduce the risks of delays.
- A comprehensive communication programme with local stakeholders affected by the scheme was cited as an important element for success in a few cases.
- Some scheme promoters suggested planning the construction schedule to maximise progress made in spring/summer where better weather conditions are more likely.
- Continuity of personnel on all sides (client, contractor, designer) if possible, is often seen as beneficial to the smooth delivery of the project.

2. Introduction

2.1. Background

Between 2011 and 2016 the Department for Transport ('DfT' or 'the Department') committed to invest in 43 local major transport infrastructure schemes. The Department provided funding to enable the development of local transport infrastructure projects that were too large to be funded through Local Authorities' own budgets.

The schemes have been put into three categories:

- Highways schemes: improvements to local roads, junctions or any other infrastructure required for the proper and efficient functioning of the highway network. There are also some maintenance schemes within this group.
- Public transport schemes: improvements to local public transport infrastructure, including new rail stations, upgrades to bus services and associated public realm improvement; and
- Integrated transport schemes: schemes that aim to create better linkages between modes of transport.

Local Authorities awarded funding by DfT committed to evaluate their schemes one and five years after opening. The purpose of these evaluation reports was to provide evidence about whether the scheme had met the objectives set out in the monitoring and evaluation plan, provide information about the performance of the scheme in its local context, and to demonstrate any lessons learned during the scheme's inception and construction. The expectations and requirements for the analysis in these reports are outlined in the Department's 2012 *Monitoring and Evaluation Framework for Local Authority Major Schemes*⁶. All Local Authorities covered in this document have been subject to this framework for the monitoring and evaluation of their Local Authority Major Schemes.

Evaluation is an integral element in understanding how well national and local government are delivering services and investing in public finances. It is essential for demonstrating that funds invested by Government have provided value for money for the taxpayer whilst also ensuring transparent and accountable decision making. Learning about which schemes are the most effective in achieving their objectives and responding to local transport issues will build the evidence base to support future decision-making and share lessons about delivery and best practice.

DfT previously published two meta-evaluations in 2014 and 2018 which sought to cover the lessons learned from scheme evaluations between 2006 and 2012. The 2018 meta-evaluation⁷ built on the findings of the 2014 meta-evaluation⁸, combining them with an additional 29 schemes to improve the robustness of the original investigation. Both of these reports analysed schemes with monitoring and evaluation plans produced prior to the publication of the 2012 *Monitoring and Evaluation Framework for Local Authority Major Schemes*.

This 2022 meta-evaluation follows a similar format to these previous meta-evaluations, however, it considers a new set of schemes from 2011 onwards and the findings should be considered separately. Of the 43 schemes covered within this meta-evaluation:

- 23 are highway schemes;
- 8 are public transport schemes; and
- 12 are integrated transport schemes.

Figure 2-1 provides a timeline of the different stages of approval, construction and monitoring for each of the schemes included in this meta-evaluation. The majority of schemes received Full

⁶ [Monitoring and Evaluation Framework for Local Authority Major Schemes, Department for Transport, September 2012](#)

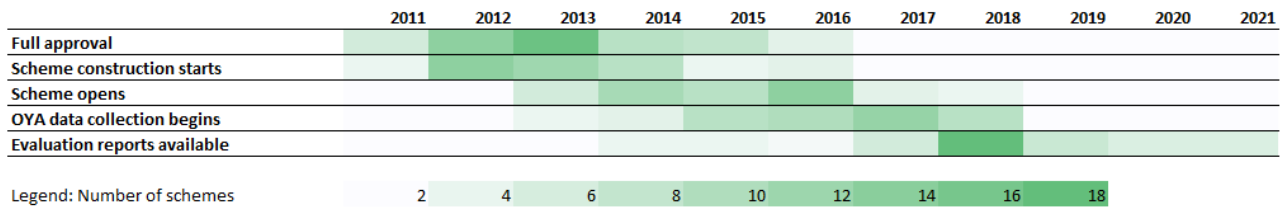
⁷ [Delivery and outcomes of Local Major Schemes: meta-evaluation of schemes funded 2006-2010, Department for Transport, August 2018](#)

⁸ [Meta Evaluation of Local Major Schemes Final Report, Department for Transport, July 2014](#)

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Approval in 2013 and the evaluation reports were published in 2018. However, some evaluation reports were only made available as recently as 2021. It should be noted that in some cases there were delays between the one year or five-year post-opening dates and the publishing of those reports. Due to the timing of all of the evaluations, all of the reports pre-date any impacts arising from the Covid-19 pandemic.

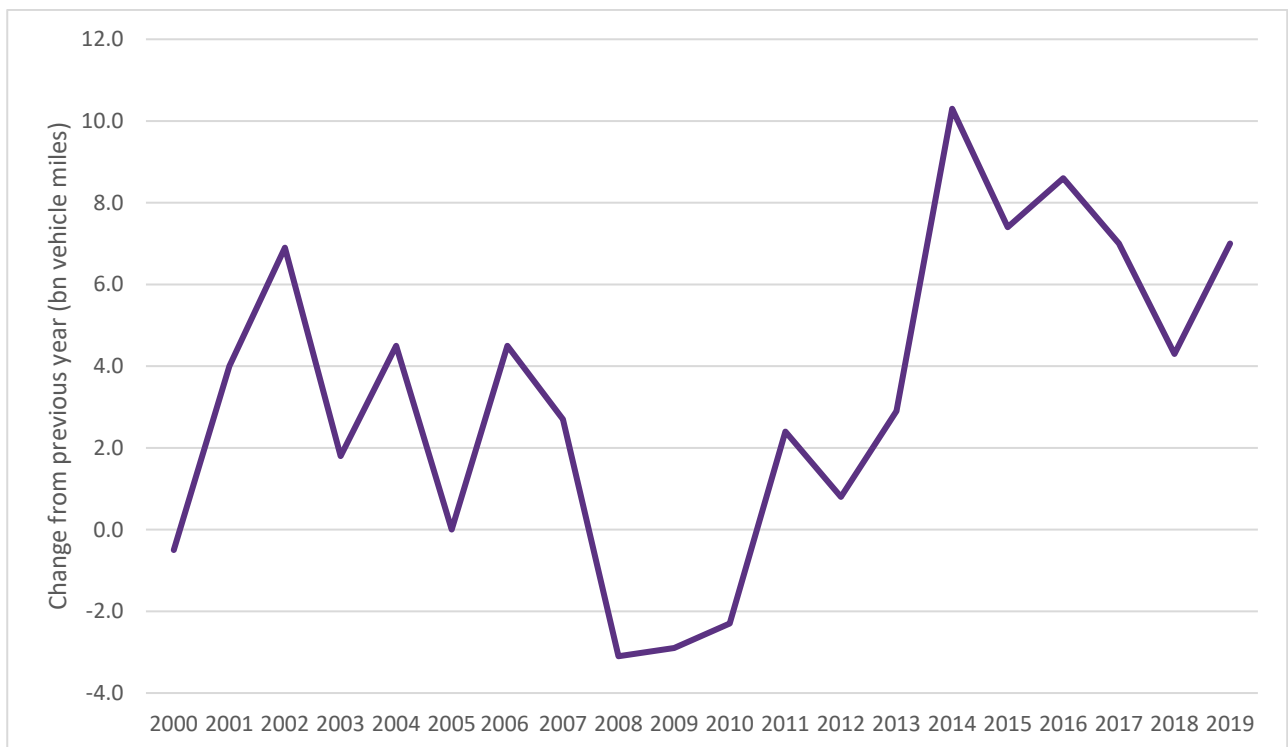
Figure 2-1 Scheme construction and evaluation timeline



Background context

Figure 2-2 gives the traffic context for the timelines of the schemes. Many of the schemes opened between 2014 and 2016 when traffic levels had largely recovered from the economic recession in 2008. This data indicates that scheme outcomes relating to traffic are likely to be accurate. However recent data shows that traffic levels dropped by 76 billion vehicle miles between 2019 and 2020 due to the Covid-19 pandemic; this will have consequences for the results of the evaluations of many of these schemes at the five-year after evaluation stage.

Figure 2-2 Change in road motor traffic from previous year⁹



Purpose of this meta evaluation report

The results of this analysis will be used by DfT to revisit the *2012 Monitoring and Evaluation Framework for Local Authority Major Schemes*, update it to clarify the expectations of DfT with regards to evaluation and reporting standards, and assist scheme promoters in producing high-quality monitoring and evaluation outputs. It will also inform future decisions by central and local government about the types of schemes to fund.

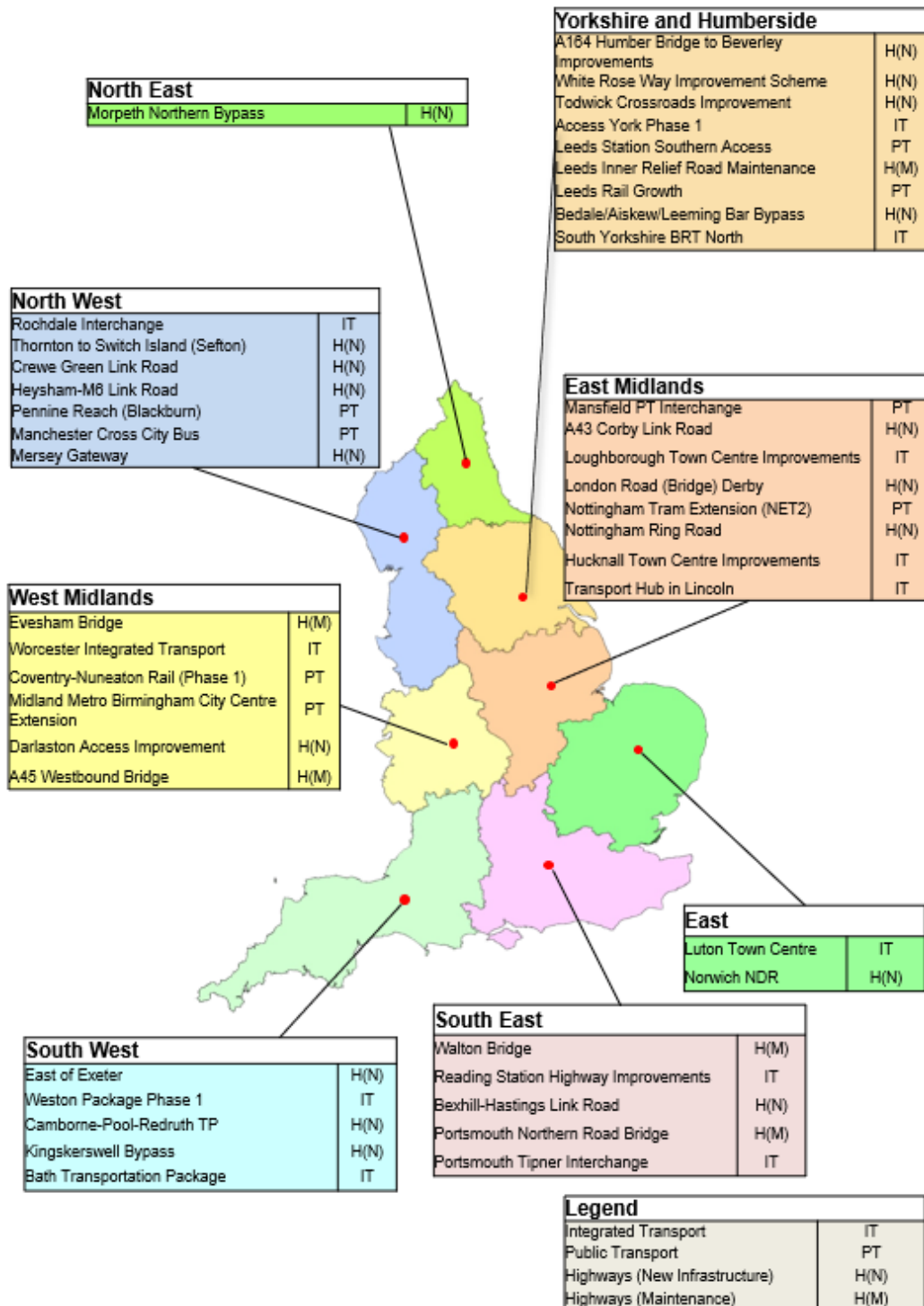
⁹ DfT Road Traffic Statistics (TRA0101), <https://www.gov.uk/government/collections/road-traffic-statistics>

3. The Schemes

3.1. Scheme geography

Between 2011 and 2016 DfT funded several Local Authority Major Schemes in various regions of England. Evaluation reports have been received for 43 schemes, as shown in Figure 3-1. Short descriptions for each scheme are included in Appendix A.

Figure 3-1 Scheme geography

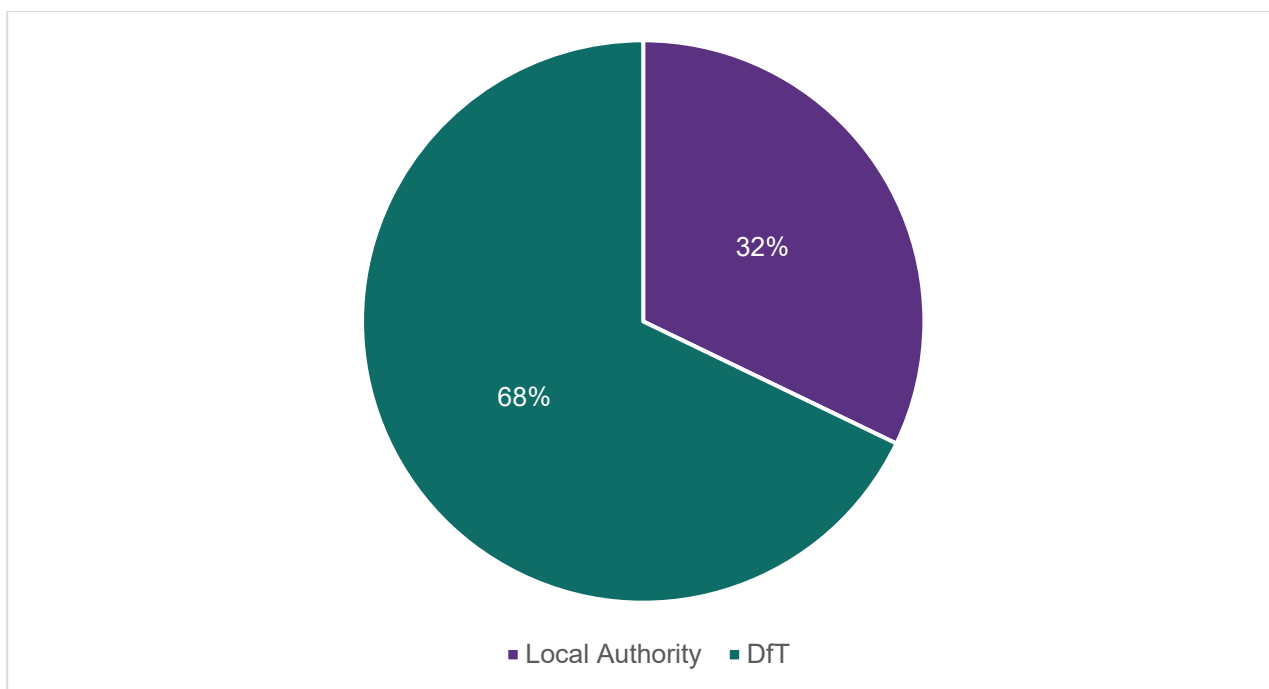


The greatest number of schemes were located in Yorkshire and Humber (nine schemes; 20%), and the fewest in the North East (one scheme; 2%). Other regions were as follows: eight (18%) in the East Midlands, seven (16%) in the North West, six (14%) in the West Midlands, five (12%) in the South West, five (12%) in the South East and two (5%) in the East.

3.2. Scheme costs

This section uses forecast scheme costs at Full Approval stage (using data provided by DfT) in order to give an indication of the overall level of investment. Two schemes (Nottingham Tram Extension and Mersey Gateway) did not have forecast costs available as they were funded by Private Finance Initiatives. Total investment across the 41 schemes was £1.3bn and the average split between DfT and Local Authority spend is shown in Figure 3-2. DfT contributed approximately two thirds of the cost of the schemes on average, although this data does not include any third party spend so actual divisions may be slightly different.

Figure 3-2 Average percentage contribution of forecast costs (excluding third party contributions)



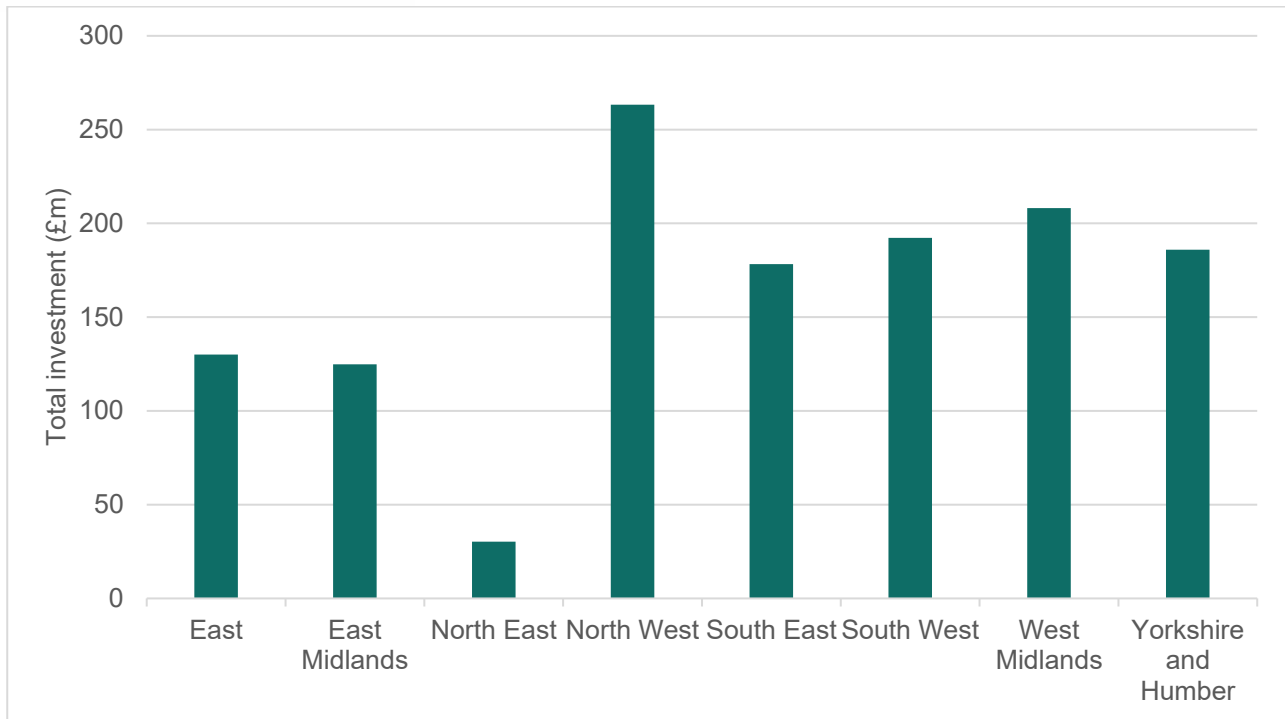
Sample size: 41

By geography

Figure 3-3 shows the total forecast investment in schemes in each of the English regions (based on available cost data¹⁰). The North West saw the most investment in schemes within the scope of this meta-evaluation (£263m) while the North East saw the least (£30m). Despite having the greatest number of schemes overall (nine), Yorkshire had the fourth largest investment at (£185m).

¹⁰ Actual split of outturn investment by region may be different if all data cost becomes available.

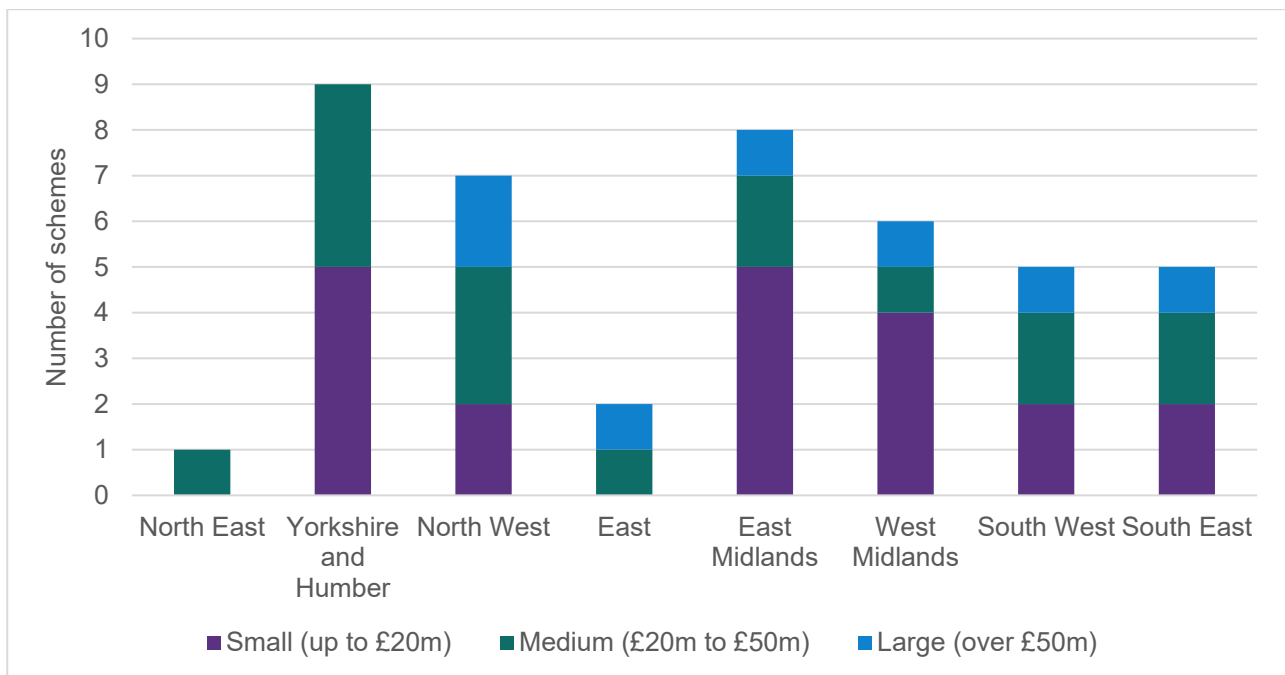
Figure 3-3 Total forecast investment (for schemes within the scope of this meta-evaluation)



Sample size: 41 (Cost data not available for two PFI schemes)

Schemes have been split into three categories; small schemes with a forecast cost of up to £20m, medium schemes with a forecast cost between £20m and £50m, and large schemes with a forecast cost of over £50m. Figure 3-4 shows a breakdown of schemes by region, according to these three categories. Despite having the second lowest total investment, the East Midlands has the second highest number of schemes. However, the data shows that these were five small schemes and just two medium schemes.

Figure 3-4 Number of schemes by geography and forecast cost

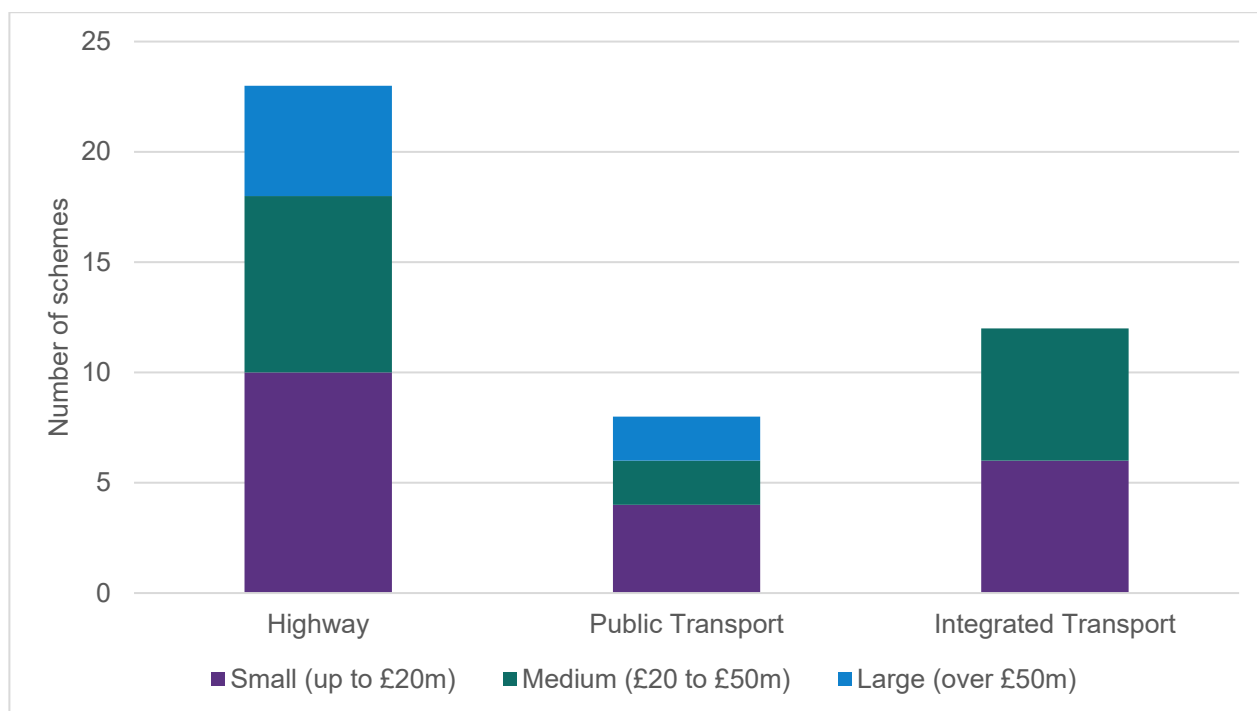


Sample size: 43

By scheme typology

Figure 3-5 shows the breakdown of scheme size (forecast cost) by scheme type. The majority of the schemes (23) are highway schemes, and these include five of the schemes with the largest forecast cost (over £50m). Integrated transport schemes are split evenly between the small and medium categories, and around half of the public transport schemes are small.

Figure 3-5 Number of schemes by scheme typology and forecast cost



Sample size: 43

This meta-evaluation covers 23 highway schemes including:

- 18 standard highway schemes such as junction improvements, new links or bypasses; and
- 5 schemes focused on maintaining highway assets.

The full list of schemes is shown in Table 3-1 Where relevant, the Five Year After evaluations are highlighted in this report.

Table 3-1 Highway schemes

Highway scheme	Type	Outturn cost (£m) ¹¹	Scheme opening
East of Exeter <i>Five Years After</i>	New infrastructure	16	Jan-13
A164 Humber Bridge to Beverley Improvements <i>Five Years After</i>	New infrastructure	10	May-13
White Rose Way Improvement Scheme	New infrastructure	17	Jun-13
Walton Bridge	Maintenance	33	Oct-14
Evesham Bridge	Maintenance	8	Mar-14
Portsmouth Northern Road Bridge	Maintenance	9	Mar-14
Todwick Crossroads Improvement	New infrastructure	15	May-14
A43 Corby Link Road	New infrastructure	37	May-14
London Road (Bridge) Derby	New infrastructure	7	Dec-15
Thornton to Switch Island (Sefton)	New infrastructure	21	Aug-15

¹¹ Rounded to nearest million

Highway scheme	Type	Outturn cost (£m) ¹¹	Scheme opening
Camborne-Pool-Redruth TP	New infrastructure	29	Oct-15
Kingskerswell Bypass	New infrastructure	118	Dec-16
Bexhill-Hastings Link Road	New infrastructure	113	Dec-15
Crewe Green Link Road	New infrastructure	26	Dec-15
Nottingham Ring Road	New infrastructure	16	Mar-16
Leeds Inner Relief Road Maintenance	Maintenance	25	Apr-16
Darlaston Access Improvement	New infrastructure	N/A ¹²	Jun-16
Bedale/Aiskew/Leeming Bar Bypass	New infrastructure	30	Aug-16
A45 Westbound Bridge	Maintenance	12 ¹³	Sep-16
Heysham-M6 Link Road	New infrastructure	139	Oct-16
Morpeth Northern Bypass	New infrastructure	33	Apr-17
Mersey Gateway (PFI)	New infrastructure	186	Oct-17
Norwich NDR	New infrastructure	178	Apr-18

This meta-evaluation considers 8 public transport schemes, including new public transport interchanges, bus priority and access schemes, and new railway stations. The schemes are detailed in Table 3-2

Table 3-2 Public transport schemes

Public transport scheme	Outturn Cost (£m) ¹¹	Scheme opening
Mansfield Public Transport Interchange	9	Mar-13
Nottingham Tram Extension (NET2)	N/A ¹⁴	Aug-15
Leeds Station Southern Access	18	Dec-15
Coventry-Nuneaton Rail (Phase 1)	16	Jan-16
Midland Metro Birmingham City Centre Extension	N/A ¹⁵	May-16
Leeds Rail Growth	N/A ¹⁶	Dec-15
Pennine Reach (Blackburn)	44	Jul-16 ¹⁷
Manchester Cross City Bus	N/A ¹⁸	N/A

This meta-evaluation includes 12 schemes categorised as integrated transport schemes. They combine elements of public transport and highway schemes, focusing on the interaction between the two and making public transport a more accessible and attractive choice. Table 3-3 summarises the schemes included in this analysis.

Table 3-3 Integrated transport schemes

Integrated transport scheme	Outturn cost (£m) ¹¹	Scheme opening
Weston Package Phase 1 (Five Years After)	13	Feb-14
Portsmouth Tipner Interchange	27	April-14
Access York Phase 1	23	June-14

¹² It is understood from the scheme promotor that the scheme was delivered within the agreed budget envelope of £25.908m but the exact cost was not supplied.

¹³ Stakeholder responses from the scheme promotor (Solihull Metropolitan Borough Council) indicated that the scheme was completed on budget, therefore the outturn costs has been assumed the same as at Full Approval.

¹⁴ Due to the PFI nature of the contract, the scheme promotor does not have access to the final outturn costs post-construction.

¹⁵ Costs were provided for this scheme, however they did not appear to be directly comparable to the forecasts so have been excluded from this evaluation.

¹⁶ Costs were provided for this scheme, however they did not appear to be directly comparable to the forecasts so have been excluded from this evaluation.

¹⁷ There is one element of this scheme still to be delivered, however the majority of the scheme opened in July 2016.

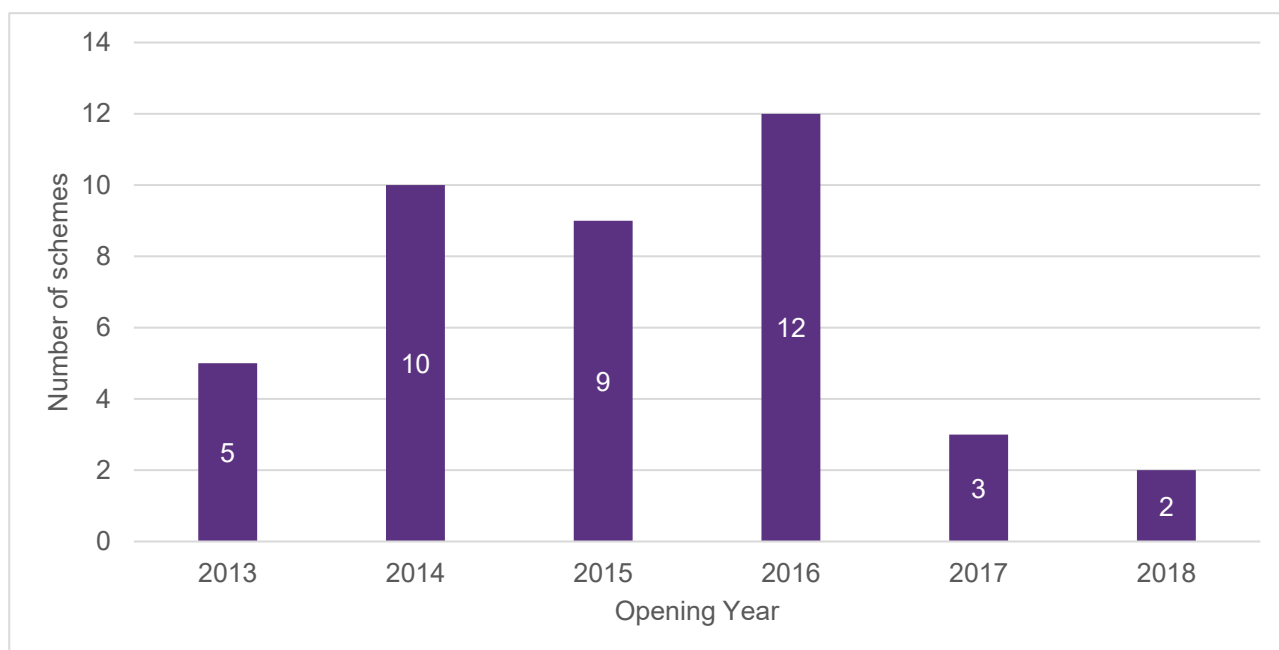
¹⁸ The Manchester Cross City Bus Package comprised many different elements and was delivered in a series of separate interventions. This made it difficult to establish an outturn cost that was comparable to the forecast, so the cost of the scheme will therefore not be included in this analysis.

Integrated transport scheme	Outturn cost (£m) ¹¹	Scheme opening
Luton Town Centre	24	Sep-14
Reading Station Highway Improvements	15	Dec-14
Loughborough Town Centre Improvements	17	Oct-14
Rochdale Interchange	12	Nov-13
Five Years After		
Worcester Integrated Transport	20	Nov-15
Bath Transportation Package	26	Apr-16
S Yorkshire Bus Rapid Transit North	37	Sep-16
Hucknall Town Centre Improvements	13	Jun-17
Transport Hub in Lincoln	29	Jan-18

3.3. Scheme chronology

As stated in Section 2.1 (and shown in Figure 3-6), most of the schemes¹⁹ opened between 2014 and 2016, with just five schemes opening after this point.

Figure 3-6 Number of schemes in sample by year of opening



Sample size: 41

3.4. Evaluation type

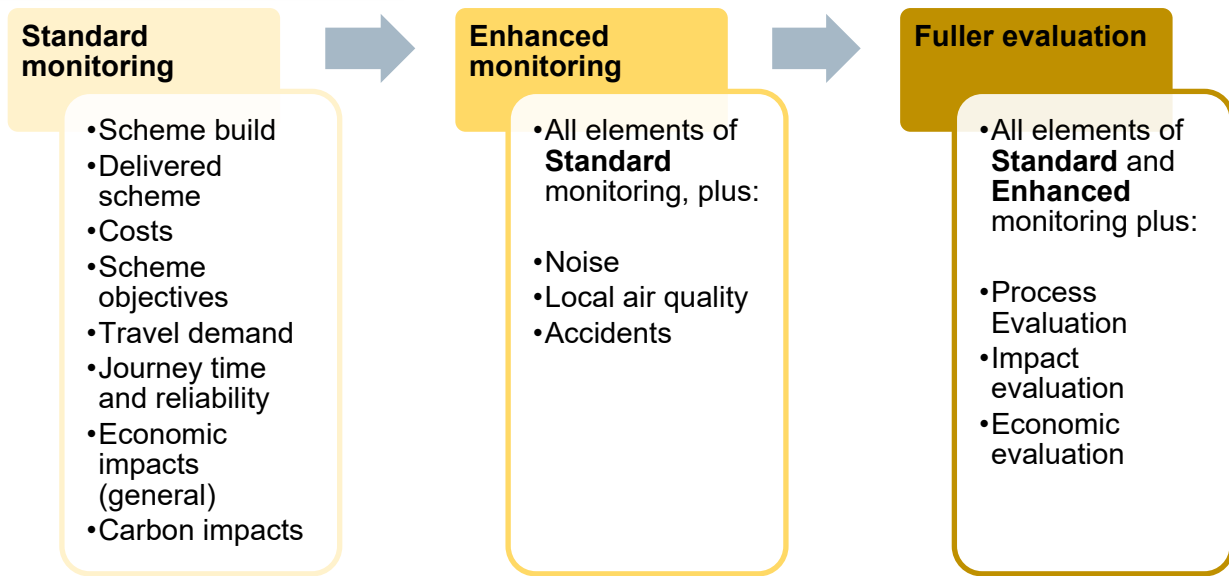
All scheme promoters are required to monitor their scheme outcomes against a set of standard criteria, referred to as a **Standard Monitoring**.

If a scheme has an estimated outturn cost in excess of £50m at Full Approval (or is expected to have significant impacts in the local area) then an **Enhanced Monitoring** is required which involves monitoring additional metrics covering air quality, noise and accidents.

For selected schemes (based on level of investment, nature of the scheme and benefits from additional evaluation) a **Fuller Evaluation** is required which takes a broader look at how the scheme was delivered (process evaluation), what the effects were and whether there were any unexpected or unintended outcomes (impact evaluation), and how the outturn value for money compared with the forecast (economic evaluation). Requirements of each level of monitoring are shown in Figure 3-7.

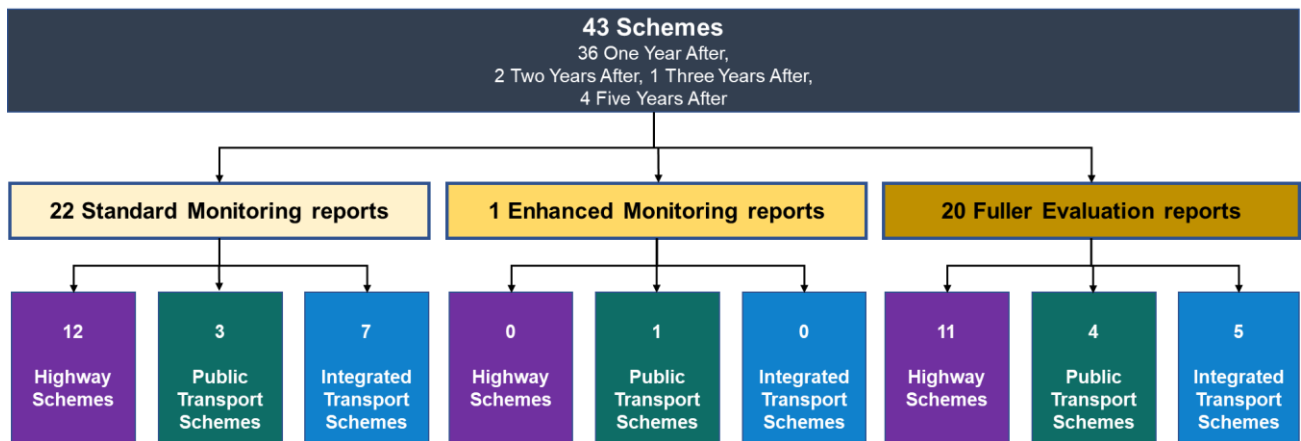
¹⁹ Includes only available opening year data; excludes Manchester Cross City Bus Package as different elements of the scheme opened at different times.

Figure 3-7 Reporting requirements for different levels of monitoring²⁰



In order to give context to the analysis presented in this report, Figure 3-8 shows the breakdown of schemes by report type, evaluation level and scheme type.

Figure 3-8 Breakdown of evaluation types covered in this meta-evaluation



Understanding the distribution of evaluation types is important as this dictates the level of reporting and the types of data that the Local Authorities are required to include in their evaluation reports.

The majority of schemes included in this meta-evaluation are either Standard Monitoring or Fuller Evaluations, undertaken one year after implementation. For reasons not detailed in the evaluation reports, the initial evaluation was delayed for a small number of schemes and undertaken two or three years after implementation. Only four five-year evaluations were available at the time of this report.

It is not unusual for scheme promoters to report that evidence is inconclusive at the one-year after stage, and for certain aspects to be missing, dealt with qualitatively or deferred to the five-year after evaluation report. Several scheme promoters noted in their evaluation reports that air quality, carbon, accidents and local economy impacts were difficult to assess at the one-year after stage and that further analysis would be provided in the five-year after report. Several Fuller Evaluations did not provide outturn benefit cost ratios (BCRs), despite this being a requirement at both one year and five years.

²⁰ Monitoring is defined as the collection of data to check progress against planned targets and benefits. Evaluation is defined as the assessment of the scheme effectiveness and efficiency during and after implementation.

4. Overview of Method

4.1. Summary of evaluations

The methods used for this report broadly follow those used in the 2014 and 2018 meta-evaluations, namely:

- a **desktop review of data quality**, exploring the usefulness of the data for meta-analysis.
- a **desktop meta-evaluation** of the evaluation reports, aiming to answer 14 primary research questions about aspects of schemes.
- a **scheme promoter survey**, in order to gain additional insights into reasons for delays, cost overruns and missing data.

Throughout this report, schemes are classified into three categories with colour coding used where relevant:

- **Highway** schemes comprise new roads and junctions or improvements to existing roads and junctions.
- **Public transport** schemes are investments in buses, trams and other forms of public transport.
- **Integrated transport** schemes aim to create better linkages between modes of transport.

4.2. Desktop review of data quality

In the 2014 and 2018 meta-evaluations, the desktop review explored whether available data was of sufficient quality to conduct a meta-*analysis* (a form of analysis that combines raw data to reach an overall conclusion). These studies concluded that a meta-analysis was possible only for scheme cost and scheme delivery.

For other aspects of the schemes, such as whether they achieved their objectives, the data could not support a meta-analysis. This was usually because, in the absence of a monitoring and evaluation framework, data has not been collected or had been measured differently for different schemes. For these aspects, it was decided to conduct a broader meta-*evaluation*, in which findings are compared qualitatively between schemes.

The data quality review was completed for this 2022 update which also confirmed the earlier conclusions that a meta-analysis was feasible for scheme cost and delivery (programme), but a broader meta-evaluation was needed for other aspects of schemes due to gaps in the evidence presented. This is a key finding in itself as many of the evaluations in this sample were undertaken following publication of the 2012 evaluation framework guidance.

4.3. Desktop meta-evaluation

The aim of the desktop meta-evaluation was to answer the 14 research questions (RQs) set out in Table 4-1.

Table 4-1 Meta-evaluation research questions

Research Question	Chapter
RQ1. Are Local Major Schemes delivered on time (if not, why not)?	5
RQ2. Are Local Major Schemes delivered on budget (if not, why not)?	6
RQ3. What are the main benefits of Local Major Schemes (does this vary by scheme type / context)?	7
RQ4. How well do schemes deliver their stated outcomes?	7
RQ5. Do Local Major Schemes deliver value for money?	8
RQ6. How well have the impacts of Local Major Schemes been forecast and what are the reasons for differences?	8
RQ7. How do Local Major Schemes impact on passenger experience?	9
RQ8. Is there evidence that Local Major Schemes impact on people’s choice of transport?	9
RQ9. How do Local Major Schemes impact on the environment?	10
RQ10. How do Local Major Schemes affect local economies?	11
RQ11. How do Local Major Schemes impact on local bus operations?	12
RQ12. Are there any unanticipated consequences of Local Major Schemes?	13
RQ13. What lessons can be learned to improve Local Major Scheme evaluation?	14
RQ14. What key learning points should be communicated to future Local Major Scheme promoters?	14

At various points in this report, **case studies** are used to present evidence of good practice and innovative use of data sources. Case studies have also been selected where there is strong evidence presented in terms of attribution (i.e. demonstrating that the scheme has been a key driver in the outcome occurring).

4.4. Scheme promoter surveys

To inform this report, an online scheme promoter survey was prepared and circulated to all scheme promoters in June 2021. The aim of this survey was twofold:

1. To attempt to fill evidence gaps in evaluation reporting and / or determine why certain analysis was not undertaken. In particular, the survey aimed to fill evidence gaps around:
 - a. Outturn scheme costs;
 - b. Key programme dates;
 - c. Carbon impacts;
 - d. Forecast vs outturn impacts; and
 - e. Value for money of schemes.
2. To determine any unintended outcomes, residual problems and the role of any external factors.

The survey was circulated to all scheme promoters and responses were received in relation to 21 schemes. The additional evidence provided by scheme promoters has been used to inform and validate the analysis presented in this report.

5. Delivering on Time

RQ1. Are Local Major Schemes delivered on time (if not, why not)?

Key findings

Overall, 15% of schemes were delivered ahead of schedule or on time. On average, scheme construction took 5 months longer than forecast. This compares to 33% of schemes being delivered ahead of schedule or on time and an average delay of 6 months for schemes included in the 2018 Meta-evaluation.

The main reasons for delays were adverse weather conditions, unforeseen ground conditions and delays obtaining rail line possessions.

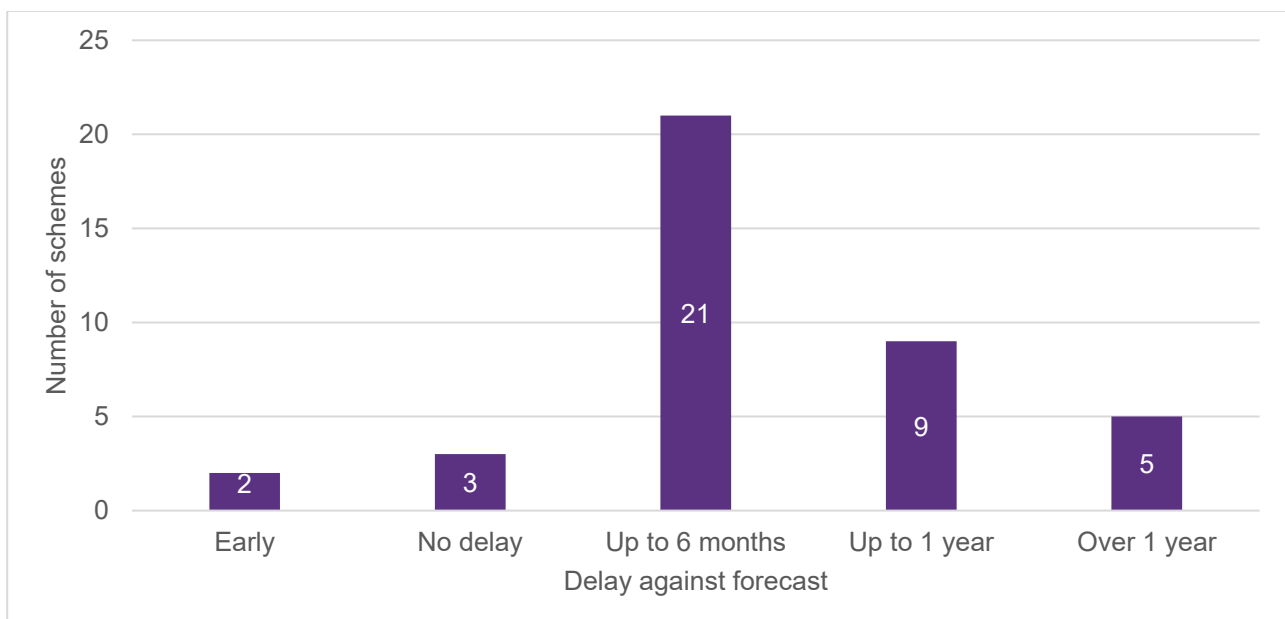
Scheme promoters should bear in mind common reasons for delays, such as adverse weather and unforeseen groundworks and take these into account in planning, as well as avoiding and mitigating them where possible.

5.1. Delivering on time

Across the 40 schemes which provided data for both the start of works and scheme opening, construction took on average one year and eight months. This varied from 10 months (Weston Package Phase 1) to over four years (Kingskerswell Bypass). This does not include the Manchester Cross City Bus Package, as this scheme had many different elements delivered and completed separately over a five-year period.

15% of schemes were completed on time, or ahead of time. On average, schemes opened just over five months later than predicted at Full Approval stage²¹. This figure varies between schemes. As Figure 5-1 shows, nine schemes encountered delays between six months and one year, with five schemes encountering delays lasting over one year.

Figure 5-1 Distribution of changes in construction time



Sample size: 40

²¹ That is, when the business case for the scheme is given final approval by the DfT. This stage is known as 'Full Approval'.

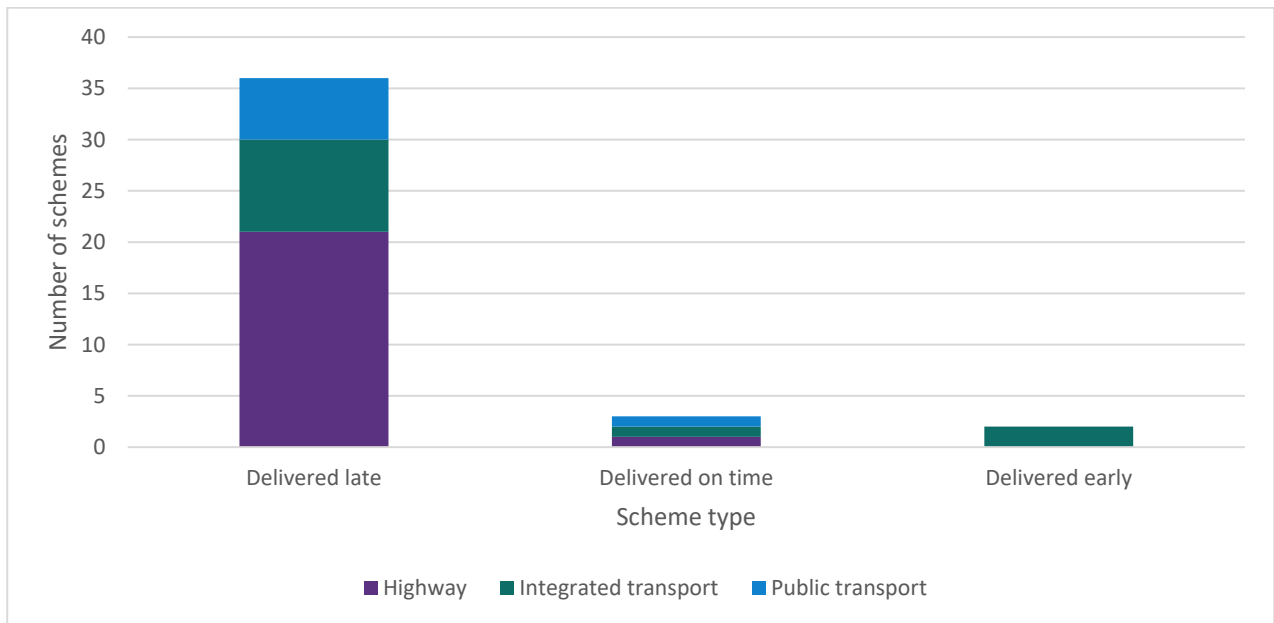
By scheme cost

In general, schemes with higher outturn costs experienced greater delays in completion relative to forecast. On average, small schemes (costing less than £20m) are delayed by 4 and a half months, medium schemes (between £20m and £50m) by just over 5 months, and large schemes (over £50m) by 7 months.

By scheme type

The number of schemes delivered late, early and on time by scheme type is shown in Figure 5-2.

Figure 5-2 Distribution of changes in construction time by scheme type

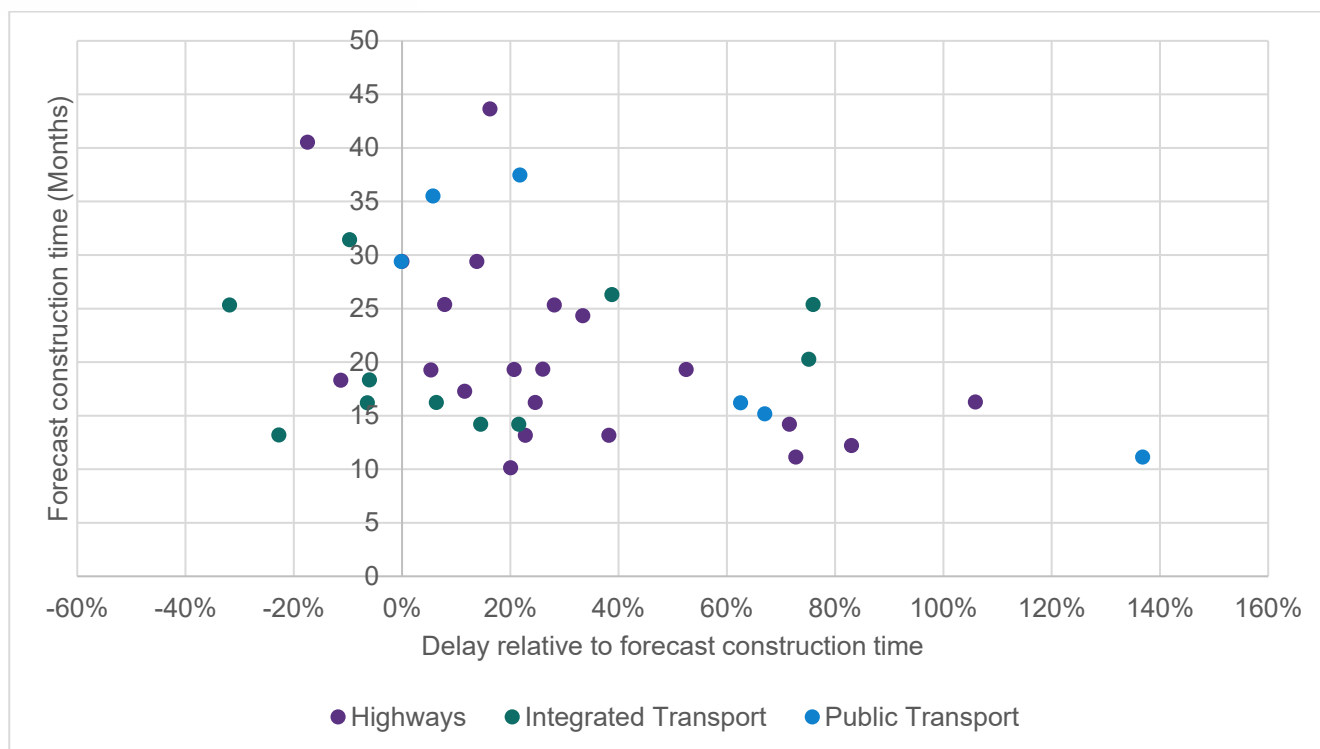


Sample size: 41

Proportionate to the estimated construction time, delays are greater for public transport schemes and least for integrated transport schemes. Figure 5-3 shows the distribution of delays compared to forecast construction time. Public transport schemes have the greatest range in delays, and integrated transport schemes have the greatest number of schemes where construction is completed ahead of forecast.

Out of the six public transport schemes with available data on the length of the construction period, two experienced over 60% delay and one over 100% delay, compared to forecasts.

Figure 5-3 Delay relative to estimated construction time



Sample size: 38

Reasons for delays

Common reasons for delays were poor weather conditions, negotiations over railway access and unforeseen additional groundwork required, as shown in Table 5-1.

Table 5-1 Main causes of programme slippage as identified by scheme promoters

Summary of causes	Number of schemes
Poor weather conditions	6
Negotiations over rail access	4
Additional groundwork required	4
Delays or problems with funding	1
Procurement processes	2

Several measures were identified by scheme promoters (via the scheme evaluation reports and the scheme promotor survey) that could be used to reduce the risk of delays:

- Early contractor involvement – This was cited as a beneficial approach to ensure that the scheme delivery risks are well understood at the earliest possible opportunity.
- Stakeholder engagement – Ensuring that stakeholder engagement is ongoing throughout scheme development.
- Public consultation – Ensuring that the public have sufficient opportunity to input / comment on the scheme development process, and keep them engaged as the scheme develops further.
- Construction planning – Plan for most construction activity to take place in the summer months (if possible).
- Rail Possessions – Fully understanding and planning for the long lead-in times required to obtain railway possessions.

Meta-evaluation of Local Major Schemes

- Section 106 / Third party contributions – Whilst Section 106²² payments and other contributions are an important funding mechanism, uncertainty over timing means that they should not be relied on to deliver time critical scheme elements or complimentary elements of schemes.

5.2. Using these findings

When planning transport schemes, scheme promoters should keep in mind that start and completion of transport schemes commonly slip.

Scheme promoters should be aware of the common reasons for slippage, as detailed in this section, and how these might be avoided or mitigated. DfT should also bear in mind that slippage has direct implications for appraisal, since the benefits of a scheme may change if the timescale changes. Timings for data collection and evaluation will also be impacted – with One Year After evaluation reports commonly being delivered at least six months later than forecast. Importantly, delivering a scheme on programme is closely associated with delivering the scheme on budget and should not be considered separately. DfT should use these findings in scheme planning, and especially in considering how to improve its appraisal processes – with a sharpened focus on the commercial, management and financial case in the business case, and identification and credible mitigation of risks to delivery of projects to time and milestones. Development of a delivery risk register may be helpful to support scheme promoters in focussing on this key area.

²² According to Section 106 (S106) of the Town and Country Planning Act 1990, anyone interested in land within the area of a local planning authority may enter into an agreement designed to reduce the impact of the proposed development on the surrounding area or existing communities. S106 agreements can take the form of payments or levies, and are often referred to as 'developer contributions'.

6. Delivering to Budget

RQ2. Are Local Major Schemes delivered on budget (if not, why not)?

Key findings

Schemes cost on average about 4% more than predicted. The most common reasons for this were the need for additional groundwork, or poor weather causing delays and additional costs. For comparison, 9% of the schemes included in the 2018 Meta-evaluation cost more than predicted.

The larger the scheme, the greater the average overspend, therefore larger schemes require a more detailed look at the risks and areas which could potentially cause slippage in the budget.

Scheme promoters should bear the risk of overspending in mind. This extra cost is borne by scheme promoters and should be budgeted for accordingly.

6.1. Delivering to budget

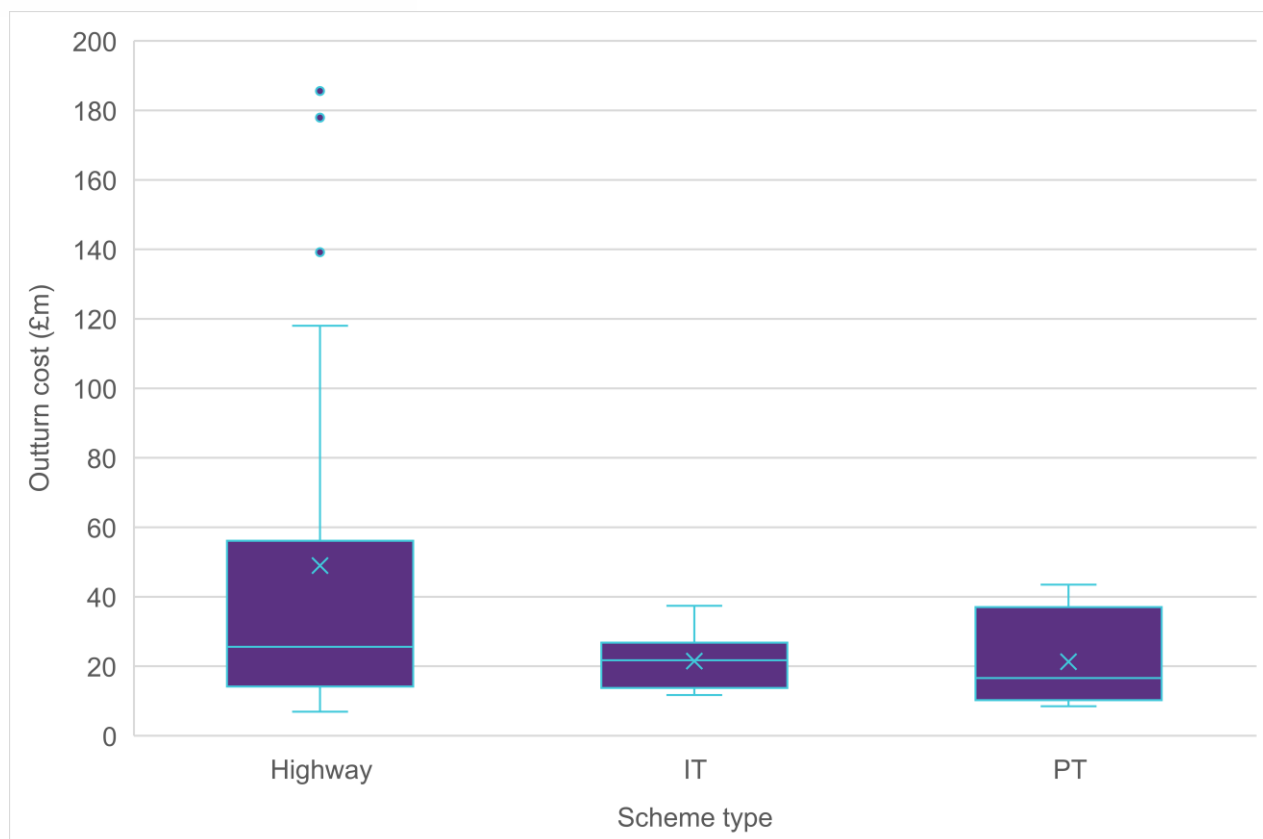
Understanding cost variances and why they occur is of relevance to both scheme promoters and DfT. Evaluation offers both parties the opportunity to learn lessons that may help to identify issues which require mitigation to ensure cost overruns do not occur. Furthermore, such lessons can also help scheme promoters to achieve greater cost certainty or identify scope for cost savings.

Across the 38 schemes with available outturn cost information, £1.3bn was invested, ranging from £6.9m to £178m across the individual schemes.

Figure 6-1 shows the distribution of costs across the three types of schemes. The vertical lines represent the range of the sample costs for each scheme type which highlights the variation in costs between schemes of the same type. The shaded area shows the middle 50% of costs, the horizontal line represents the median, which is the middle point of all of the costs presented, and the cross shows the average cost. Any figures outside the range are considered outliers.

Highway schemes have the greatest range of costs and have higher outturn costs overall. The median cost is very similar for integrated and public transport schemes.

Figure 6-1 Distribution of outturn costs by scheme type



Sample size: 38

By scheme cost

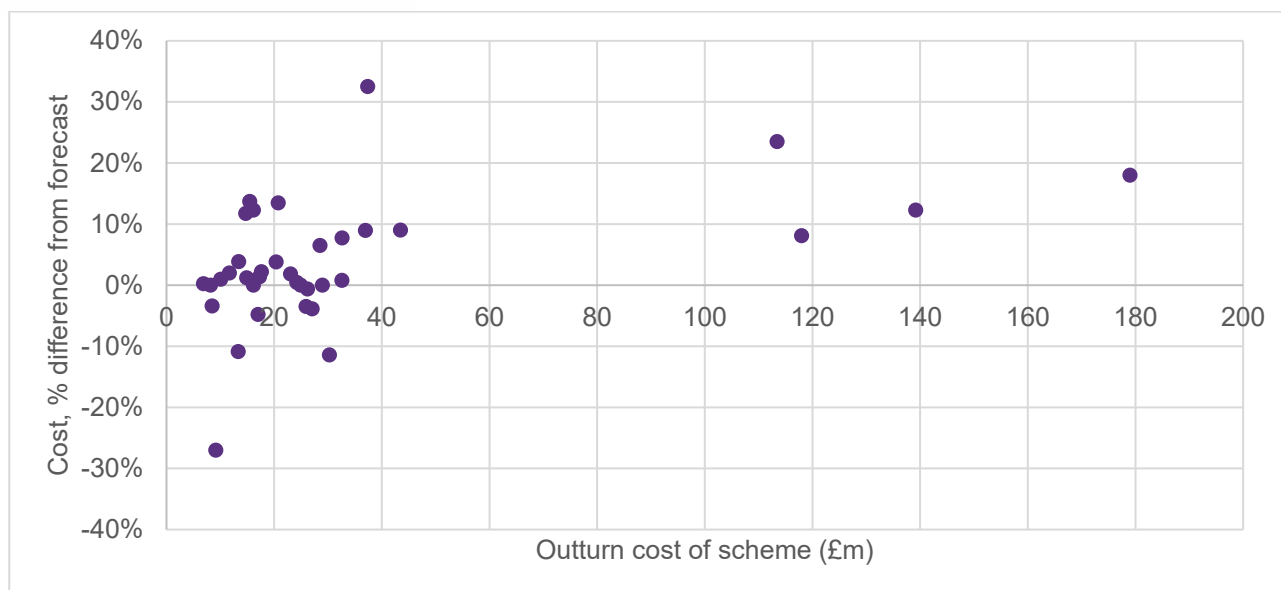
Figure 6-2 shows the deviation of actual scheme costs from the final forecast, by scheme cost. Of the schemes, 15 had outturn costs which were within 2% of the forecast cost at Full Approval stage, i.e. broadly delivered to budget. For the remaining schemes, 7 reported an underspend and 15 an overspend. In most cases the difference was within 10% of the forecast cost, but for 10 of the schemes the cost difference was much greater. The more extreme examples are:

- Portsmouth Northern Road Bridge – 27% underspend reported;
- Bexhill-Hastings Link Road – 24% overspend reported; and

South Yorkshire Bus Rapid Transit (North) – 33% overspend reported; On average, schemes cost 4% more than forecast at Full Approval stage. This equates to an average overspend of £3.3m per scheme²³. For the 22 schemes where a full breakdown of costs was available, DfT contributed on average 69% of the outturn cost, which is almost identical to forecast (68%). In total, DfT contributed £514bn to these schemes.

²³ Analysis based on the available outturn costs at the time of the evaluation reporting (36 schemes). Some schemes do not yet have final outturn costs due to unresolved defects or ongoing Part 1 (Land Compensation) claims.

Figure 6-2 Difference from forecast cost by outturn cost of scheme



Sample size: 37

For schemes under £50m there was a mix of under and overspending on budgets, with no clear pattern. On average, small schemes have a slight underspend, and medium and large schemes overspend. More detail on cost differences by small, medium and large schemes is given in Table 6-1.

Table 6-1 Adherence to budget by cost category

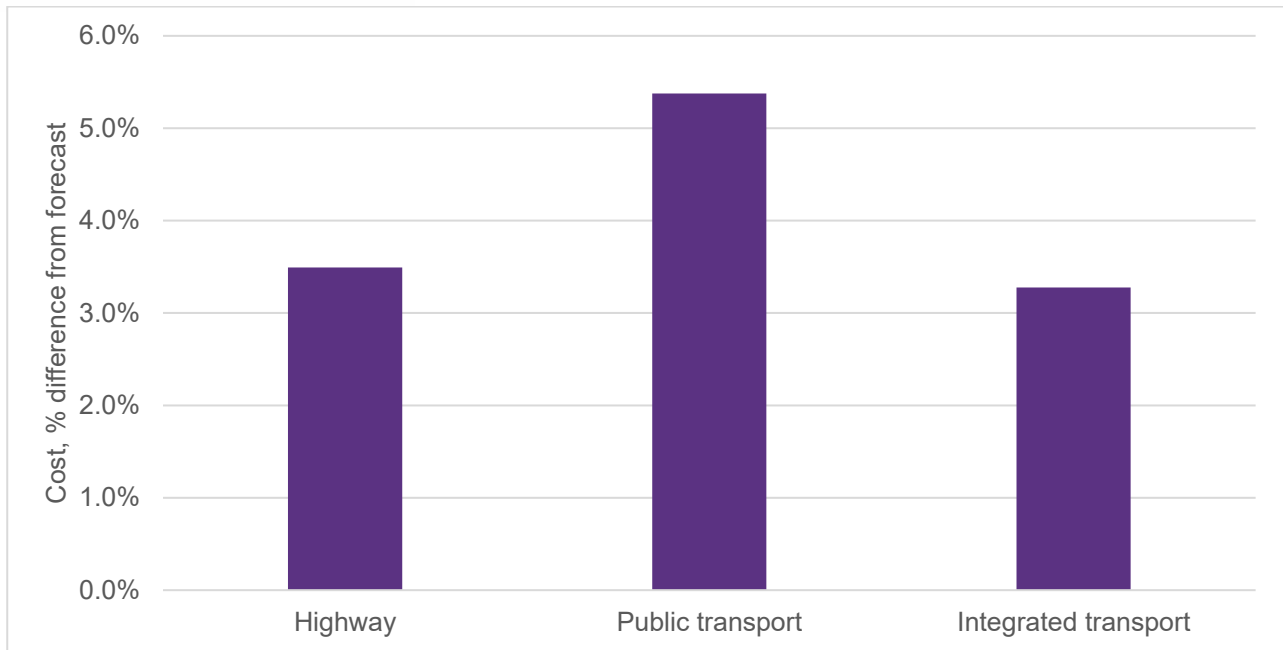
Cost category	Number of schemes	Average % difference from forecast	No. schemes over budget	No. schemes on budget	No. schemes under budget
Small (up to £20m)	19	1%	6 (32%)	9 (47%)	4 (21%)
Medium (£20m-£50m)	14	3%	6 (43%)	5 (36%)	3 (21%)
Large (greater than £50m)	4	15%	4 (100%)	-	-

By scheme type

As Figure 6-3 shows, public transport schemes overran by the greatest amount (5.4%) on average, followed by highway schemes at 4.7%). Only four public transport schemes had available outturn cost information²⁴ so it is not possible to say whether the greater cost overrun is representative of all public transport schemes.

²⁴ Excluding Manchester Cross City Bus Package as this is not considered representative of other schemes.

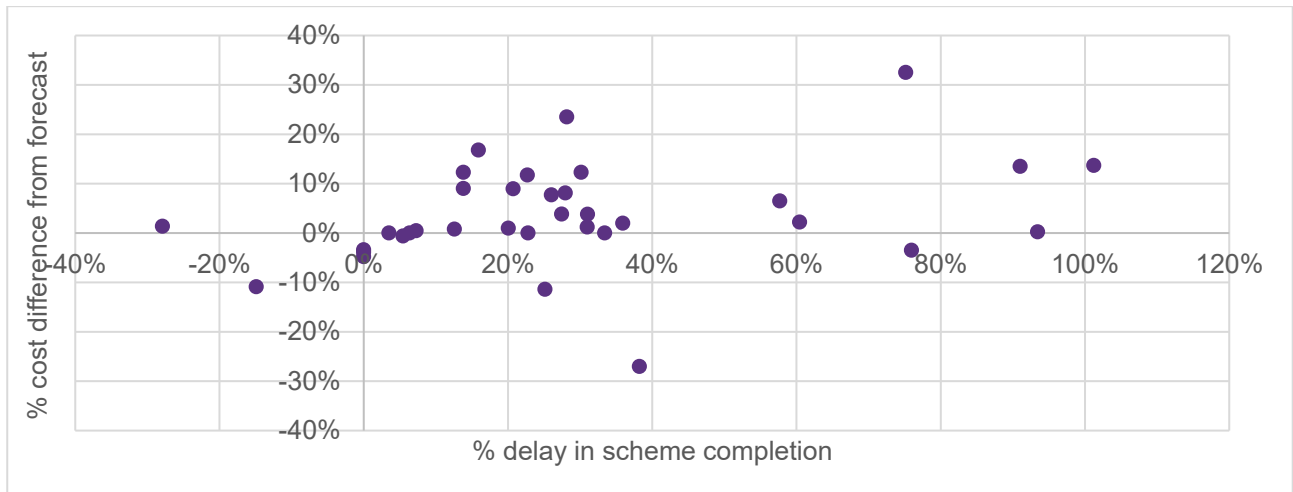
Figure 6-3 Percentage increase in costs from forecast to outturn, by scheme type



Relationship between overspend and scheme delay

Figure 6-4 shows the relationship between scheme overspend and delay to the opening date. Based on the evidence presented below, there does not seem to be a strong relationship between these two variables.

Figure 6-4 Overspend against delay in scheme completion



Sample size: 35

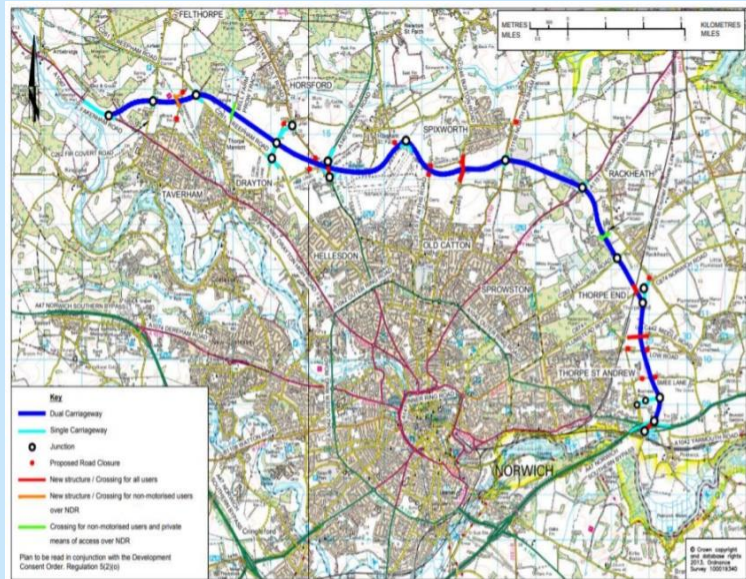
The review indicates that there was a total of 14 schemes where the total outturn costs were greater than those that were presented at the approval stage. The primary reasons for the cost overruns have been presented in Table 6-2; it should be noted that there were also secondary factors that would have impacted the costs, but these have not been listed. From the explanations provided within the evaluation reports, the most common reason for an increase in project costs was additional ground works. In some cases, this meant remediating land of asbestos. Poor weather or an unexpected weather event was cited as the second most common reason for cost overruns, in particular scheme delivery being impacted by flooding.

Table 6-2 Reasons for cost changes between Full Approval and actual cost.

Summary of causes	Number of schemes
Additional ground works	4
Poor weather or unexpected weather events	3
Change of scope/design	2
Reasons have not been explicitly provided	2
Compensation events	1
Delays with construction of a railway bridge	1
Revised Quantified Risk Assessment	1
Preparation and supervision	1

Case Study – Norwich Northern Distributor Road (Broadland Northway)

The NDR is a dual carriageway, all-purpose strategic distributor road, which links the A1067 Fakenham Road, near Attlebridge and Norwich Airport, to the A47 Trunk Road at Postwick. The NDR forms part of a package aimed to deliver sustainable transport measures, including bus rapid transit, walking and cycling measures, as well as a comprehensive transport plan aimed to boost and sustain the Norwich city centre economy. The NDR scheme is a key piece of infrastructure necessary to enable the overall delivery of the Broadland, Norwich and South Norfolk Joint Core Strategy (JCS) for housing and jobs targets by opening up development land



The NDR scheme was part financed by two funding streams as follows:

- A dual carriageway distributor road from the A47 at Postwick to the A140 junction near Norwich Airport was awarded partial funding through DfT; and
- The section of the NDR from the grade-separated A140 junction west to the A1067 Fakenham Road was funded by Norfolk County Council (NCC).

As per the Best and Final Funding Bid, the scheme costs were estimated at £111.14m. The cost of the scheme has exceeded the original budget making it necessary for NCC to seek approval for an increase in the budget. This was approved and the revised budget was £151m at Full Approval. As the land purchase negotiations are continuing, the final cost of the scheme is not yet known.

The following reasons have been identified as to why the scheme costs increased:

- Issues and delays associated with the construction of the railway bridge at Rackheath in collaboration with Network Rail
- Utility diversions (some of which were unexpected) throughout the construction of the scheme.
- Some consultees also voiced concerns over the commercial approach from the contractor citing poor project controls as a reason for additional overspend.
- Consultees also outlined the land acquisition costs increasing after a review during the construction of the scheme, which contributed towards the overall overspend on the scheme.

6.2. Using these findings

When planning transport schemes, scheme promoters should keep in mind that the majority of transport schemes (approximately 60%) cost more than forecast, with average overspend being 10%. Scheme promoters should be aware of common reasons for this overspend which is now generally borne by the scheme promoter, rather than DfT.

This is a critical risk post Covid-19 where Local Authority cash and working capital flows are under increased pressure, and receipts from commercial development, often realistic at time of the business case, may now not be available at the time or scale expected pre Covid-19. A failure to improve cost control may result in schemes being halted or subject to severe delays due to funds not being available to bridge shortfalls.



Meta-evaluation of Local Major Schemes

A range of root causes for cost overruns have been identified. DfT should use these findings in programme planning and scheme diligence, and especially in considering how to improve its appraisal processes – with a sharpened focus on the commercial, management and financial case in the business case and identification and credible mitigation of cost escalation risk.

7. Achieving Objectives

7.1. What are the main benefits of Local Major Schemes?

RQ3. What are the main benefits of Local Major Schemes (does this vary by scheme type/context)?

Key findings

Local Major Schemes deliver a range of benefits, which are closely aligned to their scheme objectives, with a mixture of qualitative and quantitative evaluation techniques used to measure scheme impacts.

The majority of evaluation reports provide narrative on whether the scheme has met its overall objectives and the benefits of Local Major Schemes are closely aligned to these objectives. Some of the main benefits were easily quantified (such as improved journey times and reduction in traffic). Other benefits were generally summarised more qualitatively, such as improved facilities for pedestrians and cyclists and improved waiting environment for passengers. However, in most cases, the evaluations did not consider what might have happened in the event of the scheme being constructed (known as the counterfactual).

A selection of the most common expected and actual benefits of schemes are shown in Figure 7-1, highlighting the benefits described earlier in Chapter 5.

Figure 7-1 Main benefits of Local Major Schemes, by scheme type

Highway	Public Transport	Integrated Transport
<ul style="list-style-type: none"> • Improved journey times. • Reduced traffic congestion. • Improved journey time reliability. • Increased highway capacity / network resilience. • Improved facilities for pedestrians and cyclists. • Reduction in traffic in town / village. 	<ul style="list-style-type: none"> • Increased public transport capacity. • Improved passenger satisfaction. • Improvement in passenger journey times. • Mode shift from car to public transport. • Improved service reliability / punctuality. • Increase in patronage. • Improved waiting environment 	<ul style="list-style-type: none"> • Improved journey time reliability. • Park and ride patronage increase. • Traffic flows reduced. • Mode shift to public transport. • Improved pedestrian / waiting environment. • Increased rail use.

7.2. How well do schemes deliver their stated outcomes?

RQ4. How well do schemes deliver their stated outcomes?

Key findings

The scheme evaluations generally reported an improvement in metrics relating to the stated objective or outcomes of the scheme:

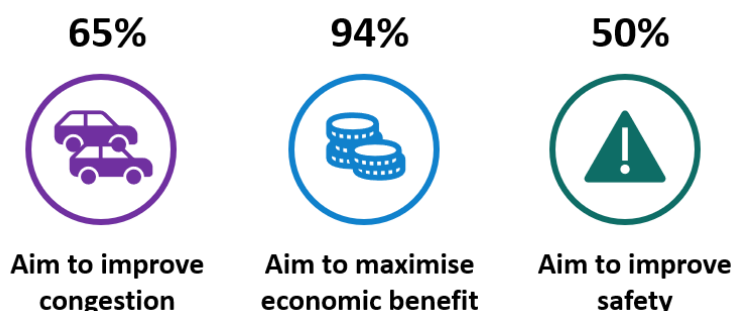
- Highway schemes generally improved journey times, congestion and traffic flow with increased traffic experienced on some routes due to the increased capacity provided.
- Public transport schemes generally improved journey times, reliability and passenger satisfaction, with some evidence of increased patronage and shift from other modes of transport to public transport.
- Integrated transport schemes generally improved journey times and reduced traffic volumes, with evidence of improved passenger facilities and regeneration of local areas.

However, the reports do not provide sufficient information to determine the extent to which the forecast benefits have been achieved to date across the sample of schemes considered.

7.2.1. Highway schemes

The majority of standard highway schemes had an objective to reduce congestion²⁵, improve safety or to provide economic benefit as shown in Figure 7-2. In addition, several schemes also aspired to improve facilities for pedestrians and cyclists and/or encourage use of sustainable modes of travel. Overall, 52% of highway schemes cited some improvement in journey times as a result of the available data, with 17% (4 schemes) either showing no improvement (or a worsening) of journey times, and 30% (7 schemes) with an inconclusive result or no journey time data at all. It should be noted that three of these were maintenance schemes, and therefore an improvement in journey time was not expected and may not have been calculated for this reason. As the type and availability of journey time data varies between schemes, it is not possible to complete any further quantitative analysis.

Figure 7-2 Highway scheme objectives



Maintenance schemes have very different objectives to highway schemes; the primary aims are to maintain an existing route and to ensure public safety by replacing or reinforcing existing structures. Out of the five maintenance schemes, three also have an objective to support the economy in the region of the scheme and allow for continued growth.

Table 7-1 gives an overall summary of some of the traffic-related findings across a selection of highway schemes.

²⁵ Includes schemes which had an objective to reduce delay, improve journey times or increase capacity.

Table 7-1 Summary of key outcomes on selected highway schemes

Highway scheme	Key highway outcomes
East of Exeter Five Years After	<ul style="list-style-type: none"> Journey times from M5 to Science Park have improved with at least 1 minute saved, and up to 2 minutes on some routes.
A164 Humber Bridge to Beverley Improvements Five Years After	<ul style="list-style-type: none"> Queue lengths have increased at junctions where no improvements have been made but have not changed significantly where improvements are in place, although traffic has increased on the A164 route which shows that the improvements have provided increased capacity.
White Rose Way Imp Scheme	<ul style="list-style-type: none"> The scheme is likely to have contributed to an increase in traffic volumes (up to 35% in the northbound direction), against a background traffic decrease of 3.3% across the whole area over the same period. There are journey time savings of over 3 minutes in the AM peak on inbound journeys, and over a minute southbound in the AM peak, despite traffic flow increases in both directions.
Walton Bridge (Maintenance Scheme)	<ul style="list-style-type: none"> Increases in average speed particularly in the AM peak – 6kph increase northbound and 10kph southbound since 2010. Greatest reduction in delay in the southbound direction (approx. 17 seconds) in the AM peak across Walton Bridge
Todwick Crossroads Improvement	<ul style="list-style-type: none"> 14% increase in weekday traffic on the scheme. Journey times have reduced on all routes apart from the M1 approach (where work was ongoing), up to 49% in the AM peak and 20% in the PM peak.
A43 Corby Link Road	<ul style="list-style-type: none"> The presence of the A43 Corby Link Road has had a positive impact on traffic volumes in the area with the suggestion that HGVs are rerouting away from the villages. The presence of the A43 Corby Link Road has a slightly positive effect on traffic speeds in the area.
London Road (Bridge) Derby	<ul style="list-style-type: none"> Out of the 7 traffic count sites with 12-hour flow available, 3 showed a decrease in traffic flow (between 1.5 and 15.1%) and 4 showed an increase (between 2.9% and 9.6%). Heavy Goods Vehicle (HGV) demand decreased up to 94% in the peak periods, but average annual daily traffic percentages from permanent count sites in the area show more consistent demand, and a slight (up to 1.3%) reduction in %HGV in 2017.
Thornton to Switch Island (Sefton)	<ul style="list-style-type: none"> Average annual daily traffic along the scheme was 25,700 with reductions between 17% and 70% on nearby local routes.
Kingskerswell Bypass	<ul style="list-style-type: none"> The South Devon Link Road (SDLR) has attracted almost 40,000 vehicles daily in its first year after opening. There was a 76% drop on the existing main road (Torquay Road) comparing traffic flow before and after construction. Northbound journey times in the AM peak dropped by over 12 minutes on the existing main route after the SDLR opened.
Bexhill-Hastings Link Road	<ul style="list-style-type: none"> There has been a total reduction in annual average daily traffic of 22% between 2015 and 2016 on the A259 (existing main route). There has also been a reduction in HGV traffic of 18% on that route in the same period.
Crewe Green Link Road	<ul style="list-style-type: none"> The scheme was being used by 10,700 annual average daily traffic at one year after – over 30% more than forecast. Alternative routes have experienced a 2% - 5% reduction in traffic. The scheme has delivered journey time savings of up to 4.5 minutes in the AM peak and 7 minutes in the PM peak.
Nottingham Ring Road	<ul style="list-style-type: none"> Average journey times per vehicle mile increased by 7% on and around the Ring Road in the AM peak period, compared with a 14.1% increase in journey times per vehicle mile on the main radial and orbital routes across the Greater Nottingham area in the same period. There has been an increase in traffic on the Ring Road and a corresponding decrease in traffic crossing the City Centre cordon.

Highway scheme	Key highway outcomes
Bedale/Aiskew/Leeming Bar Bypass	<ul style="list-style-type: none"> The majority of the bypass is used by over 7,000 vehicles a day. There has been a reduction of traffic on the former route of between 37% and 47%. Travel time savings of up to 5 minutes have been seen for traffic using the bypass.
Heysham-M6 Link Road	<ul style="list-style-type: none"> Over 22,000 vehicles per day use the new scheme over a 12-hour period. The former route has seen some large reductions in flow, up to 24%. There has been an increase of 11% in traffic through Lancaster City Centre.

7.2.2. Public transport schemes

The main aims of public transport schemes were to promote and improve the attractiveness of sustainable modes of transport (in turn resulting in a mode shift away from the private car), provide better access to major economic and social centres, and support areas of employment and residential growth.

General benefits associated with these schemes are increases in patronage, improvements in customer satisfaction, and quicker journey times. Table 7-2 gives examples of schemes where improvements in public transport outcomes were reported.

Table 7-2 Summary of key outcomes for selected public transport schemes

Objective	Scheme details
Journey time, reliability and punctuality improvements	Pennine Reach: There are inconsistencies in journey time results, however there were improvements in bus journey times at Darwen (northbound), Furthergate (southbound in the AM peak, all directions in the PM peak), Rishton and Church Gateway (southbound). The largest journey time saving was 2 minutes 24 seconds at Furthergate. A comparison with journey times for a 'do-nothing' scenario shows that the scheme has generally delivered an improvement in comparison with the counterfactual.
Improvements in customer satisfaction	Midland Metro Birmingham City Centre Extension: There were improvements in customer satisfaction in terms of: <ul style="list-style-type: none"> Personal safety (79% in 2013 to 82% in 2017) Overall satisfaction with the tram stops (88% in 2016, 92% in 2017) Overall perception of the tram journey (92% in 2013, 81% in 2015 and 92% in 2016) Amount of personal space (56% in 2013, 65% in 2017) Tram accessibility (87% in 2013, 92% in 2017)
Increase in patronage	Mansfield Public Transport Interchange: Between March 2013 and March 2014, there was a 7% increase in patronage with the opening of the new interchange building. This exceeded the 5% increase predicted in the Business Case submission. Saturdays (7am-7pm) have increased by 9% in the same 12-month period. The number of 'new' public transport users is just over 1000 a day on weekdays. Trent Barton recorded a 15.15% increase in passengers boarding their services at Mansfield Bus Station.
Modal shift	Leeds Rail Growth: Demand for both rail stations was higher than forecast. 27% of survey respondents at Apperley Bridge did not make their current journey at all before the introduction of the new stations, and 28% at Kirkstall Forge. Crucially, 26% of passengers at Apperley Bridge used to make the journey by a different mode (such as car) before the stations were opened, compared to 46% at Kirkstall Forge. When the proportion of car drivers is applied to the recorded 2016/17 annual station usage (with the sub-sample of annual trips shifting from other modes) this equates to around 42,000 car trips removed by Apperley Bridge, and 13,000 removed by Kirkstall.

7.2.3. Integrated transport schemes

Integrated transport schemes generally had a mix of objectives similar to both highway and public transport schemes including reducing congestion, promoting the use of public transport and

maximising economic benefits and regeneration of the local centres. Schemes which met these various objectives are detailed in Table 7-3.

Table 7-3 Summary of achievements against objectives

Objective	Scheme details
Reduce congestion or traffic flows	Bath Transportation Package: The number of cars passing through the outer cordon sites is still increasing, but at a rate of 0.6% per year from 2013 to 2015, compared to 5% from 2012 to 2013 (pre-scheme). Park and Ride patronage has increased, and footfall across the city centre is up, indicating a reduction in traffic flows. Journey times through key junctions have also decreased with the scheme, despite an increase in the number of vehicles passing through the junctions at 'peak loading'.
Improve the quality of interchange facilities	Rochdale Interchange: In overall terms, satisfaction with the bus station/interchange increased from 49% before the scheme to 98% after the scheme. Other key areas of improvement are the ease of wayfinding (19% increase), protection from the weather while interchanging (87% increase), accessibility (29% increase) and safety and security (72% increase).
Support regeneration and the local economy	Hucknall Town Centre Improvements: Pedestrian data collected at key locations pre-and post-scheme shows that footfall had increased since the scheme in all but 2 areas, and more people had been attracted to the town centre with a 33% increase in pedestrian movements on the High Street. The scheme has also had a major impact on the number of night time movements within the town, increased from 108 between 7pm and midnight pre-scheme, and 399 in the same period in September 2018. There has been a 62% increase in pedestrian movements on Market Day.
Increased public transport patronage	Transport Hub in Lincoln: Rail patronage data for Lincoln railway station shows that there has been a 6.7% increase in rail patronage between 2016/17 and 2018/19. This is unlikely to be entirely attributable to the scheme, but the improvements will have undoubtedly contributed. While absolute bus patronage figures have not increased, the data shows that the rate of decline in patronage has dropped significantly.

7.2.4. Residual impacts

The scheme promoter survey was used to ask scheme promoters whether there are residual issues and problems which have not been addressed or have occurred as a result of the scheme.

A range of issues were highlighted by the scheme promoters responding to this question. For example:

- some schemes intended to reduce congestion have resulted in traffic diverting to other routes, thus displacing the problem to another location;
- some public transport schemes have increased levels of public transport use but have not delivered the forecast de-congestion benefits;
- two promoters commented on the rise in anti-social behaviour following the completion of a new public transport interchange. One promoter has tackled the issue by issuing an anti-social behaviour policy and encouraging staff to deal promptly with any incidents that arise. The other suggested that design changes could have been made to discourage improper use of facilities.

Some scheme promoters reported that further improvements were required to lock in the benefits of the scheme, typically in relation to schemes to remove pinch points on the network. Some promoters had applied for funding for further highway improvements which was not granted, and they raised concerns regarding the on-going effectiveness of the original scheme.

7.3. Using these findings

These findings have shown the variety of objectives that the schemes cover and the different ways that their adherence to objectives is measured.

Meta-evaluation of Local Major Schemes

When schemes are being evaluated it is important to have a clear idea of the data which will be required to understand whether the objectives have been met. Some schemes did not have sufficient data to compare against objectives. A common problem is the availability of observed traffic data collected at the baseline stage or readily available and comparable traffic modelling outputs to analyse the counterfactual scenario. It is possible that scheme promoters lack sufficient understanding of the model forecast data presented in the business case, or awareness of the importance of forecast vs outturn comparison in addition to pre- and post-scheme comparisons. A simple checklist of data sources for each type of scheme may support scheme promoters in planning monitoring and evaluation going forward. Some examples of how to undertake counterfactual analysis for different types of schemes would also be useful.

8. Achieving Value for Money

RQ5. Do Local Major Schemes deliver value for money?

Key findings

Half of the Fuller Evaluations (10 out of 20) provided a one year after benefit-cost ratio (BCR) as required, and three other (non-Fuller Evaluation) schemes also calculated a BCR despite this not being a requirement. For comparison, only 5 out of 52 schemes included in the 2018 Meta-evaluation provided an outturn BCR; although many of these evaluations were undertaken before the *2012 Monitoring and Evaluation Framework*, and not all these schemes were expected to provide outturn BCRs.

For schemes with a revised BCR, the outturn BCR was generally in the same or lower value for money category compared to forecast.

Many schemes did not remonetise all benefit streams, or include wider benefits in the reforecast BCR, which limits the ability to undertake a 'like with like' comparison of forecast and outturn findings.

8.1. The outturn benefit-cost ratio

As part of their business case, schemes calculate an estimated benefit-cost ratio (BCR). The evaluation of the value for money of the scheme should include the re-calculation of the BCR using outturn (observed) data. This includes the outturn scheme cost as reported to DfT and measures of scheme benefits as observed through monitoring and survey activities. Calculation of the outturn BCR is only a formal requirement of fuller evaluations.

10 out of the 20 fuller evaluations undertook an analysis of the forecast vs outturn BCR with most schemes demonstrating value for money, even if the outturn BCR is lower than forecast. It is worth noting that many scheme promoters specify that an outturn BCR will only be calculated at the five year after stage (of the Fuller Evaluations only Rochdale Interchange has submitted a Five Year After evaluation report). Table 8-1 gives an overview of the forecast and outturn BCR for all schemes that calculated it (not just Fuller Evaluation schemes) and the value for money category in which the scheme falls. It should be noted that calculating an outturn BCR can be a complex undertaking and often a set of assumptions are required that means a direct like with like comparison between the forecast and outturn BCR is not valid, which may explain some of the differences presented in Table 8-1.

Table 8-1 Comparison of Forecast and Outturn BCR

Scheme	Scheme Type	Forecast		Outturn		Change in VfM category
		BCR	VfM Category	BCR	VfM Category	
White Rose Way Improvement Scheme	Highway	3.57	High	2.39	High	↔ Same
Portsmouth Northern Road Bridge	Highway	113.64 ²⁶	Very High	257.92	Very High	↔ Same
Bexhill-Hastings Link Road	Highway	1.53	Medium	1.39	Low	↓ Lower

²⁶ The BCR for Portsmouth Northern Road Bridge is unusually high for two main reasons. The first is that the business case is dependent on the relative cost of replacing the bridge over and above removal (as a failing structure could not be left over a rail line) and this substantially reduces the cost. The second is the key nature of this route to the local economy – removal of the bridge would result in substantial re-routing and additional congestion on alternative routes.

Scheme	Scheme Type	Forecast		Outturn		Change in VfM category	
		BCR	VfM Category	BCR	VfM Category		
Crewe Green Link Road	Highway	4.98	Very High	2.60	High	↓	Lower
Darlaston Access Improvement	Highway	6.5	Very High	4.2	Very High	↔	Same
Bedale/Aiskew/Leeming Bar Bypass	Highway	3.85	High	3.7	High	↔	Same
Morpeth Northern Bypass	Highway	2.9	High	2.4	High	↔	Lower
Portsmouth Tipner Interchange	Integrated Transport	7.46	Very High	0.06 ²⁷	Low	↓	Lower
Rochdale Interchange	Integrated Transport	4.2	Very High	5.63	Very High	↔	Same
Leeds Station Southern Access	Public Transport	7.50	Very High	3.77	High	↓	Lower
Coventry-Nuneaton Rail (Phase 1)	Public Transport	2.7	High	2.8	High	↔	Same
Midland Metro Birmingham City Centre Extension	Public Transport	3.3	High	3.1	High	↔	Same
Pennine Reach (Blackburn)	Public Transport	2.73	High	1.63	Medium	↓	Lower

As demonstrated above, the evaluations showed a variety of BCR outcomes relative to forecast. Table 8-2 highlights the key reasons for the changes in BCR, but also notes that some schemes opted not to remonetise or reforecast all benefits streams for various reasons; this includes it not being considered proportional to do so, or due to a lack of data availability.

Table 8-2 Summary of key reasons for changes in BCR

Scheme	Key reasons for changes in BCR	Benefits streams assumed as forecast or evaluated using other methods
White Rose Way Improvement Scheme Highway	User benefits from journey time savings were 35% less than forecast.	None
Portsmouth Northern Road Bridge Highway	High risks and optimism bias were applied to the forecast cost which did not appear during scheme delivery, therefore the outturn cost was substantially lower than the business case.	Absence of traffic flow data for the after period. 'Do Minimum' scenario (removing the bridge) never occurred. This prevented actual comparison with the Do Something scenario. Therefore, Greenhouse Gases, TEE and indirect tax revenues were all assumed as forecast.

²⁷ The large difference between the forecast and outturn BCR is due to observed dis-benefits for non-bus traffic on the M275 between Tipner and Rudmore Roundabout (believed to be due to the introduction of signals and changing priorities at Rudmore Roundabout) which eroded the benefits seen elsewhere on the network. The report states that the non-bus journey time benefits were forecast to be low in the opening year, but increasing substantially once the planned development comes online. It goes on to state that, as benefits are forecast to increase as development increases, the findings at this early (pre-development) stage cannot be assumed to be representative of likely future changes and a more thorough re-forecast (evaluation) will be undertaken at the five year after opening stage once development has started and operating costs / revenue from the park and ride are clearer.

Scheme	Key reasons for changes in BCR	Benefits streams assumed as forecast or evaluated using other methods
Bexhill-Hastings Link Road Highway	Slight increase in costs pushed the BCR down overall.	PVB was retained from original model predictions, as time savings were felt to be a good proxy of what was actually achieved.
Crewe Green Link Road Highway	Outturn costs were slightly higher than forecast. Outturn journey time benefits were estimated for the scheme section only and no benefits were included for the wider highway network.	Operating and maintenance costs assumed as forecast. No benefits were included for the wider network, and therefore the outturn BCR is considered a conservative estimate.
Darlaston Access Improvement	Economic efficiency benefits are 31% lower than forecast, and costs are 8% higher.	
Bedale/Aiskew/Leeming Bar Bypass Highway	Journey time benefits are 23% lower than forecast, costs are 28% lower than at FBC.	Forecast benefits and costs factored by the proportions of observed benefits and costs demonstrated in evaluation. All benefits other than journey time savings (carbon, noise etc.) were assumed as forecast.
Morpeth Northern Bypass Highway	Outturn costs 4% lower than forecast, travel time benefits are 18.5% lower than forecast (however, this is a conservative estimate)	Construction and maintenance impacts, noise and carbon were not remonetised.
Portsmouth Tipner Interchange Integrated Transport	Economic benefits were reforecast at the one year after opening stage using observed data, however the journey time worsening for non-bus traffic compared to forecast on the M275 between Tipner and Rudmore Roundabout resulted in a significant decrease in the BCR. It cannot be assumed that these early findings are representative of the future. A more thorough estimation (re-forecasting) of the actual BCR will be undertaken at the Five Years After stage, once development has started and operating costs/revenue from the Park and Ride are clearer.	Greenhouse gases, indirect tax, reliability and wider impacts all assumed as forecast.
Rochdale Interchange Integrated Transport	Capital expenditure was lower overall, but this was offset by increased operating costs. Patronage and footfall in Rochdale centre were higher than in the original appraisal, but baseline growth amended for future years from 0 to follow NTEM projections shows a decrease in bus patronage over time.	The original BCR included the effect on 'wider public finances' in the cost figure rather than the benefits which results in a slight increase to the BCR (0.23).
Leeds Station Southern Access Public Transport	Current usage of the scheme is below forecast (14% compared to 25% in 2012 business case).	Similar pattern of benefits assumed to 2012 business case but factored according to observed data.
Coventry-Nuneaton Rail (Phase 1) Public Transport	Reduction in benefits more than matched by the reduction in costs (associated with not operating a train with more capacity)	
Midland Metro Birmingham City Centre Extension	Passenger demand was 22% lower than forecast although higher than the MSBC do-minimum, weighted travel	Infrastructure renewal costs, tram lifecycle costs, operating costs, crowding benefits, highway travel time

Scheme	Key reasons for changes in BCR	Benefits streams assumed as forecast or evaluated using other methods
Public Transport	times are 4% higher than forecast, tram travel times are 39% lower than forecast, but this is largely offset by costs being 12% lower than forecast.	benefits and externalities, farebox revenue and indirect tax all assumed as forecast.
Pennine Reach (Blackburn) Public Transport	Observed journey time savings lower than forecast and increase in scheme costs.	

8.2. How well have impacts of Local Major Schemes been forecast and what are the reasons for differences?

Key findings

RQ6. How well have the impacts of Local Major Schemes been forecast and what are the reasons for differences?

Relatively few scheme evaluations presented forecast results or compared them to outturn results. Where they were presented, forecasts were most commonly given for traffic flows, public transport scheme patronage, and journey times. However, forecast and outturn results were not always comparable, because the scheme opened later than predicted and there was a significant time lag between the pre-construction and post opening data collection.

Few conclusions can be drawn from the forecast and outturn impacts. The forecast accuracy is variable between schemes as well as within scheme evaluations at different data collection points.

For the minority of schemes that made the comparison, there were a variety of observed outcomes relative to those forecast. This analysis considered traffic flows, patronage on public transport schemes, and journey times, all of which varied between schemes and even between different sites within scheme evaluations. Journey times in particular produced variable results at the different sites analysed. Table 8-3 to Table 8-5 give data for schemes which provided forecasts, along with some commentary around the discrepancies between the forecast and outturn impacts.

Table 8-3 Summary of evidence on forecast and actual traffic flows

Scheme	Difference between forecast and actual traffic demand	Commentary
A164 Humber Bridge to Beverley Improvements	Observed two-way flow between -627 vehicles and +607 vehicles compared to forecast	Actual flows were lower than forecast at 3 out of the 4 sites. Only one site showed an increase in observed flows compared to forecast (29% average across all peak periods). No reason for this difference is provided.

Scheme	Difference between forecast and actual traffic demand	Commentary
White Rose Way Improvement Scheme	Forecast change in flows before and after the scheme are between -11% and 48% compared to observed flows between -4% and 34%	The comparison of modelled and outturn traffic impacts does not present a clear picture. The model forecast a large increase in flows between M18 J3 and Potteric Carr Junction which did not materialise in the AM peak. However, outturn traffic flow increase was 13% higher than forecast in the PM peak on the same road. Both the forecast and the outturn flows show a reduction in flow between the before and after across peak periods in the southbound direction.
Camborne-Pool-Redruth TP	Overall forecast flows were generally higher than observed in AM peak and lower than observed in PM peak.	West of East Hill, modelled flows are within 5% of observed. East of Dudnace Lane, the traffic model has predicted more traffic remaining on Agar Road and less traffic along Wilson Way that has occurred. West of Barncoose, the traffic model has predicted more traffic remaining on Barncoose Terrace and less traffic along Barncoose Avenue than has occurred.
Todwick Crossroads Improvement	Forecast flows were between -50% and 28% from Do Minimum to Do Something, observed was between -28% and 7%	Changes in flow were largely consistent between forecast and outturn. Overall a 3% increase in traffic was expected in the scheme area, and the outturn data indicates that there has been a 1% reduction in traffic.
Thornton to Switch Island (Sefton)	Observed flows +2% compared to forecast	A comparison of the actual post opening flows with the forecast traffic flows highlights that the actual traffic volumes along the scheme are approximately 2% higher than those forecast.
Portsmouth Tipner Interchange	-21% - +78% on selected routes.	On the A3 and M275, the Do Minimum (without scheme) forecast flows are on the whole in line with pre-scheme observed flows, with the exception of the A3 northbound in the PM peak (observed flows are 78% higher than expected) and the M275 southbound in the PM peak (21% lower). The do-something forecast flows are, however, less in line with observed flows, with observed flows mostly lower on the M275 and A3, indicating that forecast levels of growth have not materialised.
Bexhill-Hastings Link Road	Forecast 39% decrease in traffic compared to 21-23% outturn decrease	Traffic on the A259 was forecast to decrease by 39% post-scheme. This is compared to a 21% observed decrease in the eastbound direction, and 23% in the westbound direction. No reason is given for this difference other than as a reflection of the scheme's performance.
Crewe Green Link Road	>30% on scheme link	In the business case it was forecast that the scheme would carry approximately 8,200 average annual daily traffic in the opening year. Observed flows show that the scheme carried 10,700 average annual daily traffic in its opening year, which is over 30% more than forecast.
South Yorkshire Bus Rapid Transit (North)	<15% difference in any time period	A traffic model was used to forecast traffic flows for the original opening year (2016) but as the scheme was delayed the data was compared with the 2017 opening year. The total modelled traffic for Blackburn Meadows Way and Sheffield Road is very similar to the observed flows (within 15% across all time periods). The forecast flow was greater than

Scheme	Difference between forecast and actual traffic demand	Commentary
		observed for the AM and interpeak periods, but lower in the PM.
Heysham-M6 link	Average difference between modelled and observed counts is 8%	The majority of locations saw less observed traffic than forecast, however this was because the scheme was attracting more traffic from elsewhere. Although individual counts varied in difference between modelled and observed, overall the forecasts were reasonably consistent with the observed data with an average difference of 8% between the two.
Hucknall Town Centre Imp	On selected roads this was between 41% - +125%	The traffic model was originally constructed in 2011 as part of the Hucknall Town Centre Improvement Scheme Planning Application. The model included a number of future housing developments (major sites) which was based on the Ashfield and Gedling District Council Local Plans. This resulted in the trip matrix for the modelled area to be increased for the future years. A number of the key developments changed in terms of housing numbers and this has resulted in traffic flow conditions being lower than originally forecast.
Mersey Gateway	Observed traffic slightly higher than forecast	The full traffic modelling report was not available, however a summary of the key findings was provided in the evaluation report. Observed traffic in the two years after opening was slightly higher than the forecast of total traffic. There were more paid-for crossing than expected, but the forecast share of traffic by vehicle class was in line with forecasts.
Bedale/Aiskew/Leeming Bar Bypass	Forecast traffic flows approximately 20% - 40% higher than observed.	All locations experienced less observed traffic than forecast. On the bypass, traffic flows at two locations (site 1 and site 3) were predicted to have flows approximately 20% and 40% higher than those observed.

A similar exercise has been undertaken for patronage relating to both rail and bus services which has been presented in Table 8-4 below.

Table 8-4 Summary of evidence on forecast and actual patronage

Scheme	Difference between forecast and actual patronage	Commentary
Mansfield PT Interchange	+2% observed compared to forecast	Passenger growth increased by 7% between March 2013 and March 2014 compared to the 5% growth forecast. Surveys indicate that the customer satisfaction with the facility has been high and this may explain the additional patronage.
Portsmouth Tipner Interchange	+21 passengers in the AM peak and +60 passengers in the interpeak	The forecast average weekly passengers boarding at the Park and Ride was half the outturn patronage in the AM peak, and 5% in the interpeak. A likely reason for the underestimation of passengers is due to the simplified approach that was adopted for Park and Ride modelling so that the benefits were not overstated in the economic appraisal. An investigation of the distribution of passengers across weekdays compared to the weekend showed that the AM and interpeak were frequently in excess of forecasts irrespective of the day, whereas the PM peak was generally in line with forecasts.

Scheme	Difference between forecast and actual patronage	Commentary
Rochdale Interchange	-10%	According to count data, the level of usage in 2014 was approximately 10% below its 2011 level and has declined in line with local reductions in bus services and patronage, these have been partly offset by usage related to Metrolink's arrival in Rochdale town centre.
Coventry-Nuneaton Rail (Phase 1)	Between -32% and -47% of forecast at the 2 new stations	The main stated reason for the difference in forecast and outturn passenger numbers is the major constraint to capacity in the AM peak with little opportunity for distributing the passenger load across the peak hour due to the low frequency of train services.
Midlands Metro Birmingham City Centre Extension	-22%	The outturn passenger demand is 22% lower than forecast in the business case. However, this still reflects an increase in patronage compared to the business case Do Minimum forecast.
Leeds Rail Growth	Between -22% - -81%	At Apperley Bridge, 78% of the forecasted patronage was realised, but at Kirkstall Forge this was just 19%. Some of the reasons for the differences between forecasted and actual patronage is that both stations were assumed to be operational by late 2012. However, they actually opened in 2015/2016. Similarly, both stations were assumed to be served by 2 trains per hour each way, on the Leeds-Bradford Forster Square service. The actual service level at the time of the analysis is less than this at Kirkstall Forge. Further, the Kirkstall Forge mixed use development was assumed to be 100% completed (commercial) and 55% complete (residential) within one year. However, this has not yet materialised, even one year after scheme opening.
S Yorkshire Bus Rapid Transit North	-12%	The reason for the service being under forecast could be attributed to a large portion of the proposed site development in the River Don District not taking place as expected, and some other developments being delayed. In addition, if general patronage had remained static over this period, rather than declining, it is believed that the X1 would have exceeded its target.

Some schemes also compared forecast and outturn journey times; the results are shown in Table 8-5.

Table 8-5 Summary of evidence on forecast and actual journey times

Scheme	Difference between forecast and actual journey times	Commentary
A164 Humber Bridge to Beverley Improvements	Observed journey times between -310 seconds and +358 seconds compared to forecast	Data comparing interpolated journey times from a 2018 traffic model and the observed journey times showed that in most time periods and directions the observed journey time was quicker than the forecast journey time. However, the northbound PM peak route showed an increase of nearly 6 minutes for the observed time compared to forecast, due to a junction north of the scheme appearing to be at capacity.

Scheme	Difference between forecast and actual journey times	Commentary
White Rose Way Improvement Scheme	Forecast change in journey times before and after the scheme are between -69% and 0% compared to observed journey times between -58% and 31%	No routes were forecast to increase in journey time, however, there have been increases (up to 31%) on some routes. The largest increases are in the PM peak, particularly northbound, which could be explained by the larger than expected increase in flow during that period. Outturn journey time savings have only exceeded forecast in one time period on one link.
Camborne-Pool-Redruth TP	Forecast journey times were quicker than observed.	The traffic model predicted quicker journey times along the 2 routes assessed. Observed journey times were higher than forecast in all time periods.
Portsmouth Tipner Interchange	Observed journey times are between 269% lower than and 37% higher than the Do Minimum and the Do Something forecasts.	The majority of observed journey times are lower than forecast in the Do Minimum and Do Something scenarios. Journey times on the M275 northbound have increased, but to a lower level than expected. In the southbound direction forecast accuracy is mixed. There is no clear correspondence with inaccuracies in forecast flows causing the difference between forecast and observed journey times.
Nottingham Tram Extension (NET2)	Largely as forecast, but outturn slightly longer on some routes.	Outturn run times between Nottingham Station and Clifton were around 21 minutes as planned in the business case and concession modelling. On the Beeston Route, journey times vary slightly as a result of the constrained nature of operations on the Chilwell High Road and along residential open spaces along the Greenway. Between Nottingham Station and the Toton Lane terminus, journey times are around 2.5 minutes longer than planned.
Bexhill-Hastings Link Road	The forecast was 1.5 minutes saving eastbound, less than 1 minute westbound. Observed savings varied from 02:53 to 00:09 depending on time period and direction.	Between A259/Combe Valley Way and A259/A21 journey time savings of 1.5 minutes eastbound and less than 1 minute westbound were forecast in the business case. Observed average journey time savings were 1 minute 51 seconds eastbound and 41 seconds westbound, although savings in individual time periods were greater. Overall, the scheme produced slightly more journey time savings than forecast.
Midlands Metro Birmingham City Centre Extension	+4%	The weighted travel times for city centre and non-city centre trips were presented and the outturn travel times are 4% higher than those forecast in the business case Do Something scenario.
Pennine Reach (Blackburn)	Variable	Overall, there has been some success in realising forecast journey times, however the results vary by location and there is no clear picture in terms of the relationship between forecast and outturn journey times.

There is no conclusive data on accident rates, since these cannot be accurately measured after a one-year period and the majority (84%) of the schemes in the sample are One Year After evaluations.

8.2.1. Is there a link between lack of outturn BCRs and lack of forecasts?

In order to calculate a robust outturn BCR, an in-depth understanding of the forecast and outturn impacts is usually required. To understand the relationship between schemes that have calculated a BCR and whether or not they have undertaken a comparison of forecast impacts versus actual impacts, a review of the schemes which presented a BCR and their other forecast outcomes was undertaken and is presented in Table 8-6.

Meta-evaluation of Local Major Schemes

Only the Portsmouth Northern Road Bridge evaluation did not present any comparison with key forecast outcomes, although forecasts for traffic re-routing (should the bridge be removed) were presented. All other highway schemes which calculated an updated BCR also compared traffic flow forecasts with observed flows, and all but one public transport scheme (Pennine Reach) provided forecasts for patronage.

Overall, there does not appear to be a consistent link between schemes which calculated an updated BCR and those that presented and compared against forecasts. While Table 8-6 shows that most schemes with an outturn BCR had some element of forecasting in their evaluation, the previous three tables show that many scheme evaluations without a BCR delivered comparisons between observed and forecast results too.

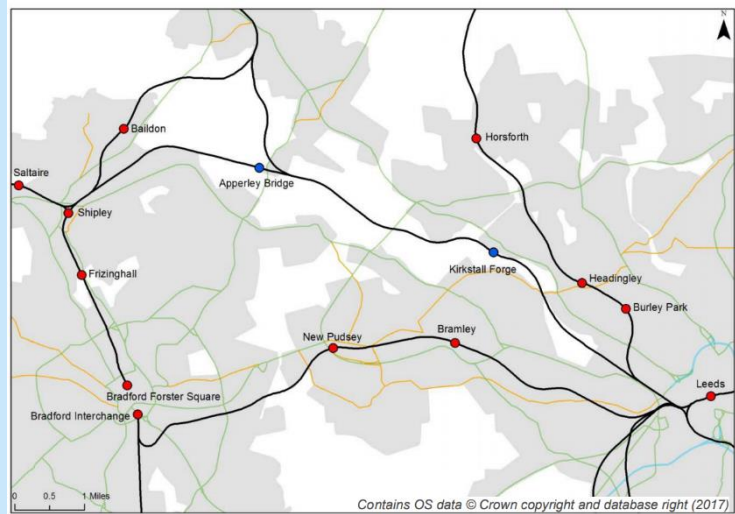
Table 8-6 Summary of schemes that calculated a BCR and their forecast outcomes

Scheme	Scheme Type	Traffic Flow	Patronage	Journey Times
White Rose Way Improvement Scheme	Highway	✓	N/A	✓
Portsmouth Northern Road Bridge	Highway		N/A	
Portsmouth Tipner Interchange	Integrated Transport	✓		
Rochdale Interchange	Integrated Transport		✓	
Bexhill-Hastings Link Road	Highway	✓	N/A	✓
Crewe Green Link Road	Highway	✓	N/A	
Leeds Station Southern Access ²⁸	Public Transport	N/A	✓	✓
Coventry-Nuneaton Rail (Phase 1)	Public Transport	N/A	✓	
Midland Metro Birmingham City Centre Extension	Public Transport	N/A	✓	✓
Darlaston Access Improvement	Highway	✓	N/A	✓
Bedale/Aiskew/Leeming Bar Bypass	Highway	✓	N/A	
Pennine Reach (Blackburn)	Public Transport			✓
Morpeth Northern Bypass	Highway	✓	N/A	✓

²⁸ Forecast for Leeds Southern Station Access were for 2029 rather than one year or five years after the scheme opening, making reasonable comparison between the observed and forecast data difficult.

Case Study – Leeds Rail Growth Package One Year After Evaluation (Public Transport)

The scheme consists of two new fully accessible rail stations (Apperley Bridge and Kirkstall Forge) on the Airedale and Wharfedale rail lines. Apperley Bridge (opened Dec 2015) was designed to operate as a park and ride station. In contrast, the primary objective of Kirkstall Forge (opened June 2016) was to serve the local community and adjacent development.



The evaluation adopts a three-stage process to compare outturn vs. forecast patronage demand, and estimate the contribution of the scheme (i.e. the level of attribution):

- Firstly, historic trend data has been analysed to determine the context to the new stations, highlighting any fluctuations in previous demand.

All stations, with the exception of Shipley, saw growth over 9% between 2013/14 to 2016/17. Some passengers who previously used Shipley now use one of the new stations.

- Secondly, the level of gross demand on the rail network and at the two new stations has been determined.

Comparing Office of Road and Rail station usage figures with an adjusted forecast shows that once the changes in assumptions (between business case and opening) are taken into consideration, actual gross demand is above expectations at Apperley Bridge and in line with expectations at Kirkstall Forge.

The level of demand at Kirkstall Forge in 2016/17 was lower than in the original business case. This is because the station was only open for part of the year, it opened later than expected, the service frequency at the time of analysis was lower than planned (although this has now improved), and the adjacent development was not generating the expected demand (only a small proportion of the commercial development was occupied, with no residential development at all).

- Thirdly, the net increase in rail demand has been determined i.e. the increase that can be attributed to the new stations.

The net increase in rail demand that can be attributed to the two new stations was 294,434 in 2016/17. Overall, the estimated level of abstraction based on station surveys (33%) was broadly in line with the Business Case (29%), however there were some significant differences at individual station level.

	ORR usage (one-way trips)	Survey abstraction rate	Estimated abstraction	Net generated demand
Apperley Bridge	350,312	37%	129,615	220,697
Kirkstall Forge (part year)	94,536	22%	20,798	73,738
Total	444,848	-	150,413	294,435

8.4. Using these findings

Calculating outturn BCRs appears to be challenging for scheme promoters to undertake and is often deferred to the five-year after stage or not undertaken at all. Scheme evaluations should calculate a outturn BCR where appropriate and ensure that sufficient data is collected to allow this to take place.

DfT should consider providing further guidance on how to calculate the outturn BCR in a proportionate manner. Scheme promoters should ensure that appropriate data collection and analysis processes are in place in accordance with this guidance. Even if data is not available, a recalculation of BCR or Net Present Value using outturn costs and benefits as stated in the business case might provide a useful indication in terms of the direction of travel of value for money one year after.

9. Impact on Passenger Experience and Choice of Transport

9.1. How do Local Major Schemes affect passenger experience?

Key findings

RQ7. How do Local Major Schemes impact on passenger experience?

Public transport and integrated transport schemes improve passenger experience in several ways including improved perceptions of security, improved cleanliness, and improved journey times and reliability of services.

A common and effective way of evaluating the impact of a scheme on passenger experience is through user surveys, which provides a method of quantifying the impact on passenger experience, particularly when surveys are undertaken before and after scheme opening.

As outlined in Section **Error! Reference source not found.**, public transport schemes often reported increased passenger satisfaction as a benefit. Additionally, many reported reduced journey time, which is assumed to also result in better passenger experience²⁹.

User satisfaction surveys proved to be an effective way of determining whether a scheme had improved passenger experience. Ten out of the 20 public transport and integrated transport scheme evaluations utilised findings from surveys which had been undertaken. All of these surveys provided evidence that passenger experience had improved, ranging from improved perceptions of safety, improved waiting facilities, improved journey times and reliability of services.

There was also evidence of traveller experience being improved through highway schemes, with the most common being improved journey times and reliability arising from highway improvements that reduce congestion.

Table 9-1 Summary of key findings relating to passenger experience from customer surveys

Scheme	Summary of evidence of changes in passenger experience
Mansfield Public Transport Interchange	93% of respondents answered that the appearance of the new bus station was either very good or good. 96% of respondents answered that the information provision on offer was either very good or good. Perception of safety had improved to good or very good. <i>See Case Study for further details.</i>
Rochdale Interchange	Overall satisfaction among passengers using the interchange has doubled, relative to the former bus station. An increase in the proportion of passengers feeling safe.
Coventry-Nuneaton (Phase 1) Rail	Whilst the passenger satisfaction survey revealed a generally high level of passengers satisfied or very satisfied with the train service on the Coventry – Nuneaton line, the comparison with the baseline surveys revealed a fall in satisfaction with train capacity and reliability.
Bath Transportation Package	Bus user satisfaction survey indicated that the scheme has improved many aspects of the service, including the quality of the bus stops and perceptions of punctuality of the service.
Midland Metro Birmingham City Centre Extension	Customer satisfaction has improved in terms of cleanliness and condition of the trams, provision of information onboard, but reduced in terms of the comfort of the seats.

²⁹ The DfT guidance for appraising costs and benefits of transport schemes, TAG, assumes that reduced journey times represent an improved passenger experience.

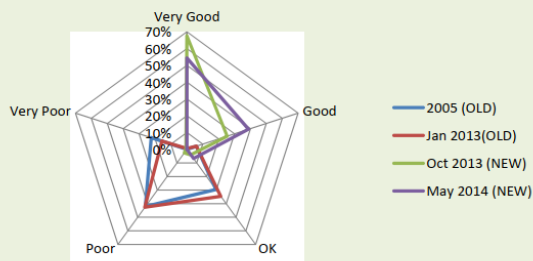
Scheme	Summary of evidence of changes in passenger experience
	Satisfaction with the provision of information at Metro stops increased from 79% in 2013 to 84% in 2017. Slight increase in the perception of safety and feedback relating to improved tram fleet reliability and improved accessibility due to lower floor units.
Leeds Rail Growth	A household survey of Apperley Bridge and Kirkstall Forge shows an increase in satisfaction with the travel options in the area.
South Yorkshire Bus Rapid Transit North	81% of customers were satisfied or very satisfied with the reliability of the service. 85% of customers were satisfied or very satisfied with the journey time of the service.
Pennine Reach (Blackburn)	The Pennine Reach bus service customer satisfaction surveys found that overall the majority of passengers feel that their bus journey has improved since the Pennine Reach scheme. The results of the bus station customer satisfaction surveys for both Blackburn and Accrington found the majority of participants prefer the new bus station and its facilities in comparison to the previous bus stations, with approximately 40% of participants at each site revealing they now utilise the bus stations more often.
Manchester Cross City Bus	Overall passenger satisfaction on the Vantage services is higher than the Greater Manchester average, at 89% and with a high proportion (48%) of passengers saying that they are 'very satisfied' with their overall journey experience. Across the bus services that traverse the city centre between the corridors, the level of recommendation is high, with 91% overall saying that they would recommend the services to their friends or family.
Hucknall Town Centre Improvements	Pedestrians and shoppers were extremely positive about the changes with 87% labelling the scheme a success. 46% of those interviewed now rated the shopping experience as good or excellent (the figure was only 16% back in 2015).
Worcester Transport Integrated	The percentage of bus passengers who are satisfied has risen from 80% to 82%.

Case Study – Mansfield Interchange (Public Transport) – Improved Passenger Satisfaction

This scheme involved the complete replacement of an existing dated bus station facility with a substantially improved bus interchange with indoor waiting areas and a connecting footbridge to the railway station.

Bus passenger surveys were undertaken when the scheme opened, which could be directly compared with the same survey which was undertaken periodically when the old bus station was operational. The graph opposite shows an example of the analysis presented which was undertaken for overall appearance (as shown), perceptions of cleanliness, safety / security and frequency of buses.

Fig.4. MPTI - Perception of Overall Appearance



Old Bus Station



New Bus Station



A summary of the main findings from the survey are as follows:

- Post opening, 51% of respondents stated that they used buses more at the new bus station.
- Pre-surveys in 2005 revealed that 46% said they would use buses more if the bus station were improved.
- Part of the growth is new trip making in the evening and night-time as people feel safer.

9.2. Do Local Major Schemes affect people’s choice of transport?

Key findings

RQ8. Is there evidence that Local Major Schemes impact on people’s choice of transport?

Of the nine schemes with an objective around sustainable transport choices, seven provide evidence to suggest that there has been an increase in trips by sustainable modes, although it is difficult to determine whether this was modal shift from private vehicles, or new trips. The evidence was obtained from a range of sources including counts of users and surveys of bus passengers.

There is no discernible pattern of increases in sustainable modes with regards to scheme type.







Mode shift in this context refers to the transfer of trips from private vehicles to more sustainable modes such as public transport and walking and cycling. DfT guidance specifies that Fuller Evaluations should demonstrate whether assumptions around mode shift have been realised, and whether there have been any unintended effects. It notes that household surveys or travel surveys may be an appropriate way to help ascertain any levels of mode shift.


Meta-evaluation of Local Major Schemes

Of the 43 schemes, nine had an objective that specifically referred to encouraging mode shift, promoting sustainable travel or increasing the use of 'environmentally friendly' modes. A further two schemes referenced opportunities for 'enhancement of sustainable travel modes' or similar, and several schemes had objectives to improve the facilities available for walkers and cyclists although not with a reference to converting this to modal shift.

Table 9-2 shows the types of evidence presented and the outturn impacts of the nine schemes with mode shift objectives.

Table 9-2 Scheme impacts on mode shift

Scheme	Type of evidence	Outturn impact	Summary
East of Exeter Highway	Cycle/pedestrian counts	In 2014, the 12-hour (07:00-19:00) average number of cyclists was 94. In 2018, the 12-hour average number of cyclists was 130, which represents an increase in cyclists of 38% between 2014 and 2018.	 Increase
Mansfield Public Transport Interchange Public Transport	Bus passenger surveys	Post opening, 51% of respondents stated that they used buses more at the new bus station. Pre-surveys in 2005 revealed that 46% said they would use buses more if the bus station were improved. 12% of respondents stated that they now use trains more since the new interchange opened.	 Increase
Access York Phase 1 Integrated Transport	Bus patronage data	Patronage for the three P&R sites on the west of York has increased by 10% against a 10% fall seen at the site which has not benefitted from Access York or other interventions and can be regarded as a control site. This equates to an additional 275,000 P&R trips per year that have taken place because of the Access York scheme.	 Increase
Nottingham Tram Extension Public Transport	Inbound mode share surveys (Nottingham City Council)	Despite fluctuations in public transport mode share, there has been an overall increase in patronage since the opening of the Nottingham Express Transit (NET) lines; on corridors not served by NET, public transport mode share has stayed fairly constant, around 30%.	 Increase (No change to overall public transport share)
Kingskerswell Bypass Highway	Pedestrian/cycle surveys, bus patronage data	60% increase in cyclists along Torquay Road and 166% increase along Newton Road comparing pre- and post-scheme. There has been a slight increase in pedestrians, but this is considered to be negligible. There has been an increase in bus patronage when comparing figures during construction with the period after the scheme opened. This is in the context of a longer-term drop in patronage however, with some bus services being reduced or stopped altogether.	 Increase
Leeds Rail Growth Public Transport	Passenger surveys	At Apperley Bridge, 27% of respondents did not make the journey before the station was built. 28% said the same at Kirkstall. It is not possible to determine the extent to which the two stations influenced these trips, but the data indicates that trips have been generated by the scheme. At Apperley Bridge, 26% already made the journey, but by a mode other than train. 46% at Kirkstall made the journey by another mode, indicating that there has been a modal shift as a result of the scheme. 14% at Apperley Bridge previously made the journey by car as a driver or passenger, and 25% did the same from Kirkstall.	 Increase

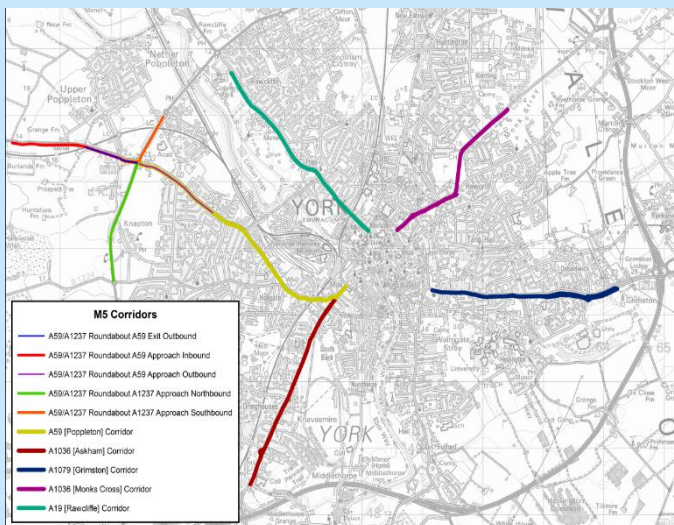
Scheme	Type of evidence	Outturn impact	Summary
Mersey Gateway Highway	N/A	No data presented.	
Transport Hub in Lincoln Integrated Transport	Pedestrian counts, rail patronage data, bus patronage data	<p>There were increases in pedestrian movements on key links around the scheme, up to 226% at the weekend over the railway bridge. These increases were higher than any increase in rail patronage, indicating that they had been generated by the scheme rather than solely being a result of more people using the railway.</p> <p>For the year 2016/17 patronage was 1,843,636, and in 2018/19 it was 6.7% higher at 1,967,284. Although this cannot entirely be attributed to the scheme, the improvements to the station and public realm as part of the scheme undoubtedly have had an impact.</p> <p>Between March and May 2018, passenger numbers reached 1,380,000 compared to 1,433,000 in 2017 and 1,517,000 in 2015. Whilst patronage has not increased one year post-opening, the rate of decline has dropped significantly.</p>	 Increase
Norwich NDR Highway	N/A	No data presented. To be considered in the five years after evaluation.	

There is not a sufficient breadth of scheme types to draw conclusions regarding the impacts of highway, integrated transport or public transport schemes on mode choice. It should be noted that while most of these schemes present evidence indicating increases in walking, cycling or public transport patronage, they generally lack the evidence to prove that this is modal shift away from private transport rather than an increase of new trips. However, the evidence in Table 9-2 indicates that schemes with a mode shift objective generally succeed in increasing trips by sustainable modes.

Case Study – Access to York (Integrated Transport) – Modal Shift and Counterfactual Analysis

This scheme comprises a package of measures to improve access to central York along two principal radials:

- Radial 1: A new park and ride facility at Askham Bar on the A1036 Tadcaster Road (to bring new capacity).
- Radial 2: A new park and ride site and bus service on the A59 Boroughbridge Road at Poppleton Bar (serving York’s last remaining major radial without a P&R site); a new and enlarged roundabout on the junction between the A59 and A1237 York outer ring road (to reduce delays at this critical junction); and inbound bus priority measures on the A59 Boroughbridge Road into central York (to provide buses with a journey time advantage over car).



The evaluation provides a comprehensive evaluation of P&R use, which considers abstraction from car and from other P&R sites, factors influencing performance, and the likely contribution of the interventions.

Since the Access York intervention, patronage for the three park and ride sites on the west of York, affected by the intervention, has increased by 10% against a 10% fall seen at the site which has not benefitted from Access York or other interventions and can be regarded as a control. This equates to an additional 275,000 park and ride trips per year that have taken place because of the Access York scheme.

The A59 bus lanes appear to have been effective in reducing journey times for buses into central York and the A59/ A1237 roundabout improvement has significantly reduced queuing and delays at this junction.

10. Environmental Impacts

Key findings

RQ9. How do Local Major Schemes impact on the environment?

Many of the evaluations that did consider air quality impacts presented some evidence of improvements. Others found it difficult to draw firm conclusions regarding the contribution of the scheme to any observed air quality changes. For those schemes that undertook air quality evaluations, the main methods of measurement were undertaking air quality data collection or basing the assessment on changes in observed traffic volumes and speeds.

There is some evidence of noise benefits and disbenefits, with most scheme evaluations unable to draw a firm conclusion in relation to the impact of the scheme. For those schemes that undertook noise evaluations, the main methods of measurement were undertaking noise surveys or basing the assessment on changes in observed traffic volumes and speeds.

Most scheme evaluations did not consider carbon impacts, despite this being a requirement of the guidance. For those schemes that did consider carbon, a variety of methods were used and there was a range of results with some schemes showing an improvement, others showing a worsening and many presenting inconclusive evidence.

Schemes rarely presented evidence on other potential environmental impacts, such as effects on landscape, biodiversity, heritage and water. When these impacts were considered, it was normally in terms of mitigation measures; for example, noise barriers or flooding protection through use of attenuation ponds.

With the exception of carbon impacts, evaluating the impact of Local Major Schemes on the environment is only a requirement for Enhanced and Fuller Evaluations. The impacts considered in evaluations are generally focused on local air quality and noise. Schemes rarely presented evidence on other potential environmental impacts, such as biodiversity, landscape/townscape, water and heritage and this is not prescribed in the guidance either.

The remainder of this section covers the findings relating to air quality, noise, and also carbon impacts, which is a requirement of all levels of evaluation.

10.1. Local air quality

Evaluation of the impacts of a scheme on local air quality is expected for Enhanced and Fuller Evaluations and in particular those schemes which may have an impact on Air Quality Management Areas (AQMAs). DfT evaluation guidance expects that the scheme impact on local air quality in the area of interest is considered, together with an analysis of the differences between forecast and outturn scheme impacts.

The findings from the 21 Enhanced and Fuller evaluations are as follows:








- 16 scheme evaluations made reference to air quality in the evaluation reports, with five evaluations not mentioning air quality at all (despite one of the five schemes having an objective specifically related to environment).
- Of the 16 scheme evaluations, nine of them made reference to observed air quality data (usually nitrogen dioxide), with four schemes showing evidence of an improvement in air quality as a result of the scheme and five schemes concluding that the evidence was inconclusive. No evaluations concluded definitively that air quality had worsened because of the scheme (A summary of these schemes is shown in Table 10-1).
- Of the remainder of the evaluations that referred to air quality but did not rely on observed air quality data, some made qualitative assessments of the air quality impact based on changes in



Meta-evaluation of Local Major Schemes

traffic volumes. Others deferred the evaluation to the five year after opening stage, citing lack of data at the one year after opening stage.

- Two schemes made reference to observed air quality impacts compared to forecast impacts. Both evaluations arrived at this conclusion following an assessment of forecast and outturn traffic flow changes.

Table 10-1 Summary of air quality impacts based on observed data

Scheme	Evidence presented on observed air quality impact	Conclusion <i>(comparison to forecast impact in brackets if available)</i>
Worcester Integrated Transport Integrated Transport	Data collected at several monitoring sites across the entire city with improvements at some sites and worsening at others.	 Inconclusive observed impact
Kingskerswell Bypass Highway	Before and after opening monitoring shows strong evidence that air quality in the existing network has improved significantly in the one year since the scheme opened to traffic. The environmental benefits to the village of Kingskerswell are substantial, as at most locations, the air pollution figures have reduced by approximately half.	 Improvement based on observed data
Bath Transportation Package Integrated Transport	An improvement in the number of nitrogen dioxide exceedances in 2015 is likely due to a number of transport interventions. The High Street has shown an improvement over 3 years since work completed in this area in 2013. There are certain instances within the BTP area where the Council's targets have not been met.	 Inconclusive observed impact
Darlaston Access Improvement Highway	Full dataset for particulate matter was not available. There has been a slight reduction in nitrogen dioxide since 2013 but given the lack of change to traffic flows it is unlikely to be due to the scheme.	 Inconclusive observed impact
South Yorkshire Bus Rapid Transit North Integrated Transport	Air pollution has continued to get worse in the Rotherham and Sheffield Districts; however, nitrous oxide concentrations have improved in the Tinsley area of the bus rapid transit route.	 Inconclusive observed impact
Heysham-M6 Link Road Highway	Decrease in nitrogen dioxide levels after scheme opened, The greatest reductions around former A683 as traffic and HGV flows have fallen.	 Improvement based on observed data
Pennine Reach Public Transport	Overall, the nitrogen dioxide annual mean levels for all sites monitored have seen an improvement to air quality since the Pennine Reach scheme.	 Improvement based on observed data

Scheme	Evidence presented on observed air quality impact	Conclusion <i>(comparison to forecast impact in brackets if available)</i>
Morpeth Northern Bypass Highway	Outturn local air quality impacts within Morpeth Town Centre were assessed based on NO2 diffusion tube measurements collected from May 2015 through to April 2018. These measurements demonstrated a clear and consistent decrease in nitrogen dioxide levels following the opening of the scheme.	 Improvement based on observed data <i>(in line with forecast impact)</i>
Mersey Gateway Highway	Air pollution concentrations fall well within the UK air quality objectives before construction and since opening of the new MGB and that there is no requirement to designate an Air Quality Management Area	 Inconclusive observed impact

It should be noted that several of the Standard Evaluations evaluated air quality impacts, despite it not being a formal requirement of DfT evaluation guidance. A further five schemes reported an improvement in air quality and three were inconclusive.

A key finding from this meta-evaluation is that scheme promoters appeared to find it difficult to draw firm conclusions regarding attribution of any observed air quality changes to the schemes. For some schemes, such as bypasses, the evidence is often clear that there has been an improvement in air quality in the town or village where most of the receptors are, with a corresponding increase on the bypass where there are fewer receptors. For other types of scheme, the evidence is not conclusive enough to be able to draw sufficient conclusions regarding the impact of the scheme. In many instances, there were changes in air quality identified over a wide area, but it is difficult to attribute this impact to the scheme when the changes have occurred over several years and are inconsistent across monitoring sites..

Case Study – Bath Transport Package (Integrated Transport) – Improved Air Quality

The Bath Transport Package comprised the following elements:

- Upgrades to nine bus routes, including real time information, shelters and bus priority measures.
- Expansion and improvement of three park and ride sites.
- Improved traffic management / signing system.
- Improved pedestrian areas in the city centre.

A key aim of the scheme was to improve air quality and nitrogen dioxide monitoring has been ongoing for a number of years at several key locations in the city centre. The table below shows pre-construction and post-opening nitrogen dioxide readings. The results show a general improvement in conditions at the majority of sites, although note that other factors external to the scheme may have had an impact on these figures.

Annual mean nitrogen dioxide concentrations – Continuous monitoring sites

Location	2011 (Pre-construction)	2015 (Post opening)
Guildhall High Street	42	34 ↓
Windsor Bridge	51	33 ↓
Newbridge Road	41	42 -
London Road	48	44 ↓
Landsdown Crescent	41	38 ↓
Warminster Road	36	37 -
Wells Road	50	46 ↓
Windsor Bridge	30	37 ↑

Further analysis will be presented in the five years after opening evaluation when more air quality data is available.

10.2. Noise

Evaluation of the impacts of a scheme on noise is expected for Enhanced and Fuller evaluations. DfT evaluation guidance expects that the scheme impact on noise levels at important receptor locations and analysis of the difference between outturn results and scheme forecasts is considered.

An evaluation of noise impacts was undertaken for twelve of the 21 Enhanced and Fuller Evaluations. For those schemes that did not undertake noise evaluations, some deferred the evaluation until the five year after stage, some cited lack of data, and others did not consider noise at all.








The evaluation of noise impacts was typically undertaken using one of the following two methods:






- Actual measurements of noise levels at key locations using specialist noise monitoring equipment. This approach was used for six of the Enhanced and Fuller evaluations.
- An assessment of noise levels based on changes in traffic volumes, vehicle types and vehicle speeds using established methodologies such as Calculation of Road Traffic Noise which quantifies the noise impact based on changes in traffic. This approach was used for six of the Enhanced and Fuller evaluations.

Based on these evaluations, a summary of the noise findings is as follows:

- Two scheme evaluation provided evidence of an improvement in noise levels. Eight scheme evaluations presented either inconclusive results or negligible change (i.e., in many cases some sites showed an improvement and other sites showed a worsening, making it difficult to draw an overall conclusion). Two scheme evaluations provided evidence to show that there has been a worsening in noise levels.
- Comparison of observed noise levels with forecast noise levels was undertaken for six schemes.

Table 10-2 Summary of noise impacts based on observed data

Scheme	Evidence presented on observed noise impact	Conclusion <i>(comparison to forecast impact in brackets if available)</i>
Luton Town Centre Integrated Transport	Noise levels were measured in 2008 (pre-construction) and in 2016 (post-construction). They were measured in three locations, which gave three different results. The results of the noise level monitoring were then used to undertake noise modelling in order to determine the number of residential properties where occupants were entitled to noise treatment.	 Negligible observed impact
Loughborough Town Centre Improvements Integrated Transport	The new scheme has had negligible or minor noise impacts after one year of operation. Calculations were undertaken using traffic flows and Calculation of Road Traffic Noise (CRTN) method.	 Negligible observed Impact
Thornton to Switch Island (Sefton) Highway	The associated reduction in traffic volumes along the B5207 corridor as a result of the scheme has led to an overall improvement in noise for local communities in Netherton and Thornton. This is due to the transfer of traffic on to the scheme, which is located further away from the major residential areas than the B5207.	 Improvement based on observed data
Kingerswell Bypass Highway	Noise measurements undertaken in 2017 show the majority of recorded levels are lower than the original predicted noise levels for the 2016 / 2017 post scheme situation and lower than pre-scheme. These changes to original predictions relate to several different factors at this stage; the upgraded Noise Reduction Road Surfacing used in the scheme, the reduced traffic flow on surrounding roads, changes made to earthworks and acoustic barriers, and the overestimations made in the original traffic flow predictions.	 Improvement based on observed data <i>(Better than forecast)</i>
Bexhill-Hastings Link Road Highway	Comparisons of observed data shows an increase in the noise level in the majority of the Combe Valley (west and central part of the Bexhill-Hastings Link Road), while a decrease in the noise level is localised to the north and east part of the Bexhill-Hastings Link Road.	 Inconclusive observed impact (Inconclusive compared to forecast)
Crewe Green Link Road Highway	Noise levels are broadly in line with forecasts, and considered to be negligible overall. The assessment indicates that noise levels from the new road (David Whitby Way) were broadly consistent to that forecast, with year one (observed) basic noise levels estimated to be 0.4 dB higher than those forecast owing to an increase in flows and a higher percentage of heavy goods vehicles than forecast. Slight reductions were calculated at other locations.	 Negligible Impact <i>(Worse than forecast)</i>
Midland Metro Birmingham City Centre Extension Public Transport	Noise monitoring was undertaken which concluded that the operating of the Metro has no material dis-benefits to local residents and businesses in terms of ground borne noise and vibrations.	 Negligible observed impact

Scheme	Evidence presented on observed noise impact	Conclusion <i>(comparison to forecast impact in brackets if available)</i>
Darlaston Access Improvement Highway	Minimal changes to traffic flow and limited build out of the development areas mean there is unlikely to be much change at the one year after opening stage.	 Negligible observed impact
Bedale/Aiskew/Leeming Bar Bypass Highway	Overall lower traffic flows and speeds compared to modelled values. Overall noise impacts due to the scheme are lower than predicted.	 Improvement (Impact better than forecast)
Heysham-M6 Link Road Highway	Increase in noise levels seen at all monitoring locations with the scheme in place, however the noise impacts due to the scheme were lower in most cases than predicted.	 Worsening based on observed data (Impact less than forecast)
Morpeth Bypass Highway	Although some adverse impacts on traffic-related noise were anticipated, it was predicted that beneficial impacts would occur at more properties because traffic on existing roads would be re-routed onto the bypass. The evaluation has demonstrated that, as expected, the scheme has resulted in increased road traffic noise levels in proximity to the new road. However, absolute noise levels at many of the nearby receptors are still relatively low as expected. Meanwhile, in line with forecasts, the as-built noise model demonstrated minor reductions in noise levels for properties facing existing routes through Morpeth.	 Inconclusive observed impact (Inconclusive compared to forecast)
Mersey Gateway Highway	Overall, there is little impact on houses in the project area. To the north of the scheme, most residential areas show a reduction of 1 to 3dB. Areas to the north of Ashley Way show a modest increase in noise of 1 to 3dB between Queensway and Ditton Junction	 Inconclusive observed impact

Case Study – Kingskerswell Bypass (Highway) – Reduced Noise Levels

A noise evaluation was undertaken on alternative routes to the new Kingskerswell Bypass. This assessment looked at changes in traffic flows to determine the impact and the analysis showed an improvement on all 4 routes as follows:

Location	Flow Change between pre and post scheme	Noise change	Classification of Noise Impact
Old Newton Road	-2,387 (-57%)	-3.7dB	Moderate Benefit
St Marychurch Road	-4,267 (-46%)	-2.7dB	Minor Benefit
Torquay Road	-21,247 (-75%)	-6.0dB	Major Benefit
Teignmouth Road	-1,578 (-22.5%)	-1.1dB	Minor Benefit







This shows that each of the previously used main routes / alternatives are showing a reduction in noise levels that would be perceivable.










10.3. Carbon emissions





Evaluation of the impacts of a scheme on carbon emissions is expected for all levels of evaluation. DfT guidance anticipates that the impact on an area of interest will be modelled based on demand / vehicle speed information and analysis of the difference between outturn results and scheme forecasts.

In total, 19 evaluations presented evidence on the carbon impacts, with some presenting the observed impact only and others presenting the observed impact and comparing back to the original forecasts. Narrative on the evidence presented, together with a summary of whether there has been an increase or decrease in emissions is shown in Table 10-3.

Table 10-3 Summary of evidence on carbon impacts

Scheme	Evidence presented on carbon impacts	Change in carbon / carbon dioxide emissions
East of Exeter Highway	Quantitative assessment using DfT Carbon Tool and observed traffic data. There has been an increase of 0.02kT in carbon emissions along the A30 since the scheme was introduced. The carbon impacts of other routes cannot be quantified because of a lack of data, however the shorter routes that are now available to and from the Science Park and for accessing the M5 southbound means that there is likely to be a reduction in emissions on these routes.	 Observed increase in carbon emissions
A164 Humber Bridge to Beverley Improvements Highway	Qualitative evaluation based on changes in traffic volumes. Evaluation undertaken by comparing forecast 'with scheme' journey times against observed data. 2019 journey times are quicker than those forecast in 2018, but slower than 2011. Therefore, it is suggested that some of the carbon benefits are likely to be realised.	 Inconclusive
Weston Package 1 Integrated Transport	Quantitative assessment using DfT Carbon Tool and observed traffic data. There was a forecast reduction in carbon dioxide of 7.62kT and the outturn reduction was 2.44kT of carbon dioxide.	 Observed reduction in carbon emissions (but less than forecast).
Portsmouth Northern Road Bridge Highway	Assumed reduction in carbon was same as forecast. There are no post-scheme traffic flows so an evaluation of carbon impacts could not be undertaken. The observed impact was therefore assumed to be the same as forecast.	 Assumed that the reduction in greenhouse gases is same as forecast.
Portsmouth Tipner Interchange Integrated Transport	Quantitative assessment using DMRB Air Quality spreadsheet and observed traffic data. Carbon emissions have reduced 7% post opening.	 Observed reduction in carbon emissions.
Luton Town Centre Integrated Transport	City wide carbon dioxide data reviewed. Carbon dioxide data for Luton was presented, which showed that levels are reducing over time, and are lower per capita than national levels. It was not possible to attribute this to the scheme.	 Inconclusive

Scheme	Evidence presented on carbon impacts	Change in carbon / carbon dioxide emissions
Reading Station Highway Improvements Integrated Transport	Qualitative evaluation. Carbon benefits will be realised by buses which can bypass queues, because of the implementation of bus priority, along with any mode shift from car to cleaner modes, such as walking and cycling.	 Assumed reduction in carbon emissions (qualitative assessment)
Loughborough Town Centre Improvements Integrated Transport	Quantitative evaluation based on changes in traffic flows. Results show that on the roads that have been assessed there has been a decrease in carbon dioxide emission rates of between 1.9 and 7.5% with an average of 3.6%.	 Observed reduction in carbon emissions
Worcester Integrated Transport Integrated Transport	Qualitative evaluation. No direct evidence presented on levels of carbon, however one of the 3 objectives is to "Reduce carbon emissions" which is measured by delivering a modal shift, which has been evidenced.	 Inconclusive
Cambourne – Pool – Redruth TP Highway	Quantitative assessment using TAG data tables and observed traffic data. An evaluation was undertaken which showed that the scheme’s emissions based on the observed data were 601 tonnes of carbon dioxide lower than forecast.	 Observed increase in carbon emissions, but less than forecast.
Kingerswell Bypass Highway	Quantitative assessment using DfT Carbon Tool and observed traffic data. The scheme leads to a decrease in emissions in each time period. This is likely as the SDLR has a higher speed limit and has less congestion, so vehicles can travel faster. In addition, most emission savings are generated from north bound trips.	 Observed reduction in carbon dioxide emissions.
Bexhill – Hastings Link Road Highway	Quantitative assessment using TAG data tables and observed traffic data. An observed disbenefit of 430 tCO ₂ in terms of GHGs. This is 262 tCO ₂ less than predicted by the baseline. This is due to fewer vehicle kms travelled in the observed situation.	 Observed increase in carbon emissions, but less than forecast.
Nottingham Ring Road Highway	Quantitative assessment using Emissions Factor Toolkit The carbon emissions from traffic using the Ring Road are 9% (3,552 tonnes/yr.) higher than would have been the case had the NRIS not been introduced. However, as flows crossing the City Centre cordon have been reduced significantly in the study period, this increase will be partially or fully offset when taking a city-wide view.	 Observed increase in carbon emissions.
Bedale / Aiskew / Leeming Bar Bypass Highway	Qualitative evaluation based on changes in traffic volumes. Significant reductions in traffic volumes along former A684 - therefore fewer vehicles - therefore reduction in carbon emissions along former A684 route.	 Observed reduction in carbon emissions.
Leeds Rail Growth Public Transport	Quantitative assessment using DfT Carbon Tool and observed traffic data. The opening of Apperley Bridge saves 1,453 tonnes carbon emissions per year; and Kirkstall Forge saves 3,210 tonnes carbon emissions per year. DEFRA Emission Factors Toolkit used.	 Observed reduction in carbon emissions.

Scheme	Evidence presented on carbon impacts	Change in carbon / carbon dioxide emissions
South Yorkshire Bus Rapid Transit North Integrated Transport	City wide carbon dioxide data reviewed. Carbon dioxide data is provided - CO ₂ emissions in both Sheffield and Rotherham have increased since the 2013 baseline. Sheffield: 632.8kT CO ₂ (2013) to 639.2kT CO ₂ (OYA). Rotherham: 521.6 kTCO ₂ (2013) to 534 kT CO ₂ (OYA)	 Inconclusive.
Heysham – M6 Link Road Highway	Qualitative evaluation based on changes in traffic volumes. Traffic flows have mostly decreased; however, the city centre saw an increase. Carbon emissions have likely reduced within study area, but may have increased within city centre.	 Inconclusive.
Morpeth Northern Bypass Highway	Re-run of forecast assessment with observed traffic data. Changes in observed emission levels are generally very similar to the forecast calculations. Consequently, it is concluded that that scheme’s impact on regional air quality and greenhouse gases is as expected.	 Observed increase in carbon emissions, in line with forecast
Manchester Cross City Bus Public Transport	Qualitative evaluation based on changes in traffic volumes. The net impact of increased carbon dioxide from running more buses and reduced carbon from modal shift is a small net increase and a programme that is therefore fairly neutral in carbon terms. The reduction in traffic brought about by the measures will have led to the improved operation of the transport system and therefore lower carbon emissions. This further impact on carbon reduction has not, however, been quantified at this time.	 Observed reduction in carbon emissions (qualitative)

The meta-evaluation of carbon impacts has shown that:

- **24 out of 43 schemes (56%) did not undertake an evaluation of the carbon impact of schemes**, despite it being a requirement for all types of evaluation.
 - In many cases, carbon was not mentioned in the evaluation reports at all.
 - Some of the scheme promoter survey feedback suggested that the need to undertake carbon evaluations was either descope at the evaluation planning stage, or will be undertaken at the Five Year After evaluation stage.
- **19 out of 43 scheme evaluations (44%) undertook a carbon evaluation.**
 - The methods used varied considerably with qualitative evaluations undertaken for seven schemes and elements of quantitative evaluation undertaken for 12 schemes.
 - The quantitative evaluations used a variety of approaches including analysis of city-wide observed emissions which proved difficult / impossible to attribute to the scheme. Various existing tools were also used including the DfT Carbon Tool (noting that this is now out of date), DMRB Air Quality Spreadsheet and Defra Emissions Factors Toolkit.
 - Most of the carbon evaluations only considered observed impacts and did not compare the observed impact with the forecast impact.
 - Of the 19 schemes that undertook a carbon evaluation:
 - Nine schemes stated that there was a decrease in carbon emissions as a result of the scheme.

- Five schemes stated that there was an increase in carbon emissions as a result of the scheme.
- Five schemes stated that there was inconclusive evidence available to be able to draw firm conclusions.

Case Study – Leeds Rail Growth Package (Public Transport) – Reduced Carbon Emissions

The scheme consists of two new fully accessible rail stations (Apperley Bridge and Kirkstall Forge) on the Airedale and Wharfedale rail lines.

To estimate the carbon impacts, four **carbon impacts scenarios** for different types of passengers were determined:

Carbon Emission Saving	Carbon Emission Increases
1. Abstracted other mode trips– Whole journeys completed previously via 'other' modes (e.g. car or bus) prior to the opening of the stations.	3. New trips - Journeys to the stations which were not made prior to their opening.
Carbon Emission Saving	Carbon Emission Increases
2. Abstracted rail trips – Participants who travelled to other stations before the new stations opened. Where journey carbon emissions to a station reduce as a result of the new station opening (across different distances/ travel modes).	4. Abstracted rail trips – Participants who travelled to other stations before the new stations opened. Where journey carbon emissions to a station increase as a result of the new station opening (across different distances/ travel modes).

Survey participants' journey carbon emissions were then calculated based on their travel distance, travel mode and an assumed speed. Carbon emissions were calculated using the DEFRA's Emissions Factors Toolkit (EFT) v8.0. For example:

Interview ID	Travel Mode to Station	Travel Distance (m)	Road Type	Annual Emission (tonnes/yr)
3	Car/van as driver	3347.00	Urban (not London)	0.168
4	On Foot	6731.54	Urban (not London)	0
9	Cycle	2030.95	Urban (not London)	0
104	Bus	3145.03	Urban (not London)	0.780

Finally, based on information on **total station passenger numbers** from ORR data, annualised average savings for the individual stations could be calculated.

The analysis shows that opening of Apperley Bridge saves 1,453 tonnes of carbon emissions per year; and Kirkstall Forge saves 3,210 tonnes carbon emissions per year. Carbon impacts from the construction of the rail stations have not been included in the assessment as detailed information relating to the construction activity was not available and the level of carbon produced by construction is expected to be minimal compared with the carbon reduction from the scheme operation which will produce benefits over the lifetime of the scheme.

10.4. Other environmental impacts

Schemes rarely presented evidence on other potential environmental impacts, such as effects on landscape, biodiversity, heritage and water. When these effects were considered, it was normally in terms of mitigation measures; for example, noise barriers or flooding protection through use of attenuation ponds.

Case Study – Bexhill to Hastings Link Road (Highway) – Landscape Mitigation

One of the key aims of the design has been to develop a scheme that retains and, where possible, enhances the integrity of the areas of distinctive landscape and townscape character. The scheme also aims to minimise and, if possible, avoid adverse landscape effects upon the High Weald Area of Outstanding Natural Beauty (which is situated to the north of the BHLR), as well as minimise visual effects upon properties and countryside. These design objectives have been used to inform the landscape proposals which are an integral part of the scheme design and are designed to avoid, reduce, or remedy potential adverse effects. The following techniques were adopted:

- Optimising the route alignment to make full use of existing vegetation and landform to screen the route and achieve a good fit into the topography.
- The provision of earth mounding to screen the route from view and blend it into the local landform.
- The provision of planting to screen the route from view and blend it into the local surroundings.

Further assessment in the future (at Year 5 and Year 15 after opening) will determine whether soft landscaping proposals have been effective, as vegetation matures over time to help screen the scheme and further soften its presence within the landscape.

11. Impact on Local Economies

Key findings

RQ10. How do Local Major Schemes affect local economies?

Evaluating the impacts of schemes on local economies is challenging, particularly at the one year after opening stage. Most of the evidence presented is based around changing levels of employment, new housing, employment development, and business activity. Attribution of impacts directly to schemes is difficult.

Business surveys were used for some evaluations which were more effective at demonstrating the perceived and actual impact of the scheme on the local economy. Evaluations which undertook business surveys presented evidence such as increased business confidence and activities and increased footfall.

The wider economic impact of Local Major Schemes remains a challenging area for evaluation, primarily for two reasons:

- The scale of schemes relative to factors influencing wider economic conditions and characteristics; and
- The time lag associated with key economic changes, making analysis within the year 1 evaluation difficult or impossible.

DfT evaluation guidance specifies that the reporting of economic impacts is undertaken in both the One Year After and Five Year After reports. As stated earlier, the majority of the reports included in this sample are at the one year after stage and most have deferred the consideration of local / wider economic impacts to the five year after stage, on the basis that economic impacts of the scheme would need longer to materialise. Even where a change is detected, it cannot usually be attributed to the scheme and there has been no comparison to forecast impacts.

Table 11-1 outlines some examples of qualitative evidence of impact on local economies. While there is some evidence of improvements, it is not always possible to directly link the change to the scheme.

Table 11-1 Summary of evidence on improvements to local economies

Scheme	Evidence presented on improvements to local economies
East of Exeter Five Years After Highway	Housing and employment statistics. 3,609 homes have been built in the East of Exeter Growth Point since 2012, and 2,350 jobs have been created since 2013.
Weston Package Phase 1 Five Years After Integrated Transport	Increased frequency of bus services, business activity and employment statistics. Since the scheme, two new businesses opened in the J21 enterprise areas creating 81 jobs. Two businesses opened or relocated in 2013 during construction, providing 334 jobs. The number of people in employment in the Weston area increased from 27,000 in 2011 to 29,997 in 2014.
Portsmouth Northern Road Bridge Highway	Business occupancy rates and parking revenue. Business occupancy performance had either been maintained or improved since the scheme, and parking revenue had remained relatively constant, indicating that the level of economic activity had been sustained.

Scheme	Evidence presented on improvements to local economies
Portsmouth Tipner Interchange Integrated Transport	<p>Government grants and funding availability. The scheme has played a pivotal role in the signing of the City Deal with central government, securing £48.75m in Government grants to support the provision of enabling infrastructure and £142m of local funding, to make the Tipner-Horsea Island site ready for private sector investment. Developing these sites is expected to lever in substantial private sector investment into the area through site development, skills and unemployment schemes; and business support services.</p>
Luton Town Centre Integrated Transport	<p>Planned development, business occupancy rates, employment statistics and GVA. There are four planned developments in and around Luton town centre which are supported by the scheme. There has been a reduction in rental values within the town centre, and an increase in vacant properties. However there has also been an increase in the number of people in employment, a reduction in the number of benefit claimants, and GVA in Luton increased by 7% (higher than the national average) between 2013 and 2014.</p>
Rochdale Interchange Five Years After Integrated Transport	<p>Stakeholder feedback planned development and footfall data. Stakeholder feedback from private sector and public sector organisations indicates that the Interchange has made a positive contribution to the ongoing redevelopment of Rochdale town centre by acting as a high-quality gateway to the town for workers, shoppers and other visitors to the town centre and the contribution of the Interchange to the wider package of improvements underway in the town centre.</p> <p>Phase Two of the comprehensive regeneration scheme for the former bus station site appears ready to follow on and deliver further commercial and residential development. There has been a 6.8% drop in people entering the town centre over the comparison period 2011 to 2014. This indicates some degree of decline of economic activity in the town centre over this period, which may have been magnified for public transport due to an associated fall in parking charges and an increase in parking availability.</p>
Worcester Integrated Transport Integrated Transport	<p>Employment statistics, GVA, business activity, income, footfall. Worcester has seen an increase in employment, GVA and the number of microbusinesses (0-9 employees) has increased. Footfall in the city centre increased between 2013 and 2015, before dropping in 2016 and recovering in 2017. There is no clear link between the scheme and the number of people accessing key locations in the town centre. Data on household income shows that it has increased markedly since 2015, and that professional occupation has grown as a proportion of total employment, which may suggest an improvement in the quality and value of employment in Worcester.</p>
Kingskerswell Bypass Highway	<p>Business surveys. 53% of businesses interviewed viewed the South Devon Link Road (SDLR) as 'excellent' and 38% as 'good'. When asked if the SDLR has helped their business the results were more mixed, with 37% answering 'yes', 33% 'no' and 29% 'don't know'.</p>
Bexhill-Hastings Link Road Highway	<p>Job creation and planned development. 39 permanent jobs were supported through the labour and supplier expenditure on the project, one business had relocated to the newly developed land as part of the scheme and their headcount had increased. A site west of the scheme has also now been fully acquired in anticipation of development. Average house prices in the area have continued to increase, JSA claimants have continued to decrease as have benefits claimants.</p>
Crewe Green Link Road Highway	<p>Planned development. The scheme directly connects the Basford East development site to the strategic road network, including the M6, and promotes the use of sustainable transport. The scheme has also resulted in the submission and approval of two outline planning applications for developments either side of the scheme. A full economic impact analysis will be done at FYA (Five Years After).</p>
Bath Transportation Package Integrated Transport	<p>Business surveys. The promoter identified that it was too early to assess the full impact, but an initial City Centre monitoring review of businesses had identified an increase in footfall and increased business activity in and around Stall St and Lower Borough Walls. 50% of businesses identified increased income. New restaurants, a hotel and a casino were planned around the theatre area.</p>
Midland Metro Birmingham City Centre Extension Public Transport	<p>Business surveys. The scheme has made a 'positive contribution' according to the business surveys. 30% of surveyed businesses in Birmingham strongly agreed that the extension would contribute to future prosperity. The proportion of employees of local businesses using the metro has increased, although there are unclear outcomes on accessibility of business and attracting new staff.</p>

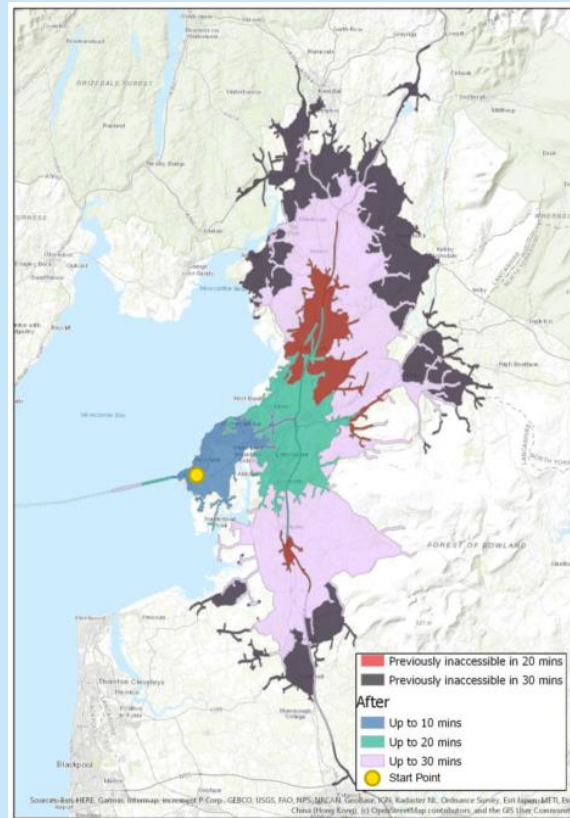
Scheme	Evidence presented on improvements to local economies
Leeds Rail Growth Public Transport	<p>Employment statistics and house prices. It is noted that FYA opening is a more appropriate timescale for a full evaluation of the impact on the local economy. However, there is some evidence provided. Employment levels have been steadily increasing since 2013, but the aggregate nature of the data means it is not feasible to attribute specific changes to the new rail stations. Property price information was also considered - there has been an increase in prices in Leeds and Bradford, but a decrease in the local postcodes for Apperley Bridge and Kirkstall Forge. However, sales over £100,000 in the Apperley Bridge area were substantially higher than the same time the previous year. Ultimately it is difficult to compare the time periods to provide evidence of any causation from the opening of the stations.</p>
South Yorkshire Bus Rapid Transit (North) Integrated Transport	<p>Employment statistics. There is an overall increase in employment across the area with the skills of the local population reported to have increased. There is no evidence on whether the service has affected local businesses/the economy.</p>
A45 Westbound Bridge Highway	<p>Employment and economic statistics. Employment in the local area mostly served by the bridge is 31,000 and increased by 24% between 2015 and 2017. The area accounts for 25.8% of the Borough's employment The size of the local economy also increased by 38% compared to 20% across the UK between 2011 and 2016.</p>
Heysham M6 Link Highway	<p>Employment accessibility, stakeholder feedback, job creation and development. There have been significant journey time savings and up to 10% more people can access key employment sites within a 20 minute drive time compared to before. Over 90% of the labour force came from the local area, surpassing the objective to train over 100 local unemployed people during the scheme's construction. There was no specific employment data, however evidence from the stakeholder workshop and aerial photos show an increase in employment, although this cannot be solely attributed to the scheme.</p>
Pennine Reach Public Transport	<p>Planned development. 24 planning applications were submitted within a 400m radius of the Pennine Reach route; 19 accepted and 5 undecided. The number of new and affordable homes being delivered has increased e.g. in Blackburn with Darwen, where 447 additional new homes were delivered in 2017/18 compared to 2016/17.</p>
Hucknall Town Centre Improvements Integrated Transport	<p>Business occupancy rates and footfall. The number of vacant units has fallen from 12% to 8%. The scheme has increased footfall in almost all locations around the town centre. The High Street has recorded an increase in footfall of 33%, and the number of pedestrian movements on market day has increased by 62% post-scheme.</p>
Transport Hub in Lincoln Integrated Transport	<p>Job creation and business activity. The Lincoln Transport Hub contributed to the following positive economic impacts:</p> <ul style="list-style-type: none"> • 360 jobs that have been directly created/safeguarded • 76,204 sq. ft commercial retail floorspace that has already been created, with 79% occupancy rate in phase 1 • New business relocating to Lincoln, and to the area around the scheme, generating additional economic output • Investment in existing businesses • 99 sqm of commercial office space

Case Study – Heysham M6 Link – Economic Impacts

The Heysham M6 Link involved the construction of a 4.8km dual carriageway link designed to improve access between Morecambe, Heysham and the M6 motorway and by this reduce traffic congestion in Lancaster.

The evaluation provided a comprehensive analysis of the effect of the new link on the local economy:

- HERE data (real-time location-based traffic information from Nokia) was used to create isochrones in 10-minute sections, showing the distance it is possible to travel in up to 30 minutes in peak periods. The results showed a significant increase in possible distance, up to 9km North and 5km South in the AM peak;
- Population estimates from 2011 census data were added to Output Areas (OA) in GIS, and in conjunction with the isochrones from the previous analysis it was estimated what proportion of each OA was within 20 minutes' drive of three key development sites. The population within 20 minutes of these key sites increased up to 10% in the AM peak and 8% in the PM peak, therefore increasing the pool of potential customers and employees;
- A stakeholder workshop was held, but only one attendee operated a business within one of the key employment sites mentioned above. They identified that the scheme had made access to the port significantly easier, and cited an 18% increase in trailers passing through the Port since the scheme opened (along with other improvements to the Port). This suggests that there may have been an increase in the numbers of HGV drivers employed by businesses operating within the Port;
- Aerial footage from Google Earth was also used to observe new developments, or completed developments which were likely to have created new jobs. Additional development was found at all of the key employment sites, however, it is unlikely that there has been a significant growth in employment as a result of the scheme; and
- A major pledge was made during scheme preparation that the construction of the scheme would create 3000 jobs for people across the region, including training for 100 local unemployed people. The post-construction statistics show that these targets were exceeded: over 90% of the labour force lived within the LA postcode, and over 100 local, unemployed people were trained and employed during construction. SMEs were engaged throughout construction, and major suppliers passed their specialist skills to local labour within the supply chain.



Out of the schemes which provided analysis of the impact on the local economy, seven used employment statistics, five used planned development and planning applications, and three used business surveys and business occupancy rates respectively. These are the main sources of evidence used for this type of analysis, however, other data sources may be available at the five year after stage. Attribution of individual impacts to a scheme remains difficult due to the variety of other factors which can affect economic outcomes, however it is still a useful indicator of the types of impact that the schemes may have on their local area.

12. Impact of Bus Improvement Schemes

RQ12. How do Local Major Schemes impact on local bus operations?

Key findings

Out of the 12 schemes with a bus improvement element which provided patronage data, eight schemes produced an increase in bus patronage, indicating the value of these schemes in encouraging the use of public transport.

There is some evidence to suggest that bus improvement schemes result in a modal shift away from private vehicles; schemes used passenger surveys or quantitative methods including cordon counts to establish whether there had been an increase of public transport users.

The average cost of delivering a bus improvement scheme was £22m, however there was a large variation between the least and most expensive schemes. Only three bus improvement schemes calculated an outturn BCR, two of which recorded a drop in Value for Money category, however with such a small sample size a definitive conclusion cannot be drawn regarding the value for money of bus improvement schemes.

Since 2019 the Government has committed to improving bus services across England through the delivery of £200 million of funding through the *Better Deal for Bus Users* programme and more recently publishing *Bus Back Better*, the national bus strategy for England. Local Authorities across England have been asked to develop a Bus Service Improvement Plan (BSIP) for their area, and therefore the interest in bus schemes is at a peak. This section of analysis has been carried out in response to the focus on England's bus service, to understand the outcomes and lessons learned from schemes with bus priority, interchange or Bus Rapid Transit (BRT) elements. This includes the schemes in Table 12-1.

Table 12-1 Schemes with a bus improvement element

Scheme	Short scheme description
Mansfield Public Transport Interchange	New bus station with a total of 15 bays and 1 dedicated coach bay - pedestrian footbridge connects to Mansfield Railway Station.
Weston Package Phase 1	Increased road capacity, new interchange and car park at Worle railway station and bus route improvements.
Portsmouth Tipner Interchange	Construction of a junction on the M275 at Tipner and a new Park and Ride facility.
Access York Phase 1	Two new park and ride sites and associated highway improvements.
Luton Town Centre Improvements	Construction of a link road which completes the missing link of the Town Centre inner ring road, construction of a new bus interchange next to Luton station and changes to traffic circulation on the north side of the town centre.
Reading Station Highway Improvements	South-Western and Northern Interchange schemes - a new multi-modal transport interchange complementary to the Reading Station performance and capacity upgrade infrastructure works.
Loughborough Town Centre Improvements	Highway and junction improvements around Loughborough town centre, an improved pedestrian environment in the heart of the town centre and a new bus interchange.
Rochdale Interchange	The scheme involved the construction of a new interchange to serve bus passengers and passengers from the adjacent town centre Metrolink terminus.
Bath Transport Package	Public transport/public realm improvements in the City of Bath, including upgrades to 9 bus routes, with real-time information, shelters and on-street bus priority measures.
South Yorkshire Bus Rapid Transit (North)	The Bus Rapid Transit North scheme consists of two main components: - A high-quality BRT service - A new highway link
Pennine Reach (Blackburn)	Dedicated bus priority, improvements to traffic signals, improved passenger waiting facilities, improved ticketing and complimentary walking and cycling routes.

Scheme	Short scheme description
Manchester Cross City Bus Package	Cross City bus package and bus priority measures, with significant measures to improve provision for cyclists and pedestrians.
Hucknall Town Centre Improvements	Two new signalised junctions, pedestrianisation of the high street, new purpose bus-only link between the new road and the High Street and new relief bypass road.
Transport Hub in Lincoln	The scheme consists of a new, modern, state-of-the-art bus station and adjacent 1000 space multi-story car park.

12.1. Journey times and reliability

All but two bus improvement schemes presented some data on journey times and reliability of bus services post-scheme. The results are largely inconclusive, with schemes reporting improvements on some routes or in some time periods but rarely all. Several schemes did not look specifically at bus journey times, but rather journey times for all vehicles and inferred the benefits or disbenefits for buses.

A summary of the findings is shown in Table 12-2.

Table 12-2 Evidence on changes in bus journey times and / or reliability




Scheme	Evidence on changes in bus journey times and / or reliability
Mansfield Public Transport Interchange	5.4% increase in the number of buses recorded on time in the new bus station , and a 13.5% increase in the annual network punctuality. Bus provider Trent Barton has reported an average saving of 3 minutes per journey in 2014.
Weston Package Phase 1	No specific bus journey time data presented, but journey time reliability has improved on the A370 and B3440 merge at Junction 21, and journey times have decreased for traffic joining from the M5. In the town centre area, journey times have improved inbound, but are slightly slower outbound. This is likely due to the additional traffic controls for pedestrians/cyclists and is therefore not necessarily a negative.
Reading Station Highway Improvements	Bus journey times were analysed using peak and free-flow speeds, showing that all bus routes' peak speed is fairly close to their free-flow speed . The journey time in the AM peak from the start of a trip at St Andrew's Church to the station has decreased from 25 minutes before the scheme opened to 20 minutes with the scheme. The timetabled journey time from Caversham Library to the Station is now 5 minutes and was previously 10 minutes. This shows a substantial time saving of 5 minutes for these bus trips to Reading station.
Loughborough Town Centre Improvements	There is no clear pattern in journey times overall . In the AM peak there has been a saving of over 3.5 mins for the route northbound through the town centre. Large savings are also seen on route 4 (to the University) - up to 1min 40 in the AM and 1min 16 in the PM peak. Most other services showed negligible changes, or a decrease in journey times.
Bath Transport Package	Journey times through all upgraded junctions decreased for all traffic . Bus punctuality was measured in 2011 and 2016 and shows that although the average punctuality of the routes has decreased slightly (5%), there has been an increase in both the minimum and maximum number of services running on time across all routes.
Portsmouth Tipner Interchange	There was almost no change (less than 10%) in journey times on the majority of strategic routes . Journey times on the M275 worsened in the AM peak and weekend peak (southbound), primarily due to increased JTs between Portsbridge and Rudmore Roundabout.

Scheme	Evidence on changes in bus journey times and / or reliability
South Yorkshire Bus Rapid Transit (North)	Overall a mixed picture; there is an increase in bus journey times for the both the AM and PM peaks and a slight increase in punctuality for the X78. For the X1 there is a slight reduction in journey times in the PM peak. A 2017 customer satisfaction survey also indicated 80.7% of customers were satisfied or very satisfied with the reliability of the service and 85.4% of customers were satisfied or very satisfied with the journey time of the service.
Pennine Reach (Blackburn)	There was an improvement in on-time compliance between 2016 and 2017 for all services analysed, although there are still some issues with ongoing works. Overall, bus journey times have been both positively and negatively affected as a result of the Pennine Reach scheme. The most significant journey time saving is seen for the Furthergate Eanam northbound movement in the PM peak period, with a journey time saving of 2 minutes 24 seconds. The most significant increase in journey time is seen for the Darwen southbound movement with an increase of 6 minutes and 46 seconds. Overall, the majority of sites have seen some benefit with no significant impact seen for bus journey times.
Access York Phase 1	The additional traffic on the A59 corridor has been accommodated without a significant increase in travel times on the corridor for general traffic. Observation suggests that bus services gain additional journey time benefits from the bus priority measures on the A59 (inbound) and work is ongoing to further improve bus benefits through enhancements to signal control on the corridor. Consequently, it is reasonable to infer that the bus priority measures on the A59 have improved bus journey times.
Manchester City Centre Bus Package	In the Regional Centre and along Oxford Road, the variability of bus journey times has reduced by over 30% in some time periods. Following the completion of the Busway scheme and associated measures, journey times between Leigh and Manchester are consistently 50 minutes. Interchange times have also been reduced by improving the bus services.










12.2. Bus patronage and modal shift

Most of the bus improvement schemes provided some information around changes in bus patronage as a result of the improvements. These has been a general background trend of decreasing bus use in England since 2013³⁰, and many of the schemes referenced this in response to bus patronage findings. Despite the background decline, two thirds of the schemes shown in Table 12-3 provide evidence of increases in patronage.

Table 12-3 Evidence of changes in bus patronage

Scheme	Patronage data	Detail
Mansfield Public Transport Interchange	 Increase	7% increase in patronage – 2% above forecast in the business case.
Portsmouth Tipner Interchange	 Increase	Patronage was higher than forecast - +21 passengers in the AM peak hour, and +60 in the inter peak. Use by commuters is much lower but increasing. Patronage has increased monthly since April 2014 (29,000 trips) to August 2014 (70,600 trips).
Access York Phase 1	 Inconclusive	Patronage for P&R as a whole has increased by about 4% from 2011/12 to 2017/18. However, the control site (Grimston) has seen patronage decline by about 10% while Askham Bar, Poppleton Bar and Rawcliffe Bar have increased patronage by around 10%.

³⁰ [Annual bus statistics: England 2019/20 \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

Scheme	Patronage data	Detail
Reading Station Highway Improvements	 Increase	32% increase in passenger movements since 2010. The number of passengers using the northern interchange for inbound journeys has increased 32% and for outbound, 42%.
Loughborough Town Centre Improvements	 Increase	Before works began, patronage was down 4.8% overall. In Q1+2 of 2017 (post-scheme) patronage was up 3.6% against the baseline. Journeys beginning in Loughborough are at 32.6% compared to 35.6% in 2013. Boardings at Leicester, Derby and Nottingham are back to pre-pedestrianisation levels. Boardings continue to increase at East Midlands Airport.
Rochdale Interchange	 Decrease	Patronage has fallen 10.5% on weekdays between 2014 and 2011, and 22.1% at weekends over the same period. There has been a fall of 9.6% in bus trips ending at the interchange. However, there has also been a 7% drop in people entering the town centre over the same period, and a 6% decline in bus usage across Greater Manchester.
Bath Transport Package	 Increase	Annual patronage has increased on the majority of bus services in Bath between 2013 and 2015. A year-on-year increase in patronage was also shown at the three park and ride sites. Patronage on services 31 and 41 increased by more than 200,000 passengers each between 2012/13 and 2014/15.
South Yorkshire Bus Rapid Transit (North)	 Increase	X1 patronage growth has outperformed the rest of the South Yorkshire bus sector, gathering 1.66 million journeys in its first 12 months and expanding the Lower Don Valley market by 0.54 million customers, against a decline across the rest of the county.
Pennine Reach (Blackburn)	 Inconclusive	Data provided by Transdev showed a 2.9% decline in passenger numbers on the route 1 service, and a 12% increase on routes 6 and 7.
Manchester Cross City Bus Package	 Increase	Data from passenger surveys suggests modal shift from car to Vantage services has been in the range of 20% to 25%, with a lower level of modal shift achieved by the other services' introduction or extension.
Hucknall Town Centre Improvements	 Increase	The number of bus users has increased by 9%, however there has been a drop of 6% in passengers getting off at bus stops within the town since 2015. Trent Barton patronage data shows that there has been a 7.8% increase on their services since 2017.
Transport Hub in Lincoln	 Decrease	Between March and May 2018, passenger numbers reached 1,380,000 compared to 1,433,000 in 2017 and 1,517,000 in 2015. Whilst patronage has not increased one-year post-implementation of the bus station, it is clear that the rate of decline has slowed substantially in the last year compared to the previous 3 years. This reduction in the rate of decline could be attributable to the scheme directly, but also indirectly through increased investment in buses by Stagecoach.

It is not possible to directly compare the increases in patronage between different schemes as the data is provided in different formats. However, out of the 12 schemes that provided data, 8 saw some measure of patronage increase relative to a pre-scheme baseline. This suggests that bus improvements on the whole do result in increases in passenger numbers. However, the wider decline in bus use can make it challenging to detect improvements unless a suitable counterfactual can be identified.

Schemes opted to evidence modal shift using different types of data. Manchester Cross City Bus Package, South Yorkshire Bus Rapid Transit, Tipner Interchange and Mansfield Public Transport Interchange all used passenger survey data to understand the level of modal shift created by the scheme. According to customer experience surveys:

Meta-evaluation of Local Major Schemes

- The Park and Ride at Tipner, Portsmouth, has encouraged 78% of questionnaire respondents to travel into Portsmouth by bus rather than by car;
- A survey of passengers on South Yorkshire's X1 service showed that 20% of respondents previously made their journey by another mode; and
- Between 20-25% of passengers on Manchester's 'Vantage' services say they would have travelled by car in the absence of the service. 58% of passengers said that they had a car available for their current journey (either as the driver or a passenger).

The surveys generally yield positive results regarding mode. However, the questions asked in the surveys often do not provide a conclusive answer to whether the modal shift is away from private vehicle or active modes.

Other schemes have adopted quantitative methods to assume mode shift. The Bath Transportation Package evaluation notes that pedestrian footfall and bus patronage have increased, and the annual increase in car trips within the outer cordon of the city centre has slowed considerably. However, there is no evidence that directly links the increase in active modes and public transport usage with the slowing of car traffic increases. Similarly, vehicular monitoring data from Luton Town Centre showed that the number of bus passengers was increasing combined with a drop in motor vehicle traffic in the town centre.

12.3. Air quality

There were seven bus improvement schemes that provided quantitative information about air quality. All of these schemes reported on NO₂ levels, with one also addressing particulate matter, and all schemes declared some level of improvement in air quality over time. Some schemes, such as the Bath Transportation Package, provided data from different sites around the local area, and in these cases the majority of sites recorded an improvement in NO₂ levels.

Attribution was a key issue for air quality analysis; while some schemes were able to measure air quality at local points on routes affected by the improvement schemes, others did not have this data available or were operating over a much larger area. The Access York scheme evaluation noted:

"The data presented...shows that the total number of passengers using park and ride buses only increased by around 4% from 2012 to 2018. Since this represents only a small proportion of total traffic within the AQMA, it is likely that very little of the 20% reduction in nitrogen dioxide concentration seen between 2012 and 2016 can be attributed to the park and ride scheme."

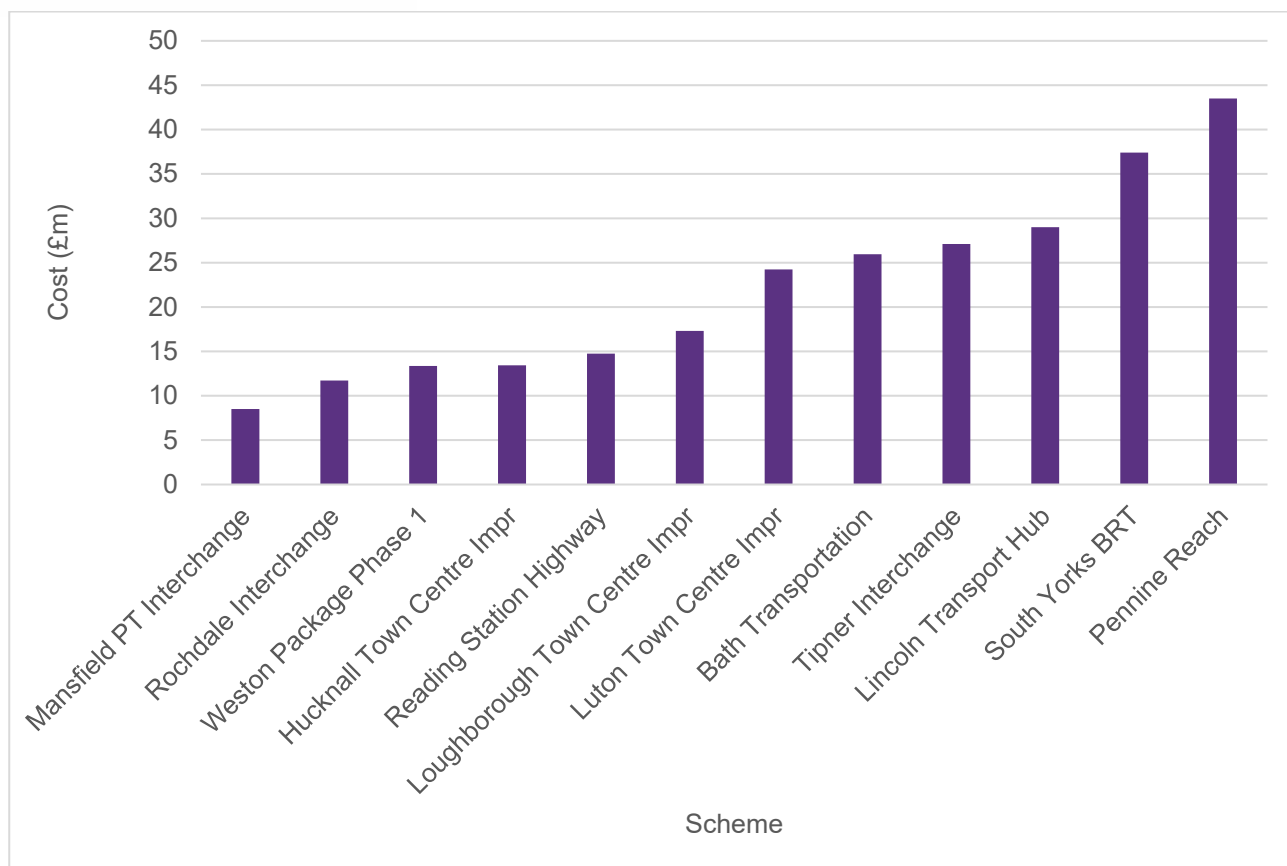
While it is logical that mode shift away from private cars that is associated with bus scheme upgrades results in better air quality, and the schemes in this sample support this conclusion, it is a very difficult link to prove on a scheme-by-scheme basis.

12.4. Cost and value for money

Cost information was available for all but one of the bus schemes, however, the Manchester Cross City Bus Package has once again been removed from the analysis to avoid skewing the results³¹. For the 12 remaining schemes, the average cost was £22.2m; the least expensive scheme came in at £8.5m (Mansfield Public Transport Interchange) and the most expensive at £43.5m (Pennine Reach).

³¹ The Manchester Cross City Bus Package comprised many different elements and was delivered in a series of separate interventions. This made it difficult to establish an outturn cost that was comparable to the forecast, so the cost of the scheme has therefore not been included in the analysis.

Figure 12-1 Outturn Cost of bus schemes



Three of the bus schemes provided an outturn BCR, as shown in Table 12-4.

Table 12-4 Value for money of bus improvement schemes

Scheme	Forecast BCR	Outturn BCR	Change in BCR
Portsmouth Tipner Interchange	7.46	0.06	↓
Rochdale Interchange	4.2	5.63	↑
Pennine Reach (Blackburn)	2.73	1.63	↓

The small sample size limits the ability to provide representative conclusions regarding the value for money achieved by bus schemes. The two schemes which reported a drop in outturn BCR did so because journey time savings were below forecast and these made up the majority of the benefits. In the case of the Tipner Interchange, the outturn BCR is assumed to have been affected by the disbenefits for non-bus traffic.

13. Unintended Impacts of Local Major Schemes?

Key findings

RQ12. Are there any unintended impacts of Local Major Schemes?

In general, unintended impacts are not well covered within scheme evaluations.

One of the aims of a Fuller Evaluation is to report on whether schemes have had any unintended adverse or positive affects, i.e. outcomes which were not anticipated in the logic map.

In general, unintended impacts are not covered within the scheme evaluation reports. Three schemes did provide explicit reference to unintended or unanticipated consequences of the scheme:

- **Rochdale Interchange:** positive unintended impacts included passenger information displays being much more popular than anticipated, the interchange acting as a destination in its own right, staff having a closer relationship with passengers due to the layout of the interchange encouraging more frequent interaction, and the new design of interchange being easier to understand and use from an accessibility point of view. Some negative impacts were also observed, such as minor remedial works being needed to the system that enabled safe roof maintenance, flooding in times of bad weather, and an increase in anti-social behaviour around the interchange.
- **Darlaston Strategic Development Area (DSDA):** one of the aims of this scheme ('improve visibility on the approach to junctions, to increase permeability and safety within the DSDA and at key strategic access points') was achieved but with some unintended outcomes according to the evaluation report. Improvements had been made on Bentley Road South to remove the curvature of the road and improve sight lines. However, some local stakeholders noted that the improvements have resulted in a perceived increase in speeds on internal roads in the site, making it difficult for some HGVs to exit and manoeuvre safely.
- **Norwich NDR:** As part of the evaluation, stakeholders were consulted on unintended outputs. They reported that there had been a number of road accidents occurring on new roundabouts built on the scheme, and that the newly constructed lagoons near Norwich Airport had not drained quickly enough to meet Environment Agency discharge requirements, and that further mitigation had been required.

The scheme promoter survey (June 2021) was also used to identify whether any unanticipated impacts have been observed following scheme delivery. Responses tended to be scheme specific.

For example, two scheme promoters delivering highway schemes reported that they had recorded several instances of drivers either wilfully or unintentionally using the new road layout incorrectly (believed to be anecdotal evidence). Both noted that although the impacts were unexpected, they have improved over time as people have become used to the new road layout and enforcement has been put in place where necessary.

Another scheme promoter reported that a scheme to reduce congestion had unexpectedly displaced traffic onto other routes and shifted congestion to another location.

14. Lessons Learned

RQ13. What lessons can be learned to improve Local Major scheme evaluation?

Key findings

Although the majority of schemes were undertaken following the publication of the 2012 DfT evaluation guidance, there are elements of evaluations that were either inconsistent, or not undertaken at all. Attribution of certain impacts to schemes (especially at the one year after opening stage) proved to be particularly challenging.

RQ14. What key learning points should be communicated to future Local Major Scheme promoters?

Key findings

Scheme promoters should be aware that timescales and budgets can slip, so should plan accordingly. There were some common themes in terms of lessons learnt that centred around the benefits of early contractor involvement and also continuous stakeholder engagement throughout the scheme development process.

14.1. What lessons can be learned to improve Local Major scheme evaluation?

The list below provides a summary of the key lessons that are of relevance to DfT. Due to the data limitations discussed in this report, the lessons drawn out mainly address appraisal and evaluation design and approaches. The lessons have been broadly grouped in the following categories:

- Adherence to DfT evaluation guidance
- Consistency of scheme evaluations
- Data Collection
- Evaluation good practice

Adherence to DfT evaluation guidance

- Most of the evaluations considered in this meta-evaluation were undertaken following publication of the 2012 evaluation framework guidance, which aimed to make the evaluation process as consistent and proportionate as possible. The list below contains several findings which suggest that this consistency in evaluations has not yet been fully achieved. The structure, content and detail of evaluation reports varies significantly, despite DfT evaluation guidance which specifies the requirements for each type of evaluation (Standard, Enhanced, Fuller).
- Very few evaluations followed the guidance that up to three main objectives of the scheme should be identified and appropriate metrics used to assess whether they have been achieved. Some reports provided very light touch objective-specific evidence, while others presented a much larger number of objectives.
- Over half of the reports in the sample did not refer to the logic maps / theory of change which should have been undertaken as part of the development of the monitoring and evaluation plans.
- There is evidence to show that scheme promoters find it very difficult to assess the impact of Local Major Schemes on carbon, based on either the lack of evidence presented or the inconsistencies in approaches used to quantify the impacts. For the vast majority of schemes, there has been no comparison between forecast and actual carbon impacts.
- There is little evidence of comparison of forecast vs outturn impacts, which makes it difficult for DfT to build up an evidence base on the accuracy of forecasting methods.

Meta-evaluation of Local Major Schemes

- To improve the quantitative evidence on achieved value for money, relevant scheme evaluations should calculate an outturn benefit to cost ratio using observed data. The current DfT evaluation guidance requests that outturn BCRs be calculated as part of Fuller Evaluations only. Consideration should be given to emphasising this requirement more clearly in the guidance and providing further advice on how to do this.
- Many reports were completed significantly later than their One or Five Year After opening anniversary. The importance of timely delivery of scheme evaluation reports should be more strongly emphasised to scheme promoters.

Consistency of scheme evaluations

- Many aspects of transport schemes (such as carbon and passenger satisfaction) were measured in different ways or not measured at all, which made comparisons across schemes difficult. Consideration should be given to providing more prescriptive guidance for some metrics to ensure comparable measurement approaches are used.
- The reporting of environmental impacts was mixed, with some scheme evaluations using observed measurements of noise and air quality, and others basing the assessment on changes in traffic volumes. Whilst it is accepted that different methods are required for different types of schemes, attribution of scheme impacts was difficult with both approaches.

Data Collection

- There was evidence of variations in the quality of data or missing data which impacted on the quality of evaluations. For example, missing data for new sections of road, or walking and cycling data collected on a single day. The guidance should stress the importance of planning ahead so that appropriate data is collected on a timely basis, that will meet the requirements of the evaluation.
- Baseline data collection that relies on that used to inform the appraisal often has limitations, due to the time gap between the appraisal and construction starting.

Evaluation good practice

- Stakeholder / user surveys were particularly useful for estimating the extent to which observed changes in key metrics can be attributed to the scheme in question, including impacts on the local economy and user satisfaction.
- A small number of reports use counterfactual or comparator analysis to demonstrate attribution of impacts, but in general this is an area for improvement. Further analysis of how to undertake counterfactual analysis would be useful.

14.2. What key learning points should be communicated to future Local Major scheme promoters?

The list below contains a summary of the key lessons relevant for scheme promoters following the review of the collective findings of the evaluation reports included in this meta-evaluation.

- Scheme delivery timescales can slip. Scheme promoters should take account of the common reasons for delays and incorporate them into their risk management strategies and scheme programmes.
- Schemes often cost more than anticipated. Scheme promoters should take account of the common reasons for overspend and incorporate these into their risk management strategies and forecasts.
- It is important to plan ahead so that appropriate data is collected on a timely basis, that will meet the requirements of the evaluation.

Some evaluation reports presented scheme specific lessons learnt, particularly those that included a process evaluation. The list below contains a summary of some of the key lessons identified that may benefit other scheme promoters:

- Early engagement with contractors during the scheme development and design phase is often seen as beneficial to ensure that a realistic programme is developed and delivery risks are identified and mitigated as early as possible.
- The public and stakeholders do not always fully understand the scheme development process i.e. when they can comment and when it's too late. It is therefore suggested that consultation material at significant consultation stages includes a flow diagram explaining the scheme development process, the stage the scheme is at and when comments can be addressed within the emerging scheme design.
- For schemes which involve rail possessions or working near railways, early engagement and clear communication with Network Rail is seen as crucial to reduce the risks of delays to scheme delivery programmes.
- A comprehensive communication programme with local stakeholders affected by the scheme was cited as an important element for success in a few cases.
- Some scheme promoters suggested planning the construction schedule to maximise progress made in spring/summer where better weather conditions are more likely.
- Continuity of personnel on all sides (client, contractor, designer) if possible, is often seen as beneficial to the smooth delivery of the project.

Appendix A. Short Scheme Descriptions

The table below sets out a short description of each scheme, including the scheme promotor and the total outturn cost.

Scheme name	Scheme promoter	Outturn scheme cost (£m)	Scheme description
North East			
Morpeth Bypass	Northern Northumberland County Council	32.654	A 3.8km new route extending from a new junction on the A1 to the existing A197/B1337 Roundabout.
North West			
Rochdale Interchange	Rochdale Borough Council	11.728	The scheme involved the construction of a new interchange to serve bus passengers and passengers from the adjacent town centre Metrolink terminus.
Thornton to Switch Island (Sefton)	Sefton Metropolitan Borough Council	20.795	The scheme consists of the provision of a new single carriageway highway link between the A565 Southport Road, Thornton and the M57, M58, A59 and A5036 Switch Island junction, bypassing the local communities of Netherton and Thornton.
Crewe Green Link Road	Cheshire East Council	26.211	The Crewe Green Link Road South (CGLRS) links the A500 Hough-Shavington Bypass and the A5020 Weston Gate Roundabout.
Heysham-M6 Link Road	Lancashire County Council	139.200	Construction of a new dual carriageway link between Heysham and the M6.
Pennine Reach	Blackburn with Darwen Borough Council	43.500	Dedicated bus priority, improvements to traffic signals, improved passenger waiting facilities, improved ticketing and complementary walking and cycling routes.
Manchester City Bus	Transport for Greater Manchester	N/A	Cross City bus package and bus priority measures on a series of routes.
Mersey Gateway	Halton Borough Council	185.600	A six-lane toll bridge over the River Mersey between the towns of Runcorn and Widnes.
Yorkshire and Humberside			
A164 Humber Bridge to Beverley Improvements	East Riding of Yorkshire Council	10.097	Improvements to the Willerby, Sports Centre, Castle Hill and Skidby roundabouts, implementation of a dual carriageway between Willerby and Castle Hill roundabouts, and improvements to NMU facilities along the A164.
White Rose Way Improvement Scheme	Doncaster Metropolitan Borough Council	17.040	Widening of 1.9km of existing single carriageway to dual carriageway standard and replacement of the 2 roundabouts with signalised junctions with associated cycle way and footpath improvements.
Todwick Crossroads Improvement	Rotherham Metropolitan Borough Council	14.913	Dualling along A57 together with a new roundabout to replace a signal-controlled crossroads.
Access York Phase 1	City of York Council	Not provided	Two new park and ride sites and associated highway improvements.
Leeds Station Southern Access	West Yorkshire Combined Authority	17.673	An additional access to Leeds Rail Station.

Scheme name	Scheme promoter	Outturn scheme cost (£m)	Scheme description
Leeds Inner Relief Road Maintenance	Leeds City Council	24.955	Essential safety and maintenance work carried out on three large highway structures on the A58M/A64M Leeds Inner Ring Road (IRR).
Leeds Rail Growth	West Yorkshire Combined Authority	N/A	Two new rail stations on the Airedale and Wharfedale rail lines.
Bedale/Aiskew/Leeming Bar Bypass	North Yorkshire County Council	30.300	4.8km single carriageway from A684 North of Bedale to A684 east of Leeming Bar.
South Yorkshire Bus Rapid Transit North	South Yorkshire Passenger Transport Executive	37.402	The Bus Rapid Transit North scheme consists of two main components: - A high-quality Bus Rapid Transit service - A new highway link
West Midlands			
Evesham Bridge	Worcestershire County Council	8.200	Refurbishment and replacement of the existing Abbey Bridge roadway and viaduct over the river Avon and flood plain.
Worcester Integrated Transport	Worcestershire County Council	20.400	Multi-modal improvement corridors North East along Tolladine Road and North along Ombersley Road, demand management using Intelligent Transport Systems (such as variable messaging and Real Time Information at bus stops), improvements to Worcester Foregate Street and Malvern Link stations, and Southern Link Road improvements
Coventry-Nuneaton Rail (Phase 1)	Coventry City Council	15.500	Two new stations opened on the Coventry-Nuneaton rail line.
Midland Metro Birmingham City Centre Extension	Transport for West Midlands	N/A	Replacement of metro fleet providing additional trams and increased capacity, and 1.4km extension through Birmingham City Centre with associated stops.
Darlaston Access Improvement	Walsall Metropolitan Borough Council	Not provided	A series of highway improvements to provide better access to key employment development sites.
A45 Westbound Bridge	Solihull Metropolitan Borough Council	11.948	Full bridge replacement.
East Midlands			
Mansfield Public Transport Interchange	Nottinghamshire County Council	8.500	New bus station with a total of 15 bays and 1 dedicated coach bay - pedestrian footbridge connects to Mansfield Railway Station.
A43 Corby Link Road	Northamptonshire County Council	37.000	Connects the A43 from Lincoln to the A6003 and the A14, improving access from the east side of Corby to Kettering and the wider highway network. The new link road comprises a 6.5 km dual carriageway.
Loughborough Town Centre Improvements	Leicestershire County Council	17.320	Highway and junction improvements around Loughborough town centre, an improved pedestrian environment in the heart of the town centre and a new bus interchange.
London Road (Bridge) Derby	Derby City Council	6.900	London Road Bridge Replacement involves a full replacement of the bridge to national weight carrying standards.
Nottingham Tram Extension (NET2)	Nottingham City Council	N/A	Extend Nottingham's existing tram network by 17.5km and 28 new tram stops.
Nottingham Ring Road	Nottingham City Council	16.175	A series of enhancements to the A6514 Ring Road, the major orbital route on the west side of Nottingham.

Scheme name	Scheme promoter	Outturn scheme cost (£m)	Scheme description
Hucknall Town Centre Improvements	Hucknall Town Centre Improvement	13.430	Two new signalised junctions; pedestrianisation of the high street; new purpose built-only link road; new relief bypass road.
Transport Hub in Lincoln	City of Lincoln Council	29.000	The scheme consists of a new, modern, state-of-the-art bus station and adjacent 1000 space multi-story car park.
East			
Luton Town Centre	Luton Borough Council	24.230	Construction of a link road which completes the missing link of the Town Centre inner ring road Construction of a new bus interchange next to Luton station. Changes to traffic circulation on the north side of the town centre.
Norwich NDR	Norfolk County Council	151.147	The NDR is a dual carriageway, all-purpose strategic distributor road, with an entire length of approximately 20km and includes at-grade roundabout junctions at intersections with existing radial routes.
South East			
Walton Bridge	Surrey County Council	32.628	Replacement of an existing life expired bridge with a new bridge.
Portsmouth Northern Road Bridge	Portsmouth City Council	9.195	Replacement of an existing life expired bridge with a new bridge.
Portsmouth Tipner Interchange	Portsmouth City Council	27.100	Construction of a junction on the M275 at Tipner and a new Park and Ride facility.
Reading Station Highway Improvements	Reading Borough Council	14.750	South-Western and Northern Interchange schemes - complementary to the Reading Station performance and capacity upgrade infrastructure works.
Bexhill-Hastings Link Road	East Sussex County Council	113.460	The Bexhill to Hastings Link Road, called Combe Valley Way is a single-carriageway road which links the outskirts of Bexhill and Hastings.
South West			
East of Exeter	Devon County Council	16.169	New all movements junction off the A30 at J29 of the M5 and a new link road providing access to the Science Park and old A30. Improved pedestrian and cyclist facilities across J29.
Weston Package Phase 1	North Somerset Council	13.357	Increased road capacity, new interchange and car park at Worle railway station and bus route improvements.
Camborne-Pool-Redruth TP	Cornwall Council	28.540	The project comprises highway improvements to facilitate regeneration of a former industrial area.
Kingskerswell Bypass	Devon County Council	117.998	5.5km dual carriageway bypass of Kingskerswell.
Bath Transportation Package	Bath & North East Somerset Council	25.958	Public transport/public realm improvements in the City of Bath.

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